UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2023

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from __________ to __________

Commission File Number 001-39277

MP MATERIALS CORP.
(Exact name of registrant as specified in its charter)

Delaware	84-4465489
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

1700 S. Pavilion Center Drive, Suite 800
Las Vegas, Nevada 89135
(Address of principal executive offices and zip code)

(702) 844-6111
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value of $0.0001 per share	MP	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☑

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☑	Accelerated filer	☐	Non-accelerated filer	☐	Smaller reporting company	☐	Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☑

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

As of June 30, 2023, the aggregate market value of the voting common stock held by non-affiliates of the registrant was approximately $3.6 billion. Such aggregate market value was computed by reference to the closing price of the common stock as reported on the New York Stock Exchange on June 30, 2023. As of February 20, 2024, the number of shares of the registrant's common stock outstanding was 178,077,678.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive 2024 proxy statement, anticipated to be filed with the Securities and Exchange Commission within 120 days after the end of the registrant's fiscal year, are incorporated by reference into Part III of this Form 10-K.

MP MATERIALS CORP. AND SUBSIDIARIES
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References herein to the “Company,” “MP Materials,” “we,” “our,” and “us,” refer to MP Materials Corp. and its subsidiaries.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Certain statements included in this Annual Report on Form 10-K for the year ended December 31, 2023 (this “Annual Report”), that are not historical facts are forward-looking statements under Section 27A of the Securities Act of 1933, as amended and Section 21E of the Securities Exchange Act of 1934, as amended. Forward-looking statements may be identified by the use of the words such as “estimate,” “plan,” “shall,” “may,” “project,” “forecast,” “intend,” “expect,” “anticipate,” “believe,” “seek,” “target,” or similar expressions that predict or indicate future events or trends or that are not statements of historical matters. These forward-looking statements include, but are not limited to, statements regarding estimates and forecasts of other financial and performance metrics and projections of market opportunity. These statements are based on various assumptions, whether or not identified in this Annual Report, and on the current expectations of our management and are not predictions of actual performance. These forward-looking statements are provided for illustrative purposes only and are not intended to serve as, and must not be relied on by any investor as, a guarantee, an assurance, a prediction or a definitive statement of fact or probability. Actual events and circumstances are difficult or impossible to predict and will differ from assumptions. Many actual events and circumstances are beyond our control.

These forward-looking statements are subject to a number of risks and uncertainties, including:

- fluctuations and uncertainties related to demand for and pricing of rare earth products;
- uncertainties regarding the growth of existing and emerging uses for rare earth products and ability to compete with substitutions for such products;
- the intense competition within the rare earth mining and processing industry;
- uncertainties relating to our commercial arrangements with Shenghe Resources (Singapore) International Trading Pte. Ltd., an affiliate of Shenghe Resources Holding Co., Ltd., a global rare earth company listed on the Shanghai Stock Exchange;
- potential changes in China’s political environment and policies;
- unanticipated costs or delays associated with the ramp-up of our Stage II optimization project;
- unanticipated costs or delays associated with our Stage III project;
- risks associated with our intellectual property rights, including uncertainties related to the Company’s ability to obtain the intellectual property rights or licenses of intellectual property rights to produce NdFeB magnets and precursor materials;
- uncertainties related to the Company’s ability to produce and supply NdFeB magnets and precursor materials;
- the ability to convert current commercial discussions with customers for the sale of rare earth oxide and metal products, NdFeB magnets and other products into contracts;
- potential power shortages and interruptions at the Mountain Pass Rare Earth Mine and Processing Facility;
- increasing costs or limited access to raw materials that may adversely affect our profitability;
- fluctuations in transportation costs or disruptions in transportation services;
- inability to meet individual customer specifications;
- diminished access to water;
- regulatory and business risks associated with the Company’s investment in VREX Holdco Pte. Ltd.;
- uncertainty in our estimates of rare earth oxide reserves;
- risks associated with work stoppages;
- a shortage of skilled technicians and engineers;
- loss of key personnel;
- risks associated with the inherent dangers involved in mining activity and manufacturing of magnet materials;
- risks associated with events outside of our control, such as natural disasters, climate change, wars or health epidemics or pandemics;
- risks related to technology systems and security breaches;
- ability to maintain satisfactory labor relations;

- ability to comply with various government regulations that are applicable to our business;
- ability to maintain our governmental licenses, registrations, permits, and approvals with numerous governmental agencies necessary for us to operate our business;
- risks relating to extensive and costly environmental regulatory requirements;
- risks associated with the terms of our convertible notes; and
- those factors discussed within “Part I, Item 1A. Risk Factors” of this Annual Report.

If any of these risks materialize or our assumptions prove incorrect, actual results could differ materially from the results implied by these forward-looking statements.

These and other factors that could cause actual results to differ from those implied by the forward-looking statements in this Annual Report are more fully described within “Part I, Item 1A. Risk Factors.” The risks described within “Part I, Item 1A. Risk Factors” of this Annual Report are not exhaustive. Other sections of this Annual Report describe additional factors that could adversely affect our business, financial condition or results of operations. New risk factors emerge from time to time, and it is not possible to predict all such risk factors, nor can we assess the impact of all such risk factors on our business or the extent to which any factor or combination of factors may cause actual results to differ materially from those contained in any forward-looking statements. All forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by the foregoing cautionary statements. We undertake no obligation to update or revise publicly any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

In addition, statements of belief and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us, as applicable, as of the date of this Annual Report, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain, and you are cautioned not to unduly rely upon these statements.

PART I

ITEM 1. BUSINESS

Overview

MP Materials Corp., including its subsidiaries (the "Company," "MP Materials," "we," "our," and "us"), is the largest producer of rare earth materials in the Western Hemisphere. The Company, which is headquartered in Las Vegas, Nevada, owns and operates the Mountain Pass Rare Earth Mine and Processing Facility ("Mountain Pass"), the only rare earth mining and processing site of scale in North America, and is constructing a rare earth metal, alloy and magnet manufacturing facility in Fort Worth, Texas (the "Fort Worth Facility"), where the Company anticipates manufacturing neodymium-iron-boron ("NdFeB") permanent magnets and its precursor products.

The Company produces rare earth concentrate products as well as refined rare earth oxides and related products. The rare earth concentrate is principally sold pursuant to the Offtake Agreement (as defined in Note 20, "Related Party Transactions," in the notes to the Consolidated Financial Statements) to Shenghe (as defined in the "Customers" section below), that, in turn, typically sells that product to refiners in China. Following the commissioning of the Company's Stage II optimization project ("Stage II") in the third quarter of 2023, the Company began producing separated rare earth products, including neodymium-praseodymium ("NdPr") oxide, that it began selling to customers globally in the fourth quarter of 2023. Additionally, in April 2022, the Company entered into a long-term agreement with General Motors Company (NYSE: GM) ("GM") to supply U.S.-sourced and manufactured rare earth materials and finished magnets for the electric motors in more than a dozen models based on GM's Ultium Platform. These developments are part of the Company's Stage III downstream expansion strategy ("Stage III").

Certain rare earth elements ("REE") serve as critical inputs for the rare earth magnets inside the electric motors and generators powering carbon-reducing technologies such as hybrid and electric vehicles (referred to collectively as "xEVs") and wind turbines, as well as drones, defense systems, robotics and many other high-growth, advanced technologies. Our integrated operations at Mountain Pass combine low production costs with high environmental standards, thereby restoring American leadership to a critical industry with a strong commitment to sustainability. As electrification drives significant global growth in demand for REE, the Company believes global economic trends, geopolitical realities and sustainability mandates are coalescing to further its opportunity to create stockholder value. Further, the Company believes businesses are increasingly prioritizing diversification and security of their global supply chains to reduce reliance on a single producer or region for critical materials. As the only scaled source in North America for critical rare earths, with a processing footprint designed to operate with best-in-class sustainability and an industry-leading cost structure, the Company believes it is well-positioned to thrive as the global economy electrifies.

The Company's mission is to maximize stockholder returns over the long-term by executing a disciplined business strategy to restore the full rare earth supply chain to the United States of America. The Company believes it will generate positive outcomes for U.S. national security and industry, the U.S. workforce, and the environment.

Rare Earth Industry Overview

When compared to industrial elements found in nature, such as aluminum, copper, and lead, the global annual production of REE is noticeably low. However, REE have become crucial enablers of technologies that are at the core of climate change initiatives worldwide, as well as ubiquitous gadgets, electronics, and robotics that have permeated modern society. REE are used in small, but often necessary, amounts in hundreds of different technologies, materials, and chemicals worldwide for commercial, industrial, social, medical, and environmental applications. In just a period of decades, REE have deeply integrated into the foundation of modern technology and industry, and have proven to be difficult to duplicate or replace.

By economic value, NdPr is the largest segment of the REE market. NdPr is primarily used in NdFeB permanent magnets for EV traction motors, wind power generators, drones, robotics, electronics and a growing list of other applications. The rapid growth of these and other end-use markets is expected to drive substantial demand growth for NdPr and NdFeB magnets in the years ahead.

The REE group includes 17 elements, primarily the 15 lanthanide elements. Lanthanum, cerium, praseodymium, neodymium and promethium are considered "light" REE ("LREE"); samarium, europium and gadolinium are often referred to as "medium" REE; while terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium are considered "heavy" REE ("HREE"). Two additional elements, yttrium and scandium, are often classified as HREE although they are not lanthanides. Depending upon the rare earth-bearing mineral, the mixture of light, medium and heavy REE will differ. The REE in the Mountain Pass ore body are contained primarily within bastnaesite and related minerals in which LREE are most abundant.

The aggregate global market for rare earth oxides (“REO”) totaled approximately 209,000 metric tons (“MTs”) in 2023 and is expected to grow at a compound annual growth rate (“CAGR”) of approximately 6.1% through 2035, according to research by Adamas Intelligence Inc. (“Adamas”). Further, Adamas estimates that the NdPr segment of the REO market, which makes up a significant majority of the market value, is expected to grow at an 8.5% CAGR through 2035 (excluding the impact of swarf recycling), well in excess of the overall REO market. This expected growth will be driven by secular growth in demand for NdPr magnets.

Rare earth materials are used in a diverse array of end markets, including:

- ***Electric Mobility:*** traction motors in passenger xEVs, commercial xEVs, special purpose vehicles, two-wheelers, and other applications;
- ***Renewable Power Generation:*** wind power generators, for on- and offshore applications;
- ***Energy-Efficient Motors, Pumps and Compressors:*** heating, ventilation and air conditioning (“HVAC”) systems, elevators, escalators, consumer appliances and other industrial applications;
- ***Industrial and Service Robotics:*** motors, actuators, brakes and sensors used in industrial robots and welders, as well as service robots;
- ***Consumer and Medical Applications:*** smart phones, tablets, laptops, hard disk drives, audio speakers, microphones, cameras, printers, cordless power tools as well as fiber optics, laser crystals, x-ray equipment, prostheses, dental crowns and more;
- ***Critical Defense Systems:*** guidance and control systems, communications, avionics, global positioning systems, radar and sonar, drones, thermal barrier coatings and firearms; and
- ***Catalysts and Phosphors:*** catalysts for vehicle emissions reduction and fuel refining, as well as phosphors for energy-efficient lighting and counterfeit currency detection.

Process

The Company has established a three-stage business plan to enable and scale the full rare earth supply chain. Processing of rare earth materials at Mountain Pass includes five primary process steps: (i) mining and crushing; (ii) milling and flotation; (iii) roasting, leaching and impurity removal; (iv) separation and extraction; and (v) product finishing. Through its upstream operations (“Stage I”) (discussed below), which are comprised of the first two of these process steps, the Company produces rare earth concentrate that is marketed to refiners via a distribution arrangement. In 2023, the Company commenced midstream operations (“Stage II”), which consist of the latter three primary process steps to produce separated rare earth products that are marketed directly to end users and indirectly via distributors, with revenue generated primarily from the magnet supply chain. Lastly, the Company is establishing downstream (“Stage III”) capabilities at its Fort Worth Facility to convert a portion of the REO produced at Mountain Pass into rare earth magnets and its precursor products to be marketed directly to end users.

Stage I

Following the acquisition of Mountain Pass in July 2017, the Company began implementing Stage I, which was designed to re-establish stable, scaled production of rare earth concentrate leveraging the site’s existing processing facility. Stage I includes the mining of primarily bastnaesite ore followed by comminution, which involves crushing and grinding the ore into a milled slurry. Then, the milled bastnaesite slurry is processed by froth flotation, whereby the bastnaesite is carried to the surface while the gangue, or non-desired, elements are suppressed and disposed as tailings.

Since restarting operations from cold-idle status, the Company implemented changes in the milling, flotation and tailings management processes; implemented and continue to advance an improved reagent scheme to improve mineral recovery; and implemented operational best practices. Together, these changes materially increased plant uptime and reliability driving enhanced flotation throughput, REO recovery and production as well as tailings facility reliability and throughput at a lower cost per processed ton. Since the implementation of the Company’s Stage I optimization plan and the achievement of commercial production of concentrate, the Company’s quarterly REO Production Volume (as defined in Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations) has exceeded 8,500 MTs, and the Company has achieved at least 40,000 MTs of annual REO Production Volume since 2021. The Company’s Stage I optimization plan enabled it to achieve what the Company believes to be world-class production cost levels for rare earth concentrate.

In November 2023, the Company announced its “Upstream 60K” strategy whereby the Company intends to grow its annual REO Production Volume to approximately 60,000 MTs by expanding upstream capacity via investments in further beneficiation, including the ability to process alternative feedstocks and upgrade lower-grade feedstocks. The Company aims to achieve this initiative within the next four years with modest incremental capital investment.

Stage II

Stage II advanced the Company's operations from the production of rare earth concentrate to the separation of individual REE. The project incorporated upgrades and enhancements to the prior facility process flow intended to reliably produce separated REE at a low cost while minimizing the impact on the environment. More specifically, the Company reintroduced an oxidizing roasting circuit, reoriented portions of the plant process flow, increased product finishing capacity, improved wastewater management, and made other improvements to materials handling and storage.

The roasting step that oxidizes the rare earth concentrate in a rotary kiln is crucial to ensuring cost-competitiveness. One of the unique attributes of bastnaesite ore is the ability to convert the trivalent cerium in the mixed rare earth concentrate to tetravalent cerium that has a low propensity to dissolve, enabling cerium to be removed expediently along with other insoluble gangue elements without selective extraction. Removal of the lower-value cerium early in the Company's separations process allows for a significant reduction in the mass of material to be separated and finished, thus reducing the energy, reagents, and wastewater required to produce the higher-value NdPr. Additionally, roasting facilitates a lower temperature leach that reduces maintenance costs and downtime.

During the third quarter of 2023, the Company began producing separated rare earth products. However, the Company expects that it may take several quarters to achieve its designed throughput of separated products. As the Company increases production of separated products over time, it expects to improve the Company's per-unit costs of NdPr oxide, which represents a majority of the value contained in the Company's concentrate. In addition, in the fourth quarter of 2023, the Company began utilizing a tolling partner in Southeast Asia to process the Company's NdPr oxide into NdPr metal for delivery to the Company's customers globally.

In February 2022, the Company was awarded a $35.0 million contract by the Department of Defense's Office of Industrial Base Policy, Industrial Base Analysis and Sustainment program, to design and build a facility to process HREE. Successful completion of this project will establish, for the first time in many years, commercial-scale processing and separation of HREE in support of commercial and defense applications in the U.S. The HREE processing and separations facility (the "HREE Facility") will be built at Mountain Pass and will be integrated into the rest of the Company's Stage I and Stage II facilities. The Company is currently advancing the facilitating works, engineering and procurement for the HREE Facility, which is expected to support the separating of HREE contained in the Mountain Pass ore as well as from third-party feedstocks.

Stage III

The Company's mission is to restore the full rare earth magnetics supply chain to the U.S. by pursuing opportunities to integrate further downstream by converting NdPr oxide into permanent magnets and precursor products, as well as advancing magnet recycling capabilities. In February 2022, the Company commenced construction of a rare earth metal, alloy and magnet manufacturing facility in Fort Worth, Texas, completing the building and office space in November 2023. As currently designed, the Company expects the Fort Worth Facility to produce approximately 1,000 MTs of finished rare earth magnets per year, sufficient to power more than 700,000 electric vehicle motors annually. The rare earth magnets and precursor products produced may also support other key markets, including clean energy, electronic and defense technologies. The Fort Worth Facility serves as the business and engineering headquarters for the Company's magnetics division.

The Company's vertical integration into magnet production would establish MP Materials as the first and only fully-integrated source of supply for rare earth magnets in the Western Hemisphere. By offering magnet customers a complete, end-to-end Western supply chain solution, the Company believes vertical integration represents a material incremental value creation opportunity. The Company believes that the ability to capture significant value from magnet production requires a scaled, steady supply of NdPr, which the Company believes it is uniquely positioned to provide in the Western Hemisphere.

Strategy

Offer the Western Hemisphere a trusted, sustainable source of supply for materials and components that enable the development of critical industries.

More than 60 years of operations at Mountain Pass have demonstrated that the Company's ore body is one of the world's largest and highest-grade rare earth resources. The low-volume nature of rare earth mining coupled with the exceptional scale and quality of the ore body results in a resource with significant viability well into the future.

Upon achieving our designed throughput of separated products, the Company believes Mountain Pass will be one of the largest, most advanced and efficient fully-integrated REO processing facilities in the world, and the only such facility located in the Western Hemisphere. The Company aims to provide users of rare earths a domestic alternative that helps avoid the risks associated with the single point-of-failure that Chinese producers represent. In addition, the U.S. government is actively seeking to end the country's reliance on foreign REE sources, and the Company believes that its constructive relationship with key regulatory agencies and the relative stability of U.S. policies provide it with an advantage relative to non-U.S. REE producers.

The global effort to curb carbon emissions and address climate change often focuses on the impact of the transportation system. The Company believes that its products will play a large role in advancing those efforts. To date, nearly all U.S. states and the District of Columbia have mandated or offer incentives to support deployment of xEVs or alternative fuel vehicles and supporting infrastructure, either through state legislation or private utility incentives within the state, with similar mandates and incentives in other countries globally. Additionally, on August 16, 2022, the U.S. government enacted the Inflation Reduction Act of 2022, which, among other things, provides several tax incentives to promote clean energy adoption, including tax credits on the purchase of xEVs and the production of certain critical minerals such as NdPr oxide. The NdPr oxide that the Company began producing in the third quarter of 2023 at Mountain Pass is essential to the permanent magnet motor technology deployed in a significant majority of current xEVs.

In addition, the Company believes end consumers will demand that the materials used to build these vehicles be extracted sustainably. MP Materials is committed to environmental responsibility. The Company's environmental management plans cover biodiversity impacts, waste and noise management, air and water pollution, water extraction and discharge, as well as natural resource disturbance and toxic chemical usage. The Company believes this commitment to responsible production of REO is a strong competitive advantage.

A confluence of geopolitical and economic factors is causing downstream customers, such as automotive original equipment manufacturers ("OEMs"), to be increasingly focused on supply risk, highlighting the need to develop domestic production of REE and related products. To meet the growth in demand for xEVs, the Company believes automotive OEMs will redesign their supply chains to ensure a ready and stable supply of rare earth products as they transition their facilities to build electric vehicle components. MP Materials aims to capitalize on and accelerate this opportunity by seeking to partner with current and future customers in their efforts to re-position the capital and labor in their supply chain and to meet the growth in electrification.

Leverage the Company's low-cost position to maximize earnings power in all commodity price environments.

The success of the Company's business reflects its ability to manage its costs. The Company's production achievements in Stage I have provided economies of scale to lower production costs per unit of REO produced in concentrate. Furthermore, Stage II was designed to enable the Company to continue to manage its cost structure for separating REE through an optimized facility process flow. This process flow allows the Company to use less energy and raw materials per ton of separated REO. Despite the initial phase of NdPr oxide production leading to elevated per-unit costs, the Company anticipates a decrease in per-unit production costs over time as production volumes expand.

Optimization of logistics is also central to maintaining a low-cost position relative to other global producers. Mountain Pass, located immediately adjacent to Interstate 15 and within a one-hour drive of a major railhead and a four-hour drive of the Ports of Los Angeles and Long Beach, offers transportation advantages that create meaningful cost efficiencies in securing incoming supplies and shipping its final products. The Company believes the self-contained nature of its operations, with mining, milling, separations, and finishing all on one site, creates additional cost advantages and operational risk mitigation. Upon achieving the designed throughput of separated products, the Company's integrated site will incur lower costs of packaging, handling and transportation as compared to competitors who lack co-located processing.

Further the Company's mission and ability to capture the full rare earth value chain through downstream integration into rare earth magnet production.

Beyond re-establishing a supply chain for REE in the Western Hemisphere, the Company expects to recognize compelling longer-term opportunities to further its mission through the capture of additional value by pairing its attractive access to a large domestic rare earth supply with growing demands for downstream magnetic materials. The Company is currently pursuing vertical integration through further downstream processing of REO into finished magnet products and precursor materials, and incorporating process waste and end-of-life magnet recycling. The Company intends to accomplish this through a buy, build and/or joint venture strategy to achieve technical and cost leadership. The Company is developing a greenfield metal, alloy and magnet manufacturing facility in Fort Worth, Texas, with GM as a foundational customer. The Company intends to continue exploring future opportunities to invest in, develop, and/or sponsor new downstream opportunities for REO and rare earth products that contribute to the electrification of the industrial economy.

MP Materials believes its successes to date at Mountain Pass demonstrate a competency in identifying undervalued assets, creating a disciplined, execution-focused strategy, and assembling the management talent to create value. The Company intends to apply its experience and skill sets across the critical minerals and related value chain, while allocating capital effectively and responsibly, toward opportunities demonstrated to be in the best interest of its stockholders and consistent with its mission.

Human Capital Resources

The people of MP Materials are the Company's most valuable asset in fulfilling the Company's mission. At the core of the Company's success is the relentless pursuit to maintain and nurture an owner-operator culture that instills an entrepreneurial spirit where its employees feel motivated and empowered to deliver results through an unwavering commitment to doing what is right in a safe environment. Throughout 2023, in living up to the owner-operator culture, all employees received a time-vested equity grant at the time of joining the Company. The Company believes equity ownership reinforces the employees' sense of their contribution to the Company's success.

Ensuring the Company attracts, develops and retains top talent across all functions with diverse experiences, backgrounds and perspectives is critical to the Company's success. An employee retention rate of 95% or higher, which was achieved in every calendar quarter during 2023, continues to demonstrate the Company's priorities of ensuring its team is healthy, incentivized, proud to work for MP Materials, and believes in the Company's mission.

Employees

Since relaunching production at Mountain Pass in July 2017, the Company has increased its full-time equivalent ("FTE") employee base from eight contractors in 2017 to 681 employees as of December 31, 2023, of which approximately 81% were field-based employees. This represents a 40% increase of FTE employees in 2023, on top of a 33% increase in 2022. None of the Company's employees are subject to any collective bargaining agreements. The Company is committed to creating employment opportunities for U.S. workers, and with the completion of the initial commissioning of Stage II, the Company has added approximately 200 employees over the past two years. In addition, the Company has hired 32 employees at its Fort Worth Facility in 2023 and plans for at least 100 additional full-time employees as part of Stage III.

Health, Safety and Well-Being

The health, safety, and well-being of the Company's employees, suppliers and communities are a priority, with "Safety" being one of the Company's six core values, along with "Empowerment," "Entrepreneurship," "Integrity," "Results," and "Unwavering" effort. MP Materials is committed to maintaining a strong safety culture and continuing to emphasize the importance of its employees' role in identifying, mitigating and communicating safety risks. To ensure the ongoing safety of employees and any contractors working on-site, the Company has a clear set of health and safety guidelines in place and routinely conducts general as well as equipment- and process-specific safety training. The Company believes that the achievement of superior safety performance is both an important short-term and long-term strategic imperative in managing its operations.

All newly-hired employees at Mountain Pass complete a minimum of 24 hours of Federal Mine Safety and Health Administration ("MSHA") training during the onboarding process and must, at a minimum, complete annual refresher training. Following their initial training, depending on their job classification, new employees complete targeted online and supervised field training specific to their roles and responsibilities. For example, operations and maintenance workers go through specific Lock Out/Tag Out/Try Out training, confined-space work and rescue, forklift classroom, and in-the-field training. In total, during 2023, the Company's employees completed over 22,000 hours of new hire and/or annual refresher training and 1,600 hours of emergency medical response training, including first aid and CPR.

The Company utilizes a formalized digital data reporting system to track all incidents reportable to the California Occupational Health and Safety Administration and MSHA. The Company tracks lost time injuries, recordable injuries, recordable injury rates, and near-miss reports. MP Materials strongly encourages the reporting of near-miss incidents so that it can mitigate hazards or change procedures to improve workforce safety in advance of any actual incident. As of December 31, 2023, the Company had completed over 1,300 days without a lost-time injury.

Diversity, Inclusion and Meritocracy

MP Materials believes that a diverse, inclusive and meritocratic workforce and Board of Directors produces better overall decision-making for employees, which benefits the organization. In addition to hiring employees with requisite skills, the Company has taken steps and will continue to strive to assemble a diverse and inclusive workforce. As of December 31, 2023, based on employees' self-reporting, veterans and women represented 4% and 17%, respectively, of the Company's workforce and 21% of managerial or supervisory positions were occupied by women. As of December 31, 2023, women represented 28%

of the Company's Board of Directors. Additionally, as of December 31, 2023, 49% of the Company's workforce was composed of underrepresented minorities.

Employee Engagement and Development

Employee engagement efforts are critical in ensuring all employees feel heard, respected and valued, and that applicable actions are taken when feedback is received. In the fourth quarter of 2023, the Company achieved professional certification for its engagement efforts, and will continue its focus on providing opportunities for employees to interact with executive management through events such as virtual town hall sessions, family days and routine stand-up briefings.

Methodical execution is key to ensuring Company goals are achieved and exceeded. To ensure the Company's employees receive the feedback they need to grow and thrive in their careers, MP Materials continually reviews and updates its performance-management processes. The Company ensures that new hires receive the feedback and support they need by scheduling periodic performance evaluations three to six months after their introductory periods. Managers hold reviews with all employees no less than annually to give them an opportunity to discuss work performance. This performance management process, rooted in the values of the organization, sets the foundation for applicable goal setting, individual development plans and career pathways going forward.

MP Materials is dedicated to the continual training and development of its employees, especially of those in field operations, to ensure the Company develops future managers and leaders from within its organization. The training starts on an employee's first day with on-boarding procedures that focus on safety, responsibility, ethical conduct and inclusive teamwork. In addition, the Company has partnered with educational institutions, governmental authorities and strategic outside organizations to further enhance and improve access to the talent required to advance the Company's mission. The Company also has an electrical and instrumentation apprenticeship program that pays for employees to attend trade school to increase their opportunity for future advancement.

Sustainability and Natural Resources

The Company's business provides a key input to carbon-reducing technologies critical for the transition to a low-carbon economy. Further, MP Materials is solving for the foreign-controlled overconcentration of the rare earth supply while helping to enable a more sustainable future. Sustainability at MP Materials means much more than maintaining environmentally conscious operations; it means caring for the health, safety, and well-being of our employees; encouraging a spirit of joint ownership, entrepreneurship, and continuous growth; supporting the communities that surround us; and operating with integrity. The Company recognizes that it has a responsibility to operate as efficiently as possible to reduce emissions.

The Company believes Mountain Pass is the world's cleanest and most environmentally sustainable rare earth production facility. Producing rare earth materials requires significant energy and resources and can lead to environmental challenges if not carefully managed. MP Materials understands that our natural resources, such as water, are precious and limited. As such, the Company is committed to limiting resource consumption, increasing efficiency, and achieving as light of an environmental footprint as possible. The Company does this, in part, by investing in water recycling, reducing reagent usage, implementing energy reduction initiatives, and utilizing a dry stack tailings process.

The Company believes it is unique among scaled rare earth producers in its use of a dry tailings process that allows recycling of the water used in the milling and flotation circuit and eliminates the need for high-risk wet tailings ponds and traditional impoundment dams. The Company's tailings and concentrate dewatering methods provide a closed-loop water resource for its beneficiation process satisfying approximately 95% of those processes' water needs at Mountain Pass. The Company also has a variety of initiatives underway at Mountain Pass to limit freshwater withdrawal and maximize recycling. In addition, the Company remains focused on ensuring the most efficient use of energy to minimize hydrocarbon consumption and greenhouse gas ("GHG") emissions.

The materials that the Company produces are essential to the supply chains for many technologies that help decarbonize the global economy, improve productivity in the workforce, and better the lives of many. Without MP Materials' conscientiously-mined materials, not only will the future of low-carbon technologies depend on more highly polluting traditional production methods, but the advanced research and development related to these vital applications and their manufacturing will continue to follow that supply overseas. MP Materials is restoring the resource independence of the U.S.— removing the single point-of-failure in the supply chain for these products and ensuring that American industry can determine its own future in the automotive, robotics, aerospace, renewable energy, and information technologies industries.

Customers

Currently, the Company sells the vast majority of its rare earth concentrate to Shenghe Resources (Singapore) International Trading Pte. Ltd. ("Shenghe") under the terms of the Offtake Agreement, which became effective in March 2022. Shenghe is an indirect majority-owned subsidiary of Shenghe Resources Holding Co., Ltd., a leading global rare earth company listed on the Shanghai Stock Exchange. Under the Offtake Agreement, Shenghe is contractually obligated to purchase the Company's rare earth concentrate product meeting certain minimum specifications as the exclusive distributor in China on a "take-or-pay" basis (such that they are obliged to pay for product even if they are unable or unwilling to take delivery), with certain exceptions for the Company's direct sales globally. Shenghe then sells the rare earth concentrate it acquires to customers in China for processing into refined products. In addition, at the discretion of the Company, Shenghe may be required to purchase on a "take-or-pay" basis certain non-concentrate rare earth products, although the Company may sell all non-concentrate rare earth products in its sole discretion to customers or end users in any jurisdiction. The Company also regularly enters into short- and long-term sales contracts with other customers for the sale of its rare earth concentrate.

In January 2024, the Company entered into a new offtake agreement with Shenghe (the "New Offtake Agreement"), that replaced and extended the Offtake Agreement. The initial term of the New Offtake Agreement is two years, with the option for the Company to extend the term for an additional one-year period. The terms of the New Offtake Agreement are substantially the same as those of the Offtake Agreement with the exception of the addition of NdPr metal into the definition of non-concentrate rare earth products.

In February 2023, the Company entered into a distributorship agreement (the "Distribution Agreement") with Sumitomo Corporation of Americas ("Sumitomo"), under which Sumitomo serves as the exclusive distributor of the NdPr oxide and NdPr metal produced by the Company to Japanese customers. The initial term of the Distribution Agreement extends through the end of 2025 with options to renew annually. The Company intends to enter into other short- and long-term sales contracts with existing and new customers for separated rare earth products.

In April 2022, as discussed above, the Company entered into a long-term agreement with GM to supply magnets and related products manufactured at the Fort Worth Facility. The Company is also pursuing sales opportunities to other customers for its future magnet products.

Suppliers

The Company uses certain proprietary chemical reagents in its flotation process, which it currently purchases from third-party suppliers. The hydrometallurgy, separations, and product finishing processes are reliant upon certain commodity reagents. These chemicals are subject to pricing volatility, supply availability and other restrictions and guidelines. In the event of a supply disruption or any other restriction, the Company believes that alternative reagents could be sourced for certain processes.

Patents, Trademarks and Licenses

The Company relies on a combination of trade secret protection, nondisclosure and licensing agreements, patents and trademarks to establish and protect its proprietary intellectual property rights. The Company utilizes trade secret protection and nondisclosure agreements to protect its proprietary rare earth technology.

Competition

The rare earth mining and processing markets are capital intensive and highly competitive. With continued state-sponsored consolidation, there remain two major rare earth groups in China. These groups and their affiliates control (and/or allocate to unaffiliated third parties) substantially all of China's quota for concentrate production and rare earth refining. Outside of China, there are few other producers operating at scale, with processing capabilities located in Australia and Malaysia.

Environmental and Regulatory Matters

The Company is subject to numerous federal, state and local environmental laws, certifications, regulations, permits, and other legal requirements applicable to the mining and mineral processing industry, including, without limitation, those pertaining to employee health and safety, air quality standards and emissions, water usage, wastewater and stormwater discharges, GHG emissions, hazardous and radioactive and other waste management, storage and handling of naturally occurring radioactive material, plant and wildlife protection, remediation of contamination, land use, reclamation and restoration of properties, procurement of certain materials used in the Company's operations, groundwater quality and the use of explosives. Environmental laws and regulation continue to evolve which may require the Company to meet stricter standards and give rise to greater enforcement, result in increased fines and penalties for non-compliance, and result in a heightened degree of responsibility for companies and their officers, directors and employees. Future laws, regulations, permits or legal requirements, as well as the interpretation or enforcement of existing requirements, may require substantial increases in capital or operating costs to achieve and maintain compliance or otherwise delay, limit or prohibit operations, or other restrictions upon the Company's current or future operations, or result in the imposition of fines and penalties for failure to comply.

Complying with these regulations is complicated and requires significant attention and resources. The Company expects to continue to incur significant sums for ongoing operating environmental expenditures, including salaries, and the costs for monitoring, compliance, remediation, reporting, pollution control equipment and permitting.

Information About Our Executive Officers

The persons serving as executive officers of MP Materials and their positions with the Company are as follows:

Name	Age	Position
James H. Litinsky	46	Chairman of the Board and Chief Executive Officer
Michael Rosenthal	45	Chief Operating Officer
Ryan Corbett	34	Chief Financial Officer
Elliot Hoops	49	General Counsel and Secretary

James H. Litinsky. Mr. Litinsky is the Founder, Chairman and Chief Executive Officer of MP Materials. Mr. Litinsky is also the Founder, Chief Executive Officer and Chief Investment Officer of JHL Capital Group LLC ("JHL"), an alternative investment management firm. Before founding JHL in 2006, he was a member of the Drawbridge Special Opportunities Fund at Fortress Investment Group. Prior to Fortress, he was a Director of Finance at Omnicom Group, and he worked as a merchant banker at Allen & Company. Mr. Litinsky received a B.A. in Economics from Yale University, cum laude, and a J.D./M.B.A. from the Northwestern University School of Law and the Kellogg School of Management. He was admitted to the Illinois Bar. Mr. Litinsky also serves as a member of the Boards of the Shirley Ryan AbilityLab and the Museum of Contemporary Art Chicago.

Michael Rosenthal. Mr. Rosenthal is a Founder and the Chief Operating Officer of MP Materials. He has managed the Mountain Pass operation since the Company acquired the site in 2017. Before MP Materials, he was a Partner at QVT Financial ("QVT"), an investment management firm. At QVT, Mr. Rosenthal concentrated on investments in the global automotive sector and in China. Prior to joining QVT, he worked as a senior high yield credit analyst for Shenkman Capital Management. Mr. Rosenthal graduated from Duke University with an A.B. degree in Economics and Comparative Area Studies.

Ryan Corbett. Mr. Corbett joined MP Materials as its Chief Financial Officer in 2019. Prior to joining MP Materials, he was a Managing Director at JHL, where he focused on JHL's investment in MP Materials. Before JHL, Mr. Corbett was a member of alternative asset managers Brahman Capital Corp. and King Street Capital Management LP, both based in New York, where he focused on special situations investments across the capital structure. Mr. Corbett began his career in investment banking and corporate finance at Morgan Stanley & Co. after graduating magna cum laude from the Wharton School of the University of Pennsylvania with a concentration in Finance.

Elliot Hoops. Mr. Hoops joined MP Materials as its General Counsel and Secretary in May 2021. Prior to joining MP Materials, he was Vice President and Deputy General Counsel at Penn National Gaming, Inc. (now known as PENN Entertainment, Inc. ("PENN")), a regional gaming company, from January 2019 to May 2021, where he was responsible for a variety of legal matters, including commercial transactions, financings, corporate governance, securities law and gaming regulatory compliance. Prior to joining PENN, he was Vice President and Legal Counsel at Pinnacle Entertainment, Inc. ("Pinnacle"), a regional gaming company (which was acquired by PENN), from June 2007 to October 2018. Prior to Pinnacle, he was an associate at Holland and Knight LLP and an attorney advisor with the U.S. Securities and Exchange Commission (the "SEC"). Mr. Hoops received his B.A. in English from the University of Michigan, J.D. from the University of Miami, and LL.M. in Securities and Financial Regulation from Georgetown University Law Center.

Available Information

The Company's website is located at www.mpmaterials.com. Annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports, proxy and information statements, earnings releases, and financial statements are made available free of charge on the investor relations section of the Company's website as soon as reasonably practicable after the Company electronically files such materials with, or furnishes such materials to, the SEC. The Company's Code of Business Conduct and Ethics is also available on the investor relations section of its website. The information contained on its website, or accessible from its website, is not incorporated into, and should not be considered part of, this Form 10-K or any other documents the Company files with, or furnishes to, the SEC. The SEC maintains an internet site (http://www.sec.gov) that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC. Annual reports, quarterly reports, current reports, amendments to those reports, proxy and information statements, earnings releases, financial statements and the Company's various corporate governance documents, including its Code of Business Conduct and Ethics, are also available free of charge upon written request.

Investors and others should note that the Company may announce material financial information to its investors using its investor relations website (https://investors.mpmaterials.com/overview), SEC filings, press releases, public conference calls and webcasts. The Company uses these channels as well as social media to communicate with its stockholders and the public about the Company, its services and other issues. It is possible that the information the Company posts on social media could be deemed to be material information. Therefore, the Company encourages investors, the media, and others interested in MP Materials to review the information the Company posts on the social media channels listed on its investor relations website.

Other

The Company was incorporated on January 24, 2020, as a Delaware corporation under the name "Fortress Value Acquisition Corp." ("FVAC") and formed for the purpose of effecting a merger, capital stock exchange, asset acquisition, stock purchase, reorganization or similar business combination with one or more businesses. On November 17, 2020, the Company consummated the transactions contemplated by the Agreement and Plan of Merger, dated as of July 15, 2020, as amended on August 26, 2020 (the "Merger Agreement"), by and among FVAC, certain direct wholly-owned subsidiaries of FVAC, MP Mine Operations LLC, a Delaware limited liability company ("MPMO"), which owns the Mountain Pass mine and processing facilities, and Secure Natural Resources LLC, a Delaware limited liability company ("SNR"), which holds the mineral rights to the Mountain Pass mine and surrounding areas as well as intellectual property rights related to the processing and development of rare earth minerals. Pursuant to the Merger Agreement, among other things, MPMO and SNR each became wholly-owned subsidiaries of FVAC (the "Business Combination"), which was in turn renamed "MP Materials Corp."

ITEM 1A. RISK FACTORS

Investing in our securities involves a high degree of risk. Investors should carefully consider the risks described below and all of the other information we file with the SEC before deciding to invest in our common stock. If any of the events or developments described below occur, our business, prospects, financial condition, or results of operations could be materially or adversely affected. As a result, the market price of our common stock could decline, and investors could lose all or part of their investment. The risks and uncertainties described below are not the only risks and uncertainties that we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations. The risks discussed below also include forward-looking statements, and our actual results may differ substantially from those discussed in these forward-looking statements. See *"Cautionary Note Regarding Forward-Looking Statements"* *above.*

Risk Factor Summary

Our business is subject to a number of risks and uncertainties, including those highlighted immediately following this summary. Some of these risks are:

- We may be adversely affected by fluctuations in demand for, and prices of, REE and magnet materials.
- The success of our business will depend, in part, on the growth of existing and emerging uses for rare earth products.
- An increase in the global supply of rare earth products, dumping, predatory pricing and other tactics designed to inhibit our further downstream integration by our competitors may materially adversely affect our profitability.
- We operate in a highly competitive industry.
- Our ability to generate revenue will be diminished if we are unable to compete with substitutions for our rare earth materials.
- We currently rely on Shenghe to purchase the vast majority of our rare earth concentrate product on a "take-or-pay" basis and sell that product to end users in China; we cannot assure you that they will continue to honor their contractual obligations to purchase and sell our products, or that they will make optimum efforts to market and sell our products.

- Changes in China's political environment and policies, including changes in export policy or the interpretation of China's export policy and policy on rare earths production or the import of rare earth feedstock, may adversely affect our financial condition and results of operations.
- The production of rare earth products is a capital-intensive business that requires the commitment of substantial resources; if we do not have sufficient resources to provide for such production, it could have a material adverse effect on our financial condition or results of operations.
- Our continued growth depends on our ability to reach anticipated production rates for the separation of REE as part of the Stage II project at Mountain Pass, our only rare earth mining and processing facility.
- The production of magnet materials in Stage III is dependent upon our ability to complete the buildout of our Fort Worth Facility; an unanticipated delay in the completion of Stage III could have a material adverse effect on our ability to produce magnets.
- If we infringe, or are accused of infringing, the intellectual property rights of third parties, it may increase our costs or prevent us from being able to commercialize new products.
- We may not be able to adequately protect our intellectual property rights. If we fail to adequately enforce or defend our intellectual property rights, our business may be harmed.
- If we are unable to perform the obligations under our long-term supply agreement with GM, this could have a material adverse effect on our financial position and results of operations.
- We may not be able to convert current commercial discussions with customers for the sale of REO products into contracts, which may have a material adverse effect on our financial position and results of operations.
- We may not successfully establish or maintain collaborative, joint venture and licensing arrangements, which could adversely affect our ability to vertically integrate into further downstream processing of our REO.
- Outbreaks, epidemics or pandemics could have an adverse effect on our business.
- We are subject to a number of operational risks of our business, including power outages or shortages at the Mountain Pass facility; increasing costs or limited access to raw materials; disruptions in transportation or other services; inability to process REO that meet individual customer specifications; access to water; uncertainty in our estimates of REO reserves; labor matters/labor relations; cybersecurity breaches; and/or environmental, social and governance ("ESG") matters.
- We are subject to regulatory and business risks associated with our investment in VREX Holdco Pte. Ltd. ("VREX Holdco").
- The conditional conversion feature of our Convertible Notes (as defined in Note 10, "Debt Obligations" in the notes to the Consolidated Financial Statements), if triggered, may adversely affect our financial condition and operating results.
- Conversion of our Convertible Notes may dilute the ownership interest of our stockholders or may otherwise depress the price of our common stock.
- Certain provisions in the indenture governing the Convertible Notes may delay or prevent an otherwise beneficial takeover attempt of us.
- Servicing our debt requires a significant amount of cash, and we may not have sufficient cash flow from our business to pay our debt.

Risks Relating to our Business and Industry

We may be adversely affected by fluctuations in demand for, and prices of, REE and magnet materials.

Because our revenue is, and will be for the foreseeable future, from the sale of rare earth products, changes in demand for, and the market price of, and taxes and other tariffs and fees imposed upon REE and magnet materials could significantly affect our profitability. Our financial results may be significantly adversely affected by declines in the prices of REE and magnet materials. For example, as a result of the decrease in the market price of NdPr oxide in 2023, our Realized Price per REO MT (as defined in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations) decreased from $11,974 for the year ended December 31, 2022, to $6,854 for the year ended December 31, 2023, which negatively impacted our results of operations and cash flows.

REE and magnet material prices may fluctuate and are affected by numerous factors beyond our control such as interest rates, exchange rates, taxes, inflation or deflation, fluctuation in the relative value of the U.S. dollar against foreign currencies on the world market, shipping and other transportation and logistics costs, global and regional supply and demand for rare earth minerals and products, potential industry trends, such as competitor consolidation or other integration methodologies, and the political and economic conditions of countries that produce and procure REE and magnet materials. Furthermore, supply side factors have a significant influence on price volatility for REE and magnet materials. Supply of REE and magnet materials is dominated by Chinese producers. The Chinese Central Government regulates production via quotas and environmental standards, and, to a lesser extent, regulation of imports, and has and may continue to change such production quotas, environmental standards, and import regulations. Over the past few years, there has been significant restructuring of the Chinese market in line with Chinese Central Government policy; however, periods of over-supply or speculative trading of REE and magnet materials can lead to significant fluctuations in the market price of such products.

A prolonged or significant economic contraction in the U.S., China, or worldwide could put downward pressure on market prices of REE and magnet materials. Protracted periods of low prices for REE and magnet materials could significantly reduce revenues and the availability of required development funds in the future. This could cause substantial reductions to, or a suspension of, REO production operations, impair asset values and reduce our proven and probable rare earth ore reserves.

Demand for our products may be impacted by demand for downstream products incorporating rare earths, including hybrid and electric vehicles, wind turbines, robotics, medical equipment, military equipment and other high-growth, advanced motion technologies, as well as demand in the general automotive and electronics industries. Lack of growth in these markets may adversely affect the demand for our products.

In contrast, extended periods of high commodity prices may create economic dislocations that may be destabilizing to REE and magnet material supply and demand and ultimately to the broader markets. Periods of high REE market prices generally are beneficial to our financial performance. However, strong REE prices also create economic pressure to identify or create alternate technologies that ultimately could depress long-term demand for rare earth minerals and products, and at the same time may incentivize development of competing mining properties.

The success of our business will depend, in part, on the growth of existing and emerging uses for rare earth products.

Our strategy is to produce REE and magnet products that are used in critical existing and emerging technologies, such as hybrid and electric vehicles, wind turbines, robotics, medical equipment, military equipment and other high-growth, advanced motion technologies. The success of our business depends on the continued growth of these end markets and the successful commercialization of rare earth products, including NdPr, in such markets. If the market for these critical existing and emerging technologies does not grow as we expect, grows more slowly than we expect, or if the demand for our products in these markets decreases, then our business, prospects, financial condition and operating results could be harmed. In addition, the market for these technologies, particularly in the automotive industry, tends to be cyclical, which exposes us to increased volatility, and it is uncertain as to how such macroeconomic factors will impact our business. Any unexpected costs or delays in the manufacturing of separated REE products or rare earth magnets, or less than expected demand for the critical existing and emerging technologies that use rare earth products, could have a material adverse effect on our financial condition or results of operations.

An increase in the global supply of rare earth products, dumping, predatory pricing and other tactics designed to inhibit our further downstream integration by our competitors may materially adversely affect our profitability.

The pricing and demand for rare earth products is affected by a number of factors beyond our control, including the global macroeconomic environment and the global supply and demand for REO products. China accounts for the significant majority of global separated REO production and also dominates the manufacture of metals and NdFeB magnets from rare earths, capabilities that are not currently present in the U.S. Over the past few years, there has been significant restructuring of the Chinese rare earth production industry, further centralizing control over production by state-owned enterprises. Chinese competitors may engage in predatory pricing or other behaviors designed to inhibit our further downstream integration. Any increase in the amount of rare earth products exported from other nations and increased competition may result in price reductions, reduced margins or loss of potential market share, any of which could materially adversely affect our profitability. As a result of these factors, we may not be able to compete effectively against current and future competitors.

We operate in a highly competitive industry.

The rare earth mining and processing and magnet manufacturing industry is capital intensive with competitive market dynamics. Production of REE and magnet products is dominated by our Chinese competitors. These competitors may have greater financial resources, as well as other strategic advantages to operate, maintain, improve and possibly expand their facilities. Additionally, our Chinese competitors have historically been able to produce at relatively low costs due to domestic economic and regulatory factors, including less stringent environmental and governmental regulations and lower labor and benefit costs. If we are not able to achieve consistent product quality at our anticipated costs of production, then any strategic advantages that our competitors may have over us, including, without limitation, lower labor, compliance and production costs, could have a material adverse effect on our business.

Industry consolidation may result in increased competition, which could result in a reduction in revenue.

Some of our competitors have made, or may make, acquisitions or enter into partnerships or other strategic relationships to achieve competitive advantages. In addition, new entrants not currently considered competitors may enter our market through acquisitions, partnerships or strategic relationships. We expect these trends to continue as demand for rare earth materials increases. Industry consolidation may result in competitors with more compelling product offerings or greater pricing flexibility than we have, or business practices that make it more difficult for us to compete effectively, including on the basis of price, sales, technology or supply. For example, in December 2021, China merged three state entities to establish the China Rare Earth Group Co. Ltd ("China Rare Earth Group"), that will account for more than half of China's heavy rare earths supplies. China Rare Earth Group will have enhanced pricing power of key rare earths, such as dysprosium and terbium, which will likely bring changes to the global rare earth supply chain. These competitive pressures could have a material adverse effect on our business.

Our ability to generate revenue will be diminished if we are unable to compete with substitutions for our rare earth materials.

Technology changes rapidly in the industries and end markets that utilize our materials. If these industries introduce new technologies or products that no longer require the rare earth materials or NdFeB magnets we produce or may produce in the future, or suitable substitutes become available, this could result in a decline in demand for our rare earth materials or NdFeB magnets. If the demand for our rare earth materials or NdFeB magnets decreases, it will have a material adverse effect on our business and the results of our operations.

We currently rely on Shenghe to purchase the vast majority of our rare earth concentrate product on a "take-or-pay" basis and sell that product to end users in China; we cannot assure you that they will continue to honor their contractual obligations to purchase and sell our products, or that they will make optimum efforts to market and sell our products.

We currently sell the vast majority of our rare earth concentrate to Shenghe, which typically sells that product to refiners in China. Demand for rare earth concentrate is currently constrained to a relatively limited number of refiners, a significant majority of which are based in China. While Shenghe is obligated under the Offtake Agreement to purchase all of the rare earth concentrate product meeting certain minimum specifications on a "take-or-pay" basis (such that they are obliged to pay for product even if they are unable or unwilling to take delivery), we cannot guarantee that Shenghe will continue to purchase all of the products that it is contractually bound to purchase or that they will purchase products that do not meet these specifications. In January 2024, the Company entered into the New Offtake Agreement that replaced and extended the Offtake Agreement. The initial term of the New Offtake Agreement is two years, with the option for the Company to extend the term for an additional one-year period. The terms of the New Offtake Agreement are substantially the same as those of the Offtake Agreement with the exception of the addition of NdPr metal into the definition of non-concentrate rare earth products.

Further, Shenghe sells the rare earth concentrate it acquires under the Offtake Agreement to customers in China who separate and extract the individual rare earth elements. We do not control the amount and timing of resources that Shenghe will dedicate to their sales efforts. Therefore, any decline or delay in Shenghe's sales efforts could reduce sales prices or sales volumes, which could have an adverse impact on our results of operations.

Changes in China's political environment and policies, including changes in export policy or the interpretation of China's export policy and policy on rare earths production or the import of rare earth feedstock, may adversely affect our financial condition and results of operations.

Because the vast majority of our rare earth concentrate product is currently sold to Shenghe under our Offtake Agreement for further processing by third-party customers in China, the possibility of adverse changes in trade or political relations with China, political instability in China, increases in labor or shipping costs, subsidies to related industries, the occurrence of prolonged adverse weather conditions or a natural disaster such as an earthquake or typhoon, or an outbreak of a global pandemic disease could severely interfere with the sale and/or shipment of our products and would have a material adverse effect on our operations.

Our sales may be adversely affected by the current and future political environment in China and the policies of the China Central Government. China's government has exercised and continues to exercise substantial control over many sectors of the Chinese economy through regulation and state ownership. Our ability to sell products to customers in China or obtain materials from suppliers in China may be adversely affected by changes in Chinese laws and regulations, including those relating to taxation, import and export tariffs and regulations, raw materials, environmental regulations, land use rights, property and other matters. The U.S. Government has instituted substantial changes to foreign trade policy with China and has assessed punitive tariffs on many categories of Chinese goods. China has retaliated with increased tariffs on U.S. goods. Any further changes in U.S. trade policy could trigger retaliatory actions by affected countries, including China, resulting in trade wars. Any changes in U.S. and China relations, including through changes in policies by the Chinese government, could adversely affect our financial condition and results of operations, including changes in laws, regulations or the interpretation thereof, confiscatory taxation, governmental royalties, restrictions on currency conversion, imports or sources of supplies, or the expropriation or nationalization of private enterprises.

In addition, there may be circumstances where we may have to incur premium freight charges to expedite the delivery of our products to customers to overcome non-tariff restrictions or due to evolving rules or delays at the ports that we typically utilize. If we incur a significant amount of freight charges, our gross profit will be negatively affected if we are unable to pass on those charges to customers. In addition, we may be adversely affected by the need to ship to alternative ports. This could lead to potential delays in the transportation of our goods, which may occur for any reason or as they are affected by domestic or international laws and regulations, taxation, import and export tariffs, environmental regulations, customs and other relevant factors.

The production of rare earth products is a capital-intensive business that requires the commitment of substantial resources; if we do not have sufficient resources to provide for such production, it could have a material adverse effect on our financial condition or results of operations.

Our ability to reach anticipated production rates as part of our Stage II project at Mountain Pass, the completion of our Stage III project, as well as the execution of other capital projects such as the HREE Facility, all require the commitment of substantial resources and capital expenditures. Our estimated expenses may increase for a variety of factors, including as a result of inflationary pressures in the U.S. The progress, the amounts and timing of expenditures and the success of these projects will depend in part on the following: (a) the ability of the Stage II facilities to separate REO as designed and engineered; (b) our ability to timely produce metal at the metal processing plant and related facilities in Vietnam under our tolling agreement with VREX Holdco (the “Tolling Agreement”); (c) our ability to timely procure new equipment and materials, certain of which may involve long lead-times, or to repair existing equipment; (d) the ability of service providers or vendors to meet contractually-negotiated delivery or completion deadlines or meet performance specifications or guarantees; (e) maintaining, and procuring, as required, applicable federal, state and local permits; (f) the incorporation of project change orders, due to engineering, process, health and safety, or other considerations; (g) negotiating contracts for equipment, earthwork, construction, equipment installation, labor and completing infrastructure and construction work following commissioning; (h) impact of planned and unplanned shut-downs and delays in our production; (i) impact of stoppages or delays on construction projects; (j) disputes with contractors or other third parties; (k) negotiating sales and offtake contracts for our planned production; (l) the execution of any joint venture agreements or similar arrangements with strategic partners; and (m) other factors, many of which are beyond our control.

Most of these activities require significant lead times and must be advanced concurrently. Unanticipated costs or delays could have a material adverse effect on our financial condition or results of operations and could require us to seek additional capital, which may not be available on commercially acceptable terms or at all.

Our continued growth depends on our ability to reach anticipated production rates for the separation of REE as part of the Stage II project at Mountain Pass, our only rare earth mining and processing facility.

Our only rare earth mining and processing facility at this time is Mountain Pass. Our continued growth is based on reaching anticipated production rates for the separation of REE in accordance with our expected timeframe. The deterioration or destruction of any part of Mountain Pass, or a failure of any necessary equipment to operate as designed, may significantly hinder our ability to reach or maintain anticipated production rates within the expected timeframe or at all. If we are unsuccessful in reaching and maintaining expected production rates for REO at Mountain Pass, including by failing to reach anticipated throughput, recoveries, uptimes, yields, product quality, or any combination thereof, within expected timeframes or at all, we may not be able to reach our full revenue potential or achieve our anticipated cost structure.

The production of magnet materials in Stage III is dependent upon our ability to complete the buildout of our Fort Worth Facility; an unanticipated delay in the completion of Stage III could have a material adverse effect on our ability to produce magnets.

In February 2022, we commenced construction of our initial rare earth metal, alloy and magnet manufacturing facility in Fort Worth, Texas, in support of our Stage III initiatives. The building portion of the Fort Worth Facility was completed in 2023. However, the Fort Worth Facility requires substantial capital for equipment purchases, installation, and commissioning, and there may be unanticipated costs or delays associated with these activities. In addition, our ability to reach our full revenue potential will be dependent on our ability to finish the buildout of our Fort Worth Facility and commence the production of magnet materials. Our proposed timeline for producing magnet materials is based on certain estimates and assumptions we have made about our business over the next few years, including reaching anticipated production rates for the separation of REE and the ability to obtain equipment on a timely basis from third party vendors. If any of these estimates or assumptions prove to be wrong, it may significantly hinder our ability to complete the Fort Worth Facility within the expected time frame or at all. If we are unsuccessful in being able to commence production at our Fort Worth Facility, within the expected time frame or at all, we will not be able to take advantage of our downstream value creation opportunity and thus we may not be able to reach our full revenue potential.

If we infringe, or are accused of infringing, the intellectual property rights of third parties, it may increase our costs or prevent us from being able to commercialize new products.

There is a risk that we may infringe, or may be accused of infringing, the proprietary rights of third parties under patents and pending patent applications belonging to third parties that may exist in the U.S. and elsewhere in the world that relate to our rare earth products and processes, including our planned future production of magnet materials in Stage III. Because the patent application process can take several years to complete, there may be currently pending applications that may later result in issued patents that cover our products and processes. In addition, our products and processes may infringe existing patents.

Defending ourselves against third-party claims would be costly and time consuming and would divert management’s attention from our business, which could lead to delays in our Stage III downstream expansion. If third parties are successful in their claims, we might have to pay substantial damages or take other actions that are adverse to our business. As a result of intellectual property infringement claims, or to avoid potential claims, we might:

- be prohibited from, or delayed in, selling rare earth products, including magnet materials, or licensing some of our products or using some of our processes unless the patent holder licenses the patent to us, which it is not required to do;
- be required to pay substantial royalties or grant a cross license to our patents to another patent holder; or
- be required to redesign a product or process so it does not infringe a third party’s patent, which may not be possible or could require substantial funds and time.

In addition, we could be subject to claims that our employees, or we, have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of third parties.

If we are unable to resolve claims that may be brought against us by third parties related to their intellectual property rights on terms acceptable to us, we may be precluded from offering some of our products or using some of our processes.

We may not be able to adequately protect our intellectual property rights. If we fail to adequately enforce or defend our intellectual property rights, our business may be harmed.

Much of the technology used in the markets in which we compete is protected by patents and trade secrets, and our commercial success will depend in significant part on our ability to obtain and maintain patent and trade secret protection for our products and methods. To compete in these markets, we rely on a combination of trade secret protection, nondisclosure and licensing agreements, patents and trademarks to establish and protect our proprietary intellectual property rights, including our proprietary rare earth production processes that are not patented. Our intellectual property rights may be challenged or infringed upon by third parties, or we may be unable to maintain, renew or enter into new license agreements with third-party owners of intellectual property on reasonable terms. In addition, our intellectual property may be subject to infringement or other unauthorized use outside of the U.S. In such case, our ability to protect our intellectual property rights by legal recourse or otherwise may be limited, particularly in countries where laws or enforcement practices are undeveloped or do not recognize or protect intellectual property rights to the same extent as the U.S. Unauthorized use of our intellectual property rights or our inability to preserve existing intellectual property rights could adversely impact our competitive position and results of operations. The loss of our patents could reduce the value of the related products. In addition, the cost to litigate infringements of our patents, or the cost to defend ourselves against patent infringement actions by others, could be substantial and, if incurred, could materially affect our business and financial condition.

Proprietary trade secrets and unpatented know-how are also very important to our business. We rely on trade secrets to protect certain aspects of our technology, especially where we do not believe that patent protection is appropriate or obtainable. However, trade secrets are difficult to protect. Our employees, consultants, contractors, outside scientific collaborators and other advisors may unintentionally or willfully disclose our confidential information to competitors, and confidentiality agreements may not provide an adequate remedy in the event of unauthorized disclosure of confidential or proprietary information. It is expensive and time consuming, with no certain outcome, to pursue a claim that a third party illegally obtained and is using our trade secrets. Moreover, our competitors may independently develop equivalent knowledge, methods and know-how. Failure to obtain or maintain trade secret protection could adversely affect our competitive business position.

We may not be able to obtain additional patents and the legal protection afforded by any additional patents may not adequately protect our rights or permit us to gain or keep any competitive advantage.

Our ability to obtain additional patents is uncertain and the legal protection afforded by these patents is limited and may not adequately protect our rights or permit us to gain or keep any competitive advantage. In addition, the specific content required of patents and patent applications that are necessary to support and interpret patent claims is highly uncertain due to the complex nature of the relevant legal, scientific and factual issues. Changes in either patent laws or interpretations of patent laws in the U.S. or elsewhere may diminish the value of our intellectual property or narrow the scope of our patent protection. Even if patents are issued regarding our products and processes, our competitors may challenge the validity of those patents. Patents also will not protect our products and processes if competitors devise ways of making products without infringing our patents.

If we are unable to perform the obligations under our long-term supply agreement with GM, this could have a material adverse effect on our financial position and results of operations.

We entered into a binding long-term supply agreement with GM. Our ability to fulfil the obligations under our long-term agreement with GM to supply them with magnet materials is subject to a number of risks and contingencies. We are embarking on building the first scaled rare earth magnet manufacturing facility in the U.S. in several decades. While we will be relying on a number of experienced engineers and other third parties in the design, engineering and construction of the Fort Worth Facility, we will be making a number of judgments and assumptions on process design, equipment selection and design, and plant operations, that may or may not prove to be correct. Design, engineering or construction delays may impair our ability to perform under our long-term supply agreement with GM. In addition, we will need to procure the necessary equipment and materials needed to produce magnets and their precursor materials, some of which may be difficult to obtain. There can be no assurance that such equipment and materials will be procured on time or not be delayed due to circumstances beyond our control.

Further, we will need to hire a sufficient number of engineers, operators and other professionals to successfully design and operate the Fort Worth Facility. It may be difficult for us to hire employees with the experience, education and skills needed to produce magnet materials, and we may need to hire employees from other countries if we cannot recruit employees in the U.S. We will also face competition for these employees.

There can be no assurance that, following the completion of construction of the Fort Worth Facility, we will obtain the equipment and materials needed and hire the necessary employees in order to successfully produce magnet materials at the volumes and quality necessary to meet the requirements under our long-term supply agreement with GM. In the event that we are not able to mitigate these risks and fail to comply with the terms of the agreement with GM, this could have a material adverse effect on our financial position and results of operations.

We may not be able to convert current commercial discussions with customers for the sale of REO products into contracts, which may have a material adverse effect on our financial position and results of operations.

In 2023, we completed construction and the initial commissioning of our Stage II project, which included installing a concentrate drying and roasting circuit, upgrading and restarting the product leaching circuit, recommissioning separation and extraction circuits, improving materials handling and brine management capability, and constructing new product finishing circuits to re-establish the full capability to produce separated rare earth products at Mountain Pass. Upon reaching anticipated production rates for REO and other planned downstream products at Mountain Pass, we expect to produce approximately 20,000 MTs of separated REO per year, which includes approximately 6,075 MTs of NdPr oxide per year, excluding cerium concentrate. Prior to reaching expected production rates for REO and other planned downstream products at Mountain Pass, we intend to enter into short- and long-term sales contracts with new customers. However, there can be no assurance that these customers will enter into sales contracts for REO. The failure to enter into such contracts may have a material adverse effect on our financial position and results of operations.

We may not successfully establish or maintain collaborative, joint venture and licensing arrangements, which could adversely affect our ability to vertically integrate into further downstream processing of our REO.

A key element of our long-term business strategy is to vertically integrate into further downstream processing of our REO into rare earth metal, alloys, and finished magnets. To implement this vertical integration strategy successfully, we may need to license certain intellectual property related to these downstream processes and/or develop the ability, or collaborate with, purchase, or form a joint venture with existing participants in the metal, alloy, and magnet production supply chain. In addition, other licenses that may be necessary for some of these downstream processing steps have not yet been obtained. Any failure to establish or maintain collaborative, joint venture or licensing arrangements for the production of downstream products on favorable terms could adversely affect our business prospects, financial condition or ability to develop and commercialize downstream rare earth products.

Outbreaks, epidemics or pandemics could have an adverse effect on our business.

Outbreaks of infectious diseases, epidemics or pandemics can significantly impact the national and global economy and commodity and financial markets. Impacts may include, among other things, extreme volatility in financial markets, a slowdown in economic activity, extreme volatility in commodity prices and a global recession. Outbreaks, epidemics or pandemics may lead to significant restrictions on travel, temporary business closures, quarantines, and a general reduction in consumer activity and sentiment globally and may impact our business and operations by, among others, increasing the cost of operations, causing shipping delays, reducing employee productivity, limiting travel of our personnel, adversely affecting the health and welfare of our personnel, or preventing or delaying important third-party service providers from performing normal and contracted activities crucial to the operation of our business.

Decisions beyond our control, such as canceled events, restricted travel, barriers to entry, temporary closures or limited availability of county, state or federal government agencies, or other factors may affect our ability to perform mining operations, corporate activities, and other actions that would normally be accomplished without such limitations. The extent to which an outbreak, epidemic or pandemic will impact our operations, our business and the economy is highly uncertain and will also depend on future developments that cannot be predicted, including new information which may emerge concerning the severity of the disease, the duration and spread of the outbreak, including the spread of variants, the scope of travel restrictions imposed, mandatory or voluntary business closures, the impact on businesses and financial and capital markets, and the extent and effectiveness of actions taken throughout the world to contain the virus or treat its impact, including the effectiveness and availability of vaccines. We cannot predict the impact of an outbreak, epidemic or pandemic, but it may materially and adversely affect our business, financial condition and results of operations.

A power outage or shortage at Mountain Pass could temporarily delay mining and processing operations and increase costs, which may materially adversely impact our business.

Our facilities at Mountain Pass are currently powered by a natural gas-powered combined heat and power (“CHP”) plant that produces electricity and steam and eliminates reliance on the regional electric power grid. Operation of the CHP plant is necessary to support the entire energy demand of Stage II. While we believe that the CHP plant will provide sufficient electricity and steam to operate our facilities at Mountain Pass, there can be no assurance that there will not be intermittent interruptions in the ability to produce electricity and steam. Instability in electrical supply could cause sporadic outages or brownouts. Any such outages or brownouts could have a negative impact on our production. If the CHP plant is unable to provide sufficient energy for the operation of Mountain Pass or if additional growth projects require energy needs in excess of CHP capacity, we may be required to obtain electricity from a single utility company in Southern California. We could incur higher operating costs, remain subject to the effects of occasional grid power outages and brownouts, and could experience temporary interruptions of processing operations. As a result, our revenue could be adversely impacted and our relationships with our customers could suffer, adversely impacting our ability to generate future revenue and otherwise perform our contractual obligations.

Increasing costs or limited access to raw materials may adversely affect our profitability.

We use significant amounts of chemical reagents to process REE. Though we may enter into long-term purchase agreements, chemical reagents sourced from third parties may be subject to significant volatility in cost and availability. In addition, third parties may not honor their agreements with us and/or declare force majeure, and as a result, we may need to obtain such chemical reagents from other parties at higher costs and expense and there may be a delay in obtaining such chemical reagents. Further, supply chains reliant on sea vessels, train, and/or truck may subject us to transportation delays in obtaining these chemical reagents. We also may not be able to store such chemical reagents without incurring substantial costs. We may not be able to pass increased costs for these chemical reagents through to our customers in the form of price increases. The Mountain Pass site includes a currently idle chlor-alkali facility that may be restarted in the future to produce hydrochloric acid, sodium hydroxide, and sodium hypochlorite. A significant increase in the price or decrease in the availability of these chemicals before we potentially restart our production of them on-site, or restrictions imposed by environmental regulations or law on chemical use, could materially increase our operating costs and adversely affect our profit margins and production volumes. There can be no assurance that we will be able to purchase the necessary chemical reagents from third parties on terms that are acceptable to us. The failure to obtain chemical reagents as needed will have an adverse effect on our financial condition and results of operations.

Fluctuations in transportation costs or disruptions in transportation services or damage or loss during transport could decrease our competitiveness or impair our ability to supply REE or magnet products to our customers, which could adversely affect our results of operations.

We currently transport our rare earth concentrate and NdPr oxide products via ocean freight. At times during 2021 and 2022, there was a backlog of container ships off the coast of Southern California that delayed shipments in and out of the ports of Los Angeles and Long Beach, the ports that we use to ship our rare earth concentrate product. While we managed to mitigate these intermittent delays in shipping rare earth concentrate product through these ports, our ability to continue to maintain stable shipments may be impacted if port delays due to congestion return or worsen.

In addition, we will in the future need to transport our products to our future customers and our tollers wherever they may be located. Finding affordable and dependable transportation is necessary for us to be able to supply customers around the world. Labor disputes, embargoes, government restrictions, work stoppages, pandemics, derailments, damage or loss events, adverse weather conditions, other environmental events, seasonal changes in supply and demand for transportation, changes to rail or ocean freight systems, domestic or international laws or regulations, permits or other approvals, or other events and activities beyond our control could interrupt or limit available transport services, which could result in customer dissatisfaction and loss of sales and could materially adversely affect our results of operations. Such events and conditions, including flooding and other natural disasters, could also impact the facilities of our customers which could have a material adverse effect on our ability to deliver our product to our customers.

We will need to process REE to exacting specifications in order to provide future customers with a consistently high-quality product. An inability to process REO that meet individual customer specifications may have a material adverse effect on our financial condition or results of operations.

With the commencement of Stage II operations, we expect to be able to process REE to meet customer needs and specifications and to provide customers with a consistently high-quality product while meeting ever-stricter purity requirements. We have limited experience operating our Stage II assets. In the event that certain equipment fails to consistently perform as designed or we are unable to maintain consistent uptime, we may struggle to meet individual customer specifications, which may have a material adverse effect on our financial condition or results of operations. In addition, customer needs and specifications may change with time. Any delay or failure in developing processes to meet changing customer needs and specifications may have a material adverse effect on our financial condition or results of operations.

Diminished access to water may adversely affect our operations.

Processing of REO requires significant amounts of water. The technology we currently use to beneficiate REO is a sustainable process with dry tailings that limits the need for fresh water usage. Although we believe our current process is sustainable, any disruption in the process could prompt the need for significant access to fresh water. Additionally, with the commencement of Stage II operations, we require an even greater amount of water for our CHP plant, separation and extraction processes, and product finishing operations, including significant demand for highly-pure water. We maintain and operate one water supply well field for potable and process water and own land and wells in another water supply well field that we may be able to operate in the future. In addition, significant volumes of water are recycled from process brine to reduce ground water usage. Any disruption to our current process, including our water treatment plant used to make highly-pure water, decreases in available water supply, or inability to recycle sufficient volumes of distillate may have a material adverse effect on our operations and our financial condition or results of operations.

We face regulatory and business risks associated with our investment in VREX Holdco.

We own a minority interest in VREX Holdco, a Singapore company. An entity affiliated with Shenghe is the majority shareholder of VREX Holdco. VREX Holdco owns Vietnam Rare Earth Company Limited (“VREX”), which owns and operates a metal processing plant and related facilities in Vietnam. As a minority shareholder of VREX Holdco, our ability to control the management, record-keeping, operations and decision-making of VREX Holdco is limited.

VREX Holdco’s operations are subject to the significant business, economic, regulatory and competitive uncertainties and contingencies frequently encountered by new businesses and other risks, many of which are beyond VREX Holdco’s or our control. Because VREX Holdco has limited operating history, it may be more difficult for them to prepare for and respond to these types of risks than for a company with an established business and operating cash flow.

VREX Holdco has operations outside the United States, which exposes us to complex foreign and U.S. regulations inherent in doing business in Vietnam. We are subject to regulations imposed by the Foreign Corrupt Practices Act (the "FCPA"), and other anti-corruption laws that generally prohibit U.S. companies and their intermediaries from offering, promising, authorizing or making improper payments to foreign government officials for the purpose of obtaining or retaining business. Violations of the FCPA and other anti-corruption laws may result in severe criminal and civil sanctions as well as other penalties. The SEC and U.S. Department of Justice in recent years have increased their enforcement activities with respect to the FCPA.

Internal control policies and procedures and the compliance program that VREX Holdco has implemented to deter prohibited practices may not be effective in prohibiting its employees, contractors or agents from violating or circumventing our policies and the law. If VREX Holdco's or our employees or agents fail to comply with applicable laws or company policies governing VREX Holdco's international operations, we and our subsidiaries may face investigations, prosecutions and other legal and regulatory proceedings and actions which could result in civil penalties, administrative remedies and criminal sanctions. Any determination that we have violated the FCPA could have a material adverse effect on our financial condition.

Compliance with international and U.S. laws and regulations that apply to VREX Holdco's international operations increases the cost of doing business in foreign jurisdictions. VREX Holdco's employees will also be subject to various reporting and anti-money laundering regulations. Any violation of anti-money laundering laws or regulations by VREX Holdco's employees could have a negative effect on us.

In addition, VREX Holdco has limited operating history with VREX. We entered into the Tolling Agreement with VREX Holdco, whereby we deliver NdPr oxide to VREX Holdco, which VREX Holdco then causes VREX to process into NdPr metal for delivery to our customers globally. We will be providing VREX with a large amount of our inventory of NdPr oxide to process into NdPr metal. We will be subject to risks associated with VREX Holdco and VREX appropriately storing and handling a significant volume and value of our inventory. In the event that VREX Holdco or VREX is unable to store or handle the NdPr oxide or process the NdPr oxide into NdPr metal based on the specifications provided by us, this may have a material adverse effect on our operations and financial condition.

Uncertainty in our estimates of REO reserves could result in lower-than-expected revenues and higher-than-expected costs.

We base our REO reserve estimates on engineering, economic and geological data assembled and analyzed by outside firms, which are reviewed by our engineers and geologists. Ore reserve estimates, however, are necessarily imprecise and depend to some extent on professional interpretation, including statistical inferences drawn from available drilling data, which may prove unreliable. There are numerous uncertainties inherent in estimating quantities and qualities of REO reserves and costs to mine recoverable reserves, including many factors beyond our control. Estimates of economically recoverable REO reserves necessarily depend upon a number of variable factors and assumptions, all of which may vary considerably from actual results, such as:

- geological, mining and processing conditions and/or effects from prior mining that may not be fully identified by available data or that may differ from experience;
- changes to the strategic approach to mining and processing the deposit depending upon market demand, corporate strategy and other prevailing economic conditions;
- assumptions concerning future prices of rare earth products, foreign exchange rates, process recovery rates, transportation costs, operating costs, capital costs and reclamation costs; and
- assumptions concerning future effects of regulation, including the issuance of required permits and taxes by governmental agencies and foreign government policies relating to the import or export of rare earth products.

Uncertainty in our estimates related to our REO reserves could result in lower-than-expected revenues and higher-than-expected costs or a shortened estimated life for the mine at Mountain Pass. Fluctuations in factors out of our control such as changes in future product pricing, foreign government policies on the import or export of rare earths and foreign exchange rates can have a significant impact on the estimates of reserves and can result in significant changes in the quantum of our reserves period-to-period.

Period-to-period conversion of probable REO reserves to proven ore reserves may result in increases or decreases to the total reported amount of ore reserves. Conversion rates are affected by a number of factors, including geological variability, applicable mining methods and changes in safe mining practices, economic considerations and new regulatory requirements.

Our profitability could be adversely affected if we fail to maintain satisfactory labor relations; work stoppages or similar difficulties could significantly disrupt our operations, reduce our revenues and materially adversely affect our results of operations.

Production at Mountain Pass is dependent upon the efforts of our employees. Although none of our employees are currently subject to any collective bargaining arrangements, our employees could, in the future, choose to be represented as a collective unit, which may result in labor disputes, work stoppages or other disruptions in our production efforts that could adversely affect us.

A work stoppage by any of the third parties providing services in connection with construction projects at Mountain Pass and our magnet facility being developed in Fort Worth, Texas, could significantly delay completion of such projects and disrupt our operations, reduce our revenues and materially adversely affect our results of operations.

A shortage of skilled technicians and engineers may further increase operating costs, which may materially adversely affect our results of operations.

Efficient production of rare earth products and magnet materials using modern techniques and equipment requires skilled technicians and engineers. In addition, our optimization and downstream efforts will significantly increase the number of skilled operators, maintenance technicians, engineers and other personnel required to successfully operate our business. In the event that we are unable to hire, train and retain the necessary number of skilled technicians, engineers and other personnel there could be an adverse impact on our labor costs and our ability to reach anticipated production levels in a timely manner, which could have a material adverse effect on our results of operations.

We depend on key personnel for the success of our business.

We depend on the services of our senior management team and other key personnel. The loss of the services of any member of senior management or a key employee could have an adverse effect on our business. We may not be able to locate, attract or employ on acceptable terms qualified replacements for senior management or other key employees if their services are no longer available.

Because of the dangers involved in the mining of minerals and the manufacture of mineral products, there is a risk that we may incur liability or damages as we conduct our business.

The mining of minerals and the manufacture of mineral products involve numerous hazards that could cause bodily harm or environmental damage and subject us to liability. These hazards include: (i) unusual and unexpected rock formations affecting ore or wall rock characteristics; (ii) ground or slope failures of the open-pit mine, overburden stockpiles, and/or tailings disposal areas; (iii) environmental hazards; (iv) industrial accidents and/or processing upsets; (v) periodic interruptions due to inclement or hazardous weather conditions or other acts of God; and (vi) mechanical equipment failure and facility performance problems.

Although we maintain insurance to address certain risks involved in our business, such as coverage for property damage, business interruption, natural disasters, terrorism and workers compensation, there can be no assurance that our coverage will be adequate for liabilities incurred or that insurance will continue to be available to us on economically reasonable terms. Additionally, we cannot be certain that all claims we may make under our insurance policies will be deemed to be within the scope of, or fully covered by, our policies. We might also become subject to liability for environmental issues, damage or other hazards that may be uninsurable or for which we may elect not to insure because of premium costs or commercial impracticality. These policies contain limits of coverage and exclusions that are typical of such policies generally. The payment of such premiums, or the assumption of such liabilities, may have a material adverse effect on our financial position and results of operations.

Our facilities or operations could be adversely affected by events outside of our control, such as natural disasters, wars or health epidemics or pandemics.

We may be impacted by natural disasters, wars, health epidemics or pandemics or other events outside of our control. For example, Mountain Pass is located in San Bernardino County, California, near active faults, that could lead to nearby earthquakes. If major disasters such as earthquakes, wildfires, health epidemics or pandemics, floods or other events occur, or our information system or communications network breaks down or operates improperly, our ability to continue operations at Mountain Pass may be seriously damaged, or we may have to stop or delay production and shipment of our products. We may incur expenses or delays relating to such events outside of our control, which could have a material adverse impact on our business, operating results and financial condition.

We are dependent upon information technology systems, which are subject to cyber threats, disruption, damage and failure.

We depend upon information technology systems in the conduct of our operations. Our information technology systems are subject to disruption, damage or failure from a variety of sources, including, without limitation, computer viruses, security breaches, cyber-attacks, natural disasters and defects in design. Cybersecurity incidents, in particular, are evolving and include, but are not limited to, malicious software, attempts to gain unauthorized access to data and other electronic security breaches that could lead to disruptions in systems, unauthorized release of confidential or otherwise protected information or the corruption of data. Various measures have been implemented to manage our risks related to information technology systems and network disruptions. However, given the unpredictability of the timing, nature and scope of information technology disruptions, we could potentially be subject to downtimes, operational delays, the compromising of confidential or otherwise protected information, destruction or corruption of data, security breaches, other manipulation or improper use of our systems and networks or financial losses from remedial actions, any of which could have a material adverse effect on our business, operating results and financial condition.

Risks Related to Environmental Regulation

Our operations are subject to extensive and costly environmental requirements; current and future laws, regulations and permits impose significant costs, liabilities or obligations or could limit or prevent our ability to continue our current operations or to undertake new operations.

We are subject to numerous and detailed federal, state and local environmental laws, certifications, regulations, permits, and other legal requirements applicable to the mining and mineral processing industry, including, without limitation, those pertaining to employee health and safety, air emissions, water usage, wastewater and stormwater discharges, air quality standards, GHG emissions, waste management, plant and wildlife protection, handling and disposal of hazardous and radioactive substances and waste, remediation of soil and groundwater contamination, land use, reclamation and restoration of properties, the discharge of materials into the environment, procurement of certain materials used in our operations, and groundwater quality and availability. These requirements may result in significant costs, liabilities and obligations, impose conditions that are difficult to achieve or otherwise delay, limit or prohibit current or planned operations and future growth. Consequently, the modernization and expansion of Mountain Pass and the development of our Fort Worth Facility may be delayed, limited or prevented and current operations may be curtailed. Failure to comply with these laws, regulations and permits, including as they evolve, may result in the assessment of administrative, civil and criminal penalties, the issuance of injunctions to limit or cease operations, fines, or the suspension or revocation of permits and other sanctions. Pursuant to such requirements, we may also be subject to third-party claims, including for damages to property or injury to persons arising from our operations. Moreover, environmental legislation and regulation are evolving in a manner that may impose stricter standards and enforcement, increased fines and penalties for non-compliance, cessation of operations, more stringent environmental assessments, and a heightened degree of responsibility for companies and their officers, directors and employees. In addition, mine safety has been the subject of increasing scrutiny resulting in federal and state legislatures and other regulatory authorities imposing more stringent regulatory requirements on mining operations. Any changes in environmental laws, regulations or permits (or the interpretation or enforcement thereof) or any sanctions, damages, costs, obligations or liabilities in respect of these matters could have a material adverse effect on our business and/or the results of our operations and financial condition.

Our operations use hazardous materials and generate hazardous waste and radioactive byproducts. While we maintain procedures for and conduct training on the handling and disposing of chemicals or other substances by our personnel, risks, including bodily injury and property damage, persist. Moreover, mining and processing of rare earths has occurred at Mountain Pass since 1952, and contamination is known to exist around the facility. We may be subject to claims under environmental laws, for toxic torts, natural resource damages and other liabilities, as well as for the investigation and remediation of soil, surface water, groundwater and other environmental media. Mountain Pass is subject to an order issued by the Lahontan Regional Water Quality Control Board, primarily related to contamination emanating from certain on-site impoundments active during prior periods of operation, pursuant to which we and previous owners have conducted various investigatory and remedial actions. These remedial activities include groundwater monitoring, extraction and treatment. We are still in the process of delineating the extent of groundwater contamination at and around the facility and cannot assure you that we will not incur material costs relating to the remediation of such contamination. Also, prior to our acquisition of Mountain Pass, leaks in a wastewater pipeline from Mountain Pass to offsite evaporation ponds on the Ivanpah dry lake bed caused contamination. Pursuant to a settlement agreement, that contamination has been remediated by Chevron Mining Inc., which retained ownership of the ponds and the pipeline and provided a full indemnity to the previous buyer of Mountain Pass for liabilities related to the Ivanpah wastewater pipeline. In 2023, the remaining portion of the pipeline was removed from Mountain Pass and safely disposed. In addition to claims arising out of our current or former properties, such claims may arise in connection with contaminated third-party sites at which we have disposed of waste. Under the federal Comprehensive Environmental Response, Compensation and Liability Act, and analogous state statutes, our liability for claims for contamination at our current or former properties, and at third-party sites at which we disposed of waste, may be joint and several, so that we may be held responsible for more than our share of any contamination, or even for the entire share. These and similar unforeseen impacts that our operations may have on the environment, as well as human exposure to hazardous or radioactive materials or wastes, could have a material adverse effect on our business, reputation, results of operations and financial condition.

In connection with our current and future operations and growth plans, we may need to amend or obtain additional permits that impose strict requirements relating to various environmental and health and safety matters. To obtain certain permits, we may be required to conduct environmental studies and present data to governmental authorities pertaining to the potential impact of our current and future operations upon the environment and take steps to avoid or mitigate those impacts, particularly impacts to desert flora and fauna. Furthermore, the permitting processes and development of supporting materials, including any environmental impact statements, may be costly and time-consuming. These permit processes and requirements, and the interpretation and enforcement thereof, change frequently, and any such future changes could materially adversely affect our mining operations and results of operations. In some cases, the public (including environmental interest groups) has the right to comment upon, and submit objections to, permit applications and environmental impact statements prepared in connection therewith, and otherwise participate in the permitting process, including challenging the issuance of permits. Accordingly, permits required for our operations, including the modernization and expansion of Mountain Pass, may not be issued, maintained, amended or renewed in a timely fashion or at all, or may be issued or renewed upon conditions that restrict our ability to conduct operations. Any such failure to obtain, maintain, amend or renew permits, or other permitting delays, including in connection with any environmental impact analyses, could have a material adverse effect on our results of operations and financial condition or otherwise impose significant restrictions on our ability to conduct our business.

Legislation and increased regulation regarding climate change could impose significant costs on us and our suppliers, including costs related to increased energy requirements, capital equipment, environmental monitoring, permitting, reporting and other costs to comply with such regulations. Our operations emit greenhouse gases, and with the restart of our CHP plant in 2022, our emissions exceeded inclusion thresholds of the California cap-and-trade program, resulting in the Company being re-entered into the program. As such, allowances will be directly allocated to us annually, with fluctuations based on energy usage and regulatory provisions. We expect that our emissions will continue to increase as our separations production ramps, which would require us to purchase additional allowances, with the price of allowances subject to market volatility. Any adopted future climate change regulations could negatively impact our ability to compete with companies situated in areas and countries not subject to such limitations. Given the political significance, regulatory or compliance obligations and uncertainty around the impact of climate change and how it should be addressed, we cannot predict how legislation and regulation will affect our financial condition, operating performance and ability to compete. Furthermore, even without such regulation, increased awareness and any adverse publicity in the global marketplace, including the investing community, about potential impacts on climate change by us or other companies in our industry could harm our reputation or our access to capital. The potential physical impacts of climate change on our operations are highly uncertain and would be particular to the geographic circumstances in areas in which we operate. These impacts may adversely impact the cost, production and financial performance of our operations.

Our inability to acquire, maintain or renew financial assurances related to the reclamation and restoration of mining property, or inaccuracies in the assumption underlying our reclamation plan and mine closure obligations, could have a material adverse effect on our business, results of operations and financial condition.

Under the California Surface Mining and Reclamation Act, we are generally obligated to restore property after it has been mined in accordance with regulatory standards and our approved mining plan. Additionally, we are required under various federal, state and local laws to maintain financial assurances, such as surety bonds, to secure such obligations. The failure to acquire, maintain or renew such assurances, as required by federal, state and local laws, could subject us to fines and penalties as well as the revocation of our mining permits. Such failure could result from a variety of factors, including:

- the lack of availability, higher expense or unreasonable terms of such financial assurances;
- the ability of current and future financial assurance counterparties to increase required collateral; and
- the exercise by third-party financial assurance counterparties of any rights to refuse to renew the financial assurance instruments.

It has become increasingly difficult for mining companies to secure new or renew existing surety bonds without posting partial or full collateral to secure the bonds. In addition, the cost to obtain surety bonds has increased while the market terms of the surety bonds generally have become less favorable. It is possible that surety bond issuers may refuse to provide or renew bonds or may demand additional collateral upon the issuance or renewal of the bonds. Our inability to acquire or failure to maintain or renew such bonds or other financial assurances could have a material adverse effect on our business, financial condition and results of operations.

Federal, state and local laws and regulations establish reclamation and closure standards applicable to our surface mining and other operations as well. Estimates of our total reclamation and mine closing liabilities are based upon our reclamation plan, third-party expert reports, current applicable laws and regulations, certain permit terms, our engineering expertise related to these requirements and review by regulatory agencies. Any change in the underlying assumptions, permissions, or other variation between the estimated liabilities and actual costs could materially and adversely affect our business, results of operations and financial condition.

Risks Related to Our Common Stock

Our stock price has experienced, and may in the future experience, volatility, and you could lose all or part of your investment as a result.

The trading price of our common stock has historically experienced, and may continue to experience, significant volatility, which could cause you to lose all or part of your investment. Moreover, as a result of the decrease in the market price of NdPr oxide in 2023, our Realized Price per REO MT decreased from $11,974 for the year ended December 31, 2022, to $6,854 for the year ended December 31, 2023. This negatively impacted our results of operations, which in turn has resulted in a dramatic decrease in the trading price of the Company's common stock. You may not be able to resell your shares at an attractive price due to a number of factors such as those listed in "Risks Relating to our Business and Industry" above and the following: (a) fluctuations in demand for, and prices of, REE and magnet products; (b) results of operations that vary from the expectations of securities analysts and investors; (c) changes in expectations as to the Company's future financial performance, including financial estimates and investment recommendations by securities analysts and investors; (d) declines in the market prices of stocks generally and market prices of mining-related companies in particular; (e) strategic actions by the Company or its competitors; (f) announcements by the Company or its competitors of significant contracts, acquisitions, joint ventures, other strategic relationships or capital commitments; (g) any significant change in the Company's management; (h) changes in general economic or market conditions or trends in the Company's industry or markets; (i) changes in business or regulatory conditions, including new laws or regulations or new interpretations of existing laws or regulations applicable to the Company's business; (j) future sales of the Company's common stock or other securities; (k) investor perceptions of the investment opportunity associated with the Company's common stock relative to other investment alternatives; (l) the public's response to press releases or other public announcements by the Company or third parties, including the Company's filings with the SEC; (m) litigation involving the Company, the Company's industry, or both, or investigations by regulators into the Company's operations or those of our competitors; (n) guidance, if any, that the Company provides to the public, any changes in this guidance or the Company's failure to meet this guidance; (o) the development and sustainability of an active trading market for the Company's stock; (p) actions by institutional or activist stockholders; (q) declines in the market price of our stock as a result of negative reports on the Company by research firms that engage in short selling; (r) changes in accounting standards, policies, guidelines, interpretations or principles; and (s) other events or factors, including those resulting from natural disasters, war, acts of terrorism, health pandemics or responses to these events.

Volatility in our stock price could adversely affect our business and financing opportunities. These broad market and industry fluctuations may adversely affect the market price of our common stock, regardless of the Company's actual operating performance. In addition, price volatility may be greater if the public float and trading volume of our common stock is low.

In the past, following periods of market volatility, stockholders have instituted securities class action litigation. If the Company was involved in securities litigation, it could have a substantial cost and divert resources and the attention of executive management from the Company's business regardless of the outcome of such litigation.

Because there are no current plans to pay cash dividends on our common stock for the foreseeable future, you may not receive any return on investment unless you sell your common stock for a price greater than that which you paid for it.

We intend to retain future earnings, if any, for future operations, expansion and debt repayment and there are no current plans to pay any cash dividends for the foreseeable future. The declaration, amount and payment of any future dividends on shares of our common stock will be at the sole discretion of our Board. Our Board may take into account general and economic conditions, our financial condition and results of operations, our available cash and current and anticipated cash needs, capital requirements, contractual, legal, tax, and regulatory restrictions, implications on the payment of dividends to our stockholders or by our subsidiaries to us and such other factors as our Board may deem relevant. In addition, our ability to pay dividends may be limited by covenants of any future indebtedness we incur. As a result, you may not receive any return on an investment in our common stock unless you sell our common stock for a price greater than that which you paid for it.

Future sales, or the perception of future sales, by us or our stockholders in the public market could cause the market price for our common stock to decline.

The sale of shares of common stock in the public market, or the perception that such sales could occur, could harm the prevailing market price of shares of common stock. These sales, or the possibility that these sales may occur, also might make it more difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate.

In the future, we may also issue our securities in connection with investments or acquisitions. The amount of shares of common stock issued in connection with an investment or acquisition could constitute a material portion of our then-outstanding shares of common stock. Any issuance of additional securities in connection with investments or acquisitions may result in additional dilution to our stockholders.

Anti-takeover provisions in our organizational documents could delay or prevent a change of control.

Certain provisions of our Second Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws may have an anti-takeover effect and may delay, defer or prevent a merger, acquisition, tender offer, takeover attempt or other change of control transaction that a stockholder might consider in its best interest, including those attempts that might result in a premium over the market price for the shares held by our stockholders.

These provisions provide for, among other things: (i) no cumulative voting with respect to the election of our Board; (ii) the division of the our Board into three classes, with only one class of directors being elected in each year; (iii) the ability of our Board to issue one or more series of preferred stock; (iv) advance notice for nominations of directors by stockholders and for stockholders to include matters to be considered at our annual meetings; (v) certain limitations on convening special stockholder meetings; (vi) limiting the ability of stockholders to act by written consent; (vii) the ability of our Board to fill a vacancy created by the expansion of the board of directors or the resignation, death, or removal of a director in certain circumstances; (viii) providing that our Board is expressly authorized to make, alter or repeal our bylaws; (ix) the removal of directors only for cause; and (x) that certain provisions may be amended only by the affirmative vote of at least 66.7% of the shares of common stock entitled to vote generally in the election of our directors.

These anti-takeover provisions could make it more difficult for a third party to acquire us, even if the third party’s offer may be considered beneficial by many of our stockholders. As a result, our stockholders may be limited in their ability to obtain a premium for their shares. These provisions could also discourage proxy contests and make it more difficult for you and other stockholders to elect directors of your choosing and to cause us to take other corporate actions you desire.

Our Second Amended and Restated Certificate of Incorporation designates the Court of Chancery of the State of Delaware as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders’ ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or stockholders.

The Second Amended and Restated Certificate of Incorporation provides that, subject to limited exceptions, any (i) derivative action or proceeding brought on behalf of the Company, (ii) action asserting a claim of breach of a fiduciary duty owed by any director, officer, stockholder or employee to the Company or its stockholders, (iii) action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law or our Second Amended and Restated Certificate of Incorporation or our Amended and Restated Bylaws or (iv) action asserting a claim governed by the internal affairs doctrine shall, to the fullest extent permitted by law, be exclusively brought in the Court of Chancery of the State of Delaware or, if such court does not have subject matter jurisdiction thereof, another state or federal court located within the State of Delaware. The Second Amended and Restated Certificate of Incorporation also provides that, to the fullest extent permitted by law, the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the U.S. federal securities laws, including the Securities Act and the Exchange Act. Additionally, investors cannot waive our compliance with federal securities laws and the rules and regulations thereunder. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our certificate of incorporation described above. This choice of forum provision may limit a stockholder’s ability to bring a claim in a judicial forum that it finds favorable for disputes with the Company or its directors, officers or other employees, which may discourage such lawsuits against the Company and its directors, officers and employees. There is uncertainty as to whether a court would enforce such an exclusive forum provision with respect to claims under the Securities Act. If a court were to find these provisions of our Second Amended and Restated Certificate of Incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business and financial condition.

Increased scrutiny regarding our sustainability and ESG practices could impact our reputation and our stock price.

In June 2023, we released our ESG report for fiscal year 2022, which highlights our key achievements, metrics and ESG strategy. Our sustainability report also includes our policies and practices on a variety of ESG matters, including water management and preservation; recycling; diversity, inclusion and meritocracy; employee health and safety; and human capital management. In addition, our business faces increasing scrutiny related to ESG issues, including sustainable development, renewable resources, environmental stewardship, supply chain management, climate change, diversity, inclusion and meritocracy, workplace conduct, human rights, philanthropy and support for local communities. Implementation of our environmental and sustainability initiatives will require financial expenditures and employee resources.

The publication of our ESG report may result in increased investor, media, employee, and other stakeholder attention to our ESG initiatives, and such stakeholders may not be satisfied with our ESG practices or initiatives. Organizations that inform investors on ESG matters have developed rating systems for evaluating companies on their approach to ESG. Unfavorable ratings may lead to negative investor sentiment, which could negatively impact our stock price. Any failure, or perceived failure, to respond to ESG concerns could harm our business and reputation. In addition, certain influential institutional investors are also increasing their focus on ESG practices and are placing importance on the implications and social cost of their investments. If our ESG practices do not meet the standards set by these investors, they may choose not to invest in our common stock, or if our peer companies outperform us in their ESG initiatives, potential or current investors may elect to invest with our competitors instead. If we do not comply with investor or stockholder expectations and standards in connection with our ESG initiatives, or are perceived to have not responded appropriately to address ESG issues within our company, our brand and reputation, as well as our business, financial condition, and results of operations could be negatively impacted, and our share price could be materially and adversely affected.

Risks Relating to our Convertible Notes

The conditional conversion feature of our Convertible Notes, if triggered, may adversely affect our financial condition and operating results.

We completed an offering of Convertible Notes in March 2021. In the event the conditional conversion feature of our Convertible Notes is triggered, holders of the Convertible Notes will be entitled to convert them at any time during specified periods at their option. If one or more holders elect to convert their Convertible Notes, unless we elect to satisfy our conversion obligation by delivering solely shares of our common stock (other than paying cash in lieu of delivering any fractional share), we would be required to settle a portion or all of our conversion obligation through the payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert their Convertible Notes, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the Convertible Notes as a current rather than long-term liability, which would result in a material reduction of our net working capital.

Conversion of our Convertible Notes may dilute the ownership interest of our stockholders or may otherwise depress the price of our common stock.

The conversion of some or all of our Convertible Notes may dilute the ownership interests of our stockholders. Upon conversion of the notes, we have the option to pay or deliver, as the case may be, cash, shares of our common stock, or a combination of cash and shares of our common stock. If we elect to settle our conversion obligation in shares of our common stock or a combination of cash and shares of our common stock, any sales in the public market of our common stock issuable upon such conversion could adversely affect prevailing market prices of our common stock. In addition, the existence of the Convertible Notes may encourage short selling by market participants that engage in hedging or arbitrage activity, and anticipated conversion of the notes into shares of our common stock could depress the price of our common stock.

Certain provisions in the indenture governing the Convertible Notes may delay or prevent an otherwise beneficial takeover attempt of us.

Certain provisions in the indenture governing the Convertible Notes may make it more difficult or expensive for a third party to acquire us. For example, the indenture governing the Convertible Notes requires us to repurchase the notes for cash upon the occurrence of a fundamental change (as defined in the indenture governing the Convertible Notes) of us and, in certain circumstances, to increase the conversion rate for a holder that converts their Convertible Notes in connection with a make-whole fundamental change (as defined in the indenture governing the Convertible Notes). A takeover of us may trigger the requirement that we repurchase the Convertible Notes and/or increase the conversion rate, which could make it more costly for a potential acquirer to engage in such takeover. Such additional costs may have the effect of delaying or preventing a takeover of us that would otherwise be beneficial to investors.

Servicing our debt requires a significant amount of cash, and we may not have sufficient cash flow from our business to pay our debt.

Our ability to make scheduled payments of the principal of, to pay interest on, or to refinance our indebtedness, including our Convertible Notes, depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. In addition, holders of the Convertible Notes will have the right to require us to repurchase their notes for cash upon the occurrence of certain fundamental changes. Upon conversion of the Convertible Notes, unless we elect to deliver solely shares of our common stock to settle such conversion (other than paying cash in lieu of delivering any fractional share), we will be required to make cash payments in respect of the notes being converted. Our business may not continue to generate cash flow from operations in the future sufficient to service our debt and make necessary capital expenditures. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring debt or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance our indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 1C. CYBERSECURITY

The Company’s information security program is managed by a dedicated Chief Technology Officer (“CTO”), who has over 25 years of professional experience within information technology roles, including 15 years of security consulting experience. The CTO leads the information technology department, which is responsible for enterprise-wide cybersecurity strategy, policy, standards, architecture, and processes. The Company’s Cybersecurity Incident Response Committee (the “CIRC”), which is comprised of the Company’s CTO, Chief Financial Officer, General Counsel, Senior Vice President of Financial Reporting and Technical Accounting, and Senior Director of Internal Audit, meets periodically and more often, as needed, in the event cybersecurity incidents are identified.

As part of the Company’s overall risk assessment process, the enterprise risk management framework considers cybersecurity risk alongside other company risks. The Company’s internal audit department collaborates with the Company’s information technology department to gather insights for assessing, identifying and managing cybersecurity threat risks, their severity, and potential mitigations. The Company actively engages with key vendors, industry participants, and intelligence and law enforcement communities as part of its continuing efforts to evaluate and enhance the effectiveness of its information security policies and procedures.

In addition, the Company’s vendor management program addresses cybersecurity risks associated with its use of third-party service providers including suppliers, software and cloud-based service providers. The Company proactively evaluates the cybersecurity risk of a third party by utilizing a repository of risk assessments, external monitoring sources, threat intelligence during contracting, and vendor selection processes. Security issues are documented and tracked, and periodic monitoring of third parties is conducted in an effort to mitigate risk.

The Company’s CTO provides periodic reports to the Audit Committee of the Company’s Board of Directors, as well as the CIRC, as appropriate. These periodic reports include updates on the Company’s cyber risks and threats, the status of projects to strengthen its information security systems, assessments of the information security program, and the emerging threat landscape. The information security program is regularly evaluated by the CTO with the results of those reviews reported to the CIRC, the Audit Committee of the Company’s Board of Directors, and the Board of Directors, as appropriate.

Cybersecurity threats, including as a result of any previous cybersecurity incidents, have not materially affected nor are they reasonably likely to affect the Company, including its business strategy, results of operations or financial condition.

ITEM 2. PROPERTIES

Mountain Pass

The Company owns and operates the Mountain Pass Rare Earth Mine and Processing Facility (previously defined as “Mountain Pass”), which is located on 2,222 fee simple acres of land, approximately 50 miles southwest of Las Vegas, Nevada, near Mountain Pass, San Bernardino County, California, at geographic coordinates 35°28’56”N latitude and 115°31’54”W longitude. Mountain Pass includes an open-pit mine in the production stage, infrastructure supporting mining and processing operations, overburden and ore stockpiles, a crusher, a mill/flotation plant, hydrometallurgy facilities, separation plants, product finishing facilities, tailings processing and storage facilities, a water treatment plant, an idle chlor-alkali facility, and on-site evaporation ponds, as well as laboratory facilities to support product analysis and research and development activities, offices, maintenance shops, warehouses and support buildings. In 2023, the Company completed recommissioning activities on its previously idle separation facilities at Mountain Pass and completed construction of new assets, which are utilized to separate rare earth concentrate into other products, including NdPr oxide. The Mountain Pass facilities and infrastructure, the majority of which were constructed between 2012 and 2023, are in good operating condition and benefit from routine maintenance. The net carrying amount of property, plant and equipment used in the operation of Mountain Pass was approximately $577 million as of December 31, 2023.

Mountain Pass directly abuts Interstate 15 and may be accessed by existing hard-surface roads. Water at Mountain Pass is supplied through active water wells, pit dewatering, and process water recovery. MP Materials’ facilities at Mountain Pass are powered by a natural gas-powered CHP plant, which was installed at Mountain Pass to produce electricity and steam and to minimize or eliminate reliance on the regional electric power grid.

As of December 31, 2023, approximately 1,118 acres of the 2,222 acres were in use (e.g., existing buildings, infrastructure or active disturbance). Portions of the fee lands, none of which are actively being mined or are currently anticipated to be mined for the purpose of recovering ore, are subject to mineral reservations in favor of the U.S. for some properties and the State of California for other properties. The specific minerals reserved on those parcels vary according to the type of land patent or conveyance document through which the land was acquired or conveyed. The Company also owns mining and mill site claims over a further 15,000 acres of adjacent land. The lands surrounding Mountain Pass are mostly public lands managed by the Bureau of Land Management and the National Park Service. In addition, MP Materials holds 525 unpatented lode and mineral mining claims and mill sites under the provisions of The Mining Law of 1872. These mining claims and mill sites provide land for mining, ancillary facilities and expansion capacity around Mountain Pass.

Mountain Pass represents the largest commercial source of rare earth materials in the Western hemisphere. Molybdenum Corporation of America began REE mining operations at Mountain Pass in 1952. Mining, milling and separation processes continued under Unocal Corporation, which purchased Molybdenum Corporation of America in 1977, until 1998. In 2005, ChevronTexaco Corporation acquired Unocal Corporation and then, in 2008, Molycorp Minerals, LLC acquired Mountain Pass from Chevron Mining Inc. Operations relating to mining, milling and separations resumed under Molycorp until they were placed into cold-idle status in mid-2015. In July 2017, the Company acquired Mountain Pass from the Molycorp estate.

The Company holds the necessary permits to operate Mountain Pass, including conditional use and minor use permits from San Bernardino County, California, and an associated environmental impact report, all of which were issued in 2004, which currently allow continued operation of Mountain Pass through 2042, though the Company expects to extend such permits to allow for continued operation through at least 2056. Since restarting operations at the facility in the fourth quarter of 2017, the Company's activities initially focused on the milling and flotation processes, leading to production of a bastnaesite concentrate, rich in REE, with the first concentrate sales in the first quarter of 2018. In third quarter of 2023, the Company also commenced production of separated finished rare earth oxides and compounds.

The bastnaesite ore body at Mountain Pass has been mined as a principal source of REE for a period of over 60 years. The Mountain Pass REE deposit is located within an uplifted block of Precambrian metamorphic and igneous rocks that are bounded to the south and east by basin-fill deposits in California's Ivanpah Valley. The two main groups of rocks in the Mountain Pass area are Early Proterozoic high-grade metamorphic rocks and Middle Proterozoic ultrapotassic rocks and monazitic carbonatites, which carbonatites are associated with higher levels of REE. The total orebody strike length is approximately 2,750 feet and dip extent is 3,000 feet; true thickness of the more than 2% total rare earth oxide ("TREO") grade zone ranges between 15 feet and 250 feet. The percentage of each rare earth material contained in typical Mountain Pass bastnaesite concentrate is estimated to be as follows:

Element	Estimated Distribution of TREO Content
Cerium	50.2 %
Lanthanum	32.3 %
Neodymium-Praseodymium	15.7 %
SEG+[(1)]	1.8 %

(1) See the "Rare Earth Resources and Reserves" section below for definition.

Fort Worth Facility

The Company owns approximately 18 acres of land in Fort Worth, Texas, on which it is constructing a metal, alloy, and magnet manufacturing facility as part of its Stage III strategy. The building and building improvements were substantially completed in the fourth quarter of 2023.

Corporate Office

The Company has a lease for corporate office space at 1700 S. Pavilion Center Drive, Suite 800, Las Vegas, Nevada 89135. The lease has an initial term of 91 months expiring in October 2030, with an option to renew for one five-year period at the Company's election.

Rare Earth Resources and Reserves

Introduction

Mineral resources and mineral reserves were estimated by SRK Consulting (U.S.) Inc. ("SRK") for inclusion in this Annual Report. Pursuant to the requirements of Regulation S-K Subpart 1300 ("S-K 1300"), SRK prepared a pre-feasibility level Technical Report Summary for Mountain Pass with an effective date of October 1, 2023 (the "2023 TRS") (refer to Exhibit 96.1 to this Annual Report). The mineral resource and mineral reserve estimated in the 2023 TRS were subsequently depleted by SRK to present an estimate of our resources and reserves as of December 31, 2023. The depletion removed by SRK represents resources and reserves that were extracted from the Mountain Pass open pit from October 1, 2023, through December 31, 2023.

Mineral Resource and Mineral Reserve Definitions

Mineral Resources

Item 1300 of S-K 1300 defines a “mineral resource” as a concentration or occurrence of material of economic interest in or on the Earth’s crust in such form, grade or quality, and quantity that there are reasonable prospects for economic extraction. A mineral resource is a reasonable estimate of mineralization, taking into account relevant factors such as cut-off grade (“COG”), likely mining dimensions, location or continuity, that, with the assumed and justifiable technical and economic conditions, is likely to, in whole or in part, become economically extractable. It is not merely an inventory of all mineralization drilled or sampled.

A “measured mineral resource” is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of conclusive geological evidence and sampling. The level of geological certainty associated with a measured mineral resource is sufficient to allow a qualified person to apply modifying factors, as defined in this section, in sufficient detail to support detailed mine planning and final evaluation of the economic viability of the deposit. Because a measured mineral resource has a higher level of confidence than the level of confidence of either an indicated mineral resource or an inferred mineral resource, a measured mineral resource may be converted to a proven mineral reserve or to a probable mineral reserve.

An “indicated mineral resource” is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of adequate geological evidence and sampling. The level of geological certainty associated with an indicated mineral resource is sufficient to allow a qualified person to apply modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Because an indicated mineral resource has a lower level of confidence than the level of confidence of a measured mineral resource, an indicated mineral resource may only be converted to a probable mineral reserve.

An “inferred mineral resource” is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. The level of geological uncertainty associated with an inferred mineral resource is too high to apply relevant technical and economic factors likely to influence the prospects of economic extraction in a manner useful for evaluation of economic viability. Because an inferred mineral resource has the lowest level of geological confidence of all mineral resources, which prevents the application of the modifying factors in a manner useful for evaluation of economic viability, an inferred mineral resource may not be considered when assessing the economic viability of a mining project and may not be converted to a mineral reserve.

Mineral Reserves

Item 1300 of S-K 1300 defines a “mineral reserve” as an estimate of tonnage and grade or quality of indicated and measured mineral resources that, in the opinion of the qualified person, can be the basis of an economically viable project. More specifically, it is the economically mineable part of a measured or indicated mineral resource, which includes diluting materials and allowances for losses that may occur when the material is mined or extracted. A “proven mineral reserve” is the economically mineable part of a measured mineral resource and can only result from conversion of a measured mineral resource. A “probable mineral reserve” is the economically mineable part of an indicated and, in some cases, a measured mineral resource.

Estimation Methodology

Mineral Resources

The mineral resource estimate has been constrained by a geological model considering relevant rock types, structure, and mineralization envelopes as defined by TREO content within relevant geological features. This geological model is informed principally by diamond core drilling and multiple phases of geological mapping. Sectional interpretation based on the combination of these data were used to influence implicit modeling of the geological data with manual controls where appropriate. Data has been composited to reasonable lengths based on the original sample lengths and expected mining unit scale, and outliers have been addressed during estimation using restrictions on influence.

A number of internal controls have been applied over the history of the Mountain Pass deposit to demonstrate the consistency and reliability of historical analytical data supporting mineral resource estimation. Almost all data supporting the mineral resource has been generated by an iteration of a site-based laboratory at the Mountain Pass mine. The Mountain Pass laboratory uses various quality assurance and quality control (“QA/QC”) measures to calibrate modern equipment and ensure analytical precision and accuracy. QA/QC generated by previous laboratories has undergone check assays at independent third-party laboratories, and generally demonstrate no consistent bias. The quality analytical database is also supported by a limited amount of blind quality control samples inserted during a re-assay program, including site-specific standards of known TREO content, a variety of duplicate samples, and blank samples. The implementation and results of these various QA/QC programs have not been fully aligned with current industry standards and are not comprehensive but are considered satisfactory for use in mineral resource estimation.

Estimates have been validated to the input data using statistical and visual comparisons, localized swath plot comparisons of mean grades, and review of the limited mine production reconciliation data to the model. In general, estimates of grade quality are shown to align closely with the input exploration data, but have been demonstrated to be under-reporting relative to the grade control drilling. SRK has categorized uncertainty and risk at Mountain Pass by classifying the contained mineral resource by varying degrees of confidence in the estimate. The mineral resources at the Mountain Pass deposit have been classified in accordance with S-K 1300 definitions. The classification parameters are defined by the distance to composited data, the number of drillholes used to inform estimated block grades and a geostatistical indicator of relative estimation quality (kriging efficiency). As an overall modifier to classification, SRK considered the results from the QA/QC noted above and the observed variability in production reconciliation in the mineral resource classification as well, both of which preclude the assignment of measured resources, as defined by the SEC. Bulk density is based on average density measurements collected from the various rock types over the years, and carbonatite density in particular is supported by extensive mining and processing experience with the materials.

An economic COG of 2.18% TREO has been developed to ensure that material reported as a mineral resource can satisfy the definition of having reasonable prospects for economic extraction as required for the SEC definition. Mineral resources have been constrained within an optimized economic pit shell based on reserve input parameters, with the exception of the assumed equivalent concentrate price ($12,461 per dry short ton (“ST”) of 60% TREO concentrate), which is set 15% higher than the reserves price. The equivalent concentrate price used for pit optimization reflects the gross contained value realized from sales of the four individual REO products (see below) produced from the onsite separations facility. The equivalent concentrate price is calculated based on (i) the expected percentage distribution of the REO products in the bastnaesite concentrate, (ii) the expected metallurgical recoveries for the separations facility and (iii) the expected sales prices for the REO products. For purposes of calculating the end-of-year (“EOY”) 2022 mineral resources, the equivalent concentrate price was reflected net of the operating costs of the separations facility, while the equivalent concentrate price for EOY 2023 mineral resources is reflected gross of these costs, with the operating costs instead included along with the other estimated operating costs (mining; processing; selling, general and administrative (“SG&A”); etc.) that were used in the pit optimization.

For mineral resources, a revenue factor of 1.0 is selected which corresponds to a break-even pit shell volume. SRK notes that the pit selected for mineral resources has been influenced by setbacks relative to critical infrastructure such as the tailing storage and the mill and flotation facilities.

A description of the methodology used to calculate mineral resources is provided in Exhibit 96.1 to this Annual Report.

Mineral Reserves

SRK developed a life-of-mine (“LoM”) plan for the Mountain Pass operation in support of mineral reserves. During 2023 the Company completed construction of a separations facility at Mountain Pass that allows the Company to separate bastnaesite concentrate into four individual REO products for sale. The separations facility is currently ramping up and the Company expects the plant to operate at full design capacity by the end of 2024. For economic modeling of the mineral reserves, SRK assumed that 2024 production will be a combination of bastnaesite concentrate sales and sales of four individual REO products: neodymium and praseodymium (previously defined as “NdPr”) oxide; samarium, europium, and gadolinium (“SEG+”) oxalate; lanthanum carbonate; and cerium chloride. Forecast economic parameters are based on historical cost performance for process, transportation, and administrative costs, as well as a first principles estimation of future mining costs. Forecast revenue from concentrate sales and individual separated product sales is based on a preliminary market study commissioned by the Company.

From this evaluation, pit optimization was performed based on an equivalent concentrate price of $10,836 per dry ST of 60% TREO concentrate. The equivalent concentrate price reflects the gross contained value realized from sales of the four individual REO products produced from the onsite separations facility. The equivalent concentrate price is calculated based on (i) the expected percentage distribution of the REO products in the bastnaesite concentrate, (ii) the expected metallurgical recoveries for the separations facility and (iii) the expected sales prices for the REO products. For purposes of calculating the EOY 2022 mineral reserves, the equivalent concentrate price was reflected net of the operating costs of the separations facility, while the equivalent concentrate price for EOY 2023 mineral reserves is reflected gross of these costs, with the operating costs instead included along with the other estimated operating costs (mining, processing, SG&A, etc.) that were used in the pit optimization.

The results of pit optimization guided the design and scheduling of the ultimate pit. SRK generated a cash flow model which indicated positive economics for the LoM plan, which provides the basis for the reserves. Reserves within the new ultimate pit are sequenced for the remaining 33-year LoM (2024 through 2056).

The costs used for pit optimization include estimated mining, processing, sustaining capital, transportation, and administrative costs, including an allocation of corporate costs. Processing and SG&A costs used for pit optimization were based on historical actual costs.

Processing recovery for concentrate is variable based on a mathematical relationship to estimate overall TREO recovery versus ore grade. The calculated COG for the reserves is 2.43% TREO, which was applied to indicated blocks contained within an ultimate pit, the design of which was guided by economic pit optimization.

The optimized pit shell selected to guide final pit design was based on a combination of the revenue factor ("RF") 0.70 pit (used on the north half of the deposit) and the RF 1.00 pit shell (used on the south half of the deposit). The inter-ramp pit slopes used for the mineral reserves pit design are based on geotechnical studies and range from 44° to 47°.

Measured resources in stockpiles were converted to proven reserves. Indicated pit resources were converted to probable reserves by applying the appropriate modifying factors to potential mining pit shapes created during the mine design process. Inferred resources present within the LoM pit are treated as waste. Internal controls to demonstrate the consistency and reliability of the historic analytical data supporting the mineral resource estimate (which forms the basis for the mineral reserve estimate) are discussed above.

A description of the methodology used to calculate mineral reserves is provided in Exhibit 96.1 to this Annual Report.

Results

Mineral Resources

As of December 31, 2023, SRK estimates total indicated resources of 1.45 million STs with an average grade of 2.75% TREO and 9.09 million STs of inferred resources with an average grade of 5.05% TREO. Mineral resources are reported exclusive of mineral reserves. The reference point for mineral resources is in situ material.

			Mass	Average Value					
Category	**Resource Type**	**Cut-Off TREO (%)**	**Million Short Tons (dry)**	**TREO(1) (%)**	**La_2O_3(2) (%)**	**CeO_2(2) (%)**	**Pr_6O_{11}(2) (%)**	**Nd_2O_3(2) (%)**	**Sm_2O_3(2) (%)**
Indicated	Within the Reserve Pit	2.18	0.94	2.31	0.75	1.15	0.10	0.28	0.02
	Within the Resource Pit	2.18	0.51	3.56	1.16	1.78	0.15	0.43	0.03
Total Indicated		**2.18**	**1.45**	**2.75**	**0.89**	**1.37**	**0.12**	**0.33**	**0.02**
Inferred	Within the Reserve Pit	2.18	6.68	5.52	1.80	2.75	0.23	0.67	0.05
	Within the Resource Pit	2.18	2.41	3.74	1.22	1.86	0.16	0.45	0.03
Total Inferred		**2.18**	**9.09**	**5.05**	**1.65**	**2.52**	**0.21**	**0.61**	**0.04**

(1) TREO% represents the total of individually assayed light rare earth oxides on a 99.7% basis of total contained TREO, based on the historical site analyses.

(2) Percentage of individual light rare earth oxides are based on the average ratios; La_2O_3 is calculated at a ratio of 32.6% grade of TREO% equivalent estimated grade, CeO_2 is calculated at a ratio of 49.9% of TREO% equivalent estimated grade, Pr_6O_{11} is calculated at a ratio of 4.3% of TREO% equivalent estimated grade, Nd_2O_3 is calculated at a ratio of 12.1% of TREO% equivalent estimated grade, and Sm_2O_3 is calculated at a ratio of 0.9% of TREO% equivalent estimated grade. The sum of light rare earths averages 99.7%; the additional 0.3% cannot be accounted for based on the analyses available to date and has been discounted from this resource statement.

General Notes:

- Mineral resources are reported exclusive of mineral reserves.
- Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resources estimated will be converted into the mineral reserves estimate.
- Mineral resource tonnage and contained metal have been rounded to reflect the accuracy of the estimate, any apparent rounding errors are considered insignificant.
- Mineral resource tonnage and grade are reported as diluted.

- The mineral resource model has been depleted for historical mining based on the December 31, 2023, pit topography.
- Pit optimization is based on an average TREO% equivalent concentrate price of $12,461 per dry ST of 60% TREO concentrate, average mining cost at the pit exit of $1.70 per dry ST mined plus $0.068 per dry ST mined for each 15 feet bench above or below the pit exit, combined milling and SG&A costs of $78.94 per dry ST ore milled, separations facility costs of $1,551 per dry ST of 60% TREO concentrate treated, freight of $163 per ST of dry product shipped, sustaining capital costs of $30.48 per dry ST of ore mined, and overall pit slope angles of 39° to 45° including ramps.
- The mineral resource statement reported herein only includes the REE cerium, lanthanum, neodymium, praseodymium, and samarium (often referred to as LREE). While other REE, often referred to as HREE, are present in the deposit, they are not accounted for in this estimate due to historic data limitations.

The following table is provided to show the change in mineral resources from December 31, 2022, to December 31, 2023:

Description	Estimate Date	Million Short Tons (dry)	TREO (%)	La_2O_3 (%)	CeO_2 (%)	Pr_6O_{11} (%)	Nd_2O_3 (%)	Sm_2O_3 (%)
Indicated Mineral Resources	December 31, 2023	1.45	2.75	0.89	1.37	0.12	0.33	0.02
Indicated Mineral Resources	December 31, 2022	1.43	2.83	0.92	1.41	0.12	0.34	0.03
Difference		**0.02**	**(0.08)**	**(0.03)**	**(0.04)**	**0.00**	**(0.01)**	**(0.01)**
% Difference(1)		**1.4 %**	**(2.8)%**	**(2.8)%**	**(2.7)%**	**(2.0)%**	**(2.1)%**	**(21.6)%**
Inferred Mineral Resources	December 31, 2023	9.09	5.05	1.65	2.52	0.21	0.61	0.04
Inferred Mineral Resources	December 31, 2022	8.90	5.13	1.67	2.56	0.22	0.62	0.04
Difference		**0.19**	**(0.08)**	**(0.02)**	**(0.04)**	**(0.01)**	**(0.01)**	**0.00**
% Difference(1)		**2.1 %**	**(1.7)%**	**(1.3)%**	**(1.8)%**	**(1.7)%**	**(1.8)%**	**(3.8)%**

(1) Percentages do not recompute as presented due to rounding.

The difference as compared to the previous year is due to inferred resources located within the mineral reserve pit that were mined and processed during 2023, and a change in the mineral resource COG due to updated project economics.

Mineral Reserves

As of December 31, 2023, SRK estimates total proven reserves of 0.64 million STs of ore with an average grade of 4.28% TREO and 27.82 million STs of probable reserves with an average ore grade of 6.25%. The Company’s total proven and probable reserves are estimated as 28.46 million STs with an average grade of 6.20%. The reference point for the mineral reserves is material delivered to the Mountain Pass mill and flotation facilities.

Based on these estimated reserves, the Company’s expected remaining mine life is approximately 33 years (2024 through 2056) to complete the processing of stockpiles and separations.

The following table states the amount of the Company’s proven and probable mineral reserves as of December 31, 2023.

