2003

Chief Inspector of Mines'

Annual Report

Mining Operations Branch
Ministry of Energy and Mines

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Foreword

The Chief Inspector of Mines is appointed by the Minister of Energy and Mines to administer the Mines Act and the Health, Safety and Reclamation Code for Mines in British Columbia.

The Chief Inspector of Mines is also the director of the Mining Operations Branch which functions through a central office in Victoria and four regional offices; Cranbrook, Kamloops, Prince George and Smithers, plus a satellite office located in Fernie.

Information about the Ministry and copies of Ministry publications are available through the following options:

Ministry Web site:
www.gov.bc.ca/em

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Further information on the activities of the various mining companies can be found in the Canadian Mines Handbook published each year by Northern Miner Press Limited at (604) 688-9908, or from each mining operation. In addition, you may contact the Mining Association of B.C. (604) 681-4321 and the Coal Association of Canada (403) 262-1544. Each issue annual reports on the status of those sectors.

1.1 Mine Health and Safety Function

MANDATE/ACTIVITIES
The Mining Operations Branch function derives its mandate from the Mines Act and its accompanying Health, Safety and Reclamation Code for Mines in British Columbia (the Code).

The Code is reviewed on an ongoing basis, by the code review committee comprising representatives from labour, industry and government, and chaired by the Chief Inspector, to ensure it remains current with new technology, mining practices and health and safety concerns. The new edition of the Code was released in 2003.

The key mandate of the branch, with respect to health and safety, is to ensure worker health and safety, and public safety. In order to accomplish this, the branch functions include:

- the review of health and safety related aspects of mining and exploration proposals;
- mine inspections and the close monitoring of mining activity for conformance with the Mines Act and Code, and the approval of mine plans with regard to health and safety concerns;
- the completion of audits to evaluate how well a safety and health program has been implemented at a mine.
- the collection of data and maintenance of records with respect to accidents, dangerous occurrences, inspection frequencies and audiometric (hearing test) data; and,
- participation in research projects.

Mine Rescue Stations
Regional mine rescue stations were consolidated in 1999. All mine rescue equipment is now located in a single centrally located station in Kamloops. The station is under the supervision of the local Mines Inspector, in Kamloops, and the Director of Health and Safety, in Victoria.

1.2 Mining Administration Function - non-health and safety component

MANDATE/ACTIVITIES
The Mining Operations Branch administers and regulates the full mining cycle, including exploration, development, production, reclamation and closure for metal, placer, industrial mineral and coal mines, and gravel pits and quarries. This mandate includes the review of applications and issuance of permits under Section 10 of the Mines Act for all mining activities including major mining projects subject to the Environmental Assessment Act, establishment of geotechnical and reclamation standards and security levels, participation in regional and subregional planning, and in reviews of draft legislation and policies being developed by other agencies. Branch staff also provides guidance and assistance to companies and individuals exploring for minerals, and monitor exploration and mining activities in order to provide policy advice to government.

In addition to health and safety functions, branch inspectors address environmental and social sensitivities of proposed and permitted mines. The process for review of Mines Act permit applications includes consultation with other government agencies and affected stakeholders, including First Nations, to identify concerns to be addressed through site-specific permit conditions. Inspectors monitor mining activities to ensure compliance with these permit conditions and take enforcement actions if necessary.

Two thousand and three was a pivotal year in the mining industry with five new applications for mines entering the Environmental Assessment Office review process adding to the one that was there in 2002. This was a dramatic change to what was considered a sunset industry two years before as mines closed through exhaustion of the deposit or falling mineral prices. The year has also seen resurgence in exploration spending resulting in an increased workload for the branch to permit and inspect these programs.

This trend of increased exploration is expected to continue into 2004 and will place a severe demand on the current resources that the ministry has for permitting and inspection. In 2002 the ministry had 20 Notices of work per employee, in 2003 this increased to 45 Notices of Work per employee and is anticipated to increase in 2004. There will also be increased demand placed on the branch to permit the mine construction, as mines move from the EA process to the mine permit stage then on to construction.

2.1 Occupational Health Group

ROLES AND RESPONSIBILITIES

The Health, Safety and Reclamation Code for Mines in B.C. requires that mine managers develop a written occupational hygiene-monitoring program. Larger operations in particular are required to establish procedures and to perform their own measurements of chemical and physical hazards to which workers were exposed in the workplace. This includes, among others, dusts, silica, respirable combustible dust, noise, gases and fumes, radiation (ionizing and non-ionizing) and heat/cold stress. The Occupational Health (OH) group also makes comparative measurements to ensure companies follow proper methodology and obtain accurate results.

Underground mine ventilation and workplace hazardous materials information system programs are also included in the group's responsibilities. Training and assistance in program development is provided as needed. Audiometric technician training is scheduled periodically as needed.

A written, preventative training program to educate OHSC members in the recognition, evaluation and prevention of adverse health effects resulting in Musculoskeletal Disorders is also a requirement of the Code. Such Musculoskeletal Disorders may consist of low back injury, repetitive strain, overexertion or vibration-induced injuries and training includes early reporting of signs and symptoms of injury. The OH group provides its expertise in the development and implementation of this training.

STRUCTURE AND ORGANIZATION
During 2003 there were three people in the OH group with specialities in Industrial hygiene, engineering and ergonomics. The current Inspector of Mines, Ergonomics, was hired in February 2003. The Industrial Hygiene Inspector of Mines joined the Ministry in November 2003 following their predecessor's retirement.

SUMMARY OF ACTIVITIES
Occurrences and situations in 2003, which required attention from the OH group of note were:

- considerable concern by neighbours of smaller quarry and sand and gravel operations where dust and noise were involved, requiring a number of investigations.

In addition, the OH group:

- conducted on-site inspections of mines to fulfil their mandate to monitor workplace conditions.
- maintained and input data to the Mining Operations Branch audiometric database, which records the results of hearing tests that are undertaken at mine sites across the province;
- provided training courses for mines' industrial audiometric technicians;
- conducted MSD Prevention training to safety representatives from 10 major mines; and
- organized this years Open Pit and Small Underground Awards Competition and Awards Dinner.

2.2 Mechanical Engineering, Electrical Engineering

ROLES AND RESPONSIBILITIES
Mechanical and electrical inspectors ensure that all mechanical and electrical equipment installed and used at mines complies with the Mines Act and the applicable codes and standards, and that the equipment is maintained in acceptable condition so that its operation causes no hazard to people or property.

STRUCTURE AND ORGANIZATION
In 2003, there was one staff member in the mechanical/electrical group and a vacancy due to retirement of a staff member.

SUMMARY OF ACTIVITIES
Mechanical Engineering
Inspections were carried out at all of the major mining operations, including the larger quarries and sand and gravel pits. There were two major events in 2003 that affected the Mechanical and Electrical group. The 2003 results-based Code was introduced, which places more responsibility on the Mine Manager to comply, subsequently, there was a reduction in the mechanical and electrical staff to one person in each discipline. Secondly, the branch had difficulty obtaining an electrical inspector and the new person was not appointed until January 2004.

In the 2003 Code the requirement to approve off highway trucks was removed and the manager was made responsible for the compliance with the code of the off highway trucks. The Code still requires that the manager notifies the Chief Inspector of any modifications for approval, several submissions of data pertaining to modified off-highway haul trucks were approved, and numerous minor modifications on various items of mobile equipment were also reviewed, with approvals issued in the majority of cases.

