ANNUAL REPORT 1976

Province of
British Columbia

Ministry of
Mines and
Petroleum Resources

Minister of Mines and Petroleum Resources Annual Report

1976

Printed by K. M. MacDonald, Printer to the Queen's Most Excellent Majesty
in right of the Province of British Columbia.
1978

ISSN 0365-9356

To Colonel the Honourable WALTER STEWART OWEN, Q.C., LL.D.,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The Annual Report of the Ministry of Mines and Petroleum Resources is herewith respectfully submitted.

JAMES R. CHABOT
Minister of Mines and Petroleum Resources

Office of *the Minister of Mines and Petroleum Resources*
June 1977

TABLE OF CONTENTS

PLATES

FOREWORD

The Annual Report of the Minister of Mines and Petroleum Resources for 1976 follows the format of the 1975 Report closely. Annual Reports have been published since 1874, from that date to 1959 as the Annual Report of the Minister of Mines and subsequently as the Mister of Mines and Petroleum Resources. Because of the increasing size of this volume, a new yearly publication, Geology, ***Exploration and Mining in British Columbia, was*** initiated ***in 1969*** incorporating geological and technical reports previously published in the Annual Report. Starting in 1975, this technical volume has been divided into separate reports that can be issued as they are prepared, hut eventually will be bound together. Detailed information on mine safety, fatal accidents, dangerous occurrences, etc., that form part of the Chief Inspector's Report was included in the Annual Report until 1973, for 1974 was issued separately, and in 1975 and subsequently forms part of the separate volume ***Mining in British Columbia*** but not included in the consolidated bound volume ***Geology, Exploration and Mining in*** British Columbia.

The Annual Report for 1976 as for 1975 therefore contains four chapters- a general review of tbe industries, a chapter on the activities of the Ministry, one on the statistics of the mineral industry. and one on the performance of petroleum industry.

The Mining and Petroleum Industries in 1976

CHAPTER 1

CONTENTS

FIGURES

Table I-I-Mineral Production in British Columbia

		1975		1976	
	Units	Quantity	Value	Quantity	Value
			$		$
Antimony	kg	364 045	1 467 928	447 001	1 636 871
Bismuth	kg	19 163	261 931	20 261	226 462
Cadmium	kg	320 923	1 971 035	356 422	1 530 800
Copper	kg	258 497 599	331 693 850	263 618 197	378 984 941
Gold—					
placer	kg	44	232 204	26	115 613
lode, fine	kg	4 819	25 082 494	5 393	21 761 502
Iron concentrates	t	1 299 215	15 245 902	1 255 277	14 760 526
Lead	kg	70 603 483	24 450 158	85 407 582	32 796 533
Molybdenum	kg	13 026 627	71 201 391	14 088 686	94 109 138
Silver	kg	196 306	30 545 947	239 721	32 532 836
Tin	kg	32 511	200 669	102 262	712 912
Zinc	kg	99 668 230	80 572 872	106 498 987	65 499 108
Others			3 695 987		2 083 161
Subtotals			586 622 368		646 750 403
Industrial Minerals					
Asbestos	t	76 771	37 849 743	70 433	40 727 296
Diatomite	t	5 847	229 483	2 737	182 159
Fluxes	t	39 589	174 824	11 378	33 263
Granules	t	33 316	1 144 968	31 476	1 219 884
Gypsum and gypsite	t	474 387	1 751 799	556 134	4 434 471
Jade	kg	110 437	414 123	483 796	1 535 030
Sulphur	t	246 079	5 738 134	231 704	4 296 189
Others			1 364 528		488 850
Subtotals			48 667 602		52 917 142
Structural Materials					
Cement	t	915 293	31 681 722	846 548	34 973 746
Clay products			6 593 189		6 995 917
Lime and limestone	t	1 976 415	4 349 800	2 173 831	5 610 063
Rubble, riprap, and crushed rock	t	4 103 452	8 723 448	2 485 215	5 205 973
Sand and gravel	t	28 945 523	39 575 457	36 073 618	48 138 635
Building-stone	t	53	4 395	657	14 314
Subtotals			90 928 011		100 938 648
Coal					
Coal—sold and used	t	8 924 816	317 111 744	7 537 695	298 683 679
Total solid minerals			1 043 329 725		1 099 289 872
Petroleum and Natural Gas					
Crude oil	m^3	2 269 898	94 229 725	2 367 450	116 595 050
Field condensate	m^3	16 094	668 092	18 309	901 711
Plant condensate	m^3	185 272	6 525 837	167 576	7 198 957
Subtotals			101 423 654		124 695 718
Natural gas to pipeline	10^6m^3	9 236	214 733 528	8 800	287 997 059
Butane	m^3	106 427	2 577 205	109 781	4 591 832
Propane	m^3	81 975	1 985 087	88 195	3 688 955
Subtotals			219 295 820		296 277 846
Totals, petroleum and natural gas			320 719 474		420 973 564
Grand totals			1 364 049 199		1 520 263 436

CONVERSION TABLE

Metric	Symbol	
Tonnes	t	÷ .90718=short tons.
Kilograms	kg	÷ .45359=pounds.
Kilograms	kg	÷ .031103=troy ounces.
Cubic metres	m^3	× 6.29=barrels.
Millions cubic metres	10^6m^3	× 35 496=thousand standard cubic feet.

INTRODUCTION

The value of mineral production in British Columbia during 1976 reached a new record of $1.5 billion (*see* Table 1-1). This is an increase of $156 million or 11.4 per cent over 1975. All segments of the industries except coal experienced growth of value of their output. Production increased in a majority of commodities, and the value of production, whether the quantity was up or slightly down, increased in most cases because of increased unit value.

The following table indicates the relative proportion of the total values of the industries taken by the various sectors in 1976 and the preceding two years:

Table 1-2

	1974 Per Cent	1975 Per Cent	1976 Per Cent
Metals	64	48	42.6
Industrial minerals	3	4	3.5
Structural materials	6	8	6.6
Coal	13	26	19.6
Petroleum and natural gas	14	14	27.7

This shows the trend continuing in which metals represent a smaller part of the whole even though metals production and value in fact showed a 10.2-per-cent increase. Coal production and value dropped (5.8 per cent) because of a prolonged strike, so its share dropped to less than 20 per cent of the total after being 26 per cent in 1975. The value of industrial minerals and structural materials increased nearly 10 per cent, so that their relative position was maintained. The quantity of all petroleum products except natural gas and plant condensate was up, the value of all production was up, and the total value was up significantly (31 per cent), so that petroleum industries share of the total also increased markedly to nearly 28 per cent.

Table 1-1 shows the details of mineral production, quantity, and value for 1976 compared with 1975. Figure 1-1 is a pie diagram of the value of mineral production in 1976.

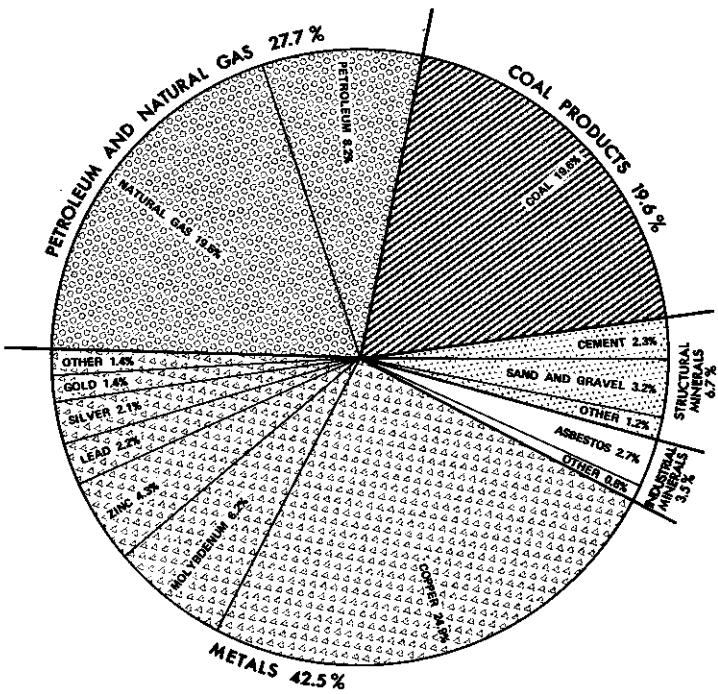


Figure 1-1—Major minerals produced in 1976 (by value).

THE MINING INDUSTRY IN 1976

By

A. SUTHERLAND BROWN, J. E. MERRETT, and W. P. WILSON

SOLID MINERAL PRODUCTION IN 1976

The value of solid minerals, that is, metals, industrial minerals, structural materials, and coal, set another new record of nearly $1.1 billion (Table 1-1), up 5.4 per cent from 1975. This was achieved on the face of a decline of some commodity prices (zinc, gold, cadmium, sulphur) because the quantity of production was generally up.

The value of metals production increased 10.3 per cent to $647 million and represents 58.8 per cent of the total value of solid mineral production; industrial minerals increased 8.7 per cent to $52.9 million or 4.8 per cent of the total; structural materials increased 11 per cent to $100.9 million or 9.2 per cent of the total; and the value of coal sold and used decreased 5.8 per cent to $298.7 million for 27.2 per cent of the total.

METALS

The growth and long-term trends of production of major metals are shown on Figure 1-2. Lead and zinc production advanced sharply in the period 1920,. to 1943, thereafter starting a slow decline, a feature dependent principally on the production history of the Sullivan mine. In contrast, copper production remained at a modest level until the onset of major porphyry copper production in the late sixties. Molybdenum, production also started its growth in this period, related principally to mining of porphyry deposits. Precious metals are not shown but their history in this period is principally one of byproduct origin related to the production of major base metals. Detailed graphs of metal production are shown in Chapter 3. Figure 1-2, however, shows the major metals were all up in 1976.

Copper continued to be the most valuable solid mineral and metal, increasing in quantity by 2 per cent. Major world stockpiles made markets weak but, nevertheless, the price of copper advanced steadily until mid-year and then dropped significantly so that the average price for the year was $1.44 per kilogram, only 12.1 per cent above the very low price of 1975. However, with the increase of quantity, the value of production increased 14 per cent to $379.0 million.

Molybdenum markets continued strongly, the price advanced about 22 per cent, and this metal overtook zinc once again to be the second metal in 1976. Production increased 8 per cent so that the value of production was up 32 per cent to $94.1 million.

Zinc production rose but the price dropped back significantly, due to depressed markets, and zinc returned to third place among the metals. Production rose 7 per cent but value dropped to $65.5 million.

For lead, the fourth metal, production increased 21 per cent over 1975 and the price increased steadily in a strong market to 38 cents per kilogram for a 34-per-cent increase in value to $32.8 million.

Production of gold and silver is chiefly dependent in the production of copper and lead and zinc respectively. Production of these metals was up but the markets for precious metals were relatively soft. The resulting interplay of these facets was that silver was the fifth and gold the sixth metal in value in 1976.

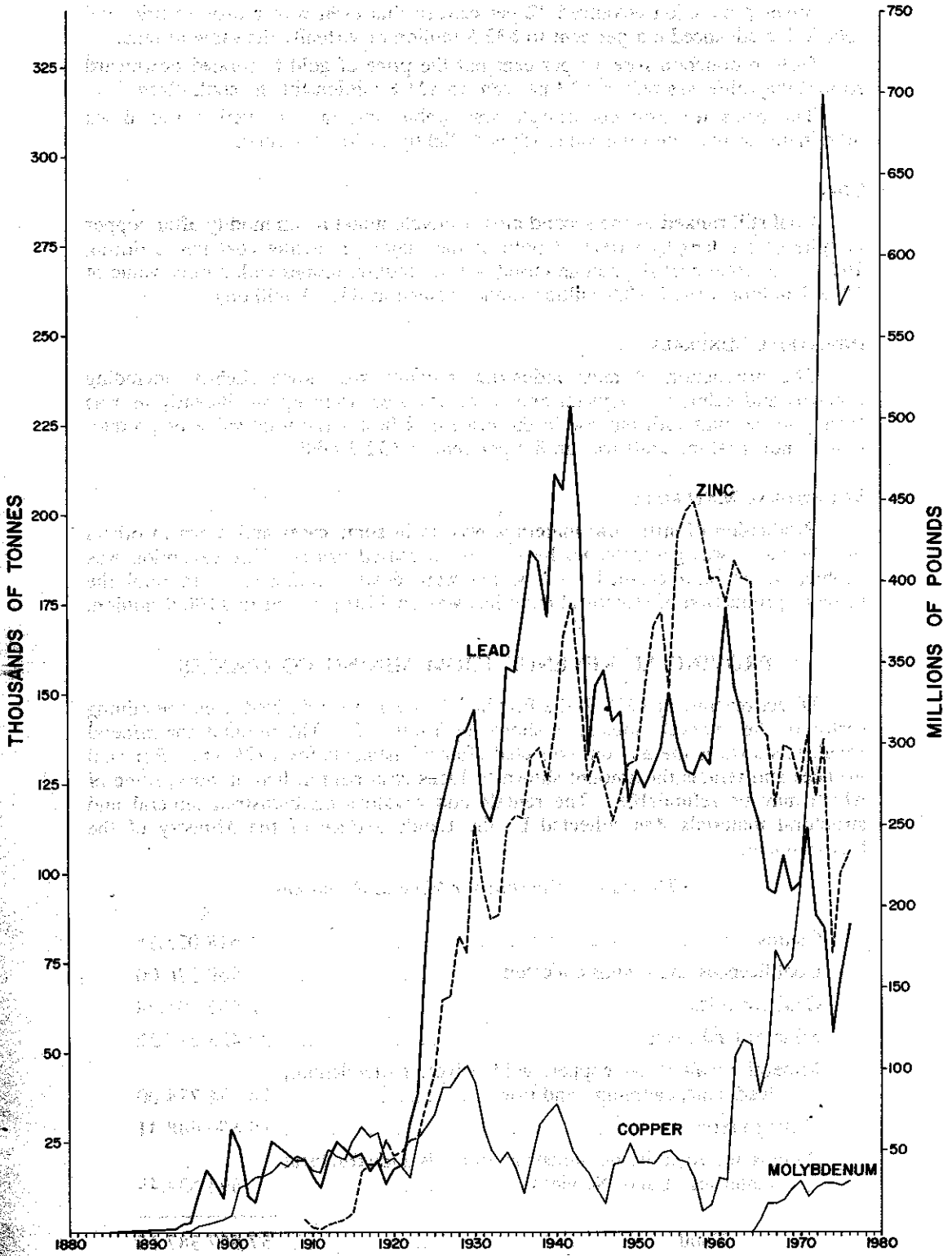


Figure 1-2—Quantities of major metals produced, 1885–1976.

Silver production advanced 22 per cent so that even with a drop in price the total value advanced 6.5 per cent to $32.5 million or virtually the same as lead.

Gold production rose 12 per cent but the price of gold fluctuated downward so that the value was reduced 13 per cent to $21.8 million for the sixth place.

The price for iron concentrate was stable and the production was down marginally so that the total value slipped slightly to $14.8 million.

COAL

Coal still ranked as the second most valuable mineral commodity after copper in spite of the lengthy strikes at both of the major producing coal mines during 1976. The total coal shipped and used was 7.5 million tonnes with a mine value of $298.7 million (1975-8.9 million tonnes valued at $317.1 million).

INDUSTRIAL MINERALS

The production of most industrial minerals was down slightly, including asbestos and sulphur. Gypsum and jade, however, were up significantly as was their price so that with the rise in the price of asbestos the total value of production of industrial minerals was up 8.7 per cent to $52.9 million.