		Run-of-Mine			Concentrate
Category	**Description**	**Million Short Tons (dry)**	**TREO%**	**MY%**	**Million Short Tons (dry)**
Proven	Current Stockpiles	0.64	4.28	3.68	0.02
	In situ	—	—	—	—
	Proven Totals	0.64	4.28	3.68	0.02
Probable	Current Stockpiles	—	—	—	—
	In situ	27.82	6.25	6.60	1.84
	Probable Totals	27.82	6.25	6.60	1.84
Proven + Probable	**Current Stockpiles**	**0.64**	**4.28**	**3.68**	**0.02**
	In situ	**27.82**	**6.25**	**6.60**	**1.84**
	Proven + Probable Totals	**28.46**	**6.20**	**6.54**	**1.86**

General Notes:

- Reserves stated as contained within an economically mineable open pit design stated above a 2.43% TREO COG.
- Mineral reserves tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
- MY% (mass yield) calculation is based on 60% concentrate grade of the product and the ore grade dependent metallurgical recovery. MY% = (TREO% * Met recovery)/60% concentrate TREO grade.
- Indicated mineral resources have been converted to probable reserves. Measured mineral resources have been converted to proven reserves.
- Reserves are diluted at the contact of the 2% TREO geological model triangulation (further to dilution inherent to the resource model and assume selective mining unit of 15 feet x 15 feet x 30 feet).
- Mineral reserves tonnage and grade are reported as diluted.
- Pit optimization is based on an average TREO% equivalent concentrate price of $10,836 per dry ST of 60% TREO concentrate, average mining cost at the pit exit of $1.70 per dry ST mined plus $0.068 per dry ST mined for each 15 feet bench above or below the pit exit, combined milling and SG&A costs of $78.94 per dry ST ore milled, separations facility costs of $1,551 per dry ST of 60% TREO concentrate treated, freight of $163 per ST of dry product shipped, sustaining capital costs of $30.48 per dry ST of ore mined, and overall pit slope angles of 39° to 45° including ramps.
- Reserves contain material inside and outside permitted mining but within mineral lease.
- Reserves assume 100% mining recovery.
- The strip ratio for the remaining reserves is 6.3 to 1 (waste to ore ratio).
- The mineral reserves were estimated by SRK.

The following table is provided to show the change in reserves from December 31, 2022, to December 31, 2023:

Description	Estimate Date	Run-of-Mine Million Short Tons (dry)	TREO%	MY%	Concentrate Million Short Tons (dry)
Proven + Probable Reserves	December 31, 2023	28.46	6.20	6.54	1.86
Proven + Probable Reserves	December 31, 2022	29.30	6.32	6.69	1.96
Difference		**(0.84)**	**(0.12)**	**(0.15)**	**(0.10)**
% Difference		**(2.9)%**	**(1.9)%**	**(2.2)%**	**(5.1)%**

The reason for the differences between the two estimates is due to reserves that were mined and processed during 2023. It is noted that reserves depletion due to mining and processing during 2023 was partially offset by additional above COG material that was identified by closely spaced blasthole sampling. This above COG material was not included in the previous reserves estimate because the material had not been identified by the wider spaced resource drilling that informed the resource block model utilized for the 2023 TRS.

Factors and Assumptions Affecting Mineral Resource and Mineral Reserve Estimates

There are numerous uncertainties inherent in estimating quantities and qualities of REO reserves and costs to mine recoverable reserves, including many factors beyond our control. We will regularly evaluate our REO reserve estimates. This may be done in conjunction with additional exploration drilling programs. The estimates of REO reserves as to both quantity and quality will also be updated to reflect new drilling or other data received. Estimates of economically recoverable REO reserves, however, necessarily depend upon a number of variable factors and assumptions, all of which may vary considerably from actual results, such as:

- geological, mining and processing conditions and/or effects from prior mining that may not be fully identified by available data or that may differ from experience;
- the strategic approach to mining and processing the deposit may change depending upon market demand, corporate strategy and other prevailing economic conditions;
- assumptions concerning future prices of rare earth products, foreign exchange rates, process recovery rates, transportation costs, operating costs, capital costs, and reclamation costs; and

- assumptions concerning future effects of regulation, including the issuance of required permits and taxes by governmental agencies and foreign government policy relating to import or export of rare earth products.

Actual REO tonnage recovered from identified REO reserves and revenues and expenditures with respect to the same may vary materially from estimates. Further, period-to-period, our future estimates of REO reserves may fluctuate significantly as macroeconomic conditions and our level of understanding with respect to the deposit change. These estimates may not accurately reflect our actual REO reserves. Any inaccuracy in our estimates related to our REO reserves could result in lower-than-expected revenues and higher-than-expected costs.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may be subject to legal and governmental proceedings and claims in the ordinary course of business. We are not currently a party to any material legal or governmental proceedings, and, to our knowledge, none is threatened.

ITEM 4. MINE SAFETY DISCLOSURES

The information concerning mine safety violations or other regulatory matters required by Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 104 of Regulation S-K is included in Exhibit 95.1 to this Annual Report.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information and Trading Symbol for Common Stock

The Company's common stock is currently quoted on the NYSE under the symbol "MP".

Holders of Record

According to Continental Stock Transfer & Trust Company, the Company's transfer agent, there were 128 active holders of record of the Company's common stock as of February 15, 2024. The actual number of stockholders is greater than these numbers and includes holders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. These numbers of active holders of record also do not include holders whose shares may be held in trust by other entities.

Dividends

The Company has not paid any cash dividends on its common stock to date. The payment of cash dividends in the future will be dependent upon the Company's revenues and earnings, capital requirements and general financial condition. The payment of any cash dividends will be within the discretion of the Company's Board of Directors at such time. In addition, the Company is not currently contemplating and does not anticipate declaring any stock dividends in the foreseeable future as it is currently expected that available cash resources will be utilized in connection with our ongoing operations and capital expenditures to support our development projects.

Unregistered Sales of Equity Securities

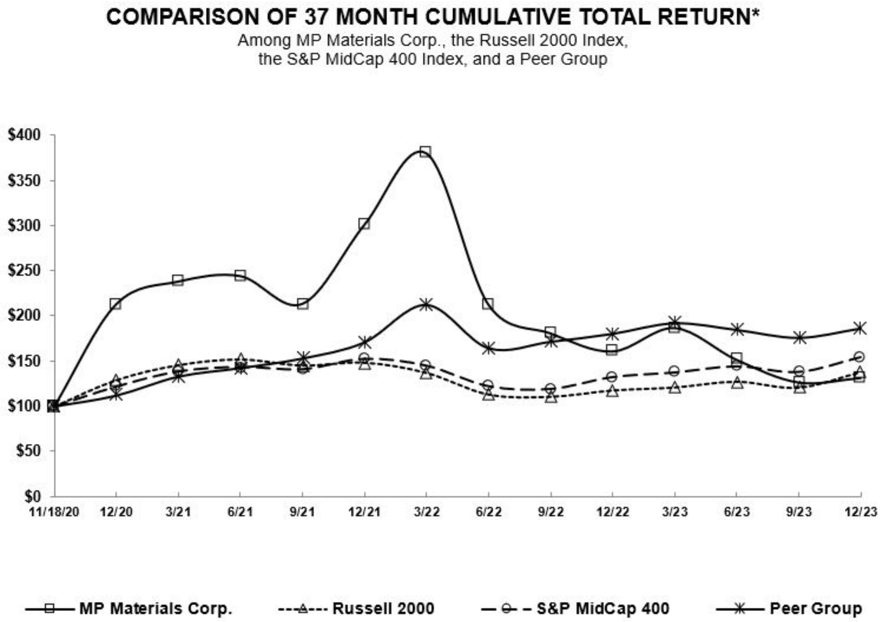
On August 18, 2023, the Company acquired a license to use patented technology, technical know-how, and other intellectual property pertaining to the development and manufacturing of magnetic products in exchange for 435,729 shares of its common stock. Pursuant to the terms of the agreement to acquire the license, 152,504 shares were issued immediately and the remaining shares will be issued as follows: 43,573 shares on each of the first, second, and third anniversaries of the acquisition date and an additional 152,506 shares on the fourth anniversary of the acquisition date. The securities were issued in reliance upon the exemption from registration available under Regulation S under the Securities Act of 1933, as amended.

Repurchase of Securities

During the three months ended December 31, 2023, neither the Company nor any of its affiliates repurchased shares of the Company's common stock registered under Section 12 of the Exchange Act.

Stock Performance Graph

The following graph compares the cumulative total stockholder return for the Company's common stock to the cumulative total returns for the Russell 2000 Index, S&P MidCap 400 Index and a peer group. The peer group consists of the following companies: Albemarle Corporation, Westlake Chemical Corporation, CF Industries Holdings, Inc., Reliance Steel & Aluminum Co., The Mosaic Company, Steel Dynamics, Inc., Axalta Coating Systems Ltd., Ashland Global Holdings Inc., Quaker Chemical Corporation, Cleveland-Cliffs Inc., Alcoa Corporation, Commercial Metals Company, Cabot Corporation and Compass Minerals International, Inc. The total cumulative return calculations are for the period commencing November 18, 2020, for investments in stock, or October 31, 2020, for investments in index, and ending December 31, 2023, and include the reinvestment of dividends. The stock price performance shown in this graph is based on historical data and is neither indicative of, nor intended to forecast, future stock price performance.



*$100 invested on November 18, 2020, in stock or October 31, 2020, in index, including reinvestment of dividends. Fiscal year ended December 31st.

	11/18/20	12/31/20	12/31/21	12/31/22	12/31/23
MP Materials Corp.	$ 100.00	$ 213.19	$ 300.99	$ 160.90	$ 131.54
Russell 2000 Index	$ 100.00	$ 128.68	$ 147.75	$ 117.55	$ 137.45
S&P MidCap 400 Index	$ 100.00	$ 121.73	$ 151.87	$ 132.03	$ 153.74
Peer Group	$ 100.00	$ 112.07	$ 170.93	$ 180.34	$ 186.27

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with our Consolidated Financial Statements and related notes appearing elsewhere in this annual report on Form 10-K for the year ended December 31, 2023 (this "Annual Report"). A discussion of changes in our results of operations and cash flows between years ended December 31, 2022 and 2021, has been omitted from this Annual Report, but may be found in "Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, Comparison of the Years Ended December 31, 2022, 2021, and 2020," of our annual report on Form 10-K for the year ended December 31, 2022, filed with the U.S. Securities and Exchange Commission on February 28, 2023. This discussion and analysis contains forward-looking statements that involve risks, uncertainties and assumptions. The actual results may differ materially from those anticipated in these forward-looking statements as a result of certain factors, including, but not limited to, those set forth under "Item 1A. Risk Factors" and elsewhere in this Annual Report. See also "Cautionary Note Regarding Forward-Looking Statements."

Executive Overview

MP Materials Corp., including its subsidiaries ("we," "our," and "us"), is the largest producer of rare earth materials in the Western Hemisphere. We own and operate the Mountain Pass Rare Earth Mine and Processing Facility ("Mountain Pass"), the only rare earth mining and processing site of scale in North America, and are also constructing a rare earth metal, alloy and magnet manufacturing facility in Fort Worth, Texas (the "Fort Worth Facility"), where we anticipate manufacturing neodymium-iron-boron ("NdFeB") permanent magnets and its precursor products.

We produce rare earth concentrate products as well as refined rare earth oxides and related products. The rare earth concentrate is principally sold pursuant to the Offtake Agreement to Shenghe (as such terms are defined in Note 20, "Related Party Transactions," in the notes to the Consolidated Financial Statements), that, in turn, typically sells that product to refiners in China. Following the commissioning of our Stage II optimization project ("Stage II") in the third quarter of 2023, we began producing separated rare earth products, including neodymium-praseodymium ("NdPr") oxide, that we began selling to customers globally in the fourth quarter of 2023. Additionally, in April 2022, we entered into a long-term agreement with General Motors Company (NYSE: GM) ("GM") to supply U.S.-sourced and manufactured rare earth materials and finished magnets for the electric motors in more than a dozen models based on GM's Ultium Platform. These developments are part of our Stage III downstream expansion strategy ("Stage III").

Certain rare earth elements ("REE") serve as critical inputs for the rare earth magnets inside the electric motors and generators powering carbon-reducing technologies such as hybrid and electric vehicles (referred to collectively as "xEVs") and wind turbines, as well as drones, defense systems, robotics and many other high-growth, advanced technologies. Our integrated operations at Mountain Pass combine low production costs with high environmental standards, thereby restoring American leadership to a critical industry with a strong commitment to sustainability.

Highlights from the year ended December 31, 2023, include:

- Completed construction and/or initial commissioning of all circuits of our Stage II optimization project;
- Commenced production and sales of separated rare earth products in the third quarter and fourth quarter of 2023, respectively;
- Announced "Upstream 60K" strategy targeting an approximately 50% expansion of rare earth oxide ("REO") in concentrate output at Mountain Pass within four years with modest incremental investment;
- Maintained strong concentrate production volumes despite continued construction and commissioning activities;
- Completed construction of the building for the Fort Worth Facility, opened the office space that will serve as our company-wide magnetics headquarters, and made further progress on advancing our metal and magnet-making production capabilities;
- Advanced the engineering and design and began procuring equipment for our heavy rare earth elements ("HREE") processing and separations facility at Mountain Pass (the "HREE Facility");
- Entered into a tolling agreement with and subsequently acquired a 49% equity interest in VREX Holdco (as defined in the "Recent Developments" section below);
- Maintained a strong balance sheet with cash, cash equivalents and short-term investments totaling $997.8 million as of December 31, 2023, despite significant capital expenditures to support Stage II, the Fort Worth Facility, and the HREE Facility;

- Generated revenue of $253.4 million, net income of $24.3 million, and diluted earnings per share (“EPS”) of $0.14;
- Generated Adjusted EBITDA (see below) of $102.5 million, Adjusted Net Income (see below) of $71.4 million, and Adjusted Diluted EPS (see below) of $0.39; and
- Generated net cash provided by operating activities of $62.7 million.

Our results of operations for the year ended December 31, 2023, demonstrate solid operational execution against a weak pricing backdrop. Our Stage I concentrate operations continue to deliver strong production levels despite significant work on completing construction and commissioning of Stage II circuits as well as advancing the HREE Facility at Mountain Pass. Upon initial commissioning of the Stage II circuits, we commenced production of separated rare earth products in the third quarter of 2023. Also in the third quarter of 2023, we began shipments of NdPr oxide to tollers for processing into NdPr metal. Furthermore, we began selling separated rare earth products in the fourth quarter of 2023, beginning with NdPr oxide. While we made significant progress on scaling production of separated rare earth products in the fourth quarter of 2023, we expect that it may take several quarters to achieve our designed throughput of separated products.

In addition, our Stage III magnetics team continued to make significant progress on our strategy to re-establish magnet manufacturing in the U.S., including completing building construction and moving into the office portion of the Fort Worth Facility, and installing our first major pieces of process and magnet prototype production equipment, while advancing the organization’s engineering and manufacturing technology capabilities.

We consider net income and diluted EPS to be the most directly comparable financial measures calculated in accordance with generally accepted accounting principles in the U.S. (“GAAP”) to Adjusted EBITDA, Adjusted Net Income, and Adjusted Diluted EPS, which are non-GAAP financial measures. Refer to the “Non-GAAP Financial Measures” section below for the definitions of Adjusted EBITDA, Adjusted Net Income, and Adjusted Diluted EPS, as well as a reconciliation of net income to Adjusted EBITDA and Adjusted Net Income, and Diluted EPS to Adjusted Diluted EPS.

Recent Developments

Distribution Agreement with Sumitomo

In February 2023, we entered into a distribution agreement (the “Distribution Agreement”) with Sumitomo Corporation of Americas (“Sumitomo”), under which Sumitomo serves as the exclusive distributor of NdPr oxide and NdPr metal, produced by us, to Japanese customers. Further, in connection with the Distribution Agreement, we intend to collaborate with Sumitomo on other business opportunities related to rare earth processing and downstream products. Under the terms of the Distribution Agreement, Sumitomo will be paid a variable commission. The initial term of the Distribution Agreement is through the end of 2025 with options to renew annually.

Patent and Intellectual Property License

In August 2023, we acquired a license to use patented technology, technical know-how, and other intellectual property pertaining to the development and manufacturing of magnetic products in exchange for 435,729 shares of our common stock. Contemporaneous with the acquisition of the license, we entered into a long-term consulting agreement in support of integrating the licensed technology and know-how into our existing processes aimed at the development of magnetic products.

Tolling Agreement with and Investment in VREX Holdco

In October 2023, we entered into a tolling agreement with VREX Holdco Pte. Ltd. (“VREX Holdco”) (the “Tolling Agreement”), a subsidiary of Shenghe. VREX Holdco owns Vietnam Rare Earth Company Limited (“VREX”), which owns and operates a metal processing plant and related facilities in Vietnam. Pursuant to the Tolling Agreement, we deliver NdPr oxide to VREX Holdco, which VREX Holdco then causes VREX to process into NdPr metal for delivery to our customers globally. As several of our potential customers that manufacture magnets outside of China prefer to purchase NdPr metal in addition to NdPr oxide, this Tolling Agreement will enable us to distribute NdPr products more widely to customers in Japan and other global markets. During the term of the Tolling Agreement, we will pay VREX Holdco a processing fee per unit of rare earth metal produced. We maintain title to the products and directly enter into sales agreements for the produced NdPr metal. The initial term of the Tolling Agreement is three years and may be renewed for additional three-year terms.

In December 2023, we invested $9.7 million of cash in exchange for a 49% equity interest in VREX Holdco. Refer to Note 6, “Equity Method Investment,” in the notes to the Consolidated Financial Statements for additional information.

New Offtake Agreement

In January 2024, we entered into a new offtake agreement with Shenghe (the “New Offtake Agreement”) that replaced and extended the Offtake Agreement. The initial term of the New Offtake Agreement is two years, with the option for us to extend the term for an additional one-year period. The terms of the New Offtake Agreement are substantially the same as those of the Offtake Agreement with the exception of the addition of NdPr metal into the definition of non-concentrate rare earth products. See Note 20, “Related-Party Transactions,” in the notes to the Consolidated Financial Statements for a discussion of the Offtake Agreement, including its terms.

Key Performance Indicators

We have historically used and/or currently use the following key performance indicators (“KPIs”) to evaluate the performance of our business. However, as our business continues to evolve and transitions from production of rare earth concentrate to production of separated rare earth products, the metrics that management uses to evaluate the business may continue to change or be revised. For example, beginning with the first quarter of 2024, we will no longer present Production Cost per REO MT, which is a metric focused solely on Stage I concentrate operations, as it will no longer be meaningful in evaluating and understanding our business or operating results. In addition, during 2023, upon the production of separated products, we identified three new KPIs of our business: NdPr Production Volume, NdPr Sales Volume and NdPr Realized Price per KG. Our calculations of these KPIs may differ from similar measures published by other companies in our industry or in other industries. The following table presents our KPIs:

	Year ended December 31,			Amount Change		% Change	
(in whole units or dollars, except percentages)	2023	2022	2021	2023 vs. 2022	2022 vs. 2021	2023 vs. 2022	2022 vs. 2021
Rare earth concentrate							
REO Production Volume (MTs)	41,557	42,499	42,413	(942)	86	(2)%	— %
REO Sales Volume (MTs)	36,837	43,198	42,158	(6,361)	1,040	(15)%	2 %
Realized Price per REO MT	$ 6,854	$ 11,974	$ 7,745	$ (5,120)	$ 4,229	(43)%	55 %
Production Cost per REO MT	$ 2,058	$ 1,728	$ 1,493	$ 330	$ 235	19 %	16 %
Separated NdPr products							
NdPr Production Volume (MTs)	200	N/A	N/A	N/A	N/A	N/A	N/A
NdPr Sales Volume (MTs)	10	N/A	N/A	N/A	N/A	N/A	N/A
NdPr Realized Price per KG	$ 70	N/A	N/A	N/A	N/A	N/A	N/A

N/A = Not applicable as there was neither NdPr production nor sales volume in these periods.

REO Production Volume

We measure our REO-equivalent production volume for a given period in metric tons (“MTs”), our principal unit of sale for our concentrate product. This measure refers to the REO content contained in the rare earth concentrate we produce and, beginning in the second quarter of 2023, includes volumes fed into downstream circuits for commissioning and starting up our separations facilities and for producing separated NdPr product, the latter of which is also included in our KPI, NdPr Production Volume. Our REO Production Volume is a key indicator of our mining and processing capacity and efficiency.

The rare earth concentrate is a processed, concentrated form of our mined rare earth-bearing ores. While our unit of production and sale is a MT of contained REO, the actual weight of our rare earth concentrate is significantly greater, as the concentrate also contains non-REO minerals, loss-on-ignition, and residual moisture from the production process. We target REO content of greater than 60% per dry MT of concentrate (referred to as “REO grade”). The elemental distribution of REO in our concentrate is relatively consistent over time and production lot. We consider this the natural distribution, as it reflects the distribution of elements contained, on average, in our ore.

REO Sales Volume

Our REO Sales Volume for a given period is calculated in MTs. A unit, or MT, is considered sold once we recognize revenue on its sale as determined in accordance with GAAP. Our REO Sales Volume is a key measure of our ability to convert our concentrate production into revenue. Our REO Sales Volume for the year ended December 31, 2023, included both traditional concentrate as well as roasted concentrate.

Realized Price per REO MT

We calculate the Realized Price per REO MT for a given period as the quotient of: (i) our rare earth concentrate sales, which are determined in accordance with GAAP, for a given period and (ii) our REO Sales Volume for the same period. Realized Price per REO MT is an important measure of the market price of our concentrate product. For the year ended December 31, 2021, we adjusted our rare earth concentrate sales for the revenue impact of tariff rebates related to prior period sales, resulting in the use of a non-GAAP financial measure, Total Value Realized. See the “Non-GAAP Financial Measures” section below for a reconciliation of our Total Value Realized, which is a non-GAAP financial measure, to our rare earth concentrate sales, which is determined in accordance with GAAP.

Production Cost per REO MT

We calculate the Production Cost per REO MT for a given period as the quotient of: (i) our Production Costs (see below) for a given period and (ii) our REO Sales Volume for the same period. We define Production Costs, which is a non-GAAP financial measure, as our cost of sales (excluding depletion, depreciation and amortization) (“COS”) less stock-based compensation expense included in COS, shipping and freight costs, and costs not attributable to concentrate sales.

Production Cost per REO MT is a key indicator of our concentrate production efficiency. As a significant portion of our cash costs of Stage I production are fixed, our Production Cost per REO MT is influenced by mineral recovery, REO grade, plant feed rate and production uptime. See the “Non-GAAP Financial Measures” section below for a reconciliation of our Production Costs, which is a non-GAAP financial measure, to our COS, which is determined in accordance with GAAP, as well as the calculation of Production Cost per REO MT.

NdPr Production Volume

We measure our NdPr Production Volume for a given period in MTs, our principal unit of sale for our NdPr separated products. NdPr Production Volume refers to the volume of finished and packaged NdPr oxide produced at Mountain Pass for a given period. NdPr Production Volume is a key indicator of our separating and finishing capacity and efficiency.

NdPr Sales Volume

Our NdPr Sales Volume for a given period is calculated in MTs and on an NdPr oxide-equivalent basis (see example below). A unit, or MT, is considered sold once we recognize revenue on its sale, whether sold as NdPr oxide or NdPr metal, as determined in accordance with GAAP. For NdPr metal sales, the MTs sold and included in NdPr Sales Volume are calculated on the basis of the volume of NdPr oxide used to produce such NdPr metal. For example, assuming a material conversion ratio of 1.25, a sale of 100 MTs of NdPr metal would be included in this KPI as 125 MTs of NdPr oxide-equivalent. NdPr Sales Volume is a key measure of our ability to convert our production of separated NdPr products into revenue.

We expect to have a mix of contracts with customers where we will sell NdPr as (i) oxide, (ii) metal, where the amount of oxide required to produce such metal is variable, and (iii) metal, where we have a guarantee of the amount produced and sold based on the amount of oxide consumed. Among other factors, differences between quarterly NdPr Production Volume and NdPr Sales Volume may be caused by the time required for the conversion of NdPr oxide to NdPr metal, including time in-transit.

NdPr Realized Price per KG

We calculate the NdPr Realized Price per kilogram (“KG”) for a given period as the quotient of: (i) our NdPr oxide and metal sales, which are determined in accordance with GAAP, for a given period and (ii) our NdPr Sales Volume for the same period. NdPr Realized Price per KG is an important measure of the market price of our NdPr products.

Factors Affecting Our Performance

We believe we are uniquely positioned to capitalize on the key trends of electrification and supply chain security, particularly as domestic EV production grows. Our continued success depends to a significant extent on our ability to take advantage of the following opportunities and meet the challenges associated with them.

Demand for REE

The key demand drivers for REE are a diverse array of growing end markets, including: electric mobility (e.g., traction motors in passenger and commercial xEVs, etc.); renewable power generation (e.g., wind power generators); energy-efficient motors, pumps, and compressors (e.g., heating, ventilation and air conditioning (“HVAC”) systems, elevators, escalators, etc.);

industrial and service robotics (e.g., motors, actuators, brakes and sensors used in industrial and service robots); consumer and medical applications (e.g., smart phones and other mobile devices, computing devices, speakers and microphones, fiber optics, laser crystals, x-ray equipment, etc.); critical defense systems (e.g., guidance and control systems, avionics, global positioning systems, radar and sonar, drones, etc.); and catalysts and phosphors (e.g., vehicle emissions reduction, fuel refining, energy-efficient lighting, etc.). Accordingly, the demand for our products may be impacted by demand for these downstream products, particularly the continued growth in xEVs.

Despite the current macroeconomic conditions, we continue to believe we benefit from the growth of the rare earth market, particularly the market for NdPr and permanent magnets, and from several demand tailwinds for REE. These include the trend toward electrification; geographic supply chain diversification, particularly in relation to China; the U.S. government initiatives to restore domestic supply of critical minerals; and the increasing acceptance of environmental, social and governance mandates.

However, changes in technology could also drive down the use of REE, including NdPr, in the components in which they are now used, or lead to a decline in reliance on such components altogether. Actual, or perceived, decreases in demand for REE, whether through changes in technology or slower growth in the end markets that utilize REE, could result in a decline in the market price of REE, including NdPr, and/or result in pricing volatility. We also operate in a competitive industry, and many of our key competitors are based in China, where competitors may not be subject to the same rigorous environmental standards and production costs are typically lower than in the U.S.

Maximizing Production Efficiency

Since the implementation of our Stage I optimization plan and the achievement of commercial production of concentrate on July 1, 2019, our quarterly REO Production Volume has exceeded 8,500 MTs, and we have achieved at least 40,000 MTs of annual REO Production Volume since 2021. These results were achieved by optimizing the reagent scheme, reducing process temperatures, improving tailings facility management, and committing to operational excellence, which has allowed us to achieve approximately 92% uptime in 2023. Our Stage I optimization plan enabled us to achieve what we believe to be world-class production cost levels for rare earth concentrate.

In November 2023, we announced our “Upstream 60K” strategy whereby we intend to grow our annual REO Production Volume to approximately 60,000 MTs by expanding upstream capacity via investments in further beneficiation, including the ability to process alternative feedstocks and upgrade lower-grade feedstocks. We aim to achieve this initiative within the next four years with modest incremental capital investment.

The success of our business reflects our ability to continue to manage our costs. Our production achievements in Stage I have provided economies of scale to lower production costs per MT of REO produced in concentrate. Furthermore, we designed our Stage II process flow to capitalize on the inherent advantages of the bastnaesite ore at Mountain Pass, that is well-suited to low-cost refining by selectively eliminating the need to carry cerium, a lower-value mineral, through the separations process. Additionally, our location offers transportation advantages that create meaningful cost efficiencies in securing incoming supplies and shipping of our final products.

We currently operate a single site in a single location, and any stoppage in activity, including for reasons outside of our control, could adversely impact our production, results of operations and cash flows. In addition, several of our current and potential competitors are government supported and may have access to substantially more capital, which may allow them to make similar or greater efficiency improvements or undercut market prices for our product.

Development of Our REE Refining and Downstream Manufacturing Capabilities

Stage II advanced our operations from the production of rare earth concentrate to the separation of individual REE. The project incorporated upgrades and enhancements to the prior facility process flow intended to reliably produce separated REE at a low cost while minimizing our impact on the environment. More specifically, we have reintroduced an oxidizing roasting circuit, reoriented portions of the plant process flow, increased product finishing capacity, improved wastewater management, and made other improvements to materials handling and storage. The reintroduction of the oxidizing roasting circuit allows subsequent stages of the production process to occur at lower temperatures, and with lower volumes of materials and reagents, which supports lower operating and maintenance costs and higher uptime than would otherwise be achievable.

During the third quarter of 2023, we began producing separated rare earth products. However, we expect that it may take several quarters to achieve our designed throughput of separated products. As we increase production of separated products over time, we expect to improve our per-unit production costs of NdPr oxide, which represents a majority of the value contained in our concentrate.

Partially supported by a $35.0 million award from the Department of Defense's Office of Industrial Base Policy, Industrial Base Analysis and Sustainment program, we are currently advancing the facilitating works, engineering and procurement on the HREE Facility, which will be built at Mountain Pass and will be integrated into the rest of our Stage I and Stage II facilities. The HREE Facility is expected to support the separating of HREE contained in the Mountain Pass ore as well as from third-party feedstocks.

In addition, we are constructing the Fort Worth Facility and developing engineering and manufacturing technology to process NdPr oxide into metal and magnets, while incorporating magnet recycling capabilities. These initiatives support our long-term plans to become a leading global source for rare earth magnets. We believe integration into magnet production will provide some protection from commodity pricing volatility, while also enhancing our business profile as the producer of a critical industrial output in addition to a producer of resources. We expect our Stage III efforts to continue to benefit from geopolitical developments, including initiatives to repatriate critical materials supply chains.

Our Mineral Reserves

Our ore body has proven over more than 60 years of operations to be one of the world's largest and highest-grade rare earth resources. As of December 31, 2023, SRK Consulting (U.S.), Inc., an independent consulting firm that we retained to assess our reserves, estimated total proven and probable reserves of 1.86 million short tons of REO contained in 28.46 million short tons of ore at Mountain Pass, with an average ore grade of 6.20%. These estimates use an estimated economical cut-off grade of 2.43% total rare earth oxide. Based on these estimated reserves and our expected annual production rate of REO upon production ramp-up of Stage II, our expected mine life was approximately 33 years as of December 31, 2023. Over time, we expect to be able to continue to grow our expected mine life through additional exploratory drilling and improved processing capabilities, which may result in changes to various assumptions underlying our mineral reserve estimate.

Mining activities in the U.S. are heavily regulated, particularly in California. Regulatory changes may make it more challenging for us to access our reserves. In addition, new mineral deposits may be discovered elsewhere, which could make our operations less competitive.

Results of Operations

Comparison of the Years Ended December 31, 2023, 2022, and 2021

The following table summarizes our results of operations:

(in thousands, except percentages)	For the year ended December 31, 2023	2022	2021	Amount Change 2023 vs. 2022	2022 vs. 2021	% Change 2023 vs. 2022	2022 vs. 2021
Revenue:							
Rare earth concentrate	$ 252,468	$ 517,267	$ 328,563	$ (264,799)	$ 188,704	(51)%	57 %
NdPr oxide and metal	695	—	—	695	—	N/M	N/M
Other rare earth products	282	10,243	3,389	(9,961)	6,854	(97)%	202 %
Total revenue	253,445	527,510	331,952	(274,065)	195,558	(52)%	59 %
Operating costs and expenses:							
Cost of sales[(1)]	92,714	92,218	76,253	496	15,965	1 %	21 %
Selling, general and administrative	79,245	75,857	56,646	3,388	19,211	4 %	34 %
Depreciation, depletion and amortization	55,709	18,356	24,382	37,353	(6,026)	203 %	(25)%
Start-up costs	21,330	7,551	378	13,779	7,173	182 %	N/M
Advanced projects and development	14,932	4,249	4,195	10,683	54	251 %	1 %
Other operating costs and expenses	7,234	1,868	4,753	5,366	(2,885)	287 %	(61)%
Total operating costs and expenses	271,164	200,099	166,607	71,065	33,492	36 %	20 %
Operating income (loss)	(17,719)	327,411	165,345	(345,130)	162,066	(105)%	98 %
Interest expense, net	(5,254)	(5,786)	(8,904)	532	3,118	(9)%	(35)%
Other income, net	56,048	19,527	3,754	36,521	15,773	187 %	420 %
Income before income taxes	33,075	341,152	160,195	(308,077)	180,957	(90)%	113 %
Income tax expense	(8,768)	(52,148)	(25,158)	43,380	(26,990)	(83)%	107 %
Net income	$ 24,307	$ 289,004	$ 135,037	$ (264,697)	$ 153,967	(92)%	114 %
Adjusted EBITDA[(2)]	$ 102,502	$ 388,631	$ 219,077	$ (286,129)	$ 169,554	(74)%	77 %
Adjusted Net Income[(2)]	$ 71,378	$ 320,557	$ 154,187	$ (249,179)	$ 166,370	(78)%	108 %
Free Cash Flow[(2)]	$ (196,398)	$ 22,049	$ (17,517)	$ (218,447)	$ 39,566	N/M	N/M

N/M = Not meaningful.

(1) Excludes depreciation, depletion and amortization.

(2) Non-GAAP financial measures are defined and reconciled to the most directly comparable GAAP financial measures in the "Non-GAAP Financial Measures" section below.

Rare earth concentrate revenue consists primarily of sales of traditional and roasted rare earth concentrate. The sales price of rare earth concentrate sold to Shenghe under both agreements is based on an agreed-upon price per MT, with an adjustment for the ultimate market price of the product realized by Shenghe upon sales to their customers, including the impact of changes in the exchange rate between the Chinese Yuan and the U.S. dollar.

The decrease in rare earth concentrate revenue for the year ended December 31, 2023, as compared to the prior year, was driven by lower Realized Price per REO MT, which decreased by 43% when compared to the prior year, as well as lower REO Sales Volume, which decreased by 15% when compared to the prior year.

Realized Price per REO MT for the year ended December 31, 2023, reflects a significantly softer pricing environment for rare earth products, as compared to the prior year when pricing peaked in February 2022. As noted above in the "Factors Affecting our Performance" section, market prices for rare earth products may be volatile due to actual or perceived changes in supply or demand. The decline in the market prices for rare earth products in 2023 was largely attributable to lower than anticipated growth in demand for magnetic products, which negatively impacted the price of REE. The decrease in REO Sales Volume for the year ended December 31, 2023, was due to the start-up of Stage II operations. A significant portion of the REO produced, which could otherwise have been sold as rare earth concentrate, was used to charge the Stage II circuits, establish separations work-in-process inventory, or produce packaged and finished separated rare earth products, the majority of which have not yet been sold.

Historically, our REO Sales Volume had generally tracked our REO Production Volume over time with slight period-to-period differences caused by the timing of shipments. However, as we continue to ramp up production of separated rare earth materials, we expect that significant volumes of REO produced from Stage I operations will be retained for separation and not sold as concentrate. In addition, a significant portion of the contained cerium in the REO produced will be intentionally rejected and may not result in finished product. Accordingly, as evidenced in the third and fourth quarters of 2023 (see the "Quarterly Performance Trend" section below), we expect that REO Sales Volume will be significantly lower than REO Production Volume in the future as we produce and sell more separated products.

NdPr oxide and metal revenue consists of sales of NdPr oxide under individual sales agreements, which commenced in the fourth quarter of 2023. As we ramp up production of separated rare earth products, we expect our NdPr oxide and metal revenue to become a larger portion of our total revenue. Accordingly, to the extent we are able to sell a greater portion of NdPr oxide and NdPr metal, we expect that rare earth concentrate revenue will decline in future periods.

Other rare earth products revenue for the year ended December 31, 2023, decreased as compared to the prior year, primarily driven by $8.5 million of revenue related to a sales agreement with Shenghe entered into in March 2022 for certain stockpiles of rare earth fluoride ("REF").

Cost of sales (excluding depreciation, depletion and amortization) consists of production- and processing-related labor costs (including wages and salaries, benefits, bonuses, and stock-based compensation), mining and processing supplies (such as reagents), parts and labor for the maintenance of our mining fleet and processing facilities, other facilities-related costs (such as property taxes and utilities), packaging materials, and shipping and freight costs.

COS for the year ended December 31, 2023, remained relatively flat year over year, primarily due to an increase in Production Cost per REO MT of $330 or 19%, offset by a decrease in REO Sales Volume and $5.5 million in lower shipping and freight costs, which are included in COS but excluded from Production Cost per REO MT. The increase in Production Cost per REO MT was driven by higher payroll costs, including the increase in employee headcount to support the expansion of operations, and to a lesser extent, higher materials and supplies costs as well as higher property and other taxes. Shipping and freight costs decreased due to reductions in trucking rates and diesel fuel prices, as well as lower sales volume. In addition, COS for the year ended December 31, 2023, included a $2.3 million write-down on certain of our inventories (refer to Note 4, "Inventories," in the notes to the Consolidated Financial Statements for more information). Production Cost per REO MT varies period to period based on the timing of scheduled outages of our production facilities for maintenance. See the "Quarterly Performance Trend" section below.

With the commissioning of Stage II in 2023, the expected headcount growth to support our refining operations is largely complete as of December 31, 2023. Therefore, we do not anticipate payroll cost growth to be as significant in future periods, although year-over-year comparisons may still be impacted given the timing of hiring in 2023. In addition, as noted below, given the commencement of initial production of separated products in late 2023, we expect certain salaries and wages of employees previously involved in start-up activities will no longer be considered start-up costs in 2024 as commercial production ramps. Instead, such costs will primarily be included in COS to the extent such costs are not absorbed into inventories. Lastly, we expect other operating costs associated with our Stage II operations, particularly chemical reagents, maintenance expenses, and consumables, which have a significant variable component, to grow in line with production in future periods.

Selling, general and administrative ("SG&A") expenses consist primarily of personnel costs (including salaries, benefits, bonuses, and stock-based compensation) of our administrative functions such as executives, accounting and finance, legal, and information technology; professional services (including legal, regulatory, audit and others); certain engineering expenses; insurance, license and permit costs; corporate office lease cost; office supplies; and certain environmental, health and safety expenses.

SG&A expenses for the year ended December 31, 2023, increased by $3.4 million, or 4%, as compared to prior year, driven primarily by $5.4 million in higher personnel costs (excluding stock-based compensation expense), along with other general and administrative costs required to further build out our corporate infrastructure in support of our downstream expansion. Additionally, with the commencement of the lease for corporate office space in April 2023, we recognized $0.9 million in higher building rent expense compared to the prior year and are expected to incur higher rent expense going forward, when compared to prior year periods. The increase in SG&A was partially offset by $8.0 million in lower stock-based compensation expense due primarily to the timing of grants and the recognition of stock-based compensation on an accelerated basis for virtually all of our stock awards.

Depreciation, depletion and amortization primarily consists of depreciation of property, plant and equipment and depletion of mineral rights. The year-over-year increase in depreciation, depletion and amortization for the year ended December 31, 2023, primarily reflects an increase in depreciation of $38.2 million, resulting from the continued placement of new circuits and facilities associated with our Stage II optimization project into service, which began at the end of the fourth quarter of 2022.

Start-up costs relate to costs associated with restarting an existing facility or commissioning a new facility, circuit or process of our production, manufacturing, or separations facilities prior to the achievement of commercial production, that do not qualify for capitalization. Such costs, which are expensed as incurred, include certain salaries and wages, outside services, parts, training, and utilities, among other items, used or consumed directly in these start-up activities.

Start-up costs for the year ended December 31, 2023, increased by $13.8 million year over year, of which $12.8 million was associated with our Stage II optimization project and the remaining $1.0 million was associated with our Stage III initiatives. Given the commencement of initial production of separated products in late 2023, we expect start-up costs associated with Stage II will decrease meaningfully in 2024 as commercial production ramps, specifically since salaries and wages of certain employees will no longer be considered start-up, and instead will primarily be included in COS to the extent such costs are not absorbed into inventories. In addition, we currently expect start-up costs pertaining to our Stage III initiatives will increase in 2024 as we advance in starting up and developing our magnetics capability.

Advanced projects and development consists principally of costs incurred in connection with research and development of new processes or to significantly enhance our existing processes, and certain government contracts, as well as costs incurred to support growth initiatives or pursue other opportunities. Advanced projects and development for the year ended December 31, 2023, increased year over year primarily due to costs incurred for legal, consulting, and advisory services to support growth initiatives, such as potential acquisitions, mergers, or other investments, which increased by $9.0 million, and continued investment in research and development activities, which increased by $1.5 million and related primarily to Stage III magnetics.

Other operating costs and expenses consists primarily of accretion of asset retirement and environmental obligations; gains or losses on disposals of long-lived assets, including demolition costs; and write-downs of legacy stockpile inventories. Other operating costs and expenses for the year ended December 31, 2023, increased by $5.4 million year over year as a result of $5.5 million in demolition costs associated with demolishing and removing certain out-of-use older facilities and infrastructure from the Mountain Pass site to accommodate future expansion in rare earth processing.

Interest expense, net principally consists of the expense associated with the 0.25% per annum interest rate and the amortization of the debt issuance costs on our Convertible Notes (as defined in the “Liquidity and Capital Resources” section below) and the amortization of the discount on a prior debt obligation to Shenghe, offset by capitalized interest. Interest expense, net for the year ended December 31, 2023, decreased year over year due to the full repayment of a debt obligation to Shenghe in the first quarter of 2022.

Other income, net consists of interest and investment income and non-operating gains or losses. Other income, net for the year ended December 31, 2023, increased year over year as a result of interest and investment income earned on our short-term investments, which were purchased starting in the second quarter of 2022. Interest and investment income is principally generated from accretion of the discount on such investments.

Income tax expense consists of an estimate of U.S. federal and state income taxes in the jurisdictions in which we conduct business, adjusted for federal, state and local allowable income tax benefits, the effect of permanent differences and any valuation allowance against deferred tax assets. The effective tax rate (income tax expense as a percentage of income before income taxes) was 26.5%, 15.3% and 15.7% for the years ended December 31, 2023, 2022 and 2021, respectively. The effective tax rate for the year ended December 31, 2023, differed from the statutory tax rate of 21% primarily due to a deduction limitation on officers’ compensation and a valuation against certain deferred tax assets, offset by the California Competes Tax Credit.

The Section 45X Advanced Manufacturing Production Credit (the “45X Credit”) provides a credit equal to 10% of eligible “production costs incurred” with respect to the production and sale of critical minerals, including NdPr oxide. In December 2023, the Internal Revenue Service released proposed regulations on the 45X Credit, which, among other things, clarified the definition of “production costs incurred.” The proposed regulations exclude direct and indirect materials costs, including costs related to the extraction or acquisition of raw materials, from the definition of “production costs incurred.” If the proposed regulations are approved as currently written, the exclusion of these costs may result in the 45X Credit being materially less than we originally anticipated. We formally submitted comments on the proposed regulations in support of including materials and extraction costs in the definition of “production costs incurred” related to critical minerals under the 45X Credit. For additional information on the 45X Credit, refer to Note 12, “Income Taxes,” and Note 16, “Government Grants,” in the notes to the Consolidated Financial Statements.

Quarterly Performance Trend

While our business is not highly seasonal in nature, we sometimes experience a timing lag between production and sales, which may result in volatility in our results of operations between periods. The timing lag may be the result of, or influenced by, factors such as the timing and duration of shipments or the time required to convert materials. In addition, quarterly production of concentrate is impacted by the timing of scheduled outages of our production facilities for maintenance, which typically occur in the second and fourth quarters. Finally, starting in the third quarter of 2023, as we ramp up production of separated rare earth materials, we expect that significant volumes of REO produced will be retained for separation and not sold as concentrate.

The following table presents our KPIs for the quarterly periods indicated:

	FY2023				FY2022				FY2021			
(in whole units or dollars)	Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1
Rare earth concentrate												
REO Production Volume (MTs)	9,257	10,766	10,863	10,671	10,485	10,886	10,300	10,828	10,261	11,998	10,305	9,849
REO Sales Volume (MTs)	7,174	9,177	10,271	10,215	10,816	10,676	10,000	11,706	9,674	12,814	9,877	9,793
Realized Price per REO MT	$ 5,622	$ 5,718	$ 6,231	$ 9,365	$ 8,515	$ 11,636	$ 13,918	$ 13,818	$ 10,101	$ 7,693	$ 7,343	$ 5,891
Production Cost per REO MT(1)	$ 2,393	$ 2,020	$ 1,938	$ 1,978	$ 1,928	$ 1,653	$ 1,750	$ 1,594	$ 1,525	$ 1,449	$ 1,538	$ 1,475
Separated NdPr products												
NdPr Production Volume (MTs)	150	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NdPr Sales Volume (MTs)	10	—	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NdPr Realized Price per KG	$ 70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A = Not applicable as there was either no NdPr production volume or no NdPr sales volume in these periods.

(1) As noted above, beginning with the first quarter of 2024, we will no longer present Production Cost per REO MT as this metric is focused solely on Stage I concentrate operations.

Liquidity and Capital Resources

Liquidity refers to our ability to generate sufficient cash flows to meet the cash requirements of our business operations, including working capital and capital expenditure needs, contractual obligations, debt service and other commitments. In recent years, our principal sources of liquidity have been financing through the consummation of the business combination with Fortress Value Acquisition Corp. in November 2020, the issuance of the Convertible Notes in March 2021, and net cash from operating activities. As of December 31, 2023, we had $997.8 million of cash, cash equivalents and short-term investments and $690.0 million principal amount of long-term debt.

Our results of operations and cash flows depend in large part upon the market prices of REO and particularly the price of rare earth concentrate. Rare earth concentrate is not quoted on any major commodities market or exchange and demand is currently constrained to a relatively limited number of refiners, a significant majority of which are based in China. Although we believe that our cash flows from operations and cash on hand are adequate to meet our liquidity requirements for the foreseeable future, uncertainty continues to exist as to the market price of REO, as evidenced by the volatility experienced in 2022 and the significant decrease seen in 2023, primarily due to concerns over the global economic conditions and actual or perceived concerns over increases in the supply of and/or decreases in demand for rare earth products. The significant decrease in the market price of rare earth products in 2023 negatively impacted our cash flows from operations and liquidity.

Our current working capital needs relate mainly to our mining, beneficiation, and separation operations. As we began the transition to selling separated rare earth products in 2023, our working capital needs increased materially, portions of which we expect to continue in 2024 as we ramp up the production and sales of separated rare earth products and advance our Stage III magnetics initiatives.

The completion of our mission to become a fully integrated domestic magnetics producer is expected to be capital intensive. With the construction portion of our Stage II optimization project complete, our principal capital expenditure requirements relate mainly to further investment in Mountain Pass, including the development of the HREE Facility, Upstream 60K, and other growth and investment projects, completing the buildout of the Fort Worth Facility, as well as periodic repairs and maintenance of mining and rare earth processing equipment. We expect to spend between $200 million and $250 million of capital costs in 2024, with further costs for all of these identified projects in 2025. Our future capital requirements will also depend on several other factors, including future acquisitions and potential additional investments in further downstream production.

Our estimated costs or estimated time to complete and commission these projects may increase, potentially significantly, due to factors outside of our control. While we believe that we have sufficient cash resources to fund these initiatives and operating working capital in the near term, we cannot assure this. If our available resources prove inadequate to fund our plans or commitments, we may be forced to revise our strategy and business plans or could be required, or elect, to seek additional funding through public or private equity or debt financings; however, such funding may not be available on terms acceptable to us, if at all. Any delays in our ongoing capital projects or substantial cost increases, including construction costs and related materials costs related to their execution, could significantly impact our ability to maximize our revenue opportunities and adversely impact our business and cash flows.

Debt and Other Long-Term Obligations

Convertible Notes: In March 2021, we issued $690.0 million aggregate principal amount of 0.25% unsecured green convertible senior notes that mature, unless earlier converted, redeemed or repurchased, on April 1, 2026 (the "Convertible Notes"), at a price of par. Interest on the Convertible Notes is payable on April 1st and October 1st of each year, beginning on October 1, 2021.

The Convertible Notes may, at our election, be settled in cash, shares of our common stock, or a combination thereof. We have the option to redeem the Convertible Notes, in whole or in part, beginning on April 5, 2024. The Convertible Notes are convertible into shares of our common stock at an initial conversion price of $44.28 per share, or 22.5861 shares, per $1,000 principal amount of notes, subject to adjustment upon the occurrence of certain corporate events. However, in no event will the conversion exceed 28.5714 shares of common stock per $1,000 principal amount of notes.

Prior to January 1, 2026, at their election, holders of the Convertible Notes may convert their outstanding notes under the following circumstances: (i) during any calendar quarter commencing with the third quarter of 2021 if the last reported sale price of our common stock for at least 20 trading days (whether or not consecutive) during the period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter is greater than or equal to 130% of the conversion price on each applicable trading day; (ii) during the five business day period after any five consecutive trading day period (the "measurement period") in which the trading price (as defined in the indenture governing the Convertible Notes) per $1,000 principal amount of Convertible Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of our common stock and the conversion rate on each such trading day; (iii) if we call any or all of the Convertible Notes for redemption, at any time prior to the close of business on the scheduled trading day immediately preceding the redemption date; or (iv) upon the occurrence of specified corporate events set forth in the indenture governing the Convertible Notes. On or after January 1, 2026, and prior to the maturity date of the Convertible Notes, holders may convert their outstanding notes at any time, regardless of the foregoing circumstances.

If we undergo a fundamental change (as defined in the indenture governing the Convertible Notes), holders may require us to repurchase for cash all or any portion of their outstanding notes at a price equal to 100% of the principal amount of the notes to be repurchased, plus accrued and unpaid interest to, but excluding, the fundamental change repurchase date. In addition, following certain corporate events that occur prior to the maturity date of the Convertible Notes or if we deliver a notice of redemption, we will, in certain circumstances, increase the conversion rate for holders who elect to convert their outstanding notes in connection with such corporate event or notice of redemption, as the case may be.

At the time of issuance, we aimed to allocate an amount equal to the net proceeds from the Convertible Notes offering to existing or future investments in, or the financing or refinancing of, eligible "green projects" intended to reduce our environmental impact and/or enable the production of low-carbon technologies. As of December 31, 2023, all the net proceeds from the Convertible Notes offering were allocated to investments in eligible green projects, including through the utilization of the permitted 36-month lookback period. Until such time that the allocation was complete, the net proceeds were held for general corporate purposes.

Equipment Notes: We have financing agreements for the purchase of certain equipment, including trucks, tractors, loaders, graders, and various other machinery. As of December 31, 2023, we had $4.7 million in principal (and accrued interest) outstanding under the equipment notes, of which $2.1 million is due within the next 12 months.

Leases: We have lease arrangements for certain equipment and facilities, including office space, vehicles and equipment used in our operations. As of December 31, 2023, we had future expected lease payment obligations totaling $10.4 million, with $1.7 million due within the next 12 months. See Note 11, "Leases," in the notes to the Consolidated Financial Statements for further information.

Purchase Obligations: Our outstanding purchase obligations as of December 31, 2023, primarily consist of purchase orders initiated with vendors and suppliers in the ordinary course of business for operating and maintenance capital expenditures that will be settled within one year. In certain instances, we are permitted to cancel, reschedule or adjust these orders. Consequently, only a small portion of these outstanding purchase orders relate to firm, non-cancelable and unconditional obligations. We have also entered into long-term supply arrangements for certain chemical reagents used in our operations, which is based on current consumption requirements.

Asset Retirement and Environmental Obligations: See Note 8, "Asset Retirement and Environmental Obligations," in the notes to the Consolidated Financial Statements for our estimated cash requirements to settle asset retirement and environmental obligations.

Other: In order to support our Fort Worth Facility, we expect to hire at least an additional 100 full-time employees within the next two years, which will result in additional cash requirements for salaries, benefits and training. We also expect to spend an additional $5 million to $6 million within the next year on completing the implementation of a new enterprise resource planning system. Lastly, our engineering, procurement, and construction contracts are typically cancellable.

Cash Flows

The following table summarizes our cash flows:

	For the year ended December 31,			Amount Change		% Change	
(in thousands, except percentages)	2023	2022	2021	2023 vs 2022	2022 vs 2021	2023 vs 2022	2022 vs 2021
Net cash provided by (used in):							
Operating activities	$ 62,699	$ 343,514	$ 101,971	$ (280,815)	$ 241,543	(82)%	237 %
Investing activities	$ 68,697	$ (1,356,971)	$ (119,363)	$ 1,425,668	$ (1,237,608)	N/M	N/M
Financing activities	$ (9,917)	$ (24,191)	$ 666,109	$ 14,274	$ (690,300)	(59)%	N/M

N/M = Not meaningful.

Net Cash Provided by Operating Activities: Net cash provided by operating activities decreased by $280.8 million for the year ended December 31, 2023, as compared to the prior year, reflecting a decrease in revenue, an increase in inventories to support our Stage II separations facilities as well as our Stage III initiatives, and a $1.2 million increase in cash paid for income taxes, as compared to the prior year. The decrease in net cash provided by operating activities was partially offset by a $20.4 million increase in interest received on our short-term investments and money market funds for the year ended December 31, 2023, as compared to the prior year. In addition, $13.6 million of our revenue was excluded from cash provided by operating activities for the year ended December 31, 2022, since that portion of the sales price was retained by Shenghe to reduce the debt obligation, with no similar amount in the current year.

Net Cash Provided by (Used in) Investing Activities: Net cash provided by investing activities was $68.7 million for the year ended December 31, 2023, compared to net cash used in investing activities of $1,357.0 million in the prior year. The change related primarily to activity in our short-term investments, with the total activity (i.e., purchases, sales, and maturities) in the current year resulting in net cash proceeds of $337.4 million, which were largely used to fund additions to property, plant and equipment. For the year ended December 31, 2022, the total activity in our short-term investments resulted in net cash purchases of $1,035.5 million. Additions to property, plant and equipment for the year ended December 31, 2023, which related primarily to construction spend on our Stage II optimization project, the Fort Worth Facility, and other investments in Mountain Pass, decreased by $64.7 million when compared to the prior year, which was largely due to the timing of substantially completing the assets associated with the Stage II optimization project. Net cash provided by investing activities in the current year was partially offset by a $9.7 million payment in exchange for a 49% equity interest in VREX Holdco.

Net Cash Used in Financing Activities: Net cash used in financing activities decreased by $14.3 million for the year ended December 31, 2023, as compared to the prior year, reflecting lower tax withholding on stock-based awards and lower principal payments on debt obligations and finance leases, principally due to a $2.9 million payment to Shenghe in the prior year to fully satisfy the debt obligation.

Non-GAAP Financial Measures

We present Adjusted EBITDA, Adjusted Net Income, Adjusted Diluted EPS, Free Cash Flow, Production Costs, and Total Value Realized, which are non-GAAP financial measures that we use to supplement our results presented in accordance with GAAP. These measures may be similar to measures reported by other companies in our industry and are regularly used by securities analysts and investors to measure companies' financial performance. Adjusted EBITDA, Adjusted Net Income, Adjusted Diluted EPS, Free Cash Flow, Production Costs, and Total Value Realized are not intended to be substitutes for any GAAP financial measures and, as calculated, may not be comparable to other similarly titled measures of performance or liquidity of other companies within our industry or in other industries.

Adjusted EBITDA

We define Adjusted EBITDA as our GAAP net income before interest expense, net; income tax expense or benefit; and depreciation, depletion and amortization; further adjusted to eliminate the impact of stock-based compensation expense; initial start-up costs; transaction-related and other costs; accretion of asset retirement and environmental obligations; gain or loss on disposals of long-lived assets; certain write-downs of inventories; tariff rebates; and other income or loss. We present Adjusted EBITDA because it is used by management to evaluate our underlying operating and financial performance and trends. Adjusted EBITDA excludes certain expenses that are required in accordance with GAAP because they are non-recurring, non-cash or are not related to our underlying business performance. This non-GAAP financial measure is intended to supplement our GAAP results and should not be used as a substitute for financial measures presented in accordance with GAAP.

The following table presents a reconciliation of our Adjusted EBITDA, which is a non-GAAP financial measure, to our net income, which is determined in accordance with GAAP:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Net income	$ 24,307	$ 289,004	$ 135,037
Adjusted for:			
Depreciation, depletion and amortization	55,709	18,356	24,382
Interest expense, net	5,254	5,786	8,904
Income tax expense	8,768	52,148	25,158
Stock-based compensation expense(1)	25,236	31,780	22,931
Initial start-up costs(2)	20,607	7,432	378
Transaction-related and other costs(3)	11,435	1,784	3,338
Accretion of asset retirement and environmental obligations(4)	908	1,477	2,375
Loss on disposals of long-lived assets, net(4)	6,326	391	569
Write-down of inventories(4)(5)	—	—	1,809
Tariff rebate(6)	—	—	(2,050)
Other income, net(7)	(56,048)	(19,527)	(3,754)
Adjusted EBITDA	$ 102,502	$ 388,631	$ 219,077

(1) Principally included in “Selling, general and administrative” within our Consolidated Statements of Operations.

(2) Included in “Start-up costs” within our Consolidated Statements of Operations and excludes any applicable stock-based compensation, which is included in the “Stock-based compensation expense” line above. Relates to certain costs incurred in connection with the commissioning and starting up of our initial separations capability at Mountain Pass and our initial magnet-making capabilities at Fort Worth prior to the achievement of commercial production. These costs include labor of incremental employees hired in advance to work directly on such commissioning activities, training costs, costs of testing and commissioning the new circuits and processes, and other related costs. Given the nature and scale of the related costs and activities, management does not view these as normal, recurring operating expenses, but rather as non-recurring investments to initially develop our separations and magnet-making capabilities. Therefore, we believe it is useful and necessary for investors to understand our core operating performance in current and future periods by excluding the impact of these start-up costs. To the extent additional start-up costs are incurred in the future to expand our separations and magnet-making capabilities after initial achievement of commercial production (e.g., significantly expanding production capacity at an existing facility or building a new separations or magnet manufacturing facility), such costs would not be considered an adjustment for this non-GAAP financial measure.

(3) Principally included in “Advanced projects and development” within our Consolidated Statements of Operations, and pertains to legal, consulting, and advisory services, and other costs associated with specific transactions, including potential acquisitions, mergers, or other investments.

(4) Included in “Other operating costs and expenses” within our Consolidated Statements of Operations.

(5) Represents a non-cash write-down of a portion of our legacy low-grade stockpile inventory during the second quarter of 2021.

(6) Represents non-cash revenue recognized in connection with a tariff rebate received relating to product sales from prior periods.

(7) Amounts for the years ended December 31, 2023 and 2022, are principally comprised of interest and investment income. Amount for the year ended December 31, 2021, principally represents a non-cash gain recognized as a result of the Small Business Administration’s approval to forgive the Paycheck Protection Loan.

Adjusted Net Income and Adjusted Diluted EPS

We calculate Adjusted Net Income as our GAAP net income excluding the impact of stock-based compensation expense; initial start-up costs; transaction-related and other costs; gain or loss on disposals of long-lived assets; certain write-downs of inventories; tariff rebates; and other items that we do not consider representative of our underlying operations; adjusted to give effect to the income tax impact of such adjustments; and the release of valuation allowance. We calculate Adjusted Diluted EPS as our GAAP diluted EPS excluding the per share impact, using adjusted diluted weighted-average shares outstanding as the denominator, of stock-based compensation expense; initial start-up costs; transaction-related and other costs; gain or loss on disposals of long-lived assets; certain write-downs of inventories; tariff rebates; and other items that we do not consider representative of our underlying operations; adjusted to give effect to the income tax impact of such adjustments; and the release of valuation allowance.

Adjusted Net Income and Adjusted Diluted EPS exclude certain expenses that are required in accordance with GAAP because they are non-recurring, non-cash, or not related to our underlying business performance. To calculate the income tax impact of such adjustments on a year-to-date basis, we utilize an effective tax rate equal to our income tax expense excluding material discrete costs and benefits, with any impacts of changes in effective tax rate being recognized in the current period. We present Adjusted Net Income and Adjusted Diluted EPS because it is used by management to evaluate our underlying operating and financial performance and trends. These non-GAAP financial measures are intended to supplement our GAAP results and should not be used as a substitute for financial measures presented in accordance with GAAP.

The following table presents a reconciliation of our Adjusted Net Income, which is a non-GAAP financial measure, to our net income, which is determined in accordance with GAAP:

	For the year ended December 31,		
(in thousands)	**2023**	**2022**	**2021**
Net income	$ 24,307	$ 289,004	$ 135,037
Adjusted for:			
Stock-based compensation expense(1)	25,236	31,780	22,931
Initial start-up costs(2)	20,607	7,432	378
Transaction-related and other costs(3)	11,435	1,784	3,338
Loss on disposals of long-lived assets, net(4)	6,326	391	569
Write-down of inventories(4)(5)	—	—	1,809
Tariff rebate(6)	—	—	(2,050)
Other(7)	(51)	(273)	(3,754)
Tax impact of adjustments above(8)	(16,482)	(6,716)	(4,071)
Release of valuation allowance	—	(2,845)	—
Adjusted Net Income	$ 71,378	$ 320,557	$ 154,187

(1) Principally included in "Selling, general and administrative" within our Consolidated Statements of Operations.

(2) Included in "Start-up costs" within our Consolidated Statements of Operations and excludes any applicable stock-based compensation, which is included in the "Stock-based compensation expense" line above. Relates to certain costs incurred in connection with the commissioning and starting up of our initial separations capability at Mountain Pass and our initial magnet-making capabilities at Fort Worth prior to the achievement of commercial production. These costs include labor of incremental employees hired in advance to work directly on such commissioning activities, training costs, costs of testing and commissioning the new circuits and processes, and other related costs. Given the nature and scale of the related costs and activities, management does not view these as normal, recurring operating expenses, but rather as non-recurring investments to initially develop our separations and magnet-making capabilities. Therefore, we believe it is useful and necessary for investors to understand our core operating performance in current and future periods by excluding the impact of these start-up costs. To the extent additional start-up costs are incurred in the future to expand our separations and magnet-making capabilities after initial achievement of commercial production (e.g., significantly expanding production capacity at an existing facility or building a new separations or magnet manufacturing facility), such costs would not be considered an adjustment for this non-GAAP financial measure.

(3) Principally included in "Advanced projects and development" within our Consolidated Statements of Operations, and pertains to legal, consulting, and advisory services, and other costs associated with specific transactions, including potential acquisitions, mergers, or other investments.

(4) Included in "Other operating costs and expenses" within our Consolidated Statements of Operations.

(5) Represents a non-cash write-down of a portion of our legacy low-grade stockpile inventory during the second quarter of 2021.

(6) Represents non-cash revenue recognized in connection with a tariff rebate received relating to product sales from prior periods.

(7) Amount for the year ended December 31, 2021, principally represents a non-cash gain recognized as a result of the Small Business Administration's approval to forgive the Paycheck Protection Loan, which is included in "Other income, net" within our Consolidated Statements of Operations.

(8) Tax impact of adjustments is calculated using an adjusted effective tax rate, which excludes the impact of discrete tax costs and benefits, to each adjustment. The adjusted effective tax rates were 25.9%, 16.3% and 17.5% for the years ended December 31, 2023, 2022 and 2021, respectively. See Note 12, "Income Taxes," in the notes to the Consolidated Financial Statements for more information on the effective tax rate.

The following table presents a reconciliation of our Adjusted Diluted EPS, which is a non-GAAP financial measure, to our diluted EPS, which is determined in accordance with GAAP:

	For the year ended December 31,		
	2023	2022	2021
Diluted EPS	$ 0.14	$ 1.52	$ 0.73
Adjusted for:			
Stock-based compensation expense	0.13	0.16	0.12
Initial start-up costs	0.11	0.04	—
Transaction-related and other costs	0.06	0.01	0.02
Loss on disposals of long-lived assets, net	0.03	—	—
Write-down of inventories	—	—	0.01
Tariff rebate	—	—	(0.01)
Other	—	—	(0.02)
Tax impact of adjustments above(1)	(0.08)	(0.04)	(0.02)
Release of valuation allowance	—	(0.01)	—
Adjusted Diluted EPS	$ 0.39	$ 1.68	$ 0.83
Diluted weighted-average shares outstanding	178,152,212	193,453,087	189,844,028
Assumed conversion of Convertible Notes(2)	15,584,409	—	—
Adjusted diluted weighted-average shares outstanding	193,736,621	193,453,087	189,844,028

(1) Tax impact of adjustments is calculated using an adjusted effective tax rate, which excludes the impact of discrete tax costs and benefits, to each adjustment. The adjusted effective tax rates were 25.9%, 16.3% and 17.5% for the years ended December 31, 2023, 2022 and 2021, respectively. See Note 12, "Income Taxes," in the notes to the Consolidated Financial Statements for more information on the effective tax rate.

(2) The Convertible Notes were antidilutive for GAAP purposes for the year ended December 31, 2023. For purposes of calculating Adjusted Diluted EPS, we have added back the assumed conversion of the Convertible Notes since they would not be antidilutive when using Adjusted Net Income as the numerator in the calculation of Adjusted Diluted EPS.

Total Value Realized

Total Value Realized, which we used to calculate our KPI, Realized Price per REO MT, for the year ended December 31, 2021, is a non-GAAP financial measure. The following table presents a reconciliation of our Total Value Realized, to our rare earth concentrate sales, which is determined in accordance with GAAP, for the year ended December 31, 2021:

(in thousands)	For the year ended December 31, 2021
Rare earth concentrate sales	$ 328,563
Adjusted for:	
Tariff rebate(1)	(2,050)
Total Value Realized	$ 326,513

(1) Represents non-cash revenue recognized in connection with a tariff rebate received relating to product sales from prior periods.

Production Costs

Production Costs, which we use to calculate our KPI, Production Cost per REO MT, is a non-GAAP financial measure. Production Cost per REO MT is a key indicator of our concentrate production efficiency. As mentioned above, beginning with the first quarter of 2024, we will no longer present Production Cost per REO MT, which is a metric focused solely on Stage I concentrate operations, as it will no longer be meaningful in evaluating and understanding our business or operating results. Accordingly, we will also no longer present Production Costs.

The following table presents a reconciliation of our Production Costs to our COS, which is determined in accordance with GAAP, as well as the calculation of Production Cost per REO MT:

	For the year ended December 31,		
(in thousands, unless otherwise stated)	**2023**	**2022**	**2021**
Cost of sales (excluding depreciation, depletion and amortization)	$ 92,714	$ 92,218	$ 76,253
Adjusted for:			
Stock-based compensation expense[1]	(3,932)	(2,853)	(4,294)
Shipping and freight[2]	(7,485)	(13,002)	(8,923)
Write-down of inventories[3]	(2,285)	—	—
Other[4]	(3,198)	(1,715)	(79)
Production Costs	75,814	74,648	62,957
Divided by:			
REO Sales Volume (in MTs)	36,837	43,198	42,158
Production Cost per REO MT (in dollars)	$ 2,058	$ 1,728	$ 1,493

(1) Pertains only to the amount of stock-based compensation expense included in "Cost of sales (excluding depreciation, depletion and amortization)" within our Consolidated Statements of Operations.

(2) Includes $1.3 million for the year ended December 31, 2022, of shipping and freight costs associated with sales of REF stockpiles.

(3) Amount pertains to a write-down of non-concentrate inventories, which is included in "Cost of sales (excluding depreciation, depletion and amortization)" within the Consolidated Statements of Operations.

(4) Amount for the year ended December 31, 2023, pertains to costs (excluding shipping and freight) associated with non-concentrate products. Amount for the year ended December 31, 2022, pertains primarily to costs (excluding shipping and freight) attributable to sales of REF stockpiles.

Free Cash Flow

We calculate Free Cash Flow as net cash provided by operating activities less additions to property, plant and equipment, net of proceeds from government awards used for construction. We believe Free Cash Flow is useful for comparing our ability to generate cash with that of our peers. The presentation of Free Cash Flow is not meant to be considered in isolation or as an alternative to cash flows from operating activities and does not necessarily indicate whether cash flows will be sufficient to fund cash needs.

The following table presents a reconciliation of our Free Cash Flow, which is a non-GAAP financial measure, to our net cash provided by operating activities, which is determined in accordance with GAAP:

	For the year ended December 31,		
(in thousands)	**2023**	**2022**	**2021**
Net cash provided by operating activities[1]	$ 62,699	$ 343,514	$ 101,971
Additions to property, plant and equipment, net[2]	(259,097)	(321,465)	(119,488)
Free Cash Flow	$ (196,398)	$ 22,049	$ (17,517)

(1) Under the terms of the A&R Offtake Agreement and pursuant to the accounting treatment thereof, $13.6 million and $54.8 million of our revenue for the years ended December 31, 2022 and 2021, respectively, was excluded from cash provided by operating activities since that portion of the sales price was retained by Shenghe to reduce the debt obligation.

(2) Amounts for the years ended December 31, 2023, 2022 and 2021, are net of $2.8 million, $5.1 million and $4.4 million, respectively, in proceeds from government awards used for construction.

Critical Accounting Estimates

Preparation of the Consolidated Financial Statements in accordance with GAAP requires our management to make judgments, estimates and assumptions that impact the reported amount of revenue and operating expenses, assets and liabilities and the disclosure of contingent assets and liabilities. We consider an accounting judgment, estimate or assumption to be critical when (i) the estimate or assumption is complex in nature or requires a high degree of judgment and (ii) the use of different judgments, estimates and assumptions could have a material impact on our Consolidated Financial Statements. Our significant accounting policies are described in Note 2, “Significant Accounting Policies,” in the notes to the Consolidated Financial Statements. Our critical accounting estimates are described below.

Revenue

We recognize revenue from sales of rare earth products produced at Mountain Pass. Shenghe purchased the vast majority of our production for the years ended December 31, 2023, 2022 and 2021, and is an affiliate of an equity holder of MP Materials. We recognize revenue at the point in time control of the products transfers to the customer and, under our offtake agreements with Shenghe, our performance obligation is typically satisfied when we deliver products to the agreed-upon shipping point. The transaction price with Shenghe is typically based on an agreed-upon price per MT, with an adjustment for the ultimate market price of the product realized by Shenghe in their sales to their customers, further adjusted for certain contractually negotiated amounts. At the end of each reporting period, we estimate forms of variable consideration, including an assessment on constraining such variable consideration, based on historical experience, current market prices and currency exchange rates, and other factors that can be reasonably anticipated. Historically, the differences between our estimates of variable consideration and actual consideration have not been material to any reporting period.

Asset Retirement Obligations

We recognize asset retirement obligations for estimated costs of legally and contractually required closure, dismantlement, and reclamation activities associated with Mountain Pass. Asset retirement obligations are initially recognized at their estimated fair value in the period in which the obligation is incurred. In determining fair value, management makes estimates based on the expected timing of reclamation activities; cash flows to perform activities, which involves utilizing an assumption for future inflation; amount and uncertainty associated with the cash flows, including adjustments for a market risk premium; and discounts such amounts using a credit-adjusted risk-free rate. Although we base our estimates on historical experience and reevaluate our estimated timing and cash flows regularly, since the majority of the cash flows to settle our asset retirement obligations occur decades in the future, it is inherently difficult to accurately predict the ultimate cash flows used to settle such obligations. As a result, these estimates and assumptions are subjective and can vary over time.

Since December 31, 2020, our asset retirement obligations have decreased from $25.6 million to $5.7 million as of December 31, 2023, as a result of revisions in our estimated timing and cash flows pertaining to required reclamation activities. In particular, as a result of an updated life-of-mine, which revised the estimated timing of cash flows by approximately an additional 13 years, we recorded a decrement of $9.8 million during the year ended December 31, 2021. Furthermore, during the year ended December 31, 2022, we recorded a decrement of $13.1 million, the effect of removing estimated cash flows pertaining to certain of our processing and separations facilities at Mountain Pass that no longer required reclamation. See Note 8, “Asset Retirement and Environmental Obligations,” in the notes to the Consolidated Financial Statements for more information.

Recently Adopted and Issued Accounting Pronouncements

Recently adopted and issued accounting pronouncements are described in Note 2, “Significant Accounting Policies,” in the notes to the Consolidated Financial Statements.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We have in the past and may in the future be exposed to certain market risks, including commodity price, foreign currency, and interest rate risks, in the ordinary course of our business, as discussed further below.

Commodity Price Risk

Our results of operations depend in large part upon the market prices of REO and particularly the price of rare earth concentrate. Rare earth concentrate is not quoted on any major commodities market or exchange as product attributes vary and demand is currently constrained to a relatively limited number of refiners, a significant majority of which are based in China.

NdPr represents a significant portion of the economic value of our rare earth concentrate. We expect demand for NdPr to continue to grow, driving demand for our concentrate, separated NdPr oxide, and in the future, permanent magnets containing NdPr. However, actual demand and pricing may fluctuate for numerous reasons beyond our control, including, among other things, supply of NdPr from other producers, discoveries of new mineral properties, technological changes that lead to diminished reliance on NdPr and/or permanent magnets, and shifts in underlying end-user demand for products or components manufactured with NdPr. We have not entered into derivative contracts to protect the price of our products, and do not expect to do so in the foreseeable future, as there is no liquid market for such contracts and their cost may be prohibitive, if they could be obtained at all.

The solvent extraction and finishing processes are highly reliant upon commodity reagents. These reagents, as well as certain other raw materials and supplies we use in our operations, are subject to price volatility caused by weather, supply conditions, political and economic variables and other unpredictable factors. We have not historically used options or swap contracts to manage the volatility related to the above exposures. When possible, we seek to limit our exposure by entering into long-term contracts and price increase limitations in contracts. Also, we currently use natural gas to operate our CHP plant, which powers our processing and separations facilities at Mountain Pass, and expect to use natural gas to power backup generators at our Fort Worth Facility in the future. We generally purchase or expect to purchase natural gas from suppliers at market or tariff rates. From time to time, we use commodity contracts to hedge energy exposures. Such commodity price fluctuations may cause volatility in our results of operations and cash flows in the future.

Foreign Currency Risk

While we currently generate revenue in the United States and in U.S. dollars, the market transactions are denominated mainly in the Chinese Yuan, and we are therefore exposed to currency volatility and devaluation risks. For example, we negotiate monthly U.S. dollar REO prices with Shenghe, which are based in part on the exchange rate between the U.S. dollar and the Chinese Yuan. Geopolitical tensions between the U.S. and China may lead to increased tariffs, preferences for local producers, some of which may be government-supported, changes in taxing regimes or other trade barriers. Foreign currency risk has not historically had a material impact on our results of operations or cash flows. However, as we expand internationally, we become further exposed to foreign currency risk by entering new markets with additional foreign currencies. The economic impact of currency exchange rate movements is often linked to variability in real growth, inflation, interest rates, governmental actions and other factors. Accordingly, to the extent that foreign currency risk becomes material, we may enter into hedging transactions to manage our exposure to fluctuations in foreign currency exchange rates.

Interest Rate Risk

We had cash, cash equivalents and short-term investments totaling $997.8 million as of December 31, 2023, of which $995.0 million was invested in money market funds, U.S. Treasury and agency securities, commercial paper and certificates of deposit. Our cash, cash equivalents and short-term investments are held for working capital and general corporate purposes. We have not historically entered into investments for trading or speculative purposes.

Our cash equivalents and short-term investments are subject to market risk due to changes in interest rates. Fixed-rate securities may have their market value adversely affected due to a rise in interest rates. Due in part to these factors, our future investment income may fall short of our expectations due to changes in interest rates or we may suffer losses in principal if we are forced to sell securities that decline in market value due to changes in interest rates. As our short-term investments are classified as available-for-sale, no gains are recognized due to changes in interest rates. As losses due to changes in interest rates are generally not considered to be credit related, no losses in such investments are recognized due to changes in interest rates unless we intend to sell, it is more likely than not that we will be required to sell, we sell prior to maturity, or we otherwise determine that all or a portion of the decline in fair value is due to credit related factors.

As of December 31, 2023, a hypothetical increase of 100-basis points in interest rates would not have a material impact on the value of our cash equivalents or short-term investments in our Consolidated Financial Statements.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors
MP Materials Corp.:

Opinions on the Consolidated Financial Statements and Internal Control Over Financial Reporting

We have audited the accompanying consolidated balance sheets of MP Materials Corp. and subsidiaries (the Company) as of December 31, 2023 and 2022, the related consolidated statements of operations, comprehensive income, changes in stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2023, and the related notes (collectively, the consolidated financial statements). We also have audited the Company's internal control over financial reporting as of December 31, 2023, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2023 and 2022, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2023, in conformity with U.S. generally accepted accounting principles. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2023 based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's consolidated financial statements and an opinion on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of a critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Identification and disclosure of related party transactions with Shenghe

As discussed in Note 20 to the consolidated financial statements, the Company has entered into a series of commercial agreements with Shenghe Resources (Singapore) International Trading Pte. Ltd (Shenghe), a related party. Under the agreements, Shenghe purchases rare earth products produced by the Company at specified prices.

We identified the identification and disclosure of the related party transactions with Shenghe as a critical audit matter. Subjective auditor judgment was required in assessing the sufficiency of the procedures performed to determine whether all such transactions were identified and disclosed properly by the Company.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls related to the identification and disclosure of transactions with Shenghe. We applied auditor judgment to determine the nature and extent of procedures to be performed to identify transactions with Shenghe. We evaluated the identification and disclosure of transactions with Shenghe by:

- inquiring of management of the Company and the Audit Committee of the Board of Directors regarding (i) the Shenghe Relationship and (ii) transactions between the Company and Shenghe
- reading the minutes from meetings of the Board of Directors
- obtaining and analyzing underlying documentation for a sample of sales transactions and comparing it to the contractual agreements with Shenghe
- confirming transactions and contractual agreements with Shenghe as of and for the year ended December 31, 2023 and comparing the responses to the Company's consolidated financial statements
- reading the contractual agreements with Shenghe and comparing the terms to the disclosures in the Company's consolidated financial statements.

We evaluated the sufficiency of audit evidence obtained by assessing the results of procedures performed over the transactions with Shenghe, including the appropriateness of such evidence.

/s/ KPMG LLP

We have served as the Company's auditor since 2017.

Denver, Colorado
February 28, 2024

MP MATERIALS CORP. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

(in thousands, except share and per share data)	December 31, 2023	December 31, 2022
Assets		
Current assets		
Cash and cash equivalents	$ 263,351	$ 136,627
Short-term investments	734,493	1,045,718
Total cash, cash equivalents and short-term investments	997,844	1,182,345
Accounts receivable, net of allowance for credit losses of $0 and $0, respectively (including related party)	10,029	32,856
Inventories	95,182	57,554
Government grant receivable	19,302	—
Prepaid expenses and other current assets	8,820	21,073
Total current assets	1,131,177	1,293,828
Non-current assets		
Property, plant and equipment, net	1,158,054	935,743
Operating lease right-of-use assets	10,065	99
Inventories	13,350	5,744
Equity method investment	9,673	—
Intangible assets, net	8,881	89
Other non-current assets	5,252	2,284
Total non-current assets	1,205,275	943,959
Total assets	$ 2,336,452	$ 2,237,787
Liabilities and stockholders' equity		
Current liabilities		
Accounts and construction payable	$ 27,995	$ 15,326
Accrued liabilities	73,939	56,939
Income taxes payable	—	21,163
Other current liabilities	6,616	4,053
Total current liabilities	108,550	97,481
Non-current liabilities		
Asset retirement obligations	5,518	5,295
Environmental obligations	16,545	16,580
Long-term debt, net	681,980	678,444
Operating lease liabilities	6,829	15
Deferred government grant	17,433	—
Deferred income taxes	130,793	122,353
Other non-current liabilities	3,025	4,985
Total non-current liabilities	862,123	827,672
Total liabilities	970,673	925,153
Commitments and contingencies (Note 13)		
Stockholders' equity:		
Preferred stock ($0.0001 par value, 50,000,000 shares authorized, none issued and outstanding in either year)	—	—
Common stock ($0.0001 par value, 450,000,000 shares authorized, 178,082,383 and 177,706,608 shares issued and outstanding, as of December 31, 2023 and December 31, 2022, respectively)	17	18
Additional paid-in capital	979,891	951,008
Retained earnings	385,726	361,419
Accumulated other comprehensive income	145	189
Total stockholders' equity	1,365,779	1,312,634
Total liabilities and stockholders' equity	$ 2,336,452	$ 2,237,787

See accompanying notes to the Consolidated Financial Statements.

MP MATERIALS CORP. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS

	For the year ended December 31,		
(in thousands, except share and per share data)	2023	2022	2021
Revenue:			
Rare earth concentrate (including related party)	$ 252,468	$ 517,267	$ 328,563
NdPr oxide and metal	695	—	—
Other rare earth products (including related party)	282	10,243	3,389
Total revenue	253,445	527,510	331,952
Operating costs and expenses:			
Cost of sales (excluding depreciation, depletion and amortization) (including related party)	92,714	92,218	76,253
Selling, general and administrative	79,245	75,857	56,646
Depreciation, depletion and amortization	55,709	18,356	24,382
Start-up costs	21,330	7,551	378
Advanced projects and development	14,932	4,249	4,195
Other operating costs and expenses	7,234	1,868	4,753
Total operating costs and expenses	271,164	200,099	166,607
Operating income (loss)	(17,719)	327,411	165,345
Interest expense, net	(5,254)	(5,786)	(8,904)
Other income, net	56,048	19,527	3,754
Income before income taxes	33,075	341,152	160,195
Income tax expense	(8,768)	(52,148)	(25,158)
Net income	$ 24,307	$ 289,004	$ 135,037
Earnings per share:			
Basic	$ 0.14	$ 1.64	$ 0.78
Diluted	$ 0.14	$ 1.52	$ 0.73
Weighted-average shares outstanding:			
Basic	177,181,661	176,519,203	173,469,546
Diluted	178,152,212	193,453,087	189,844,028

See accompanying notes to the Consolidated Financial Statements.

MP MATERIALS CORP. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(in thousands)	For the year ended December 31, 2023	2022	2021
Net income	$ 24,307	$ 289,004	$ 135,037
Other comprehensive income (loss), net of tax:			
Change in net unrealized gains (losses) on available-for-sale securities	(44)	189	—
Total comprehensive income	$ 24,263	$ 289,193	$ 135,037

See accompanying notes to the Consolidated Financial Statements.

MP MATERIALS CORP. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY

	Preferred Stock		Common Stock					
(in thousands, except share data)	Shares	Amount	Shares	Amount	Additional Paid-in Capital	Retained Earnings (Accumulated Deficit)	Accumulated Other Comprehensive Income	Total Stockholders' Equity
Balance as of January 1, 2021	—	$ —	170,719,979	$ 17	$ 916,482	$ (62,622)	$ —	$ 853,877
Redemption of Public Warrants	—	—	7,080,005	1	(2)	—	—	(1)
Stock-based compensation	—	—	180,026	—	22,931	—	—	22,931
Forfeiture of restricted stock	—	—	(90,000)	—	—	—	—	—
Shares used to settle payroll tax withholding	—	—	(73,456)	—	(3,330)	—	—	(3,330)
Net income	—	—	—	—	—	135,037	—	135,037
Other	—	—	—	—	218	—	—	218
Balance as of December 31, 2021	—	—	177,816,554	18	936,299	72,415	—	1,008,732
Stock-based compensation	—	—	357,845	—	33,066	—	—	33,066
Shares used to settle payroll tax withholding	—	—	(467,791)	—	(18,357)	—	—	(18,357)
Net income	—	—	—	—	—	289,004	—	289,004
Unrealized gains on available-for-sale securities	—	—	—	—	—	—	189	189
Balance as of December 31, 2022	—	—	177,706,608	18	951,008	361,419	189	1,312,634
Stock-based compensation	—	—	472,047	—	27,104	—	—	27,104
Shares used to settle payroll tax withholding	—	—	(248,776)	(1)	(7,184)	—	—	(7,185)
Common stock issued to acquire intangible asset	—	—	152,504	—	8,963	—	—	8,963
Net income	—	—	—	—	—	24,307	—	24,307
Unrealized losses on available-for-sale securities	—	—	—	—	—	—	(44)	(44)
Balance as of December 31, 2023	—	$ —	178,082,383	$ 17	$ 979,891	$ 385,726	$ 145	$ 1,365,779

See accompanying notes to the Consolidated Financial Statements.

MP MATERIALS CORP. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)	For the year ended December 31, 2023	2022	2021
Operating activities:			
Net income	$ 24,307	$ 289,004	$ 135,037
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation, depletion and amortization	55,709	18,356	24,382
Accretion of asset retirement and environmental obligations	908	1,477	2,375
Accretion of discount on short-term investments	(26,316)	(9,958)	—
Gain on forgiveness of Paycheck Protection Loan	—	—	(3,401)
Loss on disposals of long-lived assets, net	808	391	569
Stock-based compensation expense	25,236	31,780	22,931
Accretion of debt discount and amortization of debt issuance costs	3,536	4,034	7,384
Write-downs of inventories	2,285	—	1,809
Revenue recognized in exchange for debt principal reduction	—	(13,566)	(54,828)
Deferred income taxes	8,455	17,789	17,425
Decrease (increase) in operating assets:			
Accounts receivable (including related party)	22,827	18,153	(47,420)
Inventories	(47,099)	(24,314)	(8,229)
Government grant receivable	(19,302)	—	—
Prepaid expenses, other current and non-current assets	2,377	(8,223)	(4,154)
Increase (decrease) in operating liabilities:			
Accounts payable and accrued liabilities	11,305	1,962	5,530
Income taxes payable	(21,163)	17,700	3,463
Deferred government grant	19,120	—	—
Other current and non-current liabilities	(294)	(1,071)	(902)
Net cash provided by operating activities	62,699	343,514	101,971
Investing activities:			
Additions to property, plant and equipment	(261,897)	(326,595)	(123,870)
Purchases of short-term investments	(1,185,477)	(2,779,666)	—
Proceeds from sales of short-term investments	507,736	1,463,160	—
Proceeds from maturities of short-term investments	1,015,190	281,000	—
Investment in equity method investee	(9,673)	—	—
Proceeds from sale of property, plant and equipment	18	—	125
Proceeds from government awards used for construction	2,800	5,130	4,382
Net cash provided by (used in) investing activities	68,697	(1,356,971)	(119,363)
Financing activities:			
Proceeds from issuance of long-term debt	—	—	690,000
Principal payments on debt obligations and finance leases	(2,732)	(5,834)	(2,435)
Payment of debt issuance costs	—	—	(17,749)
Tax withholding on stock-based awards	(7,185)	(18,357)	(3,330)
Other	—	—	(377)
Net cash provided by (used in) financing activities	(9,917)	(24,191)	666,109
Net change in cash, cash equivalents and restricted cash	121,479	(1,037,648)	648,717
Cash, cash equivalents and restricted cash beginning balance	143,509	1,181,157	532,440
Cash, cash equivalents and restricted cash ending balance	$ 264,988	$ 143,509	$ 1,181,157
Reconciliation of cash, cash equivalents and restricted cash:			
Cash and cash equivalents	$ 263,351	$ 136,627	$ 1,179,297
Restricted cash, current	1,290	6,287	1,344
Restricted cash, non-current	347	595	516
Total cash, cash equivalents and restricted cash	$ 264,988	$ 143,509	$ 1,181,157

See accompanying notes to the Consolidated Financial Statements.

MP MATERIALS CORP. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE 1—DESCRIPTION OF BUSINESS AND BASIS OF PRESENTATION

Description of Business: MP Materials Corp., including its subsidiaries (the "Company" or "MP Materials"), is the largest producer of rare earth materials in the Western Hemisphere. The Company, which is headquartered in Las Vegas, Nevada, owns and operates the Mountain Pass Rare Earth Mine and Processing Facility ("Mountain Pass"), the only rare earth mining and processing site of scale in North America, and is constructing a rare earth metal, alloy and magnet manufacturing facility in Fort Worth, Texas (the "Fort Worth Facility"), where the Company anticipates manufacturing neodymium-iron-boron ("NdFeB") permanent magnets and its precursor products.

The Company produces rare earth concentrate products as well as refined rare earth oxides and related products. The rare earth concentrate is principally sold pursuant to the Offtake Agreement to Shenghe (as such terms are defined in Note 20, "Related-Party Transactions"), a related party of the Company, that, in turn, typically sells that product to refiners in China. Following the commissioning of the Company's Stage II optimization project ("Stage II") in the third quarter of 2023, the Company began producing separated rare earth products, including neodymium-praseodymium ("NdPr") oxide, that it began selling to customers globally in the fourth quarter of 2023. Additionally, in April 2022, the Company entered into a long-term agreement with General Motors Company (NYSE: GM) ("GM") to supply U.S.-sourced and manufactured rare earth materials and finished magnets for the electric motors in more than a dozen models based on GM's Ultium Platform. These developments are part of the Company's Stage III downstream expansion strategy ("Stage III").

Operating segments are defined as components of an enterprise engaged in business activities, about which separate financial information is available and evaluated regularly by the chief operating decision maker ("CODM"), or decision-making group, in deciding how to allocate resources and in assessing performance. The Company's CODM views the Company's operations and manages the business as one reportable segment.

The cash flows and profitability of the Company's operations are significantly affected by the market price of rare earth products. The prices of rare earth products are affected by numerous factors beyond the Company's control. The products of the Company are sold globally, with a primary focus in the Asian market due to the refining, metallization, and magnet manufacturing capabilities of the region. Rare earth products are critical inputs in hundreds of existing and emerging clean-tech applications including electric vehicles and wind turbines as well as robotics, drones, and defense applications.

Basis of Presentation: The Consolidated Financial Statements of the Company have been prepared in accordance with generally accepted accounting principles in the U.S. ("GAAP") and with the rules and regulations of the U.S. Securities and Exchange Commission (the "SEC").

NOTE 2—SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation: The Consolidated Financial Statements include the accounts of MP Materials Corp. and its subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Concentration of Risk: Financial instruments that potentially subject the Company to credit risk consist principally of cash, cash equivalents and short-term investments, and receivables from customers. The Company believes that its credit risk is limited because the Company's current contracts are with companies that have a reliable payment history. The Company does not believe that it is exposed to any significant risks related to its cash accounts, money market funds, or short-term investments.

As of December 31, 2023, Shenghe was the Company's principal customer and accounted for more than 90% of revenue. Rare earth concentrate is not quoted on any major commodities market or exchange and demand for rare earth concentrate is currently constrained to a relatively limited number of refiners, a significant majority of which are based in China. Uncertainty exists as to the market price of rare earth oxide ("REO"), as evidenced by the volatility experienced in 2022 and 2023 primarily due to concerns over the global economic conditions and actual or perceived concerns over increases in the supply of or slower growth in the demand for rare earth products. Furthermore, while revenue is generated in the U.S., Shenghe conducts its primary operations in China and may transport and sell products in the Chinese market. Therefore, the Company's revenue is affected by Shenghe's ultimate realized prices in China, including the impact of changes in the exchange rate between the Chinese Yuan and the U.S. dollar. In addition, the ongoing economic conflict between China and the U.S., which has previously resulted in tariffs and trade barriers, may negatively affect the Company's business and results of operations. See Note 20, "Related-Party Transactions," for additional information.

***Use of Estimates*:** The preparation of the Consolidated Financial Statements in conformity with GAAP requires management to make estimates and assumptions that affect (i) the reported amounts of assets and liabilities, (ii) the disclosure of contingent assets and liabilities at the date of the Consolidated Financial Statements, and (iii) the reported amounts of revenues and expenses during the reporting period. The more significant areas requiring the use of management estimates and assumptions relate to the useful lives and recoverability of long-lived assets (such as the effects of mineral reserves and cash flows from operating the mine in determining the life of the mine); the valuation allowance of deferred tax assets; asset retirement and environmental obligations; and determining the net realizable value of inventories. Management bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances. Accordingly, actual results may differ from those estimates.

Cash, Cash Equivalents and Investments: Cash and cash equivalents consist of all cash balances and highly liquid investments, including commercial paper, certificates of deposit, and U.S. treasury and agency securities, with a maturity of three months or less at the time of purchase.

The Company's investments in U.S. treasury and agency securities, commercial paper, and certificates of deposit have been classified and accounted for as available-for-sale securities and the Company reevaluates the classification each reporting period. The Company classifies its available-for-sale securities that do not otherwise meet the requirements to be accounted for as cash equivalents as either current or non-current based on each instrument's underlying contractual maturity date as well as the Company's expectations of sales and redemptions within the next twelve months. See Note 3, "Cash, Cash Equivalents and Investments," for additional information.

Available-for-sale securities are recorded at fair value each reporting period. For unrealized losses in securities that the Company intends to hold and will not more likely than not be required to sell before recovery, the Company further evaluates whether declines in fair value below amortized cost are due to credit or non-credit related factors. The Company considers credit related impairments to be changes in value that are driven by a change in the creditor's ability to meet its payment obligations and records an allowance and recognizes a corresponding loss when the impairment is incurred.

Unrealized non-credit related losses and unrealized gains are reported, net of income taxes, in "Accumulated other comprehensive income" within the Company's Consolidated Balance Sheets, until realized. Realized gains and losses are determined based on the specific identification method and are reported in "Other income, net" within the Company's Consolidated Statements of Operations upon realization. Premiums and discounts are amortized or accreted over the life of the related available-for-sale security as an adjustment to yield using the straight-line method. Interest income is recognized when earned. These amounts are reported in "Other income, net" within the Company's Consolidated Statements of Operations. Accrued interest receivable was $0.9 million and $2.5 million as of December 31, 2023 and 2022, respectively, and is included in "Prepaid expenses and other current assets" within the Company's Consolidated Balance Sheets.

Restricted Cash: Restricted cash consists of funds that are contractually restricted as to usage or withdrawal due to legal agreement. The Company determines current or non-current classification based on the expected duration of the restriction. Current and non-current restricted cash is included in "Prepaid expenses and other current assets" and "Other non-current assets," respectively, within the Consolidated Balance Sheets.

Accounts Receivable: Accounts receivable pertain to receivables arising from contracts with customers and are recorded at the invoiced amount and do not bear interest. The Company evaluates its estimate of expected credit losses based on historical experience and current economic conditions for each portfolio of customers, though at present, the amounts are typically concentrated in a single customer. As of December 31, 2023 and 2022, the Company did not have an allowance for expected credit losses, as principally all of the Company's receivables are from Shenghe and there is no history or expectation of uncollectible amounts.

Inventories: Inventories consist of raw materials, supplies, mined ore stockpiles, work in process, and finished goods. Raw materials and supplies consist of spare parts, reagent chemicals, maintenance supplies, and packaging materials used in the production of rare earth products. Mined ore stockpiles represent bastnaesite ore that has been mined and stockpiled for future processing. Work in process consists of bastnaesite ore and separated rare earth products in various stages of the production process, as well as finished and packaged NdPr oxide shipped to tollers for processing into NdPr metal. Finished goods primarily consists of packaged traditional or roasted bastnaesite concentrate as well as finished and packaged NdPr oxide and NdPr metal (including quantities tolled) that is ready for sale.

Raw materials, mined ore stockpiles, work in process, and finished goods are carried at average cost. Supplies are carried at moving average cost. All inventories are carried at the lower of cost or net realizable value, which represents the estimated selling price of the product during the ordinary course of business based on current market conditions less reasonably predictable costs of completion, disposal, and transportation. Inventory cost includes all costs directly attributable to the manufacturing process, including labor and stripping costs, and an appropriate portion of production overhead costs, including depreciation, based on normal capacity of the production facilities.

Stockpiled ore tonnages are verified by periodic surveys. The Company evaluates the carrying amount of inventory each reporting period, considering recent market prices, slow-moving items, obsolescence, excess inventory levels, and other factors and recognizes related write-downs if it is determined that the inventory is impaired. Mined ore stockpiles that are not expected to be processed within the next twelve months and raw materials and spare parts that are not expected to be consumed within the next twelve months are classified as non-current. See also Note 4, “Inventories.”

Property, Plant and Equipment: Property, plant and equipment are recorded at cost and depreciated over their useful lives. Expenditures for new property, plant and equipment and improvements that extend the useful life or functionality of the assets are recorded at their cost of acquisition or construction. Depreciation on property, plant and equipment is recognized on a straight-line basis over their estimated useful lives, as follows:

	Years
Land improvements	10-25
Buildings and building improvements	10-40
Machinery and equipment	3-20

Assets under construction include costs directly attributable to the construction or development of long-lived assets. These costs may include labor and employee benefits associated with the construction of the asset, site preparation, permitting, engineering and design, installation and assembly, procurement, insurance, legal, initial commissioning, and interest on borrowings to finance the construction of the assets. Depreciation is not recorded on the related assets until they are ready for their intended use. Repair and maintenance costs that do not extend the useful life of an asset are expensed as incurred. Gains and losses arising from the sale or disposal of property, plant and equipment are determined as the difference between the proceeds from sale or disposal and the carrying amount of the asset, and are included, along with demolition costs, in “Other operating costs and expenses” within the Company’s Consolidated Statements of Operations.

Property, plant and equipment primarily relate to the Company’s open-pit mine and processing and separations facility at Mountain Pass as well as the building associated with the Company’s Fort Worth Facility. In addition to the mine pit, Mountain Pass includes a crusher and mill/flotation plant, mineral recovery and separation plants, tailings processing and storage facilities, product finishing facilities, on-site evaporation ponds, a combined heat and power plant, water treatment plant, a chlor-alkali plant, as well as laboratory facilities to support research and development activities, offices, warehouses and support infrastructure. See also Note 5, “Property, Plant and Equipment.”

Mineral Rights: The Company capitalizes costs for acquiring and leasing mining properties and expenses costs to maintain mineral rights as incurred. Depletion on mineral rights is recognized on a straight-line basis over the estimated remaining useful life of the mine, which was approximately 33 years as of December 31, 2023. The Company determined that the straight-line method of depletion appropriately captures the estimated economic costs of extracting the minerals of the mine across its estimated useful life, and aligns with the benefit obtained from the depletion of the asset consistent with the current mine plan. Mineral rights are classified as a component of “Property, plant and equipment” within the Company’s Consolidated Balance Sheets. See also Note 5, “Property, Plant and Equipment.”

Leases: The Company determines if an arrangement is, or contains, a lease at contract inception. In some cases, the Company has determined that its lease arrangements include both lease and non-lease components. The Company has elected to use a practical expedient to account for each separate lease component and its associated non-lease components as a single lease component for the majority of its asset classes. The Company recognizes right-of-use (“ROU”) assets and lease liabilities upon commencement for all leases with a lease term greater than 12 months. The Company has elected to use a practical expedient to not recognize leases with a lease term of 12 months or less in the Consolidated Balance Sheets for the majority of its asset classes. These short-term leases are expensed on a straight-line basis over the lease term.

ROU assets represent the Company’s right to use an underlying asset for the lease term and lease liabilities represent the Company’s obligation to make lease payments arising from the lease. ROU assets and lease liabilities are recognized at commencement date of the lease based on the present value of lease payments over the lease term. When the rate implicit in the lease cannot be readily determined, the Company utilizes its incremental borrowing rate in determining the present value of the future lease payments. Lease liabilities are accreted each period and reduced for payments. The ROU asset also includes other adjustments, such as for the effects of lease prepayments, initial lease costs, or lease incentives received. The lease term may include periods covered by options to extend or terminate the lease when it is either reasonably certain that the Company will exercise a renewal option, or reasonably certain it will not exercise an early termination option. For operating leases, lease expense is recognized on a straight-line basis over the lease term. For finance leases, the ROU asset amortizes on a straight-line basis over the shorter of the lease term or the useful life of the underlying asset (or the useful life of the underlying asset if title transfers at the end of the lease term or there is a purchase option the Company is reasonably certain to exercise) and the lease liability accretes interest based on the interest method using the discount rate determined at lease commencement. For operating and finance leases, variable lease payments not included in the lease liability are expensed as incurred unless such costs are capitalized as part of another asset (e.g., inventory). Additionally, ROU assets are subject to impairment testing whenever events or changes in circumstances indicate that their carrying amount may not be recoverable. If the carrying amounts of ROU assets exceed their fair value, the excess amount is recognized as an impairment. See also Note 11, "Leases."

Impairment of Long-Lived Assets: Long-lived assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset or asset group may not be recoverable. In estimating undiscounted cash flows, assets are grouped at the lowest level for which there are identifiable cash flows that are largely independent of undiscounted cash flows from other asset groups. The Company's estimates of undiscounted cash flows are based on numerous assumptions, and it is possible that actual cash flows may differ significantly from estimates, as actual produced reserves, prices, commodity-based and other costs, and closure costs are each subject to significant risks and uncertainties. The estimated undiscounted cash flows used to assess recoverability of long-lived assets and to measure the fair value of the Company's mining operations are derived from current business plans, which are developed using short-term price forecasts reflective of the current price environment and the Company's projections for long-term average prices. In addition to short- and long-term price assumptions, other assumptions include estimates of production costs; proven and probable mineral reserve estimates, including the timing and cost to develop and produce the reserves; value beyond proven and probable estimates; and estimated future closure costs.

If the carrying amount of the long-lived asset or asset groups is not recoverable on an undiscounted cash flows basis, an impairment is recognized to the extent that the carrying amount exceeds its fair value. Fair value is determined through various valuation techniques, including discounted cash flow models, quoted market values, and third-party independent appraisals, based on the approach the Company believes a market participant would use.

Equity Method Investment: Investments in equity securities are accounted for under the equity method if the Company has the ability to exercise significant influence, but not control, over an investee's operating and financial policies. Judgment regarding the level of influence includes considering key factors such as the Company's ownership interest, representation on the board of directors, participation in policy-making decisions and material intra-entity transactions. Under the equity method, an investment's carrying amount is adjusted for the Company's share of the investee's net income or loss (including other comprehensive income or loss), amortization/accretion of certain basis differences (if any), capital contributions to and distributions from an investee, as well as any other-than-temporary impairments.

The Company records its share of an equity method investment's net income or loss on a one-quarter lag due to the timing of when an investee's financial statements become available. The Company evaluates material events occurring during the one-quarter lag to determine whether the effects of such events should be reflected or disclosed within the Company's Consolidated Financial Statements. For intra-entity transactions between the Company and its equity method investee, the Company eliminates its share of profits and losses until realized by the Company or investee. Such elimination is recorded as an adjustment of the carrying amount of the equity method investment.

The Company evaluates its equity method investment for impairment whenever events or changes in circumstances indicate that the carrying amount of its investment may not be recoverable. If such conditions exist, the Company compares the estimated fair value of the investment to its carrying amount to determine if an impairment is indicated, and if so, determines whether the impairment is "other-than-temporary" based on its assessment of all relevant factors, including consideration of the Company's intent and ability to retain its investment. If the Company determines the decline is other-than-temporary, an impairment is recognized for the excess amount by which the investment's carrying amount exceeds its fair value. See Note 6, "Equity Method Investment," for additional information.

Intangible Assets: Indefinite-lived intangible assets are tested annually for impairment, or more frequently if events or changes in circumstances indicate that it is more likely than not that the assets are impaired. If the carrying amounts of the indefinite-lived intangible assets exceed their fair value, the excess amount is recognized as an impairment. Intangible assets that have a definite life are amortized on a straight-line basis over their estimated useful lives to reflect the expected pattern of economic benefits consumed. The Company reviews the carrying amount of its amortizing intangible assets for possible impairment whenever events or changes in circumstances indicate that their carrying amount may not be recoverable. If the carrying amounts of the amortizing intangible assets exceed their fair value, the excess amount is recognized as an impairment. Once an impairment of an intangible asset has been recorded, it cannot be reversed. See also Note 7, "Intangible Assets."

Asset Retirement Obligations: The Company recognizes asset retirement obligations ("ARO") for estimated costs of legally and contractually required closure, dismantlement, and reclamation activities associated with Mountain Pass. ARO are initially recognized at their estimated fair value in the period in which the obligation originates. Fair value is based on the expected timing of reclamation activities, cash flows to perform activities, amount and uncertainty associated with the cash flows, including adjustments for a market risk premium, and discounted using a credit-adjusted risk-free rate. The liability is accreted over time through periodic charges to earnings and reduced as reclamation activities occur with differences between estimated and actual amounts recognized as an adjustment to operating expenses. Accretion of asset retirement obligations is included in "Other operating costs and expenses" within the Company's Consolidated Statements of Operations.

Subsequent increments in expected undiscounted cash flows are measured at their discounted values using updated estimates of the Company's credit-adjusted risk-free rate applied to the increment only. Subsequent decrements in expected undiscounted cash flows are reduced based on the weighted-average credit-adjusted risk-free rate associated with the obligation. When increments and decrements are caused by a change in the estimated timing of settlement, the Company treats the increase in cash flows in the year of the updated estimate as an increment and the increase in cash flows in the original year as a decrement. Associated asset retirement costs, including the effect of increments and decrements, are recognized as adjustments to the related asset's carrying amount and depreciated over the related asset's remaining useful life. If a decrement is greater than the carrying amount of the related asset, the difference is recognized as a reduction to depreciation expense. See also Note 8, "Asset Retirement and Environmental Obligations."

Environmental Obligations: The Company has certain environmental remediation obligations that primarily relate to groundwater monitoring activities. Estimated remediation costs are accrued based on management's best estimate at the end of each reporting period of the costs expected to be incurred to settle the obligation when those amounts are probable and estimable. Such cost estimates may include ongoing care, maintenance and monitoring costs associated with remediation activities. Changes in remediation estimates are reflected in earnings in the period the estimate is revised. Remediation costs included in environmental obligations are discounted to their present value when payments are readily estimable, and are discounted using a risk-free rate, which the Company derives from U.S. Treasury yields. Accretion of environmental obligations is included in "Other operating costs and expenses" within the Company's Consolidated Statements of Operations. See also Note 8, "Asset Retirement and Environmental Obligations."

Debt Issuance Costs: Costs that are incurred by the Company in connection with the issuance of debt are deferred and amortized to interest expense using the effective interest method over the contractual term of the underlying indebtedness. Debt issuance costs reduce the carrying amount of the associated debt. See also, Note 10, "Debt Obligations."

Commitments and Contingencies: Liabilities for loss contingencies arising from claims, assessments, litigation, fines and penalties, and other sources are recorded when it is probable that a liability has been incurred and the amount can be reasonably estimated. If a loss contingency is not probable or reasonably estimable, disclosure of the contingency and estimated range of loss, if determinable, is made in the financial statements when it is at least reasonably possible that a material loss could be incurred. Legal costs incurred in connection with loss contingencies are expensed as incurred. See also Note 13, "Commitments and Contingencies."

Revenue Recognition: The Company's revenue comes from sales of rare earth products produced at Mountain Pass. The Company's sales are primarily to an affiliate of Shenghe. The Company's performance obligation is to produce and deliver rare earth products and the Company recognizes revenue at the point in time control of the products transfers to the customer, which is typically when the rare earth products are delivered to the agreed-upon shipping point. At that time, the customer has the ability to direct the use of and obtain substantially all of the remaining benefits from the products, and the customer bears the risk of loss. Commissions paid to distributors are deemed to be consideration payable to customers and are recorded as a reduction of the transaction prices.

For sales to unrelated third parties, the transaction price is agreed to at the time the sale is entered into. For sales to Shenghe, the transaction price is based on a preliminary market price (net of taxes, tariffs, and certain other agreed charges) less applicable discounts per metric ton ("MT"), subject to an adjustment for the ultimate market price of the product realized by Shenghe upon sales to their customers. Consequently, the ultimate market prices are a form of variable consideration. Initial pricing is typically billed upon delivering the product to the agreed-upon shipping point and paid within 30 days or less. Final adjustments to prices may take longer to resolve. When the final price has not been resolved by the end of a reporting period, the Company estimates the expected sales price based on the initial price, current market pricing and known quality measurements, and further constrains such amounts to an amount that is probable not to result in a significant reversal of previously-recognized revenue. Revenue from product sales is recorded net of taxes collected from customers that are remitted to governmental authorities. When necessary and appropriate, the Company applies a portfolio approach in estimating a refund obligation. See also Note 15, "Revenue Recognition."

Government Grants: Government grants represent benefits provided by federal, state, or local governments that are not subject to the scope of Accounting Standards Codification ("ASC") Topic 740, "Income Taxes" ("ASC 740"). Government grants are recognized when there is reasonable assurance the conditions of the grant will be met, and the grant will be received. When a grant is related to the purchase or construction of a long-lived asset (considered asset-based grants), the funds received are recorded as reductions of the related asset's carrying amount, thereby reducing future depreciation expense. Alternatively, when a grant is related to an expense item (considered income-based grants), it is recognized as a reduction of expense to which the grant activity relates over the periods necessary to match the grant on a systematic basis to the costs that it is intended to compensate. See also Note 16, "Government Grants."

Stock-Based Compensation: The cost of employee services received in exchange for an award of equity instruments is based on the grant-date fair value of the award. The fair value of Stock Awards (as defined in Note 17, "Stock-based Compensation") is equal to the fair value of the Company's stock on the grant date. The fair value of performance awards that include performance and/or market conditions is determined using a Monte Carlo simulation technique. The Monte Carlo simulation requires the use of inputs and assumptions such as the grant-date closing stock price, expected volatility, correlation coefficient to relevant peer groups or indices, risk-free interest rate and dividend yield.

Compensation cost for Stock Awards with graded vesting schedules is recognized on a straight-line basis over the requisite service period for each separately vesting portion of the award as if the award was, in substance, multiple awards, which results in accelerated recognition of compensation cost. Compensation cost for performance awards with cliff vesting schedules is recognized on a straight-line basis over the requisite service period. Compensation cost is not adjusted based on the actual achievement of the market-based performance goals. The Company accounts for forfeitures in the period in which they occur based on actual forfeitures. See also Note 17, "Stock-based Compensation."

Start-up Costs: Costs associated with restarting an existing facility or commissioning a new facility, circuit or process of the Company's production, manufacturing, or separations facilities prior to the achievement of commercial production, that do not qualify for capitalization, are expensed as incurred and considered start-up costs. Such costs may include certain salaries and wages, outside services, parts, training, and utilities, among other items, used or consumed directly in these start-up activities.

Earnings Per Share: Basic earnings per share ("EPS") is computed by dividing net income by the weighted-average number of common shares outstanding during the period. Diluted EPS reflects the additional dilution for all potentially dilutive securities such as unvested Stock Awards. See also Note 19, "Earnings per Share."

Income Taxes: The Company accounts for income taxes using the balance sheet method, recognizing certain temporary differences between the book basis of the liabilities and assets and the related income tax basis for such liabilities and assets. This method generates either a net deferred income tax liability or asset for the Company, as measured by the statutory tax rates in effect. The Company derives a deferred income tax expense or benefit by recording the change in either the net deferred income tax liability or asset balance for the year. The Company's policy, if it were to have uncertain tax positions, is to recognize interest and/or penalties related to unrecognized tax benefits as part of its income tax expense. See also Note 12, "Income Taxes."

Valuation of Deferred Tax Assets: The Company's deferred income tax assets include certain future tax benefits. The Company records a valuation allowance against any portion of those deferred income tax assets when it believes, based on the weight of available evidence, it is more likely than not that some portion or all of the deferred income tax asset will not be realized. The Company reviews the likelihood that the benefit of the deferred tax assets will be realized and the need for valuation allowances on a quarterly basis, or more frequently if events indicate that a review is required.

Certain categories of evidence carry more weight in the analysis than others based upon the extent to which the evidence may be objectively verified. The Company looks to the nature and severity of cumulative pretax losses (if any) in the current three-year period ending on the evaluation date, recent pretax losses and/or expectations of future pretax losses. Other factors considered in the determination of the probability of the realization of the deferred tax assets include, but are not limited to: earnings history; projected future financial and taxable income based upon existing reserves and long-term estimates of commodity prices; the duration of statutory carry forward periods; prudent and feasible tax planning strategies readily available that may alter the timing of reversal of the temporary difference; nature of temporary differences and predictability of reversal patterns of existing temporary differences; and the sensitivity of future forecasted results to commodity prices and other factors.

Concluding that a valuation allowance is not required is difficult when there is significant negative evidence which is objective and verifiable, such as cumulative losses in recent years. However, recent cumulative losses are not solely determinative of the need for a valuation allowance. The Company also considers all other available positive and negative evidence in its analysis. See also Note 12, "Income Taxes."

Recently Issued Accounting Pronouncements: During the year ended December 31, 2023, there were no accounting pronouncements adopted by the Company that had a material impact on the Company's Consolidated Financial Statements.

In November 2023, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2023-07, "Improvements to Reportable Segment Disclosures" ("ASU 2023-07"), which expands public entities' segment disclosures by requiring disclosure of significant segment expenses that are regularly provided to the CODM and included within each reported measure of segment profit or loss, an amount and description of its composition for other segment items, and interim disclosures of a reportable segment's profit or loss and assets. All disclosure requirements under ASU 2023-07 are also required for public entities with a single reportable segment. ASU 2023-07 is effective for the Company's fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024, with early adoption permitted, and should be applied on a retrospective basis. The Company is currently evaluating the effect of adopting ASU 2023-07 on its disclosures.

In December 2023, the FASB issued ASU No. 2023-09, "Improvements to Income Tax Disclosures" ("ASU 2023-09"), which enhances public entities' existing income tax disclosures to better assess how an entity's operations, related tax risks, tax planning and operational opportunities affect its tax rate and prospects for future cash flows. ASU 2023-09 requires public entities to annually disclose specific categories in the rate reconciliation table of the income tax footnote and provide additional information for reconciling items that meet a quantitative threshold. ASU 2023-09 is effective for the Company's annual periods beginning after December 15, 2024, with early adoption permitted. The Company is currently evaluating the effect of adopting ASU 2023-09 on its disclosures.

Reclassifications: Certain amounts in prior periods have been reclassified to conform to the current year presentation.

NOTE 3—CASH, CASH EQUIVALENTS AND INVESTMENTS

The following table presents the Company's cash, cash equivalents and short-term investments:

	December 31, 2023				December 31, 2022			
(in thousands)	Amortized Cost Basis	Unrealized Gains	Unrealized Losses	Estimated Fair Value	Amortized Cost Basis	Unrealized Gains	Unrealized Losses	Estimated Fair Value
Cash:								
Demand deposits	$ 2,795	$ —	$ —	$ 2,795	$ 7,373	$ —	$ —	$ 7,373
Cash equivalents:								
Money market funds	61,166	—	—	61,166	64,855	—	—	64,855
U.S. agency securities	—	—	—	—	63,605	1	(2)	63,604
U.S. Treasury securities	92,113	14	—	92,127	795	—	—	795
Commercial paper	93,447	15	—	93,462	—	—	—	—
Certificates of deposit	13,799	2	—	13,801	—	—	—	—
Total cash equivalents	260,525	31	—	260,556	129,255	1	(2)	129,254
Total cash and equivalents	263,320	31	—	263,351	136,628	1	(2)	136,627
Short-term investments:								
U.S. agency securities	118,370	—	(78)	118,292	979,878	361	(17)	980,222
U.S. Treasury securities	615,962	249	(10)	616,201	65,586	1	(91)	65,496
Total short-term investments	734,332	249	(88)	734,493	1,045,464	362	(108)	1,045,718
Total cash, cash equivalents and short-term investments	$ 997,652	$ 280	$ (88)	$ 997,844	$ 1,182,092	$ 363	$ (110)	$ 1,182,345

The Company does not intend to sell, nor is it more likely than not that the Company will be required to sell, any investments in unrealized loss positions before recovery of their amortized cost basis. The Company did not recognize any credit losses related to its available-for-sale investments during the years ended December 31, 2023 and 2022. The unrealized losses on the Company's available-for-sale investments were primarily due to unfavorable changes in interest rates subsequent to initial purchase. None of the available-for-sale investments held as of December 31, 2023, were in a continuous unrealized loss position for greater than 12 months and the unrealized losses and the related risk of expected credit losses were not material.

The Company recognized the following income and expense amounts, all of which are included in “Other income, net” within the Company’s Consolidated Statements of Operations:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Gross realized gains	$ 575	$ 258	$ —
Gross realized losses	$ 203	$ 573	$ —
Interest and investment income(1)	$ 55,637	$ 19,774	$ —

(1) Includes interest and investment income on the Company’s available-for-sale securities and other money market funds.

As of December 31, 2023, the fair values of available-for-sale investments, by remaining contractual maturity, were as follows:

(in thousands)	
Due within one year	$ 911,096
Due after one year through two years	22,787
Total	$ 933,883

NOTE 4—INVENTORIES

The Company’s inventories consisted of the following:

	December 31,	
(in thousands)	2023	2022
Raw materials and supplies, including spare parts(1)	$ 42,371	$ 28,590
Mined ore stockpiles	28,507	25,502
Work in process	15,019	1,710
Finished goods	9,285	1,752
Total current inventories	95,182	57,554
Add: Non-current portion(2)	13,350	5,744
Total inventories	$ 108,532	$ 63,298

(1) Includes raw materials to support activities pertaining to the Company’s rare earth metal, alloy and magnet manufacturing capabilities.

(2) Represents stockpiled ore that is not expected to be processed within the next 12 months as well as certain raw materials that are not expected to be consumed within the next 12 months. The stockpiled ore amounts as of December 31, 2023 and 2022, were $9.1 million and $5.7 million, respectively.

During the fourth quarter of 2023, the Company determined that the cost of a portion of its inventory exceeded its net realizable value, resulting in a write-down on certain inventories of $2.3 million, which is included in “Cost of sales (excluding depreciation, depletion and amortization) (including related party)” within the Consolidated Statement of Operations for the year ended December 31, 2023. This write-down was largely attributable to elevated carrying costs of the Company’s initial production of separated products given the early stage of ramping the Stage II facilities to normalized production levels.

No write-downs of inventories were recorded for the year ended December 31, 2022.

During the second quarter of 2021, the Company recognized a write-down of a portion of its legacy low-grade stockpile inventory of $1.8 million, after determining that it contained a significant amount of alluvial material that did not meet the Company’s requirement for mill feed and, as a result, was deemed unusable. Since the write-down pertained to a legacy stockpile, it was included in “Other operating costs and expenses” within the Consolidated Statement of Operations for the year ended December 31, 2021, rather than in “Cost of sales (excluding depreciation, depletion and amortization) (including related party).”

NOTE 5—PROPERTY, PLANT AND EQUIPMENT

The Company's property, plant and equipment consisted of the following:

	December 31,	
(in thousands)	2023	2022
Land and land improvements	$ 27,091	$ 16,102
Buildings and building improvements	92,203	15,111
Machinery and equipment	503,145	186,388
Assets under construction	211,848	338,482
Mineral rights	438,395	438,395
Property, plant and equipment, gross	1,272,682	994,478
Less: Accumulated depreciation and depletion	(114,628)	(58,735)
Property, plant and equipment, net	$ 1,158,054	$ 935,743

Additions to Property, Plant and Equipment: The Company capitalized expenditures related to property, plant and equipment of $280.0 million, $361.2 million and $138.0 million for the years ended December 31, 2023, 2022 and 2021, respectively, including amounts not yet paid (see Note 21, "Supplemental Cash Flow Information"). The capitalized expenditures related primarily to buildings and building improvements, machinery and equipment, and assets under construction to support the Company's Stage II optimization project, its Fort Worth Facility, its HREE Facility (as defined in Note 16, "Government Grants"), and other assets at Mountain Pass. Additionally, the capitalized expenditures for the year ended December 31, 2022, included the purchase of approximately 18 acres of land in Fort Worth, Texas.

Placement of Assets into Service: During the year ended December 31, 2023, the Company placed assets into service relating to its Stage II optimization project, primarily machinery and equipment, as well as its Stage III initiatives, relating primarily to the land improvements and building of its Fort Worth Facility.

Change in Estimates of Asset Retirement Costs: As a result of decrements to the Company's ARO during the third quarter of 2022 and fourth quarter of 2021, the carrying amount of the Company's total property, plant and equipment was reduced by $10.4 million and $8.7 million, respectively, the majority of which pertained to buildings, machinery and equipment, and assets under construction, in the amounts of $0.6 million, $2.7 million and $6.7 million, respectively, and $2.0 million, $2.4 million and $3.2 million, respectively. Additionally, the Company's depreciation expense for the years ended December 31, 2022 and 2021, was reduced by $2.7 million and $1.1 million, respectively, reflecting the excess of the decrement over the carrying amount of the related property, plant and equipment. See Note 8, "Asset Retirement and Environmental Obligations," for further information on the decrements.

The Company's depreciation and depletion expense were as follows:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Depreciation expense	$ 43,998	$ 5,808	$ 6,825
Depletion expense[(1)]	$ 11,067	$ 12,209	$ 17,200

(1) At the beginning of the fourth quarter of 2021, as a result of an updated life of mine, the Company revised its estimate of the remaining useful life of the mineral rights to approximately 35 years from approximately 23 years.

The Company recognized $5.5 million of demolition costs for the year ended December 31, 2023, which are included in "Other operating costs and expenses" within the Company's Consolidated Statements of Operations, incurred in connection with demolishing and removing certain old facilities from the Mountain Pass site that have never been used in the Company's operations. There were no property, plant and equipment impairments recognized for the years ended December 31, 2023, 2022 and 2021. For information on the Company's asset-based government grants, which impact the carrying amount of the Company's property, plant and equipment, see Note 16, "Government Grants."

