Poster Library

Updated Sept 24, 2021

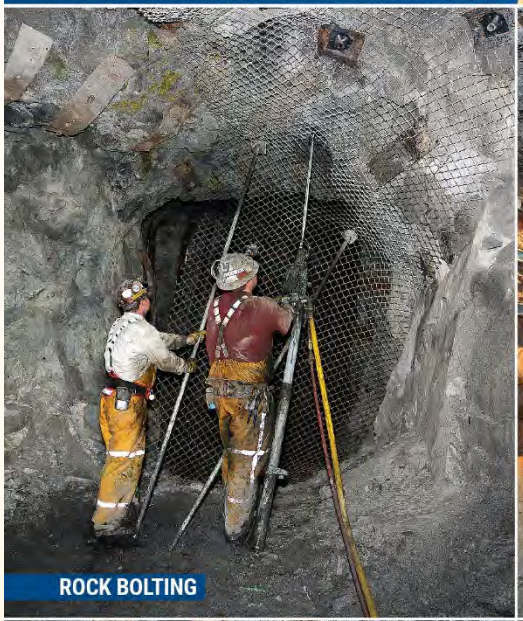
ENERGY FUELS

POSTER LIBRARY

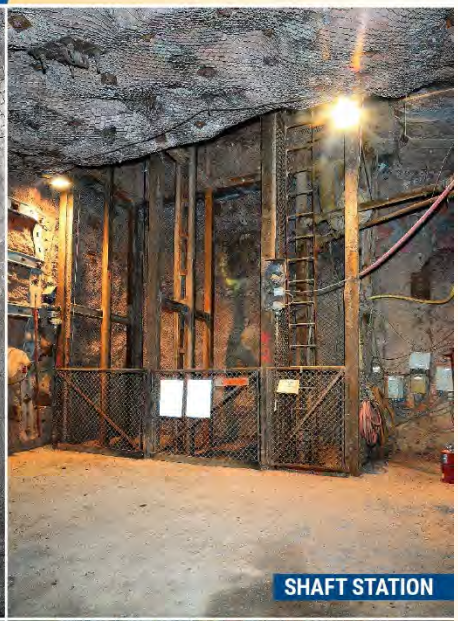
MINING

UNDERGROUND MINING

ENERGY FUELS



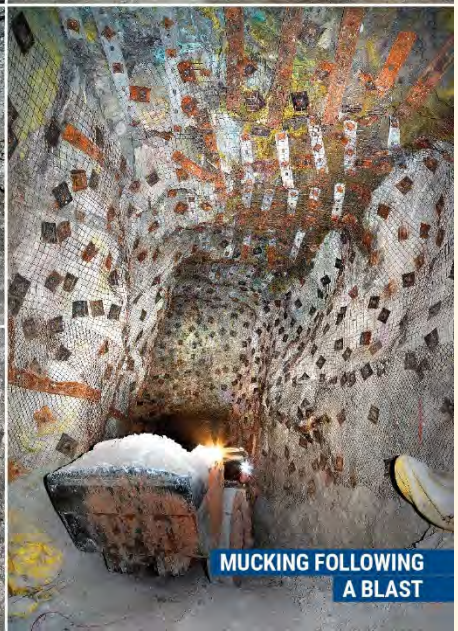
ROCK BOLTING



SHAFT STATION

DRILLING THE FACE

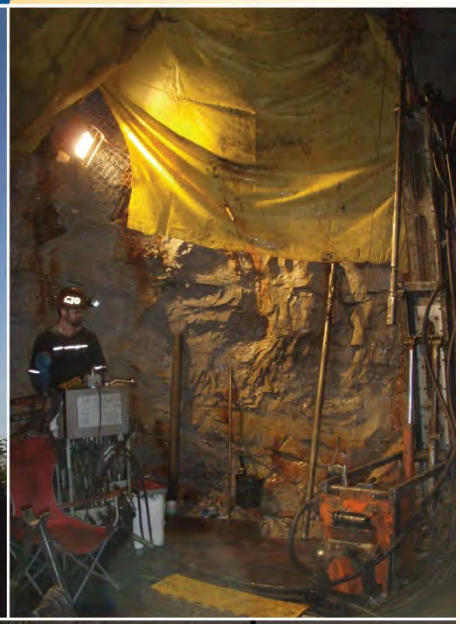
LOADING A ROUND

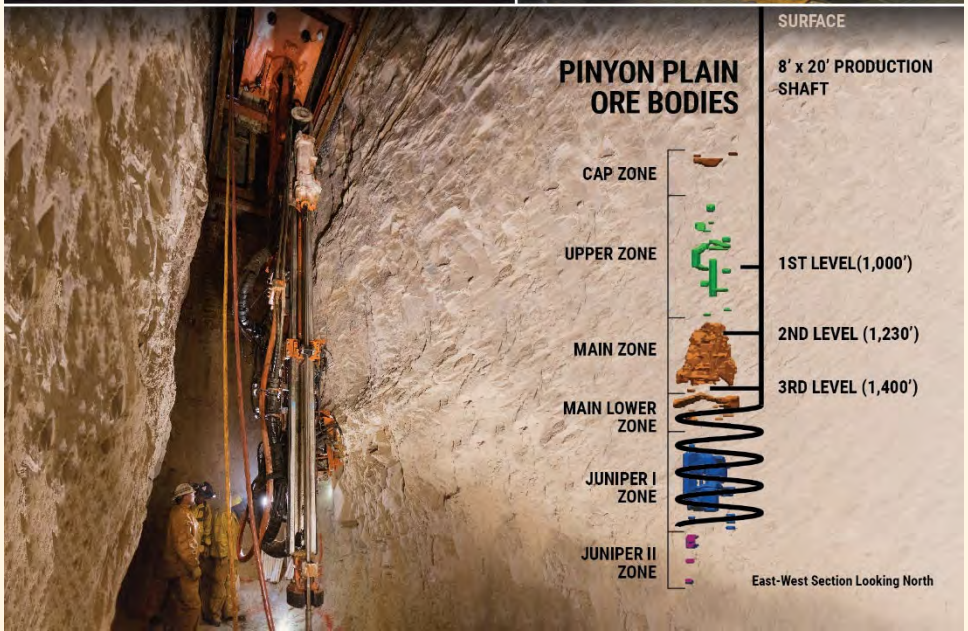


MUCKING FOLLOWING A BLAST

PINYON PLAIN MINE
Tusayan, AZ

ENERGY FUELS





POSTER LIBRARY

ENVIRONMENTAL

RADIATION AND ENVIRONMENTAL MONITORING

ENERGY FUELS

