

## **BAYAN SECURES EXCLUSIVE GLOBAL LICENCE TO COLORADO SCHOOL OF MINES RARE EARTH PROCESSING TECHNOLOGIES**

### **Highlights**

- **Exclusive Licence Agreement Secured:** Bayan has secured an exclusive worldwide licence from Colorado School of Mines (Mines) for a suite of 4 patented rare earth processing technologies spanning beneficiation, leaching and resin-based separation.
- **Developed and Tested on MP Materials Mountain Pass Materials Ore:** Three of the patents were developed using ore and process streams sourced directly from MP Materials' Mountain Pass deposit in California, located in close proximity to Bayan's Desert Star Project, providing strong geological compatibility.
- **Targeting Higher Recoveries and Lower Cost:** The patented bastnaesite leach flowsheet is designed to lift theoretical REE recovery from ~50–60% under legacy two-stage leach routes to ~90% and beyond in a single stage of leaching, while reducing acid and reagent consumption and overall leach cost. This directly supports the economic case for bastnaesite-dominant projects in the Mountain Pass district.
- **Increased Value from Fines and Nonstandard Mineralogy:** The suite includes specific solutions for ultra-fine material giving Bayan multiple levers to unlock additional value from lower-grade, complex and previously marginal material.
- **Supported by the U.S. Department of Energy (DOE):** Development of the patented technologies was partially funded by the DOE Critical Materials Institute (now the DOE Critical Materials Innovation Hub), as part of the United States' government initiatives to strengthen domestic critical mineral supply chain resilience and domestic "mine-to-magnet" capability.
- **Strengthened Position in U.S. Critical Minerals Value Chain:** The exclusive licencing agreement significantly enhances Bayan's competitive position within the U.S. rare earth value chain, supporting U.S. and allied efforts to onshore critical mineral processing capacity while advancing clean-technology and sustainable resource recovery objectives.
- **Three Granted and One Pending U.S. Patents:** The licence covers four U.S. granted and pending patents and associated applications encompassing advanced rare earth beneficiation, leaching, and resin-based separation methods for rare earth elements technologies:



- Advanced Systems and Methods for Leaching Rare Earths from Ore (bastnaesite single-stage HCl leach);
  - Compounds, Methods, and Systems for Beneficiation of Rare Earth Elements by Flotation and Gravity concentration;
  - Upgrade of Yttrium in a Mixed Rare Earth Stream Using Iminodiacetic Acid Functionalized Resin; and
  - Beneficiation of Rare Earth Elements Bearing Ancyllite.
- **Exclusive Access to Leading U.S. Technical Expertise:** The REE technologies licenced by Bayan were developed within the Kroll Institute for Extractive Metallurgy (KIEM) at Colorado School of Mines, one of the world’s foremost institutions in mineral processing and extractive metallurgy. The Kroll Institute was created in 1974 through an endowment from Dr. William J. Kroll, creator of the technologies that built the world’s titanium and zirconium industries. The patents were pioneered by a team of researchers led by Dr. Corby G. Anderson PE, Director of KIEM and a globally recognised leader in extractive metallurgy and critical minerals processing. The Kroll Institute team included Ben Kronholm, Dr. Hao Cui, Grant Colligan, Dr. Phil Keller, Dylan Everly, Nathaneal Williams, Alex Norgren, and Professor Brock O’Kelley. They were supported in part by Dr. Vyacheslav Bryantsev and Dr. Santa Jansone-Popova of the U. S. Department of Energy’s Oak Ridge National Laboratory.
  - **Strategic Location of Desert Star Projects:** Bayan’s Desert Star Project is strategically located just 4.5 km northeast of MP Materials’ Mountain Pass REE Mine<sup>1</sup> one of the largest and highest-grade rare earth operations globally. Desert Star North Project lies only 3 km north of the Colosseum Gold Mine<sup>2</sup>. Both properties are located within the same regional corridor and share structural and geological characteristics with the globally significant Mountain Pass Rare Earth Mine.
  - **Research and Development Collaboration in Progress:** Bayan and Mines are progressing a definitive Research & Development Agreement to collaborate and commercialise the technologies for Bayan’s resource assets and downstream applications.