Delivery of new machinery and equipment to mines, together with the steady upgrading of much of the existing items, results in mines in British Columbia maintaining their competitive capabilities. At the same time, safety systems on new and upgraded equipment are usually enhanced, often as a result of new technology employed in such systems. The highly automated and complex control systems found on the equipment demands a high level of skill from those who operate and maintain the equipment. Branch staff are involved in reviewing engineering drawings associated with the safety systems on such equipment, as a precursor to field inspections on the items. The branch endeavours to keep abreast of the many changes and innovations. In addition, inspectors, in collaboration with the mines, have to ensure that people operating equipment are aware of how equipment modifications may affect its operating functions, and ensure operators understand the consequences of failures occurring in installed control or sensing systems.

Electrical Engineering
Electrical inspections were conducted by non electrical staff at all major mines including the larger sand and gravel operations as well as some of the smaller operations. Those that demanded an in-depth electrical inspection were required to provide the branch with a report stamped and sealed by a Professional Engineer confirming compliance with the code. Most mines are still continuing to upgrade their electrical equipment and systems in order to increase efficiency and reduce power consumption costs.

2.3 Competitions and Awards

ROLES AND RESPONSIBILITIES
The primary mandate of the Mining Operations Branch is to ensure worker health and safety, public safety and suitable reclamation and protection of the land and watercourses affected by mining and exploration work.

The Mines Act, and the Health, Safety and Reclamation Code for Mines in British Columbia stipulate the legal responsibility of provincial mining companies in meeting this mandate; however, many B.C. mining companies and their individual workers voluntarily and consistently exceed these legal requirements. Through the efforts of these individuals, companies and staff of the Ministry of Energy and Mines, mining is one of B.C.'s safest heavy industries.

Mine rescue competitions, first-aid competitions, and safety awards all contribute to the overall climate of safety. Reclamation awards acknowledge those companies that go

beyond what is called for in their mining plans, by conducting superior research and introducing innovative techniques to restore the land.

MINE RESCUE COMPETITIONS

Branch mine inspectors and industry judge the Provincial Mine Rescue competitions personnel who are responsible for all aspects of worker and public safety in B.C.'s mining industry. This year's competition was held in Powell River on June 14, 2003.

Zone Competition

The East Kootenay Zone competitions were held in Sparwood. The participating teams were as follows:

- Elkview Coal Corporation – Line Creek Resources
- Fording Coal Ltd. - Greenhills Operations
- Elkview Coal Corporation – Elkview Mine
- Fording Coal Ltd. - Coal Mountain
- Fording Coal Ltd. – Fording River Operation

The North / South / Central Zone competitions were held on Texada Island on June 12th. The participating mines were as follows:

North Zone

- Endako Mines Ltd.
- Imperial Metals Corp. - Huckleberry Mine
- Northgate Exploration Ltd. – Kemess Mine

South/Central Zone

- Ashgrove Cement Company – Blubber Bay Quarry
- Highland Valley Copper
- Sechelt Construction Aggregates

Provincial Competition

The first and second placed teams from each regional zone became eligible to compete in the provincial competition on June 14, in Powell River. These teams were:

- Fording Coal Ltd. – Fording River Operation
- Elkview Coal Corp. – Line Creek Operations
- Imperial Metals Corp. - Huckleberry Mine
- Northgate Exploration Ltd. – Kemess Mine
- Ashgrove Cement Company – Blubber Bay Quarry
- Highland Valley Copper

Surface Mine Rescue Champions
The team from Highland Valley Copper won the 2003 surface mine competition and was the provincial champion. Team members were: Dirk Werring (Capt), Dale Konowalchuk (Vice-Capt), Neil Rideout, Susan Lavigne, John Brennan, Peter Dreschsler, Steve Hippisley, Gerry Wong (Coach).

Surface Bench Competition
The surface bench competition originated in 1995. The trophy is awarded to the surface mine rescue team that excels at the practical bench competition. The practical bench task is designed to test the individual team members on their knowledge and practical skills in mine rescue equipment and techniques. The competition is held in memory of Maurice Boisse, Mine Rescue Team Coach, Island Copper Mine. Highland Valley Copper won the award in 2003.

Underground Mine Rescue Champions
Three underground mine rescue teams competed in the provincial competitions in 2003:

- Boliden Westmin (Canada) Ltd. - Myra Falls Operations
- Homestake Canada Inc. - Eskay Creek Mine
- Quinsam Coal Corporation - Quinsam Mine

Boliden Westmin (Canada) Ltd. - Myra Falls Operations won the underground mine rescue competition and are the provincial champions. Team members were: Rick Kretzechmar (Capt), Alan Day (Vice-Capt), Dayton Ostrosser, Nigel King, Rory McFadden, Joe Fil, Keith Notter, Wilf Penney (Coach).

Underground Bench Competition
The underground bench competition originated in 1978. The competition is held in memory of the late Barry Abbott, Captain of the Cominco HB mine rescue team whom, in 1976, won the Canadian Championship. The award was won by the team from Myra Falls Operations.

Underground Bench Technician
No competition was held.

First Aid Competitions
In the first-aid category there are two separate competitions; three-person first-aid competition, and the first-aid component of the underground and surface mine rescue competition. The judging of the first-aid component is in conjunction with the provincial surface and underground mine rescue competition.

Underground First Aid
This award was previously introduced by Cominco Ltd. for the best first aid by an underground mine rescue team. The award known as the “Sullivan Cup” was presented to Homestake Canada Inc. – Eskay Creek Mine.

Three-Person First Aid
The first provincial miner's three-person first-aid competition was held in 1978. The competition simulates accident situations - the local St John Ambulance Brigade and the BC Provincial Council design the problem, supply the judges, patients, props and medical supplies. After doing a short written exam the three team members render first aid. The St. John's standard course is the training standard, and only those who work in or about a mine are permitted to enter this competition.

This competition was designed as an extension of training for workers in basic first-aid skills, in order that they may assist their fellow workers at the face or at the work place in the event of an injury or medical emergency. Competing teams at the provincial level were as follows:

- Ashgrove Cement Company – Blubber Bay Quarry
- Elkview Coal Corp. – Elkview Operations
- Elkview Coal Corp. – Fording River Operations
- Imperial Metals Corp. - Huckleberry Mine
- Northgate Exploration Ltd. – Kemess Mine
- Texada Quarrying Ltd.

The 2003 champion team was from Texada Quarrying Ltd.

The National Western Regional Competitions
To improve Canada's mine rescue mutual aid response capability, the national mine rescue committee, consisting of representatives from across Canada, has divided the country into three specific regions - East, Central and West. The rationale is based on the expediency of responding with teams and equipment from adjacent provinces and territories and to coordinate procedures within those jurisdictions.

The national western regional committee, consisting of representatives from Alberta, B.C., Saskatchewan, Northwest Territories, United States and the Yukon Territories, in conjunction with the city of Fernie (sponsor of the event), initiated underground and surface mine rescue competitions in 1993. The competitions are conducted on a biennial basis and serve to provide a medium for mine rescue teams to exercise their skills and to promote and coordinate an interchange of procedures and training standards.

The Fifth National Western Regional Mine Rescue Competition was held in Fernie, B.C. on September 14th and 15th, 2003; the next is due in 2005.

The teams eligible to compete in 2003 were the underground and surface mine rescue winners from the 2002 and 2003 provincial, territorial and United States competition events.

