

A Guide for Students, Parents and Teachers.

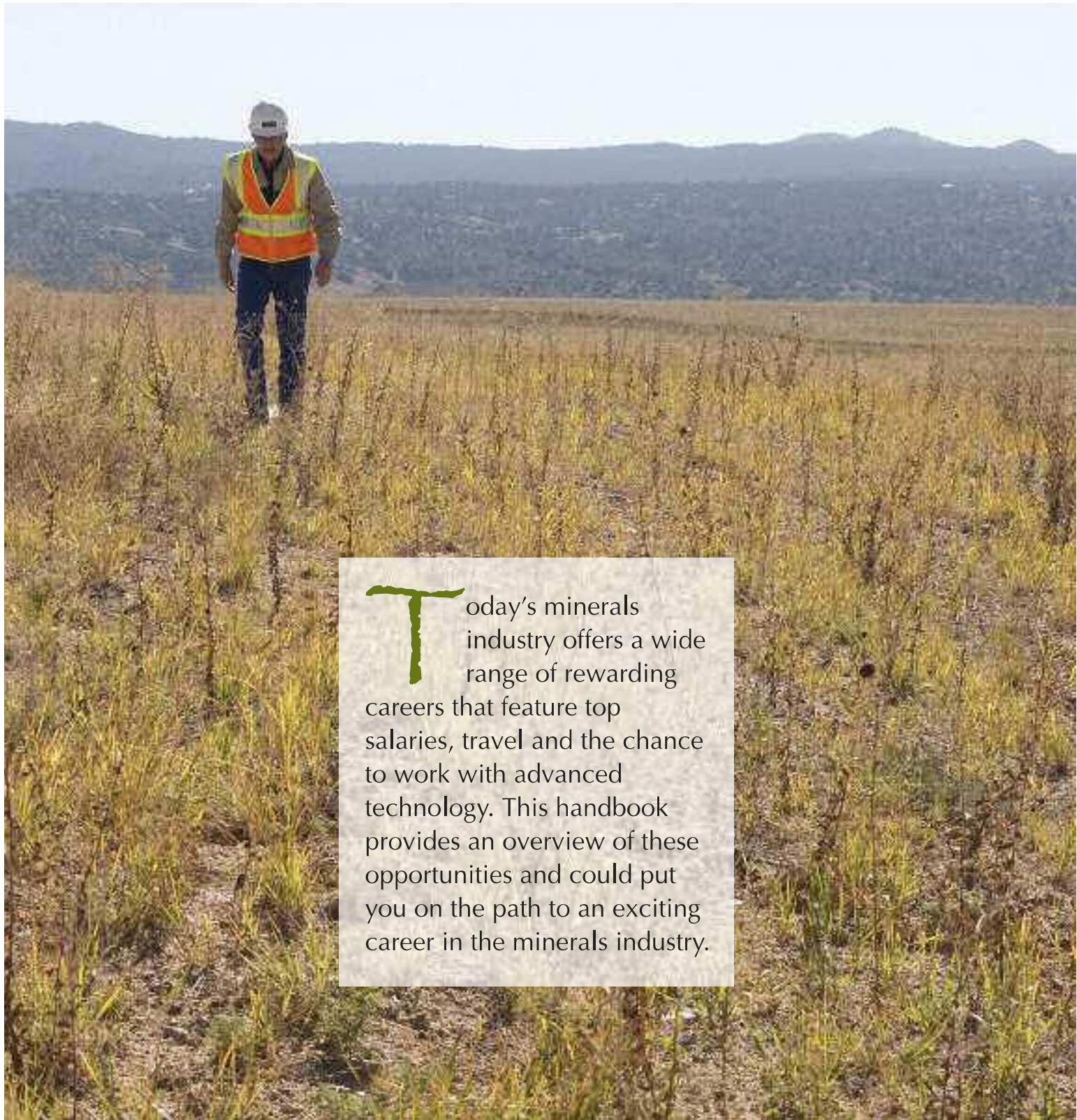
Exploring Opportunities:

# CAREERS

in the  
Minerals Industry

Edited by: Anthony K.M. Staley and John L. Uhrie





**T**oday's minerals industry offers a wide range of rewarding careers that feature top salaries, travel and the chance to work with advanced technology. This handbook provides an overview of these opportunities and could put you on the path to an exciting career in the minerals industry.



# Exploring Opportunities: Careers in the Minerals Industry

Publication Edited by: **Anthony K.M. Staley** and **John L. Uhrie**

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This career guidance booklet is presented as a public service to students, parents and teachers by the Society for Mining, Metallurgy and Exploration (SME), Inc. SME is devoted to serving members who are involved in mineral resources exploration, mining, processing and reclamation.