<sup>1</sup> MP Materials Corp. (NYSE:MP) [www.mpmaterials.com](http://www.mpmaterials.com)

<sup>2</sup> Dateline Resources Ltd (ASX:DTR) [www.datelineresources.com.au](http://www.datelineresources.com.au)

Proximate Statement: This release contains references to mineral exploration results derived by other parties either nearby or proximate to the Desert Star Projects and includes references to topographical or geological similarities to that of the Desert Star Projects. It is important to note that such discoveries or geological similarities do not in any way guarantee that the Company will have similar exploration successes on the Desert Star Projects, if at all.

**Bayan Mining and Minerals Ltd (ASX: BMM; "BMM", "Bayan" or "the Company")**

is pleased to announce that its wholly owned subsidiary, BMM Nevada LLC, has executed a binding licencing agreement with Colorado School of Mines (Mines) to acquire an exclusive global licence for four of Mines' rare earths and minerals processing technologies patents.

This agreement provides Bayan with full rights to deploy, enhance, and sub-licence the technologies worldwide, enabling the Company to integrate advanced beneficiation, leaching, and separation processes directly into its project development strategy. The exclusivity of the licence secures Bayan's strategic position at the forefront of rare earth processing innovation within the United States.

**Colorado School of Mines (Mines)**

Colorado School of Mines, a public R1 research university focused on applied science and engineering, is widely regarded as the premier institution in mining, metallurgy, and applied earth sciences. Founded in 1874 to support Colorado's gold and silver industry, Mines' research excellence today spans the entire critical minerals value chain from exploration and extraction through to advanced processing and recycling.

The patented technologies licensed by Bayan were developed through a team effort by the Kroll Institute for Extractive Metallurgy under the leadership of Dr. Corby G. Anderson PE, a distinguished professor and one of North America's foremost experts in mineral processing and extractive metallurgy. With over four and a half decades of industry and academic experience, Dr. Anderson's work has driven major advancements in beneficiation, hydrometallurgy and rare earth separation forming the technical foundation of Bayan's newly acquired processing intellectual property.

The Kroll Institute team included Ben Kronholm, Dr Hao Cui, Grant Colligan, Dr Phil Keller, Dylan Everly, Nathaneal Williams, Alex Norgren and Professor Brock O'Kelley, supported in part by Dr Vyacheslav Bryantsev and Dr Santa Jansone-Popova of the U.S. Department of Energy's Oak Ridge National Laboratory.



*Figure 1: Aerial view of Guggenheim Hall, at the historic heart of the Colorado School of Mines campus in Golden, Colorado, USA.*

The licence covers four U.S. granted and pending patents and associated applications encompassing advanced rare earth beneficiation, leaching, and resin-based separation methods for rare earth elements technologies:

### **Advanced systems and methods for leaching rare earths from ore**

#### **Improved leaching of bastnaesite ores**

With the world's rapid advancement of technology, the demand and need for the materials that make up that technology has exploded. An important group of materials needed in this rapid advancement are the rare earth elements (REE) used in countless necessary applications. One source of rare earths is bastnaesite, a rare earth bearing fluorocarbonate, mined at the Mountain Pass Mine in California. A novel single stage hydrochloric leach system to optimize the rare earth extraction from bastnaesite is covered in this patent. Typically, this process has utilised a two-stage leach system involving a high temperature hydrochloric acid leach followed by a caustic crack.

The patent represents a significant advancement over existing processes by simplifying the flowsheet while maintaining high recovery rates, particularly relevant for processing Mountain Pass bastnasite and similar rare earth ores.

- Reduced processing costs through the use of a single stage operation requiring lower reagent consumption
- Higher REE recovery rates
- Potential to process previously uneconomical and lower grade ore deposits
- The ability to treat lower-grade, previously marginal material is particularly important in the U.S. context, where accelerating time-to-production from existing districts like Mountain Pass and the broader Mojave corridor is a key policy objective.