The following teams competed in the Underground Competition:

- Boliden Westmin - Myra Falls Operations, Campbell River, BC
- Barrick Gold Corp. - Eskay Creek Mine, Smithers, BC
- Atomic Energy of Canada Ltd., Pinawa, MB
- Agrium-Vanscoy Potash Operations, Vanscoy, SK
- Kinross Gold Corporation – New Brittania Mine, Snow Lake, MB
- Miramar Con Mine - Yellowknife, NWT
- BHP Diamonds Inc. – Ekati, Yellowknife, NWT

The overall winner was: Miramar Con Mine, Yellowknife, NWT

The following teams competed in the Surface Mine Competition:

- Luscar Ltd. - Poplar River Mine, Coronach, SK
- Highland Valley Copper, Logan Lake, BC
- Luscar Ltd. – Boundary Dam, Estevan, SK
- Syncrude Canada Ltd., #504, Fort McMurray, AB
- Diavik Diamond Mines Inc. – Yellowknife, NWT
- Jacobs Ranch Coal Co. – Gilette, Wyoming, USA
- Luscar Ltd. – Highvale Mine, Seba Beach, AB
- Elk Valley Coal Corp.- Fording River Mine, Elkford, BC

The overall winner was: Highland Valley Copper, Logan Lake, BC

SAFETY AWARDS COMPETITION

The presentation of awards at the 41st (2002) Annual Mine Safety Awards took place at the Harbour Towers Hotel in Victoria on Monday April 14, 2003. The winners for 2002 were as follows:

Small Underground Mines

This award was donated by the West Kootenay Mine and Industrial Safety Association in 1951 to encourage and promote safety in small underground mines. Since 1956, the competition has been open to qualifying mines throughout the province. The award is given to the mine having the lowest compensable accident rate after working from 2,500 to 30,000 shifts per year, at least one third of which were underground. The mine must have operated for at least nine months during the calendar year. A fatality automatically disqualifies a mine for that year. The 2002 winner was
Quinsam Operating Corp., Quinsam Coal.

The John Ash Award - **Open-Pit Mines and Quarries**

Is presented to the mine that has worked more than 1,000,000 hours in a year and attained the lowest compensable injury frequency rate. The 2002 winner was Highland Valley Copper.

The Edward Prior Safety Award - Open-Pit Mines and Quarries
Is presented to the mine with the lowest compensable injury frequency rate for 200,000 to 1,000,000 hours worked. The 2002 award was won by Teck Cominco, Bullmoose Mine.

The Stewart-O'Brian Safety Award - **Open-Pit Mines and Quarries**
Is presented to the mine with the lowest compensable injury frequency rate for 35,000 to 200,000 hours worked. The award was shared by three mines:

- Allard Contractors Ltd. - Pit "D"
- Lafarge Canada Inc. - Central Aggregates
- Steelhead Aggregates Ltd. - Skway Pit

Certificates of Achievement
Certificates of achievement are presented to those mines with a zero compensable injury frequency rate and which have accumulated 15,000 to 35,000 employee hours. There were a total of seven mines that qualified for certificates for work conducted in 2002:

- Caveman Construction & Aggregates – Korman Pit
- Coquitlam Sand & Gravel Ltd – Mantle Creek
- Hub City Paving Ltd. - Cassidy Pit
- Jack Cewe Ltd. - Jervis Inlet
- Lafarge Cannon Contracting – Cannon Pit
- Pitt River Quarries – Pitt River Quarries
- Steelhead Aggregates Ltd – Cannor Road Pit

Occupational Health and Safety Committee (OHSC) Award
This award is presented to the occupational health and safety committee at a mine that has demonstrated excellence in its operations and policies that relate to their OHSC. The 2002 award went to the Elkview Coal Corporation, Elkview Mine.

National Safety Awards - John T. Ryan Trophies
The John T. Ryan trophies are awarded by the Mine Safety Appliances Canada Limited as a memorial to the founder of the company. The 2003 Canada trophies were awarded by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) to the metal mine, the coal mine and the select mine which, in the previous year (2002), experienced the lowest reportable injury frequency per 200,000 employee hours in all of Canada. There are two trophy categories: Canada and Regional. In the National Coal mine category, Quinsam Coal Corporation was the 2002 trophy recipient.

2.4 Examinations and Certifications

Section 26 of the Mines Act requires that every person employed at a mine, where required by the Code, be under the daily supervision of a person who holds a valid and appropriate certificate as required by the Code. The appropriate certification is specified in Part 1.12 of the Code. Recipients of a valid permanent certificate require re-examination every five years regarding their current knowledge of the Code.

BOARD OF EXAMINERS

The Board of Examiners comprises the Chief Inspector of Mines as chair and other inspectors appointed by the Chief Inspector. During 2003, F.W. (Fred) Hermann chaired the board, with R. Booth, A. Hoffman and D. Morgan administrator and member. The board is responsible for examination of applicants for shiftboss certificates and certificates of competency, for considering applications for interchange certificates of competency, for issuing certificates and for conducting a review of all suspended certificates. The board is also responsible for administering blasting certification.

The changes to the code in 2003 removed the requirement for Supervisor Certification at mines, however many mines requested copies of our examinations to continue the practice internally. The new Code allowed for the shiftboss exam to include questions on mine rescue and blasting, removing the need for them to obtain individual certification in these categories streamlining the process for a person that did not require to be a mine rescue person or a blaster. The blasting certification was also time limited to five years form the date of the 2003 code.

Shiftboss Certificates

An applicant for a shiftboss certificate must hold an appropriate blasting certificate (if blasting is carried out), a mine rescue certificate (surface or underground as required), and a valid first-aid certificate. The applicant must also have obtained acceptable experience in and about a mine and pass a written examination on knowledge of the Mines Act and the Code.

Previously under Part 1.13.10(1) of the Code, a holder of a shiftboss certificate was required to revalidate every five years. As of June 2003, shiftboss certificates no longer expire after 5 years. Persons with valid shiftboss tickets were informed that was no need to recertify.

Total Shiftboss Certification Activity 2003

Activity	New Certificates	Revalidation
Applications received	7	0
Examinations written	9	0
Number passed	9	0
Number of permanent certificates issued	4	0
Provisional certificates issued	0	0

Shiftboss Certificate Suspensions (Part 1.13.12 of the Code)

In 2003, there were no shiftboss certificate suspensions

Total Underground Coal Fireboss Certifications 2003

There were no applications for underground Coal Fireboss Certifications in 2003.

Blasting Certificates

Blasting certification is required under Part 8.2.1 of the Code. Types of blasting certificates include:

- Basic
- Exploration
- Surface
- Underground
- Underground coal (Shotfirer)
- Electrical
- General-which includes all categories (except Underground Coal)

Blasting certificates are now valid for 5 years. Provisional certificates can be issued for a period not exceeding 90 days. There were 17 blasting tickets issued in 2003.

Blasting Certificate Suspensions (Parts 8.2.6, 8.2.7 of the Code)
During 2003, there was 1 suspension of a blasting certificate.

1. #39788 Manager suspended blaster from working with explosive Nov. 17/03 for 30 days. Reinstatement Requirements: Automatically

Mine Rescue Certifications
To qualify for mine rescue certification, mine employees must complete approved training and must pass written exams developed for various types of mining, as per Part 3 of the Health, Safety and Reclamation Code for Mines in British Columbia.

The Mining Operations Branch is responsible for certifying miners in several categories of mine rescue, as listed below.

Mine Rescue Certificates issued in 2003:

Type	Number Issued	Re-certified
Underground mine rescue	13	2
Surface (open-pit) mine rescue	42	20
Gravel pit mine rescue	14	9
Total Certificates Issued	69	31

Instructors were last certified in 2002. The Branch no longer certifies instructors.

2.5 Accidents and Incidents

DANGEROUS and/or UNUSUAL OCCURRENCES

In 1999 the Ministry reviewed requests from the mines that we stop requiring the labour intensive MINACC to be filled in at the minesite, or that the MINACC be made compatible with their systems. To this end, the Ministry reviewed its computer needs, which resulted in a plan to develop the Mine Management System (MMS) to replace MIS (Mine Information System). This system was developed with a staged implementation starting with the replacement of the basic Mine Information System, then the peripheral systems that include MINACC, the incident module of the database. This implementation continued throughout 2000, and has been expanded in 2001 to include all of the branch offices. In 2003 this module has continued to be developed and the inspector has the responsibility to determine which incidents should be included, this has been influenced by workload and with staff reductions the Occupational Health and Safety Committee – OHSC has been the primary incident investigation tool at a mine with less involvement from the branch with consequently less incidents entered into the system.

