LASERS - THE FUTURE OF MINING

An Innovative New Method for Mining In Narrow Vein and Conventional Applications

The Process of Using High Power Lasers for Mining Precious Metals

"Patent Pending"

The Progression of Mining

Since the beginning of mankind, there has been mining. Man searched the hillsides for obsidian for making points and the stream beds for rocks suitable for hammers or clubs. King Solomon, of Biblical times, had iron, gold, silver and turquoise mines. His miners used moil, hammers and fire to chip and spall the rocks. The early Romans mined in all of the areas that they conquered. Their mining methods were similar to those of King Solomon's day, except by that time new tools of iron were available.

In the mid 1880's, miners were hand steeling and using black powder to blast the rock. By the late 1800's and early 1900's, steam power, electricity and compressed air were available. Mining was becoming simpler and less manual labor was involved. Today, mining is highly specialized, using diesel, electricity, gas or compressed air to power all types of mining equipment. The 21st Century has brought us a new tool with which to mine. Lasers will replace drilling and blasting methods that are presently the standard in the mining industry. Finally, man has come full circle, from spalling rock with hammers and fire, to now spalling rock with the power of lasers.

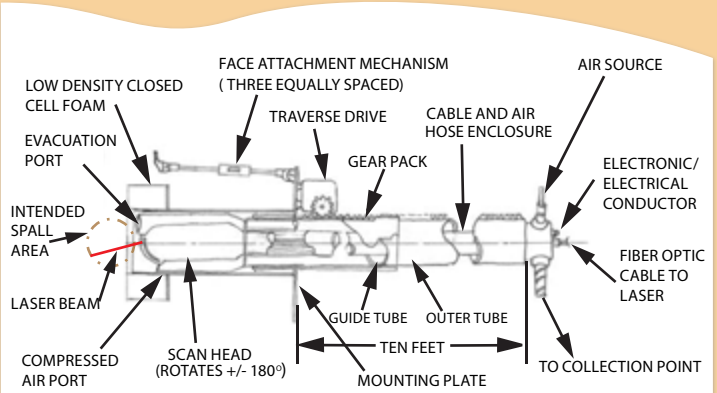
Overview

Merger Mines Corporation (MMC), using technology developed by recent acquisition, Bright Flash Development Inc., is focused on creating new methods in mining by using lasers to mine precious metal ore deposits. The process was first researched by Argonne National Laboratory in their Laser Applications Laboratory (ANL-LAL), in the 2003-2004 time frame. See the videos of rock spalling from the Lab on our website. (www.mergerminescorp.com)

Lasers, the Future of Mining

In an environment of low metal prices, Merger's innovative mining methods will reduce mining costs, especially in mines with narrow vein systems. The use of lasers and robotics will reduce miners' exposure to hazardous underground environments, increase production of raw ore containing valuable minerals, and makes possible the disposal of mine waste underground instead of transporting it to the surface. Instead of blast and muck operations, Merger's method will make use of a high output power fiber laser with a scan head packaged to fit within an environmentally sealed containment unit.

The primary users of Merger's fiber laser technology will be the operators of traditional existing mines where mining between existing drifts, or mining narrow veins within a drift, are not now economically feasible by conventional mining or in newly developed mines where ore bearing veins are known to be narrow. Because the laser "scan head" and related pieces of equipment are modular in nature, there are virtually no limits on configurations tailored for any application. Estimates by Merger's engineering department of material removal rates, when compared to conventional methods, indicate a higher production rate with fewer personnel at the face, the capability of round the clock operations, and alleviation of many safety and environmental concerns.