### **Compounds, methods, and systems for beneficiation of rare earth elements by flotation and gravity concentration**

#### **Improved recoveries of REE**

The patent covers devices and systems for effectively separating carbonate gangue from bastnaesite without sacrificing significant REE grade or recovery. Testing was carried out with Mountain Pass ores. Centrifugal concentrators may be used to beneficiate Ultra-Fine (UF) bastnaesite and calcite bearing flotation concentrates. Initial gravity REE recoveries can exceed 90% while rejecting most of the total calcium. The patent also covers beneficiation of fine ore feed of 35 microns. The disclosed methods, compounds, and systems may be used to complement existing or modified flotation systems to improve the recovery of REEs.

- The patent specifically addresses the challenge of separating calcite-bearing bastnaesites, which traditional gravity separation methods struggle with
- Demonstrates that gravity separation can be effectively applied to ultra-fine bastnaesites
- Achieves separation at particle sizes considered too fine for traditional gravity methods
- For Bayan, this opens the door to designing flowsheets that pull additional value from ultra-fine fractions and tailings, potentially increasing overall project recoveries and extending mine life.



## **Upgrade of Yttrium in a Mixed Rare Earth Stream Using Iminodiacetic Acid Functionalized Resin**

Separation by ion-exchange for lower throughput of heavy rare earths, as is the case with the Mountain Pass, can be considered viable. Ion-exchange offers the benefits of a smaller plant footprint, the potential for lower power requirements and a more flexible flowsheet given availability of skid mounted columns and ease of reconfiguration.

The patent, utilising research of Mountain Pass industrial REE bearing hydrometallurgical solutions, covers methods, techniques, and processes for enhancing the purity of a mixed rare earth solution using ion-exchange. The resin is a chelating resin that interacts poorly with one or more rare earth elements. In one embodiment a rare earth can be selectively excluded for example, Lanthanum, Cerium, Praseodymium, Neodymium, Promethium, Samarium, Europium, Gadolinium, Terbium, Dysprosium, Holmium, Erbium, Thulium, Ytterbium, Lutetium, Scandium, and/or Yttrium. In another embodiment, yttrium can be selectively excluded from the column.

The "selective exclusion" approach represents a paradigm shift from traditional "selective retention" methods. By optimising what NOT to capture, the process potentially:

- Reduces reagent consumption
- Minimises column fouling
- Enables simpler elution protocols
- Increases yttrium purity in fewer steps

This patent essentially uses a counter-intuitive approach of achieving separation by preventing uptake rather than maximizing it, which could offer economic advantages in commercial-scale operations.

In a downstream environment where U.S. and allied OEMs are seeking specific REE blends for magnets, lasers, ceramics and defence applications, flexible ion-exchange routes such as this create opportunities for tailored products and premium pricing.

## **Beneficiation of Rare Earth Elements Bearing Ancyrite**

Currently, bastnaesite and monazite are two major economically exploited rare earth minerals throughout the world. A large amount of literature has been published to investigate the separation of bastnaesite and monazite from their gangue minerals such as calcite, barite, and apatite. Other rare earth minerals have been rarely studied.

This patent discloses methods and systems for recovery of ancylite, a rare earth mineral comprising strontium carbonate, from rare earth ore. In many embodiments, the disclosed methods and systems provide for recovery of greater than 50 % of the ancylite

from an ancylite containing ore and where the ore is subjected to flotation in the presence of an acid, for example a hydroxamic acid, such as octano hydroxamic acid. The ore may also be subjected to magnetic separation.

Testing was conducted on an ore sample containing ancylite from the Bear Lodge rare earth deposit, located in Wyoming.

This patent offers the opportunity to improve rare earth recovery in resources containing ancylite or other mineralogy with similar chemical and magnetic properties.

Patents based on processing of Mountain Pass ore have a direct impact on Bayan’s Desert Star Project, sharing similar structural and geological characteristics<sup>3</sup>.