STRUCTURAL MATERIALS

Production of structural materials was up in some. cases and down in others but the value was generally up because of increased prices. The exception was rubble, riprap, and crushed rock, which were down significantly. In total the value of production of structural materials was up 11.0 per cent to $100.9 million.

PROVINCIAL REVENUE FROM MINING COMPANIES

Direct revenue in 1975 to the Provincial Government derived from the mining sector of the mineral industry is shown in Table 1-3. The amount for mineral royalties shown is the amount collected after adjustments for 1975, etc. For coal licences and rentals the amount shown includes cash paid in lieu of work, some of which may be refundable. The rentals and royalties on industrial mineral and structural materials was collected by the Lands Service of the Ministry of the Environment.

Table 1-3—Revenue for Mineral Resources

	$
Claims	1 618 025.16
Coal licences and rentals collected	569 376.00
Coal royalties	2 502 201.78
Mineral land taxes	22 428 217.32
Mineral royalties on copper, gold, silver, molybdenum, lead, zinc, cadmium, and iron	14 094 284.00
Mining taxes	15 650 648.41
Rentals and royalties on industrial minerals and structural materials (Lands Service)	694 634.48
Total	**57 557 387.15**

Mines in British Columbia Which Produced More Than 1 000 Tonnes of Ore in 1976

Name of Mine	Products	NTS Location	Rated Capacity of Mill/Cleaning Plant (Tonnes/Day)	Mine[1] Type	Name of Company	Company Address	Mine Address
Metal Mines							
Phoenix	Cu, Au, Ag	82E/2E	2 500	O	Granby Mining Corp.	17th Floor, 1050 W. Pender St., Vancouver V6E 2H7	Box 490, Grand Forks (Mining ended 1976).
Horn Silver	Ag, Pb, Zn, Cu	82E/4E	140	U	Dankoe Mines Ltd.	2002, 1177 W. Hastings St., Vancouver V6E 2K3	Box 190, Keremeos.
Susie	Ag, Pb, Zn, Cu, Au	82E/4E	.....	U	Hem Mines Ltd.	Box 855, Oliver	Box 855, Oliver.
Dusty Mac	Au, Ag	82E/5E	.....	O	Dusty Mac Mines Ltd.	433, 355 Burrard St., Vancouver	Box 402, Okanagan Falls.
Highland Bell	Ag, Zn, Pb, Au, Cd	82E/6E	110	U	Teck Corp. Ltd.	1199 W. Hastings St., Vancouver V6E 2K5	Beaverdell V0H 1A0.
HB	Zn, Pb, Ag, Cd	82F/3E	1 090	U	Cominco Ltd. (HB mine)	200 Granville Square, Vancouver V6C 2R2	Salmo.
Silmonac	Zn, Pb, Ag, Cd	82F/14	140	U	Kam-Kotia Mines Ltd. and Silmonac Mines Ltd.	420, 475 Howe St., Vancouver V6C 2B3	Box 189, New Denver.
Scranton	Au, Ag, Zn, Pb	82F/14E	.....	U	Silver Star Mines Ltd.	c/o Kirkstuk, 1900 Guinness Tower, 1055 W. Hastings St., Vancouver V6E 2E9	Kaslo.
Ottawa	Ag, Pb, Zn	82F/14W	68	U	Slocan Development Corp.	2002, 1177 W. Hastings St., Vancouver V6E 2K6.	
Sullivan	Zn, Pb, Ag, Cd	82G/12W	9 500	U	Cominco Ltd. (Sullivan mine)	200 Granville Square, Vancouver V6C 2R2	Box 2000, Kimberley V1A 2G3.
Ruth Vermont	Ag, Pb, Zn	82K/15W	450	U	Consolidated Columbia River Mines Ltd.	3rd Floor, 73 Water St., Vancouver V6B 1A1	Box 1649, Golden.
Texada	Fe, Cu	92F/10E	4 500	U	Texada Mines Ltd.	Box 10, Gillies Bay V0N 1W0	Box 10, Gillies Bay (Mining ended 1976).
Lynx, Myra	Zn, Cu, Ag, Pb, Au, Cd	92F/12E	900	O	Western Mines Ltd.	Rm. 1103, Box 49066, 595 Burrard St., Vancouver V7X 1C4	Box 8000, Campbell River.
Similkameen	Cu, Ag, Au	92H/7E	13 600	O	Similkameen Mining Co. Ltd.	14th Floor, 750 W. Pender St., Vancouver V6C 1K3	Box 520, Princeton V0X 1W0.
Brenda	Cu, Mo, Ag	92H/16E	22 000	O	Brenda Mines Ltd.	Box 420, Peachland V0H 1X0	Box 420, Peachland V0H 1X0.
Craigmont	Cu	92I/2W	4 860	U	Craigmont Mines Ltd.	700, 1030 W. Georgia St., Vancouver V6E 3A8	Box 3000, Merritt.
Lornex	Cu, Mo, Ag	92I/6E	40 900	O	Lornex Mining Corp. Ltd.	202, 580 Granville St., Vancouver V6C 1W8	Box 1500, Logan Lake V0K 1W0.
Bethlehem	Au Cu, Ag, Au	92I/7W	16 800	O	Bethlehem Copper Corp. Ltd.	2100, 1055 W. Hastings St., Vancouver V6E 2H8	Box 520, Ashcroft.
Warman	Au, Ag	92J/3E	426	U	Northair Mines Ltd.	333, 885 Dunsmuir St., Vancouver V6C 1N5	Squamish.
Island Copper	Cu, Mo, Ag Au	92L/11W	34 500	O	Utah Mines Ltd.	1600, 1050 W. Pender St., Vancouver V6E 3S7	Box 370, Port Hardy V0N 2P0.
Boss Mountain	Mo	93A/2W	1 590	U	Noranda Mines Ltd. (Boss Mt. Div.)	1050 Davie St., Vancouver V6B 3W7	Hendrix Lake.
Gibraltar	Cu, Mo, Ag	93B/9W	36 330	O	Gibraltar Mines Ltd.	700, 1030 W. Georgia St., Vancouver V6E 3A8	Box 130, McLeese Lake V0L 1P0.
Endako	Mo	93K/3E	24 500	O	Canex Placer Ltd. (Endako Div.)	700, 1030 W. Georgia St., Vancouver V6E 3A8	Endako.
Granisle	Cu, Ag, Au	93L/16E	12 260	O	Granisle Copper Ltd.	17th Floor, 1050 W. Pender St., Vancouver V6E 2H7	Box 1000, Granisle.
Bell (Newman)	Cu, Au	93M/1E	11 800	O	Noranda Mines Ltd. (Bell Copper Div.)	1050 Davie St., Vancouver V6B 3W7	Box 2000, Granisle.
Tasu	Fe, Cu	103C/16E	7 300	O	Westrob Mines Ltd. (Tasu)	603, 1112 W. Pender St., Vancouver V6E 2S5	Tasu.
Granduc	Cu, Ag, Au	104B/1W	7 270	U	Granduc Operating Co.	520, 890 W. Pender St., Vancouver V6C 1K3	Box 69, Stewart.
Atlin-Ruffner	Ag, Pb, Zn	104N/12E	54	U	Atlin Silver Corp.	200, 124 Seymour St., Kamloops V2C 2E1	Atlin.
Industrial Mineral Open Pits and Quarry							
Western Gypsum	Gypsum	82J/5W	2 450	O	Westroc Industries Ltd.	Box 5638, Postal Station A, Calgary, Alta. T2H 1Y1	Box 217, Invermere V0A 1K0.
Mineral King	Barite	82K/8W	Small	O	Mountain Minerals Ltd.	Box 700, Lethbridge, Alta.	Box 603, Invermere.
Brisco	Barite	82K/16W	.....	U	Mountain Minerals Ltd.	Box 700, Lethbridge, Alta.	Box 603, Invermere.
Cassiar	Asbestos	104P/5W	3 630	O	Cassiar Asbestos Corp. Ltd.	2000, 1055 W. Hastings St., Vancouver V6E 3V3	Cassiar V0C 1E0.
Coal Mines							
Byron Creek (Corbin)	Coal	82G/10E	1 700	O	Byron Creek Collieries Ltd.	Box 270, Blairmore, Alta.	Box 270, Blairmore, Alta.
Kaiser (Harmer Ridge; Balmer North and Hydraulic)	Coal	82G/10, 15	28 000	O, U	Kaiser Resources Ltd.	2600, 1177 W. Hastings St., Vancouver V6E 2L1	Box 2000, Sparwood.
Fording (Clode Creek and Greenhill)	Coal	82J/2W	17 000	O	Fording Coal Ltd.	206, 205 Ninth Ave. S.E., Calgary, Alta. T2G 0R4	Box 100, Elkford V0B 1H0.
Coleman (Tent Mountain)	Coal	82G/10W	.....	O	Coleman Collieries Ltd.	Box 640, Coleman, Alta.	Tent Mountain T0K 0M0.

[1] O—Open pit. U—Underground.

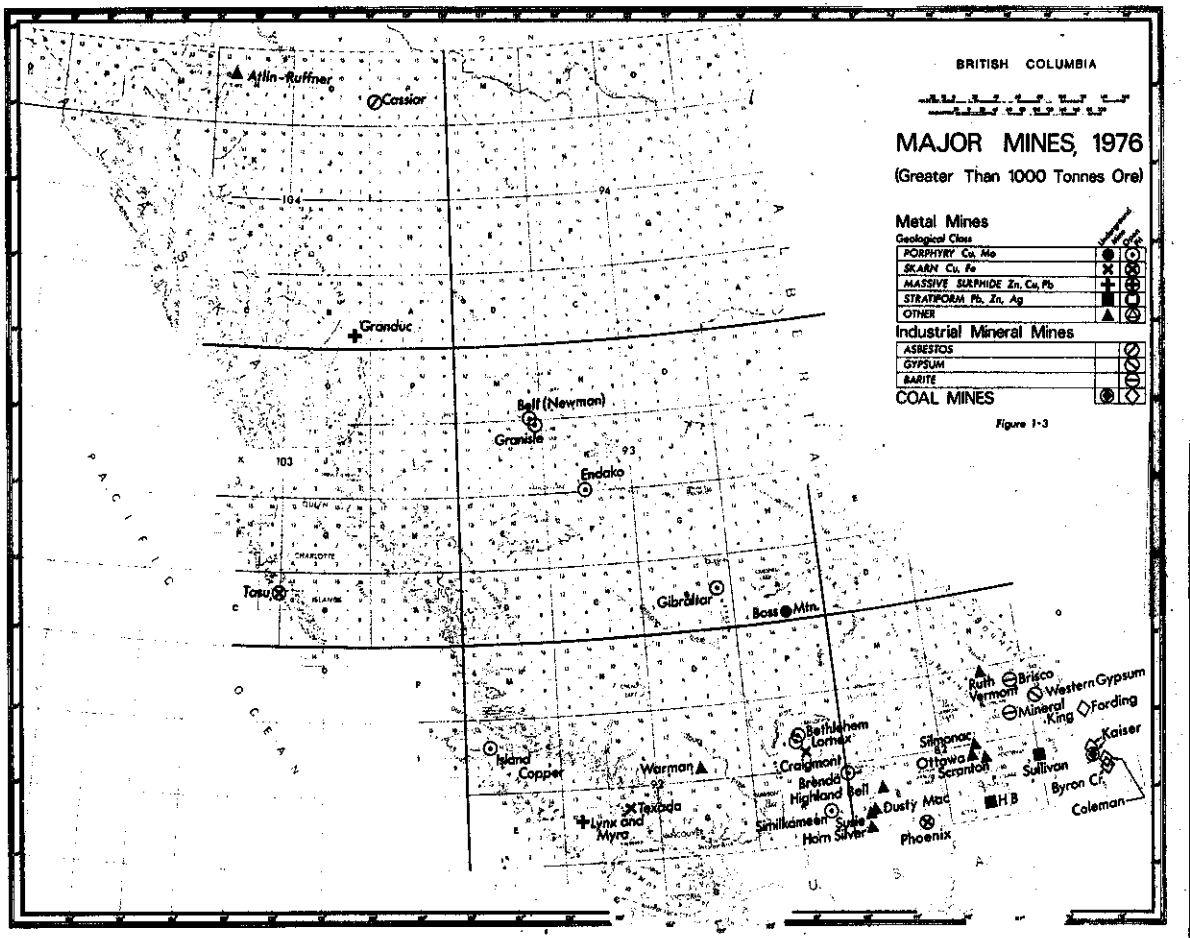


Figure 1-3

Figure 1-3—Major mines, 1976 (greater than 1 000 tonnes of ore).

EXPENDITURES BY MINING COMPANIES

Major expenditures in 1976 by companies involved in exploration, development, and mining of metals, minerals, and coal were. as shown in Table l-4. A major part of the capital and development cost was related to the Afton mine and plant and coal developments in tbe Crowsnest Coalfield. The total expenditures in *1976* were up 5.2 per cent over 1975.

Table I-4-Expenditures (Mining Companies)

	$	$
Capital expenditures	94 868 964	
Exploration and development	76 294 132	
		171 163 096
Mining operations (metals, minerals, coal)		382 378 963
Mining operations (structural materials)		46 158 758
Repair expenditures		134 309 808
Total		734 010 625

MINING AND TREATMENT

METAL MINES

Metal mining continued to be adversely affected by inflation in costs, including fuel, machinery, and taxes; by generally low commodity prices; and by the depressed world market.-- Only lead and molybdenum showed much market strength in 1976. In spite of this scenario, production increased in all major metals during the year and the total value of metals produced rose 10.3 per cent to $646.8 million.

In 1976, 59 mines produced an aggregate of 83 024 513 tonnes of ore, which was concentrated or shipped directly to a smelter (see Table 3-13). Thii contrasts with 66 mines in 1975 producing 80360807 tonnes. Fewer small mines were producing in 1976 but aggregate tonnage increased 3.3 per cent. Of the 59 mines, 28 produced more than 1 000 tonnes and these are shown on Figure 1-3 classified as to geological type, and whether open pit or underground. Thirteen mines produced more than 1 million tonnes of ore in 1976 and in aggregate produced more than 79.5 million tonnes or about 96 per cent of the total. Of these 13 large mines, only three are underground mines (Craigmont, Granduc, and Sullivan) and their *aggregate* tonnage *was* only *5 204 010 or 6.3* per cent of the aggregate tonnage. In regard to geological type, nine were mining porphyry deposits, two skam deposits, one stratiform deposit, and one massive sulphide deposit. There were five intermediate-sized mines operating in 1976 with tonnage produced between 1 million and 100 thousand tonnes. Of these, two were skarn, one porphyry, one massive sulphide, and one stratiform. Only one of these was an open-pit mine. There were 10 small mines with tonnages between 100 thousand tonnes and 1 thousand tonnes per year, all but one were vein deposits, and all but the same one (Dusty Mac) were underground mines.

During the year one new mine, the Warman mine of Northair Mines Ltd., came into full production. This is a vein deposit in a volcanic setting near Brandywine Falls which produces gold-silver dross bars and lead and zinc concentrates. The concentrate has a rated capacity of 426 tonnes per day. In addition, two former small producing mines were reactivated, the Atlin Ruffner (Atlin Silver Corpora-

tion), a lead-silver-zinc vein mine near Atlin and the Ottawa mine, a silver-lead-zinc mine in the Slocan.