1 SAMPLING AND ANALYSIS OF MULTIPLE ENVIRONMENTAL MATRICES

2 INSPECTION OF THE PHYSICAL FEATURES OF THE MILL

PURPOSE:

TO MINIMIZE ANY IMPACTS TO WORKERS, THE PUBLIC & THE ENVIRONMENT

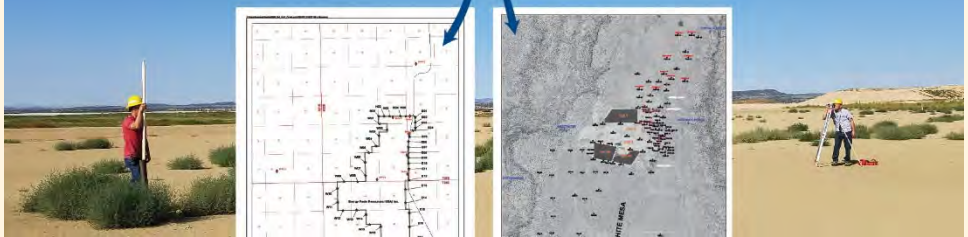
- To ensure that any potential doses to workers and the public are kept to a minimum
- To ensure that any environmental impacts of mill operations during operations and after reclamation are kept to a minimum
- To establish baseline data to assist with reclamation

WHERE?

ON AND OFF THE MILL PROPERTY

WHEN?