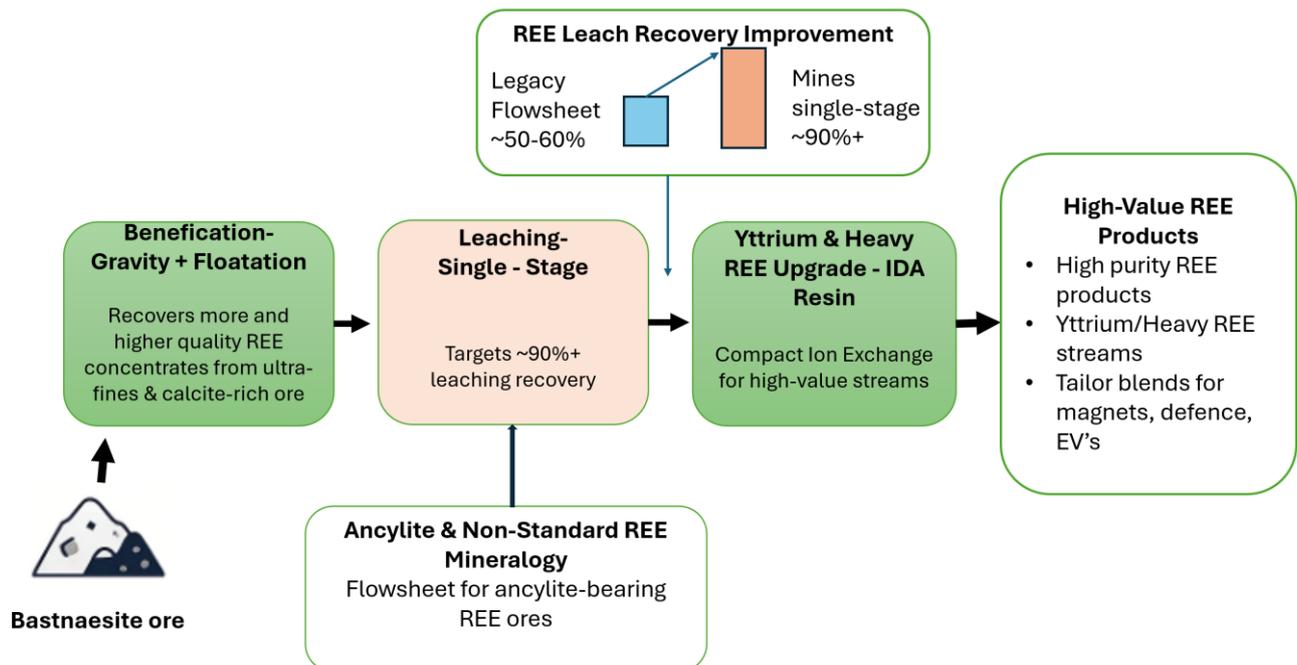


Figure 2: Integrated Mines patent flowsheet for Mountain Pass-style bastnaesite ore, showing Bayan’s pathway from ore to high-value REE products with higher recoveries and lower reagent use.

<sup>3</sup> Proximate Statement: This release contains references to mineral exploration results derived by other parties either nearby or proximate to the Desert Star Projects and includes references to topographical or geological similarities to that of the Desert Star Projects. It is important to note that such discoveries or geological similarities do not in any way guarantee that the Company will have similar exploration successes on the Desert Star Projects, if at all.