The following accident information is produced from the MMS. The MMS was newly implemented in 2000 and the information presented represents all of the year 2003 as input by each office. The percentage is useful in that it may be compared to subsequent years as the system is developed.

LOCATION	COUNT	%
PIT	139	58.9
PLANT / MILL	26	11.0
MAINTENANCE (SHOP)	24	13.2
MAINTENANCE (FIELD)	16	6.8
HIGHWALL	7	3.0
DUMP	9	3.8
TAILINGS POND	9	3.8
OFFICE	0	0
DRY	0	0
UNDERGROUND GENERAL	5	2.1
UNDERGROUND FACE	1	0.4
UNDERGROUND OUTBYE / HAULAGE DRIFT	1	0.4

WORK PRACTICE	COUNT	%
EQUIPMENT FAILURE	88	37.0
INADEQUATE PLANNING	35	15.0
INADEQUATE MANAGEMENT	40	17.0
INADEQUATE EQUIPMENT	15	6.0
POOR WORK STANDARDS	56	24.0
ABUSE OR MISUSE	1	0.0
TRAINING	28	12.0

NOT FOLLOWING WORK PROCEDURES	39	17.0
OPERATOR ERROR	95	40.0

EQUIPMENT	**COUNT**	**%**
HAUL TRUCK	102	43.2
GRADER	3	1.3
LOADER	9	3.8
SHOVEL	17	7.2
DOZER	18	7.6
DRILL SURFACE	9	3.8
DRILL UNDERGROUND	0	0
PICKUP	14	5.9
LHD	1	0.4
CONVEYOR	4	1.7
ELECTRICAL	40	16.9
EXPLOSIVES	5	2.1
EXCAVATOR/BACKHOE	8	3.4
CRANE	10	4.2
FORKLIFT	2	0.8
WATER TRUCK	0	0
SCRAPER	1	0.4
SERVICE TRUCK	4	1.7

GENERAL INFORMATION	**COUNT**	**%**
# OF PERSONS INVOLVED	296	n/a
# OF PERSONS INJURED	38	n/a
NEAR MISS	53	22.0
TIME INTO SHIFT	185	78.0
GEOTECHNICAL	17	7.0
FATALITY (MINING RELATED)	1	n/a
FATALITY (NON MINING)	0	0
FIRE	55	23.0

FATALITIES

On the morning of May 2, 2003 at 3:41 a.m. a fatal accident occurred at the Greenhills Mine. The deceased was a 27-year-old equipment operator who was performing work as a dump supervisor at the time.

The deceased was directing haulage trucks (240 t capacity) to dump on the 2170 spoil from his pickup truck. A haulage truck mistakenly backed to a dozer that was operating in close proximity to the pickup and struck the pickup, partially crushing the cab and trapping the operator.

The truck driver immediately realized his mistake and pulled forward, away from the pickup. Mine Rescue personnel attempted to revive the operator but were unsuccessful in restoring pulse or respiration. The resultant autopsy attributed his death to massive crush injuries with multiple internal injuries in the thoracic region.

2.6 Summary of Mine Production

The table below summarizes production and average employment at major British Columbia mine sites.

Statistics 2003[1]

Coal Mines	Annual Rated Plant Capacity (Tonnes)	Actual Tonnes Produced	% of Capacity	Days Mill Operated	Average Employment	Contract Employment
Bullmoose[2]	2,300,000	479,000	21%	67.5	15	-
Elkview	6,000,000	5,372,000	90%	245.0	706	-
Coal Mountain	3,675,000	2,029,000	55%	197.0	167	-
Greenhills	5,000,000	4,071,000	81%	263.0	448	-
Fording River	9,500,000	8,930,000	94%	322.0	768	-
Line Creek	3,600,000	1,231,000	34%	122.0	272	-
Quinsam Coal	780,000	442,000	57%	222.0	47	1
Compliance Energy[3]	400,000	12,000	3%	-	4	-

Metal & Precious Metal Mines	Annual Rated Mill Capacity (Tonnes)	Actual Tonnes Milled	% of Capacity	Days Mill Operated	Average Employment	Contract Employment
Endako	10,950,000	9,706,000	89%	365	196	3
Eskay Creek	91,000	115,000	126%	365	150	108
Highland Valley Copper	49,776,000	49.030,000	99%	365	919	67
Huckleberry	7,665,000	7,000,000	91%	365	214	-
Kemess	18,354,000	18,633,000	102%	365	343	65
Myra Falls	1,460,000	1.035,000	71%	365	379	-

2.7 Volume of Inspections

The Mine Management System (MMS) allows tracking of mine visits and the issuance of orders at mines. The following figures represent inspections performed by the Mining Operations Branch. When an inspector conducts a mine site inspection, the inspector passes on to other branches information they may need to attend to. Note the number of inspections is not an indicator of the relative volume of activity of each office. Some regions contain a few very large mining operations, whereas others contain hundreds of smaller operations. Therefore, the length of time to conduct an inspection varies from region to region.

[1] The Mining Industry in British Columbia – 2003 PricewaterhouseCoopers
[2] Closed March 31, 2003 after exhausting ore reserves
[3] Mine commenced production in 2003, with commercial production expected to be reached in 2004

As can be seen in Figure 1, the graph of inspections and staff by year, there has been a significant reduction in the number of inspections that corresponds to the reduction in staff.

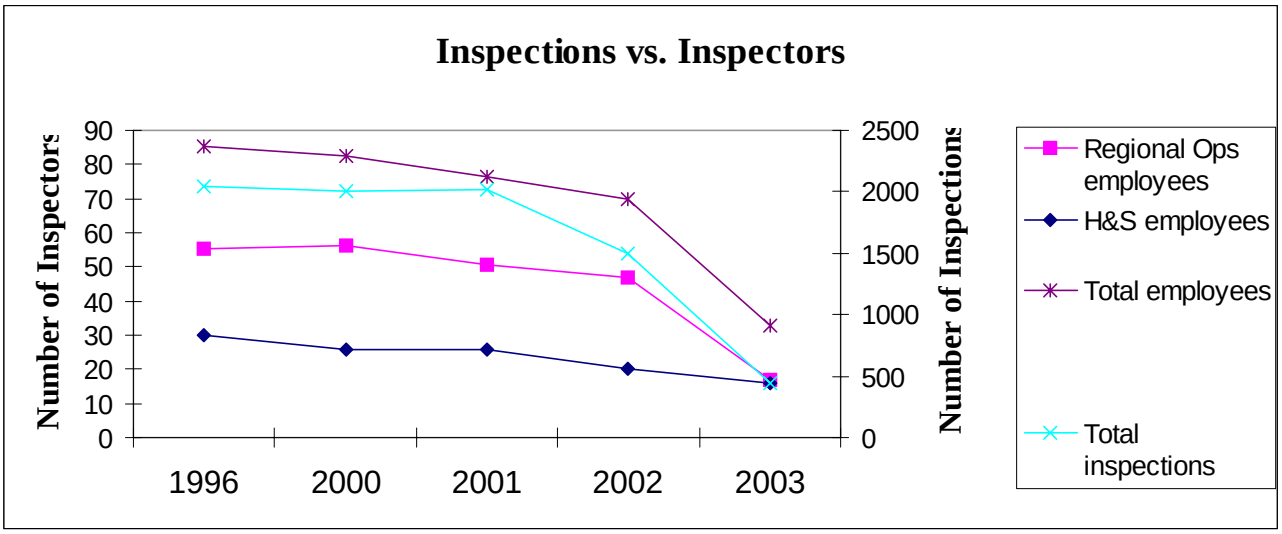

Figure 1

In 2003 the mines branch conducted 449 inspections and mines inspectors issued 695 orders and shut down 9 pieces of equipment. The following were recorded for 2003 in the MMS.