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## Is a CAREER in the Minerals Industry for You?

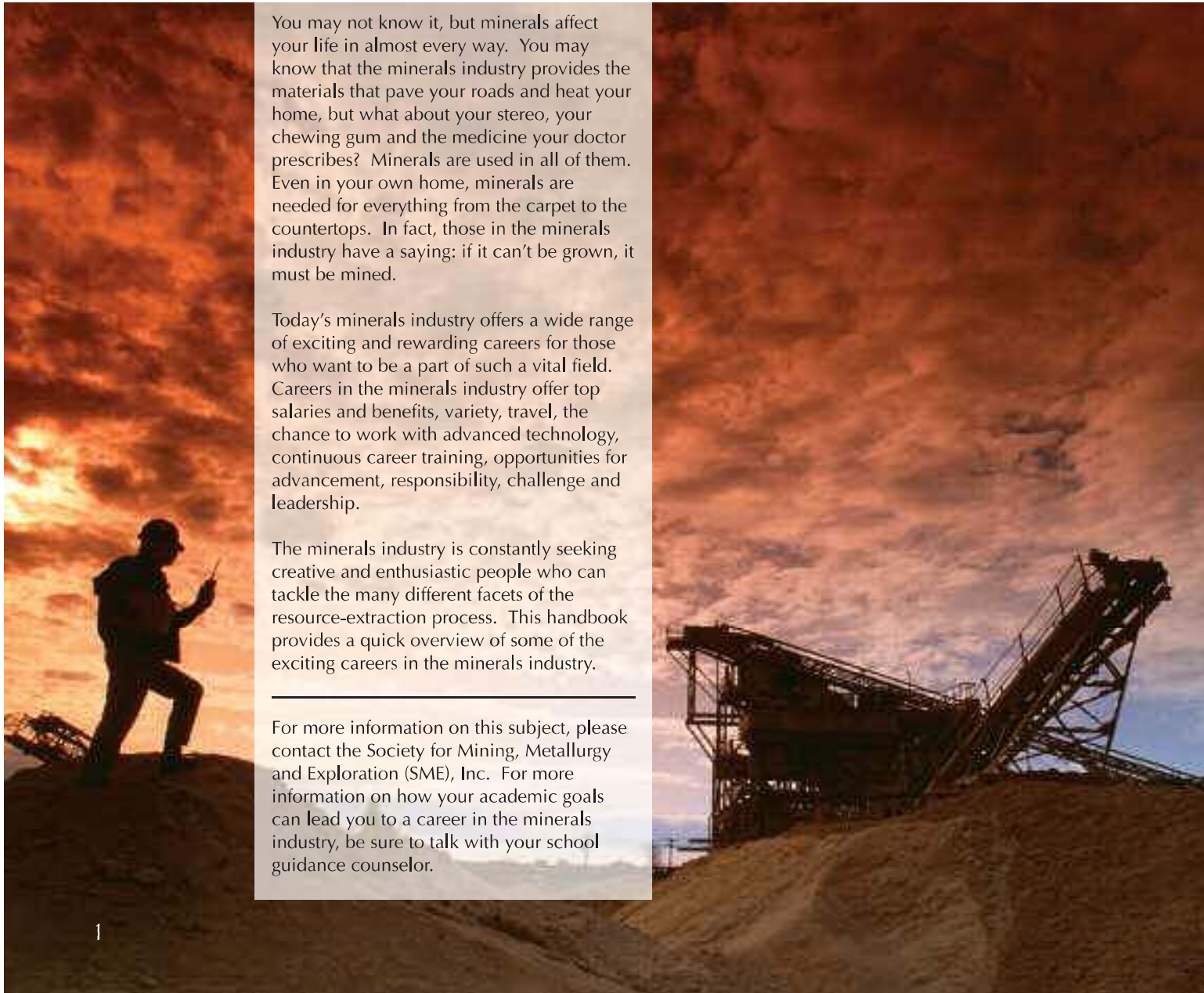
You may not know it, but minerals affect your life in almost every way. You may know that the minerals industry provides the materials that pave your roads and heat your home, but what about your stereo, your chewing gum and the medicine your doctor prescribes? Minerals are used in all of them. Even in your own home, minerals are needed for everything from the carpet to the countertops. In fact, those in the minerals industry have a saying: if it can't be grown, it must be mined.