Two productive old, intermediate-sized mines closed during the year, tbe Phoenix and tbe Texada. The Phoenix mine of Granby Mining Corporation near Greenwood completed mining in October 1976 but will continue milling from their low-grade stockpile. This copper skarn mine produced as an underground mine continuously from 1900 to 1919 and then intermittently until it was reactivated as an open-pit mine in 1959. The Texada mine also had an early life as a small producer, started as an open-pit mine in 1952, went underground in 1964, and continued production until December 1976.

Concentrating

In 1976, 27 concentrators at metal mines were in operation (see Table 3-12); seven treated copper ore, three treated copper-iron ore, one treated zinc-copper-silver-lead ore, eleven treated lead-zinc-(silver) ore, three treated copper-molybdenum ore, and two treated molybdenum ore.

Smelting, Refining, and Destination of Concentrates

Tbe only base-metal smelter in operation in the Province is the lead-zinc smelter owned and operated by Cominco Ltd. *in* Trail. Concentrates of other *metals* are mostly exported to smelters in diverse parts of the world, but mainly Japan and the United States. However, molybdenum concentrates at Endako are roasted to form molybdenum trioxide and are also processed to make ferromolybdenum.

The smelter at Trail received concentrates and scrap from a number of sources--company mines within the Province (Sullivan and HB), outside the Province (Pine Point), and custom sources both inside and outside the Province. The smelter received 114 222 tonnes of lead concentrates and 174 742 tonnes of zinc concentrates from the Sullivan and HB mines, and 11 309 tonnes of lead coo-centrates and 3 912 tonnes of zinc concentrates from other British Columbia mines. The total value of concentrates, including byproduct metal, from British Columbia treated at Trail was $112 667 994 or 17 per cent of metal production of the Province in 1976.

Endako shipped products containing 6 766 374 kilograms of molybdenum. Of this, 1 098 tonnes was molybdenum concentrates, 9 771 tonnes was molybdenum trioxide, and 288 tonnes was ferromolybdenum.

The proportions of the total metal production going to the various destinations are not known accurately but are approximately as follows: Smelted or treated in British Columbia, $112.7 million (17.4 per cent); shipped to other parts of Canada, $43.1 million (6.6 per cent); exported to Japan, $282.9 million (43.7 per cent); exported to the United States, $78.2 (12.1 per cent); exported to Germany, $6.2 million (1.0 per cent); other plus unattributed, $123.6 million (19.2 per cent).

Tbe destination of concentrates of the major metals is shown in Table 3-13. and discussed following.

Copper concentrates produced in British Columbia were shipped to the following destinations: Eastern Canada, 105 819 tonnes; the United States, 144 921 tomes; Japan, 668 347 tonnes; Germany, 13 378 tonnes; elsewhere, 37 787 tonnes.

Details of the disposition of molybdenum (14 008 686 kilograms valued at $94 109 138) are not always ascertainable but, from known sales, slightly over one half of the total was shipped to Europe and about one third to Japan. The balance was disposed of to a multitude of countries.

Some salient facts of coal production in 1976 are as follows:

(1) About 90.7 per cent of raw coal produced in 1976 comes from surface mining operations.

(2) About 90.5 per cent of clean coal produced in 1976 was metallurgical coal.

(3) Clean coal output was down 21.7 per cent to 7 498 369 tonnes in 1976 because of prolonged strikes at Kaiser and Fording.

(4) The value of coal sold and used decreased to $298 683 679, down only 5.8 per cent from 1975.

(5) The percentage of clean coal to raw coal remained at 74 per cent.

(6) Coal sales to Japan were down 16.6 per cent but account for 87.2 per cent of the total sales. Canadian sales dropped 38.5 per cent and coal used domestically in making coke dropped to 162 404 tonnes from 240 628 tonnes in 1.975;

MINE INSPECTION AND SAFETY

In an endeavour to minimize. 'personal injury, property damage, multiple resource-use dislocation, and insure optimum mineral resource recovery, the Inspection and Engineering Division has the responsibility of enforcing, where pertinent, the observance of the Mines *Regulation Act* and *Coal Mines Regulation Act* by all persons working in the mines in this Province. The Inspection and Engineering Division maintained a Province-wide system of districts staffed by inspection and rescue personnel. Staffs of specialized personnel have also been established and during the year additional staff was obtained to assist the specialists in their duties.

To ensure that the supervision of mines is knowledgeable in safe and acceptable operating practices, certain supervisors and officials at mines require various certificates of competency depending on their supervisory functions. For this purpose Boards of Examiners have been appointed from the Inspection and Engineering Division to conduct examinations and award certifications. In addition, miners' certificates, coal miners' certificates, and blasting certificates are issued by the District Inspectors.

During the year a minor number of amendments were made to the two Acts. Two of the amendments were directed at improving safety practice and training at both metal and coal-mining operations, another revised certain subsections of the reclamation legislation in both Acts, while another was directed in particular *to the Mines Regulation Act to require* more detail *to* be provided concerning intended operating plans and procedures in the development of mining operations. The Province continued to maintain its leadership in the design, development, and installation of improved safety equipment on the large haulage vehicles, particularly in the provision for adequate braking capabilities. The same thrust was also directed to the installation of nonflammable hydraulic fluid systems on underground equipment.

Monitoring of dust, ventilation, and noise conditions continued at most mining operations and, where the environmental conditions were found unsatisfactory, orders were issued for their improvement. Subsequent surveys were made to ensure compliance was being achieved. Audiometric testing of mine employees was continued at most operations. The test equipment and procedures being used at each installation were monitored to ensure conformity.

Mine-rescue stations, manned by qualified staff and fully supplied with rescue equipment, were maintained at Fernie, Kamloops, Nanaimo, Nelson, Prince

George, and Smithers. Each station had on hand sufficient self-contained oxygen-supplying breathing apparatus to maintain at least two mine-rescue teams of six men each. In addition, each station had auxiliary equipment such as Type N gas masks, gas detectors, oxygen therapy units, and first-aid equipment. The Ministry also had some equipment on loan to some -mining companies to supplement their own equipment.

A senior mine rescue co-ordinator in Victoria oversaw the training being done by the rescue co-ordinators at the various rescue stations. The co-ordinators at the stations made periodic visits to the mines in their areas to give or to assist in giving instruction in surface and underground mine-rescue training. They assisted also in survival rescue and first-aid training, and checked on all rescue equipment at the mines to insure it was being well maintained and immediately available for use at any time.

The four mine. safety associations sponsored jointly by the Ministry of Mines and Petroleum Resources and the Workers' Compensation Board continued with their annual competitions in surface and underground mine-rescue and first-aid events. They were as usual aided by mining companies, safety supervisors, mine inspectors, mine rescue cc-ordinators, and in some instances; local industry. The winners of the local underground competitions met in 'Nelson on June 19 for the Provincial Underground Mine Rescue Competition. The HB mine team of Cominco Ltd., captained by Barry Abbott, won the trophy and went on to compete in the Tenth Canadian Underground Mine Rescue finals in Victoria on June 26 where they captured the Canadian Trophy.

The Provincial Surface Mine Rescue Competition was held in Nelson on June 19, at which competition the team from the Phoenix Copper Division of Granby Mining Corporation, captained by N. Varabioff, won the Provincial Trophy.

Annual awards and trophies have been provided by various organizations in recognition of deeds of bravely, rescue work, and for good safety records at mining operations.

In 1976 there were no awards for either bravery or rescue work, but there were several awards made for good safety records and are herewith detailed.

The John T. Ryan Safety trophies were established in 1941 by the Mine Safety Appliance Co. of Canada Ltd. to promote safety in coal and metal mines in Canada. Three Canadian and six regional trophies were established and their administration was given to the Canadian Institute of Mining and Metallurgy. There were no awards made to British Columbia mines either in the coal or metal-mining categories in 1976. Granduc mine, managed by Granduc Operating Company, had a lower accident rate than the regional award winning company but had an insufficient number of hours worked to compete for the award.

In 1951 the West Kootenay Mine Safety Association donated a trophy to promote safety in small mines, and in 1976 this trophy was again awarded to the Horn Silver mine of Dankoe Mines Ltd.

In 1961 the Department of Mines and Petroleum Resources organized a safety competition for the open-pit and quarry industry, and provided two trophies. Since that time three categories of competition have been established, based on amassed man-hours, and trophies or certificates of achievement awarded to mines having the least number of compensable accidents in their respective categories. In 1976, the A trophy was won jointly by seven operations, each having no compensable or lost-time accidents. These were British Columbia Cement Company Limited (Cobble Hill quarry), Canada Cement Lafarge Ltd. (Vananda quarry), Construction Aggregates Ltd. (Hillside-Furry Creek quarries), Ideal Basic Industries Limited (Vananda quarry), Imperial Limestone Limited (Vananda quarry),

Jack Cewe Limited (Port Coquitlam gravel operation), and Lafarge Concrete Ltd. (Surrey gravel operation).

Wesfrob Mines Limited's operation at Tasu won the B trophy with an accident frequency of 10.78 per million man-hours. In addition, Certificates of Achievement were won by the following smaller operations having a full year of accident-free operation: Blackham's Construction Ltd. (Abbotsford), Construction Aggregates Ltd. (Langley Division), Ocean Cement Northern Ltd. (Kamloops Division), and Plateau Construction Limited (Kamloops-Lafarge quarry).

RECLAMATION

In 1969 *the Mines Regulation Act* and *the Coal Mines Regulation Act were* amended to provide for the reclamation of the surface of lands disturbed by surface mines. Inasmuch as the surface development at mining properties involves the protection of other resources, a Reclamation Committee, comprised of representatives of the resource agencies of, the Government, was formed with the Chief Inspector as Chairman. This committee reviews all reclamation proposals before the permits are submitted for Cabinet approval. The permits are issued only after a performance bond has been posted. In 1976, 81 reclamation permits were issued and 34 permits were approved for renewal. To date, a total of 368 permits has been authorized involving a total bonding of $4 393 940 on 16 440 hectares of, land disturbed by mining operations.

Closely associated with reclamation of disturbed lands is the construction of tailings impoundments and mine dumps, because in the ultimate stages of these structures, revegetation will be necessary. In these projects where their size can place them in the category of some of the largest man-made structures on earth, property engineering design and construction are essential. It is therefore incumbent on the Inspection and Engineering Division to insure. these structures are being designed and constructed in accordance with acceptable engineering practices. In 1976, construction of the L-L starter dam for Lornex Mining Corporation Ltd. began and when completed the total dam will be about 320 metres long, 160 metres high, and Will impound 1.8 billion tonnes of tailings.

MINING ROAD PROGRAM

The Inspection and Engineering Division super&es the mining road and trail construction program authorized by the *Department of Mines and Petroleum Resources Act.'* In 1976, 25 applications for such assistance were received of which assistance was offered to 17 applicants with a total allocation of $838 304. In addition, a total of $400 000 was spent to provide access from Dawson Creek to the Babcock coal area in the Northeast Coal study area, and $392 000 was expended to maintain, upgrade, and extend the Omineca Road from Mile 65 to Moosevale Creek and from Germansen River to Tsayta Lake.

EXPLORATION

METALS

Although exploration for metals in 1976 remained at a relatively low level compared to other years in the previous decade, for the first year since 1970 it showed an increase over a previous year. The indices of metal exploration in the following table are mixed but many show upward trends, particularly total expenditure. and claims staked. These indicate a resurgence of exploration substantially related to tbe search for uranium and massive sulphide deposits.

Table 1-S

	1974	1975	1976
Exploration expenditure --	$25 400 000	$22 100'000	$27 182 927
Claims recorded	16 971	11751	28 970
Certificates of work	48 071	39 403	36 729
Free miners' certificates-			
Individual	9 998	8 484	7 826
companies	700	562	555
Total drilling (metres)	192 935	92 802	97 277
Total geophysical surveys (line-kilometres)	6 989	4 835'	4 267

Pattern

The pattern of distribution of metals exploration on properties is grossly similar to former years. The changes from the pattern in 1975 can be summarized as follows: General increases in exploration in the East Kootenays (Invermere, Cranbrook, Fernie areas) and to the north in Revelstoke to Clearwater area, partly as a result of the discovery of the Goldstream massive sulphide deposit. Increases also occurred in the Kelowna to Rock Creek area, as the search for uranium deposits intensified. A modest increase also occurred in the north in the Cassiar to Kutcho Creek and Dease Lake areas, again partly as a result of the success of the massive sulphide deposits at Kutcho Creek and the Red-Chris porphyry deposit near Eddontenajon.

Much of the rest of the Province continued as before but some decreases in activity were evident in the Northern Rockies near Robb Lake; the Tatshenshini area, the Iskut-Stewart-Alice Arm area, and the Sustut, Cariboo, Northern Vancouver Island, and Bridge River to Alta Lake areas.

Reconnaissance exploration activity was clearly up by an unmeasured amount, much of it directed to the search for secondary uranium deposits or massive sulphides in the Omineca Belt.

Major Exploration Activity

Major exploration activity at properties not in production, defined as programs of greater than 3 000 metres of drilling or 300 metres of underground development, occurred at seven properties, the same number as in 1975. The following programs exceeded the criteria:

PAT, GOLDSTREAM (Noranda Exploration Company Limited), 92M/9W—north of Revelstoke, a bedded copper-zinc massive sulphide deposit, 3 000 metres of underground drilling, 1 200 metres of development.

SHEBA, JOY (Sheba Copper Mines Ltd.), 92I/7W—Highland Valley, a porphyry copper-molybdenum prospect, 3 130 metres of drilling.

IRON MASK, DM, NORMA (Canadian Superior Exploration Liited), 92I/9W—Iron Mask batholith near Kamloops and the Afton mine, a syenitic porphyry copper prospect, 4 010 metres of drilling.

POPLAR (Utah Mines Ltd.), 93L/2W; 93E/15W—60 kilometres south of Houston, a porphyry copper prospect, 4 334 metres of drilling.

HAB, BUY (Stikine Copper Limited), 104G/3W—Galore Creek, 160 kilometres northwest of Stewart, a major syenitic porphyry copper prospect, 5 233 metres of drilling.

JEFF, Bow, KRIS, PY (Imperial Oil Limited), 104I/1W—Kutcho Creek, 130 kilometres cast of Dease Lake, bedded, massive copper-zinc sulphide prospect, 3 $33 metres of drilling.

SMRB (Sumac Mines Ltd.), 104I/1W—Kutcho Creek, 130 kilometres east of Dease Lake and adjacent to Jeff, Bow, Kris, Py, 3 260 metres of drilling.

RED, CHRIS (Texasgulf Inc.), 104H/12W—near Eddontenajon Lake, a porphyry copper-gold prospect, about 3 000 metres of drilling (just short of the criteria).

Development and Feasibility Studies

During 1976 development work continued at two properties and feasibility studies continued at a number of others without decisive results. Warman mine of Northair Mines Ltd. came into production in March 1976 and construction of the Afton mine and plant proceeded on schedule toward production in late 1977.

Feasibility studies continued at Sam Goosly and Chappelle, and were initiated at Goldstream and Rexspar. Early in 1976, Noranda Exploration Company, Limited announced that the Goldstream deposit had reserves of 2.9 million tonnes with an average grade of 4.49 per cent copper, 3.24 per cent zinc, and 28.33 ppm of silver. No announcement was made of intentions. Drilling and feasibility studies on the Rexspar property north of Kamloops continued in 1976 with a decision to proceed to production partly dependent on necessary permits in regard to environmental aspects. Reserves are stated to be in the order of 1.45 million tonnes of better than 0.07s per cent U_3O_8.

Non-metallic Commodities

Exploration activity related to non-metallic minerals in 1976 was maintained at a moderate level similar to 1975.

