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INSIDE THIS ISSUE 2023

IDAHO MINING ASSOCIATION

mineIdaho

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A message from the
President of the Idaho Mining Association

MARK KIRBY

IDAHO STATE OF MINED

As I sit here and write my thoughts, I am overwhelmed by the great strides our industry has made in this state and the success of the Idaho Mining Association (IMA) over the last year. This is largely thanks to the comradery of our collective industries. Together, we have all helped grow the mining industry and spur necessary advancements in Idaho through education, advocacy and action.

2022 proved to be a remarkably busy year for the association. With an aggressive slate of objectives, we leaned heavily on our executive director, board of directors, and members, which is now 106 companies strong. What we were able to accomplish was nothing short of amazing and is a testament to the hard-working spirit of Idaho miners.

We continued to be a strong presence and trusted voice in the legislative and regulatory arenas. Our diligence positively affected mining legislation and rulemaking activities; the ongoing deployment of our public education, outreach, and marketing campaigns to expand awareness and education of responsible mining in Idaho; and the hosting of multiple networking events across the state, bringing together members, contractor support groups, suppliers, elected officials and agency representatives. For the first time in three years, we were able to host a mine tour with several lawmakers to demonstrate the great work mining companies are doing in the Gem State. We again outdid ourselves with our annual mining conference, pulling off the largest and most successful event to date. And lastly, the IMA Board of Directors executed a strategic planning session and developed a roadmap for continued success in the coming years.

The impacts of these efforts are far reaching and have contributed a great deal to the current state of the Idaho mining industry.

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According to the Fraser Institute in Canada's 2021 Annual Survey of Mining Companies, Idaho continues to be one of the most mining friendly jurisdictions in both the United States and the world. Using their Investment Attractiveness Index, which is a composite index that rates regions on their geologic attractiveness and measures the effects of government policy on attitudes toward exploration investment, Idaho ranked fourth in the nation and seventh worldwide.

It is well known that the Gem State is home to a vast array of mineral resources. It has also become increasingly clear that policy makers across Idaho understand the significant role that domestically sourced raw materials must play in advancing technology, sustaining our modern lifestyle, and reducing our reliance on foreign producers, while taking action to support, promote and encourage mining in Idaho. This sentiment is summed up quite well by Idaho Governor Brad Little, who said, "Responsible modern-day mining that balances economic prosperity with environmental stewardship is the reason that Idaho is one of the best climates for mineral extraction. Mining has a bright future in Idaho."

I could not agree more with our governor. The Idaho mining industry is uniquely positioned to deliver on our nations ever-growing economic needs. I am confident that miners across the state will continue to accept the challenges of the future, find creative solutions to complex issues, and show the world what responsible, sustainable mining looks like.

I am extremely proud to work in the mining industry, honored to serve as president of the Idaho Mining Association and privileged to be an Idahoan!

Source: Fraser Institute
https://www.fraserinstitute.org/categories/mining ▲

A message from the Executive Director of the Idaho Mining Association

BENJAMIN J. DAVENPORT

It is often missed, but if you look closely at the Seal of the Great State of Idaho, you will see a miner. Standing strong since the turn of the century, that miner is a lasting symbol showing the fundamental and important role mining has and still does play in each corner of Idaho.

Emma Edwards Green designed our Great Seal in 1890, and when asked what her inspiration was, she wrote;

"...as mining was the chief industry, and the mining man the largest financial factor of the state at that time, I made the figure of the man the most prominent in the design, while that of the woman, signifying justice, as noted by the scales; liberty, as denoted by the liberty cap on the end of the spear, and equality with man as denoted by her position at his side, also signifies freedom. The pick and shovel held by the miner, and the ledge of rock beside which he stands, as well as the pieces of ore scattered about his feet, all indicate the chief occupation of the State. The stamp mill in the distance, which you can see by using a magnifying glass, is also typical of the mining interest of Idaho. The shield between the man and woman is emblematic of the protection they unite in giving the

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state. The large fir or pine tree in the foreground in the shield refers to Idaho's immense timber interests. The husbandman plowing on the left side of the shield, together with the sheaf of grain beneath the shield, are emblematic of Idaho's agricultural resources, while the cornucopias, or horns of plenty, refer to the horticultural. Idaho has a game law, which protects the elk and moose..."

Natural resources were then, and still are now, a vital element that was necessary for the settlement and growth of Idaho. Those of us who make up today's modern mining industry are working to continue to reinforce its value. While we have come a long way over the past 160 years, we still have much to do to advance the mining industry to its fullest potential, and it will take the hard work and dedication from us all to uphold our industry to the highest standard of excellence.

Restoration around the state continues to show how reclamation can be achieved; we can leave Idaho better than ever. The Gem State mining industry continues to lead the way in finding best practices and creating innovative solutions to the challenges that arise. Mining in Idaho plays a major role in our state and our nation's future. Our abundant resources and diverse mineral deposits are important to securing domestic supply chains for farming, manufacturing, national defense, clean energy, energy storage, and beyond. At the same time, current projects in Idaho offer the opportunity to help with legacy issues that remain, in some cases, from more than a century ago. Now, we have the opportunity and the responsibility to partner with others and lead the nation in responsible mineral development, while correcting project sites from generations before us.

A world without mining would be a significantly different place, one that many may have a tough time envisioning. Modern daily life would not be possible without it. From the fertilizer that increases the yield of our crops, or the toothpaste we use to brush our teeth, to the hundreds of metals that go into the development of phones, computers, refrigerators, cars, bicycles, batteries, solar panels, wind turbines, and even our homes, the world we know right now is all thanks to our dedicated mining industry.

One of our most important and defining features is the location of our mines and project sites. Mining provides quality, high-paying opportunities to Idahoans in rural areas.

Economists estimate that for every job created at a mine, two-and-a-half more are created throughout the community. The total economic impacts to Idaho include more than 10,000 jobs and produce more than one billion dollars in Gross State Product. These impacts are significant in local communities like Wallace, Marsing, Soda Springs, or Challis. The diverse array of available jobs allow for Idaho families to live and work in their hometowns, support their local communities, and help supply the rest of the world with the critical natural resources they need.

As an industry, we must continue to allow access to mineralized areas for responsible mineral development and extraction in order to achieve these goals and advance modern societal needs. As consumers, we must demand that the production of these minerals be done in places with stringent environmental and labor standards that protect the land and the humans that are helping make our daily lives possible. Mining has always been an essential contributor to our nation's commerce and will continue to be essential going forward.

We must continue to be vocal about the importance of our industry. We must continue to share the stories and reasons why our projects need permitting and our operations must continue.

From Idaho's humble beginnings in 1890, to becoming one of the fastest growing states in 2023, Idaho miners continuing to put in the hard work. We are still the vision etched into history by Emma Edwards Green; providing critical, raw materials and protecting our natural resources for today and for future generations. ▲

IMA PRINCIPLES

OUR VISION

The Idaho Mining Association advocates for a responsible and sustainable mining industry, benefiting our state and local communities

OUR MISSION

TO BE RECOGNIZED AS THE TRUSTED VOICE OF IDAHO'S MINING INDUSTRY BY...

1. Advancing responsible development of Idaho's diverse mineral resources
2. Encouraging economic growth by creating and maintaining high quality jobs
3. Engaging government to support the interests of the membership
4. Promoting industry best practices and technology
5. Demonstrating the importance of the mineral industry to society
6. Interacting with other organizations on matters of common interest

OUR BELIEFS

1. Idaho's uniquely diverse mineral base is a major asset of the state and its utilization will enhance the economy
2. A financially healthy mining industry is necessary to derive value from this asset
3. Mining can be conducted in an environmentally responsible manner
4. A close working relationship with government is necessary to accomplish the IMA mission

OUR MEMBER VALUES

1. Excellence in Safety
2. Environmental Stewardship
3. Stakeholder Engagement
4. Ethical Business Practices
5. Trusted Community Partner

Idaho Mining Association

IMA MEMBERSHIP INFORMATION

MEMBERSHIP CATEGORIES

OPERATING

Companies that have produced or processed minerals in Idaho for at least a one year.

2023 dues are $32,000

DEVELOPING

Companies that have located minerals and are now in the process of contracting/ permitting a mine to produce or process minerals.

2023 dues are $5,500

NON-OPERATING

Companies that were operating members of IMA for at least 3 years, but are not currently producing minerals.

2023 dues are $1,500

EXPLORATION

Companies that are engaged in the exploration for minerals in Idaho but are not currently producing or processing minerals.

2023 dues are $2,750

LEGAL FIRMS/POLICY CONSULTANTS

2023 dues are $1,200

ASSOCIATE

Companies that provide products or services to the mining industry.

2023 dues are based on the volume of business done with the mining industry according to the following schedule:

VOLUME OF BUSINESS	DUES
Less than $250,000	$350
$250,000 - $500,000	$475
$500,000 - $1,000,000	$800
$1,000,000 - $2,500,000	$1,550
More than $2,500,000	$7,250

IDAHO MINING ASSOCIATION

IMA MEMBERSHIP BENEFITS

INFORMATION

Stay informed on up-to-the-minute industry news that might otherwise pass you by. Becoming a member of the Idaho Mining Association (IMA) gives you access to news and developments in the industry along with the opportunity to hear and learn from peers in the industry.

NETWORKING

Connect and create relationships. The IMA provides a great networking opportunity for members who want to strengthen ties with clients or colleagues in their industry, hunt for jobs or make long-term connections.

BEST PRACTICES

Lead the way in implementing industry best practices. Members of the IMA gain resources on what is happening in the industry to keep our practices safe and efficient and have a head start on implementing new practices as they are amended or change.

EVENTS

Make staying engaged easy. Companies who join IMA participate in association events focused on forming valuable connections and trade shows, seminars and workshops that provide valuable connections and education opportunities.

STRENGTH AND POWER IN NUMBERS

Influence how decisions are made. Working together, our collective experience on the issues and in navigating the burdensome regulatory environment are valuable benefits all IMA members enjoy.

SUPPORT THE CAUSE AND THE FUTURE

Amplify industry's voice, support industry growth and act as a watchdog for mining as a whole. As a member, you will be supporting the mission of the IMA and the work we do. Many of our members see the value of helping promote the future of mining.