***Executive Director Fadi Diab, commented:***

*"Securing exclusive global rights to these Colorado School of Mines technologies marks a technical milestone for Bayan. The patented processes developed and tested using ore from the Mountain Pass district, just 4.5 km from our Desert Star Project provide us with a rare geological and metallurgical alignment that few emerging rare earth developers can access.*

*This licence not only gives us a proprietary toolkit designed specifically for bastnaesite-dominant systems like Desert Star, it also positions us to meaningfully participate in the rapidly expanding U.S. critical minerals and downstream supply chain initiatives. By integrating these technologies into our development strategy, we have the opportunity to unlock higher recoveries, reduce processing complexity and accelerate the path toward producing high-quality REE concentrates in the United States. It is a strong step forward for Bayan.*

*We anticipate commencing drilling in 2026, subject to the completion of these technical and preparatory works. This measured approach reinforces our focus on disciplined exploration and long-term value creation for shareholders."*

**U.S. Critical Minerals & Downstream Technology Context**

The United States has formally identified critical minerals and rare earth elements as strategic assets that underpin both economic prosperity and national security. In December 2017, President Donald Trump signed Executive Order 138174, "A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals", establishing it as U.S. policy to reduce the nation's vulnerability to disruptions in critical mineral supply chains and to identify new domestic and allied sources of supply.

Since then, successive administrations and agencies, including the Department of Energy (DOE) and the Department of Defence (DoD), have launched programs and funding initiatives aimed at rebuilding a "mine-to-magnet" rare earth supply chain, from upstream mining and midstream separation through to metal, alloy and permanent magnet manufacturing in the United States. These initiatives include substantial DOE funding rounds for critical minerals processing and recycling, and DoD investments in rare earth separation and magnet plants to support defence, energy and advanced manufacturing supply chains.

Recent export restrictions and supply disruptions have further highlighted U.S. vulnerability to foreign control over rare earth magnets and heavy rare earths,

---

<sup>4</sup> Executive Order 13817—A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals | The American Presidency Project



accelerating efforts to secure alternative sources of ore, processing technology and downstream capacity in partnership with allies such as Australia. A new U.S.–Australia framework on critical minerals and rare earths specifically encourages co-development of mining and processing projects that can supply U.S. value chains with non-Chinese feedstock.

Against this backdrop, Bayan’s exclusive global licence in US DOE-supported rare earth processing technologies, developed at Colorado School of Mines using Mountain Pass materials, is highly strategic. It positions Desert Star, located just 4.5 km from the only operating rare earth mine in the United States, as a potential hub for new, high-efficiency flowsheets that can feed downstream metal, alloy and magnet projects targeting U.S. and allied defence, EV, wind and electronics markets.

### **Next Steps**

Following execution of the binding licensing agreement, Bayan and the Kroll Institute at Mines are progressing the finalisation of a research and development collaboration agreement to define the scope of works, project planning, and framework for joint development activities. The collaboration will establish clear technical objectives and workstreams to guide the integration of the patented rare earth and mineral processing technologies across Bayan’s project portfolio, ensuring alignment with the Company’s broader critical minerals strategy.

This partnership represents a significant step in combining the Colorado School of Mines world-class process technology and metallurgical research capabilities with Bayan’s operational and resource development expertise. Together, the parties aim to advance the practical deployment of innovative processing solutions that enhance recovery efficiency, reduce environmental impact, and strengthen supply chain resilience within the rare earth sector.

### **Use of Funds and Strategic Direction**

The Company does not view this strategic direction as amounting to a diversion from Bayan’s main undertaking and considers the execution of the binding licensing agreement to be supportive of, and directly aligned with, its principal business of rare earth exploration.

The purpose of the entering into the binding licensing agreement is to secure access to processing technology that is relevant to the style of mineralisation the Company is targeting, and which can be used alongside its exploration activities to better understand the potential economic characteristics of any discoveries.

The Company only intends to apply minimal funds towards developing the licences in the near term, and is not proposing to divert material funds away from its exploration activities on its drill-ready projects. The binding licensing agreement is therefore intended to be leveraged as an evaluation tool supporting exploration, while the vast majority of the Company's funding continues to be deployed toward exploration activities over the next two years.

