

MINING

START TO FINISH.



Nevada Business
the decision maker's magazine

SPECIAL REPORT

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MINING

START TO FINISH.



Mining is not typically associated with the words high-tech or sophisticated. Rather, one might imagine high-tech as having something to do with computers, aircraft technology or even medical research. Although it may not be one of the first industries to come to mind, mining today is a state-of-the-art operation that encompasses everything from exploration and research to the use of technologies that make mines safer, more efficient and environmentally friendly.

Mining itself is both the science and the business of mineral discovery and exploitation. Because Nevada is such a mineral rich state, the industry is a large part of the Silver State's past and, more importantly, future.

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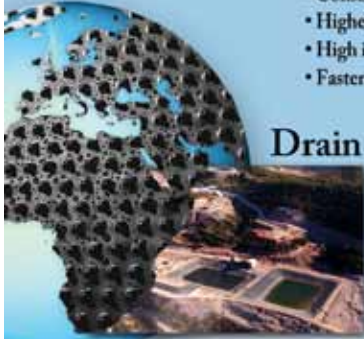
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The Future Is Bright

Nevada's mining future has never been brighter. New mines are being discovered and developed every year. Additionally, Nevada is rife with possibilities when it comes to alternative energy and "green" projects. Mining will play a large part in these projects moving forward. In addition to the sampling below, Nevada has several geothermal projects in the works and new sites are being discovered all the time.

Some mining developments in the works now are:

Emigrant Springs

Developed by Newmont
Near Carlin
Gold

Cortez Hills

Developed by Barrick Gold
Near Elko
Gold

Pumpkin Hollow Property

Developed by Nevada Copper
Near Yerington
Copper

Mount Hope

Developed by General Moly
Near Eureka
Molybdenum

Kings Valley

Developed by Western Lithium
Humboldt County
Lithium

A large white mining truck is shown on a dirt road. The truck is a haul truck, and it is facing right. The background shows a cloudy sky and some distant hills.


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There is often a misperception of mining that the industry is low-tech and filled with men armed with pick-axes, shovels and mining pans. This image couldn't be further from the reality of modern mining. The industry is full of highly intelligent, specialized individuals. A mine itself goes through several processes before it can even get to the stage where it begins producing minerals and the individuals involved in mining range from the geologists that prospect a potential location and the investment analyst that determines financial viability to the engineer that helps find the most efficient ways to extract minerals.

STAGE 1 Exploration and Prospecting

Before a mine can begin operations, it must undergo extensive field testing. Before field testing can begin, miners need

to know where to start, that is where a geologist comes in. A geologist or prospector begins with researching an area to determine the viability of mining. He or she looks for the ore body and whether or not the ore is sufficient to sustain a mine. Everything is accounted for from mineral potential to the economic and political climate of a region. The geologist does a full assessment, testing the area for the types of ore potentially mineable and the feasibility of opening a mine.

According to David Shaddrick, president of the Nevada Mineral Exploration Coalition, "The mining cycle starts with grass-roots geologic research. A geologist trained in economic geology identifies an area as having indications that a mineral system is present." After a positive identification, field work begins.

Field work consists of a series of tests at the site to determine how much of the mineral is present and whether or not that

is enough to mine. Geologists use mineral deposits, geologic mapping, rock and soil sampling, geophysical surveys and drilling to determine the viability of a site. During field work, title to the minerals is claimed through either direct claim staking of public lands or leasing of existing claims or private land holdings. After extensive field testing, the most expensive aspect of the exploration and prospecting stage can begin: drilling.

"Today, since most near-surface deposits have been discovered, drilling is typically to depths of 500 to 1,500 feet below the surface," explains Shaddrick. "If significant mineralization is encountered, the project advances to further exploration stages."

Shaddrick adds that, "While many prospects advance to the drilling stage, less than 1 percent advance to become mineral resources that are potentially mineable."

Modern technology is used extensively

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It's Not All Gold and Silver

While Nevada is known as the Silver State and gold has been a rich commodity here, there are several other minerals that are mined in the state.