2021 ECONOMIC IMPACT OF IMA MEMBER FIRMS*

10,309 jobs | $696.8 million in compensation | $99.2 million in taxes generated | $1.36 billion in GSP

FOR EVERY 1 DIRECT IMA JOB, AN ADDITIONAL 1.38 JOBS ARE CREATED IN IDAHO'S ECONOMY

*Numbers include a multiplier effect

IDAHO MINING ASSOCIATION

IMA MEMBERS

OPERATING MEMBERS

America's Gold and Silver

Bayer

Hecla Mining Company

Itafos

J.R. Simplot AgriBusiness Group

DEVELOPING MEMBERS

Idaho Strategic Resources | Integra Resources
Jervois Mining | Liberty Gold | Perpetua Resources | Revival Gold

EXPLORATION MEMBERS

Bunker Hill Mining | Excellon Resources | Electra Battery Minerals | Freeman Gold Corp
Gold Express Mines | Hercules Silver Corp. | Idaho Champion Gold Mines | Idaho Lime
Phoenix Copper Limited | Silver Valley Metals | Sunshine Silver Mines

NON-OPERATING MEMBERS

Thompson Creek Mining | FMC | Solvay USA | Nutrien

ASSOCIATED MEMBERS

ACZ Laboratories | AECOM | AFFCO | Air Sciences Inc
Albatross Environmental & Process Consulting | Arcadis | AstraAlloy | Ball Ventures
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Brewer Exploration Inc. | Brooks and Nelson | Brown and Caldwell | Cate-Idaho Equipment | CDM Smith
CGS Mule | Conrad and Bischoff | Consolidated Pipe and Supply/High Country | Cumberland Surety Inc.
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Parsons Behle & Latimer | Perkins Coie | Pray and Company | Rain for Rent | Ramboll
S & G Electric Motor Repair | SBS Associates | Shimmick | Smith Power Products, Inc.
Specialty Construction Supply | Stantec | State Fire | Stinker Stations Stoel Rives LLP | Sullivan Reberger
SVL Analytical | Tetra Tech | Theiss | Tierra Group Intl. | True North Steel | Valley Science and Engineering
Varin Thomas LLC | WCRM | Westerberg and Associates | Western States Equipment Company
Whiteman Lumber Company | Worldwide Rental Services

EVENTS RECAP

BUSY YEAR FOR THE IMA

2022 was a busy year for the Idaho Mining Association. Fortunately, things have slowly started returning to normal after the COVID-19 pandemic and we were able to have many in-person events, including our annual Idaho Mining Conference.

The year kicked off with our annual Legislative event where we hosted over 120 members, legislators and policy makers at our reception and dinner.

After the 2022 Legislative Session, IMA spent the warmer months on mine tours, accompanying legislators and government agency heads to all corners of our state on member site tours. From the phosphate patch, to the Silver Valley and everywhere in between!

We hosted regional membership receptions throughout the state, providing valuable opportunities for membership to network and gather.

The IMA board met with all four members of our Federal Congressional Delegation and had meaningful meetings with agency personnel throughout the August recess, as well as our annual DC Fly-In event in September.

IMA once again sponsored the Lowe Family Farmstead mining sluice in 2022, where thousands of kids were able to mine for fossils and gems.

Finally, in October, IMA had its biggest Idaho Mining Conference yet with over 50 sponsors and over 450 attendees. It was a great success.

Another year has gone by and we remain impressed by all the hard work of our members to keep mining great in Idaho. ▲

Legislastors touring Itafos Condo's Rasmussen Valley Mine.

IMA's annual Congressional Delegation reception.

Clockwise from top left: IMA sponsors an Idaho Legislative Sportsman Caucus event. Touring Stibnite with Perpetua Resources agency personnel. More mine tours! IMA's biggest annual Idaho Mining Conference yet with over 450 attendees. IMA in Washington D.C. for the annual D.C. Fly-In.

IDAHO MINING CONFERENCE 2022 – A NATURAL PROGRESSION

By D. Kerner

On October 24-25, 2022, more than 450 miners, consultants, drillers, geologists, engineers, environmental scientists, regulators, attorneys, etc. gathered at the Boise Centre West on the Grove in Idaho's capital city for the 2022 Idaho Mining Conference.

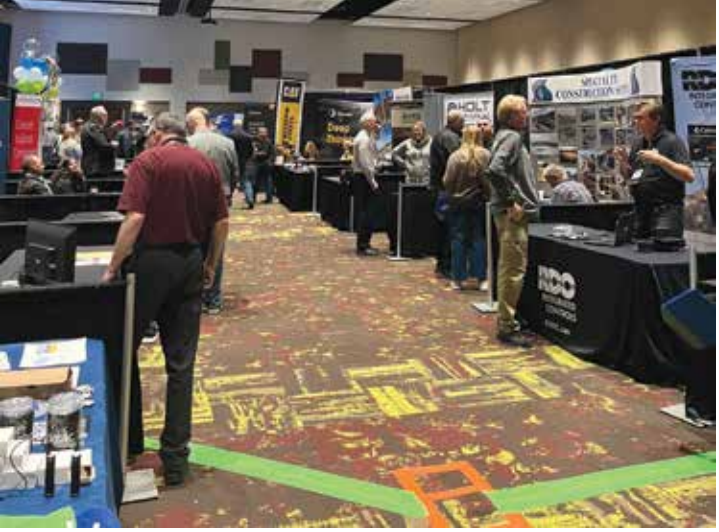
The growth of the Idaho Mining Association's (IMA) annual conference over the past five years since its re-inception might lead one to think that its popularity is a modern phenomenon. In fact, the event has deep roots and a tradition of strong participation. Consider the February 15, 1923 edition of the *Wallace Miner* which dutifully – and artfully – reported on the IMA's annual meeting in its lead story:

The annual meeting of the Idaho Mining Association, which was held in Boise Tuesday and Wednesday of this week, attracted a good attendance of representatives of the mining industry from all parts of the state. The session opened with an address of welcome to the miners by Governor (Charles Calvin) Moore…Subjects discussed and which received formal action covered a wide range and have a direct bearing upon the future of the mining industry of the state.

At the time of the 1923 conference, the IMA was just 10 years in existence. An inaugural meeting in February 1913 under its first President Harry L. Day marked the establishment of the organization which the press opined, "will further the interest of every prospector, miner and all directly or indirectly interested in the mining industry in the state. It is the proper move." (*Wallace Miner,* February 6, 1913).

Proper move indeed. And that propitious assessment – now more than a century old – has aged well and serves as a suitable introduction to the 2022 Idaho Mining Conference (IMC); an event that in just a few years has re-claimed its historical place of importance and become an anticipated focal point for individuals representing all aspects of Idaho's mining industry. This year's theme: It's in Our Nature is an appropriate tagline that reflects how deeply embedded mining is in the history of our state and points to its importance in years to come. The wealth of diverse mineral resources in Idaho offer opportunities not only to provide the raw materials that our economy and nation demand; they also put Idaho at the forefront of leading the way in responsible and sustainable mining practices.

On October 24-25, 2022, more than



450 miners, consultants, drillers, geologists, engineers, environmental scientists, regulators, attorneys, etc. gathered at the Boise Centre West on the Grove in Idaho's capital city. The IMC's continued expansion of both attendees and sponsors required the move to the Boise Centre's more expansive venue and the now permanent adoption of a two-day format. The opening day of the conference facilitates a more relaxed registration process and free time for personal interaction, a hallmark of any mining event (we are a sociable bunch). It also affords sponsors more access to attendees with added free time to cruise the vendor hall and observe the innovations in products and services that are meeting the needs of burgeoning exploration and mine development in Idaho, not to mention their role in keeping operating mines running smoothly and safely. That is not to say Day 1 of the IMC is content-free...far from it. Marquee speakers and themed sessions spur attendees into conference mode and set the tone for the following day's technical sessions and panel discussions, which go deep and get to the heart of the issues of most importance to our industry.

This year's IMC Day 1 activities kicked off mid-morning with (now re-elected) Governor Brad Little's welcoming comments. Noting Idaho's status as the "least regulated state," Governor Little reiterated his continued commitment to

streamlining Idaho's regulatory processes while maintaining an appropriate level of oversight to ensure for the protection of Idaho's environment. Governor Little was followed by Ryan Jackson of the National Mining Association, who speculated on the outcomes of the then-forthcoming mid-term elections and their potential to impact the federal approach to mining regulation. Afternoon activities offered several options, including a newly-instilled Reverse Expo; an opportunity for vendors to gain exposure to a broad range of potential clients in a speed-dating-type format. Down the hall, the Idaho Working Together session provided a look at the Interagency Review Process from Richard Stover, administrator for the Idaho Governor's Office of Energy and Mineral Resources (OEMR), a topic complementary to Governor Little's opening remarks on "leaning up" Idaho regulatory processes. Hugh Agro, president and CEO of Revival Gold, Inc., rounded out the session with a discussion on mining investment in Idaho.

The first day of the IMC also included events focused on drawing university students to the IMC, an initiative which we hope will continue its upward trajectory. A Student and Professionals Luncheon put on by the Boise Section of the Society of Mining, Metallurgy and Exploration (SME) brought together seasoned industry professionals with students keen on initiating their professional networks and meeting (perhaps) their future employer. Special guests to the luncheon included American Exploration and Mining Association (AEMA) representatives Mark Compton (executive director) and Sidney Smith (government affairs manager). Following the luncheon, students engaged in research projects related to topics that support the mining industry participated in a student poster session that was likewise coordinated by the SME Boise Section. Boise State University undergraduates, graduate students and PhD candidates presented their research to a panel of judges in the hopes of garnering a scholarship award. The SME Boise Section's annual fundraising activities and IMA's generous support translated to scholarships for seven student participants this year totaling $5,000.

The IMC truly hit its stride on Day 2 of the conference, with multiple technical sessions and panel discussions that have consistently proven to be the defining trait of IMA's annual meeting. Three parallel technical tracks allowed conference-goers a wealth of opportunities to hear about Idaho mining projects that span the spectrum of exploration, development, permitting, operations and reclamation. Featuring presentations from Idaho's workhorse phosphate and silver mining districts, as well as the multiple would-be operators navigating their way

through multi-tiered regulatory processes, the biggest challenge of the day for the curious attendee was selecting from the diversity of presentations. The lunch program brought all together in the main hall to hear from keynote speaker Ryan Sistad, executive director for Better in our Backyard (BIOBY). Sistad spoke to his organization's efforts to improve public perception of mining and natural resource projects in Minnesota, Michigan and Wisconsin. Grounded in education and true understanding of the beneficial impacts of responsible resource development rather than indoctrination and emotional appeal, Sistad spoke to BIOBY's facts-based approach to engaging stakeholders and garnering support for much-needed operations that support economies at both a regional and national scale.

Afternoon panel discussions and presentations likewise provided a centralized location for attendees to come together and hear from those who have served foundational roles in Idaho's mining industry. With the assistance of moderator Laurel Sayer (Perpetua Resources' president and CEO), panelists Jeff Cundick (Bureau of Land Management – retired), Luke Russell (Hecla Mining Company – retired) and Rick Johnson (Idaho Conservation League – retired) shared their perspectives from careers spent in – or in opposition to – Idaho's mining industry. The interaction of regulatory, operational and conservational entities certainly have led to much-improved mining practices and environmental outcomes in Idaho, and there is work yet to be done. This discussion aptly queued up Tyre Gray, president of the Nevada Mining Association, who spoke to the look ahead. In addition to providing the essential materials that we all need to maintain our quality of life, the mining industry can also serve as a leader in our society by demonstrably embracing the strength that comes from diversity and educating the populace to pull back the curtain that sometimes separates the producer from the consumer.

Remarks from Ben Davenport, the executive vice president of the IMA, once again closed the conference, giving due appreciation to an ever-growing list of IMC sponsors and attendees who continue to support this event and the strength of unity that it brings to Idaho's mining industry. The level of support that the IMA and the IMC enjoy speaks well to Ben's leadership, it exemplifies the dedication of the individuals engaged in this worthy cause, and it bodes well for the future of mining in Idaho. The IMA's first president, the late Harry L. Day, would likely be impressed by the progress of his organization, but it's doubtful that he'd be surprised. After all, it's in our nature. ▲

OVERVIEW OF STATEWIDE MINING OPERATIONS AND THE MINERALS-RELATED ACTIVITIES OF THE IDAHO GEOLOGICAL SURVEY

By Virginia Gillerman, Reed Lewis, Claudio Berti and Christopher Tate, Idaho Geological Survey

Idaho's mining and exploration industry had a successful year in 2022. Precious and base metal prices remained high during the first half of the year, and phosphate rock prices were up as well, likely due in part to the war in Ukraine. Inflation and labor shortages did impact operations and the agencies regulating them. Permitting and its lengthy timelines remained a top industry concern. Federal interest in domestic supplies of critical minerals and concerns for the vulnerability of supply chains provided fuel for both research and exploration in Idaho, and the state's diverse geology and mineral resource base offered multiple opportunities. Several advanced projects targeted commodities on the national critical minerals list.