Today's minerals industry offers a wide range of exciting and rewarding careers for those who want to be a part of such a vital field. Careers in the minerals industry offer top salaries and benefits, variety, travel, the chance to work with advanced technology, continuous career training, opportunities for advancement, responsibility, challenge and leadership.

The minerals industry is constantly seeking creative and enthusiastic people who can tackle the many different facets of the resource-extraction process. This handbook provides a quick overview of some of the exciting careers in the minerals industry.

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For more information on this subject, please contact the Society for Mining, Metallurgy and Exploration (SME), Inc. For more information on how your academic goals can lead you to a career in the minerals industry, be sure to talk with your school guidance counselor.





# Questions about Careers in the Minerals Industry

## What is the minerals industry all about?

The minerals industry is about quality of life, both for today and tomorrow. The minerals industry produces the raw materials for many of the items you use each day: the house you live in, the foods you eat, the clothes you wear, and the car you drive. Everything from lipstick to breakfast cereal—even your toothpaste—could not be made without the minerals industry.



## What is my career outlook in the minerals industry?

The career outlook for the minerals industry remains positive and the demand is predicted to steadily and dramatically increase in the years to come. Although somewhat cyclic, the overall use of minerals and metals are increasing every year due to the improvement of living conditions in the developing world, increased human longevity and new uses. As a result, new sources of the minerals must be found and produced worldwide.

## How open is the minerals industry to women and minorities?

The industry is open to women and minorities. In fact, many senior executives in the mining industry are women. In increasing numbers, women and minorities are pursuing careers in the minerals industry and filling positions without question of gender, race or nationality. A perfect example of this is Barb Filas.



**Name:** BARBARA FILAS

**Education:** B.S. 1978 in Mining Engineering, University of Arizona

**Position:** President, Knight Piesold LLC, Denver, Colorado

*“As a third-generation miner, I’ve grown up loving the mines: from old abandoned dog-holes to huge, contemporary operations. I have always loved traveling, too, seeing new places and meeting new people. I never dreamed that there was a ‘job’ that would combine the two, but the consulting work I do for the mining industry requires me to travel all over the world visiting all kinds of mines; supplies me with tour guides like biologists, geologists, archaeologists and socioeconomics who make sure I understand the ecological, human interest and historical aspects of those sites; and as unbelievable as it may seem, they actually pay me.”*



# Top 10 Benefits of a Career in the Minerals Industry

## 1. Job Satisfaction.

Studies have shown that job dissatisfaction is one of the top reasons for unhappiness among people in the United States. People in the minerals industry enjoy a high level of job satisfaction and some of the reasons why are listed below.

## 2. Benefit to Society.

A career in the minerals industry will allow you to work on projects that clearly benefit society. For example, you can be involved in minerals extraction projects that minimize impact on the environment, find new sources of energy and increase the standard of living for people around the world.

## 3. Challenging Work.

The minerals field has no shortage of challenging problems. In school, most problems have a single correct answer. In the field, when finding solutions involving complex geologic materials, you must often work with incomplete and uncertain data. You must devise a creative solution and persuade others that your solution is the best one.

## 4. Opportunities for Career Advancement.

As the world continues to develop and the global economy expands the demand for minerals and mineral processing continues to increase. The world will always need minerals and that means opportunities now and in the future.

## 5. Financial Benefits.

The minerals industry is one of the highest paying of all industries. Because of the challenges and rewards involved in the minerals industry, companies offer excellent financial benefits in order to attract the very best people.

## 6. Variety of Work Environments.

Do you like to work outdoors in the fresh air or do you prefer the indoors? Would you like to work in a busy city skyscraper or would you rather be at a remote site? Is your goal to work in the United States or overseas? How about working underground or even on the ocean floor? Only the minerals industry offers such a wide variety of working environments.

## 7. Prestige.

Your career in the minerals industry will contribute significantly to our Nation's international competitiveness and will ensure a strong national security, help maintain and improve our standard of living, and protect the environment. People understand that it takes hard work and strong technical skills to work in the minerals industry and you will be recognized for that.

## 8. Variety of Work Experiences.

The minerals industry is extremely diverse. Its activities include exploration for mineral deposits, developing new mine sites, underground or surface mines, processing minerals to extract the commodity and the transportation and marketing of mineral products.

## 9. Safe and Professional Work Environment.

The minerals industry has unique hazards and safety challenges, and working in mining you will find that management and workers agree that everyone has a personal commitment for the safety and well-being of fellow workers.

## 10. Creative Thinking.

The infinite variety of occurrences and properties of natural materials that you will work with in the minerals industry requires creative thinking. You will be required to develop solutions to open-ended and unique problems that require the ability to think beyond the obvious and include requirements across many disciplines.