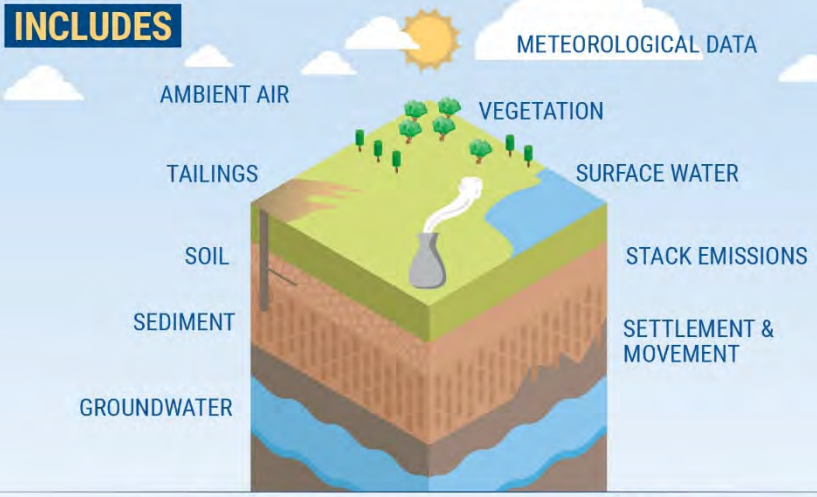
DAILY, WEEKLY, MONTHLY QUARTERLY, SEMI-ANNUALLY AND ANNUALLY



RADIATION AND ENVIRONMENTAL MONITORING

ENERGY FUELS

INCLUDES



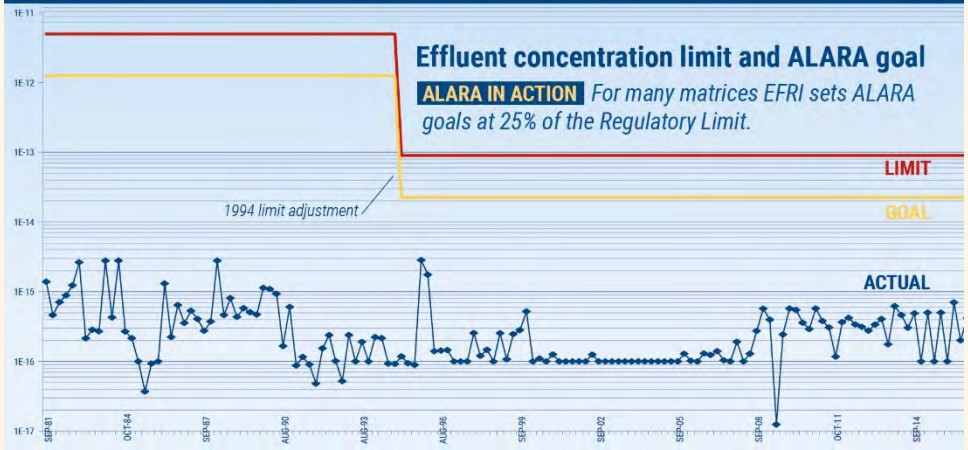
plus: GAMMA OPACITY AMBIENT RADON RADON FLUX

80+ groundwater wells

52 soil sampling locations

8 high volume air stations

100+ settlement monitors



REGULATORY OVERSIGHT

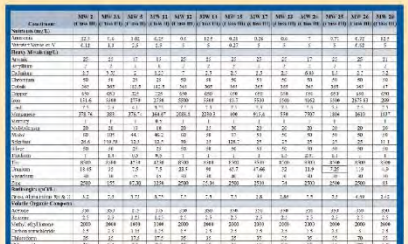
ENERGY FUELS

REGULATED BY:

- UTAH DEPARTMENT of ENVIRONMENTAL QUALITY WASTE MANAGEMENT & RADIATION CONTROL
- UTAH DEPARTMENT of ENVIRONMENTAL QUALITY AIR QUALITY
- United States Department of Labor MSHA Mine Safety and Health Administration
- Utah Division of Water Rights
- U.S. DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA
- U.S.NRC United States Nuclear Regulatory Commission
- EPA United States Environmental Protection Agency

ASSESSMENT

- ☑ Compliance monitoring is reported quarterly, semi-annually and annually
- ☑ All results are scrutinized and assessed by regulators for compliance to applicable standards
- ☑ Regulators collect split samples for independent analysis
- ☑ The mill is inspected ***by regulators*** approximately 20 times per calendar year
- ☑ The mill has an extensive Quality Assurance/Quality Control program to ensure data are defensible, usable, representative and comparable



ENERGY FUELS

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INTRO 101

URANIUM 101

ENERGY FUELS

Uranium
92
U
238.029

WHAT IS URANIUM?