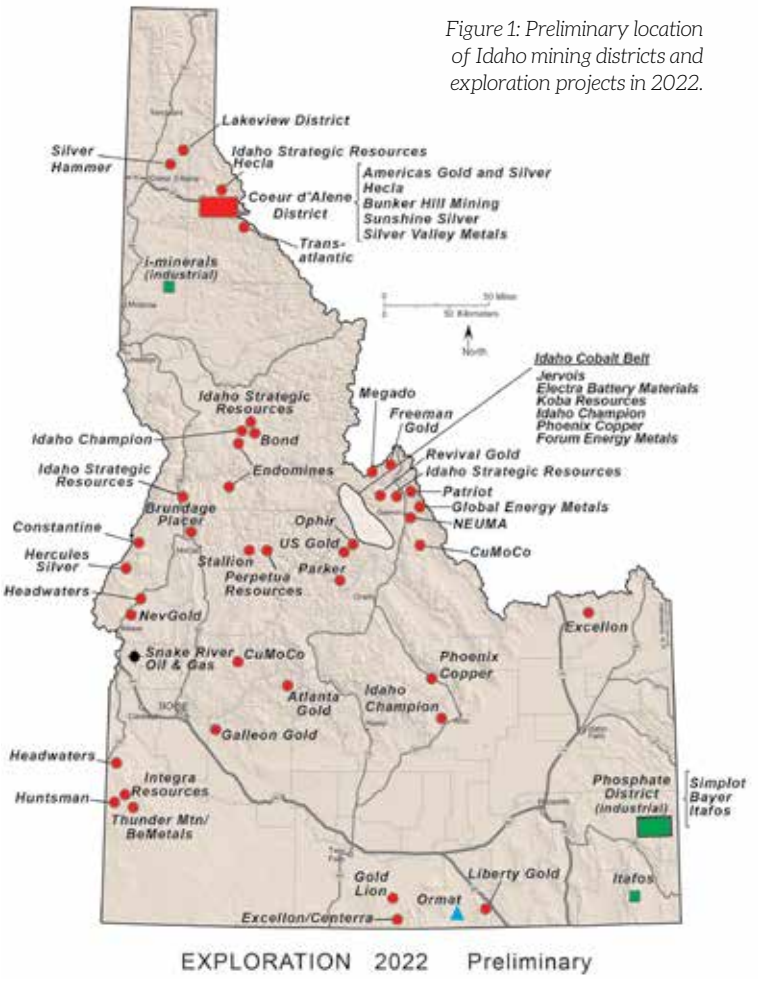


Figure 1: Preliminary location of Idaho mining districts and exploration projects in 2022.

Figure 2: New concrete for Galena hoist replacement.

Figure 1 shows the location of Idaho's two world-class mining districts, the Coeur d'Alene (CDA) district in north Idaho and the Phosphate district in southeast, as well as a number of mineral exploration projects around the state. Two mines have been operating in the CDA district (Silver Valley) and another one is on the road to reopen. As documented in a new publication by the Idaho Geological Survey (GeoNote 47), the total historic production is over 1.256 million troy ounces (39,085 metric tons) of silver metal plus significant base metals and antimony. Hecla Mining Company's Lucky Friday mine was on target to produce about 4.3 million troy ounces during 2022 from the Gold Hunter vein system. The mine designed and successfully implemented a new underhand closed bench mining method that uses longhole drilling to relieve stress and reduce seismic risk at the deep stopes. At Americas

Figure 3: Aerial view of new mill buildings and facilities at Jervois' Idaho Cobalt Operations, October 2022.

Figure 4: Geologist Kellie logging core at Electra's Iron Creek copper-cobalt deposit.

Gold and Silver Corporation's Galena mine, exploration and rehabilitation work again increased the mineral reserves and resource by over 30 percent. Replacement of the Galena hoist, a two-year project, was in its final stages (Figure 2). Zinc was a new addition to the critical mineral list. At the Bunker Hill mine, a historic lead-zinc producer, underground development work, installation of a newly purchased ball mill, and upgrading of electrical and other mine infrastructure were underway to reopen the giant mine for Bunker Hill Mining. Exploration, including geophysics, continued at the nearby Ranger-Page project of Silver Valley Metals. Idaho Strategic Resources (ISR), formerly New Jersey Mining, expanded gold production at the Golden Chest gold mine at Murray and discovered new veins and ore shoots. Ore is processed at their mill at Kellogg.

Idaho's phosphate industry continued in full production with mining and processing of four to five million tons of phosphate rock from the Permian-age Phosphoria Formation. Simplot mined the F and G panels at the Smoky Canyon mine and drilled geotechnical holes on the adjacent East Smoky deposit. Bayer was mining at the Blackfoot Bridge mine and constructing initial facilities at the larger Caldwell Canyon project, located near the old Dry Valley mine. Itafos was mining at the Rasmussen Valley mine and working on the EIS for their Husky 1/North Dry Ridge project. Two large phosphoric acid fertilizer plants and one elemental phosphorus plant processed the mined phosphate rock.

Perpetua Resources, formerly Midas Gold, completed the first phase of pre-mining removal actions at the Stibnite Gold Project in Valley County, as allowed in a historic agreement with the EPA to clean up Second World War vintage mine wastes located next to the East Fork South Fork Salmon River. The long-awaited Supplemental Draft EIS was released on October 28, 2022 by the Payette National Forest; it cites Perpetua's mining and restoration plan as a preferred alternative. The gold resource is accompanied by significant antimony which would constitute the only raw domestic supply of that critical mineral.

The Idaho cobalt belt was the site of an October 7, 2022 ceremonial commissioning of Idaho's next mine, Jervois Global's Idaho Cobalt Operation (ICO), located in the backcountry of Lemhi County. The onsite ceremony was attended by Governor Little, the Australian ambassador to the United States, and Department of Energy officials. Mill facilities, a 100-bed person-camp, tailings and water management facilities, and two underground adits were under construction during the year (Figure 3). Production from and milling of the RAM deposit copper-cobalt-gold ore is targeted by the end of the year. The RAM deposit, which is peripheral to the historical Blackbird mine, was discovered in 1997 by Formation Capital Corporation which was eventually bought by Jervois. The ICO has an announced eight-year mine life with a 1,200-ton/day mill, and significant exploration potential. It will be the nation's only primary cobalt mine, although the cobalt concentrate will go to Jervois' refinery in Brazil for processing. Cobalt is essential for its use in EV batteries. Three other cobalt occur-

Figure 5: ISR's excavator digging trench at the Lucky Gem oxidized rare earth vein, Diamond Creek property, Lemhi County, October 2022. Samples will assist the IGEM project.

rences along the belt were also being drilled. The other advanced project was Electra Battery Materials' work at the Iron Creek property on the southeast end of the cobalt belt. Electra drilled six core holes, totaling 1,674 meters, on the Ruby zone which is located east of the Iron Creek resource area and No Name adit (Figure 4). Koba Resources drilled at Blackpine and the Colson property, two other copper-cobalt occurrences on the belt.

The Idaho Geological Survey (IGS) released a new geologic map at 1:16,000 scale of the Blackbird Co-Cu-Au district in Lemhi County as part of a cooperative project with the USGS under the Earth Mapping Resources Initiative (Earth MRI). Geologic maps of three nearby 7.5' quadrangles were also posted on the IGS website. These maps will assist ongoing exploration both for cobalt-copper and gold deposits, and mapping is ongoing in two adjoining quadrangles.

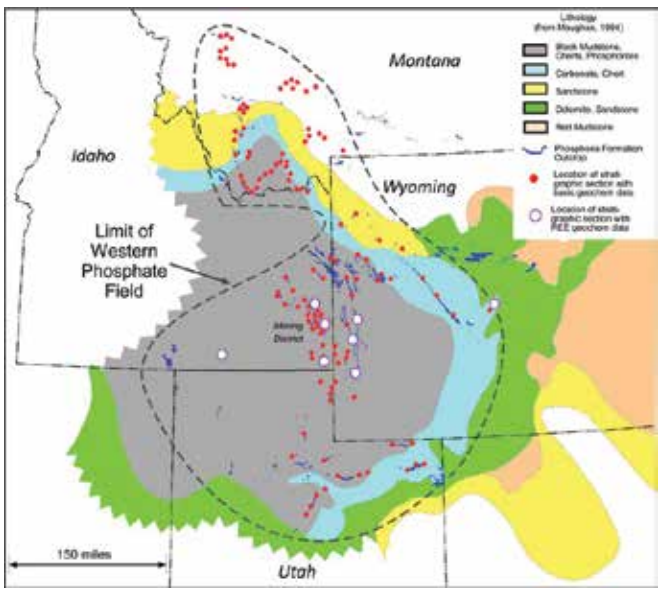


Figure 6: Extent of the Western Phosphate Field and location of proposed geochemical and stratigraphic investigations.

After a two-month delay due to the Moose fire near North Fork, Idaho Strategic Resources (ISR) commenced drilling for rare earths at the Diamond Creek property northwest of Salmon in Lemhi County. Megado Minerals conducted surface geologic exploration for rare earths on their claims in the Mineral Hill district west of North Fork.

Other advanced projects in Idaho focused on precious metals. Revival Gold's project at the Beartrack mine was impacted by the Moose fire in Lemhi County, but all personnel were safe and the mine buildings, as well as historic cabins at Leesburg, remained undamaged. Drilling at Beartrack and nearby Arnett Creek continued into late fall. Favorable results at the deep Joss target south of Beartrack included 6.2 g/t gold over 14.2 meters in hole BT22-241D. A mineral resource calculation released in May 2022, estimated about four million troy ounces of gold in the two Lemhi County projects. Liberty Gold had four drill rigs active at the Black Pine gold mine in Cassia County, and the company was conducting metallurgical and baseline environmental studies. A new Preliminary Economic Assessment was due out in late 2022. Drilling focused on the new Rangefront discovery in the valley east of the old Black Pine pits. In southwestern Idaho, Integra Resources drilled most of the year at their De Lamar project, reporting favorable intercepts cutting the deep epithermal veins at Florida Mountain and from drilling at the Sullivan Gulch area on the northeast side of the De Lamar mine. They were also exploring greenfields