# exploring opportunities: in Geology

## What is geology?

Geology is the scientific study of the nature, formation, origin and development of the planet Earth, including its raw materials, natural processes and resulting products.

## Why is geology important to the mining industry?

The knowledge of the Earth, its processes and its materials are used to aid in the discovery of metals, minerals and fuels, to identify geological conditions, hazards and stability of mine sites and to remediate and reclaim mine and mill sites.

## What geological specialists are used by the mining industry?

There are many specialists in the field of geology. These include mineralogy, petrology, paleontology, geophysics, geochemistry, hydrology, engineering geology, economic geology and environmental geology.

## What are the jobs for geoscientists?

Geoscientists and geological engineers work for mining and exploration companies, consulting, and geotechnical firms that provide technical expertise to the mining industry, government agencies such as the United States Geological Survey and state geological surveys and universities. Companies that employ geosciences professionals range in size from Fortune 500 corporations that employ hundreds to small consulting firms that may employ only a few individuals.



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## FOCUS ON: Specialties in Geology

**Geologist.** Geologists study the materials and processes of the Earth to explain how, when and why events occurred in the formation of the Earth's rock record. Economic geologists apply geology to explore for, develop the metal, mineral, and coal resources that are used as the foundation of our standard of living and modern society. Structural geologists analyze the Earth's forces by studying deformation, fracturing and folding of the Earth's crust.

**Geochemist.** Geochemists use physical, organic and inorganic chemistry to investigate the type and distribution of major and trace elements and organic compounds in rocks, soils and waters.

**Mineralogist.** Mineralogists study mineral formation, crystal structure, chemistry and properties to understand ore genesis, to develop process strategies for mineral liberation and beneficiation, and to develop and modify mineral-based products for industrial and consumer use.

**Geophysicist.** Geophysicists apply the principles of physics to studies of the Earth's interior and investigate Earth's magnetic, electrical and gravitational properties.

**Geophysical Engineer.** Geophysical engineers apply geophysical techniques to understand and plan for geologic conditions that affect mines.



## Profile in Geology



**Name:** RAY YOST

**Education:** B.S. 1992 in Geology, Oregon State University and M.S. 1996 in Geological Engineering, University of Arizona

**Position:** Principal Geological Engineer, Rio Tinto Minerals – Boron Operations, Boron, California

*"I am a geological engineer at California's largest open pit mine and my role encompasses several of the specialties in the field of geology – stability analysis, hydrology, slope and pore pressure monitoring, rock mechanics, geophysics, slope design, failure mitigation and mine reclamation. Central to many of these aspects is a sound understanding of statistics and probability given the variability in earth materials and in earth processes.*

*Beyond the technical role, I also spend a considerable amount of time mentoring and developing existing staff, recruiting new personnel, budgeting, developing programs, training, and, of course, working on numerous aspects of safety. Geotechnical engineering plays a key role in maintaining a safe working environment in the mine through the development of reliable slopes, in the monitoring of final and working slopes and in the mitigation of slope failures. On the personal side, I attend regular safety meetings, perform safety observations, and am involved in risk assessment for processes throughout the site.*

*What I most enjoy about the career is the ability to blend technical challenges with personnel and program management in what can be a fluid and rapidly changing environment. My schedule is a mix of analyses, people, numbers, long term forecasts, immediate data, assessments, interviews, reading, travel, and writing and few days are ever the same."*

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# exploring opportunities: in Geological Engineering

## What is a geological engineer?

Geological engineering combines the fields of geology and engineering in a way that is exciting, logical, and unique. Geological engineers evaluate sites. They examine ways to search for and harvest mineral and energy resources. They analyze geologic hazards. Geological engineers discover ways to protect earth's environment while producing needed resources. Their work is very much out-of-doors oriented but uses the most recent technology.

## Why is geological engineering important to the minerals industry?

Geological engineering brings a unique combination of the science of geology and engineering practice to the minerals industry. This unique set of skills enables geological engineers to work effectively in the minerals industry using their understanding of the earth's crust.

## What geological engineering specialists are used in the minerals industry?

Expertise provided to the mining industry includes exploration for and development of mineral and energy resources and construction materials resources; site and geotechnical evaluations, (slope stability, rock mechanics; previous site/land use impacts); land reclamation; and hydrogeology (ground water and surface water).

## Where are the jobs for geological engineers?

Geological engineers serve the minerals industry to integrate knowledge of engineering, the science of geology, and stewardship of the earth's resources and environment. They work for minerals and aggregate companies, consulting companies that support mining companies, and equipment and services providers to mining companies.

