



July 2018

# CAREER PATHWAYS: MINING



**Bulkley-Nechako  
Workforce Opportunities Table**



## Sector Size and Performance

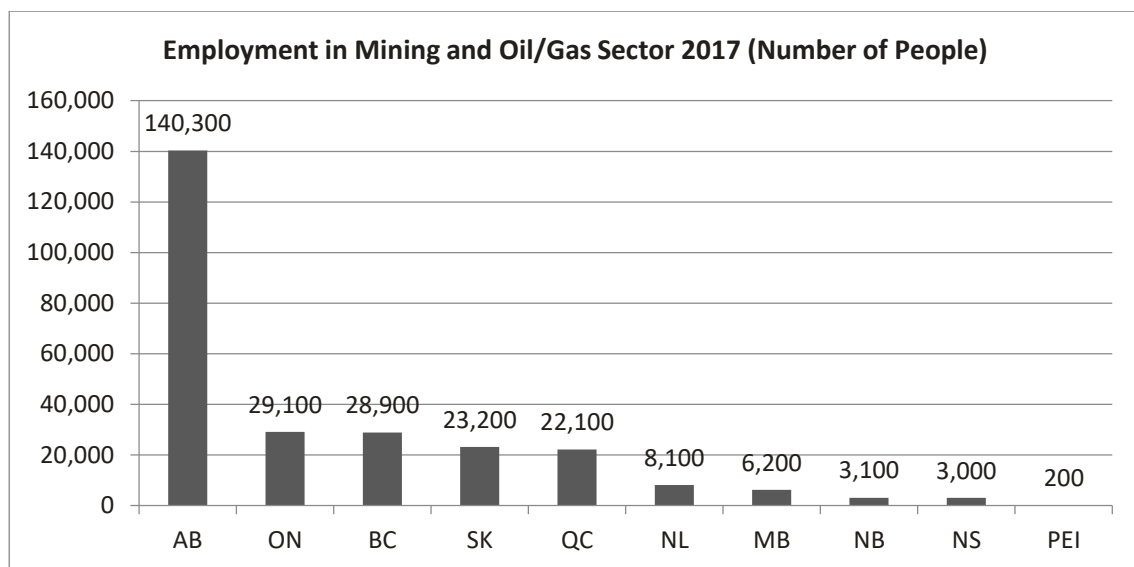
The mining sector comprises establishments primarily engaged in mining or preparing metallic and non-metallic minerals. It is composed of three segments: coal mining; metal ore mining; and non-metallic mineral mining and quarrying.

Canada's mining sector contributed \$26.9 billion to Canada's overall GDP in 2016. British Columbia is the third largest contributor to total mining GDP in Canada (after Ontario and Quebec), contributing more than \$4.3 billion (or 16%) in 2016.

British Columbia's mining sector GDP grew year-over-year from 2012 to 2014, before dropping in 2015 and 2016. However, overall the sector has grown 0.9 percent from 2012-2016.<sup>1</sup>

Approximately 28,900 people were employed in British Columbia's mining, quarrying, and oil and gas extraction sector in 2017. Although the amount employed in this sector has seen decreases in certain years, it has grown overall by 1,300 jobs in the last five years.

Almost 11 percent of all mining and oil/gas employees in Canada are employed within British Columbia; this makes British Columbia the third largest sector employer out of all provinces in Canada.<sup>23</sup>



Canada's mining sector is projected to have an average of 2,340 job openings each year over the next five years.<sup>4</sup> The Government of British Columbia is forecasting 5,800 total job openings in mining in British Columbia and 510 job openings in North Coast/Nechako Region over the next 10 years.<sup>5</sup>

<sup>1</sup> Statistics Canada GDP by NAICS, CANSIM Table 379-0030, 2017

<sup>2</sup> Statistics Canada Labour Force Survey Estimates by NAICS, CANSIM Table 282-0008, 2017

<sup>3</sup> Alberta represents a high proportion of employees due to the combined sector of mining and oil/ gas extraction – which cannot be delineated in the Labour Force Survey. Therefore their presence in the mining sector alone is exaggerated.

<sup>4</sup> Canadian Occupational Projection System, Job Opening Projections by Industry, 2015

<sup>5</sup> British Columbia Labour Market Outlook, 2017



## Careers in Mining

There are many different careers within the mining sector to pursue, the top twelve in terms of employment in British Columbia's mining sector include:

- Geological Technologist/ Technician;
- Geoscientists;
- Heavy-Duty Equipment Mechanics;
- Heavy Equipment Operators;
- Industrial Mechanic / Millwright;
- Manager in Natural Resources Production;
- Mining Engineer;
- Mining Labourer;
- Senior Manager, Mining;
- Supervisor for Mining and Quarrying;
- Transport Truck Driver;
- Underground Production & Dev. Miner.