NOTE 6—EQUITY METHOD INVESTMENT

In December 2023, the Company invested $9.7 million of cash in exchange for a 49% equity interest in VREX Holdco Pte. Ltd. ("VREX Holdco"), an entity incorporated in Singapore. Shenghe, a related party to the Company, owns the remaining 51% equity interest in VREX Holdco. VREX Holdco wholly owns Vietnam Rare Earth Company Limited ("VREX"), which owns and operates a metal processing plant and related facilities in Vietnam. As discussed in Note 20, "Related-Party Transactions," in October 2023, the Company entered into the Tolling Agreement (as defined in Note 20, "Related-Party Transactions") with VREX Holdco whereby VREX Holdco causes VREX to process the Company's NdPr oxide into NdPr metal for delivery to the Company's customers globally.

The Company determined that VREX Holdco is a variable interest entity, but that the Company is not the primary beneficiary since it does not meet both of the following characteristics: (i) have the power to direct the activities that most significantly impact the economic performance of VREX Holdco and (ii) have the obligation to absorb losses or the right to receive benefits from VREX Holdco that could potentially be significant to VREX Holdco. In the Company's determination that it is not the primary beneficiary, among other factors, it considered that all major decisions regarding the operations, capital structure and financial condition of VREX Holdco and VREX are subject to approval by VREX Holdco's board of directors, which is not controlled by the Company. In addition, Shenghe is responsible for the day-to-day project management and operations of VREX Holdco and VREX. Consequently, the Company does not consolidate VREX Holdco, and instead, accounts for its investment in VREX Holdco under the equity method of accounting as it has the ability to exercise significant influence, but not control, over VREX Holdco's operating and financial policies via its seats on the board of directors and its related party agreements.

As of December 31, 2023, the difference between the carrying amount of the Company's investment in VREX Holdco, which was $9.7 million, and the amount of underlying equity in the net assets of the investee substantially relates to equity method goodwill, which is not amortized by the Company as a basis difference. The Company records its share of VREX Holdco's net income or loss on a one-quarter lag due to the timing of when the investee's financial statements become available. Due to the timing of the investment and the one-quarter lag, the Company did not record any income or loss from this equity method investment during the year ended December 31, 2023. With the exception of the initial investment, there were no contributions to, or distributions received from, VREX Holdco during the year ended December 31, 2023.

The Company capitalizes to inventories the tolling fees paid to VREX Holdco pursuant to the Tolling Agreement. To the extent intra-entity profits or losses remain in the Company's inventories balance as of each reporting period date, the Company will eliminate its proportional share of such profits or losses until the inventory is sold to an unrelated party. As of December 31, 2023, the tolling fees capitalized to inventories subject to elimination were immaterial. See Note 20, "Related-Party Transactions," for a discussion on the transactions between the Company and VREX Holdco during the year ended December 31, 2023.

As of December 31, 2023, the Company evaluated its equity method investment for impairment to determine if there were any events or changes in circumstances that would indicate if the carrying amount of its investment had experienced an "other-than-temporary" decline in value. As a result, no impairment charge was recorded during the year ended December 31, 2023.

NOTE 7—INTANGIBLE ASSETS

In August 2023, the Company acquired a license to use patented technology, technical know-how, and other intellectual property pertaining to the development and manufacturing of magnetic products in exchange for 435,729 shares of the Company's common stock. Pursuant to the terms of the agreement to acquire the license, 152,504 shares were issued immediately and the remaining shares will be issued as follows: 43,573 shares on each of the first, second, and third anniversaries of the acquisition date and an additional 152,506 shares on the fourth anniversary of the acquisition date.

Upon obtaining the license, the Company recorded a definite-lived intangible asset in the amount of $9.0 million, based on the closing price of the Company's common stock on the acquisition date. The intangible asset will be amortized on a straight-line basis, with no estimated residual value, over the estimated useful life of 7.5 years, which the Company based on the life of the patents associated with the licensed technology.

Contemporaneous with the acquisition of the license, the Company entered into a consulting agreement in support of integrating the licensed technology and know-how into its existing processes aimed at the development of magnetic products. Unless earlier terminated, under the consulting agreement, the Company will pay a total of approximately $15 million over the next four years, of which, the first payment will be in cash on the first anniversary of the consulting agreement and the payments pertaining to the second, third, and fourth anniversaries of the consulting agreement may be settled in cash or shares of the Company's common stock at the Company's election. The Company will ratably record an expense over the four years unless the costs qualify for capitalization.

The Company’s intangible assets were as follows:

(in thousands)	December 31, 2023	December 31, 2022
Intangible assets with indefinite lives:		
Emissions allowances	$ 316	$ 89
Intangible assets with definite lives:		
Patent and intellectual property license	8,963	—
Less: Accumulated amortization	(398)	—
Patent and intellectual property license, net	8,565	—
Intangible assets, net	$ 8,881	$ 89

Amortization expense related to amortizing intangible assets was $0.4 million for the year ended December 31, 2023. There was no amortization expense related to amortizing intangible assets recognized for years ended December 31, 2022 and 2021. No impairment charges were recorded during the years ended December 31, 2023, 2022 and 2021.

The following table presents the estimated amortization expense based on amortizing intangible assets as of December 31, 2023:

(in thousands)	
Period:	
2024	$ 1,195
2025	1,195
2026	1,195
2027	1,195
2028	1,195
Thereafter	2,590
Total	$ 8,565

NOTE 8—ASSET RETIREMENT AND ENVIRONMENTAL OBLIGATIONS

Asset Retirement Obligations

The Company estimates ARO based on the requirements to reclaim certain land areas associated with mineral extraction activities and certain related facilities at Mountain Pass. Minor reclamation activities related to discrete portions of the Company’s operations are ongoing. As of December 31, 2023, the Company estimated a significant portion of the cash outflows for major reclamation activities including the retirement of Mountain Pass will be incurred beginning in 2056.

In June 2021, San Bernardino County approved a re-zoning request for certain of the Company’s properties such that certain of the Company’s processing and separations facilities would be zoned for industrial end uses as opposed to the prior “resource conservation” designation. In September 2022, and as a result of the re-zoning of this land, the Company received final approval from San Bernardino County and the Division of Mine Reclamation (California) on a revised reclamation plan. The revision removed from the regulatory oversight under The Surface Mining and Reclamation Act of 1975 the majority of the buildings and equipment used in the processing and separations facilities, including the land underlying such buildings and equipment.

In the third quarter of 2022, as a result of the final approval of the reclamation plan, the Company revised its estimated cash flows pertaining to the settlement of the reclamation and removal activities associated with Mountain Pass, including removing the previous estimates of the cash flows associated with the processing and separations facilities that no longer require reclamation. The changes in estimates resulted in an ARO decrement of $13.1 million, of which $10.4 million reduced the carrying amounts of the associated property, plant and equipment, and $2.7 million, reflecting the excess of the decrement over the carrying amount of the related property, plant and equipment, was recorded as a reduction to depreciation expense for the year ended December 31, 2022.

In the fourth quarter of 2021, the Company revised its estimated timing and cash flows pertaining to the settlement of the reclamation and removal activities associated with Mountain Pass as a result of an updated life of mine where the Company determined that the estimated commencement of the reclamation and removal activities would then occur in 2056 and 2057 for a significant portion of the assets requiring reclamation at the time. The changes in estimates resulted in an ARO decrement of $9.8 million, of which $8.7 million reduced the carrying amounts of the associated property, plant and equipment, and $1.1 million, reflecting the excess of the decrement over the carrying amount of the related property, plant and equipment, was recorded as a reduction to depreciation expense for the year ended December 31, 2021.

The following is a summary of the Company's ARO:

	December 31,	
(in thousands)	**2023**	**2022**
Beginning balance	$ 5,475	$ 17,757
Obligations settled	(180)	(144)
Accretion expense	407	976
Revision in estimated cash flows	—	(13,114)
Ending balance	$ 5,702	$ 5,475

The balance as of both December 31, 2023 and 2022, included current portions of $0.2 million, which are included in "Other current liabilities" within the Company's Consolidated Balance Sheets. The total estimated future undiscounted cash flows required to satisfy the Company's ARO as of December 31, 2023 and 2022, were $50.2 million and $50.4 million, respectively. As of December 31, 2023, the credit-adjusted risk-free rate ranged between 6.5% and 12.0% depending on the timing of expected settlement and when the increment was recognized. There were no significant increments or decrements for the year ended December 31, 2023, and there were no significant increments for the years ended December 31, 2022 and 2021.

Environmental Obligations

The Company has certain environmental monitoring and remediation obligations related to the monitoring of groundwater contamination. The Company engaged an environmental consultant to develop a remediation plan and remediation cost projections based upon that plan. Utilizing the consultant's plan, the Company developed an estimate of future cash payments for the environmental obligations.

As of December 31, 2023, the Company estimated the cash outflows related to these environmental activities will be incurred annually over the next 24 years. The Company's environmental obligations are measured at the expected value of future cash outflows discounted to their present value using a discount rate of 2.93%. There were no significant changes in the estimated remaining costs for the years ended December 31, 2023, 2022 and 2021.

The total estimated aggregate undiscounted cost of $26.7 million and $27.2 million as of December 31, 2023 and 2022, respectively, principally related to water monitoring activities required by state and local agencies. Based on the Company's estimate of the cost and timing and the assumption that payments are considered to be fixed and reliably determinable, the Company has discounted the liability. The balance as of both December 31, 2023 and 2022, included current portions of $0.5 million, which are included in "Other current liabilities" within the Company's Consolidated Balance Sheets.

As of December 31, 2023, the total environmental costs were as follows (in thousands):

Year ending December 31,	
2024	$ 536
2025	552
2026	569
2027	587
2028	605
Thereafter	23,806
Total	26,655
Effect of discounting	(9,574)
Total environmental obligations	$ 17,081

Financial Assurances

The Company is required to provide certain government agencies with financial assurances relating to closure and reclamation obligations. As of December 31, 2023 and 2022, the Company had financial assurance requirements of $45.4 million and $43.5 million, respectively, which were satisfied with surety bonds placed with applicable California state and regional agencies.

NOTE 9—ACCRUED LIABILITIES

The Company's accrued liabilities consisted of the following:

	December 31,	
(in thousands)	**2023**	**2022**
Accrued payroll and related	$ 14,499	$ 10,909
Accrued construction costs	46,976	39,226
Accrued taxes	3,373	281
Other accrued liabilities	9,091	6,523
Accrued liabilities	$ 73,939	$ 56,939

NOTE 10—DEBT OBLIGATIONS

The Company's long-term debt was as follows:

	December 31,	
(in thousands)	**2023**	**2022**
Convertible Notes due 2026	$ 690,000	$ 690,000
Less: Unamortized debt issuance costs	(8,020)	(11,556)
Long-term debt, net	$ 681,980	$ 678,444

Convertible Notes

On March 26, 2021, the Company issued $690.0 million aggregate principal amount of 0.25% unsecured green convertible senior notes that mature, unless earlier converted, redeemed or repurchased, on April 1, 2026 (the "Convertible Notes"), at a price of par. Interest on the Convertible Notes is payable on April 1st and October 1st of each year, beginning on October 1, 2021. The Convertible Notes may, at the Company's election, be settled in cash, shares of common stock of the Company, or a combination thereof. The Company has the option to redeem the Convertible Notes, in whole or in part, beginning on April 5, 2024. The Company received net proceeds of $672.3 million from the issuance of the Convertible Notes.

The Convertible Notes are convertible into shares of the Company's common stock at an initial conversion price of $44.28 per share, or 22.5861 shares, per $1,000 principal amount of notes, subject to adjustment upon the occurrence of certain corporate events. However, in no event will the conversion price exceed 28.5714 shares of common stock per $1,000 principal amount of the Convertible Notes. As of December 31, 2023, based on the initial conversion price, the maximum number of shares that could be issued to satisfy the conversion feature of the Convertible Notes was 19,714,266. The Convertible Notes' if-converted value did not exceed its principal amount as of December 31, 2023.

Prior to January 1, 2026, at their election, holders of the Convertible Notes may convert their outstanding notes under the following circumstances: (i) during any calendar quarter commencing with the third quarter of 2021 if the last reported sale price of the Company's common stock for at least 20 trading days (whether or not consecutive) during the period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter is greater than or equal to 130% of the conversion price on each applicable trading day; (ii) during the five business day period after any five consecutive trading day period (the "measurement period") in which the trading price (as defined in the indenture governing the Convertible Notes) per $1,000 principal amount of Convertible Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of the Company's common stock and the conversion rate on each such trading day; (iii) if the Company calls any or all of the Convertible Notes for redemption, at any time prior to the close of business on the scheduled trading day immediately preceding the redemption date; or (iv) upon the occurrence of specified corporate events set forth in the indenture governing the Convertible Notes. On or after January 1, 2026, and prior to the maturity date of the Convertible Notes, holders may convert their outstanding notes at any time, regardless of the foregoing circumstances.

If the Company undergoes a fundamental change (as defined in the indenture governing the Convertible Notes), holders may require it to repurchase for cash all or any portion of their outstanding notes at a price equal to 100% of the principal amount of the notes to be repurchased, plus accrued and unpaid interest to, but excluding, the fundamental change repurchase date. In addition, following certain corporate events that occur prior to the maturity date of the Convertible Notes or if the Company delivers a notice of redemption, it will, in certain circumstances, increase the conversion rate for holders who elect to convert their outstanding notes in connection with such corporate event or notice of redemption, as the case may be.

Interest expense related to the Convertible Notes was as follows:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Coupon interest	$ 1,725	$ 1,725	$ 1,318
Amortization of debt issuance costs	3,536	3,517	2,675
Convertible Notes interest expense	$ 5,261	$ 5,242	$ 3,993

The debt issuance costs are being amortized to interest expense over the term of the Convertible Notes at an effective interest rate of 0.51%. The remaining term of the Convertible Notes was 2.3 years as of December 31, 2023.

Equipment Notes

The Company has financing agreements for the purchase of certain equipment, including trucks, tractors, loaders, graders, and various other machinery. The Company's equipment notes, which are secured by the purchased equipment, have terms of between 4 to 5 years and interest rates of between 0.0% and 6.5% per annum. See also Note 21, "Supplemental Cash Flow Information."

The current and non-current portions of the equipment notes, which are included within the Consolidated Balance Sheets in "Other current liabilities" and "Other non-current liabilities," respectively, were as follows:

	December 31,	
(in thousands)	2023	2022
Equipment notes		
Current	$ 2,106	$ 2,392
Non-current	2,637	4,743
	$ 4,743	$ 7,135

Paycheck Protection Loan

In April 2020, the Company obtained a loan of $3.4 million pursuant to the Paycheck Protection Program under the CARES Act (the "Paycheck Protection Loan"). In June 2021, the Company received notification from the Small Business Administration that the Paycheck Protection Loan and related accrued interest was forgiven. Consequently, for the year ended December 31, 2021, the Company recorded a gain on forgiveness of the Paycheck Protection Loan in the amount of $3.4 million, which is included in "Other income, net" within the Company's Consolidated Statements of Operations.

Interest expense, net

Interest expense, net, was as follows:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Interest expense	$ 5,580	$ 6,146	$ 9,168
Interest capitalized to property, plant and equipment, net	(326)	(360)	(264)
Interest expense, net	$ 5,254	$ 5,786	$ 8,904

Debt Maturities

The following is a schedule of debt repayments as of December 31, 2023:

(in thousands)	Convertible Notes	Equipment Notes
Year ending December 31,		
2024	$ —	$ 2,106
2025	—	2,098
2026	690,000	539
2027	—	—
2028	—	—
Thereafter	—	—
Total minimum payments	$ 690,000	$ 4,743

As of December 31, 2023, none of the agreements governing the Company's indebtedness contain financial covenants.

NOTE 11—LEASES

The Company has operating and finance leases for certain office space, warehouses, vehicles and equipment used in its operations, with lease terms ranging from one month to nine years. The majority of these leases require monthly lease payments that may be subject to annual increases throughout the lease term. Certain of these leases also include renewal options at the election of the Company to renew or extend the lease for an additional one to five years. The Company's lease agreements do not contain material residual value guarantees or restrictive covenants. As of December 31, 2023, the Company was not reasonably certain of exercising any material purchase, renewal, or termination options contained within its lease agreements. No ROU asset impairment charges were recorded during the years ended December 31, 2023, 2022 and 2021.

In November 2021, the Company entered into a lease agreement for corporate office space. The lease commenced in the second quarter of 2023, and at lease commencement, the Company recorded an operating lease liability of $7.3 million and an ROU asset of $10.3 million, primarily comprised of the lease liability as well as $2.9 million of payments for lessor-owned tenant improvements. The lease has an initial term of 91 months expiring in October 2030, with an option to renew for one five-year period at the election of the Company. Excluding rent abatement in the first year of the lease, the initial annual base rent payment is $1.2 million, subject to an annual escalator.

Total lease cost included the following components:

		For the year ended December 31,		
(in thousands)	Location on Consolidated Statements of Operations	2023	2022	2021
Operating lease cost	Primarily Selling, general and administrative	$ 1,328	$ 424	$ 780
Finance lease cost				
Amortization of right-of-use assets	Depreciation, depletion and amortization	246	339	357
Interest on lease liabilities	Interest expense, net	32	44	60
		278	383	417
Short-term lease cost	Primarily Cost of sales (excluding depreciation, depletion and amortization) (including related party)	2,134	1,509	1,163
		$ 3,740	$ 2,316	$ 2,360

Information related to lease terms and discount rates was as follows:

	December 31, 2023	December 31, 2022
Weighted-average remaining lease term:		
Operating leases	6.6 years	1.2 years
Finance leases	4.4 years	1.8 years
Weighted-average discount rate:		
Operating leases	6.9 %	3.1 %
Finance leases	6.0 %	6.3 %

As of December 31, 2023, the maturities of the Company's operating and finance lease liabilities were as follows:

(in thousands)	Operating Leases	Finance Leases
Period:		
2024	$ 1,452	$ 228
2025	1,472	179
2026	1,362	59
2027	1,370	54
2028	1,403	54
Thereafter	2,663	106
Total lease payments	9,722	680
Less: Imputed interest	(1,934)	(97)
Total	$ 7,788	$ 583

Supplemental disclosure for the Consolidated Balance Sheets related to the Company's operating and finance leases is as follows:

(in thousands)	Location on Consolidated Balance Sheets	December 31, 2023	December 31, 2022
Operating leases:			
Right-of-use assets	Operating lease right-of-use assets	$ 10,065	$ 99
Operating lease liability, current	Other current liabilities	$ 959	$ 84
Operating lease liability, non-current	Operating lease liabilities	6,829	15
Total operating lease liabilities		$ 7,788	$ 99
Finance leases:			
Right-of-use assets	Other non-current assets	$ 591	$ 451
Finance lease liability, current	Other current liabilities	$ 195	$ 354
Finance lease liability, non-current	Other non-current liabilities	388	242
Total finance lease liabilities		$ 583	$ 596

NOTE 12—INCOME TAXES

Income tax expense consisted of the following:

(in thousands)	For the year ended December 31, 2023	2022	2021
Current:			
Federal	$ (178)	$ (24,382)	$ (4,818)
State	(135)	(9,977)	(2,915)
Total current	(313)	(34,359)	(7,733)
Deferred:			
Federal	(11,334)	(19,236)	(15,851)
State	2,879	1,447	(1,574)
Total deferred	(8,455)	(17,789)	(17,425)
Total tax expense	$ (8,768)	$ (52,148)	$ (25,158)

Income before income taxes, by tax jurisdiction, was as follows:

(in thousands)	For the year ended December 31, 2023	2022	2021
United States	$ 33,075	$ 341,152	$ 160,195

Income taxes differed from the amounts computed by applying the U.S. federal income tax rate of 21% to pretax income as a result of the following:

	For the year ended December 31,					
	2023		2022		2021	
(in thousands, except tax rates)	Percent	Amount	Percent	Amount	Percent	Amount
Computed income tax expense at the statutory rate	21.0 %	$ (6,946)	21.0 %	$ (71,642)	21.0 %	$ (33,641)
Changes resulting from:						
State and local income taxes, net of federal benefits	2.6 %	(867)	3.3 %	(11,395)	2.7 %	(4,288)
Limitation on officer's compensation	11.0 %	(3,640)	2.3 %	(8,067)	1.7 %	(2,638)
Depletion in excess of basis	— %	—	(4.5)%	15,248	(6.1)%	9,663
Paycheck Protection Loan forgiveness	— %	—	— %	—	(0.5)%	714
Foreign-derived intangible income	— %	—	(4.0)%	13,676	(1.8)%	2,886
California Competes Tax Credit, net of federal detriment	(11.3)%	3,753	(0.9)%	3,160	(1.2)%	1,975
Excess tax benefits (expense) on stock-based compensation	0.6 %	(190)	(1.0)%	3,575	(0.6)%	974
Valuation allowance	4.1 %	(1,360)	(0.8)%	2,845	0.5 %	(821)
Section 45X Advanced Manufacturing Credit	(0.1)%	38	— %	—	— %	—
State rate change and other state adjustments	(1.6)%	514	— %	—	— %	—
Other, net	0.2 %	(70)	(0.1)%	452	— %	18
Total effective tax rate and income tax expense	26.5 %	$ (8,768)	15.3 %	$ (52,148)	15.7 %	$ (25,158)

The tax effects of temporary differences that gave rise to significant portions of the deferred income tax assets and deferred income tax liabilities were as follows:

	December 31,	
(in thousands)	2023	2022
Deferred tax assets:		
Asset retirement and environmental obligations	$ 5,640	$ 5,643
Net operating losses	25,107	—
Inventories	15,310	12,448
Research and experimental costs	960	691
Stock-based compensation	5,065	3,785
Organization costs	688	776
Lease liabilities	2,084	173
Credits	3,057	346
Other	439	178
Gross deferred tax assets	58,350	24,040
Less: Valuation allowance	(1,706)	(346)
Net deferred tax assets	56,644	23,694
Deferred tax liabilities:		
Property, plant and equipment	(83,834)	(36,481)
Prepaid expenses	(520)	(1,567)
ROU assets	(2,638)	(138)
Deferred revenue	(3,270)	(6,604)
Mineral rights	(97,127)	(101,195)
Other	(48)	(62)
Total deferred tax liabilities	(187,437)	(146,047)
Non-current deferred tax liabilities, net	$ (130,793)	$ (122,353)

As of December 31, 2023 and 2022, the Company had net operating loss carryforwards for federal income tax purposes of $119.6 million and zero, respectively, and did not have any in either period for state income tax purposes. The federal net operating loss may be carried forward indefinitely. As of December 31, 2023, the Company considered the positive and negative evidence to determine the need for a valuation allowance to offset its deferred tax assets and has concluded that it is more likely than not that, with the exception of certain deferred tax assets related to California Alternative Minimum Tax credits, its deferred tax assets will be realized through future taxable temporary differences, principally resulting from the deferred tax liability recorded from the acquisition of Secure Natural Resources LLC ("SNR") in the 2020 tax year.

During the fourth quarter of 2021, the Company received notice from the State of California that it had been awarded a California Competes Tax Credit ("CCTC") of $14.8 million that is available to be offset against the Company's California state income tax liability over the next several years. The credit is allocated in varying amounts over a five-year period based on the Company's ability to meet certain milestones related to California employees hired, the annual wage of these employees, and the capital investments made by the Company in California. Once the annual milestones are met, a credit amount is awarded. However, a portion of the credit could be "clawed back" if the milestones are not continually met for each of the three following years. For the years ended December 31, 2023, 2022, and 2021, it was determined that the Company had met the relevant annual milestones for the CCTC and as a result, the Company recorded a credit of $4.8 million, $4.0 million, and $2.5 million, respectively, which resulted in an income tax benefit and a reduction to the Company's California state income tax payable for the 2023, 2022 and 2021 tax years.

In August 2022, the U.S. government enacted the Inflation Reduction Act of 2022, which, among other things, provides several tax incentives to promote clean energy adoption for tax years beginning after December 31, 2022. Specifically, the Section 45X Advanced Manufacturing Production Credit (the "45X Credit") provides a credit equal to 10% of eligible "production costs incurred" with respect to the production and sale of critical minerals, including NdPr oxide. For more information on the 45X Credit, see Note 16, "Government Grants."

The Company has evaluated its tax positions for the years ended December 31, 2023, 2022 and 2021, and determined that there were no uncertain tax positions requiring recognition in the Consolidated Financial Statements. The tax years from 2020 onward remain open to examination by the taxing jurisdictions to which the Company is subject.

NOTE 13—COMMITMENTS AND CONTINGENCIES

Litigation: The Company may become party to lawsuits, administrative proceedings and government investigations, including environmental, regulatory, construction, and other matters, in the ordinary course of business. Large, and sometimes unspecified, damages or penalties may be sought in some matters, and certain matters may require years to resolve. Other than the matter described below, the Company is not aware of any pending or threatened litigation that it believes would have a material adverse effect on its Consolidated Financial Statements.

The Company is currently in dispute with a general contractor for a construction project, which may go to binding arbitration. The Company disputes that it owes any monies in connection with this construction project. The Company is unable to estimate a range of loss, if any, at this time. If an unfavorable outcome were to occur in the case, it is possible that the impact could be material to the Company's Consolidated Financial Statements in the period in which any such outcome becomes probable and reasonably estimable.

401(k) Plan: The Company maintains a qualified defined contribution retirement plan under the provisions of Section 401(k) of the Internal Revenue Code, which covers all eligible employees (the "MP 401(k) Plan"). Under the MP 401(k) Plan, eligible employees may contribute up to 90% of their pretax salary, subject to the Internal Revenue Service annual contribution limits. The Company makes a discretionary match contribution, where applicable, of 100% of employees' elective salary deferrals, up to a maximum of 4% of eligible employee compensation. For the years ended December 31, 2023, 2022, and 2021, the Company recognized contribution expense of $2.0 million, $0.9 million, and $0.6 million, respectively.

NOTE 14—STOCKHOLDERS' EQUITY

Common Stock and Preferred Stock

The Company's certificate of incorporation authorizes it to issue up to 500,000,000 shares, consisting of (i) 450,000,000 shares of common stock and (ii) 50,000,000 shares of preferred stock, each with a par value of $0.0001 per share.

Public Warrants

Warrants to purchase 11,499,968 shares of the Company's common stock at $11.50 per share (the "Public Warrants") were issued in connection with the initial public offering of Fortress Value Acquisition Corp., the special purpose acquisition company that acquired MP Mine Operations LLC, a Delaware limited liability company ("MPMO") and SNR on November 17, 2020 (the "Business Combination"), pursuant to the Warrant Agreement, dated April 29, 2020 (the "Warrant Agreement"), by and between the Company and Continental Stock Transfer & Trust Company ("CST"), as warrant agent. These warrants qualified as equity instruments as they were indexed to the Company's stock and settlement in shares was within the Company's control.

On May 4, 2021, at the direction of the Company, CST, in its capacity as warrant agent, delivered a notice of redemption to each of the registered holders of the outstanding Public Warrants for a redemption price of $0.01 per warrant (the "Redemption Price"), that remained outstanding on June 7, 2021 (the "Redemption Date"). In accordance with the Warrant Agreement, the Company's Board of Directors elected to require that, upon delivery of the notice of redemption, all Public Warrants were to be exercised only on a "cashless basis." Accordingly, a holder exercising a Public Warrant was deemed to pay the $11.50 per warrant exercise price by the surrender of 0.3808 of a share of common stock that such holder would have been entitled to receive upon a cash exercise, resulting in exercising warrant holders receiving 0.6192 of a share of common stock for each Public Warrant surrendered for exercise. All Public Warrants that remained unexercised on the Redemption Date were delisted, voided and no longer exercisable, and the holders had no rights with respect to those Public Warrants, except to receive the Redemption Price.

During the year ended December 31, 2021, the Company issued 7,080,005 shares of its common stock as a result of the cashless exercise of 11,434,455 Public Warrants. The Company redeemed the remaining 65,513 Public Warrants outstanding at the Redemption Date for a nominal amount.

NOTE 15—REVENUE RECOGNITION

The following table disaggregates the Company's revenue from contracts with customers by type of good sold, which are transferred to customers at a point in time:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Rare earth concentrate	$ 252,468	$ 517,267	$ 328,563
NdPr oxide and metal	695	—	—
Other rare earth products	282	10,243	3,389
Total revenue	$ 253,445	$ 527,510	$ 331,952

The Company evaluates the recognition of revenue based on the criteria set forth in ASC Topic 606, "Revenue from Contracts with Customers." Given the nature of the Company's contracts with customers, contract assets and contract liabilities are not material for any period presented. Furthermore, the amount of revenue recognized in the periods presented from performance obligations that were satisfied (or partially satisfied) in previous periods were not material to any period presented. Refer to Note 2, "Significant Accounting Policies," for the Company's revenue recognition policies.

Rare earth concentrate revenue is primarily generated from sales to Shenghe under the amended and restated offtake agreement ("A&R Offtake Agreement") for sales between January 2022 and February 2022, or the Offtake Agreement (as defined in Note 20, "Related-Party Transactions") for sales beginning in March 2022. The sales price of rare earth concentrate sold to Shenghe under both agreements is based on an agreed-upon price per MT, with an adjustment for the ultimate market price of the product realized by Shenghe upon sales to their customers, including the impact of changes in the exchange rate between the Chinese Yuan and the U.S. dollar.

NdPr oxide and metal revenue was generated from sales that commenced in the fourth quarter of 2023 under individual sales agreements. Other rare earth product revenue was generated primarily from sales of non-concentrate products, including sales to Shenghe of certain stockpiles of rare earth fluoride for the year ended December 31, 2022.

NOTE 16—GOVERNMENT GRANTS

Asset-Based Grants: In November 2020, the Company was awarded a Defense Production Act Title III technology investment agreement ("TIA") from the Department of Defense ("DOD") to establish domestic processing for separated light rare earth elements (this "project") in the amount of $9.6 million. Pursuant to the terms of the TIA, the Company was required to utilize the funds to acquire property and equipment that contribute to the mission of this project. Furthermore, in exchange for these funds, the Company is required to provide the DOD with periodic reporting specific to this project for up to approximately five years.

During the years ended December 31, 2022 and 2021, pursuant to the TIA, the Company received $5.1 million and $4.4 million, respectively, in reimbursements from the DOD. The funds received reduced the carrying amount of certain fixed assets associated with the Company's Stage II optimization project, which were included in machinery and equipment as of December 31, 2023 and 2022. As of December 31, 2023, the Company is entitled to receive an additional $0.1 million from the DOD under the TIA.

In February 2022, the Company was awarded a $35.0 million contract by the DOD's Office of Industrial Base Analysis and Sustainment program to design and build a facility to process heavy rare earth elements ("HREE") at Mountain Pass (the "HREE Facility") (the "HREE Production Project Agreement"). The Company must utilize the funds to acquire property and equipment that will contribute to commercial-scale production of separated HREE at Mountain Pass. The Company will be paid fixed amounts upon the completion of certain project milestones. In exchange for these funds, the DOD will have certain rights to technical data following the completion of the project. The funds received pursuant to the HREE Production Project Agreement reduce the carrying amount of the fixed assets associated with the HREE Facility. During the year ended December 31, 2023, the Company had received $2.8 million from the DOD under the HREE Production Project Agreement, which reduced the carrying amount of assets under construction.

Income-Based Grants: As mentioned in Note 12, "Income Taxes," in August 2022, the U.S. government enacted the Inflation Reduction Act of 2022, which, among other things, promotes clean energy adoption by providing several tax incentives for the domestic production and sale of eligible components for tax years beginning after December 31, 2022. Specifically, the 45X Credit provides a credit equal to 10% of eligible "production costs incurred" with respect to the production and sale of critical minerals, including NdPr oxide. In December 2023, the Internal Revenue Service released proposed regulations on the 45X Credit which, among other things, clarified that the definition of "production costs incurred" excludes direct and indirect materials costs, including costs related to the extraction or acquisition of raw materials.

For corporate taxpayers, the 45X Credit is eligible for the direct pay election, which allows a refund of the credit in excess of tax liability. The Company intends to make this election on its 2023 tax return, and such election is binding, unless revoked, for five years (i.e., through 2027). Accordingly, the Company determined that the 45X Credit is not within the scope of ASC 740, and instead, should be accounted for as an income-based grant. As such, during the period that the 45X Credit is refundable, the Company will recognize such credit as a reduction to either "Cost of sales (excluding depreciation, depletion and amortization) (including related party)" or "Depreciation, depletion and amortization," within the Company's Consolidated Statements of Operations, depending on the location of the corresponding expense, in the period the critical mineral is sold to a customer. Within the Company's Consolidated Balance Sheets, such 45X Credit is reflected in "Government grant receivable" and, when applicable, "Deferred government grant."

As of December 31, 2023, the 45X Credit in government grant receivable of $19.3 million as well as the related deferred government grant of $19.1 million, of which $1.7 million is included in "Other current liabilities" within the Company's Consolidated Balance Sheet, primarily related to the inclusion of tax depreciation on assets that support production of critical minerals, including the Company's Stage II circuits that were placed into service during 2023 and qualify for bonus tax depreciation treatment. The deferred government grant associated with tax depreciation in 2023 will be recognized as a reduction of depreciation expense on a straight-line basis over the remaining estimated useful life of the underlying long-lived assets, which is approximately 11 years. For the year ended December 31, 2023, the benefits recognized from income-based government grants in the Company's Consolidated Statements of Operations were not material.

NOTE 17—STOCK-BASED COMPENSATION

2020 Incentive Plan: In November 2020, the Company's stockholders approved the MP Materials Corp. 2020 Stock Incentive Plan (the "2020 Incentive Plan"), which permits the Company to issue stock options (incentive and/or non-qualified); stock appreciation rights ("SARs"); restricted stock, restricted stock units ("RSUs") and other stock awards ("Stock Awards"); and performance awards. As of December 31, 2023, the Company has not issued any stock options or SARs.

Pursuant to the 2020 Incentive Plan, 9,653,671 shares of common stock were initially available for issuance. The number of shares of common stock available under the 2020 Incentive Plan may be increased annually on the first day of each calendar year, beginning with the year ended December 31, 2021, and continuing until (and including) the year ending December 31, 2030, with such annual increase equal to the lesser of (i) 2% of the number of shares of stock issued and outstanding on December 31st of the immediately preceding fiscal year and (ii) an amount determined by the Board of Directors. The number of shares of common stock that remain available for future grants under the 2020 Incentive Plan shall be reduced by the sum of the aggregate number of shares of common stock that become subject to outstanding options, outstanding free-standing SARs, outstanding Stock Awards, and outstanding performance awards denominated in shares of common stock, other than substitute awards. As of December 31, 2023, there were 5,928,540 shares available for future grants under the 2020 Incentive Plan.

Market-Based PSUs: In February 2023, pursuant to the 2020 Incentive Plan, the Compensation Committee of the Company's Board of Directors adopted a performance share plan (the "2023 Performance Share Plan"). Pursuant to the 2023 Performance Share Plan, for the year ended December 31, 2023, the Company granted 62,709 of market-based performance stock units ("PSUs") at target, all of which cliff vest after a requisite performance and service period of three years. The PSUs have the potential to be earned at between 0% and 200% of the number of awards granted depending on the level of growth of the Company's total shareholder return ("TSR") as compared to the TSR of the S&P 400 Index and the S&P 400 Materials Group over the performance period. The fair value of the market-based PSUs was determined using a Monte Carlo simulation technique.

The following table contains information on the Company's performance awards:

	Number of Shares	Weighted-Average Grant Date Fair Value
Nonvested as of January 1, 2023	—	$ —
Granted	62,709	$ 50.40
Vested	—	$ —
Forfeited	—	$ —
Nonvested as of December 31, 2023	62,709	$ 50.40

As of December 31, 2023, the unamortized compensation cost not yet recognized related to performance awards totaled $2.1 million and the weighted-average period over which the costs are expected to be recognized was 2.0 years.

Stock Awards: Pursuant to the terms and conditions of certain executive employment agreements, in connection with the consummation of the Business Combination, 2,013,006 shares of restricted stock were issued in November 2020, of which 200,000 shares immediately vested and the remainder of shares were to vest ratably pursuant the respective employment agreements over the requisite service period of four years.

The Company granted 805,322, 382,742 and 1,026,387 RSUs to employees during the years ended December 31, 2023, 2022, and 2021, respectively, which, with the exception of 67,700, 36,461 and 80,350 RSUs granted during the years ended December 31, 2023, 2022 and 2021, respectively, that vested immediately, vest ratably in equal installments over the requisite service period of four years.

Additionally, the Company granted 48,177, 23,975 and 18,394 RSUs to non-employee directors during the years ended December 31, 2023, 2022, and 2021, respectively, of which, 10,691, 6,881 and 5,810 vested immediately into tax-deferred stock units ("DSUs") during the years ended December 31, 2023, 2022 and 2021, respectively. The remaining RSUs granted vest into DSUs upon the earlier of one year after the grant date and the next annual stockholder meeting. The DSUs are settled as shares of common stock of the Company upon the earlier of (i) June 15th of the fifth year after grant, (ii) a change in control of the Company, or (iii) the director's separation from the Board, unless the director elects to defer settlement until retirement.

The grant date fair value of the Company's Stock Awards is based on the closing stock price of the Company's shares of common stock on the date of grant. The weighted-average grant date fair value of Stock Awards granted during the years ended December 31, 2023, 2022, and 2021 was $24.13, $38.52 and $41.24, respectively.

The following table contains information on the Company's Stock Awards:

	Number of Shares	Weighted-Average Grant Date Fair Value
Nonvested as of January 1, 2023	2,208,163	$ 26.76
Granted	853,499	$ 24.13
Vested	(841,466)	$ 25.80
Forfeited	(44,475)	$ 28.34
Nonvested as of December 31, 2023	2,175,721	$ 26.06

As of December 31, 2023, the unamortized compensation cost not yet recognized related to Stock Awards totaled $23.2 million and the weighted-average period over which the costs are expected to be recognized was 1.8 years. The total fair value of Stock Awards that vested during the years ended December 31, 2023, 2022 and 2021, was $20.7 million, $40.0 million and $10.9 million, respectively.

Stock-Based Compensation: The Company's stock-based compensation and related income tax benefit were recorded as follows:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Cost of sales (excluding depreciation, depletion and amortization) (including related party)	$ 3,932	$ 2,853	$ 4,294
Selling, general and administrative	20,508	28,554	18,246
Start-up costs	723	119	—
Advanced projects and development	73	254	391
Total stock-based compensation expense	$ 25,236	$ 31,780	$ 22,931
Stock-based compensation capitalized to property, plant and equipment, net	$ 1,868	$ 1,286	$ —
Income tax benefit for stock-based compensation arrangements	$ —	$ 4,256	$ 3,185

NOTE 18—FAIR VALUE MEASUREMENTS

ASC Topic 820, "Fair Value Measurement," establishes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). The three levels of the fair value hierarchy are described below:

Level 1 Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities;

Level 2 Quoted prices in markets that are not active, quoted prices for similar assets or liabilities in active markets, quoted prices or inputs that are observable, either directly or indirectly, for substantially the full term of the asset or liability and model-based valuation techniques (e.g. the Black-Scholes model) for which all significant inputs are observable in active markets.

Level 3 Prices or valuation techniques that require inputs that are both significant to the fair value measurement and unobservable (supported by little or no market activity).

The Company's assessment of the significance of a particular input to the fair value measurement requires judgment and may affect the valuation of assets and liabilities and their placement within the fair value hierarchy. The following methods and assumptions are used to estimate the fair value of each class of financial instruments for which it is practicable to estimate. The fair value of the Company's accounts receivable, accounts payable, and accrued liabilities approximates the carrying amounts because of the immediate or short-term maturity of these financial instruments.

Cash, Cash Equivalents and Restricted Cash

The Company's cash, cash equivalents and restricted cash are classified within Level 1 of the fair value hierarchy. The carrying amounts reported in the Consolidated Balance Sheets approximate the fair value of cash, cash equivalents and restricted cash due to the short-term nature of these assets.

Short-term Investments

The fair value of the Company's short-term investments, which are classified as available-for-sale securities, is estimated based on quoted prices in active markets and is classified as a Level 1 measurement.

Convertible Notes

The fair value of the Company's Convertible Notes is estimated based on quoted prices in active markets and is classified as a Level 1 measurement.

Equipment Notes

The Company's equipment notes are classified within Level 2 of the fair value hierarchy because there are inputs that are directly observable for substantially the full term of the liability. Model-based valuation techniques for which all significant inputs are observable in active markets were used to calculate the fair values of liabilities classified within Level 2 of the fair value hierarchy.

Assets and liabilities are classified in their entirety based on the lowest level of input that is significant to the fair value measurement. The carrying amounts and estimated fair values by input level of the Company's financial instruments were as follows:

	December 31, 2023				
(in thousands)	Carrying Amount	Fair Value	Level 1	Level 2	Level 3
Financial assets:					
Cash and cash equivalents	$ 263,351	$ 263,351	$ 263,351	$ —	$ —
Short-term investments	$ 734,493	$ 734,493	$ 734,493	$ —	$ —
Restricted cash	$ 1,637	$ 1,637	$ 1,637	$ —	$ —
Financial liabilities:					
Convertible Notes	$ 681,980	$ 619,496	$ 619,496	$ —	$ —
Equipment notes	$ 4,743	$ 4,628	$ —	$ 4,628	$ —

	December 31, 2022				
(in thousands)	Carrying Amount	Fair Value	Level 1	Level 2	Level 3
Financial assets:					
Cash and cash equivalents	$ 136,627	$ 136,627	$ 136,627	$ —	$ —
Short-term investments	$ 1,045,718	$ 1,045,718	$ 1,045,718	$ —	$ —
Restricted cash	$ 6,882	$ 6,882	$ 6,882	$ —	$ —
Financial liabilities:					
Convertible Notes	$ 678,444	$ 610,650	$ 610,650	$ —	$ —
Equipment notes	$ 7,135	$ 6,807	$ —	$ 6,807	$ —

NOTE 19—EARNINGS PER SHARE

Basic EPS is computed by dividing net income by the weighted-average number of common shares outstanding during the period. Diluted EPS is computed by dividing net income by the weighted-average number of common shares outstanding plus the effect of dilutive potential common shares outstanding during the period using the treasury stock method or the if-converted method, as applicable.

The following table reconciles the weighted-average common shares outstanding used in the calculation of basic EPS to the weighted-average common shares outstanding used in the calculation of diluted EPS:

	For the year ended December 31,		
	2023	2022	2021
Weighted-average shares outstanding, basic	177,181,661	176,519,203	173,469,546
Assumed conversion of Public Warrants	—	—	2,840,624
Assumed conversion of Convertible Notes	—	15,584,409	11,997,860
Assumed conversion of restricted stock	609,326	921,772	1,257,360
Assumed conversion of RSUs	361,225	427,703	278,638
Weighted-average shares outstanding, diluted	178,152,212	193,453,087	189,844,028

The following table presents potentially dilutive shares that were not included in the computation of diluted EPS because to do so would have been antidilutive:

	For the year ended December 31,		
	2023	2022	2021
Convertible Notes	15,584,409	—	—
RSUs	3,184	24,442	18,322
Total	15,587,593	24,442	18,322

The following table presents the calculation of basic and diluted EPS for the Company's common stock:

	For the year ended December 31,		
(in thousands, except share and per share data)	2023	2022	2021
Calculation of basic EPS:			
Net income	$ 24,307	$ 289,004	$ 135,037
Weighted-average shares outstanding, basic	177,181,661	176,519,203	173,469,546
Basic EPS	$ 0.14	$ 1.64	$ 0.78
Calculation of diluted EPS:			
Net income	$ 24,307	$ 289,004	$ 135,037
Interest expense, net of tax(1):			
Convertible Notes(2)	—	4,441	3,366
Diluted income	$ 24,307	$ 293,445	$ 138,403
Weighted-average shares outstanding, diluted	178,152,212	193,453,087	189,844,028
Diluted EPS	$ 0.14	$ 1.52	$ 0.73

(1) The years ended December 31, 2022, and 2021, were tax-effected at a rate of 15.3% and 15.7%, respectively.

(2) The Convertible Notes were antidilutive for the year ended December 31, 2023. Convertible debt becomes antidilutive whenever its interest expense (net of tax) per common share obtainable upon conversion exceeds basic EPS.

NOTE 20—RELATED-PARTY TRANSACTIONS

Offtake Agreement: In March 2022, the Company entered into an offtake agreement (the "Offtake Agreement") with Shenghe Resources (Singapore) International Trading Pte. Ltd. ("Shenghe"), a majority-owned subsidiary of Leshan Shenghe Rare Earth Co., Ltd. whose ultimate parent is Shenghe Resources Holding Co., Ltd., a leading global rare earth company listed on the Shanghai Stock Exchange. The Offtake Agreement became effective upon the termination of the amended and restated offtake agreement with Shenghe. The initial term of the Offtake Agreement is two years, with the option to extend the term at the Company's discretion for an additional one-year period.

Pursuant to the Offtake Agreement, and subject to certain exclusions, Shenghe is obligated to purchase on a "take or pay" basis the rare earth concentrate produced by the Company as the exclusive distributor in China, with certain exceptions for the Company's direct sales globally. In addition, at the discretion of the Company, Shenghe may be required to purchase on a "take or pay" basis certain non-concentrate rare earth products, although the Company may sell all non-concentrate rare earth products in its sole discretion to customers or end users in any jurisdiction.

The sales price of rare earth concentrate sold to Shenghe is based on an agreed-upon price per metric ton, with an adjustment for the ultimate market price of the product realized by Shenghe upon sales to their customers. The sales price and other terms applicable to a quantity of offtake products are set forth in monthly purchase agreements between the Company and Shenghe. Under the Offtake Agreement, Shenghe is paid a variable commission on net proceeds to the Company.

In January 2024, the Company entered into a new offtake agreement with Shenghe (the "New Offtake Agreement") that replaced and extended the Offtake Agreement. The initial term of the New Offtake Agreement is two years, with the option for the Company to extend the term for an additional one-year period. The terms of the New Offtake Agreement are substantially the same as those of the Offtake Agreement with the exception of the addition of NdPr metal into the definition of non-concentrate rare earth products.

Tolling Agreement with VREX Holdco: In October 2023, prior to the Company's investment in VREX Holdco, the Company entered into a tolling agreement with VREX Holdco (the "Tolling Agreement"). Pursuant to the Tolling Agreement, the Company delivers NdPr oxide to VREX Holdco, which VREX Holdco then causes VREX to process into NdPr metal for delivery to the Company's customers globally. As several of the Company's potential customers that manufacture magnets outside of China prefer to purchase NdPr metal in addition to NdPr oxide, this Tolling Agreement enables the Company to distribute NdPr products more widely to customers in Japan and other global markets. During the term of the Tolling Agreement, the Company will pay VREX Holdco a processing fee per unit of rare earth metal produced. The Company maintains title to the products and directly enters into sales agreements for the produced NdPr metal. The initial term of the Tolling Agreement is three years and may be renewed for additional three-year terms.

During the year ended December 31, 2023, prior to the Company's investment in VREX Holdco, the Company made a payment of $1.2 million to VREX Holdco for tolling services, of which, the majority was for services yet to be performed by VREX. Refer to Note 6, "Equity Method Investment," for additional information on the investment in VREX Holdco.

Revenue and Cost of Sales: The Company's related-party revenue and cost of sales were as follows:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Revenue:			
Rare earth concentrate	$ 242,516	$ 487,006	$ 326,599
Other rare earth products[1]	$ —	$ 9,740	$ —
Cost of sales (excluding depreciation, depletion and amortization)	$ 89,260	$ 88,681	$ 75,930

(1) Represents sales agreements with Shenghe for non-concentrate products, including certain stockpiles of rare earth fluoride.

Purchases of Materials and Supplies: The Company purchases certain reagent products (generally produced by an unrelated third party manufacturer) used in the flotation process as well as other materials from Shenghe in the ordinary course of business. Total purchases for the years ended December 31, 2023, 2022 and 2021, totaled $8.3 million, $18.5 million and $4.8 million, respectively.

Accounts Receivable: As of December 31, 2023 and 2022, $9.2 million and $29.8 million, respectively, of the accounts receivable as stated on the Consolidated Balance Sheets, were receivable from and pertained to sales made to Shenghe in the ordinary course of business.

NOTE 21—SUPPLEMENTAL CASH FLOW INFORMATION

Supplemental cash flow information and non-cash investing and financing activities were as follows:

	For the year ended December 31,		
(in thousands)	2023	2022	2021
Supplemental cash flow information:			
Cash paid for interest	$ 2,059	$ 2,096	$ 1,204
Cash payments related to income taxes, net	$ 20,105	$ 18,860	$ 4,172
Change in construction payables and accrued construction costs	$ 18,086	$ 34,569	$ 14,082
Supplemental non-cash investing and financing activities:			
Common stock issued to acquire intangible asset	$ 8,963	$ —	$ —
Operating ROU assets obtained in exchange for lease liabilities	$ 7,690	$ 168	$ —
Finance ROU assets obtained in exchange for lease liabilities	$ 371	$ 42	$ 88
Property, plant and equipment acquired with equipment notes	$ —	$ —	$ 9,407
Revenue recognized in exchange for debt principal reduction	$ —	$ 13,566	$ 54,802
Paycheck Protection Loan forgiveness	$ —	$ —	$ 3,401
Decrease in estimates of asset retirement costs	$ —	$ 10,395	$ 8,713

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

Under the supervision and with the participation of our management, including our principal executive officer and principal financial and accounting officer, we conducted an evaluation of the effectiveness of our disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) as of December 31, 2023. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that, as of the end of the period covered by this Annual Report on Form 10-K (this "Annual Report"), our disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed by us in reports we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in SEC rules and forms, and is accumulated and communicated to management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosures.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining a system of internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of our financial reporting and preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America. Internal control over financial reporting includes maintaining records that in reasonable detail accurately and fairly reflect our transactions; providing reasonable assurance that transactions are recorded as necessary for preparation of our financial statements in accordance with accounting principles generally accepted in the United States of America; providing reasonable assurance that our receipts and expenditures are made in accordance with authorizations of our management and directors; and providing reasonable assurance that unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements would be prevented or detected on a timely basis.

Management conducted an assessment of the effectiveness of our internal control over financial reporting based on the framework set forth by the Committee of Sponsoring Organizations of the Treadway Commission in the *Internal Control— Integrated Framework (2013)*. Based on this assessment, our management concluded that our internal control over financial reporting was effective as of December 31, 2023, to provide reasonable assurance regarding the reliability of financial reporting and preparation of financial statements for external reporting purposes in accordance with accounting principles generally accepted in the United States of America.

Attestation Report of the Registered Public Accounting Firm

The effectiveness of our internal control over financial reporting as of December 31, 2023, has been audited by KPMG LLP, an independent registered public accounting firm, as stated in their report which is included in Part II, Item 8 of this Annual Report.

Changes in Internal Control Over Financial Reporting

During the fourth quarter of the year ended December 31, 2023, there were no changes in our internal control over financing reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that have materially affected, or are reasonably likely to materially affect our internal control over financing reporting.

ITEM 9B. OTHER INFORMATION

During the fourth quarter of the year ended December 31, 2023, none of the Company's directors or officers (as defined in Rule 16a-1(f) of the Securities Exchange Act of 1934) adopted, terminated or modified a Rule 10b5-1 trading arrangement or non-Rule 10b5-1 trading arrangement (as such terms are defined in Item 408 of Regulation S-K of the Securities Act of 1933).

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The remaining information required by this item concerning directors and corporate governance is hereby incorporated by reference to the Company's definitive proxy statement for its Annual Meeting of Stockholders (the "2024 Proxy Statement"), to be filed with the SEC within 120 days after December 31, 2023, pursuant to Regulation 14A under the Securities Act. Information required by this item concerning executive officers is included in Part I of this Annual Report on Form 10-K.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is hereby incorporated by reference to the 2024 Proxy Statement, except as to information disclosed therein pursuant to Item 402(v) of Regulation S-K relating to pay versus performance.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item is hereby incorporated by reference to the 2024 Proxy Statement.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item is hereby incorporated by reference to the 2024 Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this item is hereby incorporated by reference to the 2024 Proxy Statement.

PART IV

ITEM 15. EXHIBIT AND FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of this Annual Report:

(1) Report of Independent Registered Public Accounting Firm

Auditor Name: KPMG LLP

Auditor Location: Denver, CO

Auditor Firm ID: 185

Financial Statements (see Item 8. "Financial Statements and Supplementary Data" and incorporated herein by reference).

(2) Financial Statement Schedules (Schedules to the Financial Statements have been omitted because the information required to be set forth therein is not applicable or is shown in the accompanying Financial Statements or notes thereto).

(3) Exhibits (incorporated herein by reference or filed as part of this Annual Report).

Ex. No.	Description
2.1	Agreement and Plan of Merger, dated as of July 15, 2020, by and among Fortress Value Acquisition Corp., FVAC Merger Corp. I, FVAC Merger LLC II, FVAC Merger LLC III, FVAC Merger LLC IV, MP Mine Operations LLC and Secure Natural Resources LLC (incorporated herein by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed on July 15, 2020).
2.2	Amendment No. 1 to the Agreement and Plan of Merger, dated as of August 26, 2020, by and among Fortress Value Acquisition Corp., FVAC Merger Corp. I, FVAC Merger LLC II, FVAC Merger LLC III, FVAC Merger LLC IV, MP Mine Operations LLC and Secure Natural Resources LLC (incorporated herein by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed on August 27, 2020).
3.1	Second Amended and Restated Certificate of Incorporation of MP Materials Corp. (incorporated herein by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed on November 17, 2020).

Ex. No.	Description
3.2	Amended and Restated Bylaws of MP Materials Corp. (incorporated herein by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K filed on November 17, 2020).
4.1	Description of Securities (incorporated herein by reference to Exhibit 4.1 to the Company's Annual Report on Form 10-K for the year ended on December 31, 2021).
4.2	Indenture, dated as of March 26, 2021, by and between MP Materials Corp. and U.S. Bank National Association, as trustee (incorporated herein by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed on March 26, 2021).
4.3	Form of 0.25% Green Convertible Senior Notes due 2026 (included as Exhibit A to Exhibit 4.1) (incorporated herein by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed on March 26, 2021).
10.1	Amended and Restated Registration Rights Agreement, dated November 17, 2020, by and between MP Materials Corp.(f/k/a Fortress Value Acquisition Corp.) and the restricted stockholders (incorporated herein by reference to Exhibit 10.6 to the Company's Current Report on Form 8-K filed on November 17, 2020).
10.2	Registration Rights Agreement, dated as of March 26, 2021, by and among MP Materials Corp. and BofA Securities, Inc. and Deutsche Bank Securities Inc., as representatives of the initial purchasers of the Convertible Notes (incorporated herein by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on March 26, 2021).
10.3†	MP Materials Corp. 2020 Stock Incentive Plan (incorporated herein by reference to Exhibit 10.7 to the Company's Current Report on Form 8-K filed on November 17, 2020).
10.4	Form of Indemnification Agreement (incorporated herein by reference to Exhibit 10.8 to the Company's Current Report on Form 8-K filed on November 17, 2020).
10.5†	Employment Agreement, dated November 18, 2021, effective as of January 1, 2022, between MP Materials Corp. and James H. Litinsky (incorporated herein by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on November 19, 2021).
10.6†	Employment Agreement, dated November 18, 2021, effective as of January 1, 2022, between MP Materials Corp. and Ryan Corbett (incorporated herein by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on November 19, 2021).
10.7†	Employment Agreement, dated November 18, 2021, effective as of January 1, 2022, between MP Materials Corp. and Michael Rosenthal (incorporated herein by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed on November 19, 2021).
10.8†	Employment Agreement, dated November 18, 2021, effective as of January 1, 2022, between MP Materials Corp. and Elliot D. Hoops (incorporated herein by reference to Exhibit 10.4 to the Company's Current Report on Form 8-K filed on November 19, 2021).
10.9†	Form of MP Materials Corp. 2020 Stock Incentive Plan Restricted Stock Unit Agreement (incorporated herein by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2021).
10.10†	Form of MP Materials Corp. 2020 Stock Incentive Plan Non-Employee Director Restricted Stock Unit Award Agreement (incorporated herein by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2021).
10.11†	Form of MP Materials Corp. 2020 Stock Incentive Plan Restricted Stock Award Agreement (incorporated herein by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2021).
10.12†	Form of MP Materials Corp. 2020 Stock Incentive Plan Restricted Stock Unit Award Agreement (incorporated herein by reference to Exhibit 10.15 to the Company's Annual Report on Form 10-K for the year ended on December 31, 2021).
10.13†	Form of MP Materials Corp. 2020 Stock Incentive Plan Restricted Stock Unit Award Agreement with Performance Conditions (incorporated herein by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2023).
10.14+++	Amended and Restated Offtake Agreement, dated as of May 19, 2020, between MPMO and Shenghe Resources (Singapore) (incorporated herein by reference to Exhibit 10.15 to the Company's Registration Statement on Form S-4 filed with the SEC on August 27, 2020).

Ex. No.	Description
10.15+++	Offtake Agreement, dated as of March 4, 2022, between MP Mine Operations LLC and Shenghe Resources (Singapore) International Trading PTE LTD. (incorporated herein by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2022).
10.16†	MP Materials Corp. 2021 Director Deferred Compensation Plan (incorporated herein by reference to Exhibit 10.14 to the Company's Annual Report on Form 10-K for the year ended December 31, 2020).
10.17†*	MP Materials Corp. Compensation Recoupment Policy.
10.18*	MP Materials Corp. Insider Trading Policy.
21.1*	Subsidiaries of the Registrant.
23.1*	Consent of KPMG LLP.
23.2*	Consent of SRK Consulting (U.S.), Inc.
23.3*	Consent of Adamas Intelligence Inc.
23.4*	Consent of SGS North America, Inc.
24.1*	Power of Attorney (included as part of signature page).
31.1*	CEO Certification pursuant to rule 13a-14(a) or 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2*	CFO Certification pursuant to rule 13a-14(a) or 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1**	CEO Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2**	CFO Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
95.1*	Mine Safety Disclosure pursuant to Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act.
96.1*	Technical Report Summary of SRK Consulting (U.S.), Inc. prepared for MP Materials Corp. and issued effective as of October 1, 2023.
101.INS	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema Document.
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document.
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104	Cover Page Inline XBRL File (included in Exhibit 101).
*	Filed herewith.
**	Furnished herewith.
†	Indicates a management contract or compensatory plan or arrangement.
+	Annexes, schedules and/or exhibits have been omitted pursuant to Item 601(a)(5) of Regulation S-K. MP Materials Corp. agrees to furnish supplementally a copy of any omitted attachment to the SEC on a confidential basis upon request.
++	Certain portions of this exhibit (indicated by "[***]") have been omitted pursuant to Regulation S-K, Item (601)(b)(10).

ITEM 16. FORM 10-K SUMMARY

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

MP MATERIALS CORP.

Dated:	February 28, 2024	By:	/s/ Ryan Corbett
			Ryan Corbett Chief Financial Officer

POWER OF ATTORNEY AND SIGNATURES

We, the undersigned officers and directors of MP Materials Corp. hereby severally constitute and appoint James H. Litinsky and Ryan Corbett, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for her or him and in her or his name, place and stead, and in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and generally to do all things in our names and on our behalf in such capacities to enable MP Materials Corp. to comply with the provisions of the Securities Exchange Act of 1934, as amended, and all the requirements of the Securities Exchange Commission.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Name	Title	Date
/s/ James H. Litinsky James H. Litinsky	Chief Executive Officer (principal executive officer), Chairman of the Board of Directors and Director	February 28, 2024
/s/ Ryan Corbett Ryan Corbett	Chief Financial Officer (principal financial and accounting officer)	February 28, 2024
/s/ Gen. Richard B. Myers Gen. Richard B. Myers	Director	February 28, 2024
/s/ Andrew A. McKnight Andrew A. McKnight	Director	February 28, 2024
/s/ Arnold Donald Arnold Donald	Director	February 28, 2024
/s/ Randall Weisenburger Randall Weisenburger	Director	February 28, 2024
/s/ Maryanne R. Lavan Maryanne R. Lavan	Director	February 28, 2024
/s/ Connie K. Duckworth Connie K. Duckworth	Director	February 28, 2024

MP MATERIALS CORP.
COMPENSATION RECOUPMENT POLICY

In the event of any required accounting restatement of the financial statements of MP Materials Corp. (the "**Company**") due to the material noncompliance of the Company with any financial reporting requirement under the applicable U.S. federal securities laws, including any required accounting restatement to correct an error in previously issued financial statements that is material to the previously issued financial statements, or that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period (a "**Restatement**"), the Company shall recover reasonably promptly from any person, who is or was an "**Executive Officer**," as such term is defined in Rule 10D-1 adopted under the Securities Exchange Act of 1934, as amended (the "**Exchange Act**") and Section 303A.14 of the listing standards of the New York Stock Exchange (the "**NYSE**"), of the Company (each, a "**Covered Person**") the amount of any "**Erroneously Awarded Incentive-Based Compensation**" (as defined below). This Policy shall be effective as of October 2, 2023, the effective date of Section 303A.14 of the NYSE's listing standards (the "**Effective Date**").

The amount of Incentive-Based Compensation (as defined below) that must be recovered from a Covered Person pursuant to the immediately preceding paragraph is the amount of "**Recoverable Incentive-Based Compensation**" (as defined below) received by a Covered Person that exceeds the amount of Recoverable Incentive-Based Compensation that otherwise would have been received had it been determined based on the restated amounts, computed without regard to any taxes paid (referred to as the "Erroneously Awarded Incentive-Based Compensation"). For Recoverable Incentive-Based Compensation based on stock price or total shareholder return, where the amount of Erroneously Awarded Incentive-Based Compensation is not subject to mathematical recalculation directly from the information in a Restatement, the amount must be based on a reasonable estimate of the effect of the Restatement on the stock price or total shareholder return, as applicable, upon which the Recoverable Incentive-Based Compensation was received, and the Company must maintain documentation of that reasonable estimate and provide such documentation to the NYSE. For the purposes of this Policy, Recoverable Incentive-Based Compensation will be deemed to be received in the fiscal period during which the financial reporting measure specified in the applicable Incentive-Based Compensation award is attained, even if the payment or grant occurs after the end of that period.

For purposes of this Policy, "**Incentive-Based Compensation**" means any compensation that is granted, earned, or vested based wholly or in part upon the attainment of a "financial reporting measure," which means a measure that is determined and presented in accordance with Generally Accepted Accounting Principles which are used in preparing the Company's financial statements, and any measure that is derived wholly or in part from such measures. Stock price and total shareholder return are also financial reporting measures for this purpose. For avoidance of doubt, a financial reporting measure need not be presented within the Company's financial statements or included in a filing with the Securities and Exchange Commission.

For purposes of this Policy, "**Recoverable Incentive-Based Compensation**" means all Incentive-Based Compensation received on or after the Effective Date of this Policy set forth above by a Covered Person: (i) after beginning service as an executive officer; (ii) who served as an Executive Officer at any time during the performance period for the Incentive-Based Compensation; (iii) while the Company has a class of securities listed on a national securities exchange or a national securities association; and (iv) during the three completed fiscal years immediately preceding the date that the Company is required to prepare a Restatement, including any applicable transition period that results from a change in the Company's fiscal year within or immediately following those three completed fiscal years. For this purpose, the Company is deemed to be required to prepare a Restatement on the earlier of: (i) the date the Board of Directors of the Company (the "**Board**"), or the Company's officers authorized to take such action if Board action is not required, concludes, or reasonably should have concluded, that the Company is required to prepare a Restatement; and (ii) the date a court, regulator, or other legally authorized body directs the Company to prepare a Restatement. The Company's obligation to recover Erroneously Awarded Incentive-Based Compensation is not dependent on if or when the restated financial statements are filed with the Securities and Exchange Commission.

The Company shall recover the Erroneously Awarded Incentive-Based Compensation from Covered Persons unless the Board determines that recovery is impracticable because: (i) the direct expense to a third party to assist in enforcing this Policy would exceed the amount of Erroneously Awarded Incentive-Based Compensation; provided that the Company must make a reasonable attempt to recover the Erroneously Awarded Incentive-Based Compensation before concluding that recovery is impracticable, document such reasonable attempt to recover the Erroneously Awarded Incentive-Based Compensation and provide such documentation to the NYSE; or (iii) recovery would likely cause an otherwise tax-qualified retirement plan, under which benefits are broadly available to employees of the Company, to fail to meet the applicable requirements of 26 U.S.C. 401(a)(13) or 26 U.S.C. 411(a) and regulations thereunder.

In no event will the Company indemnify any Covered Person for any amounts that are recovered under this Policy. This Policy is in addition to (and not in lieu of) any right of repayment, forfeiture or right of offset against any employees that is required pursuant to any statutory repayment requirement (regardless of whether implemented at any time prior to or following the adoption or amendment of this Policy), including Section 304 of the Sarbanes-Oxley Act of 2002. Any amounts paid to the Company pursuant to Section 304 of the Sarbanes-Oxley Act of 2002 shall be considered in determining any amounts recovered under this Policy.

The application and enforcement of this Policy does not preclude the Company from taking any other action to enforce a Covered Person's obligations to the Company, including termination of employment or institution of legal proceedings. Nothing in this Policy restricts the Company from seeking recoupment under any other compensation recoupment Policy or any applicable provisions in plans, agreements, awards or other arrangements that contemplate the recoupment of compensation from a Covered Person. If a Covered Person fails to repay Erroneously Awarded Incentive-Based Compensation that is owed to the Company under this Policy, the Company shall take all appropriate action to recover such Erroneously Awarded Incentive-Based Compensation from the Covered Person, and the Covered Person shall be required to reimburse the Company for all expenses (including legal expenses) incurred by the Company in recovering such Erroneously Awarded Incentive-Based Compensation.

The terms of this Policy shall be binding and enforceable against all Covered Persons subject to this Policy and their beneficiaries, heirs, executors, administrators or other legal representatives. If any provision of this Policy or the application of such provision to any Covered Person shall be adjudicated to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Policy, and the invalid, illegal or unenforceable provisions or shall be deemed amended to the minimum extent necessary to render any such provision (or the application of such provision) valid, legal or enforceable.

Each Covered Person shall sign and return to the Company, within 30 calendar days following the later of (i) the effective date of this Policy first set forth above or (ii) the date the individual becomes a Covered Person, the Acknowledgement Form attached hereto as **Exhibit A**, pursuant to which the Covered Person agrees to be bound by, and to comply with, the terms and conditions of this Policy.

This Policy shall be interpreted in a manner that is consistent with Rule 10D-1 under the Exchange Act, Section 303A.14 of the NYSE Listed Company Manual and any related rules or regulations adopted by the Securities and Exchange Commission or the NYSE as well as any other applicable law.

<u>EXHIBIT A</u>

MP MATERIALS CORP.

COMPENSATION RECOUPMENT POLICY

ACKNOWLEDGEMENT FORM

By signing below, the undersigned acknowledges and confirms that the undersigned has received and reviewed a copy of the MP Materials Corp. (the “Company”) Compensation Recoupment Policy (the “Policy”).

By signing this Acknowledgement Form, the undersigned acknowledges and agrees that the undersigned is and will continue to be subject to the Policy and that the Policy will apply both during and after the undersigned’s employment with the Company. Further, by signing below, the undersigned agrees to abide by the terms of the Policy, including, without limitation, by returning any Erroneously Awarded Incentive-Based Compensation (as defined in the Policy) to the Company to the extent required by, and in a manner consistent with, the Policy.

COVERED PERSON

____
Signature

____
Print Name

____
Date

MP MATERIALS CORP.

INSIDER TRADING POLICY

This Insider Trading Policy ("**Policy**") of MP Materials Corp. and its subsidiaries (the "**Company**") applies to all directors, executive officers, and employees of the Company. The Company may also determine that other persons should be subject to this Policy, such as contractors or consultants who have access to material nonpublic information. This Policy also applies to family members, other members of a person's household, and entities controlled by a person covered by this Policy, as described below. This Policy is subject to modification from time to time as the Company's Board of Directors deems necessary or advisable.

In this Policy, "**executive officer**" means any executive officer of the Company approved by the Company's Board of Directors, and "**director**" means any member of the Company's Board of Directors.

Purpose

This Policy provides guidelines with respect to transactions in the securities of the Company and the handling of confidential information about the Company and the companies with which the Company does business. The Company's Board of Directors has adopted this Policy to promote compliance with federal, state, and foreign securities laws that prohibit certain persons who are aware of material nonpublic information about a company from: (i) trading in securities of that company; or (ii) providing material nonpublic information to other persons who may trade on the basis of that information.

Transactions Subject to the Policy

This Policy applies to transactions in the Company's securities (collectively referred to in this Policy as "Company Securities"), including the Company's common stock, options to purchase common stock, or any other type of securities that the Company may issue, including (but not limited to) preferred stock, convertible debentures and warrants, as well as derivative securities that are not issued by the Company, such as exchange-traded put or call options or swaps relating to Company Securities.

Individual Responsibility

Persons subject to this Policy have ethical and legal obligations to maintain the confidentiality of information about the Company and to not engage in transactions in Company Securities while in possession of material nonpublic information. Persons subject to this Policy must not engage in illegal trading and must avoid the appearance of improper trading. Each individual subject to this Policy is responsible for complying with this Policy and making sure that any family member, household member, or entity whose transactions are subject to this Policy, as discussed below, also comply with this Policy. In all cases, the responsibility for determining whether an individual is in possession of material nonpublic information rests with that individual, and any action on the part of the Company, the Company's General Counsel, or any employee, executive officer, or director pursuant to this Policy (or otherwise) does not in any way constitute legal advice or insulate an individual from liability under applicable securities laws. You could be subject to severe legal penalties and disciplinary action by the Company for any conduct prohibited by this Policy or applicable securities laws, as described below in more detail under the heading "Consequences of Violations."

Administration of the Policy

The Company's General Counsel or, in the General Counsel's absence, another employee designated by the General Counsel, shall be responsible for administration of this Policy. All determinations and interpretations by the General Counsel regarding this Policy shall be final and not subject to further review.

Statement of Policy

It is the policy of the Company that no director, executive officer, or other employee of the Company (or any other person designated by this Policy or by the General Counsel as subject to this Policy) who is aware of material nonpublic information relating to the Company may, directly, or indirectly through family members or other persons or entities:

1. Engage in transactions in Company Securities, except as otherwise specified in this Policy under the headings "Transactions Under Company Plans," "Transactions Not Involving a Purchase or Sale," and "Rule 10b5-1 Plans;"
2. Recommend the purchase or sale of any Company Securities;
3. Disclose material nonpublic information to persons within the Company whose jobs do not require them to have that information, or outside of the Company to other persons, including, but not limited to, family, friends, business associates, investors, and expert consulting firms, unless any such disclosure is made in accordance with the Company's policies regarding the protection or authorized external disclosure of information regarding the Company; or
4. Assist anyone engaged in the above activities.

In addition, it is the policy of the Company that no director, executive officer, or other employee of the Company (or any other person designated as subject to this Policy) who, in the course of working for the Company, learns of material nonpublic information about a company (1) with which the Company does business, including a customer or supplier of the Company, or (2) that is involved in a potential transaction or business relationship with the Company, may engage in transactions in that company's securities until the information becomes public or is no longer material.

It is also the policy of the Company that the Company will not engage in transactions in Company Securities while aware of material nonpublic information relating to the Company or Company Securities.

There are no exceptions to this Policy, except as specifically noted in this Policy. Transactions that may be necessary or justifiable for independent reasons (such as the need to raise money for an emergency expenditure) or small transactions are not excepted from this Policy. The securities laws do not recognize any mitigating circumstances, and, in any event, even the appearance of an improper transaction must be avoided to preserve the Company's reputation for adhering to the highest standards of conduct.

Definition of Material Nonpublic Information

Material Information. Information is considered "material" if a reasonable investor would consider that information important in making a decision to buy, hold, or sell securities. Any information that could be expected to affect a company's stock price, whether it is positive or negative, should be considered material. There is no bright-line standard for assessing materiality; rather, materiality is based on an assessment of all of the facts and circumstances and is often evaluated by enforcement authorities with the benefit of hindsight. While it is not possible to define all categories of material information, some examples of information that ordinarily would be regarded as material are:

- Projections of future earnings or losses, or other earnings guidance;
- Changes to previously announced earnings guidance or the decision to suspend earnings guidance;
- A pending or proposed merger, acquisition, or tender offer;
- A pending or proposed acquisition or disposition of a significant asset;
- A pending or proposed joint venture;
- A Company restructuring;

- Significant related party transactions;
- A change in dividend policy, the declaration of a stock split, or an offering of additional securities;
- Bank borrowings or other financing transactions out of the ordinary course;
- The establishment of a repurchase program for Company Securities;
- A change in the Company's pricing or cost structure;
- A material event at the Company's Mountain Pass mine or magnet factory or their operations;
- A change in Company management;
- A change in auditors or notification that the auditor's reports may no longer be relied upon;
- Development of a significant new product, process, or service;
- Pending or threatened significant litigation, or the resolution of such litigation;
- Impending bankruptcy or the existence of severe liquidity problems;
- A significant cybersecurity incident, such as a data breach, or any other significant disruption in the Company's operations or loss, potential loss, breach, or unauthorized access of its property or assets, whether at its facilities or through its information technology infrastructure; or
- The imposition of an event-specific restriction on trading in Company Securities or the securities of another company or the extension or termination of such restriction.

When Information is Considered Public. Information that has not been disclosed to the public is generally considered to be nonpublic information. In order to establish that the information has been disclosed to the public, it may be necessary to demonstrate that the information has been widely disseminated. Information generally would be considered widely disseminated if it has been disclosed through the Dow Jones "broad tape," newswire services, a broadcast on widely-available radio or television programs, publication in a widely-available newspaper, magazine or news website, publication on the Company's website or social media pages, or public disclosure documents filed with the SEC that are available on the SEC's website. By contrast, information would likely not be considered widely disseminated if it is available only to the Company's employees, or if it is only available to a select group of analysts, brokers, and institutional investors.

Once information is widely disseminated, it is still necessary to provide the investing public with sufficient time to absorb the information. As a general rule, information should not be considered fully absorbed by the marketplace until the second trading day after the day on which the information is released. If, for example, the Company were to make an announcement on a Thursday, you should not trade in Company Securities until the following Monday. Depending on the particular circumstances, the Company may determine that a longer or shorter period should apply to the release of specific material nonpublic information.

Transactions by Family Members and Others

This Policy applies to your family members who reside with you (including a spouse, a child, a child away at college, stepchildren, grandchildren, parents, stepparents, grandparents, siblings, and in-laws), anyone else who lives in your household, and any family members who do not live in your household but whose transactions in Company Securities are directed by you or are subject to your influence or control, such as parents or children who consult with you before they trade in Company Securities (collectively referred to as "Family Members"). You are responsible for the transactions of these other persons and therefore should make them aware of the need to confer with you before they trade in Company Securities, and you should treat all such transactions for the purposes of this Policy and applicable securities laws as if the transactions were for your own account. This Policy does not, however, apply to personal securities transactions of Family Members where the purchase or sale decision is made by a third party not controlled by, influenced by, or related to you or your Family Members.

Transactions by Entities that You Influence or Control

This Policy applies to any entities that you influence or control, including any corporations, partnerships, or trusts (collectively referred to as "Controlled Entities"), and transactions by these Controlled Entities should be treated for the purposes of this Policy and applicable securities laws as if they were for your own account.

Transactions Under Company Plans

This Policy does not apply in the case of the following transactions, except as specifically noted:

- **Stock Option Exercises.** This Policy does not apply to the exercise of an employee stock option acquired pursuant to the Company's plans or to the exercise of a tax withholding right pursuant to which a person has elected to have the Company withhold shares subject to an option to satisfy tax withholding requirements. This Policy does apply, however, to any sale of stock as part of a broker-assisted cashless exercise of an option, or any other market sale for the purpose of generating the cash needed to pay the exercise price of an option.
- **Restricted Stock Awards; Restricted Stock Units; Performance Shares.** This Policy does not apply to the vesting of restricted stock awards, restricted stock units, performance shares or the exercise of a tax withholding right pursuant to which you elect to have the Company withhold shares of stock to satisfy tax withholding requirements upon the vesting of any restricted stock awards, restricted stock units, or performance shares. This Policy does apply, however, to any market sale of restricted stock awards, restricted stock units, or performance shares.
- **Other Similar Transactions.** Any other purchase of Company Securities from the Company or sales of Company Securities to the Company are not subject to this Policy.

Transactions Not Involving a Purchase or Sale

Gifts of Securities may not be made if the person is aware of material nonpublic information or is subject to the trading restrictions specified below under the headings "Quarterly Trading Restrictions" or "Event-Specific Trading Restriction Periods." Gifts of Securities by executive officers or directors and their Family Members and Controlled Entities are subject to the "Pre-Clear Procedures." Transactions in mutual funds or exchange traded funds that are invested in Company Securities are not transactions subject to this Policy.

Quarterly Trading Restrictions

All persons subject to this Policy, as well as their Family Members or Controlled Entities, may not conduct any transactions involving Company Securities (other than as specified by this Policy), during a "Blackout Period" beginning ten trading days prior to the end of each fiscal quarter and ending on the second trading day following the date of the public release of the Company's earnings results for that quarter. In other words, these persons may only conduct transactions in Company Securities during the "Window Period" beginning on the second trading day following the public release of the Company's quarterly earnings and ending ten trading days prior to the close of the next fiscal quarter.

Event-Specific Trading Restriction Periods

From time to time, an event may occur that is material to the Company and is known by only a few directors, executive officers, and/or employees. So long as the event remains material and nonpublic, the persons designated by the General Counsel may not trade Company Securities. In addition, the Company's financial results may be sufficiently material in a particular fiscal quarter that, in the judgment of the General Counsel, designated persons should refrain from trading in Company Securities even sooner than the typical Blackout Period described above. In that situation, the General Counsel may notify these persons that they should not trade in Company Securities without disclosing the reason for the restriction. The existence of an event-specific trading restriction period or extension of a Blackout Period will not be announced to the Company as a whole and should not be communicated to any other person. Even if the General Counsel has not designated you as a person who should not trade due to an event-specific restriction, you should not trade while aware of material nonpublic information. Exceptions will not be granted during an event-specific trading restriction period.

Short-Swing Profits and Pre-Clearance Procedures for Transactions by Executive Officers and Directors.

Securities laws place certain restrictions on transactions in a company's securities by executive officers and directors. This Policy therefore restricts short-term trading of Company Securities by executive officers and directors and requires executive officers and directors to obtain pre-clearance from the General Counsel before engaging in any transaction in Company Securities as set forth below.

- **Short-Swing Profits.** Any director or executive officer of the Company who purchases Company Securities in the open market may not sell any Company Securities of the same class during the six months following the purchase. Any director or executive officer of the Company who sells Company Securities in the open market may not purchase any Company Securities of the same class during the six months following the sale.
- **Pre-Clearance Procedures.** Directors and executive officers may not engage in any transaction in Company Securities without first obtaining pre-clearance of the transaction from the General Counsel. A request for pre-clearance should be submitted to the General Counsel at least 48 hours in advance of the proposed transaction. The General Counsel is under no obligation to approve a transaction submitted for pre-clearance and may determine not to permit the transaction. If a person seeks pre-clearance and permission to engage in the transaction is denied, then the requestor should refrain from initiating any transaction in Company Securities and should not inform any other person of the restriction. When a request for pre-clearance is made, the requestor should carefully consider whether the requestor may be aware of any material nonpublic information about the Company and should describe fully those circumstances to the General Counsel. The requestor should also indicate whether the requestor has effected any non-exempt "opposite-way" transactions within the past six months, and should be prepared to report the proposed transaction on an appropriate Form 4 or Form 5. The requestor should also be prepared to comply with SEC Rule 144 and file Form 144, if necessary, at the time of any sale.

Exceptions

The quarterly trading restrictions and event-specific trading restrictions described above do not apply to those transactions to which this Policy does not apply, as described above under the headings "Transactions Under Company Plans" and "Transactions Not Involving a Purchase or Sale." Further, the requirement for pre-clearance, the quarterly trading restrictions, and event-specific trading restrictions do not apply to transactions conducted pursuant to approved Rule 10b5-1 plans, described under the heading "Rule 10b5-1 Plans" below.

Special and Prohibited Transactions

The Company has determined that there is a heightened legal risk and/or the appearance of improper or inappropriate conduct if the persons subject to this Policy engage in certain types of transactions. It therefore is the Company's policy that any persons covered by this Policy may not engage in any of the following transactions, or should otherwise consider the Company's preferences as described below:

- **Short Sales.** Short sales of Company Securities (*i.e.*, the sale of a security that the seller does not own) may evidence an expectation on the part of the seller that the securities will decline in value, and therefore have the potential to signal to the market that the seller lacks confidence in the Company's prospects. In addition, short sales may reduce a seller's incentive to seek to improve the Company's performance. For these reasons, short sales of Company Securities are prohibited. In addition, Section

16(c) of the Exchange Act prohibits officers and directors from engaging in short sales. Short sales arising from certain types of hedging transactions are governed by the paragraph below captioned "Hedging Transactions."

- **Publicly-Traded Options.** Given the relatively short term of publicly-traded options, transactions in options may create the appearance that a director, executive officer, or employee is trading based on material nonpublic information and focus a director's, executive officer's, or other employee's attention on short-term performance at the expense of the Company's long-term objectives. Accordingly, transactions in put options, call options, or other derivative securities on an exchange or in any other organized market are prohibited by this Policy. Option positions arising from certain types of hedging transactions are governed by the next paragraph below.
- **Hedging Transactions.** Hedging transactions may insulate you from upside or downside price movement in the Company Securities which can result in the perception that you no longer have the same interests as the Company's other stockholders. Accordingly, employees, executive officers and directors and their family members who share their household may not enter into hedging or monetization transactions or similar arrangements with respect to the Company Securities, including the purchase or sale of puts or calls or the use of any other derivative instruments, except as pre-cleared by the General Counsel and approval of the Board.
- **Margin Accounts and Pledged Securities.** Company Securities held in a margin account or pledged as collateral for a loan may be sold without a person's consent by the broker if the person fail to meet a margin call or by the lender in foreclosure if the person defaults on the loan. A margin or foreclosure sale that occurs when the person is aware of material nonpublic information may, under some circumstances, result in unlawful insider trading. Because of this danger, the person may not hold Company securities in a margin account nor pledge Company Securities as collateral for a loan, except as pre-cleared with the General Counsel and approval of the Board.
- **Standing and Limit Orders.** Standing and limit orders (except standing and limit orders under approved Rule 10b5-1 Plans, as described below) create heightened risks for insider trading violations similar to the use of margin accounts. There is no control over the timing of purchases or sales that result from standing instructions to a broker, and as a result the broker could execute a transaction when a director, executive officer, or other employee is in possession of material nonpublic information. The Company therefore discourages placing standing or limit orders on Company Securities. If a person subject to this Policy desires to use a standing order or limit order, the order should be limited to a maximum duration of two days and should otherwise comply with this Policy.

Rule 10b5-1 Plans (Pre-Approval Required by General Counsel)

Rule 10b5-1 under the Exchange Act provides a defense from insider trading liability under Rule 10b-5. In order to be eligible to rely on this defense, a person subject to this Policy must enter into a Rule 10b5-1 plan for transactions in Company Securities that meets certain conditions specified in the Rule (a "Rule 10b5-1 Plan"). If the plan meets the requirements of Rule 10b5-1, Company Securities may be purchased or sold without regard to certain insider trading restrictions. To comply with the Policy, a Rule 10b5-1 Plan must be approved by the General Counsel. All employees, executive officers and directors are limited to having only one Rule 10b5-1 Plan in place at any time. In general, a Rule 10b5-1 Plan must be entered into at a time when the person entering into the plan is not aware of material nonpublic information. Once the plan is adopted, the person must not exercise any influence over the amount of securities to be traded, the price at which they are to be traded, or the date of the trade. The plan must either specify the amount, pricing, and timing of transactions in advance or delegate discretion on these matters to an independent third party.

Under Rule 10b5-1 Plan, a director or executive officer must have a cooling off period prior to beginning to purchase or sell securities until the later of (1) 90 days after the adoption of the 10b5-1 Plan or (2) two business days following the issuance of the Form 10-K or Form 10-Q for the fiscal quarter in which the plan was adopted (which need not exceed 120 days following plan adoption or modification). For those employees (other than an executive officer or director), there is a 30-day cooling off period prior to beginning to purchase or sell securities.

Any Rule 10b5-1 Plan must be submitted for approval by the General Counsel prior to the entry into the Rule 10b5-1 Plan. No further pre-approval of transactions conducted pursuant to the Rule 10b5-1 Plan will be required.

Post-Termination Transactions

This Policy continues to apply to transactions in Company Securities even after termination of service to the Company. If an individual is in possession of material nonpublic information when that individual's service terminates, that individual may not trade in Company Securities until that information has become public or is no longer material. The pre-clearance procedures specified under the heading "Pre-Clearance Procedures" above, however, will cease to apply to transactions in Company Securities upon the expiration of any Blackout Period or other Company-imposed trading restrictions applicable at the time of the termination of service.

Confidentiality

Serious problems could be caused for the Company and you by unauthorized disclosure of internal information about the Company, whether or not for the purpose of facilitating improper trading in Company Securities. Therefore, executive officers, directors, and employees should not discuss internal matters or developments with anyone outside of the Company, except as required in the performance of regular job requirements.

This prohibition applies specifically (but not exclusively) to inquiries about the Company which may be made by customers (except for ordinary-course customer-sales representative discourse), the press, investment analysts, or others in the financial community. It is important that all such communications on behalf of the Company be made in accordance with Company policy. Unless you are expressly authorized to the contrary, if you receive any inquiries of this nature, you should decline comment and refer the inquiry to the Chief Executive Officer, Chief Financial Officer, or General Counsel.

Consequences of Violations

The purchase or sale of securities while aware of material nonpublic information or the disclosure of material nonpublic information to others who then trade in Company Securities is prohibited by federal and state laws. Insider trading violations are pursued vigorously by the SEC, U.S. Attorneys, and state enforcement authorities as well as the regulatory authorities of foreign jurisdictions. Punishment for insider trading violations is severe and could include significant fines and imprisonment. While the regulatory authorities concentrate their efforts on the individuals who trade or who tip inside information to others who trade, the federal securities laws also impose potential liability on companies and other "controlling persons" if they fail to take reasonable steps to prevent insider trading by company personnel.

In addition, an individual's failure to comply with this Policy may subject the individual to Company-imposed sanctions, including dismissal for cause, whether or not the individual's failure to comply results in a violation of law. Needless to say, a violation of law, or even an SEC investigation that does not result in prosecution, can tarnish a person's reputation and irreparably damage a career.

Company Assistance

Any person who has a question about this Policy or its application to any proposed transaction may obtain additional guidance from the General Counsel.

Exhibit 21.1

MP MATERIALS CORP.

SUBSIDIARIES*

Company	State or Jurisdiction of Incorporation
MP Mine Operations LLC	Delaware
Secure Natural Resources LLC	Delaware
MP Magnetics LLC	Delaware
MP Separations Company LLC	Delaware

* Pursuant to Item 601(b)(21)(ii) of Regulation S-K, the names of other subsidiaries of MP Materials Corp. are omitted because, considered in the aggregate, they would not constitute a significant subsidiary as of the end of the year covered by this report.

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the registration statements (Nos. 333-251239 and 333-261954) on Forms S-3 and registration statement (No. 333-252361) on Form S-8 of our report dated February 28, 2024, with respect to the consolidated financial statements of MP Materials Corp. and the effectiveness of internal control over financial reporting.

/s/ KPMG LLP

Denver, Colorado
February 28, 2024

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denver@srk.com
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February 22, 2024

MP Materials Corp.
1700 S. Pavilion Center Drive, Suite 800
Las Vegas, Nevada 89135
Attention: Ryan Corbett
Chief Financial Officer

Dear Mr. Corbett:

Consent Letter – Mountain Pass Technical Report Summary

In connection with the Annual Report on Form 10-K for the fiscal year ended December 31, 2023 and any amendments thereto (collectively, the "Form 10-K") to be filed by MP Materials Corp. (the "Company") with the U.S. Securities and Exchange Commission ("SEC"), SRK Consulting (U.S.), Inc. ("SRK"), hereby consents to:

(1) the filing and/or incorporation by reference by the Company and use of the Technical Report Summary titled "SEC Technical Report Summary, Pre-Feasibility Study, Mountain Pass Mine, San Bernardino County, California" with an effective date of October 1, 2023, and a report date of February 22, 2024 (the "Technical Report Summary") that was prepared in accordance with Subpart 1300 of Regulation S-K promulgated by the SEC, as an exhibit to and referenced in the Form 10-K;

(2) the use of and references to SRK's name as a "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the SEC), in connection with the Form 10-K and any such Technical Report Summary; and

(3) the use of any quotation from, or summarization of, the particular section or sections of the Technical Report Summary in the Form 10-K, to the extent it was prepared by SRK, that SRK supervised its preparation of and/or that was reviewed and approved by SRK, that is included or incorporated by reference to the Form 10-K.

SRK is responsible for, and this consent pertains to the following sections of the Technical Report Summary:

- Portions of Sections 1, 10, 14, 18, 22, 23, 24, and 25
- Sections 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 15, 17, 19, 20, 21

SRK also consents to the incorporation by reference in the Company's registration statements on Form S-8 (No. 333-252361) and Form S-3 (Nos. 333-251239 and 333-261954) of the above items as included in the Form 10-K.

Neither the whole nor any part of the Technical Report Summary nor any reference thereto may be included in any other filings with the SEC without the prior written consent of SRK as to the form and context in which it appears.

Yours faithfully,

SRK Consulting (U.S.), Inc.

Fernando Rodrigues, BSc, MBA, MAusIMM, MMSAQP
Practice Leader, Principal Consultant

Adamas Intelligence

February 22, 2024

MP Materials Corp.
1700 S. Pavilion Center Drive, 8th Floor
Las Vegas, Nevada 89135
Attention: Ryan Corbett, Chief Financial Officer

Dear Mr. Corbett:

Consent Letter – Mountain Pass Technical Report Summary

In connection with the Annual Report on Form 10-K for the fiscal year ended December 31, 2023 and any amendments thereto (collectively, the "Form 10-K") to be filed by MP Materials Corp. (the "Company") with the U.S. Securities and Exchange Commission ("SEC"), Adamas Intelligence Inc. ("Adamas Intelligence"), hereby consents to:

(1) the filing and/or incorporation by reference by the Company and use of the Technical Report Summary titled "SEC Technical Report Summary, Pre-Feasibility Study, Mountain Pass Mine, San Bernardino County, California" with an effective date of October 1, 2023, and a report date of February 22, 2024 (the "Technical Report Summary") that was prepared in accordance with Subpart 1300 of Regulation S-K promulgated by the SEC, as an exhibit to and referenced in the Form 10-K;

(2) the use of and references to Adamas Intelligence's name as a "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the SEC), in connection with the Form 10-K and any such Technical Report Summary; and

(3) the use of any quotation from, or summarization of, the particular section or sections of the Technical Report Summary in the Form 10-K, to the extent it was prepared by Adamas Intelligence, that Adamas Intelligence supervised its preparation of and/or that was reviewed and approved by Adamas Intelligence, that is included or incorporated by reference to the Form 10-K.

Adamas Intelligence is responsible for, and this consent pertains to Section 16 and portions of Sections 1, 22, 23, 24, and 25 of the Technical Report Summary.

Adamas Intelligence also consents to the incorporation by reference in the Company's registration statements on Form S-8 (No. 333-252361) and Form S-3 (Nos. 333-251239 and 333-261954) of the above items as included in the Form 10-K.

Neither the whole nor any part of the Technical Report Summary nor any reference thereto may be included in any other filings with the SEC without the prior written consent of Adamas Intelligence as to the form and context in which it appears.

Regards,

Darren L. Smith, M.Sc., P.Geo.
Mentor and Senior Technical Advisor, Rare Earths and Niobium
Dahrouge Geological Consulting Ltd.

Qualified Person for
Adamas Intelligence Inc.

SGS

22 February 2024
519-11

MP Materials Corp.
1700 Pavilion Drive, Suite 800
Las Vegas, NV 89135

Attention Ryan Corbett
Chief Financial Officer

Subject: Consent Letter – Mountain Pass Technical Report Summary

Dear Mr. Corbett:

In connection with the Annual Report on Form 10-K for the fiscal year ended December 31, 2023 and any amendments thereto (collectively, the "Form 10-K") to be filed by MP Materials Corp. (the "Company") with the U.S. Securities and Exchange Commission ("SEC"), SGS North America, Inc. ("SGS"), hereby consents to:

(1) the filing and/or incorporation by reference by the Company and use of the Technical Report Summary titled "SEC Technical Report Summary, Pre-Feasibility Study, Mountain Pass Mine, San Bernardino County, California" with an effective date of October 1, 2023, and a report date of February 22, 2024 (the "Technical Report Summary") that was prepared in accordance with Subpart 1300 of Regulation S-K promulgated by the SEC, as an exhibit to and referenced in the Form 10-K;

(2) the use of and references to SGS's name as a "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the SEC), in connection with the Form 10-K and any such Technical Report Summary; and

(3) the use of any quotation from, or summarization of, the particular section or sections of the Technical Report Summary in the Form 10-K, to the extent it was prepared by SGS, that SGS supervised its preparation of and/or that was reviewed and approved by SGS, that is included or incorporated by reference to the Form 10-K.

SGS is responsible for, and this consent pertains to portions of Sections 1, 10, 14, 18, 22, 23, 24 and 25 of the Technical Report Summary.

SGS also consents to the incorporation by reference in the Company's registration statements on Form S-8 (No. 333-252361) and Form S-3 (Nos. 333-251239 and 333-261954) of the above items as included in the Form 10-K.

Neither the whole nor any part of the Technical Report Summary nor any reference thereto may be included in any other filings with the SEC without the prior written consent of SGS as to the form and context in which it appears.

Very truly yours,

Joseph Keane

Joseph Keane P.E., Q.P.
Mineral Processing Engineer Consultant
SGS North America, Inc.

Exhibit 31.1

CERTIFICATION

I, James H. Litinsky, certify that:

1. I have reviewed this annual report on Form 10-K of MP Materials Corp.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 28, 2024

/s/ James H. Litinsky

James H. Litinsky

Chairman and Chief Executive Officer

Exhibit 31.2

CERTIFICATION

I, Ryan Corbett, certify that:

1. I have reviewed this annual report on Form 10-K of MP Materials Corp.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant’s other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant’s internal control over financial reporting that occurred during the registrant’s most recent fiscal quarter (the registrant’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant’s internal control over financial reporting; and

5. The registrant’s other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant’s auditors and the audit committee of the registrant’s board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant’s ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant’s internal control over financial reporting.

Date: February 28, 2024

/s/ Ryan Corbett
Ryan Corbett
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002,
18 U.S.C. SECTION 1350

In connection with the annual report of MP Materials Corp. (the "Company") on Form 10-K for the fiscal year ended December 31, 2023, as filed with the U.S. Securities and Exchange Commission on the date hereof (the "Report"), I, James H. Litinsky, Chairman and Chief Executive Officer of the Company, certify, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that, to my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 28, 2024

/s/ James H. Litinsky
James H. Litinsky
Chairman and Chief Executive Officer

Exhibit 32.2

CERTIFICATION PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002,
18 U.S.C. SECTION 1350

In connection with the annual report of MP Materials Corp. (the "Company") on Form 10-K for the fiscal year ended December 31, 2023, as filed with the U.S. Securities and Exchange Commission on the date hereof (the "Report"), I, Ryan Corbett, Chief Financial Officer of the Company, certify, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that, to my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 28, 2024

/s/ Ryan Corbett
Ryan Corbett
Chief Financial Officer

MINE SAFETY DISCLOSURE

Pursuant to Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act"), issuers that are operators, or that have a subsidiary that is an operator, of a coal or other mine in the United States are required to disclose in their periodic reports filed with the SEC information regarding specified health and safety violations, orders and citations, issued under the Federal Mine Safety and Health Act of 1977 (the "Mine Act") by the Mine Safety and Health Administration (the "MSHA"), as well as related assessments and legal actions, and mining-related fatalities.

The table below provides information for the year ended December 31, 2023, at the Mountain Pass mine in San Bernardino County, California.

Additional information about the Mine Act and MSHA references used in the table follows:

- *Section 104(a) Significant and Substantial ("S&S") Citations:* Citations received from MSHA under §104(a) of the Mine Act for violations of mandatory health or safety standards that could significantly and substantially contribute to the cause and effect of a mine safety or health hazard.
- *Section 104(b) Orders:* Orders issued by MSHA under §104(b) of the Mine Act, which represent a failure to abate a citation under §104(a) within the period of time prescribed by MSHA. This results in an order of immediate withdrawal from the area of the mine affected by the condition until MSHA determines that the violation has been abated.
- *Section 104(d) S&S Citations and Orders:* Citations and orders issued by MSHA under §104(d) of the Mine Act for unwarrantable failure to comply with mandatory, significant and substantial health or safety standards.
- *Section 110(b)(2) Violations:* Flagrant violations issued by MSHA under §110(b)(2) of the Mine Act.
- *Section 107(a) Orders:* Orders issued by MSHA under §107(a) of the Mine Act for situations in which MSHA determined an "imminent danger" (as defined by MSHA) existed.

Mine	Mine Act §104(a) S&S Citations	Mine Act §104(b) Orders	Mine Act §104(d) S&S Citations and Orders	Mine Act §110(b)(2) Violations	Mine Act §107(a) Orders	Proposed MSHA Assessments (in whole dollars)(1)	Mining Related Fatalities	Mine Act §104(e) Notice (Yes/No)(2)	Pending Legal Actions before Federal Mine Safety and Health Review Commission (Yes/No)
Mountain Pass	9	0	0	0	0	$21,324	0	No	No

(1) As of December 31, 2023, MSHA had not yet proposed an assessment for one S&S citation.

(2) A written notice from the MSHA regarding a pattern of violations, or a potential to have such pattern under §104(e) of the Mine Act.

SEC Technical Report Summary
Pre-Feasibility Study
Mountain Pass Mine
San Bernardino County, California

Effective Date: October 1, 2023
Report Date: February 22, 2024

Report Prepared for

MP Materials Corp.

1700 S. Pavilion Center Dr.
Eighth Floor
Las Vegas, NV 89135

Report Prepared by

SRK Consulting (U.S.), Inc.
1125 Seventeenth Street, Suite 600
Denver, CO 80202

SRK Project Number: USPR001660

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List of Abbreviations

The US System for weights and units has been used throughout this report. Tons are reported in short tons of 2,000 lb, drilling and resource model dimensions and map scales are in feet (ft). All currency is in U.S. dollars (US$) unless otherwise stated.

The following abbreviations may be used in this report.

Abbreviation	Unit or Term
A	ampere
AA	atomic absorption
A/m^2	amperes per square meter
amsl	meters above mean sea level
ANFO	ammonium nitrate fuel oil
AP	Action Plan
°C	degrees Centigrade
CCD	counter-current decantation
CIL	carbon-in-leach
cm	centimeter
cm^2	square centimeter
cm^3	cubic centimeter
cfm	cubic feet per minute
CHP	combined heat and power plant
COG	cut-off grade
ConfC	confidence code
CRec	core recovery
CSS	closed-side setting
CTW	calculated true width
CUP	Conditional Use Permit
°	degree (degrees)
dia.	diameter
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
FA	fire assay
Factor of Safety	FoS
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
g	gram
gal	gallon
g/L	gram per liter
g-mol	gram-mole
gpm	gallons per minute
g/t	grams per metric tonne
ha	hectares
HDPE	Height Density Polyethylene
hp	horsepower
HREE	heavy rare earth elements
HRSG	heat recovery steam generators
HTW	horizontal true width
ICP	inductively coupled plasma
ID2	inverse-distance squared
ID3	inverse-distance cubed
IFC	International Finance Corporation
ILS	Intermediate Leach Solution
kA	kiloamperes
kg	kilograms

Abbreviation	Unit or Term
km	kilometer
km^2	square kilometer
koz	thousand troy ounce
kt	thousand tonnes
kt/d	thousand tonnes per day
kt/y	thousand tonnes per year
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
kWh/t	kilowatt-hour per metric tonne
L	liter
L/sec	liters per second
L/sec/m	liters per second per meter
lb	pound
LLDDP	Linear Low Density Polyethylene Plastic
LOI	Loss on Ignition
LoM	life-of-mine
LREE	light rare earth elements
LUS	Land Use Services
m	meter
m^2	square meter
m^3	cubic meter
mg/L	milligrams/liter
mL	milliliter
mm	millimeter
mm^2	square millimeter
mm^3	cubic millimeter
MME	Mine & Mill Engineering
Moz	million troy ounces
Million short tons	million short tons
mtw	measured true width
MW	million watts
m.y.	million years
NGO	non-governmental organization
NTU	nephelometric turbidity unit
oz	troy ounce
%	percent
PLC	Programmable Logic Controller
PLS	Pregnant Leach Solution
PMF	probable maximum flood
ppb	parts per billion
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RC	rotary circulation drilling
RCRA	Resource Conservation and Recovery Act
REE	rare earth elements
REO	rare earth oxide
RF	Revenue Factor
RO	reverse osmosis
RoM	Run-of-Mine
RQD	Rock Quality Description
SEC	U.S. Securities & Exchange Commission
sec	second
SG	specific gravity
SLS	spent leach solution
SPT	standard penetration testing
st	short ton (2,000 pounds)
SX	solvent extraction
SXD	solvent extraction didymium

Abbreviation	Unit or Term
SXH	solvent extraction heavies
SXI	solvent extraction impurities
t	tonne (metric tonne) (2,204.6 pounds)
t/h	tonnes per hour
t/d	tonnes per day
t/y	tonnes per year
TEM	technical economic model
TREO	total rare earth oxide
TSF	tailings storage facility
TSP	total suspended particulates
TVR	thermal vapor recompression
μm	micron or microns
V	volts
VFD	variable frequency drive
W	watt
XRD	x-ray diffraction
y	year
yd^3	cubic yard

1 Executive Summary

This report was prepared as a pre-feasibility level Technical Report Summary in accordance with the Securities and Exchange Commission ("SEC") S-K regulations (Title 17, Part 229, Items 601 and 1300 until 1305) for MP Materials Corp. ("MP Materials") by SRK Consulting (U.S.), Inc. ("SRK") on the Mountain Pass Mine ("Mountain Pass").

Sections of this report pertaining to the rare earth element (REE) separations facility at Mountain Pass were authored by SGS North America Inc. ("SGS"). Portions of this report pertaining to products and markets, including long term price forecast for REE products, were authored by Adamas Intelligence Inc. ("Adamas").

1.1 Property Description and Ownership

Mountain Pass is located in San Bernardino County, California, north of and adjacent to Interstate-15 (I-15), approximately 15 miles (mi) southwest of the California-Nevada state line and 30 mi northeast of Baker, California, at geographic coordinates 35°28'56"N latitude and 115°31'54"W longitude. This area is part of the historic Clark Mining District established in 1865. Mountain Pass is the only rare earth deposit identified within this district. The Project lies within portions of Sections 11, 12, 13, and 14 of Township 16 North, Range 14 East, San Bernardino Base and Meridian.

On November 17, 2020, pursuant to a merger agreement dated July 15, 2020, MP Mine Operations LLC ("MPMO") and Secure Natural Resources LLC ("SNR"), the company that holds the mineral rights to the mine, were combined with Fortress Value Acquisition Corp., a special purpose acquisition company ("FVAC") (the "Business Combination"). In connection with the Business Combination, MPMO and SNR became subsidiaries of FVAC, which was in turn renamed MP Materials Corp.

Mining claims and surface rights associated with the Project include:

- Patented claims with surface rights owned by MPMO and mineral rights held by SNR
- Unpatented lode and mineral claims held by SNR
- Surface ownership by MPMO and mineral rights controlled by the State of California
- Surface ownership by MPMO and mineral rights controlled by the U.S.
- Surface ownership by School District and mineral rights controlled by the U.S.

The rare earth mineralization at the Project is located within land either owned or leased by MP Materials.

1.2 Geology and Mineralization

The Mountain Pass deposit is a rare-earth-element-enriched carbonatite deposit, historically referred to as the Sulfide Queen orebody. The carbonatite and numerous other alkaline intrusives in the vicinity are hosted in Proterozoic gneissic rocks which have been altered through alkali metasomatism (fenitized) by the intrusive carbonatite dikes. Smaller dikes and breccia bodies surround the Sulfide Queen orebody which comprises several different types of carbonatite (sovite, beforsite, dolosolvite, and white sovite) which are interlayered within a relatively large carbonatite package. This is unique in terms of size of the concession, and globally significant in terms of its enrichment in rare-earth minerals.

The southern part of the Sulfide Queen orebody strikes to the south-southeast and dips at 40° to the west-southwest; the northern part of the orebody strikes to the north-northeast and dips at some 40° to the west-north-west. Several post-mineralization faults result in slight offsets to the otherwise simple tabular/lensoid geometry. The total orebody strike length is approximately 2,750 feet (ft) and dip extent is 3,000 ft; true thickness of the more than 2.0% total rare earth oxide (TREO) grade zone ranges between 15 ft and 250 ft.

The main rare-earth-bearing mineral, bastnaesite, is present in all carbonatite subtypes, but in relatively lower concentrations in the breccias and the monazitic carbonatites which typically occur outside and proximal to the main orebody. Monazite and crocidolite ("blue ore" found on the hangingwall contact in the northern part of the orebody) are both considered deleterious in the processing plant. In some areas, post-mineral fault zones provide a conduit for water which results in localized hydration and oxidation of the fresh carbonatite. This weathering dissolves the calcite and dolomite gangue minerals, leaving behind elevated concentrations of bastnaesite with limonite, resulting in what is referred to as brown and black ore types, the most altered of which results in a loosely consolidated high grade bastnaesite sand. The altered ore types are mined, stockpiled separately, and blended to maintain target ore grades in the mill feed blend.

1.3 Status of Exploration, Development and Operations

The Mountain Pass mine is an active operating mine. The primary mineral of economic interest is bastnaesite. MP Materials mines ore from the open pit, transports the ore to a primary crushing/stockpile facility and transports the ore to the mill. At the mill, the crushed material is ground further with a ball mill and conveyed via a slurry pipeline to the flotation plant to separate the bastnaesite from the gangue minerals. The primary product of the flotation process is a bastnaesite concentrate, which is filtered and then transported to customers for sale. MP Materials has recently recommissioned a REE separations facility at Mountain Pass that allows MP Materials to produce four saleable REE products: praseodymium and neodymium (PrNd) oxide, samarium, europium, and gadolinium (SEG+) oxide, lanthanum (La) carbonate, and cerium (Ce) chloride. As the REE separations facility ramps up, it is expected that all or nearly all of bastnaesite concentrate will be processed on-site to produce the saleable REE products.

1.4 Mineral Processing and Metallurgical Testing

1.4.1 Existing Crushing and Concentrating Operations

During the later years of mining operations at Mountain Pass, the ore grade is expected to decline. To assess TREO (total rare earth oxide) recovery from lower grade ore, MP Materials conducted rougher flotation tests on ore samples over a grade range from 1.86 - 8.10% TREO using standard concentrator test conditions. Based on the results of this testwork, MP Materials has developed a mathematical relationship to estimate overall TREO recovery versus ore grade. This relationship has been used to estimate TREO recovery from lower grade ores later in the mine life.

1.4.2 Rare Earths Separations

MP Materials is currently ramping up separation facility operations to increase production of four marketable rare earth products (PrNd oxide, SEG+ oxalate, La carbonate/La oxide, and Ce chloride).

The specifications for the four products are shown in Table 1-1, with further discussion on the product specification provided in Section 14.3.

Table 1-1: Product Specifications

Product	Compound	w/w % TREO	Purity
PrNd Oxide	75% Nd_2O_3 + 25% Pr_6O_{11} (+/-2%)	99%	99.5%+ PrNd/TREO
SEG+ Oxalate/Concentrate	-	25% to 45%	99% SEG+/TREO
Lanthanum Carbonate	$La_2(CO_3)_3$ + La_2O_3	99%	99% La/TREO
Cerium Chloride	$LaCeCl_3$	45%	85% Ce/TREO

Source: MP Materials, 2021
Note: w/w % is the weight concentration of the solution.

The work effort to develop the design criteria for the separation facility is briefly described below and is detailed in Section 10.4. Unit operations for the separation facility are described below.

Concentrate Drying and Roasting

Concentrate drying and roasting was practiced at Mountain Pass commencing in the mid 1960's. Tonnage quantity roasting test work to confirm optimum operating parameters was conducted at Hazen Research. Studies involving the definition of specific leaching conditions were conducted at SGS Lakefield and at Mountain Pass facilities. These studies served to elucidate optimum operational conditions. Of major importance was the adjustment of roasting parameters such that leaching dissolved trivalent rare earths and left the majority of the cerium undissolved.

Leaching

Optimization studies to specify the most appropriate leaching parameters were conducted at several external laboratories and at MP Materials Cerium 96 leaching facility. MP Materials upgraded a small-scale onsite leaching pilot facility which provided superior temperature control so as to define the optimum leach facility operating conditions. The leaching operations produced an undissolved cerium concentrate and solubilized trivalent rare earths plus dissolved impurities.

Impurity Removal

Soluble impurities in the leach solution include iron, aluminum, uranium, calcium, magnesium, and other minor quantities of dissolved elements. The MP Materials solvent extraction system used for this duty has been successfully operated for a number of years.

SXH and SXD

The solvent extraction heavies (SXH) circuit makes a bulk separation of heavy rare earths and the solvent extraction didymium (SXD) circuit separates a PrNd stream. These circuits have been piloted and have been demonstrated to function as designed.

Brine Recovery, Treatment, Crystallizing

MP Materials has conducted several rounds of pilot studies taking appropriate mixtures of brine from previously operated facilities and solvent extraction (SX) pilot plant investigations to produce a representative brine. Past experience coupled with recent modeling work indicate that the system has sufficient capacity to handle anticipated feed volumetric changes.

Conclusions

As with any extensive process modification effort, all possible contingencies may not be anticipated. However, based upon the project documentation provided, a site visit to the MP Materials installations at Mountain Pass, and conversations with MP Materials engineers who are directly involved with the ongoing ramp up operations, it is the opinion of SGS North America Inc. (SGS) that the Mountain Pass modification and modernization project has been performed in a professional manner.

1.5 Mineral Resource Estimate

The Mineral Resources are reported in accordance with the S-K regulations (Title 17, Part 229, Items 601 and 1300 until 1305). Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into Mineral Reserves. The Mineral Resource modelling and reporting was completed by SRK Consulting (U.S.) Inc.

The mineral resource estimate has been constrained by a geological model considering relevant rock types, structure, and mineralization envelopes as defined by TREO content within relevant geological features. This geological model is informed principally by diamond core drilling and multiple phases of geological mapping. Three-dimensional (3D) and sectional interpretation is based on the combination of these data and utilized in the Mountain Pass geological model which forms the basis for the mineral resource domaining.

The mineral resources at the Mountain Pass deposit have been classified in accordance with the S-K 1300 regulations and definitions. SRK has addressed uncertainty and risk at Mountain Pass through the application of classification categories. The classification parameters are defined by a combination of geological understanding, quality of drilling and analytical data, the average distance to composited drilling data, the number of drillholes used to inform block grades, and a geostatistical indicator of relative estimation quality (kriging efficiency). Bulk density is based on average density measurements collected from the various rock types, and carbonatite density in particular is supported by extensive mining and processing reconciliation data. The in situ mineral resources at Mountain Pass are classified into Indicated and Inferred mineral resources.

The mineral resources at Mountain Pass demonstrate reasonable prospects for economic extraction through the application of a cut-off grade (COG) and volumetric constraint within the economic pit shell. SRK has calculated a resources COG of 2.18% TREO based on engineering and economic assumptions as outlined in this TRS. Mineral resources have been constrained within an economic pit shell based on reserve input parameters. For mineral resources, a revenue factor of 1.0 is selected which corresponds to a break-even economic pit shell. SRK notes that the pit selected for mineral resources has been influenced by setbacks relative to critical infrastructure such as the tailing storage and the rare earth oxide (REO) concentrator.

The September 30, 2023, mineral resource statement is shown in Table 1-2.

Table 1-2: Mineral Resource Statement Exclusive of Mineral Reserves for the Mountain Pass Rare Earth Project, September 30, 2023

Category	Resource Type	Cut-Off TREO%	Mass (million short tons)	Average Value (%)					
				TREO[(1)]	La_2O_3[(2)]	CeO_2	Pr_6O_{11}	Nd_2O_3	Sm_2O_3
Indicated	Within the Reserve Pit	2.18	0.94	2.31	0.75	1.15	0.10	0.28	0.02
	Within the Resource Pit	2.18	0.50	3.56	1.16	1.77	0.15	0.43	0.03
Total Indicated		**2.18**	**1.45**	**2.75**	**0.89**	**1.37**	**0.12**	**0.33**	**0.02**
Inferred	Within the Reserve Pit	2.18	6.70	5.52	1.80	2.76	0.23	0.67	0.05
	Within the Resource Pit	2.18	2.40	3.74	1.22	1.86	0.16	0.45	0.03
Total Inferred		**2.18**	**9.10**	**5.05**	**1.64**	**2.52**	**0.21**	**0.61**	**0.05**

Source: SRK 2023

(1): TREO% represents the total of individually assayed light rare earth oxides on a 99.7% basis of total contained TREO, based on the historical site analyses.

(2): Percentage of individual light rare earth oxides are based on the average ratios; La_2O_3 is calculated at a ratio of 32.6% grade of TREO% equivalent estimated grade, CeO_2 is calculated at a ratio of 49.9% of TREO% equivalent estimated grade, Pr_6O_{11} is calculated at a ratio of 4.3% of TREO% equivalent estimated grade, Nd_2O_3 is calculated at a ratio of 12.1% of TREO% equivalent estimated grade, and Sm_2O_3 is calculated at a ratio of 0.90% of TREO% equivalent estimated grade. The sum of light rare earths averages 99.7%; the additional 0.3% cannot be accounted for based on the analyses available to date and has been discounted from this resource statement.

General Notes:

- Mineral Resources are reported exclusive of Mineral Reserves.
- Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves estimate.
- Mineral Resource tonnage and contained metal have been rounded to reflect the accuracy of the estimate, any apparent errors are insignificant.
- Mineral Resource tonnage and grade are reported as diluted.
- The Mineral Resource model has been depleted for historical and forecast mining based on the September 30, 2023, pit topography.
- Pit optimization is based on an average TREO% equivalent concentrate price of US$12,461 per dry st of 60% TREO concentrate, average mining cost at the pit exit of US$1.70 per dry st mined plus US$0.068 per dry st mined for each 15 ft bench above or below the pit exit, combined milling and G&A costs of US$78.94 per dry st ore milled, separations facility costs of US$1,551 per dry st of 60% TREO concentrate treated, freight of US$163 per st of dry product shipped, sustaining capital costs of US$30.48 per dry st of ore mined, and overall pit slope angles of 39° to 45° including ramps.
- The mineral resource statement reported herein only includes the rare earth elements cerium, lanthanum, neodymium, praseodymium, and samarium (often referred to as light rare earths). While other rare earth elements, often referred to as heavy rare earths, are present in the deposit, they are not accounted for in this estimate due to historic data limitations (see Section 9.1.5).

1.6 Mineral Reserve Estimate

SRK developed a life-of-mine (LoM) plan for the Mountain Pass operation in support of mineral reserves. MP Materials will operate an on-site separations facility at the Mountain Pass that will allow the Company to separate bastnaesite concentrate into four individual REO products for sale (PrNd oxide, SEG oxalate, La carbonate/La oxide, and Ce chloride). For economic modeling purposes, a combination of concentrate sales and separated product sales was assumed for Q4 2023 through Q4 2024 while the separations facility ramps up to full capacity. From 2025 onward, it was assumed that all concentrate will be fed to the separations facility. Forecast economic parameters are based on current cost performance for process, transportation, and administrative costs, as well as a first principles estimation of future mining costs. Forecast revenue from concentrate sales and individual separated product sales is based on a preliminary market study commissioned by MP Materials, as discussed in Section 16 of this report.

From this evaluation, pit optimization was performed based on an equivalent concentrate price of US$10,836 per dry short ton (st) of 60% TREO concentrate. The results of pit optimization guided the design and scheduling of the ultimate pit. SRK generated a cash flow model which indicated positive economics for the LoM plan, which provides the basis for the reserves. Reserves within the new ultimate pit are sequenced for the full 34-year LoM (Q4 2023 through 2056).

The costs used for pit optimization include estimated mining, processing, sustaining capital, transportation, and administrative costs, including an allocation of corporate costs.

Processing recovery for concentrate is variable based on a mathematical relationship to estimate overall TREO recovery versus ore grade. The calculated COG for the reserves is 2.43% TREO, which was applied to indicated blocks contained within an ultimate pit, the design of which was guided by economic pit optimization.

The optimized pit shell selected to guide final pit design was based on a combination of the revenue factor (RF) 0.70 pit (used on the north half of the deposit) and the RF 1.00 pit shell (used on the south half of the deposit). The inter-ramp angles (IRA) used for the mine design are based on operational-level geotechnical studies and range from 44° to 47°.

Measured resources in stockpiles were converted to proven reserves. Indicated pit resources were converted to probable reserves by applying the appropriate modifying factors, as described herein, to potential mining pit shapes created during the mine design process. Inferred resources present within the LoM reserves pit are treated as waste.

The mine design process results in in situ open pit probable mineral reserves of 28.1 million st with an average grade of 6.26% TREO. Additionally, there are 0.6 million st of proven mineral reserves in stockpiles with an average grade of 4.33% TREO. Table 1-3 presents the mineral reserve statement, as of September 30, 2023, for Mountain Pass (MP Materials' mining engineers provided a September 30, 2023 topography as a reserve starting point). The reference point for the mineral reserves is ore delivered to the Mountain Pass concentrator.

Table 1-3: Mineral Reserves at Mountain Pass as of September 30, 2023 - SRK Consulting (U.S.), Inc.

Category	Description	Run-of-Mine (RoM) Million Short Tons (dry)	TREO%	MY%	Concentrate Million Short Tons (dry)
Proven	Current Stockpiles	0.61	4.33	3.67	0.02
	In situ	--	-	-	-
	Proven Totals	**0.61**	**4.33**	**3.67**	**0.02**
Probable	Current Stockpiles	-	-	-	-
	In situ	28.08	6.26	6.62	1.86
	Probable Totals	**28.08**	**6.26**	**6.62**	**1.86**
Proven + Probable	Current Stockpiles	0.61	4.33	3.67	0.02
	In situ	28.08	6.26	6.62	1.86
	Proven + Probable Totals	**28.69**	**6.22**	**6.56**	**1.88**

Source: SRK, 2023
General Notes:

- Reserves stated as contained within an economically minable open pit design stated above a 2.43% TREO COG.
- Mineral reserves tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
- MY% calculation is based on 60% concentrate grade of the product and the ore grade dependent metallurgical recovery. MY% = (TREO% * Met recovery)/60% concentrate TREO grade.
- Indicated mineral resources have been converted to Probable reserves. Measured mineral resources have been converted to Proven reserves.
- Reserves are diluted at the contact of the 2% TREO geological model triangulation (further to dilution inherent to the resource model and assume selective mining unit of 15 ft x 15 ft x 30 ft).Mineral reserves tonnage and grade are reported as diluted.
- Pit optimization is based on an average TREO% equivalent concentrate price of US$10,836 per dry st of 60% TREO concentrate, average mining cost at the pit exit of US$1.70 per dry st mined plus US$0.068 per dry st mined for each 15 ft bench above or below the pit exit, combined milling and G&A costs of US$78.94 per dry st ore milled, separations facility costs of US$1,551 per dry st of 60% TREO concentrate treated, freight of US$163 per st of dry product shipped, sustaining capital costs of US$30.48 per dry st of ore mined, and overall pit slope angles of 39° to 45° including ramps..
- The topography used was from September 30, 2023.
- Reserves contain material inside and outside permitted mining but within mineral lease.
- Reserves assume 100% mining recovery.
- The strip ratio was 6.3 to 1 (waste to ore ratio).
- The mineral reserves were estimated by SRK Consulting (U.S.) Inc.

In the opinion of SRK as the QP, the conversion of mineral resources to mineral reserves has been completed in accordance with CFR 17, Part 229 (S-K 1300).

The reserve estimate herein is subject to potential change based on changes to the forward-looking cost and revenue assumptions utilized in this study. It is assumed that MP Materials will ramp up its on-site separations facilities to full capacity by the end of 2024. For economic modeling purposes, a combination of concentrate sales and separated product sales was assumed for Q4 2023 through Q4 2024. From 2025 onward, it was assumed that all concentrate will be fed to the separations facility.

Full extraction of this reserve is dependent upon modification of current permitted boundaries for the open pit. Failure to achieve modification of these boundaries would result in MP Materials not being able to extract the full reserve estimated in this study. It is MP Materials' expectation that it will be successful in modifying this permit condition. In SRK's opinion, MP Materials' expectation in this regard is reasonable.

A portion of the resource pit encroaches on an adjoining mineral right holder's concession. This portion of the pit would only include waste stripping (i.e., no rare earth mineralization is assumed to be extracted from this concession). The prior owner of Mountain Pass had an agreement with this concession holder to allow this waste stripping (with the requirement that aggregate mined be stockpiled for the owner's use). MP Materials does not currently have this agreement in place, but SRK believes it is reasonable to assume MP Materials will be able to negotiate a similar agreement.