The major exploration projects were related to jade, magnesite, and phosphate.

Development of jade properties continued in the Marshall Creek area northwest of Lillooet, the Mount Ogden area north of Takla Lake, and the Provencher Lake area of northern British Columbia.

Baymag Mines continued their investigation of the ROK magnesite deposit near Mount Brussilof, northeast of Radium Hotsprings.

Cominco conducted some exploration diamond drilling for phosphate on their Grave Lake property in the Elk River valley.

COAL

Distribution of Coalfields

The principal coal resources of the Province occur in comparatively narrow linear belts within the intermontane basins of the East Kootenay area (the Crowsnest Coalfield) and the inner foothills region of northeastern British Columbia (the Peace River Coalfield). These deposits of Late Jurassic to Early Cretaceous age contain major reserves of medium to low-volatile bituminous coal, generally suitable for the production of metallurgical coke.

In addition to the above-described mountain coals, local deposits of lignite, sub-bituminous, high-volatile bituminous, and semi-anthracite coals, of Late Cretaceous and Tertiary age, occur in widely scattered areas of British Columbia. Size and economic potential of most of these, including possible reserves in the former

coal-mining areas of Vancouver Island, are comparatively small, although they are of potential value for base-load power development as energy costs continue to increase. An exception to the foregoing is the Hat Creek property, which is a Tertiary lignite of limited area1 extent but of remarkable thickness.

Exploration

Exploration and development in these settings have been intense for the last three years. Exploration rose to a peak in 1975 of $13 013 350 on undeclared mines and $1 million on declared mines. In 1976 this fell very marginally to $12 913 162 on undeclared mines and $693 000 on declared mines (see Table *3-5).* The moratorium on issuance of new coal licences was continued except for seven issued to Quintette Coal Ltd. to consolidate their existing holdings. This exploration was confined to 1 090 coal licences covering 248 992 hectares, excluding the land held by freehold.

Exploration in 1976 was intense at all the producing mines of the Crowsnest Coalfield during the year with Kaiser drilling 6 553 metres on Natal Ridge, Fording drilling 3 000 metres of diamond and 84 000 metres of rotary, Coleman drilling 3 598 metres at Tent Mountain, and Byron Creek drilling 1 608 metres. Many of the other major properties in the Crowsnest Coalfield have completed their drill programs and are in tbe process of getting necessary permits and sales contracts. However, Elco Mining Ltd. carried out a major program of drilling (6 790 metres of diamond, 310 metres of rotary) as well as bulk sampling.

In the Peace River Coalfield exploration programs are not generally as advanced and very active drilling is still under way. Major projects (3 000 metres of drilling or 300 metres of underground development) were carried out at the following properties, listed from south to north:

SAXON (Denison Coal Limited), 93I/8—adjacent to Alberta boundary 4 421 metres, four adits.

BELCOURT-MONKMAN (Canadian Superior Oil Limited), 93I/8, 10, 15—from Kinuseo Creek to Belcourt River, 3 344 metres.

QUINTETTE (Denison Coal Limited), 93I/14, 93P/3—Kinuseo Creek to Bullmoose Creek, 4 102 metres, three adits with 222 metres combined.

BULLMOOSE-CHAMBERLAIN (Teck Corporation Ltd.), 93P/3, 4—Bullmoose Mountain, 3 846 metres, two adits with 100 metres combined.

CARBON CREEK (Utah Mines Ltd.), 93O/15, 94B/2—south of Williston Lake, 3 288 metres of diamond drilling, 6 300 metres of rotary drilling, six adits with 515 metres combined.

In the other coalfields the only major program was at Hat Creek, 24 kilometres west-northwest of Ashcroft, where British Columbia Hydro and Power Authority drilled 89 diamond-drill holes with an aggregate depth of 20 422 metres and a 108-tonne sample was produced by auger holes.

Late in 1976, B P Exploration Canada Limited acquired the underground rights in the Sukunka-Coalition coal properties formerly held by Brameda Resources Ltd. Teck Corporation Ltd. retained the surface rights in the Bullmoose-Chamberlain area.

THE PETROLEUM AND NATURAL GAS INDUSTRY IN 1976

by

A. G. T. WEAVER and W. L. INGRAM

A substantial recovery of most activities r&ted to the petroleum industry in the Province was made in 1976 due primarily to substantial gas price increases introduced in October 1975. For three consecutive years steady decreases had been recorded in both the drilling and production operations. However, except for the continuing decline in gas production due to normal depletion, this downward trend was reversed in 1976.

DRILLING

Footage drilled and total wells completed increased over 120 per cent compared to 1975. During the year, 184 wells were. completed and 928 776 feet were drilled in comparison to 81 wells and 421 547 feet. The footage made at development locations more than tripled, while exploratory footage was nearly double. Successful wells similarly increased from 2 to 13 oil completions and from 31 to 95 gas completions. There were 71 well locations abandoned compared to 44 in 1975.

All of the drilling activity, which was again limited to the northeastern corner of the Province, was accomplished by 52 individual drilling rigs owned by 18 contractors and employed by 51 different oil companies.

During 1976, industry experienced considerable success in stimulating shallow Cretaceous gas wells utilizing both the gelled condensate frac and alcoholic foam frac. Resultant flow rates from wells stimulated in this manner have been so encouraging that these techniques have gained industry acceptance.

One major blow out and resultant fire occurred during 1976 at a well located in 1 l-26-84-23. This well was being completed for production when the blow out occurred. The gas flow was estimated at between 5 and 10 MMSCF/D and continued fairly steady for about three and one-half days, blowing sweet gas up through the drilling rig derrick. Adair well control specialists were called in and, while attempting to save the drilling rig and other ancillary equipment, the well caught fire presumably from truck exhaust. At this point all efforts were then concentrated toward killing and closing in the well. It took nine days to finally close. in the well and during this time section personnel continuously monitored events at the well site.

During 1976 a major recompletion and testing program was undertaken in the Grizzly Valley area. Seven wells were. selected for recompletion, stimulation, and subsequent testing. This project continued for three and one-half months and during that period section personnel were continuously involved in all aspects of the field work.

PRODUCTION

An abrupt reversal in the annual oil production was noted for 1976, although the gas production continued to decline. The oil production increased 5 per cent to 14 890 811 barrels or an average of 40 797 barrels a day. Annual gas production decreased 4 per cent to 372 565 267 MCF.

The largest producing oil fields were Boundary Lake, 6 919 634 barrels; Peejay, 1 725 748 barrels; Inga, 1 669 051 barrels, and Milligan Creek, 1 079 651 barrels. The Clarke Lake field produced the largest gas volume, 80 226 278 MCF,

which was followed by Yoyo, 71 640 639 MCF; Sierra, 31582 013 MCF; and Laprise Creek, 20 583 020 MCF. Of the eight oil and gas fields mentioned only Inga and Yoyo produced greater annual volumes than in 1975.

Two operational procedures involving water continued throughout the year. Waterflood operations to aid the efficiency of oil recovery were used in 10 producing pools in the Province. A total of 35 950 531 barrels, including both fresh and formation water, was injected into 150 water-injection wells. Disposal of salt-water produced with petroleum and natural gas was accomplished by injection into subsurface formations, preferably the formation from which the water originated. During 1976, there were 8 588 798 barrels injected into 28 disposal wells and 19 985 barrels put into evaporation pits. Six applications to convert wells to salt-water disposal service were approved in Fort St. John, Gundy Creek, Helmet (2), Sierra, and Tsea fields.

An application for 320-acre spacing in the Baldonnel gas pool in Laprise Creek Field was denied following an objection from one of the operators. The Branch felt that it would be improper to permit one operator to drill on 320-acre spacing at his location boundary if the offsetting operator did not wish to do so but would be forced to follow suit to prevent drainage. Three applications for 320-acre spacing for oil wells were approved.

Five applications for concurrent depletion of oil column and gas cap were received for the Aitken Creek Gething pool, Boundary Lake Dunlevy B pool, Cecil Lake North Pine A pool, Peejay North Halfway project, and Peejay West Halfway pool. These were all approved in principle but were subject to certain conditions. At year-end only the Peejay North Halfway project was producing concurrently. The Aitken Creek application for concurrent depletion was supported by a model study with predictions of the performance of the reservoir under the present production method, with several offtake rates from the gas cap and under waterflood. The Branch approved the application on the basis that the present worth of increased energy production from the reservoir was beneficial to the Province.

Consideration is being given to the utilization of the Aitken Creek gas cap as a 'gas storage reservoir. Gas would be taken from the Westcoast main line during the low demand months and stored in the gas cap; during the high demand months gas would be taken from the gas cap and returned to the main line. During the year a program of testing wells in the Aitken Creek gas cap to determine productivity and injectivity was carried out by the operator.

Major changes in production facilities made during 1976 included the extension of the Inland Natural Gas pipeline system in southern British Columbia, the connection of the gas pipeline to the Helmet area, and the commencement of sulphur extraction at the Fort Nelson plant.

EXPLORATION AND DEVELOPMENT

An aggressive exploratory drilling program heavily committed to the general Fort St. John area and to a lesser extent north of Fort Nelson resulted in 11 New Pool oil discoveries and 3 1 New Pool gas discoveries for an over-all success ratio of 48 per cent. None of the 42 completions were given major discovery status.

Most of the oil discoveries were made within the Triassic Charlie Lake Formation in stratigraphic sand developments of limited thickness and areal extent. All of the New Pool oil discoveries were encountered within the Fort St. John area and are considered to be relatively insignificant in terms of new reserve potential.

Approximately two thirds of the New Pool gas discoveries were made in Mesozoic rock sequences of the Fort St. John area. With the exception of the Half-

way Formation most of the discovered gas offered small appreciable reserve potential. However, the continuous sandstone phase of the Halfway Formation located west of the Peejay-Beatton River oil trend registered several encouraging gas completions during the year: These commercial gas accumulations were encountered in relatively thick sandstone sequences associated with narrow structural folds.

A number of New Pool discoveries of interest were completed to the northeast of Fort Nelson. The Quintana HBOG Roger a-30-A/94-J-15 well encountered a Middle Devonian gas-bearing pinnacle reef a few miles to the north of the Clarke Lake facies front. The reservoir rock and accumulation is comparable to the producing intervals of the Yoyo and Sierra gas pools. Mobil Sahtaneh d-86-J/94-I-12 located midway between the Clarke Lake and Sierra fields penetrated a substantial thickness of Slave Point gas-bearing section. The gas accumulation of the Sahtaneh well is associated with a reefal front which would appear to offer excellent prospects of extension type drilling. A minor amount of new gas was encountered in the Upper Devonian Jean Marie carbonates of several wells within the general Helmet area.

Development drilling activity which more than doubled over the previous years drilling had a success ratio of 64 per cent. Most of the development drilling took place within the general Fort St. John area with successful gas extensions to a number of established pools and the more recently discovered Town Halfway and Buick Creek West Bluesky gas pools. Development activity in the northern area included extension drilling at Helmet and Kotcho and deliverability drilling in the Clarke Lake, Yoyo, and Sierra gas fields.

The volume of geophysical industry activity increased almost four-fold over the previous year. Most of this activity was centred in tbe Middle Devonian Reef areas near Fort Nelson with a minor amount being in the Cretaceous and Triassic plays further south near Fort St. John and Dawson Creek. A total of 84 projects was approved during the year.

Table 1-6—Oil Discoveries, 1976

Well Authorization No.	Well Name	Location	Total Depth (Feet)	Productive Horizon
3649	Imperial et al Mica 11-34	11-34-81-14 W6M	12 154	Confidential.
3671	Coseka et al Velma d-79-E	d-79-E/94-H-8	3 700	Charlie Lake.
3723	Pacific Stoddart A6-16	A6-16-86-19 W6M	4 300	Cecil.
3770	Wescent et al Red Creek 11-15	11-15-85-21 W6M	5 136	Confidential.
3780	Dome Buick a-63-G	a-63-G/94-A-14	3 645	Confidential.
3782	Scurry CanPlac Eagle 14-27	14-27-84-18 W6M	6 050	Siphon.
3802	Scurry CanPlac Eagle West 6-36	6-36-84-19 W6M	6 190	Confidential.
3803	Ashland Numac Fireweed b-8-H	b-8-H/94-A-13	4 440	Dunlevy.
3804	Monsanto Cecil 6-7	6-7-84-17 W6M	5 525	Confidential.
3806	Monsanto Cecil 6-6	6-6-85-17 W6M	4 892	Cecil.
3838	Kilo Buick a-67-I	a-67-I/94-A-11	4 604	Confidential.

Table I-7-Ga.s Discoveries, 1976

Well Authorization No.	Well Name	Location	Total Depth (Feet)	Productive Horizon
3637	Quintana HBOG Roger a-30-A	a-30-A/94-J-15	6 735	Pine Point.
3640	Decalta Fina Chowade d-8-A	d-8-A/94-B-10	9 987	Doig.
3664	Pacific Red Creek 11-8	11-8-86-21 W6M	5 572	Halfway.
3665	Cdn Res Union et al Kotcho d-7-J	d-7-J/94-I-14	6 500	Slave Point.
3676	Chevron SOBC Kyklo d-26-K	d-26-K/94-I-11	6 110	Slave Point.
3678	Chevron Helmet North b-22-B	b-22-B/94-P-10	6 810	Jean Marie.
3684	Quintana PCP Helmet S c-61-C	c-61-C/94-P-7	6 235	Slave Point.
3685	Mobil Sahtaneh d-86-J	d-86-J/94-I-12	7 799	Slave Point.
3699	BP GAO Birley d-91-I	d-91-I/94-H-3	4 058	Bluesky.
3706	BP Ethyl Dot 4-11-I	d-11-I/94-H-5	4 480	A Marker.
3712	APL CanPlac Sunlite Helmet a-6-K	a-6-K/94-P-7	6 140	Jean Marie.
3717	ARCo Maxhamish b-21-K	b-21-K/94-O-14	7 520	Mattson.
3728	Pacific WP Ft St John SE 14-33	14-33-82-17 W6M	4 180	Siphon.
3733	Westccast et al Kimea b-7-L	b-7-L/94-P-8	6 880	Slave Point.
3750	Dome et al Laurel d-19-C	d-19-C/94-H-1	3 669	Gething.
3752	Ashland et al Helmet a-85-G	a-85-G/94-P-7	6 138	Jean Marie-Slave Point.
3758	CZAR et al Fireweed a-81-A	a-81-A/94-A-13	4 155	Bluesky-Dunlevy.
3762	Canhunter Bubbles a-9-A	a-9-A/94-G-8	5 390	Halfway.
3765	Sundance et al Flatrock 10-17	10-17-85-16 W6M	4 800	Halfway.
3771	CZAR et al Birch a-89-E	a-89-E/94-A-14	4 000	Confidential.
3772	Norcen Pembina Attachie 11-26	11-26-84-23 W6M	4 825	Pingel.
3779	Pacific Westccast Pingel 6-27	6-27-81-18 W6M	3 460	Confidential.
3792	Canhunter et al Julienne S b-82-L	b-82-L/94-B-16	8 632	Confidential.
3797	Canhunter et al Altares a-23-A	a-23-A/94-B-8	7 000	Confidential.
3801	Kilo Dome Buick c-14-H	c-14-H/94-A-14	3 850	Confidential.
3808	CZAR et al Blueberry A11-19	A11-19-88-24 W6M	4 259	Bluesky-Dunlevy.
3819	CZAR et al Monias 10-5	10-5-82-21 W6M	4 940	Halfway.
3820	Pacific Canhunter Grewatsch d-99-B	d-99-B/94-G-8	5 390	Baldonnel.
3821	AEG Cache North b-82-I	b-82-I/94-A-12	5 218	Confidential.
3835	Westcoast Numac Silver a-23-C	a-23-C/94-H-11	4 215	Confidential.
3857	Westcoast Mesa Kyklo a-47-I	a-47-I/94-I-11	1 710	Debolt.