The median wage for positions in British Columbia's mining sector ranges from \$25.00 to \$55.00 per hour. Mining workers in British Columbia make a higher median wage than Canada as a whole – approximately \$2.45 more per hour, on average.

## Career Progression in Mining Sector

### **LEVEL D (*On-Job Training*):**

#### Mine Labourers (NOC 8614)

- Completion of secondary school is usually required.
- A short period of on-job introductory training is provided.

Median Wages (/Hr):

BC: \$25.88

Canada \$23.65

### **LEVEL C (*Some College or Industry Specific Training/ Certification, On-Job Training*):**

#### Transport Truck Driver (NOC 7511)

- Completion of secondary school is usually required.
- On-the-job-training is provided.
- Completion of an accredited driver training course of up to three months duration, through a vocational school or community college, may be required.
- A Class 3 or D licence is required to drive straight-body trucks.
- A Class 1 or A licence is required to drive long combination vehicles.
- Air brake endorsement (Z) is required for drivers who operate vehicles equipped with air brakes.
- Transportation of dangerous goods (TDG) certification is required for drivers who transport hazardous products or dangerous goods.
- Additional licensing endorsement or certification may be required to drive articulated trucks.

Median Wages (/Hr):

BC: \$25.00

Canada \$21.00



### Heavy Equipment Operator (7521)

- Some secondary school education is required.
- Completion of a 1- to 2-year apprenticeship program or some high school, college or industry courses in heavy equipment operating combined with on-the-job training are required.
- Certification for heavy equipment operator (dozer, excavator, tractor-loader-backhoe) may be required.
- Internal company certification may be required by some employers.
- Red Seal endorsement is also available to qualified heavy equipment operators upon successful completion of the interprovincial Red Seal examination.

Median Wages (/Hr):                      BC: \$28.00                      Canada \$27.00

### **LEVEL B (College or Apprenticeship, Some Certification, Some Experience):**

### Construction Millwrights and Industrial Mechanics (NOC 7311)

- Completion of secondary school and training courses or a vocational program is usually required.
- Completion of a 3- to 4-year apprenticeship program or combination of over 5 years of work experience and industry courses in industrial machinery repair or millwrighting is usually required.
- Industrial mechanic trade certification is available, but voluntary, in all provinces and territories.
- Red Seal endorsement is also available to qualified industrial mechanics or millwrights upon successful completion of the interprovincial Red Seal examination.

Median Wages (/Hr):                      BC: \$35.00                      Canada \$29.33

### Heavy-Duty Equipment Mechanics (NOC 7312)

- Completion of secondary school and training courses or a vocational program is usually required.
- Completion of a 3- to 5-year apprenticeship program or combination of over 4 years of work experience and industry courses in heavy equipment repair is usually required to be eligible for trade certification.
- Heavy-duty equipment technician trade certification is available but voluntary, in BC.
- Red Seal endorsement is also available to qualified heavy duty equipment technicians and agricultural equipment technicians upon successful completion of the interprovincial Red Seal examination.

Median Wages (/Hr):                      BC: \$30.00                      Canada \$29.94

### Supervisors for Mining and Quarrying (NOC 8221)

- Completion of secondary school is required.
- Completion of a college or university program in mining technology or engineering may be required.
- Several years of experience in the occupations supervised are usually required.
- Provincial certification as an underground mine supervisor, shift boss, or coal mining supervisor may be required.

Median Wages (/Hr):                      BC: \$41.46                      Canada \$35.00

### Underground Production and Development Miners (NOC 8231)

- Completion of secondary school is usually required.
- Formal training of up to six weeks followed by extended periods of specialized training as a helper or in support occupations is usually provided.
- Previous experience as a mine labourer or in other mine occupations is usually required.



- Provincial blasting licence may be required.
- Company licensing or certification is often required for occupations in this unit group.
- Certificate in first aid may be required.

Median Wages (/Hr):                      BC: \$36.00                      Canada \$32.00

### **LEVEL A (*Bachelor Degree or Higher, Intermediate Experience*):**

#### Geoscientists and Oceanographers (NOC 2113)

- A Geoscientists require a university degree in geology, geochemistry, geophysics or a related discipline.
- A master's or doctoral degree in geophysics, physics, mathematics or engineering may be required for employment as a geophysicist.
- Registration with a provincial or territorial association of professional engineers, geologists, geophysicists or geoscientists is usually required for employment and is mandatory to practice in British Columbia.
- Geologists and geophysicists are eligible for registration following graduation from an accredited educational program and after several years of supervised work experience and, in some provinces, after passing a professional practice examination.

