



## **USA Rare Earth and Texas Mineral Resources Corp Announce Opening of First Heavy and Light Rare Earths Processing Facility Outside of China**

### **USA Rare Earth CEO: Colorado Rare Earth and Critical Mineral Pilot Processing Facility “a Major Step in Developing a U.S. Critical Mineral Supply Chain”**

### **Mining REE and Processing the REE Oxides “Without the Materials Ever Leaving the United States”**

#### **With all 6 Magnet REEs, Round Top Deposit “Indispensable” to Non-Chinese/U.S. Domestic Permanent Magnet Supply Chain**

- **Wheat Ridge, Colorado pilot plant expected to be operational in Q1 2020**
- **Pilot plant will utilize proven continuous ion exchange/continuous ion chromatography (CIX/CIC) processing**
- **Round Top ore will be processed into fully separated high purity rare earths and include lithium, technology metals and industrial minerals**
- **Pilot plant will ultimately be moved to Texas and scaled to full industrial capability**
- **Active discussions with potential tolling customers currently being serviced in China**

**New York, NY** – (PR Newswire- December 16, 2019) - USA Rare Earth LLC, the funding and development partner of the Round Top Heavy Rare Earth and Critical Minerals Project with Texas Mineral Resources Corp. (OTCQB: TMRC), is pleased to announce the opening of a pilot plant facility in Wheat Ridge, Colorado for the purpose of fully separating and purifying rare earth and other tech metals and critical minerals, leached from ore from the Round Top project, located just outside El Paso, Texas.

Aside from the significant concentration of heavy rare earths (HREE’s) and lithium, the Round Top deposit also includes uranium, beryllium, gallium, hafnium and zirconium – all of which are on the U.S. Government’s Critical Minerals List.

Pini Althaus, CEO of USA Rare Earth, commented, “Our Colorado pilot plant will be the first processing facility outside of China with the ability to separate the full range of rare earths – Lights, Mids and Heavies. Our Wheat Ridge pilot plant is the second piece of a 100% U.S.-based rare earth oxide supply chain, drawing on feedstock from our Round Top heavy rare earth and critical minerals deposit in southwest Texas. Taken together, Round Top and our pilot plant constitute essential links in restoring a domestic U.S. rare earth supply chain, extracting rare earths and processing them into individual REE oxides – without the material ever leaving the United States, thereby alleviating the current dependence on China for the both raw materials and mineral processing.



“Aside from Round Top’s potential to supply a significant amount of material for U.S. defense as well as commercial applications, we believe our initiative will reinvigorate advanced technology manufacturing in the U.S. and provide companies currently doing business overseas a viable alternative.

“We see another advantage as well, resulting from our processing method. Using continuous ion exchange and continuous ion chromatography (CIX-CIC) will not only enable processing of the ore from our Round Top project, but also enable us to explore tolling arrangements with other rare earth projects, which are currently relying on China as the sole destination for processing their materials. We are taking the view that ‘a rising tide lifts all boats’, in an effort to bolster not just U.S. domestic rare earths production but also that of countries who are strategic partners with the U.S.”

Working in conjunction with Inventure Renewables, Fenix NZ Limited, Resource Development Inc., and Pro Solv Consulting, the Colorado pilot plant is being designed to extract and purify multiple elements -- including the rare earths and scandium, lithium, hafnium, zirconium, gallium and beryllium, among others. This new plant will process leach solutions from the Round Top ore using continuous ion exchange and continuous ion chromatography (CIX-CIC) to separate and purify up to a total of 26 different recoverable elements.

### **Round Top Indispensable to Non-Chinese/U.S. Domestic Permanent Magnet Supply Chain**

“To our knowledge, no other deposit outside of China can generate the volume of all six permanent magnet Rare Earth Oxides as Round Top,” noted Mr. Althaus. In the case of Dysprosium -- where 99% of current production is in China -- leading demand forecasts predict a looming Dysprosium shortage. At full production, Round Top is projected to produce annually more than 200 metric tons of Dysprosium oxide, 23 tons of Terbium, 65 tons of Gadolinium, 65 tons of Samarium, 180 tons of Neodymium and 67 tons of Praseodymium.

“Given the importance of surety of supply, geo-political considerations and the necessity of low political risk, we believe it will matter to the U.S. Government that some rare earths companies have significant Chinese ownership, or send their rare earths materials to China for processing, or do their concentrating in non-U.S. allied countries where political risk is always present, or have deposits that simply do not host key Heavy Rare Earths in any significant volume”, said Mr. Althaus. “That is why we see Round Top as indispensable to any attempt to maintain a permanent magnet supply chain outside of China – a deposit with significant volume of the key rare earths, with no Chinese ownership, and a supply chain that will be 100% U.S.-based. it’s not enough to check one of those boxes and hope for the best on the rest. Round Top checks them all.”

### **CIX-CIC: A Historically Proven and Environmentally Friendly Process**

The ion exchange-ion chromatographic methodology being employed will be a significant advancement of the processing method for rare earth elements. as well as numerous other technology and industrial minerals.

- Ion exchange was developed initially by the Manhattan Project in the 1940’s for refining the actinide series elements, using the more benign rare earth elements as a proxy in its development.



- The process subsequently was adapted to many high-volume industrial uses and came into its own with the advent of the “continuous” process in conjunction with its cost-effectiveness, simplicity of operation and versatility.
- Additionally, CIX-CIC has a small footprint, significantly reducing the amounts of reagents normally used in rare earth processing.
- The resins and eluent reagents used in the process are “off-the-shelf” items and are readily available from multiple suppliers.