### Patent Details

<b>Patent No. / Application No.</b>	<b>Year</b>	<b>Title Description</b>	<b>Field of Application</b>	<b>Status</b>
<b>US 10,696,562 B2</b>	2020	<i>Upgrade of Yttrium in a Mixed Rare Earth Stream using IDA Resin</i>	Chemical separation and upgrading of yttrium and light rare earth elements via ion-exchange resin technology.	Granted
<b>US 2022/0040707 A1</b>	2022	<i>Beneficiation of Rare Earth Elements by Flotation and Gravity</i>	Concentration of rare earth minerals through combined flotation and gravity separation methods.	Patent Pending
<b>US 12,442,059 B2</b>	2025	<i>Leaching Rare Earths from Bastnaesite</i>	Hydrometallurgical leaching process for recovery of rare earth elements from bastnaesite ores.	Granted
<b>US 10,618,058 B2</b>	2020	<i>Beneficiation of Rare Earth Elements Bearing Ancylyte</i>	Processing and upgrading of ancylyte-bearing rare earth ores through selective beneficiation.	Granted

## Material Terms of Licencing Agreement

Under the terms of the agreement BMM has secured an exclusive worldwide licence to the Rare Earths and Mineral Process Technologies developed by the Colorado School of Mines (Mines).

- **Licence Fee:** Aggregate US\$100,000, payable in four equal annual instalments of US\$25,000.
- **Patent Rights Reimbursement:** US\$127,541 payable to Mines for prior and ongoing costs in seeking, prosecuting, and maintaining the patents.
- **IP Maintenance Fee:** Annual payment of US\$20,000 to ensure all intellectual property remains in good standing until commercialisation commences.
- **Equity Consideration:** Issue of 1,344,155 fully paid ordinary shares to Mines (or its nominees), representing approximately 1% of BMM's issued capital, in four equal annual tranches.

*Note that the 1,344,155 Equity Consideration shares will be issued pursuant to the Company's existing placement capacity under ASX Listing Rule 7.1, with the first 336,038 fully paid ordinary shares being issued within the next 10 business days.*

- **Royalties:** 3% of annual net sales from products and/or services utilising the licensed technology, subject to a minimum annual royalty of US\$20,000 commencing from 2030. In the event the licences are sublicensed, Mines will earn a royalty of 30% of the sublicense income.
- **Licensee Due Diligence Milestones and Obligations:** BMM shall use commercially reasonable efforts to develop, manufacture, sublicense, market and sell the Licensed Products in the Fields of Use and the Territory in accordance with the milestones defined here:

### **Phase 1: Partnering & Setup by end of 2025**

- Finalise exclusive IP licence with Mines.
- Finalise Research and Development agreement
- Finalise Consultancy Agreement with Mines team members.
- Stand up the Technology Integration Team.

### **Phase 2: Bench Validation by end of 2026**

- Optimise beneficiation (Falcon + flotation), single-stage HCl leach, Y-resin, and ancylite flowsheet at bench scale; issue lab reports demonstrating target grades/recoveries.
- Complete pilot-plant concept designs.

**Phase 3: Pilot Build & Trials by end of 2028**

- Procure/construct pilot units (beneficiation, leach, resin, WHIMS).
- Run pilot campaigns; generate product samples and a pilot results report for customers.
- Complete PEA/Scoping.

**Phase 4: Studies, Permitting & Financing by end of 2030**

- Launch full permitting, deliver PFS & DFS; Commence offtake discussions and secure project financing.
- Prepare Plant construction design.

**Phase 5: Build → Commission → Operate by end of 2032**

- Construct the plant; commission circuits; achieve trial production, then commercial operations; kick off first tolling/licensing deals.

A milestone will be deemed accomplished when BMM provides written notice of such to Mines. In the event of a disagreement between the parties regarding achievement of a milestone, the parties will engage a mutually acceptable professional with knowledge or experience regarding the specific milestone, who will determine if the milestone has been achieved, which judgment will be binding on the parties.

In the event a milestone is missed, Mines has the right to terminate the Agreement.

**About Desert Star Projects**

The Desert Star Project comprises two adjoining claim blocks, Desert Star and Desert Star North, located in San Bernardino County in California's eastern Mojave Desert. Together, the projects cover an area of approximately 9.75 km<sup>2</sup> and consist of 117 federal lode claims, all of which have been staked with applications lodged to the relevant county and federal authorities for registration.