Median Wages (/Hr):                      BC: \$44.87                      Canada \$40.63

#### Mining Engineers (NOC 2143)

- A bachelor's degree in mining engineering or in a related engineering discipline is required.
- A master's degree or doctorate in a related engineering discipline may be required.
- Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.). To become eligible as a P.Eng, engineers must graduate from an accredited educational program, complete three or four years of supervised work experience in engineering, and passing a professional practice examination.

Median Wages (/Hr):                      BC: \$54.88                      Canada \$43.94

#### Geological and Mineral Technologists and Technician (NOC 2212)

- Geological and mineral technologists usually require completion of a two- to three-year college program in geological technology, petroleum technology, petroleum engineering technology, hydrogeology or groundwater technology, mining technology, mining engineering technology, mineralogy, metallurgical technology, or welding technology.
- Geological and mineral technicians usually require completion of a one- to two-year college program in a related field.
- Certification in geological and mineral technology or in a related field is available through provincial associations of engineering/applied science technologists and technicians and may be required by employers. A period of supervised work experience, usually two years, is required before certification.

Median Wages (/Hr):                      BC: \$31.25                      Canada \$33.00



## **LEVEL O (*Management Positions - Combination of Education and Advanced Experience*):**

### Senior Managers – Construction, Transportation, Production, Utilities (NOC 0016)

- A university degree or college diploma in engineering, business administration, commerce or other discipline related to the company's product is usually required.
- Several years of experience as a middle manager in goods production, utilities, transportation or construction are usually required.
- Specialization in a particular functional area or product is possible through specific university or college training in that area or through previous experience.
- Senior managers in finance usually require a professional accounting designation.

Median Wages (/Hr):                      BC: \$47.65                      Canada \$48.99

### Managers in Natural Resources Production (NOC 0811)

- Mining/ quarrying managers usually require a bachelor's degree in mining engineering or earth sciences.
- Several years of experience in a supervisory occupation in the particular industry are usually required and may substitute for formal education requirements.

Median Wages (/Hr):                      BC: \$41.93                      Canada \$48.08

## Local Education/Training Programs

### **College of New Caledonia**

The College of New Caledonia is a post-secondary educational institution that serves the residents of the Central Interior of British Columbia. The college has campuses in Burns Lake, Fort St. James, Mackenzie, Prince George (main), Quesnel and Vanderhoof. It offers a range of programs including: apprenticeship trade training, certificates, diplomas, associate degrees, university transfer credit, continuing education/vocational training, and individualized training sponsored to the client's needs in the college or onsite at a location of the clients choosing. College of New Caledonia also offers a variety of online and direct digital delivery courses and programs to those within the Regional District of Bulkley Nechako. To see up-to-date programming visit: [www.cnc.bc.ca](http://www.cnc.bc.ca)

#### Relevant Programs to Mining (Current):

[Driver Training, Licence](#) – Location: Burns Lake, Fort St. James, Fraser Lake, Vanderhoof

The College of New Caledonia offers commercial driver training for Class 1, 3, 4 (Restricted & Unrestricted), and 5. It also offers air brake certification.

[Excavator Training, Certificate](#) – Location: Fort St. James, Vanderhoof

This program combines hands-on equipment operation with training in an excavator simulator. Students will also get industrial certifications as well as entry level service and maintenance skills needed to work as an excavator operator.



### Heavy Equipment Operator, Certificate – Location: Mackenzie

The HEO program is a 12-week program with intensive, hands-on training in heavy equipment operation, routine maintenance of equipment, and practical field operations. The program will include core curriculum following Industry Training Authority (ITA) guidelines. Graduates will complete a minimum of 90 classroom hours and 300 equipment seat hours. In addition, training a number of safety and occupation-specific certificates will be included.

### Industrial Mechanic, Apprenticeship – Location: Burns Lake, Mackenzie, Prince George, Quesnel

Industrial mechanics (millwrights) install and repair machinery and heavy mechanical equipment in a variety of work sites including production facilities, lumber mills, ski hills, mines, and more. Industrial mechanics have a broad skill set that allows them to perform a variety of duties from the analytical – reading diagrams and schematic drawings, performing alignments and precision work – to the physically intensive – operating rigging and heavy equipment, fabrication and tack welding, and construction.

### Industry Training, Courses

The College of New Caledonia offers industry training courses and certification, many of which respond to the needs of the mining sector. Relevant courses include: Driving Certification; Confined Space—Awareness/Entry/Rescue; Hoisting and Rigging; WHIMS; WorkSafeBC, and more.

### Mining Industry, Certificate Location: Burns Lake, Fort St. James, Mackenzie, Prince George, Vanderhoof

The Mining Industry Certificate includes classroom instruction; WorkSafeBC Certification; Ministry of Energy, Mines, and Petroleum Resources (MEMPR) education based on the Health, Safety and Reclamation Code for Mines in British Columbia; skill certification; applied human relations skills, employability skills; simulator training; and field orientation and experience.

