



**W**estar Mining (formerly B.C. Coal) operates a major mining facility near Sparwood. The Balmer Operations, as it is known, straddle a rich coal belt that contains proven recoverable reserves of more than 225 million tonnes of clean coal, enough to supply current and future customers well into the twenty-first century.

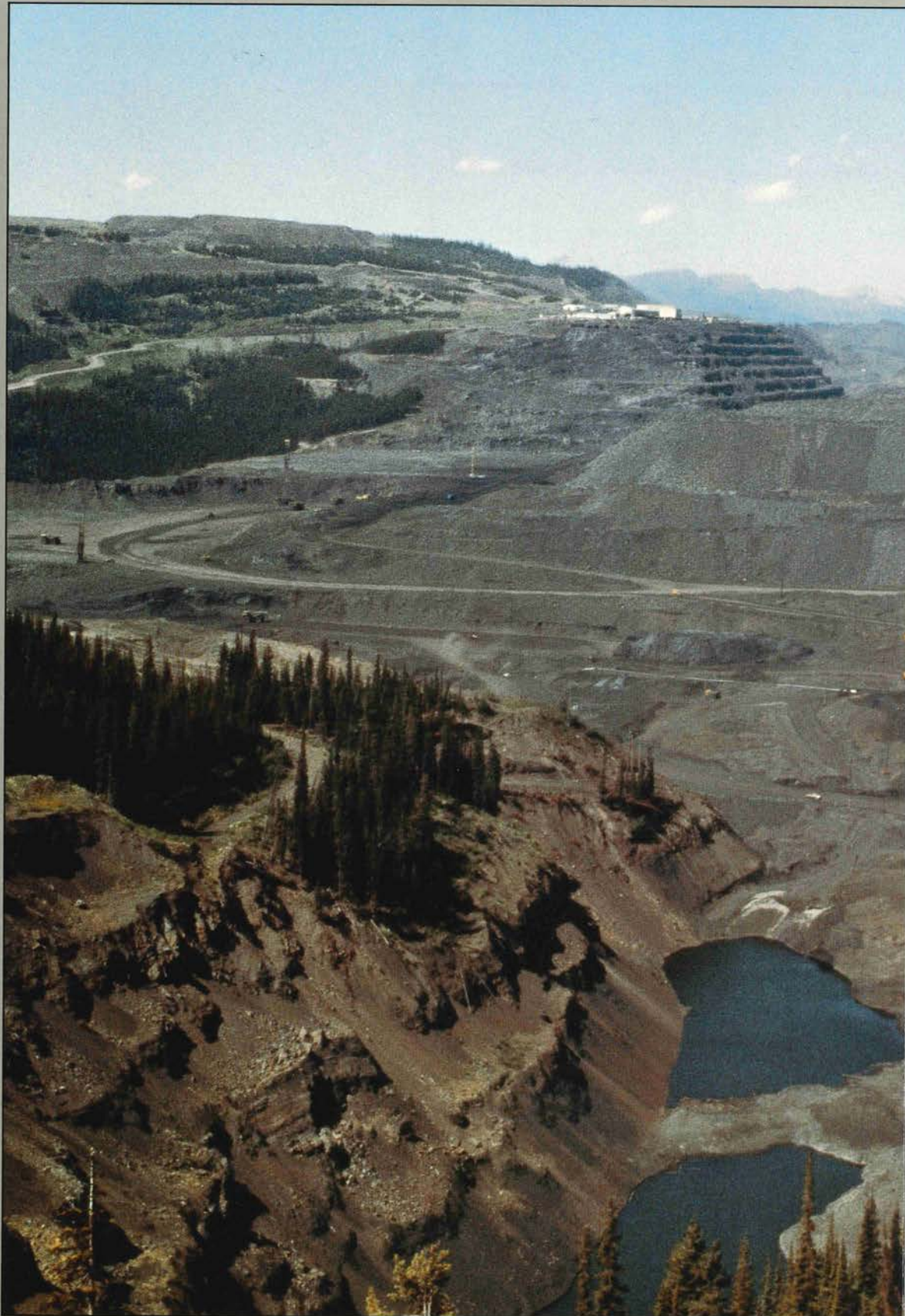
These operations include a large surface mine, a technologically-advanced underground hydraulic mine, a conventional room and pillar underground mine, and one of the world's largest coal processing plants.

Coal is contained in 15 seams, although nearly all mining during the past ten years has been confined to the bottom or No. 10 seam. This seam is 12 to 15 metres thick, low in sulphur with excellent coking characteristics. Volatile content of the coal ranges from 18 to 38 percent and varies with the stratigraphic location of the seams — the greater the depth, the lower their volatile matter.

Roughly 90 percent of the company's annual Balmer coal production comes from its surface mine, which is the largest truck and shovel operation in the world. Its open pit covers 1,200 hectares of mountainous terrain, rising to more than 1,800 metres above sea level.