## FOCUS ON: Specialties in Geological Engineering

**Exploration.** Geological engineers are involved in exploring and characterizing the quantity, quality, properties, and value of mineral resources. Results from these efforts form the basis for determining the feasibility for mining and reclamation/post mining site use.

**Site Characterization,** Geological engineers are involved in characterizing geologic conditions (soil, rock, groundwater, etc.) and hazards at the mine sites for the safe design, construction, operation, and closure of these facilities.

**Hydrogeology,** Geological engineers evaluate ground and surface water conditions with respect to quality, quantity, flow and volumes, and protection or remediation of these resources.

**Geotechnical.** Geological engineers assess the physical properties of soils and rocks for safe design of foundations, tunnels, excavations, pit slopes, and other facilities for all kinds of mining, construction, and development practices.

**Environmental Studies.** Geological engineers will be part of a team to design and construct mine waste disposal and environmental protection facilities, e.g., tailings dams, and the development and conduct of reclamation plans at mine sites.

**Management,** Geological engineers will, after gaining experience in exploration, design, operation and leadership, move up the ladder to management positions.

Geological engineers work for federal and state agencies. They also start and manage their own consulting or service companies.

## Profile in Geological Engineering:



**Name:** RYAN STACK

**Education:** B.S. Geological Engineering 2002, University of Missouri-Rolla  
P.E. January 2008

**Position:** Environmental Engineer Missouri Department of Natural Resources  
Jefferson City, Missouri

*"In just over five years in the aggregate industry I have had great opportunity to travel and utilize my background in geotechnical and geological engineering. I worked as the Quality Control Manager at the FEC Quarry in Miami, Florida, the largest production aggregate quarry in America producing over 13 million tons per year. As a Division Technical Manager for Rinker Materials in Knoxville, Tennessee, I used my geotechnical background ensuring the quality of our products and their end uses in concrete and asphalt for 18 quarry locations. The technical side of aggregates utilizes statistics and the engineering properties of soil and rock extensively to assist in management decisions of production and sales.*

*Surrounded and supported by professionals, I reached my goal of acquiring Professional Engineering licensure in the State of Tennessee. I now reside in my hometown in South Central Missouri and remain working with the industry by ensuring our operations work within the State of Missouri permit requirements. Geological Engineering poured the foundation and paved the road for my career. Rock On!"*





# exploring opportunities: in Mining

## What is mining?

Mining is varied in its application, but consists of extracting the desired mineral resources that are found naturally deposited within the earth. This requires an understanding of the market for the particular mineral or minerals, the economics associated with the actual operation and maintenance of the mining facility and coordination with other mineral scientists to convert the mineral resource into a salable product. It also requires the implementation of sound engineering practices, good equipment operation and maintenance procedures and compliance with safety and environmental regulations.

## Why is mining engineering important to the minerals industry?

Mining is the first step toward extracting the mineral resource. Mining is the initial selection process where the material that is desired is separated from the non-desired material. Engineering is required to identify the resource and to finally optimize the extraction of the mineral resource.

## Where are the jobs for mining engineers?

Mining engineers work all over the world. They are located at corporate offices or consulting services offices that are typically located in major cities throughout the world. They are also located at operating properties that may be near urban areas such as sand and gravel operations. But typically, mining engineers are located in more remote locations.

## FOCUS ON: Specialties in Mining Engineering

**Mine Valuation.** Mine valuation is the process of determining the worth of a specific mineral deposit. This is necessary to determine the viability of extracting the mineral resource and making a return on the investment.

**Mine Design.** After a mineral resource is located and defined, the approach to mining the deposit must be engineered. The method of mining must be established, typically defined as surface or underground mining. The selection of which method to use must consider many factors, which will be specific to the site and location of the deposit.

**Materials Handling.** Mining is the process of selecting the resource material from other materials. Generally, depending on the nature of the mine, the volume of the materials that must be handled is quite large, whether the resource itself, the surrounding materials or the combination of both.

**Rock Excavation.** The most common method of extracting the resource rock is excavation. The method of excavating the rock will vary dramatically depending on the physical properties of the rock. Rock excavation may be accomplished by simple scraping or gouging practices, in the case of soft materials such as coal. Or it may require intense drilling followed by loading explosives in the drill holes and blasting.