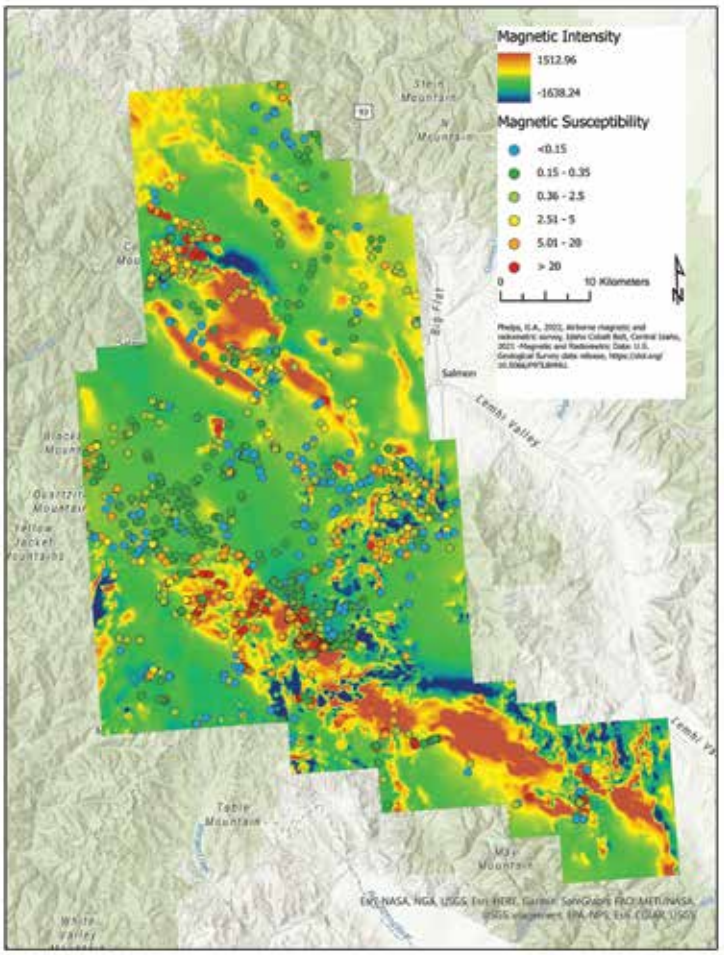
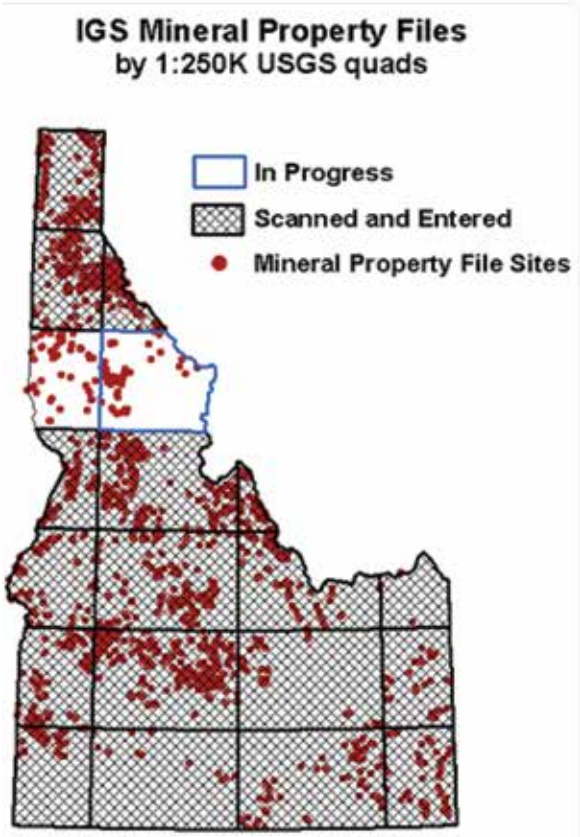


Figure 7: Airborne magnetic data over the Idaho cobalt belt, with overlayed field magnetic susceptibility data.

targets, drilling prior mine stockpiles, and conducting extensive metallurgical and baseline environmental work in preparation for a potential mine plan submission.

Locations of many smaller projects are shown in Figure 1. Overall, it was another very active year for exploration in Idaho. Drill rigs and labor continued to be hard to get and turn-around times very long for contracting labs. Work by the Idaho Geological Survey continued to assist mineral exploration efforts by generating new knowledge in areas of interest, especially in Lemhi County and its areas of critical mineral mineralization, the Idaho cobalt belt and rare earth districts. A new grant from the Idaho Department of Commerce's IGEM program funded collaborative work between industry (Idaho Strategic Resources), the University of Idaho and INL. Two UI entities will be characterizing and testing mineralized surface and drill material from ISR's drilling and trenching (Figure 5). The Idaho Geological Survey will provide mineralogical identification and other geological studies of the Diamond Creek rocks, while the UI engineering faculty and students assess the potential for agromining, bioleaching and other biological processing to extract rare earths from the oxidized REE-Th veins.

Rare earths are also the main focus of a new USGS-funded, Earth MRI project for geochemical characterization and sequence-stratigraphic interpretation of the Western Phosphate Basin. The three-year project involves collaborators with state



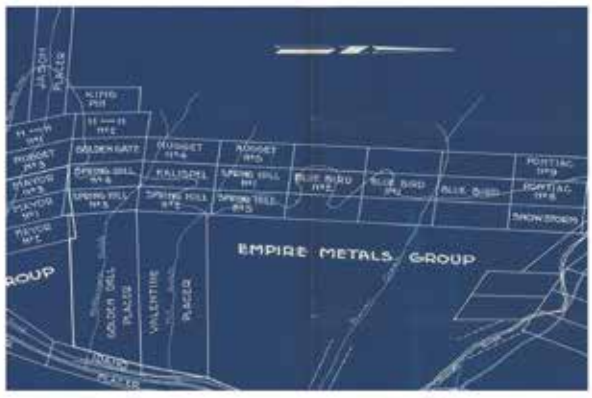


Figure 8: Left: Map showing IGS Mineral Property file scan progress. Right (upper): Example Mineral Property file showing detail of claim locations for Empire Metals Group at Orogrande-Frisco mine (1932). Right (lower): Detail of map of Red Bird (CH1232) underground workings.

surveys in Wyoming, Montana, and Utah. The black, organic-rich phosphatic mudstones in the Phosphoria Fm. host anomalous concentrations of many critical elements, including vanadium and rare earths (Figure 6).

In August 2022, the USGS released the data from an USGS-IGS co-lead airborne magnetic and radiometric survey over approximately 1,160 square miles of the Salmon National Forest in Lemhi County, including the majority of the Idaho cobalt belt and surrounding areas. The Idaho Geological Survey partnered with three mining companies operating in the area to acquire the necessary funding and sponsor part of the study, fostering a public-private partnership that will hopefully serve as a template for similar future endeavors. Data from the airborne survey can be found through the USGS ScienceBase Catalog at https://doi.org/10.5066/P9TLBM4U. Parallel to this study, the IGS has been collecting magnetic susceptibility data in the field, in the effort to better characterize the magnetic properties of the different formations outcropping in the area and facilitate the regional interpretation of the airborne dataset (Figure 7). A database of magnetic susceptibility is in the final stage of preparation and will be released in early 2023.

For over 15 years, the IGS, in conjunction with the Idaho Department of Lands and U.S. Geological Survey, has been involved with digital data preservation activities. These efforts have resulted in the scanning of historic mine maps, assays, geologic and mine reports, images, and drill-hole maps, amounting to over 20,000 documents, along with digitized video files. All are available for download at no cost to the public (Figure 8). Data preservation efforts at IGS have resulted in millions of dollars of investment in the state of Idaho from the mining industry, particularly with exploration efforts. Other users of IGS Data Preservation products include students, academics, historians, anthropologists, genealogists, hobby miners, gem collectors, and state and federal agencies.

Interactive web map applications are the primary interface for discovering and obtaining materials generated by Data Preservation efforts. This year, the Survey added a query filter to the Mines web app that facilitates searching for documents and mine sites related to company names. The Oil & Gas web app underwent an extensive upgrade to allow for dynamic searches including well names and API numbers. Downloads of oil and gas well data through our app have been expanded to include LAS files generated from historical well logs. The LAS file format is an industry standard for importing data into modern software used for modelling and analyses. Conversion to LAS is an ongoing effort, and currently there are 244 files available for download.

For information on any of the products and databases released by IGS, please visit the Survey's webpage at www.idahogeology.org. ▲

REGULATORY WATCH: REGULATIONS YOU NEED TO KNOW

By Todd Glindeman and Kelly Collins, Brown and Caldwell

The regulatory environment continues to change and evolve both at the federal level and here in the state of Idaho. At the federal level, the Clean Water Act (CWA) remains a focus for the Biden-Harris Administration while also introducing a new focus on environmental justice. Here at home, arsenic and mercury continue to be in the news. The Idaho Mining Association, led by Executive Vice President Ben Davenport, continues to be actively engaged in representing the mining industry's interests as an active stakeholder.

This article spotlights several updates to state regulations and federal laws that will affect the Idaho mining community.

Idaho regulations

Arsenic water quality negotiated rulemaking

In 2010, the Idaho Department of Environmental Quality (IDEQ) initiated rulemaking to update its arsenic surface water quality criteria for human health. The proposed criteria were aligned with the Environmental Protection Agency's (EPA's) standard under the Safe Drinking Water Act (10 micrograms per liter [µg/L]) instead of the EPA recommended criteria under the CWA. EPA approved the criteria, was sued, and the ensuing court order required the EPA to withdraw approval of the criteria and approve new criteria by November 23, 2024.

Idaho's Human Health criteria have ranged from 0.018 to 50 µg/L at various times since 1992. It is challenging to develop reasonable and enforceable arsenic criteria in part because many areas of Idaho have elevated levels of naturally occurring arsenic. IDEQ presented proposed criteria of eight micrograms per kilogram (µg/kg) in fish tissue and 4.3 µg/L water column only. The Idaho Board of Environmental Quality approved the proposed criteria with a very minor amendment. The next steps in the path are approval by the Idaho legislature and EPA approval.

At the time of this publication, rulemaking is still underway, with a final deadline for the EPA to approve or promulgate criteria by November 2023. In 2022, IDEQ introduced proposed draft criteria during recent public meetings. One of the proposed Human Health criteria values would continue the 10.0 µg/L criterion for Water and Fish Consumption, while the other would comprise an inorganic arsenic criterion of 8.0 µg/kg in fish tissue limit for Fish Only Consumption, with an associated water column value of 4.3 µg/L with the fish tissue criterion superseding the water column criterion when tissue data are available. IDEQ has started a public input process on developing implementation guidance for the criteria.

Mercury water quality standard update

The mercury freshwater aquatic life water quality standard has been the same since 1996 for CWA purposes: 0.012 µg/L chronic and 2.1 µg/L acute. In 2005, the Idaho legislature adopted the narrative toxics standard for mercury. The EPA disapproved this change in 2008 which effectively kept the 1996 numeric criteria in place for National Pollutant Discharge Elimination System and Idaho Pollutant Discharge Elimination System permitting and other CWA purposes. In 2013, two plaintiffs filed a lawsuit against the EPA for violating the CWA by not promptly promulgating mercury water quality standards for Idaho after disapproving them.

In September 2022, EPA proposed a settlement in the lawsuit. The EPA agreed to propose aquatic life mercury criteria unless Idaho adopts aquatic life mercury criteria and EPA approves it first. The IDEQ Surface & Wastewater Division Administrator confirmed that it is unlikely that Idaho would pursue developing a mercury criterion, as IDEQ continues to maintain that the 0.3 microgram per kilogram fish tissue criterion established to protect human health is also protective of aquatic life.

EPA has 18 months to finalize the criteria. Under the settlement, EPA would have nine months to (1) determine whether the Endangered Species Act Section 7 consultation with the Services is required, and (2) initiate any such consultation. If after nine months, the EPA determines that consultation is not required, the EPA would have to finalize the criteria within eight months of that determination.