LAND DISPOSITIONS

As a result of a very considerable increase in activity and interest in exploration and development, revenues to the Crown for fees, rents, and bonuses were up 227 per cent to $57 426 007. The fees and rents were up slightly but the major increase of 339 per cent to $43 226 441 was recorded in the Crown reserve disposition bonuses paid to explore and develop resources. AU three categories, i.e., permits, leases, and drilling reservations, were up sharply both in totals received and in prices paid per acre.

Activity of the Ministry

CHAPTER 2

CONTENTS

HISTORY AND FORMATION

The Department of Mines was created in 1874. Before that time, mining laws were administered by the Provincial Secretary's Department, to a great extent through the Gold Commissioners, the first of whom was appointed in 1858. As the Province grew, and mining increased in importance and diversity, the Bureau of Mines was formed as a technical division within the Department. Composed of professional men under the direction of a Provincial Mineralogist, the Bureau lasted from 1896 to 1934, when it was succeeded by the Mineralogical Branch. In 1953, tbe Department took over from the Department of Lands the administration of the *Petroleum* and Natural *Gas* Act and the Coal Act. The Department of Mines became the Department of Mines and Petroleum Resources in 1960, and then the Ministry of Mines and Petroleum Resources in October 1976.

The Ministry administers the laws and regulations governing the entire mineral industry, which is second only to tbe forest industry in terms of gross value. The value of production was over $1.5 billion, while that of the forest industry was $4.3 billion. However, the annual revenue of approximately $141 million generated by the Ministry is about double the revenue of the Ministry of Forests.

The Ministry provides technical services that are intended particularly to aid in the orderly development of tbe Province's natural resources of metals, minerals, coal, petroleum, and natural gas. These services include geological mapping and research investigations; aid to prospectors; financial aid in the construction of mining roads; advice to small operators; information to the public; determination of rocks and minerals; promotion of safety in all operations; general betterment of working conditions; encouragement of exploration, development, and conservation; and maintenance of records. These services are provided in order that new deposits and fields may be found to maintain the industry and in order that the known deposits and fields may be worked to the best advantage of the Province.

LEGISLATION

During the Session of the Legislature in 1976, four Acts directly affecting the mineral and petroleum industries were passed. These were Bill 21, ***Prospectors Assistance Amendment Act,*** 1976; Bill 25, ***Petroleum and Natural Gas (1965) Amendment Act,*** 1976; Bill 30, ***Mineral Amendment Act,*** 1976; and Bill 57, ***Mineral Resource Tax Act.*** In addition, Bill 53, ***Municipal Amenment Act, 1976*** and Bill 54, ***Energy Amendment Act, 1976*** had some impact on mineral resources.

The Prospectors Assistance Act was amended to eliminate the first rights of the Government to purchase; lease, or option properties discovered on the program and to emphasize training of prospectors;

The ***Petroleum and Natural Gas Act, 1965 was*** amended to clarify some. sections and correct certain differences in Part III concerning entry, mediation, and arbitration.

The Mineral Act was amended in regard to the conditions under which mineral claim owners can bring mines into production. The principal amendments in this regard are the following:

(1) The right of the free miner to mine his mineral claim is given by an amendment to section 12.

(2) For major production a mining lease is required, which must be certified in production. This certification requires the submission of technical reports to the Chief Gold Commissioner, payment of a prescribed fee, and compliance with sections 10 and 11 of the Mines Regulation *Act,* which relate to approval by the Mining Inspector and approval of reclamation plans.

(3) Limited production may take place on a mineral claim provided certain technical reports are submitted, a prescribed fee has been paid, and the free miner complies with sections 10 and 11 of the *Mines Regulation Act.*

(4) Suspension of a lease at the discretion of the Minister of cancellation by the Lieutenant-Governor in Council has been removed.

The *Mineral Resource Tax Act* imposes a 17½-per-cent tax on the net income from the operation of a mine producing minerals as defined in the *Mineral Act.* The Act also

(1) repeals the *Mineral Royalties Act as* of January 1, 1977, and abolishes the incremental royalty from April 1, 1976;

(2) amends the *Mining Tax Act* to make it no longer applicable to minerals to which this Act applies. Coal, sand, gravel, and certain industrial minerals will remain subject to the Mining *Tax Act;*

(3) amends the Mineral *Land Tax Act* to allow the forgiveness of the *section 4* tax on land used for agricultural purposes;

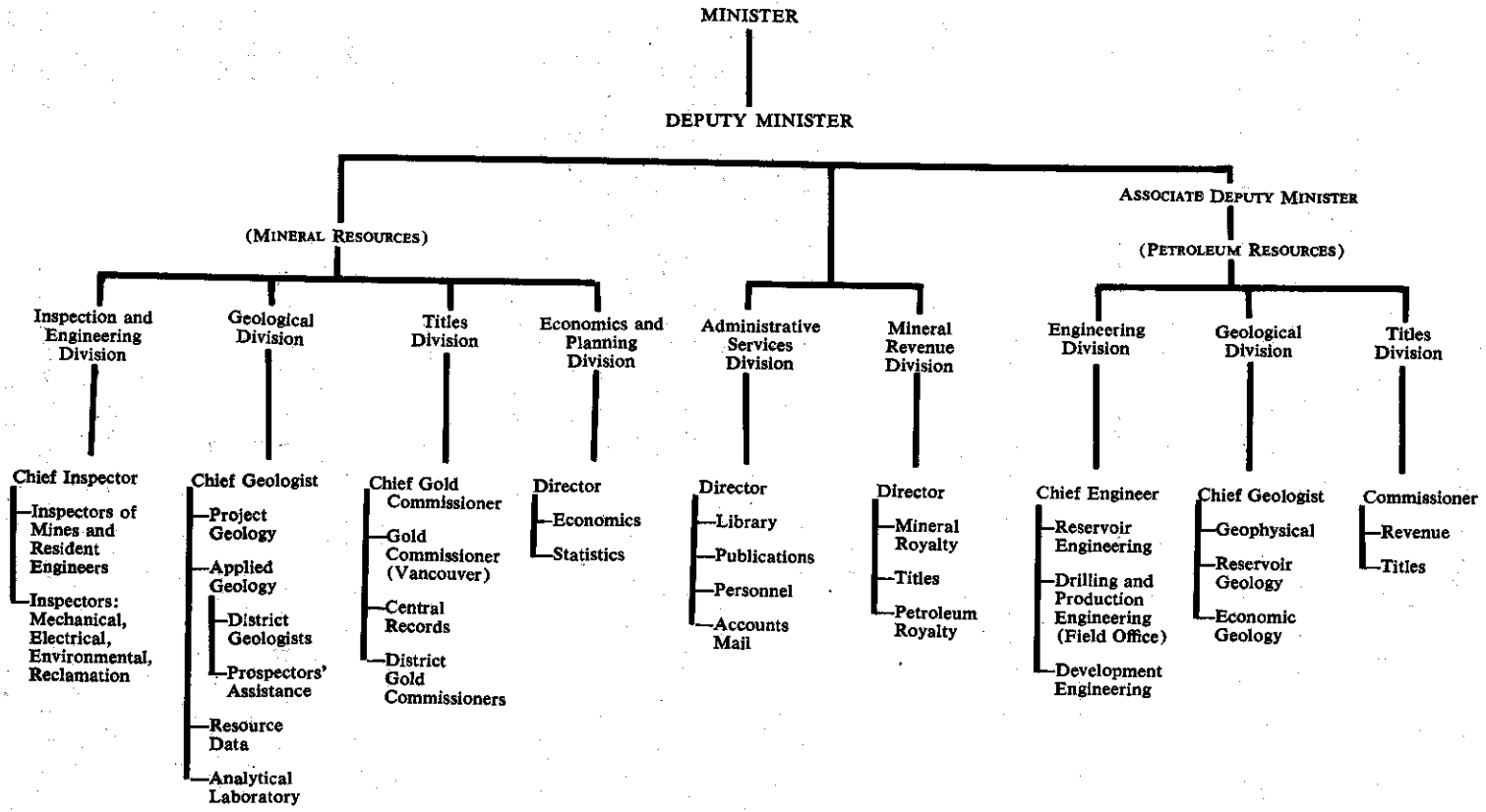
(4) amends the Income *Tax Act* to disallow the resource allowance and the deduction from *income* of 1976 royalties assessed under the *Mineral Royalties Act.*

The new tax is effective at the beginning of the fiscal year of operation starting in 1976.

ORGANIZATION

The organization of the Ministry continued to evolve in 1976, mostly early in the year. Firstly, a management committee was created on January 6, 1976, consisting of the two Associate Deputy Ministers, James T. Fyles and John D. Lineham. At the same time, Operations Branch, created in 1975, was discontinued and its components redistributed. Basically administrative components and Mineral Revenue Division reported directly to the management committee; Mineral Development Division became Economics and Planning Division, Mineral Resources Branch; Prospectors' Assistance was transferred to Geological Division, Mineral Resources Branch; and Roads and Trails returned to Inspection and Engineering Division, Mineral Resources Branch. The Public Information function was dispersed; Library and Publications reported to committees.

Dr. Fyles was appointed Deputy Minister by the Honourable T. M. Waterland on January 16, 1976, but otherwise the organization continued similarly as shown on the accompanying chart-applicable on December 31, 1976.


MINISTER
DEPUTY MINISTER
(MINERAL RESOURCES)
ASSOCIATE DEPUTY MINISTER
(PETROLEUM RESOURCES)
Inspection and Engineering Division
Geological Division
Titles Division
Economics and Planning Division
Administrative Services Division
Mineral Revenue Division
Engineering Division
Geological Division
Titles Division
Chief Inspector
Inspectors of Mines and Resident Engineers
Inspectors: Mechanical, Electrical, Environmental, Reclamation
Chief Geologist
Project Geology
Applied Geology
District Geologists
Prospectors' Assistance
Resource Data
Analytical Laboratory
Chief Gold Commissioner
Gold Commissioner (Vancouver)
Central Records
District Gold Commissioners
Director
Economics
Statistics
Director
Library
Publications
Personnel
Accounts Mail
Director
Mineral Royalty
Titles
Petroleum Royalty
Chief Engineer
Reservoir Engineering
Drilling and Production Engineering (Field Office)
Development Engineering
Chief Geologist
Geophysical
Reservoir Geology
Economic Geology
Commissioner
Revenue
Titles

APPOINTMENTS

The Honourable T. M. Waterland, who was appointed Minister of Forests as well as of Mines and Petroleum Resources in December 1975, relinquished the latter portfolio on October 29, 1976. The Honourable James R. Chabot was appointed Minister of Mines and Petroleum Resources at that time.

Dr. James T. Fyles was appointed Deputy Mister on January 16, 1976. Dr. E. W. Grove, Senior Geologist of Applied Geology Section, Mineral Resources Branch, was also appointed Director of Prospectors' Assistance on January 9, 1976.

BRANCH ACTIVITY

The organization, function, staff, and activities of the major components of the Ministry are reviewed.

MINERAL RESOURCES BRANCH

The Mineral Resources Branch, under the direction of Deputy Minister James T. Fyles, consisted of four divisions—Inspection and Engineering, Geological, Titles, and Economics and Planning.

INSPECTION AND ENGINEERING DIVISION

Inspectors stationed at the following listed locations inspected coal mines, metal mines, and quarries. They also examined prospects, mining properties, roads and trails, and carried out special investigations under the Mineral Acf. The Environmental Control Inspectors, supervised by S. Elias, conducted dust, ventilation, and noise surveys at all mines and quarries and, where necessary, made recommendations to improve environmental conditions. P. E. Olson supervised the roads and trails program. J. D. McDonald administered the reclamation sections of the Coal *Mines Regulation Act* and *the Mines Regulation Act.* A. R. C. James, Senior Inspector, Coal, had additional duties as mining adviser to the Securities Commission. Mine-rescue training is completed under the direction of the Co-ordinators, Rescue Training, for the areas in which their stations are located.

Staff

Inspectors and Resident Engineers

J. W. Peck, Chief Inspector of Mines ..... Victoria
J. E. Merrett, Deputy Chief Inspector of Mines ..... Victoria
A. R. C. James, Senior Inspector of Mines; Aid to Securities ..... Victoria
V. E. Dawson, Senior Inspector of Mines, Electrical-Mechanical ..... Victoria
J. Cartwright, Inspector of Mines, Electrical ..... Victoria
P. E. Olson, Senior Inspector, Mining Roads ..... Victoria
J. D. McDonald, Senior Inspector, Reclamation ..... Victoria
D. M. Galbraith, Inspector, Reclamation ..... Victoria
S. Elias, Senior Inspector, Environmental Control ..... Vancouver
G. V. Lewis, Inspector, Environmental Control ..... Vancouver
N. D. Birkenhead, Technician, Environmental Control ..... Vancouver
J. W. Robinson, Inspector and Resident Engineer ..... Vancouver

Inspectors and Resident Engineers—Continued

W. H. Childress, Inspector, Technician	Vancouver
W. C. Robinson, Inspector and Resident Engineer	Nanaimo
H. A. Armour, Inspector, Technician	Nanaimo
B. M. Dudas, Inspector and Resident Engineer	Prince Rupert and Kamloops
B. Varkonyi, Inspector, Technician	Prince Rupert
J. F. Hutter, Inspector and Resident Engineer	Smithers
S. J. North, Inspector, Technician	Smithers
A. D. Tidsbury, Inspector and Resident Engineer	Prince George
D. I. R. Henderson, Inspector and Resident Engineer	Prince George and Fernie
L. H. Kocich, Inspector and Resident Engineer	Prince George
K. G. Hughes, Inspector, Technician, Mechanical	Prince George
J. J. Sutherland, Inspector, Technician	Prince George
B. E. Warner, Technician, Reclamation	Prince George
D. Smith, Inspector and Resident Engineer	Kamloops
E. S. Sadar, Inspector and Resident Engineer	Kamloops
R. H. Heistad, Inspector, Technician, Mechanical	Kamloops
J. A. Thomson, Inspector, Technician	Kamloops
J. B. C. Lang, Inspector and Resident Engineer	Nelson
A. L. O'Bryan, Technician, Reclamation	Nelson
R. W. Lewis, Inspector and Resident Engineer	Fernie

Co-ordinators, Mine-rescue Training

G. J. Lee, Senior Co-ordinator	Victoria
T. H. Robertson	Nanaimo
J. E. A. Lovestrom	Smithers
R. J. Stevenson	Prince George
B. A. McConachie	Kamloops
E. C. Ingham	Nelson
A. Littler	Fernie

Staff Changes

In February, Gordon V. Lewis resigned from the staff of the Environmental Control Section, and R. W. Lewis resigned from the Inspection staff in April. T. H. Robertson, Co-ordiiator, Rescue Training, retired in August. In December 1975, T. M. Waterland was elected as member of the Provincial Government and was appointed Minister of Mines and Petroleum Resources, and Mister of Forests, in 1976.

On R. W. Lewis' resignation from the Femie office he was replaced by D. I. R. Henderson on transfer from Prince George. L. H. Kocich was appointed Inspector and Resident Engineer in November in Prince George.

B. M. Dudas transferred from Prince Rupert to the Kamloops office in October to fill the Inspector and Resident Engineer's vacancy caused by the leave of absence granted to T. M. Waterland.