**Ventilation.** In underground operations, special consideration must be given to the condition of the air. Emissions from underground equipment, combustion gases from blasting operations and moisture and heat from rock surfaces affect the quality of the air. If not addressed, this will result in an unsafe or an unproductive work environment. Even if emissions are not a safety issue, in the case of certain mine locations, work productivity and the premature onset of fatigue can be an issue due to higher humidity and temperatures.

**Rock Mechanics.** The physical properties of resource and non-resource materials are key considerations when designing and operating a mine. How well the rock holds together, how it responds to different stresses, and how that response is affected by the moisture content of the material will greatly influence the overall mine design and the approach to mining.

## Profile in Mining:



**Name:** BRANDICE DAHL

**Education:** Bachelor of Science, Mining Engineering;  
Colorado School of Mines, 2007

**Position:** Mining Engineer, Rio Tinto's Kennecott Utah Copper Corp.,  
Bingham Canyon Mine

*"Working in the mining industry provides competitive salaries, job satisfaction, worldwide employment possibilities, and numerous challenges and opportunities, as well as professional advancement and recognition in various aspects of the industry."*

*As a Mining Engineer for Rio Tinto's Kennecott Utah Copper, I work with various people within the industry from the miners operating the equipment to professionals who are recognized worldwide for their expertise. I encounter new challenges each day concerning daily operations and future projects and operations. I have the chance to work with and develop top of the line equipment, technologies, and processes.*



*Mining Engineers can work with diverse projects and tasks in all fields of mining including underground, surface, coal, metals, aggregates and civil construction. Because the opportunities are so vast, Mining Engineers can choose to work near larger cities, smaller towns, and in remote locations around the world."*

# exploring opportunities: in Mineral Processing



## What is mineral processing?

Mineral processing is a broad field that involves the production of both metallic and nonmetallic industrial materials. Metallic products include copper, iron, zinc and gold. Nonmetallic products include silica, kaolin, gypsum and aggregates. Mineral processing engineers have a background in the crushing grinding and separation of the mineral from the host rock.

## What is the role of science in mineral processing?

Materials engineers or physical metallurgists investigate the roles and uses of material or metals and determine their use for new applications. This includes the production raw materials for metal alloys, ceramics, glasses and other products. For example, the tiles use to protect the spaces shuttle from the heat of re-entering the Earth's atmosphere are produced from industrial minerals.

## Where are the jobs in mineral processing?

Worldwide. For example, large-scale metals mining in North America, South America, Australia, Asia and Africa.

## What is the role of engineering in mineral processing?

Engineers develop, or direct, the mining and processing of ores to produce the raw materials used in a wide range of products. This includes the design of mines, utilities, equipment ergonomics, equipment used in the mining or production of the minerals and the processes use to produce the mineral.

### FOCUS ON: Specialties in Mineral Processing

**Mineral Processing Engineer.** Mineral processing engineers develop and direct the processes that separate minerals from other materials. These processes include crushing, grinding and treatment with chemicals, heat, water, microbes and electrolysis.

**Materials Scientist.** Materials scientists create new products for existing uses or new uses for existing products.

**Process Chemist.** Process chemists investigate or develop processes used in the production of metals or materials. Process chemists work with the process plants to reduce costs, increase production recovery, purify the metal or material, or develop new processes.

**Metallurgical Engineer.** Metallurgical engineers deal primarily with the separation of the metals or materials from the ore. This specialty includes the research metallurgist, who is involved with laboratory testing to evaluate existing or new processes or equipment; the mineral processing plant metallurgist, who oversees the separation of the product from the ore; the pyrometallurgist who employs high-temperature processes to produce metals and alloys; and the hydrometallurgist, who uses solvents and other solution to extract valuable minerals.



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## Profile in Mineral Processing:



**Name:** SIMON JOY

**Education:** Metals & Materials Engineering,  
University of British Columbia, 2005

**Position:** Lead Metallurgist, Freeport-McMoRan Copper & Gold,  
Bagdad, Arizona

*“The mining industry has a great deal to offer young engineers in terms of salary, stimulating work, and geographic flexibility. As a recent graduate working as a Metallurgist for Freeport-McMoRan Copper & Gold, I have experienced these criteria first hand and have been very satisfied.*

*The salaries and benefits for Metallurgists in mining are very competitive with other industries that require a similar amount of education.*

*As far as stimulation, I find that I am exposed to a wide variety of tasks which range from daily operational challenges to the design and implementation of medium and long term projects. I find the constant change in daily happenings is stimulating and keeps me excited about the future.*

*Mines are located all over the globe and for the most part are in need of talented and motivated engineers to manage their processes. This allows Metallurgists the freedom to work anywhere in the world and the ability to be selective about the type of work they engage in.”*