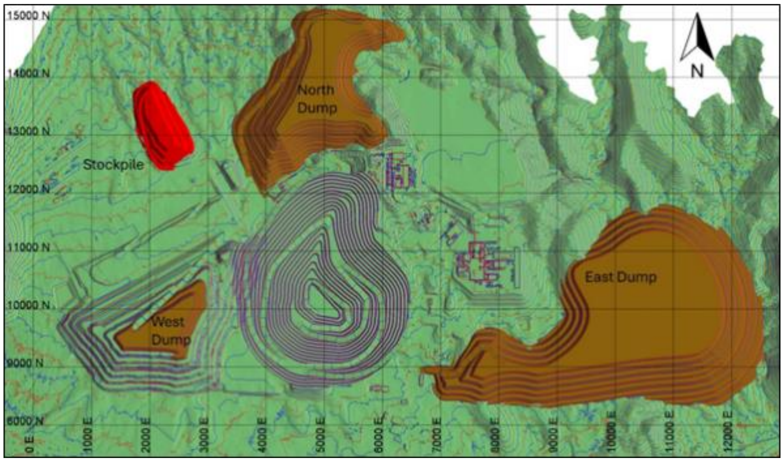
1.7 Mining Methods

Mountain Pass is currently being mined using conventional open-pit methods. The open pit is in gently undulating topography intersecting natural drainages that require diversion to withstand some rainfall events during the summer and winter months. Waste dumps are managed according to the Action Plan (AP), are located on high ground, and are designed for control of drainage (contact water) if required.

The open pit that forms the basis of the mineral reserves and the LoM production schedule is approximately 3,100 ft from east to west and 3,800 ft from north to south with a maximum depth of 1,400 ft. Total pit mining is estimated at 203.9 million st comprised of 28.1 million st of ore and 175.8 million st of waste, resulting in a strip ratio of 6.3 (waste to ore). Additional mill feed is sourced from existing stockpiles (0.6 million st). LoM mill feed grade averages 6.22% TREO yielding over 1.88 million dry st of recoverable 60% TREO concentrate.

SRK designed four pit pushbacks that adhere to proper minimum mining widths. Bench sinking rates are approximated to no more than six benches per year per pushback.

Figure 1-1 illustrates the site layout and final pit design.



Source SRK, 2023

Figure 1-1: Final Pit Design and Site Layout

Mine activities include drilling, blasting, loading, hauling, and mining support activities. Drill and blast operations are performed by a contractor, and this will continue for the foreseeable future. All other mine operations are performed by MP Materials. The primary loading equipment is front-end loaders (15 cubic yards (yd^3)), which were selected for operational flexibility. Rigid frame haul trucks with 102 wet short tons (wst) capacity were selected to match with the loading units.

Material within the pit will be blasted on 30 ft high benches. Material classified as reserves will be sent to the RoM stockpiles for near-term blending to the primary crusher or, alternatively, to long-term stockpiles for processing later in the mine life. Waste dumps will be used for material below the cut-off grade.

The mine operations schedule includes one 12-hour day shift, seven days per week for 365 days per year.

1.8 Recovery Methods

1.8.1 Existing Crushing and Concentrating Operations

MP Materials operates a 2,000 t/d flotation concentrator that produces concentrates that are further processed to produce separated rare earth oxides. The concentrator flowsheet includes crushing, grinding, rougher/scavenger flotation, cleaner flotation, concentrate thickening and filtration and tailings thickening and filtration followed by dry stack tailings disposal. Significant improvements in concentrator performance have occurred since inception of operations, which are attributed primarily to new reagent and ore blending schemes as well as the introduction of steam to heat the flotation slurry. During 2022 TREO recovery averaged 65.3% into concentrates containing an average of 61.3% TREO. During 2023 (January – September) TREO recovery has averaged 64.0% into concentrates averaging 61.9% TREO.

1.8.2 Modified and Recommissioned Separations Facility

MP Materials is in the process of ramping up its modified and recommissioned on-site separations facility to produce individual rare earth products as summarized in Table 1-3. The incentive for this substantial process change is the enhancement of revenue that will be realized for producing individual rare earth products as compared to the previous practice of producing a single rare earth containing flotation concentrate which was sold to various entities that separate and market individual rare earth products. Over the past several years, MP Materials has made substantial technical and financial commitments to modify and recommission an on-site separation facility that will allow for the sale of individual rare earth products.

Consequently, based upon the project documentation provided, a site visit to the MP Materials installations at Mountain Pass, and conversations with MP Materials engineers who are directly involved with the ongoing ramp up operations, it is the opinion of SGS North America Inc. (SGS) that the Mountain Pass modification and modernization project has been performed in a professional manner. It is SGS's further opinion that the ramp up schedule assumed for economic modeling purposes, which estimated feeding 20% and 61.25% of concentrate production into the facility in Q4 2023 and full year 2024, respectively, is likely to be achieved. From 2025 onward, the separations facility is likely to operate at full capacity thereby consuming all or nearly all of the bastnaesite flotation concentrate produced on site.

1.9 Project Infrastructure

The Project is in San Bernardino County, California, north of and adjacent to Interstate 15 (I-15), approximately 15 mi southwest of the California-Nevada state line and 30 mi northeast of Baker, California (Figure 3-2).

The nearest major city is Las Vegas, Nevada, located 50 mi to the east on I-15. The Project lies immediately north of I-15 at Mountain Pass and is accessed by the Bailey Road Exit (Exit 281 of I-15), which leads directly to the main gate. The mine is approximately 15 mi southwest of the California-Nevada state line in an otherwise undeveloped area, enclosed by surrounding natural topographic features.

Outside services include industrial maintenance contractors, equipment suppliers and general service contractors. Access to qualified contractors and suppliers is excellent due to the proximity of population centers such as Las Vegas, Nevada as well as Elko, Nevada (an established large mining district) and Phoenix, Arizona (servicing the copper mining industry).

Access to the site, as well as site haul roads and other minor roads are fully developed and controlled by MP Materials. There is no public access through the Project area. All public access roads that lead to the Project are gated at the property boundary.

MP Materials has fully developed an operating infrastructure for the Project in support of mining, concentrating and separations activities. A manned security gate is located on Bailey Road for providing required site-specific safety briefings and monitoring personnel entry and exit to the Project.

Substantially all the power to the Mountain Pass facility is currently supplied by a Combined Heat and Power (CHP) or co-generation (cogen) power facility with two natural gas-fired turbines capable of producing up to 26 MW of power combined. In addition, the site is served by a 12-kV line from a Southern California Edison substation two miles away.

Water is supplied through active water wells located eight miles west of the project. Fire systems are supplied by separate fire water tanks and pumps.

The site has all facilities required for operation, including the open pit, concentrator, separations facility, access and haul roads, explosives storage, fuel tanks and fueling systems, warehouse, security guard house and perimeter fencing, tailings filter plant, tailings storage area, waste rock storage area, administrative and office buildings, surface water control systems, evaporation ponds, miscellaneous shops, truck shop, laboratory, multiple laydown areas, power supply, water supply, waste handling bins and temporary storage locations, and a fully developed communications system.

The LoM plan will require the relocation in 2035 of the paste tailings plant and the water tanks currently located northeast of the pit highwall near the concentration plant. Additionally, the crusher will be relocated in 2028 to allow the pit to expand to the north. Capital cost provisions are included in the technical economic model (TEM) for these relocations.

The design capacity of the tailings storage facility is approximately 24 million st. The project has utilized approximately 4.2 million st of that space. The existing facility will have a remaining capacity of approximately 19.8 million st which will provide approximately 24 years of storage. MP Materials will expand the existing tailings facility to the northwest in approximately 2047 to provide an additional 9 years of storage capacity. A capital cost provision has been included in the TEM for this expansion.

Site logistics are straightforward with the concentrate product shipped in supersacks within a shipping container by truck to the port of Los Angeles. At the port, the containers are loaded onto a container ship and shipped to the final customers. Refined products for domestic customers are shipped in supersacks and intermediate bulk containers (IBC tote).

1.10 Market Studies and Contracts

Section 16 of this report provides an overview of key trends within the rare earths market. Analysis outlined in this report reveals a high degree of variability in the demand profiles of individual rare earth elements and their associated end-uses.

Consequently, a strong demand outlook for PrNd oxide – the main rare earth input for neodymium iron boron (NdFeB) permanent magnets - drives a weak supply outlook for Ce and La products, which are sacrificially overproduced as a function of keeping up with magnet demand.

While centered in China, the rare earths market is increasingly global with suppliers and potential suppliers emerging around the world. Section 16 of this report highlights the favorable demand conditions that non-China producers may face as they enter the market but also highlights the unfavorable supply side conditions end users can expect without prompt new investment into new production.

Products outlined in this report (PrNd oxide, SEG+ precipitate, La carbonate, Ce chloride and rare earth mineral concentrate) are desirable from a market perspective, provided market standards and requirements are met. As shown in Table 1-4, and based on outlined product specifications, Adamas forecasts a long-term price of US$131.6/kg REO for PrNd oxide, US$51.90/kg REO for SEG+ oxalate, US$1.5/kg REO for Lanthanum carbonate, and US$2.51/kg REO for Cerium chloride. The mixed rare earth concentrate price of US$10.94/kg of contained REO will be principally driven by trends in PrNd and dysprosium (Dy), price swings of which will be mirrored by concentrates.

Table 1-4: Summary of Long-Term Price Forecasts

Product	Long-Term Price Forecast, Real 2023 US$/KG
Rare Earth Mineral Concentrate	US$10.94
PrNd Oxide	US$131.60
SEG+ Precipitate	US$51.90
La Carbonate	US$1.50
Ce Chloride	US$2.51

Source: Adamas, 2023

Many of the near-term risks facing players in the rare earths market are political, with past disputes responsible for exacerbating volatility of REE prices. Specific risks to products are highlighted where perceived, though the indicated specifications and communicated sales terms enforce the conclusion that products are both desirable and marketable.

1.11 Environmental, Closure and Permitting

As of September 30, 2023, MP Materials holds the necessary operating permits, including conditional use and minor use permits from the County of San Bernardino (SBC), which currently allows continued operations of the Mountain Pass facility through 2042.

MP Materials maintains financial assurance cost estimates for closure, post-closure maintenance (PCM), and All Known and Reasonably Foreseeable Releases (AKRFR) for current and planned operations at the Mountain Pass property. The Lahontan Regional Water Quality Control Board (LRWQCB) administers the groundwater and surface water related financial assurance obligations. The SBC administers financial assurance requirements for surface reclamation of the property. The California Department of Health, Radiological Health Branch administers financial assurance requirements for decontamination and decommissioning activities. MP Materials maintains miscellaneous financial assurance instruments for other closure-related obligations. As of September 2023, the total financial assurance obligation is approximately US$45.4 million.

1.12 Capital and Operating Costs

Capital and operating costs are incurred and reported in US dollars and are estimated at a pre-feasibility level with an accuracy of approximately +/-25%.

1.12.1 Capital Costs

The mine is currently operating and, as such, there is no initial capital expenditure required. All capital expenditure as contemplated by this report is expected to be sustaining capital. Sustaining capital expenditures include the sustaining capital cost associated with the mining fleet. Also included are sustaining capital cost provisions for the separations facility, planned paste tailings plant, crusher and water tank relocations, tailings storage facility expansion, and the “other” category, which captures all other sustaining capital costs.

Capital costs for the separations facility have been reviewed and approved by SGS. All other capital costs have been reviewed and approved by SRK.

Table 1-5 summarizes the LoM capital costs for Mountain Pass.

Table 1-5: LoM Capital Expenditures

Category	Years Incurred	LoM Total (US$ million)
Mining Equipment Replacements and Rebuilds	2024-2054	72.8
Infrastructure Relocations	2028 and 2035	78.7
TSF Expansion	2047	11.3
Closure	2057	45.4
Separations Facility Sustaining	2024-2056	537.9
Other Sustaining	2023-2056	109.8
Total		**855.9**

Source: SRK and SGS

1.12.2 Operating Costs

For economic modeling, the operating costs are allocated among three main areas: mining, processing and site general and administrative (G&A). SRK developed a first principles operating cost forecast for mining. SGS and MP Materials developed a first principles operating cost forecast for the separations facility. Otherwise, costs are forecast based on current operating results, with appropriate adjustments for anticipated future changes in the configuration of the operation.

The estimated operating costs are presented in Table 1-6.

Table 1-6: Operating Costs

Category	LoM Total (US$ million)	Average Unit Cost (US$/st ore processed)
Mining	663.8	23.1
Processing (including separations)	4,401.4	153.4
Site G&A	706.4	24.6
Total	**5,771.6**	**201.2**

Source: SRK and SGS

1.13 Economic Analysis

SRK generated an economic model for the life of the reserve stated in this report. The economic model utilized the capital and operating costs described in Section 18. Product sales price assumptions are described in Section 16 and are based on a preliminary market study. Based on this economic analysis, the reserve stated herein generates positive free cash flow and meets the economic test for the declaration of a reserve under SEC regulations.

Economic analysis, including estimation of capital and operating costs is inherently a forward-looking exercise. These estimates rely upon a range of assumptions and forecasts that are subject to change depending upon macroeconomic conditions, operating strategy and new data collected through future operations and therefore actual economic outcomes often deviate significantly from forecasts.

The Mountain Pass operation consists of an open pit mine and processing facilities fed by the open pit mine. The operation is expected to have a 34-year life with the first modeled year of operation a partial year to align with the effective date of the reserves. The final years (2049 through 2056) are limited to the processing of remaining stockpiles.

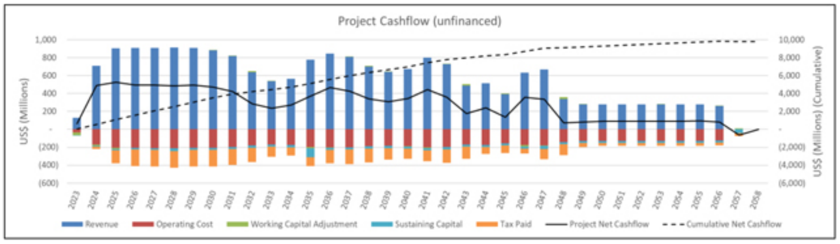
The economic analysis metrics are prepared on an annual after-tax basis in US$. The results of the analysis are presented in Table 1-7. The results indicate that, at prices outlined in the market study section of this report, the operation returns an after-tax net present value (NPV) at 6% of US$5.2 billion. Note that because the mine is in operation and is valued on a total project basis with prior costs treated as sunk, internal rate of return (IRR) and payback period analysis are not relevant metrics.

Table 1-7: Cash Flow Summary

LoM Cash Flow (Unfinanced)	Units	Value
Total Revenue	**US$ (million)**	**20,040**
Total Opex	**US$ (million)**	**(5,772)**
Operating Margin	US$ (million)	14,268
Operating Margin Ratio	%	71%
Taxes Paid	US$ (million)	(3,638)
Before Tax		
Free Cash Flow	US$ (million)	13,412
NPV at 6%	US$ (million)	6,998
After Tax		
Free Cash Flow	US$ (million)	9,775
NPV at 6%	US$ (million)	5,193

Source: SRK

A summary of the cashflow on an annual basis is presented in Figure 1-2.



Source: SRK

Figure 1-2: Project Cashflow

1.14 Conclusions and Recommendations

Based on the data available and the analysis described in this report, in SRK's opinion, the Mountain Pass operation has a valid mineral resource and mineral reserve, as stated herein. The resource estimation has been validated using conventional means and reconciled against production records.

The resources and reserves are subject to potential change based on changes to the forward-looking cost and revenue assumptions utilized in this study. Rare earth concentrate sales to China are currently subject to value added tax (VAT). Sales of individual rare earth products are assumed to begin in Q4 2023, with the separations facility ramping up to full capacity by the end of 2024.

Full extraction of this reserve is dependent upon modification of current permitted boundaries. Failure to achieve modification of these boundaries would result in MP Materials not being able to extract the full reserve estimated in this study. It is MP Materials' expectation that it will be successful in modifying this permit condition. In SRK's opinion, MP Materials' expectation in this regard is reasonable.

A portion of the pit encroaches on an adjoining mineral right holder's concession. This portion of the pit only includes waste stripping (i.e., no rare earth mineralization is assumed to be extracted from this concession). The prior owner of Mountain Pass had an agreement with this concession holder to allow this waste stripping (with the requirement that aggregate mined be stockpiled for the owner's use). MP Materials does not currently have this agreement in place, but SRK believes it is reasonable to assume that MP Materials will be able to negotiate a similar agreement.

Additional opportunity exists for the potential to convert current inferred resources both within the LoM pit and on the fringes of the pit. The conversion of inferred resources to either measured or indicated resources, if successful, would increase the mine life and reduce waste stripping. Therefore, SRK recommends that MP Materials target infill drilling for the purpose of this conversion.

Other, more minor recommendations are detailed in Section 23.

2 Introduction

2.1 Registrant for Whom the Technical Report Summary was Prepared

This report was prepared as a pre-feasibility level Technical Report Summary in accordance with the Securities and Exchange Commission (SEC) S-K regulations (Title 17, Part 229, Items 601 and 1300 until 1305) for MP Materials Corp. (MP Materials) by SRK Consulting (U.S.), Inc. (SRK) on the Mountain Pass Mine (Mountain Pass).

2.2 Terms of Reference and Purpose of the Report

The quality of information, conclusions, and estimates contained herein are consistent with the level of effort involved in SRK's services, based on: i) information available at the time of preparation and ii) the assumptions, conditions, and qualifications set forth in this report. This Technical Report Summary is based on pre-feasibility level engineering and cost estimation.

This report is intended for use by MP Materials subject to the terms and conditions of its contract with SRK and relevant securities legislation. The contract permits MP Materials to file this report as a Technical Report Summary with U.S. securities regulatory authorities pursuant to the SEC S-K regulations, more specifically Title 17, Subpart 229.600, Item 601(b)(96) - Technical Report Summary and Title 17, Subpart 229.1300 - Disclosure by Registrants Engaged in Mining Operations. Except for the purposes legislated under U.S. securities law, any other uses of this report by any third party are at that party's sole risk. The responsibility for this disclosure remains with MP Materials.

The purpose of this Technical Report Summary is to report mineral resources and mineral reserves.

2.3 Sources of Information

This report is based in part on internal Company technical reports, previous engineering studies, maps, published government reports, Company letters and memoranda, and public information as cited throughout this report and listed in Section 24 of this report.

Reliance upon information provided by the registrant is listed in Section 25 when applicable.

2.4 Details of Inspection

Table 2-1 summarizes the details of the personal inspections on the property by each qualified person or, if applicable, the reason why a personal inspection has not been completed.

Table 2-1: Site Visits

Expertise	Company	Date(s) of Visit	Details of Inspection
Infrastructure	SRK Consulting (U.S.), Inc.	September 11 and September 25, 2023	Infrastructure, tailings area, general site inspection
Slope Stability/ Engineering Geology	SRK Consulting (U.S.), Inc.	September 25, 2019	Open pit slopes and stockpiles
Mining/Reserves	SRK Consulting (U.S.), Inc.	September 11, 2023	Review of the current practices and inspection
Geology/Mineral Resources	SRK Consulting (U.S.), Inc.	September 11, 2023	Review of the current practices and inspection of laboratory and core facility, tour of pit geology, meetings and technical sessions on geological modeling.
Metallurgy/ Process	SRK Consulting (U.S.), Inc.	September 25, 2023	Review of the current practices and inspection
Separations Facility	SGS North America Inc.	September 25, 2023	Review of construction and commissioning progress
Environmental/ Permitting/Closure	SRK Consulting (U.S.), Inc.	No recent site visit	Visited site on several occasions under previous ownership

Source: SRK, 2023

2.5 Report Version Update

The user of this document should ensure that this is the most recent Technical Report Summary for the property.

This Technical Report Summary is an update of a previously filed technical report summary filed pursuant to 17 CFR §§ 229.1300 through 229.1305 (subpart 229.1300 of Regulation S-K). The previously filed technical report summary is titled “SEC Technical Report Summary Pre-Feasibility Study Mountain Pass Mine San Bernardino County, California” with an effective date of September 30, 2021 and a report date of February 16, 2022.

2.6 Units of Measure

The U.S. System for weights and units has been used throughout this report. Tons are reported in short tons (st) of 2,000 lb, drilling and resource model dimensions and map scales are in feet (ft). All currency is in U.S. dollars (US$) unless otherwise stated.

2.7 Mineral Resource and Mineral Reserve Definitions

The terms “mineral resource” and “mineral reserves” as used in this Technical Report Summary have the following definitions as per the SEC, Regulation S-K, Item 1301.

2.7.1 Mineral Resources

17 CFR § 229.1300 defines a “mineral resource” as a concentration or occurrence of material of economic interest in or on the Earth’s crust in such form, grade or quality, and quantity that there are reasonable prospects for economic extraction. A mineral resource is a reasonable estimate of mineralization, taking into account relevant factors such as cut-off grade, likely mining dimensions, location or continuity, that, with the assumed and justifiable technical and economic conditions, is likely to, in whole or in part, become economically extractable. It is not merely an inventory of all mineralization drilled or sampled.

A “measured mineral resource” is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of conclusive geological evidence and sampling. The level of geological certainty associated with a measured mineral resource is sufficient to allow a qualified person to apply modifying factors, as defined in this section, in sufficient detail to support detailed mine planning and final evaluation of the economic viability of the deposit. Because a measured mineral resource has a higher level of confidence than the level of confidence of either an indicated mineral resource or an inferred mineral resource, a measured mineral resource may be converted to a proven mineral reserve or to a probable mineral reserve.

An “indicated mineral resource” is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of adequate geological evidence and sampling. The level of geological certainty associated with an indicated mineral resource is sufficient to allow a qualified person to apply modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Because an indicated mineral resource has a lower level of confidence than the level of confidence of a measured mineral resource, an indicated mineral resource may only be converted to a probable mineral reserve.

An “inferred mineral resource” is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. The level of geological uncertainty associated with an inferred mineral resource is too high to apply relevant technical and economic factors likely to influence the prospects of economic extraction in a manner useful for evaluation of economic viability. Because an inferred mineral resource has the lowest level of geological confidence of all mineral resources, which prevents the application of the modifying factors in a manner useful for evaluation of economic viability, an inferred mineral resource may not be considered when assessing the economic viability of a mining project, and may not be converted to a mineral reserve.

2.7.2 Mineral Reserves

17 CFR § 229.1300 defines a “mineral reserve” as an estimate of tonnage and grade or quality of indicated and measured mineral resources that, in the opinion of the qualified person, can be the basis of an economically viable project. More specifically, it is the economically mineable part of a measured or indicated mineral resource, which includes diluting materials and allowances for losses that may occur when the material is mined or extracted. A “proven mineral reserve” is the economically mineable part of a measured mineral resource and can only result from conversion of a measured mineral resource. A “probable mineral reserve” is the economically mineable part of an indicated and, in some cases, a measured mineral resource.

2.8 Qualified Person

This report was compiled by SRK Consulting (U.S.), Inc., with contributions from SGS North America Inc. (SGS) and Adamas Intelligence Inc. (Adamas). All three firms are third-party firms comprising mining experts in accordance with 17 CFR § 229.1302(b)(1). MP Materials has determined that all three firms meet the qualifications specified under the definition of qualified person in 17 CFR § 229.1300.

SGS North America Inc. prepared the following sections of the report.

- Sections 1.4.2 and 1.8.2 (Separations Facility)
- Section 1.12 (Separations Facility Capital and Operating Cost)
- Section 10.4 (Separation of Rare Earth Elements)
- Section 14.3 (Individual Rare Earths Separations)
- Sections 18.1.2 and 18.1.5 (Separations Facility Capital Cost)
- Section 18.2.2 (Separations Facility Operating Cost)
- Section 22.3.2 (Separations Facility)
- Section 22.5 (Products and Markets)
- Related contributions to Section 1 (Executive Summary), Section 23 (Recommendations), Section 24 (References), Section 25 (Reliance on Information Provided by the Registrant)

In sections of this report prepared by SGS, references to the Qualified Person or QP are references to SGS North America Inc. and not to any individual employed at SGS.

Adamas Intelligence Inc. prepared the following sections of the report.

- Section 16 (Market Studies and Contracts)
- Related contributions to Section 1 (Executive Summary), Section 22 (Interpretations and Conclusions), Section 23 (Recommendations) and Section 24 (References) and Section 25 (Reliance on Information Provided by the Registrant)

In sections of this report prepared by Adamas, references to the Qualified Person or QP are references to Adamas Intelligence Inc. and not to any individual employed at Adamas.

SRK Consulting (U.S.) Inc. prepared all sections of the report that are not identified in this Section 2.8 as being prepared by SGS and Adamas. In sections of this report prepared by SRK, references to the Qualified Person or QP are references to SRK Consulting (U.S.), Inc. and not to any individual employed at SRK.

3 Property Description and Location

MP Materials' surface ownership includes approximately 2,222 acres (900 hectares (ha)). The County of San Bernardino General Plan previously designated the Official Land Use District for the majority of the site as Resource Conservation. In 2021, a rezoning was completed with the majority of the site designated for Regional Industrial (IR). The site is located within Improvement Overlay District 5, which applies to very rural areas with little or no development potential. The County Development Code permits mining in any land use district within the County subject to a conditional use permit.

The lands surrounding the Mountain Pass Mine site are mostly public lands managed by the Bureau of Land Management (BLM). The Mojave National Preserve, managed by the National Park Service, lies two to three miles to the north, west, and south of the site. The Clark Mountain Wilderness Area is located four miles northwest of the project site.

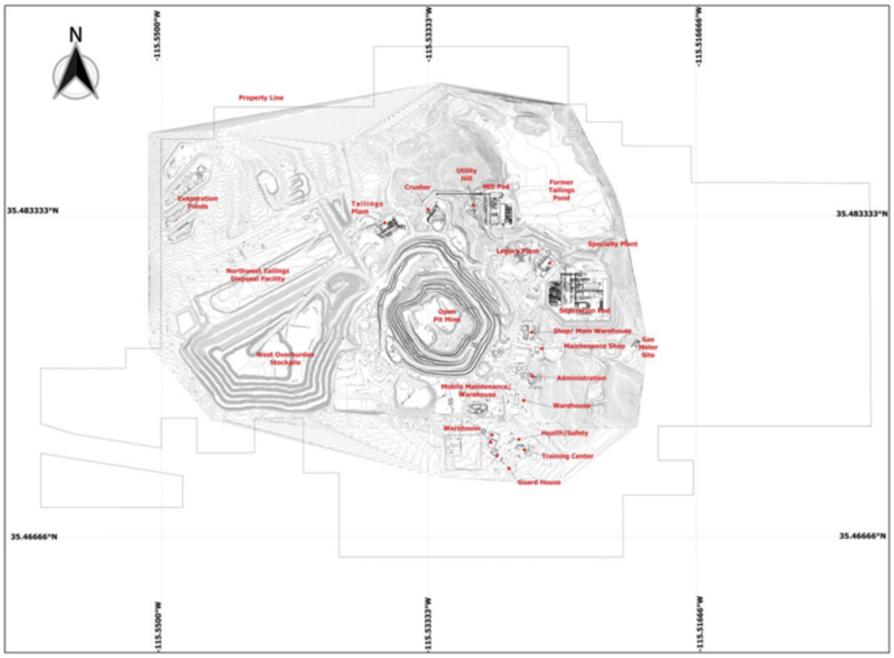
Current mining and mineral recovery operations include the following major activities and facilities at the mine site (Figure 3-1):

- A single open pit mine for extraction of the rare earth mineralization
- West and north overburden stockpiles (overburden consists of un-mineralized rock extracted from the pit)
- Crusher and mill/flotation plant
- Paste tailings disposal facility
- Mineral recovery plants (concentrator and separations facility)
- Offices, warehouses, and support buildings
- Onsite evaporation pond facility
- Product storage
- Stormwater ponds

The primary mineral of economic interest mined historically at the Project is bastnaesite, a light brown carbonate mineral that is significantly enriched with 14 of the lanthanide elements plus yttrium.

As the Mountain Pass operation is currently configured, the material is crushed and blended at the crushing plant and then transported to the concentrator. At the concentrator, the crushed ore is combined with recycled water and ground further in a ball mill. The slurry is then pumped to the downstream conditioning and flotation equipment to separate the rare-earth bearing minerals away from the gangue minerals. The primary product of the flotation process is a bastnaesite concentrate that prior to the commissioning of the rare earth separations facility discussed below, has been MP Materials' primary product. This has been press filtered and packaged for export. Engineered containment facilities are used for storage and packaging of product.

MP Materials has recently recommissioned a REE separations facility at Mountain Pass that allows MP Materials to produce four saleable REE products: praseodymium and neodymium (PrNd) oxide, samarium, europium, and gadolinium (SEG+) oxide, lanthanum (La) carbonate, and cerium (Ce) chloride. As the REE separations facility ramps up, it is expected that all or nearly all of bastnaesite concentrate will be processed on-site to produce the saleable REE products.



Source: MP Materials, 2023

Figure 3-1: General Facility Arrangement (WGS84 Coordinate System)

3.1 Property Location

Mountain Pass is located in San Bernardino County, California, north of and adjacent to Interstate-15 (I-15), approximately 15 miles southwest of the California-Nevada state line and 30 miles northeast of Baker, California, at geographic coordinates 35°28'56"N latitude and 115°31'54"W longitude (Figure 3-2). This area is part of the historic Clark Mining District established in 1865. The Project lies within portions of Sections 11, 12, 13, and 14 of Township 16 North, Range 14 East, San Bernardino Base and Meridian.

Source: Google, 2023

Figure 3-2: Location Map

3.2 Mineral Title

Figure 3-3 illustrates the boundaries of the current mineral claims and surface rights associated with the Project, as provided by MP Materials. Mining claims and surface rights associated with the Project include:

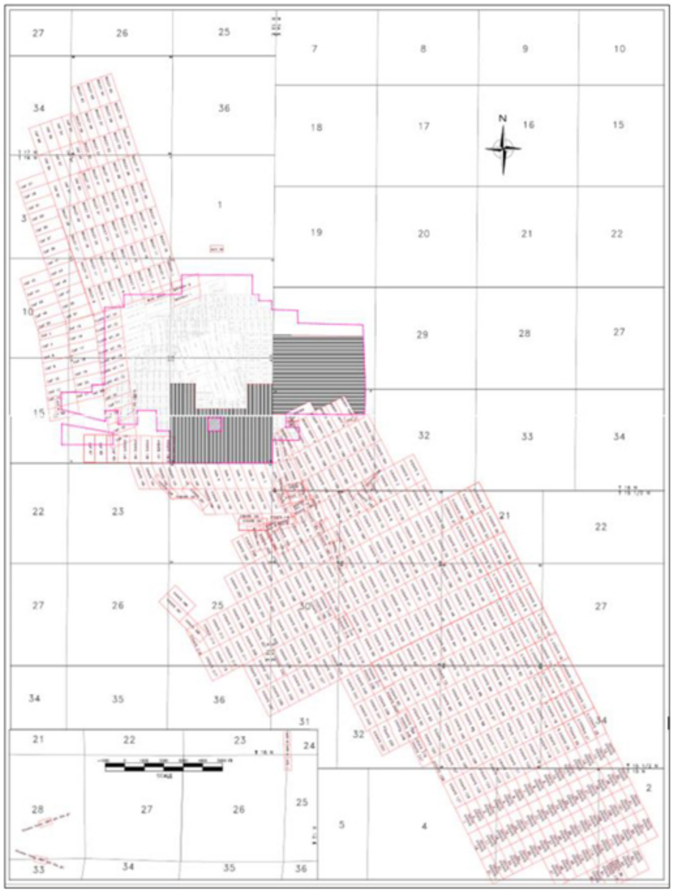
- Patented claims with surface rights owned by MP Mine Operations LLC (MPMO) and mineral rights held by Secure Natural Resources LLC ("SNR")
- Unpatented lode and mineral claims held by SNR
- Surface ownership by MPMO and mineral rights controlled by the State of California
- Surface ownership by MPMO and mineral rights controlled by the U.S.
- Surface ownership by School District and mineral rights controlled by the U.S.

The rare earth mineralization at the Project is located within land owned by MP Materials.

Historically, the surface and subsurface rights associated with the Project were held by Molycorp, Inc. (Molycorp), which filed for Chapter 11 bankruptcy protection in 2015. As part of the corporate restructuring in the bankruptcy proceedings, the former assets of Molycorp, associated with the

Project, were split between multiple parties. This included MPMO, which purchased the real property (e.g., equipment, surface rights, water rights, surface use rights, access rights, easements, etc.) and SNR, which purchased the subsurface mineral rights and certain intellectual property. MPMO entered into a lease agreement with SNR on April 3, 2017, allowing MP Materials to extract rare earth products and byproducts from the Project mineral rights (note that this agreement excludes rights to all other minerals and hydrocarbons that could be present at the Project) and utilize the intellectual property, held by SNR. At the time of entering into the lease agreement, MPMO and SNR had shareholders common to both entities; however, they were not partners in business nor did they hold any other joint interest. On November 17, 2020, MPMO and SNR were combined with Fortress Value Acquisition Corp. (FVAC) and became wholly-owned subsidiaries of FVAC, which was in turn renamed MP Materials Corp. Consequently, the intercompany transactions between MPMO and SNR are eliminated in the consolidated financials of MP Materials Corp.

Discussion of each category of land ownership is provided in the following sections. Figure 3-3 provides a land tenure map. Listings of claims for MPMO and SNR as reflected on the Bureau of Land Management (BLM) website are located in Appendix A to this Technical Report Summary.



Source: MP Materials, 2023

Figure 3-3: Land Tenure Map

3.2.1 Nature and Extent of Registrant's Interest

Surface Ownership by MP Materials and Mineral Rights by the State of California

The California State Lands Commission (CSLC) retains a mineral right in T16N, R14E, Section 13 (Figure 4-2). In a June 19, 2003, letter from the CSLC letter to the previous Project owner, "...the CSLC has advised San Bernardino County that the State acquired and patented certain lands within the proposed project boundary, reserving a 100% mineral interest in approximately 400 acres in the S1/2, SE1/4 of NE1/4, and the SW1/4 of the NW1/4 of Section 13, T16N, R13E, SBM. This interest is under the jurisdiction of the CSLC." (CSLC, 2003).

Surface Ownership by MP Materials and Mineral Rights by the U.S. Government

The U.S. government holds the mineral rights to an approximate 2.25 square mile parcel of land located east of the planned area of operations.

Surface Ownership by School District and Mineral Rights by the State of California

The School District owns a 40-acre parcel of land adjacent to the Bailey Road highway exit. The State of California retains the mineral rights to this parcel. This mineral right is located to the south of the existing deposit and does not encroach on the ultimate boundaries of the open pit or overburden stockpiles. MPMO has entered into a lease with the School District for this parcel excluding those areas covered by the legacy school assets.

3.3 Royalties, Agreements, and Encumbrances

Several public service and utility easements and rights-of-way are located within the mine boundaries, including a Southern California Edison (SCE) electric utility easement and an AT&T right-of-way.

3.4 Environmental Liabilities and Permitting

MP Materials maintains financial assurance cost estimates for closure, PCM, and AKRFR for current and planned operations at the Mountain Pass property. The LRWQCB administers groundwater and surface water related financial assurance obligations. San Bernardino County administers financial assurance requirements for surface reclamation of the property. The California Department of Health, Radiological Health Branch administers financial assurance requirements for decontamination and decommissioning activities. MP Materials maintains miscellaneous financial assurance instruments for other closure-related obligations. Table 3-1 presents the current financial assurance obligations for the Mountain Pass property. The total financial assurance obligation is approximately US$45.4 million.

Table 3-1: Current Financial Assurance Obligations

Regulatory Authority	Regulatory Obligation	FA Instrument	FA Instrument (US$)
Lahontan Regional Water Quality Control Board	Closure Post-Closure AKRFR	Bond EACX4029377 Bond EACX4029378 Bond EACX4029379	14,777,095 4,697,948 9,757,091
County of San Bernardino	Closure – Physical Grading, Capping, Vegetating and Monitoring	Bond EACX4029382	10,233,989
	Closure and Regrading of NW Evaporation Ponds	Bond EACX4029382	723,100
California Department of Resource, Recycling and Recovery	Closure – Landfill Post-Closure Monitoring	Bond EACX4029381 Bond EACX4029375	364,553 137,162
California Department of Public Health – Radiological Health Branch	Closure – Decommissioning of Industrial Facilities	Bond EACX4029380	4,442,667
Bureau of Land Management	Shadow Valley Fresh Water Wells ROW Wheaton Wash Wells	Bond EACX4029374 Bond EACX4029376	191,200 64,077
State Lands Commission	Fresh Water Pipeline ROW		20,000
Total			**$ 45,408,882**

Source: MP Materials, 2023

Existing closure obligations include:

- Reclamation and closure of the existing overburden stockpiles and dry stack tailings facility
- Completing active Corrective Action Programs (CAP) for groundwater remediation
- Operation and ultimate closure of the on-site evaporation ponds
- Indirect costs associated with direct costs listed above

Existing post-closure obligations include annual inspection and maintenance for the following closed facilities:

- Pond P-1
- Pond P-16
- Community landfill

3.4.1 Remediation Liabilities

The AKRFR costs include approximately 20 years of ongoing groundwater extraction and treatment of a plume of impacted groundwater generated during historic operations. Pursuant to a 1998 clean up and abatement order issued by the LRWQCB, previous ownership conducted, and MP Materials continues to conduct various investigatory, monitoring, and groundwater abatement activities related to contamination at and around the Mountain Pass facility. These activities include soil remediation and the operation of groundwater monitoring and recovery wells, water treatment systems, and evaporation ponds.

3.4.2 Required Permits and Status

MP Materials holds conditional use and minor use permits from SBC, which currently allow continued operations of the Mountain Pass facility through 2042. MP Materials also holds permits to operate from the LRWQCB and the Mojave Desert Air Quality Management District. The Company has restarted the rare earth separations facility with some modifications to the process. The Company maintains the current permit authorization to operate the NWTDF and to co-dispose of other waste streams in the NWTDF. MP Materials anticipates these waste streams will meet the approved waste characterization profiles.

The updated mine plan extends open pit mining through 2048 and stockpile processing through 2056. MP Materials will be required to amend the conditional use permit from SBC to accommodate the updated mine plan. Section 17.2 provides further information.

3.5 Other Significant Factors and Risks

Full extraction of this reserve is dependent upon modification of current permitted boundaries. Failure to achieve modification of these boundaries would result in MP Materials not being able to extract the full reserve estimated in this study. It is MP Materials' expectation that it will be successful in modifying this permit condition. In SRK's opinion, MP Materials' expectation in this regard is reasonable.

A portion of the pit encroaches on an adjoining mineral right holder's concession. This portion of the pit only includes waste stripping (i.e., no rare earth mineralization is assumed to be extracted from this concession). The prior owner of Mountain Pass had an agreement with this concession holder to allow this waste stripping (with the requirement that aggregate mined be stockpiled for the owner's use). MP Materials does not currently have this agreement in place, but SRK believes it is reasonable to assume MP Materials will be able to negotiate a similar agreement.

SRK is not aware of any other risk items that can reasonably be assumed to impact access, title, right, or ability to perform work on the property.

4 Accessibility, Climate, Local Resources, Infrastructure, and Physiography

The Project is located in San Bernardino County, California, north of and adjacent to Interstate 15 (I-15), approximately 15 miles southwest of the California-Nevada state line and 30 miles northeast of Baker, California (Figure 3-2).

4.1 Topography, Elevation, and Vegetation

The area is in the southwestern part of the Great Basin section of the Basin and Range physiographic province, which is characterized by a series of generally north to south-trending mountain ranges separated by broad, low-relief alluvial basins, which often have internal drainage (Peterson, 1981).

The Project occupies the highest elevation along I-15 between Barstow, California, and Las Vegas, Nevada. Elevations range from 4,500 to 5,125 ft above mean sea level (amsl), with most of the site located between 4,600 to 4,900 ft amsl. Clark Mountain (located northwest of the Project) is the highest local peak at 7,903 ft amsl.

The major habitat in the Project area is Mojave Desert scrub. Local surface drainages support a mixture of scrub and riparian species. Vegetation is characterized by various yuccas with a predominance of Eastern Joshua trees, larger shrubs, thorn bushes, and a host of smaller shrubs. Areas of ongoing disturbance in the Project area are barren of vegetation.

4.2 Accessibility and Transportation to the Property

The nearest major city is Las Vegas, Nevada, located 50 miles to the northeast on I-15. The Project lies immediately north of I-15 at Mountain Pass and is accessed by the Bailey Road Exit (Exit 281 of I-15), which leads directly to the main gate. The mine is approximately 15 miles southwest of the California-Nevada state line in an otherwise undeveloped area, enclosed by surrounding natural topographic features. I-15 follows the natural drainages, east-west between the Clark Mountain and Mescal mountains ranges, cresting at Mountain Pass Summit at an elevation of 4,730 ft amsl.

All access to the Project is controlled by MP Materials, and there is no public access through the Project area. All public access roads that lead to the Project are gated at the property boundary.

MP Materials maintains the existing infrastructure for the Project in support of mining and processing activities. A manned security gate is located on Bailey Road for providing required site-specific safety briefings and monitoring personnel entry and exit to the Project.

4.3 Climate and Length of Operating Season

The climate at Mountain Pass is described as arid desert, generally hot and dry in the summer and mild in the winter, with limited precipitation and cloud cover. Based on Western Regional Climate Center Statistics, the coldest month of the year is January with an average minimum temperature of 29.5°F (-1.4°C). The warmest month is July with an average high temperature of 92.8°F (33.8°C).

Precipitation in the area of the mine averages 8.4 inches per year. The maximum precipitation from a single storm in the past 45 years was 5.9 inches (Geomega, 2000). Most storms yield a precipitation of 0.5 inch or less. Precipitation most frequently occurs during November through February, accounting for over 40% of the annual total rainfall. However, the most significant portion of the annual rainfall can occur as summer thunderstorms during July and August with average monthly precipitation above 1.0 inch per month during these two months. These storms may result in heavy rainfall and flash floods. The snowfall in the winter months can accumulate rapidly but has minimal effect on operations. Operations at the Project are year-round.

4.4 Infrastructure Availability and Sources

MP Materials has fully developed operating infrastructure for the Project in support of mining and processing activities. A manned security gate is located on Bailey Road for providing required site-specific safety briefings and monitoring personnel entry and exit to the Project.

Given the relative proximity of the Project to the city of Las Vegas, Nevada, most personnel at the Project commute from the greater Las Vegas area. This regional city provides an adequate source of skilled and unskilled labor for the operation.

Outside services include industrial maintenance contractors, equipment suppliers, and general service contractors. Access to qualified contractors and suppliers is excellent due to the proximity of population centers, such as Las Vegas, Elko, Nevada (an established large mining district), and Phoenix, Arizona (servicing the copper mining industry).

Substantially all of the power to the Mountain Pass facility is currently supplied by a Combined Heat and Power (CHP) or co-generation (cogen) power facility with two natural gas-fired turbines capable of producing up to 26 MW of power combined. In addition, the site is served by a 12-kV line from a Southern California Edison substation two miles away.

Water is supplied through active water wells located eight miles west of the Project. Fire systems are supplied by separate fire water tanks and pumps.

Site logistics are straightforward with the concentrate product shipped in supersacks within a shipping container by truck approximately 4.5 hours to the port of Los Angeles. At the port, the containers are loaded onto a container ship and shipped to the final customers. Refined products for domestic customers are shipped in supersacks and intermediate bulk containers (IBC tote).

5 History

5.1 Prior Ownership and Ownership Changes

The Molybdenum Corporation of America (MCA) purchased the Birthday claims and the Sulfide Queen properties in 1950 and 1951, respectively. In 1974, MCA changed its name to Molycorp, Inc. ("Old Molycorp"). In 1977, Union Oil of California (Unocal) purchased Old Molycorp and operated the company as a wholly-owned subsidiary. In 2005, Chevron Corporation purchased Unocal. On September 30, 2008, Chevron sold the Mountain Pass facility and Rare Earth business, including the rights to the name Molycorp, to a private investor group who formed Molycorp, LLC. Molycorp, Inc. ("Molycorp") was formed on March 4, 2010, for the purpose of continuing the business of Molycorp, LLC in corporate form. Molycorp filed for Chapter 11 bankruptcy protection in June 2015. As part of the corporate restructuring in the bankruptcy proceedings, the former assets of Molycorp associated with the Project were split between multiple parties. This included MPMO, which purchased the real property (e.g., equipment, surface rights, water rights, surface use rights, access rights, easements, etc.) and SNR, which purchased the subsurface mineral rights and certain intellectual property.

MPMO entered into a lease agreement with SNR on April 3, 2017, allowing MP Materials to extract rare earth products and byproducts from the Project mineral rights (note that this agreement excludes rights to all other minerals and hydrocarbons that could be present at the Project) and utilize the intellectual property, held by SNR. At the time of entering into the lease agreement, MPMO and SNR had shareholders common to both entities; however, they were not partners in business nor did they hold any other joint interest. On November 17, 2020, MPMO and SNR were combined with FVAC and became wholly-owned subsidiaries of FVAC, which was in turn renamed MP Materials Corp. Consequently, the intercompany transactions between MPMO and SNR did not continue after the business combination.

5.2 Exploration and Development Results of Previous Owners

The mining history of the area began with the organization of the Clark Mining District in 1865. This district produced about US$5,000,000 in silver between 1865 and about 1895 (Olson et al., 1954). Between 1900 and 1920, many small lead, zinc, copper, gold, and tungsten mines were operated in the area.

Mining at Mountain Pass began in 1924 when prospectors identified galena (lead sulfide) on Sulfide Queen Hill, which is near the location of the existing open pit. Several small shafts and trenches were excavated by various operators; however, no ore was shipped. The Sulfide Queen mine was developed and worked for gold between 1939 and 1942, producing about 350 ounces of gold from an inclined shaft about 320 ft deep and about 2,200 ft of workings developed on four levels.

The discovery of rare earth mineralization at Mountain Pass was made in April of 1949 by prospectors searching for uranium. Having noted that samples from the Sulfide Queen gold mine were radioactive, prospectors returned to the area and discovered a radioactive vein containing a large proportion of a light brown mineral (bastnaesite) that the prospectors were unable to identify. This original discovery is known as the Birthday vein. The prospectors sent a sample of the unknown mineral to the United States Bureau of Mines (USBM) for identification.

The USBM confirmed the bastnaesite discovery and made a public announcement in November 1949 (Olson et al., 1953). This attracted the attention of several mining companies, including MCA, which purchased the Birthday group of claims in February 1950. MCA sank a 100 ft-deep shaft on the Birthday claims, but no mineable ore was delineated, and development was stopped.

During this time, prospectors identified carbonatite dikes throughout a wider, adjacent area. The USGS proceeded to conduct detailed mapping of the entire Mountain Pass area. During this work, the USGS staff identified a massive body of carbonatite to the south of the Birthday claims, largely made up of barite, calcite, dolomite, and bastnaesite. Much of this carbonatite body was located on the original Sulfide Queen claims. MCA bought the Sulfide Queen claim group and the surrounding properties in January 1951. The existing gold mine and its associated equipment and buildings were also purchased, and a new crushing plant was installed. MCA drilled several hundred shallow churn holes in the following months and analyzed the cuttings for their rare-earth element contents (Olson et al., 1954).

Production of rare earth concentrate at the Project began in 1952, using the old gold plant, a new ball mill, and flotation cells from MCA's Urad, Colorado, molybdenum property. Mining started on a portion of the deposit where the ore averaged more than 15% TREO. The production rate varied from 80 to 120 st per day.

MCA signed a contract with the U.S. General Services Administration to produce rare earth concentrates for the government stockpile. By 1954, MCA shipped one hundred and twenty 60 t carloads of bastnaesite concentrate to the government stockpile, thereby fulfilling the terms of the contract. Other markets for TREOs had not yet developed, and the mine and mill operated part-time with a small crew.

Due to the increasing demand for europium for use in color televisions, MCA constructed a europium oxide plant in 1965 and increased production six-fold from the previous year to approximately 6.1 million pounds (Mlb) of TREO concentrate. The following year, a new concentrator was completed with a capacity of 600 metric tonnes per day. At the start of 1965, MCA produced 6,000 pounds per year (lb/yr) of europium oxide. By year-end, production of europium oxide reached 20,000 lb/yr. By the end of 1966, total production at the Project had quadrupled to 24 Mlb/yr of TREO concentrates.

Old Molycorp (formerly MCA) undertook a major geologic evaluation program at Mountain Pass between 1976 and 1980. MCA and Old Molycorp drilled dozens of diamond drillholes between 1953 and 1992 for exploration, mine development, and condemnation. More than 300 new mining claims were added over ground which could potentially contain rare earth mineralization. Regional aeromagnetic and radiometric surveys were conducted within and beyond the known rare earth mineralization, and Landsat imagery for the region was evaluated. The geological program included characterization of the alkaline rocks and rare earth mineralization of the district and involved detailed geologic mapping and petrographic studies of the Sulfide Queen deposit and the surrounding rocks. Ground-based geophysical surveys were completed over the known bastnaesite-bearing carbonatite and associated intrusive rocks.

Due to the continued expansion of the rare earths market, a new separation plant was completed in 1982, which could produce samarium and gadolinium oxides up to 99.999% in purity by solvent extraction (SX). Subsequently, the plant was modified to produce high-purity terbium oxide for fluorescent lighting.

In 1989, Old Molycorp began production of dysprosium oxide and increased its output of neodymium to satisfy the demand created by the growing neodymium-iron-boron permanent magnet industry. By 1990, lanthanide processing facilities at Mountain Pass expanded to produce various TREO concentrates. Between 1995 and 1997, Molycorp produced and sold in excess of 40 Mlb of rare earth oxide products per year. Limited mining of overburden and mineralized rock took place through 2002. The historical mill entered care and maintenance in 2002. Between 2007 and 2012, there was limited production of rare earth oxides from various types of stockpiled rare earth concentrates (primarily lanthanum concentrates and bastnaesite concentrate) through the historical separation facility.

In December 2010, under the new Molycorp, mining operations were restarted, and in January 2011, a major redevelopment project was initiated targeting modernization of milling and separation facilities. These new mining and separation facilities were intended to be developed in two phases, with the first phase targeting 19,050 metric tonnes (42 Mlb) of rare earth production per year and the second phase targeting 40,000 metric tonnes (88 Mlb) of rare earth production per year. This modernization included construction of a new mill, cracking facilities, separation facilities, and associated infrastructure, including power generation and reagent recycling facilities. The new separation facilities included production of cerium, lanthanum, neodymium, and praseodymium, with the remaining rare earths sold as a samarium, europium, and gadolinium (SEG) concentrate. During initial construction activities, Molycorp changed its development strategy and decided to build out capacity for both phases at the same time. Construction activities were largely completed by the end of 2013, with all first phase equipment constructed and most of the second phase constructed. Ramp up of the concentrator, separation facility and associated infrastructure (e.g., chlor-alkali/reagent recycling) encountered several issues that limited production and prevented operations from achieving targeted goals. 2013 production from Mountain Pass was approximately 7.7 Mlb of rare earth oxides, and 2014 production was approximately 10.5 Mlb. January through June 2015 production was approximately 8.1 Mlb of rare earth oxides. Molycorp declared bankruptcy in June 2015, and mining and processing operations were halted at that time.

The current owner, MP Materials, restarted milling and flotation operations in December 2017. MP Materials began production of separated REEs in 2023.

5.3 Historical Production

The reported historic production for the Mountain Pass deposit for the period 1953 through 1970, including the tonnage of mineralized and overburden materials mined, the plant feed grades and recovery, and pounds of rare-earth oxides produced, is shown in Table 5-1. The historic production from 1968 to 2002, including short tons mined, crushed, and milled, is presented in Table 5-2. Historic rare earth oxide production from 2009 to 2015, which includes reprocessing of existing stockpiles (2009 to 2012) and processing of freshly mined ore (2012 to 2015), is presented in Table 5-3. MP Materials' historic rare earth oxide production from 2018 through September 2023 is presented in Table 5-4.

Table 5-1: Production History, 1952 to 1970

Item	1952 to 1964	1965	1966	1967	1968	1969	1970[1]	Total
Waste stripped, st	0	0	0	15,000	20,000	85,000	14,000	134,000
Ore mined and fed to plant, st	255,375	37,476	179,721	201,233	193,100	259,097	182,290	1,308,292
Flotation Plant Feed, % TREO	9.1	10.2	9.1	8.3	8.1	7.5	7.2	8.3
Concentrate No. 400, klb TREO	31,934	6,094	12,873	16,483	2,361	2,188	7,519	154,444
Concentrate No. 401, klb TREO	0	0	11,139	8,001	20,408	25,155	10,289	0
Flotation Plant Recovery, %	68.6	80.1	73.0	73.2	72.7	70.5	68.1	0
Chemical Plant Feed, klb TREO	0	6,899	18,380	13,198	14,087	19,604	11,178	83,346
RE Oxide Nos. 410/411, klb TREO	0	275	282	307	1,731	409	0	3,004
Cerium Nos. 530/ 532, klb CeO_2	0	0	1,925	1,668	1,680	1,901	1,672	8,846
Lanthanum, 521, klb TREO	0	0	0	3,250	6,669	7,568	5,522	23,009
Lanthanum, 523, klb TREO	0	0	306	501	249	28	64	1,148
Neo-Praseo No. 545, lb Pr_6O_{11}	0	0	0	0	0	74,702	3,677	78,379
Gadolinium No. 573, lb Gd_2O3	0	0	0	0	17,084	17,881	13,990	48,955
Gad-Sam No. 575, lb TREO	0	0	0	9,961	12,095	0	0	22,056
Samarium No. 583, lb Sm_2O_3	0	0	0	0	29,600	0	0	29,600
Europium Nos. 500/ 501/ 510/510B/ 511, lb	0	1,845	11,384	9,058	3,234	7,847	8,226	41,594

Source: Mountain Pass monthly operational reports
(1): Through October 31, 2007

Table 5-2: Mine Production History, 1971 to 2002

Year	Mined (st)	Crushed (st)	Milled (st)	Overburden (st)
1971	214,000	181,175	181,175	No data
1972	163,000	228,488	228,488	No data
1973	303,000	305,072	305,073	No data
1974	479,000	499,597	499,596	9,100
1975	296,693	296,693	296,693	70,100
1976	355,253	308,938	308,938	73,980
1977	314,946	321,508	321,508	66,255
1978	292,760	266,757	266,757	132,200
1979	326,010	358,399	358,399	327,760
1980	386,927	360,068	360,068	219,345
1981	371,553	370,207	370,207	225,691
1982	400,428	400,427	391,417	221,625
1983	485,315	322,771	371,252	226,000
1984	621,714	439,000	543,354	728,000
1985	365,000	204,000	253,000	1,233,000
1986	343,000	214,000	225,000	1,225,000
1987	402,000	320,000	358,000	1,072,000
1988	143,000	214,000	221,764	1,049,000
1989	445,000	419,000	418,446	1,610,000
1990	706,000	508,000	480,161	1,749,000
1991	404,000	446,000	336,344	2,477,000
1992	275,000	247,000	409,000	1,771,000
1993	540,000	447,000	433,000	1,232,000
1994	567,000	494,000	508,000	1,217,000
1995	714,000	546,000	537,000	2,388,000
1996	604,000	551,000	544,000	2,312,000
1997	632,000	452,000	424,000	3,355,000
1998	234,000	269,000	321,000	688,000
1999	94,000	0	0	43,000
2000	78,000	0	0	239,000
2001	175,010	260,000	175,010	634,000
2002	201,520	217,204	183,487	255,520

Source: Mountain Pass monthly operational reports
Mill quantities do not include tailings that were reprocessed.
Between 1975 and 1982, crushing tonnages were not recorded (assumed to be the same as milling tonnages).

Table 5-3: Mountain Pass Production History, 2009 to 2015, as Separated RE Products

Year	TREO Production (Metric Tonnes)
2009	2,103
2010	1,296
2011	3,062
2012	2,236
2013	3,473
2014	4,769
2015[(1)]	3,678

Source: Molycorp 10-K and 10-Q filings
[(1)]: January to June production

Table 5-4: Mountain Pass Production History, 2018 to 2023, as Bastnaesite Concentrate

Year	TREO Production (Metric Tonnes)
2018	13,913
2019	28,442
2020	38,561
2021	44,413
2022	42,500
2023[1]	32,299

Source: MP Materials
[1]: January to September production

6 Geological Setting, Mineralization and Deposit

6.1 Regional Geology

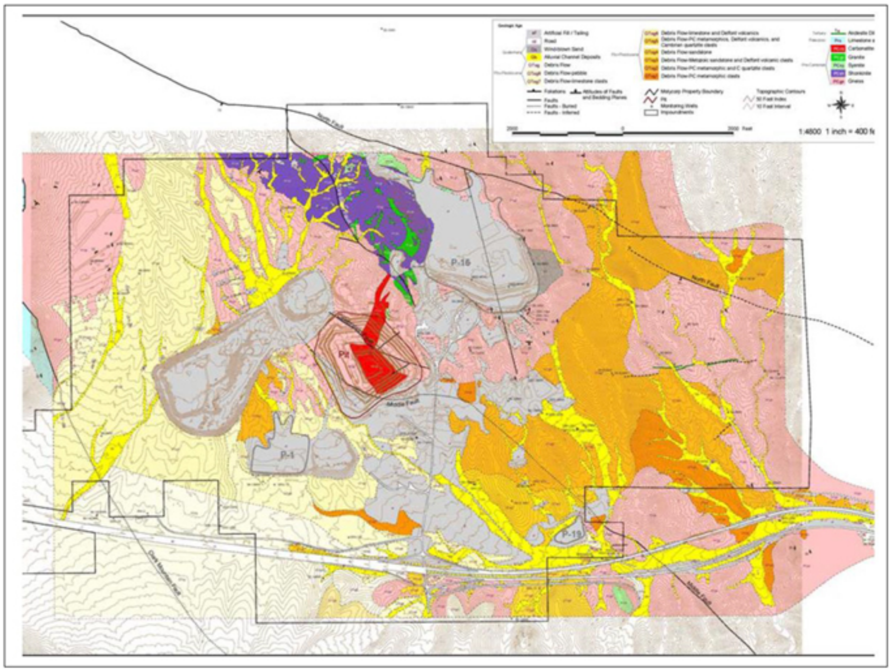
Mountain Pass is located in the southern part of the Clark Range in the northern Mojave Desert. The Mojave is situated in the southwestern part of the Basin and Range physiographic province which extends from central Utah to eastern California and is characterized by Tertiary extensional deformation and associated volcanics. This deformational event resulted in north-south trending mountain ranges separated by elongated valleys, characteristic of Basin and Range topography. The Mountain Pass rare earth deposit is located within an uplifted block of Proterozoic metamorphic and igneous rocks that is bounded to the south and east by basin-fill deposits in the Ivanpah Valley. This block is separated from Paleozoic and Mesozoic rocks on the west and southwest by the Clark Mountain thrust complex, which strikes north-northwest and dips from 35° to 70º west but averages 55 Wº. The North Fault forms the northern boundary of the block, striking west-northwest and dips from 65° to 70° south (Olson, et al., 1954; Castor, 2008). Geology of the Mountain Pass property is shown in Figure 6-1.

There are two main groups of rocks in the Mountain Pass area divided by age and rock type. These are Early Proterozoic high-grade metamorphic rocks, which are intruded by unmetamorphosed Middle Proterozoic ultrapotassic and carbonatite rocks. The Early Proterozoic high-grade metamorphic complex represents a wide variety of compositions and textures, as follows:

- Garnetiferous micaceous gneiss and schist
- Biotite-garnet-sillimanite gneiss
- Hornblende gneiss, schist, and amphibolite
- Biotite gneiss and schist
- Granitic gneiss and migmatite with associated granitic pegmatite
- Minor occurrences of foliated mafic rocks

The Middle Proterozoic ultrapotassic rocks are intrusive bodies of granite, syenite, and composite shonkinite-syenite, which contain augite and orthoclase. These have been intruded by carbonatites which formed swarms of thin dikes, stocks, and the tabular Sulfide Queen carbonatite currently the focus of mining activities (Olson et al, 1954; Castor 2008). The Middle Proterozoic ultrapotassic rocks have been age dated using U-Th-Pb and ^{40}Ar-^{39}Ar methods at 1,410 ± 5 Ma and 1,403 ± 5 Ma for shonkinite and syenite respectively. The rare earth-bearing carbonatite units, including the Sulfide Queen deposit, are younger with age dates, using Th-Pb ratios, of 1,375 ± 5 Ma (DeWitt et al, 1987). Both the Early Proterozoic metamorphic rocks and the Middle Proterozoic intrusive rocks have been crosscut by volumetrically minor, Mesozoic to Tertiary age dikes of andesitic to rhyolitic composition. Large portions of the Mountain Pass district are covered by younger (Tertiary to Quaternary) basin-fill sedimentary deposits (Olson et al, 1954; Castor 2008) (Figure 6-1).

Significant rare earth mineralization is only associated with carbonatite intrusions. Strongly potassic igneous rocks of approximately the same age are known from other localities in and around the Mojave Desert, but no significant carbonatite bodies or rare earth mineralization have been identified (Haxel, 2004).



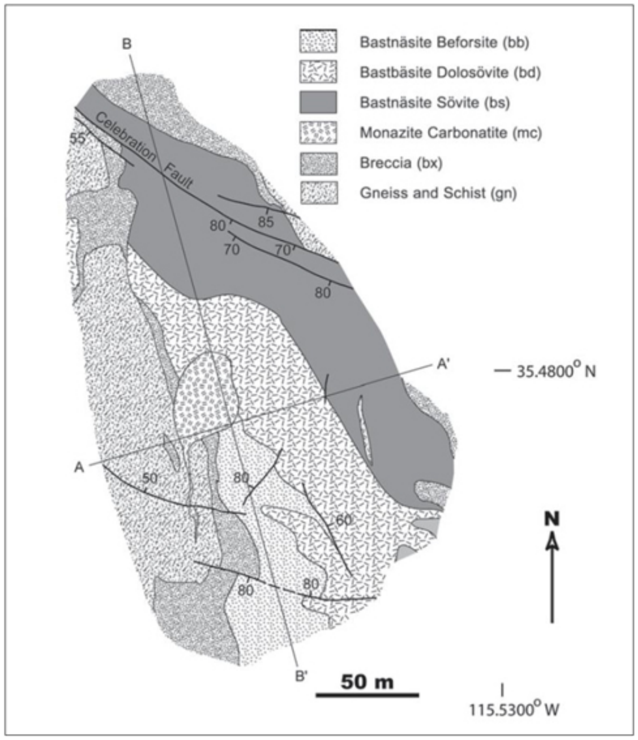
Source: Geomega, 2012

Figure 6-1: Regional Geological Map

6.2 Local and Property Geology

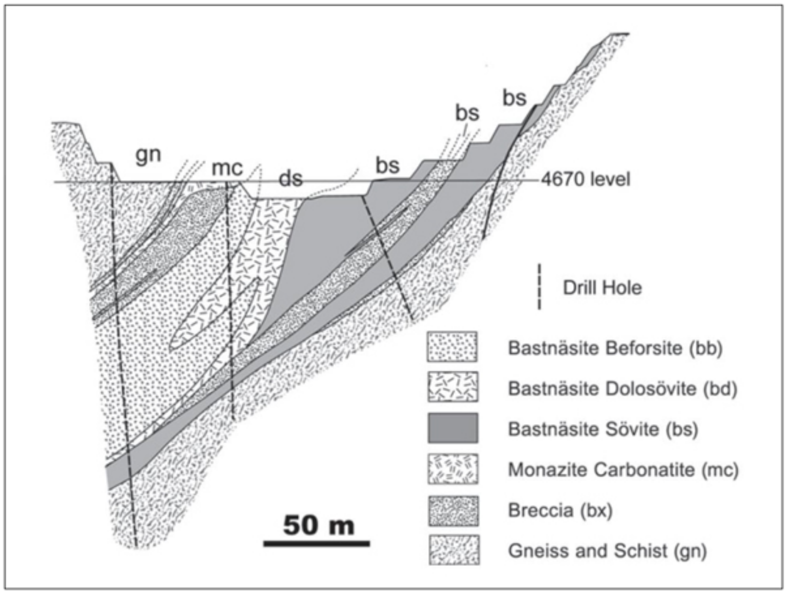
At Mountain Pass, the ultrapotassic rocks occur in seven larger stocks and as hundreds of smaller dikes. The largest single body is a composite shonkinite-syenite-granite stock approximately 6,400 ft in length and 2,100 ft wide (Olson, et al., 1954). These rocks span a variety of compositions, from phlogopite shonkinite (melanosyenite) to amphibole-biotite (mesosyenite and leucosyenite) to alkali-rich granite (Haxel, 2005). These complex and varied lithologies are believed to be sourced from the same parent magma formed from partial melting of the upper mantle (asthenosphere) beneath the North American continent during the Middle Proterozoic. The different compositions reflect different phases of magma differentiation (Castor, 2008). A generalized geologic map of the area is shown in Figure 6-2.

The Sulfide Queen carbonatite, which hosts the mineralization at the Project is referred to as a stock but is a roughly tabular, sill-like body that strikes approximately north and dips to the west at about 40° as shown in Figure 6-3. The carbonatite-bearing magma is believed to have formed by liquid immiscibility, separating from the same parent magma which formed the ultrapotassic rocks occurring nearby (Castor, 2008).



Source: Castor, 2008

Figure 6-2: Generalized Geologic Map – Sulfide Queen Carbonatite



Source: Castor, 2008
Note: Section looking N-NE

Figure 6-3: Schematic Cross Section (A-A') of Sulfide Queen Carbonatite

6.2.1 Local Lithology

In the open pit and to the south, east and west, lithology is dominated by gneiss and the Sulfide Queen carbonatite. Immediately north of the pit, carbonatite is found at surface and a small outcrop of syenite is found adjacent to and on the east flank of the Sulfide Queen. The Sulfide Queen extends to the contact with shonkinite and ultrapotassic granite approximately 650 ft northwest of the open pit boundary.

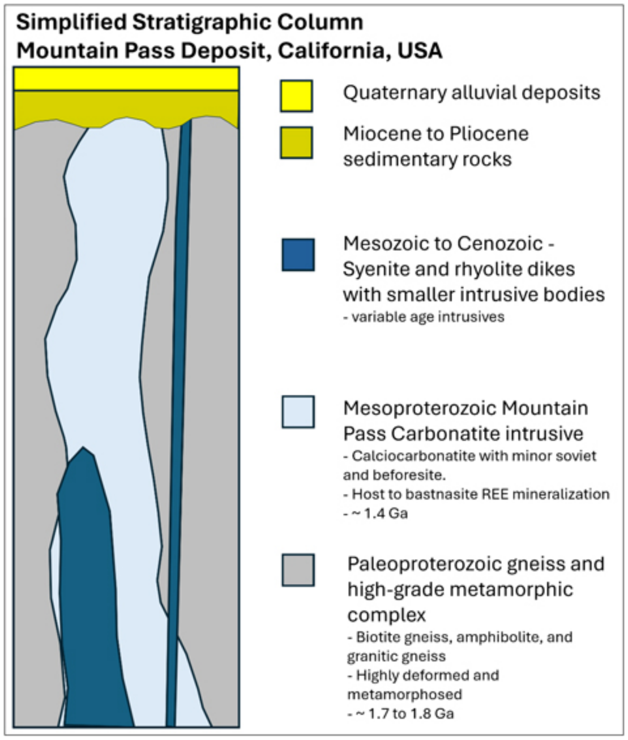
The carbonatite rocks at the Project have been divided by geologists at Mountain Pass into six types:

- Bastnaesite sövite (Bastnaesite-barite sövite)
- Bastnaesite beforsite (Bastnaesite-barite sövite)
- Bastnaesite dolosövite (Bastnaesite-barite dolomitic sövite)
- White sövite (White bastnaesite-barite sövite)
- Parisite sövite (Parisite sövite)
- Monazitic sövite (Monazite-bearing carbonatite)

These divisions are based on the carbonate mineral composition of the carbonatite, either calcite or dolomite, the dominant rare earth mineral, texture, and other criteria detailed in the following sections (based largely on Castor, 2008). The different carbonatite types and their specific mineralization are discussed in detail in Section 6.3.

Breccia is found within and adjacent to the Sulfide Queen and includes altered clasts of country rock as well as carbonatite. It is most abundant in the northern part of the open pit and to the south under the former mill. Breccia textures range from matrix to clast supported breccia with rounded to angular clasts. In the hangingwall of the Sulfide Queen, breccia occurs as a stockwork while in other areas it appears to have formed by intrusive stoping. In the footwall of the carbonatite, the breccia is composed of rounded and crushed gneiss, syenite and shonkinite, which is interpreted by Castor (1988, 2008) as indicating a pre-carbonate intrusive formation. Breccia has previously been thought to be unmineralized but contains monazite in places.

A simplified stratigraphic column is presented in Figure 6-4 showing the primary lithology types on the property.



Source: SRK, 2023

Figure 6-4: Simplified Stratigraphic Column for the Mountain Pass Site

6.2.2 Alteration

Alteration at the Property is primarily contact metamorphism associated with the emplacement of the Sulfide Queen carbonatite. It is primarily fenitic alteration and found in the country rock adjacent to the carbonatite. Fenitic alteration or fenitization is associated with carbonate-rich fluids and is characterized by secondary potassium feldspar, phlogopite, and magnesio-riebeckite with chlorite and hematite in places. Due to the resulting distinctive color and textures of these minerals, the fenitic alteration type is relatively easy to recognize in outcrop and drill core by its light-colored minerals. Fenitization is typically less intense and widespread proximal to the ultrapotassic rocks relative to the intense alteration observed in the more reactive Middle Proterozoic rocks in the open pit area (Castor, 1988, 2008).

Other alteration identified locally includes hydrothermal alteration and silicification around the Celebration Fault. This is considered late stage and has little effect on mineralization (Castor, 1988; 2008). Additionally, weathering from meteoric water resulting in oxidation and hydration of minerals is commonly observed in the pit resulting in depleted carbonate minerals and thus, enrichments in TREO.

The presence of sillimanite in the biotite-garnet-sillimanite gneiss indicates that rocks of the Middle Proterozoic age reached high temperatures and pressures during metamorphism and were metamorphosed to the granulite facies. The carbonatite sills are not metamorphosed, and the Late Proterozoic age ultrapotassic rocks show limited contact metamorphism where these rocks host carbonatite.

6.2.3 Structure

Structural controls include local brecciation and faulting. Regional structural controls include the Clark Mountain Thrust and North Faults, which bound the block separating the Proterozoic rocks at the Property from the surrounding Paleozoic and Mesozoic age rocks. The Clark Mountain Thrust fault strikes north-northwest and dips from 35° to 70º W but averages 55º W. The North Fault strikes west-northwest and dips from 65° to 70º S and has offset the Clark Mountain Thurst by an estimated 1,200 ft near the Property. In general, all major faults in the Property area strike north-westerly and dip to the southwest. This includes the Middle and South Faults near the open pit (Olsen et al., 1954; Castor, 2008).

Within the open pit area, the important faults are the Ore Body, Middle, and the Celebration faults. The Ore Body Fault is a splay of the North Fault and the carbonatite and ultrapotassic rocks are found primarily between the Middle and Ore Body Faults. Both are normal faults that strike northwest and dip moderately to steeply southwest. Both faults display evidence of left-lateral and dip-slip displacements and were active until the Pliocene-Pleistocene. Both faults contain substantial gouge zones and are barriers to groundwater flow. Many smaller faults with similar orientations and displacement have been mapped between these two faults.

The Celebration Fault transects the open pit along the highwall and dips into the pit. It also functions as a groundwater conduit and is a target for two dewatering wells. This structure is sub-parallel to the Middle Fault and strikes at an average of N60º W with a dip of approximately 60° SW. Although appreciable dip-slip offset is not noted north of 800 NW on the mine grid, shallowly plunging slickensides indicate a component of right lateral strike-slip motion. The Celebration Fault is marked by a 10 to 20 ft wide zone of shearing and brecciation with only local cementation. The Friendship Fault is visible in the pit, dips approximately 78º NE, and is considered to be a splay of the Celebration Fault. Information from drilling indicates that the Sulfide Queen carbonatite is offset downdip by a series of faults with limited displacement. These structures are sub-parallel to the Friendship Fault, do not offset the Celebration Fault, and displacement of the Sulfide Queen carbonatite is less than 100 ft in most places (Castor, 1988; Molycorp, 2003; Nason, 2009).

6.3 Significant Mineralized Zones

Mineralization occurs entirely within the Sulfide Queen carbonatite within the Project area. This has been defined through drilling and mapping. Grade distribution internal to this mineralized zone is variable. Higher grade zones (>10% TREO) tend to occur in lenses parallel to the hangingwall - footwall contacts, both downdip, and along strike. High grade also occurs along faults which have variable orientations due to meteoric water in faults dissolving carbonate minerals resulting in elevated concentration of bastnaesite in a weathered host rock. Continuity of mineralization internal to the carbonatite zone is well defined both along strike and downdip.

The currently defined zone of rare earth mineralization exhibits a strike length of approximately 2,750 ft in a north-northwest direction and extends for approximately 3,000 ft downdip from surface. The true thickness of the >2.0% TREO zone ranges between 15 to 250 ft.

The principal economic mineral at the Project is bastnaesite, a rare earth fluorocarbonate with the generalized chemical formula $LnCO_3F$, where *Ln* is a variable representing a lanthanide elemental component (usually lanthanum or cerium). This naming convention is applied throughout this resource report. The bastnaesite composition at the Project is dominated by cerium, lanthanum, and neodymium, with smaller concentrations of praseodymium, europium, samarium, gadolinium, dysprosium, terbium, and heavier rare-earth elements.

Bastnaesite mineralization at the Project were subdivided by Castor (1988, 2008) as described below. Non-mineralized rock types within the open pit area are also described.

6.3.1 Bastnaesite Sövite

Bastnaesite-sövite is a calcite-rich mineralized rock type containing relatively coarse, early-formed bastnaesite, along with recrystallized barite phenocrysts, in an anhedral matrix of fine calcite and barite. Where unaltered, this material is a pink to mottled white and red-brown rock carrying about 65% calcite, 25% strontian barite, and 10% bastnaesite. However, chemical and mineralogic changes subsequent to crystallization have produced more complex mineralogy. The sövite is characterized by relatively high calcium, strontium and lead, moderate barium, and low phosphorous.

The bastnaesite sövite forms the basal portions of the resource area, and all of the resource at the north end of the pit. At the south end of the pit, sövite makes up less than half the mineralized zone thickness.

Celestite occurs in the bastnaesite sövite as bladed replacements and outgrowths from barite phenocrysts. Celestite is particularly abundant, along with variable amounts of very coarse bastnaesite, in a basal sheet of otherwise unaltered sövite about 50 ft thick. This celestite sövite zone is separated from the main mineralized body by a zone of gneiss and/or breccia. Late celestite veins have been observed cutting talc-altered sövite.

Dark brown or ochre limonite is locally pervasive in sövite, particularly in silicified ore. Such rocks rarely have higher iron contents than unaltered sövite. Coarse bastnaesite typifies sovitic mineralized rock. On the 4640 level the average bastnaesite grain diameter is about 300 µm. For the most part, monazite

[$LNPO_4$)] occurs sparingly in the sövite, almost always as small primary euhedral and patches of radial secondary needles.

6.3.2 Bastnaesite Beforsite

The bastnaesite beforsite unit generally lies above the sovitic material and is separated from it by dolosovite. Bastnaesite beforsite is a carbonate-rich mineralized rock type, containing ferroan dolomite (ankerite) as the major carbonate phase, instead of calcite, and is largely unaltered. Locally this rock contains minor quartz. Beforsite is tan or grey to pinkish tan and contains abundant grey or purple to pink and white single-crystal barite phenocrysts. The matrix consists mainly of fine dolomite rhombs set in very fine interstitial material consisting mainly of bastnaesite with calcite and barite. The mineralogical composition of an average beforsite is about 55% dolomite, 25% barite, 15% bastnaesite, and 5% calcite. Zones of barite-rich beforsite, associated with barite-poor zones have been logged in core holes and noted during pit mapping. Compared with the sövite, beforsite in pit samples has higher Ln and Ba, along with lower Sr and Pb. Phosphate content is variable but can be high in areas of irregular late veinlets of felty monazite. This is known as “bone” monazite and can be as much as 5% of the rock.

Dark brown limonitic alteration occurs in places in the beforsite, particularly along faults and in structural zones. In many instances, the limonite forms rhomb-shaped pseudomorphs indicating it formed by replacing the ferroan dolomite. In addition, secondary lanthanide minerals occur in portions of the beforsite such as sahamalite [$(Mg,Fe^{2+})Ln_2(CO_3)_4$], synchisite [synchysite, $CaLn(CO_3)_2F$] and ancylite [$SrLn(CO_3)_2(OH)•H_2O$] which was also identified using XRD. Large amounts of these secondary LN carbonates occurring within beforsite are associated with secondary calcite. Along the south wall of the pit, the beforsite contains crude, nearly vertical banding. On close examination, this is seen to consist of braided discontinuous veins of late bastnaesite/calcite. This texture probably formed by upward streaming of lanthanum and calcium-rich residual fluids remaining in the beforsite after dolomite crystallization.

6.3.3 Bastnaesite Dolosovite

Bastnaesite dolosovite occurs in a 100 to 200 ft wide zone between the beforsite and sövite. It contains both dolomite and calcite and is generally limonitic. Similar to the beforsite, dark brown limonite commonly forms pseudomorphs after dolomite rhombs. The dolosovite generally contains white to pink recrystallized barite phenocrysts. Some dolosovite samples contain coarse bastnaesite as in the sövite, but often samples have fine, late beforsite-style bastnaesite. A line drawn along the interface between the zone of coarse-grained (greater than 150 μm) bastnaesite average crystal sizes and the zone characterized by fine (less than 150 μm) average crystal size roughly bisects the bastnaesite dolosovite zone.

Chemically, the dolosovite shows both sovitic and beforsitic attributes. It is highly variable in terms of gangue mineralogy, particularly with regard to the carbonate minerals which show much evidence of secondary redistribution. In some samples, dolomitization is obvious, along with later limonitic replacement of the dolomite. In other locations, late white to brown calcite veining is abundant.

Some consider the dolosovite to be a hybrid rock and not a separate intrusive type. In this case, it is plausible it was formed by carbonate redistribution during and after intrusion of the beforsite. Based on bastnaesite grain size, it is mainly dolomitized sövite; but contains some finely divided bastnaesite and is in part calcitized beforsite. Strongly limonitized dolosovite, referred to as “black ore”, creates extreme milling problems. “Black ore” is mainly restricted to the dolosovite but in places extends into the beforsite. This material is generally dark brown soft material with white calcite veining. It typically exhibits high lanthanum content, carrying large amounts of coarse- or fine-grained bastnaesite. In part, the elevated lanthanide (Ln) values may be due to removal of carbonate, resulting in an abundance of void space allowing the formation of larger grain sizes. This material generally has relatively low densities and is poorly indurated. Analysis of this rock type shows that bastnaesite dolosovite has above average iron, manganese, and phosphorous contents as compared with the bastnaesite sövite.

The bastnaesite dolosovite has high strontianite contents derived from sovitic rock. It is locally high in fine, anhedral, late-stage silica. Although the dolosovite appears to be dominated by alteration minerals, it rarely contains talc.

Ln-bearing minerals other than bastnaesite commonly occur in the dolosovite, though mainly as minor phases. Bright yellow synchisite replacing bastnaesite was observed in many thin sections. Secondary sahamalite and ancylite have also been identified in many dolosovite samples. Bastnaesite in dolosovite is generally yellow-brown or dark-brown, rather than in normal light tan to grey colors. Bone monazite is more abundant than primary monazite.

6.3.4 White Sövite

White sövite occurs above the beforsite in the southwest corner of the pit (current pit bottom 4,300 ft). It carries very fine, late bastnaesite as in the beforsite, but contains little or no dolomite. White sövite appears to be the product of late stage calcitization of beforsite by rising residual fluids responsible for late bastnaesite/calcite deposition in the underlying beforsite.

In addition to fine bastnaesite, the white sövite contains abundant single-crystal barite phenocrysts as in the beforsite. Chemically, white sövite has high Ln and low Pb relative to beforsite. Its Sr content ranges from low to moderate. Phosphate contents are variable, with most present as veins of bone monazite.

On the 4,640 level, the white sövite is exposed as a thick dike within hangingwall stockwork breccia 10 to 20 ft above the beforsite. Drillhole 85-1 intercepted 80 ft of white sövite before encountering dolomitic carbonatite.

6.3.5 Parisite Sövite

Parisite sövite is found in the pit above the 4,700 level in the footwall. A dike carrying about 20% of flow-oriented parisite [$CaLn_2(CO_3)_3F_2$] was mapped on the 4,760 level at the south end of the pit. This dike was intercepted in core hole 85-2.

6.3.6 Monazitic Carbonatite

Bodies of carbonatite which contain primary monazite in amounts that approach or exceed bastnaesite contents occur within, and adjacent to, the mineralized zone. In addition, monazitic sövite comprises most of the small carbonatite dikes in the vicinity of the mineralized zone.

The monazitic carbonatite has low total TREO content, generally in the 2% to 4% range. It is also characterized by high Ca and P, and low Ba. In hand specimen, the monazitic carbonatite is nearly equigranular because barite phenocrysts are sparse or lacking.

Although sovitic and beforsitic carbonate rock types have both been documented, nearly all of the monazitic-bearing carbonatite rocks observed on the 4,700 to 4,640 levels are dolosovite. Monazite sövite is abundant in core holes drilled on the north part of the pit. Significant amounts of monazite dolosovite occur at the south end of the mineralized zone and extend beneath the mill.

Monazitic carbonatite is generally associated with brecciated rocks. Small, phlogopitized clasts are commonly present in the monazite carbonatite as well as phlogopite xenocrysts. At the north and south ends of the pit monazitic carbonatite appears to form envelopes around breccia masses. A large monazite dolosovite mass along the hangingwall of the deposit contains areas rich in clasts.

The monazite in the monazitic carbonatite occurs predominantly as primary euhedra or subhedra. Bone monazite replaces primary crystals in some samples. Where present, bastnaesite occurs as sparse corroded grains, generally observed in coarser sizes similar to those documented in the basal sövite.

The location of monazitic carbonatite masses, and the lack of barite phenocrysts suggest the monazitic magma was filter pressed out of the adjacent breccias. Formation of the monazitic carbonatite units probably post-dated sövite emplacement and predated beforsite emplacement.

Alteration in the monazitic carbonatite is similar to that observed in the dolosovite. However, “black ore” formed from monazitic carbonatite has not been recognized to date.

6.3.7 Breccia

Breccia with a carbonatite matrix comprises a significant proportion of the Mountain Pass carbonatite body. Like the related monazitic carbonatite, the breccia nearly always has low lanthanum oxide (LnO) and high P and has historically not been added to mill feed in significant quantities. Breccia has been observed in abundance at the north end of the current pit, and essentially limits mining in that direction due to metallurgical concerns. Breccia is also present at the south end of the pit, where considerable tonnages extend under the current mill location.

Breccia occurrences associated with the main carbonatite body at the Project are variable. The breccia bodies were previously noted to be semi-continuous envelopes on the hangingwall and footwall contact with the carbonatite intrusion and interlayered within the mineralized rock types. In the hangingwall, they range from stockworks of randomly oriented or sheeted carbonatite dikes cutting altered gneiss, clast-supported breccia with more than 70% altered angular clasts, to matrix-supported breccia with angular to rounded clasts which locally grades into monazitic carbonatite with sparse clasts.

In the footwall, abundant rounded clasts of gneiss, shonkinite, and syenite occur in a crushed rock matrix with little or no carbonatite. This breccia grades to matrix supported breccia with rounded clasts. Some footwall breccia has protomylonitic textures, along with occurrences of talc and crocidolite. Breccia at the north end of the pit is strongly altered to talc, which renders clast identification difficult. Brecciated zones have also been observed internal to the main carbonatite body.

6.4 Surrounding Rock Types

The carbonatite stock at the Project is intruded into the metamorphic rocks and the ultrapotassic suite. Both of these rock types are typically strongly fenitized near their contacts with carbonatite, and fenitized clasts are commonly included in igneous breccias at the edges of the intrusion (Castor, 1988).

6.5 Relevant Geological Controls

The primary geologic control on mineralization is lithology; and only the carbonatitic rock types appear to be favorable for economically significant rare earth mineralization. Although a number of high-angle normal faults bisect the mineralized zone, offset appears to be post mineral in all cases.

6.6 Deposit Type, Character, and Distribution of Mineralization

Mountain Pass is a carbonatite hosted rare earth deposit (USGS Deposit Model 10; Singer, 1986). The mineralization is hosted principally in carbonatite igneous rock. Mountain Pass is the only known example of a rare earth deposit in which bastnaesite is mined as the primary magmatic economic mineral in the world (Haxel, 2004).

Mineralization occurs entirely within the carbonatitic portion of the currently drilled geologic sections, although grade distribution internal to this mineralized zone is variable. Higher grade zones (>10% TREO) tend to occur in lenses parallel to the hangingwall/footwall contacts, both downdip and along strike. Continuity of mineralization internal to the carbonatite zone is well defined both along strike and downdip.

The currently defined zone of rare earth mineralization exhibits a strike length of approximately 2,750 ft (850 m) in a north-northwest direction and extends for approximately 3,000 ft (930 m) downdip from surface. The true thickness of the >2.0% TREO zone ranges between 15 to 250 ft (5 to 75 m).

Globally, carbonatites are subdivided into two main groups: apatite-magnetite bearing, mined for iron and/or phosphorus ± various by-products, and rare-earth bearing carbonatites. Many other commodities may be present in economically significant concentrations, such as uranium, thorium, titanium, copper, vermiculite, zirconium, niobium, and phosphorus. The majority of carbonatite complexes display a series of variable carbonatitic magma compositions, the majority of which are not significantly enriched in rare earths. Mountain Pass is unique in that the carbonatite does not exhibit such variation and has significant intervals of elevated rare earths throughout its entirety.

7 Exploration and Drilling

7.1 Exploration

In 1949, the rare earth-bearing carbonatite was discovered by a USGS field team (Olson, et al., 1954). The discovery and exploration details of Mountain Pass were published in USGS Professional Paper 261, which included regional and local scale geological and structural maps as well as maps of the underground workings at the Sulfide Queen Mine. USGS Professional Paper 261 details petrography, mineralogy, and chemical analyses in addition to structural and geologic data collected by the USGS. This document served as the basis for further exploration and eventual exploitation of the Mountain Pass Mine.

There is no other relevant exploration work on the property, other than drilling, conducted by or on behalf of current and previous owners at the Mountain Pass Mine. Drilling is discussed in Section 7.2. The USGS has conducted regional exploration work which is largely focused outside the Mountain Pass property.

7.2 Drilling

Extensive drilling at the Mountain Pass mine has been undertaken since the 1950's, some of which is utilized to define the orebody and relevant geological features. The prior owner, Molycorp, completed drilling campaigns in 2009, 2010 and 2011. Data prior to those exploration campaigns are considered historical in nature. While this historical data provides geological and grade information, the historical drilling has no quality control (QC) data associated with it. In 2021, MP Materials performed a limited geotechnical and exploratory drilling campaign and handled core logging/sampling in a similar manner to the 2009-2011 drilling.

The 2009 drilling campaign consisted of an infill drilling program to upgrade the resource classification within and adjacent to the existing Sulfide Queen area. The program consisted of twelve, 5.5-inch reverse circulation (RC) holes around the south, west, and north sides of the pit. The 12 holes ranged in depth from 230 to 1,245 ft (70.1 to 379.5 m) and were drilled between December 2009 and February 2010. Sampling was done on 5 ft (1.524 m) intervals, and the bagged samples were delivered by SRK to the on-site sample prep facility. Among the 12 holes, MP-09-01 is missing all data.

The 2010 program was designed as a diamond drill hole (DDH) in-fill, exploration, and condemnation program. The program consisted of two DDH infill holes on the south side of the pit, two DDH exploration holes north of the pit, and two condemnation holes. One condemnation hole was complete as a DDH drilled northwest of the existing waste rock dump to test a possible future tailings site; the other was a RC hole drilled northeast of the pit, at the site of the separation plant expansion. Core sampling was conducted on 5 ft intervals and bagged samples were stored at the on-site sample preparation facility. RC samples were submitted as approximate 10-kilogram (kg) splits of the original recovered sample.

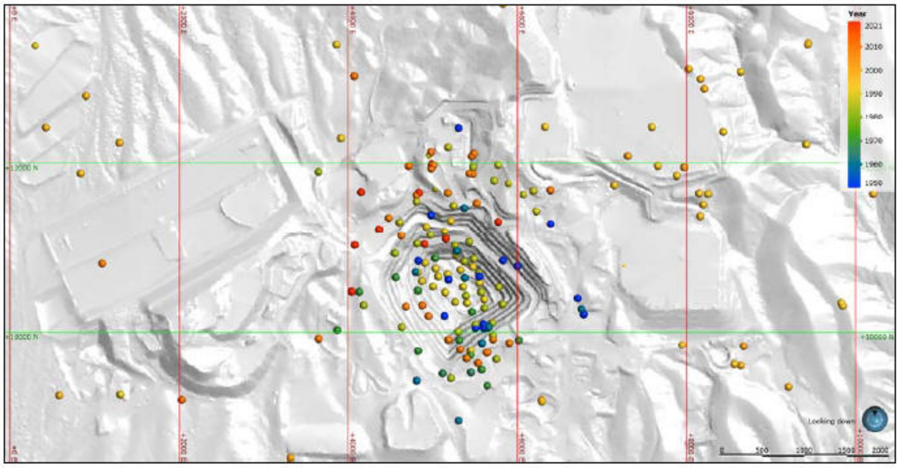
In 2011, Molycorp completed a DDH infill drilling campaign. In addition to routine total rare earth assaying, Molycorp randomly selected 683 core samples for laboratory analysis of the individual light rare earth components.

Core recoveries from the 2009 and 2010 drill campaigns exceeded 95%. MP Materials has noted similar results for the 2011 and 2021 drilling as well. Sample protocols described in Sections 8.1

through 8.3 of this report provide reproducible results. SRK is of the opinion that drilling and sampling in these campaigns provides generally accurate and reliable results.

MP Materials conducted a geotechnical / exploration DDH drilling campaign in 2021 with 16 holes drilled at a total depth of 10,136 ft for geotechnical and resource evaluation purposes. All cores have been sampled at an interval of 10 ft on host rocks, and 5 ft on mineralized samples.

Figure 7-1 illustrates the locations of the drillholes, color coded by drill campaign. Several drillholes are located outside of the field of view but these do not impact the mineral resource model which is shown as block grades on the pit surface.



Source: SRK, 2019
Note: colored points are drill collars shaded by relative approximate date of drilling.

Figure 7-1: Drilling in MP Materials Pit Area

Geotechnical data for the project was acquired by detailed rock fabric mapping of surface exposures and subsurface sampling using drill core. SRK has reviewed the industry-accepted procedures and methods used by Call and Nicholas, Inc. (“CNI”), which are documented in Nicholas & Sims (2001) to characterize the rock mass. In SRK’s opinion, the geotechnical conditions are well characterized, and a sufficient number of holes have been drilled into the final pit wall to interpret the ground conditions.

CNI conducted laboratory testing to determine the intact and fracture strengths of the rock mass at their laboratory in Tucson, Arizona. Laboratory testing at this laboratory is done in general accordance with procedures outlined in ASTM standards for rock and soil testing. Using the intact and fracture strengths, rock mass strength estimates were developed using a procedure outlined in the Guidelines for Open Pit Slope Design (Read & Stacey, 2009). SRK has reviewed the rock mass strength calculations and inputs to the stability analysis. SRK concurs with the methods, approach, and results of the documented geotechnical study and interpretation of the results. Further discussion of the geotechnical parameters used for open pit mine design is presented in Section 13.1.

8 Sample Preparation, Analysis and Security

The majority of data in the resource database is from historical drilling conducted prior to 2009. SRK has relied on prior discussions, from the time of Molycorp ownership, with former site geologists (e.g., Geoff Nason and John Landreth) for description of sample collection, preparation, analysis, and security (Nason and Landreth; personal communication; 2009). SRK conducted a verification program at the Project between 2009 and 2010 that included reanalysis of archived core from historic drilling programs and a limited infill program. This is discussed in Section 9.2.

No additional drilling was completed until 2021, during which MP Materials drilled a series of 16 holes for geotechnical purposes (GT series), some of which were in carbonatite zones and featured mineralization. Similar to previous programs, samples were processed and analyzed at the on-site laboratory with duplicate samples analyzed by an outside lab for validation. SRK is of the opinion that the sample preparation, security, and analytical procedures are adequate for reliance in the mineral resource estimation. Any uncertainty related to the historical or variable nature of the analyses are addressed in mineral resource classification as described in Section 11 of this report.

8.1 Sampling

8.1.1 Historical Sampling Procedures

The sample and drilling procedures prior to 2009 described by Nason and Landreth (2009) indicate that during drilling, the core or drill cuttings were in the custody of the drillers or geologists or secured in an onsite storage location at all times. Field geologists delivered samples to the sample preparation area. The sample preparation and laboratory facilities were within the secured Mountain Pass property boundary. This was industry standard practice at the time for ongoing exploration at an operating mine. Access to the Mountain Pass Mine is controlled by security at the gate 24 hours per day. Drilling since 2009 has been conducted in and around the open pit, which is a restricted area. All drill cores and RC samples were transported from the drill sites by a Molycorp employee and stored in a secure storage area until the core or RC chips were logged. Sample security was controlled and supervised by Molycorp personnel. Molycorp observed accepted industry practice chain of custody.

Nason and Landreth (2009) described the sampling methods prior to 2009. After the core was logged, a geologist selected sample intervals for analysis. Sample intervals were based on lithology and were generally 5 ft in mineralized zones. Zones identified by the logging geologist as being waste zones were not sampled. Sample intervals could be shorter or slightly longer at lithological contacts and through fault zones. Lithological contacts are generally sharp and recognizable.

The core was split longitudinally using a hydraulic core splitter. Half of the core was placed in a bag for analysis and the remaining half retained for geological reference. Following sample collection, the samples were delivered to the sample processing facility located in the mill facility. Preparation of the split core samples included overnight drying and subsequent crushing and pulverizing. The entire crushed and dried sample was then passed through a cone crusher, homogenized and split using a Jones splitter to a 100 gram (g) sample. Reject material was placed in envelopes and labeled for storage. From the 100 g sample, 10 g was delivered to the on-site lab for X-ray fluorescence (XRF) analysis. The grain size of the 90 g of remaining sample was further reduced using a shatterbox swing mill. A split of the pulverized material was placed in sample envelopes and delivered to the Mountain

Pass Lab. All pulp and coarse rejects were packaged and labeled. After analysis the pulp and coarse rejects were returned to the geology department for onsite storage.

SRK was not able to independently verify or observe the sampling methods employed during the historical drilling campaigns and has relied on verbal and written descriptions of the processes by former employees of Molycorp and its predecessors. SRK reviewed drill logs, sample summary sheets, a limited number of coarse and pulp rejects and remaining drill core. The remaining drill core is stored on site and is organized by drillhole and interval. Coarse and pulp rejects are no longer available on site.

SRK conducted a random inspection of the historical sample preparation area and core in the storage areas from the various major drilling programs and is of the opinion that sample handling, sample preparation and storage of core and rejects meets current industry accepted practices.

8.1.2 Sampling 2009-2011

The 2009 to 2011 drilling programs include photographs of core, a system of marking sample intervals on the core boxes, a sample numbering system and record-keeping for all sample intervals in the drill log.

Sampling procedures include:

- A written record of the sample collected
- Marking the sample interval on the core box
- Identifying the sample interval and box interval on the inside top of the box
- Photographing the core as both dry and wet core and core box top
- Splitting of the core lengthwise using a hydraulic press
- Placing the split core into a pre-labeled sample bag
- Inserting core blocks at the beginning and end of the removed core
- Inserting a lath cut to the sample interval as a space keeper in the core box

Sample numbers were generated using a combination of the drillhole identification and from-to sample interval. Control samples were placed in the sample stream with similar numbers using a drillhole and interval to be unrecognizable to the laboratory. The sample interval used for control samples was beyond the total depth of the drillhole to eliminate confusion with an actual sample. This was noted on the sample log to avoid future confusion on total depth of drillholes.

8.1.3 Sampling 2021

Procedures of sampling 2021 drilling cores are identical to the procedures used in 2009-2011. Core samples were collected by MP Materials' geologists, logged, photographed, split, and provided to the on-site lab for preparation and analysis.

8.2 Laboratory Analysis

There were various analytical procedures used by MP Material's predecessors for sample preparation and analytical methods. Historically, quality assurance and quality control (QA/QC) samples were not inserted into the sample stream as part of the drilling programs.

There were two types of analytical techniques used for measuring TREO at the Project:

- Gravimetric methods
- X-ray fluorescence (XRF)

Results for rare earths were typically reported as percent TREO.

The analysis for the drilling data in the existing assay database was obtained primarily by XRF analysis.

8.2.1 Note on Assay Terminology

For many rare earth projects, laboratory results typically include assays for all the individual rare earth oxides as well as for Y_2O_3 which is not considered a rare earth oxide but is geochemically similar and is often associated with heavy rare earth oxides. The exact grouping of individual oxides into light and heavy categories is not consistent from one project to another.

Mountain Pass is considerably enriched in light rare earth oxides (“LREO”) compared with heavy rare earth oxides and Yttrium (“HREO+Y”), due to the predominance of bastnaesite whose mineral structure favors inclusion of lighter rare earth elements. The Mountain Pass assay suite was limited to the lighter rare earth oxides, specifically La_2O_3, CeO_2, Pr_6O_{11}, Nd_2O_3, and Sm_2O_3 and these were routinely summed together and reported as a single value representing the sum of the five individual oxide assays. Therefore, for the Mountain Pass project, the grades entered into the drillhole database as “LnO” or “REO” and presented in this report as “TREO” represent the sum of La_2O_3, CeO_2, Pr_6O_{11}, Nd_2O_3, and Sm_2O_3.

Many rare earth projects discuss LREO or HREO+Y ratios by expressing one group as a percentage of the sum (LREO+HREO+Y) and may refer to this summed assay value as TREO or TREO+Y; however, this is not the case for Mountain Pass.

Specifically, the definition of the term TREO in this report is different from the same term typically used when discussing other projects. In this report, TREO is the sum of La_2O_3, CeO_2, Pr_6O_{11}, Nd_2O_3, and Sm_2O_3 and it excludes the heavier rare earth oxides and yttrium oxide.

8.2.2 Historical Analyses

Prior to 1970, Molycorp used a gravimetric method for samples from the drilling and sampling programs. The gravimetric method determined Re_2O_3% and was reported as TREO%. In this method, approximately 0.5 to 1.0 g of sample was dissolved through heating in a mixture of perchloric acid ($HClO_4$) and hydrogen peroxide (H_2O_2). The rare earths were then isolated in two precipitation and dissolution steps using organic solvents and inorganic rinses. The first step involved using phenolphthalein and NH_4OH and the second used oxalic acid. This procedure separated the TREO and thorium from iron, aluminum, uranium, titanium, phosphate, manganese, alkaline and alkali earth metals and other divalent cations. The final filtered precipitate of RE-oxalate was then ignited at 900 to 1,000°C and when cooled weighed as total Re_2O_3 (Jennings, 1966). SRK does not know the detection limit for this technique.

8.2.3 Current Analytical Practices

Currently, the on-site lab uses XRF and Inductively Coupled Plasma (ICP) techniques for determination of individual rare earth species and reports the analysis as individual and TREO.

Laboratory equipment at the on-site laboratory includes:

- One Philips PW2404 x-ray spectrometer XRF with a PW2450 VRC sample changer capable of running up to 150 samples per day (the lab is currently capable of prepping 50 fusion disks per day)
- One X'Pert PRO X-ray Diffraction (XRD) PANalytical
- One Perkin and Elmer Atomic Absorption Spectrometer (AAS)
- Two Ultima2 Inductively Coupled Plasma Atomic Emission spectrometers (ICP-AES) each capable of 100 samples per day
- One Agilant Inductively Coupled Plasma-Mass Spectrometer (ICP-MS) with an Agilant 7500cc Octopole Reaction System capable of speciation that can analyze 600 samples per day

Table 8-1 presents the detection limits for the oxides and TREO parameters.

Table 8-1: Oxides and TREO Detection Limits, Mountain Pass Laboratory

Oxide	P_2O_5	ThO_2	SiO_2	Fe_2O_3	MgO	CaO	SrO	BaO
Limit (%)	0.05	0.01	0.05	0.05	0.05	0.05	0.05	0.05
TREO	TREO	CeO_2	La_2O_3	Pr_6O_{11}	Nd_2O_3	Sm_2O_3		
Limit (%)	0.1	0.03	0.03	0.02	0.02	0.02		

Source: SRK, 2012

8.2.4 2009 and 2010 Samples

Drill samples for the 2009 and 2010 campaigns were analyzed at both the Mountain Pass Laboratory and at SGS Minerals in Lakefield, Ontario, Canada. SGS Minerals has ISO/IEC 17025 accreditation.

Quality control samples included:

- Field blanks (roadside marble and scoria grab samples)
- Pulp blanks prepared from purchased silica sand
- Field duplicates (i.e., two splits of RC cuttings collected at the drill rig)
- Coarse reject duplicates
- Pulp duplicates
- A pit standard (pulp prepared by Mountain Pass)

8.2.5 2011 Samples

The analysis for the 2011 drilling program completed by Molycorp were analyzed at Actlabs in Ancastor, Ontario, Canada using the Code 8 Rare Earth Element Assay Package. In this package, the analysis is conducted using a lithium metaborate/tetraborate fusion followed by dissolution in acid and analysis by ICP-MS. Detection limits for this technique are shown in Table 8-2. Actlabs has ISO/IEC 17025 accreditation.

Table 8-2: Oxides and Element Detection Limits, Actlabs Laboratory

Oxide or Element	Detection Limit	Element	Detection Limit	Element	Detection Limit	Element	Detection Limit
Al_2O_3	0.01%	Be	1 ppm	Rb	2 ppm	La	0.1 ppm
CaO	0.01%	Bi	0.4 ppm	Sb	0.5 ppm	Ce	0.1 ppm
Fe_2O_3	0.01%	Co	1 ppm	Sc	1 ppm	Pr	0.05 ppm
K_2O	0.01%	Cr	20 ppm	Sn	1 ppm	Nd	0.1 ppm
MgO	0.01%	Cs	0.5 ppm	Sr	2 ppm	Sm	0.1 ppm
MnO	0.001%	Cu	10 ppm	Ta	0.1 ppm	Eu	0.05 ppm
Na_2O	0.01%	Ga	1 ppm	Th	0.1 ppm	Gd	0.1 ppm
P_2O_5	0.01%	Ge	1 ppm	Tl	0.1 ppm	Tb	0.1 ppm
SiO_2	0.01%	Hf	0.2 ppm	U	0.1 ppm	Cy	0.1 ppm
TiO_2	0.001%	In	0.2 ppm	V	5 ppm	Ho	0.1 ppm
LOI	0.01%	Mo	2 ppm	W	1 ppm	Er	0.1 ppm
Ag	0.5 ppm	Nb	1 ppm	Y	2 ppm	Tm	0.05 ppm
As	5 ppm	Ni	20 ppm	Zn	30 ppm	Yb	0.1 ppm
Ba	3 ppm	Pb	5 ppm	Zr	4 ppm	Lu	0.04 ppm

Source: Modified from Actlabs fee schedule (http://www.actlabs.com/files/Canada_2012.pdf, 2012

8.2.6 2021 Samples

A relatively small subset of the database is comprised of samples taken during 2021 geotechnical drilling. These samples function for two purposes, primarily as additional information to characterize select interceptions of mineralization, and secondly as verification of the sample prep and analysis methodology employed by the Mountain Pass laboratory.

8.3 Quality Control and Quality Assurance

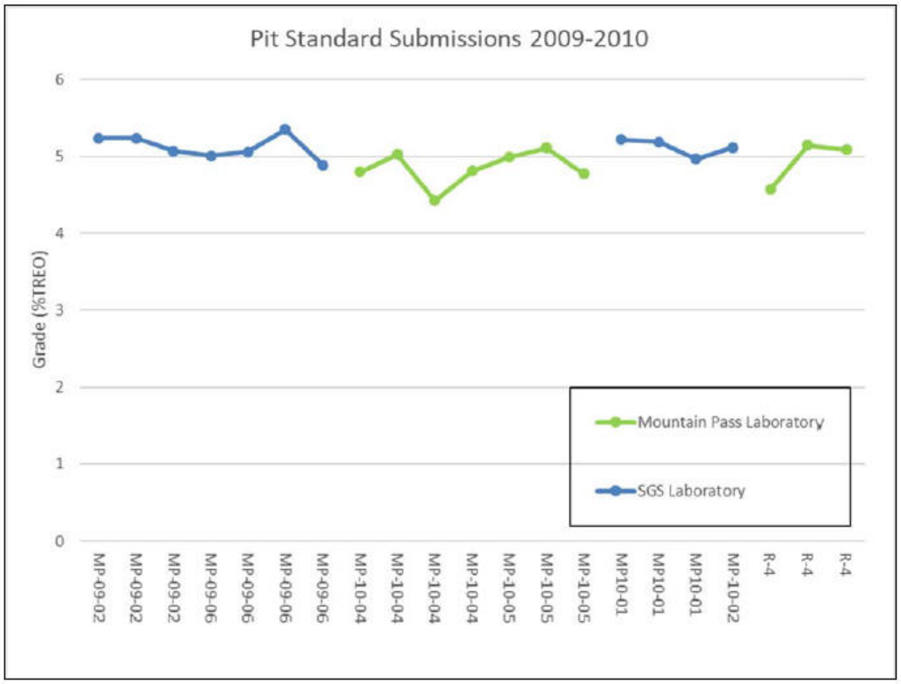
8.3.1 Historical QA/QC

During the drilling programs at the Project, which were conducted prior to 1992, there was no QA/QC in place that included the regular insertion of standards, blanks, and duplicates into the sample stream. SRK located a limited number of laboratory printouts but no analytical certificates. Within the printouts, SRK found a limited number of re-analyses, but these were not systematic, appeared to be confirmation of higher grades and did not represent the entire spectrum of analytical results. Current laboratory personnel report that instrument QA/QC was in place at the on-site laboratory during these drilling programs, but no records are available.

The pre-1992 drilling comprises more than half of the drilling used in the resource model. The uncertainty that results from the lack of QA/QC is counteracted by the production reconciliation presented in this report.

8.3.2 2009-2010 Campaign QA/QC Program

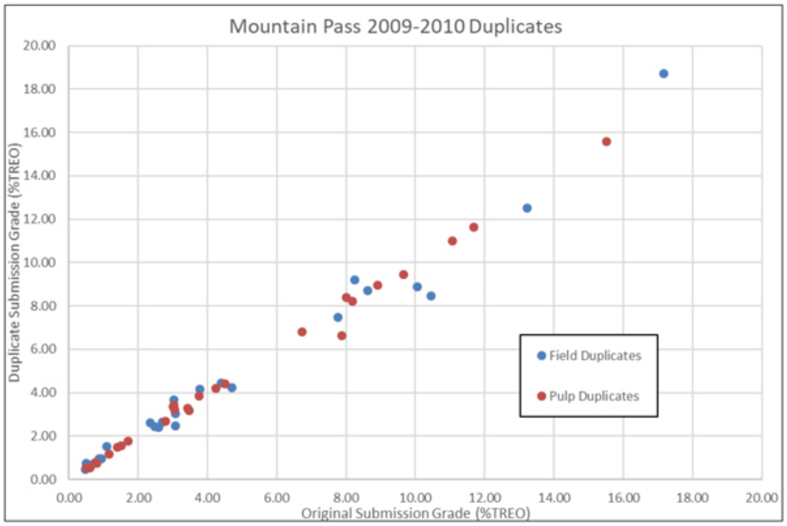
The infill drilling program conducted in 2009 through 2010 used both the Mountain Pass laboratory and SGS Lakefield for sample assay. Figure 8-1 illustrates the assay results returned for the pit standard. The pit standard was prepared and homogenized by Molycorp and was not subjected to a round robin assay study which would normally be completed to ‘certify’ the standard material; nevertheless, the results were quite precise, and both laboratories were broadly in agreement with each other with Mountain Pass laboratory returning slightly lower grades on average than SGS laboratory.



Source: SRK, 2019

Figure 8-1: 2009 Through 2010 Pit Standard Assays

A number of duplicate samples were submitted during the course of the program to assess the repeatability of sample assays both for field duplicates and for pulp duplicates. Figure 8-2 illustrates the results, generally both field and pulp duplicates compare closely, the half average relative difference for each dataset is up to +/-17% and up to +/-6% respectively. This shows that the mineralization is reasonably homogeneous within the drill core and that there is only limited potential for sampling error.



Source: SRK, 2019

Figure 8-2: 2009 Through 2010 Duplicates

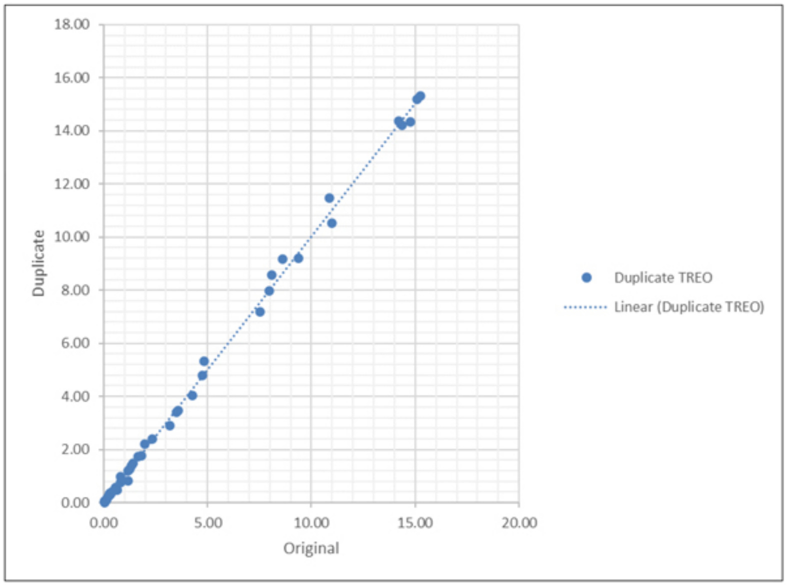
8.3.3 2011 Campaign QA/QC Program

The 2011 drilling program included the insertion of blanks and duplicates but no standards. The prior standard samples were depleted during the 2010 drilling campaign. Blanks, standards, and duplicates are part of an industry best practice drilling program and are used to independently check precision and accuracy during analysis.

SRK was not provided with the QA/QC data from the 2011 drilling program. As a result, SRK has not reviewed this QA/QC data and cannot comment.

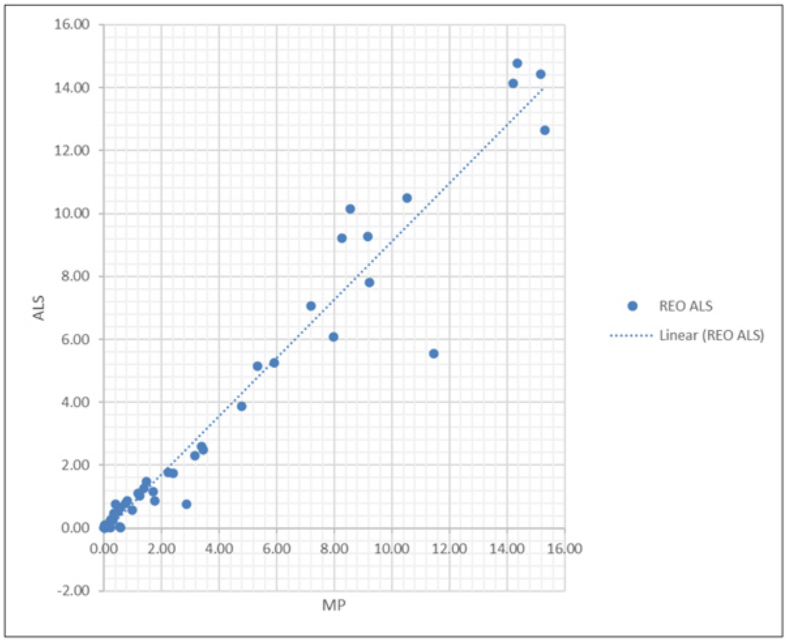
8.3.4 2021 Campaign QA/QC Program

The 2021 drilling included a series of field duplicate analyses and four blank insertions into the sample stream. No standards (certified reference materials) were inserted to test laboratory precision. Duplicates were collected as quarter core from the remaining half not sent for analysis as the primary sample. One quarter was provided to the Mountain Pass lab to test against the primary half core sample. The second quarter was sent to ALS Minerals in Tucson, AZ for processing and ALS Minerals Vancouver for analysis. While the comparison for the duplicates within the MP lab (Figure 8-3) show excellent agreement, the comparison for the duplicates submitted to ALS (Figure 8-4) appear relatively poor, with significant deviations in grade from the original Mountain Pass sample. In SRK's opinion, this likely demonstrates differences between laboratories in terms of preparation/analytical methodology.



Source: SRK, 2021

Figure 8-3: 2021 Field Duplicate Analyses – MP Materials Lab



Source: SRK, 2021

Figure 8-4: External Duplicate Analyses – MP vs. ALS

9 Data Verification

This section summarizes data verification performed by SRK in relation to information supporting the mineral resources.

9.1 Re-Assaying Program

In 2009, SRK conducted a review of historical sample preparation and analytical procedures. The result of this review was to perform a check assay program. Sample pulp and reject material was largely discarded from previous owners so SRK utilized archived split core stored onsite.

For this check assay program, samples were shipped to then prepared at SGS Minerals preparation laboratory located in Elko, Nevada, USA. (SGS Elko). The primary analytical laboratory used for this program was SGS Minerals (SGS Minerals) located in Lakefield, Ontario, Canada and approximately 10% of these check samples were also analyzed on site at the internal Mountain Pass Laboratory.

9.1.1 Procedures

The 2009 sample check program included re-analysis of approximately 1% of the historical assay database results. The program included the following sample types and numbers:

- 108 half-core samples with original assay results between 0.18% to 16.30% TREO
- 10 site-specific standard samples based on two samples of known TREO content
- 10 blind duplicates
- 5 blank samples

SRK selected random duplicate samples from sample intervals within the database that covered a range of analytical results from 0.18% TREO to 16.30% TREO. Since these duplicate samples are retained half split core, they are effectively field duplicates. Of the 108 core samples, 66 core samples had historical assay results between 3.00% and 11.00% TREO. The remaining 42 core samples had historical assay results between 0.18% and 2.99% or 11.01% and 16.30% TREO.

Standards and blanks were site specific. The site-specific standards are non-certified and were created by the on-site laboratory from a pit sample and a high-grade sample from the Birthday claim. The blank material was a non-mineralized sample collected at the Mountain Pass site by SRK.

SRK directed SGS Elko to prepare ten duplicates from the pulverized samples and to give them unique sample numbers. The duplicates were prepared and inserted into the sample stream prior to shipping to the SGS Minerals laboratory for analysis. Ten pulverized splits of the core samples were also sent back to the on-site laboratory for comparative analysis. The pulverized splits are considered pulp duplicates, with an allowed a ±10% error.

In addition to the external SRK quality control (QC) samples, SGS Minerals included their internal laboratory QC sampling including one blank, one sequential duplicate (i.e., a duplicate placed immediately after the primary sample) and three additional duplicates per batch at the analytical lab in Lakefield. The analysis was run in two batches, totaling two blanks, two in-line duplicates and six duplicates in addition to the external QC samples from SRK. Calibration standards were provided by the Mountain Pass Laboratory to insure similar analytical sensitivity for both labs.

For the onsite Mountain Pass laboratory, site technicians inserted two duplicates and one standard in the ten samples analyzed onsite.

For specific gravity (SG) QC, ten samples were selected from the core samples and sent to ALS in Reno, Nevada U.S.A for SG measurements. SG is further discussed further in Section 11.5.

9.1.2 SGS Check Assay Sample Preparation

Sample preparation for the check analysis was completed at SGS Elko. The preparation technique used was SGS Minerals code PRP90, which used the following procedures:

- The sample was dried at 100°C for 24 hours.
- The sample was crushed to 90% passing a 2 millimeter (mm) (10 mesh) screen.
- The sample was split using a riffle splitter to 250 g.
- The 250 g split was placed in a vibratory mill and pulverized until 85% passed a 75-micron (200 Mesh) screen.
- The coarse reject was retained and returned to the client for any future analysis.

The sample was then shipped to the SGS Minerals laboratory for X-Ray Fusion (XRF) analysis (SGS Minerals, 2009).

9.1.3 SGS Check Assay XRF Procedures

SGS Minerals worked closely with the Mountain Pass Laboratory to identify the appropriate method for preparing fusion discs for the XRF to ensure that both labs used similar procedures for TREO analysis. A 0.2 g to 0.5 g pulp sample is fused with 7 g of a 50/50 mixture of lithium tetraborate and lithium metaborate into a homogenous glass disk. This is then analyzed using a wave dispersive XRF (WDXRF). Loss on ignition at 1000°C is determined separately using gravimetric techniques and is part of the matrix correction calculation. These calculations are performed by WDXRF software (SGS, 2009). This method is accredited with the Standards Council of Canada (SCC) and conforms with the requirements of ISO/IEC 17025 (SGS, 2009).

The analyses performed for the SRK study included SGS Minerals control quality measures, which are used to monitor and control metallurgical or manufacturing processes. They are analyzed individually for better quality output. The oxides analyzed and their detection limits are listed in Table 9-1. The analytical work included Loss on Ignition (LOI) as a separate analysis.

Table 9-1: Oxides Analyzed with Detection Limits

Oxide	Limit (%)	Oxide	Limit (%)	Oxide	Limit (%)
Whole Rock Analysis					
SiO_2	0.01	Na_2O	0.01	CaO	0.01
Al_2O_3	0.01	TiO_2	0.01	MgO	0.01
Fe_2O_3	0.01	Cr_2O_3	0.01	K_2O	0.01
P_2O_5	0.01	V_2O_5	0.01	MnO	0.01
Rare Earth Oxide Analysis					
La_2O_3	0.01	CeO_2	0.02	Nd_2O_3	0.02
Pr_6O_{11}	0.02	Sm_2O_3	0.03	BaO	0.02
SrO	0.02	ThO_2	0.01		

Source: SRK, 2012

9.1.4 Analysis of Light Rare Earth Oxide Distribution

Starting in 2009, Molycorp expanded the assay method to include the individual rare earths present in each sample. During the 2009 in-fill and 2010 condemnation drilling campaigns, SRK selected

403 samples for the assay of light rare earth elements (i.e., lanthanum, cerium, praseodymium, neodymium and samarium). Table 9-2 presents a statistical summary of the light rare earth element results.

Table 9-2: Light Rare Earth Oxide Distribution Statistics: 2009 and 2010 Analyses

Statistic	La_2O_3	CeO_2	Pr_6O_{11}	Nd_2O_3	Sm_2O_3
Number of Samples	403	403	403	403	403
Mean Fraction of TREO	0.325	0.497	0.043	0.121	0.009
Standard Deviation	0.026	0.021	0.003	0.012	0.002
Coefficient of Variance	0.079	0.042	0.075	0.095	0.238
Minimum	0.26	0.44	0.02	0.09	0.01
Maximum	0.41	0.61	0.05	0.17	0.02
Abs Diff (Min – Max)	0.151	0.167	0.028	0.080	0.015

Source: SRK, 2012

Standard deviation and associated coefficient of variance indicate a relatively narrow range of variability suggesting that the light rare earth distribution is consistent. SRK has verified the QA/QC aspects of the 2009/2010 data set and is of the opinion that the protocols in place during this period meet or exceed industry best practices.

In 2011, Molycorp completed an expanded assay program using a combination of existing core samples and additional drilling in the resource area. Molycorp conducted an additional 395 assays for individual light rare earths. Table 9-3 presents the summary statistics for this assay program.

Table 9-3: Light Rare Earth Oxide Distribution Statistics: 2011 Analyses

Statistic	La_2O_3	CeO_2	Pr_6O_{11}	Nd_2O_3	Sm_2O_3
Number of Samples	395	395	395	395	395
Mean Fraction of TREO	0.327	0.500	0.043	0.121	0.009
Standard Deviation	0.019	0.010	0.003	0.012	0.002
Coefficient of Variance	0.060	0.019	0.077	0.101	0.242
Minimum	0.27	0.46	0.02	0.09	0.01
Maximum	0.37	0.54	0.05	0.16	0.02
Range (Min – Max)	0.102	0.075	0.028	0.070	0.016

Source: SRK, 2012

Similar to the 2009 and 2010 statistical summary, the 2011 analyses corroborate the relative light rare earth oxide distribution as a function of TREO. The standard deviation and associated coefficient of variation represent a wider range of variability but still suggest a narrow overall range for light rare earth distribution and that the data are consistent.