LASER DRILL CONFIGURATION

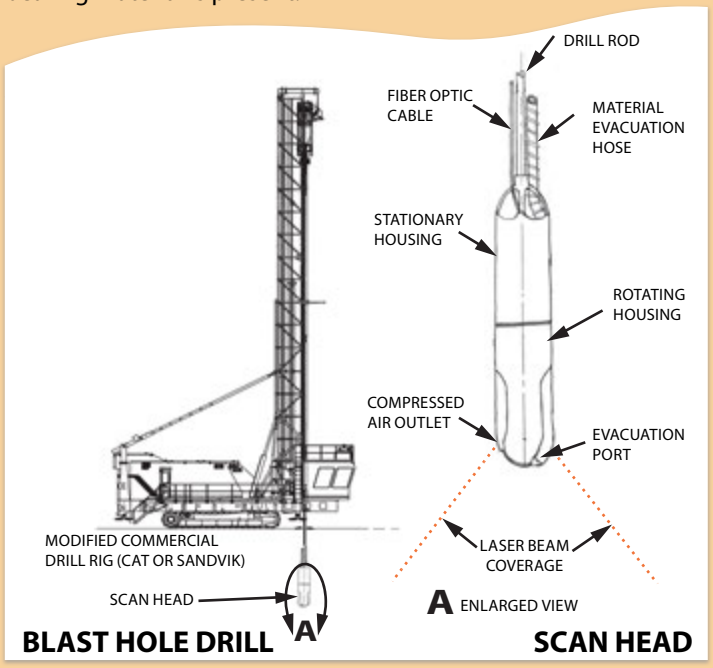
While the fiber laser, the fiber optic cable and other optical components are special order, many of the other components of the system are commercial off-the-shelf items. Components for the scan head are unique and must be custom manufactured as well as much of the mounting and handling equipment. Control software for the scan head and other parts of the system will have to be customized for the system.

What are we doing?

Building upon on the ANL-LAL research, MMC is establishing parameters such that a ytterbium doped fiber laser with sufficient optical power is capable of spalling/cutting/drilling an approximated 25 cm diameter bore to a depth of at least 3.5 m in an appropriate geologic venue. The laser drill will consist of an industrial fiber laser connected to our scan head through a fiber optic cable. The fiber optic cable is terminated with beam shaping optical elements in the scan head. Other optical elements within the scan head, controlled by a servo system, direct the laser beam to a site of about 10 mm diameter with sufficient dwell time to produce the desired spalling action within the targeted site. The beam is rapidly redirected to a new target site before any melting or vaporization occurs. The rate of material removed is anticipated to be in excess of 2.6 tons per hour across the approximate 325 square centimeter surface area. To assist in material removal from the target site and to offer some degree of thermal control for the working surface, a stream of high pressure compressed air will be directed at the target site. In order to remove the spalled material from the working surface, a commercial vacuum assist unit, augmented by the compressed air stream, is a component of the scan head. All equipment will be operated with a commercial power generation unit or on site power.