# exploring opportunities: in Environment

## Why is the environment important to the mining industry?

Many people moved West in the 1800's in search of a new life. They helped open the frontier. Mining was one of the industries that provided jobs and wealth for a country that was growing and expanding every day. At first, and for many years into the 20th century, a mine was built and the ore extracted without regard to its effect on the surrounding environment. But this practice no longer exists. The mining industry today is responsible and dedicated to compliance with all local, state and federal regulations required by environmental law. It usually takes years for a mining company to have all of the environmental permits approved before the mine is allowed to open. The mining industry has learned from its history and strives to be a good neighbor and do the right thing for the environment. Every mine today has a staff of environmental professionals to ensure that the mine meets or exceeds all environmental regulations.

## What is the role of environmental specialists in the mining industry?

Environmental specialists make certain that mine management is aware of new laws and regulations that can affect the mine operation. The mine management team includes environmental professionals from various specialty fields. They work closely together, to ensure the mine operates efficiently and without a mishap that could endanger the mine operations. Environmental specialists constantly monitor the air and groundwater at the mine so that public and private lands surrounding the mine property are protected. Environmental specialists can be found working outdoors with special tools and instruments to take measurements, indoors in laboratories analyzing data, designing, and planning environmental processes.



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## Where are the environmental jobs in the mining industry?

Environmental professionals are found in the mining industry at all levels of employment throughout the world. If you like travel and adventure, you could find yourself working at a mine in a jungle in South America. Some mines are near large towns and cities. You might like planning new environmental projects and work in an office. You could find yourself eventually working at the corporate headquarters of a mining company.

### FOCUS ON: Specialties in Environment

**Hydrologist.** Hydrologists study the properties, distribution and effects of water in the atmosphere, on the earth's surface and in soil and rocks.

**Biologist.** Biologists study the science of living organisms and life processes, including the structure, functioning, growth, origin, evolution and distribution of living organisms.

**Environmental Engineer.** Environmental engineers are certified professionals who apply math, science and engineering principles to the design, construction and operation of economical and efficient structures, equipment and systems in the natural environment.

## Profile in Environment:



**Name:** JENNIFER BECK

**Education:** B.A., Geology, 1998, Whitman College, Walla Walla, WA. M.S., Geology (emphasis in Environmental Geochemistry), 2003, University of Idaho, Moscow, Idaho.

**Position:** Staff Geochemist, Schlumberger Water Services (formerly Water Management Consultants), Denver, CO.



*“As a geochemist, I provide guidance and supporting documentation for permits proposed on existing and future mining projects. Supporting geochemical work includes ore and waste rock sampling to determine potential for acid rock drainage (ARD). I also construct predictive models to simulate the progression and development of pit lake so that impact to the environment is minimized. Previous work experience as a hydrogeologist with the USGS has enabled me to gain experience in the installation, development and sampling of monitoring wells for the assessment of water quality conditions*

*as part of a baseline analysis. I enjoy my work very much. Each day there is a new challenge to face. I am continually learning and improving my skills. Various field programs in places like Mexico and Alaska provide me with an opportunity to travel.*



# exploring opportunities: in Health & Safety

## Why is health and safety important in the minerals industry?

During the 19th century, mining methods and equipment were crude and did not improve until modern times. Miners often worked in very hazardous conditions deep in underground mines. There were fires, accidents, serious injuries, illnesses and fatalities in the mines. Miners' unions were formed and demanded safer working conditions. The financial loss of valuable employees and equipment caused mining industry leaders to rethink how they did business. Today, mine safety and health is regarded as the top priority for the mining industry. Every mine has a staff of safety professionals whose exclusive duty is to ensure that the miners are knowledgeable about the equipment they use and are aware at all times about their working conditions.

## What is the role of health and safety specialists in the minerals industry?

Health and safety specialists keep mine management informed about all new and applicable safety laws and regulations for the safe operation of the mine. The safety department is an important part of the management team. Mines are very proud of safety records that result in no loss of time or injuries. Safety professionals monitor working conditions throughout the mine, mill, shops and laboratories to ensure that all employees use personal protective equipment and are proactive about health and safety in their respective work areas. Health and safety specialists can be found working indoors and out with a wide variety of instruments and tools for taking measurements and analyzing data.



Photo: Copyright 2007 Freeport-McMoRan Copper & Gold

## Where are the jobs for health and safety specialists?

Health and safety professionals work in the mining industry throughout the world and at all levels of employment based on their knowledge and experience. Mines are where the minerals, coal, sand, gravel or any economically extractable material is located. This can be in a jungle, desert, in the mountains or near a big city. You could also find yourself working in the corporate offices of a mining company.