Strategically positioned within a globally significant critical minerals corridor, Desert Star lies just 4.5 km from MP Materials' operating Mountain Pass Rare Earth Mine and approximately 4.7 km north of the Colosseum Gold Mine. The area is exceptionally well supported by infrastructure, including direct access to Interstate 15, high-voltage power transmission lines servicing Mountain Pass, and a Union Pacific rail line within 25 km that could support bulk logistics in future development. The presence of renewable energy infrastructure within the nearby Ivanpah Valley provides additional opportunities for low-emission power integration.

The Desert Star claim block covers roughly 6 km<sup>2</sup> across 72 federal lode claims and is situated within a structurally uplifted zone of Paleoproterozoic metamorphic and igneous basement rocks, intruded by Mesoproterozoic alkaline and carbonatite bodies such as shonkinite, syenite, granite, and carbonatite. These intrusions are genetically associated with rare earth element (REE) mineralisation across the district, characterised by alteration assemblages of barite, fluorite, hematite, phlogopite, and calcite, indicative of a magmatic-hydrothermal origin. The tenement is bounded by two major regional structures, the Ivanpah Fault to the east and the Clark Mountain Fault to the west, both of which are spatially linked to mineralisation at Mountain Pass and Colosseum.

The Desert Star North block comprises 45 federal lode claims covering approximately 3.75 km<sup>2</sup>. Geologically, it represents a transition from Paleoproterozoic basement rocks in the west to Cambrian marine sedimentary sequences in the east, including limestone, quartzite, and shale, formations that host both rare earth and gold mineralisation throughout the region. The area is transected by the northwest-trending Ivanpah and Clark Mountain Faults, which display vertical displacement exceeding 10,000 feet and are recognised as key regional controls on REE and gold mineralisation, including at Mountain Pass and Colosseum immediately to the south.