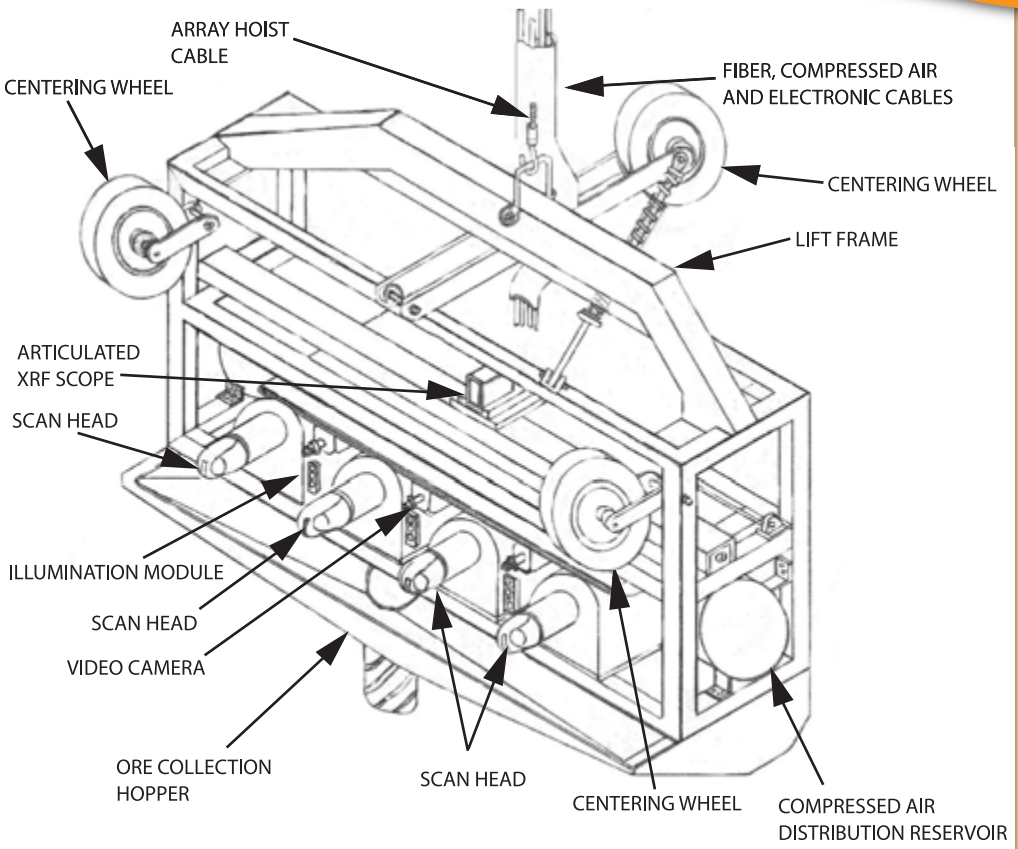
What are we confirming?

Through the course of the project, the plan is to verify the exact power requirements for the laser and the optimum scan rate for the optical system. Also planned is the confirmation that the coatings on the optical elements in the scan head are capable of withstanding the thermal effects of the laser power required. We will demonstrate that the laser is capable of the spalling action required to remove the ore bearing deposits in the optimum time and that the system is capable of mining efficiently where ore bearing material is present.



BLAST HOLE DRILL

SCAN HEAD



VEIN MINER ARRAY

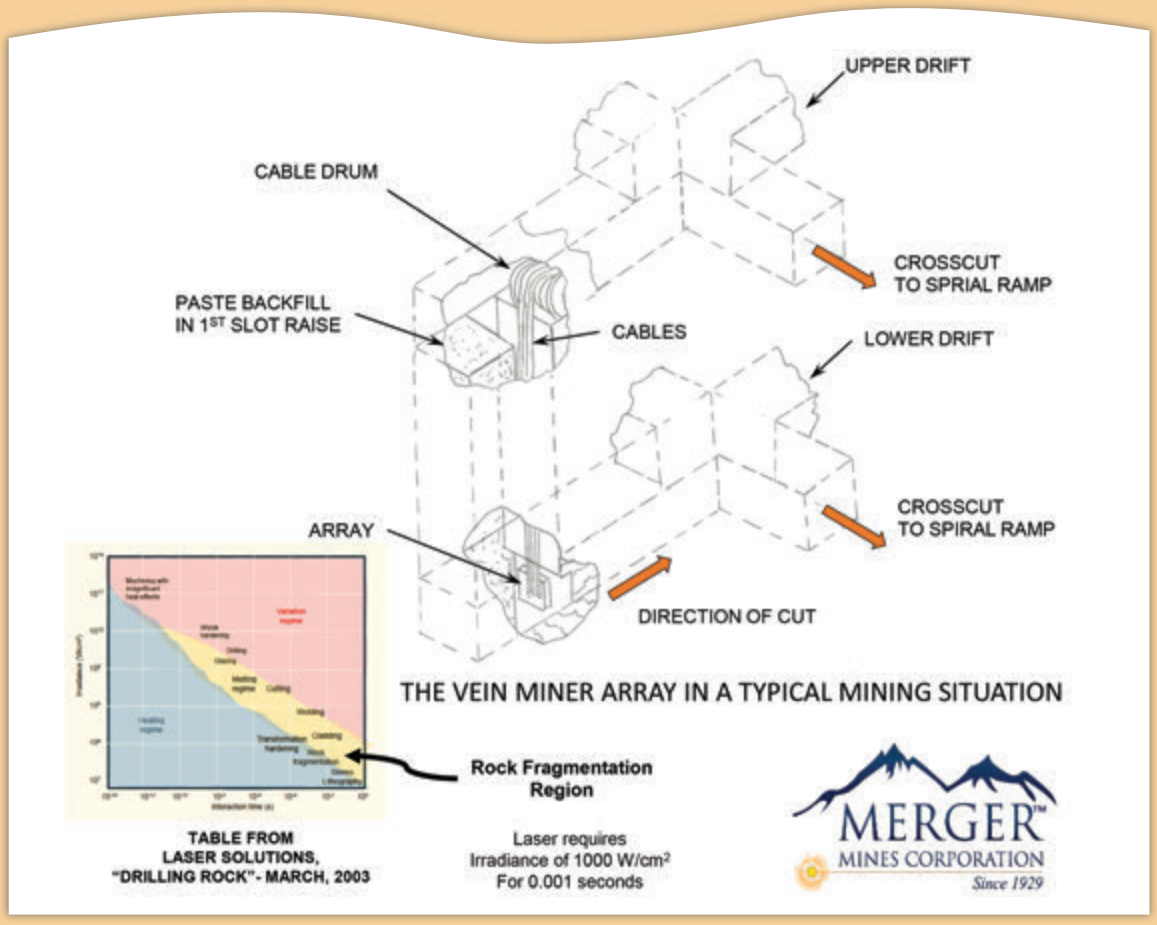
How are we doing it?