GEOLOGICAL DIVISION

Objectives

The objectives of the Geological Division are to provide accurate and current information on the quantity and distribution of mineral and coal deposits of the Province for Government and industry, to provide maps and other data, ideas, and interpretations useful in the search for these deposits, and to assist in the orderly exploration, development, and use of these resources.

Organization and Function

To carry out these objectives, the Division is organized into four sections, under the over-all direction of Dr. A. Sutherland Brown. The Division is dominantly oriented to geological mapping and field studies but also carries on significant office studies. The roles of the various sections are as follows:

Project Geology, under Dr. N. C. Carter, is a field-oriented section with 11 geologists concerned principally with geological mapping of areas of high and moderate mineral and coal potential, and studies of the deposits in these areas. Such projects in the past have contributed to increased exploration and the discovery of additional resources. The emphasis in the past has been on metal deposits, but geologists in the section are currently making significant contributions *in* regard to the coal program.

Applied Geology, under Dr. E. W. Grove, is a field-oriented section of six geologists concerned with monitoring the activity of the exploration and mining industry, evaluating mines and prospects for several purposes, and with helping small operators, prospectors, and exploration geologists. The section was therefore highly involved in the Prospectors' Assistance Program and related training of prospectors. The District Geologists, resident in Smithers, Prince George, Kamloops, and Nelson, also represent the Ministry on many intergovernmental committees.

Resource Data, under Dr. J. A. Gamett, is an office-oriented section of five geologists concerned principally with the gathering, compilation, and computerization of data relating to the mineral resources of the Province, and also with interpretations of this data for various integrated land use studies and other special projects.

Analytical Laboratory, under Dr. W. M. Johnson, has a professional and technical staff of nine. The laboratory provides a full service of analyses of rocks and assays of metals in significant and trace amounts of samples submitted by Ministry geologists and engineers, prospectors under the ***Prospectors Assistance Act*** and other prospectors, and by other ministries of the Government.

Staff

The professional staff of the Division on December 31, 1976, was as follows:

A. Sutherland Brown, Ph.D., P.Eng. ---------- -.-Chief Geologist
N. C. Carter, Ph.D., P.Eng. ---------- -Senior Geologist
J. A. Gamett, Ph.D., P.Eng. . . . . ----Senior Geologist
E. W. Grove, Ph.D., P.Eng. ---------- Senior Geologist
W. M. Johnson, Ph.D. ---------- Chief Analyst
P. F. Ralph, L.R.I.C. ---------- Deputy Chief Analyst
P. A. Christopher, Ph.D., P.Eng. ---------- Geologist

B. N. Church, Ph.D., P.Eng. ---- Geologist
G. E. P. Eastwood, Ph.D., P.Eng. ---- Geologist
R. D. Gilchrist, B.Sc. ---- Geologist
T. Höy, Ph.D., P.Eng. ---- Geologist
E. V. Jackson, B.Sc., P.Eng. ---- Geologist
W. D. McCartney, Ph.D., P.Eng. ---- Geologist
W. J. McMillan, Ph.D., P.Eng. ---- Geologist
K. E. Northcote, Ph.D., P.Eng. ---- Geologist
A. Panteleyev, Ph.D., P.Eng. ---- Geologist
D. E. Pearson, Ph.D., P.Eng. ---- Geologist
V. A. Preto, Ph.D., P.Eng. ---- Geologist
A. F. Shepherd, B.A.Sc., P.Eng. ---- Geologist
G. G. Addie, M.Sc., P.Eng. ---- District Geologist, Nelson
G. H. Klein, B.A.Sc., P.Eng. ---- District Geologist, Prince George
T. G. Schroeter, M.Sc. ---- District Geologist, Smithers
G. P. E. White, B.Sc., P.Eng. ---- District Geologist, Kamloops
G. L. James ---- Systems Analyst (Geology)
Rosalyn J. Moir ---- Assistant Editor
J. L. Armitage ---- Chief Draughtsman
R. E. Player ---- Lapidary and Photographer
N. G. Colvin ---- Laboratory Scientist
R. J. Hibberson, B.Sc. ---- Laboratory Scientist
B. Bhagwanani, B.Sc. ---- Laboratory Scientist
Miss V. V. Vilkos, Ph.D. ---- Laboratory Scientist
M. A. Chaudhry ---- Laboratory Technician
F. F. Karpick ---- Assayer
L. E. Sheppard ---- Laboratory Technician

The Ministry also has contracted for the services of A. H. Matheson, B.Sc., to supervise the coal inventory and prepare Mineral Deposit/Land Use maps.

Staff Changes

During the year, three geologists resigned or retired and no replacements were made.

J. W. McCammon retired after 28 years with the Ministry as a specialist in industrial minerals and structural materials. During that time he had been responsible for inventory and had been author or co-author of bulletins on "Clay and Shale Deposits of British Columbia," "Calcareous Deposits of Southwestern British Columbia," and "Surficial Geology and Sand and Gravel Deposits of the Sunshine Coast, Powell River, and Campbell River Areas."

Judith Winsby resigned as Research Officer (Geology) after four years with the Ministry.

A. F. Bowman resigned as geomathematician after two years with the Ministry.

A. F. Shepherd was transferred, January 11, from the Administrative Services Division, Operations Branch. His new duties with the Applied Geology Section as 'Assistant Director, Prospectors' Assistance, involved prospectors' grants, prospectors' training programs, and co-ordination of Ministry-sponsored geology

courses throughout the Province. He has continued his geological information services to the public, prospectors, and industry.

R. J. Moir was transferred from the Administrative Services Division, Operations Branch, to the Publications Section.

Review of *Work in 1976*

Project Geology-The highlights in the year included the extension of field mapping programs in the Peace River Coalfield as well as Crowsnest Coalfield; extension of mapping related to massive sulphide deposits in the Omineca Belt, and start of the intensive uranium program of field mapping as well as initiation of the Federal-Provincial Uranium Reconnaissance Program of geochemistry.

An outline of major field projects was as follows:

P. A. Christopher started study of secondary uranium deposits in the Kelowna area.

B. N. Church completed studies in the Greenwood area.

G. *E. P. Eastwood* continued review of mineral deposits on Vancouver Island.

T. Höy continued studies in the East Kootenays in regard to lead-zinc stratiform deposits and the structure and stratigraphy relative to Goldstream and other massive sulphide deposits.

W. J. McMillan reviewed porphyry and other deposits in the Taseko Lakes area.

K. E. Northcote continued with his studies of the Iron Mask batholith and its copper deposits.

V. A. Preto concluded his studies of the Nicola volcanic rocks and mineral deposits.

A. *Panteleyev* continued his studies of structure and stratigraphy and massive sulphide deposits at Kutcho Creek and the Red-Chris and Galore Creek porphyry deposits.

Coal Program

D. E. Pearson started detailed study of the coal beds and measures in the southern Crowsnest Coalfield.

R. D. Gilchrist started 1:50 000 scale mapping in the southern part of the Peace River Coalfield.

Prof. D. McL. Duff continued his correlation studies, this year in the Peace River Coalfield.

In addition, a number of thesis projects were sponsored.

Resource Data-This section continued its former program but augmented it in two ways. Firstly, coal files were consolidated under the supervision of A. H. Matheson as the coal inventory. Secondly, the MINDEP computer file of over 8 000 mineral occurrences, that had been developed over a four-year period by the Department of Geological Sciences, University of British Columbia, in co-operation with the Geological Division and with Provincial, Federal, and industry support, became operational on the Government computer facility at Victoria. Updating and expansion of this file is now the responsibility of the section.

Applied Geology-This section became responsible for the Prospectors' Assistance Program in addition to its previous program related to aiding and monitoring exploration by district offices. New policy emphasized prospector training but continued a program of grants to prospectors on proof of competency and within limits of the budget. In addition, district geologists were involved in short-term but detailed field studies at a large number of properties within their areas.

Analytical Laboratory-The Analytical Laboratory had a productive year in terms of output and method improvement. In addition, a satellite terminal connected to the Government Honeywell computer system was installed which improved the turn-around time. for the data treatment of our total silicate analysis from three weeks to one day. The 'Laboratory purchased a double-beam IL 351 atomic absorption spectrometer with background correction capabilities and this has significantly improved our ability to do trace element analyses on rock and silt samples. We also received a new U-Th analysis system based on a NaI detector and multi-channel analyser.

W. M. Johnson spent March and April in the Geological Survey of Canada Laboratories in Ottawa on educational leave. He visited many other laboratories while he was there, including the U.S.G.S. facilities in Reston, Virginia, N.R.C., A.E.C., and Bondar Clegg.

Paul Ralph attended a very informative seminar on the computerization of analytical instruments held in Ottawa in November.

M. A. Chaudhry went to New York for a two-week course on X-ray diffraction at the end of August.

The Analytical Laboratory hosted an X-ray School and Workshop run by Philips in May. There were 18 registrants, including three persons from our laboratory who attended (B. Bhagwanani, M. A. Chaudhry, and V. Vilkos) .

Wet Chemical Laboratory: There were 323 results reported on 126 samples from general prospectors, 701 results on 326 samples from grubstaked prospectors, and 5 622 results on 933 samples from Ministry geologists and other Governmental personnel. This represents a total of 6 646 results on 1 385 samples. Of these, 236 samples were for total silicate analysis. The 236 samples, duplication, standards, quality control, and method improvement involved doing over 500 individual samples to obtain the results for the 236. These included numerous K results determined for age-dating purposes.

Emission Spectrographic Laboratory: There were approximately 22 500 semi-quantitative determinations made on 780 samples and 3 738 quantitative trace element results on 1 528 samples. This includes a large number of results on the suite of samples submitted by E. W. Grove.

X-ray Diffraction Laboratory: There were 132 mineral identifications made, 56 diffractograms recorded for D. E. Pearson's coal project, and numerous F and U_3O_8 determinations (the latter included in the Wet Chemical section and the former not yet reported and so not yet counted in the statistics).

Sample Comrninution: There were 990 samples submitted by Ministry geologists and other Government personnel prepared for subsequent analytical work and 498 samples submitted by prospectors (general and grantees) were prepared. Also 24 samples were crushed and fused for RI work.

Mineral Separation: A total of 24 mineral separates were prepared for age-dating purposes and seven samples were crushed and sized in preparation for separation.

In. total, the Laboratory produced 33 016 results, 56 diffractograms, 24 mineral separates, and other miscellaneous services during the year.

Publications

Most of the work of the Division is made available to the interested public through a series of publications, maps, and also through open files. The most important publications include the following:

(1) ***Geology, Exploration and Mining in British Columbia*** is our major yearly 'publication that summarizes and collates all known exploration and mining activity each year as well as reports on properties by Division geologists and by Mine Inspection engineers. Since 1975 the publication is issued initially as three separate publications.

(2) Geological Fieldwork is a smaller yearly publication that describes the work of project and district geologists in a preliminary manner as soon as possible after the completion of the field season and within the same calendar year.

(3) Bulletins are produced at irregular intervals, usually one or two a year, and generally describe the geology and mineral deposits in detail of various areas of mineral potential mapped by Division geologists. No bulletins were published in 1976.

(4) Lithographed Geological Maps. In 1976 the following were issued:

Map ***A-Generalized Geological Map*** of ***the Canadian Cordillera, 48*** degrees north to 65 degrees north, by E. V. Jackson (1:2 500000).

Map ***B-Faults, Porphyry Deposits and Showings, and Tectonic Belts of the Canadian Cordillera,*** 48 degrees north to 65 degrees north, by R. H. Seraphim, V. F. Hollister, E. V. Jackson, S. H. Pilcher, J. J. McDougall, and A. Sutherland Brown (1: 2 500 000) ; an overlay for Map A.

(5) Preliminary Maps, issued as ozalids. In 1976 the following were issued :

Map 20—*Morehead* ***Lake Area*** (92A/ 1 2), by David G. Bailey.

Map ***21-Nicola Group south*** of ***Allison Lake*** (92H/10E), by V. A. Preto.

Map ***22-Radioactive Occurrences in British Columbia,*** by P. A. Christopher.

Map 23—*Toby* ***Creek Area*** (82K/8, 9), by Susan J. Atkinson.

(6) Mineral Inventory Maps show locations and commodities of all known mineral deposits. In 1976 a complete set of revised maps was issued (89 in total), covering the Province except for some non-mineralized terrain in the Peace River area.

(7) Mineral Deposit/Land Use Maps are interpretive maps that portray the varying mineral potential of terrain in a simple five-fold classification. In 1976, five maps at a scale of 1:250 000 were issued.

(8) Aeromagnetic Maps of 'two series were issued, Federal/Provincial maps in 1:250 000 map sheets and more detailed Provincial maps. In 1976 no Federal/Provincial maps were released from the current survey program. British Columbia issued a series of 17 maps at 1 inch to 2 640 feet plus interpretative notes of parts of Vancouver Island and adjacent Mainland.

(9) Assessment Report Index Maps are available which show the location and number of reports accepted for assessment credit by the Ministry. These maps, at various scales, cover the mineralized terrain of the Province. They are regularly updated.

Table 2-1—Gold Commissioner's and Mining Recorder's Office Statistics, 1976

Mining Division	Free Miners' Certificates		Lode Mining								Placer Mining					Revenue		
								Production										
	Individual	Company	Mineral Claims	Work Record	Cash in Lieu	Rental	Bills of Sale, Etc.	Lease	Percentage	Mineral Lease Rental	Lease Issued	Work Numbers	Rental and Cash in Lieu	Bills of Sale, Etc.	Extensions	Free Miners' Certificates	Mining Receipts	Total
			(Units)	(Years)	$	$				$			$			$	$	$
Alberni	56	5	216	347	6 300	9 680	31	.....	.....	3 400.00	.....	.....	300	1	1	2 047	23 347.00	25 394.00
Atlin	124	.....	1 303	952	12 800	20 115	11	.....	.....	366.00	15	119	1 600	34	30	600	43 825.05	44 425.05
Cariboo	873	3	1 014	831	16 900	19 920	31	.....	.....	10 496.00	123	348	6 800	53	60	4 701	80 717.37	85 418.37
Clinton	24	4	352	543	5 100	16 460	14	.....	.....	940.00	34	32	1 200	28	11	1 310	27 807.76	29 117.76
Fort Steele	205	5	784	2 009	17 400	31 320	26	.....	.....	2 888.00	5	28	2 450	3	17	2 315	57 745.14	60 060.14
Golden	116	6	573	466	3 300	10 015	26	.....	.....	1 028.00	5	3	6 300	4	3	2 557	23 321.50	25 878.50
Greenwood	145	1	3 182	893	12 900	32 650	78	.....	2	7 248.00	11	18	100	3	5	1 022	68 652.22	69 674.22
Kamloops	459	18	5 171	3 227	57 700	87 005	202	3	2	11 654.00	5	11	300	.....	2	7 397	166 980.65	174 377.65
Liard	218	1	1 857	5 451	66 300	91 845	86	.....	1	3 572.00	14	105	2 700	7	10	1 215	164 780.50	165 995.50
Lillooet	88	1	524	1 043	8 700	15 320	35	.....	.....	2 355.00	9	23	650	1	7	640	29 476.10	30 116.10
Nanaimo	274	8	456	1 873	15 600	35 310	37	.....	.....	8 372.00	.....	8	.....	.....	7	3 400	62 562.19	65 962.19
Nelson	255	5	446	270	5 700	5 950	31	.....	.....	1 034.00	1	8	50	.....	3	2 440	14 871.50	17 311.50
New Westminster	659	9	542	1 015	9 800	19 170	47	.....	.....	2 692.00	11	73	500	.....	7	5 217	40 424.00	45 641.00
Nicola	56	1	1 283	688	8 000	16 075	35	.....	.....	2 045.00	.....	.....	.....	.....	.....	645	27 899.50	28 544.50
Omineca	272	2	2 356	9 098	34 800	135 270	167	.....	2	17 208.00 632.00[1]	23	70	480[2] 4 850	4	22	1 517	206 901.13	208 418.13
Osoyoos	254	4	1 062	1 413	20 600	23 070	48	.....	1	7 430.00	.....	.....	.....	.....	.....	2 250	53 227.25	55 477.25
Revelstoke	109	1	3 311	2 408	5 400	43 955	48	.....	.....	896.00	3	11	650	2	4	890	53 776.00	54 666.00
Similkameen	151	5	797	784	18 300	18 725	17	.....	.....	4 484.00	24	56	2 400	8	17	2 235	44 558.50	46 793.50
Skeena	195	.....	568	1 770	41 900	34 480	39	.....	.....	3 922.00	.....	6	.....	.....	3	872	80 987.20	81 859.20
Slocan	133	.....	371	286	11 000	7 195	41	.....	1	7 502.00	.....	2	.....	.....	.....	535	25 738.47	26 273.47
Trail Creek	75	4	169	92	400	2 495	7	.....	.....	430.00 780.00[1]	.....	.....	.....	.....	.....	2 295	4 370.00	6 665.00
Vancouver	1 989	302	467	751	5 400	15 055	28	.....	1	1 574.00	.....	.....	.....	.....	.....	121 210	36 365.53	157 575.53
Vernon	385	4	1 976	481	800	14 940	26	.....	1	654.00	2	11	100	2	3	3 250	18 516.01	21 766.01
Victoria	711	166	190	38	2 400	2 670	7	.....	.....	184.00	4	2	600	3	2	63 335	27 279.59	90 614.59
Totals, 1976	7 826	555	28 970	36 729	387 500	708 690	118	3	11	103 788.00	289	935	32 030	153	214	233 895	1 384 130.16	1 618 025.16
Totals, 1975	8 484	562	11 751	39 403	411 000	725 095	169	2	8	114 845.88	120	828	46 250	157	188	237 538	1 399 472.76	1 637 810.76

[1] Prod.
[2] S.P.M.L.