To reach the coal seam, overburden consisting of shale and sandstone ranging from a couple of metres to a few hundred metres in thickness must first be removed. To accomplish this, 31-centimetre drills bore to a depth of 17 metres and the holes are then loaded with explosives and blasted. A typical blast involves 250 holes. The fragmented rock is shovel-loaded into 180-tonne trucks and hauled to disposal areas or future reclamation sites.

Coal is recovered using bulldozers and front-end loaders and hauled to the breaker station for crushing, then conveyed through the moun-





tain to raw coal silos to await processing at the preparation plant. The average daily production from the surface mine can reach 22,000 tonnes of raw coal, bringing its potential annual output to about eight million tonnes.

The company's surface operation is complemented by an underground hydraulic mine which is capable of producing approximately one million tonnes of raw coal annually. The technique of using a high-pressure water jet to dislodge coal is especially effective in mining the thick, steeply graded coal seams which are not economically accessible by surface mining methods.

To extract coal using the hydraulic technique, continuous miners first prepare tunnels into the coal seam. A high-pressure water jet is then directed against the coal face, slicing through the coal as it oscillates back and forth under a pressure of between 3,790 to 17,580 kPa (550-2,550 p.s.i.). Hydraulic mining is the safest form of underground mining with the monitor operator's cabin located in the fresh air intake, 12 metres from the face of the rock.

This mining method, which has resulted in increases in coal seam recovery of up to 400 percent over conventional underground mining techniques, is actively marketed by Westar Mining throughout the world.

The company also operates a smaller conventional room and pillar underground mine which uses continuous miners to dig the coal from the seam.

Advanced technology and efficient large-scale mining equipment are in use throughout the mine site. Surface mining equipment includes electric shovels of 23, 19 and 11-cubic metre capacity, trucks of 180, 154 and 90-tonnes, 17 and 27-cubic metre capacity front-end loaders, drills and a supporting fleet of crawler and rubber tired bulldozers, graders and other

vehicles. The largest dump truck ever manufactured, a 320-tonne Terex Titan, is currently undergoing tests to determine its suitability for use in removing overburden.

To improve equipment efficiency and minimize down-time, Westar Mining's maintenance facilities located at the surface mine are equipped to handle preventative maintenance and repairs to all types of equipment. At the Rebuild Centre — a major facility for rebuilding engines, transmissions, hydraulic and braking systems for trucks and other large equipment — work is carried out by highly-skilled mechanics, millwrights and machinists. A central warehouse carries an inventory of over 35,000 replacement parts.

Computers play an important role in providing a quick and efficient information retrieval system. They are used to plan and engineer surface and underground mining operations, to produce geological statistics and maps for use in exploration, and to forecast equipment needs and production volumes. In addition, the entire inventory control program and all equipment maintenance schedules are fully computerized.

Maintaining strict quality control over its product is one of Westar Mining's primary objectives. Continuous laboratory analysis of field samples ensures that a consistent blend is delivered to the company's Elkview Preparation Plant. A new laboratory facility near Elkview will ensure that quality control will continue at the highest technical level.

During the preparation process, raw coal is conveyed from the storage silos to the wash plant and screened to remove debris. Coal larger than one centimetre in

diameter is washed in heavy media vessels and delivered directly to the clean coal silos. Finer coal is screened in two sizes for washing by a separate process. After washing, the two size fractions are recombined and conveyed to a thermal dryer to reduce the moisture content. From the dryer, the coal is conveyed to clean coal silos to await loading onto unit trains.

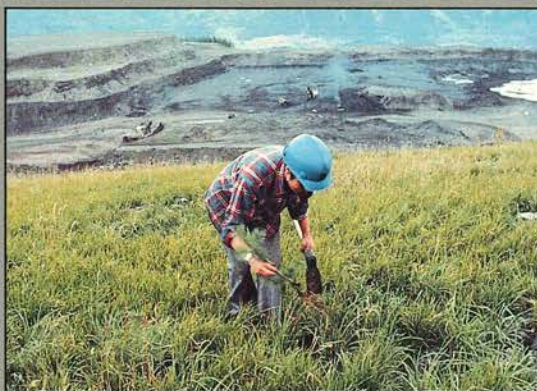
At the load-out area, computerized measuring equipment ensures that each car is loaded to its capacity of approximately 92 tonnes. At the same time, a latex emulsion is



sprayed over each full carload to prevent dust from escaping during the trip to the coast.

Environmental protection is of major concern and in the 15 years since the company began operations in the Elk Valley, Westar Mining has developed an active program to rehabilitate previously mined areas. To date, more than 1,000 hectares have been planted with grasses, trees and shrubs.

In addition, the company maintains strict water and air quality control standards through a series of advanced treatment facilities and monitoring stations.



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