- A mildly radioactive, naturally-occurring metallic element
- As common in the Earth's crust as tin, tungsten, & molybdenum
- Occurs naturally in rock, soil, food, and water
- Primarily used as the fuel for clean, carbon-free nuclear energy

HOW DO NUCLEAR REACTORS WORK?

- Two main isotopes of uranium: U-238 (99.3%) & U-235 (0.7%)
- U-235 fissions easily, creating heat in the process
- Nuclear reactors produce electricity by harnessing this heat to produce steam that drives turbines and generators.

HOW IS NATURAL URANIUM MADE INTO NUCLEAR FUEL?

1 MINING & MILLING: Companies like Energy Fuels produce natural uranium concentrate (U_3O_8) that is sold to nuclear utilities.

2 CONVERSION: U_3O_8 is converted into a gas called uranium hexfluoride (UF_6).

3 ENRICHMENT: The unenriched UF_6 is placed into centrifuges for enrichment, increasing the percentage of U-235 from 0.7% to 4%-5%, allowing controlled fission to occur.

4 FUEL FABRICATION: The enriched UF_6 is formed into solid UO_2 fuel pellets that are placed into metal tubes, and bundled into fuel assemblies that are loaded into nuclear reactors.

ENERGY FUELS' URANIUM MINES, MILLS, AND PRODUCTION FACILITIES

VANADIUM 101

ENERGY FUELS

Vanadium
23
V
50.9415

WHAT IS VANADIUM?

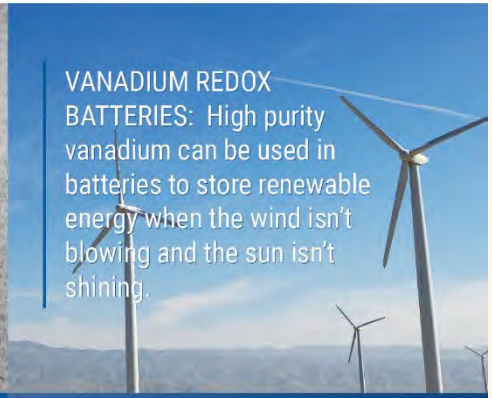
- A naturally-occurring metallic element
- The most common forms of industrial vanadium are vanadium pentoxide (V_2O_5) and ferrovanadium (FeV)

WHAT IS VANADIUM USED FOR?

- Primarily used in high strength steel, titanium, and other alloys
- High capacity batteries using vanadium currently being commercialized for use in renewable energy systems

The 1st large-scale commercial use of vanadium was in the steel chassis of the Model T

Tool made from vanadium steel



VANADIUM REDOX BATTERIES: High purity vanadium can be used in batteries to store renewable energy when the wind isn't blowing and the sun isn't shining.

ENERGY FUELS' LA SAL COMPLEX AND WHIRLWIND MINES CONTAIN HIGH-GRADE VANADIUM

NUCLEAR ENERGY 101

ENERGY FUELS

NUCLEAR PROVIDES CLEAN, CARBON FREE, 24/7 ELECTRICITY– ALL FUELED BY URANIUM

AROUND THE WORLD

443 operable reactors

57 reactors under construction

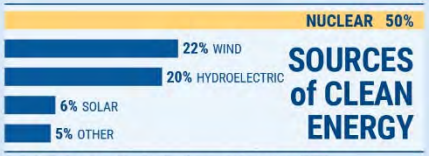
426 reactors on order, planned, or proposed