### FOCUS ON: Specialties in Health & Safety

**Industrial Hygienist.** Industrial hygienists study the science of health, prevention of disease and illness, and the conditions and practices that promote or preserve health.

**Occupational Safety and Health Specialist.** Occupational safety and health specialists, through education and experience demonstrate a thorough knowledge of safety principles, laws and regulations and apply them in the workplace.

**Safety Engineer.** Safety Engineers are certified professionals who apply math, science and engineering principles to the design of systems with inherent safety and fail-safe features.

## Profile in Health & Safety



**Name:** STACY L. KRAMER, CSP

**Education:** B.S., Occupational Safety and Health 1995, Montana College of Mineral Science and Technology; MPH in Health and Safety Management 2005, Tulane University; CSP Certified Safety Professional, Board Certified Safety Professionals 2000.

**Position:** Manager, Health and Safety, Freeport-McMoRan Copper & Gold, responsible for health, safety, security, and emergency response.



*"I began my health and safety career working in the chemical industry. Growing up in a mining town and having two generations of miners in my family, I always had an interest in a mining career. I saw my grandfather suffer from silicosis for over ten years before his death. As soon as a position came up with Freeport-McMoRan Copper & Gold at their Morenci operation, I jumped at the chance to work for a large mining company and make a difference in the health and safety of miners."*

*"I have been with the company for over ten years and the work has been very challenging as safety takes a constant effort. Management commitment and employee involvement are key to a successful health and safety process."*





## Academics: Making the Right Choices

### Selecting the Right School.

It is an important first step in pursuing a career in the mineral industry. Schools differ in academic, social and financial demands and opportunities. Given below are the most important criteria for selecting a school for a minerals career:

- **TYPE OF SCHOOL**
- **ACADEMIC PROGRAMS**
- **FACULTY**
- **COST AND FINANCIAL AID**

### Type of School.

Most mineral schools are located either in a university, an institute of technology or a polytechnic institute. One should also consider related factors, such as professional societies, student body, school size and campus facilities such as housing, sports facilities, cultural and leisure activities. It is always wise to tour the institution you are considering attending to see if they have the facilities important to you.

### Academic Programs.

Many minerals engineering programs in the United States have been accredited by the Accreditation Board for Engineering and Technology (ABET). This organization follows national standards of quality for faculty, curricula, students, administration, facilities and institutional commitment. Be sure to check the accreditation of the particular program of interest to you. Once you have narrowed your choices, look through each school's catalog and browse through its homepage on the Internet. You should also check out a school's academic approach—



whether the programs take a theoretical approach or also provide practical experience. A school that offers an interdisciplinary approach is highly referable.

Other items to be considered are internship and co-op programs with the minerals industry and research opportunities. It is a good idea to talk to students currently enrolled in the program.

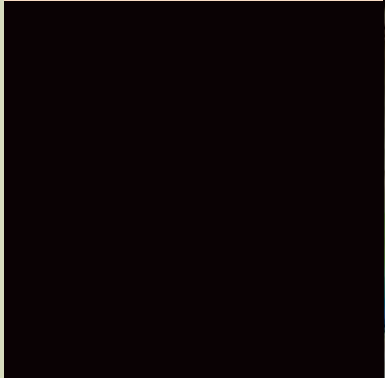
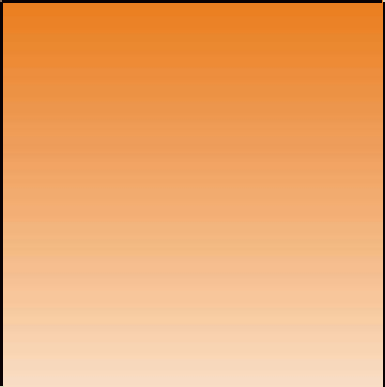
### Faculty.

An ABET-accredited program meets certain national standards in maintaining the faculty. Examine whether the faculty has an established reputation for teaching or research. Also, a diverse faculty prepares you to work with people from different cultures, strength when considering the global nature of the minerals industry.

Finally, check out the academic resources, such as library facilities, computer facilities, laboratory equipment and types of counseling and tutorial services available on the campus.

### Cost and Financial Aid.

Cost sometimes becomes a primary factor in selecting a school. Remember, public institutions offer excellent engineering programs and are less expensive than private institutions. In most of the mineral schools, scholarships, grants, part-time employment, and co-op work-study programs are available.



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