The EPA intends to propose water column concentrations, or default water column values that can be modified on a case-by-case basis, if the EPA determines

there are sufficient data available to support this form of criteria.

Throughout the process, there will be opportunities to be involved in and comment on mercury water quality standards that are proposed.

Federal regulations

Water Quality Certification CWA Section 401

Under Section 401 of the CWA, a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into 'waters of the United States' (WOTUS) unless the state where the discharge would occur certifies that the discharge will not violate State water quality standards.

The primary federal agencies that issue permits that could affect water quality are the United States Army Corps of Engineers (404 dredge and fill permits) and the Federal Energy Regulatory Commission (i.e., hydropower project licenses). States and authorized tribes where the discharge would originate are generally responsible for issuing water quality certifications. The certifying agency can issue the certification, issue certification with conditions, or waive the certification.

The regulations for water quality certifications are under 40 CFR 121, codified in 1971. The certification regulations were revised effective September 11, 2020 (2020 rule). Numerous legal challenges were filed, but the 2020 Rule is currently in effect. The EPA published a proposed rule to revise 2020 rule in 2022 and the EPA expects to finalize the rule in the spring of 2023.

The 2020 rule differs from the 1971 regulations and the 2022 proposed rule in the scope of certification. The previous and proposed regulations applied to certifying that the activity as a whole will comply with all applicable water quality requirements, which allowed certifying agencies to address water quality impacts from any aspect of the construction or operation of the activity as a whole. The 2020 rule limited certifying agencies to assuring that the discharge from a federally licensed or permitted activity will comply with water quality requirements.

Clean Water Act – Supreme Court Hears Sackett v. EPA

In 2004, Michael and Chantell Sackett bought a residential lot near Priest Lake, Idaho. The EPA notified the Sacketts that they could not place fill on their lot without obtaining a CWA 404 Permit because wetlands on the property fell under the CWA. The question the Supreme Court is considering is what the proper test is for determining whether wetlands are WOTUS under the CWA.

The CWA applies only to WOTUS. WOTUS has been defined and re-defined by the Supreme Court over the past 20 years and the scope of CWA jurisdiction has correspondingly fluctuated. The "test" for determining WOTUS is largely focused on the degree of hydrologic connectivity between wetlands and WOTUS. Hydrologic

conditions differ throughout the country and the key challenge in defining WOTUS and jurisdictional boundaries is that they are applicable and appropriate to all parts of the country.

EPA's new focus on environmental justice (EJ)

The EPA has created the Office of Environmental Justice and External Civil Rights to implement the newly released Environmental Justice Action Plan, released in September 2022. To provide guidance on addressing EJ, the EPA recently released Interim Environmental Justice and Civil Rights in Permitting Frequently Asked Questions (the FAQ). The FAQs focus on the incorporating of civil rights legislation into permitting. The FAQ cites to Title VI of the Civil Rights Act of 1964, which applies to public and private entities that receive federal funds. EPA interprets Title VI and the EPA's related regulations as prohibiting intentional discrimination and disparate impacts in permitting policies, processes and decisions.

Key take-away from the FAQs is that a project could pass environmental review, but a permitting agency still could deny a permit on civil rights grounds.

The FAQ states that Title VI requires an analysis of whether the action disparately impacts members of a group identified by race, color, or national origin:

- Is there an adverse impact on members of such a group?
- Is a disproportionate share of the adverse impact borne by such a group?
- Is there a causal link between the permitting policy, process, or decision and the disparate impact?

The FAQ says Title VI requires the permitting agency to determine if there are "comparably effective alternative practices" with less discriminatory effect. That, in turn, requires consideration of mitigation measures to address the adverse impact, and EPA includes "not renewing the permit" as one possible alternative. Further, cumulative impacts analysis to assess whether the adverse impact from the permitting decision "may be even greater considering cumulative impacts from other chemicals and non-chemical stressors."

The EPA and other agencies have created environmental justice tools and resources such as EPA's EJScreen, EPA's Strategic Plan, and Environmental Justice Legal Toolkit. These tools can be used to analyze EJ indicators to consider in permit applications and renewals.

Todd Glindeman is the Brown and Caldwell (BC) mining market sector director and Kelly Collins is a managing principal hydrogeology specializing in regulatory compliance at BC. BC provides compliance and permitting, industrial water, and site investigation and remediation support services to the mining industry. ▲

PERPETUA RESOURCES IMPROVING WATER QUALITY AT HISTORIC STIBNITE MINING DISTRICT

From left to right: Kyle Fend with Perpetua Resources; Michael Bogert with Perpetua Resources; mayor of Cascade Judy Nissula; IMCO Construction CEO Tyler Kimberley; president and CEO of Perpetua Resources Laurel Sayer; Idaho Department of Environmental quality director Jess Byrne; Kim Glineski from Idaho Department of Commerce.

Perpetua Resources, formerly known as Midas Gold, has always planned to use responsible, modern mining to address the environmental legacies left behind at Stibnite after a century of mining activity. But work to clean up the site is starting before mining even begins.

This past summer, Perpetua Resources launched early cleanup activities to improve water quality in the area. The work marks the start of a multi-year, multimillion-dollar commitment designed to address time-critical actions to improve environmental conditions at the historic site before operations begin. These actions were approved and are being overseen by EPA and the Forest Service.

Mining in the region first started in 1899. The Stibnite Mining District then gained national significance during the Second World War when the U.S. Government commissioned antimony and tungsten production to help with the war effort. Unfortunately, most of the mining that occurred at Stibnite took place long before modern environmental protections and regulations were established. As a result, the site was never fully reclaimed and all potentially responsible parties no longer have any responsibility for cleanup, thus leaving the site abandoned.

Today, millions of tons of unlined tailings and waste leach arsenic and antimony into ground and surface water, the East Fork of the South Fork of the Salmon River flows into an abandoned mining pit and habitat conditions are degraded. The Stibnite Gold Project was designed to address the environmental legacies that overlap the mine footprint by providing large-scale site restoration through the construction and operations of the project. However, this means critical water quality concerns would not be addressed until after the project is permitted.

Rather than waiting to act, Perpetua Resources voluntarily approached the Environmental Protection Agency (EPA) and the U.S. Forest Service (with the concurrence of the U.S. Department of Justice) to identify a faster solution. After three years of negotiation, Perpetua received permission to conduct time-critical early action cleanup activities.

The first four-year phase of cleanup includes removing 325,000 tons of legacy

Perpetua Resources worked with IMCO Construction on the first phase of water quality improvements.

waste and tailings away from the river and rerouting streams to keep clean water clean. Later phases will allow for more comprehensive cleanup activities throughout the district should the Stibnite Gold Project move into operations.

"We did not cause the contamination in the historic Stibnite Mining District that has worsened water quality for decades, but we have always wanted to be part of the solution," said Laurel Sayer, CEO of Perpetua Resources. "We put our commitments into action this summer. Our work is demonstrating that when we work together, big ideas can become reality. We are grateful for the coordination of our state and federal agencies who helped shape this visionary solution to revive the Stibnite Mining District. We are proud to bring much needed stewardship to Idaho's headwaters and invest more in cleanup of this site than it has witnessed in decades."

Perpetua Resources worked with IMCO Construction on the first phase of water quality improvements. The work included lining, improving and rerouting stream channels on site to keep clean water from interacting with old waste dumps on site and removing the Defense Minerals Exploration Administration legacy waste rock dump from within and alongside a tributary to the East Fork of the South Fork of the Salmon River and restoring the original streamflow course.

High-ranking elected officials from across Idaho pointed to the work being done by Perpetua Resources as a model for private investment to help address legacy environmental issues at historic mine sites.

"Idaho's natural resources can contribute a steady domestic supply of the materials we need to advance our economy," said Idaho Governor Brad Little. "At the same time, cleanup projects like you see here at Stibnite are a critical part of the future of responsible mining in Idaho. Idaho has a rich history of collaborative work that balances economic prosperity with environmental stewardship. Perpetua Resources is another great example of this responsible balance, and I applaud their efforts to work with the respective agencies to make cleaning up the historic Stibnite mine site a reality."

Perpetua Resources' proposed Stibnite Gold Project is currently under regulatory review with the United States Forest Service. The company is planning to mine for gold and the critical mineral antimony, while concurrently restoring the environment.

"Water is one of Idaho's most treasured resources," said Idaho Congressman Russ Fulcher. "The work by Perpetua Resources shows the company shares this belief. By improving water quality in the historic Stibnite mining district through voluntary cleanup activities, Perpetua is showing the way for collaborative mining into the future." ▲

ITAFOS CONDA: TAKING IT TO THE NEXT LEVEL

By Mark Kirby, Corporate Operations Manager, Itafos Conda

Itafos Conda's core values are to be socially responsible and to do zero harm.

It's hard to imagine living, working and playing in a place other than Idaho. This beautiful state, full of rugged mountains, pristine waterways, and rolling fields, is its own oasis, an Eden that also happens to be home to one of the best mining jurisdictions in the world. And even with Itafos Conda's more than 35 years of continuous operations in the Gem State, we know we've only just started to chip away at the opportunities awaiting us here.

Conda is proud to responsibly supply fertilizer to North America from our vertically integrated phosphate operation in Soda Springs, Idaho. Our crew of Idaho miners, plant operators, and support teams work hard every day to supply a vital resource to our bustlingly agricultural industry. While Itafos owns and operates projects across the globe, Conda is working to continue the century-long tradition of phosphate mining in southeast Idaho with our Husky 1/North Dry Ridge (H1/NDR) project. Phosphate is one of the three essential ingredients to growing life, and H1/NDR will help us keep putting food on family's tables. Plus, the millions in economic benefits our next project will bring to the state of Idaho are unmatched.

But we still think we can do more for our community. Now, we are.

Itafos Conda's core values are to be socially responsible and to do zero harm. That is why we have modified our existing phos-

phoric acid evaporation process at Conda and have begun to produce hydrofluorosilicic acid (HFSA).

"We are pleased to have safely and successfully completed our HFSA plant at Conda and look forward to supplying the North American market for many years to come. Our team did an incredible job to bring this initiative from concept to production in 18 months," said G. David Delaney, CEO of Itafos.

Hydrofluorosilicic acid is manufactured from Conda's extracted ore. It is a colorless, fuming liquid with a pungent odor that is created when phosphate rock is converted to soluble fertilizer. Once converted, HFSA is most commonly used for water fluoridation at water treatment plants to help fight periodontal problems. Other uses include disinfecting copper and brass tools, manufacturing aluminum fluoride, and etching glass.

The extraction and commercialization of HFSA is our next step to utilizing every part of what we mine, and to help protect and actively contribute to our community.

