

agricultural limestone and building materials. Mining activities may be classified as placer, general minerals (veined minerals and bedded minerals), fuels (coal, petroleum and gas) and quarrying.

In provinces where placer deposits occur, regulations define the size of placer holdings, the terms under which they may be acquired and the royalties to be paid.

General minerals are sometimes described as quartz, lode, or minerals in place. The most elaborate laws and regulations apply in this division pertaining to prospector or miner licences to search for mineral deposits, staking and recording claims, time limits, recording fees where required, work of a specified cost to be performed in some provinces, and renewals of development licences. Mining taxation is applied most frequently as a percentage of net profits of producing mines.

Coal, petroleum and natural gas. In provinces where coal occurs, specifications include the size of holdings, and their conditions of work and rental. In the search for petroleum and natural gas, an exploration permit or reservation is usually required; in Saskatchewan, Alberta and British Columbia leases usually follow when a discovery of oil or gas is made; exploration costs may be applied to the lease rental. In other provinces, discovery of oil or gas is usually a prerequisite to obtaining a lease or grant of a limited area, subject to carrying out drilling obligations and paying a rental, a fee, or a royalty on production.

Quarrying regulations define the size of holdings and the terms of lease or grant concerning quarryable substances (ordinary stone, building and construction stone, sand, gravel, clay, limestone and peat moss). In several provinces, such substances belong to the owner of the land, but regulations vary. For further details on quarrying regulations and other mining information mentioned in this section, refer to provincial mining legislation.

10.9 Energy, Mines and Resources Canada

The Department of Energy, Mines and Resources was created in October 1966 from the former department of mines and technical surveys. It has jurisdiction over federal matters related to energy, mines, minerals and other non-renewable resources, technical surveys and explosives. The department is responsible for federal mineral and energy policies and for conducting technical

surveys and research related to mineral and energy resources. The surveys and research are conducted in three sectors: research and technology, earth sciences and energy.

10.9.1 Research and technology

This sector is responsible for research and development in mining, minerals, metals and fuels technologies, remote sensing and explosives. The work is conducted in-house and by contract in three branches: the Canada Centre for Mineral and Energy Technology (CANMET), the Canada Centre for Remote Sensing (CCRS) and the Explosives Branch.

CANMET. Since its inception in 1907, the Canada Centre for Mineral and Energy Technology (CANMET), has provided scientific and technological support to the Canadian mineral and energy industries through production and protection technology oriented programs.

The CANMET program in mining R&D concentrates on mine design and the environmental safety of mine workers. It includes research on rock mechanics, the development of mining methods and better and safer mining equipment, explosives testing, mining environments, the certification of equipment, fire and explosive hazards, tailings control, and assessment of uranium and coal reserves.

The branch is also responsible for research, development, evaluation and assessment of new technologies which will provide a more complete recovery and upgrading of Canadian ores in a safe and environmentally acceptable manner. Mineral processing programs focus on the efficient extraction of metal from complex concentrates or low grade ores, computerized techniques for increasing plant efficiencies, and the recovery of byproducts.

R&D on fossil fuels is directed toward improving coal recovery and reducing sulphur emissions, increasing the yield of liquid products and ensuring that the products can be incorporated into the conventional oil supply and refining systems without major changes in refining practices. Technologies investigated include the upgrading of oil sands, heavy oil and synthetic crude production, coal combustion and carbonization, coal gasification and liquefaction, and the improvement of oil and gas domestic heating furnaces.

CANMET investigates the performance of metals and develops new processing and fabricating techniques in order to increase productivity and decrease pollution and energy consumption in metallurgical processes. CANMET research is