IN THE UNITED STATES

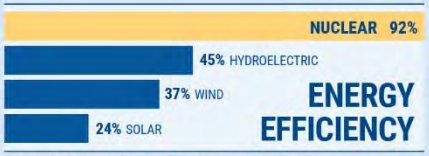
- The U.S. is the largest producer of nuclear energy in the world
- 20% of all electricity – and **50% of all the clean, carbon-free electricity** – in the U.S. comes from nuclear
- The U.S. does not currently mine enough uranium to fuel **a single reactor**
- **About 50%** of U.S. uranium imports come from Russia, China and their allies

ENORMOUS DEPENDENCE ON IMPORTED URANIUM

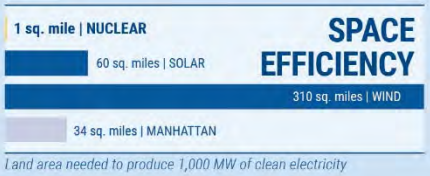
NUCLEAR FACTS



% of Emission-Free Electricity Generated in U.S. in 2020



Electricity Generated as % of Capacity in U.S. in 2017



Land area needed to produce 1,000 MW of clean electricity

Uranium / Vanadium
ORE PROCESS

ENERGY FUELS

Ore Receiving → Grind → Leach → Counter Current Decantation *(CCD)*

Uranium Solvent Extraction *(USX)* → Uranium Precipitation → Uranium Calcining

Oxidation → Vanadium Solvent Extraction *(VSX)* → Vanadium Precipitation → Deammoniation → Fusing

ENERGY FUELS

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RECLAMATION

MINE RECLAMATION

ENERGY FUELS

Restoring Disturbed Land to a Beneficial Use

RECLAMATION BEGINS WITH PLANNING

- Environmental baseline studies
- Detailed plans approved by government officials
- Reclamation bonds to ensure successful completion of the process

HACK CANYON MINE

WHY THE PAST WILL NOT BE REPEATED

- Today's environmental standards
- The mining industry's commitment to health, safety & the environment

MILL TAILINGS RECLAMATION

ENERGY FUELS

BEAR CREEK URANIUM MILL, WYOMING

RECLAIMED TAILINGS

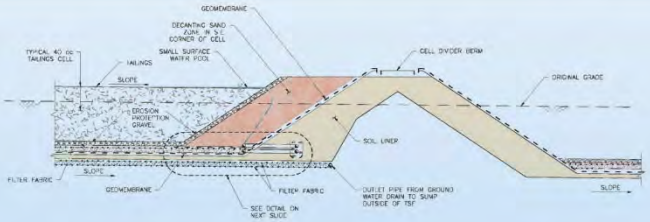
- ☑ Reclaimed Site Owned by Federal Government
- ☑ Must be Stable for Minimum 1000 Years Without Maintenance

L BAR TAILINGS SITE, NEW MEXICO

VEGETATION COVER

KEY DESIGN FEATURES

- ☑ Radon Barrier
- ☑ *Vegetative Evapotranspiration Cover*
- ☑ *Impermeable Multiple Liners to Prevent Seepage*



ALTERNATE FEED MATERIALS

ENERGY FUELS

WHAT ARE THEY?

- Uranium-bearing materials other than conventional ores
- Often process residue streams from other metal processing facilities and uranium conversion processes
- Can be low-cost sources of uranium
- Environmentally responsible recycling of valuable resources
- Tailings from processing alternate feeds are permanently disposed of at the Mill as 11e.(2) byproduct material and ultimately transferred to the US Govt. on mill final closure

EXAMPLES

Uranium-bearing tailings from other metal processing facilities

Process residues from uranium conversion facilities

Uranium-bearing resins from municipal drinking water treatment facilities

Facility decommissioning materials & debris from FUSRAP and other government and private sites

IMPORTANCE OF WHITE MESA MILL

1. **UNIQUE CAPABILITY:** The mill is the only operating facility in the U.S. capable of processing and disposing of these types of materials.
2. **GOVERNMENT SERVICE:** The mill provides a cost-effective, environmentally secure recycling and disposal option to the US Govt. for many of these materials.
3. **ECONOMICS:** Processing of alternate feeds allows the mill to continue operating when uranium prices are low.
4. **TRACK RECORD:** Energy Fuels has received authorizations to process over 20 different alternate feeds over the last 30 years and has recovered about 4 million lbs of uranium in the process.