The rate of material removal will be achieved with approximately 1,000 watts per square centimeter of optical power from the laser. This will generate a particle volume of about one cubic centimeter with an average material density of 2.65 grams per cubic centimeter. Our calculations suggest a mining rate of some 2.6 tons per hour or about 62.4 tons over a 24 hour time span. To assist in material removal from the targeted area, a stream of compressed air will be directed at the targeted site. In the drill application, a vacuum system will be used to assist in material removal, while in the Vein Miner Array, material removal will be by gravity into an on-board hopper. The hopper offers the potential for concentrate separation and removal to refining facilities. The waste can then be retained on site and immediately used for backfill as appropriate.

What else are we doing?

Merger Mines Corporation, utilizing recently acquired Bright Flash Development Inc. technical expertise, is currently completing detail design on an optical scan head that will direct the laser beam over the target surface area at a rate that will cause spalling of the material. The scan head is configured such that the laser beam may be directed anywhere within a 90 degree spherical volume. This will allow patterns to be excavated, whether round in the drill application or square in the Vein Miner Array application. Software will control the motions of the scan head during upcoming testing of a laser drill. The laser drill testing program will be used to verify laser power levels and scan times for optimum material removal, and to debug the control software. The drill is for a production unit for preparing blast holes for open pit mining or other places where larger bore holes are appropriate.

Another version of the scan head described as the Vein Miner Array, portrays the use of multi scan heads for removing larger sections of material where narrow veins of ore suddenly widen or blow out. The Vein Miner Array consists of multiple scan heads, depending on the desired size of the drift or winze. The Vein Miner Array also has an articulated X-Ray Fluorescence Unit (XRF), as well as video and illumination modules with high speed cameras available to monitor spall effects. Using the Array on a face, will, to a high degree, automate the material removal process and minimize ground disturbance to the surrounding area.



OUR MANAGEMENT STAFF

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THE PURCHASE OF THE COMPANY'S SECURITIES INVOLVES A HIGH DEGREE OF RISK AND IS SUITABLE ONLY FOR PERSONS OF SUBSTANTIAL FINANCIAL MEANS WHO HAVE NO NEED FOR LIQUIDITY OR CURRENT CASH FLOWS AND WHO CAN AFFORD A COMPLETE LOSS OF THEIR INVESTMENT.

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