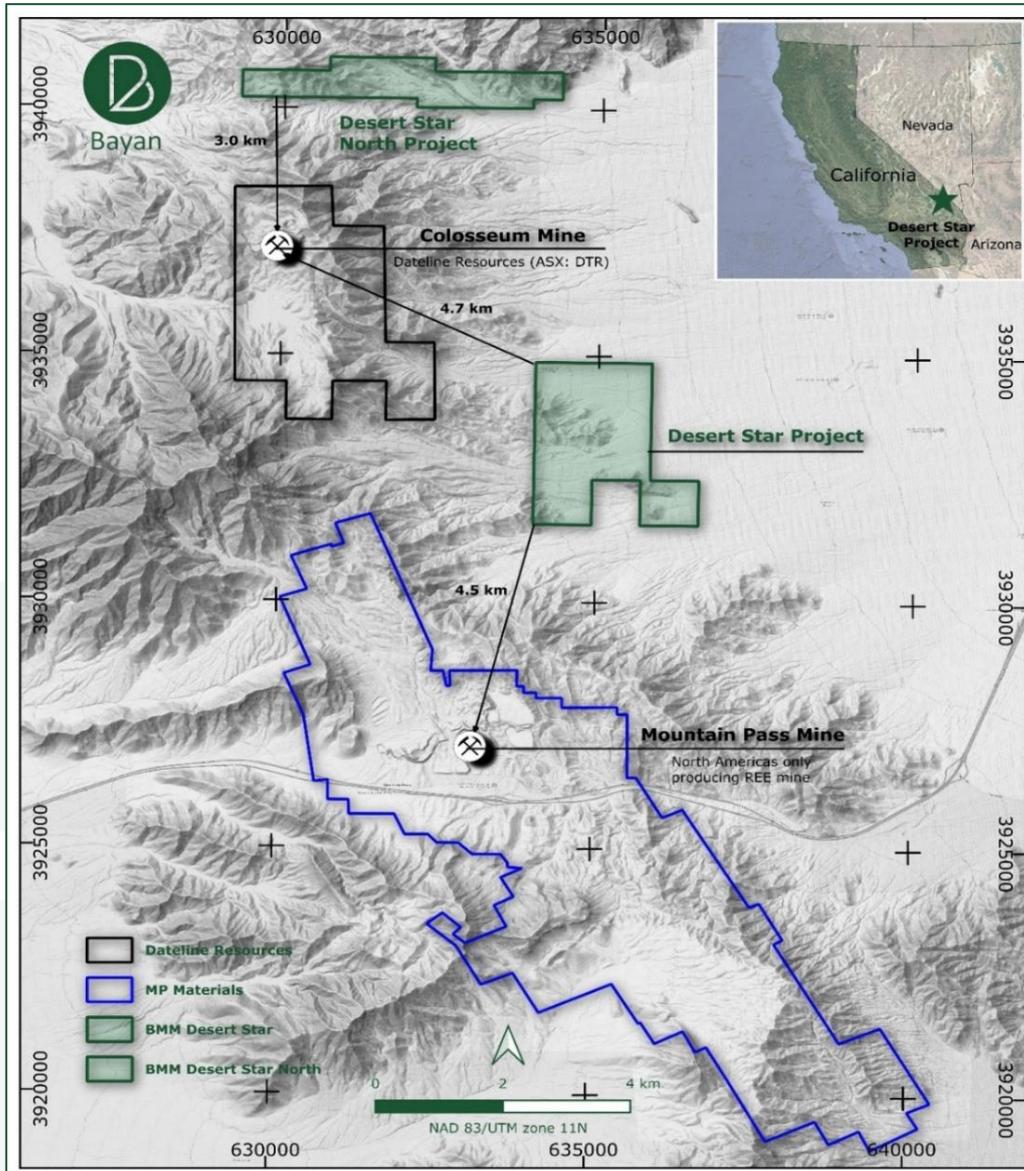


Figure 3: Desert Star Projects Location Map

**For further information, please contact:**

**Fadi Diab**

Executive Director

Tel: +61 8 6188 8181

E: [Fadi.Diab@bayanminerals.com.au](mailto:Fadi.Diab@bayanminerals.com.au)

**Authorised for release by the Board of Bayan Mining and Minerals Limited**

**-ENDS-**

### **Forward-looking Statements**

Certain statements included in this release constitute forward-looking information. Statements regarding BMM's plans with respect to its mineral properties and programs are forward-looking statements. There can be no assurance that BMM's plans for development of its mineral properties will proceed as currently expected. There can also be no assurance that BMM will be able to confirm the presence of additional mineral resources, that any mineralisation will prove to be economic or that a mine will successfully be developed on any of BMM's mineral properties. The performance of BMM may be influenced by a number of factors which are outside the control of the Company and its Directors, staff, and contractors.

These statements include, but are not limited to statements regarding future production, resources or reserves and exploration results. All such statements are subject to certain risks and uncertainties, many of which are difficult to predict and generally beyond the control of the Company, that could cause actual results to differ materially from those expressed in, or implied or projected by, the forward-looking information and statements.

The Company confirms that it is not currently aware of any environmental restrictions or requirements that would impede the continuation of planned activities.

Except for statutory liability which cannot be excluded, each of BMM, its officers, employees and advisors expressly disclaim any responsibility for the accuracy or completeness of the material contained in these forward-looking statements and excludes all liability whatsoever (including in negligence) for any loss or damage which may be suffered by any person as a consequence of any information in forward-looking statements or any error or omission. BMM undertakes no obligation to update publicly or release any revisions to these forward-looking statements to reflect events or circumstances after today's date or to reflect the occurrence of unanticipated events other than required by the Corporations Act and ASX Listing Rules. Accordingly, you should not place undue reliance on any forward-looking statement.

### **Proximate Statements**

This release contains references to mineral exploration results derived by other parties either nearby or proximate to the Desert Star Projects and includes references to topographical or geological similarities to that of the Desert Star Projects. It is important to note that such discoveries or geological similarities do not in any way guarantee that the Company will have similar exploration successes on the Desert Star Projects, if at all.