Decontaminating alt feed shipment truck before leaving mill

WHAT ARE AUMs?

ENERGY FUELS

ABANDONED URANIUM MINES

- Historic mines from the 1950s-60s
- No reclamation/closure requirements at that time
- Mainly supplied uranium to the U.S. government
- Now being reclaimed by the government, Navajo Nation and responsible parties

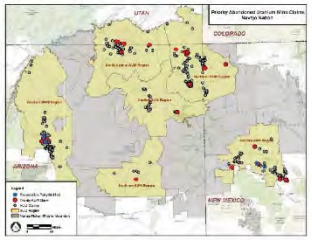
500+
on Navajo Reservation

100+
on USFS, BLM land in Four Corners area

MILLIONS
of tons of waste rock ore

$2 BILLION
committed for remediation

PROGRESS TO DATE VERY SLOW



WHITE MESA MILL'S ROLE

- ☑ Most materials are conventional ores and can be processed by the mill right now, under its existing licensing
- ☑ Recover valuable uranium
- ☑ Tailings from processing will be permanently disposed of in the mill's state-of-the-art tailings facilities as 11e.(2) byproduct material
- ☑ Title will ultimately be transferred to the U.S. Government on final mill closure

ENERGY FUELS

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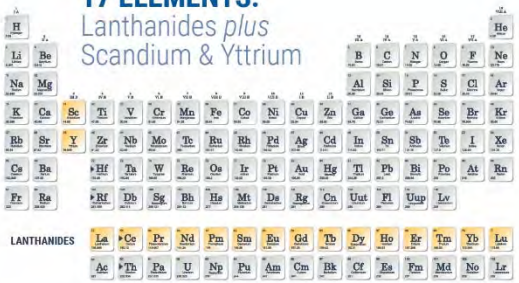
RARE EARTH ELEMENTS

REEs

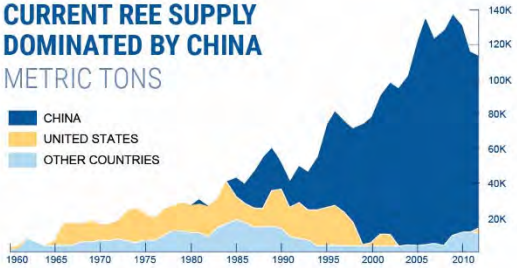
RARE EARTH ELEMENTS

ENERGY FUELS

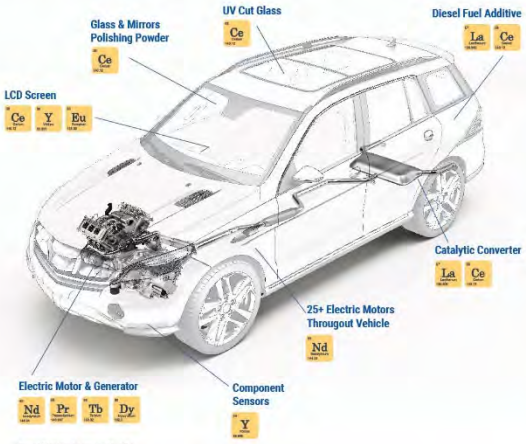
17 ELEMENTS:
Lanthanides *plus*
Scandium & Yttrium



CURRENT REE SUPPLY DOMINATED BY CHINA
METRIC TONS



REEs In Electric Vehicles
Demand Expected to Increase Significantly



PROCESSED FOR DIFFERENT END USES

USES BY VOLUME

USES BY VALUE

RARE EARTH ELEMENTS AND WHITE MESA MILL

ENERGY FUELS

A PERFECT FIT: *Monazite Ore from Chemours ~ 0.2% U_3O_8*

- Waste streams will be relatively small. *(Feed quantities less than uranium processing)*
- Process utilizes existing equipment and expertise.
- Grade is similar to surrounding uranium mines. *(La Sal Complex: 0.18 - 0.21% U_3O_8)*

THE WHITE MESA RARE EARTH PROCESS

1. Monazite Arrives at Mill

Shipped in a closed container from Georgia

2. Rare Earths Extracted

Monazite is broken down with crack and leach process

3. Rare Earths Put into Solution

Produces a high purity solution of all rare earths

4. Uranium, Thorium & Radium Removed

Used for nuclear fuel, cancer treatments + other uses

5. Rare Earths Precipitated & Bagged

We precipitate the mixture of Rare Earths as carbonate and prep for shipping to Estonia

6. WHITE MESA TO PRODUCE REEs

Lab work is underway to design a specific process to produce individual Rare Earths at the Mill. This process is similar to how we produce uranium and vanadium.