## **Coast Mountain College (formerly Northwest Community College)**

Coast Mountain College is a post-secondary education institution that serves the residents of northwest British Columbia. The college has campuses in Hazelton, Kitimat, Masset, Prince Rupert, Queen Charlotte, Smithers, and Terrace (main). It offers a range of programs including: apprenticeship trade training, certificates, diplomas, associate degrees, university transfer credit, continuing education/vocational training, aboriginal education and distance and online learning. To see up-to-date programming visit: [www.nwcc.bc.ca](http://www.nwcc.bc.ca)

Relevant Programs to Mining (Current):

### Applied Earth & Environmental Studies, Certificate – Location: Terrace

Applied Earth & Environmental Studies is a one year program that emphasizes the practical application of earth and environmental studies. Hands-on curriculum includes community-based projects and field-based studies, building valuable skills and knowledge that meet employment and career needs. Students gain the academic and applied skills relevant for entry-level employment in natural resource, mining and mineral exploration, tourism, outdoor adventure and environmental industries.



[Environmental Geoscience, Associate of Science Degree](#) – Location: Prince Rupert, Terrace

The Environmental Geoscience Specialization encompasses a broad range of disciplines that allow students to develop an understanding of Earth's related natural systems and processes. Graduates will be well versed in atmospheric, hydrological, ecological, and geological studies and may go on to find work in a variety of fields, such as mining and mineral exploration, forestry, wildlife and freshwater management, climate modelling and green energy production.

[Heavy Equipment Operator, Apprenticeship](#) – Location: Terrace

Heavy Equipment Operator program students log operator time on four pieces of heavy equipment: excavator, articulated rock truck, dozer and loader. These machines are used universally in construction, earth moving, road building, mining, and forestry operations.

[Industrial Mechanic, Apprenticeship](#)

Indentured apprentices combine on-the-job training with formal classroom technical training at Northwest Community College to earn journeyman classification. Journeyman millwrights find employment in manufacturing, processing, and construction. Their duties include a variety of skills required for other trades making them good candidates for promotion to supervisory and superintendent positions.

[Mining Engineering and Technology](#)

The Collaborative Mining Engineering and Technology Degree/Diploma Program provides students across British Columbia with a local and alternative pathway into Mineral Exploration and Mining Technology or Mining and Mineral Resource Engineering Programs at BCIT. Students will begin their academic studies toward a technology diploma or engineering degree at their home institution before transferring to the full program at BCIT and studying in the Lower Mainland of British Columbia.

[School of Exploration and Mining, Workshops & Training Programs](#)

Northwest Community College's School of Exploration & Mining (SEM) has taken a leadership role in providing training for the minerals industry workforce in Northern BC communities. In partnership with Smithers Exploration Group and the Province of BC, SEM develops and delivers essential courses and programs targeted for the minerals industry. NWCC's School of Exploration and Mining offers mobile and customizable courses to meet the employment training needs of the minerals and natural resource industries. Courses can be offered individually, packaged by contract or modified to meet the specific training needs of the client. Available on demand programs include:

- Mining Exploration & Natural Resources Field Assistant (14 Days)
- Mineral Processing Operator (77 Days)
- Drill Core Technician Basic Training (6 Days)
- Surface Diamond Driller's Helper (11 Days)
- Environmental Monitor Assistant Program (50 Days)
- Workforce Exploration Skills Training (40 Days)
- Mining Fundamentals (20 Days)





## University of Northern British Columbia

The University of Northern British Columbia is a small research-intensive university that serves the residents of Northern British Columbia. The university has campuses in Fort St. John, Prince George (main), Quesnel, and Terrace. It offers a range of programs including: certificates, diplomas, undergraduate and graduate degrees. To see up-to-date programming visit: [www.unbc.ca](http://www.unbc.ca)

Relevant Programs to Mining (Current):

[Environmental Engineering, Bachelor of Applied Science](#) – Location: Prince George

The UNBC/UBC Environmental Engineering Program is a unique, 4 1/2 year joint degree offered collaboratively between the University of Northern British Columbia and the University of British Columbia. Students develop a foundation in mathematics, biology, chemistry, and environmental science, as well as a hands-on understanding of engineering fundamentals, analysis and design.

[Environmental Science, Bachelor of Science](#) – Location: Prince George

The Major in Environmental Science is designed to provide students with knowledge of the fundamental biological, chemical, physical and applied aspects integral to the field of environmental science. In addition, students receive exposure to many of the human dimensions that underlie environmental issues.

[opportunities.rdbn.bc.ca](http://opportunities.rdbn.bc.ca)

**Bulkley-Nechako Workforce Opportunities Table**

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**Canada** 



**BRITISH  
COLUMBIA**

*Funding provided through the Canada-British Columbia  
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