Here is a sampling of other mineral mined in the Silver State:

Silver

Industrial uses, jewelry, silverware and photography

Copper

Electrical wiring, plumbing and heating and in the creation of several useful alloys

Aggregates

Construction projects

Barite

Weighting agent in drilling muds, also has healthcare related uses

Diatomite

Filtration aid, mild abrasive, mechanical insecticide, absorbent, cat litter and horticultural uses

Dolomite

Building stones, refractory bricks and ornamental stone

Gypsum

Wallboard, cement, soil conditioning and plaster

Limestone

Roadbeds, building and landscape construction and cement manufacturing

Lithium

Glass, ceramics, aluminum, synthetic rubber, greases, new battery applications and some healthcare uses

Molybdenum

Makes stronger steel, machinery, electrical applications, transportation, chemicals and used in the oil and gas industries

Magnesium Oxide

Book preservation, heartburn relief, laxative, insulation, construction uses and leather processing

Perlite

Construction, horticultural uses and industrial uses

Precious Opals

Jewelry, precious gemstones

Salt

Food preparation, chemicals, de-icer for winter roads

Silica Sand

Glass manufacturing

Various Specialty Clays

when researching a potential mine. Geographic information systems are used to study maps, surface geochemistry and geophysics. With the advent of mobile computer technologies, field work can be done faster and better.

The geographic picture isn't the only factor considered when looking for a usable mining location. The social, economic and political aspects of the location are heavily considered as well. It's obviously important to know, prior to starting a mining operation, the reaction a company will get from the local communities. If the operation is not favored or if there isn't a developed community nearby, starting a mining operation becomes all the more difficult.

"We have to co-exist with lots of other entities," explains Tim Crowley, president of the Nevada Mining Association. "To be good corporate citizens, you've got to make sure that the communities are supportive of your operation and that they have the things any company needs to be successful. Working with the local governments and communities to co-exist is just good business and something that you should do."

STAGE 2

Financing and Developing

As is most likely evident, building a mine is not an inexpensive project. Financing is as necessary to the process as the mineral itself. Investments are needed from the very first exploration up until the mine is constructed and begins producing. The creation of a mine doesn't happen overnight. According to Crowley, simply permitting and constructing the mine takes several years and significant finances are needed for that entire time, before the mine itself generates any revenue.

Investments can be obtained from a variety of sources from shareholders to investors and companies typically begin looking for these investors during the exploration stage. They have the difficult task of proving that a particular site does have mineable potential and will yield a

profit, eventually. It takes time and patience, but a successful mine can be lucrative for those involved.

There is a high-risk involved in mining investments because essentially, the investor is putting money into a business where the price of what is being produced, such as gold, can change by the time it actually begins production.

Another aspect that should be considered through each stage is the permitting process. Completing the permitting process can take anywhere from two years to ten years. As such, it's important that permitting begin as early as possible. Some companies are able to obtain permitting prior to development to begin building infrastructure for the mine. This can save the company a significant amount of time when the mine is ready to be constructed.

After a site has been explored, tested, financed and permitted, development of the mine can begin. It is possible for development to occur simultaneously with some of the other steps and the end result is a productive, efficient mine that begins to see a return on investment. All in all, it isn't unusual for the entire process to take almost a decade.

STAGE 3

A Working Mine, Expansion and Closure

A mine can and should be in operation for decades. Mining companies don't get to the development and construction phase without having both a thorough plan and an estimate of how much ore is available and about how long the mine can produce.


"Usually you have an identified and mapped out strategy for both short-term and long-term," explains Crowley. "You know what you're going to be doing on a day-to-day basis and you know where you want to lead your business in terms of how you're extracting the minerals for the next several years. You also want to explore in the same area so you can keep the mine producing for decades to come."

Every aspect of the mining operation is mapped out and should work like a well-oiled machine. The company has an estimated lifespan for the mine, and exploration continues until that lifespan is significant enough to warrant no further exploration of a region.

Crowley adds, "Most mine lives will give you a lifespan that they have a proven reserve of 10 years. They only say that because that's what they've drilled for, identified and have enough confidence to tell the public and the shareholders that they know the ore is there. To continue to explore wouldn't be a good use of capital. Once they have enough of a guarantee for a good amount of years, they'll slow down their search for more."

After a mine's lifespan has been completed and all of the ore reserves are used, the mine begins the process of closure. From the very beginning, each mine must have a cash bond of the estimated closure costs.

This is in place to ensure that, no matter what happens, the mine will be able to be closed safely and effectively. The areas that are mined, especially those on public lands, must be restored in such a way that the region can again be utilized by the public. Improperly shutting down mining operations is both dangerous and potentially expensive to the taxpayer. This is why every mining operation today has the funds guaranteeing the proper closure of each mine.

Modern mining no longer represents panning for gold or finding a "shiny" rock and digging for more. Mining today encompasses several fields of expertise and represents millions of dollars in our industry. The process is time-consuming and intense. The importance of this industry to the Silver State cannot be understated and an understanding of the work that goes into the process is important for businesses in any industry. 





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