TITLES DIVISION

Staff

E. J. Bowles ---- Chief Gold Commissioner
R. Rutherford ---Deputy Chief Gold Commissioner
D. Doyle --Gold Commissioner, Vancouver

Gold Commissioners, Mining Recorders, and Sub-Mining Recorders, whose duties are laid down in the ***Mineral Act*** and the ***Placer Mining Act,*** administer these Acts and other Acts relating to mining. Mining Recorders, in addition to their own functions, may also exercise the powers conferred upon Gold Commissioners with regard to mineral claims within the mining division for which they have been appointed.

Recording of location and of work upon a mineral claim as required by the ***Mineral Act*** and upon a placer lease by the ***Placer Mining Act*** must be made at the office of the Mining Recorder for the mining division in which the claim or lease is located. Information concerning claims and leases and concerning the ownership and standing of the claims and leases in any mining division may be obtained from the Mining Recorder for the mining division in which the property is situated or from the Ministry's offices at Victoria and Room 320, 890 West Pender Street, Vancouver. Officials in the offices of the Gold Commissioner at Victoria and the Gold Commissioner in Vancouver act as Sub-Mining Recorders for all mining divisions. Sub-Mining Recorders, who act as forwarding agents, are appointed at various places throughout the Province. They are authorized to accept documents and fees, and forward them to the office of the Mining Recorder for the correct mining division. Officials and their offices in various parts of the Province are listed in the following table:

Table 2-2—List of Gold Commissioners and Mining Recorders

Mining Division	Location of Office	Gold Commissioner	Mining Recorder
Alberni	Port Alberni	W. G. Mundell	W. G. Mundell.
Atlin	Atlin	R. E. Hall	R. E. Hall.
Cariboo	Quesnel	H. S. Tatchell	H. S. Tatchell.
Clinton	Clinton	W. R. Anderson	W. R. Anderson.
Fort Steele	Cranbrook	W. L. Draper	W. L. Draper.
Golden	Golden	J. Olson	J. Olson.
Greenwood	Grand Forks	S. Matsuo	S. Matsuo.
Kamloops	Kamloops	N. R. Blake	N. R. Blake.
Liard	Victoria	E. A. H. Mitchell	E. A. H. Mitchell.
Lillooet	Lillooet	M. Sakakibara	M. Sakakibara.
Nanaimo	Nanaimo	R. H. Archibald	R. H. Archibald.
Nelson	Nelson	G. L. Brodie	G. L. Brodie.
New Westminster	New Westminster	F. E. Hughes	J. Hoem.
Nicola	Merritt	L. P. Lean	L. P. Lean.
Omineca	Smithers	A. W. Milton	A. W. Milton.
Osoyoos	Penticton	I. D. Sands	I. D. Sands.
Revelstoke	Revelstoke	D. G. B. Roberts	D. G. B. Roberts.
Similkameen	Princeton	W. L. Marshall	W. L. Marshall.
Skeena	Prince Rupert	T. H. W. Harding	T. H. W. Harding.
Slocan	Kaslo	T. P. McKinnon	T. P. McKinnon.
Trail Creek	Rossland	A. Sherwood	A. Sherwood.
Vancouver	Vancouver	D. Doyle	D. Doyle.
Vernon	Vernon	N. A. Nelson	N. A. Nelson.
Victoria	Victoria	E. A. H. Mitchell	E. A. H. Mitchell.

Central Records Office (Victoria and Vancouver)

Transcripts of all documents recorded in Mining Recorders' offices throughout the Province are sent to the office of the Chief Gold Commissioner in Victoria twice each month. Mineral claim recordings are reported daily. The records and maps showing the approximate positions of mineral claims held by record and of placer leases may be viewed by the public during office hours at Victoria and at the office of the Gold Commissioner at Vancouver, Room 320, 890 West Pender Street. The approximate position of mineral claims held by record and of placer leases is plotted from details supplied by locators.

During 1976, 13 investigations were carried out pursuant to section 80 of the ***Mineral Act.*** Eleven investigations were made with regard to mineral claims having been located or recorded otherwise than in accordance with the ***Mineral Act,*** which resulted in 18 mineral claims being cancelled.

Mineral and Placer Title Maps

The Mineral Titles map series has now been completed for the whole of the Province at the scale of 1:50 000 and shows the location of mineral claims (based on the locator's sketch, unless surveyed or verified by inspection), Crown-granted mineral claims, and mining leases. The Placer Titles map series shows placer leases and those areas available for staking under the ***Placer Mining Act.***

Indexes for the two series are available, free of charge, from the offices of all Gold Commissioners and all maps may be viewed at Room 411, Douglas Building, Victoria, and at Room 320, 890 West Pender Street, Vancouver. It is advisable to order claim maps from an index.

Prints of the maps at the scale of 1:50 000 may be purchased for 50 cents each (tax and third class mail included) by applying in person at both the Victoria and Vancouver offices, and may be ordered by mail from the Victoria office.

Coal

Information concerning the ownership and standing of coal licences and coal leases may be obtained upon application to the Chief Gold Commissioner, Ministry of Mines and Petroleum Resources, Victoria. Maps showing location of coal licences and coal leases are also available upon application and payment of the required fee.

Table 2-3—Coal Revenue From Licences

	197.5	1976
	$	$
Fees	16 880	8 830
Rental	932 121	560 546

Maps showing the location of coal licences issued under the ***Coal Act*** maybe seen at the Titles Division, Mineral Resources Branch, Room 411, Douglas Building, Victoria. An index of coal reference maps is obtainable from the Chief Gold Commissioner at the above address.

During 1976, seven coal licences were issued. As of December 31, 1976, a total of 1 090 coal licences, amounting to 249 093 hectares, was held in good standing.

ECONOMICS AND PLANNING DIVISION

During 1976 the name and direction of the Division was returned to Economics and Planning from Mineral Development. This change shifted the emphasis from a development-oriented concept of mineral evaluation to long-range planning studies, economic research, and analysis. The Division became a part of the Mineral Resources Branch and the responsibilities under the Prospectors Assistance Act and the administration of the Roads and Trails Program were transferred to other Divisions within that Branch.

buring 1976 the Division was under the direction of J. S. Poyen and operated without an Assistant Director. The latter position was vacated in mid-1975 and a replacement, F. C. Basham, was subsequently recruited late in 1976 and assumed his responsibilities in January 1977.

During 1976 the economic analysis was focused on coal development with the main emphasis centred on the co-ordinated studies of the Peace River Coalfield. A major coal resource analysis was co-ordinated in this Division for the joint evaluation by Federal and Provincial representatives concerned with Northeast Coal Development. A significant byproduct of this work was the development of a Coal Cost Model. The work on the model was completed in 1976 and the published documentation will be available in the near future. In addition to coal resource studies, the Economics Section continued analysis in commodity studies, mineral and coal price forecasting, resource taxation, recreation corridors, natural gas pricing, mineral policy review, studies under the ***Foreign Investment Review Act,*** and work in the development of a cost/benefit manual for the Province. The work of the Economic Section has been co-ordinated by J. F. Clancy.

The ongoing statistical work, co-ordinated by W. P. Wilson, included the Annual Census of Mining, mail out, compilation, and organization of mineral statistics for the Annual Report, and monthly mineral statistics for intergovernmental use (under review). The Section is currently involved in a number of committees relevant to mineral statistics, including Mines Ministers' Subcommittee on Mineral Statistics, Consultative Council for Mineral Statistics, Coal Statistics, and Statistics Canada, and represents the Government of British Columbia on such committees. A Task Force on Mineral Valuation established at the Mines Ministers' Conference was charged with evaluating and, if necessary, redesigning the statistical forms currently in use throughout Canada. A three-man working group (British Columbia Ministry of Mines and Petroleum Resources, Statistics Canada, and Department of Energy, Mines and Resources, Ottawa) has worked to this end and significant progress has been made.

PETROLEUM RESOURCES BRANCH

The Petroleum Resources Branch, under the general direction of Associate Deputy Minister J. D. Lineham, Chief of Branch, administers the ***Petroleum and Natural Gas Act, 1965*** and the regulations made thereunder, including the Drilling and Production Regulations, the Geophysical Regulations, the Drilling Reservation Regulations, and the Development Road Regulations. It also administers. the ***Underground Storage Act, 1964.*** Therefore, the Branch is responsible for all matters related to the disposition of Crown-owned petroleum and natural gas rights as well as the regulation of the exploration, development, and production phases of the oil and gas industry.

The Branch is divided into three Divisions, namely, the Engineering Division, the Geological Division, and the Titles Division.

ORGANIZATION, FUNCTION, AND STAFF

Engineering Division

The Engineering Division, under the direction of Chief Engineer A. G. T. Weaver, is responsible for all engineering activities of the Petroleum Resources Branch.

There are three main functions:

(1) Enforcement of the Drilling and Production Regulations under the *Petroleum* and Natural *Gas Act, 196.5,* together with provision of advice to the Minister with respect to applications made by industry under the Act.

(2) Collection, filing for Branch and public use, and publication of drilling and production statistics, production and disposition data, reservoir and pool performance data.

(3) Reservoir analysis of all oil and gas pools in the Province, including maintenance of current production rate forecasts together with data concerning reserves discovered to date and estimates of potential reserves growth.

The Development Engineering Section, under the supervision of Senior Development Engineer W. L. Ingram, licenses drilling and service rigs, issues well authorizations, and maintains detailed records pertaining to all drilling and production operations.

The Reservoir Engineering Section, under the Senior Reservoir Engineer B. T. Barber, is concerned with all reservoir engineering aspects of the Division's activities. The section is responsible for determination of reservoir and production characteristics of oil and gas pools in the Province. This involves interpretation of reservoir pressure, rock and fluid properties, and production data. These parameters are. used to forecast ultimate recoveries obtainable from oil and gas accumulations in the Province, and the rates at which these volumes will be produced. Oil and gas allowable rates are set by tbe Section, and recommendations concerning proposed improved recovery and produced fluid disposition schemes are made.

The Drilling and Production Engineering Section, under the supervision of District Engineer D. L. Johnson, is located at the field office at Charlie Lake and is primarily responsible for enforcement of the Drilling and Production Regulations in the field. It also collects reservoir and other data as required, acts in a liaison capacity with industry at the field level, and maintains core and drill sample storage and examination facilities.

Geological Division

The Geological Division, under the direction of Chief Geologist W. M. Young, consists of three Sections and is responsible for all geological and geophysical activities of the Petroleum Resources Branch.

Data resulting from the drilling of wells, geophysical surveys, and other related sources in the Province in the search for and development of accumulations of oil and gas are supplied to the Branch. These data are used by staff geologists and geophysicists as a basis for reports on, and maps and cross-sections of, the economically important sedimentary rocks of the Province. The Division is responsible for providing data and opinions to attract, assist, and encourage the exploration and development of the petroleum resources of the Province. The Division also directs and provides all draughting services required by the Geological and Engineering Divisions.

The Economic Geology Section, under J. A. Hudson, is primarily concerned with those matters related to exploration and economic geology.

The Reservoir Geology Section, under R. Stewart, is primarily concerned with the detailed knowledge of the geology of oil and gas wells and reservoirs. This is required to assist in reserve estimations and in the framing of procedures that ensure the best returns from these reservoirs.

Titles Division

The Titles Division consists of two Sections, under the direction of Commissioner R. E. Moss, and is responsible for administering those parts of the ***Petroleum and Natural Gas*** Act, 1965 relating to and affecting title to Crown petroleum and natural gas rights.

The Division administers tbe disposition of Crown petroleum and natural gas rights and, in consultation with the Engineering and Geological Divisions, approves and selects parcels for posting, and accepts or rejects the tenders received.

The Tides Section is responsible for all transactions involving petroleum and natural gas permits, all leases, natural gas licences, drilling reservations, geophysical licences, notices of commencement of exploratory work, affidavits of work, unit agreements, and miscellaneous recordings.

The Revenue Section, under W. J. Quinn, is responsible for the collection of all petroleum and natural gas revenue, except royalty, payable to the Crown under the provisions of the Act.

staff

On December 31, 1976, the professional and technical staff included the following:

Associate Deputy Minister, J. D. Lineham, P.Eng. – Chief of Branch

Engineering Division

A. G. T. Weaver, P.Eng – Chief Engineer
W. L. Ingram, P.Eng – Senior Development Engineer
M. B. Hamersley, C.E.T. – Development Technician
B. T. Barber, P.Eng. – Senior Reservoir Engineer
P. S. Attariwala, P.Eng. – Reservoir Engineer
L. Pepperdiie, P.Eng. – Reservoir Engineer
P. K. Huus – Reservoir Technician
J. H. Burt – Reservoir Technician
D. L. Johnson, P.Eng – District Engineer
D. A. Selby – Field Technician
G. T. Mohler – Field Technician
H. W. Spooner – Field Technician
J. W. D. Kielo – Field Technician
G. L. Holland – Field Technician
J. L. Withers – Geophysical Technician

Geological Division

W. M. Young, P.Eng. — Chief Geologist
R. Stewart, P.Eng. — Senior Reservoir Geologist
T. B. Ramsay, P.Eng. — Reservoir Geologist
K. A. McAdam — Reservoir Geologist
J. A. Hudson, P.Eng. — Senior Economic Geologist
D. W. Dewar — Economic Geologist

Titles Division

R. E. Moss — Commissioner
W. J. Quinn — Assistant Commissioner

HIGHLIGHTS OF BRANCH ACTIVITIES

Legislation

The Petroleum and Natural Gas Act, 1965 was amended during I976 for the purpose of clarifying some sections and correcting certain deficiencies in Part III concerning Entry, Mediation, and Arbitration. In addition, authority was provided to make regulations respecting the exploration, development, and production of oil sand, oil sand products, oil shale, and oil shale products,' and to order that all or part of the Mines ***Regulation Ad*** applies to the exploration, development, and production of oil sand, oil sand products, oil shale, and oil shale products.