SRK combined the 2009 through 2011 light rare earth assays and calculated summary statistics for each light rare earth. Table 9-4 presents the results of this combined analysis of light rare earths.

Table 9-4: Light Rare Earth Oxide Distribution Statistics: 2009, 2010 and 2011 Analyses

Statistic	La_2O_3	CeO_2	Pr_6O_{11}	Nd_2O_3	Sm_2O_3
Number of Samples	798	798	798	798	798
Mean Fraction of TREO	0.326	0.499	0.043	0.121	0.009
Standard Deviation	0.023	0.015	0.003	0.012	0.002
Coefficient of Variance	0.069	0.031	0.076	0.098	0.240
Minimum	0.258	0.444	0.022	0.092	0.005
Maximum	0.410	0.611	0.051	0.171	0.021
Range (Min – Max)	0.151	0.167	0.028	0.079	0.016

Source: SRK, 2012

The combined dataset of 798 individual assays provides a robust basis to define the distribution of light rare earths in the target carbonatite mineral, bastnaesite.

SRK examined the individual assay parameters for the 2009 and 2010 drilling campaigns. Table 9-5 presents the results of this examination. The mean TREO% of this dataset is 7.96%, indicating that the majority of assayed samples are likely above the 5% TREO cut-off grade. Standard deviations are greater than 50% of the mean estimates. SRK notes that as mean TREO grades are reduced in future mining, it is recommended that the applied LREO applied concentrations are revised and evaluated to whether adjustments are warranted.

Table 9-5: Light Rare Earth Oxide Assay Statistics: 2009 and 2010 Analyses

Statistic	La_2O_3	CeO_2	Pr_6O_{11}	Nd_2O_3	Sm_2O_3
Length (ft)	1,972	1,972	1,972	1,972	1,972
Number	395	395	395	395	395
Mean Grade (%)	2.652	3.970	0.336	0.932	0.067
Standard Deviation	1.69	2.35	0.19	0.51	0.03
Coefficient of Variance	0.637	0.593	0.579	0.546	0.511
Minimum Grade (%)	0.80	1.35	0.11	0.35	0.03
Maximum Grade (%)	7.81	10.84	0.95	2.68	0.21
Abs Diff Grade (%)	7.01	9.49	0.85	2.33	0.18

Source: SRK, 2012

9.1.5 Analysis of Heavy Rare Earth Oxide Assays

Based on a limited re-assaying program of 210 five ft composite samples from eight of the 2009 Mountain Pass drillholes, the HREO+Y subtotal expressed as a proportion of LREO+HREO+Y is on average 0.8% in the high-grade samples (TREO>5%), 1.8% in low to medium grade samples (TREO 2% to 5%) and 2.2% in the lowest grade samples (TREO<2%). Table 9-6 summarizes the results per element for the three grade categories.

SRK notes that while this data shows the presence of these heavy rare earths in the Mountain Pass deposit, given the majority of historical sampling does not include analysis for these elements, they have been excluded from the mineral resource estimate given the uncertainty around the consistency of distribution across the deposit. Further investigation is recommended to improve the understanding and confidence in average grade distributions prior to inclusion of these elements in the mineral resource statement.

Table 9-6: Heavy Rare Earth Summary

	Assay Grade (%)			Proportion of LREO+HREO+Y		
	Grade Category			Grade Category		
	>5%	2%-5%	<2%	>5%	2%-5%	<2%
Y_2O_3	0.02	0.02	0.01	0.21%	0.66%	0.79%
La_2O_3	2.85	0.75	0.33	33.4%	30.4%	29.1%
CeO_2	4.19	1.20	0.55	49.1%	48.8%	49.0%
Pr_6O_{11}	0.36	0.11	0.05	4.25%	4.52%	4.67%
Nd_2O_3	0.98	0.32	0.15	11.5%	13.2%	13.8%
Sm_2O_3	0.07	0.03	0.01	0.86%	1.21%	1.34%
Eu_2O_3	0.013	0.006	0.003	0.15%	0.24%	0.27%
Gd_2O_3	0.021	0.011	0.006	0.25%	0.46%	0.53%
Tb_4O_7	0.004	0.002	0.001	0.05%	0.06%	0.08%
Dy_2O_3	0.006	0.004	0.002	0.07%	0.17%	0.20%
Ho_2O_3	0.001	0.001	0.001	0.01%	0.03%	0.05%
Er_2O_3	0.005	0.002	0.001	0.06%	0.08%	0.09%
Tm_2O_3	0.001	0.001	0.001	0.01%	0.02%	0.04%
Yb_2O_3	0.001	0.001	0.001	0.01%	0.03%	0.05%
Lu_2O_3	0.001	0.001	0.001	0.01%	0.02%	0.04%
LREO	8.46	2.41	1.10	99.2%	98.2%	97.8%
HREO+Y	0.07	0.04	0.02	0.8%	1.8%	2.2%
LREO+HREO+Y	8.53	2.46	1.12	100%	100%	100%

Source: Molycorp, 2009

9.1.6 Results

Statistical comparison of the analytical results for the 108 core samples with the historical assay database values indicate the datasets are broadly comparable within tolerance limits. Results for the site-specific standards and duplicate samples were also within acceptable confidence limits.

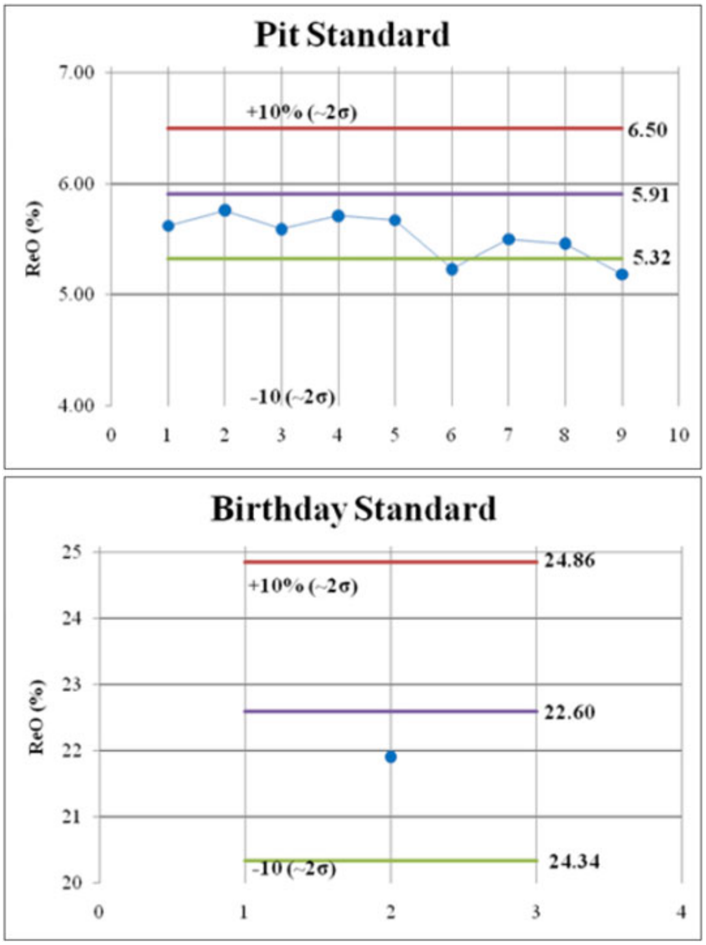
There were no blank failures indicating that there was no cross contamination during sample preparation. However, two failures were observed in the low-grade standard in the 2009 and 2010 QA/QC analysis at the Project. Only one high grade standard was inserted in the sample stream due to delays in creating this sample. Both standards performed lower than the expected value and the nine low grade standard analyses suggest instrument drift, based on a consistent downward slope in the graph over time.

In addition, one of the standards that failed was within a group of samples that showed acceptable correlation with the original sample. The standard failure may be due to failure to adequately determine the accepted mean and standard deviation of the standard samples. Table 9-7 lists the standards with expected analytical values and Figure 9-1 shows the results of the standards.

Table 9-7: Standards with Expected Analytical Performance

	Maximum TREO (%)	Median TREO (%)	Minimum TREO (%)
Pit Standard	6.50	5.91	5.32
Birthday Standard	24.86	22.60	20.34

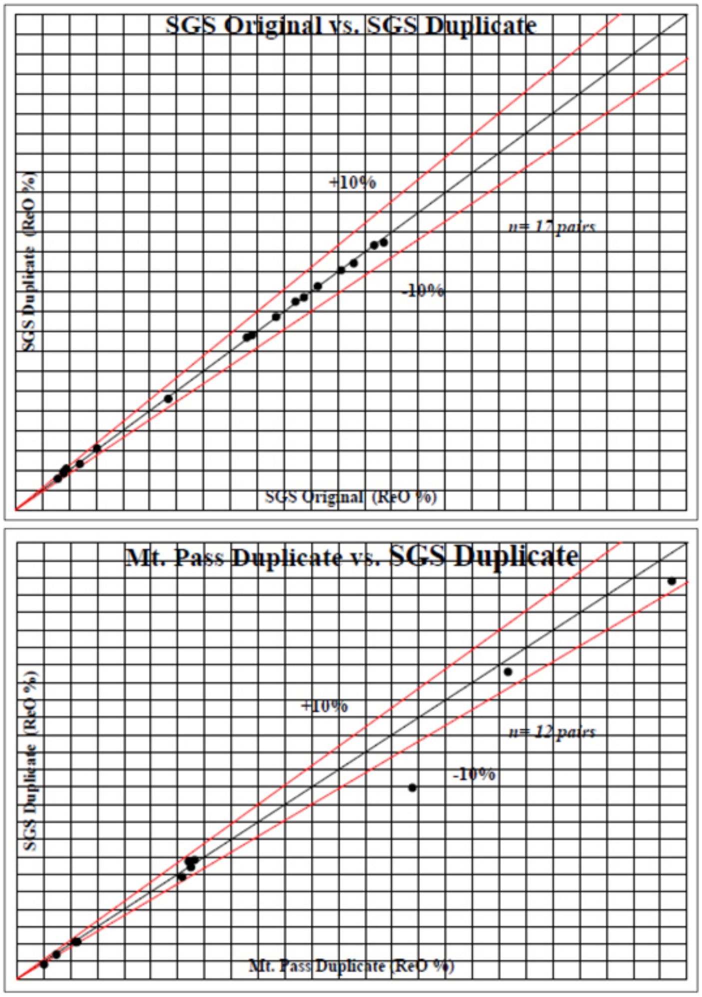
Source: SRK, 2012



Source: SRK, 2012

Figure 9-1: Results of Standard Analysis

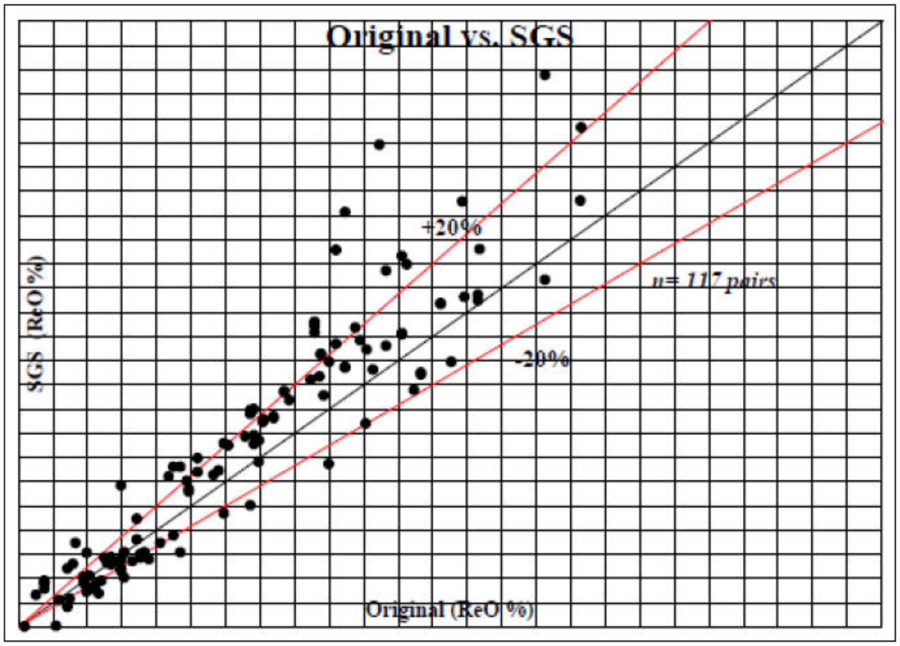
The Mountain Pass pulp duplicates showed satisfactory agreement with the SGS Lakefield original analyses being within ±10% with one failure. The blind pulp duplicate assay value pairs analyzed by SGS were all within ±10% of each other. These results are shown in Figure 9-2.



Source: SRK, 2012

Figure 9-2: Results of Pulp Duplicate Analysis

Overall, the historical Project analyses in the resource database are on average lower than the corresponding SGS Minerals analyses and the present-day Mountain Pass Laboratory analyses. This is shown in the scatterplot provided in Figure 9-3. SRK notes that the observed scatter between labs from this program is similar to the 2021 duplicate core samples submitted to ALS, indicating that there are likely minor differences in processing of samples between labs. It is SRK's opinion that these differences are considered immaterial as it applies to confidence of mineral resources.



Source: SRK, 2012

Figure 9-3: Results of Field Duplicate Analysis

9.2 Opinion on Data Adequacy

It is SRK's opinion that the database of geological and analytical data used to determine and classify mineral resources is appropriate to application of confidence categories.

The duplicate pulps assayed at Mountain Pass during this verification exercise show that assays generated by the internal Mountain Pass Laboratory provide a satisfactory comparison with the external laboratory of SGS Lakefield. SRK concludes that assay results from the 108-half core duplicate samples show minor scatter and variations which are partly due to the differences in grade from one half of the core to the other and partly due to laboratory precision. This conclusion is based upon the 2021 duplicate analysis as well. It appears that the historical samples which were prepared on site and assayed at the Mountain Pass Laboratory 20 years ago returned lower assay grades than those returned by SGS Lakefield based on the field duplicate analysis.

Overall, average grades for field duplicates submitted to ALS for the 2021 samples returned a lower grade of 3.4% TREO vs. the MP lab at 3.8%. Given the limited duplicate data set and the nature of there being no consistent bias observed, SRK notes that this remains unresolved at the time of this report. SRK strongly recommends that MP investigates the source of the variance in the duplicates from the 2021 sampling.

The production reconciliation has shown that the MRE model is generally reliable although demonstrably lower grade than the grade control data. The MRE grades are expectedly smoother than those in the grade control data which suggests opportunity to potentially improve the delineation of higher and lower grade populations in the resource model during future updates and iterations.

Overall, SRK is of the opinion that the historical analytical data in the database can support a level of confidence commensurate with long term resource estimation. Uncertainties in the underlying quality of the analytical data accounted for in mineral resource classification and compensated by the fact that Mountain Pass is an operating mine with ongoing production and reconciliation to support the long-term resource.

10 Mineral Processing and Metallurgical Testing

10.1 Background

MP Materials mines ore from the open pit, transports the ore to a primary crushing/stockpile facility and transports the ore to the mill. At the mill, the crushed material is ground further with a ball mill and conveyed via a slurry pipeline to the flotation plant to separate the bastnaesite from the gangue minerals. The primary product of the flotation process is a bastnaesite concentrate, which is filter dried and then transported to customers for sale or fed to the on-site separations facility. The discussion in Sections 10.2 and 10.3 have been prepared by SRK. MP Materials has determined SRK meets the qualifications specified under the definition of qualified person in 17 CFR § 229.1300.

MP Materials has recommissioned a rare earths separations facility that is ramping up, with full capacity expected to be achieved by the end of 2024. The separations facility allows the Company to separate the bastnaesite concentrate into four saleable products (PrNd oxide, SEG+ oxalate, La carbonate, and Ce chloride). The discussion of the separations facility in Section 10.4 has been prepared by SGS. MP Materials has determined SGS meets the qualifications specified under the definition of qualified person in 17 CFR § 229.1300.

10.2 Flotation Studies Versus Ore Grade

During the later years of mining operations at Mountain Pass, the ore grade is expected to decline. To assess TREO (total rare earth oxide) recovery from lower-grade ore, MP Materials conducted rougher flotation tests on ore samples over a grade range from 1.86% to 8.10% TREO using standard concentrator test conditions. Each test composite was prepared and assayed for the full suite of analyses shown in Table 10-1.

Rougher flotation tests were conducted on each test composite for a total retention time of eight minutes with concentrates collected at timed increments, which allowed the evaluation of TREO recovery versus concentrate grade. The results of these rougher flotation tests are summarized in Table 10-2.

TREO recovery versus concentrate grade was plotted for each test and is shown graphically in Figure 10-1 along with the corresponding grade versus recovery equation that was developed for each test composite. MP Materials has established from plant experience that a rougher flotation concentrate containing 25% TREO is required in order to produce a final upgraded cleaner concentrate containing 60% TREO.

Table 10-3 shows interpolated TREO recoveries for each test composite at a fixed 25% TREO rougher flotation concentrate grade. TREO recovery into the rougher concentrate increased from 29.0% to 83.4% as the feed grade increases from 1.9% to 8.1% TREO. Additionally, MP Materials reports that the concentrator recovers, on average, 83.1% of the TREO contained in the rougher flotation concentrate into a final cleaner flotation concentrate containing 60% TREO. As shown in Table 10-3, estimated overall REO recovery into a cleaner flotation concentrate containing 60% TREO increases from 24.1% to 69.3% as the ore grade increases from 1.9% to 8.1% TREO. A TREO recovery versus ore grade equation was developed by MP Materials based on these results.

Table 10-1: Head Analyses for Grade Range Test Composites

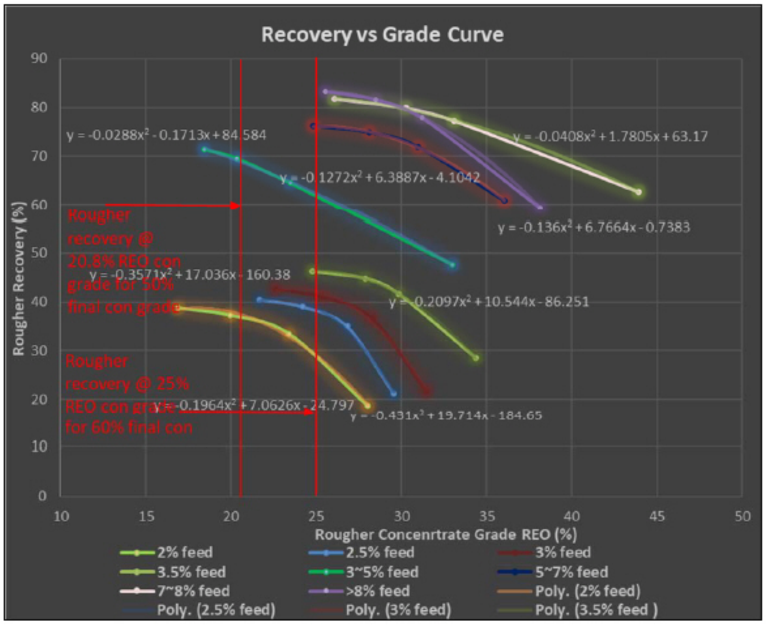
Composite	TREO (%)	La_2O_3 (%)	CeO_2 (%)	Pr_6O_{11} (%)	Nd_2O_3 (%)	MnO (%)	Fe_2O_3 (%)	Al_2O_3 (%)	BaO (%)	CaO (%)	SiO_2 (%)	MgO (%)	P_2O_5 (%)	SrO (%)
2019 test 3~5%	3.22	1.00	1.61	0.07	0.23	0.30	6.11	6.63	9.60	13.13	28.12	3.32	0.52	2.60
2020 test 3~5%	3.92	1.25	2.02	0.12	0.34	0.30	5.94	5.28	9.57	16.36	22.04	3.51	0.63	3.24
2020 test 5~7%	5.65	1.84	2.92	0.20	0.62	0.31	5.17	5.22	9.99	15.02	23.10	2.71	0.48	3.91
2020 test 7~8%	7.13	2.33	3.68	0.28	0.88	0.30	4.63	5.41	9.74	13.42	24.57	1.92	0.32	4.23
2020 test > 8%	8.10	2.70	4.18	0.33	0.89	0.45	3.46	2.03	15.70	18.96	9.85	4.26	0.51	1.99
2021 test 2%	1.86	0.57	0.93	0.07	0.12	0.17	4.55	10.56	3.99	7.93	46.23	3.48	0.31	0.73
2021 test 2.5%	2.70	0.82	1.35	0.10	0.22	0.20	4.40	9.29	5.54	8.78	41.52	3.42	0.35	0.98
2021 test 3%	3.22	0.98	1.61	0.13	0.29	0.22	4.29	8.55	6.49	9.98	37.18	3.75	0.38	1.00
2021 test 3.5%	3.46	0.99	1.73	0.02	0.39	0.26	4.67	9.57	7.09	11.00	31.98	4.57	0.40	1.42

Source: MP Materials, 2021

Table 10-2: Cumulative Rougher Flotation Concentrate Grade and Recovery Versus Ore Grade

Ore Grade	Cumulative Ro Conc Grade (TREO%)				Cumulative TREO Recovery (%)			
REO %	Ro Conc-1	Ro Conc-2	Ro Conc-3	Ro Conc-4	Ro Conc-1	Ro Conc-2	Ro Conc-3	Ro Conc-4
1.86	28.0	23.4	20.0	16.9	18.7	33.5	37.3	38.7
2.70	29.6	26.8	24.2	21.7	21.2	35.0	39.1	40.5
3.22	31.5	28.2	25.4	22.6	21.7	36.8	41.0	42.6
3.46	34.4	29.8	27.9	24.8	28.5	41.6	44.8	46.2
3.92	33.0	23.5	20.3	18.4	47.6	64.5	69.7	71.4
5.65	36.1	31.0	28.1	24.8	60.9	71.9	74.9	76.2
7.13	43.9	33.1	30.3	26.1	62.6	77.2	79.8	81.8
8.10	38.2	31.2	28.5	25.5	59.4	77.9	81.6	83.3

Source: MP Materials, 2021



Source: MP Materials, 2021

Figure 10-1: TREO Rougher Flotation Recovery versus Concentrate Grade for Different Feed Grades

Table 10-3: Estimated Rougher and Cleaner Flotation REO Recovery (1)

Head Grade	Rougher Concentrate		Estimated Cleaner Concentrate	
TREO (%)	TREO (%)	TREO Recovery (%)	TREO (%)	TREO Recovery (%) (2)
1.86	25	29.0	60	24.1
2.70	25	38.8	60	32.2
3.22	25	42.3	60	35.1
3.46	25	46.3	60	38.5
3.91	25	62.3	60	51.7
5.65	25	76.1	60	63.2
7.13	25	82.2	60	68.3
8.10	25	83.4	60	69.3

Source: MP Materials, 2021
(1) Based on 25%TREO Rougher Concentrate Grade and 60% TREO Cleaner Concentrate Grade
(2) Plant cleaner flotation unit recovery: 83.1%

10.3 Concentrator Recovery Estimate

The TREO recovery versus ore grade relationship developed by MP Materials based on the results of rougher flotation tests over a range of feed grades is shown on Figure 10-2. TREO recovery versus ore grade is expressed by the following relationship which is capped at 70% recovery to conservatively reflect actual plant performance:

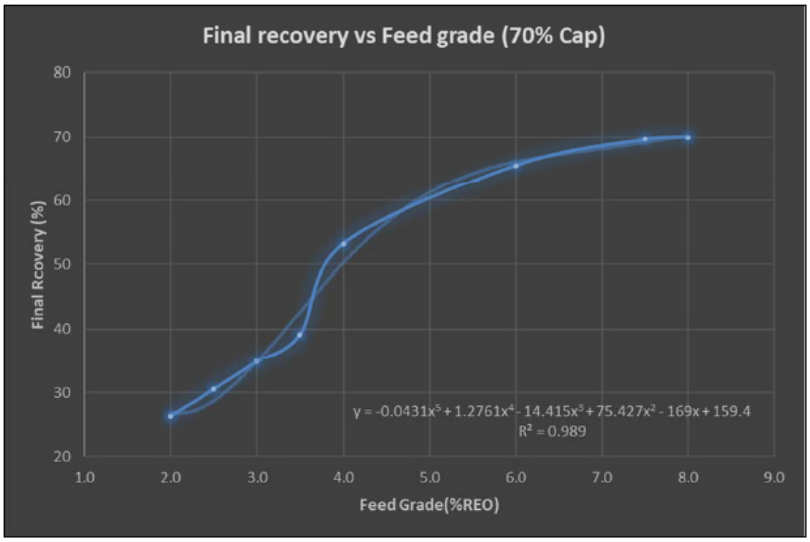
$$Y = -0.0431x^5 + 1.2761x^4 – 14.415x^3 + 75.427x^2 – 169x + 159.4$$

Where:

Y = TREO recovery % into the cleaner flotation concentrate at a grade of 60% REO

x = Ore grade: REO%

At ore grades less than 2% TREO this recovery relationship is not valid and begins to estimate incrementally higher REO recoveries. To address this issue, SRK has interpolated REO recovery at 22% for the ore grade increment of 1.5% to 2.0% TREO and zero % recovery for ore grades less than 1.5% TREO. SRK is of the opinion that the data relied upon is adequate for the purposes of estimating concentrator recoveries across the anticipated range of mill feed grades.



Source: MP Materials, 2021

Figure 10-2: TREO Recovery to Cleaner Flotation Concentrate versus Feed Grade

10.4 Separation of Individual Rare Earths

The findings put forth by SGS are based on decades of process data, implied results from MP Materials' current customers, plant data from the same assets operating between 2012-2015, bench data, and pilot data. For the purposes of this report, it was assumed that the separations facility ramp up will follow a Type 2 McNulty curve, resulting in feeding 100% of concentrate production into the facility by 2025.

10.4.1 Metallurgical Testwork

MP Materials has conducted extensive pilot testing to both generate data to design circuits and to confirm existing legacy data. There are 11 primary processes that make up the separations ("Stage 2") operation; they are outlined in Figure 10-3 below.

Process	Data Source	Analytical Results
1 Concentrate Drying & Roasting	Historical Data (1965-1998); customer data; pilot data (small/large scale)	MP & 3rd Party Laboratories
2 Leaching Impurity Removal	Historical Data (1965-2011); 3rd party lab; pilot data (small/large scale)	MP & 3rd Party Laboratories
3 HREE/LREE Separation	Plant data (2012-2015); pilot data (small/large)	MP & 3rd Party Laboratory
4 PrNd Separation	Plant data (2012-2015); pilot data (small scale)	MP Laboratory
5 PrNd Finishing	Plant data (2012-2015); 3rd party lab testing; pilot data (small scale)	MP & 3rd Party Laboratories
6 La Finishing	Plant data (2012-2015); 3rd party lab testing; pilot data (small scale)	MP & 3rd Party Laboratories
7 Ce Finishing	Plant data (2012-2015); pilot testing (small scale)	MP, 3rd Party Laboratory, Customer qualification
8 SEG+ Finishing	Plant data (2012-2015); pilot data (small scale); interference testing	MP Laboratory; 3rd Party Laboratory; Customer Data
9 Brine Recovery, Treatment, Crystallizing	Plant data (2012-2015); pilot data (small scale); vendor testing/engineering	MP & 3rd Party Laboratories

Source: MP Materials, 2021

Figure 10-3: Primary Processes for Stage 2 Operation

Details of the test work performed are as follows.

Concentrate drying and roasting: roasting of bastnaesite concentrate began at Mountain Pass in 1965 or 1966. Roasting of bastnaesite is known to convert the carbonates into oxides with the salutary effect of converting much of the trivalent cerium to the tetravalent state, which is largely insoluble. The roasting conditions are critical to leach recovery. Consequently, roasting is a most important thermal step that will allow for economical downstream rare earth processing. Legacy records from the multi-hearth furnace (that remains onsite) suggested a roasting temperature of approximately 600°C. To confirm these figures, MP Materials conducted initial scoping studies of different roasting temperatures and roasting residence times at Hazen Research. The roasted concentrate was then leached at various temperatures and acid consumption levels to confirm recoveries of trivalent rare earth elements (REEs) and rejection of cerium. This testing was then scaled up by sending at least 5 st of concentrate to multiple outside labs and tolling facilities. These organizations performed larger scale roasting exercises using their pilot equipment. These samples were sent to SGS Lakefield for further confirmatory testing. These tests confirmed the optimal process conditions. Lastly, an approximately 2 st batch of roasted concentrate was leached at MP Materials' Cerium 96 plant in two large reactors to confirm the scalability of the results. Subsequent smaller scale leach tests using the same roasted concentrate have been performed to optimize the timing and temperature of HCl to further enhance PrNd recovery and Ce rejection.

Leaching: given the interconnectedness of roasting with the leach steps, leaching pilot studies were used to confirm both the effectiveness of the roasting conditions and the optimization of leach conditions. As mentioned above, testing was performed at several outside laboratories, and MP Materials' pilot plant. The results were duplicated on a larger scale in MP Materials' Cerium 96 plant. To mirror the temperature control and flexibility provided in MP Materials' multi-stage, temperature-controlled reactors, MP Materials upgraded its small-scale leach pilot facility to incorporate better temperature control than was available in the Cerium 96 plant or at outside laboratories. This generated the best results, superior to those of previous tests. Notwithstanding, MP Materials has used the more conservative recovery estimates to underly its pre-feasibility study for the separations facility.

Impurity Removal: following the leach step and the removal of the cerium concentrate and insoluble impurities, the next stages initiate the removal of remaining impurities. The primary end point is the removal of iron, uranium, aluminum, and any other salts that may be partially solubilized with the potential to produce solids (i.e., CRUD – defined as interphase suspended solids or emulsions) in the solvent extraction circuits. These circuits were operated by MP Materials' predecessor from 2012-2015. Plant data confirms that these circuits operated with few major issues. Improvements include a new thickener, filter press, and a pressure leaf filter to ensure full removal of precipitated solids induced by pH adjustment. Also, the installation of a system to add filter aid to assist in the solid-liquid separation stage of additional impurities is expected to further reduce the risk of CRUD formation in the (solvent extraction) SX circuits and improve consistent throughput. SGS Lakefield pilot tests for impurity removal and MP Materials own pilot tests confirm the ability to successfully remove sufficient iron, uranium, and dramatically reduce aluminum prior to SX. A secondary bulk extraction is then performed to remove rare earths from remaining impurities, in particular the cations Ca and Mg. Historical plant data demonstrates that this system operated largely without major complications. The removal of a significant portion of the cerium during leaching will offset the increased volumetric flow which will result from higher concentrate production. MP Materials has conducted several pilot plant runs using glass mixer-settlers to produce feed for heavy REE separations and (solvent extraction didymium) SXD pilot plant experiments to further minimize CRUD formation. All these studies have confirmed high recovery and purity of the RE-enriched preg solution.

SXH: a bulk separation of the heavy rare earths (SEG+) fraction from light rare earth element (LREE) will be performed in solvent extraction heavies (SXH). Previous plant operating experience between 2012-2015 and MP Materials' modeling confirms that this plant is adequately sized to ensure clean separation of Sm+ from Nd while minimizing losses of Nd into Sm. The separation factor between Sm and Nd is large (aided largely by the absence of Pm in nature), so MP Materials has not performed any additional piloting on this circuit.

SXD: the SXD circuit separates a PrNd stream from the La and residual Ce in the SXH raffinate. SXD operated smoothly under the predecessor entity and sufficient data exists from the later months to conclude that once in equilibrium, the ability to make on-spec PrNd is confirmed. However, MP Materials is pursuing an additional separation in this facility involving the elimination of the need for a separate cerium removal stage.

PrNd Finishing: precipitation of PrNd from the chloride media has been piloted at SGS Lakefield as well as in MP Materials' pilot plant. Both carbonate and oxalate experiments were conducted and analyzed for rheology, particle size, settling rate, impurities, ability to meet market product specifications, and determination of equipment sizing. The products were analyzed by a 3rd party laboratory and MP Materials' analytical laboratory. The finishing circuit has been designed for maximum flexibility for product precipitation and high-purity finishing based upon testing performed by MP Materials, 3rd party laboratories, and equipment vendors.

La Finishing: lanthanum precipitation by soda ash, solid liquid separation, drying and calcining tests were conducted at 3rd party laboratories, and in MP Materials' pilot plant to confirm rheology, equipment sizing, and the ability to meet market specifications. The implementation of a 2-stage (countercurrent decantation) CCD solid-liquid separation circuit is anticipated to improve spent leach solution (SLS), minimize losses, and improve product quality. This approach was demonstrated in several pilot plant runs.

PhosFIX™ Finishing: a multi-month pilot study conducted by MP Materials demonstrated the ability to produce a clean cerium chloride solution for sale into the water treatment market. This confirmed previous modeling studies. The laboratory data were confirmed by MP Materials' laboratory and by mass balances. The wide range of acceptable La to Ce ratios means that little additional pilot work has been necessary.

SEG+ Finishing: MP Materials plans to use the same SEG+ finishing assets as previously employed from 2012-2015 with minimal change. Legacy plant data confirms that the equipment is appropriately sized and designed, so no additional testing was performed.

Brine Recovery, Treatment, Crystallizing: MP Materials has conducted several rounds of pilot studies taking appropriate mixtures of brine from previously operated facilities and SX pilot plant investigations to produce a representative brine. Additional flocculant testing and soda ash precipitation has been conducted in several runs to confirm the ability to perform adequate solid/liquid separation. MP Materials plans an upgrade to the brine recovery circuit, including the addition of an additional filter press (like in kind), and a pressure leaf filter as a final polishing step. These will facilitate removal of non-sodium salts, to be disposed on site, prior to sending the sodium chloride solution to the brine evaporator and crystallizer. As no material chemical changes are expected, the major focus has been on confirming adequate equipment sizing. Legacy plant data combined with SysCAD modeling confirm that there should be sufficient redundancy to handle the expected volume. A salt crystallizer is being designed to handle the expected plant flow (including an engineering factor). A conservative brine assay was provided to confirm suitability of the materials of construction as well as throughput. The existing brine evaporator ran smoothly to service the chlor-alkali plant (that is not slated for restart until a later date) and is being repositioned to optimize the crystallizer feed solution. No direct piloting of the crystallizer has been performed, though the vendor has provided a performance guarantee.

10.4.2 Representativeness of Test Samples

The Mountain Pass ore body has been consistent over 70 years of regular mining, beneficiation, and processing. The mineral resource and mineral reserve estimates presented in this Technical Report Summary forecast a similar mineralogy over the life of mine. For this reason, the pilot results are considered to be representative of the results to be expected for the deposit as a whole.

The most critical steps in the entire hydrometallurgical and separation process are the roasting and leaching steps. These steps are critical for cracking the bastnaesite mineral as well as maximizing trivalent recovery and minimizing cerium recovery that underlie the processing of the Mountain Pass ore. MP Materials has extensively piloted roasting and leaching variations from concentrate produced over different periods (early 2018, 2019, 2020, and 2021) and has always found the optimal results utilize similar conditions. Testing was conducted by 3rd party laboratories, various vendors and cross-checked with legacy data, verified as consistent with Chinese processing conditions, and further piloted at bench, pilot, and commercial scale at MP Materials. These optimized conditions, apparently not coincidentally, were nearly identical to those practiced by its predecessor from 1966 to 1998.

This suggests that within the typical volatility of the ore body, these roasting and leaching conditions have produced the optimal results over time. In recent years, MP Materials has shipped approximately

100,000 metric tonnes of REO to different processors in China. MP Materials understands that the vast majority of its customers pursue a similar hydrometallurgical process as is planned by MP Materials. Despite the concentrate being produced from different mining phases of the open pit (and different ore blends and final concentrate grades), the sales pricing framework has remained largely intact. This suggests that the leaching recovery has been consistent over the four-year period, providing further comfort of the representativeness of the samples tested.

Once the bastnaesite has been leached, it is not expected that variations in mineralogy will materially impact plant performance. Therefore, satisfaction of consistent leachability should provide sufficient support for the assumption of the suitability of the process design for life of mine.

10.4.3 Analytical Laboratories

MP Materials has been supported in its process design effort by a number of institutions and laboratories, as shown in Table 10-4. With the exception of MP Materials' own analytical and engineering laboratories, all are fully independent of MP Materials and were compensated on a fee-per-service basis with no compensation tied to results achieved.

Table 10-4: Analytical Laboratories

Name	Location	Certification
Hazen Research, Inc.	Golden, Colorado, USA	https://www.hazenresearch.com/capabilities/analytical-laboratories
SGS Lakefield	Lakefield, Ontario, Canada	https://www.scc.ca/en/system/files/client-scopes/ASB_SOA_15254-Scope_v2_2021-07-30.pdf
Paterson & Cooke USA Ltd	Golden, Colorado, USA	http:///www.dcmsciencelab.com/certifications/ through DCM Science Laboratories
Golder Associates Inc.	Lakewood, Colorado, USA	https://acz.com/index.php/certifications/ through ACZ Laboratories Inc.

Source: MP Materials, 2021

10.4.4 Separations Facility Recovery Estimates

In order to design, size, and optimize the operation of the circuits in the Stage 2 process, MP Materials has analyzed legacy plant data and conducted (and continues to conduct) a range of bench-scale and larger-scale pilot activities. The primary end points relate to the following, summary data of which will be explained in more detail in the subsequent sections:

1) Optimizing roasting and leaching conditions to maximize trivalent (La, Pr, Nd, SEG+) rare earth recoveries while maintaining cerium recovery below 20%
2) Ensuring sufficient settling rate of cerium concentrate with clear thickener overflow
3) Efficient iron and uranium removal with minimal REE loss
4) pH adjustment and further impurity removal with minimal trivalent REE loss
5) Clean separation of Nd from Sm, with a focus on minimizing Sm into the raffinate stream (i.e., into Nd)
6) Clean separation of PrNd from La and Ce along with pure La and on-spec Ce (with no more than 20% La)
7) Sufficient settling of PrNd oxalate with clear overflow and low impurities
8) Sufficient settling and purity of lanthanum carbonate

9) Ability to remove non sodium (Na) impurities from brine stream to feed the crystallizer, allowing for relatively pure sodium salt (non-Resource Conservation and Recovery Act) discharge that could be either sold or disposed onsite in the Northwest Tailings Disposal Facility (NWTDF)

The data confirms the recovery figures shown in Figure 10-4.

Overall Recovery: Concentrate to Finished Products	
Lanthanum	78.5%
Cerium	9.2%
Praseodymium/Neodymium	89.6%
SEG+	97.8%

Source: MP Materials, 2021
Note: SEG+ includes the impact of LREE losses into SEG+ stream (considered an impurity)

Figure 10-4: Recovery Estimates

Summary of Continuous Roasting and Leaching

Experimental Conclusions

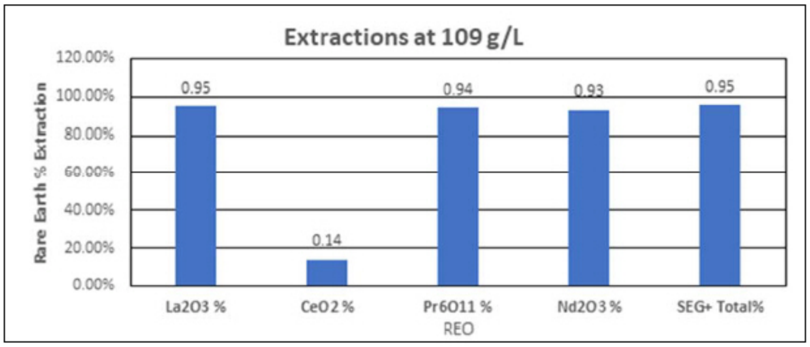
For the leach pilot, an optimal extraction of 94.63% Nd_2O_3 and %Pr_6O_{11} and %SEG+ was achieved at 109 grams per liter (g/L) REO in pregnant leach solution (PLS). Respective Ce extraction was 13.90%. During the stabilized run of the pilot, the highest achievable consistent g/L was 125 to 127 g/L. The respective optimal cerium extraction achieved was 9.57%.

Experiment Background and Objectives

During previous runs of the REE separation circuit at Mountain Pass, further downstream processes were required to separate cerium from the blend of rare earth elements in the concentrate. The purpose of this pilot was to show that parametric optimization of the roasting and leaching conditions in the leach circuit can result in the rejection of 80%+ cerium oxide and the extraction of 90%+ PrNd and SEG+ Oxides.

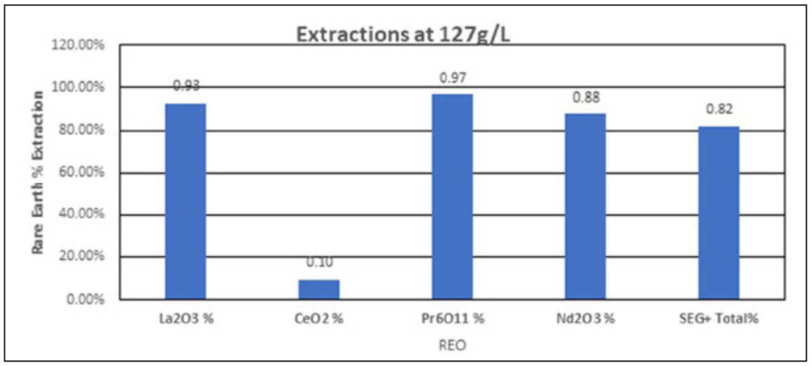
Experiment Metrics

Experiment results are presented in Figure 10-5 and Figure 10-6 and in Table 10-5 through Table 10-7.



Source: MP Materials, 2021

Figure 10-5: Extraction of Rare Earth Oxides at 109 g/L with 93+% PrNd



Source: MP Materials, 2021
Note: Lower extraction of Nd2O3 and SEG+

Figure 10-6: Extraction of Rare Earth Oxides at 127 g/L

Table 10-5: Feed Conditions that Resulted in Optimal Extractions at 109 g/L

Ore Feed Rate (g/min)	RO Water (mL/min)	HCl TK2 (mL/min)	HCL TK3 (mL/min)	HCL TK4 (mL/min)	HCL TK5 (mL/min)	HCL TK6 (mL/min)	Total Volume Pilot Tanks (mL)	Residence Time Distribution (hours)
8.3	18.3	1.8	1.4	1.4	1.4	1	17,500	9.55

Source: MP Materials, 2021
Note: “g/min” is grams per minute; “mL/min” is milliliters per minute.

Table 10-6: Test Material Feed Composition by % Solid REO

La_2O_3%	CeO_2%	Pr_6O_{11}%	Nd_2O_3%	SEG%+
24.4	37.7	3.3	8.5	1.5

Source: MP Materials, 2021

Table 10-7: Outlet Stream Composition by g/L REO at 109 g/L

La_2O_3 g/L	CeO_2 g/L	Pr_6O_{11} g/L	Nd_2O_3 g/L	SEG g/L
62.034	13.739	7.939	22.095	3.3139

Source: MP Materials, 2021

Summary of Leach Slurry Settling Tests

Experimental Conclusions

With the assistance of two vendors, MP Materials evaluated various anionic high molecular weight dry flocculants mixed at 0.20% and dosed into 500 mL samples of well mixed slurry. It was found that two worked best at a minimal dosage of 40 ppm for all 3 CCD thickeners. For CCD 1, this translated to 1,012 grams per metric tonne (g/t) dosages and for CCD 2 and 3 translated to approximately 909.1 g/t. See Table 10-8 below for full breakdown.

Experiment Background and Objectives

Tests were performed on the CCD 1 thickener feed slurry with both vendors' products. Two products of similar settling efficacy were found.

Experiment Metrics

Experiment results are presented in Table 10-8. NTU (as a measure of clarity) refers to nephelometric turbidity unit.

Table 10-8: Settling Test Results Including Overflow Clarity with Various Flocculants and Dosages

CCD	Test Product #	Dose (PPM)	Minimum Dosage (grams/metric tonne)	Size	Settle	Clarity (NTU)
1	1	40	1,012.0	Small	Fast	28
1	2	40	1,012.0	Small	Med.	1000+
1	3	40	1,012.0	Small	Fast	428
1	4	40	1,012.0	Small	Med.	1000+
1	1	40	1,012.0	Small	Fast	23
1	5	40	1,012.0	Small	Fast	38
1	6	40	1,012.0	Small	Fast	113
1	1	40	1,012.0	Small	Fast	50
1	7	40	1,012.0	Small	Fast	36
1	2	40	1,012.0	Small	Med.	1000+
1	7	40	1,012.0	Small	Fast	29
1	1	40	1,012.0	Small	Med	29
2	1	40	909.1	Small	Fast	45
3	1	40	909.1	Small	Fast	31
1	8	40	1,012.0	Small	Fast	31
1	8	40	909.1	Small	Fast	31
1	8	40	909.1	Small	Fast	31

Source: MP Materials, 2021

Summary Fe/U Loading and Losses

Experimental Conclusions

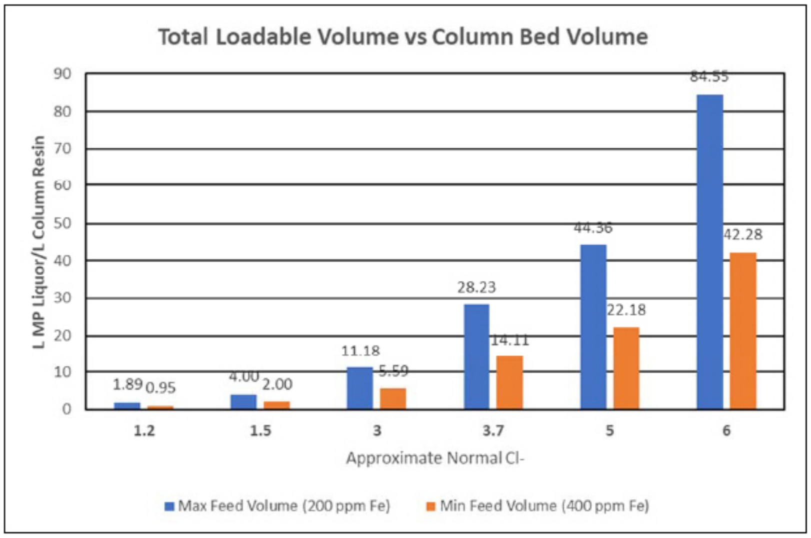
The range of Fe in MP Materials' leach solution exists nominally within a range of 200 to 400 ppm, and, as such, ion exchange loading capacity is reported as a range respective to these two conditions. With the addition of 12N HCl and a 10% dilution of the feed solution, it is possible to reach a loading capacity of 0.95 to 1.89 L mother liquor/L column resin. With the addition of 1.8 N NaCl and a 10% dilution of the feed solution with 12N HCl (total Cl- of 3N), that number can be increased to 5.59 to 11.18 L mother liquor/L column resin. It was determined that 250 g/L of solid NaCl (4.27 Mol Cl-) can be safely added to further boost the loading capacity of the resin and that NaCl should be dissolved first to avoid the formation of sodium hydride salts in the reactor. At a 20% dilution with 12N HCl, this would increase the loading capacity to 22.18 to 44.36 L mother liquor/ L column resin. Mass balances of the rare earths that hover between 98% and 102% indicate analytical statistical error and are not indicative of rare earth losses to the resin. However, loading of iron and uranium can be observed as shown in the mass balance of cell 10 of Table 10-10.

Experimental and Objectives

The objective of these experiments is to alter the Cl- composition of the feed stock leach liquor to improve loading capacity of the Fe/U IX columns. This is achieved with the addition of HCl and NaCl.

Experimental Metrics

Experiment results are presented in Figure 10-7, Table 10-9, and Table 10-10.



Source: MP Materials, 2021

Figure 10-7: Volumes of Leach Liquor per Volume of Resin Required Before a Regeneration Cycle

Table 10-9: Assays of Feed, Cell of Complete Rare Earth Breakthrough, and Cell of Fe/U Bleed

Sample ID	La_2O_3 g/L	CeO_2 g/L	Pr_6O_{11} g/L	Nd_2O_3 g/L	Fe mg/L	Na mg/L	U mg/L
INFLB Cell 10	36	22.14	5.69	21.91	2.7	34840.9	0.1
INFLB Cell 78	36.47	22.4	5.56	22.1	65.3	34257.3	5.3
INFLB Feed	36.89	22.53	5.54	22.55	129.7	34195.9	19.1

Source: MP Materials, 2021

Table 10-10: Mass Balance Calculations for Outlet Streams at Various Fractions

Sample ID	La/La Feed	Ce/Ce Feed	Pr/Pr Feed	Nd/Nd Feed	Fe/Fe Feed	Na/Na Feed	U/U Feed
INFLB Cell 10	97.59%	98.27%	102.71%	97.16%	2.08%	101.89%	0.52%
INFLB Cell 78	98.86%	99.42%	100.36%	98.00%	50.35%	100.18%	27.75%
INFLB Feed	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: MP Materials, 2021

Summary of Impurity Removal

The Impurity Removal circuit is designed to achieve a high purity SX feed. First the pH of the liquor is increased by the addition of 32% NaOH solution to the highest practical value with less than 1% of rare earth losses. This process was piloted at Mountain Pass in Summer 2021 to attain process parameters. A secondary goal of the pilot work was to determine whether this could serve as the primary aluminum-removal step for MP Materials' entire plant process.

Figure 10-8 shows a before and after for the steady-state operation of the pilot effort. The assay for “T2 Shift Avg” represents the product stream of this pilot work. The absolute concentrations are listed as well as the adjusted values.

Sample ID	La2O3 g/L	CeO2 g/L	Pr6011 g/L	Nd2O3 g/L	Sm2O3 g/L	Eu2O3 g/L	Gd2O3 g/L
Fe/U-removed leach liquor	27.065	30.054	4.386	19.510	3.953	0.247	0.163
T2 Shift Avg - Absolute	24.093	26.003	3.986	17.862	3.634	0.219	0.148
T2 Shift Avg - Dilution Adjusted	26.310	28.396	4.353	19.505	3.969	0.239	0.162
T2 % Loss	2.79	5.52	0.76	0.03	-0.39	3.01	0.95

Source: MP Materials, 2021

Figure 10-8: Mass Balance

The pilot effort also showed that an additional aluminum removal step will continue to be required.

Summary of SXI Recovery / Mass Balance

A subsequent impurity removal stage has two main functions in the overall MP Materials flowsheet:

- Remove the divalent impurities from the leach liquors
- Increase the concentration of rare earth elements feeding solvent extraction

One of the relevant modifications in the circuit from the legacy operations is that around 10% of the lanthanum present in the feed stream will be intentionally rejected. The process was tested on a pilot scale for a total of 10 weeks to achieve statistical process control.

Summary of SXH Recovery / Mass Balance

The SXH circuit which follows the solvent extraction impurities (SXI) circuit in the overall MP Materials flowsheet, receives the purified SX solution as the feed, after a stage of pH adjustment. The primary functions of the SXH circuit in the circuit are:

- To separate the heavy fraction (i.e., the SEG+ elements) from the light rare earths (i.e., LaCePrNd fraction). The light REE fraction is subsequently separated in the SXD circuit
- To concentrate the SEG+ fraction from ~20 g/L to ~350 g/L in the preg stream

The process has three input streams as shown below in Figure 10-9; Feed, NaOH, and HCl. There are two output streams: Raffinate containing the light REs, and the heavy RE-enriched preg stream.

Source: MP Materials, 2021

Figure 10-9: Diagram of the SXH Process

The process was run on a pilot scale using a synthetic feed produced by blending SXI preg with heavy rare earth element (HREE) concentrate produced from the legacy circuit. Although the REO distribution in the synthetic feed does not match what would be encountered in the full-scale plant, the outcome of the testing would be the same at plant conditions. Piloting feed concentrations were adjusted to provide a reasonable timeframe for results.

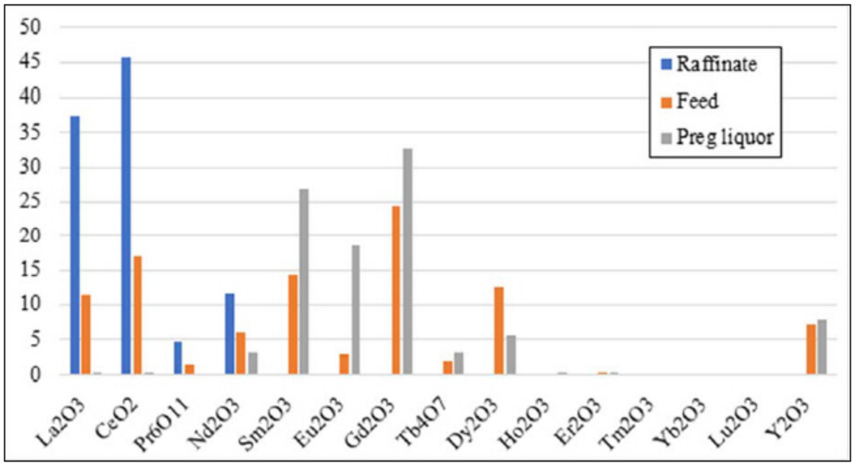
The process control of the circuit was done by complexometric titrations to measure the REO concentrations in different streams of the circuit. Additionally periodic samples were analyzed by ICP-MS to evaluate the efficacy of the process. The concentrations of relevant species, i.e., Pr, Nd and Hv (abbreviation for SEG+ fraction), in the pilot during steady state are given in Table 10-11 with the flowrates.

Table 10-11: Volumetric Flowrates of Different Streams along with Mass Flowrates of Different Components

	Feed	NaOH	Scrub	Strip	Raffinate	Preg liquor
Flowrate (ml/min)	60	6.4	5.2	12.2	71.6	12.2
Pr g/L	0.77	0	0	0	0.828	0.008
Nd g/L	3.1	0	0	0	2.5	2.4
Hv g/L	33.2	0	0	0	0.068	342

Source: MP Materials, 2021

The elemental distribution of the raffinate, preg, and feed streams as shown in Figure 10-10, indicate that >99.5% of the light REE fraction reported to the raffinate and >95% of the heavy REE fraction reported to the preg solution in the pilot run described. This effort also resulted in 7.7% Nd losses in the pregnant solution stream. As the synthetic feed had significantly higher proportion of HREEs (65% by weight) in contrast to the natural distribution of REEs in bastnaesite (~2% by weight), the purity numbers achieved were not optimized. Furthermore, to minimize the heavy fraction in the raffinate, greater than optimal concentration of neodymium was lost in the pregnant liquor stream. The large separation factor between Nd and Sm and the legacy operation indicates that high yield and purity of Hv can be achieved with low loss of Nd into the pregnant solution.



Source: MP Materials, 2021

Figure 10-10: % REO in Feed, Raffinate, and Preg Liquor

Summary of SXD Pilot

Piloting data for SXD indicated that >99% pure (Pr/Nd)Cl_3 can be produced as a product in both the traditional configuration, and in a new configuration. The new configuration increased the purity of the La in raffinate to be >99.5% pure for sustained periods of several days, while maintaining the purity of the $PrNdCl_3$ product. The purity of the Ce-La product achieved was >99% with an average ratio of Ce to La of 2.87 (74% Ce) on an oxide basis. The low residence time of the mixer settlers as well as the low inventory volume led to high volatility compared to what is expected in the full-scale operation. In the full-scale operation, it is believed that even higher purity may be achieved due to increased SX circuit stability. Characterization of Ce and La in the $PrNdCl_3$ product was to the nearest 1 g/L.

PrNd Oxalate/Carbonate Precipitation – PrNd

PrNd Precipitation was conducted with SXD Pregnant Solution (containing 166 g/L TREO at about 30% Pr and 70% Nd) and precipitant being fed into Reactor 1 and cascading down a series of four reactors before overflowing into a collection bucket.

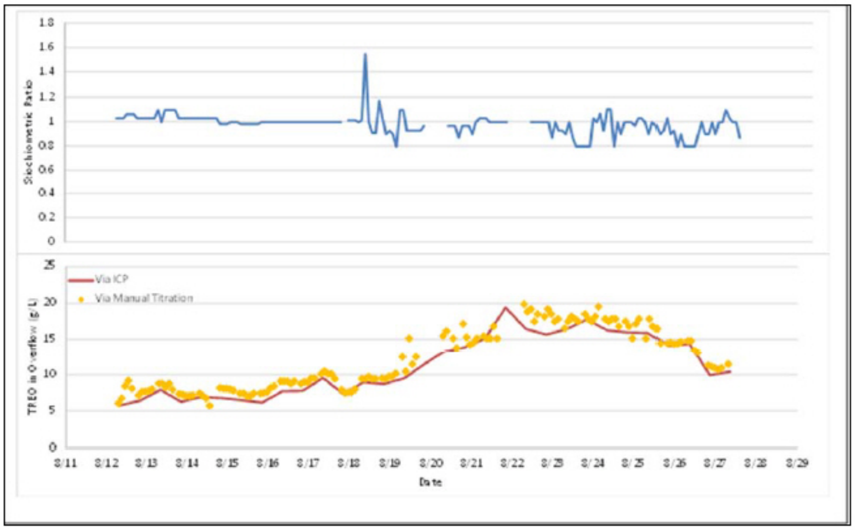
Average recovery for the first five days was 99.9%, suggesting that even at feed ratios close to (or even slightly lower than) 1.0 can achieve nearly complete recovery.

From this study, stoichiometric feed ratio may be a good starting point for determining feed rates, but from a control standpoint, pH appears to be a good indicator for precipitation performance. Based on the data, low pH values should be targeted.

Lanthanum Carbonate Precipitation – Summary of La Recovery

Lanthanum Carbonate Precipitation was conducted with a solution containing 70 g/L of lanthanum on an oxide basis and soda ash solution (at 15% sodium carbonate by weight) being fed into Reactor 1 and cascading down a series of four reactors before overflowing into a collection bucket.

Figure 10-11 shows the stoichiometric feed ratio (actual/theoretical for soda ash) and residual TREO in the overflow liquor (both via ICP and manual titration) over the course of a two-week period. Stoichiometric feed ratio was calculated from recorded feed rates measured every two hours using a stopwatch and graduated cylinder. This crude method may account for some of the noise in this dataset. Average recovery for the first five days was 90.3%.



Source: MP Materials, 2021

Figure 10-11: TREO in Overflow Liquor Over Time vs Stoichiometric Feed Ratio and pH

On day six, soda ash flow became more erratic. In response, a reduction in lanthanum recovery is noted. While there were periods of time where flow was normal, this circumstance did not appear to be sufficient to maintain a consistent level of recovery in the pilot facility, suggesting that a consistent flow is critical to the operation of carbonate precipitation. This situation should be more easily maintained in the full-scale process.

Brine Recovery Summary

The Brine Recovery circuit is designed to remove impurities via carbonate precipitation from the brine crystallizer feed stream and allow for the impurities to be impounded as carbonate solids. This process was piloted at Mountain Pass in Spring 2021 to display proof of concept and to attain process parameters.

The Mountain Pass pilot showed that impurities can be removed from the crystallizer stream to the point at which the wet cake salt (generated from the crystallizer) may be impounded. The Company would like to sell the salt as a product in the future. The pilot work also showed that the solids generated from the process are permissible to be impounded.

Table 10-12 shows the average concentrations of relevant impurities from the Mountain Pass pilot effort. The Impurity Removal Solution is an average of multiple grabs from the starting material, while the crystallizer feed is multiple grabs of the supernatant generated from the thickener.

Table 10-12: Impurities in Brine Before and After Treatment

Brine Recovery Pilot - Average of Grab Sample Assays			
Component	Unit of Measure	Impurity Removal Solution	Crystallizer Feed
Al	mg/L	5.0	<0.1
Ba	mg/L	2,240	0.56
Ca	mg/L	23,845.1	2.4
Co	mg/L	3.0	<0.1
Fe	mg/L	6.0	<0.1
Mg	mg/L	345.4	<0.1
Mn	mg/L	249	<0.1
Na	mg/L	69,864	66,192
Ni	mg/L	1.3	<0.1
P	mg/L	5.3	0.4
Pb	mg/L	200	<0.1
Si	mg/L	18.8	1.2
Sr	mg/L	4,587	0.44
Th	mg/L	<0.1	<0.1
U	mg/L	<0.1	<0.1
Cl	mg/L	77,302	76,837
PO_4	mg/L	13.4	2.1
SO_4	mg/L	7.0	14.2
K	mg/L	78.0	54

Source: MP Materials, 2021

The thickener from the pilot plant did not provide any relevant data regarding settling time, however the solids did settle easily with both flocculants which were deployed.

10.4.5 Expected Product Specifications

Lanthanum Carbonate/Oxide

For lanthanum, MP Materials has designed its circuits to primarily meet the required specifications for the FCC catalyst market in the U.S. and Europe, which are the largest future customers. These specifications are not considered exceedingly tight, and the implementation of the SXD upgrades in MP Materials' Stage 2 will enable the Company to alter the amount of lanthanum directed into the cerium chloride product to ensure on-spec La/TREO for those customers requiring higher purity La carbonate or oxide. MP Materials produced sample material for customer testing during the SXD pilot operation in mid-2020, which confirmed the ability to meet these primary specifications.

Cerium Chloride

The cerium (or cerium-lanthanum) chloride market does not yet have a fixed specification. However, the ratio of cerium to lanthanum, in MP Materials' experience, does not dramatically impact performance. MP Materials' predecessor produced and sold cerium chloride solution into the market for several years, and MP Materials has continued to sell legacy inventory of this product to an existing customer at premiums to observed market prices. The MP Materials flowsheet will produce cerium chloride in a similar process flow to the predecessor, where there should be no difficulty continuing to meet market expectations. Product that does not meet market specifications can be recycled back to the separation plant or neutralized and disposed through brine recovery without significant financial impact.

PrNd Oxide

Market standard PrNd oxide specifications, as confirmed by MP Materials' customer discussions, are demonstrated in Figure 10-12. Mountain Pass's primary production and separation assets were previously operated at commercial scale, and several representative 5 metric tonne lots are compared to market specifications below, highlighting the ability to produce on-spec PrNd Oxide. Further, MP Materials will be implementing more robust solid liquid separation, QA/QC, and finishing assets, which are expected to improve upon the ability and economics of producing to market specification.

Element	Specification	5450-15-0826-1B	5450-15-0827-1B	5450-15-0827-2B	5450-15-0828-1B
TREO	99.00%	99.70%	99.80%	99.70%	99.70%
LOI	<1%	0.33%	0.24%	0.32%	0.28%
Pr_6O_{11}		23.60%	22.20%	22.90%	23.00%
Nd_2O_3		76.80%	78.00%	77.50%	77.30%
Pr_6O_{11}+Nd_2O_3/TREO	99.50%	100.40%	100.20%	100.40%	100.30%
Pr_6O_{11}/(Pr_6O_{11}+Nd_2O_3)	25% +/- 3%	23.51%	22.16%	22.81%	22.93%
La_2O_3/TREO	0.05%	0.003%	0.002%	0.001%	0.003%
CeO_2/TREO	0.05%	0.008%	0.007%	0.008%	0.008%
Sm_2O_3/TREO	0.03%	0.007%	0.005%	0.005%	0.005%
Y_2O_3/TREO	0.01%	n/a	n/a	n/a	n/a
Other REO	n/a	0.005%	0.005%	0.005%	0.005%
Fe_2O_3	0.05%	0.002%	0.002%	0.001%	0.002%
CaO	0.05%	0.004%	0.004%	0.001%	0.001%
Al_2O_3	0.05%	0.001%	0.001%	0.003%	0.001%
Na_2O	0.05%	0.004%	0.001%	0.005%	0.001%
SiO_2	0.05%	0.006%	0.006%	0.006%	0.006%
SO_4	0.05%	0.001%	0.001%	0.001%	0.001%
Cl^-	0.05%	0.030%	0.050%	0.030%	0.020%

Source: MP Materials, 2021

Figure 10-12: Market Standard PrNd Oxide Specification and Mountain Pass Historical Results

SEG+ Oxalate

There are varying specifications for SEG+ Oxalate products driven by the varying ratios of Tb and Dy and purity requirements. The typical SEG+ contract would include a minimum Tb and Dy assay percentage.

A representative SEG+ transaction specifies a 4% Tb+Dy minimum (REO equivalent). While there is sample volatility due to low concentrations of certain elements, recently produced samples from material extracted from legacy circuits and other testing indicate between 4% and 8% as a conservative range for Tb+Dy.

11 Mineral Resource Estimate

The mineral resource estimate was prepared and reported by SRK Consulting (U.S.) Inc.

Mountain Pass site geology is modeled using Seequent's Leapfrog Geo™ software, and a 3D block model, grade estimation, and classification are developed in the same software utilizing the EDGE module. Pit optimization was conducted in Maptek Vulcan™ software. The Project limits are based on the near-mine area and are represented in local mine coordinate system.

Rare earth mineralization at Mountain Pass is contained within intrusive carbonatite hosted by Proterozoic gneissic and shonkinitic/syenitic rocks. Rare earth mineralization has a relatively constant dip of 35° to 45° to the west southwest (255º), offset by minor post-mineral west and north-northwest normal faults. Drillholes are predominantly vertical to steeply dipping almost perpendicular to the dip of the mineralized zone. Drill spacing averages 100 to 300 ft throughout the deposit along the strike and downdip. Most of the drilling occurred prior to or during mine production in the early 1950's to late 1990's. The current mineral resource estimate incorporates drilling and mapping information that has been sourced or revised by MP Materials as part of a geological database review process in 2021.

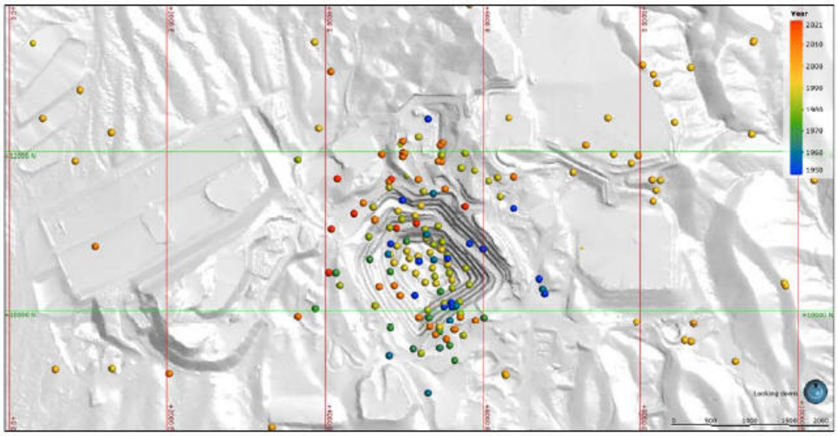
SRK generated the mineral resource estimate in 2021 based on drillhole sample assay results. The estimate is constrained by a combination of lithology and TREO grade shell domains. Grade interpolation was defined based on the geology, drillhole spacing, and geostatistical analysis. The mineral resources are classified based on geological understanding, historical production, proximity to drilling data, number of drillholes used in the estimate, and relative indicator of estimation quality (Kriging Efficiency (KE)). The reported mineral resources are reported above a nominal cut-off grade (COG) developed from assumptions of internal cost and pricing from MP Materials, and within an economic pit shell to demonstrate reasonable prospects for economic extraction.

11.1 Topography and Coordinate System

The mineral resource estimate has been confined to a topography dated September 30, 2023. The Mountain Pass property utilizes a local mine in easting and northing with elevation being true elevation above mean sea level (amsl). The local mine grid is based in U.S. feet (ft).

11.2 Drillhole Database

As described in Section 7, the majority of drilling activities at the Project were conducted throughout the 1950's to 1990's, and data was recorded in U.S. standard units with locations in a local mine grid. Drilling locations relevant to the project area are shown in Figure 11-1.



Source: SRK, 2021

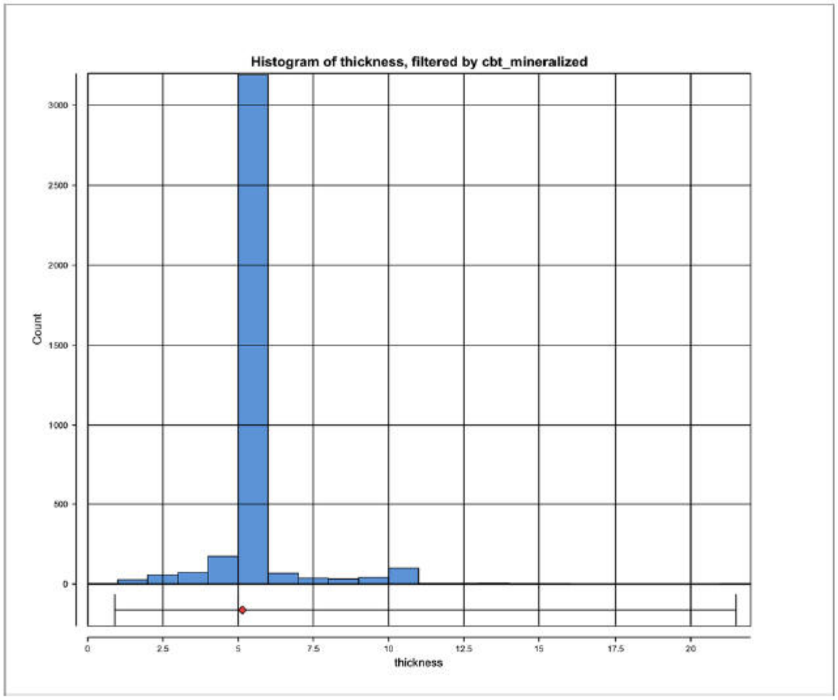
Figure 11-1: Drilling Distribution near Mountain Pass Mine

MP Materials compiled a digital drilling database based on information available from original laboratory analyses. In some cases, the original lab sheets were not located, and SRK relied on typed and hand-written analyses as posted on drilling logs. This database differs from previous drilling information compiled by SRK or other consultants and includes revisions to historical information based on relatively newly discovered records as well as drilling added to the database from 2011 to 2021 drilling. MP Materials compiled this drilling database in Microsoft Excel.

The drilling database used for the current resource model utilizes a total of 233 drillholes with a cumulative length of 118,621 ft in the vicinity of the mine area. SRK notes that there are additional drillholes in the database excluded from the resource estimate as they were completed for other purposes (hydrogeological, geotechnical, etc.), could not be located accurately from historical information, or were outside of the project area. Individual drill holes range in length from 50 to 2,499 ft, and average 510 ft. The drilling is located on a series of generally east-northeast and east to west oriented sections spaced at nominal 150 ft intervals. Drill spacing is not consistent down-dip and less than 100 ft in the higher-grade center of the deposit but widens to over 300 ft in other areas. Drillhole spacing averages approximately 200 ft x 100 ft throughout the deposit area.. In some cases, there are drill holes that contain geological logging, but missing assay data. These holes are outside of the main carbonatite zone but are used to inform the geological model.

Within the geological model, there are 6,975 samples analyzed for TREO with grades ranging from 0.01% TREO to a maximum of 26.42% TREO. Historically, core samples were selectively assayed based on visual confirmation of mineralization. Accordingly, many intervals in the hangingwall and footwall of the mineralized zone were not assayed and thus, assigned a -0.01 TREO grade. These intervals were re-assigned a grade of 0.001 % TREO by SRK for the purposes of domain evaluation and estimation. Intervals which are entirely missing in terms of logging and assays are rare within the mine area and were omitted from compositing and estimation.

Individual sampling intervals range from 0.9 ft to a maximum of 21.5 ft, with an average of 5.14 ft. On a percentage basis, more than 83% of the sample internal in the carbonatite are 5 ft with another 7% between 5 and 10 ft (Figure 11-2). A portion of the samples have also been tested for multi-element geochemistry including P_2O_5, CaO, SrO, Fe_2O_3, PbO, SiO_2, ThO, with a limited selection of lanthanide series elements assayed. Only P_2O_5 was evaluated and estimated in the model to potentially aid in determination of where monazite may host the rare earth content, but this is not reported in the mineral resource summary and is not utilized for reporting.



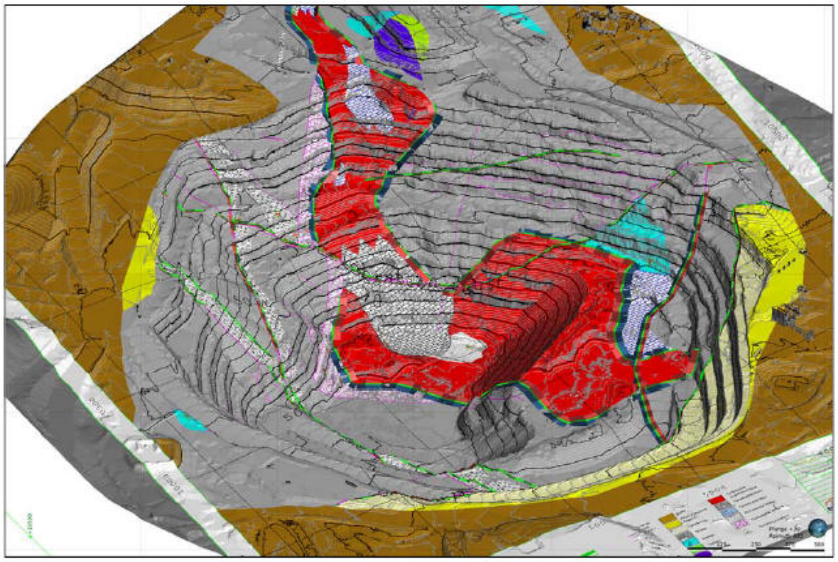
Source: SRK, 2021

Figure 11-2: Sample Length Histogram – Mineralized CBT

There is limited information available regarding drilling recoveries recorded on the original drill logs. Anecdotal information by site personnel indicates acceptable core recovery, and no relationship was historically observed between core recovery and TREO grade. Zones of low or no recovery are noted in drilling logs and generally remain unsampled due to lost core. These intervals neither contribute to, nor are assigned grade on the basis of review of the drill logs and communication with site personnel. If there was an issue with recoveries, SRK would expect this to be evident as the relationship between recovery and grade as a result of the highest-grade ore being also very friable; this should be reviewed in more detail in future.

11.3 Geology

SRK modeled the geology in 2021 as 3D wireframes utilizing Leapfrog Geo™. Downhole geological information has been compiled from physical paper records for most of the historical drilling at Mountain Pass. In addition to the drilling, SRK registered geological mapping to the corresponding topographical surfaces and incorporated this mapping into the modeling effort as GIS or polylines in Leapfrog. Most important to this effort was the mapping completed by MP during July and August of 2021 to inform areas where historical exploration drilling was relatively sparse in the pit area. This is shown in Figure 11-3.



Source: SRK, 2021

Figure 11-3: Geological Mapping and Fault Expressions – August 2021

11.3.1 Structural Model

SRK constructed a structural model including the five major faults observed in the open pit. SRK utilized the structural mapping from the July-August 2021 pit mapping as primary contacts for structures observed in the pit area. These include:

- Celebration Fault – Offsetting carbonatite (CBT) and trending NW along orientation of CBT.
- Middle Fault Zone – Identified as a relatively wide damage zone dipping to the W from the pit area.
- QAL Fault – Significant down-dropping W-NW fault exposed in south pit wall. Juxtaposes QAL with host rocks and would offset CBT. No drilling has identified CBT south of this fault.
- F1 Fault – Mapped as minor down-dropping fault trending W-NW. Likely sympathetic to Quaternary alluvium (QAL) Fault Offsets and truncates CBT to the south.

- F2 Fault – Appears to be NE trending minor splay of Middle Fault Zone. Not activated in the geological model due to minimal or no perceived offset but retained to inform geotechnical model development.
- Shear Zone - Appears to be NW trending shear developed in central part of pit. Not activated in geological model due to minimal or no perceived offset but retained to inform geotechnical model development.

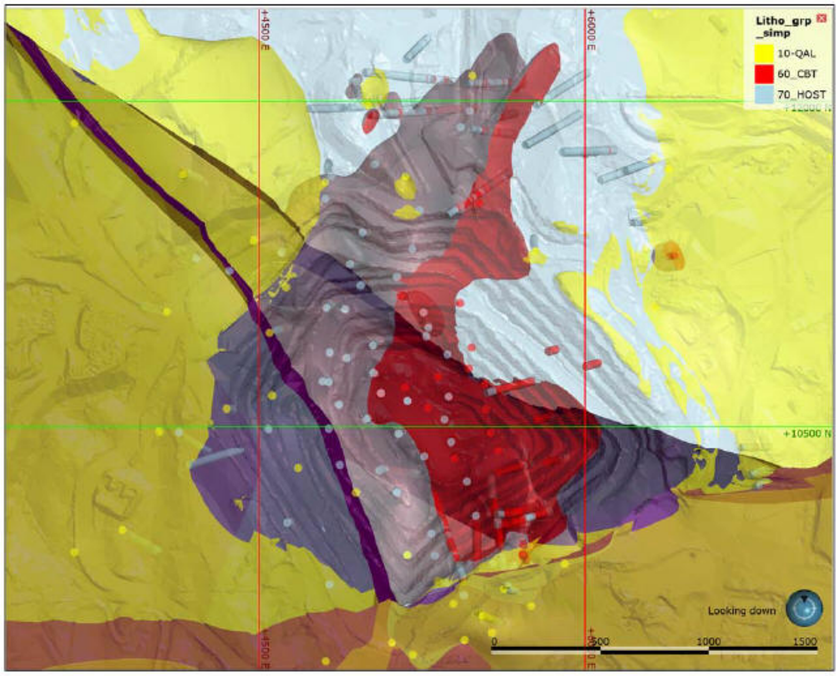
Where possible, SRK projected these structures from pit measurements and linked them to intersections of structure noted in the drilling, when available. The structural logging is inconsistent in the drilling. It is likely that observations were not recorded which may correspond to other structures or that some observations should be ignored due to the same inconsistency. Relative interactions of the structures noted above were reviewed with MP geology staff for consistency to the observed mapping and current geological interpretation. The resulting interactions effectively define fault blocks which are discrete from each other and bound the lithological model.

11.3.2 Lithology Model

The lithology was modeled based on drill logging simplified to key units at a level commensurate with the relative consistency of the drilling and mapping information. Basic lithologies which could be grouped from the variable historical logging were carbonatite (CBT), host rock (HOST - primarily gneiss with minor granite/shonkinite/syenite), and Quaternary alluvium (QAL). Although sub-lithologies are defined, the inconsistency of the logging over various generations would result in inaccuracies and potential errors in the model. In addition, the relative importance of the definition of sub-lithologies is considered minor according to the current operational mine plan. The primary purpose of the geological model at Mountain Pass is to define areas with different densities and waste rock geochemistry, slope stability, or other general engineering parameters. Thus, a more detailed lithological model was not deemed necessary by MP to support mineral resources:

- The QAL was defined as an erosional surface superseding all other lithologies as the most recent unit and is informed primarily from drilling. Surface mapping of the distribution of the QAL is incorporated from 2013 geological mapping of the area.
- Carbonatite was modeled primarily from the grouped logging codes which represent carbonatite logging information generated over the various drilling campaigns. SRK notes that TREO grade was not utilized to generate the carbonatite shape, and that this was based purely on the geological logging or mapping conducted by MP or predecessors.
- Host or country rocks are effectively the remaining volume not broken out for CBT or QAL. The host rocks are mixed and generally understood to not vary significantly in terms of bulk density or other parameters relevant for the current operation.
- A fault damage zone was also constructed between the hangingwall and footwall surfaces of the Middle fault zone and is a separate lithology for the purposes of evaluating specific gravity, rock mechanics, hydrogeology, or other relevant disciplines.

A rotated view of the 3D geological model is shown below in Figure 11-4.



Source: SRK, 2021
Note: Faults shown as shaded linear features.

Figure 11-4: Plan View of 3D Geological Model

11.3.3 Mineralogical / Alteration Model

No mineralogical or alteration model has been developed for the Project. In general, consistency in nomenclature of specific types of carbonatite or alteration in the carbonatites or host rocks has been poor. MP has previously noted carbonatite “types” that may exist internal to the CBT orebody, primarily based on ore type designations including “black” (high grade relatively friable CBT), “blue” (low grade CBT featuring chrysotile), and “breccia” (marginal or contact-altered CBT which is more friable and erratic in terms of REO distribution). The data is inconsistent in its approach to defining these zones in the drilling or mapping, and SRK elected to not model these features. Anecdotal discussions with MP personnel noted that these types of carbonatite which may be observed are generally dealt with satisfactorily through the current blending strategy, and generally have no impact on overall metallurgical recovery or other economic/operational factors.

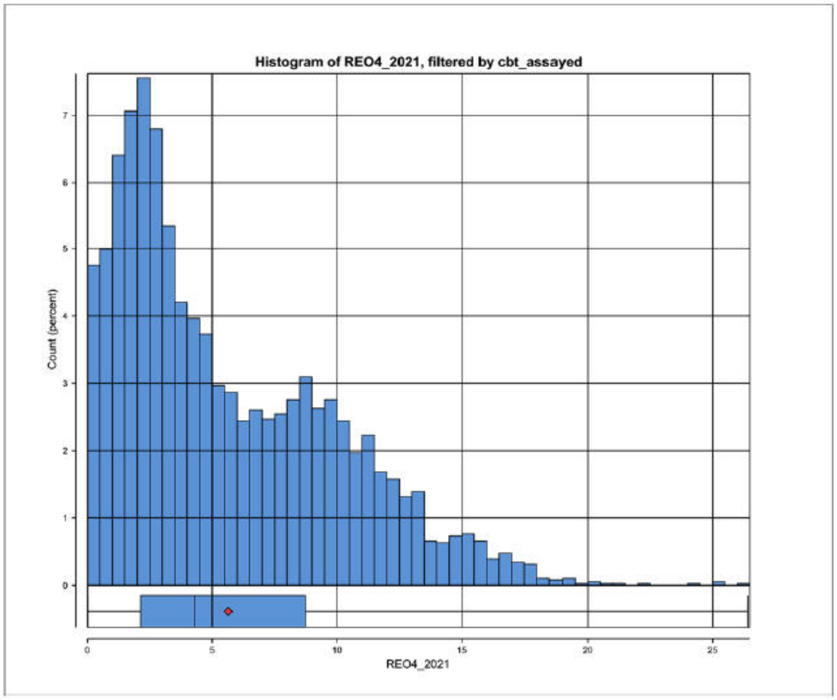
SRK notes that ore typing within the CBT is currently done solely on the basis of TREO grade, and that mineralogy or alteration are not considered in mine scheduling, mill feed, or downstream economics. If this changes over time, significant effort will need to be applied to either re-logging historical drilling on a consistent basis for these details or utilizing other means to obtain and characterize this data.

11.4 Exploratory Data Analysis

11.4.1 Resource Domains

The modeled CBT volume has been domained into high-grade (HG) and Undifferentiated (UNDIFF) domains. Based on exploratory data analyses (EDA), SRK's opinion is that, sub-domaining of the CBT is appropriate based on likely mineralization multiple phases or types of intrusion within the broader CBT volume. . Unfortunately, the inconsistency of the geological data does not provide a robust mineralogical or other categorical feature appropriate for producing a model of the phases internal to the CBT. SRK notes there are a number of published papers that have discussed the variable mineralogy and its relationship to REO grades, but reasonable spatial models of these features have not been generated to date.

A histogram of the REO grades internal to the CBT unit is shown in Figure 11-5.



Source: SRK, 2021

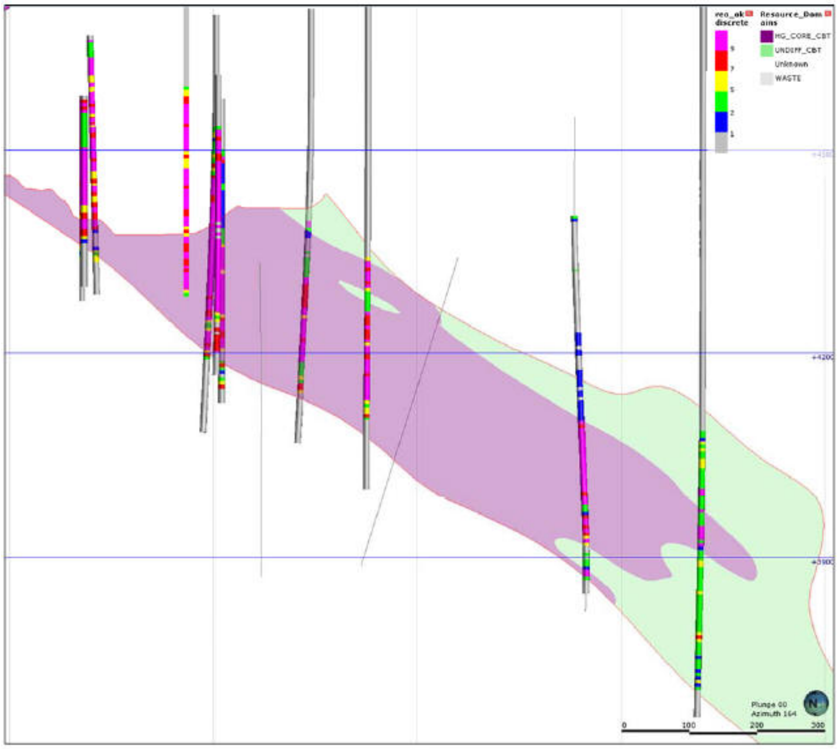
Figure 11-5: Histogram of TREO% within CBT

The bimodal nature of this histogram distribution and a review of the spatial context of these populations shows a distinctly higher-grade interior portion of the CBT relative to a more erratic and undifferentiated lower grade outer zone of the CBT. This is consistent with in-pit observations of the CBT, as well as the local sectional interpretation of the CBT. SRK selected a nominal 5.0% REO cut-off for the purposes of generating an indicator model of the higher-grade portion of the CBT. In addition to the threshold of 5.0% REO, a probabilistic factor of 0.4 was used to assess intervals and areas for which the probability of exceeding the 5.0% REO cut-off was greater than 40%.

Other parameters defining this domain are as follows:

- The same structural trends utilized for creation of the CBT unit itself were applied to the indicator.
- The indicator was limited to samples only within the CBT, and each fault block defined from the structural model constrained its own indicator.
- Continuity was applied to the indicator for interpolation in Leapfrog. The range was set to 300 ft, with a total sill of 0.2 and a nugget of 0.02 (10%). No drift was applied.
- Discrete volumes less than 10,000,000 ft^3 were discarded.

The results of the TREO grade-based domaining process provided a robust constraint on grade distribution within the CBT which define a relatively contiguous “core” of REO mineralization relative to the undifferentiated CBT. Performance statistics for the indicator also show robust dilution metrics of approximately 7.2% of samples within the domain being lower than the defined COG. It is SRK’s opinion that this domain is acceptable for use in mineral resource estimation, and a reasonable approximation of the geological features and related grade distribution of the deposit (Figure 11-6).



Source: SRK, 2021
Note: Looking SE

Figure 11-6: Cross-Section Illustrating CBT Domains and TREO Grades

11.4.2 Outliers

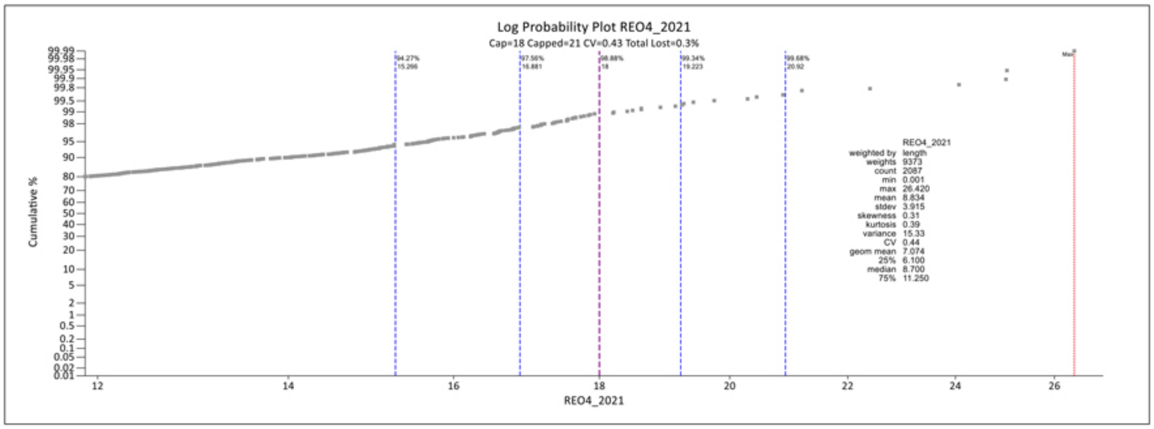
SRK performed an outlier analysis aimed at identifying high-grade outlier values that may adversely impact grade estimation. It was determined that no capping was necessary for TREO but outlier influence restriction was utilized. Upper-end log probability plots for TREO within the two domains are provided in Figure 11-7 and Figure 11-8, respectively. Other capping scenarios were evaluated for each data population and demonstrated relatively low sensitivity to a capping strategy in terms of impact to average grade or coefficient of variation (CV).

SRK elected to utilize a reduction of influence or a “clamp” for reducing the impact of outliers on the grade estimation. For this, SRK assumed that the full composite grade would be utilized for a relative distance of 30 ft (one block) after which the grade would be reduced to a nominal upper limit level as defined below in Table 11-1. This outlier restriction is applied during the estimation, and successfully retains the local high grade as have been demonstrated to exist but reduces the scope of their impact on larger volumes and distances which are not likely as supported based on the probability plots. SRK generated probability plots for the two domains and visually reviewed the consistency of populations at varying grade ranges to understand both the spatial context of the outlier populations (i.e., what part of the orebody contain outliers) as well as the consistency of the populations to each other.

Table 11-1: TREO Influence Limitations

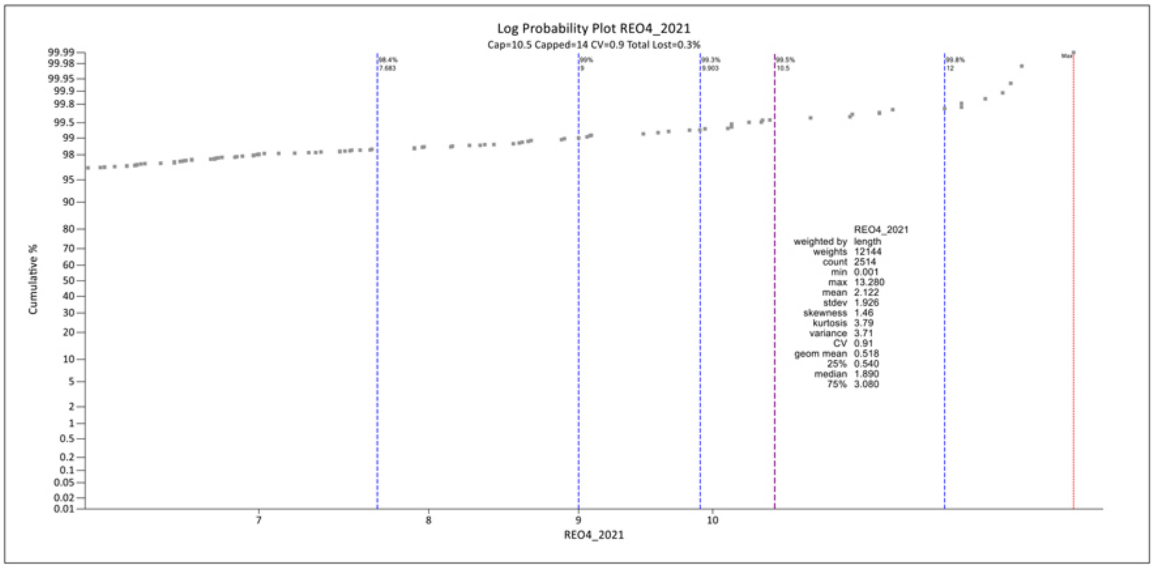
Domain	Outlier Threshold Level (%)	Distance (ft)	Percentile of Distribution
HG Core	18.0	30	98.88
Undifferentiated	10.5	30	99.50

Source: SRK, 2021



Source: SRK, 2021

Figure 11-7: Log Probability Plot for TREO – HG Core



Source: SRK, 2021

Figure 11-8: Log Probability Plot for TREO – Undifferentiated CBT

11.4.3 Compositing

All exploration assay data were composited into 10 ft downhole lengths. Composites were broken by the CBT and internal resource domains for use in grade estimation.

Blastholes were composited to their nominal 30 ft bench height, or 15 ft in selected older holes which were not drilled to the full bench height.

11.5 Bulk Density

For the purposes of determining the bulk density at the Mountain Pass deposit, SRK reviewed historical tonnage factors and collected limited samples for specific gravity testing. For the purposes of calculating tonnages in the resource model, bulk density is considered the same as specific gravity.

For all historic resource and reserve estimates, a tonnage factor of 10.0 ft^3/ton (specific gravity = 3.20) was applied to mineralized carbonatite, and a tonnage factor of 11.5 or 11.0 ft^3/ton (SG = 2.79 to 2.91) was applied to the enclosing country rock (Cole, 1974; Couzens, 1997, Nason, 1991). Original documentation related to specific gravity cannot be located, although it was reported that IMC performed a truck weight study in the field on waste rock during prior operations.

In order to validate the historical specific gravity assumptions, SRK collected a total of 10 samples for specific gravity determination, and the results of this testwork are provided in Table 11-2. Based on these results, SRK assigned a tonnage factor of 10.25 ft^3/ton (specific gravity = 3.13) for mineralized carbonatite, and 11.57 ft^3/ton (specific gravity = 2.77) for the enclosing gneissic rocks, which is in reasonable agreement with historical assumptions.

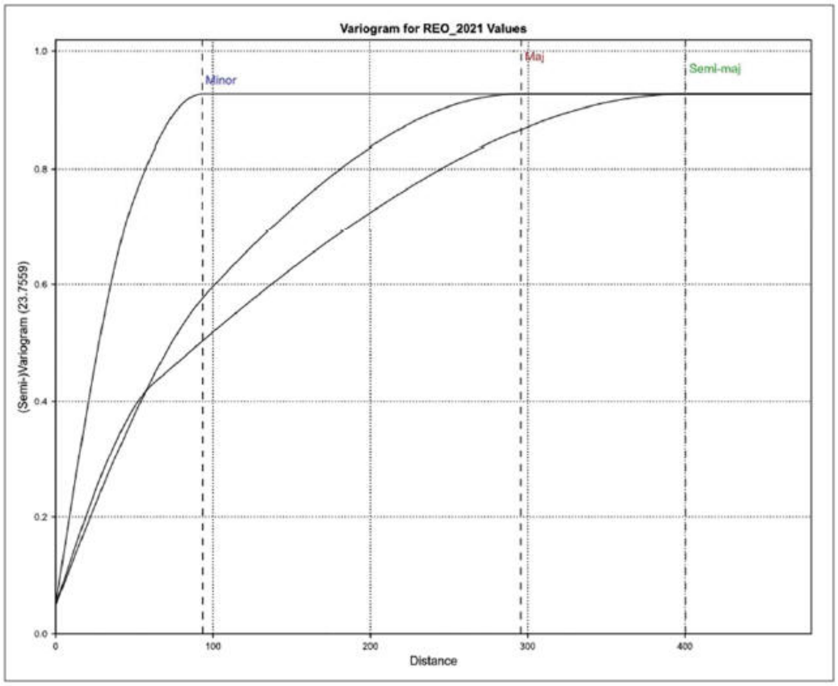
Table 11-2: 2009 Specific Gravity Results - Carbonatite

Sample ID	Hole	Sample Depth (ft)	g/cm^3	ft^3/ton	Rock Type	Notes
SGMP833531	83-3	531	3.22	9.95	Carbonatite	With red and brown flow foliation
SG854224	85-4	224	3.14	10.20	Carbonatite breccia	Pink and white to pink and brown matrix with green amphibole clasts altered to chlorite and sericite
SG859233	85-9	233	2.82	11.36	Gneiss	Fine grained biotite-qtz gneiss “sparse red feldspar and crocidolite mostly along veins”
SG8520427	85-20	427	2.62	12.23	Carbonatite	Dark yellow brown strong limonite replacement of carbonatite bastnaesite rare
SG8521437	85-21	437	2.72	11.78	Carbonatite breccia	With abundant syenite/shonkinite clasts
SG882399	88-2	399	3.29	9.74	Carbonatite breccia	Blue to red brown matrix pink to brown barite, abundant crocidolite
SG9013464	90-13	464	3.37	9.51	Carbonatite	Pink barite and white to gray calcite
SG9016244	90-16	244	2.87	11.16	Carbonatite	Pink barite and white calcite, iron pseudomorphs black ore up to 60%, some violet barite
SG9111153	91-11	153	2.91	11.01	Carbonatite breccia	Matrix supported breccia, matrix is light gray to maroon with salt and pepper texture, abundant feox
SG9111258	91-11	258	3.65	8.78	Carbonatite	Pink to light gray mottled with clear to light pink barite phenocrysts

Source: SRK, 2012

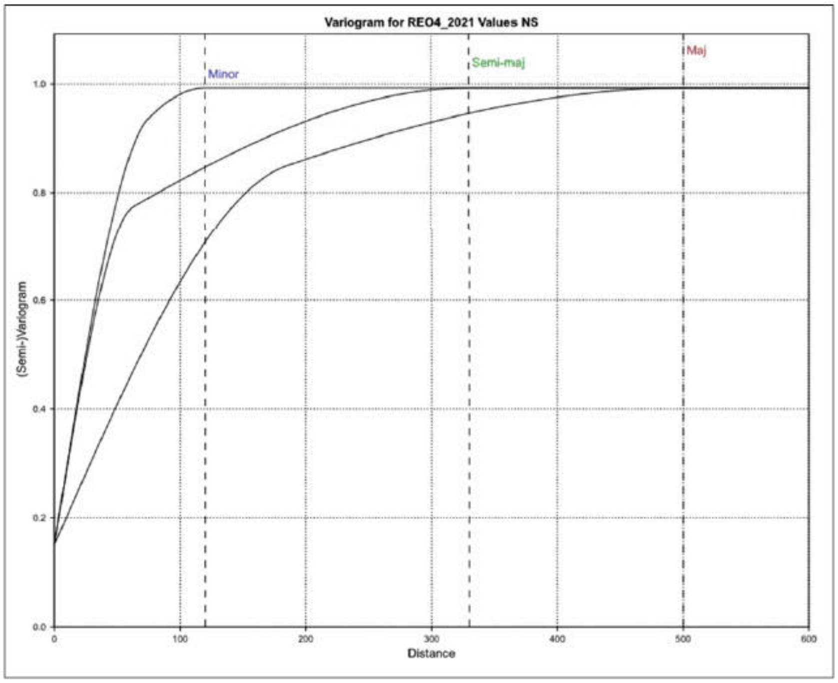
11.6 Spatial Continuity Analysis

Variography was calculated to model the spatial continuity of TREO grades within the relevant domains (and data types) for the Mountain Pass deposit. Orientations of the variograms were selected based on the overall geological continuity and generally follow a dip of 38° to an azimuth of 250°, with a varying pitch depending on the domain. Orientations of the orebody are known to vary locally, and SRK used broad orientation for directional variogram models given the expected use of variable orientations in the estimation process. SRK modeled both semi-variograms and normal-score transformed semi-variograms to achieve improved models for ordinary kriging interpolation. Back transforms for the normal score variography were done prior to estimation. Continuity ranges are between 400 to 500 ft depending on the data set. Blastholes generally demonstrate relatively shorter ranges compared to the exploration composites which is a function of both the closer spacing of the blastholes and the inherent variability of the blastholes relative to the more broadly continuous exploration data. Blastholes demonstrate comparably better short-range continuity due to this close spacing. In general, both sets of variograms (Figure 11-9 and Figure 11-10) show relatively steep rises to the sill, reaching 60-70% within 100-150ft, with the remaining variability coming over an additional 200-300ft. Nugget effects were modeled independently using downhole variograms for each domain and data set, and generally range from about 5% to 20% of the sill.



Source: SRK, 2021

Figure 11-9: Example of Directional Variogram – Blastholes TREO



Source: SRK, 2021

Figure 11-10: Example of Directional Variogram – Exploration TREO

11.7 Block Model Limits

A sub-blocked model was created in Leapfrog EDGE with the origin and extent presented in Table 11-3. The model features a total of 6,818,200 blocks and duplicates the geological volumes to within 0.2% of the wireframes in the model. Sub-blocking triggers in the 2021 block model include, topography, the 2013 topography bounding the geological model, the geological wireframes, and the resource domain boundaries. Blocks are coded with geological model codes, domain codes, densities, estimated TREO grades, and relevant supporting parameters derived from the estimation or classification process. All estimates were done at the parent block dimension, which is approximately 1/3 to 1/5 of the exploration drill spacing the majority of the deposit.

Table 11-3: Block Model Specifications

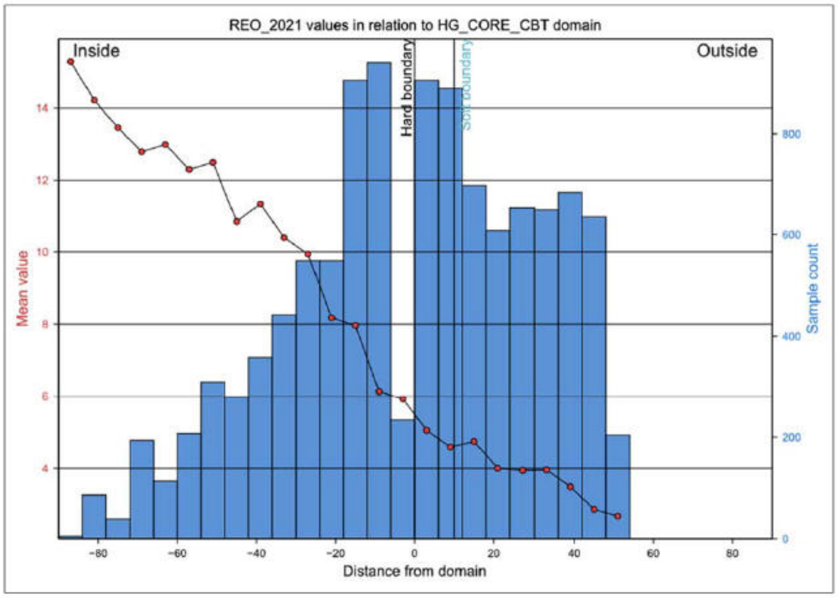
Axis	Minimum (ft)	Maximum (ft)	Number of Parent Blocks	Parent/Child Block Size (ft)
X	2,200	7,840	188	30/7.5
Y	7,800	13,200	180	30/7.5
Z	2,510	5,300	93	30/7.5

Source: SRK, 2021

11.8 Grade Estimation

SRK estimated TREO from the composited assay values from both the exploration and blasthole data provided by MP Materials. Estimates were compiled into a single TREO variable for reporting with priority assigned to estimates using Ordinary Kriging (OK) from exploration data over inverse distance weighting squared (IDW2) estimation. A general description of the estimation process is below.

SRK first conducted boundary analysis of the high-grade core and undifferentiated CBT domains and noted that (particularly for blastholes) the domains appeared to be transitional over a relatively short distance (Figure 11-11). SRK elected to apply a soft boundary to the estimation process, by which each domain could use samples from within a 10ft buffer internal to the other, but not from outside of both.

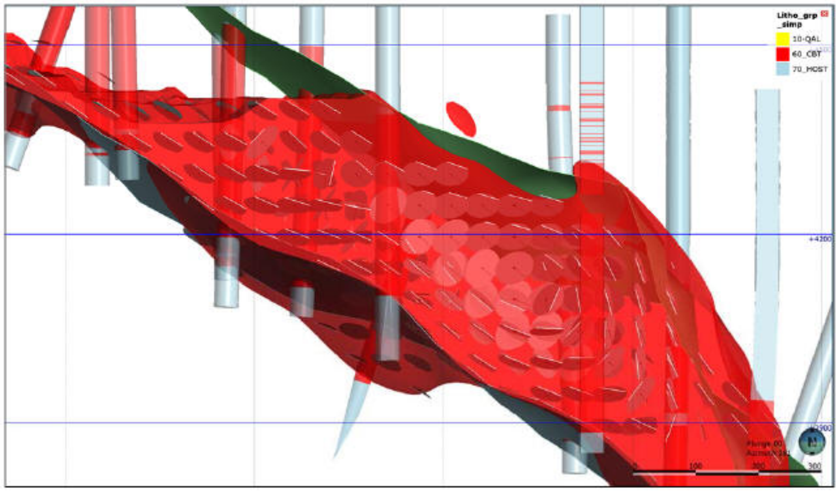


Source: SRK, 2021

Figure 11-11: Domain Boundary Analysis – HG Core Domain within CBT

OK was used as the interpolation method. Orientations for search ellipsoids were varied as a function of the geology of the deposit as reflected from digitized surfaces representing the hangingwall and footwall of the carbonatite (Figure 11-12). This is commonly referred to as variable orientation modeling, and adjusts both the search orientation as a function of the relationship to the geological controls on mineralization. This was utilized for both the blasthole and exploration estimations.

The normal scores back-transformed variograms were used to inform the ordinary kriging estimate. Nested search neighborhood passes were used for exploration data estimates and were also utilized to assist in classification of mineral resources. Differences between the estimation relying on blastholes vs. exploration data is noted below.



Source: SRK, 2021

Figure 11-12: Variable Orientation Surfaces for Estimation Orientation

11.8.1 Blasthole Estimate Specifics

In general, SRK utilized a single 60 ft x 60 ft x 30 ft search pass from a minimum of three and maximum of 15 blasthole composites. Quadrant restrictions were applied to ensure that no estimates were unduly extrapolated beyond the tightly clustered blasthole data. This selection is not relevant to the blasthole variograms as the intent to only allow the blastholes to affect a maximum of two benches from the last data. This decision was made based on review of the inherent variability of the blasthole dataset relative to the exploration data and the naturally clustered data.

No outlier restrictions (limitations on influence) were placed on the blasthole data, as this data has been supported by production and affects a relatively small volume of blocks.

11.8.2 Exploration Estimate Specifics

SRK estimated grades from composite data using the 10 ft composites, within the relevant geological wireframes. Two nested search neighborhood passes were used, with the first pass was designed to estimate blocks within well-informed volumes. The first pass uses between 3 and 15 samples for estimation, with quadrant restrictions which must fill at least two quadrants, and only allow a maximum of two samples per hole to contribute to the estimate.

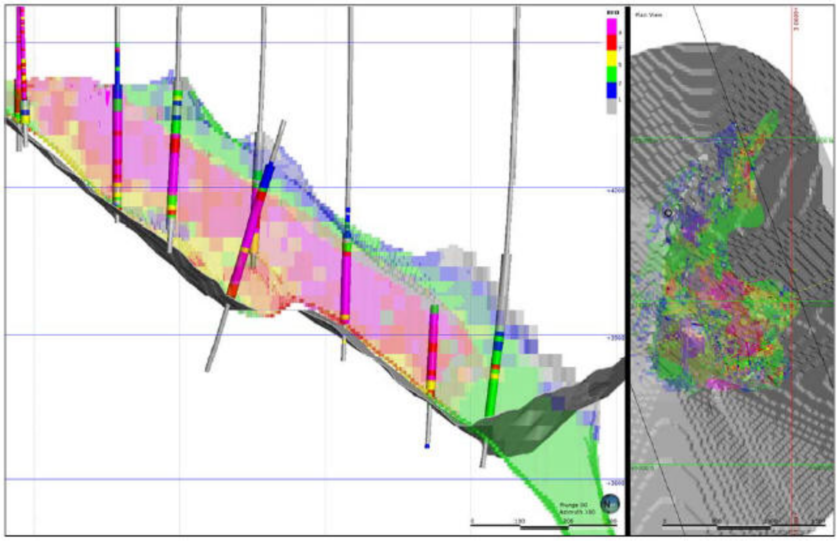
The second pass neighborhood was designed to populate unestimated blocks from the first pass by selecting relatively fewer data at larger distances. Second pass searches are 3X multipliers of the first pass (900 ft x 900 ft x 100 ft) and allow sample selection from as little as a single hole.

Outlier limitations or clamping were used on interpolation in the exploration data. The first pass uses a nominal restriction of a value of 18% TREO or 10.5% TREO for the HG Core and Undifferentiated domains respectively, both to a distance of 10% of the search (30 ft = 1 bench) after which the original composite grade reverts to either of the values noted above. Similar restrictions were placed on the second pass in terms of grades, but reduces the distance applied to 3.33% of the total search (30 ft = 1 bench).

11.9 Model Validation

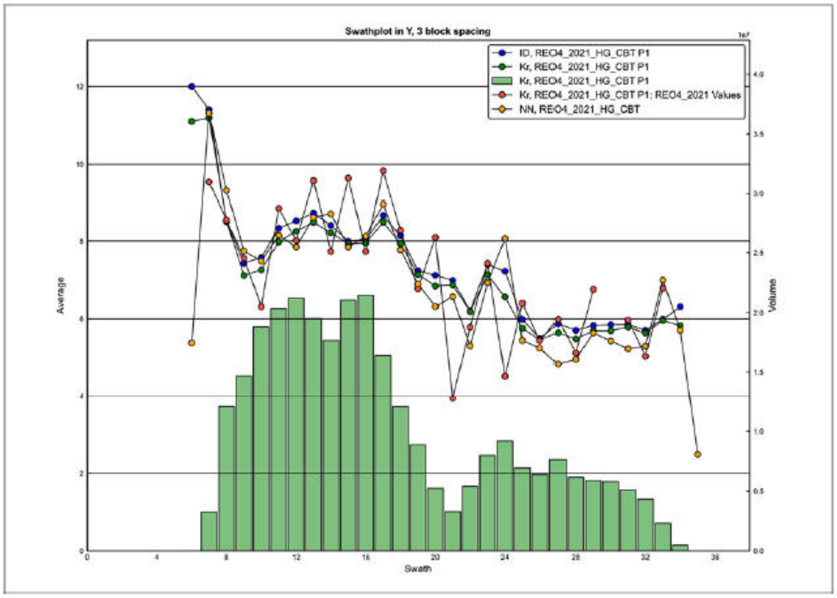
SRK performed model validation using several methods. These include a thorough visual review of the model grades in relation to the underlying drillhole composite grades in section and plan, comparisons with other estimation methods (inverse distance weighting and nearest neighbor), and statistical comparisons between block and composite grades and volumes. SRK has also reconciled the mineral resource model with production records as described in Section 11.10.

Visual comparison between the block grades and the underlying composite grades in plan and section views show close agreement, which would be expected considering the estimation methodology employed. An example cross section showing block grades, composite grades and resource pit outline are provided in Figure 11-13. Swath plots show excellent agreement between mean composites and block estimates over the various orientations, and generally demonstrate that estimates are respecting overall trends in grade with minimal smoothing as expected for a block estimate compared to composite drill data (Figure 11-14).



Source: SRK, 2021

Figure 11-13: NW-SE Cross-Section Showing Block Grades, Composite Grades, Resource Pit Outline



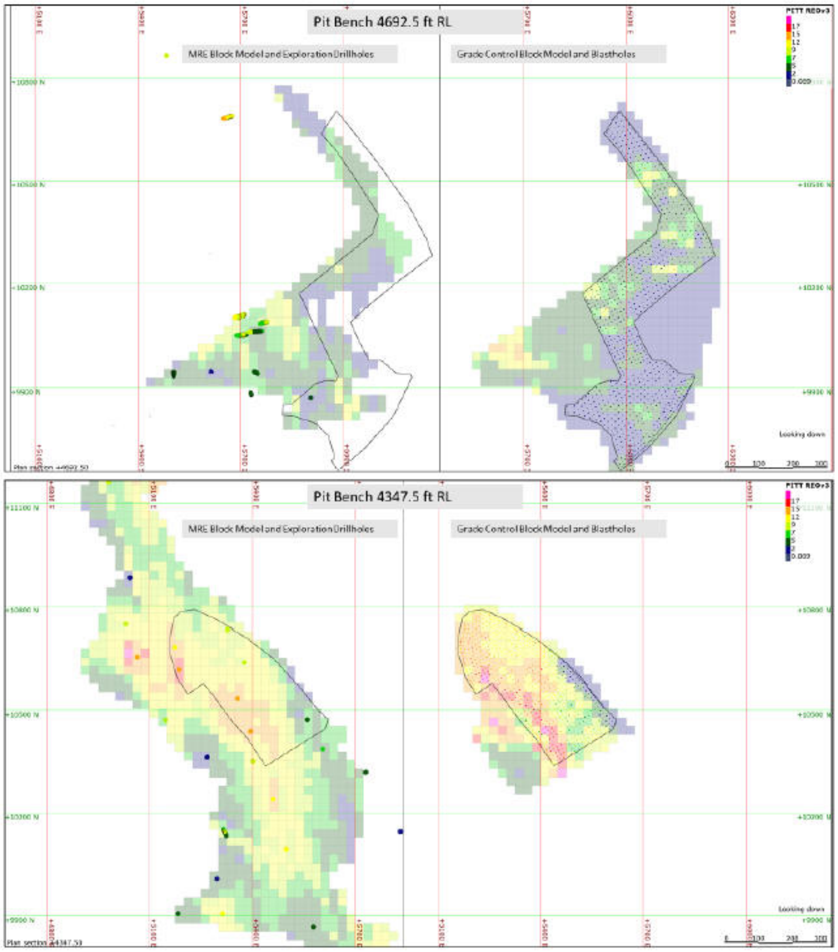
Source: SRK, 2021
Note: Composite grades shown in red, ordinary kriged estimated grades shown in green, inverse distance estimated grades shown in blue, and nearest neighbor estimated grades shown in orange. Green bars illustrate relative volumes of blocks where the estimates are made.

Figure 11-14: Swath Plot (NS Orientation) Comparison Between TREO Block Grades and Composite Grades

11.10 Production Reconciliation

During 2020-2021, SRK has performed model reconciliation of the resource block model used for the mineral resource statement, which is based on exploration drilling only, against a grade control model, which is based on blasthole data collected by MP Minerals during routine mining operations. The follow section summarizes work completed for this reconciliation exercise as this work continue to support the confidence and classification of mineral resources at Mountain Pass.

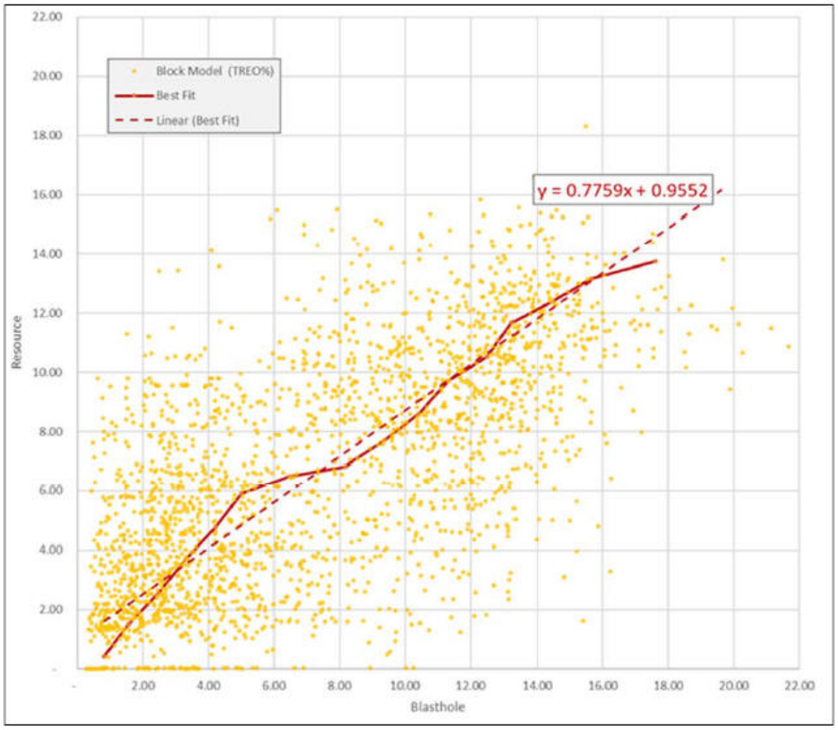
The blasthole samples are 15 ft bench composite grades taken on a regular pattern with a spacing of approximately 12 ft. These grades were estimated into the same block model framework using a simple inverse distance weighting (IDW) method. SRK then analyzed the resultant grade distributions spatially and statistically. Figure 11-15 shows the grade distribution on two example benches.



Source: SRK, 2012

Figure 11-15: Spatial Comparison of MRE Grade Distribution with Blasthole Grade Distribution

A regression plot showing resource model grade and blasthole model grade is shown in Figure 11-16. A best fit line through the cloud of points shows that on average, in higher grade parts of the deposit, blasthole model values are higher grade than resource model values. For example, where blasthole grades are around 14%, resource model grades are around 12%.



Source: SRK, 2020

Figure 11-16: Comparison of Resource and Grade Control Models

In addition to the block model comparison exercise, a reconciliation was undertaken of material movements and tonnage and grade records based on production records from January 2020 to May 2020 (inclusive).

Based on the block model comparison described above, there is understood to be some 20% more TREO contained in the grade control model compared with the resource model when a 5% TREO COG is applied.

The production tonnage (mined ex pit) records are based on truck weightometer readings. Based on diglines in the pit which subdivided each bench into mining shapes depending on blasthole grades, each truck was known to be carrying material belonging to one of the following grade categories:

- >9% TREO
- 7% to 9% TREO
- 5% to 7% TREO
- 2% to 5%TREO

The tonnages so recorded include planned and unplanned mining dilution.

The grades assigned to each category are those reported in the mine's production records which come from the mine's ore control (OC) model. Grades are based on blasthole data within practical mining dig lines representing each grade band, therefore incorporating planned dilution.

The trucked tonnage is locally 25% greater than that reported by the blasthole block model in the same January to May 2020 mining volume, largely as a result of planned and unplanned dilution. The trucked grade is some 20% lower due to the dilution, and the contained TREO is some 10% higher.

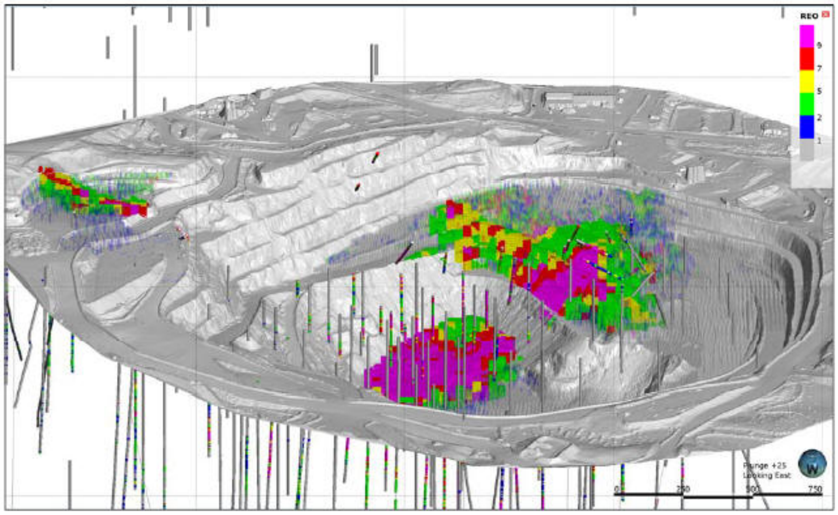
If these two steps are combined, the trucked tonnage is some 25% greater than the SRK model, and the grade is slightly higher (being 9.0% instead of 8.4%), resulting in some 35% more TREO being trucked than predicted by the SRK model. MP has noted that trucked tonnages include moisture content and that this may affect the accuracy of the reconciliation.

The direct crusher feed is blended with supplemental material sourced from stockpiles to achieve a planned mill feed grade. The planned mill feed tonnage and grade typically agrees well with the actuals according to weightometer records and mill samples. Therefore, the trucked tonnage and grade estimate combined with the estimated stockpile loadings and depletions can be considered robust. Despite the absence of routine QA/QC for the majority of resource drilling samples, SRK's reconciliation study demonstrates that the MRE model is sufficiently reliable and demonstrably conservative for long-term mine planning and mineral resource and mineral reserve reporting.

11.10.1 Blasthole "Bias"

Subsequent to the reconciliation noted above, SRK compared the 2019-2021 production blasthole data against the exploration datasets by estimating both data into the same volume of blocks using similar methods and reviewing the spatial context of the discrepancies in reference to observations in the pit. Figure 11-17 shows the three general areas where this comparison could be made, i.e., where both data types exist at spacings within an approximate 60 ft x 60 ft grid. Table 11-4 shows a global comparison of each estimate within the same volume and supports the assertions from reconciliation to production that the blastholes are seen to predict higher grades than the exploration data. On review of this data spatially, SRK notes that much of this bias is observed in selected areas which are characterized by relatively little exploration drilling.