Mine Type	Inspections	H&S Orders	Equipment Shutdowns	Environmental Orders	Dang.Occ.	Invest.	Training	Other
Abandoned Mine	7	2	0	0	0	0	0	0
Custom Mill	3	7	0	0	4	0	0	0
Coal - Surface	37	105	0	0	154	0	0	14
Coal-Underground	4	0	0	0	0	0	0	2
Exploration-Surface	78	50	0	40	11	1	0	2
Exploration-Underground	14	28	1	4	2	0	0	0
Industrial Minerals - Surface	24	55	0	5	4	0	0	6
Industrial Minerals-Underground	0	0	0	0	0	0	0	0
Metal Leach-Surface	1	0	0	0	0	0	0	0
Metal Mine - Surface	28	106	2	0	52	0	3	5

Metal Mine-Underground	20	131	1	1	2	0	0	4
Non Assignable/ Unidentified	1	2	0	0	0	0	0	0
Placer-Surface	123	36	1	30	0	0	0	0
Placer-Underground	0	0	0	0	0	0	0	0
Rock Quarry	9	4	0	0	0	1	0	6
Sand/Gravel Pit	100	169	4	28	2	0	0	8
TOTALS	**449**	**695**	**9**	**108**	**231**	**2**	**3**	**47**

2.8 Audit Program

The safety audit program is designed to investigate how well a safety and health program has been implemented at a mine. At the present time with the change in focus of staff during the downsizing the audit program has been put on hold and is being revised to reflect the new 2003 code and to put more emphasis on the findings of branch staff through interviews to determine the facts and the report will reflect the views of the mines branch as a result of the interviews with management and staff and research of the mines records.

The trigger for an audit to be conducted will be determined by the Chief Inspector.

3.1 Notices of Work

The following Notices of Work and permit information was entered into MMS in 2003.

TYPE	NOTICE OF WORK APPLICATIONS	PERMITS ISSUED	AVERAGE DAYS TO ISSUE
Mineral and Coal (Exploration)	311	220	34
Mineral and Coal (other)	66	41	28
Placer	290	207	42
Sand & Gravel	119	92	79
Total	**786**	**560**	**43**

The breakdown of the 2003 Notice of work by area is as follows:

REGION	PLACER	SAND & GRAVEL	MINERAL AND COAL	TOTAL
Kootenay	16	21	71	**108**
Central	25	30	91	**146**
Southwest	6	32	37	**75**
Northeast	164	24	78	**266**
Northwest	78	10	95	**183**
Victoria - Head Office	0	1	0	**1**
Total	**289**	**118**	**372**	**779**

The areas covered by the regions are as follows:

- Southwest = Nanaimo, Lower Mainland and Vancouver Island areas
- Central = Kamloops, Okanagan and Thompson areas
- Kootenay = Cranbrook, Fernie and Elk Valley areas
- Northeast = Prince George, Omineca, Horsefly and Valemont areas
- Northwest = Smithers, Skeena and Queen Charlottes areas

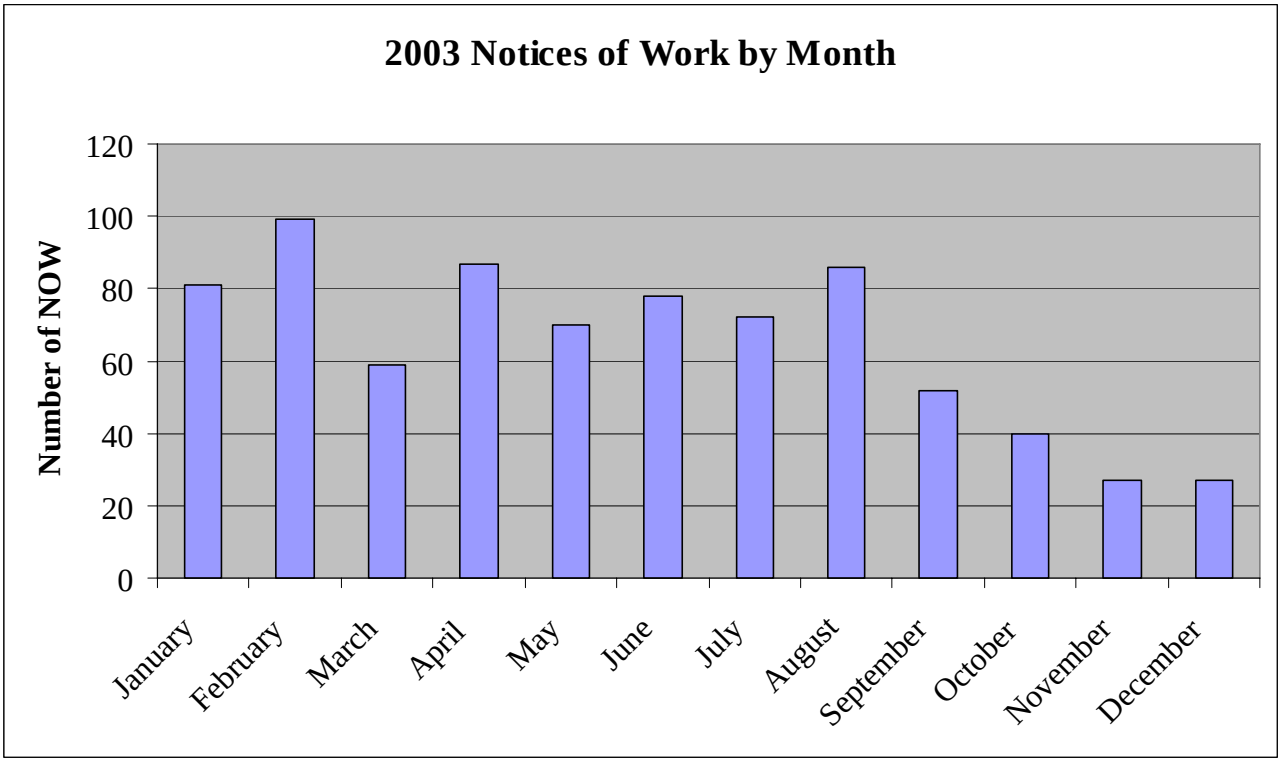

Figure 2

4.1 Reclamation

ROLES AND RESPONSBILITIES

Reclamation and environmental protection are a major component of all mineral exploration and mine development activities in BC. Since 1969, mining companies have been required by law to reclaim all lands disturbed by mining. BC was one of the first jurisdictions in Canada to enact mine reclamation legislation, and the first to extend this policy to exploration sites. Reclamation and environmental protection are the responsibility of each mining company. Mining companies are required to obtain a permit approving the mine plan, the program for protection of the land and watercourses, and the reclamation program. Mining companies must also place a security deposit with the province to ensure that the reclamation permit conditions are completed.

The environmental protection and reclamation objectives of the province's *Mines Act* and Code are to ensure:

- land and watercourses on mine sites in BC are reclaimed to a level equal to that which existed prior to mining;
- disturbed lands and water courses are re-integrated into the surrounding landscape;
- mining and mitigation requirements associated with metal leaching and acid rock drainage (ML/ARD) are conducted in a manner which prevents significant impacts to downstream or on-site biota and minimizes any reduction in post-mining productive capability of the site.