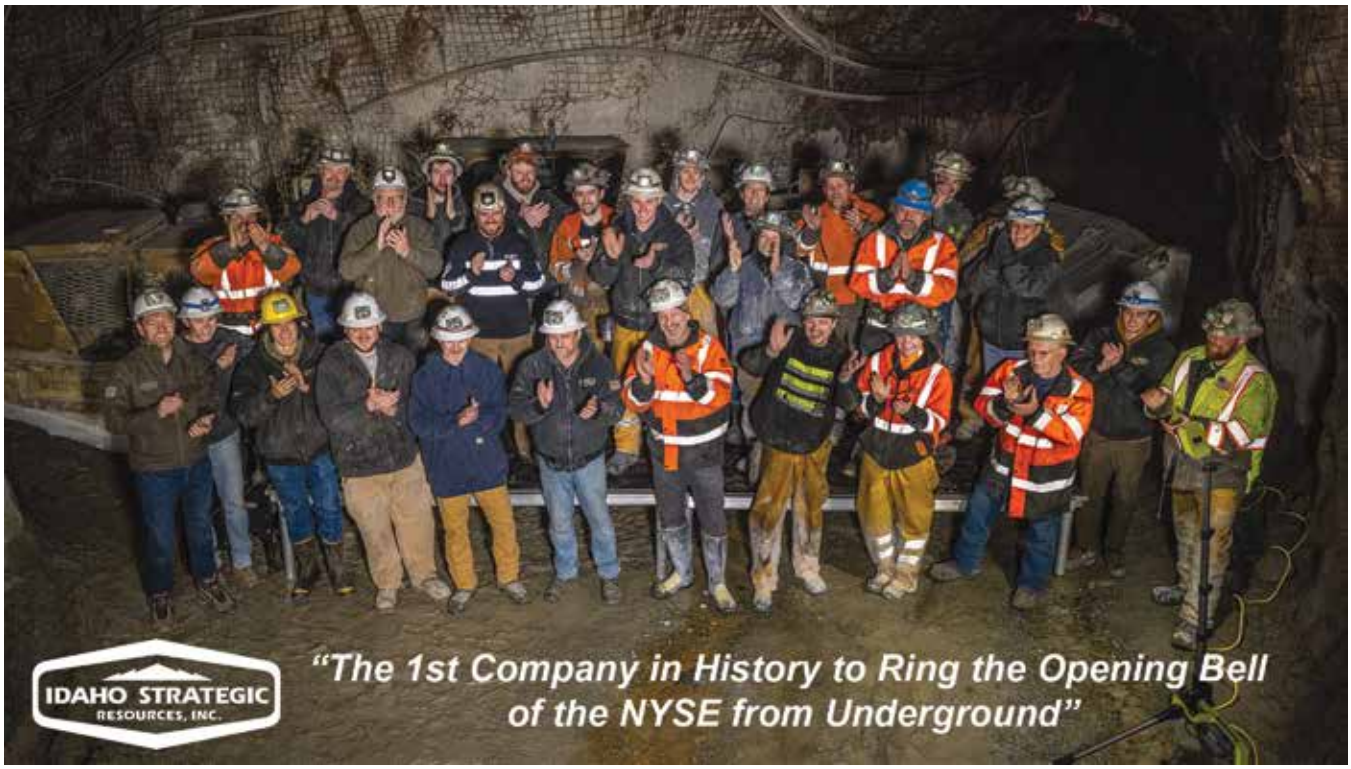
Before Conda's plant modifications, HFSA was a by-product of fertilizer production that largely went to waste. Now, we are using every part of the ore that we extract, thus helping protect our environment from excessive waste and supplying a necessary acid to individuals and companies who require it. Itafos Conda has taken every precaution to ensure HFSA will lead to zero harm.

In addition to the benefits for our ecosystem, HFSA is largely used to help safeguard our drinking water. As we see an increase in once-in-a-lifetime weather events, it is more important than ever to help provide drinkable water to people across North America. Itafos Conda is honored to work with industry partners to ensure everyone has access to clean water.

Our social responsibility goes a step further with the commercialization of HFSA. By monetizing the acid, Conda can ensure more money is generated into Caribou County's economy, as well as for the state through taxes and royalties. This means more jobs with better pay for more Idahoans. At Itafos, we are working to ensure that our children do not have to leave the home they love to be able to work and feed their families.

Mining is an integral part of Idaho. By taking our operations to the next level, Itafos Conda is proud to be an active part of sustainable solutions, by helping to provide ongoing environmental protections with the use of our natural resources. We are excited to continue our legacy in this great state, and to be a leader in innovation through the responsible and practical use of our critical resources. ▲

IDAHO STRATEGIC RESOURCES, INC.: AN IDAHO-BASED GOLD PRODUCER WITH NATIONALLY RECOGNIZED RARE EARTH ELEMENT AND THORIUM PROJECTS



Idaho Strategic is one of the few companies nationwide that performs its own mining, milling, and drilling for its own account.

Idaho Strategic Resources, Inc. (IDR), formerly known as New Jersey Mining Company, changed its name in 2021 as part of a larger plan that included uplisting onto the New York Stock Exchange (IDR: NYSE American) and announcing a new direction for the company that extends beyond its producing gold mine into the technology and energy metals sectors. Idaho Strategic is an asset-rich company that has bootstrapped its way into gold production while simultaneously acquiring two of the top five U.S. rare earth element projects and the number-one thorium project in the country, all within the state of Idaho. What sets Idaho Strategic apart is its management's focus on stakeholder value creation and an ownership structure that is aligned with 'winning together'; not to mention an executive compensation structure that is significantly below the rest of the industry.

Idaho Strategic continues to expand its gold production at the Golden Chest Mine and exploration in the Murray Gold Belt area of the Silver Valley within the Coeur d'Alene Mining District. In many ways, Idaho Strategic is a big company that is masquerading as a smaller company. It is one of the few companies nationwide that performs its own mining, milling, and drilling for its own account. The company has plans to expand its gold production to approximately 15,000 ounces per year, and recently announced positive results from its first ever drill program in an area nearly

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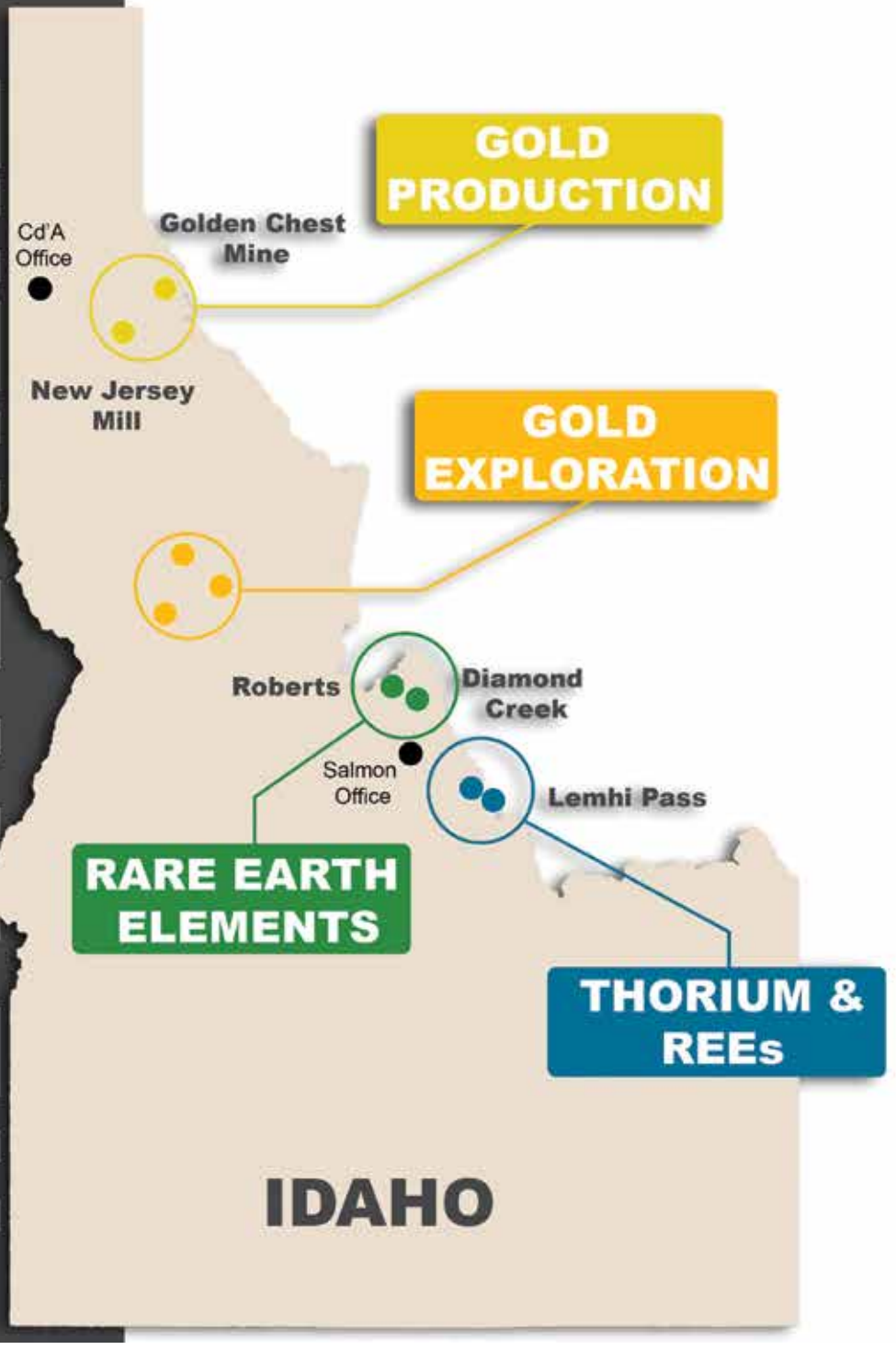
IDAHO STRATEGIC RESOURCES, INC.

Gold Production - Technology Metals - Energy Metals

"WE LIVE HERE"



"Operating in the state of Idaho has been a tremendous strategic advantage," stated IDR's president and CEO, John Swallow.

two miles away from its current underground workings; verifying management's belief that the Murray Gold Belt has the potential to be a large undiscovered gold mineralized district.

Beyond gold production and exploration, Idaho Strategic commenced its first ever drill program on one of its two Idaho-based rare earth element properties, Diamond Creek. Diamond Creek has a previously estimated USGS resource of 70,000-plus tons of total rare earth oxide (TREO) at an average grade of 1.22 percent. However, Idaho Strategic's VP of exploration, Rob Morgan, has identified further mineralization on strike which nearly doubles the total strike length of Diamond Creek beyond what the USGS considered in its 70,000-plus ton estimate. In addition to increasing the strike length of the previous resource estimate, the company has also received numerous XRF (X-ray fluorescence analyzer) results from its drill core which returned total rare earth oxide values more than the reported 1.22 percent average grade. Idaho Strategic has continued surface sampling and mapping of its other rare earth element project, the Roberts project, which has returned grab sample grades upwards of 12 percent TREO. Work at the company's Lemhi Pass Project, the largest known concentration of thorium resources in the United States, is ongoing and will accelerate during the field season following this winter.

"Operating in the state of Idaho has been a tremendous strategic advantage," stated IDR's president and CEO, John Swallow. "Not only does Idaho have a significant mineral endowment, but the kind of support that we also have experienced while working with state and local politicians, the Idaho Department of Commerce, Idaho National Laboratory, the University of Idaho, Idaho Geological Survey, and the Center for Advanced Energy Studies as part of our IGEM Program, which studies environmentally friendly processing technologies for rare earth elements has been amazing."

Swallow adds that their approach is very relatable to many, and it is as simple as living in the state where they operate.

"I grew up in Coeur d'Alene and experienced first-hand the economic impact to an area as the timber and mining jobs went away," he says. "I firmly believe that we all share in the desire to invest in our communities in such a way that a critically important extractive industry such as mining can safely participate in preparing for the future – especially in a low-carbon future." ▲

EXCELLON LAYS DOWN ROOTS IN IDAHO

With up to 5,000 meters across 13 holes planned for the Kilgore project this year, Excellon Idaho Gold is proud to be exploring for gold in Idaho. After a two-year hiatus, we are very excited to see exploration rigs turning again in this great state. Kilgore, our flagship property, currently hosts a mineral resource of approximately one million ounces of gold (across the indicated and inferred resource categories). Our goal for this year's exploration campaign is to add to that number.