Note: at this point in the process, all radionuclides have been removed.

WHY MONAZITE?

ENERGY FUELS

1 HIGH AVAILABILITY

Produced at heavy mineral sand ("HMS") operations in U.S., Australia, Africa & elsewhere

Titanium & Zirconium is the target, but Monazite is a low-cost by-product

HMS operators have issues with Monazite due to uranium and thorium content

2 HIGH VALUE

~53-55% Total Rare Earth Oxides (TREO) + ~0.2% U_3O_8

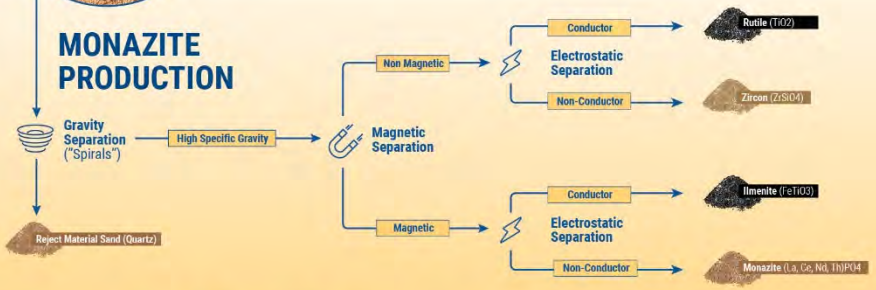
3 HIGH DISTRIBUTIONS of RE

Monazite has superior distributions of critical REEs (%TREO Basis)

~20-25% NdPr (Used for magnets in motors) and >10% "Heavies" (Sm+)

Typical U.S. bastnaesite ore has lower RE distribution

MONAZITE PRODUCTION



MONAZITE SUPPLY CHAIN

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COMMUNITY INVOLVEMENT

COMMUNITY BENEFITS

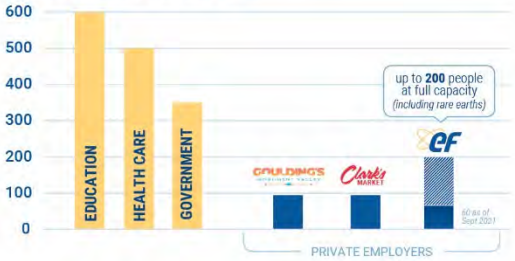
ENERGY FUELS

EMPLOYMENT

MAJOR EMPLOYER

One of the Largest Private Employers in San Juan County *(top 15 overall)*

ANNUAL AVERAGE EMPLOYMENT



HIGH QUALITY JOBS

27.5% Higher Salaries than Median Household Income

MEDIAN INCOME

ENGAGED COMMUNITY PARTNER

HIGH SCHOOL CONTRIBUTOR

- Provides financial support to FIELDS Program at Whitehorse High School on Navajo Nation
- Provides internships in electromechanical technology work at the Mill

Takenya Yazzie
Whitehorse High School
FIELDS Scholar and
FIELDS Intern at Energy Fuels

"I have a bright future. I see myself doing big things because of this program. The hands-on learning has allowed me to understand what goes on at the Mill and troubleshoot. I'd like to see other Navajo students join the program and have a shot at a better future."

- Provides scholarships to high school seniors entering math and science fields:

2021	$5,000 to San Juan High School $5,000 to Whitehorse High School

LOCAL EVENT SPONSOR

- July 4th celebration *(a major regional attraction)*
- Blanding Fall Festival & Youth Rodeo Series
- San Juan County Fair Junior Livestock Show
- All high school football & basketball game broadcasts

SMALL BUSINESS SUPPORTER

- Clarks Market
- Bearskin Custom Ink
- Redd's Ace Hardware
- Local young entrepreneurs *(bakers, sticker makers, etc.)*

Friends of Arches and Canyonlands Parks

Donations and Board Membership

SAN JUAN COUNTY

Clean Energy Foundation

ENERGY FUELS

NEW PROGRAM

Energy Fuels is establishing a new San Juan County focused community investment fund to share the benefits of the Mill's new clean tech future

WHY?