In order to achieve these objectives, the reclamation section:

- conducts detailed technical reviews of new projects or project revisions under the *Environmental Assessment Act*;
- conducts detailed technical reviews and issues permits for operating and closed mines with outstanding reclamation responsibilities under Section 10 of the *Mines Act*;
- inspects mine reclamation activity;
- administers reclamation security deposits on behalf of the provincial government;
- organizes a number of provincial committees and activities which conduct technology transfer, review Ministry practices, and enhance government/industry/public/academia cooperation, including the Technical and Research Committee on Reclamation, the Annual Reclamation Symposium, the Annual ML/ARD Workshop and the MEM Expert Advisory Committee for ML/ARD; and
- participates in national and international committees conducting research and technology transfer, including the national Mine Environment Neutral Drainage (MEND) Committee.

The reclamation section has expertise in the technical areas of soil restoration, re-vegetation, land capability, erosion control, geology, geochemistry, and metal leaching and acid rock drainage. Technical assistance is provided from within the Ministry on geotechnical and mining issues and by the Ministry of Water, Land and Air Protection (MWLAP) on biological and effluent discharge requirements.

STRUCTURE AND ORGANIZATION

The Reclamation Section began the year with a staff complement comprised of the manager, a senior reclamation agrologist, a senior reclamation geologist, a senior mine review geologist and one administrative staff located at headquarters, as well as four reclamation inspectors located in Cranbrook, Kamloops, Prince George and Smithers.

On March 31, 2003 the four-reclamation inspector positions were reduced to one based in Victoria. This position was filled for a short time during the year and then became vacant.

SUMMARY OF ACTIVITIES

Permitting

The section enforces the reclamation provisions of the *Mines Act* through permit conditions and detailed technical reviews aimed at finding environmentally sound, economically viable solutions that enable industry to remain internationally competitive without compromising the province's rigorous environmental standards.

During 2003, permitting activity for major mines remained high. One new permit was issued for the Eagle Rock Quarry, and 15 amendments were made to existing permits (Table 1).

Summary of permit activity for 2003 on major mines

TYPE	AMENDMENTS
Metal	9
Coal	6
Quarries	1
Total	16

Permit revisions were made at Huckleberry Mines Ltd., Kemess Mine, Sullivan Mine, Britannia, Island Copper, Golden Bear, Endako, Line Creek, Elkview, Fording River, Coal Mountain, Basin Coal, Hat Creek and Highland Valley. Under the *Environmental Assessment Act*, reviews were conducted for Eagle Rock Quarry, Wolverine Coal, Kemess North, Sea to Sky, Morrison, Red Chris, Orca Sand & Gravel, Galore Creek and Goldstream/Willa. The section also organized and/or participated on public committees reviewing activities at the Brenda, Quinsam, Equity Silver and Sullivan mines.

Cooperation and Consultation with Stakeholders

The section works closely with industry, other government agencies, First Nations and the public to inform them of our activities and ensure that all concerns are considered. For reclamation permits involving mechanical disturbance of the land surface, applications are referred to other government agencies, the public, and First Nations where their interests are affected. The section provides regular assistance to MWLAP, MOT, Environment Canada, First Nations and the public on ML/ARD issues.

Cooperation facilitated by the reclamation section between industry, the public, government, and the academic community continues to result in a constructive climate for information exchange and dissemination of new technology.

Metal Leaching and Acid Rock Drainage (ML/ARD)
The Ministry has produced a provincial ML/ARD policy, a more detailed set of ML/ARD guidelines, and a manual of recommended methods for the prediction of ML/ARD. These documents indicate what constitutes acceptable mine design and adequate technical evidence. They provide a checklist for industry and also inform the public of regulatory conditions and environmental protection requirements. The major ML/ARD activity in 2003 was mine review, mine inspections and technology transfer.

Reclamation Securities and Funds
All mines operating in BC must deposit security with the government to provide reasonable assurance that reclamation costs do not fall on provincial taxpayers. Over the past few years, the value of security deposits has increased to reflect more closely the true costs of reclamation. The total value of securities held by the province rose from $10 million in 1984 to more than $189.5 million by the end of 2003.

Reclamation Security Deposits Held by the Province of B.C., 1984 to 2003

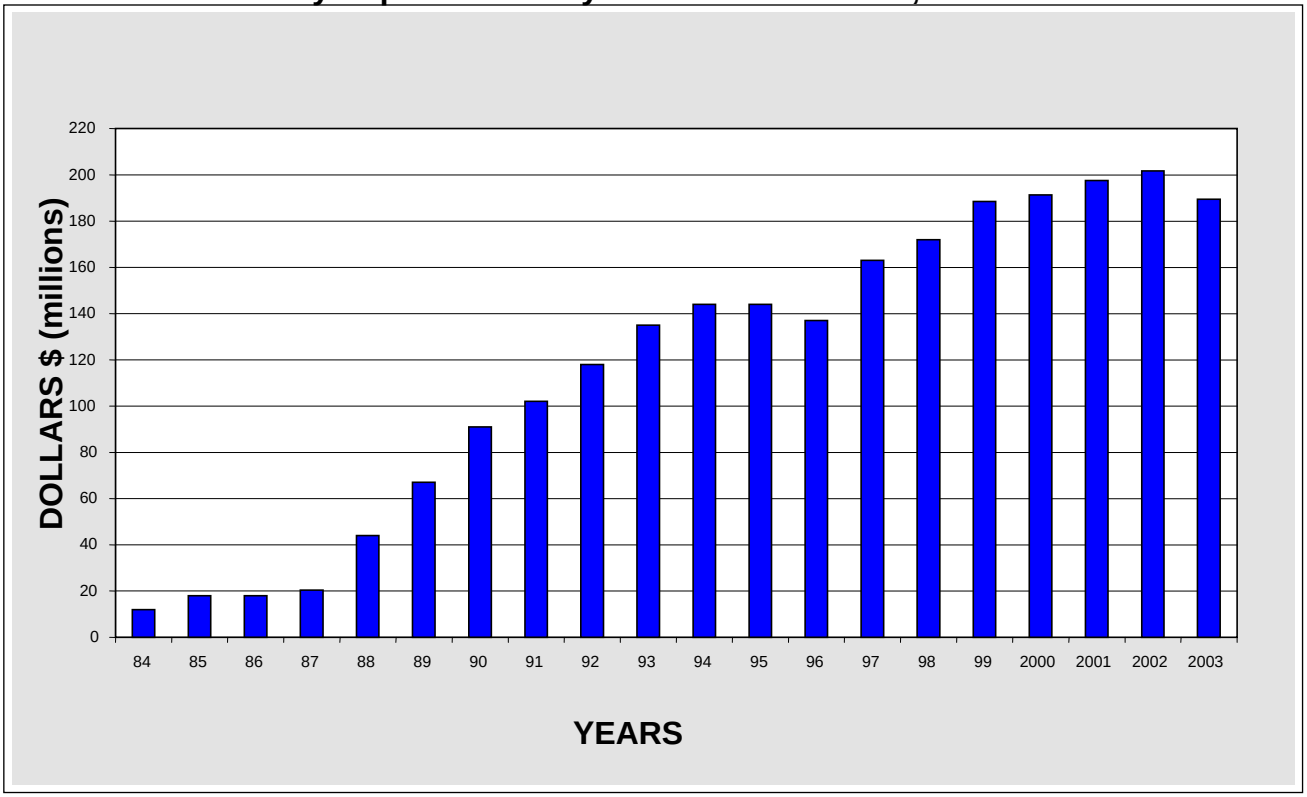

Figure 3

Technical and Research Committee on Reclamation
This committee has been active in promoting and fostering reclamation research and information exchange for more than two decades. Members are drawn from the Ministry of Energy and Mines, Ministry of Water, Land and Air Protection, mining companies, the Mining Association of B.C., the University of B.C., and the Coal Association of Canada. This committee has been responsible for the organization of the annual B.C. Mine Reclamation Symposium for the past 26 years.