Through advanced computer modeling and geophysical analysis over the last two years, Excellon Idaho Gold has worked diligently to better refine our understanding of gold mineralization at Kilgore. We are now turning that theory into practice; as the drills return core from Kilgore, we can validate our computer modeling by physically examining and analyzing core samples in a non-invasive way.

At Excellon Idaho Gold, we always strive to minimize our impact on the environment and surrounding communities. By taking a "measure twice, cut once" approach, we are living that mantra. We have been successful at communicating the economic benefits of exploring for gold to our surrounding communities, and we value the relations fostered over the past several years.

We are committed to Idaho

Excellon loves Idaho and the communities in which it operates. Our guiding principles are founded on respect, curiosity and natural resource stewardship. Our commitment to upholding these principles shapes how we do business in Idaho and our dedication to communicating clearly and transparently with all Idahoans.

"We continue to develop our stakeholder relationships and enhance our corporate citizenship in Dubois, Clark County, and throughout the great State of Idaho," says Phil Bandy, senior project manager with Excellon Idaho Gold. "Through our support and participation in local events, we have fostered many relationships and have benefited from these opportunities to discuss Excellon and our exploration plans. Our regular interactions with local, legislative, statewide, and congressional political leaders, as well as federal and state regulatory agency representatives have provided valuable opportunities to answer any questions they may have."

A closer look at Kilgore geology

Over the last couple of years, our geologists have started to rethink what the Kilgore Project could be. We have identified what we believe could be higher grade-bearing structures within the existing mineralization, which we hope to confirm with the drilling

"We continue to develop our stakeholder relationships and enhance our corporate citizenship in Dubois, Clark County, and throughout the great State of Idaho."

underway. We stand to benefit from a better understanding of the deposit and the quality of our ounces, which could factor into a more efficient mining operation in the future.

We are also exploring areas not included in our gold resource estimate, but that we believe could potentially contain gold mineralization. If this "step out" drilling works out, it could be big for Excellon Idaho Gold and the community by adding significant ounces to our current mineral resource estimate.

Kilgore is a caldera-related, low-sulfidation epithermal gold deposit, located in Clark County. The gold mineralization is widely disseminated, which means most of the gold occurs across wide intervals at a relatively consistent grade.

Oakley Gold Project

We are also exploring the Oakley Gold Project in Cassia Country, in collaboration with our partner, Centerra Gold, a mid-tier gold producer headquartered in Canada and trading on the TSX. Centerra has an option to earn up to a 70 percent interest in the project by investing money into the ground through exploration and geophysics.

Oakley hosts gold-silver, epithermal hot spring-type mineralization at two targets: Blue Creek and Cold Creek, along with detachment-related gold-silver mineralization at Matrix Creek.

This year, Centerra has drilled approximately 620 meters at Cold Creek and has built four drill pads at Blue Creek, with further drilling expected in that area. ▲

REVIVAL GOLD: A LOCAL FOCUS, LOCAL GAIN

The task of finding more gold falls to University of Idaho (U of I) alumni and Revival Gold's vice president of exploration, Steve Priesmeyer (M.Sc. Geology, 1986).

Revival Gold has brought modern scientific exploration techniques to this corner of Idaho where mining first occurred with rudimentary methods more than a century ago.

Gold exploration and development company Revival Gold aims to make a lasting positive impact in Idaho through its Beartrack-Arnett project near Salmon in Lemhi County, with initiatives that extend far beyond the project's boundaries.

Revival Gold has brought modern scientific exploration techniques to this corner of Idaho where mining first occurred with rudimentary methods more than a century ago. Using geochemical and geophysical techniques, the company continues to extend the gold deposits on its claims, working in collaboration with the Idaho Geological Survey and the University of Idaho, as well as Idaho State University and Boise State University.

The task of finding more gold falls to University of Idaho (U of I) alumni and Revival Gold's vice president of exploration, Steve Priesmeyer (M.Sc. Geology, 1986). Having worked around the world throughout his career in 2017, Priesmeyer chose to return to Idaho and reconnect with the state.

Through Priesmeyer, Revival Gold has established a strong connection with the Idaho Geological Survey (IGS), with the Survey becoming a key partner in the advancement of the Beartrack-Arnett project. IGS is based out of U of I and has collaborated with Revival Gold on the development of geophysical surveys and regional data.

The IGS has been mapping regionally for several years with recent mapping focused on the Beartrack-Arnett area. The Survey has contributed a regional perspective that Revival Gold doesn't necessarily have because, like most exploration companies, Revival Gold is focused on its own land position and not the broader area.

"The IGS is an excellent sounding board for ideas, particularly ideas that involve regional geology," said Priesmeyer. "We value their input and perspective."

Apart from regional mapping, the IGS has also coordinated with the US Geological Survey on a regional airborne magnetic-radiometric survey of the Idaho Cobalt Belt, which includes Beartrack-Arnett. This initiative should help Revival Gold geologists to understand regional structure as it relates to the project. Petrographic work (which looks at the composition and properties of rocks) being undertaken by IGS is another aspect of scientific work that will help the company build with its understanding of mineralization at both Beartrack and Arnett.

Revival has hired recent U of I graduates and currently employs a U of I geology student intern, providing hands-on work experience, which is an important step in the development of new geology professionals.

"One of the best ways we can collaborate with the U of I is to help with internships and exposing geology students to mineral exploration. This helps the U of I, the students, and Revival Gold," said Priesmeyer.

Idaho State University (ISU) and Boise State University (BSU) have contributed to the project in other ways as well. An ISU-educated geologist made important scientific contributions to the project and Revival has been able to have age date testing done at both ISU and BSU. Age dates are used to determine the age of rocks or mineralization. This information can be used to unravel the sequence of geological events leading to gold deposition.

Revival Gold has also brought leading-edge computer technology to Idaho to help with its exploration effort. For example, Mira Geoscience and its integrated 3D multidisciplinary models, which is used to generate an exploration model driven from a detailed structural interpretation and artificial intelligence (AI). Such models predict where mineralization may be found with a data-driven targeting workflow approach.

Working with Mira Geoscience and its unbiased approach enables the company to look at Beartrack-Arnett with no constraints or preconceived notions about what we might find. Mira uses data processing techniques developed by the oil sector to understand 3D data and visualize that information. This has enabled Revival to identify two grade trends within the Panther Creek Shear Zone, the geological feature hosting gold mineralization at Beartrack.

"AI is revolutionizing many different sectors where there is an abundance of data, including mineral exploration," said Priesmeyer. "For Revival, using AI enables our team to pick up insights from the data, taking out some of the guess work involved in exploration, enabling us to be more efficient in the allocation of our resources and increasing our chances of success."

While bringing new technologies to Idaho as he leads the exploration of Beartrack-Arnett, Priesmeyer is also helping to contribute to the overall knowledge and understanding of Idaho's geology. This has seen him become a leading proponent of the theory that Idaho hosts an orogenic gold province. Orogenic gold is a type of hydrothermal mineral deposit from which more than 75 percent of the gold recovered by humans through history has originated.

Priesmeyer's work suggests that central Idaho host a number of orogenic districts at Mackinaw, Mineral Hill, Elk City, Big Creek, and Stibnite, among others. Beartrack-Arnett is located within the Mackinaw district and the orogenic theory is helping Revival Gold to extend mineralization on its project while, at the same time, the theory has helped build enthusiasm for exploration potential across the state.

For more information, visit revival-gold.com. ▲

SAFETY PROGRESS IN THE PHOSPHATE REGION

The Southeast Idaho Safety Committee meets biannually with safety representatives from each operation to discuss driving continuous improvement in safety at all operations.

Mining in Idaho has a rich past and a bright future. In the mid-1800s, the western states were booming with the thrill of finding precious minerals. With the influx of people seeking these precious minerals, safety was not the top priority for individuals or companies. Hundreds of miners were losing their lives every year. Even as recently as 1972, Idaho suffered its worst mining disaster. At the Sunshine Mine in Kellogg, Idaho, a fire broke out resulting in 91 miners losing their lives.

Faced with these devastating statistics, poor working conditions, and work practices across the country, the Federal Government passed legislation in 1977 called the Federal Mine Safety and Health Act of 1977 or the "Mine Act." This Act created a Federal Agency – the Mine Safety and Health Administration (MSHA).

MSHA was tasked with the oversight and enforcement of the Mine Act. Subsequently, mining fatalities have dropped significantly; however, the mining industry still loses approximately 24 miners each year. A single life lost in the industry is one too many.

In Southeast Idaho's phosphate mining community, a group called the Southeast Idaho Safety Committee has been organized. The committee members believe that safety is not proprietary and that lessons learned and best practices should be shared. When one miner is hurt or killed anywhere, it affects the whole mining community.

The committee meets biannually with safety representatives from each operation to discuss driving continuous improvement in safety at all operations.

In July 2022, the committee met at Bayer's Mining Offices outside of Soda Springs, Idaho. A conference room presentation was held evaluating how mining has contributed to several of the United States' worst man-made or natural disasters. The group then reviewed the area's MSHA citation performance and recordable injury history to identify trends and progress over the past few years.

Discussions were held around specific incidents since the last meeting, tools for improving regular inspections around the mines, and mitigating hazards for their potential to create incidents. Each company contributed to the discussion,

The barbecue at Blackfoot Bridge Mine was to acknowledge the recently completed routine MSHA inspection which resulted in zero citations issued to either company.

facilitating the whole group's learning experience. The committee then went to the Blackfoot Bridge Mine, where they joined the day shift production crews of N.A. Degerstrom and the Bayer Mine group for a barbecue.

The barbecue was to acknowledge the recently completed routine MSHA inspection which resulted in zero citations issued to either company. This is a great accomplishment attesting to the safety culture being cultivated at the mine.

Following the appreciation meal, the committee split up to inspect different areas of the mine. This allowed the various operations to be seen by a new set of safety eyes. The groups were able to discuss hazards and potential hazards observed, thereby ensuring the best forms of protection are in place to protect the miners.

By collaborating as a committee, each company can achieve its mutual goal of sending its workforce home safe and healthy every day. Mining has a prosperous future in Idaho. As long as we ensure miners remain safe, people will continue to support and be a part of this remarkable industry we so desperately need. ▲

Klepfer Mining Services, LLC (KMS) is proud to be a part of Idaho's thriving mining community.

EXPERIENCE DRIVES INNOVATION

By Eric Klepfer, President, Klepfer Mining Services, LLC

Klepfer Mining Services, LLC (KMS) has been doing business in the beautiful community of Hayden, Idaho, and most of the western United States since 2003. KMS has comprised a unique group of mining professionals that provide project management, engineering, and environmental services to the mining industry.

KMS is proud to be a part of Idaho's thriving mining community. A critical element of success for any project is strategic planning. Experience brings innovation to this process. Important items include:

- Identifying potential issues early;
- Developing strategies; and
- Proper implementation.

It is essential for companies to recognize potential technical and environmental issues for any given project in the early stages of exploration. Early evaluation of national, regional and local issues that may affect the project will help to drive data collection and/or the corporate decision-making processes.