Because operational mining is informed by the blasthole data more so than the resource model, benches are taken relative to the blastholes over the exploration data by default. Since mining also tends to favor focus on higher grade material over waste, the bias trends positive in conventional reconciliation. A percent difference calculation of the two check estimates supporting this review is noted below in Figure 11-18, and shows these areas where the blastholes appear to have a high bias in red, vs. the opposite in blue. The blue areas, by comparison, are shown to be comparably lower in the blastholes relative to the exploration data, and the reconciliation process has simply been biased by the effects of mining higher grades over the relevant production period. Overall, SRK believes this indicates that the exploration data may not be able to predict the local variability of grade (implying the necessity of a local grade control/short term drilling program), but that this has not seemed to currently be an issue for the mine production. This is a contributing factor in Mountain Pass not being assigned a Measured level of confidence in the in situ mineral resource estimation and is discussed in classification.



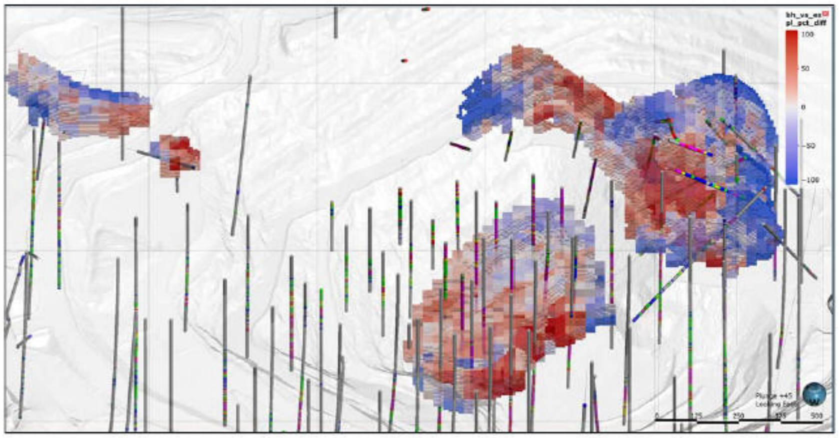
Source: SRK, 2021

Figure 11-17: Previous Production Areas for Reconciliation Validation

Table 11-4: Blasthole vs. Exploration Comparison

Resource Domains	Mass (thousand sh. Ton)	Average Value (%)		Material Content (Mlb)	
		REO Blastholes	REO Exploration	REO BH	REO EXP
CBT - HG CORE	3,513	8.89	7.91	624	556
CBT – LOW GRADE	2,001	4.84	2.88	194	115
Total	**5,514**	**7.42**	**6.08**	**818**	**671**

Source: SRK, 2021
Note: Differences may occur in totals due to rounding.



Source: SRK, 2021
Note: Warmer coloring indicates apparent high bias in blastholes vs. exploration, with cooler colors being the opposite.

Figure 11-18: Percent Difference BH/EXP Estimate

SRK considers there to be a few possible explanations for these outcomes:

- The most recent blastholes are processed using industry standard methodology in terms of material preparation or analytical bias. Moreover, MP Materials has noted in personal communication that blastholes generally agree with samples taken from the plant and stockpiles for production blending. Historically, the Mountain Pass Laboratory tended to underestimate higher grade sample assay values; there is no direct evidence of this, and no adjustment has been made to the historical assays.
- Exploration drill core used for the resource model may not recover high-grade friable ore as well as blastholes do; there is no direct evidence of this, and no adjustments have been made to account for this.
- The wider sample spacing in the exploration drilling is insufficient to characterize the inherent local variability of the orebody. SRK notes that this is likely the case based on observations in mining of the most recent production areas which feature local discrepancies between what is predicted by exploration drilling and what is in the pit.
  - For the previous two years of production, this has been a positive swing with reconciled mine grade exceeding that predicted by the resource model. SRK notes that there is no guarantee that positive reconciliation will continue as a trend, and that the exploration drilling should be considered appropriate for long term resource estimation and not for short term production models. Additional tighter-spaced grade control drilling should support short and medium range planning for the operation to optimize local understanding of TREO distribution.

11.11 Uncertainty and Resource Classification

All mineral resource estimates carry an inherent risk and uncertainty depending on a variety of factors, many of which influence or compound the effects of others. Mountain Pass is an operating mine, which implies that a certain amount of inherent risk in mineral resource estimation has been borne in the sunk cost of the operation and ongoing production to date. This being noted, uncertainty in the data collection and geological complexity of the deposit remain relevant to the estimation of mineral resources at Mountain pass. The primary mechanism utilized to minimize uncertainty for Mountain Pass has been to improve the geological modeling and utilize a more robust database and geological information repository than what has been used prior to recent modeling. This includes robust geological logging (previously not included in a database for modeling) and geological mapping from the pit. This has resulted in a complete structural and lithological model which SRK notes shows material differences from previous grade-based interpretations. Most importantly, SRK believes the current resource model to be satisfactory to support the resource classification performed and disclosure of mineral resources on the property.

SRK notes the following sources of uncertainty in the Mountain Pass resource model:

- The analytical QA/QC program at Mountain Pass is not considered consistent good industry practices. The limited historical QA/QC information that does exist shows relatively acceptable performance, but ongoing improvements are recommended by SRK.
- The exploration drilling has been sufficient to characterize a mineral resource at the classification applied and described in this report. SRK notes that the exploration drilling is considered at insufficient spacing to report a Measured reason based on the variability observed in the tighter spaced blasthole data.
    - SRK notes that production reconciliation tends to show an underestimation of TREO grades. No studies have been conducted in terms of sample representativity or other potential biases between drilling methods. SRK notes that this apparent bias seems to be local and geological in nature, and simply is showing that higher grade areas of the deposit were “missed” by exploration drilling which have now been picked up by blastholes.

SRK has dealt with uncertainty and risk at Mountain Pass by classifying the contained resource by varying degrees of confidence in the estimate. The mineral resources at the Mountain Pass deposit have been classified in accordance with the S-K 1300 regulations. The classification parameters are defined by geological understanding of the deposit, confidence in drilling locations, quality of QA/QC, distance to composite data, the number of drillholes used to inform block grades and a geostatistical indicator of relative estimation quality (kriging efficiency). The classification parameters are intended to encompass zones of reasonably continuous mineralization. The distances utilized for resource classification are generally based on interpretation of the ranges based on the directional variography (Section 11.6).

Classification is assigned using an iterative process which followed a simple script to categorize blocks based on the parameters below and modified as necessary by the QP:

- Measured mineral resources: Tonnages of stockpiles at surface for mill feed. Stockpiles resources, as of September 2023, are based on detailed grade control, well-established bulk density and accurate survey data, and have been depleted according to a detailed short term mine plan and blending schedule.

  - No Measured resources have been assigned to in situ resources at Mountain Pass at this time. This is based on relatively inconsistent QA/QC practices and the relatively poor reconciliations/observed blasthole vs. exploration comparison.
- Indicated mineral resources: Blocks in the model estimated using a minimum of three drillholes which are at maximum average distance of 300 ft, and for which the kriging efficiency of the estimate exceeds 0.
  - Kriging efficiency (KE) is used as a relative indicator of estimation quality. Even where the drill spacing may meet a reasonable grid with the requisite number of holes, and the grade variance is relatively high, blocks may be assigned Inferred based on the uncertainty this presents using a relatively poor kriging efficiency. This was determined from review of histograms of the KE and the spatial impact of filtering portions of this population on the grade continuity of the blocks.
- Inferred mineral resources: Blocks in the model which have been estimated but do not meet the criteria for Indicated resources within the mineralized carbonatite model.
- Subsequent to this process, the results are manually contoured and smoothed to eliminate artifacts from the scripting process. The final classification results are coded into the block model for reporting.

11.12 Cut-Off Grade and Pit Optimization

A cut-off grade (COG) of 2.18% TREO has been calculated to ensure that material reported as a mineral resource can satisfy the definition of reasonable potential for economic extraction (RPEE). COG input assumptions are shown below in Table 11-5. The COG is based on an equivalent concentrate selling price of US$12,461/dry st of 60% TREO concentrate (a 15% increase to the mineral reserve selling price of US$10,836/dry st of 60% TREO concentrate). The equivalent concentrate price reflects the gross contained value realized from sales of the four individual REO products produced from the onsite separations facility. The equivalent concentrate price is calculated based on (i) the expected percentage distribution of the REO products in the bastnaesite concentrate, (ii) the expected metallurgical recoveries for the separations facility and (iii) the expected sales prices for the REO products.

Pricing is based on a preliminary marketing study as summarized in Section 16 of this report. Additional costs and recovery considerations have been applied to the cut-off grade assumption as a result of this change.

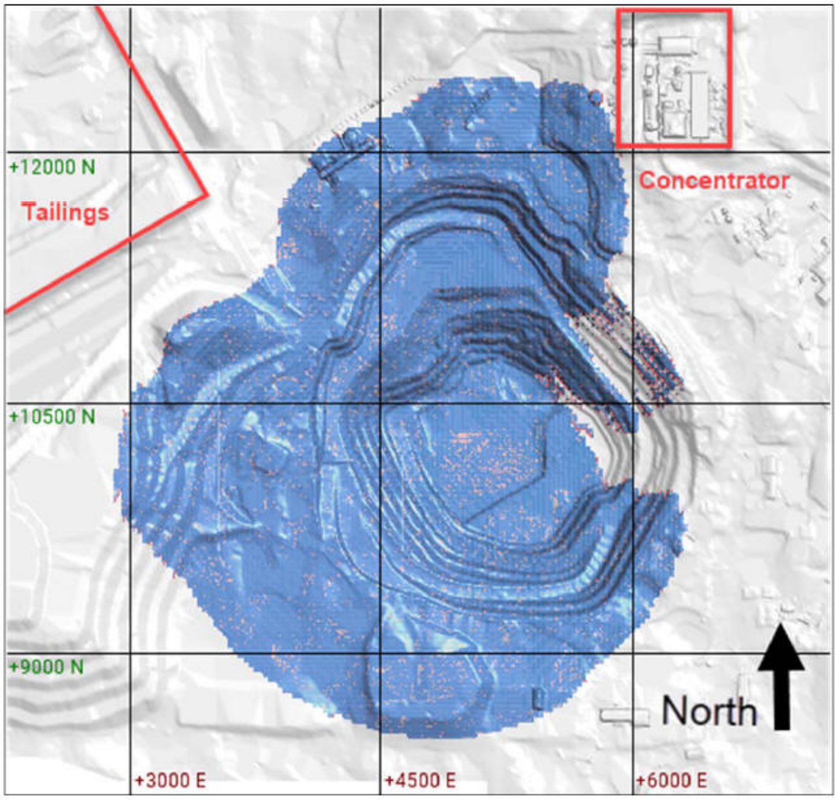
Table 11-5: Cut-Off Grade Input Parameters

Production	Value	Units
Concentrator Recovery	Variable based on mined grade	%
Target Concentrate Grade	60.0%	% TREO
Pricing		
Applied Price[(1)]	US$/dst conc.	12,461
Ore Rehandling[(2)]	US$/dst ore processed	1.32
Concentrator Cost	US$/dst ore processed	54.32
General and Administration	US$/dst ore processed	24.62
Separations Cost	US$/dst conc. processed onsite	Variable[(3)]
Freight and Marketing	US$/dst product sold	163.29

Source: SRK, 2023
(1) This is an equivalent concentrate price that reflects the gross contained value realized from sales of the four individual REO products produced from the onsite separations facility.
(2) Pit mining costs were excluded from the COG calculation because all resource blocks are constrained by an optimized economic pit shell. The pit optimization considered all costs, including mining costs.
(3) The separations cost per dst of concentrate is dependent on the quantity of processed concentrate per year (i.e., there is a fixed cost and a variable cost).

Mineral resources have been constrained within an economic pit shell based on reserve input parameters as defined in Table 12-1 of this report. Pit slope angles are variable based on geotechnical study inputs, and mining costs are variable based on haulage and pit depth. Pit optimizations were completed using Maptek Vulcan Lerch-Grossman (LG) optimization algorithms. Various scenarios were evaluated yielding a range of revenue factors. For mineral resources, a revenue factor of 1.0 is selected which corresponds to a break-even pit shell at the nominal pricing of US$12,461/dry st concentrate. SRK notes that the pit selected for mineral resources has been influenced by setbacks relative to critical infrastructure such as the tailing storage facility and the REO concentrator. These setbacks are approximately 280 ft, and “heavy” blocks or extreme densities were assigned to these areas in pit optimization to avoid the optimization mining these areas. Removal of these constraints would increase the overall volume of the pit and thereby the resource. SRK is of the opinion that these constraints are reasonable and in line with the overall determination of RPEE.

Figure 11-19 shows the extents of the optimized pit shape used for resources.



Source: SRK, 2024

Figure 11-19: Extents of Optimized Pit Shape Relative to Surface Topography

11.13 Mineral Resource Statement

The Mineral Resources are reported in accordance with the S-K regulations (Title 17, Part 229, Items 601 and 1300 until 1305). Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into Mineral Reserves. The Mineral Resource modelling and reporting was completed by SRK and are summarized in Table 11-6. The reference point for the mineral resources is in situ material.

Table 11-6: Mineral Resource Statement Exclusive of Mineral Reserves for the Mountain Pass Rare Earth Project, September 30, 2023

Category	Resource Type	Cut-Off TREO%	Mass (million sh. ton)	Average Value (%)					
				TREO[1]	La_2O_3[2]	CeO_2	Pr_6O_{11}	Nd_2O_3	Sm_2O_3
Indicated	Within the Reserve Pit	2.18	0.94	2.31	0.75	1.15	0.10	0.28	0.02
	Within the Resource Pit	2.18	0.50	3.56	1.16	1.77	0.15	0.43	0.03
Total Indicated		**2.18**	1.45	2.75	0.89	1.37	0.12	0.33	0.02
Inferred	Within the Reserve Pit	2.18	6.70	5.52	1.80	2.76	0.23	0.67	0.05
	Within the Resource Pit	2.18	2.40	3.74	1.22	1.86	0.16	0.45	0.03
Total Inferred		**2.18**	9.10	5.05	1.64	2.52	0.21	0.61	0.05

Source: SRK 2023
(1): TREO% represents the total of individually assayed light rare earth oxides on a 99.7% basis of total contained TREO, based on the historical site analyses.
(2): Percentage of individual light rare earth oxides are based on the average ratios; La_2O_3 is calculated at a ratio of 32.6% grade of TREO% equivalent estimated grade, CeO_2 is calculated at a ratio of 49.9% of TREO% equivalent estimated grade, Pr_6O_{11} is calculated at a ratio of 4.3% of TREO% equivalent estimated grade, Nd_2O_3 is calculated at a ratio of 12.1% of TREO% equivalent estimated grade, and Sm_2O_3 is calculated at a ratio of 0.90% of TREO% equivalent estimated grade. The sum of light rare earths averages 99.7%; the additional 0.3% cannot be accounted for based on the analyses available to date and has been discounted from this resource statement.
General Notes:

- Mineral Resources are reported exclusive of Mineral Reserves.
- Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves estimate.
- Mineral Resource tonnage and contained metal have been rounded to reflect the accuracy of the estimate, any apparent errors are insignificant.
- Mineral Resource tonnage and grade are reported as diluted.
- The Mineral Resource model has been depleted for historical and forecast mining based on the September 30, 2023, pit topography.
- Pit optimization is based on an average TREO% equivalent concentrate price of US$12,461 per dry st of 60% TREO concentrate, average mining cost at the pit exit of US$1.70 per dry st mined plus US$0.068 per dry st mined for each 15 ft bench above or below the pit exit, combined milling and G&A costs of US$78.94 per dry st ore milled, separations facility costs of US$1,551 per dry st of 60% TREO concentrate treated, freight of US$163 per st of dry product shipped, sustaining capital costs of US$30.48 per dry st of ore mined, and overall pit slope angles of 39° to 45° including ramps.
- The mineral resource statement reported herein only includes the rare earth elements cerium, lanthanum, neodymium, praseodymium, and samarium (often referred to as light rare earths). While other rare earth elements, often referred to as heavy rare earths, are present in the deposit, they are not accounted for in this estimate due to historic data limitations (see Section 9.1.5).

Resources inclusive of the reserves are stated in Table 11-7.

Table 11-7: Mineral Resources Inclusive of Mineral Reserves for the Mountain Pass Rare Earth Project, September 30, 2023

Material Type	Classification	Mass (million sh. ton)	TREO(1) (%)	La_2O_3(2) (%)	CeO_2 (%)	Pr_6O_{11} (%)	Nd_2O_3 (%)	Sm_2O_3 (%)
Stockpile	Measured	0.61	4.33	1.41	2.13	0.19	0.52	0.04
In Situ	Indicated	30.25	6.16	2.01	3.07	0.26	0.75	0.055
	Inferred	9.1	5.05	1.65	2.52	0.22	0.61	0.045

Source: SRK, 2024
(1) TREO% represents the total of individually assayed light rare earth oxides on a 99.7% basis of total contained TREO, based on the historical site analyses.
(2) Percentage of individual light rare earth oxides are based on the average ratios; La_2O_3 is calculated at a ratio of 32.6% grade of TREO% equivalent estimated grade, CeO_2 is calculated at a ratio of 49.9% of TREO% equivalent estimated grade, Pr_6O_{11} is calculated at a ratio of 4.3% of TREO% equivalent estimated grade, Nd_2O_3 is calculated at a ratio of 12.1% of TREO% equivalent estimated grade, and Sm_2O_3 is calculated at a ratio of 0.90% of TREO% equivalent estimated grade. The sum of light rare earths averages 99.7%; the additional 0.3% cannot be accounted for based on the analyses available to date and has been discounted from this resource statement.
General Notes:

- Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves estimate.
- Resources stated as contained within a potentially economically minable open pit stated above a 2.18% TREO Equivalent cut-off.
- Mineral Resource tonnage and contained metal have been rounded to reflect the accuracy of the estimate, any apparent errors are insignificant.
- Mineral Resource tonnage and grade are reported as diluted.
- The Mineral Resource model has been depleted for historical and forecast mining based on the September 30, 2023, pit topography.
- Pit optimization is based on an average TREO% equivalent concentrate price of US$12,461 per dry st of 60% TREO concentrate, average mining cost at the pit exit of US$1.70 per dry st mined plus US$0.068 per dry st mined for each 15 ft bench above or below the pit exit, combined milling and G&A costs of US$78.94 per dry st ore milled, separations facility costs of US$1,551 per dry st of 60% TREO concentrate treated, freight of US$163 per st of dry product shipped, sustaining capital costs of US$30.48 per dry st of ore mined, and overall pit slope angles of 39° to 45° including ramps.
- The mineral resource statement reported herein only includes the rare earth elements cerium, lanthanum, neodymium, praseodymium, and samarium (often referred to as light rare earths). While other rare earth elements, often referred to as heavy rare earths, are present in the deposit, they are not accounted for in this estimate due to historic data limitations (see Section 9.1.5).

11.14 Mineral Resource Sensitivity

In order to assess the impact of COG on contained metal, tonnage, and grade were summarized within the TREO resource pit above a series of TREO cut-offs (Table 11-8 and Table 11-9). As can be observed from these sensitivities, the resource is relatively sensitive to cut-off grade in the 3.0% to 5.0% TREO range, which is shown to be above the COG range of economic interest.

Table 11-8: TREO Cut-off Sensitivity Analysis Within Resource Pit –Indicated Category

Cut-off Grade (TREO%)	Short Tons ≥ Cut-off (million short tons)	Average Grade ≥ Cut-off (TREO%)	Material Content (%)
0.25	45.57	5.13	99.99
0.50	45.36	5.15	99.96
0.75	44.92	5.19	99.84
1.00	44.31	5.26	99.61
1.25	43.61	5.32	99.27
1.50	42.47	5.43	98.60
1.75	41.43	5.52	97.88
2.00	40.14	5.64	96.83
2.25	38.57	5.78	95.40
2.50	36.73	5.95	93.53
2.75	34.92	6.12	91.50
3.00	32.90	6.32	89.01
3.25	31.01	6.52	86.48
3.50	28.94	6.74	83.49
3.75	27.11	6.95	80.66
4.00	25.43	7.16	77.87
4.25	23.86	7.36	75.11
4.50	22.59	7.53	72.73
4.75	21.36	7.69	70.30
5.00	20.22	7.85	67.92

Source: SRK, 2024

Table 11-9: TREO COG Sensitivity Analysis Within Resource Pit – Inferred Category

Cut-off Grade (TREO%)	Short Tons ≥ Cut-off (million short tons)	Average Grade ≥ Cut-off (TREO%)	Material Content (%)
0.25	33.72	3.03	99.94
0.50	33.14	3.08	99.71
0.75	32.08	3.16	99.08
1.00	30.44	3.28	97.66
1.25	27.70	3.49	94.58
1.50	26.01	3.63	92.29
1.75	24.52	3.75	89.91
2.00	20.93	4.07	83.33
2.25	18.98	4.27	79.32
2.50	17.52	4.43	75.93
2.75	15.47	4.67	70.66
3.00	13.81	4.89	66.00
3.25	12.22	5.12	61.15
3.50	10.77	5.35	56.37
3.75	9.30	5.62	51.14
4.00	7.41	6.07	43.97
4.25	5.99	6.53	38.28
4.50	5.15	6.89	34.69
4.75	4.11	7.46	29.98
5.00	3.76	7.70	28.30

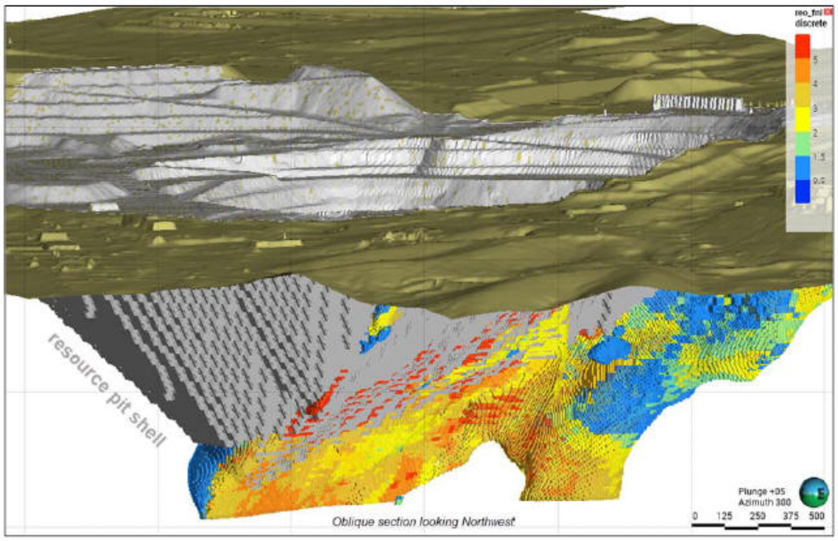
Source: SRK, 2024

In addition to the sensitivity noted above, SRK notes that pit optimization selection does demonstrate sensitivity to those parameters. At the current pricing, recovery assumptions, infrastructure setbacks, and other parameters, the resource pit excludes mineralized blocks above the COG, and typically located at depth. This volume does not meet the constraining criteria for a mineral resource but are estimated above the economic COG are termed “mineralized material”. The relationship to the pit shape and non-resource, above COG blocks are shown in Figure 11-20. A summary of mineralized material above COG and external to the constraining resource pit is summarized in Table 11-10.

Table 11-10: Mineralized Material External to Resource Pit

Resource Shell	Relative Confidence	Mass (million sh. ton)	Average Value TREO (%)
External	Indicated	8.8	4.30
	Inferred	8.0	3.57

Source: SRK, 2024
Note: Mineralized material does not meet the SEC definition for mineral resources.
The terms “indicated” and “inferred” are not a measure of relative confidence in block tons and grade and do not suggest the material meets the definition for a mineral resource.



Source: SRK, 2024

Figure 11-20: Mineralized Material >= 2.18% TREO and External to Resource Pit Shell

11.15 Assumptions, Parameters, and Methods

SRK uses a comprehensive set of assay analyses and ratio assumptions for individual light rare earth oxides to manually back-calculate rare earth grades and contained metal, as previously described in Section 9.1.4. Based on a statistical review of these analytical data, SRK is of the opinion that the low variances and numerical ranges of these ratios provide a reasonable assessment of individual metals within the TREO estimate, and that these calculations are suitable for resource reporting.

The mineral resource reported herein is subject to potential change based on changes to the forward-looking cost and pricing assumptions as disclosed in this report.

Extraction of this resource is dependent on modification of current permitted boundaries for the open pit. It is MP Materials' expectation that it will be successful in modifying these permit conditions. In SRK's opinion, MP Material's expectation in this regard is reasonable.

A portion of the resource pit encroaches on an adjoining mineral right holder's concession. This portion of the pit would only include waste stripping (i.e., no rare earth mineralization is assumed to be extracted from this concession). The prior owner of Mountain Pass had an agreement with this concession holder to allow this waste stripping (with the requirement that aggregate mined be stockpiled for the owner's use). MP Materials does not currently have this agreement in place, but SRK believes it is reasonable to assume MP Materials will be able to negotiate a similar agreement.

SRK is of the opinion that the reported mineral resources would not be materially affected by current environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or any other relevant factors. Should any of these factors change in the future, it is SRK's expectation that the mineral resources may be impacted.

12 Mineral Reserve Estimate

SRK developed a life-of-mine (LoM) plan for the Mountain Pass operation in support of mineral reserves. MP Materials will operate an on-site separations facility at the Mountain Pass site that will allow the Company to separate bastnaesite concentrate into four individual REO products for sale (PrNd oxide, SEG oxalate, La carbonate/La oxide, and Ce chloride). For economic modeling purposes, a combination of concentrate sales and separated product sales was assumed for Q4 2023 through Q4 2024 while the separations facility ramps up to full capacity. From 2025 onward, it was assumed that all concentrate will be fed to the separations facility. Forecast economic parameters are based on current cost performance for process, transportation, and administrative costs, as well as a first principles estimation of future mining costs. Forecast revenue from concentrate sales and individual separated product sales is based on a preliminary market study commissioned by MP Materials, as discussed in Section 16 of this report.

From this evaluation, pit optimization was performed based on an equivalent concentrate price of US$10,836 per dry st of 60% TREO concentrate. The equivalent concentrate price reflects the gross contained value realized from sales of the four individual REO products produced from the onsite separations facility. The equivalent concentrate price is calculated based on (i) the expected percentage distribution of the REO products in the bastnaesite concentrate, (ii) the expected metallurgical recoveries for the separations facility and (iii) the expected sales prices for the REO products. The results of pit optimization guided the design and scheduling of the ultimate pit. SRK generated a cash flow model which indicated positive economics for the LoM plan, which provides the basis for the reserves. Reserves within the ultimate pit are sequenced for the full 34-year LoM (Q4 2023 through 2056).

The costs used for pit optimization include estimated mining, processing, sustaining capital, transportation, and administrative costs, including an allocation of corporate costs.

Processing recovery for concentrate is variable based on a mathematical relationship to estimate overall TREO recovery versus ore grade. The calculated COG for the reserves is 2.43% TREO, which was applied to indicated blocks contained within an ultimate pit, the design of which was guided by economic pit optimization.

12.1 Conversion Assumptions, Parameters, and Methods

All conversion assumptions, such as mining dilution, mining recovery, COG calculation, pit optimization, and costs were taken into consideration to calculate the reserve estimate.

The following steps were used to calculate the reserves:

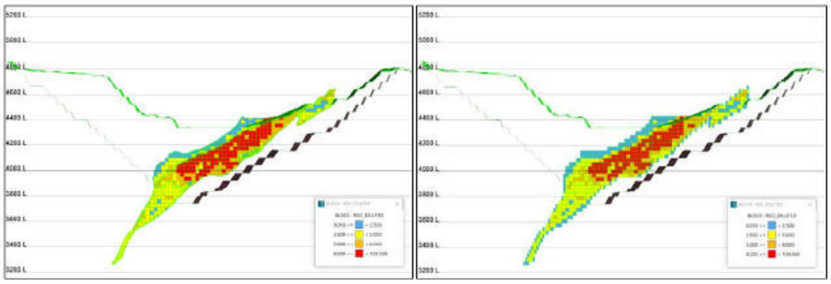
- Apply mining dilution to resource block model (using 3D techniques).
- Compile and confirm costs and process recoveries.
- Input optimization parameters into pit optimizer to calculate nested pits using different rare earth concentrate selling prices (only indicated resources were included in the evaluation).
- Choose a pit optimization shell based on strip ratio, revenue, grade distribution, discounted cash flow, cash costs, equipment sizes, pit footprint, depth of pit, minimum mining widths, COG, processing plant size, and other factors.
- Detailed phase design with ramp access to all benches
- Multiple trade-off mine plans based on different mining rates

- Detailed truck haulage estimates
- Detailed mine cost estimates based on detailed mine plan
- Discounted cash flow based on all capital and operating cost inputs
- Choose final mine plan and cash flow followed by reported reserves.

The following sections provide a description of how mining dilution was applied and how the in-pit COG was calculated.

12.1.1 Model Grade Dilution and Mining Recovery

The SRK resource block model is based on a sublocked 7.5 ft x 7.5 ft x 7.5 ft block size. The sublocked block model has approximately 3.5% estimated dilution. SRK's selected SMU is 15 x 15 x 30 ft. SRK ran a comparison between the original block model and the final reserves and determined that dilution is approximately 7.1% and the mining recovery from the reblocking is approximately 95%. Based on site reconciliation, SRK has noted that the grades have been higher than predicted. In SRK's opinion, there is a potential opportunity to reduce dilution by modeling consistently with the 15 ft x 15 ft x 15 ft SMU however the current mining methodology is based on 30 ft bench height. Figure 12-1 shows side by side comparison of the original sublocked model (pre-diluted) and the final 15x15x30 ft SMU selected diluted block model.



Source: SRK, 2021

Figure 12-1: Side by Side Comparison Non-Diluted (Left) Block Model and Diluted (Right) Block Model

It is SRK's opinion that the reblocking exercise added sufficient dilution to support the Probable category that has been used for the reserves statement. There is a risk that unmodeled internal dykes could increase dilution locally in some areas; however, the current resource drilling information does not have enough resolution to identify these dykes. MP Materials takes care in the mining operations to exclude dyke material from the ore to the extent possible. Dyke material is identifiable in the blasthole cuttings that are used for grade control, and it is visually identifiable by the loader operators.

12.1.2 Cut-Off Grade Calculation

Table 12-1 shows the parameters used for pit optimization. A selling price of US$10,836 per dry st of equivalent concentrate at 60% TREO was used for estimating reserves. The equivalent concentrate price reflects the gross contained value realized from sales of the four individual REO products produced from the onsite separations facility. The equivalent concentrate price is calculated based on

(i) the expected percentage distribution of the REO products in the bastnaesite concentrate, (ii) the expected metallurgical recoveries for the separations facility and (iii) the expected sales prices for the REO products. The design of the ultimate reserves pit was guided by economic pit optimization. Indicated blocks mined from within the reserves pit were included in the reserves tabulation if they have sufficient value to pay for ore rehandling, processing (including separations), G&A, and product shipping costs. The COG that meets this value threshold is 2.43% TREO. SRK notes that pit mining costs were excluded from the COG calculation because all reserve blocks are constrained by a designed ultimate pit. The designed ultimate pit was based on economic pit optimization that considered all costs, including mining costs.

Table 12-1: Pit Optimization Inputs

Parameter	Unit	Value
Mining Parameters		
Ex-Pit Mining Rate (ore + waste)	Mdst/y	Variable (11 Mdst/y maximum)
Mining Dilution(1)	%	0
Mining Dilution Grade	% TREO	0
Mining Recovery	%	100
Interramp Slope Angles(2)		
Azimuth 0° to 110°	degrees	46.0
Azimuth 110° to 270°	degrees	47.0
Azimuth 270° to 300°	degrees	45.0
Azimuth 300° to 0°	degrees	44.0
Processing Parameters		
Processing Rate	Dry st/y	863,590
Target Concentrate Grade	% TREO	60.0
Concentrate Moisture	%	9.0
Processing Recovery		
>1.5% TREO	%	0.0
1.5% to 2.1% TREO	%	22.0
2.1% to 8.3% TREO	%	Variable Based on Grade
>8.3% TREO	%	70.0
Price		
Equivalent Concentrate Price(3)	US$/dry st conc.	10,836
Costs		
Mining Cost Base Cost	US$/dst mined (ore and waste)	1.700
Mining Cost 15 ft Adjustment	US$/dst mined (ore and waste)	0.068
Sustaining Capital Costs	US$/dst ore mined	30.48
Concentrator Costs	US$/dst ore processed	54.32
General and Administration	US$/dst ore processed	24.62
Separations Cost	US$/dst conc. processed onsite	1,551
Freight and Marketing	US$/dst product sold	163.29
Royalty	% of gross revenue	-

Source: SRK, 2023
(1): Mining dilution is already built into the resource model and no further dilution was applied.
(2): An azimuth of zero degrees corresponds to north.
(3): The equivalent concentrate price reflects the gross contained value realized from sales of the four individual REO products produced from the onsite separations facility.

12.2 Reserve Estimate

The pit optimization considered only the indicated mineral resource category. The revenue factor 1.0 pit shell is the optimized pit shell that corresponds to 100% of the US$10,836 per dry st selling price selected for reserves estimation. The optimized pit shell selected to guide final pit design was based on a combination of the revenue factor (RF) 0.70 pit (used on the north half of the deposit) and the RF

1.00 pit shell (used on the south half of the deposit). The inter-ramp angles (IRA) used for the mine design are based on operational-level geotechnical studies and range from 44° to 47°.

Measured resources in stockpiles were converted to proven reserves. Indicated pit resources were converted to probable reserves by applying the appropriate modifying factors, as described herein, to potential mining pit shapes created during the mine design process. Inferred resources present within the reserves pit are treated as waste.

The mine design process results in in situ open pit probable mining reserves of 28.1 million st with an average grade of 6.26% TREO. Additionally, there are 0.6 million st of proven mineral reserves in stockpiles with an average grade of 4.33% TREO. The mineral reserve statement, as of September 30, 2023, for Mountain Pass is presented in Table 12-2. The reference point for the mineral reserves is ore delivered to the Mountain Pass concentrator.

Table 12-2: Mineral Reserves at Mountain Pass as of September 30, 2023, SRK Consulting

Category	Description	Run-of-Mine (RoM) Million Short Tons (dry)	TREO%	MY%	Concentrate Million Short Tons (dry)
Proven	Current Stockpiles	0.61	4.33	3.67	0.02
	In situ	-	-	-	-
	Proven Totals	**0.61**	**4.33**	**3.67**	**0.02**
Probable	Current Stockpiles	-	-	-	-
	In situ	28.08	6.26	6.62	1.86
	Probable Totals	**28.08**	**6.26**	**6.62**	**1.86**
Proven + Probable	Current Stockpiles	0.61	4.33	3.67	0.02
	In situ	28.08	6.26	6.62	1.86
	Proven + Probable Totals	**28.69**	**6.22**	**6.56**	**1.88**

Source: SRK, 2023

- Reserves stated as contained within an economically minable open pit design stated above a 2.43% TREO COG.
- Mineral reserves tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
- MY% calculation is based on 60% concentrate grade of the product and the ore grade dependent metallurgical recovery. MY% = (TREO% * Met recovery)/60% concentrate TREO grade.
- Indicated mineral resources have been converted to Probable reserves. Measured mineral resources have been converted to Proven reserves.
- Reserves are diluted at the contact of the 2% TREO geological model triangulation (further to dilution inherent to the resource model and assume selective mining unit of 15 ft x 15 ft x 30 ft).Mineral reserves tonnage and grade are reported as diluted.
- Pit optimization is based on an average TREO% equivalent concentrate price of US$10,836 per dry st of 60% TREO concentrate, average mining cost at the pit exit of US$1.70 per dry st mined plus US$0.068 per dry st mined for each 15 ft bench above or below the pit exit, combined milling and G&A costs of US$78.94 per dry st ore milled, separations facility costs of US$1,551 per dry st of 60% TREO concentrate treated, freight of US$163 per st of dry product shipped, sustaining capital costs of US$30.48 per dry st of ore mined, and overall pit slope angles of 39° to 45° including ramps.
- The topography used was from September 30, 2023.
- Reserves contain material inside and outside permitted mining but within mineral lease.
- Reserves assume 100% mining recovery.
- The strip ratio was 6.3 to 1 (waste to ore ratio).
- The mineral reserves were estimated by SRK Consulting (U.S.) Inc.

In the opinion of SRK as the QP, the conversion of mineral resources to mineral reserves has been completed in accordance with CFR 17, Part 229 (S-K 1300).

12.3 Relevant Factors

The reserve estimate herein is subject to potential change based on changes to the forward-looking cost and revenue assumptions utilized in this study. It is assumed that MP Materials will ramp up its on-site separations facilities to full capacity by the end of 2024. For economic modeling purposes, a combination of concentrate sales and separated product sales was assumed for Q4 2023 through Q4 2024. From 2025 onward, it was assumed that all concentrate will be fed to the separations facility.

Full extraction of this reserve is dependent upon modification of current permitted boundaries for the open pit. Failure to achieve modification of these boundaries would result in MP Materials not being able to extract the full reserve estimated in this study. It is MP Materials' expectation that it will be successful in modifying this permit condition. In SRK's opinion, MP Materials' expectation in this regard is reasonable.

A portion of the resource pit encroaches on an adjoining mineral right holder's concession. This portion of the pit would only include waste stripping (i.e., no rare earth mineralization is assumed to be extracted from this concession). The prior owner of Mountain Pass had an agreement with this concession holder to allow this waste stripping (with the requirement that aggregate mined be stockpiled for the owner's use). MP Materials does not currently have this agreement in place, but SRK believes it is reasonable to assume MP Materials will be able to negotiate a similar agreement.

SRK is not aware of other existing environmental, permitting, legal, socio-economic, marketing, political, or other factors that might materially affect the open pit mineral reserve estimate.

13 Mining Methods

The Mountain Pass deposit is mined by open pit mining methods. Surface mining operations include:

- Drilling and blasting to remove overburden material
- Loading and haulage
- General maintenance and services

The mine requires blending of mill ore to ensure that the mill receives a head grade within the operating range of the mill. The MP Materials mining equipment fleet includes wheel loaders, trucks, dozers, and graders. Maintenance shops are available at the mine site to service mine equipment.

The open pit is located in gently undulating topography intersecting natural drainages that require small diversions to withstand some rainfall events during the summer months. Waste dumps are managed according to the Action Plan (AP), are located on high ground, and are designed for control of drainage (contact water) if required. Some small diversions are already in place; however, additional diversions will need to be established.

The open pit that forms the basis of the mineral reserves and the LoM production schedule is approximately 3,100 ft from east to west and 3,800 ft from north to south with a maximum depth of 1,400 ft. Total LoM pit mining is estimated at 203.9 million st comprised of 28.1 million st of ore and 175.8 million st of waste, resulting in a strip ratio of 6.3 (waste to ore). Additional mill feed is sourced from existing stockpiles (0.6 million st). LoM mill feed grade averages 6.22% TREO yielding over 1.88 million dry st of recoverable 60% TREO concentrate.

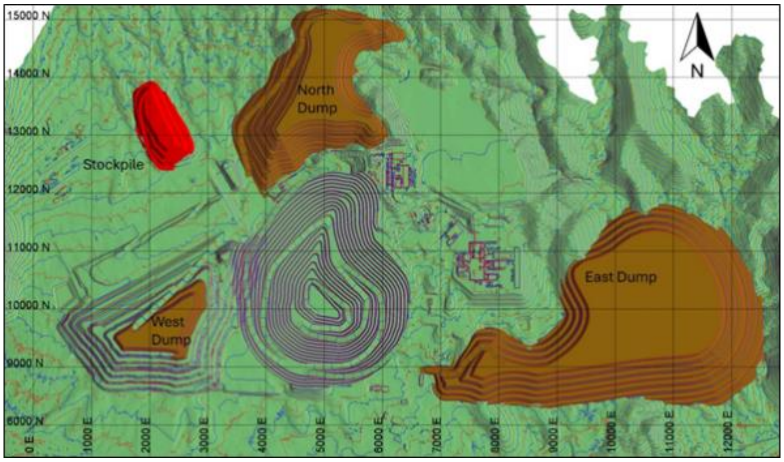
SRK designed four pit pushbacks that adhere to proper minimum mining widths. Bench sinking rates are approximated to no more than six benches per year per pushback.

Figure 13-1 illustrates the site layout and final pit design.

SRK's evaluation included:

- Open pit block model incorporating dilution and other required mining variables
- Pit optimization analysis and sensitivities
- Pit and phase designs
- Bench-based LoM production schedule integrated with the processing schedule
- Low-grade stockpile design
- Waste dump design
- Quarterly progression of pit and waste dumps for developing annual haulage cycle time estimation
- Fleet estimation of open pit equipment based on the mining production schedule

Results developed included estimated equipment fleet requirements, sustaining capital costs, and operating costs.



Source: SRK, 2023

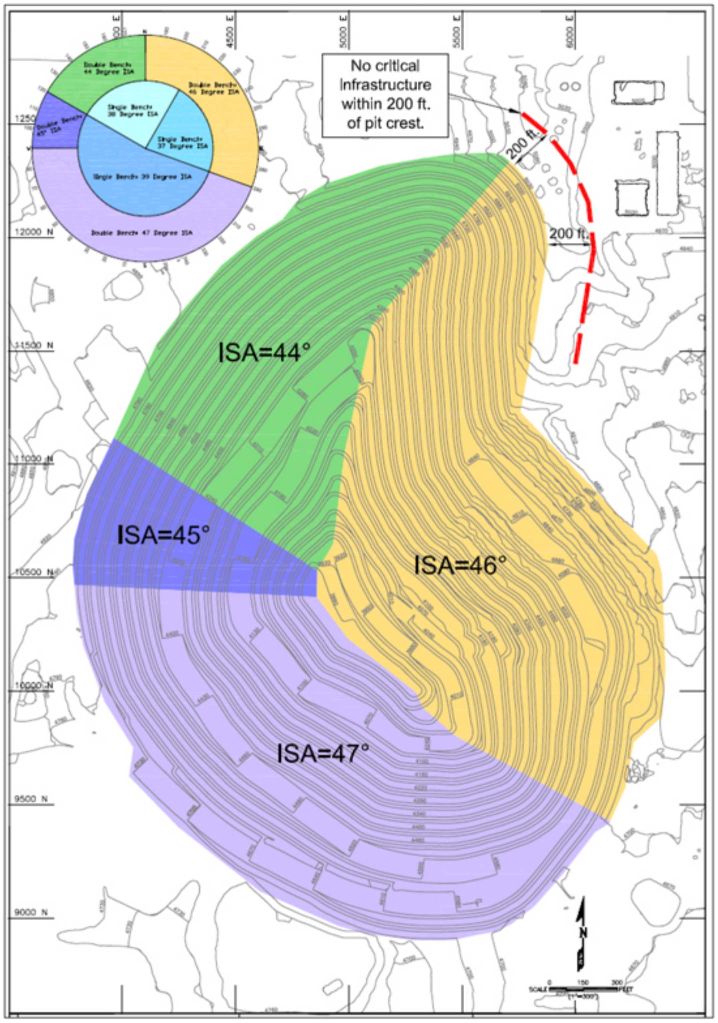
Figure 13-1: Final Pit Design and Site Layout

13.1 Parameters Relevant to Mine or Pit Designs and Plans

13.1.1 Geotechnical

For pit optimization and phase design, SRK used recommendations for pit slope inter-ramp angles (IRA) between 44° and 47° for all phases. These angles are based on results of a geotechnical study that was prepared by Call & Nicholas, Inc. in 2022 (CNI, 2022). Figure 13-2 shows the final IRA recommended by CNI, 2022 for the phase and final pit designs. SRK's mine design work was based on these IRA's, as presented in Table 13-1.

The recommended slope angles are controlled by the bench and inter-ramp stability, for all design sectors with the exception of the northwest (azimuth 300-0). An 80% catch bench reliability for the 60 ft high double bench configuration was used to determine the bench and inter-ramp slope angles. Overall slope wall factor of safety (FoS) exceeds 2.0 for the stability analysis sections analyzed by CNI. CNI has recommended that no critical infrastructure be placed within 200 ft of the final pit crest. SRK has reviewed and concurs with this recommendations. Locally, a minimum FoS was calculated for critical surfaces in the upper 2 to 3 benches of alluvium. All FoS calculated meet or exceed the guidelines for open pit slope stability guidance for wall stability (Read & Stacey, 2009).



Source: CNI, 2022
Note: ISA is equivalent to IRA

Figure 13-2: Recommended Double Bench IRA from CNI

Rock Mass Characterization

The rock mass consists of several different engineering geologic properties, including Carbonatite, Breccia, and Gneiss/Schist. The carbonatites are strong, dense, coarsely crystalline rocks and carbonatites which comprise most of the north, east, and south walls. The rock mass is strongly foliated with a dip to the west-southwest at approximately 50° to 70°. Distinct sets of cross joints are observed orthogonal to the main foliation; however, the orientation of these joints varies over short distances.

Intact strengths have been estimated by both point load testing (Vector, 1995) and by uniaxial compressive strength (UCS) testing of surface samples conducted by CNI in 2011. Intact UCS values range from 10,000 to 20,000 pounds per square inch (psi).

Rock Quality Designation/Rock Mass Rating

The Rock Quality Designation (RQD) ranges from 20 to 80 as observed by both CNI and Golder in the pit slope walls. An average RQD value of 50 is appropriate for characterizing the rock mass. A full Rock Mass Rating (RMR), including analysis of drill core at depth in the final walls, has not been completed but is estimated by SRK to be in the range of RMR 50 to 60. Four geotechnical studies with a defined rock mass for stability analyses have been completed to date on the Project. These studies include studies by Call & Nicholas, in 2011, 2020, and 2022. Prior work was done by Golder Associates in 2002 and Vector Engineering in 1995.

SRK has reviewed CNI slope angle recommendations (CNI, 2022) and consider them valid and appropriate for slope design. Pit slope angles have been determined using the recommendations from the CNI report assuming an 80% catch bench reliability.

SRK conducted a site visit on September 25, 2019, to observe the conditions of the Mountain Pass open pit. Key observations included successful double benching on the west wall with greater than 80% catch reliability in slopes excavated by MP Materials.

Open Pit Mine Design Parameters

The recommended slope angles for the Mountain Pass open pit were developed from the review of the 2022 CNI slope stability report and a review of the slope conditions of the west wall excavated by MP Materials. The recommended slope design parameters are listed in Table 13-1, and the slope design sectors are graphically illustrated on Figure 13-2.

Table 13-1: Recommended Slope Design Parameters

Open Pit Parameters	
Bench increment	15 ft
Bench height	30 or 60 ft
Bench face/batter angle (BFA)	66° to 68°
Design bench/berm width (60 ft high bench)	30 to 36 ft
Minimum bench width (modified Ritchie Criteria, 30 and 60 ft high)	15 to 24 ft
Maximum IRA by design sector	44° to 47°
Maximum overall slope angle (OSA)	45°
Design Criteria	
Minimum factor of safety (FoS)	2.0

Source: SRK, 2023

Slope design constraints assume a 15 ft model block height. Mining production will be conducted primarily on 30 ft bench heights. Most areas of the mine are in competent rock mass, and it is envisioned that in these areas the mining in the final wall will be finished to a 30 ft face or a 60 ft face height. Using a multiple-bench final wall configuration permits a steeper IRA in competent ground. The maximum inter-ramp slope height (bench stack height) is 500 ft. A geotechnical berm, or haul ramp, with a minimum width of 65 ft is required between bench stacks.

The minimum catch bench width is developed using the modified Ritchie Criteria (Ryan and Pryor, 2000). The minimum catch bench width for a 60 ft high bench face is 24 ft using the Ritchie Criteria. For a 30 ft high bench, the minimum width is 15 ft.

Bench face angles vary by sector and are based on average obtained values by mapping. The measured bench face angle using highwall controlled blasting procedures results in average bench face angles ranging from 66° to 68°. For the given slope design parameters and limited subsurface data, dual ramp access is required to ensure access to ore material for each mining phase. With the ramps and the recommended IRAs, the final wall overall slope angle maximum is 45°. Stability of the pit slope, including hydrogeological inputs, is documented in the CNI, 2022 report. SRK has reviewed the results, and stability of the pit slope using these design parameters meets a slope acceptance criterion with a minimum FoS of greater than 2.0. These FoS results are within the guidelines of the current reclamation plan, and also meet the criteria outlined in Guidelines for Open Pit Slope Design (Read & Stacey, 2009).

Table 13-2 lists the CNI recommended slope design parameters by wall sector, as illustrated on Figure 13-2.

Table 13-2: CNI Final Recommended Slope Design Parameters by Design Sector

Mine Planning Azimuth		Wall DDR (Clockwise)		Bench Height (ft)	Design IRA (°)	BFA (°)	Design Layout Bench Width (ft)
Start	End	Start	End				
110	270	290	90	60	47	70	34.1
270	300	90	120	60	45	71	39.3
300	0	120	180	60	44	68	37.9
0	110	180	290	60	46	68	33.7

Source: CNI, 2022

MP Materials has been using controlled wall blasting in order to achieve the recommended bench configurations. Trim shots are used against final walls. In SRK's opinion, the blasting procedures in place are sufficient to achieve the recommended slope design parameters.

CNI recommended a slope offset for mine facilities, including the concentrator, paste tailings plant, process plant, and water storage tanks, of 200 ft. CNI recommends if the pit crest is within 200 ft of critical infrastructure, the recommended IRA is 44° for at least four benches (120 ft). Below these benches, the IRA may be increased to 46°. SRK concurs with this recommendation.

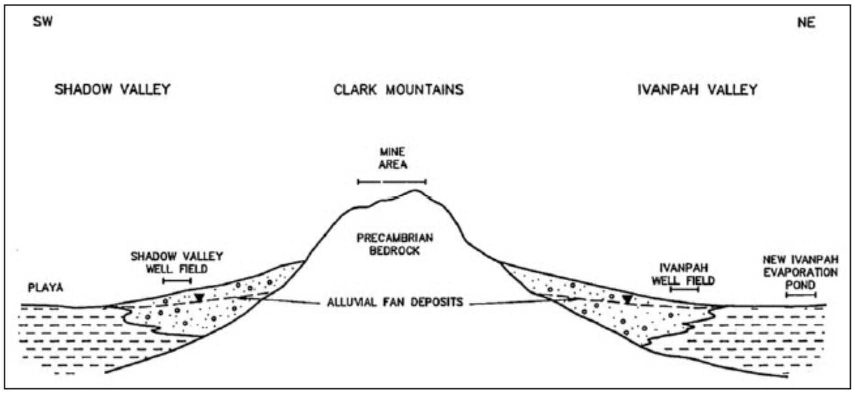
As a part of the CNI Geotechnical study (CNI, 2022), Three multi-level piezometers with a total of nine transducers were reviewed to characterize the current phreatic surface elevation. An Environmental Impact Report written in 1996 (ENSR, 1996) shows that groundwater flows Northwest to Southeast in the pit area. The stability analysis incorporates modeled pore pressures based on the piezometric data.

Geotechnical Recommendations

Routine geotechnical slope monitoring, data collection, and analysis should continue. MP Materials should review geotechnical parameters and optimize the mine plan prior to starting new phases based on this review.

13.1.2 Hydrogeological

Groundwater in the vicinity of the mine occurs within coarse unconsolidated alluvial sediments and within underlying fractured Precambrian bedrock. In general, most of the groundwater flows eastward through the alluvium toward the Ivanpah Valley and westward toward the Shadow Valley as shown schematically in Figure 13-3.



Source: Draft EIR (1996)

Figure 13-3: Idealized Cross-Section Through Mine Area and Adjacent Valleys

The surface geology of the site is characterized by partially lithified, cemented Tertiary to Quaternary age alluvial deposits and debris flows in the southwest and central areas, Precambrian gneissic bedrock outcropping in the north, east, and southeast, and by Precambrian gneiss, terrace gravels, and recent alluvial deposits in the wash areas in the northwest, east and southeast. Bedrock at the site consists of Precambrian metamorphic and younger intrusive rocks. The older metamorphic rocks consist primarily of granitic and mafic gneiss. The main igneous bodies at the site, which have intruded the older metamorphic complex, consist of shonkinite and syenite stocks and associated carbonatites. The dominant structural fabric as represented by faulting, foliation, jointing, and fracture-controlled dikes, trends northwest and dips steeply to the northeast or southwest.

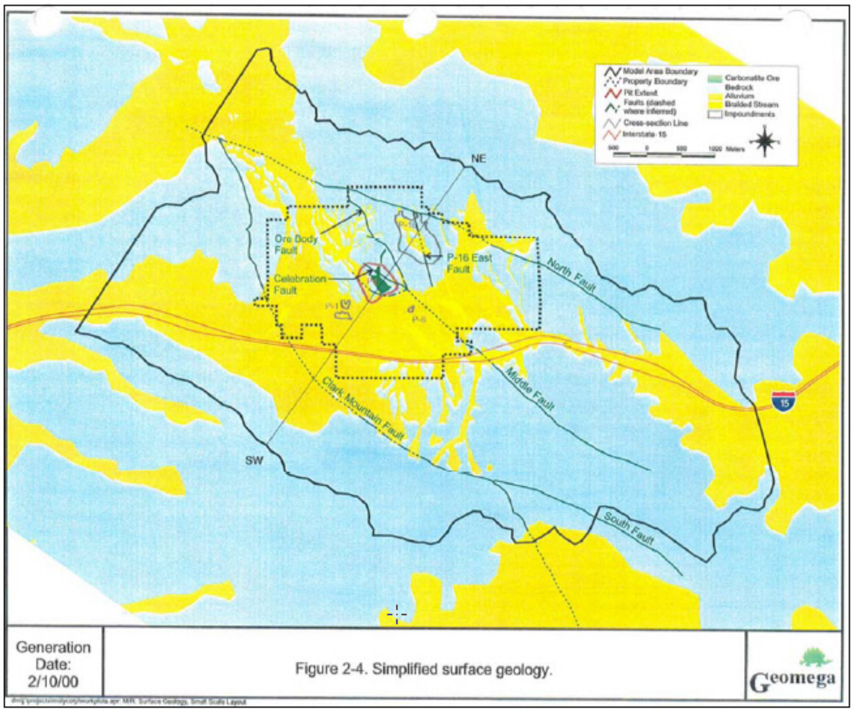
Extensive faulting in the mountain ranges is also hydrologically significant. Several lateral transverse faults have been mapped in the area. This can lead to sharp contrasts in bedrock permeability-fracturing can be extensive along fault zones and affect permeability. Often faults act as barriers normal to flow and as groundwater conduits parallel to flow.

Major faults were identified and incorporated into the numerical groundwater model developed by Geomega in 2000 (Geomega, 2000) for the early stage of open pit excavation. The model simulated several faults as flow barriers, including two in the pit area:

- Clark Mountain fault, a normal/reverse fault
- South fault, a left lateral fault
- North fault, a left lateral fault
- Middle fault, a left lateral fault
- East Ore Body fault, a normal fault
- P-16 Fault, a normal fault

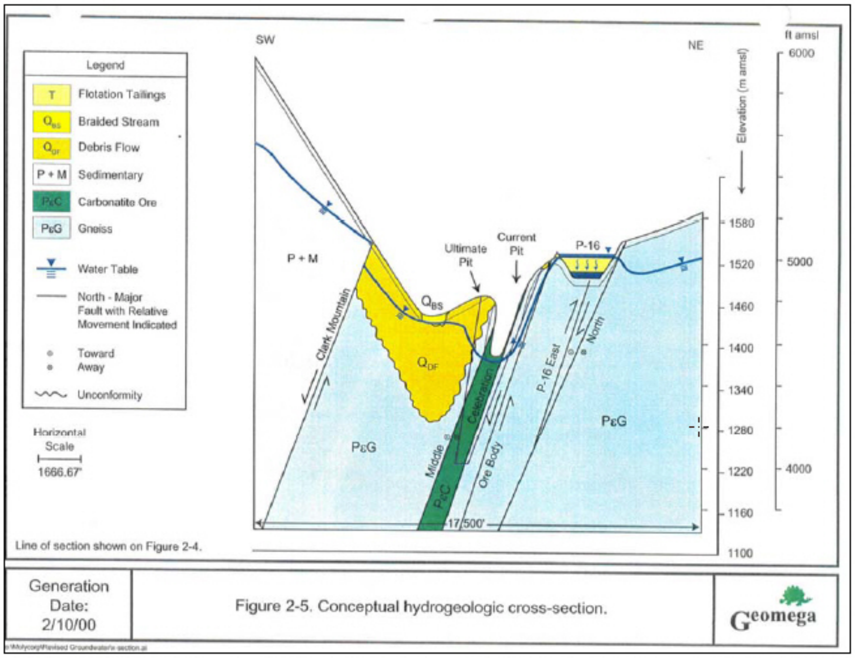
Additionally, the Geomega model simulated the Celebration fault, a left lateral fault with some normal movement, as a conduit to flow.

The location of these faults is shown in a simplified surface geological map and conceptual hydrogeologic cross-section made by Geomega (2000) in Figure 13-4 and Figure 13-5, respectively.



Source: Geomega (2000)

Figure 13-4: Simplified Surface Geology



Source: Geomega (2000)

Figure 13-5: Conceptual Hydrologic Cross-Section

Hydraulic conductivity values of sediments and bedrock units exhibit considerable variability depending both on the lithology and the degree of cementation, fracturing, or other secondary permeability development. Groundwater permeability within the bedrock is fracture-controlled. Hydraulic conductivity values in fractured zones range up to 17 feet per day (ft/d), while those in less fractured zones range up to 0.04 ft/d (GSi/water, 1991). Within the older alluvium, variation may result from differing degrees of cementation and clay content associated with alternating sequences of alluviation and debris flows. The older alluvium deposits have been found to be significantly less permeable than the recent alluvium, exhibiting hydraulic conductivity values on the order of 0.03 to 0.003 ft/d (GSi/water, 1991). The recent wash deposits are the most permeable at the site, exhibiting hydraulic conductivity values in order of tens ft/d (SRK, December 1985).

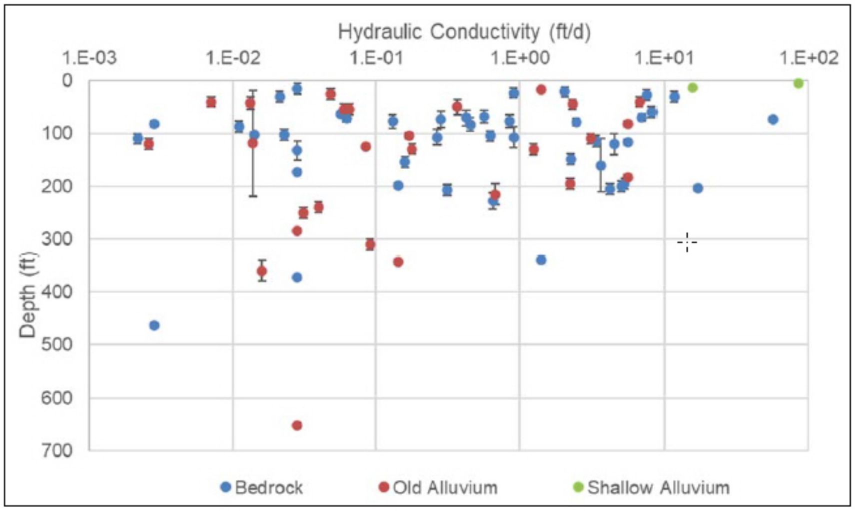
The hydraulic parameters of the hydrogeological units were tested by pumping tests, slug tests, and packer testing. Table 13-3 summarizes statistics of the measured hydraulic conductivity values.

Table 13-3: Summary of Measured Hydraulic Conductivity Values

Hydrogeological Unit	Number of Tests	Hydraulic Conductivity (ft/d)			
		Min	Max	Average	Geomean
Shallow Alluvium	2	15.6	85.0	50.3	36.4
Old Alluvium	27	0.003	6.8	1.1	0.16
Bedrock	45	0.002	56.7	3.5	0.41

Source: Compiled by SRK using data in Geo-Logic (March 2023)

Figure 13-6 shows the distribution of measured hydraulic conductivity values per depth:



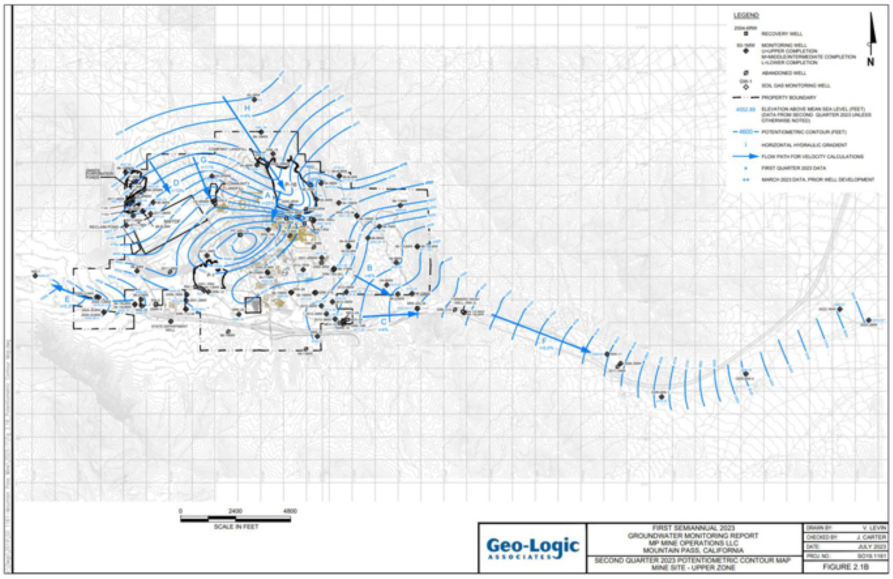
Source: Compiled by SRK using data in Geo-Logic (March 2023)
Note: Error bars show tested intervals.

Figure 13-6: Measured Hydraulic Conductivity Values per Depth

Table 13-3 and Figure 13-6 indicate:

- Large variability in hydraulic parameters (up to 4 orders of magnitude)
- Relatively large hydraulic conductivity for bedrock where the open pit is being excavated (geometric mean is 0.4 ft/d)
- General trend of decreasing bedrock hydraulic conductivity with depth
- Testing of the shallow bedrock with limited tests completed below the depth of 250 ft

The groundwater levels around open pit and other mine facilities have been observed by monitoring wells. Their location, currently measured water table elevation and direction of groundwater flow is shown in Figure 13-7.



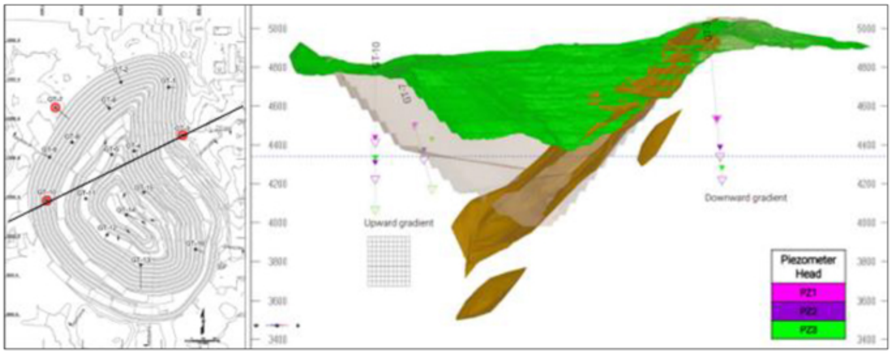
Source: Geo-Logic (July 2023)

Figure 13-7: Location of Monitoring Wells, Measured Water Table Elevation, and Direction of Groundwater Flow (as Q2 2023)

Figure 13-7 and Geo-Logic (July 2023) indicate:

- Groundwater generated by recharge from precipitation at the Clark Mountains north of the mine flows to the southeast and discharges in alluvial fan deposits of the Ivanpah Valley and Shadow Valley to the east and west, respectively.
- The open pit creates a local cone of drawdown due to pumping from two pit dewatering wells. The estimated lowest water table elevation within the pit is about 4,400 ft amsl.
- Measured groundwater levels at the site during the first 2023 monitoring period reflect a continued long-term decreasing trend, and several have become dry. The steady decline in water levels extends back to a particularly wet year in 2005 when there was a marked increase in water levels at the site.

Water level elevations in the walls of the proposed ultimate pit were measured in the piezometers recently installed in geotechnical core holes. Their location and measured water levels are shown in Figure 13-8.



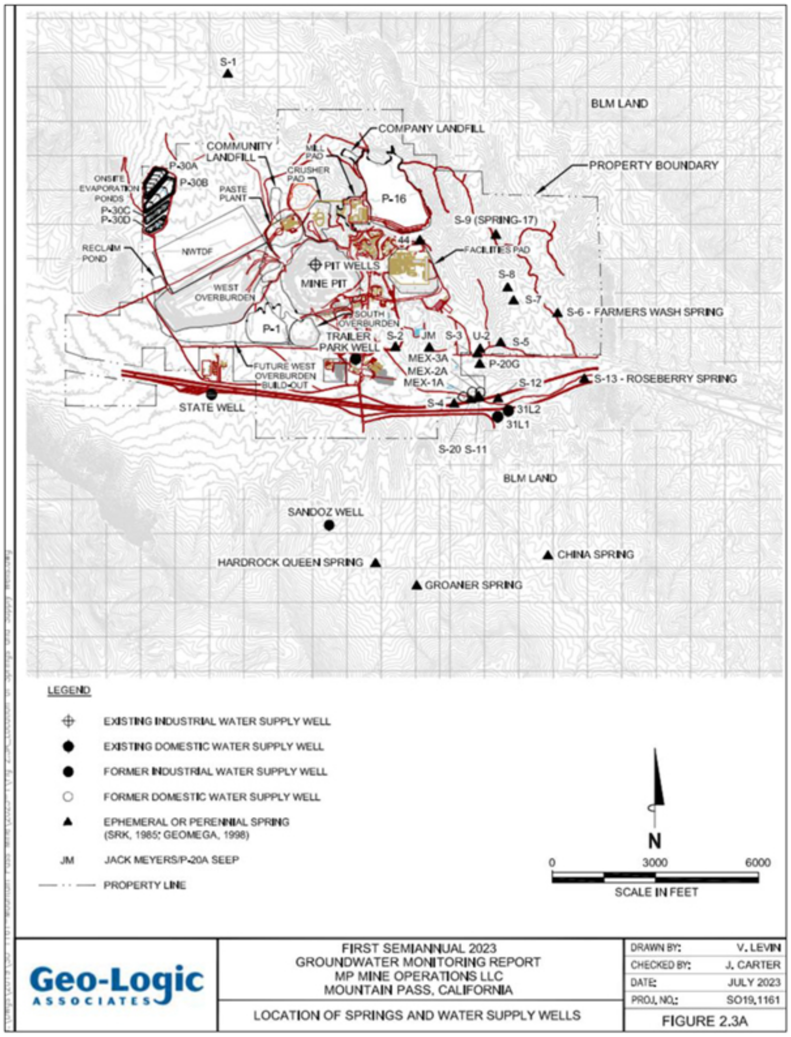
Source: CNI (January 2022)
Note: The existing pit is shown in the right figure in green, with the phase 10 pit evaluated by CNI– in grey. Ultimate pit shells proposed by SRK are not shown – they consider deepening of the pit to 3,740 ft amsl.

Figure 13-8: Location of Piezometers and Measured Water Levels in Pit Walls

Figure 13-8 indicates:

- The lower part of the water table in the pit area is slightly below 4,400 ft amsl
- Presence of a downward hydraulic gradient in the eastern wall (recharge area) and an upward gradient in the western wall (toward the discharge area).

The location of industrial and domestic water supply wells (both historic and existing) with the mine facilities is shown in Figure 13-9.



Source: Geo-Logic (July 2023)

Figure 13-9: Location of Industrial and Domestic Water Supply Wells and Mine Facilities

Mine Dewatering

- Mine pit dewatering is accomplished using one or two dewatering wells at the bottom of the mine pit.
- Historically, dewatering of the open pit was done by one dewatering well. The pumping rate was about 36 gpm during 1987 through 1991. From June to November 1993 the pit well pumped an average 127 gpm to depress the water table below the 4,510 ft mining level.
- Two extraction dewatering wells (PEW-1 and PEW-2) were installed at the bottom of the pit within fractured bedrock in 2018 and drilled to the depths of 215 m and 162 m, respectively. The screen depth intervals in PEW-1 are from 115 to 214 m, and in PEW-2 are from 60 to 160 m. The location of these wells is shown in Figure 13-5.
- A summary of pit water production during the first half of 2023 is provided in Table 13-4. Pit dewatering yielded approximately 19.1 million gallons during the last two quarters of 2023. The pumping rate varied from 28 to 112 gpm with an average rate of 74 gpm. The pit water was used exclusively for dust control on the mine's roads. Pumping from wells PEW-1 and PEW-2 allows the mine to maintain local containment of groundwater (shown in Figure 13-5).

Table 13-4: Summary of Pit Water Production in the First Half of 2023

Month of 2023	The Volume of Pumped Water (gal)	Average Pumping Rate (gpm)
January	1,255,700	28.1
February	2,413,900	59.9
March	2,494,000	55.9
April	4,857,300	112.4
May	4,016,500	90.0
July	4,080,300	94.5
Average	3,186,283	73.5

Source: Geo-Logic (July 2023)

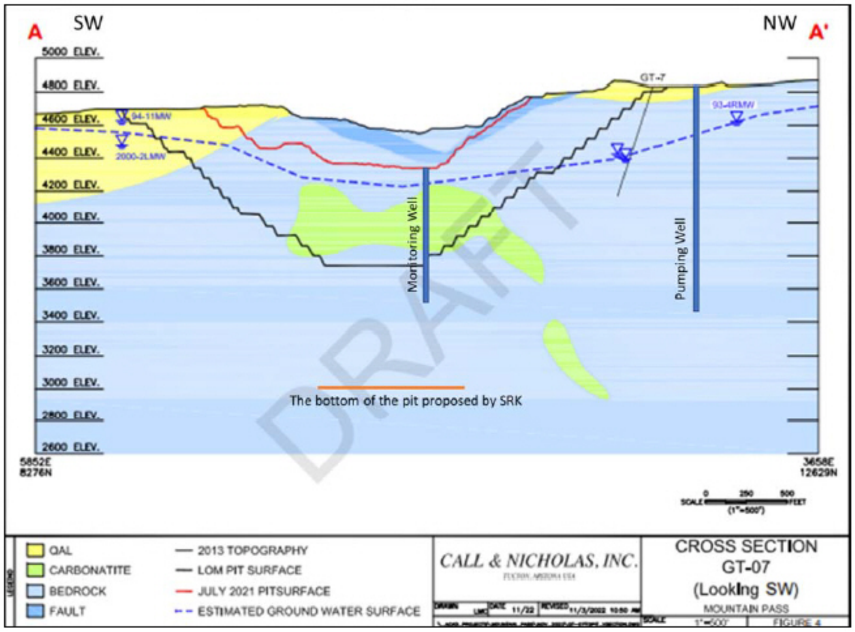
CNI proposed to drill a new pumping well to the northwest from the current pit to the bottom elevation of 3,440 ft amsl and a monitoring well in the center of the pit with 3 nested grouted-in transducers for conducting long-term pumping test (CNI, November 2022). The locations of the pumping and monitoring wells are shown in Figure 13-10 and Figure 13-11.

In SRK's opinion, this pumping test can be successful if bedrock to the elevation of 3,440 ft amsl is permeable and sufficient drawdown will propagate toward the proposed well. The total transmissivity of bedrock would be measured without the possibility of differentiating it per depth. If MP Minerals proceeds with the suggested CNI plan to drill pumping and monitoring wells, SRK strongly recommends adding spinner logging testing of the pumping well to allow at least preliminary re-distribute measured total transmissivity per depth.

Available data shown in Figure 13-4 suggest that hydraulic conductivity values decrease with depth and only isolated interval testing can verify this trend, considering that ultimate pit bottom elevation evaluated by SRK will reach an elevation of about 3,740 ft amsl.

Source: CNI (November 2022)

Figure 13-10: Location of Proposed Pumping and Monitoring Wells by CNI Shown in Plan-View



Source: CNI (November 2022) with modification by SRK

Figure 13-11: Location of Proposed Pumping and Monitoring Wells by CNI Shown on Cross-Section

The proposed deepening of the bottom of the pit to the ultimate elevation of 3,740 ft amsl will increase dewatering rates compared to currently observed. The major sources of groundwater inflow into the proposed pit would be:

- Fractured zones of the bedrock (location of these zones at the depth is currently unknown).
- Old alluvium sediments to the southeast (as shown in Figure 13-11); these sediments need to be dewatered by pumping well(s) to avoid groundwater spillover into the pit.

Most likely, pit dewatering can be handled by a system of bedrock pumping wells (in-pit, similar to existing wells PEW-1 and PEW-2, or perimeter wells drilled to the greater depths) and residual passive inflow captured by in-pit sumps).

It should be noted that:

- Hydrogeological conditions of the bedrock have not been tested at the proposed depth of the future pit. Packer testing was not completed in geotechnical and exploration core holes.
- Future effectiveness of in-pit pumping wells is unclear considering the deepening of the existing pit bottom by an additional 585 ft.

- The numerical groundwater model of the mine area developed by Geomega in 2000 has not been updated to allow the prediction of:
  - Dewatering requirements during future mining conditions
  - Pit lake infilling during post-mining conditions

SRK recommends that MP Minerals:

- Conduct additional hydrogeological studies of the deep part of the bedrock to the elevation of the proposed bottom of the pit (3,000 ft amsl) by conducting packer-isolated tests in three or four core holes defining bedrock permeability and dewatering targets (where and to what depth dewatering wells can be installed). The strings of vibrated wire piezometers (similar to those installed by CNI) are also recommended in these core holes to better define vertical hydraulic conductivity and the hydrogeological role of encountered faults.
- If zones of significant permeability are found by packer testing, pumping wells with long screens should be drilled targeting these zones with the drilling of pilot holes prior to their construction. Spinner logging needs to be done within the screen intervals of these pumping wells.
- Update or develop new numerical groundwater flow to predict inflow to the proposed pit and better define:
  - Dewatering requirements
  - Pore pressures in pit walls and the potential necessity to reduce them by installation of horizontal drain holes from pit benches (if required by geotechnical conditions of the slopes)
  - Propagation of the drawdown cone during both mining and post-mining conditions (including pit lake infilling) to evaluate the potential impact on the groundwater system because of the continued deepening of the open pit

Water Supply

MP Minerals maintains and operates two water supply wellfields for portable and process water. The Ivanpah well field, established in 1952, is located on private land eight miles east of the mine site and consists of six freshwater-producing wells, three booster stations, and associated pipelines. The Shadow Valley well field, established in 1980, is located 12 miles west of the mine site and consists of four wells of which three are on public land and one on private land, a single booster station, and associated pipelines. The water supply wells are completed within coarse alluvial sediments.

The amount of freshwater consumed by the facility in 1996 was approximately 850 gpm from both wellfields. The five-year annual average between 1993 and 1997 was 795 gpm. As part of the comprehensive plan for continued operations, MP Materials placed emphasis on on-site management and treatment of process water and maximizing reuse (SRK, 2010).

As the water supply systems have consistently produced much larger amounts of fresh water for the facility in the past, the water supply is not anticipated to be problematic.

13.2 Pit Optimization

SRK completed a pit optimization exercise to provide the basis for the final LoM reserve pit design. This process utilizes initial approximated assumptions for the LoM production such as an average overall slope angle, typical production costs and typical process recoveries, as discussed below. It is important to note that these parameters do not exactly reflect the final reserve assumptions as this process is an interim step that precedes these final reserve calculations. Therefore, there are typically small differences between initial pit optimization assumptions and final reserve assumptions on items such slope design and costs, which are calculated as part of the final mine design process.

For the purposes of this analysis, SRK utilized Whittle™ software which uses a Lerchs-Grossmann algorithm to produce a series of nested pit shells which are derived by incrementally changing revenue assumptions. These incremental changes are referred to as Revenue Factors (RF) with, for example, a RF 1.0 reflecting a pit requiring 100% of the assumed base case revenue to be economic. In comparison, a RF 0.9 pit only requires 90% of the base case revenue to be economic, and this pit is inherently smaller than the RF 1.0 pit and hence is nested within it.

13.2.1 Mineral Resource Models

The current block model block sizes are 15 ft by 15 ft by 30 ft (Table 13-5). SRK applied dilution to the edge blocks based on the percentage of waste material within this block. This was done by performing a reblocking calculation on all the blocks. SRK is of the opinion that the grades will vary considerably at the local scale when mining.

Table 13-5: Block Model Block Sizes

Item	Main Pit Area
X (ft)	15
Y (ft)	15
Z (ft)	30

Source: SRK, 2023

The resource block model was imported into Whittle™ and Maptek Vulcan LG and verified against the original mineral resource block model (block model), created in Vulcan™. The Vulcan™ block model subsequently was coded in preparation for optimization. This included diluting the block model to account for mining practices. The verification process indicated no material changes to the block model tonnages and grade during the process of importing into Whittle™.

13.2.2 Topographic Data

SRK was provided a September 30, 2023, surface to be used in the reserve calculation. The site uses a DJI Phantom 4 RTK Drone, Pix4D, and Maptek's I-Site software to provide detailed surveys.

13.2.3 Pit Optimization Constraints

The Mountain Pass pit design combines current site access, mining width requirements, and generalized geotechnical parameters to evaluate the possibility for full extraction of resources through open pit techniques. Restrictions were placed on the pit optimization to prevent the optimized pit shell from encroaching on the concentrator and tailings storage facility.

The optimization process was restricted to indicated resources. There are no pit resources classified as measured. For the purpose of the optimization, there were no production or processing limits used within Whittle™, and all material not classified as indicated was treated for calculation purposes as waste.

13.2.4 Pit Optimization Parameters

Mining Dilution

The block model is based on 15 ft by 15 ft by 30 ft blocks. Where the interpretation of the mineralized rock intersects a block model block centroid, the block within the mineralized shape is recorded. The flagging of ore type is based on block centroid and accounts for the location and placement of the ore contact. Because the contact of waste and ore is not always clearly visible, dilution is expected and has been accounted for. Average dilution across the deposit results in a 3.5% reduction in ore grades.

The Whittle™ optimization software used settings of 0% mining dilution and 100% ore recovery (as this was pre-coded into the block model). These parameters were supplied by the client but are considered by SRK to be reasonable because the imported block model was already diluted.

Discount Rate

The pit optimization process used a 6% discounting factor. Inflation was not factored into the costs or the selling price used in the analysis.

Geotechnical Parameters

For the pit optimization, SRK used a variable overall slope angle between 39° and 45°, which approximates the inclusion of ramps (the pit optimization process cannot include actual ramp design so this must be approximated). The final pit design, including the location of the ramps will differ slightly from the pit optimization initial assumptions.

Revenue

SRK utilized a base case selling price of US$10,836/dry st for a 60% TREO equivalent concentrate. The equivalent concentrate price reflects the gross contained value realized from sales of the four individual REO products produced from the onsite separations facility. The equivalent concentrate price is calculated based on (i) the expected percentage distribution of the REO products in the bastnaesite concentrate, (ii) the expected metallurgical recoveries for the separations facility and (iii) the expected sales prices for the REO products.

Royalties

No royalties have been applied to the optimization.

Mining Costs

SRK reviewed MP Materials’ recent actual costs and modified the pit optimization costs based on prior experience with similar projects. A base mining cost per short ton at the pit exit elevation has been applied for all material. The base mining cost is US$1.700/st. For each 15 ft bench that is mined above or below the pit exit elevation, an incremental cost of US$0.068/st was added. Subsequent to pit optimization, SRK prepared a first principles mining cost model, the results of which were used for economic modeling.

Recoveries

The current forecast mill recoveries are variable based on ore grade, and the concentrate grade target is 60% TREO. SRK is using the following equation for the mass yield calculation: MY% = (TREO% * Met Recovery)/60%.

Other Input Parameters

Table 12-1 presents the full list of pit optimization parameters.

13.2.5 Optimization Process

As a result of the pit optimization, the relationship of potential pit shells is based on stripping ratio variability and subject to the base case selling price of US$10,836/dry st (60% TREO equivalent concentrate). By looking at the relationship of ore to waste and the associated best-case and worst-case cash flows generated at each incremental pit, the risk profile and revenue generating potential of the deposit can be estimated.

To estimate the LoM pit utilized as the basis for the final reserve pit design, a series of nested pit shells were calculated over a range of Revenue Factors (RF). Each of the nested pit shells were generated based on the maximum pit value calculated for the applicable RF. The generated nested pit shells increase in size as the RF and maximum pit value also increase.

The final pit design will not exactly match this optimization output and will often include a small amount of material outside of this estimated LoM pit.

13.2.6 Optimization Results

Pit optimization results are presented in Table 13-6. The optimized pit shell selected to guide final pit design was based on a combination of the RF 0.70 pit (pit shell 11, used on the north half of the deposit) and the RF 1.00 pit shell (pit shell 17, used on the south half of the deposit).

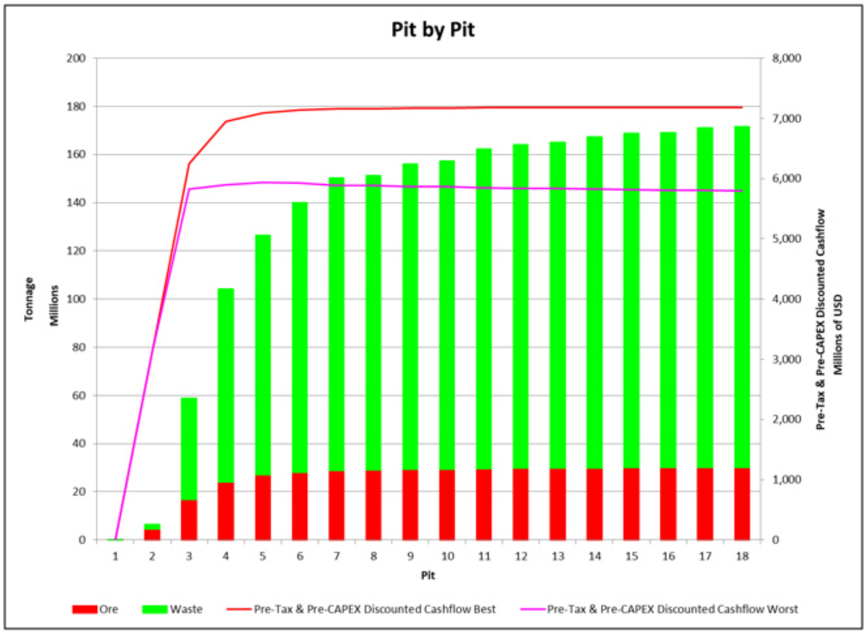
Table 13-6: Mountain Pass Pit Optimization Result Using Indicated Classification Only

Pit	Revenue Factor	Concentrate (60% TREO) Equivalent Price (US$/dry st)	Strip Ratio	Total Mined (million st)	Ore (million st)	Waste (million st)	Concentrate Produced (thousand st)	MY%	TREO Dil%
1	0.2	$ 2,167	0.09	0.0	0.0	0.0	1.2	20.76%	17.81
2	0.25	$ 2,709	0.49	6.5	4.4	2.2	459.9	10.50%	9.18
3	0.3	$ 3,251	2.51	58.9	16.8	42.2	1,360.2	8.11%	7.35
4	0.35	$ 3,793	3.32	104.2	24.1	80.1	1,776.1	7.37%	6.80
5	0.4	$ 4,334	3.70	126.5	26.9	99.5	1,911.2	7.10%	6.60
6	0.45	$ 4,876	3.99	140.1	28.1	112.0	1,965.2	7.00%	6.53
7	0.5	$ 5,418	4.22	150.3	28.8	121.5	1,995.2	6.92%	6.48
8	0.55	$ 5,960	4.23	151.4	28.9	122.4	1,998.7	6.91%	6.47
9	0.6	$ 6,502	4.34	156.0	29.2	126.8	2,008.2	6.88%	6.45
10	0.65	$ 7,043	4.37	157.3	29.3	128.0	2,011.1	6.86%	6.44
11	0.7	$ 7,585	4.49	162.4	29.6	132.9	2,018.9	6.83%	6.41
12	0.75	$ 8,127	4.53	164.1	29.7	134.4	2,021.6	6.81%	6.40
13	0.8	$ 8,669	4.55	165.1	29.7	135.4	2,023.1	6.80%	6.40
14	0.85	$ 9,211	4.62	167.5	29.8	137.6	2,025.2	6.79%	6.39
15	0.9	$ 9,752	4.65	168.9	29.9	138.9	2,027.9	6.78%	6.38
16	0.95	$ 10,294	4.64	169.0	30.0	139.1	2,028.5	6.77%	6.38
17	1	$ 10,836	4.70	171.1	30.0	141.0	2,030.2	6.76%	6.37
18	1.05	$ 11,378	4.71	171.7	30.1	141.6	2,030.8	6.76%	6.36

Source SRK, 2023

The optimized pit shell selected to guide final pit design was based on a combination of the RF 0.70 pit (pit shell 11 (blue line), used on the north half of the deposit) and the RF 1.00 pit shell (pit shell 17 (yellow line), used on the south half of the deposit)

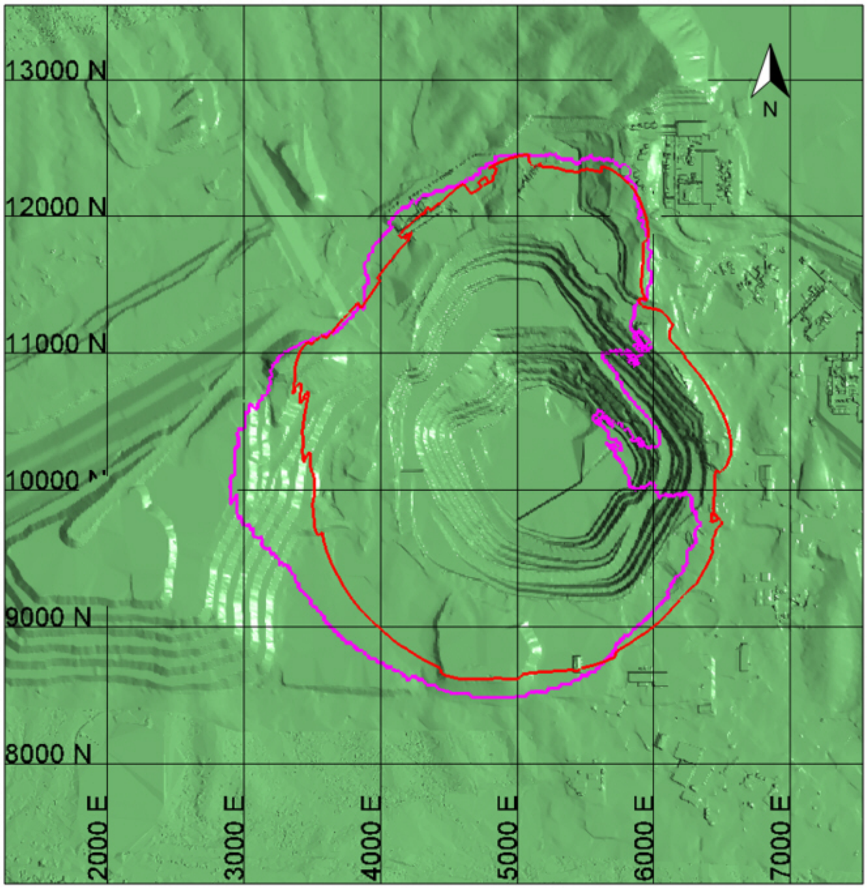
Figure 13-12 shows the results of the pit optimization in a pit-by-pit graph.



Source: SRK, 2023
Note: Pit value is pre-capex, pre-tax and assumes a 6% discount rate.

Figure 13-12: Mountain Pass Pit by Pit Optimization Result

Figure 13-13 shows the mineral reserves (red line) versus the mineral resources (magenta line) pit optimization shells.



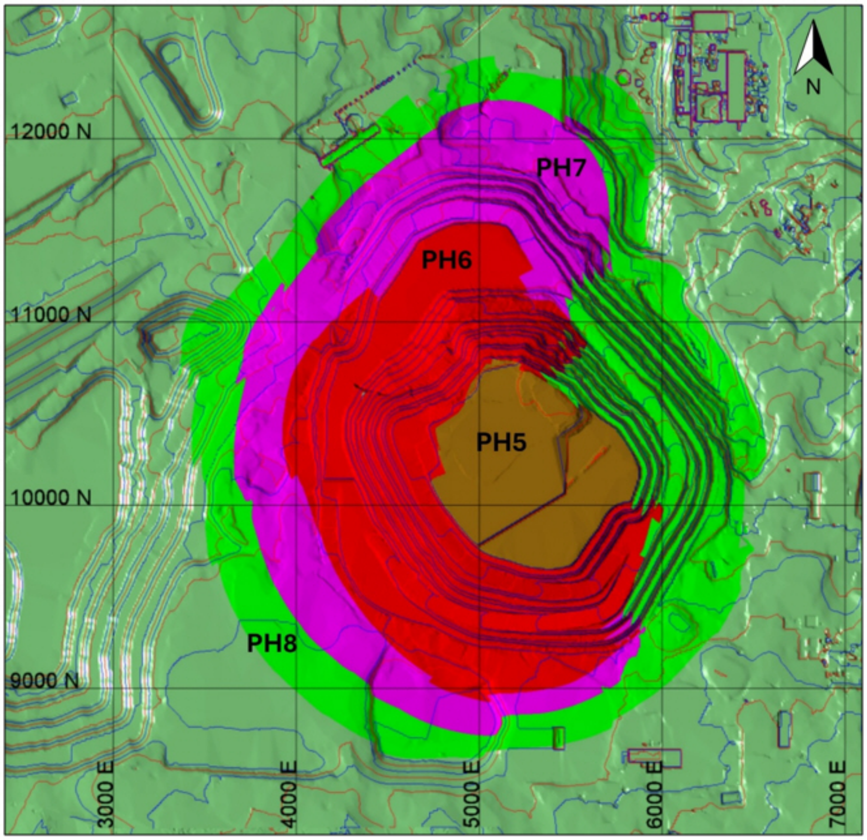
Source: SRK, 2023

Figure 13-13: Mountain Pass Mineral Reserves Pit (Red Line) and Mineral Resources Shell (Magenta Line) Surface Intersection

13.3 Design Criteria

13.3.1 Pit and Phase Designs

Phase designs for the deposit are largely driven by the effective mining width and its influence on access to the resource. The same design parameters used in the final pit design have been incorporated into the phase designs. A total of four phase designs were created for the Mountain Pass pit, all of which fall within the selected optimized pit shell. Figure 13-14 shows the location of each phase.



Source SRK, 2023
Note: Phases 1 through 4 were previously mined.

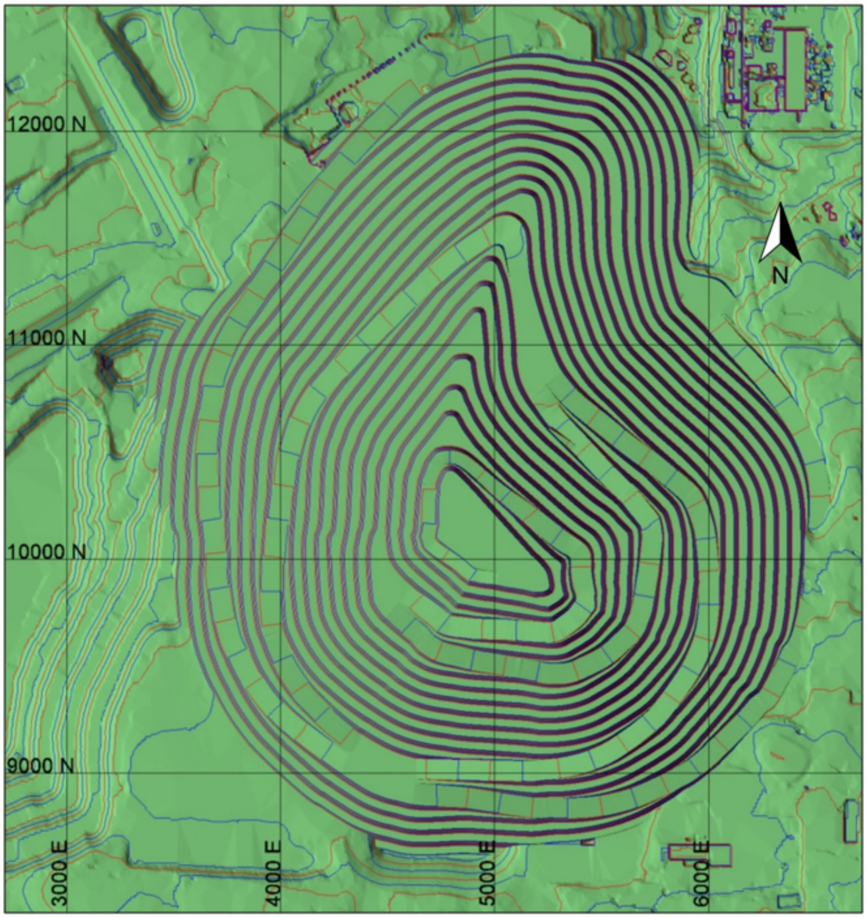
Figure 13-14: Phase Design Locations

To ensure proper ore exposure and access to different TREO grades, SRK created multiple mining phases. To improve the economics of the Project, phases were divided by following pit optimization shells to ensure that the higher profit pit shells were being mined first.

Figure 13-15 shows the September 30, 2023, starting reserve topography. Figure 13-16 below shows the final pit design.

Source: SRK, 2023

Figure 13-15: Reserve Starting Topography, September 30, 2023



Source: SRK, 2023

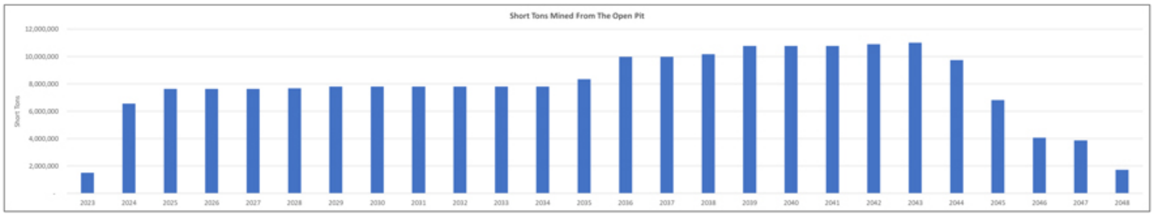
Figure 13-16: Final Pit Design

13.4 Mine Production Schedule

The current LoM plan has pit mining for approximately 26 years (Q4 2023 through 2048), followed by approximately 8 years of processing long-term ore stockpiles (2049 through 2056). The entire reserve is mined by the LoM plan. The average strip ratio is 6.3. A tabulation of annual mining and processing physicals is presented in Section 19 (specifically, Figure 19-9).

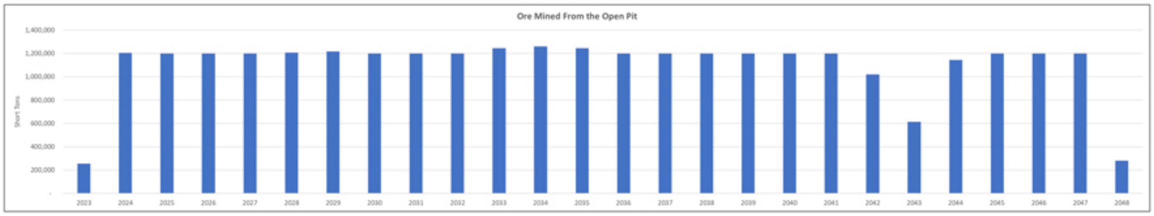
13.4.1 Mine Production

Figure 13-17 to Figure 13-25 present the LoM production schedule and haulage profiles for the Mountain Pass mine. The production schedule is used as the basis of the technical economic model (TEM) and comprises mill feed ore and waste. To ensure proper ore exposure, SRK generated the mine plan using quarterly periods for the duration of the mine life.



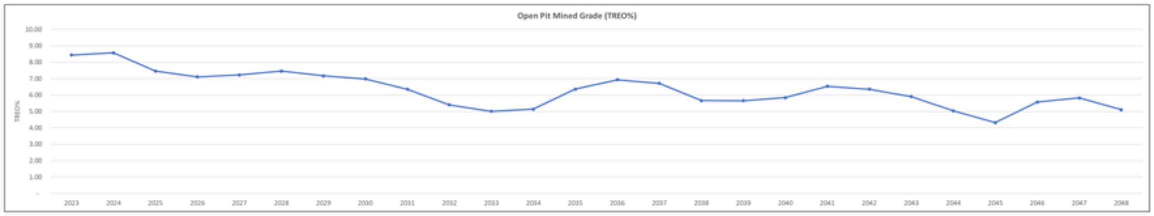
Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-17: Total Mined Material from the Open Pit (Ore and Waste)



Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-18: Ore Mined from the Open Pit

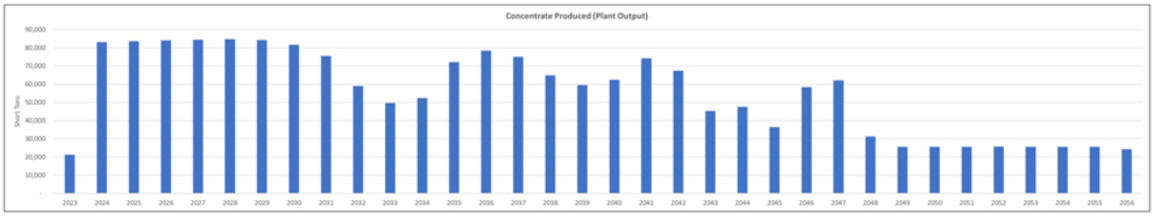


Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-19: Mined Ore Grade

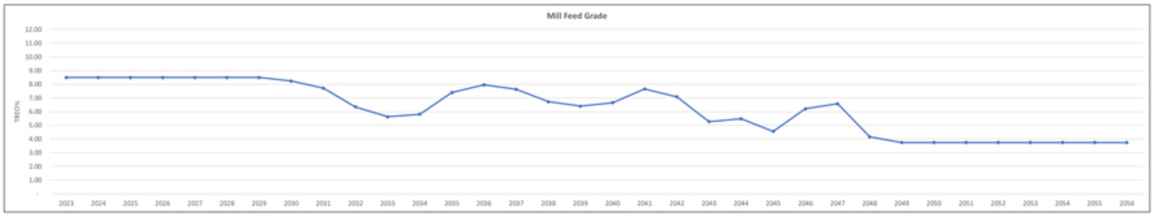
Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-20: Rehandled Material



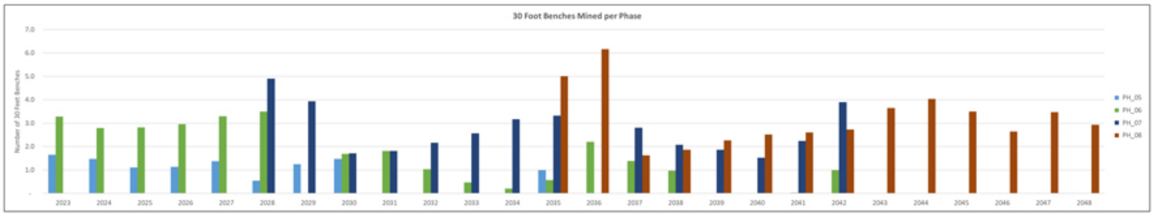
Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-21: Mill Concentrate Production



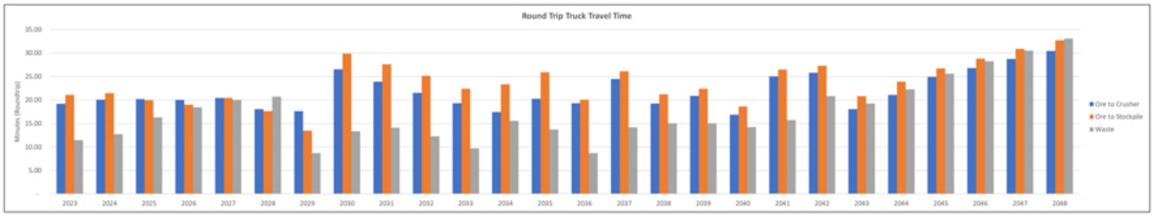
Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-22: Mill Feed Grade



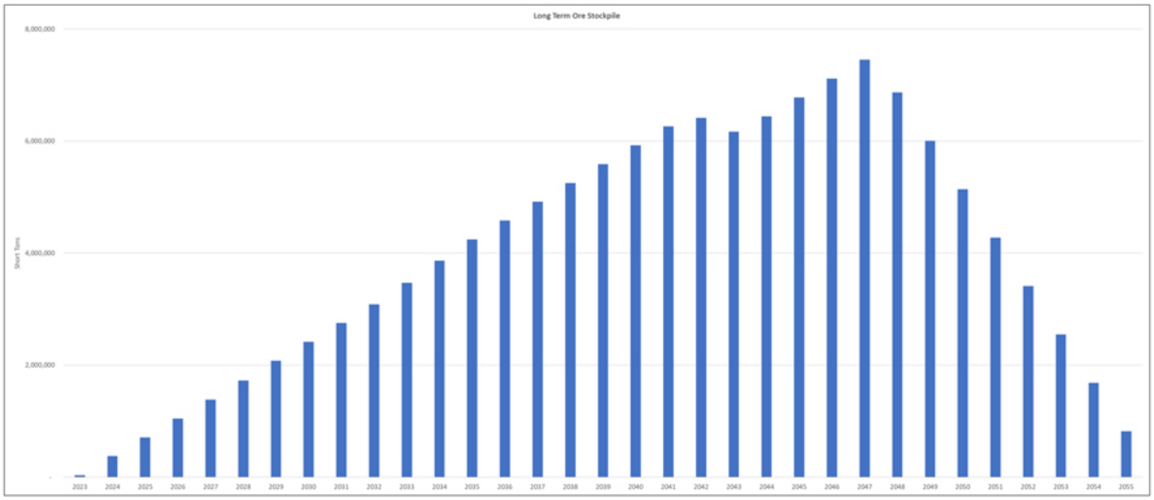
Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-23: Number of Benches Mined



Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-24: Haul Truck Cycle Time



Source: SRK, 2023
Note: 2023 includes only October - December

Figure 13-25: Long-Term Ore Stockpile End of Period Balance

Grade Control

Grade control provides critical control to ensure that ore and waste are identified at a high resolution prior to mining and then hauled to the appropriate destination (i.e., primary crusher, stockpile, or waste dump). The grade control process is as follows:

- All blastholes will be sampled near the mineralized zones.
- For the 30 ft mining bench height, the following sampling technique will be utilized.
    - Drillers/samplers will gather cuttings and define them by their drill hole number and pattern number.
    - Samples will be analyzed in a laboratory set up on-site.
- The geologist / mine engineer will build outlines based on the analyzed grade range.
- The geologist and surveyors will place flags in the pattern based on the grade control outlines.

13.5 Waste and Stockpile Design

13.5.1 Waste Rock Storage Facility

The waste rock storage for the Mountain Pass operation has been designed to limit the vertical expansion of the waste dumps and have dump toes located for control of surface run-off. The dumps have also been located in areas that will not be impacted by potential future mining operations.

The mine plan includes full development of the west overburden stockpile, located to the west of the existing open pit. As of September 30, 2023, the remaining, permitted storage capacity of the west overburden stockpile is 3.8 million st.

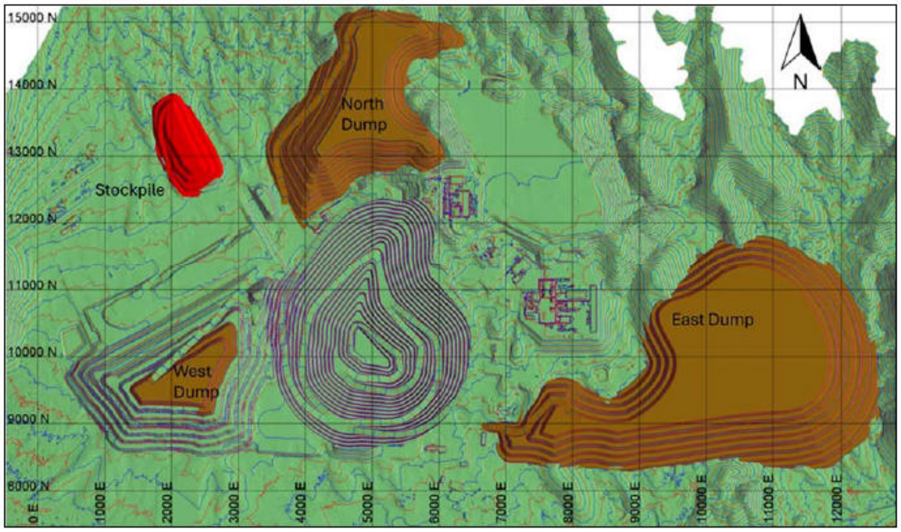
The total estimated waste rock storage requirement associated with the mine plan is 175.8 million st. Mountain Pass will fill the west overburden stockpile and place the balance of overburden material in the north overburden stockpile and/or the east overburden stockpile. Total estimated waste rock capacities for each dump are provided in Table 13-7.

Table 13-7: Estimated Remaining Storage Capacity for Waste Rock

Dump	Toe Elevation	Volume (million ft^3)	Million Short Tons	Years Active
North	4,850	0.8	0.0	2023
	4,900	22.5	1.4	2024
	4,950	62.3	3.8	2024
	5,000	101.8	6.3	2025
	5,050	133.0	8.2	2026
	5,100	139.2	8.6	2028
	5,150	105.6	6.5	2029
	5,200	28.6	1.8	2029
	North Total	**593.8**	**36.6**	
West	5,000	0.1	0.0	2029
	5,050	25.4	1.6	2029
	5,100	36.1	2.2	2030
	West Total	**61.6**	**3.8**	
East	4,450	6.0	0.4	2030
	4,500	58.0	3.6	2030
	4,550	139.1	8.6	2031
	4,600	216.6	13.3	2033
	4,650	318.7	19.6	2036
	4,700	405.4	25.0	2039
	4,750	390.8	24.1	2041
	4,800	330.7	20.4	2043
	4,850	262.5	16.2	2046
	4,900	184.6	11.4	2048
	East Total	**2,312.4**	**142.4**	
All	**Total**	**2,967.8**	**182.7**	

Source: SRK, 2023

Figure 13-26 shows the locations of the waste dumps and long-term ore stockpile.



Source SRK, 2023

Figure 13-26: Final Pit Design and Waste Dump Locations

13.5.2 Stockpiles

The long-term ore stockpile will hold a maximum of about 7.5 million st of ore, all of which will eventually be sent to the primary crusher. The long-term ore stockpile is located to the northwest of the pit.

The current operation uses four low-capacity RoM blending stockpiles in front of the primary crusher. These stockpiles are small, and the total capacity for all of them is less than 50,000 st. The operation plans to continue this practice in the future.

13.6 Mining Fleet and Requirements

13.6.1 General Requirements and Fleet Selection

Mountain Pass is an open pit mine using front-end wheel loaders loading haul trucks for waste and ore haulage. The operations are described further in the following sections.

Mining activities include drilling, blasting, loading, hauling and support activities. Ore will be sent to the primary crusher RoM stockpiles for near-term blending or to long-term stockpiles for processing later in the mine life. Waste dumps will be used for material below the cut-off grade.

The loading, hauling, and support equipment operations are performed with a fleet that is owned and operated by MP Materials. Drill and blast operations are performed by a contractor, and this will continue for the foreseeable future. The primary loading equipment is front-end loaders (15 yd^3), which were selected for operational flexibility. Rigid frame haul trucks (102 wet st) were selected to match with the loading units.

The mine equipment fleet requirements are based on the annual mine production schedule, the mine work schedule, and shift production estimates. The equipment fleet requirements are further discussed in the individual sections that follow in this report.

All mine mobile equipment is diesel-powered to avoid the requirement to provide electrical power into the pit working areas.

The mine operations schedule includes one 12-hour day shift, seven days per week for 365 days per year. Mine productivity and costing included estimating the productive shift operating time. Non-productive time includes shift change (travel time), equipment inspections, fueling, and operator breaks. SRK estimated that the total time per shift for these items will be 2.25 hours. The scheduled production time (scheduled operating hours) was therefore estimated at 9.75 hours per shift, representing a (shift) utilization of 81.3% of the 12-hour shift period (and excludes mechanical availability and work efficiency factors).

In addition, allowances were made for work efficiencies including equipment moves (production delays while moving to other mining areas within the pit), and certain dynamic operational inefficiencies. These work efficiencies are further discussed in the respective sections for loading and hauling.

Equipment fleet mechanical availability was estimated for the various major mine equipment fleets. Replacement equipment units for units that have reached their useful life are assumed to be new.

Table 13-8 shows the mining equipment fleet requirements for the mine plan.

Table 13-8: Mining Equipment Requirements

Equipment Units	Model	Size	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056
Loading																																				
Wheel loader	WA600	8.4 yd^3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Wheel loader	WA900	15.0 yd^3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
Hauling																																				
Haul truck	775G	75 wst	1	1	2	2	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1
Haul truck	HD785	102 wst	6	7	9	10	11	11	7	9	9	8	7	9	9	8	11	11	12	11	12	15	14	14	11	8	8	5	2	2	2	2	2	2	2	2
Other Mine Equip																																				
Track dozer	D9	405 hp	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Motor grader	GD655	218 hp	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Motor grader	14M3	238 hp		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Excavator	PC400	306 hp	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water truck	775G	15,000 gal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water truck	HM400	8,000 gal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Support Equip																																				
Track dozer	D6	150 hp	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wheel loader	WA600	8.4 yd^3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Haul truck	HM400	44 wst	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fuel/Lube truck			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HD mech			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Welding truck			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Flatbed truck			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pumps / generators			1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4								
Personnel bus			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
Pickup trucks			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	4	4	4	4	4	4	4	4
Light plant			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	3	3	3	3	3	3	3	3

Source: SRK, 2023

13.6.2 Drilling and Blasting

MP Materials has contracted for drilling and blasting services. The contractor will provide all equipment, supplies, and labor to complete the services. It is MP Materials' intention to continue with contractor drilling and blasting services for the foreseeable future. Accordingly, SRK has included a provision in the mining cost estimate for drilling and blasting services for the LoM timeframe.

Drilling is based on a 15 ft blasthole spacing and a 15 ft burden. The designed hole depth is 30 ft with a 4 ft subdrill. Dry blastholes will be loaded with ammonium nitrate fuel oil (ANFO). It is assumed that there will be 20% additional holes for pre-splitting, and 10% of blastholes will be loaded with emulsion (wet conditions).

The blasting contractor transports blasting accessories to site and stores these separately in a suitable explosives magazine. The blasting contractor has an explosives truck (ANFO/emulsion), which delivers bulk explosives to the open pit blast sites during daylight hours. Stemming material is ¾ inch rock. The blasting contractor manages and conducts the blasting operations.

13.6.3 Loading

The main loading equipment fleet for the mining operations is two Komatsu WA900 front-end loaders (15.0 yd^3 bucket capacity). This equipment loads a fleet of six Komatsu HD785 haul trucks (102 wet st capacity).

The main loading equipment fleet for the mining operations will be assisted by two smaller front-end loaders (8.4 yd^3 Komatsu WA600 units) and two Caterpillar 775 haul trucks (75 wet st capacity).

The dry density for waste was estimated to be 0.0864 st/ft^3 (2.77 metric $tonne/m^3$). The dry density for ore was estimated to be 0.0976 st/ft^3 (3.13 metric $tonne/m^3$). Rock moisture content was estimated to be 2% on average and swell in loading blasted rock to be 40%.

Table 13-9 shows selected loading statistics for the loading units when operating in waste.

Table 13-9: Loading Statistics by Unit Type in Waste

Equipment Type	Unit	Loader (Komatsu WA900)	Loader (Komatsu WA600)
Bucket Size	yd^3	15.0	8.4
Matched Truck Rated Size	wet st	102	75
Number of Passes(1)	passes	4	6
Total Truck Loading Time	**min**	**2.5**	**3.5**
Moving and Delay Time	min/op hr	10	10
Waste Prod. Per Unit (100% Available)	dry short ton/op hr	1,986	1,052

Source: SRK, 2023
(1) Average 2% moisture assumed.

The total truck loading times included a truck spotting (initial positioning of the trucks for loading) time of 50 seconds.

Table 13-10 shows selected loading productivity information in waste for the planned loading equipment.

Table 13-10: Loading Productivities by Unit Type in Waste

Equipment Type	Unit	Loader (Komatsu WA900)	Loader (Komatsu WA600)
Waste Prod. per Unit (100% Available)	dry t/op hr	1,986	1,052
Planned Operating Hours per Shift	scheduled op hrs	9.75	9.75
Planned Operating Hours per Year	scheduled op hrs	3,559	3,559
Estimated Mechanical Availability	op hrs %	85%	85%
Actual Operating Hours per Year	op hrs	3,025	3,025
Annual Waste Production Capacity per Unit	dry million st/yr	6.6	3.5

Source: SRK, 2023

As part of the mining operations, an allowance was made for re-handling crushed ore between the crusher and the mill with Komatsu WA900 loaders and HD785 haul trucks.

13.6.4 Hauling

Waste is hauled to the waste dumps. Ore is hauled to RoM stockpiles close to the primary crusher or, alternatively, to long-term stockpiles.

The main hauling equipment fleet for the pit mining operations is composed of 102 wet short ton capacity haul trucks (Komatsu HD785). The main fleet is supplemented with two Caterpillar 775G haul trucks (75 wet short ton capacity).

The Maptek Vulcan™ haulage module was used to calculate the cycle times and distances. Routes were drawn from every bench for each pit phase to the destinations, and one-way distances reported.

Various haul profiles were developed for different time periods, and haulage cycle times from the pits were estimated for waste and ore. Base haul cycle times were estimated using the software, and these were factored for practical operational hauling aspects to reflect realistic cycle times.

Truck spot, load, and dump times were then added to the factored haul cycle times to make up total haul cycle times. Spot and loading times used were taken the loading unit time estimates.

Table 13-11 shows selected hauling productivity information for waste haulage.

Table 13-11: Hauling Statistics by Unit Type in Waste

Hauling Equipment Type	Unit	Komatsu HD785	Caterpillar 775
Rated Truck Size	wet st	102	75
Truck Fill Factor by Weight	Wet Tonnage Basis %	100%	100%
Typical Total Truck Loading Time (1)	**min**	**2.50**	**3.50**
Total Truck Dumping Time	**min**	**1.20**	**1.20**
Production per Unit (100% Available)	st/op hr	Variable based on haul profile	Variable based on haul profile

Source: SRK, 2023
(1) Includes truck spotting time; Komatsu HD785 loading with Komatsu WA900 and Cat 785G loading with Komatsu WA 600.

Table 13-12 summarizes the factored truck haulage cycle times from the pit for each year. These cycle times are the total truck cycle times and include truck spotting, loading and dumping times.

Table 13-12: Pit Haulage Cycle Times (minutes)

Year	Waste	Ore
2023	15.1	22.9
2024	16.4	23.8
2025	20.0	23.9
2026	22.1	23.7
2027	23.7	24.2
2028	24.4	21.8
2029	12.4	21.3
2030	17.0	30.2
2031	17.8	27.6
2032	16.0	25.2
2033	13.4	23.0
2034	19.2	21.1
2035	17.4	24.0
2036	12.4	23.0
2037	17.9	28.2
2038	18.8	23.0
2039	18.8	24.6
2040	17.9	20.6
2041	19.4	28.8
2042	24.5	29.5
2043	22.9	21.8
2044	26.0	24.8
2045	29.3	28.6
2046	31.9	30.5
2047	34.2	32.4
2048	36.8	34.2

Source: SRK, 2023
Note: Total factored haul truck cycle times including loading, spotting and dumping.

Truck hauling productivities were calculated for each year of the mining operations and were used to estimate respective fleet hauling operating hours required, which were then used as the basis for determining the truck fleet requirements.

13.6.5 Auxiliary Equipment

Other major mining operations support equipment was previously shown in Table 13-8. The Caterpillar D9 track dozer is used for drill site preparation, road and ramp development, and maintenance of loading areas and waste dumps. The graders and water trucks maintain ramps, haul roads, and operating surfaces. The excavator performs site development work including pioneering and drainage diversion ditch development. The major mining equipment fleet size for roads and dumps is based on the general production level and allowance for general site conditions (including annual precipitation).

Annual operating hours were estimated for all of the major mining support equipment units, in general, between 1,512 and 3,025 operating hours per unit per year were scheduled for the mining operations.

The Caterpillar D6 track dozer is used for handling paste tailings. Other mining equipment involved in the handling of the paste tailings includes a Komatsu WA600 loader and two Komatsu HM400 articulated dump trucks (ADT) which will haul the paste to the tailings area for the dozer to then place.

Mining support equipment includes equipment maintenance units such as a fuel/lube truck, which delivers to equipment in the field from the fuel station, heavy duty mechanics' truck, and welders' truck.

Mine site operations and development utilize a flatbed truck, various moveable generators/pumps, light plants, transport van, and various service pickup trucks.

Dewatering is required for the pit. A combination of precipitation falling within the outer perimeter of the pit (normally only a few inches of rain per year) and groundwater inflows into the pit account for the total volume of water that is handled by the dewatering equipment.

13.6.6 Mining Operations and Maintenance Labor

The mine has salaried staff for mine administration, supervision of mine operations, supervision of mine equipment maintenance, and for technical services (geology and mining departments). These positions are on a permanent day shift. Operations employees fill mining production, mining support functions, and mining equipment maintenance positions.

The mine administration and operations supervision staff totals nine positions, and the technical services staff totals five positions. The total staff includes 14 positions. The operations, mine equipment maintenance, and technical services positions include:

- Mine administration includes a Senior Vice President Mining.
- Mine operations includes three shift foremen and two trainers/safety supervisors.
- Mobile maintenance includes a maintenance superintendent, a maintenance foreman and a maintenance planner.
- Mine geology includes a geologist and a senior geologist.
- Mine engineering includes a senior mine engineer, a mine planner and a surveyor.

Equipment operator labor positions are based on the number of mining equipment units required, and on the assumption that most of the operators are cross-trained (i.e., when operators are not required to be on one type of heavy equipment, they will be able to operate another type of equipment).

Operator positions are estimated for each year of operation. Required pit loading, hauling, and other support fleet equipment operators are based on the annual operating hours required. The operations assigned to the mining department also include the paste tailings loading and hauling, crusher feed loader, and loading and hauling crushed ore to the mill. Estimated annual labor costs include overtime allowances and burdens (33%).

A maintenance group is staffed with mobile equipment mechanics, electricians, welders, and other maintenance personnel.

The mining operations and maintenance labor requirements are shown in Table 13-13. The peak number of operations and maintenance personnel is 85, which occurs in 2042. The mine department staffing levels are reduced significantly during the later years of the mine life because pit mining concludes in 2048 and only stockpile rehandling occurs from 2049 through 2056.

Table 13-13: Mining Operations and Maintenance Labor Requirements

Category	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Loading Operators	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Truck Drivers	14	16	22	24	26	26	16	22	22	20	16	22	22	20	26	26	28
Other Mine Equipment	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Support Activities	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Total Mining Ops	44	47	53	55	57	57	47	53	53	51	47	53	53	51	57	57	59
Senior Mech/Elec	3	4	4	5	5	5	4	4	4	4	4	4	4	4	5	5	5
Mech/Elec	5	5	6	7	7	7	5	6	6	6	5	6	6	6	7	7	8
Assistant Mech	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Maintenance	9	11	12	14	14	14	11	12	12	12	11	12	12	12	14	14	15
Total	53	58	65	69	71	71	58	65	65	63	58	65	65	63	71	71	74

Category	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056
Loading Operators	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4
Truck Drivers	26	28	36	32	32	26	18	18	12	6	6	6	6	6	6	6	6
Other Mine Equipment	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	9	9
Support Activities	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Total Mining Ops	57	59	67	63	63	57	47	47	41	34	34	34	34	34	34	34	34
Senior Mech/Elec	5	6	6	6	6	5	4	4	3	1	1	1	1	1	1	1	1
Mech/Elec	7	8	9	9	8	7	5	6	4	2	2	2	2	2	2	2	2
Assistant Mech	2	2	3	3	3	2	2	2	1	1	1	1	1	1	1	1	1
Total Maintenance	14	16	18	18	17	14	11	12	8	4	4	4	4	4	4	4	4
Total	71	75	85	81	80	71	58	59	49	38	38	38	38	38	38	38	38

Source: SRK, 2023
Note: Support activities include paste tailings loading and hauling, crusher feed loader, and loading and hauling crushed ore to the mill

14 Processing and Recovery Methods

14.1 Historic Production

Over a 50-year operating history MP Material's predecessor companies successfully produced bastnaesite flotation concentrates on a continuous basis for sale and/or further on-site processing. Table 14-1 presents the historic mill production from 1980 to 2002. During this period REO recovery ranged from about 52 to 69% from ore that that ranged from 7.18 to 9.47% TREO.