National Orphaned/Abandoned Mine Initiative (NOAMI)
The National Orphaned/Abandoned Mines Advisory Committee was struck in March 2002 at the request of Canadian Mines Ministers. The Advisory Committee has been asked to study the issue of orphaned/abandoned mines and to develop initiatives and partnerships to implement remediation programs across Canada.

The Advisory Committee takes direction from Mines Ministers and reports back to Mines Ministers through the Intergovernmental Working Group on the Mineral Industry (IGWG).

At their annual meeting in Halifax, 2003, Mines Ministers endorsed recommendations put forward by NOAMI, including two priority areas for immediate action: 1) development of intergovernmental cost sharing arrangements to address remediation of high priority sites; and 2) development of a policy framework that addresses legislative/regulatory issues associated with specific challenges presented by orphaned/abandoned mines.

The Advisory Committee consists of representatives of federal/provincial/territorial governments, the Canadian mining industry, environmental non-governmental organizations and Aboriginal peoples and their communities. Committee members are responsible for communication with their constituencies. The Ministry of Energy and Mines represents the Province of British Columbia on the Advisory Committee.

Mine Reclamation Symposium
The 27th Annual Mine Reclamation Symposium was held from September 15 to 18, 2003 in Kamloops, B.C. with a theme of “Reclamation at Closed Mines and at Mines where Molybdenum is an Issue.” Delegates toured Highland Valley Copper and were privileged to see an extensive program of reclamation at the largest open pit copper mine in Canada.

The Annual British Columbia Mine Reclamation Award
The annual reclamation award, and up to five citations are awarded for outstanding achievement in mine reclamation and have been presented at the BC Mine Reclamation Symposium every year since 1977.

This year, the recipient of the British Columbia Jake McDonald Mine Reclamation Award was Kinross Gold for its exceptional program at the QR Mine.

The Quesnel River Mine is located in forested rolling terrain in the Cariboo approximately 60 kilometres southeast of Quesnel. The mine produced gold from three small open pits as well as from underground. During operations, which ran from 1994 until April 1998, it produced approximately a million tonnes of ore. Most of the production was from the Main Zone pit. Mining in two other small pits had just started when the price of gold fell and the mine closed.

This project, although not extensive in area, is an excellent reclamation program that is, in a large part, a tribute to the staff of Kinross Gold and the environmental review process it went through.

The QR gold mine wastes were recognized as having a potential for metal leaching and acid rock drainage and the mine was designed for closure at the outset. Key features of the mine closure program included flooding the main zone pit, constructing a cross dyke and raising the North tailings dam to flood the tailings impoundment. This allowed all potentially acid-generating (PAG) material already stockpiled within the tailings impoundment to be placed below water. All other PAG dumps were moved and placed in either the tailings impoundment or the Main Zone Pit.

Permanent spillways were constructed from the tailings pond and two open pits. Basic material was used to build islands for waterfowl nesting inside the tailings impoundment and these islands were seeded with cattails.

The other two small pits were backfilled and covered with basic acid consuming material to reduce the probability of acid rock drainage from the pit walls. Backfilled material was recontoured to a final slope of 3:1, covered with stockpiled soils and revegetated. Remaining waste rock dumps were also recontoured, covered with topsoil and revegetated.

The mine is not fully decommissioned, yet the large majority of mine liability has been eliminated through their excellent program. The mill and mill buildings are still intact and the property is about to be sold, hopefully to a new operator who can develop additional ore and restart the mine. If the new owner is unable to restart the mine then there will be little reclamation left to do, other than to remove the machinery and buildings.

Kinross has shown that a mine can be planned, developed, operated and closed in an excellent manner; proving once again that if done right, mining can be a temporary use of the land.

Four citations were also awarded:

- Coal mine reclamation - was awarded to Quintette Coal Limited for the Quintette Mine.
- Metal mine reclamation - was awarded to Homestake Canada Inc. for their exceptional reclamation efforts at the Snip Mine.
- Mineral Exploration reclamation - was awarded to Silver Standard Resources Inc. for their work on the Duthie mine property.
- Placer mine reclamation - was awarded to Sisters Resources Limited for their exceptional reclamation efforts at their placer mine on Wright Creek.

Metal Leaching and Acid Rock Drainage Workshop

The 10th annual workshop was held in Vancouver on December 2 and 3, 2003. This year, the workshop focused on the performance of ARD generating wastes, material characterization and MEND projects.

Industry Reclamation Record

The mining industry in BC currently consists of large-scale open pit metal mines, open pit coal mines, underground metal mines and one underground coal mine.

Since the late 1960's, land occupied by the mining industry has steadily grown. Major coal and metal mines, which occupied less than 1,000 hectares in 1969 had, by the end of 2003, expanded to cover 41,693 hectares. Reclamation (where revegetation has been successfully established for one year or more) has occurred on over 36 percent or 15,119 hectares (Figure 1).

Metal mines have disturbed 23,754 hectares, and 8,291 hectares (or 35 percent), have been reclaimed (Figure 2).

Coal mines have disturbed 17,938 hectares, and 6,827 hectares (or 38 percent) have been reclaimed (Figure 3). The sharp increase in disturbance and reclamation at metal mines during the late 1990's reflects the construction and development of three new mines at Huckleberry, Mt. Polley, and Kemess South and the closure and commencement of mine reclamation at others.

The data presented in Figures 4, 5, 6 indicate that disturbance has been increasing at a faster rate than reclamation. This can largely be explained by the expansion of the mining industry during the past 30 years. Now that there has been a general industry decline, where mines are closing at a rate faster than they are opening, the rate of reclamation is starting to exceed the rate of disturbance.