Energy Fuels cares about the local community surrounding White Mesa Mill, and we want to set up a long-term institution with ongoing funding to boost local priorities

POTENTIAL AREAS *of* FOCUS

- TRIBAL COMMUNITY INITIATIVES
- EDUCATION
- HEALTH / WELLBEING
- ENVIRONMENT

LOCAL LEADERSHIP & FUNDING

- A Board including representatives from the community to help the Fund fit the needs of the communities
- Community will help direct the goals and vision of the Fund
- Board designed to provide accountability and management of the Fund
- Support local assets and institutions

$1 million initial contribution from Energy Fuels

Annual funding equal to **1% of mill revenues**

ESG / CLIMATE CHANGE

ENERGY FUELS

"Climate change is the number one issue facing humanity."

President Joe Biden

Energy Fuels is at the forefront of the effort to electrify the US:

+ existing uranium production
+ vanadium business
+ entry into rare earths elements!

We responsibly produce the raw materials needed for many clean energy and advanced technologies

60 **Nd** Neodymium 144.24

(17 Rare Earths)

92 **U** Uranium 238.028

23 **V** Vanadium 50.94

RARE EARTHS QUICK FACTS

- Needed for electric vehicles (EVs), wind energy, batteries, cell phones, computers
- Energy Fuels could create 100+ clean-tech jobs at White Mesa Mill in rare earths

URANIUM QUICK FACTS

- Uranium fuels carbon-free, emission-free nuclear power—one of the cleanest forms of energy in the world
- Nuclear energy provides nearly 55% of carbon-free electricity in the US

VANADIUM QUICK FACTS

- Vanadium is used primarily in the steel, alloys, and chemical industries
- Grid-scale batteries using vanadium now being deployed

RECYCLING

Energy Fuels has recycled 6 million pounds of uranium, which when converted to nuclear fuel will:

- Eliminate over 85 million tons of CO_2
- Produce as much electricity as coal in a train that extended from LA to NYC – and almost all the way back
- Produce as much electricity as 24,500 wind turbines annually

ENERGY FUELS

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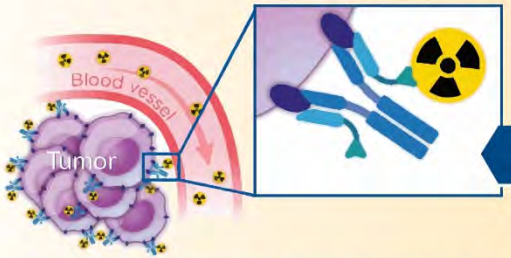
CANCER TREATMENTS

CANCER TREATMENT

ENERGY FUELS

Extracting Radioactive Isotopes from Thorium



Targeted Alpha Therapies (TAT)

A cutting edge cancer treatment that shows great potential to treat cancers with reduced impact on surrounding healthy tissue.

Targeting mechanisms seek out cancerous cells and deliver radioactive isotopes to destroy them.

PROBLEM: Shortage of Radioactive Isotope Material

- Methods for production are exorbitantly expensive
- Isotope production isn't scalable to meet the demand of new drugs
- Shortage limits research and development of new TAT drugs

SOLUTION: IsoCap Technology

- An efficient & lower cost way to extract target isotopes
- Isotopes can be extracted from thorium-232 and/or uranium-238

R|T RadTran

RadTran's patented IsoCap-AA technology extracts medical isotopes for cancer therapeutics—specifically the rare alpha-emitters: Pb-212, Ac-225, Bi-213, Ra224, Ra-223

Ac225 and Bi213 from Thorium

RESULT: A Scalable Supply of Effective TAT Drugs

IsoCap provides pharmaceutical companies the means to develop new drugs *from natural byproducts of mining*