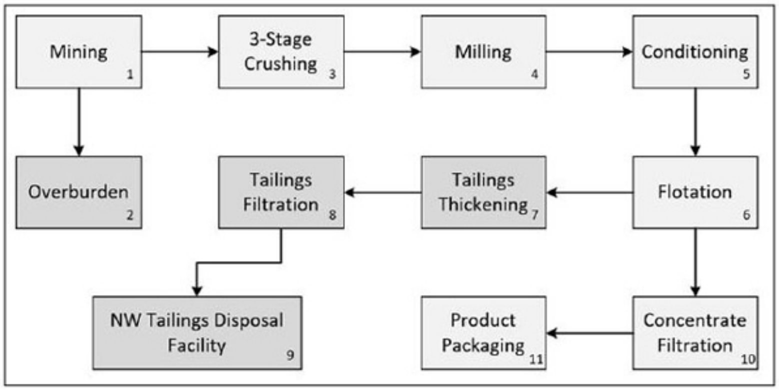
Table 14-1: Historic Mill Production, 1980 to 2002

Year	Milled (st)	Mill Feed Grade (TREO %)	REO Recovery (%)	Flotation Concentrate (lb TREO)
2002	183,487	7.91	67.0	2,616,000
2001	175,010	8.09	62.8	17,845,000
2000	No operation			
1999	No operation			
1998	321,000			
1997	424,000	8.43	57.5	41,117,711
1996	544,000	--	--	42,513,000
1995	537,000	9.01	52.0	49,029,000
1994	508,000	8.68	56.4	49,726,403
1993	433,000	8.31	55.3	39,722,150
1992	409,000	8.80	60.4	42,800,327
1991	336,344	8.74	59.8	35,143,870
1990	480,161	8.81	60.2	50,943,008
1989	418,446	8.96	62.2	46,613,913
1988	221,764	9.74	60.5	26,135,080
1987	358,000	9.31	58.4	38,962,866
1986	225,000	9.47	57.3	24,414,453
1985	253,000	8.15	75.6	31,193,018
1984	543,354	7.82	68.9	58,176,586
1983	371,252	7.85	67.3	39,224,489
1982	391,417	7.30	69.0	38,581,897
1981	370,207	7.43	68.4	37,659,763
1980	360,068	7.18	68.2	35,243,503

Source: Mountain Pass Monthly Operational Reports, 1980 through 2002

14.2 Current Operations

MP Materials initiated the operation of a 2,000 t/d flotation concentrator during December 2017. The concentrator flowsheet includes crushing, grinding, rougher/scavenger flotation, cleaner flotation, concentrate thickening and filtration, and tailings thickening and filtration followed by dry stack tailings disposal. The generalized process flowsheet is shown in Figure 14-1, and each unit operation is briefly discussed in this section. Site infrastructure that supports the processing operations (e.g., power and water supply) is discussed in Section 15.



Source: MP Materials, 2021

Figure 14-1: MP Materials Concentrator Flowsheet

14.2.1 Crushing

RoM ore is truck-hauled and stockpiled at the crusher in three separate stockpiles dependent upon grade. A front-end loader pulls from each stockpile as needed to achieve a target ore blend grade of approximately 8% to 9% TREO. The blended ore is crushed through a three-stage crushing circuit that includes a Svedala jaw crusher and two Terex cone crushers (MVP-380). Ore is crushed at the rate of 180 st per hour to produce a final -$^3/_8$ inch crushed product that is stockpiled in multiple 20,000 st stockpiles.

14.2.2 Grinding

Crushed ore is truck-hauled to stockpiles beside the concentrator and then trammed with a front-end loader to the ore feed hopper from which it is conveyed to the grinding circuit. The grinding circuit consists of a 3.8 m diameter by 7.1 m EGL ball mill (2,500 horsepower (hp)), which is operated in a closed circuit with a cluster of Cavex-Weir cyclones to produce a final grind size of 80% passing (P_{80}) 45 microns (μm).

14.2.3 Reagent Conditioning and Flotation

The cyclone overflow from the grinding circuit is advanced to a four-stage conditioning circuit in which the required flotation reagents are sequentially conditioned at 135°F. The mineral collectors are added in the second and third conditioner. Froth modifiers are stage-added to the fourth conditioner. The conditioned slurry is then advanced to the rougher/ scavenger flotation circuit, which consists of two banks of tank cells. The resulting rougher/scavenger flotation concentrate is then advanced to multiple stages of cleaner/cleaner scavenger flotation. The final cleaner flotation concentrate is thickened to over 70% solids in a 35 ft diameter thickener and then filtered to about 8% moisture in a 1,500 mm x 1,500 mm 20/16 Siemens filter press. The filtered concentrate is hauled to a storage area pending sampling and bagging for shipment. The rougher and cleaner scavenger flotation tailings are combined as the final concentrator tailing, which is pumped to the paste tailings plant where it is filtered to about 15% moisture and then truck-hauled to the northwest tailing disposal facility (NWTDF).

14.2.4 Sampling and Bagging

The bastnaesite flotation concentrate is manually loaded into 1.5-tonne Super Sacks with a small front-end loader. Each loader bucket of concentrate is sampled multiple times with a pole sampler prior to being added to the Super Sack, and a sample representing the contents of each Super Sack is sent to the analytical laboratory for analyses and moisture content determination. Each Super Sack is weighed with a scale as it is being loaded, and the final weight of each Super Sack is recorded. Concentrate is shipped from site in containers, and each container contains 13 Super Sacks.

14.2.5 Paste Tailings Plant

Concentrator tailings are pumped to the paste plant, which is remotely located near the dry stack NWTDF. At the paste tailings plant, the concentrator tailings are thickened to about 65% solids and then filtered in three fully automatic filter presses (Siemens 1,500 mm x 2,000 mm 60/50) to about 15% moisture. In order to achieve a clear thickener overflow, a coagulant is added, followed by the addition of a slightly anionic flocculant at the thickener mix box. Tailings are conveyed to a stockpile outside the paste tailings plant and then hauled to the NWTDF, which is discussed in Section 15.

14.2.6 Metallurgical Control and Accounting

Ore feed tonnage to the concentrator is obtained from a belt scale on the ball mill feed conveyor, and operational performance of the concentrator is monitored by manually sampling the feed, final flotation concentrate, and final tailings every two hours, which are then prepared and analyzed by x-ray fluorescence (XRF) for %TREO. This information is used to monitor the concentrator performance and to make any required adjustments to the process. This information is also used to calculate a metallurgical TREO recovery and metric tonnes of bastnaesite flotation concentrate produced.

Final flotation concentrate production is weighed and sampled as it is being loaded into 1.5 tonne Super Sacks for shipment, and a concentrate sample representing each shipment lot is assayed at the on-site laboratory using a total digestion/titration technique to determine %CeO_2 content. Based on experience, MP Materials has determined that bastnaesite at Mountain Pass contains approximately 50% CeO_2, and from this they are able to calculate the total %TREO content of the concentrate. There is reasonable agreement between the metallurgical TREO recovery reported by the concentrator (which is determined by XRF analyses of concentrator samples) and packaged recovery (which is determined by actual shipments of TREO concentrate).

14.2.7 Concentrator Performance

Concentrator performance for 2022 is summarized in Table 14-2, and concentrator performance for 2023 (January – September) is summarized in Table 14-3. During 2022, the concentrator processed 782,985 metric tonnes (mt) of ore at an average grade of 8.5% TREO and produced 74,859 mt of bastnaesite concentrate at an average grade of 61.3% TREO. Overall TREO recovery averaged 65.3%. During Q4 2022, 276 t of TREO was roasted to provide feed to the new separations plant as part of initial plant commissioning activities. During 2023 (January to September), the concentrator processed 601,107 mt of ore at an average grade of 8.6% TREO and produced 56,552 mt of bastnaesite concentrate at an average grade of 61.9% TREO. Overall TREO recovery during 2023 (January to September) has averaged 64.0%. During 2023 (January – September) 10,859 mt of TREO was roasted to support commissioning activities at the new separations plant. Roasted TREO was either bagged and shipped directly along with unroasted concentrate or advanced to the separation plant leach circuit.

Table 14-2: Concentrator Production Summary - 2022

Period	Feed			Concentrate			TREO to Concentrate		TREO Tonnes	
	Tonnes	TREO (%)	TREO Tonnes	Tonnes	Moisture (%)	TREO (%)	Tonnes	Recovery (%)	Unroasted	Roasted
Q1	187,533	8.67	15,934	19,149	8.0	61.5	10,829	68.0	10,829	
Q2	192,673	8.42	15,851	18,192	7.6	61.3	10,295	64.9	10,295	
Q3	206,577	8.34	16,851	19,305	8.1	61.3	10,877	64.5	10,877	
Q4 (1)	196,202	8.54	16,393	18,213	8.4	61.2	10,486	64.0	10,210	276
Total	**782,985**	**8.49**	**65,029**	**74,859**	**8.0**	**61.3**	**42,487**	**65.3**	**42,211**	**276**

Source: MP Materials, 2023
Note: Q4 TREO production includes 276 t that was roasted as feed to the separation plant.

Table 14-3: Concentrator Production Summary - 2023 (Jan-Sep)

Period	Feed			Concentrate			TREO to Concentrate		TREO Tonnes (1)	
	Tonnes	TREO (%)	TREO Tonnes	Tonnes	Moisture (%)	TREO (%)	Tonnes	Recovery (%)	Unroasted	Roasted
Q1	198,044	8.61	16,663	18,629	7.6	62.0	10,671	64.0	7,674	2,997
Q2	196,515	8.71	16,766	19,097	8.0	61.8	10,862	64.8	7,342	3,520
Q3	206,548	8.41	17,019	18,826	7.7	61.9	10,766	63.3	6,423	4,342
Total	**601,107**	**8.57**	**50,448**	**56,552**	**7.7**	**61.9**	**32,299**	**64.0**	**21,439**	**10,859**

Source: MP Materials, 2023
(1) A portion of flotation concentrate production was roasted, and a portion of the roasted concentrate was advanced to the separation plant leach circuit.

14.2.8 Significant Factors

The following significant factors for the crushing and concentrating operations have been identified:

- MP Materials conducted flotation studies to evaluate TREO recovery versus ore grade and developed a mathematical relationship to estimate overall TREO recovery versus ore grade. This relationship has been used to estimate TREO recovery from lower grade ores later in the mine life.
- MP Materials has operated a flotation concentrator since December 2017 to recover a bastnaesite concentrate. Significant improvements in concentrator performance have occurred since inception of operations, which are attributed primarily to the installation of a boiler that has enabled flotation to be conducted at a constant higher temperature, as well as new reagent testing and blending of historically problematic ores.
- During 2022 TREO recovery averaged 65.3% into concentrates containing an average of 61.3% TREO.
- During 2023 (January - September) TREO recovery has averaged 64.0% into concentrates averaging 61.9% TREO.
- MP Materials has constructed a new separations plant to further process bastnaesite concentrate into separate rare earth products. The new separations plant is currently in commissioning and is expected to ramp-up to full production capacity by the end of 2024.

14.3 Individual Rare Earth Separations

The discussion in Section 14.3 has been prepared by SGS. MP Materials has determined that SGS meets the qualifications specified under the definition of qualified person in 17 CFR § 229.1300.

MP Materials plans to produce four main products initially: PrNd oxide, lanthanum carbonate, cerium chloride, and an SEG+ concentrate. The specifications are as shown in Table 14-4.

Table 14-4: Product Specifications

Product	Compound	w/w % TREO	Purity
PrNd Oxide	75% Nd_2O_3 + 25% Pr_6O_{11} (+/-2%)	99%	99.5%+ PrNd/TREO
SEG+ Oxalate/Concentrate	-	25% to 45%	99% SEG+/TREO
Lanthanum Carbonate	$La_2(CO_3)_3$ + La_2O_3	99%	99% La/TREO
Cerium Chloride	$LaCeCl_3$	45%	85% Ce/TREO

Source: MP Materials, 2021
Note: w/w % is the weight concentration of the solution.

The current rare earth concentrate production of approximately 42,700 metric tonnes of TREO in the twelve months trailing September 2023 supports this plan.

To achieve the individual production and purity targets, the process flow will combine traditional processing methods applied successfully at Mountain Pass for decades with unique circuits designed for efficiency or to reduce environmental impact.

Figure 14-2 serves as the basis for the rare earth distribution in the concentrate being fed into the downstream separations facilities. These values are based on recent concentrate production and historical values. The rare earth distribution in the ore coming out of the mine, and the resulting concentrate produced from milling & flotation, has been very consistent throughout the decades of operations at Mountain Pass. These values fall within recently and historically reported values.

Flotation Concentrate - REO Distribution	
Lanthanum	32.3%
Cerium	50.2%
Praseodymium+Neodymium	15.7%
SEG+	1.8%

Source: MP Materials, 2021

Figure 14-2: Rare Earth Distribution in Flotation Concentrate

Concentrate Thickening & Filtration: The Stage 2 optimization will install a new like-in-kind filter press and ancillary equipment. This modification is being added primarily for material handling considerations rather than for technical ones. The existing filter press – from which the new press is designed – is currently in successful operation. However, the handling of semi-damp filter cake on a batch basis into the dryer was expected to have created a challenge in its existing location. Hence a redundant press was designed to minimize conveyance risks.

Concentrate Drying & Calcining: The direct-fire natural gas dryer was designed to manage the batch flow of concentrate from the filter press. The function of low temperature drying is to reduce the cake moisture from 7% to 10% down to less than 1%. This dried material will feed a storage bin that will continuously feed the electric fired calciner. The multiple, electric heating elements are designed to maximize temperature control and stability throughout the rotary kiln so that the targeted LOI (loss on ignition) is achieved in the concentrate prior to leaching. The discharge of the calciner will include a cooling screw and storage and cooling tanks with up to two days of capacity. There will also be the ability to automatically package calcined concentrate.

Leach and Scrubber: The concentrate will be pneumatically conveyed into a dissolution tank where it will be cooled to ambient temperature in chilled water. Temperature will be maintained by application of a glycol chiller system. The concentrate will be continuously fed into the existing Leach 2.0 reactor tanks where HCl will be added at different concentrations to maximize trivalent REO recovery and cerium rejection. Temperature will be maintained by the chiller and heat exchangers. The additional mass flow as compared to the predecessor system and the insolubility of the cerium results in the production of chlorine gas that will be scrubbed using the new, larger scrubber system combined with an existing venturi system.

Leach Thickening & Filtration: A new three stage countercurrent decantation tank system will be installed. This installation mirrors the leaching process from the 1970's. The countercurrent motion of overflow and underflow and multiple flocculent addition points are designed to ensure clean overflow and minimal loss of soluble REEs to the underflow. The final underflow slurry will pass through a filter press. The cake will then be washed to remove remaining rare earth chloride solution and then either packaged for sale or reslurried and comingled with beneficiation tailings for disposal.

Impurity Removal: Removal of soluble impurities begins in this block that is being recommissioned with minimal change Initially, the solution will pass through three existing ion exchange columns containing a standard resin. Substantially all iron and uranium will be removed and sent to the brine recovery circuit. The solution will then undergo pH adjustment to remove certain non-REE impurities. The solid will precipitate in a new thickener to replace temporary assets previously operated. A filter aid will be added from a new bulk handling system. This addition will increase the propensity to settle and enhance the ease of filtration. To capture all fine solids as well as minimize the production of hazardous waste, a new pressure leaf filter will be installed prior to existing cartridge filters. The new filter press will be installed in place of previously operated temporary filter presses. In the next step, REE will be separated from the remaining impurities. The waste will be sent to brine recovery and the high-concentrate REE feed will go to SXH.

Brine Purification: Brine feeds from impurity removal stages, various finished product solid/liquid separation steps, and water treatment plant will converge at the existing brine purification circuit. Two existing thickeners will be operated with soda ash, flocculant, and caustic soda to adjust pH and maximize settling of impurities. A second filter press, relocated from another use at Mountain Pass, will be installed to help balance the filtration needs. A new pressure leaf filter will be installed to assist in removal of any fines from the filtrate feeding the crystallizer, to which the clean brine will be sent.

SXH: The purified rare earths will be pumped to the existing SXH circuit. SXH is a series of small mixer/settlers utilized to perform a bulk extraction of heavy rare earths (from samarium and heavier) from the light rare earths (La, Ce, Pr, Nd). Minor upgrades are planned to the existing assets to increase automation control. The cleaner feed stream supplying SXH is expected to ensure a cleaner separation between Nd and Sm.

SEG+ Finishing: The pregnant solution from SXH will contain the SEG+ chloride solution. This will be sent to the existing finishing circuit in the “Specialty Plant.” An oxalic solution will be added to the SEG+ chloride solution to produce SEG+ oxalate. The oxalate will be maintained in an agitated tank before passing through a centrifuge. The thick slurry will then be washed, dried, and packaged in recommissioned, existing assets. The mother liquor will be returned to the leach circuit as low acid solution or sent to brine purification for neutralization.

SXD: The raffinate from SXH will travel to the existing SXD circuit. The custom-designed mixer/settlers will ensure clean separation between PrNd and La and the remaining Ce. Certain additions are being made to allow for the subsequent production of high-purity (greater than 99.5%) lanthanum product and a greater than 80% Ce (20% La) cerium chloride product to be produced. The cerium product solution will be directly packaged from this circuit. No additional changes are planned.

PrNd Finishing: The PrNd finishing circuit is being constructed to ensure maximum on-specification production of PrNd oxide. No new technology is being implemented, but redundance and enhanced quality control capability are included in the design. The initial step will be the precipitation reactors. The new reagent handling system will produce the precipitant solution which will mix with the PrNd chloride solution. This mixture then feeds a new 2-tank CCD thickener to ensure maximum PrNd recovery with maximum disentrainment of chloride from rare earths. The rare earth underflow will feed a belt filter equipped with multiple washing steps to remove remaining chlorides. The cake will then be repulped in RO water and fed to a new filter press. The filter cake will feed a new gas-fired rotary dryer. The dry product will be pneumatically conveyed into a new rotary calciner to produce the oxide. Finally, the cooled oxide will be automatically packaged. At each step there will be QA/QC tanks, hold points, and automatic blending capability. Between the dyer and the calciner will be a large rotary mixer to allow for blended “batches” to be thoroughly mixed to meet specifications.

La Finishing: The La finishing circuit will start with the lanthanum chloride from the SXD ancillary strip section. This solution will be pumped to the existing precipitation tanks in the specialty plant. Here soda ash solution from the central tank farm’s new soda ash system will be mixed to produce a lanthanum carbonate precipitate. This solution will be pumped to the new 2-tank CCD thickener system to remove the lanthanum carbonate in the underflow while minimizing REE loss to the overflow. The carbonate will undergo the same belt filter, repulp, filter press steps as the PrNd, using identical assets. The filter cake will be fed to a new rotary dryer. The dry carbonate can be packaged directly. A minority of customers may prefer lanthanum oxide over lanthanum carbonate, so a new pneumatic conveyance line will be installed to transport the dry carbonate to the existing lanthanum calciner. The existing feed system is being modified to account for the improved handling conditions (dry carbonate vs wet cake).

Brine Evaporation: The clean brine from the brine purification process will feed the existing brine evaporation system. This process is being upgraded to manage the new service to feed the crystallizer (rather than chlor-alkali installation). The four heat effects will concentrate the brine to 300 g/L NaCl from approximately 100 g/L NaCl, thereby maximizing the crystallizer capacity.

Salt Crystallizing: A thermal vapor recompression (TVR) crystallizer is being installed to evaporate the high-concentration brine, remove the salt, and condense the high-purity water for re-use. The unit is designed to operate using the excess steam from the combined heat and power plant (CHP), thereby reducing the energy footprint.

Water Softening / RO Water Treatment: The existing Water Treatment Plant (WTP) was in operation from 2012-2015 and was recommissioned in fall 2021. It has the capability to make triple-pass RO water from potable water, with the retentate discharge being sent to brine recovery. RO water from this plant can be used to feed the leach, SX, product finishing, and CHP requirements. It is expected that once the crystallizer is operational, condensate from the crystallizer and CHP will provide the vast majority (possibly more than 100%) of pure water needs, resulting in minimal use of the WTP.

CHP: the CHP operated safely and reliably from 2012-2015. It has undergone a large recommissioning effort overseen by a specialty power plant recommissioning group. As of fall 2023 it has been in full operation in island mode over the last several years. In addition, a new load bank, back-up generator, and dump condenser were installed and commissioned. The plant was put into full service at the end of 2021. The two single-cycle generators with heat recovery steam generators (HRSG) are each capable of producing 12-13MW. The two turbines in operation will more than adequately cover the power needs of the site while producing sufficient steam for the crystallizer, flotation plant, and various other heating needs across the facility.

Stage 2 Related Infrastructure: In addition to the captive power and water treatment plant, general site services include a centralized bulk reagent tank farm with storage for HCl and NaOH. Bulk handling for soda ash and other reagents are being buttressed as part of the Stage 2 project.

15 Infrastructure

The Project is in San Bernardino County, California, north of and adjacent to Interstate 15 (I-15), approximately 15 mi southwest of the California-Nevada state line and 30 mi northeast of Baker, California (Figure 3-2).

The nearest major city is Las Vegas, Nevada, located 50 mi to the northeast on I-15. The Project lies immediately north of I-15 at Mountain Pass and is accessed by the Bailey Road Exit (Exit 281 of I-15), which leads directly to the main gate. The mine is approximately 15 mi southwest of the California-Nevada state line in an otherwise undeveloped area, enclosed by surrounding natural topographic features.

Outside services include industrial maintenance contractors, equipment suppliers and general service contractors. Access to qualified contractors and suppliers is excellent due to the proximity of population centers such as Las Vegas, Nevada as well as Elko, Nevada (an established large mining district) and Phoenix, Arizona (servicing the copper mining industry).

Access to the site, as well as site haul roads and other minor roads are fully developed and controlled by MP Materials. There is no public access through the Project area. All public access roads that lead to the Project are gated at the property boundary.

MP Materials has fully developed an operating infrastructure for the Project in support of extraction and concentrating activities. A manned security gate is located on Bailey Road for providing required site-specific safety briefings and monitoring personnel entry and exit to the Project.

Substantially all the power to the Mountain Pass facility is currently supplied by a Combined Heat and Power (CHP) or co-generation (cogen) power facility with two natural gas-fired turbines capable of producing up to 26 MW of power combined. In addition, the site is served by a 12-kV line from a Southern California Edison substation two miles away.

Water is supplied through active water wells located eight miles west of the project. Fire systems are supplied by separate fire water tanks and pumps.

The site has all facilities required for operation, including the open pit, concentrator, access and haul roads, explosives storage, fuel tanks and fueling systems, warehouse, security guard house and perimeter fencing, tailings filter plant, tailings storage area, waste rock storage area, administrative and office buildings, surface water control systems, evaporation ponds, miscellaneous shops, truck shop, laboratory, multiple laydown areas, power supply, water supply, waste handling bins and temporary storage locations, and a fully developed communications system.

Site logistics are straightforward with the flotation concentrates shipped in supersacks within a shipping container. The shipping containers are hauled by truck to the port of Los Angeles, which is about 4.5 hours from the mine site. At the port the containers are loaded onto a container ship and shipped to the final customers. Refined products for domestic customers are shipped in supersacks and intermediate bulk containers (IBC tote). Rail transshipment infrastructure are available in Henderson, NV and Barstow, CA less than 2 hours drive from the site.

15.1 Access and Local Communities

The Project is located in San Bernardino County, California, north of and adjacent to Interstate 15 (I-15), approximately 15 mi southwest of the California-Nevada state line and 30 mi northeast of Baker, California. The site is accessed via I-15 and leaving the highway at exit 281 onto Bailey Road north of the interstate for less than 1 mile.

The majority of the employees live in Las Vegas, Nevada 50 miles northeast of the site via I-15. Las Vegas is a major metropolitan area with approximately 650,000 people in the city and 2.2 million in the metropolitan area. Major services to support the Project including vendors, contractors, and services are available in Las Vegas as well as approximately four hours southwest in the Los Angeles (LA), California metropolitan area. Baker California, population of approximately 700, is the next nearest town 37 mi southwest along highway toward LA on I-15.

Air access to the Project is provided at McCarran International Airport located approximately 47 mi northeast of the project in south Las Vegas. Other airports are available in the Los Angeles area.

Employees drive or carpool to work and park in the company parking lots on site. Full emergency facilities are available in Las Vegas with emergency dispatch in Primm, NV and Baker, CA.

15.2 Site Facilities and Infrastructure

15.2.1 On-Site Facilities

The Project has fully developed operating facilities and facilities necessary to support the current operations. The general layout of the facilities is shown in Figure 15-1.

Source: MP Materials, 2022

Figure 15-1: Facilities General Location

The currently operating facilities include:

- Maintenance shop
- Truck shop
- Warehouse
- Administrative building/offices
- Change house
- Explosives storage
- Electrical shop
- Fuel storage tanks and fueling system
- Multiple laydown areas
- Core storage
- Water evaporation ponds
- Mineral processing facilities (concentrator)
- REE separations facility
- Laboratory
- Fuel storage
- Fire system including fire tank and pumps
- Water supply system
- Tire repair area
- Tailings filter plant
- Lined tailings storage facilities
- Waste rock storage
- Security building and site fencing

The LoM plan will require the relocation in 2035 of the paste tailings plant and the water tanks currently northeast of the pit highwall near the concentration plant. Additionally, the crusher will be relocated in 2028 to allow the pit to expand to the north. Capital cost provisions are included in the economic model for these relocations.

15.2.2 Explosives Storage and Handling Facilities

The site has two explosives storage locations. Contractors manage the ANFO storage and emulsion storage locations.

15.2.3 Service Roads

The Project has a completely developed system of on-site access roads to all process facilities, tailings storage area, and a system of auxiliary roads for the mining, processing and on-site operations.

15.2.4 Mine Operations and Support Facilities

The open pit mine has a full complement of haul roads, ramps, and auxiliary roads with access to the pit, waste storage area, shops, and crusher area.

15.2.5 Waste and Waste Handling (Non-Tailings/Waste Rock)

The Project has established waste handling procedures and does not store waste on site, except for the permitted rock storage and tailings facilities. Waste other than tailings and mine waste rock is handled as follows.

- Solid Waste (non-toxic) – Waste is stored on-site in roll off containers, and a contractor hauls the containers to permitted third party landfills near Las Vegas.
- Septic – The site has septic systems for the facilities.
- Toxic or hazardous waste – Very little hazardous or toxic waste is generated at the Project. The small volumes of materials have a separate storage area. The materials are removed by a qualified contractor and disposed of in approved disposal areas.

15.2.6 Waste Rock Handling

Mine waste rock is stored in designated mine rock storage areas. Waste rock is discussed in detail in Section 13.

15.2.7 Power Supply and Distribution

Substantially all the power to the Mountain Pass facility is currently supplied by a Combined Heat and Power (CHP) or co-generation (cogen) power facility with two natural gas-fired turbines capable of producing up to 26 MW of power combined. In addition, the site is served by a 12-kV line from a Southern California Edison substation two miles away.

15.2.8 Natural Gas

The Project has access to natural gas through an 8.6 mi, 8-inch-diameter pipeline, extending from the Kern River Gas Transmission Company mainline. It has a capacity of 24,270 dekatherms per day. A new gas meter was installed in 2021 to provide flexibility for high and low gas usage.

15.2.9 Vehicle and Heavy Equipment Fuel

The site has multiple fuel storage tanks and fuel delivery systems for the large mining equipment and smaller vehicles. Fuel for the mining equipment is supplied through the mining contractor who receives the fuel from a vendor located in Las Vegas. MP Materials can contract the fuel directly in the future. There are tanks for diesel near the pit and near the processing facility. Additional tanks are used for unleaded fuel for the vehicles.

The site has several diesel and gasoline storage tanks that are for Project use. The tanks are fueled by contractor fuel trucks from Las Vegas. Tank storage is more than adequate for the Project needs.

15.2.10 Other Energy

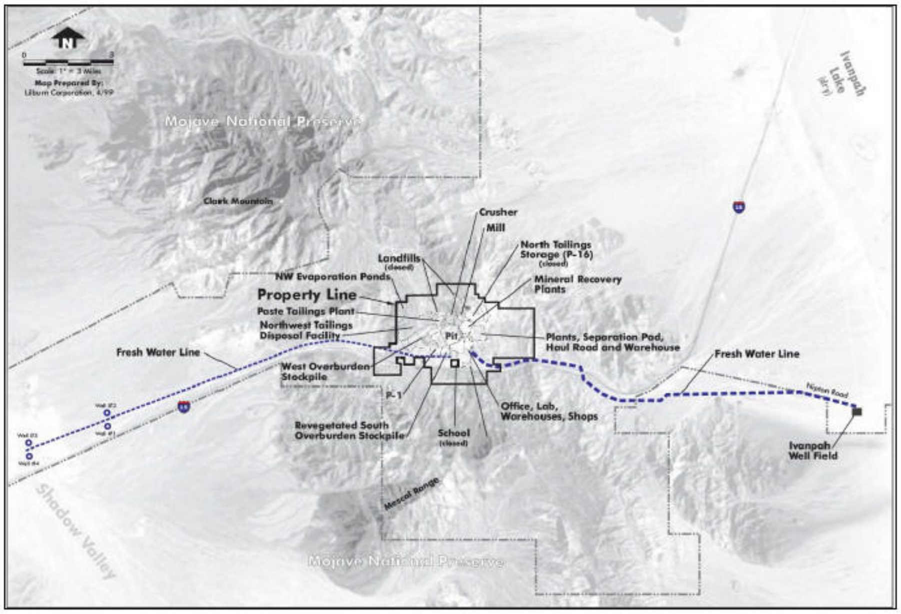
There are several compressed air systems on the site used for process and maintenance. The site also has several small propane tanks used for miscellaneous minor heating needs at the various facilities.

15.2.11 Water Supply

MP Materials maintains and operates two water supply well fields for potable and process water. The Ivanpah well field, established in 1952, is located on private land 8 mi east of the mine site and consists of six freshwater producing wells, three booster pumping stations, and associated pipelines. This well field is available to supply water but is currently used only to provide water to the Mojave National Preserve Ivanpah Desert Tortoise Research Facility. The Shadow Valley well field, established in 1980, is located 8 mi west of the mine site, consists of four wells of which three are on public land and one on private land, a single booster pumping station, and associated pipelines. The water supply wells are completed within coarse alluvial sediments.

The amount of freshwater consumed by the facility in 1996 was approximately 850 gpm from both wellfields. The five-year annual average between 1993 and 1997 was 795 gpm. As part of the comprehensive plan for continued operations, MP Materials placed emphasis on-site management and treatment of process water and maximizing reuse (SRK, 2010). As the water supply systems have consistently produced much larger amounts of fresh water for the facility in the past, water supply is not anticipated to be problematic.

Additional water is supplied from recovery well water from legacy operations, pit water, and natural precipitation. The site also has water storage tanks that store water for use as needed on site. The site has a net-positive site water balance with excess water evaporated as necessary in the evaporation ponds. The water supply system can be seen in Figure 15-2.



Source: Molycorp Mine Reclamation Plan Revised, 2015

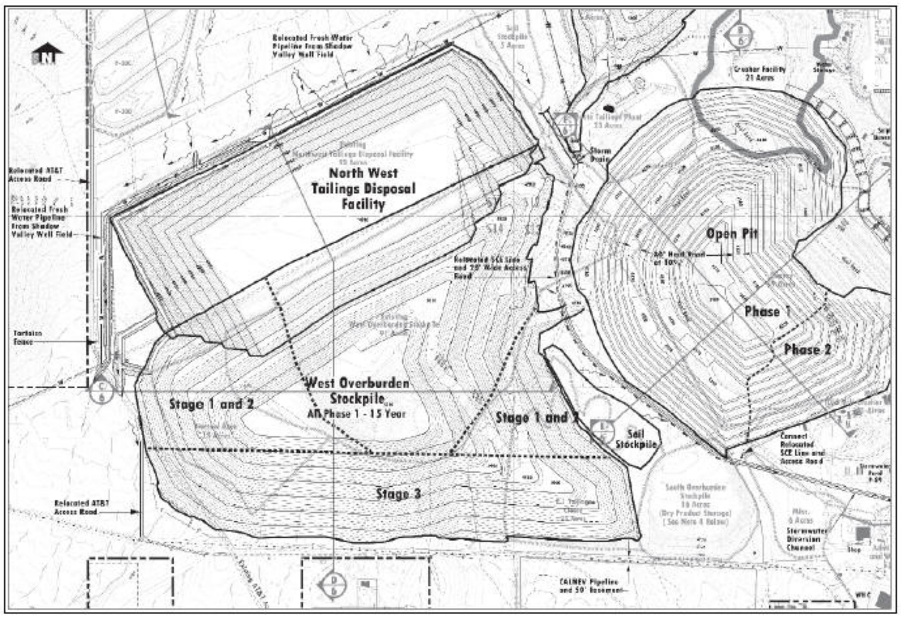
Figure 15-2: Water Supply System

The site has installed surface water control drainage channels and ponds, including lined evaporation ponds and a lined tailings water control pond.

15.3 Tailings Management Area

The Project handles tailings through use of a filtered tailings facility located adjacent to the pit to the north and west of the primary crushing facility and northwest of the existing open pit adjacent to the pit to the northwest and east of the overburden stockpile. The Project manages tailings through use of a filtered tailings facility that produces filtered tailings. The concentrator generates tailings that are piped to the filter plant via pipeline. The filtered tailings plant then filters the tailings to approximately 15% moisture content. The filtered tailings are moved on a conveyor to a temporary storage facility where the tailings are stacked out near the tailings plant and then loaded by front end loader (FEL) into articulated mine trucks that transport the tailings approximately 1 mile to the lined tailings facility known as the Northwest Tailings Disposal Facility (NWTDF). After the material is dumped by the trucks, a small dozer levels the tailings and prepares the material for the next truck lift.

The NWTDF is a lined containment facility that is designed to receive and store tailings material. The NWTDF at full buildout will eventually cover approximately 90 acres (36 hectares) and about the north face of the west overburden stockpile. The design capacity of the NWTDF is approximately 24 million st. The project has utilized approximately 4.2 million st of that space as of September 30, 2023. The facility will have a remaining capacity of approximately 19.8 million st which will provide approximately 24 years of storage. The current facility covers about half the overall acreage and abuts the waste rock pile. Expansion is straightforward in the future with the addition of liner and then placement of the additional tailings. The facility design at full buildout is shown in Figure 15-3.



Source: Molycorp Mine Reclamation Plan Revised, 2015

Figure 15-3: Northwest Tailings Disposal Facility

The tailings site was designed by Golder. MP Materials personnel have been doing design and placement reviews with Golder. There is compaction information being taken, but the program at this point is not fully developed.

MP Materials will expand the existing tailings facility to the northwest in approximately 2047 to provide an additional 9 years of storage capacity. A capital cost provision has been included in the economic model for this expansion.

15.4 Security

The site is controlled in its entirety by fencing with a security building and controlled access through the main gate. MP contracts with a security firm to staff the main gate and provide roving services around the perimeter of the site.

The site is fully fenced and has a restricted entry through a guard gate and building at the main entrance.

15.5 Communications

The site communications are fully developed and functioning, including a fiber line to site. Additionally, a strong cell phone signal is available due to placement of a third-party cell phone tower on a peak near the site. The site has telephone, internet, and all necessary infrastructure to support needed communications.

15.6 Logistics Requirements and Off-Site Infrastructure

15.6.1 Rail

Rail is not currently used by the Project. Union Pacific has a rail line located approximately 16 miles away by paved road to the east of the Project near Nipton, California. There are existing double track sections near the Nipton warehouse and loading platforms are still in place but have not been used or maintained.

15.6.2 Port and Logistics

It is approximately 230 miles southwest of the Project to the Port of Los Angeles. The 4.5 hour drive is on improved two and four lane highway with the majority of the trip by Interstate highway. The travel closer to LA is impacted by traffic. Site logistics are straightforward with the concentrate product shipped in supersacks within a shipping container by truck to the port of Los Angeles. At the port, the containers are loaded onto a container ship and shipped to the final customers. Refined products for domestic customers are shipped in supersacks and intermediate bulk containers (IBC tote).

16 Market Studies and Contracts

This section of the Technical Report Summary discusses market studies and contracts and was prepared by Adamas Intelligence Inc. (Adamas). It is primarily based on an Adamas authored preliminary market study titled "MP Materials SK 1300 Market Study Update" dated October 16, 2023 (Adamas, 2023). Adamas prepared the preliminary market study for MP Materials. MP Materials has determined that Adamas meets the qualifications specified under the definition of qualified person in 17 CFR § 229.1300.

16.1 Abbreviations

The following abbreviations apply to the discussion of market studies and contracts.

Table 16-1: Abbreviations for Market Studies and Contracts

Elements	**Organizations**
Ce - Cerium	MIIT - Ministry of Industry and Information Technology (China)
Dy - Dysprosium	MOFCOM - Ministery of Commerce (China)
Er - Erbium	USEPA - United Stated Environmental Protection Agency
Eu - Europium	WTO - World Trade Organisation
Gd - Gadolinium	**Other**
Ho - Holmium	CAGR - compound annual growth rate
La - Lanthanum	NdFeB - neodymium iron boron
Lu - Lutetium	NdPr - neodymium/Praseodymium mixed product
Nd - Neodymium	OEM - original equipment manufacturer
Pr - Praseodymium	TC/RC - treatment charge/refining charge
Sc - Scandium	VAT - value added tax
Sm - Samarium	EV - electric vehicle
Tb - Terbium	**Units and Measurements**
Th - Thorium	kg - kilogram
Tm - Thulium	t - metric tonne
Y - Yttrium	kt - thousand tonnes
Yb - Ytterbium	Mgal - million gallons
U - Uranium	Mgal/d - million gallons per day
Rare earth element abbreviations	$ - USD dollars (unless stated otherwise)
REE - rare earth element	
LREE - light rare earth element	
HREE - heavy rare earth element	
REO - rare earth oxide	
TREO - total rare earth oxide	
SEG - samarium europium gadolinium	

Source: Adamas, 2023

16.2 Introduction

On the Periodic Table of Elements, rare earth elements (REEs) include the lanthanide series, with atomic numbers 57 to 71, plus yttrium and scandium, which bear similar physical and chemical properties to the lanthanides and thus are often hosted by many of the same minerals.

Despite the misleading moniker, rare earth elements are not remarkably rare in nature but rather are rarely concentrated into economically significant amounts for extraction and processing owing to certain physical and chemical properties that promotes their broad dissipation throughout most rock types.

REEs occur together in host minerals in different relative proportions, depending on the host mineral, deposit type and other factors. As a result, REEs are mined and processed together, up to the stage of REE precipitate production (e.g., mixed rare earth carbonate). They are then chemically separated into individual elements and compounds for use in a wide array of different industries and applications. For example, the main REEs used in rare earth permanent magnets are neodymium (Nd) and praseodymium (Pr), while the main elements used in catalysts are cerium (Ce) and lanthanum (La).

Owing to these different end use profiles, individual rare earth elements have different demand growth rates, but are supplied in proportions dictated by orebody composition, giving rise to the so-called “balance problem”.

Over the past decade, rare earth producers globally have sacrificially overproduced certain low value rare earth elements, such as cerium, to keep up with rapidly growing demand for other higher value elements, such as neodymium and praseodymium. This balance problem fundamentally shapes rare earth market trends and impacts the economics of producers.

Since the mid-1980s, China has grown to become the largest producer and consumer of rare earth elements globally. In the 1980s and 1990s, China accelerated exports of low-priced rare earth materials resulting in the economic displacement of production elsewhere. More recently, China has leveraged its control of upstream REE supply, coupled with aggressive policies and government support, to establish control of downstream REE value chains that convert mine outputs into oxides, metals, magnets, motors and more.

However, rapid global demand growth for rare earth permanent magnets for electric vehicles, wind power generators and other applications, combined with strong government support for development of alternative rare earth supply chains, indicate that China’s dominance is likely to erode over the coming decade.

Towards that end, the past 12 months have seen more momentum to establish alternative mine-to-magnet supply chains in North America and Europe than the past 12 years combined. With the ongoing diversification of upstream REE supplies, much of the chicken-and-egg dilemma of yesteryear has been resolved, helping accelerate downstream investments in North American and European metals, alloy and magnet production capacity.

Below, Adamas provides considerations on the rare earth market in terms of the products presently produced and to be produced in the future by MP Materials’ Mountain Pass Rare Earth Mine and Processing Facility.

Based on expected product specifications as discussed by SGS in Sections 10.4.5 and 14.3 of this Technical Report Summary, which appear reasonably achievable, MP Materials will likely be able to market products at forecasted prices. These product specifications are based on the opinion of MP Materials and SGS, which are in turn based on test work and prior operations using the existing infrastructure as well as initial production runs from MP’s recently recommissioned facility.

All prices shown and discussed below are in REO terms, unless stated otherwise.

16.3 General Market Outlook

16.3.1 Historical Pricing

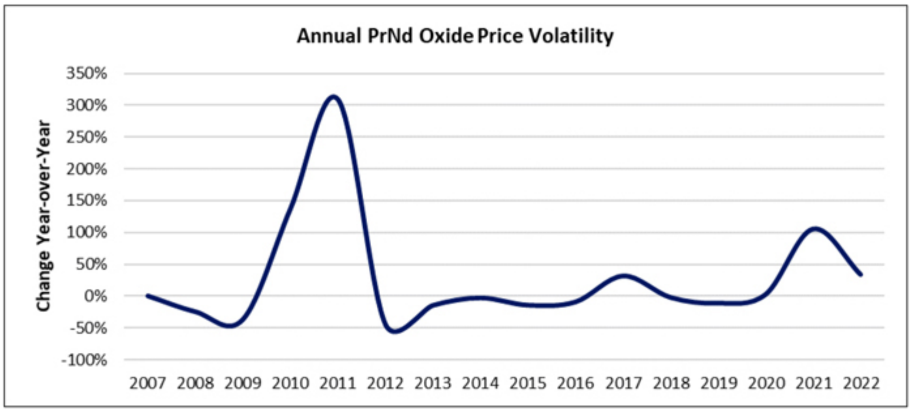
Historically, rare earth prices have occasionally been tied to geopolitical events.

For example, on September 7, 2010, a Chinese fishing trawler operating in disputed waters near the Senkaku/Diayu Islands collided with one or more Japanese Coast Guard patrol boats, resulting in the detention of the trawler's skipper. The detention sparked a major diplomatic dispute between China and Japan, leading China to unofficially restrict and eventually halt rare earth element exports to Japan, its largest customer, for several months. Consequentially, global rare earth prices, controlled by China, soared to record levels in 2011 resulting in unprecedented cost increases for rare earth consumers worldwide.

Starting in the early-2000s, China's Ministry of Industry and Information Technology (MIIT) began imposing export restrictions that over time limited the amount of rare earths available to foreign manufacturers. At the same time, China imposed export duties on refined rare earth products and implemented tax policies to limit the volume of semi-processed rare earths leaving the country with the aim of luring foreign manufacturers (such as NdFeB magnet producers) to move their operations and/or transfer their technology to China.

These practices prompted the U.S., EU and Japan to initiate a WTO dispute in 2012, which ruled in their favor in 2015, leading to the abolishment of China's rare earth export quotas and duties.

Annual PrNd oxide price volatility is shown in Figure 16-1.



Source: Adamas, 2023

Figure 16-1: Annual PrNd Oxide Price Volatility

In the second half of 2010, China's Ministry of Commerce (MOFCOM) slashed the export quota allotted to domestic rare earth suppliers, effectively limiting the amount of material available for consumption outside of the nation. As of August 2010, the constrained availability of rare earth elements for export in China had already begun to propel prices higher. The subsequent Senkaku/Diayu Islands incident the following month exacerbated the market's concerns and fueled a buying frenzy into mid-2011 that pushed rare earth prices to record high levels.

From January 2010 through July 2011, the China export price of cerium oxide increased by 3,528% while that of lanthanum oxide, neodymium oxide, praseodymium oxide and yttrium oxide increased by 2,619%, 1,640%, 1,167% and 1,341%, respectively, over the same period.

The political dispute was resolved soon after prices spiked, leading most rare earth prices to fall back to historical normal levels in the ensuing 24 months. In the aftermath, global supply and demand contracted, the latter the result of demand destruction as rattled manufacturers outside of China looked to reduce the mass of rare earths used in their products.

Since that period, demand for PrNd oxide – the main rare earth input material for high strength permanent magnets – has returned to strong year-over-year growth on the back of electric vehicle traction motors, wind power generators, industrial robots and more. In response to this demand growth, global production of PrNd oxide has more than doubled and prices have appreciated overall.

As a consequence of the balance problem and the pervasive overproduction of some rare earth elements (e.g., cerium) to keep up with rapidly growing demand for other rare earth elements (e.g., PrNd oxide), prices have diverged in recent years with the latter increasing and the former falling overall since 2017.

For the sake of comparability and consistency, prices of products sold by MP Materials are presented in terms of oxide or oxide equivalent herein. Concentrate prices are a function of the individual rare earth elements they contain and thereby tend to follow an aggregate value trend.

PrNd Oxide

Five-year prices for PrNd oxide can be broken down into three trends:

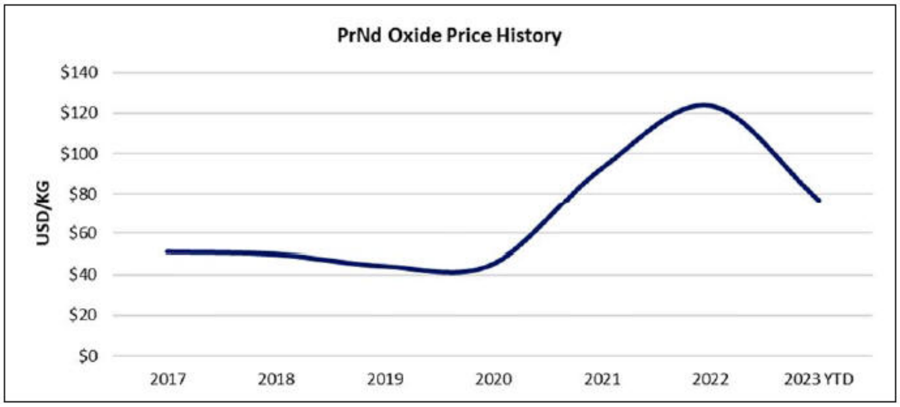
1. Relatively flat prices from 2017 to July 2020, following a minor spike in 2017
2. Sudden, rapid increase in prices from October 2020 to February 2022
3. Steady decrease in prices from February 2022 to July 2023, with a minor increase since

From 2018 to February 2022, PrNd oxide prices more than tripled, from US$50/kg to over US$150/kg.

The rapid increase in PrNd oxide prices was underpinned by growing demand for NdFeB magnets and the relatively limited supply of PrNd oxide available to produce these magnets. From 2018 through 2021, Adamas data shows that global demand for NdFeB magnets increased at a CAGR of 10%, challenging the ability of the supply side to keep up.

In early 2022, following complaints from rare earth users and industry, Chinese authorities encouraged major producers in the nation to reduce prices which, coupled with the weakening of economic conditions, resulted in a gradual 64% drop in PrNd oxide price by June 2023. Since June 2023, prices have trended higher overall and remain well above October 2020 levels.

Figure 16-2 shows PrNd oxide price history since 2017.



Source: Adamas, 2023
YTD = January through September

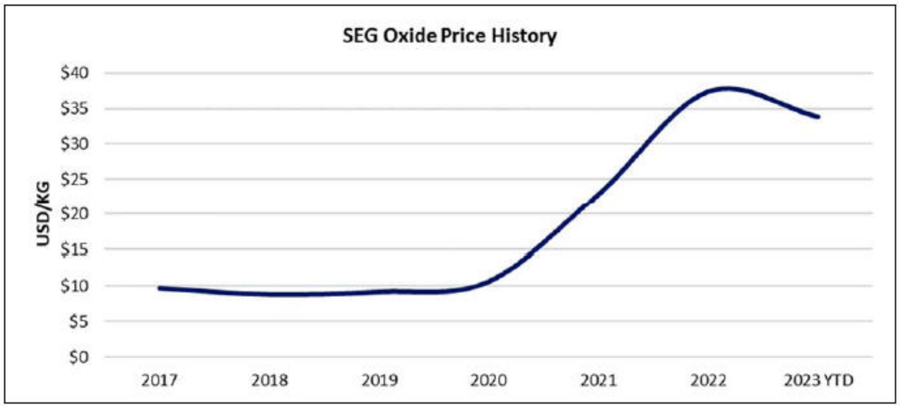
Figure 16-2: PrNd Oxide Price History

SEG+ Oxide

The five-year history for SEG+ oxide (which includes Sm, Eu, Gd, through to Y) follows a similar trend to that of PrNd oxide, though average annual prices have increased overall by 287%, from US$9.64/kg to US$37.39/kg, lifted higher by a rise in prices of dysprosium and terbium, which are minor but valuable components of the mixture. SEG oxalate with specifications of MP Materials' product mix have a higher sales price, as will be discussed, but follows the same trend as most quoted SEG concentrates.

Driven by dysprosium and terbium's use in high performance permanent magnets for electric vehicles and wind power generators, their prices have performed strongly overall since 2020, translating to a comparable uptick in SEG concentrate prices overall.

Figure 16-3 shows SEG oxide price history since 2017.



Source: Adamas, 2023
YTD = January through September

Figure 16-3: SEG Oxide Price History

Lanthanum Oxide

As a casualty of the balance problem, La oxide prices have broadly followed the same downward trend as cerium prices since 2017, dragging down the price of La carbonate at the same time. Much like Ce oxide, the decline in the prices of La oxide and La carbonate is due to pervasive overproduction (i.e., the balance problem) as a consequence of the supply side trying to keep up with rapid demand growth for PrNd oxide.

Figure 16-4 shows La oxide price history since 2017.

Source: Adamas, 2023
YTD = January through September

Figure 16-4: La Oxide Price History

Cerium Oxide

Cerium is the most abundantly produced rare earth element globally, accounting for approximately 40% of all production. As the main applications of cerium (predominantly in catalytic converters and abrasives) are growing slower than magnet-related applications, cerium has been chronically overproduced for nearly two decades. Cerium is currently finding new end uses and applications, including in lower-performance permanent magnets, but is still in significant oversupply globally.

As such, since 2017, Ce oxide prices have fallen below the cost of production.

Figure 16-5 shows Ce oxide price history since 2017.

Source: Adamas, 2023
YTD = January through September

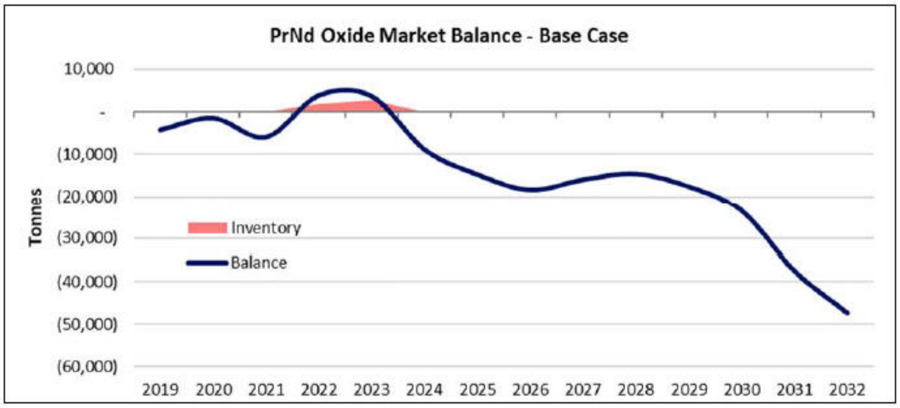
Figure 16-5: Ce Oxide Price History

16.3.2 Market Balance

Chinese rare earth production quotas have doubled over the past five years, from 120kt in 2018 to 240kt in 2023, leading global mine production of PrNd oxide to increase by 62%. Over the same period, global demand for NdFeB magnets increased by a comparable 60% overall, resulting in a relatively tight supply demand balance. Adamas expects oversupply in 2023 but from 2024 onwards we expect the market will experience a growing and sustained deficit of PrNd oxide through the end of the forecast period.

Adamas expects the start-up of several new projects will slow growth of the market's deficit between 2025 and 2029 but production will increasingly struggle to keep up with demand growth in the years thereafter.

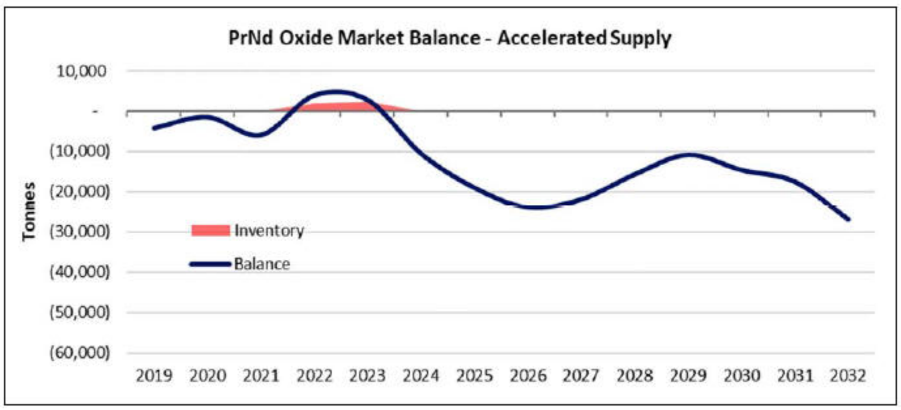
Figure 16-6 shows the base case PrNd market balance.



Source: Adamas, 2023

Figure 16-6: Supply Gap Growth to Accelerate from Late-2020s without Prompt New Investment

In Figure 16-7, Adamas shows the long-term market balance for the accelerated supply growth scenario that sees the addition of 20 new “advanced” producers outside of China (over and above the base case) coupled with accelerated demand growth for NdFeB magnets for electric vehicle traction motors, wind power generators and other applications.



Source: Adamas, 2023

Figure 16-7: Adamas Accelerated Supply Growth Scenario Envisages Moderately Balanced Market Until Early 2030s Before Deficit Growth Accelerates

The price response to the expected market deficit is uncertain, but historically minerals and commodity markets experience upward price reactions when supply is unable to meet demand. As such, if expected conditions materialize, rare earth inputs for NdFeB magnets – namely PrNd, Dy and Tb – are likely to experience price increases.

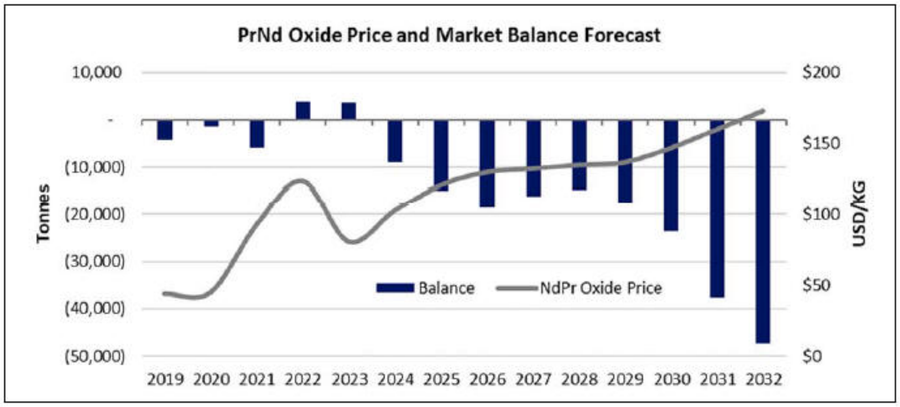
As shown in Figure 16-8, Adamas expects the price of PrNd oxide to increase from US$70-80/kg this year to US$120-130/kg in the mid-2020s. While the outlook is uncertain, in a rational market we would expect these price increases to induce investment in new production capacity. However, owing to the long lead times to develop new rare earth supplies and the lack of advanced, financially committed projects in the pipeline today, Adamas sees potential for pervasive deficits to push prices above required inducement levels (estimated at US$100-150/kg in the long term).

By 2035, Adamas projects that EVs, wind power generators and other energy-efficient motors, pumps and compressors will drive nearly two-thirds of global rare earth permanent magnet demand.

This evolution is noteworthy as it implies that the future of magnet rare earths demand will be less sensitive to price than that of the past because future demand will be increasingly driven by applications in which the use of rare earth permanent magnets imparts an economic benefit at the system level.

Be it through battery cost thrifting in an electric vehicle, maintenance cost savings in a wind farm, or electricity cost savings in an industrial facility, grocery store or hotel, the economic upsides enabled by using technologies based on rare earth permanent magnets allow for a significant rise in magnet rare earth prices going forward before it would be economically justifiable to switch to a REE-free alternative.

As such –Adamas expects that the future of rare earths demand (at least in the case of PrNd, Dy and Tb) will be more robust, more resilient and less sensitive to price than demand of the past and present, which is still largely driven by consumer and legacy automotive applications.



Source: Adamas, 2023

Figure 16-8: Adamas Base Case PrNd Oxide Price and Market Balance Forecast

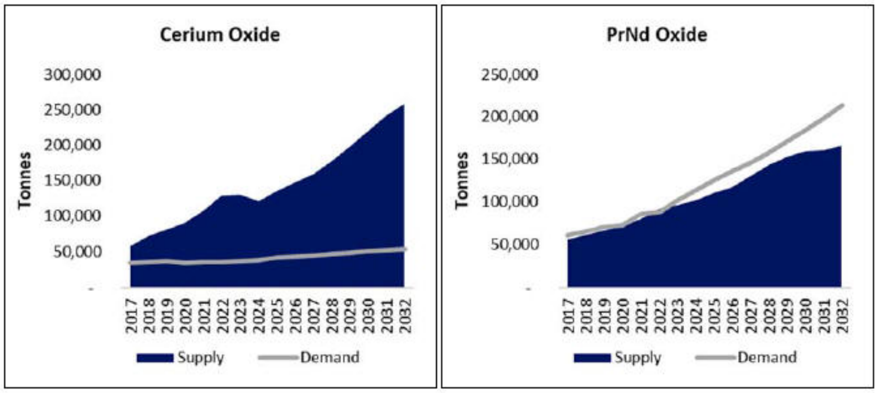
In 2023, Adamas expects that global PrNd oxide supply will exceed global demand by 3% but by 2024 the market will underproduce by over 5% resulting in the drawdown of historically accumulated inventories, the accelerated consumption of cerium and gadolinium as alternatives, and ultimately, a growing deficit through the end of the forecast period.

Overall, for the global market to effectively balance production and demand from 2026 through 2040 will require the addition of 270,000 to 340,000 tonnes of LREO-rich production by 2040, over-and-above the production growth already expected, which is highly unlikely to happen in Adamas' view.

Long Term Balance

The long-term market balance for the collective REE suite is expected to be in oversupply due to the balance problem (i.e., the sacrificial overproduction of some rare earth elements, such as cerium, to keep up with rapidly growing demand for other elements and compounds, such as PrNd).

Figure 16-9 shows the market balance forecast for Ce oxide and PrNd oxide.



Source: Adamas, 2023

Figure 16-9: Rare Earth Market Balance Forecast

Looking forward, while markets for magnet rare earths (namely PrNd, Dy and Tb) are expected to experience long-term deficits, markets for cerium, lanthanum and yttrium are expected to be in relative oversupply as a consequence of strong magnet rare earths demand growth. Increasingly, Adamas expects magnet rare earth prices will appreciate to account for the losses producers are chronically incurring by necessarily overproducing other surplus rare earth elements.

16.3.3 Costs

Globally, rare earth production costs are a function of multiple factors, including geology, mineralogy, operational logistics, processing infrastructure, process design and regulatory regime.

The opacity of rare earth production costs and reporting in China, the world's largest production center, make a transparent comparison between producers challenging.

Through the lens of several key production cost drivers, MP Materials presents apparent advantages and disadvantages relative to major producers in China. On balance, the factors point to MP Materials being a global low-cost producer of rare earth concentrate and oxide.

Geology and Mineralogy

At MP Materials' Mountain Pass mine, mined ore contains greater than 6.3% TREO on average versus 4% to 6% TREO at the Bayan Obo mine in China, the nation's largest, highest-grade source of production and host to over 80% of China's known rare earth reserves. The higher grade at Mountain Pass and relatively high recovery rates and higher concentrate grade reduces MP Materials' handling and processing volumes and reduces reagent consumption per ton of ore relative to most major producers.

Logistics

Logistically, the co-location of mining and processing assets at Mountain Pass presents another potential cost advantage for MP Materials versus competitors that ship intermediate products to processing facilities offsite or offshore. This eliminates a precipitation, packaging, shipping, and redissolution step relative to most non-collocated peers.

Conversely, the availability and cost of chemical reagents used to process rare earths is a potential cost disadvantage for MP Materials relative to major producers in China, where reagent costs are lower, and availability is higher. A future restart of chlor-alkali production facilities at Mountain Pass may help reduce this cost disadvantage.

Production Assets

The relatively straightforward ease of beneficiation of Mountain Pass ore, high asset throughput, and high automation help leverage production assets and minimize labor costs.

Conversely, the professionalization of preventative maintenance plans and the costs and logistics of maintaining spare parts and inventory presents a potential cost disadvantage for MP Materials versus major producers in China pursuing a failure-based approach to maintenance.

Regulatory Regime

Relative to major producers in China, Mountain Pass is subject to higher wastewater management and environmental compliance costs owing to a stricter regulatory regime in the U.S., presenting a potential cost disadvantage for MP Materials.

However, at Mountain Pass the dewatering of tailings prior to storage means that over 95% of water used on site comes from recycled sources on site, helping offset the potential cost disadvantage.

16.4 Products and Markets

16.4.1 Mineral Concentrate

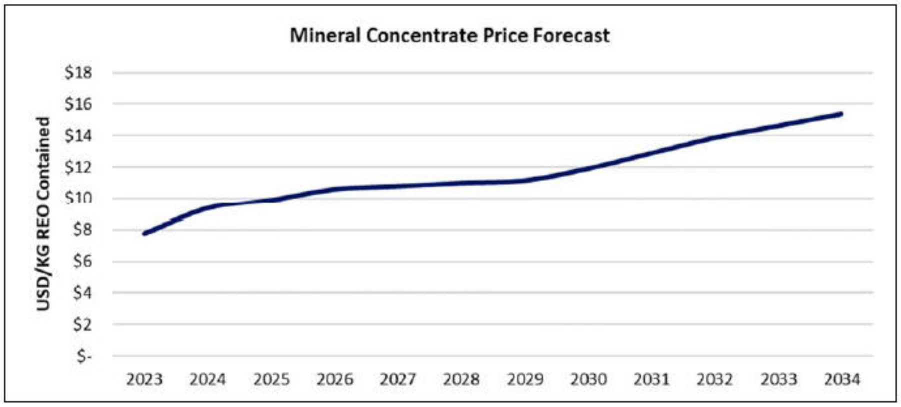
Market Overview

Mineral concentrates are a first-stage beneficiation product yielded along the rare earths value chain. Rare earth mineral concentrates vary from producer to producer according to the nature of the deposit, the minerals being recovered and the relative abundance of each rare earth element in those minerals. Mineral concentrate is yielded at a stage prior to separation of rare earth elements from each other and as such contains all individual rare earth elements present in the deposit.

As the largest rare earths producer and processor globally, China is home to a fluid and active market for rare earth mineral concentrate and other downstream products. Over the past five years, processors and traders in China have actively imported growing volumes of rare earth mineral concentrates from abroad and invested in development of foreign sources of supply.

Outside of China, third-party imports and processing of mineral concentrates have been relatively limited to-date owing to limited processing capacity. While MP Materials' supply to China has grown substantially over the past five years, it is expected this will wane in the years ahead as MP Materials ramps up in-house processing and production of separated PrNd oxide in the U.S.

Figure 16-10 shows the mineral concentrate price forecast.



Source: Adamas, 2023
Note: Forecast specific to MP Materials' Mineral Concentrate

Figure 16-10: Mineral Concentrate Price Forecast

Adamas expects a rare earth mineral concentrate with MP Materials' composition and purity will have a long-term average price of US$10.94/kg of contained REO. The mineral concentrate price will be principally driven by trends in PrNd oxide price, with expected PrNd oxide price movements to be mirrored by concentrates.

Buyers

At present, buyers are owners and operators of Chinese processing and separation facilities. According to Adamas data, there are over 30 separate legal entities in China with notable processing and separation capacity. These entities purchase mineral concentrate, crack and leach into a chemical solution, and then separate into individual rare earth products according to market-desired specifications. Producers of separated La, Ce and PrNd products often also yield a mixed Sm-Eu-Gd-HREE chemical precipitate which is sold to HREE-focused separation plants with the required production lines.

Sellers

Sellers are rare earth mining operations producing a mineral concentrate. At present, the only known significant mining operation supplying this market outside of China is MP Materials' Mountain Pass and, with the exception of emerging byproduct monazite producers, this is not expected to change in the near-term. In Adamas' view, the majority of incoming rare earths production capacity in the near-term will aim to produce a mixed rare earth chemical precipitate (e.g., mixed rare earth carbonate), or even separate the product themselves.

Traders

Key traders of rare earth mineral concentrates reside mainly in China due to the presence of abundant capacity and a merchant processing industry there. Shenghe Resources is known to be an active importer and trader of rare earth mineral concentrate, which it distributes to processing and separation facilities in China.

Required Product Specifications

In order to be economical, concentrate grades require a minimum relative abundance of high value elements. Generally, for a LREE-rich mineral concentrate, a relative abundance of PrNd oxide above 10% is acceptable, however, this depends on the entire basket distribution since elevated concentrations of dysprosium and terbium, for example, could reduce this threshold.

The REO grade for commercially traded mineral concentrates varies from around 15% to 73%.

Typical Sales Terms

Sales terms are based on the value of contained rare earths in the concentrate, minus a discount for value added tax (VAT), implied processing costs, profit margin and other relevant penalties, as discussed below.

Treatment Charges / Refining Charges

Due to the opaque nature of concentrate markets, the terms for treating concentrates are relatively uncertain. The number of concentrate transactions globally is relatively small, and the terms for custom concentrate treatment are generally not disclosed by market participants.

In general, Adamas analysis shows that high purity rare earth mineral concentrates in China trade at a price level equal to 30-40% of the rare earth oxide value they contain, whereas some mineral concentrates imported into China sell at a higher 50%+ of contained value because they bear preferential properties (e.g., pre-roasted, high grade, low presence of acid consuming minerals, etc.) or because processors have dialed in their facility for that particular feedstock. This implies a treatment charge of US$4-$10/kg.

Typical Penalty Adjustments

Penalty adjustments can be applied if concentrates contain high levels of non-REE material. Examples include thorium and/or uranium content in monazite mineral concentrates. At above 0.2% thorium and/or uranium content by weight, monazite concentrates may need to be exported under specific restrictions as they will be treated as Class 7 radioactive material. Provincial-level disposal facility charges may apply for radioactive byproduct and there are limited number of processing facilities with the proper licenses to process certain monazite. The cost and operational risk of removing this material and subsequently disposing of it is moderate, and therefore can result in moderate penalty adjustments.

There may be further penalty adjustments for excessive moisture content and elevated presence of acid consuming minerals. Depending upon the REO distribution and nature of impurities, prices may experience step changes in price for lower contained REO grade.

16.4.2 PrNd Oxide

Market Overview and Pricing

Nearly all PrNd oxide consumed globally is used in the production of PrNd alloy and subsequently NdFeB permanent magnets. Small amounts of individual Nd and Pr, as well as mischmetal containing Nd and Pr, are used in other applications, including battery alloys, catalysts, ceramics, laser crystals, metallurgy, pigments and more.

From 2023 through 2040, Adamas forecasts that global demand for PrNd oxide will increase at a CAGR of 7.2%, led by double-digit demand growth for NdFeB magnets in electric vehicle traction motors and wind power generators.

Specifically, from 2023 through 2040 Adamas forecasts that global PrNd oxide demand for passenger EV traction motors, commercial EV traction motors and “other e-mobility” applications will collectively increase at a CAGR of 10.6% on the back of rising demand for passenger BEVs, PHEVs, and light, medium and heavy commercial electric vehicles.

Over the same period, Adamas forecasts that global PrNd oxide demand for direct drive and hybrid direct drive wind power generators for onshore and offshore applications will increase at a CAGR of 10.7% as the increasingly competitive economics of wind power generation (and low maintenance of permanent magnet direct drive generators) spur increased adoption.

Moreover, from 2023 through 2040 Adamas forecasts that global PrNd oxide demand for industrial applications will increase at a CAGR of 4.2%, bolstered by strong demand growth for power-dense energy-efficient motors, pumps, compressors, fans, blowers, elevators, escalators, industrial robots and more.

Additionally, from 2023 through 2040 Adamas forecasts that global PrNd oxide demand for certain emerging and novel end-uses and applications will increase at a CAGR of 12.1%, led by service robots, magnetocaloric chillers and other upcoming applications.

By 2035, Adamas projects that EVs, wind power generators and other energy-efficient motors, pumps and compressors will drive nearly two-thirds of global rare earth permanent magnet demand.

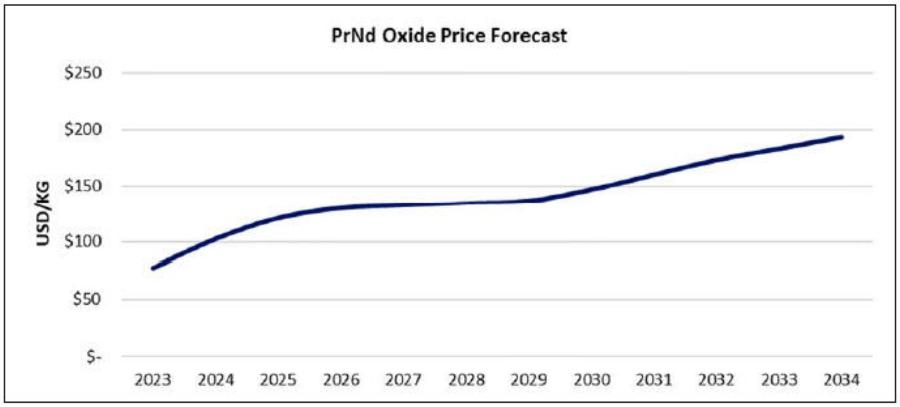
As noted above, this evolution is noteworthy as it implies that the future of magnet rare earths demand will be less sensitive to price than that of the past because future demand will be increasingly driven by applications in which the use of rare earth permanent magnets imparts an economic benefit at the system level.

As such, Adamas expects that the future of rare earths demand (at least in the case of PrNd, Dy and Tb) will be more robust, more resilient and less sensitive to price than demand of the past and present, which is still largely driven by consumer and legacy automotive applications.

Although Adamas anticipates significant supply growth over the forecast period, it appears unlikely that PrNd oxide supply will be able to keep up with demand growth in the near-term, leading to market deficits that Adamas expects may persist for several years. This forecast is sensitive to production expansions in China, which are directed by government, and could exceed expectations in its growth out to 2034.

With PrNd oxide being the key driver of LREE mining economics, Adamas expects the market to strive for balance over the long-term. In the near-term, moderate and steady deficit levels are expected to sustain prices at modest levels (US$80-130/kg), incentivizing the development of new supplies. However, with long lead times to develop new supplies, and demand growth accelerating on the back of electric vehicles, wind power generators and more, deficits are expected to widen from the early 2030s, pushing prices higher overall.

The PrNd oxide price forecast is shown in Figure 16-11.



Source: Adamas, 2023

Figure 16-11: PrNd Oxide Price Forecast

Adamas forecasts a long-term average price of US$131.60/kg for PrNd oxide. This forecast is based on the premise that PrNd continues to carry the cost of rare earth production. From 2024 through 2029, Adamas forecasts that prices will increase just slightly as new supplies enter the market, steadying the deficit, but from 2029 through 2034 prices will rise faster as the deficit grows.

Buyers

Buyers of PrNd oxide are divided into two main groups, downstream NdFeB magnet and magnetic alloy producers, and oxide-to-metal plants.

To produce NdFeB magnetic alloys (i.e., bulk NdFeB materials from which final magnets are produced), PrNd oxide must first be reduced to PrNd metal. Some magnetic alloy producers have oxide reduction capacity in-house and thereby purchase and consume PrNd oxide directly, whereas others purchase metals from third-party reduction facilities. As there is no significant profit to be realized in upgrading from oxide to metal, and thus little incentive for standalone reduction facilities, the metallization step of the value chain could become a bottleneck for some emerging magnet and magnetic alloy producers.

At present, global NdFeB magnet and magnetic alloy production is dominated by China, with emerging growth underway in the U.S. and Europe. Major Chinese magnet producers (and thus buyers of PrNd) include JL-Mag, Beijing Zhong Ke San Huan Hi-Tech, Tianhe Magnets and Ningbo Yunsheng. Collectively, Chinese magnet production makes up approximately 90% of global supply with Japan host to nearly all the rest. Major magnet producers outside of China include Proterial, Shin-Etsu Chemical, TDK, all in Japan, and Vacuumschmelze, located in Germany. Emerging producers in the U.S. and Europe include MP Materials, Noveon, GKN Powder Metallurgy and Neo Performance Materials.

Strong government support for magnet making in the U.S. and Europe suggest that non-China magnet production will grow.

Due to expected market tightness and the opacity of upstream supplies, automotive and wind OEMs are increasingly amenable to purchasing oxides directly and supplying them to third-party metal and magnet makers in order to increase transparency and security of supplies.

Sellers

In the PrNd oxide market, rare earth processors act directly as sellers. Vertically integrated miners with in-house processing plants directly produce and sell PrNd oxide to metal and/or magnet making facilities. Merchant traders play a relatively limited role at present although some are emerging outside of China (e.g., Tradium in Germany).

Key producers, and therefore sellers, of PrNd oxide are currently located predominantly in China, with China Northern Rare Earth Group accounting for the largest portion of the nation's oxide sales. In China, PrNd oxide is only sold domestically. Foreign buyers can only import individual Nd or Pr oxides from China, which are priced at a premium to PrNd oxide, advantaging China's domestic consumers.

In 2023, MP Materials started production of separated PrNd oxide in the U.S. By the mid-2020s, Adamas expects that the share of non-China PrNd oxide production will have grown with new output from MP Materials, expansion of Lynas' production, and the potential of additional volumes from smaller start-up producers and/or minerals sands.

Traders

The role of traders is limited in the PrNd oxide market. With few exceptions, buyers and sellers trade directly with no intermediate participant required. Japanese trading companies (i.e., Sojitz and Sumitomo) are known to participate in the market, mainly to facilitate logistics for domestic users.

Required Product Specifications

PrNd oxide is sold as a mixed oxide, in a concentrated, powdered, form. Compositionally, PrNd oxide commonly contains 75% Nd oxide and 25% Pr oxide, +/- 5%. Minimum purity for PrNd oxide is 99% TREO, of which PrNd/TREO = 99.5%.

Typical Sales Terms

PrNd oxide sales are typically contract based due to the criticality of the raw materials to magnet makers. Typical sales terms (beyond material pricing) in China are opaque. Due to the relatively high value of the product per kilogram, logistics costs are a minor consideration in final sales agreements.

Treatment Charges / Refining Charges

With few reduction facilities outside of China, the terms for refining PrNd oxide are relatively uncertain. Major PrNd oxide producers in China prefer to complete reduction in-house and sell PrNd metal. As such, the terms for custom PrNd oxide refinement are generally not disclosed by market participants.

In general, Adamas analysis shows that the price of PrNd metal in China is consistently 122% to 124% the price of PrNd oxide. Considering the cost structure in China, this implies a treatment charge of US$4-10/kg.

Typical Penalty Adjustments

Inferring from the product specifications, no specific penalty adjustments are applicable for PrNd oxide. The typical 99% minimum grade specifications mean that anything below this purity would be scrutinized and potentially face material reductions in agreed price, if not be rejected entirely.

16.4.3 SEG+ Oxalate, Carbonate, Chloride and Oxide (SEG+ precipitate)

Market Overview and Pricing

SEG+ precipitate is an intermediate product comprised of a mixture of medium and heavy rare earths. It is generally made up primarily of so-called medium rare earths (samarium, europium and gadolinium - SEG), with lesser amounts of heavy rare earth elements, including around 4% dysprosium and terbium. Most producers of separated La, Ce and PrNd products often also yield a mixed SEG+ chemical precipitate, such as a carbonate, oxalate or chloride, which may be converted to oxide and sold to HREE-focused separation plants that have the required production lines.

There is no defined end use market for SEG+ precipitates other than as an intermediate feedstock for further processing and separation into market desired individual rare earth products. SEG+ precipitate prices and treatment terms are therefore relatively uncertain and opaque.

The end uses of rare earth elements contained in SEG+ precipitate range from permanent magnets (Sm, Gd, Tb, Dy, Ho) to phosphors (Eu, Tb, Y) to glass additives (Er, Gd, Y) and more. As a result, the market demand and prices of SEG+ precipitate are driven by a variety of factors and considerations.

End use demand growth is inherently variable, thus a market balance for SEG+ precipitate as a single product is not necessarily indicative of pricing or current market dynamics. Like mineral concentrate, the market for SEG+ precipitate is driven entirely by its composite parts. The elements contained in SEG+ precipitate most likely to drive pricing changes are dysprosium, terbium, gadolinium and holmium – elements used in NdFeB permanent magnets with insufficient supply responses expected in the years ahead. Persistent market tightness will help these elements drive SEG+ precipitate prices to higher levels.

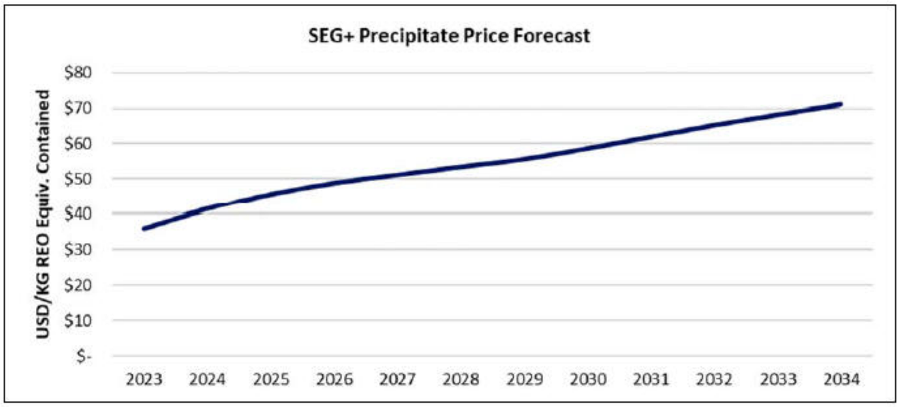
As SEG+ precipitate contains a variety of elements, most of which will likely experience demand growth lower than magnet metals (e.g., Eu, Er, Y), the market for the combined SEG+ products as individual oxides is expected to be in surplus over the long term. In fact, owing to the relatively high concentration of Sm and Y in SEG+ precipitate, supply may exceed demand by double by 2040 at current trends. Despite this collective surplus, SEG+ prices may still be favorable as markets for dysprosium and terbium are also expected to experience growing deficits over the coming decade. The capacity for these markets to remain supplied is challenged by HREE resource scarcity in China and political uncertainty in Myanmar.

The principal global sources of supply for dysprosium and terbium as separated products are ion adsorption clay (IAC) mining operations in China and Myanmar, plus minor volumes from SEG+ chemical precipitates yielded by PrNd, La and Ce oxide separation plants.

The only notable IAC operations today are in China and Myanmar although others are being explored elsewhere. China's operations are expected to face significant stress in the near-term due to resource depletion and scarcity. Myanmar's operations, which have experience extensive shutdowns and social resistance since 2020, face an uncertain future in light of the political and environmental situation there.

Closures of ionic adsorption clay operations in either country may lead to pronounced deficits in the dysprosium and terbium markets.

The SEG+ precipitate price forecast is shown in Figure 16-12.



Source: Adamas, 2023

Figure 16-12: SEG+ Precipitate Price Forecast

Adamas expects an increase in the SEG+ precipitate price out to 2034 due mainly to expected increases dysprosium and terbium prices. Adamas forecasts a long-term average price of US$51.90/kg for a SEG+ precipitate with MP Materials specifications. This price is built up on internal modelling of Chinese separation facilities' costs of production and required feedstock price (at which they would purchase the material) to meet profitability targets of 10-20%. It is unclear exactly how terms will develop over the coming years.

Buyers

Key buyers of SEG+ precipitate are Chinese separation facilities capable of separating heavy rare earths. As discussed in Section 16.4.1, Adamas notes the existence of at least 30 separate legal entities in China with significant commercial capacity for rare earth separation through solvent extraction.

Over time, buyers are expected to emerge in other regions, such as the U.S., Australia and Europe, where heavy rare earth processing capacity is being developed, including internally at MP Materials.

Sellers

Sellers are typically facilities with light rare earth separation capacity. Typical light rare earth separation facilities have too little Dy and Tb in their feedstock to economically justify the construction and operation of heavy rare earth separation lines thus they precipitate these elements into a mixed SEG+ chemical concentrate for sale to plants with HREE separation capacity.

Traders

Outside of China, it is understood that Lynas Rare Earths conducts a monthly auction for the SEG+ precipitate it produces in Malaysia.

Required Product Specifications

There are no required product specifications for SEG+ oxalate, however, the costs of consuming SEG+ oxalate to produce separated rare earth oxides are high thus it must contain a high enough concentration of valuable elements to be viable.

Typical Sales Terms

The sales terms SEG+ oxalates are generally opaque, given the limited number of sellers of the product (i.e. currently Lynas with MP Materials beginning to participate). As price participants, we understand that in China the product, like other mixed rare earth intermediates, may be purchased on the basis of a percentage of contained rare earth value.

Treatment Charges / Refining Charges

Due to the opaque nature of intermediate markets, the terms for treating SEG+ precipitate are relatively uncertain. The number of SEG+ precipitate transactions globally is small, and the terms for custom concentrate treatment are generally not disclosed by market participants.

In general, Adamas analysis shows that high purity mixed rare earth precipitates in China trade at a price level equal to 65-80% of the rare earth value they contain.

Typical Penalty Adjustments

Potential penalty adjustments may be made if the SEG+ oxalate does not contain enough dysprosium and/or terbium to be considered economic for processing.

16.4.4 La Carbonate

Market Overview and Pricing

The U.S. is the largest consumer of imported La carbonate globally. Currently, it is understood that no La carbonate (outside of the recent launch of MP's production capability) is produced in the U.S., meaning domestic production may replace existing imported supply.

In recent years, U.S. imports of La carbonate have ranged from ~5 kt to 15 kt albeit volumes are declining over time. The main use of La carbonate is in fuel cracking catalysts and catalytic converters for gasoline-powered vehicles, both applications that have been negatively affected by rising global sales of electric vehicles.

In the fuel industry, La-containing catalysts are used to break down crude oil molecules into market-desired distillates, such as gasoline, kerosene, diesel and more. Adding lanthanum to fuel cracking catalysts increases gasoline make, which, next to diesel, has seen demand challenged by rising electric vehicle adoption globally.

Moreover, La carbonate is sometimes also used alongside cerium in catalytic converters of gasoline-powered vehicles in which rare earths and other precious metals help reduce pollutants in the vehicle's exhaust stream into less harmful varieties.

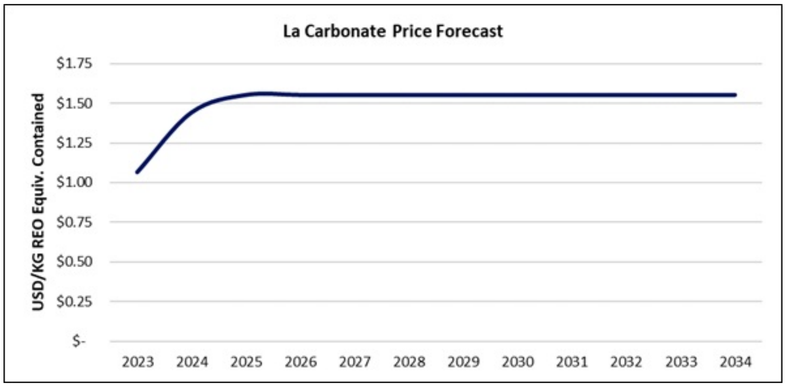
Relatively small amounts of La carbonate are also used in the pharmaceutical sector, consumer electronics sector, certain metals and alloys, and in wastewater treatment for phosphate removal - more detail is provided for the water treatment market in Section 16.4.5.

Like cerium, the market balance of lanthanum is heavily influenced by the balance problem. In a typical bastnaesite or monazite deposit, lanthanum makes up 20-35% of the contained TREO whereas lanthanum's share of overall TREO demand is a lower 15% resulting in pervasive overproduction.

With PrNd demand expected to drive TREO production growth over the long term, the amount of sacrificially overproduced lanthanum will increase in tandem.

As a result, in both the near- and long-term, the market for lanthanum will continue to be oversupplied, and the extent of oversupply will continue to grow unless new end-uses and applications for lanthanum emerge. In the near-term, however, with lanthanum oxide prices having fallen below the cost of production, and inventories in the relatively disciplined hands of China's major producers, we expect lanthanum and cerium oxide, carbonate and chloride prices to appreciate moderately and then stay relatively flat across the remainder of the forecast period.

Figure 16-13 shows the lanthanum carbonate price forecast.



Source: Adamas, 2023

Figure 16-13: La Carbonate Price Forecast

Lanthanum carbonate prices closely track oxide prices. Adamas forecasts a long-term average price of US$1.50/kg for La carbonate (on La oxide equivalent basis). This forecast is calculated on the basis of the relationship between historic lanthanum carbonate and oxide prices. As a product in chronic oversupply, the costs of production are mostly covered by PrNd oxide, meaning that there is no current inducement or incentive price for lanthanum.

Buyers

Buyers of La carbonate include fuel cracking catalyst manufacturers, catalytic converter washcoat manufacturers, and others consuming lanthanum for use in medical products, consumer electronics, metals and alloys, and in wastewater treatments.

Sellers

The main sellers of lanthanum carbonate are rare earth separation facilities. With conventional solvent extraction, lanthanum requires separation from the rare earth mixture before more valuable products, such as PrNd, thus the vast majority of LREE separation facilities globally will produce a lanthanum product, be it oxide, carbonate, chloride or other. We believe MP Materials is currently the only commercial scale lanthanum carbonate producer in the U.S.

Current re-sellers or importers of Chinese lanthanum carbonate in the U.S. for sale downstream will struggle to compete against domestic production since transport and logistics costs of low value lanthanum products may account for more than half of their landed costs.

Traders

In the case of La carbonate, vertically integrated miners with in-house processing plants produce La carbonate for sale to downstream consumers, or sale to local and foreign traders that sell to downstream consumers. The majority of La carbonate is currently produced in China, making MP Materials the only known domestic U.S. producer. Current re-sellers in the U.S. and Europe market imports of concentrates from China.

Required Product Specifications

Typical La carbonate is marketed as a powder containing 45% TREO minimum and with La_2O_3/TREO of at least 99.5%.

Typical Sales Terms

The sale of La carbonate is contract based with no official spot price reported globally. It is understood that contracts typically include fixed supply periods between buyers and sellers at a fixed rate, renegotiated periodically as a function of La oxide price. Buyers usually pay transportation costs.

Treatment Charges / Refining Charges

As a light rare earth product in surplus, and a sacrificial byproduct of PrNd, treatment charges for this product do not exist in isolation – the economics of magnets rare earths will factor in.

Typical Penalty Adjustments

Potential trade penalties may exist where the La carbonate sold to a seller is below 45% TREO including free moisture and LOI or contains less than 99.5% La_2O_3/TREO.

16.4.5 Cerium Chloride

Market Overview and Pricing

The market for Ce chloride is led by vertically integrated miners and companies with in-house processing plants that produce and sell material to downstream consumers as a branded product.

One of the primary uses of Ce chloride is as a coagulant (a substance which causes curdling and clotting of liquids) in the water treatment sector. Ce chloride is an alternative to traditional coagulants in this sector where it is well suited for phosphorous (P) removal.

Based on U.S. Environmental Protection Agency (USEPA) mandates, companies and water treatment facilities in the U.S. are required to maintain P levels between 0.05-0.1 mg/L, levels that some traditional coagulants struggle to achieve.

Buyers of Ce chloride are typically end users of the product, such as water treatment plants. Sellers are those producing the product and often packaging into branded merchandise for marketing to buyers. Traders are the vertically integrated miners or in-house bulk upstream producers of Ce chloride.

Table 16-2: Summary of U.S. Facilities Monitoring and Limiting P-levels

Facility type	Total number of facilities	Total discharge (billion gallons per day)	Facilities required to monitor phosphorus			Facilities with phosphorus concentration limits		
			Number of facilities	Percentage of facilities	Sum of design flow (Mgal/d)	Number of facilities	Percentage of facilities	Sum of design flow (Mgal/d)
Municipal	15,939	42	2,437	15	16,447	1,163	7	7,145
Industrial	50,599	2,379	na	5	16,950	877	2	9,336
Federal	1,119	110	na	10	113	50	5	51
Other	5,087	142	na	3	28	26	1	5
Total	**72,744**	**2,380**	**5,068**	**7**	**33,538**	**2,116**	**3**	**16,537**

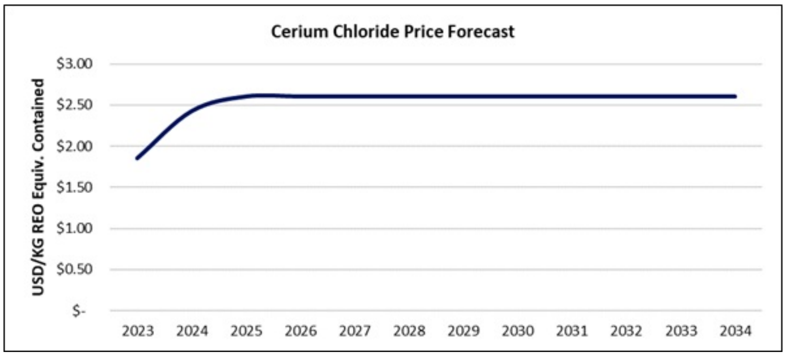
Source: Adamas after USEPA, 2023

Overall, the cerium market outlook is similar to that of lanthanum, with oversupply expected to persist in both the near- and long-term as a consequence of the balance problem. In a typical bastnaesite or monazite deposit, cerium makes up 35-50% of the contained TREO whereas cerium's share of overall TREO demand is a lower 15-20% resulting in pervasive overproduction.

As such, the market for cerium is expected to face similar price pressures as lanthanum over the forecast period, however, as a phosphate removal product, Ce chloride is not priced as a rare earth product.

At present, the U.S. cerium chloride market is supplied mainly by companies that import cerium oxide or carbonate and subsequently convert it into a chloride in-house. A domestic rare earth mine able to produce cerium chloride on-site may have a cost advantage over its competitors.

Figure 16-14 shows the cerium chloride price forecast.



Source: Adamas, 2023

Figure 16-14: Ce Chloride Price Forecast

Buyers

With principle use in the water treatment industry, buyers of Ce chloride reside in that same industry. Municipal water suppliers and industrial facilities (power, chemicals, and mining) are consumers and buyers of Ce chloride for treating P. The growing use of P-based fertilizers in agriculture results in increased levels of P within water supplies making regions with the highest P demand among the largest likely buyers of Ce chloride.

Sellers

Sellers of Ce chloride market the material as a branded, packaged liquid compounds, or as a salt for preparing solutions. Although most products utilize Ce chloride in a similar manner, sellers often target their products to specific applications (e.g., pool treatment) for marketing and differentiation purposes.

Traders

Traders of Ce chloride sit upstream of the end use market, including vertically integrated miners with in-house processing plants that sell bulk cerium chloride to downstream sellers. In this regard, MP Materials has the option to act as a trader or a seller or both in this market.

Required Product Specifications

Ce chloride coagulants are sold in liquid or solid form. Typical product contains a minimum of 45% TREO on a dry basis and CeO_2/TREO of at least 80%.

Typical Sales Terms

As a value-added product, market participants (traders) currently buy Ce oxide or chloride salt/flake (mostly from China) and convert it to Ce chloride in the U.S. for sale to downstream re-sellers on a US$/weight-solution basis. Re-sellers then brand and package the product and sell on a similar basis as upstream traders. As such, the product is not treated as a rare earth product and thus is not priced on a rare earth content basis. Pricing may be against comparable coagulants or water treatment products, in particular ferric chloride and alum chloride.

Treatment Charges / Refining Charges

As a light rare earth product in surplus, and a sacrificial byproduct of PrNd, treatment charges for this product, like La carbonate, do not exist in isolation – the economics of magnets rare earths will factor in.

Typical Penalty Adjustments

We do not believe of the primary Ce chloride penalty would relate to product concentration. Low gram/liter of REO could incur shipping and handling penalties. Conversely, domestic production should favor MP Materials since currently domestic sources of Ce chloride are derived from imported and upgraded Ce oxide.

16.5 Specific Products

Forecasts for relevant rare earth product prices are presented in Section 16.4. A brief summary of price forecasts is presented in Table 16-3.

Table 16-3: Summary of Long-Term Price Forecasts

Product	Long-Term Price Forecast, Real 2023 US$/KG
Rare Earth Mineral Concentrate	10.94
PrNd Oxide	131.60
SEG+ Precipitate	51.90
La Carbonate	1.50
Ce Chloride	2.51

Source: Adamas, 2023

All prices are modelled based on production costs and established market trends where they exist.

16.5.1 Concentrate

Typical Project Specifications

Adamas understands MP Materials' rare earth mineral concentrate is produced to a grade of roughly 60% TREO, with PrNd oxide making up approximately 15.7% of contained TREO.

Market Space

Adamas understands that concentrate grades typically range from 15% to 73% REO and as such, MP Materials' concentrate is considered within industry acceptable specifications.

Shipping

Shipment of rare earth mineral concentrate products into China is the responsibility of the supplier, such as MP Materials.

Contract vs. Spot Sales

MP Materials receives revenue from mineral concentrate sales via a contractual agreement with Shenghe Resources with observed sales terms largely reflecting spot market PrNd oxide price movements.

Marketability

MP Materials' rare earth mineral concentrate product is sold into the Chinese processing market. With ample unused processing capacity available in China, marketability of this product is not considered a risk.

Sales Terms

Rare earth mineral concentrate products are priced based on purity, the distribution of rare earths contained and the prices of contained rare earths, less any applicable penalties. MP Materials' high TREO content and comparably low levels of thorium/uranium translates to favorable prices for its product.

The prices agreed upon with Shenghe Resources are based on an agreed market benchmark for separated rare earth oxides. The concentrate price agreed contains an implicit treatment and refining charge.

Applied Penalties

Penalties may be applied to concentrates with high radioactive content, as explained in Section 16.4.1., high moisture content, low purity, or a high concentration of acid consuming minerals.

16.5.2 PrNd Oxide

Typical Project Specifications

PrNd oxide will be produced to industry standard specifications, containing at least 99% TREO and at least 99.5% PrNd/TREO.

Typical PrNd oxide contains 75% Nd oxide and 25% Pr oxide, +/- 5%. MP Materials will produce PrNd oxide to typical specifications +/- 3%, thereby within the limits of acceptability.

Market Space

Variation in the ratio of Nd to Pr is acceptable if the Nd percentage does not fall below 70% and does not exceed 80%, although Adamas believes consumers have a high degree of flexibility in this regard since the main reason magnet makers use PrNd is that it is lower priced than individual Nd or Pr, not because it bears a particular ratio of Nd to Pr.

With MP Materials producing an PrNd oxide product at 99.5% to 99.9% purity, we believe it will satisfy current industry standards.

Shipping

The responsibility of shipping under MP Materials' contractual obligations for the sale or distribution of PrNd oxide typically falls to the seller, per market norms.

Contract v Spot Sales

With MP Materials starting production of refined PrNd oxide in late 2023, the eventual mixture of spot and contract sales is presently unknown, although the majority of contracts (or contracts under consideration) as of the report date contain a rolling price adjustment based on prevailing market prices. Both contract and spot sales are likely for PrNd oxide.

Marketability

We understand that MP Materials intends to use a portion of its PrNd oxide to produce metals, magnetic alloys and magnets at its Texas magnetics factory currently under construction and sell the remaining portion to existing and emerging metals and magnet manufacturers. With a growing number of magnet plants under development in the U.S. and Europe, and demand for alternative sources of supply in Japan, we believe the PrNd oxide planned to be produced is a marketable and desirable product.

Sales Terms

PrNd oxide is a globally traded material, and we would expect sales terms to reflect known global prices. Material contract terms are generally not disclosed, but we understand MP Materials contracts to be in line with industry norms. We understand that MP Materials does not expect to face penalties associated with the quality of PrNd oxide produced.

Applied Penalties

As PrNd oxide is a refined, market desired product in high purity form, MP Materials does not expect to incur any penalties.

16.5.3 SEG+ Precipitate

Typical Project Specifications

As a mixed rare earth product, SEG+ precipitates will be produced to typical industry standards for chemical precipitates (45% TREO minimum), as a solid powder. There is no official standard for SEG+ precipitates specifically.

Market Space

SEG+ precipitate prices are heavily influenced by their Dy and Tb contents, with typical SEG precipitates containing around 4%. MP Materials will produce SEG+ oxalate with at least 5% Dy and Tb contents making it a desirable product.

Shipping

We understand that no definitive shipping terms are in place for SEG+ precipitate sales to-date, however, purchasers will likely incur shipping costs for delivery. MP Materials intends to maintain significant SEG+ precipitate inventory in order to eventually separate the SEG+ into separated HREE products.

Contract v Spot Sales

We understand that no contractual agreements are yet in place for SEG+ precipitate thus the eventual mixture of spot and contract sales is presently unknown. Both contract and spot sales are likely for SEG+ precipitate, although MP Materials has expressed an intention to maintain SEG+ precipitate inventory for eventual separation into separated HREE products.

Marketability

If the tight market balance of Dy and Tb that Adamas forecasts materialize, we believe MP Materials should not face significant risk if seeking to sell SEG+ precipitate to Chinese separators or other emerging HREE separation plants outside China.

Sales Terms

Sales of SEG+ precipitate are priced according to the purity of the material and the value of rare earths contained thus are heavily influenced by Dy and Tb. The elevated Dy and Tb content within MP Materials' SEG+ precipitate suggests that prices should be favorable in reflection of the tight market balance expected for Dy and Tb.

Applied Penalties

SEG+ precipitates with low purity, high levels of LREEs, low Dy and Tb contents (<4%), or requiring additional pre-processing (i.e., roasting to oxide) could incur a penalty. MP Materials is not expected to incur penalties as its SEG+ precipitate is high purity and contains elevated Dy and Tb contents.

16.5.4 La Carbonate

Typical Project Specifications

Typical La carbonate is marketed as a powder containing 45% TREO minimum and with La_2O_3/TREO of at least 99.5%., though no official standard exists. We understand MP Materials plans to sell La carbonate as a nearly anhydrous solid powder with a high purity (>98%).

Market Space

The U.S. is the largest consumer of imported La carbonate globally. However, due to the balance problem, La carbonate supply is expected to remain abundant. As a low-priced product, logistics and transportation costs are relatively high for U.S. imports of La carbonate giving MP Materials a competitive advantage in the market.

Shipping

Currently contemplated contracts for La carbonate involve MP Materials covering the cost of domestic shipping, however, certain contemplated contract structures include shipping costs as part of a cost-plus pricing framework.

Contract vs. Spot Sales

Both contract and spot sales are likely for La carbonate, as well as the potential for contracts involving elements of a cost-plus framework (including shipping costs).

Marketability

As a low-cost producer of La carbonate located in the U.S., MP Materials will have a competitive position from which to market its product.

Sales Terms

Sales terms for La carbonate are currently under negotiation with domestic buyers. Domestic availability (and thus reduced logistics and transportation costs for buyers, as well as supply chain security) can help ensure marketability for MP Materials' products.

Applied Penalties

As the La carbonate produced by MP Materials is expected to meet specifications for use in catalysts and other applications, it does not expect to incur any penalties.

16.5.5 Cerium Chloride

Typical Project Specifications

Ce chloride coagulants are sold in liquid or solid form. Typical products contain a minimum of 45% TREO on a dry basis and CeO_2/TREO of at least 50%. MP Materials will sell Ce chloride in a liquid form, with low levels of La chloride as well (<20%).

Market Space

While demand for Ce chloride is not expected to keep up with growth in Ce oxide supply, promising new markets for Ce chloride are materializing – such as the water treatment market. No known domestic producers of Ce chloride exist within the U.S. at present, offering MP Materials an economical and logistical advantage.

Shipping

No international shipping of Ce chloride is expected, MP materials will distribute Ce chloride domestically. Purchasers will cover shipping costs.

Contract v Spot Sales

MP Materials may utilize both contractual and spot sales, catering to smaller independent consumers and national-scale municipal consumers.

Marketability

Ce chloride use in the water treatment sector is a relatively new approach, with room for growth as a replacement of traditional chemicals used in this space. As a low-cost producer of Ce chloride located in the U.S., MP Materials will have a competitive position from which to market its product. Risks faced would include the immature market for Ce chloride in the water treatment sector.

Sales Terms

Sales of Ce chloride are priced on a dollar-per-weight-solution basis. Since Ce chloride is not marketed as a rare earth product, both spot and contractual sales would expectedly cover the cost of production.

Applied Penalties

Excessive La chloride content (>20%) would likely cause MP Materials to incur a penalty. As MP Materials has flexibility to control lanthanum content based on customer demand, this penalty is not expected to be applied.

16.6 Conclusions

This report provides an overview of key trends within the rare earths market. Analysis outlined in this report reveals a high degree of variability in the demand profiles of individual rare earth elements and their associated end-uses.

Consequently, a strong demand outlook for PrNd oxide – the main rare earth input for NdFeB permanent magnets - drives a weak supply outlook for Ce and La products, which are sacrificially overproduced as a function of keeping up with magnet demand.

While centered in China, the rare earths market is increasingly global with suppliers and potential suppliers emerging around the world. This report highlights the favorable demand conditions that non-China producers may face as they enter the market but also highlights the unfavorable supply side conditions end users can expect without prompt new investment into new production.

Products outlined in this report (PrNd oxide, SEG+ precipitate, La carbonate, Ce chloride and rare earth mineral concentrate) are desirable from a market perspective, provided market standards and requirements are met.

Many of the near-term risks facing players in the rare earths market are political, with past disputes responsible for exacerbating volatility of REE prices. Specific risks to products are highlighted where perceived, though the indicated specifications and communicated sales terms enforce the conclusion that products are both desirable and marketable.

16.7 Contracts

Information pertaining to contracts associated with MP Materials' current and future operations was obtained from conversations between Adamas and MP Materials. As such, Adamas can only comment on the status of contractual agreements described to it by MP Materials and based on Adamas' understanding of normal commercial practice and prevailing market conditions.

Adamas understands that MP Materials is an existing producer satisfying all contracts required for the functioning of current operations. Current production of rare earth mineral concentrate is sold under contract to an offtake partner (Shenghe).

We understand that the pricing terms and other contractual stipulations of the existing contract are in line with industry and broader global market terms. This, along with other contracts needed to sustain current and future operations, is the extent of MP Materials' currently executed contracts.

Having commenced internal separation of oxides in late-2023, we believe MP Materials aims to increasingly consume its own concentrate to produce the following product mix:

- PrNd oxide
- SEG+ precipitate
- Lanthanum carbonate
- Cerium chloride

Adamas understands that MP Materials is in discussion with potential consumers and distributors of these separated products and aims to finalize these contracts as it ramps up production. In February 2023, MP Materials and Sumitomo Corporation announced an agreement whereby the latter will serve as the exclusive distributor of PrNd oxide produced by MP Materials to Japanese customers. We believe the current state of negotiations is in line with standard practice for a new minerals producer seeking to qualify a new product with customers. The planned separated products are more abundantly traded than mineral concentrates and we believe ongoing negotiations are likely to lead to industry standard agreements and terms.

Adamas understands that MP Materials' present offtake partner (Shenghe) may reasonably be deemed an affiliated party due to Shenghe's minority equity interest in MP Materials. To our knowledge, Shenghe is the only notable affiliated partner for the purposes of this review of commercial contracts.

Based on information reviewed by Adamas, it appears that offtake terms with Shenghe do not disproportionally benefit either party involved through non-standard commercial terms. Adamas believes that current terms with Shenghe are reasonable and fair for offtake agreements with non-affiliated third parties.

Based on guidance provided by MP Materials, Adamas understands that MP Materials maintains various operational contracts with external parties to support current and future operations. The operational contracts include, but are not limited to, a variety of services including those listed below.

- Chemical reagent procurement
- Industrial gas procurement
- Natural gas procurement
- Drilling services
- Blasting services
- Freight carrier services
- Supplemental contract labor services
- Equipment maintenance services
- Equipment rental services
- Environmental monitoring services
- Analytical services

- Security services
- Insurance and risk management services
- Information technologies and support services

In addition, Adamas understands (based on guidance provided by MP Materials) that MP Materials fulfils and maintains contracts, services and other requirements for recommissioning, functioning and operating its separation facility. These contracts have been understood to include:

- Engineering, Procurement, and Construction (“EPC”)
- Engineering services
- Owner’s representation
- Procurement services
- Supplemental contract labor services

The existence and maintenance of these contractual arrangements is in line with Adamas’ understanding of normal commercial practice for a company such as MP Materials.

17 Environmental Studies, Permitting, and Closure

The following discussion of environmental studies, permitting, and community impacts presents an overview of recent environmental impact reports and active environmental permits.

17.1 Environmental Study Results

In 2004, the previous owner completed an environmental assessment process to gain approval for a 30-year mine plan. The legal framework for the environmental assessment process was the California Environmental Quality Act, and the lead regulatory agency was San Bernardino County (SBC). The final Environmental Impact Report (EIR) described the proposed action and assessed baseline environmental conditions for aesthetics, air quality, biological resources, cultural resources, geology/soils, hydrology/water quality, and noise. This environmental assessment process included extensive public consultation as well as inter-agency (state and federal) collaboration. SBC certified the final EIR in 2004.

17.2 Required Permits and Status

In 2004, the Land Use Services (LUS) Department of SBC (SBC-LUS) approved the 30-year open pit mine plan, including an ultimate open pit design. The SBC-LUS issued a Conditional Use Permit (CUP) based on mitigation measures identified in the final EIR. In 2010, the previous operator applied for a modification to the 2004 approved land use to accommodate process improvements and the elimination of 100 acres of evaporation pond area approved in the 2004 CUP. The SBC-LUS approved the Minor Use Permit (MUP) and issued the updated Mine and Reclamation Plan (2004M-02) in November 2010.

The previous owner revised the approved Mine and Reclamation Plan in 2015. The SBC approved the change of ownership to MP Mine Operations LLC (dba MP Materials) in 2017. In April 2021, MP Materials filed an application for Stage 2 Facilities Construction (previously approved under the 2010 MUP and vested under the Mining and Reclamation Plan). This application includes constructing, redesigning, improving and/or re-locating several processing facilities identified in the 2010 MUP. MP Materials received formal approval of the modification of the MUP to proceed with the Stage 2 Facilities Construction plan in April 2021.

The future mine plan expands the current permit boundary. The previous owner and MP Materials demonstrate a proactive and constructive dialogue with the SBC-LUS on previous modifications of the Mine and Reclamation Plan (e.g., 2010, 2015 and 2021). The change in the future open pit boundary is within the existing mine disturbance.

MP Materials plans to expand the North Overburden Stockpile, relocate a stormwater diversion channel and relocate the primary crusher (2028). The stockpile expansion and primary crusher relocation will require a permit amendment. The proposed action for the stormwater diversion channel will be a minor amendment. Based on their recent record of permit applications and approvals with regulatory authorities, MP Materials estimates the longest duration of regulatory review and approval of an amendment to be less than 18 months. Minor amendments typically require less than 6 months. MP Materials schedules application submittal dates based on these durations.

The future mine plan also requires construction of a new, 142 million short ton East Overburden Stockpile by 2030. The 2004 EIR considered a tailings storage facility east of the processing area. MP Materials will need to engage with the SBC-LUS and allow sufficient time to assess if a mitigated negative declaration is possible or if additional data collection will be required before SBC-LUS will consider a new application.

Since 2017, MP Materials demonstrated a pro-active, working relationship with the SBC-LUS and other regulatory authorities. This relationship includes timely and successful permit amendments and approvals for current operations. SRK is of the opinion that MP Materials will continue to successfully engage regulatory authorities and gain approval for future amendments related to site operations within the private property boundary.

Table 17-1 presents a summary of current Mountain Pass environmental permits.

Table 17-1: Current Environmental Permits and Status

Permit	Agency	Expiration Date
Right of Way for the Shadow Valley Fresh Water Pipeline CA12455	Bureau of Land Management	12/31/2041
San Bernardino County Domestic Water Supply Permit #36000172 (Duplicate of PT0006375)	San Bernardino County Departmentof Public Health	No Expiration
EPA Identification Number CAD009539321	US Environmental Protection Agency	No Expiration
Hazardous Materials Certificate of Registration	US Department of Transportation	6/30/2024(1)
NRC Export License XSOU8707/08	US Nuclear Regulatory Commission	12/31/2031
NRC Export License XSOU8827/03 (2)	US Nuclear Regulatory Commission	12/31/2031
Conditional Use Permit 07533SM2/DN953-681N	San Bernardino County Land UseServices Department	11/23/2042
CUPA Annual Permit FA0004811	San Bernardino County FireProtection District	9/30/2024
LRWQCB Order 6-01-18 Domestic Wastewater System	Lahontan Regional Water QualityControl Board	No Expiration
LRWQCB Order R6V-2005-0011On Site Evaporation Ponds	Lahontan Regional Water QualityControl Board	No Expiration
LRWQCB Order R6V-2010-0047 - Mine and Mill Site, including paste tailings	Lahontan Regional Water QualityControl Board	No Expiration
Mojave Desert Air Quality Management District - Permits to Operate	Mojave Desert AQMD	2/28/2024(3)
Right-Of-Way Lease 6375.2	California State Lands Commission	1/19/2032
Radioactive Materials License #3229-36 for ongoing operations and Paste Tailings	California Department of PublicHealth — Radiologic Health Branch	12/21/2032
Right of Way for the Shadow Valley Fresh Water Pipeline CA12455	Bureau of Land Management	Active
Minor Use Permit - Project Phoenix (Amended Reclamation Plan)	San Bernardino County	11/22/2042

Source: MP Materials, 2023
(1): Renewed annually.
(2): New License replaces XSOU8708.
(3): Mojave Desert Air Quality Management District online records indicate the Mountain Pass operation (Facility ID 364) held approximately 272 individual air quality related permits within the last 22 years. This historical total includes discontinued unit operations. The permit record indicates timely renewals and approvals, including extensions.

17.3 Mine Closure

Mine closure obligations consist of the Mine and Reclamation Plan administered by the SBC, groundwater and surface water measures administered by the LRWQCB, and decommissioning requirements by the California Department of Resource, Recycling and Recovery. SBC and LRWQCB permit authorizations also stipulate post-closure inspection, maintenance, and monitoring activities. Table 3-1 summarizes the current closure, reclamation, and post-closure obligations for the Mountain Pass property.

18 Capital and Operating Costs

Capital and operating costs are incurred and reported in US dollars and are estimated at a pre-feasibility level with an accuracy of approximately +/-25%.

18.1 Capital Cost Estimates

The mine is currently operating and, as such, there is no initial capital expenditure required. All capital expenditure as contemplated by this report is expected to be sustaining capital. Sustaining capital expenditures include the sustaining capital cost associated with the mining fleet, separations facility, planned paste tailings plant, crusher and water tank relocations, tailings storage facility expansion, and the “other” category, which captures all other sustaining capital costs.

18.1.1 Mining Capital Cost

The operation is being run as an owner mining operation. A contractor will perform all drilling and blasting operations.

Table 18-1 shows the annual mining equipment capital costs, as estimated by SRK.

Table 18-1: Mining Equipment Capital Cost Estimate (US$000's)

Capital Costs	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
Mobile Equip. (Purchases)																		
Loading																		
Hauling		1,440	2,691	1,346											1,346		1,346	
Other Ops (1)		718								937		1,561		1,224		755	671	671
Support (2)				1,083	84	1,087	599		903	1,411	829	1,482	84			1,595		829
Subtotal Purchases		**2,157**	**2,691**	**2,428**	**84**	**1,087**	**599**	**-**	**903**	**2,348**	**829**	**3,043**	**84**	**1,224**	**1,346**	**2,350**	**2,016**	**1,499**
Mobile Equip. (Rebuilds)																		
Loading		460		695				460			695	1,154					460	1,390
Hauling					1,009				202	1,117		202	2,018				404	807
Other		281	141	569	508	382		950		428		201	141	201		656		281
Support		271	271	445	271	271		445				135	135		493	271		271
Subtotal Rebuilds	**-**	**1,011**	**411**	**1,708**	**1,787**	**652**	**-**	**1,855**	**202**	**1,544**	**695**	**1,693**	**2,294**	**201**	**493**	**926**	**863**	**2,749**
Mining Equip. Total	**-**	**3,169**	**3,102**	**4,137**	**1,871**	**1,739**	**599**	**1,855**	**1,104**	**3,892**	**1,524**	**4,736**	**2,378**	**1,425**	**1,839**	**3,276**	**2,879**	**4,248**

Capital Costs	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**	**2056**	**LoM Total**
Mobile Equip. (Purchases)																	
Loading							2,316										2,316
Hauling		4,037															12,206
Other Ops					937					1,224		1,561					10,259
Support	599		84	1,411	903		829	1,087	1,482	508	84		599	549			18,121
Subtotal Purchases	**599**	**4,037**	**84**	**1,411**	**1,839**	**-**	**3,145**	**1,087**	**1,482**	**1,732**	**84**	**1,561**	**599**	**549**	**-**	**-**	**42,897**
Mobile Equip. (Rebuilds)																	
Loading																	5,314
Hauling	1,117	1,211	807	202		202	404						807				10,509
Other Ops	281	581	382	101		468	428	342					201	508			8,031
Support	715				445		135	135		271	271	222	271	271			6,015
Subtotal Rebuilds	**2,113**	**1,792**	**1,189**	**302**	**445**	**670**	**967**	**477**	**-**	**271**	**271**	**222**	**1,279**	**778**	**-**	**-**	**29,860**
Mining Equip. Total	**2,712**	**5,829**	**1,273**	**1,713**	**2,284**	**670**	**4,111**	**1,564**	**1,482**	**2,003**	**355**	**1,783**	**1,879**	**1,327**	**-**	**-**	**72,758**

Source: SRK, 2023
Notes:
(1) "Other Ops" includes dozers, water trucks, motor grader and excavator.
(2) "Support" includes mobile equipment used in paste tailings operations, maintenance vehicles, light vehicles and pit dewatering pumps.

18.1.2 Separations Facility Capital Cost

The separations facility has been constructed and commissioned and is currently in the process of ramping up to full capacity by the end of 2024. As such, future capital costs for the separations facility are treated as sustaining capital costs. The sustaining capital costs, as estimated by MP Materials and SGS, are presented in Table 18-2.

Table 18-2: Estimated Separations Facility Sustaining Capital Costs

Year	Amount (US$000's)
2024(1)	6,624
2025	6,787
2026	10,180
2027	13,574
2028(2)	26,030
2029 through 2056(3)	475,089
Total	**537,924**

Source: MP Materials / SGS
(1): Includes US$2,871,000 for a freshwater storage pond.
(2): Includes CHP turbines.
(3): From 2029 through 2056, the estimated annual cost is US$16,967,449.

18.1.3 Other Sustaining Capital

For the purposes of estimating total sustaining capital, SRK utilized the current capital depreciation which is approximately US$3.3 million per year. In SRK's opinion, this value is a reasonable estimate for long-term sustaining capital for the current operation other than the individually estimated capital items.

In addition to the long-term sustaining capital allowance of US$3.3 million per year, the following non-recurring items have been included in the estimate of other sustaining capital:

- Crusher relocation (2028): US$3.4 million
- Water tank relocation (2035): US$5.6 million
- Paste plant relocation (2035): US$69.7 million
- Tailing storage facility expansion (2047): US$11.3 million

18.1.4 Closure Costs

Closure costs are captured as a capital expenditure during the final year of mine operation in the financial model at a value of US$45.4 million.

18.1.5 Basis for Capital Cost Estimates

Mining Capital Cost

The mining equipment requirements were based on the mine production schedule, and estimates for scheduled production time, mechanical availability, equipment utilization, and operating efficiencies.

Estimates of annual operating hours for each type of equipment were made, and equipment units were utilized in the mining operations until a unit reached its planned equipment life, after which a replacement unit was added to the fleet, if necessary. Major mining equipment rebuild (overhaul) costs were included in the mining equipment capital cost estimates.

The mining equipment capital cost estimate was based on the following:

- All replacement mining units are based on new equipment purchases.
- Freight cost for mining equipment was generally estimated to be between 3% and 5%.
- Allowances were made for on-site equipment erection costs for some units.
- Mining equipment rebuilds were included at appropriate intervals in the mining capital costs.

Separations Facility Capital Cost

To calculate estimated sustaining capital for the separations facility, MP Materials and SGS used a first principles approach utilizing a proxy of a percentage of invested capital into the plant and accompanying facilities, including the CHP plant, to calculate a reasonable estimate for average required reinvestment. This yielded an estimate of US$17 million per year in long-term sustaining capital for the separations plant and accompanying facilities. Some adjustment of this annual cost was applied to reflect the fact that the facility is new and therefore is likely to experience a reduced rate of sustaining capital expenditures in the first five years of operation.

Other Capital Cost

Costs for the tailings storage facility expansion and relocation of the paste plant, crusher and water tanks were based on an engineering cost estimate. Depreciation values were utilized as a proxy for other sustaining capital.

Closure Costs

Closure cost and post closure cost estimates were sourced from the most recent financial assurance estimates provided by MP Materials.

18.2 Operating Cost Estimates

Operating costs have been forecast based on the mine's recent actual costs for concentrator, sales, general and administrative costs. For mining, the operating costs were estimated by SRK from a first principles basis. For crushing, concentrator and site general and administrative, SRK compared forecast operating costs to the historical cost data and believes the forecasts represent a reasonable outlook for the operation. For the separations facility, SGS and MP Materials estimated the operating costs based on a first principles build-up.

As with capital costs, operating costs are captured in US dollars and are estimated at a pre-feasibility level with an accuracy of approximately +/- 25%.

18.2.1 Mining Operating Cost

SRK estimated the required mining equipment fleet, required production operating hours, and manpower to arrive at an estimate of the mining costs that the mining operations would incur. The mining costs were developed from first principles and compared to recent actual costs. The mining operating costs are presented in the following categories:

- Drilling (contractor)
- Blasting (contractor)
- Loading
- Hauling

- Other Mine Operations (dozing, grading, road maintenance operations, etc.)
- Support Equipment Operations (equipment fueling, pit dewatering, pit lighting, etc.)
- Miscellaneous Operations (various support operations, etc.)
- Mine Engineering (mine technical personnel and technical consulting)
- Mine Administration and Supervision (mine and maintenance supervision, etc.)
- Freight (for equipment supplies and parts, excluding freight for fuel)
- Contingency

A maintenance cost was allocated to each category that required equipment maintenance.

The mine operating cost estimate includes all mine functions to deliver material to the dumps, stockpiles, and primary crusher. The mining cost center also includes operating labor for the crusher feed loader and for loading, hauling, and dozing of paste tailings.

A summary of the LoM unit mine operating costs is presented in Table 18-3. The unit mining costs are presented both with and without long-term stockpile tons included in the divisor. “Per short ton mined” refers to the LoM mining cost divided by the number of short tons of ore and waste excavated from the open pit but excluding all re-handled ore. “Per short ton moved” refers to the LoM mining cost divided by the number of short tons of ore and waste excavated from the open pit, but also including all ore re-handled from long term stockpiles, all ore fed to the crusher by front-end-loader, and all fine ore transferred by trucks from the crusher to the mill.

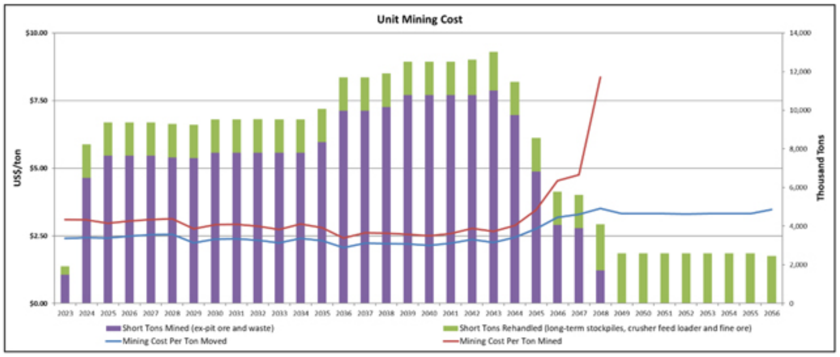
Total LoM mining costs are estimated at US$664 million, with expected unit costs of US$3.26/st-mined and US$2.47/st-moved.

Table 18-3: Mining Operating Costs

LoM Short Tons Mined/Moved (000)		**203,872**	**269,150**
Category	**US$000**	**US$/st-Mined**	**US$/st-Moved**
Drilling/Blasting/Loading/Hauling	368,641	1.808	1.370
Other mining costs	204,462	1.003	0.760
Mine engineering and administration	47,257	0.232	0.176
Contingency (7%)	43,425	0.213	0.161
Total	**$663,786**	**$3.26**	**$2.47**

Source: SRK, 2023

Annual mining unit costs and annual material movement are presented in Figure 18-1.