### **Processing of Round Top Leach Solution**

The pilot plant is being designed to continuously process the primary leach solution produced by irrigating the crushed ore from the Round Top deposit in Texas with dilute sulfuric acid to produce highly-refined end products such as individual rare earth oxides, lithium hydroxide and various other metal oxides and sulfates.

The work at the new center will build upon previous applications of the CIX-CIC process successfully demonstrating the ability to produce highly refined (99.999% purity) rare earth elements from the Round Top leach solution.

- Under a Defense Logistics Agency (DLA) grant—using the CIX/CIC process—Round Top material was successfully processed into high-purity (99.99% or 99.999%) rare earths.
- Industry standard REE purity is typically 99.5%.

The pilot facility in Colorado is a major advancement in the establishment of a long-sought U.S. critical mineral supply chain. The ion exchange-ion chromatographic methodology being deployed has been previously utilized by joint venture partner TMRC in the separation and purification of our rare earths for the Department of Defense, thus de-risking the basis for the new pilot plant. The development of advanced processing methods is a necessary step in re-establishing a U.S. domestic supply of these strategic metals and ending the United States dependency of China for rare earth mining and processing.

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The Round Top NI 43-101 August 2019 PEA (Preliminary Economic Assessment) may be found [here](#).

An detailed overview of the NI 43-101 August 2019 PEA (Preliminary Economic Assessment) from the August 20, 2019 press release may be found [here](#).

### **Highlights of the Round Top PEA Include:**

- **Net Present Value (NPV):** \$1.56 Billion at a 10% discount rate, pre-tax.
- **Internal Rate of Return (IRR):** 70%.
- **Payback Period:** 1.4 years.
- **Capital Cost:** \$350.4 Million, **including** a complete on-site rare earth oxide (REO) and mineral separation plant, **and** a 25% contingency provision of \$65.7 Million.
- **Current Spot Market Pricing Assumptions:** Yields 70% IRR.
- **Mining Rate:** 20,000 tonnes per day (TPD).



- **All mineral processing at site:** Deployment of conventional ion exchange and ion chromatography (CIX/CIC) processing to generate high purity individual rare earth oxides at the site as well as technology metals and industrial minerals.
- **REO Production:** Averaging 2,313 tonnes per year (TPY) of marketed REO, including approximately 180 TPY of Neodymium (Nd) and 67 TPY of Praseodymium (Pr).
- **New Lithium Resource:** Estimated 9,800 TPY lithium carbonate production.
- **Heap Leach Processing:** Proven conventional method utilizing leach pads built to Texas Environmental Standards.
- **Economic Mine Life:** 20 years, based on mining only 14% of the existing Mineral Resource Estimate, implying overall potential mine life of 140 years.
- **Direct Employment:** 179 employees.
- **Ease of Shipping Access:** Only 3 miles north of Interstate Highway 10 and within 3 miles of a major railroad. 85 miles southeast of El Paso, Texas.
- **Located on State Property:** 6.25% Net Smelter Royalty (NSR) owed to Texas General Land Office (GLO).

#### **About USA Rare Earth, LLC**

USA Rare Earth, LLC has an option to earn up to an 80% interest in the Round Top rare earth and technical metals industrial minerals project located in Hudspeth County, Texas. Round Top hosts a large range of critical heavy rare earth elements, high-tech metals, including lithium, uranium and beryllium, and is among the lowest-cost rare earth projects in the world. The Round Top Deposit hosts 15 of the 17 rare earth elements, plus other high-value tech minerals (including lithium) and is well located to serve the US internal demand. Round Top contains 13 of the 35 minerals deemed “critical” by the Department of the Interior and contains critical elements required by the United States; both for national defense and industry. For more information about USA Rare Earth, visit [www.usarareearth.com](http://www.usarareearth.com)

#### **About Texas Mineral Resources Corp.**

Texas Mineral Resources Corp.'s focus is to develop and commercialize its Round Top heavy rare earth and industrial minerals project located in Hudspeth County, Texas, 70 miles southeast of El Paso. Additionally, the Company plans on developing alternative sources of strategic minerals through the processing of coal waste and other related materials. The Company's common stock trades on the OTCQB U.S. tier under the symbol “TMRC.”

#### **About Inventure Renewables**

Inventure Renewables pioneers process technologies for the rapid, low-cost, high-yield extraction of natural biochemical & material building blocks from low-value/waste biomass to provide cost-effective, carbon neutral biofuels, biochemicals and biomaterials.

#### **About Fenix NZ Limited**

Fenix NZ Limited is a leading results-oriented chemical engineering company, specializing in minerals processing and metal recovery by implementing the design, development, construction and installation of hydrometallurgical circuits. Fenix have been involved in the testing, development and installation of Ion Exchange systems in numerous countries around the world. Fenix have laboratory, pilot and industrial experience in conventional fixed bed ion exchange, continuous ion exchange as well as chromatographic separations bringing knowledge and experience highly relevant to the Round Top Project.

#### **About ProSolv**

Pro Solv Consulting, LLC provides consulting services in the areas of Due Diligence, process development, trouble shooting/optimization of process plants, Capex/Opex estimates and project management to mining companies



worldwide. Dr. Deepak Malhotra, Principal, has over 47 years of experience in the mining industry and had worked on sulfide, industrial and rare earth minerals.

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