It is critical to assess specific site characteristics that may influence technical designs, baseline data collection programs, and the permitting process. Developing clear alternatives to avoid and minimize impacts can expedite project approval. This requires a thorough understanding of potential issues that may be present. This includes ore types, processing options, power availability, jurisdiction, and other key elements. Things as basic as where water will be obtained during exploration and operations can easily side-track progress. In many locations throughout the arid west, water basins are closed to any new water applications. Pre-planning can avoid costly oversights.

Identifying key issues should continue throughout the development process; however, once the initial issues are identified, developing strategies early on is critically important. While exploration drilling objectives generally focus on mineral expansion, it is also important to broaden data collection during drilling to address items such as hydrological characterization. For example, KMS's team researched DNA scat studies that were used for various species population counts. The scat collection technique was modified by KMS for one of our clients that provided important data regarding grizzly bear populations in the project area. This type of innovative approach benefited the client and the project.

Internally analyzing project economics (pre-scoping report) early on will help a company understand how robust the project may be and what, if any, resources should be allocated to properly address issues. Is the potential mineral resource of sufficient size to properly implement strategies and is the company financially stable to work through a potentially lengthy permitting process? These questions are pertinent for both early exploration and advanced development projects.

Understanding data adequacy, proper staging of data collection (exploration, technical, or environmental), and manag-

ing budgets to meet objectives are all key steps. For successful project development, exploration, technical studies, and environmental data collection should all be advanced concurrently.

Schedules should be flexible to allow the project to advance while the permitting process is underway. This may require a staged permitting approach that allows continuous project development throughout the process. A skilled partner, such as KMS, can assist and bring experience that helps companies look ahead and proactively identify and address issues that could impact the overall project schedule.

Performance is the final aspect of project success. Say what you will do and do what you say!

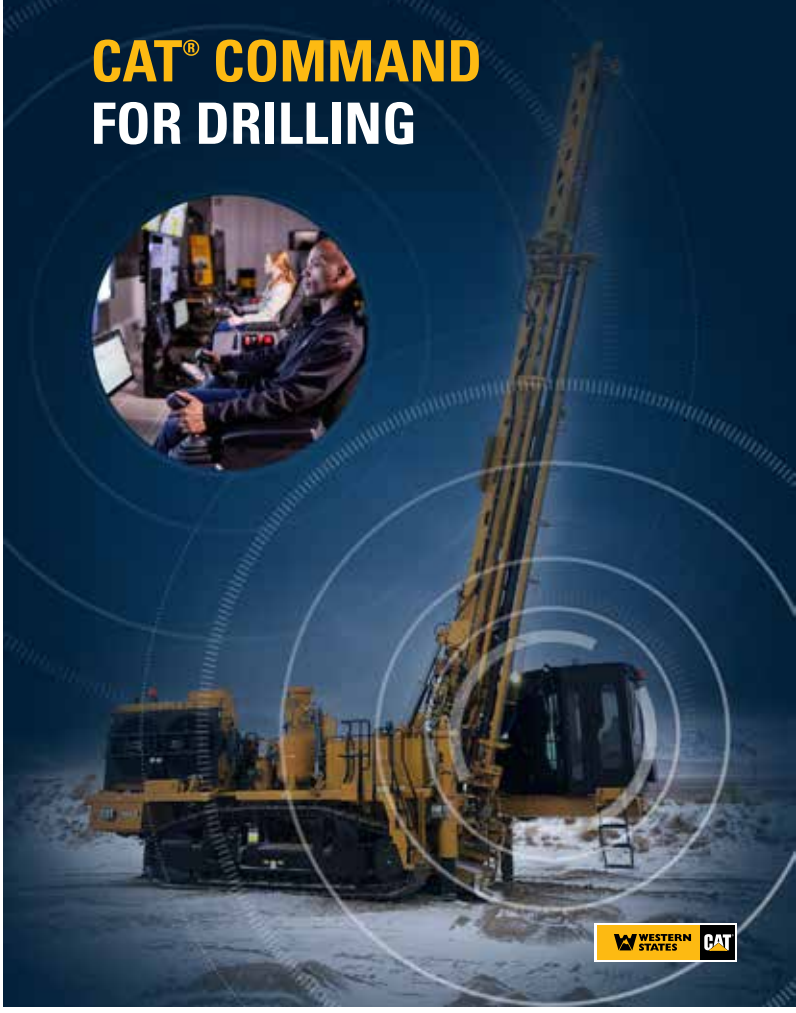
KMS has been involved with early-stage development of numerous projects throughout Idaho and the western United States, covering technical and environmental issues. We provide in-depth experience to support in-house staff to develop innovation specific to each project we work on.

KMS is proud to be providing technical services to mineral companies in Idaho for gold, copper/cobalt and industrial minerals.

For more information, visit klepfermining.com. ▲

KMS has been involved with early-stage development of numerous projects throughout Idaho and the western United States, covering technical and environmental issues.

DRILL MORE SAFELY, MORE ACCURATELY AND MORE PRODUCTIVELY WITH COMMAND FOR DRILLING



Surface & underground mining presents special challenges when it comes to safe, efficient, and productive operation. Even simple logistical issues become harder to manage as you dig deeper in search of new reserves. Western States Cat specializes in utilizing mining technologies to provide operations with real-time data to help mine leadership make more informed decisions on how to lower the cost per ton while providing operators with the in-cab tools to help them improve their daily performance in various activities including loading, hauling, grading and drilling.

One of these technologies is Cat Command for Drilling, which integrates with Cat Minestar to optimize both productivity and operator safety. Removing the operator from the machine reduces operator exposure to noise, dust, vibration and injuries related to drill tool functionality or drill deck activity. Automated drilling also creates better holes, which leads to improved containment of the explosive energy, thereby reducing the occurrence of flying rock and face venting of energy. The use of digital drill plans and remote operations enhances safety by reducing the number of survey and operating personnel needed on the bench.

Command for Drilling allows mines to improve accuracy with high-precision satellite guidance capabilities to ensure that every hole is drilled exactly to the designed coordinates and the desired floor elevation. Each shot produces a smooth, level bench that saves wear and tear on tires, undercarriages and other equipment. The autonomous system minimizes the risk of drilling into bootlegs, which may contain undetonated explosive material. Users can expect to see increased utilization and reduced operational costs.

The system automates the drilling cycle, enabling each operator to manage up to three machines. It facilitates short breaks and quick shift changes while drilling continues, giving mines more working time and less idle time during every shift. Command also allows mines to reduce or eliminate the costs of operator travel. In addition, autonomous drill operations capture unused time at shift change and lunch breaks, resulting in greater drill utilization.

Command delivers consistency with automation features for manned automation using In-Cab Operator Machine Assist & Cat Terrain for Drilling. These features automate three primary drill processes: Auto Leveling, which provides safe, solid footing on uneven ground; Auto Mast positioning, which raises and locks the mast at the proper angle; and Auto Drill reactive drilling control, which maintains optimum performance parameters and air pressure for a quality hole that stands up until it can be loaded with explosives.

Caterpillar has been providing innovative technology solutions both on-machine and off for the mining industry for over 25 years, making customers more productive and reducing cost per ton. Western States is ready to assist you with matching machine guidance systems to the application and responsive, knowledgeable support. Through innovation and partnership, we help you operate as efficiently and safely as possible. Together we can produce more and waste less. ▲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SHIMMICK: MINING INFRASTRUCTURE AND SUPPORT SERVICES

Shimmick and its legacy companies have been delivering construction services and building infrastructure for our clients for more than 50 years. Shimmick provides excellence in safety, quality, efficiency, and construction execution, and is committed to exceeding our customers' expectations in project delivery. With a substantial fleet of job-owned heavy mobile earthmoving equipment and self-performing teams, our mining group focuses on infrastructure construction, reclamation and remediation services, process plant waste stream operations and maintenance management, working with clients in the mining, energy and manufacturing sectors.

Shimmick's number-one core value is safety; we pride ourselves in conducting all work in a safe manner. We recognize that our people are our most valuable asset and are proud that our safety achievements are recognized throughout the industry. Recently, the Black Thunder Mine experienced no lost-time injuries for the past nine years, and over seven years since the last recordable. Other notable and recent safety achievements and awards include:

- Bayer Quarry: 27 years without a lost-time incident, 16 years without a recordable incident and perennial MSHA Sentinels of Safety recipient
- Nu-West Ponds Project: 20 years without a lost-time incident and 10 years without a recordable incident

Services

- Construction of stormwater and erosion control management structures: dams, diversion canals and embankments and inflow/outflow structures;
- Topsoil and overburden stripping: loading, hauling, direct-place and stockpile;
- Specialty rock products processing to include drill, blast, load/haul, crush, screen and wash;
- Haul road construction;
- Tailings pond construction;
- Tailings pond operations and maintenance;
- Tailings pond remediation and closure;
- Active and legacy mine reclamation and remediation;
- Site restoration.

FEATURED PROJECTS

Black Thunder Mine
Location: Gillette, WY
Client name: Arch Resources

Nu-West Ponds
Location: Soda Springs, ID
Client name: Itafos

Gypsum Stack Closure
Location: Soda Springs, ID
Client name: Nutrien

Bayer Silica Quarry
Location: Soda Springs, ID
Client name: Bayer

Questa Mills Basin
Location: Questa, NM
Client name: Chevron

Morenci Mine
Location: Morenci, AZ
Client name: Freeport McMoRan ▲

Established in 2001, FlowTech Fueling is the leader in fueling process improvement.

SMALL FUELING PROCESS IMPROVEMENTS LEAD TO BIG PRODUCTION GAINS

Market forces continue to demand that the mining industry learn to do more with less. Increasing productivity while adhering to strict safety and environmental standards can be challenging, but fueling process improvement is an easy way to boost efficiency quickly without a huge capital expenditure.

Established in 2001, FlowTech Fueling is the leader in fueling process improvement. Their patented Fueling Systems and large-scale Mobile Fueling Depots are designed to meet the challenges of harsh mining environments. With several decades of mining experience, FlowTech's expertise and dedication to customer service is second to none.

FlowTech's non-pressure, overfill prevention Fueling Systems installed on your mobile equipment will eliminate fuel spillage, improve personnel safety, reduce tank maintenance, and minimize environmental impacts. With over 1,800 systems installed throughout the United States and Canada, FlowTech's Systems provide ease of installation, reliability, low

FlowTech Mobile Fueling Depots provide the efficiency and flexibility of a high-flow, multi-station fueling facility with the added benefit of easily moving it as the mine plan requires.

Fuel is often a mine's second largest operating expense, yet little time is spent focusing on fueling process improvements.

maintenance, and are backed by excellent service and an absolute commitment to customer satisfaction.

FlowTech Mobile Fueling Depots provide the efficiency and flexibility of a high-flow, multi-station fueling facility with the added benefit of easily moving it as the mine plan requires. Our Fuel Depots are extremely customizable with various options for fuel storage capacity and fueling station configurations. A mine that recently installed two FlowTech Fuel Depots, decreased fueling times nearly 50 percent for a fleet of 240-ton class haul trucks, improving production by over 8,000 tons per shift. The return on investment was less than six months.

Fuel is often a mine's second largest operating expense, yet little time is spent focusing on fueling process improvements. FlowTech helps customers develop a customized and comprehensive plan to boost efficiency from delivery, to bulk storage, to equipment refueling. Fueling process improvement provides a unique opportunity to easily increase productivity while reducing operating costs so your operation can do more with less. ▲

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