Source: SRK, 2023

Figure 18-1: Mining Unit Cost Profile

The basis for the mining operating cost estimates includes the following parameters:

- Diesel fuel cost of US$2.92/US gallon (delivered to site)
- Average density for waste of 0.0864 st /ft^3 (2.77 t/m^3)
- Average density for ore of 0.0976 st /ft^3 (3.13 t/m^3)
- Average moisture content for rock is 2%
- Average swell factor of mined rock is 40% for loading and hauling estimation
- Typical mining operations support equipment utilization of 1,512 to 3,025 operating hours per year (for track dozer, grader, water trucks, excavator, etc.)
- Rehandling crusher ore feed to the primary crusher from RoM stockpiles
- Estimated average tire lives of:
    - Wheel loaders: 4,000 operating hours
    - Haul trucks: 4,000 operating hours
    - Other major mining equipment: 3,500 operating hours
- 3 to 5% freight cost on mining operating and maintenance supplies
- 7% contingency is included in the mining operating cost estimates

Employee wages (including appropriate overtime allowances) and wage burdens (33%) were based on labor cost information provided by MP Materials. The costs for maintenance supplies and materials were based on estimates presented in the current InfoMine mining cost service publications. Other mining related costs were provided by MP Materials.

Included in the mine operating cost estimate are the following:

- Drilling contractor costs
- Blasting contractor costs
- Equipment and labor costs for ore and waste mining from the pit
- Equipment and labor costs for stockpile rehandling
- Equipment and labor costs for the crusher feed loader
- Equipment and labor costs for loading, hauling, and dozing of paste tailings

- Contractor and professional services
- Memberships and subscriptions
- Office and building costs

Excluded from the mine operating cost estimate are the following:

- Mining equipment replacements and rebuilds (overhauls) which are included in the mining sustaining capital costs
- Post-mining reclamation costs
- Processing related costs
- General overheads outside of the mine

18.2.2 Processing Operating Cost

Crushing and Concentrating Cost

The forecast average LoM processing cost, inclusive of crushing costs, is US$54.32 per short ton of ore fed to the mill. This cost is based on actual costs incurred by MP Materials during the period January – September 2023.

The processing cost includes:

- Crushing
- Milling, Flotation, Tailings and Lab
- Warehouse
- Engineering
- Utilities
- Facilities,
- Maintenance
- Other Related Costs

Separations Facility Operating Cost

The operating cost estimate for the separations facility (currently ramping up) is based on a first principles estimate developed by SGS and MP Materials. The costs are estimated at a pre-feasibility level with an accuracy of +/- 25%.

The separations cost includes:

- Filtration and Drying
- Calcining
- Leaching, Thickening and Filtration
- Impurity Removal Steps
- Solvent Extraction
- Product Finishing
- Brine Purification and Salt Crystallization
- Water Treatment Plant and Combined Heat and Power Plant costs
- Incremental facilities and utilities expenses
- Incremental maintenance expenses
- Other Related Costs

Operations and labor were determined by MP Materials' analysis of staffing needs by circuit, including operations, maintenance, and engineering. A significant proportion of supplies and services costs are reagents, which usage was estimated by MP Materials and SGS as derived from historical operations and records, pilot testing, and 3rd party analysis.

Table 18-4 shows the estimated annual separations facility operating cost when treating 84,148 st of concentrate feed per year. In the economic model, adjustments to the annual separations operating costs were applied based on fixed costs ($25.94 million) and variable costs (US$1,080.59 per st of concentrate) for periods when more or less concentrate is being treated. The fixed cost is factored in the first year of operations to account for a partial operational year.

Table 18-4: Separations Operating Costs

Category	US$000's/year
Fixed Cost	25,940
Variable Cost	90,929
Total	**$116,869**

Source: MP Materials / SGS
Note: Based on 84,148 st of concentrate treated.

18.2.3 Selling, General, and Administrative Operating Costs

SRK evaluated site general and administrative (G&A) expenses for the Mountain Pass operation on the basis that any additional G&A costs associated with the separations facility are captured within the operating cost estimate for that facility provided by SGS (as the QP responsible for those costs). Actual G&A costs over the trailing 9 months (January 2021 to September 2021) are shown in Table 18-5.

Table 18-5: Summary of MP Materials Site G&A Operating Costs

G&A Costs	Units	Trailing (9 Month Total
G&A	US$ (000)	15,933

Source: MP Materials, 2023

Given the current inflationary environment, SRK views the most recent costs (i.e., 9 months trailing) as most reflective of the operation's forward looking costs.

The Mountain Pass mining operation is in steady state and no significant changes are forecast with respect to G&A expenses other than those associated with the addition of the separations facility which are captured within that facilities operating costs and are not accounted for here. In SRK's opinion, the steady state operation of the asset and lack of forecast significant changes to G&A spend indicate that material changes in G&A spend are unlikely and SRK is therefore comfortable extending this operating cost without modification. This results in G&A costs of US$21.2 million per year, which is treated as fully fixed for modeling purposes. This cost is factored in the first year of operations to account for a partial operational year.

As part of the net revenue calculation in the model, selling (i.e., shipping) costs are calculated separately from G&A costs. The modeled shipping costs are US$180 per metric tonne of product as provided by MP Materials. This is broadly in line with previous realized shipping costs at the operation and the current market environment.

19 Economic Analysis

19.1 General Description

SRK prepared a cash flow model to evaluate Mountain Pass ore reserves on a real basis. This model was prepared on an annual basis from the reserve effective date to the exhaustion of the reserves. This section presents the main assumptions used in the cash flow model and the resulting indicative economics. The model results are presented in U.S. dollars (US$), unless otherwise stated.

All results are presented in this section on a 100% basis.

As with the capital and operating cost forecasts, the economic analysis is inherently a forward-looking exercise. These estimates rely upon a range of assumptions and forecasts that are subject to change depending upon macroeconomic conditions, operating strategy and new data collected through future operations.

19.2 Basic Model Parameters

Key criteria used in the analysis are presented throughout this section. Basic model parameters are summarized in Table 19-1.

Table 19-1: Basic Model Parameters

Description	Value
TEM Time Zero Start Date	October 1, 2023
Mine Life	34 years (partial first year)
Percentage of Concentrate Fed to the Separations Facility	
Q4 2023	20%
2024	61.25%
2025 through 2056	100%
Discount Rate	6%

Source: SRK, MP Materials

All costs incurred prior to the model start date are considered sunk costs. The potential impact of these costs on the economics of the operation is not evaluated. This includes contributions to depreciation and working capital as these items are assumed to have a zero balance at model start.

The selected discount rate is 6% as directed by MP Materials.

19.3 External Factors

19.3.1 Pricing

Modeled prices are based on the prices developed in the Market Studies and Contracts section of this report (Section 16). The prices are modeled as:

- Concentrate – US$10.94/kg contained REO (equivalent to US$6,564 per metric tonne of 60% TREO concentrate)
- Separated PrNd product – US$131.60/kg
- Separated La product – US$1.50/kg
- Separated Ce product – US$2.51/kg
- Separated SEG+ product – US$51.90/kg

These prices are modeled as a CIF price and shipping costs are applied separately within the model.

All product streams produced by the operation are modeled as being subject to the prices presented above.

Shipping costs are modeled at US$180.00 per metric tonne of material for both concentrate and separated material. A 13% VAT tax and 2.5% commission are applied to concentrate sold to outside parties to account product taxes and selling costs for concentrate per MP Materials. VAT and commission are applied in the model for material processed through the separations plant.

19.3.2 Taxes and Royalties

As modeled, the operation is subject to a combined 26.84% (federal and state) income tax rate. This rate reflects reductions in tax rates resulting from depletion. This approach was recommended by MP Materials for modelling purposes. All expended capital is subject to depreciation over an 8 year period. Depreciation occurs via straight line method. No existing depreciation pools are accounted for in the model.

SRK notes that the project is being evaluated as a standalone entity for this exercise (without a corporate structure). As such, tax calculations presented here may differ significantly from actuals incurred by MP Materials.

19.3.3 Working Capital

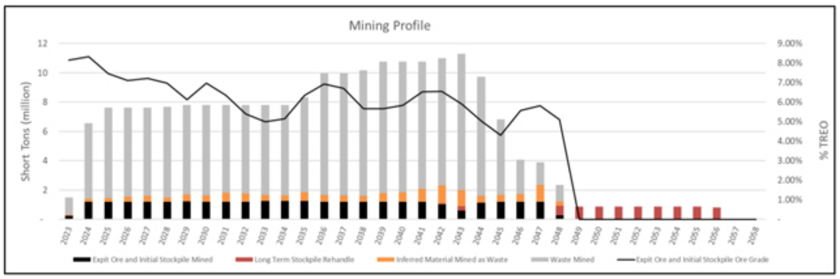
The assumptions used for working capital in this analysis are as follows:

- Accounts Receivable (A/R): 30 day delay
- Accounts Payable (A/P): 30 day delay
- Zero opening balance for A/R and A/P

19.4 Technical Factors

19.4.1 Mining Profile

The modeled mining profile was developed by SRK. The details of the mining profile are presented previously in this report. No modifications were made to the profile for use in the economic model. The modeled profile is presented on a 100% basis in Figure 19-1.



Source: SRK

Figure 19-1: Mining Profile

A summary of the modeled life of mine mining profile is presented in Table 19-2.

Table 19-2: LoM Mining Summary

Description	Units	Value
Total Ore Mined	**dst (million)**	**28.08**
Initial Stockpiles	**dst (million)**	**0.61**
Total Waste Mined	**dst (million)**	**175.79**
Total Material Mined	**dst (million)**	**204.78**
Average Grade (Mill Feed) LoM Strip Ratio	%TREO Num#	6.22% 6.3 x

Source: SRK

19.4.2 Processing Profile

The concentrator processing profile was developed by SRK and results from the application of stockpile and binning logic to the mining profile external to the economic model. No modifications were made to the profile for use in the economic model other than for sensitivity analysis.

A summary of the modeled life of mine processing profile is presented in Table 19-3.

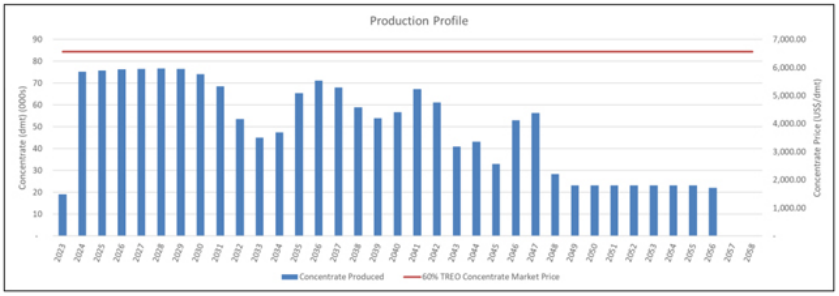
Table 19-3: LoM Processing Profile

Description	Units	Value
LoM Ore Processed	dst (million)	28.69
Average Feed Grade	% TREO	6.22%
Concentrate Grade Target	% TREO	60.00%
Concentrate Moisture	%	9.00%
LoM Concentrate Produced	dmt (million)	1.71
Avg Annual Concentrate Produced	wmt	55,176

Source: SRK

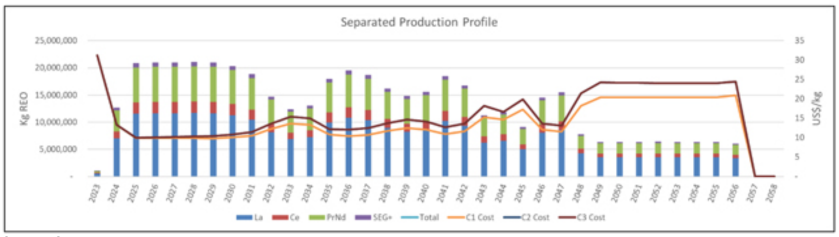
The production profile was developed by SRK and results from the application of processing logic to the processing profile external to the economic model. No modifications were made to the profile for use in the economic model other than for sensitivity analysis. The modeled profile for concentrate production is presented in Figure 19-2 and the resulting separated product profile is presented in Figure 19-3.

As the separations facility continues to ramp up, the product from the concentrator will be fed to the separations facility to produce separated materials for sale as per the descriptions contained within this report. It is expected that the separations facility will operate at 20% of its capacity in Q4 2023, 61.25% of its capacity in 2024, and 100% of its capacity from 2025 onward. When the separations facility is operating at 100% capacity, it is assumed that it will consume all of the concentrate that is produced on site.



Source: SRK

Figure 19-2: Concentrate Production

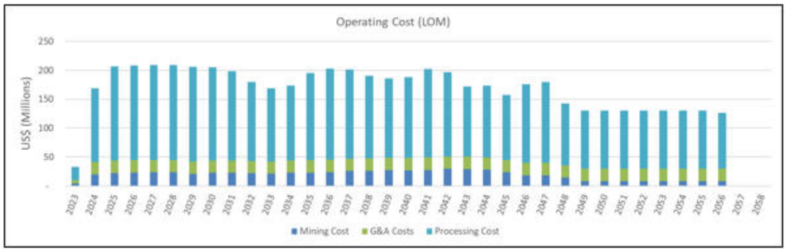


Source: SRK
Note: The costs are higher for 2023 because the processing facilities operate for only three months and the separations plant is not at full capacity.

Figure 19-3: Separations Production Profile

19.4.3 Operating Costs

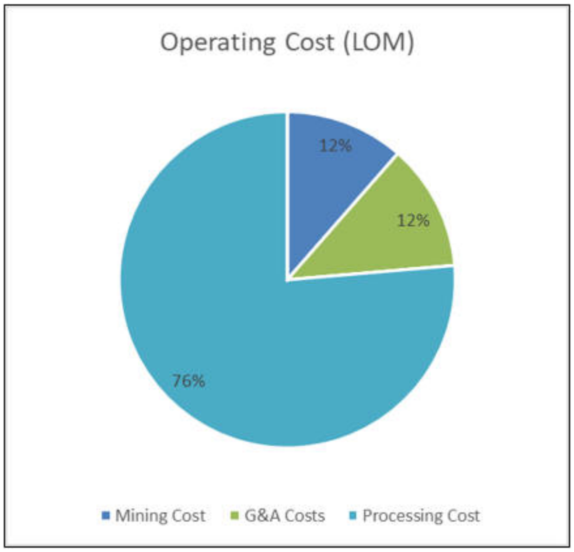
Operating costs modeled in US dollars and can be categorized as mining, processing and site G&A costs. No contingency amounts have been added to the operating costs within the financial model; however, the mining costs were imported from a first principles cost buildup that included 7% contingency. A summary of the operating costs over the life of the operation is presented in Figure 19-4.



Source: SRK

Figure 19-4: Annual Operating Costs

The contributions of the different operating cost segments over the life of the operation are presented in Figure 19-5.



Source: SRK

Figure 19-5: LoM Operating Costs

19.4.4 Mining

The mining cost profile was developed external to the model and was imported into the model as a fixed cost on an annual basis. The result of this approach is presented in Table 19-4.

Table 19-4: Mining Cost Summary

LoM Mining Costs	Units	Value
Mining Costs	US$ (million)	663.8
Mining Cost	US$/st mined	3.26

Source: SRK

19.4.5 Processing

Processing costs were incorporated into the model as variable costs for the concentrator and a combination of fixed and variable costs for the separations facility. Variable concentrator costs are applied to the tonnage processed through the concentrator. Fixed costs for the separations facility were applied on an annual basis and variable costs are applied on a per ton of feed basis. Table 19-5 presents the cost on a per ton basis for the combined plants.

Table 19-5: Processing Cost Summary

LoM Processing Costs	Units	Value
Processing Costs	US$ (million)	4,401.4
Processing Cost	US$/st processed	153.41

Source: SRK

19.4.6 G&A Costs

Site G&A costs were incorporated into the model as annual fixed costs as presented in Table 19-6.

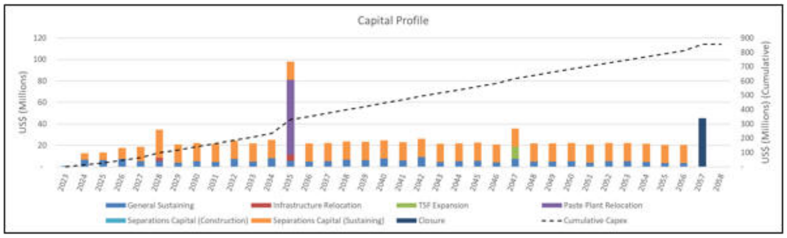
Table 19-6: G&A Cost Summary

LoM G&A Costs	Units	Value
G&A Costs	US$ (million)	706.4
G&A Cost	US$/st processed	24.62

Source: SRK

19.4.7 Capital Costs

As the operation is an existing mine, no initial capital has been modeled. Capital is modeled on an annual basis and is used in the model as developed in previous sections. No contingency amounts have been added to the sustaining capital within the model. Closure costs are modeled as capital and are captured as a one-time payment the year following cessation of operations. The modeled capital profile is presented in Figure 19-6.

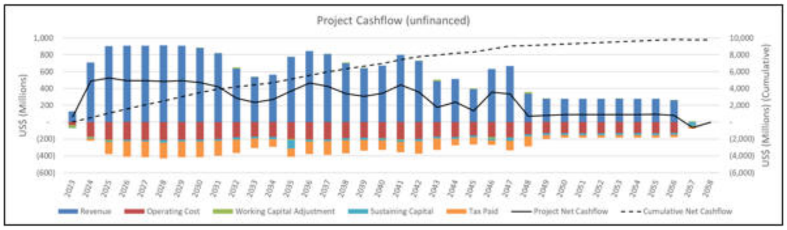


Source: SRK

Figure 19-6: Capital Expenditure Profile

19.4.8 Results

The economic analysis metrics are prepared on annual after-tax basis in 2023 US$. The results of the analysis are presented in Table 19-7. The results indicate that, at modeled prices, the operation returns a pre-tax NPV at 6% of US$7.0 billion and an after-tax NPV at 6% of US$5.2 billion. Note that because the mine is in operation and is valued on a total project basis with prior costs treated as sunk, IRR and payback period analysis are not relevant metrics. Annual project after tax cash flow is presented in Figure 19-7.



Source: SRK

Figure 19-7: Annual Cash Flow

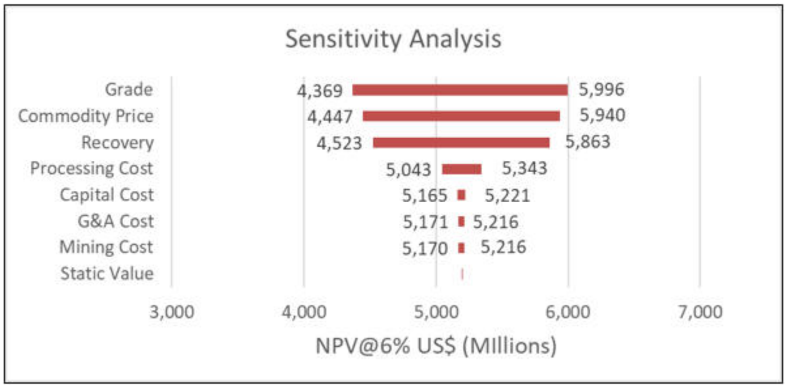
Table 19-7: Economic Result

LoM Cash Flow (unfinanced)	Units	Value
Total Revenue	**US$ (Million)**	**20,040**
Total Opex	**US$ (Million)**	**(5,772)**
Operating Margin	US$ (Million)	14,268
Operating Margin Ratio	%	71%
Taxes Paid	US$ (Million)	(3,638)
Before Tax		
Free Cash Flow	US$ (Million)	13,413
NPV at 6%	US$ (Million)	6,998
After Tax		
Free Cash Flow	US$ (Million)	9,775
NPV at 6%	US$ (Million)	5,193

Source: SRK

19.4.9 Sensitivity Analysis

SRK performed a sensitivity analysis to determine the relative sensitivity of the operation's after-tax NPV to a number of key parameters (Figure 19-8). This is accomplished by flexing each parameter upwards and downwards by 10%. Within the constraints of this analysis, the operation appears to be most sensitive to mined grades, commodity prices and recovery or mass yield assumptions within the processing plant. SRK cautions that this sensitivity analysis is for information only and notes that these parameters were flexed in isolation within the model and are assumed to be uncorrelated with one another which may not be reflective of reality. Additionally, the amount of flex in the selected parameters may violate physical or environmental constraints present at the operation.



Source: SRK
Note: Parameters flexed upwards and downwards by 10%.

Figure 19-8: After-Tax Sensitivity Analysis

19.4.10 Physical and Cash Flow Snapshot

The annual cashflow, expressed in million U.S. dollars, is presented in Figure 19-9.

Calendar Year			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Physicals																
Mining																
Ore and Initial Stockpile Material Mined	ktons	28,690	255	1,204	1,200	1,200	1,200	1,208	1,217	1,200	1,200	1,200	1,245	1,260	1,245	1,200
Long Term Stockpile Rehandle	ktons	7,898	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ore and Initial Stockpile Grade Mined	% REO	6.22%	8.16%	8.34%	7.46%	7.11%	7.23%	6.98%	6.13%	6.98%	6.36%	5.40%	5.00%	5.14%	6.36%	6.93%
Waste Mined	ktons	175,788	1,250	5,360	6,440	6,440	6,440	6,480	6,600	6,600	6,600	6,600	6,555	6,540	7,100	8,780
Processing																
Ore Processed	ktons	28,690	218	866	864	864	864	866	864	864	864	866	864	864	864	866
Grade Processed	% REO	6.22%	8.50%	8.50%	8.50%	8.50%	8.50%	8.50%	8.50%	8.24%	7.72%	6.35%	5.63%	5.81%	7.40%	7.96%
Concentrate Produced	ktons	1,882	21	83	84	84	84	85	84	82	76	59	50	52	72	78
Concentrate to Separations Plant	ktons	1,833	4	51	84	84	84	85	84	82	76	59	50	52	72	78
Concentrate Grade	% REO	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Recovered La	tonnes	252,964	584	7,019	11,541	11,615	11,638	11,684	11,633	11,270	10,430	8,140	6,857	7,231	9,962	10,820
Recovered Ce	tonnes	46,102	106	1,279	2,103	2,117	2,121	2,129	2,120	2,054	1,901	1,483	1,250	1,318	1,815	1,972
Recovered PrNd	tonnes	140,375	324	3,895	6,404	6,445	6,458	6,484	6,455	6,254	5,788	4,517	3,805	4,012	5,528	6,004
Recovered SEG+	tonnes	17,555	41	487	801	806	808	811	807	782	724	565	476	502	691	751
Cashflow Waterfall																
Income																
Net Revenue	USDM	20,040	129.3	708.3	903.2	909.0	910.8	914.4	910.4	882.0	816.3	637.0	536.7	565.9	779.6	846.8
Interest Income	USDM	-														
Total	USDM	20,040	129.3	708.3	903.2	909.0	910.8	914.4	910.4	882.0	816.3	637.0	536.7	565.9	779.6	846.8
Operational Expenditure																
Fixed	USDM	(2,233)	(16.5)	(67.2)	(69.8)	(70.5)	(70.9)	(70.9)	(68.0)	(69.9)	(69.9)	(69.4)	(68.5)	(70.1)	(70.6)	(71.4)
Variable	USDM	(3,539)	(16.4)	(102.0)	(137.3)	(137.8)	(138.0)	(138.5)	(138.0)	(135.1)	(128.6)	(110.8)	(100.6)	(103.5)	(124.9)	(131.7)
Royalty	USDM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	USDM	(5,772)	(32.9)	(169.2)	(207.1)	(208.3)	(209.0)	(209.4)	(205.9)	(205.0)	(198.5)	(180.2)	(169.1)	(173.6)	(195.5)	(203.1)
Working Capital Adjustment	USDM	0	(31.4)	(12.8)	(13.0)	(0.4)	(0.1)	(0.1)	(0.1)	2.3	4.9	13.3	7.2	(2.0)	(15.8)	(4.7)
Capital Costs																
Sustaining Capital Mining Capital	USDM	(73)	-	(3.2)	(3.1)	(4.1)	(1.9)	(1.7)	(0.6)	(1.9)	(1.1)	(3.9)	(1.5)	(4.7)	(2.4)	(1.4)
Sustaining Capital Other Capital	USDM	(110)	(0.8)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)
Sustaining Capital Crusher Move	USDM	(3)	-	-	-	-	-	(3.4)	-	-	-	-	-	-	-	-
Sustaining Capital Water Tank Move	USDM	(6)	-	-	-	-	-	-	-	-	-	-	-	-	(5.6)	-
Sustaining Capital Closure	USDM	(45)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital TSF Expansion	USDM	(11)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital Paste Plant	USDM	(70)	-	-	-	-	-	-	-	-	-	-	-	-	(69.7)	-
Sustaining Capital SPARE	USDM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital Separations Capital (Sustaining)	USDM	(538)	-	(6.3)	(6.8)	(10.2)	(13.6)	(26.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)
Total	USDM	(856)	(0.8)	(12.7)	(13.2)	(17.6)	(18.7)	(34.5)	(20.9)	(22.1)	(21.4)	(24.2)	(21.8)	(25.0)	(97.9)	(21.7)
Cashflow Before Tax	USDM	13,412	64.1	513.5	669.9	682.7	683.0	670.5	683.5	657.1	601.3	446.0	353.0	365.3	470.4	617.2
Tax Paid	USDM	(3,638)	-	(25.9)	(144.6)	(186.4)	(187.2)	(186.9)	(187.1)	(185.8)	(177.7)	(161.1)	(117.2)	(92.9)	(99.2)	(150.5)
Net Cashflow	USDM	9,775	64.1	487.7	525.3	496.3	495.9	483.6	496.4	471.3	423.5	284.9	235.8	272.4	371.2	466.8

Calendar Year	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057
Physicals																					
Mining																					
Ore and Initial Stockpile Material Mined	1,200	1,200	1,200	1,200	1,200	1,020	614	1,143	1,200	1,200	1,200	280	-	-	-	-	-	-	-	-	-
Long Term Stockpile Rehandle	-	-	-	-	-	97	283	-	-	-	-	651	864	864	864	866	864	864	864	819	-
Ore and Initial Stockpile Grade Mined	6.72%	5.67%	5.65%	5.85%	6.54%	6.55%	5.90%	5.03%	4.32%	5.58%	5.83%	5.10%	-	-	-	-	-	-	-	-	-
Waste Mined	8,780	8,980	9,580	9,580	9,580	9,880	10,406	8,602	5,629	2,862	2,684	1,439	-	-	-	-	-	-	-	-	-
Processing																					
Ore Processed	864	864	864	866	864	864	864	866	864	864	864	866	864	864	864	866	864	864	864	819	-
Grade Processed	7.64%	6.74%	6.41%	6.66%	7.66%	7.09%	5.28%	5.48%	4.57%	6.22%	6.59%	4.17%	3.74%	3.74%	3.74%	3.74%	3.74%	3.74%	3.74%	3.74%	-
Concentrate Produced	75	65	59	62	74	67	45	48	36	58	62	31	26	26	26	26	26	26	26	24	-
Concentrate to Separations Plant	75	65	59	62	74	67	45	48	36	58	62	31	26	26	26	26	26	26	26	24	-
Concentrate Grade	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	-
Recovered La	10,356	8,954	8,201	8,619	10,238	9,303	6,246	6,560	5,028	8,066	8,567	4,313	3,533	3,533	3,533	3,543	3,533	3,533	3,533	3,350	-
Recovered Ce	1,887	1,632	1,495	1,571	1,866	1,695	1,138	1,196	916	1,470	1,561	786	644	644	644	646	644	644	644	611	-
Recovered PrNd	5,747	4,969	4,551	4,783	5,681	5,162	3,466	3,640	2,790	4,476	4,754	2,393	1,960	1,960	1,960	1,966	1,960	1,960	1,960	1,859	-
Recovered SEG+	719	621	569	598	711	646	433	455	349	560	595	299	245	245	245	246	245	245	245	232	-
Cashflow Waterfall																					
Income																					
Net Revenue	810.5	700.8	641.9	674.6	801.3	728.1	488.8	513.4	393.5	631.2	670.5	337.6	276.5	276.5	276.5	277.2	276.5	276.5	276.5	262.2	-
Interest Income																					
Total	810.5	700.8	641.9	674.6	801.3	728.1	488.8	513.4	393.5	631.2	670.5	337.6	276.5	276.5	276.5	277.2	276.5	276.5	276.5	262.2	-
Operational Expenditure																					
Fixed	(73.3)	(73.6)	(74.7)	(74.1)	(75.0)	(77.0)	(76.5)	(75.3)	(70.8)	(65.6)	(65.6)	(61.6)	(55.8)	(55.8)	(55.8)	(55.8)	(55.8)	(55.8)	(55.8)	(55.7)	-
Variable	(128.0)	(117.0)	(111.1)	(114.5)	(127.1)	(119.7)	(95.8)	(98.4)	(86.3)	(110.1)	(114.0)	(80.8)	(74.6)	(74.6)	(74.6)	(74.8)	(74.6)	(74.6)	(74.6)	(70.7)	-
Royalty	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	(201.3)	(190.6)	(185.8)	(188.6)	(202.1)	(196.8)	(172.3)	(173.7)	(157.1)	(175.7)	(179.6)	(142.4)	(130.3)	(130.3)	(130.3)	(130.6)	(130.3)	(130.3)	(130.3)	(126.4)	-
Working Capital Adjustment	2.7	8.1	4.4	(2.3)	(9.4)	5.6	17.7	(1.8)	8.4	(18.0)	(2.9)	24.3	4.0	0.0	(0.0)	(0.0)	0.0	0.0	(0.0)	0.9	11.1
Capital Costs																					
Sustaining Capital Mining Capital	(1.8)	(3.3)	(2.9)	(4.2)	(2.7)	(5.8)	(1.3)	(1.7)	(2.3)	(0.7)	(4.1)	(1.6)	(1.5)	(2.0)	(0.4)	(1.8)	(1.9)	(1.3)	-	-	-
Sustaining Capital Other Capital	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	-
Sustaining Capital Crusher Move	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital Water Tank Move	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital Closure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(45.4)
Sustaining Capital TSF Expansion	-	-	-	-	-	-	-	-	-	-	(11.3)	-	-	-	-	-	-	-	-	-	-
Sustaining Capital Paste Plant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital SPARE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital Separations Capital (Sustaining)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	-
Total	(22.1)	(23.5)	(23.1)	(24.5)	(23.0)	(26.1)	(21.5)	(22.0)	(22.6)	(20.9)	(35.7)	(21.8)	(21.8)	(22.3)	(20.6)	(22.1)	(22.1)	(21.6)	(20.3)	(20.3)	(45.4)
Cashflow Before Tax	589.8	494.8	437.4	459.1	566.8	510.8	312.6	315.9	222.3	416.6	452.3	197.7	128.4	123.9	125.5	124.6	124.0	124.6	125.9	116.4	(34.3)
Tax Paid	(163.8)	(155.0)	(128.3)	(113.8)	(121.7)	(152.1)	(133.8)	(76.2)	(85.0)	(57.2)	(116.0)	(125.6)	(45.8)	(32.7)	(32.8)	(32.9)	(33.1)	(32.9)	(32.9)	(32.9)	(30.6)
Net Cashflow	426.0	339.8	309.0	345.3	445.1	358.6	178.8	239.8	137.4	359.4	336.3	72.1	82.6	91.1	92.8	91.7	90.9	91.6	92.9	83.4	(64.9)

Source: SRK
Note: 2023 is a partial year covering October 1st through December 31st.

Figure 19-9: Mountain Pass Annual Physicals and Cashflow (US$ millions)

20 Adjacent Properties

The Mojave National Preserve is located to the north and southwest of the Mountain Pass property. The U.S. Bureau of Land Management and National Park Service administer the National Preserve as well as other public lands surrounding the property. SRK is not aware of any other active mining properties in the vicinity of Mountain Pass.

21 Other Relevant Data and Information

There is no additional relevant data or information that would be material to the mineral resources or reserves at the Mountain Pass Project, beyond what is discussed in the other sections of this report.

22 Interpretation and Conclusions

Based on the data available and the analysis described in this report, in SRK's opinion, the Mountain Pass operation has a valid resource and reserve, as stated herein.

22.1 Mineral Resource Estimate

The mineral resource estimate is constrained by a geological model and grade boundaries internal to the carbonatite shapes which define a higher grade TREO-rich core vs. an undifferentiated outer shell. The project features a simple Excel-based drilling "database", most of which has no quality control. SRK supervised a historical drill core re-sampling and re-assaying program in 2009 through 2010 which demonstrated that, historically, the Mountain Pass laboratory underestimated grade. This is supported further by the fact that grade control and production grades are higher than predicted by the resource block model. The mine currently features positive reconciliations to previous modeling efforts as well as the current prediction of grade if based solely on exploration data. Consequently, SRK is confident that the resource block model is based on drilling data which has been demonstrated to be reliable, albeit conservative, representation of the TREO grade. Other elements such as phosphorus or the discrete LREO or HREO components have been variably analyzed and do not exist at the same density as the TREO information.

SRK has constrained and controlled the mineral resource estimation as a function of a robust geological model based on updated information collected as recently as 2020. TREO samples from drilling and blastholes have been composited for the purposes of use in estimation. Estimates of grade from both data sets have been made into a conventional block model, coded by lithology, resource domain, and a variety of other factors relevant to mining and reporting.

The block model has been constrained by a resource pit shell and reported above the reported cut-off grade. Mineral resources have been reported in this report both inclusive of reserves, and exclusive of reserves. The latter should be considered final and authoritative for SEC disclosure purposes.

SRK has addressed uncertainty and risk in the estimate by categorizing the mineral resources with respect to confidence in the estimate or underlying data supporting it. The mineral resources at the Mountain Pass deposit have been classified in accordance with SEC S-K 1300 definitions and guidance. The classification parameters are defined by both the distance to composite data, the number of drillholes used to inform block grades and a geostatistical indicator of relative estimation quality (kriging efficiency).

22.2 Mineral Reserve Estimate

SRK developed a life-of-mine (LoM) plan for the Mountain Pass operation in support of mineral reserves. MP Materials will operate an on-site separations facility at the Mountain Pass site that will allow the Company to separate bastnaesite concentrate into four individual REO products for sale (PrNd oxide, SEG oxalate, La carbonate/La oxide, and Ce chloride). For economic modeling purposes, a combination of concentrate sales and separated product sales was assumed for Q4 2023 through Q4 2024 while the separations facility ramps up to full capacity. From 2025 onward, it was assumed that all concentrate will be fed to the separations facility. Forecast economic parameters are based on current cost performance for process, transportation, and administrative costs, as well as a first principles estimation of future mining costs. Forecast revenue from concentrate sales and individual separated product sales is based on a preliminary market study commissioned by MP Materials.

From this evaluation, pit optimization was performed based on an equivalent concentrate price of US$ 10,836 per dry st of 60% TREO concentrate. The results of pit optimization guided the design and scheduling of the ultimate pit. SRK generated a cash flow model which indicated positive economics for the LoM plan, which provides the basis for the reserves. Reserves within the new ultimate pit are sequenced for the full 34-year LoM (Q4 2023 through 2056).

The costs used for pit optimization include estimated mining, processing, sustaining capital, transportation, and administrative costs, including an allocation of corporate costs.

Processing recovery for concentrate is variable based on a mathematical relationship to estimate overall TREO recovery versus ore grade. The calculated COG for the reserves is 2.43% TREO, which was applied to indicated blocks contained within an ultimate pit, the design of which was guided by economic pit optimization.

The optimized pit shell selected to guide final pit design was based on a combination of the revenue factor (RF) 0.70 pit (used on the north half of the deposit) and the RF 1.00 pit shell (used on the south half of the deposit). The IRA pit slope angles used for the mine design are based on operational-level geotechnical studies and range from 44° to 47°.

Measured resources in stockpiles were converted to proven reserves. Indicated pit resources were converted to probable reserves by applying the appropriate modifying factors, as described herein, to potential mining pit shapes created during the mine design process. Inferred resources present within the LoM pit are treated as waste.

The mine design process results in in situ open pit probable mining reserves of 28.1 million st with an average grade of 6.26% TREO. Additionally, there are 0.6 million st of proven mineral reserves in stockpiles with an average grade of 4.33% TREO. The reference point for the mineral reserves is ore delivered to the Mountain Pass concentrator.

In the opinion of SRK as the QP, the conversion of mineral resources to mineral reserves has been completed in accordance with CFR 17, Part 229 (S-K 1300).

The reserve estimate herein is subject to potential change based on changes to the forward-looking cost and revenue assumptions utilized in this study. It is assumed that MP Materials will ramp up its on-site separations facilities to full capacity by the end of 2024. For economic modeling purposes, a combination of concentrate sales and separated product sales was assumed for Q4 2023 through Q4 2024. From 2025 onward, it was assumed that all concentrate will be fed to the separations facility.

Full extraction of this reserve is dependent upon modification of current permitted boundaries for the open pit. Failure to achieve modification of these boundaries would result in MP Materials not being able to extract the full reserve estimated in this study. It is MP Materials' expectation that it will be successful in modifying this permit condition. In SRK's opinion, MP Materials' expectation in this regard is reasonable.

A portion of the resource pit encroaches on an adjoining mineral right holder's concession. This portion of the pit would only include waste stripping (i.e., no rare earth mineralization is assumed to be extracted from this concession). The prior owner of Mountain Pass had an agreement with this concession holder to allow this waste stripping (with the requirement that aggregate mined be stockpiled for the owner's use). MP Materials does not currently have this agreement in place, but SRK believes it is reasonable to assume MP Materials will be able to negotiate a similar agreement.

22.3 Metallurgy and Processing

22.3.1 Existing Crushing and Concentration Operations

- MP Materials has operated a flotation concentrator since December 2017 to recover a bastnaesite concentrate that is currently shipped to China for further processing.
- MP Materials has conducted flotation studies to evaluate TREO recovery versus ore grade and has developed a mathematical relationship to estimate overall TREO recovery versus ore grade, which has been used to estimate TREO recovery from lower grade ores later in the mine life.
- Significant improvements in concentrator performance have occurred since May 2019, which are attributed primarily to the installation of a boiler that has enabled flotation to be conducted at a constant higher temperature, as well as new reagent testing and blending of historically problematic ores.
- During 2022 TREO recovery averaged 65.3% into concentrates containing an average of 61.3% TREO.
- During 2023 (January - September) TREO recovery has averaged 64.0% into concentrates averaging 61.9% TREO.

22.3.2 Modified and Recommissioned Separations Facility

MP Materials is in the process of ramping up its modified and recommissioned on-site separations facility to produce individual rare earth products. The incentive for this substantial process change is the enhancement of revenue that will be realized for producing individual rare earth products as compared to the previous practice of producing a single rare earth containing flotation concentrate which was sold to various entities that separate and market individual rare earth products. Over the past several years, MP Materials has made substantial technical and financial commitments to modify and recommission an on-site separation facility that will allow for the sale of individual rare earth products.

Consequently, based upon the project documentation provided, a site visit to the MP Materials installations at Mountain Pass, and conversations with MP Materials engineers who are directly involved with the ongoing ramp up operations, it is the opinion of SGS that the Mountain Pass modification and modernization project has been performed in a professional manner. It is SGS's further opinion that the ramp up schedule assumed for economic modeling purposes, which estimated feeding 20% and 61.25% of concentrate production into the facility in Q4 2023 and full year 2024, respectively, is likely to be achieved. From 2025 onward, the separations facility is likely to operate at full capacity thereby consuming all or nearly all of the bastnaesite flotation concentrate produced on site.

22.4 Project Infrastructure

The Mountain Pass site has all facilities required for operation, including the open pit, concentrator, separations facility, access and haul roads, explosives storage, fuel tanks and fueling systems, warehouse, security guard house and perimeter fencing, tailings filter plant, tailings storage area, waste rock storage area, administrative and office buildings, surface water control systems, evaporation ponds, miscellaneous shops, truck shop, laboratory, multiple laydown areas, power supply, water supply, waste handling bins and temporary storage locations, and a fully developed communications system.

Access to the site, as well as site haul roads and other minor roads are fully developed and controlled by MP Materials. There is no public access through the Project area. All public access roads that lead to the Project are gated at the property boundary.

Outside services include industrial maintenance contractors, equipment suppliers and general service contractors. Access to qualified contractors and suppliers is excellent due to the proximity of population centers such as Las Vegas, Nevada as well as Elko, Nevada (an established large mining district) and Phoenix, Arizona (servicing the copper mining industry).

Substantially all the power to the Mountain Pass facility is currently supplied by a Combined Heat and Power (CHP) or co-generation (cogen) power facility with two natural gas-fired turbines capable of producing up to 26 MW of power combined. In addition, the site is served by a 12-kV line from a Southern California Edison substation two miles away.

Water is supplied through active water wells located eight miles west of the project. Fire systems are supplied by separate fire water tanks and pumps.

The LoM plan will require the relocation in 2035 of the paste tailings plant and the water tanks currently northeast of the pit highwall near the concentration plant. Additionally, the crusher will be relocated in 2028 to allow the pit to expand to the north. Capital cost provisions are included in the economic model for these relocations.

The design capacity of the tailings storage facility is approximately 24 million st. The project has utilized approximately 4.2 million st of that space. The existing facility will have a remaining capacity of approximately 19.8 million st which will provide approximately 24 years of storage. MP Materials will expand the existing tailings facility to the northwest in approximately 2047 to provide an additional 9 years of storage capacity.

Site logistics are straightforward with the concentrate product shipped in supersacks within a shipping container by truck to the port of Los Angeles. At the port, the containers are loaded onto a container ship and shipped to the final customers. Refined products for domestic customers are shipped in supersacks and intermediate bulk containers (IBC tote).

22.5 Products and Markets

Separated REE products outlined in this report (PrNd oxide, SEG+ oxalate, La carbonate, and Ce chloride) are considered marketable from an economic perspective, provided market standards and requirements are met. Adamas forecasts a long-term price of US$131.6/kg REO for PrNd oxide, US$51.9/kg REO for SEG+ oxalate, US$1.5/kg REO for Lanthanum carbonate, and US$2.51/kg REO for Cerium chloride. The mixed rare earth concentrate price of US$10.94/kg of contained REO will be principally driven by trends in PrNd and dysprosium, price swings of which will be mirrored by concentrates.

22.6 Environmental, Closure, and Permitting

As of September 30, 2023, MP Materials holds the necessary operating permits, including conditional use and minor use permits from the County of San Bernardino (SBC), which currently allows continued operations of the Mountain Pass facility through 2042. The proposed mine plan extends the mine life to 2056. The future mine plan requires expansion of the current permitted boundary of the open pit, expansion of the North Overburden Stockpile and construction of a new East Overburden Stockpile.

MP Materials will need to engage with the SBC-LUS and other regulatory authorities and allow sufficient time to prepare the permit applications and gain the necessary approvals to implement the mine plan described herein. There is a risk that the timing for regulatory approvals may be longer than anticipated. In this case, MP Materials may not be able to implement or follow the mine plan as currently proposed. SRK is of the opinion that MP Materials will continue to successfully engage regulatory authorities and gain approval for future amendments related to site operations within the private property boundary.

22.7 Projected Economic Outcomes

The Mountain Pass operation consists of an open pit mine and several processing facilities fed by the open pit mine. The operation is expected to have a 34 year life with the first modeled year of operation a partial year to align with the effective date of the reserves. Under the forward-looking assumptions modeled and documented in this report, the operation is forecast to generate positive cashflow. As modeled for this analysis, the operation is forecast to produce 1.71 million dry metric tonnes of concentrate to be either sold or processed into separated materials. This results in a forecast after-tax project NPV at 6% of US$5.2 billion.

The analysis performed for this report indicates that the operation's NPV is most sensitive to variations in the grade of ore mined, the commodity price received and processing plant performance.

23 Recommendations

As an operating mine, there are no further work programs or studies that are required to extract the reserve estimated herein. However, there remain opportunities for MP Materials to perform additional data collection or study to potentially benefit the operation.

23.1 Geology and Resources

SRK notes that ongoing infill and exploration drilling is recommended for further development of the Mountain Pass mine. As shown in recent production reconciliation, modeling of short-range variability in the resource will depend on additional information at relatively close spacings to characterize and improve prediction of tons and grade for short term planning. Such a program would involve continuous drilling of immediate near-term production and should be considered an operational cost of the mine in the future. In addition, the resource locally remains open at depth and may benefit from additional drilling in more widely-spaced areas. SRK estimates a drilling program of 10,000 to 20,000 ft of drilling would improve confidence in the model and potentially convert existing Inferred resources to a higher category appropriate for conversion to reserves.

Additional recommendations include:

- Update of the geological and resource model based on data collected onsite since the previous update in 2020.
- Refinement of the existing structural model with additional data and mapping collected by structural geologists or rock mechanics experts to support the geological model and
- A study of ore density versus ore grade, which can be completed using existing core in storage, could improve the accuracy of the block model grade and tonnage estimation.
- Improved database architecture and validation of exploration and mine data. Currently, this is based almost entirely on digital spreadsheets.
- Separate assaying of the light rare earth oxides and phosphorus through the carbonatite units and 20 ft into the hangingwall and footwall units should be implemented routinely for future drilling and further re-assaying of existing drill core. This should be extended to individual heavy rare earth oxides should the project strategy consider incorporating these as products in the future.
- Phosphorus assays may help to refine the resource model by identifying monazite-rich zones. SRK also recommends creating a minimum of two (a high and low grade) site specific reference standards for QA/QC to be used in all future assaying programs. These reference standards should be certified through a multi-laboratory round-robin program to achieve industry best practice.
- SRK strongly recommends improving the QA/QC process to demonstrate that the internal laboratory and any external laboratories can be independently checked for precision and accuracy. Currently, the lack of commercial standards and a consistent approach to blank and duplicate insertion and analysis is not consistent with industry standards.

The estimated cost for the additional drilling and other recommendations is approximately US$3 million.

23.2 Mining and Reserves

23.2.1 Geotechnical Recommendations:

- Routine geotechnical slope monitoring, data collection, and analysis should continue. MP Materials should review geotechnical parameters and optimize the mine plan prior to starting new phases based on this review. This is an ongoing effort at Mountain Pass and costs are part of the mine operating costs that have been estimated for extraction of the mineral reserves.

23.2.2 Hydrogeology:

- Conduct additional hydrogeological studies of the deep part of the bedrock to the elevation of the proposed bottom of the pit (3,000 ft amsl) by conducting packer isolated tests in three or four core holes defining bedrock permeability and dewatering targets (where and to what depth dewatering wells can be installed). Vibrated wire piezometers (similarly installed by CNI) are also recommended in these core holes).
- Develop numerical groundwater flow to predict inflow to the proposed pit and better define:
  - Dewatering requirements
  - Pore-pressures in pit walls and the potential necessity to reduce them by installation of horizontal drain holes from pit benches (if required by geotechnical conditions of the slopes)
  - Propagation of the drawdown cone during both mining and post-mining conditions (including pit lake infilling) to evaluate potential impact the groundwater system as a result of continued deepening of the open pit.
- The estimated cost to conduct the recommended hydrogeological studies and numerical groundwater modeling is approximately US$920,000.

23.2.3 Costs and Economics

- Develop a more-detailed mid- and long-term sustaining capital expenditure estimate. SRK completed a long-term estimate for mining-related capital, and other components of the operation should generate a similar forecast to improve long-term budgeting. There would be no additional cost for this recommendation as the work would be performed by existing MP Materials staff.

24 References

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25 Reliance on Information Provided by the Registrant

The Qualified Person's opinions contained herein is based on information provided to the Qualified Persons by MP Materials throughout the course of the investigations. Table 25-1 of this section of the Technical Report Summary will:

(i) Identify the categories of information provided by the registrant;

(ii) Identify the particular portions of the Technical Report Summary that were prepared in reliance on information provided by the registrant pursuant to Subpart 1302 (f)(1), and the extent of that reliance; and

(iii) Disclose why the qualified person considers it reasonable to rely upon the registrant for any of the information specified in Subpart 1302 (f)(1).

Table 25-1: Reliance on Information Provided by the Registrant

Category	Report Item/ Portion	Portion of Technical Report Summary	Disclose Why the Qualified Person Considers it Reasonable to Rely Upon the Registrant
Claims List	3	3.2 Mineral Title	MP Materials provided SRK with a current listing of claims. The information was sourced from the Bureau of Land Management.
Marketing Agreements	16	16.5 Specific Products	MP Materials provided Adamas with information regarding the product specifications intended for production both now and in future
Marketing Agreements	16	16.7 Contracts	MP Materials provided Adamas with current marketing agreements and potential terms of agreements tied to future product sales and operations.
Marketing Plans	19	19 Economic Analysis	MP Materials provided SRK with input into the shipping points of sale and associated shipping costs used in the model.
Environmental Studies	17	17.1 Environmental Studies	SRK was provided with various environmental studies conducted on site. These studies were of a vintage that independent validation could not be completed.
Discount Rates	19	19 Economic Analysis	MP Materials provided SRK with discount rates for project evaluation in line with previous evaluations.
Tax rates and government royalties	19	19 Economic Analysis	SRK was provided with income and applicable VAT tax rates by MP Materials for application within the model. These rates are in line with SRK's understanding of the tax regime at the project location.

Source: SRK and Adamas

Signature Page

This report titled "SEC Technical Report Summary, Pre-Feasibility Study, Mountain Pass Mine, San Bernardino County, California" with an effective date of October 1, 2023, was prepared and signed by:

SRK Consulting (U.S.) Inc.

Dated at Denver, Colorado
February 22, 2024

(Signed) SRK Consulting (U.S.) Inc.

SGS North America Inc.

Dated at Tucson, Arizona
February 22, 2024

(Signed) SGS North America Inc.

Adamas Intelligence Inc.

Dated at Toronto, Canada
February 22, 2024

(Signed) Adamas Intelligence Inc.

Appendices

Appendix A: Claims List

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DEPARTMENT OF THE INTERIOR
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MINING CLAIMS

MINING CLAIM CUSTOMER INFORMATION

Admin State: CA
Geo State: CA
Claimant: MP MINE OPERATIONS LLC
Street: HC 1 BOX 224
City: MOUNTAIN PASSS State: CA Postal Code: 92366

Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	County	Case Disposition	Claim Type	Interest Relationship
CA101304758	CA101304758	CAMC259387	CAMC259387	JACK 66	SAN BERNARDINO	ACTIVE	MILL SITE	CLAIMANT
CA101334324	CA101334324	CAMC51761	CAMC51692	JACK NO 39	SAN BERNARDINO	ACTIVE	MILL SITE	CLAIMANT
CA101347323	CA101347323	CAMC70768	CAMC70767	ACE #2	SAN BERNARDINO	ACTIVE	MILL SITE	CLAIMANT
CA101348437	CA101348437	CAMC70767	CAMC70767	ACE #1	SAN BERNARDINO	ACTIVE	MILL SITE	CLAIMANT
CA101349790	CA101349790	CAMC70769	CAMC70767	ACE #3	SAN BERNARDINO	ACTIVE	MILL SITE	CLAIMANT
CA101452381	CA101452381	CAMC273770	CAMC273769	ACE NO 6	SAN BERNARDINO	FILED	MILL SITE	CLAIMANT
CA101452742	CA101452742	CAMC263510	CAMC263510	QUEEN 90	SAN BERNARDINO	FILED	MILL SITE	CLAIMANT
CA101547491	CA101547491	CAMC51760	CAMC51692	JACK NO 36	SAN BERNARDINO	ACTIVE	MILL SITE	CLAIMANT
CA101600622	CA101600622	CAMC153273	CAMC153272	SHADOW VLY 1857 #2	SAN BERNARDINO	ACTIVE	MILL SITE	CLAIMANT
CA101759245	CA101759245	CAMC273769	CAMC273769	ACE NO 7	SAN BERNARDINO	FILED	MILL SITE	CLAIMANT
CA101759479	CA101759479	CAMC153272	CAMC153272	SHADOW VLY 1857 #1	SAN BERNARDINO	ACTIVE	MILL SITE	CLAIMANT

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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MINING CLAIMS

MINING CLAIM CUSTOMER INFORMATION

Admin State: CA
Geo State: CA
Claimant: SECURE NATURAL RESOURCES LLC
Street: 900 N MICHIGAN AVE STE 1340
City: CHICAGO State: IL Postal Code: 60611-6542

Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
CA101300112	CA101300112	CAMC16271	CAMC16264	MINERAL HILL NO 8	ACTIVE	LODE CLAIM	9/3/2024
CA101300164	CA101300164	CAMC233783	CAMC233774	SYENITE 185A	ACTIVE	LODE CLAIM	9/3/2024
CA101300349	CA101300349	CAMC51743	CAMC51692	EARL NO 5	ACTIVE	LODE CLAIM	9/3/2024
CA101300353	CA101300353	CAMC5950	CAMC5840	SYENITE 114	ACTIVE	LODE CLAIM	9/3/2024
CA101300355	CA101300355	CAMC5889	CAMC5840	SYENITE 50	ACTIVE	LODE CLAIM	9/3/2024
CA101300382	CA101300382	CAMC5872	CAMC5840	SYENITE 33	ACTIVE	LODE CLAIM	9/3/2024
CA101300397	CA101300397	CAMC234432	CAMC234416	SYENITE 210	ACTIVE	LODE CLAIM	9/3/2024
CA101300466	CA101300466	CAMC5900	CAMC5840	SYENITE 61	ACTIVE	LODE CLAIM	9/3/2024
CA101300737	CA101300737	CAMC234453	CAMC234416	SYENITE 231	ACTIVE	LODE CLAIM	9/3/2024
CA101300754	CA101300754	CAMC6000	CAMC5840	SYENITE 165	ACTIVE	LODE CLAIM	9/3/2024
CA101300927	CA101300927	CAMC244770	CAMC244736	CMF 35	ACTIVE	LODE CLAIM	9/3/2024
CA101301524	CA101301524	CAMC5994	CAMC5840	SYENITE 159	ACTIVE	LODE CLAIM	9/3/2024
CA101301536	CA101301536	CAMC234454	CAMC234416	SYENITE 232	ACTIVE	LODE CLAIM	9/3/2024
CA101302125	CA101302125	CAMC5895	CAMC5840	SYENITE 56	ACTIVE	LODE CLAIM	9/3/2024
CA101302176	CA101302176	CAMC201788	CAMC201787	SYENITE 90	ACTIVE	LODE CLAIM	9/3/2024
CA101302380	CA101302380	CAMC177649	CAMC177640	SOUTH SYENITE 10	ACTIVE	LODE CLAIM	9/3/2024
CA101302391	CA101302391	CAMC5978	CAMC5840	SYENITE 142	ACTIVE	LODE CLAIM	9/3/2024
CA101302697	CA101302697	CAMC5917	CAMC5840	SYENITE 78	ACTIVE	LODE CLAIM	9/3/2024
CA101302706	CA101302706	CAMC5871	CAMC5840	SYENITE 32	ACTIVE	LODE CLAIM	9/3/2024
CA101302962	CA101302962	CAMC244790	CAMC244736	CMF 55	ACTIVE	LODE CLAIM	9/3/2024
CA101302967	CA101302967	CAMC5892	CAMC5840	SYENITE 53	ACTIVE	LODE CLAIM	9/3/2024

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CA101303524	CA101303524	CAMC47650	CAMC47621	BAILEY 30	ACTIVE	LODE CLAIM	9/3/2024
CA101303534	CA101303534	CAMC245119	CAMC245118	SOUTH SYENITE 108	ACTIVE	LODE CLAIM	9/3/2024
CA101303907	CA101303907	CAMC5947	CAMC5840	SYENITE 111	ACTIVE	LODE CLAIM	9/3/2024
CA101303917	CA101303917	CAMC233775	CAMC233774	SYENITE 146A	ACTIVE	LODE CLAIM	9/3/2024
CA101304196	CA101304196	CAMC51739	CAMC51692	EARL NO 1	ACTIVE	LODE CLAIM	9/3/2024
CA101304375	CA101304375	CAMC5862	CAMC5840	SYENITE 23	ACTIVE	LODE CLAIM	9/3/2024
CA101304648	CA101304648	CAMC5858	CAMC5840	SYENITE 19	ACTIVE	LODE CLAIM	9/3/2024
CA101304759	CA101304759	CAMC5951	CAMC5840	SYENITE 115	ACTIVE	LODE CLAIM	9/3/2024
CA101304800	CA101304800	CAMC5901	CAMC5840	SYENITE 62	ACTIVE	LODE CLAIM	9/3/2024
CA101305328	CA101305328	CAMC244750	CAMC244736	CMF 15	ACTIVE	LODE CLAIM	9/3/2024
CA101305329	CA101305329	CAMC5967	CAMC5840	SYENITE 131	ACTIVE	LODE CLAIM	9/3/2024
CA101305361	CA101305361	CAMC201789	CAMC201787	SYENITE 91	ACTIVE	LODE CLAIM	9/3/2024
CA101305378	CA101305378	CAMC234486	CAMC234416	SYENITE 264	ACTIVE	LODE CLAIM	9/3/2024
CA101330471	CA101330471	CAMC301781	CAMC301781	EAST SYENITE 3	FILED	LODE CLAIM	9/3/2024
CA101330472	CA101330472	CAMC301782	CAMC301781	EAST SYENITE 4	FILED	LODE CLAIM	9/3/2024
CA101330473	CA101330473	CAMC301783	CAMC301781	EAST SYENITE 5	FILED	LODE CLAIM	9/3/2024
CA101330474	CA101330474	CAMC301784	CAMC301781	EAST SYENITE 6	FILED	LODE CLAIM	9/3/2024
CA101330475	CA101330475	CAMC301785	CAMC301781	EAST SYENITE 7	FILED	LODE CLAIM	9/3/2024
CA101330476	CA101330476	CAMC301786	CAMC301781	EAST SYENITE 8	FILED	LODE CLAIM	9/3/2024
CA101330477	CA101330477	CAMC301787	CAMC301781	EAST SYENITE 9	FILED	LODE CLAIM	9/3/2024
CA101330478	CA101330478	CAMC301788	CAMC301781	EAST SYENITE 10	FILED	LODE CLAIM	9/3/2024
CA101330479	CA101330479	CAMC301789	CAMC301781	EAST SYENITE 11	FILED	LODE CLAIM	9/3/2024
CA101330480	CA101330480	CAMC301790	CAMC301781	EAST SYENITE 12	FILED	LODE CLAIM	9/3/2024
CA101330481	CA101330481	CAMC301791	CAMC301781	EAST SYENITE 13	FILED	LODE CLAIM	9/3/2024
CA101330482	CA101330482	CAMC301792	CAMC301781	EAST SYENITE 14	FILED	LODE CLAIM	9/3/2024

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CA101331275	CA101331275	CAMC301798	CAMC301781	EAST SYENITE 20	FILED	LODE CLAIM	9/3/2024
CA101331276	CA101331276	CAMC301799	CAMC301781	EAST SYENITE 21	FILED	LODE CLAIM	9/3/2024
CA101331277	CA101331277	CAMC301800	CAMC301781	EAST SYENITE 22	FILED	LODE CLAIM	9/3/2024
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CA101331280	CA101331280	CAMC301803	CAMC301781	EAST SYENITE 25	FILED	LODE CLAIM	9/3/2024
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CA101331283	CA101331283	CAMC301806	CAMC301781	EAST SYENITE 28	FILED	LODE CLAIM	9/3/2024
CA101331284	CA101331284	CAMC301807	CAMC301781	EAST SYENITE 29	FILED	LODE CLAIM	9/3/2024
CA101331285	CA101331285	CAMC301808	CAMC301781	EAST SYENITE 30	FILED	LODE CLAIM	9/3/2024
CA101331286	CA101331286	CAMC301809	CAMC301781	EAST SYENITE 31	FILED	LODE CLAIM	9/3/2024
CA101331287	CA101331287	CAMC301810	CAMC301781	EAST SYENITE 32	FILED	LODE CLAIM	9/3/2024
CA101331288	CA101331288	CAMC301811	CAMC301781	EAST SYENITE 33	FILED	LODE CLAIM	9/3/2024
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CA101331290	CA101331290	CAMC301813	CAMC301781	EAST SYENITE 35	FILED	LODE CLAIM	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
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CA101331294	CA101331294	CAMC301817	CAMC301781	EAST SYENITE 39	FILED	LODE CLAIM	9/3/2024
CA101331951	CA101331951	CAMC5861	CAMC5840	SYENITE 22	ACTIVE	LODE CLAIM	9/3/2024
CA101331971	CA101331971	CAMC5931	CAMC5840	SYENITE 93	ACTIVE	LODE CLAIM	9/3/2024
CA101332007	CA101332007	CAMC47663	CAMC47621	BAILEY 50	ACTIVE	LODE CLAIM	9/3/2024
CA101332024	CA101332024	CAMC5939	CAMC5840	SYENITE 103	ACTIVE	LODE CLAIM	9/3/2024
CA101332041	CA101332041	CAMC47637	CAMC47621	BAILEY 17	ACTIVE	LODE CLAIM	9/3/2024
CA101332086	CA101332086	CAMC301818	CAMC301781	EAST SYENITE 40	FILED	LODE CLAIM	9/3/2024
CA101332768	CA101332768	CAMC244124	CAMC244124	SYENITE 297	ACTIVE	LODE CLAIM	9/3/2024
CA101332798	CA101332798	CAMC177641	CAMC177640	SOUTH SYENITE 2	ACTIVE	LODE CLAIM	9/3/2024
CA101332810	CA101332810	CAMC233778	CAMC233774	SYENITE 173A	ACTIVE	LODE CLAIM	9/3/2024
CA101332820	CA101332820	CAMC244801	CAMC244736	CMF 66	ACTIVE	LODE CLAIM	9/3/2024
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CA101333498	CA101333498	CAMC245120	CAMC245118	SOUTH SYENITE 109	ACTIVE	LODE CLAIM	9/3/2024
CA101333517	CA101333517	CAMC5999	CAMC5840	SYENITE 164	ACTIVE	LODE CLAIM	9/3/2024
CA101333526	CA101333526	CAMC5876	CAMC5840	SYENITE 37	ACTIVE	LODE CLAIM	9/3/2024
CA101333529	CA101333529	CAMC5949	CAMC5840	SYENITE 113	ACTIVE	LODE CLAIM	9/3/2024
CA101333542	CA101333542	CAMC234429	CAMC234416	SYENITE 207	ACTIVE	LODE CLAIM	9/3/2024
CA101333548	CA101333548	CAMC5851	CAMC5840	SYENITE 12	ACTIVE	LODE CLAIM	9/3/2024
CA101333564	CA101333564	CAMC5995	CAMC5840	SYENITE 160	ACTIVE	LODE CLAIM	9/3/2024
CA101333572	CA101333572	CAMC5945	CAMC5840	SYENITE 109	ACTIVE	LODE CLAIM	9/3/2024
CA101333573	CA101333573	CAMC47669	CAMC47621	BAILEY 56	ACTIVE	LODE CLAIM	9/3/2024
CA101333588	CA101333588	CAMC234487	CAMC234416	SYENITE 265	ACTIVE	LODE CLAIM	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
CA101333600	CA101333600	CAMC234424	CAMC234416	SYENITE 202	ACTIVE	LODE CLAIM	9/3/2024
CA101334335	CA101334335	CAMC177680	CAMC177640	SOUTH SYENITE 41	ACTIVE	LODE CLAIM	9/3/2024
CA101334336	CA101334336	CAMC234468	CAMC234416	SYENITE 246	ACTIVE	LODE CLAIM	9/3/2024
CA101335033	CA101335033	CAMC122227	CAMC122227	DESERT POPPY 2	ACTIVE	LODE CLAIM	9/3/2024
CA101335038	CA101335038	CAMC51748	CAMC51692	LUCKY STRIKE NO 4	ACTIVE	LODE CLAIM	9/3/2024
CA101335040	CA101335040	CAMC5955	CAMC5840	SYENITE 119	ACTIVE	LODE CLAIM	9/3/2024
CA101335046	CA101335046	CAMC5926	CAMC5840	SYENITE 87	ACTIVE	LODE CLAIM	9/3/2024
CA101335057	CA101335057	CAMC177737	CAMC177640	SOUTH SYENITE 98	ACTIVE	LODE CLAIM	9/3/2024
CA101335073	CA101335073	CAMC47665	CAMC47621	BAILEY 52	ACTIVE	LODE CLAIM	9/3/2024
CA101335077	CA101335077	CAMC5869	CAMC5840	SYENITE 30	ACTIVE	LODE CLAIM	9/3/2024
CA101335099	CA101335099	CAMC234489	CAMC234416	SYENITE 267	ACTIVE	LODE CLAIM	9/3/2024
CA101335742	CA101335742	CAMC245121	CAMC245118	SOUTH SYENITE 110	ACTIVE	LODE CLAIM	9/3/2024
CA101335773	CA101335773	CAMC5905	CAMC5840	SYENITE 66	ACTIVE	LODE CLAIM	9/3/2024
CA101335799	CA101335799	CAMC5880	CAMC5840	SYENITE 41	ACTIVE	LODE CLAIM	9/3/2024
CA101335810	CA101335810	CAMC244803	CAMC244736	CMF 68	ACTIVE	LODE CLAIM	9/3/2024
CA101335834	CA101335834	CAMC234426	CAMC234416	SYENITE 204	ACTIVE	LODE CLAIM	9/3/2024
CA101336526	CA101336526	CAMC47661	CAMC47621	BAILEY 41	ACTIVE	LODE CLAIM	9/3/2024
CA101336540	CA101336540	CAMC47633	CAMC47621	BAILEY 13	ACTIVE	LODE CLAIM	9/3/2024
CA101336564	CA101336564	CAMC234447	CAMC234416	SYENITE 225	ACTIVE	LODE CLAIM	9/3/2024
CA101337163	CA101337163	CAMC5974	CAMC5840	SYENITE 138	ACTIVE	LODE CLAIM	9/3/2024
CA101337190	CA101337190	CAMC17408	CAMC17399	SYENITE 174	ACTIVE	LODE CLAIM	9/3/2024
CA101337191	CA101337191	CAMC16272	CAMC16264	MINERAL HILL NO 9	ACTIVE	LODE CLAIM	9/3/2024
CA101337212	CA101337212	CAMC5894	CAMC5840	SYENITE 55	ACTIVE	LODE CLAIM	9/3/2024
CA101337812	CA101337812	CAMC16270	CAMC16264	MINERAL HILL NO 7	ACTIVE	LODE CLAIM	9/3/2024
CA101337825	CA101337825	CAMC5873	CAMC5840	SYENITE 34	ACTIVE	LODE CLAIM	9/3/2024
CA101337837	CA101337837	CAMC6002	CAMC5840	SYENITE 167	FILED	LODE CLAIM	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
CA101337862	CA101337862	CAMC177640	CAMC177640	SOUTH SYENITE 1	ACTIVE	LODE CLAIM	9/3/2024
CA101337863	CA101337863	CAMC234428	CAMC234416	SYENITE 206	ACTIVE	LODE CLAIM	9/3/2024
CA101338439	CA101338439	CAMC51744	CAMC51692	EARL NO 6	ACTIVE	LODE CLAIM	9/3/2024
CA101338442	CA101338442	CAMC101870	CAMC101865	SYENITE #182	ACTIVE	LODE CLAIM	9/3/2024
CA101338452	CA101338452	CAMC244780	CAMC244736	CMF 45	ACTIVE	LODE CLAIM	9/3/2024
CA101338462	CA101338462	CAMC51694	CAMC51692	CLARK MOUNTAIN NO 12	ACTIVE	LODE CLAIM	9/3/2024
CA101338481	CA101338481	CAMC5844	CAMC5840	SYENITE 5	ACTIVE	LODE CLAIM	9/3/2024
CA101338510	CA101338510	CAMC234449	CAMC234416	SYENITE 227	ACTIVE	LODE CLAIM	9/3/2024
CA101338523	CA101338523	CAMC5992	CAMC5840	SYENITE 157	ACTIVE	LODE CLAIM	9/3/2024
CA101338528	CA101338528	CAMC233777	CAMC233774	SYENITE 169A	ACTIVE	LODE CLAIM	9/3/2024
CA101338533	CA101338533	CAMC5942	CAMC5840	SYENITE 106	ACTIVE	LODE CLAIM	9/3/2024
CA101338534	CA101338534	CAMC47639	CAMC47621	BAILEY 19	ACTIVE	LODE CLAIM	9/3/2024
CA101338538	CA101338538	CAMC244800	CAMC244736	CMF 65	ACTIVE	LODE CLAIM	9/3/2024
CA101339113	CA101339113	CAMC244125	CAMC244124	SYENITE 296	ACTIVE	LODE CLAIM	9/3/2024
CA101339139	CA101339139	CAMC5952	CAMC5840	SYENITE 116	ACTIVE	LODE CLAIM	9/3/2024
CA101339148	CA101339148	CAMC51698	CAMC51692	CLARK MOUNTAIN NO 16	ACTIVE	LODE CLAIM	9/3/2024
CA101339173	CA101339173	CAMC47635	CAMC47621	BAILEY 15	ACTIVE	LODE CLAIM	9/3/2024
CA101347058	CA101347058	CAMC51700	CAMC51692	CLARK MOUNTAIN NO 18	ACTIVE	LODE CLAIM	9/3/2024
CA101347320	CA101347320	CAMC5980	CAMC5840	SYENITE 144	ACTIVE	LODE CLAIM	9/3/2024
CA101347324	CA101347324	CAMC234475	CAMC234416	SYENITE 253	ACTIVE	LODE CLAIM	9/3/2024
CA101347329	CA101347329	CAMC5930	CAMC5840	SYENITE 92	ACTIVE	LODE CLAIM	9/3/2024
CA101347354	CA101347354	CAMC5875	CAMC5840	SYENITE 36	ACTIVE	LODE CLAIM	9/3/2024
CA101347356	CA101347356	CAMC5944	CAMC5840	SYENITE 108	ACTIVE	LODE CLAIM	9/3/2024
CA101347357	CA101347357	CAMC244791	CAMC244736	CMF 56	ACTIVE	LODE CLAIM	9/3/2024
CA101347592	CA101347592	CAMC234474	CAMC234416	SYENITE 252	ACTIVE	LODE CLAIM	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
CA101347643	CA101347643	CAMC234434	CAMC234416	SYENITE 212	ACTIVE	LODE CLAIM	9/3/2024
CA101347680	CA101347680	CAMC234455	CAMC234416	SYENITE 233	ACTIVE	LODE CLAIM	9/3/2024
CA101347895	CA101347895	CAMC5891	CAMC5840	SYENITE 52	ACTIVE	LODE CLAIM	9/3/2024
CA101347898	CA101347898	CAMC234423	CAMC234416	SYENITE 201	ACTIVE	LODE CLAIM	9/3/2024
CA101347915	CA101347915	CAMC5841	CAMC5840	SYENITE 2	ACTIVE	LODE CLAIM	9/3/2024
CA101347924	CA101347924	CAMC234444	CAMC234416	SYENITE 222	ACTIVE	LODE CLAIM	9/3/2024
CA101347958	CA101347958	CAMC234433	CAMC234416	SYENITE 211	ACTIVE	LODE CLAIM	9/3/2024
CA101348272	CA101348272	CAMC5997	CAMC5840	SYENITE 162	ACTIVE	LODE CLAIM	9/3/2024
CA101348380	CA101348380	CAMC5921	CAMC5840	SYENITE 82	ACTIVE	LODE CLAIM	9/3/2024
CA101348430	CA101348430	CAMC233785	CAMC233774	SYENITE 193	ACTIVE	LODE CLAIM	9/3/2024
CA101348441	CA101348441	CAMC234465	CAMC234416	SYENITE 243	ACTIVE	LODE CLAIM	9/3/2024
CA101348457	CA101348457	CAMC215721	CAMC215721	SYENITE 186	ACTIVE	LODE CLAIM	9/3/2024
CA101348599	CA101348599	CAMC234464	CAMC234416	SYENITE 242	ACTIVE	LODE CLAIM	9/3/2024
CA101348600	CA101348600	CAMC5865	CAMC5840	SYENITE 26	ACTIVE	LODE CLAIM	9/3/2024
CA101349355	CA101349355	CAMC244739	CAMC244736	CMF 4	ACTIVE	LODE CLAIM	9/3/2024
CA101349452	CA101349452	CAMC244792	CAMC244736	CMF 57	ACTIVE	LODE CLAIM	9/3/2024
CA101349456	CA101349456	CAMC5888	CAMC5840	SYENITE 49	ACTIVE	LODE CLAIM	9/3/2024
CA101349727	CA101349727	CAMC5859	CAMC5840	SYENITE 20	ACTIVE	LODE CLAIM	9/3/2024
CA101349738	CA101349738	CAMC233774	CAMC233774	SYENITE 81A	ACTIVE	LODE CLAIM	9/3/2024
CA101349791	CA101349791	CAMC234485	CAMC234416	SYENITE 263	ACTIVE	LODE CLAIM	9/3/2024
CA101350032	CA101350032	CAMC5963	CAMC5840	SYENITE 127	ACTIVE	LODE CLAIM	9/3/2024
CA101350033	CA101350033	CAMC234445	CAMC234416	SYENITE 223	ACTIVE	LODE CLAIM	9/3/2024
CA101350037	CA101350037	CAMC5913	CAMC5840	SYENITE 74	ACTIVE	LODE CLAIM	9/3/2024
CA101350176	CA101350176	CAMC5918	CAMC5840	SYENITE 79	ACTIVE	LODE CLAIM	9/3/2024
CA101350332	CA101350332	CAMC5845	CAMC5840	SYENITE 6	ACTIVE	LODE CLAIM	9/3/2024
CA101350334	CA101350334	CAMC5914	CAMC5840	SYENITE 75	ACTIVE	LODE CLAIM	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
CA101350346	CA101350346	CAMC233784	CAMC233774	SYENITE 192	ACTIVE	LODE CLAIM	9/3/2024
CA101350372	CA101350372	CAMC51745	CAMC51692	LUCKY STRIKE NO 1	ACTIVE	LODE CLAIM	9/3/2024
CA101361815	CA101361815	CAMC244749	CAMC244736	CMF 14	ACTIVE	LODE CLAIM	9/3/2024
CA101363414	CA101363414	CAMC51747	CAMC51692	LUCKY STRIKE NO 3	ACTIVE	LODE CLAIM	9/3/2024
CA101376605	CA101376605	CAMC234467	CAMC234416	SYENITE 245	ACTIVE	LODE CLAIM	9/3/2024
CA101377544	CA101377544	CAMC244782	CAMC244736	CMF 47	ACTIVE	LODE CLAIM	9/3/2024
CA101377594	CA101377594	CAMC5998	CAMC5840	SYENITE 163	ACTIVE	LODE CLAIM	9/3/2024
CA101377597	CA101377597	CAMC5902	CAMC5840	SYENITE 63	ACTIVE	LODE CLAIM	9/3/2024
CA101377635	CA101377635	CAMC5923	CAMC5840	SYENITE 84	ACTIVE	LODE CLAIM	9/3/2024
CA101377645	CA101377645	CAMC5988	CAMC5840	SYENITE 153	ACTIVE	LODE CLAIM	9/3/2024
CA101377652	CA101377652	CAMC5938	CAMC5840	SYENITE 102	ACTIVE	LODE CLAIM	9/3/2024
CA101377660	CA101377660	CAMC177660	CAMC177640	SOUTH SYENITE 21	ACTIVE	LODE CLAIM	9/3/2024
CA101377673	CA101377673	CAMC51718	CAMC51692	BEARGRASS	ACTIVE	LODE CLAIM	9/3/2024
CA101377675	CA101377675	CAMC5887	CAMC5840	SYENITE 48	ACTIVE	LODE CLAIM	9/3/2024
CA101377679	CA101377679	CAMC234488	CAMC234416	SYENITE 266	ACTIVE	LODE CLAIM	9/3/2024
CA101378502	CA101378502	CAMC51742	CAMC51692	EARL NO 4	ACTIVE	LODE CLAIM	9/3/2024
CA101378504	CA101378504	CAMC5977	CAMC5840	SYENITE 141	ACTIVE	LODE CLAIM	9/3/2024
CA101378513	CA101378513	CAMC5948	CAMC5840	SYENITE 112	ACTIVE	LODE CLAIM	9/3/2024
CA101378559	CA101378559	CAMC244802	CAMC244736	CMF 67	ACTIVE	LODE CLAIM	9/3/2024
CA101378567	CA101378567	CAMC233779	CAMC233774	SYENITE 175A	ACTIVE	LODE CLAIM	9/3/2024
CA101378572	CA101378572	CAMC47667	CAMC47621	BAILEY 54	ACTIVE	LODE CLAIM	9/3/2024
CA101378579	CA101378579	CAMC234469	CAMC234416	SYENITE 247	ACTIVE	LODE CLAIM	9/3/2024
CA101378597	CA101378597	CAMC234425	CAMC234416	SYENITE 203	ACTIVE	LODE CLAIM	9/3/2024
CA101378615	CA101378615	CAMC234446	CAMC234416	SYENITE 224	ACTIVE	LODE CLAIM	9/3/2024
CA101379414	CA101379414	CAMC51746	CAMC51692	LUCKY STRIKE NO 2	ACTIVE	LODE CLAIM	9/3/2024
CA101379430	CA101379430	CAMC122228	CAMC122227	BRENDA	ACTIVE	LODE CLAIM	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
CA101379437	CA101379437	CAMC51696	CAMC51692	CLARK MOUNTAIN NO 14	ACTIVE	LODE CLAIM	9/3/2024
CA101379440	CA101379440	CAMC5897	CAMC5840	SYENITE 58	ACTIVE	LODE CLAIM	9/3/2024
CA101379470	CA101379470	CAMC5971	CAMC5840	SYENITE 135	ACTIVE	LODE CLAIM	9/3/2024
CA101379484	CA101379484	CAMC234427	CAMC234416	SYENITE 205	ACTIVE	LODE CLAIM	9/3/2024
CA101379500	CA101379500	CAMC5966	CAMC5840	SYENITE 130	ACTIVE	LODE CLAIM	9/3/2024
CA101379507	CA101379507	CAMC5916	CAMC5840	SYENITE 77	ACTIVE	LODE CLAIM	9/3/2024
CA101380331	CA101380331	CAMC244804	CAMC244736	CMF 69	ACTIVE	LODE CLAIM	9/3/2024
CA101380340	CA101380340	CAMC5868	CAMC5840	SYENITE 29	ACTIVE	LODE CLAIM	9/3/2024
CA101380345	CA101380345	CAMC47631	CAMC47621	BAILEY 11	ACTIVE	LODE CLAIM	9/3/2024
CA101380377	CA101380377	CAMC234448	CAMC234416	SYENITE 226	ACTIVE	LODE CLAIM	9/3/2024
CA101380394	CA101380394	CAMC5870	CAMC5840	SYENITE 31	ACTIVE	LODE CLAIM	9/3/2024
CA101451263	CA101451263	CAMC5962	CAMC5840	SYENITE 126	ACTIVE	LODE CLAIM	9/3/2024
CA101451444	CA101451444	CAMC16267	CAMC16264	MINERAL HILL NO 4	ACTIVE	LODE CLAIM	9/3/2024
CA101451505	CA101451505	CAMC47630	CAMC47621	BAILEY 10	ACTIVE	LODE CLAIM	9/3/2024
CA101451561	CA101451561	CAMC244747	CAMC244736	CMF 12	ACTIVE	LODE CLAIM	9/3/2024
CA101451562	CA101451562	CAMC233781	CAMC233774	SYENITE 183A	ACTIVE	LODE CLAIM	9/3/2024
CA101451565	CA101451565	CAMC47653	CAMC47621	BAILEY 33	ACTIVE	LODE CLAIM	9/3/2024
CA101451818	CA101451818	CAMC5986	CAMC5840	SYENITE 151	ACTIVE	LODE CLAIM	9/3/2024
CA101451875	CA101451875	CAMC177688	CAMC177640	SOUTH SYENITE 49	ACTIVE	LODE CLAIM	9/3/2024
CA101451919	CA101451919	CAMC16268	CAMC16264	MINERAL HILL NO 5	ACTIVE	LODE CLAIM	9/3/2024
CA101451930	CA101451930	CAMC177656	CAMC177640	SOUTH SYENITE 17	ACTIVE	LODE CLAIM	9/3/2024
CA101452024	CA101452024	CAMC5936	CAMC5840	SYENITE 100	ACTIVE	LODE CLAIM	9/3/2024
CA101452113	CA101452113	CAMC234471	CAMC234416	SYENITE 249	ACTIVE	LODE CLAIM	9/3/2024
CA101452187	CA101452187	CAMC234492	CAMC234416	SYENITE 270	ACTIVE	LODE CLAIM	9/3/2024
CA101452286	CA101452286	CAMC247590	CAMC247586	CMF 74	ACTIVE	LODE CLAIM	9/3/2024
CA101452294	CA101452294	CAMC5956	CAMC5840	SYENITE 120	ACTIVE	LODE	9/3/2024

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						CLAIM	
CA101452296	CA101452296	CAMC101868	CAMC101865	SYENITE #180	ACTIVE	LODE CLAIM	9/3/2024
CA101452298	CA101452298	CAMC234440	CAMC234416	SYENITE 218	ACTIVE	LODE CLAIM	9/3/2024
CA101452383	CA101452383	CAMC5906	CAMC5840	SYENITE 67	ACTIVE	LODE CLAIM	9/3/2024
CA101452386	CA101452386	CAMC177646	CAMC177640	SOUTH SYENITE 7	ACTIVE	LODE CLAIM	9/3/2024
CA101452482	CA101452482	CAMC5850	CAMC5840	SYENITE 11	ACTIVE	LODE CLAIM	9/3/2024
CA101452487	CA101452487	CAMC177677	CAMC177640	SOUTH SYENITE 38	ACTIVE	LODE CLAIM	9/3/2024
CA101452551	CA101452551	CAMC234419	CAMC234416	SYENITE 197	ACTIVE	LODE CLAIM	9/3/2024
CA101452666	CA101452666	CAMC244778	CAMC244736	CMF 43	ACTIVE	LODE CLAIM	9/3/2024
CA101452669	CA101452669	CAMC120581	CAMC120576	DESERT POPPY 5	ACTIVE	LODE CLAIM	9/3/2024
CA101452805	CA101452805	CAMC5853	CAMC5840	SYENITE 14	ACTIVE	LODE CLAIM	9/3/2024
CA101452888	CA101452888	CAMC47670	CAMC47621	BAILEY 57	ACTIVE	LODE CLAIM	9/3/2024
CA101453075	CA101453075	CAMC177690	CAMC177640	SOUTH SYENITE 51	ACTIVE	LODE CLAIM	9/3/2024
CA101453197	CA101453197	CAMC47622	CAMC47621	BAILEY 2	ACTIVE	LODE CLAIM	9/3/2024
CA101453367	CA101453367	CAMC201790	CAMC201787	SYENITE 94	ACTIVE	LODE CLAIM	9/3/2024
CA101453393	CA101453393	CAMC47655	CAMC47621	BAILEY 35	ACTIVE	LODE CLAIM	9/3/2024
CA101453396	CA101453396	CAMC234450	CAMC234416	SYENITE 228	ACTIVE	LODE CLAIM	9/3/2024
CA101453397	CA101453397	CAMC5864	CAMC5840	SYENITE 25	ACTIVE	LODE CLAIM	9/3/2024
CA101453491	CA101453491	CAMC47646	CAMC47621	BAILEY 26	ACTIVE	LODE CLAIM	9/3/2024
CA101453494	CA101453494	CAMC177651	CAMC177640	SOUTH SYENITE 12	ACTIVE	LODE CLAIM	9/3/2024
CA101453588	CA101453588	CAMC177672	CAMC177640	SOUTH SYENITE 33	ACTIVE	LODE CLAIM	9/3/2024
CA101453770	CA101453770	CAMC234478	CAMC234416	SYENITE 256	ACTIVE	LODE CLAIM	9/3/2024
CA101453886	CA101453886	CAMC177667	CAMC177640	SOUTH SYENITE 28	ACTIVE	LODE CLAIM	9/3/2024
CA101454110	CA101454110	CAMC234461	CAMC234416	SYENITE 239	ACTIVE	LODE CLAIM	9/3/2024
CA101454113	CA101454113	CAMC5877	CAMC5840	SYENITE 38	ACTIVE	LODE CLAIM	9/3/2024
CA101454190	CA101454190	CAMC234482	CAMC234416	SYENITE 260	ACTIVE	LODE CLAIM	9/3/2024
CA101454389	CA101454389	CAMC234481	CAMC234416	SYENITE 259	ACTIVE	LODE	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
						CLAIM	
CA101454544	CA101454544	CAMC5857	CAMC5840	SYENITE 18	ACTIVE	LODE CLAIM	9/3/2024
CA101454626	CA101454626	CAMC244788	CAMC244736	CMF 53	ACTIVE	LODE CLAIM	9/3/2024
CA101454670	CA101454670	CAMC244783	CAMC244736	CMF 48	ACTIVE	LODE CLAIM	9/3/2024
CA101454798	CA101454798	CAMC234418	CAMC234416	SYENITE 196	ACTIVE	LODE CLAIM	9/3/2024
CA101454900	CA101454900	CAMC177655	CAMC177640	SOUTH SYENITE 16	ACTIVE	LODE CLAIM	9/3/2024
CA101454909	CA101454909	CAMC47662	CAMC47621	BAILEY 42	ACTIVE	LODE CLAIM	9/3/2024
CA101455024	CA101455024	CAMC234460	CAMC234416	SYENITE 238	ACTIVE	LODE CLAIM	9/3/2024
CA101455025	CA101455025	CAMC16269	CAMC16264	MINERAL HILL NO 6	ACTIVE	LODE CLAIM	9/3/2024
CA101455032	CA101455032	CAMC177666	CAMC177640	SOUTH SYENITE 27	ACTIVE	LODE CLAIM	9/3/2024
CA101455092	CA101455092	CAMC177687	CAMC177640	SOUTH SYENITE 48	ACTIVE	LODE CLAIM	9/3/2024
CA101455309	CA101455309	CAMC120577	CAMC120576	DESERT POPPY 1	ACTIVE	LODE CLAIM	9/3/2024
CA101455314	CA101455314	CAMC234457	CAMC234416	SYENITE 235	ACTIVE	LODE CLAIM	9/3/2024
CA101455398	CA101455398	CAMC245122	CAMC245118	SOUTH SYENITE 111	ACTIVE	LODE CLAIM	9/3/2024
CA101455399	CA101455399	CAMC244741	CAMC244736	CMF 6	ACTIVE	LODE CLAIM	9/3/2024
CA101455462	CA101455462	CAMC247586	CAMC247586	CMF 70	ACTIVE	LODE CLAIM	9/3/2024
CA101455615	CA101455615	CAMC5933	CAMC5840	SYENITE 97	ACTIVE	LODE CLAIM	9/3/2024
CA101455694	CA101455694	CAMC51702	CAMC51692	CLARK MOUNTAIN NO 20	ACTIVE	LODE CLAIM	9/3/2024
CA101455700	CA101455700	CAMC234470	CAMC234416	SYENITE 248	ACTIVE	LODE CLAIM	9/3/2024
CA101456043	CA101456043	CAMC47654	CAMC47621	BAILEY 34	ACTIVE	LODE CLAIM	9/3/2024
CA101456046	CA101456046	CAMC5874	CAMC5840	SYENITE 35	ACTIVE	LODE CLAIM	9/3/2024
CA101456249	CA101456249	CAMC17400	CAMC17399	SYENITE 191	ACTIVE	LODE CLAIM	9/3/2024
CA101456456	CA101456456	CAMC234436	CAMC234416	SYENITE 214	ACTIVE	LODE CLAIM	9/3/2024
CA101456846	CA101456846	CAMC177676	CAMC177640	SOUTH SYENITE 37	ACTIVE	LODE CLAIM	9/3/2024
CA101456915	CA101456915	CAMC101867	CAMC101865	SYENITE #179	ACTIVE	LODE CLAIM	9/3/2024
CA101456921	CA101456921	CAMC177645	CAMC177640	SOUTH SYENITE 6	ACTIVE	LODE CLAIM	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
CA101457204	CA101457204	CAMC5912	CAMC5840	SYENITE 73	ACTIVE	LODE CLAIM	9/3/2024
CA101457207	CA101457207	CAMC51740	CAMC51692	EARL NO 2	ACTIVE	LODE CLAIM	9/3/2024
CA101457536	CA101457536	CAMC245127	CAMC245118	SOUTH SYENITE 116	ACTIVE	LODE CLAIM	9/3/2024
CA101457538	CA101457538	CAMC233780	CAMC233774	SYENITE 176A	ACTIVE	LODE CLAIM	9/3/2024
CA101457664	CA101457664	CAMC244794	CAMC244736	CMF 59	ACTIVE	LODE CLAIM	9/3/2024
CA101457670	CA101457670	CAMC5972	CAMC5840	SYENITE 136	ACTIVE	LODE CLAIM	9/3/2024
CA101457705	CA101457705	CAMC47640	CAMC47621	BAILEY 20	ACTIVE	LODE CLAIM	9/3/2024
CA101457706	CA101457706	CAMC234491	CAMC234416	SYENITE 269	ACTIVE	LODE CLAIM	9/3/2024
CA101457805	CA101457805	CAMC244762	CAMC244736	CMF 27	ACTIVE	LODE CLAIM	9/3/2024
CA101457860	CA101457860	CAMC5878	CAMC5840	SYENITE 39	ACTIVE	LODE CLAIM	9/3/2024
CA101457865	CA101457865	CAMC177700	CAMC177640	SOUTH SYENITE 61	ACTIVE	LODE CLAIM	9/3/2024
CA101457866	CA101457866	CAMC244777	CAMC244736	CMF 42	ACTIVE	LODE CLAIM	9/3/2024
CA101457869	CA101457869	CAMC120580	CAMC120576	DESERT POPPY 4	ACTIVE	LODE CLAIM	9/3/2024
CA101457872	CA101457872	CAMC47656	CAMC47621	BAILEY 36	ACTIVE	LODE CLAIM	9/3/2024
CA101457920	CA101457920	CAMC47625	CAMC47621	BAILEY 5	ACTIVE	LODE CLAIM	9/3/2024
CA101458121	CA101458121	CAMC5983	CAMC5840	SYENITE 147	ACTIVE	LODE CLAIM	9/3/2024
CA101458461	CA101458461	CAMC5953	CAMC5840	SYENITE 117	ACTIVE	LODE CLAIM	9/3/2024
CA101458647	CA101458647	CAMC47623	CAMC47621	BAILEY 3	ACTIVE	LODE CLAIM	9/3/2024
CA101458882	CA101458882	CAMC244752	CAMC244736	CMF 17	ACTIVE	LODE CLAIM	9/3/2024
CA101458961	CA101458961	CAMC5903	CAMC5840	SYENITE 64	ACTIVE	LODE CLAIM	9/3/2024
CA101459245	CA101459245	CAMC120583	CAMC120576	DESERT POPPY 7	ACTIVE	LODE CLAIM	9/3/2024
CA101459247	CA101459247	CAMC234442	CAMC234416	SYENITE 220	ACTIVE	LODE CLAIM	9/3/2024
CA101459250	CA101459250	CAMC5979	CAMC5840	SYENITE 143	ACTIVE	LODE CLAIM	9/3/2024
CA101459515	CA101459515	CAMC47652	CAMC47621	BAILEY 32	ACTIVE	LODE CLAIM	9/3/2024
CA101459952	CA101459952	CAMC47660	CAMC47621	BAILEY 40	ACTIVE	LODE CLAIM	9/3/2024
CA101459977	CA101459977	CAMC177657	CAMC177640	SOUTH SYENITE 18	ACTIVE	LODE CLAIM	9/3/2024

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CA101459983	CA101459983	CAMC234472	CAMC234416	SYENITE 250	ACTIVE	LODE CLAIM	9/3/2024
CA101460015	CA101460015	CAMC101869	CAMC101865	SYENITE #181	ACTIVE	LODE CLAIM	9/3/2024
CA101460035	CA101460035	CAMC234430	CAMC234416	SYENITE 208	ACTIVE	LODE CLAIM	9/3/2024
CA101460133	CA101460133	CAMC5976	CAMC5840	SYENITE 140	ACTIVE	LODE CLAIM	9/3/2024
CA101460369	CA101460369	CAMC51719	CAMC51692	BIRTHDAY NO 1	ACTIVE	LODE CLAIM	9/3/2024
CA101477207	CA101477207	CAMC5907	CAMC5840	SYENITE 68	ACTIVE	LODE CLAIM	9/3/2024
CA101477346	CA101477346	CAMC5990	CAMC5840	SYENITE 155	ACTIVE	LODE CLAIM	9/3/2024
CA101477352	CA101477352	CAMC47664	CAMC47621	BAILEY 51	ACTIVE	LODE CLAIM	9/3/2024
CA101477429	CA101477429	CAMC234438	CAMC234416	SYENITE 216	ACTIVE	LODE CLAIM	9/3/2024
CA101477431	CA101477431	CAMC5882	CAMC5840	SYENITE 43	ACTIVE	LODE CLAIM	9/3/2024
CA101477536	CA101477536	CAMC177675	CAMC177640	SOUTH SYENITE 36	ACTIVE	LODE CLAIM	9/3/2024
CA101477544	CA101477544	CAMC5940	CAMC5840	SYENITE 104	ACTIVE	LODE CLAIM	9/3/2024
CA101477546	CA101477546	CAMC5879	CAMC5840	SYENITE 40	ACTIVE	LODE CLAIM	9/3/2024
CA101477592	CA101477592	CAMC51704	CAMC51692	CLARK MOUNTAIN NO 22	ACTIVE	LODE CLAIM	9/3/2024
CA101477595	CA101477595	CAMC234490	CAMC234416	SYENITE 268	ACTIVE	LODE CLAIM	9/3/2024
CA101477618	CA101477618	CAMC244796	CAMC244736	CMF 61	ACTIVE	LODE CLAIM	9/3/2024
CA101477651	CA101477651	CAMC120579	CAMC120576	DESERT POPPY 3	ACTIVE	LODE CLAIM	9/3/2024
CA101477720	CA101477720	CAMC47674	CAMC47621	BAILEY 63	ACTIVE	LODE CLAIM	9/3/2024
CA101477723	CA101477723	CAMC5941	CAMC5840	SYENITE 105	ACTIVE	LODE CLAIM	9/3/2024
CA101477724	CA101477724	CAMC47629	CAMC47621	BAILEY 9	ACTIVE	LODE CLAIM	9/3/2024
CA101477742	CA101477742	CAMC213565	CAMC213564	EAST SYENITE #1	ACTIVE	LODE CLAIM	9/3/2024
CA101477745	CA101477745	CAMC47671	CAMC47621	BAILEY 58	ACTIVE	LODE CLAIM	9/3/2024
CA101477750	CA101477750	CAMC101866	CAMC101865	SYENITE #178	ACTIVE	LODE CLAIM	9/3/2024
CA101477751	CA101477751	CAMC47626	CAMC47621	BAILEY 6	ACTIVE	LODE CLAIM	9/3/2024
CA101477783	CA101477783	CAMC244754	CAMC244736	CMF 19	ACTIVE	LODE CLAIM	9/3/2024
CA101477991	CA101477991	CAMC51721	CAMC51692	BIRTHDAY	ACTIVE	LODE	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
				NO 6		CLAIM	
CA101478201	CA101478201	CAMC47628	CAMC47621	BAILEY 8	ACTIVE	LODE CLAIM	9/3/2024
CA101478210	CA101478210	CAMC5928	CAMC5840	SYENITE 89	ACTIVE	LODE CLAIM	9/3/2024
CA101478745	CA101478745	CAMC244785	CAMC244736	CMF 50	ACTIVE	LODE CLAIM	9/3/2024
CA101478981	CA101478981	CAMC244776	CAMC244736	CMF 41	ACTIVE	LODE CLAIM	9/3/2024
CA101479076	CA101479076	CAMC5991	CAMC5840	SYENITE 156	ACTIVE	LODE CLAIM	9/3/2024
CA101479330	CA101479330	CAMC244764	CAMC244736	CMF 29	ACTIVE	LODE CLAIM	9/3/2024
CA101479333	CA101479333	CAMC233828	CAMC233827	SYENITE 190A	ACTIVE	LODE CLAIM	9/3/2024
CA101479409	CA101479409	CAMC47624	CAMC47621	BAILEY 4	ACTIVE	LODE CLAIM	9/3/2024
CA101479601	CA101479601	CAMC5848	CAMC5840	SYENITE 9	ACTIVE	LODE CLAIM	9/3/2024
CA101479717	CA101479717	CAMC5852	CAMC5840	SYENITE 13	ACTIVE	LODE CLAIM	9/3/2024
CA101479722	CA101479722	CAMC234459	CAMC234416	SYENITE 237	ACTIVE	LODE CLAIM	9/3/2024
CA101479724	CA101479724	CAMC177701	CAMC177640	SOUTH SYENITE 62	ACTIVE	LODE CLAIM	9/3/2024
CA101480382	CA101480382	CAMC177644	CAMC177640	SOUTH SYENITE 5	ACTIVE	LODE CLAIM	9/3/2024
CA101480388	CA101480388	CAMC5960	CAMC5840	SYENITE 124	ACTIVE	LODE CLAIM	9/3/2024
CA101490538	CA101490538	CAMC234441	CAMC234416	SYENITE 219	ACTIVE	LODE CLAIM	9/3/2024
CA101490641	CA101490641	CAMC244766	CAMC244736	CMF 31	ACTIVE	LODE CLAIM	9/3/2024
CA101490698	CA101490698	CAMC5890	CAMC5840	SYENITE 51	ACTIVE	LODE CLAIM	9/3/2024
CA101490847	CA101490847	CAMC234421	CAMC234416	SYENITE 199	ACTIVE	LODE CLAIM	9/3/2024
CA101490931	CA101490931	CAMC245118	CAMC245118	SOUTH SYENITE 107	ACTIVE	LODE CLAIM	9/3/2024
CA101490936	CA101490936	CAMC5985	CAMC5840	SYENITE 150	ACTIVE	LODE CLAIM	9/3/2024
CA101490995	CA101490995	CAMC244772	CAMC244736	CMF 37	ACTIVE	LODE CLAIM	9/3/2024
CA101491028	CA101491028	CAMC234483	CAMC234416	SYENITE 261	ACTIVE	LODE CLAIM	9/3/2024
CA101491174	CA101491174	CAMC215723	CAMC215721	SYENITE 188	ACTIVE	LODE CLAIM	9/3/2024
CA101491177	CA101491177	CAMC47647	CAMC47621	BAILEY 27	ACTIVE	LODE CLAIM	9/3/2024
CA101491192	CA101491192	CAMC5860	CAMC5840	SYENITE 21	ACTIVE	LODE CLAIM	9/3/2024
CA101491203	CA101491203	CAMC177669	CAMC177640	SOUTH	ACTIVE	LODE	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
				SYENITE 30		CLAIM	
CA101491436	CA101491436	CAMC16264	CAMC16264	MINERAL HILL NO 1	ACTIVE	LODE CLAIM	9/3/2024
CA101491526	CA101491526	CAMC177668	CAMC177640	SOUTH SYENITE 29	ACTIVE	LODE CLAIM	9/3/2024
CA101491667	CA101491667	CAMC5867	CAMC5840	SYENITE 28	ACTIVE	LODE CLAIM	9/3/2024
CA101491670	CA101491670	CAMC47621	CAMC47621	BAILEY 1	ACTIVE	LODE CLAIM	9/3/2024
CA101491677	CA101491677	CAMC177661	CAMC177640	SOUTH SYENITE 22	ACTIVE	LODE CLAIM	9/3/2024
CA101491831	CA101491831	CAMC177679	CAMC177640	SOUTH SYENITE 40	ACTIVE	LODE CLAIM	9/3/2024
CA101492424	CA101492424	CAMC5969	CAMC5840	SYENITE 133	ACTIVE	LODE CLAIM	9/3/2024
CA101492565	CA101492565	CAMC234462	CAMC234416	SYENITE 240	ACTIVE	LODE CLAIM	9/3/2024
CA101492678	CA101492678	CAMC5932	CAMC5840	SYENITE 96	ACTIVE	LODE CLAIM	9/3/2024
CA101492687	CA101492687	CAMC234451	CAMC234416	SYENITE 229	ACTIVE	LODE CLAIM	9/3/2024
CA101492722	CA101492722	CAMC5898	CAMC5840	SYENITE 59	ACTIVE	LODE CLAIM	9/3/2024
CA101492902	CA101492902	CAMC5996	CAMC5840	SYENITE 161	ACTIVE	LODE CLAIM	9/3/2024
CA101493072	CA101493072	CAMC234452	CAMC234416	SYENITE 230	ACTIVE	LODE CLAIM	9/3/2024
CA101493120	CA101493120	CAMC5893	CAMC5840	SYENITE 54	ACTIVE	LODE CLAIM	9/3/2024
CA101493145	CA101493145	CAMC16266	CAMC16264	MINERAL HILL NO 3	ACTIVE	LODE CLAIM	9/3/2024
CA101493146	CA101493146	CAMC6001	CAMC5840	SYENITE 166	FILED	LODE CLAIM	9/3/2024
CA101493154	CA101493154	CAMC5843	CAMC5840	SYENITE 4	ACTIVE	LODE CLAIM	9/3/2024
CA101493212	CA101493212	CAMC5922	CAMC5840	SYENITE 83	ACTIVE	LODE CLAIM	9/3/2024
CA101493216	CA101493216	CAMC177699	CAMC177640	SOUTH SYENITE 60	ACTIVE	LODE CLAIM	9/3/2024
CA101493241	CA101493241	CAMC244789	CAMC244736	CMF 54	ACTIVE	LODE CLAIM	9/3/2024
CA101493406	CA101493406	CAMC5896	CAMC5840	SYENITE 57	ACTIVE	LODE CLAIM	9/3/2024
CA101493425	CA101493425	CAMC234473	CAMC234416	SYENITE 251	ACTIVE	LODE CLAIM	9/3/2024
CA101493430	CA101493430	CAMC5846	CAMC5840	SYENITE 7	ACTIVE	LODE CLAIM	9/3/2024
CA101493730	CA101493730	CAMC51749	CAMC51692	LUCKY STRIKE NO 5	ACTIVE	LODE CLAIM	9/3/2024
CA101493733	CA101493733	CAMC5863	CAMC5840	SYENITE 24	ACTIVE	LODE CLAIM	9/3/2024
CA101493736	CA101493736	CAMC177689	CAMC177640	SOUTH	ACTIVE	LODE	9/3/2024

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				SYENITE 50		CLAIM	
CA101493744	CA101493744	CAMC234420	CAMC234416	SYENITE 198	ACTIVE	LODE CLAIM	9/3/2024
CA101493750	CA101493750	CAMC16265	CAMC16264	MINERAL HILL NO 2	ACTIVE	LODE CLAIM	9/3/2024
CA101493760	CA101493760	CAMC234493	CAMC234416	SYENITE 271	ACTIVE	LODE CLAIM	9/3/2024
CA101493764	CA101493764	CAMC177678	CAMC177640	SOUTH SYENITE 39	ACTIVE	LODE CLAIM	9/3/2024
CA101494022	CA101494022	CAMC177658	CAMC177640	SOUTH SYENITE 19	ACTIVE	LODE CLAIM	9/3/2024
CA101494024	CA101494024	CAMC5919	CAMC5840	SYENITE 80	ACTIVE	LODE CLAIM	9/3/2024
CA101494125	CA101494125	CAMC234477	CAMC234416	SYENITE 255	ACTIVE	LODE CLAIM	9/3/2024
CA101494154	CA101494154	CAMC5946	CAMC5840	SYENITE 110	ACTIVE	LODE CLAIM	9/3/2024
CA101495479	CA101495479	CAMC244768	CAMC244736	CMF 33	ACTIVE	LODE CLAIM	9/3/2024
CA101496241	CA101496241	CAMC5866	CAMC5840	SYENITE 27	ACTIVE	LODE CLAIM	9/3/2024
CA101496271	CA101496271	CAMC177648	CAMC177640	SOUTH SYENITE 9	ACTIVE	LODE CLAIM	9/3/2024
CA101496338	CA101496338	CAMC47648	CAMC47621	BAILEY 28	ACTIVE	LODE CLAIM	9/3/2024
CA101496343	CA101496343	CAMC177671	CAMC177640	SOUTH SYENITE 32	ACTIVE	LODE CLAIM	9/3/2024
CA101496578	CA101496578	CAMC177647	CAMC177640	SOUTH SYENITE 8	ACTIVE	LODE CLAIM	9/3/2024
CA101496580	CA101496580	CAMC244779	CAMC244736	CMF 44	ACTIVE	LODE CLAIM	9/3/2024
CA101496583	CA101496583	CAMC120582	CAMC120576	DESERT POPPY 6	ACTIVE	LODE CLAIM	9/3/2024
CA101496892	CA101496892	CAMC234431	CAMC234416	SYENITE 209	ACTIVE	LODE CLAIM	9/3/2024
CA101496894	CA101496894	CAMC5925	CAMC5840	SYENITE 86	ACTIVE	LODE CLAIM	9/3/2024
CA101497039	CA101497039	CAMC233782	CAMC233774	SYENITE 184A	ACTIVE	LODE CLAIM	9/3/2024
CA101497041	CA101497041	CAMC47651	CAMC47621	BAILEY 31	ACTIVE	LODE CLAIM	9/3/2024
CA101497524	CA101497524	CAMC5935	CAMC5840	SYENITE 99	ACTIVE	LODE CLAIM	9/3/2024
CA101497746	CA101497746	CAMC244737	CAMC244736	CMF 2	ACTIVE	LODE CLAIM	9/3/2024
CA101498009	CA101498009	CAMC244793	CAMC244736	CMF 58	ACTIVE	LODE CLAIM	9/3/2024
CA101498219	CA101498219	CAMC234435	CAMC234416	SYENITE 213	ACTIVE	LODE CLAIM	9/3/2024
CA101498832	CA101498832	CAMC5854	CAMC5840	SYENITE 15	ACTIVE	LODE CLAIM	9/3/2024
CA101526286	CA101526286	CAMC234456	CAMC234416	SYENITE 234	ACTIVE	LODE	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
						CLAIM	
CA101540601	CA101540601	CAMC245124	CAMC245118	SOUTH SYENITE 113	ACTIVE	LODE CLAIM	9/3/2024
CA101540603	CA101540603	CAMC244743	CAMC244736	CMF 8	ACTIVE	LODE CLAIM	9/3/2024
CA101540721	CA101540721	CAMC234479	CAMC234416	SYENITE 257	ACTIVE	LODE CLAIM	9/3/2024
CA101540725	CA101540725	CAMC5856	CAMC5840	SYENITE 17	ACTIVE	LODE CLAIM	9/3/2024
CA101540729	CA101540729	CAMC5929	CAMC5840	SYENITE 189	ACTIVE	LODE CLAIM	9/3/2024
CA101540861	CA101540861	CAMC244784	CAMC244736	CMF 49	ACTIVE	LODE CLAIM	9/3/2024
CA101542063	CA101542063	CAMC47643	CAMC47621	BAILEY 23	ACTIVE	LODE CLAIM	9/3/2024
CA101542115	CA101542115	CAMC245125	CAMC245118	SOUTH SYENITE 114	ACTIVE	LODE CLAIM	9/3/2024
CA101542123	CA101542123	CAMC51706	CAMC51692	CLARK MOUNTAIN NO 24	ACTIVE	LODE CLAIM	9/3/2024
CA101542169	CA101542169	CAMC47644	CAMC47621	BAILEY 24	ACTIVE	LODE CLAIM	9/3/2024
CA101542206	CA101542206	CAMC234458	CAMC234416	SYENITE 236	ACTIVE	LODE CLAIM	9/3/2024
CA101542264	CA101542264	CAMC177643	CAMC177640	SOUTH SYENITE 4	ACTIVE	LODE CLAIM	9/3/2024
CA101543402	CA101543402	CAMC201791	CAMC201787	SYENITE 95	ACTIVE	LODE CLAIM	9/3/2024
CA101543403	CA101543403	CAMC177673	CAMC177640	SOUTH SYENITE 34	ACTIVE	LODE CLAIM	9/3/2024
CA101543429	CA101543429	CAMC47676	CAMC47621	BAILEY 65	ACTIVE	LODE CLAIM	9/3/2024
CA101543539	CA101543539	CAMC5975	CAMC5840	SYENITE 139	ACTIVE	LODE CLAIM	9/3/2024
CA101543575	CA101543575	CAMC244753	CAMC244736	CMF 18	ACTIVE	LODE CLAIM	9/3/2024
CA101544613	CA101544613	CAMC177663	CAMC177640	SOUTH SYENITE 24	ACTIVE	LODE CLAIM	9/3/2024
CA101544615	CA101544615	CAMC5961	CAMC5840	SYENITE 125	ACTIVE	LODE CLAIM	9/3/2024
CA101544667	CA101544667	CAMC5885	CAMC5840	SYENITE 46	ACTIVE	LODE CLAIM	9/3/2024
CA101544668	CA101544668	CAMC5954	CAMC5840	SYENITE 118	ACTIVE	LODE CLAIM	9/3/2024
CA101544694	CA101544694	CAMC244786	CAMC244736	CMF 51	ACTIVE	LODE CLAIM	9/3/2024
CA101544955	CA101544955	CAMC234416	CAMC234416	SYENITE 194	ACTIVE	LODE CLAIM	9/3/2024
CA101545807	CA101545807	CAMC5911	CAMC5840	SYENITE 72	ACTIVE	LODE CLAIM	9/3/2024
CA101547304	CA101547304	CAMC244755	CAMC244736	CMF 20	ACTIVE	LODE CLAIM	9/3/2024

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CA101547435	CA101547435	CAMC177642	CAMC177640	SOUTH SYENITE 3	ACTIVE	LODE CLAIM	9/3/2024
CA101547436	CA101547436	CAMC244774	CAMC244736	CMF 39	ACTIVE	LODE CLAIM	9/3/2024
CA101547625	CA101547625	CAMC245123	CAMC245118	SOUTH SYENITE 112	ACTIVE	LODE CLAIM	9/3/2024
CA101548828	CA101548828	CAMC177653	CAMC177640	SOUTH SYENITE 14	ACTIVE	LODE CLAIM	9/3/2024
CA101548940	CA101548940	CAMC5883	CAMC5840	SYENITE 44	ACTIVE	LODE CLAIM	9/3/2024
CA101550011	CA101550011	CAMC177670	CAMC177640	SOUTH SYENITE 31	ACTIVE	LODE CLAIM	9/3/2024
CA101550031	CA101550031	CAMC5904	CAMC5840	SYENITE 65	ACTIVE	LODE CLAIM	9/3/2024
CA101550111	CA101550111	CAMC5965	CAMC5840	SYENITE 129	ACTIVE	LODE CLAIM	9/3/2024
CA101600612	CA101600612	CAMC244787	CAMC244736	CMF 52	ACTIVE	LODE CLAIM	9/3/2024
CA101600620	CA101600620	CAMC47657	CAMC47621	BAILEY 37	ACTIVE	LODE CLAIM	9/3/2024
CA101600722	CA101600722	CAMC234480	CAMC234416	SYENITE 258	ACTIVE	LODE CLAIM	9/3/2024
CA101600728	CA101600728	CAMC47632	CAMC47621	BAILEY 12	ACTIVE	LODE CLAIM	9/3/2024
CA101600768	CA101600768	CAMC5970	CAMC5840	SYENITE 134	ACTIVE	LODE CLAIM	9/3/2024
CA101600771	CA101600771	CAMC5881	CAMC5840	SYENITE 42	ACTIVE	LODE CLAIM	9/3/2024
CA101600946	CA101600946	CAMC47636	CAMC47621	BAILEY 16	ACTIVE	LODE CLAIM	9/3/2024
CA101601067	CA101601067	CAMC5957	CAMC5840	SYENITE 121	ACTIVE	LODE CLAIM	9/3/2024
CA101601216	CA101601216	CAMC47642	CAMC47621	BAILEY 22	ACTIVE	LODE CLAIM	9/3/2024
CA101601219	CA101601219	CAMC247588	CAMC247586	CMF 72	ACTIVE	LODE CLAIM	9/3/2024
CA101601292	CA101601292	CAMC177686	CAMC177640	SOUTH SYENITE 47	ACTIVE	LODE CLAIM	9/3/2024
CA101601378	CA101601378	CAMC234417	CAMC234416	SYENITE 195	ACTIVE	LODE CLAIM	9/3/2024
CA101601601	CA101601601	CAMC245126	CAMC245118	SOUTH SYENITE 115	ACTIVE	LODE CLAIM	9/3/2024
CA101601603	CA101601603	CAMC244745	CAMC244736	CMF 10	ACTIVE	LODE CLAIM	9/3/2024
CA101601835	CA101601835	CAMC5937	CAMC5840	SYENITE 101	ACTIVE	LODE CLAIM	9/3/2024
CA101601873	CA101601873	CAMC244756	CAMC244736	CMF 21	ACTIVE	LODE CLAIM	9/3/2024
CA101601922	CA101601922	CAMC47673	CAMC47621	BAILEY 62	ACTIVE	LODE CLAIM	9/3/2024
CA101602001	CA101602001	CAMC5927	CAMC5840	SYENITE 88	ACTIVE	LODE CLAIM	9/3/2024

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Serial Number	Lead File Number	Legacy Serial Number	Legacy Lead File Number	Claim Name	Case Disposition	Claim Type	Next Payment Due Date
CA101602004	CA101602004	CAMC177665	CAMC177640	SOUTH SYENITE 26	ACTIVE	LODE CLAIM	9/3/2024
CA101602121	CA101602121	CAMC177654	CAMC177640	SOUTH SYENITE 15	ACTIVE	LODE CLAIM	9/3/2024
CA101603434	CA101603434	CAMC215722	CAMC215721	SYENITE 187	ACTIVE	LODE CLAIM	9/3/2024
CA101603492	CA101603492	CAMC51741	CAMC51692	EARL NO 3	ACTIVE	LODE CLAIM	9/3/2024
CA101606407	CA101606407	CAMC5943	CAMC5840	SYENITE 107	ACTIVE	LODE CLAIM	9/3/2024
CA101606408	CA101606408	CAMC47649	CAMC47621	BAILEY 29	ACTIVE	LODE CLAIM	9/3/2024
CA101609046	CA101609046	CAMC5973	CAMC5840	SYENITE 137	ACTIVE	LODE CLAIM	9/3/2024
CA101609679	CA101609679	CAMC234476	CAMC234416	SYENITE 254	ACTIVE	LODE CLAIM	9/3/2024
CA101610219	CA101610219	CAMC5993	CAMC5840	SYENITE 158	ACTIVE	LODE CLAIM	9/3/2024
CA101730629	CA101730629	CAMC244751	CAMC244736	CMF 16	ACTIVE	LODE CLAIM	9/3/2024
CA101751224	CA101751224	CAMC5984	CAMC5840	SYENITE 149	ACTIVE	LODE CLAIM	9/3/2024
CA101751226	CA101751226	CAMC5899	CAMC5840	SYENITE 60	ACTIVE	LODE CLAIM	9/3/2024
CA101751235	CA101751235	CAMC5849	CAMC5840	SYENITE 10	ACTIVE	LODE CLAIM	9/3/2024
CA101751261	CA101751261	CAMC47675	CAMC47621	BAILEY 64	ACTIVE	LODE CLAIM	9/3/2024
CA101751510	CA101751510	CAMC47641	CAMC47621	BAILEY 21	ACTIVE	LODE CLAIM	9/3/2024
CA101751521	CA101751521	CAMC47634	CAMC47621	BAILEY 14	ACTIVE	LODE CLAIM	9/3/2024
CA101751627	CA101751627	CAMC177662	CAMC177640	SOUTH SYENITE 23	ACTIVE	LODE CLAIM	9/3/2024
CA101752643	CA101752643	CAMC47668	CAMC47621	BAILEY 55	ACTIVE	LODE CLAIM	9/3/2024
CA101754007	CA101754007	CAMC5886	CAMC5840	SYENITE 47	ACTIVE	LODE CLAIM	9/3/2024
CA101754010	CA101754010	CAMC5959	CAMC5840	SYENITE 123	ACTIVE	LODE CLAIM	9/3/2024
CA101754125	CA101754125	CAMC47666	CAMC47621	BAILEY 53	ACTIVE	LODE CLAIM	9/3/2024
CA101754177	CA101754177	CAMC234437	CAMC234416	SYENITE 215	ACTIVE	LODE CLAIM	9/3/2024
CA101755423	CA101755423	CAMC5855	CAMC5840	SYENITE 16	ACTIVE	LODE CLAIM	9/3/2024
CA101755425	CA101755425	CAMC5924	CAMC5840	SYENITE 85	ACTIVE	LODE CLAIM	9/3/2024
CA101755430	CA101755430	CAMC177745	CAMC177640	SOUTH SYENITE 106	ACTIVE	LODE CLAIM	9/3/2024
CA101755495	CA101755495	CAMC244795	CAMC244736	CMF 60	ACTIVE	LODE CLAIM	9/3/2024

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CA101755519	CA101755519	CAMC247587	CAMC247586	CMF 71	ACTIVE	LODE CLAIM	9/3/2024
CA101756663	CA101756663	CAMC247589	CAMC247586	CMF 73	ACTIVE	LODE CLAIM	9/3/2024
CA101756696	CA101756696	CAMC177652	CAMC177640	SOUTH SYENITE 13	ACTIVE	LODE CLAIM	9/3/2024
CA101756700	CA101756700	CAMC5909	CAMC5840	SYENITE 70	ACTIVE	LODE CLAIM	9/3/2024
CA101756843	CA101756843	CAMC5915	CAMC5840	SYENITE 76	ACTIVE	LODE CLAIM	9/3/2024
CA101756918	CA101756918	CAMC5958	CAMC5840	SYENITE 122	ACTIVE	LODE CLAIM	9/3/2024
CA101758021	CA101758021	CAMC5934	CAMC5840	SYENITE 98	ACTIVE	LODE CLAIM	9/3/2024
CA101758025	CA101758025	CAMC244797	CAMC244736	CMF 62	ACTIVE	LODE CLAIM	9/3/2024
CA101758030	CA101758030	CAMC47658	CAMC47621	BAILEY 38	ACTIVE	LODE CLAIM	9/3/2024
CA101758039	CA101758039	CAMC234439	CAMC234416	SYENITE 217	ACTIVE	LODE CLAIM	9/3/2024
CA101758310	CA101758310	CAMC177674	CAMC177640	SOUTH SYENITE 35	ACTIVE	LODE CLAIM	9/3/2024
CA101758313	CA101758313	CAMC5908	CAMC5840	SYENITE 69	ACTIVE	LODE CLAIM	9/3/2024
CA101759275	CA101759275	CAMC47672	CAMC47621	BAILEY 59	ACTIVE	LODE CLAIM	9/3/2024
CA101759276	CA101759276	CAMC47627	CAMC47621	BAILEY 7	ACTIVE	LODE CLAIM	9/3/2024
CA101759484	CA101759484	CAMC47659	CAMC47621	BAILEY 39	ACTIVE	LODE CLAIM	9/3/2024
CA101759521	CA101759521	CAMC177664	CAMC177640	SOUTH SYENITE 25	ACTIVE	LODE CLAIM	9/3/2024
CA101759615	CA101759615	CAMC101865	CAMC101865	SYENITE #177	ACTIVE	LODE CLAIM	9/3/2024
CA101759617	CA101759617	CAMC213564	CAMC213564	EAST SYENITE #2	ACTIVE	LODE CLAIM	9/3/2024
CA101759661	CA101759661	CAMC47638	CAMC47621	BAILEY 18	ACTIVE	LODE CLAIM	9/3/2024
CA101759673	CA101759673	CAMC47645	CAMC47621	BAILEY 25	ACTIVE	LODE CLAIM	9/3/2024
CA101780868	CA101780868	CAMC177650	CAMC177640	SOUTH SYENITE 11	ACTIVE	LODE CLAIM	9/3/2024
CA102493275	CA102493275	CAMC5964	CAMC5840	SYENITE 128	CLOSED	LODE CLAIM	
CA102520546	CA102520546	CAMC234463	CAMC234416	SYENITE 241	ACTIVE	LODE CLAIM	9/3/2024
CA102521164	CA102521164	CAMC201787	CAMC201787	SYENITE 71	ACTIVE	LODE CLAIM	9/3/2024
CA102521176	CA102521176	CAMC234484	CAMC234416	SYENITE 262	ACTIVE	LODE CLAIM	9/3/2024
CA102521342	CA102521342	CAMC177659	CAMC177640	SOUTH SYENITE 20	ACTIVE	LODE CLAIM	9/3/2024

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CA102521349	CA102521349	CAMC5968	CAMC5840	SYENITE 132	ACTIVE	LODE CLAIM	9/3/2024
CA102521367	CA102521367	CAMC234422	CAMC234416	SYENITE 200	ACTIVE	LODE CLAIM	9/3/2024
CA102521371	CA102521371	CAMC234443	CAMC234416	SYENITE 221	ACTIVE	LODE CLAIM	9/3/2024