Land Disturbed and Reclaimed by Metal and Coal Mines in BC, 1969 - 2003

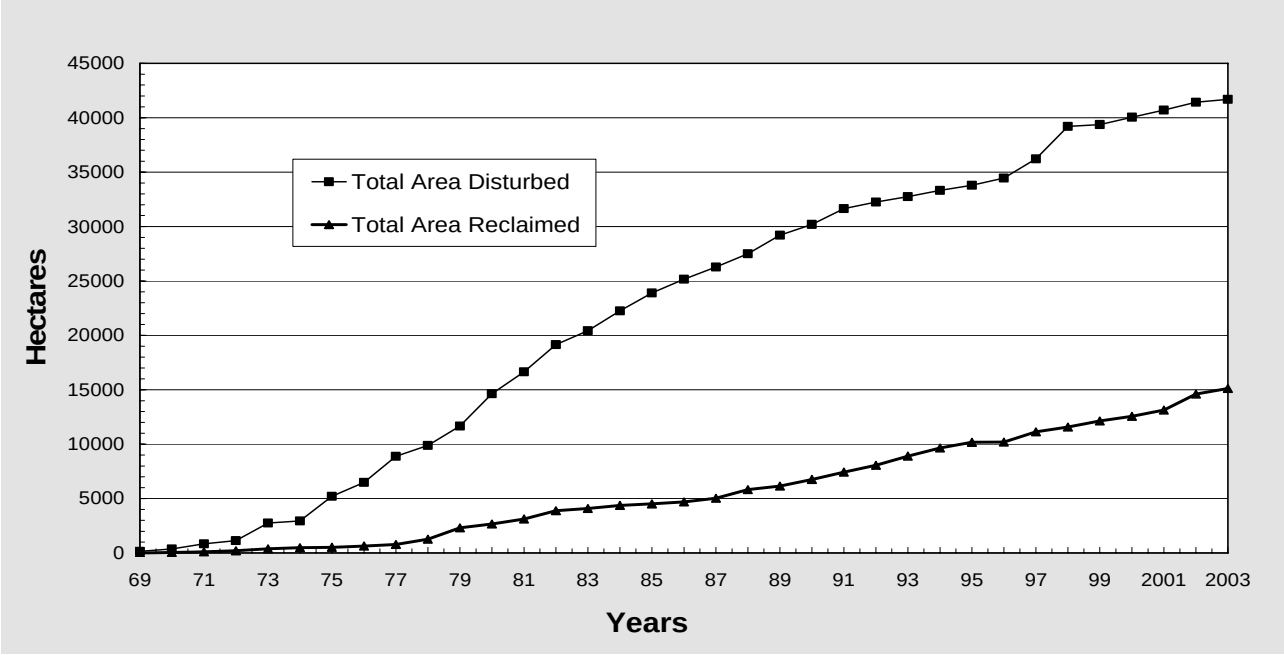

Figure 4

Area Disturbed and Reclaimed by Metal Mines in BC, 1969 - 2003

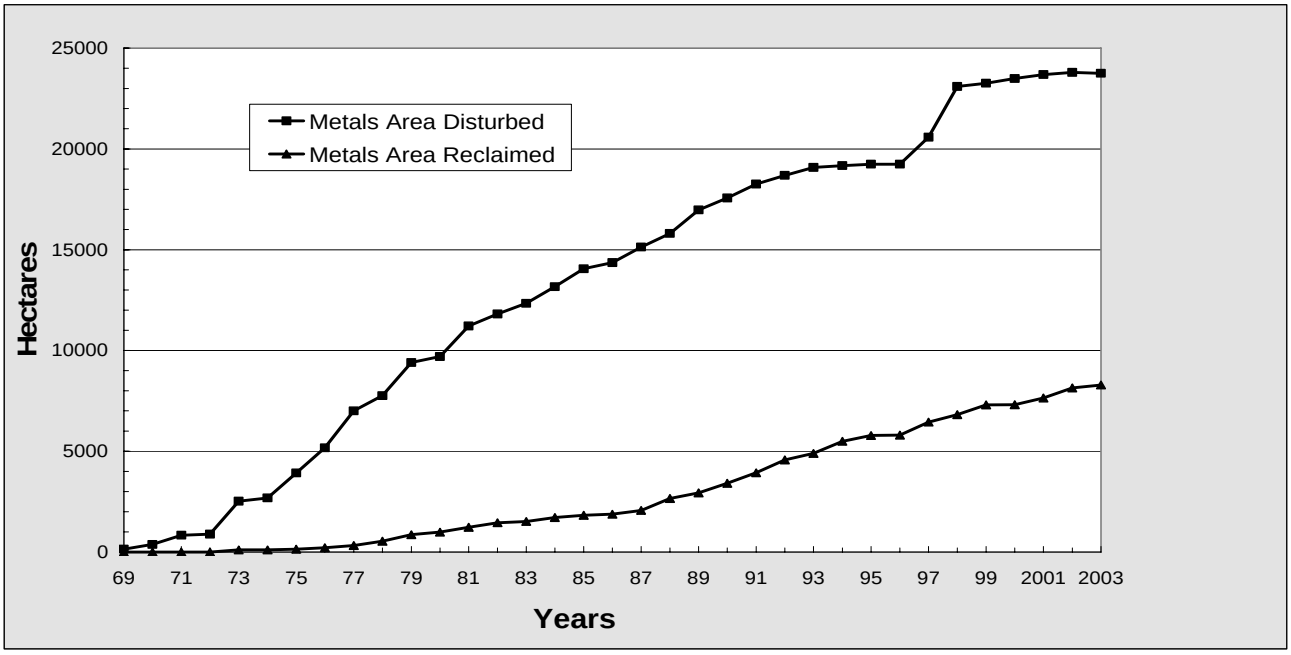

Figure 5

Area Disturbed and Reclaimed by Coal Mines in BC, 1969 - 2003

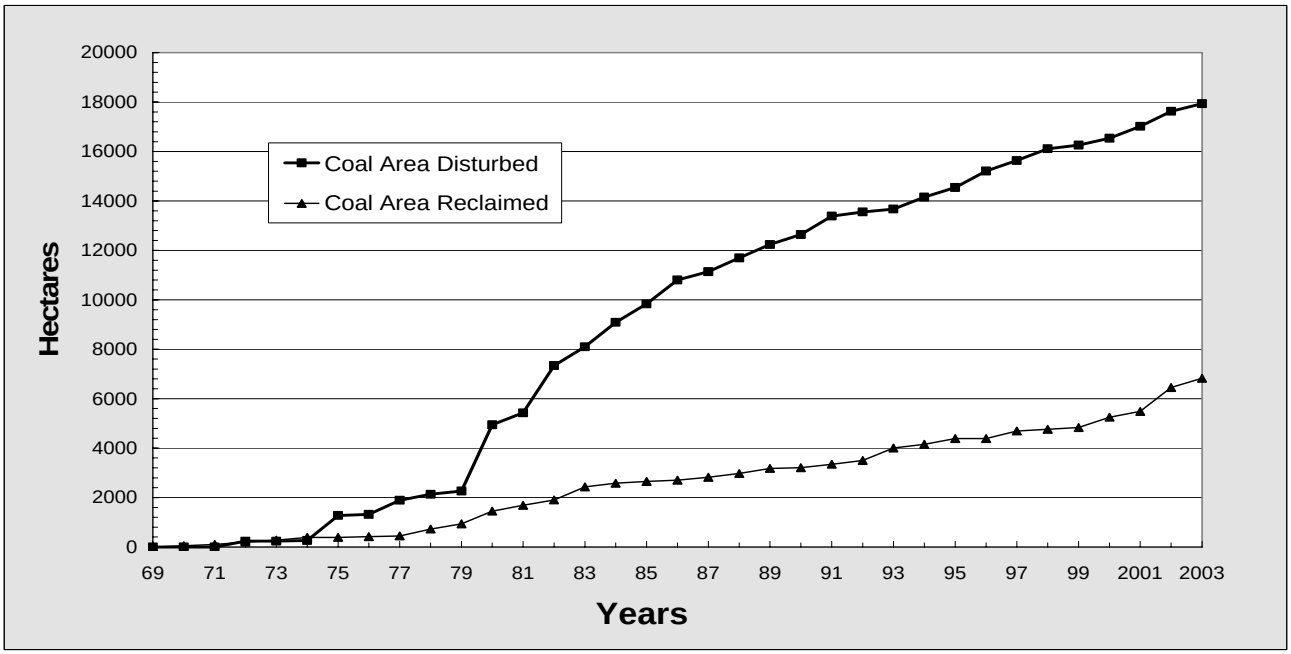

Figure 6

4.2 Geotechnical/Mining Roads

ROLES AND RESPONSIBILITIES

The geotechnical section presently consists of a Geotechnical Engineer who reviews mine designs for the project review stage of the Environmental Assessment Act process, as well as the application of the Mines Act under Section 10. Other duties include the inspection of major geotechnical works at mines, the assessment of geotechnical performance for worker protection and public health and safety, and for protection of land and watercourses.

The section provides in-house technical expertise and policy advice for:

- Tailings impoundments and dams, sediment control structures, waste rock dumps, soil overburden dumps;
- Open pit and underground rock mechanics;
- Roads, including route selection, standards and construction; and
- Risk evaluation for worker protection and public health and safety, and environmental impact of geotechnical projects.

SUMMARY OF ACTIVITIES

- In 2003, the geotechnical section conducted 41 inspections.
- Numerous operating permits or permit amendments were issued for construction and operation of major structures associated with tailings impoundments and waste rock dumps.
- Reviews were undertaken for several new mines that have submitted applications for environmental assessment certification.
- An external geotechnical review panel was convened to review activities at the Kemess South tailings storage facility.

F.W. Hermann, P. Eng
Chief Inspector of Mines