In addition to the above, the Drilling and Production Regulations issued under the ***Petroleum and Natural*** Gas ***Act,*** 1965 were significantly updated and reissued in new format. While many of tbe amendments were of a housekeeping nature there Were others designed to simplify and add greater flexibility to drilling and production procedures. Particularly affected were regulations concerning well spacing, well classifications, production allowables, and the requirements for production testing.

In conjunction with the new regulations, work was started on a Procedural Handbook primarily designed to guide industry in their dealing with the Branch. This will be issued in 1977 for inclusion with tbe regulations in a loose-leaf binder.

Mediation and Arbitration Board

CHAIRMAN: Patrick D. Walsh.
VICE-CHAIRMAN: Douglas Pomeroy.
MEMBER: Cecil Ruddell.

The Mediation and Arbitration Board, established under the authority of the ***Petroleum and Natural Gas Act, 1965*** grants rights of entry to oil and gas companies over alienated lands, and determines, conditions of entry and compensation therefore. The Act now provides for a process, of mediation by the Chairman of the Board. Failing satisfactory agreement between the parties upon mediation, the Act provides for final disposition by the Board of entry conditions and compensation. The Board is also charged with responsibility to review and set compensation on leases and previous Board orders of more than Eve years' duration, and to terminate rights of entry when an operator has ceased, to use occupied, lands.

In 1976, 16 field inspections were carried out by the Board; the Board made a total of 25 orders, 13 as a result of Board bearings and 12 to vary or ten&ate existing orders; the Board met 105 times during the year to deal with general Board matters and specific concerns of the public.

Engineering Division

An important aspect of the Division's function continued to be the provision of a service with respect to petroleum engineering, regulatory, and administrative matters for Government, Crown agencies (such as the B.C. Energy Commission), and industry. This involved numerous meetings and the attendance at hearings. Work specifically carried out by the three Sections in the Division is outlined below.

Development Engineering-The Development Engineering Section is responsible for the administration of all matters related to the location, drilling, completion, and abandonment of wells in the Province. This involves the assurance that operators of all wells located and drilled conform with the Drilling and Production Regulations and submit the required applications, reports, and information to the Branch.

Approval of well authorizations to drill proposed well locations is granted by the Section after review and reference to the Titles and Geological Divisions. In 1976, there were 195 authorizations issued, an increase of 95 per cent over 197.5. Throughout the life of a well the status, well name, and assigned classification may be changed as circumstances require. During the year statuses were changed on 119 occasions, well names on 53, and well classifications on 20.

In addition to comprehensive well data records, all geological and geophysical reports submitted for work credits and the Branch correspondence files are maintained by the Section. Reorganization of the filing system to a unified system continued throughout 1976. The Development Section itself was reoriented into two distinct functions. One dealt with the aspects of drilling and production and the other with the determination of product disposition and certain administrative dhties, including a typing pool, and the Branch file room.

Each drilling or service rig operating in the Province must have a valid rig licence. Sixty-one licences were renewed in 1976 and 16 new ones were issued.

In view of the impending conversion to metric measurements, various preparatory steps were taken by the Section, including the identification of all petroleum-related legislation and a detailed review of the effect of metrication on the ministerial forms and files in present use.

Drilling and Production Engineering-During 1976, some 180 000 miles were driven by staff members in the course of fulfilling their primary function which is the enforcement at the field level of the Drilling and Production Regulations of the ***Petroleum and Natural Gas Act, 1965.*** Oil production facilities were inspected on 318 different occasions and inspections of drilling, producing, and abandoned well sites were conducted 3 148 times. A total of 580 inspections of active drilling sites was made during 1976. Two oil-well tests were conducted by Branch personnel, and 31 gas-well tests (AOFP deliverability and reservoir limit) were witnessed. To ensure reliability of gas volumes being reported (both sales and individual well volumes), 489 complete orifice meter calibrations were performed and spot checks were made on 556 other occasions.

During the year, 124 static-pressure gradients were conducted on selective oil and gas wells to augment data received by the Reservoir Engineering Section and to farther ensure the reliability of pressure data being received, 1 028 bottom-hole pressure-bomb elements were calibrated.

Some 86 man-days were spent on seismic inspections ensuring that regulations concerning geophysical activity were being carried out.

During 1976, this Section continued its involvement with the British Colombia Oil Spill Contingency Plan, taking an active role in all meetings and training

exercises. No major spills occurred during 1976, and only six man-days were spent inspecting oil spills.

Inspections of salt-water disposal systems and witnessing of segregation tests were again emphasized during 1976.

During the year a map showing areas of northeastern British Colombia which might be accessible for summer drilling operations was finalized by this Section and, after gaining Branch approval, was forwarded to industry for their comments. At year-end; favourable response and support had been received from the drilling contractors, and from several oil companies.

Reservoir Engineering-Hydrocarbon reserve estimations were made as of year-end 1976. It was decided that, henceforth, oil reserves will be reported as "established" reserves rather than as "proved and probable." It was felt that the use of a single number for reserves would remove any confusion which may have occurred as a result of the earlier nomenclature, which is used by other reporting bodies in Canada but not always with the same meaning.

Table 4-2 is a summary of the hydrocarbon and by-products reserves in the Province as at December 31, 1976, and indicates the following:

Oil, established	154 981 MSTB
Natural gas, established—	
Raw	8 520 MSTB
Residue	7 310 BSCF
Residue (1 000 Btu/SCF)	7 588 BSCF
Natural gas liquids-	
Propane	8 054 MSTB
Butane	12 154 MSTB
Pentanes plus	23 449 MSTB
Sulphur	6 467 MLT

It may be observed from Table 4-2 that the oil reserves have decreased 24.5 MMSTB from last year. Additions due to drilling were 2.8 MMSTB; revisions reduce the reserves by 12.4 MMSTB and 14.9 MMSTB were produced. Raw gas reserves of 8.5 TSCF at the end of 1976 show an increase of 0.5 TSCF. Additions due to drilling were 0.5 TSCF; revisions added 0.4 TSCF and 0.4 TSCF were produced.

A submission which showed the effect on reserves and deliverability of drilling from May 1974 to April 1975 and from May 1975 to April 1976 was prepared and presented to the British Columbia Energy Commission at a hearing in Vancouver in June 1916 for "the purpose of an annual review of present and future field prices of petroleum and natural gas and other factors that may affect the level of exploration and development of petroleum and natural gas in British Colombia."

A forecast of oil and condensate production in the Province was prepared and submitted to the National Energy Board at a hearing in Calgary in October 1976. The results of this forecast may be summarized as follows:

(1) Oil producing rates from existing reservoirs are expected to decline from an estimated 40.3 MSTB/D in 1976 to 7.3 MSTB/D in 1995. (Actual 1976 production averaged 40.8 MSTB/D.)

(2) Based on statistical data from current geological considerations, it is not expected that oil production from new discoveries will appreciably increase tbe predicted oil supply rate. The predicted oil *reserve* addition from new discoveries is some 9 MMSTB only.

(3) Pentanes plus supply rates are forecast to remain relatively constant at about 3.2 MSTB through 1982 and then to decline to 1.1 MSTB

in 1995. No additional volumes of pentanes plus are forecast to be obtained from any future plants installed to process currently unconnected gas reserves or from future gas discoveries.

A forecast of gas production in the Province at year-end led to the following conclusions:

(1) Raw gas production is forecast to increase from 370 BCF/yr in 1977 to a peak of 450 BCF in 1982. Thereafter, production is essentially constant in the range 430-440 BCF/yr until 1995 and declines to about 300 BCF/yr in 2004.

(2) This forecast is based on the assumption that

(a) some 2.3 TCF of known raw gas reserves will be connected to pipeline in the period 1977-82 and will add about 25 BCF/yr. This will more than balance the decline of 9 BCF/yr from presently connected reserves;

(b) production from future discoveries of 340 BCF/yr of raw gas will yield.18 BCF/yr which balances the forecast decline of 18 BCF/yr from presently connected reserves in the period 1982-95;

(c) the last year of gas discovery was arbitrarily selected as 1995, so after 1999 no additional production domes from new discoveries. In addition, gas production from earlier discoveries commences to decline and causes the decline experienced from 1995 on.

The Branch has been concerned for some time by the problems of water influx into and water production from gas reservoirs in the Slave Point formations. In a preliminary study of water influx, Clarke Lake, Clarke Lake South, Yoyo, Sierra, and Kotcho Lake fields were examined and the following conclusions drawn:

(1) All these pools except Sierra have the same hydrostatic gradient and perhaps a common aquifer; Sierra has a higher gradient and is isolated from this common aquifer,

(2) Water influx appears to be occurring in Clarke Lake, Clarke Lake South, and Sierra. No water influx has been detected in Yoyo or Kotcho Lake. Water production (in excess of water condensation) is a problem in Clarke Lake and Kotcho Lake. Thus it would appear that water production can occur without water influx and that water influx can occur without water production.

(3) A straight-lie plot of P/Z vs. cumulative gas production does not necessarily indicate no water influx.

(4) A recent well in Sierra penetrated the gas-water contact some 70 feet above the original level which would suggest a residual gas saturation in the invaded zone of some 50 per cent.

Another aspect which concerns the Branch is the effect, if any, of the rate of gas production from a pool with water influx on ultimate recovery. In the hope of obtaining some insight into this problem, the Branch decided to have a reservoir simulation study performed on a portion of the Clarke Lake reservoir which included wells of completely different performance characteristics with respect to water production. Once this portion of the reservoir has been successfully modelled, the model will be tested at different rates of production. At year-end, specifications had been forwarded to various consultants who were invited to 'bid.

A number of pressure drawdown and build-up tests conducted on various wells in the Grizzly Valley-Sukunka trend were analysed by the Section in an attempt to confirm that the gas in matrix porosity was flowing into the reservoir fracture system.

In the opinion of the Branch this has now been established and, consequently, it is correct to include in reserves the estimated recoverable gas in the matrix porosity.

Geological Division

Economic Geology--During the year the Economic Geology Section continued with its program of initiating, organizing, and carrying through to publication regional subsurface compilation, mapping, and related projects within the sedimentary basin of northeastern British Columbia.

The drillstem test and penetration compilation map series using the National Topographic System were converted to a scale of 1: 100 000 from the previous scale of 1: 125 000. The east half and west half of NTS map sheets 93-1,93-O, and 93-P completed the series and coverage of the northeastern sedimentary area. The latter compilation series of 36 map sheets shows for all wells outside designated field boundaries the deepest geological Formation penetrated, all Formation drillstem tests, and the Zone(s) in which gas and oil wells are completed. In addition to the latter information and within the designated field limit the penetration map will show drillstem tests in horizons other than that productive in the field as well as the Formation at total depth for wells which have penetrated below the lowest productive horizon within the field.

Subsurface structural coverage of the Lower Cretaceous Bullhead Group (Top Bluesky-Gething) was completed with the mapping of the east half of NTS map sheets 93-I, 93-0, 93-P, and the west half of 93-P. Most of the published series on regional subsurface mapping were updated as of May. 1, 1976, with the latest released information. A total of 74 map sheets covering the mapping of all major economic oil and gas producing horizons on a scale of 1: 100 000 has been made available to industry and the public through publication.

A geological assessment was completed on the ultimate reserve potential of the Grizzly Valley-Sukunka gas trend. The project included an in-depth study of the geology and reservoir characteristics of the primary producing horizons. The estimated ultimate reserve potential was concluded by determining the ratio of the present drilling density to the' optimum drilling density over the selected area in relation to the established reserve. from completed drilling. In conjunction with this assessment a series of structural cross-sections combining surface and subsurface geology across the disturbed foothills belt was completed from south of the Grizzly Valley area northwest to the John Hart 'Highway.

In addition to the activities outlined above, the Economic Geology Section spent considerable time in assisting other Divisions and Ministries of tbe Government, Crown agencies, and intergovernmental relations in matters concerning petroleum geology. Frequent meetings were held with various industry representatives to discuss various aspects of geology, geophysics, and exploration in general and to clarify questions arising from the regulations with respect to the drilling of wells and its relationship to the tenure of petroleum and natural gas rights.

Geophysical-The method of using released geophysical data as an integral part of the regional subsurface mapping program was continued for the first half of the year. Data received by the Ministry in support of applications to record geophysical work are converted to depth and integrated into the appropriate regional subsurface map. This work has provided significant structural control at the Devonian, Mississippian, and Triassic levels within the Foothills Belt area extending north of the Peace River to Fort Nelson.

An assessment of the complete geophysical coverage submitted by industry on the Grizzly Valley gas-bearing structures was carried out by members of the Geophysical and Economic Geology Sections. In general, the quality and resolution

of the sectional seismic data provided good correlation and ties with available information obtained from drilling operations. Structural configuration and areal extent of the Halfway and Nikanassin Formation gas-bearing horizons have been reasonably well defined.

Reservoir Geology—The Reservoir Geology Section continued with its ongoing program of assessing and mapping in detail all oil and gas accumulations encountered by the drilling during the year. Structural stratigraphic and reservoir geologic data made available through drilling were used as basis for map revision work, reservoir studies, evaluation of reserves, and the control of remedial work, cycling, repressuring, and secondary recovery projects.

Revision work on the Slave Point gas productive interval in Helmet Field was concluded. Previous mapping in this area indicated a series of small isolated one-to-three well pools. However, the determination of gas/water interfaces based on drilling and pressure depth studies supports the interpretation of one large pool and one-to-three small isolated pools located to the south and east of the main pool.

A considerable amount of work was expended in reassessing the net gas pay thicknesses and areal extent of existing Nikanassin, Baldonnel, and Halfway gas pool reservoirs of the Grizzly-Sukunka area. The geological and associated reservoir engineering studies carried out on the various pools were instrumental in assigning a substantial increase to the established reserve estimates.

The geologic evaluation of development and outpost drilling completed during the year extended the defined limits of a number of producing pools and some shut-in pools waiting to be placed on production.

In addition to the above ongoing type of work, members of the staff completed special studies on a concurrent production scheme of the Weasel East Halfway pool; re-evaluation of the Currant Halfway pool in order to account for additional reserves as indicated by production history and material balance results, and reinterpretation of the Willow Gething and Halfway gas pools.

Other reservoir geology work completed included a detailed stratigraphic correlation study of the Baldonnel/Charlie Lake Formation contact in the Laprise gas field; review of the gas/water interfaces of the Beg and Nig Creek Baldonnel reservoirs and defining the limits of a number of small isolated oil and gas-bearing reservoirs within development and (or) developing Peace River Block areas.

In addition to the above the Reservoir Geology Section assisted other Divisions in providing a geological evaluation and assessment on Crown lands posted for disposal of petroleum and natural gas rights, reclassification of wells under the regulations, maintaining current oil and gas pool boundary designations and related geological evaluations concerning industry production schemes, and the disposal of salt water.

Titles Division

There were five dispositions of Crown reserve petroleum and natural gas rights held during 1976. These resulted in tender bonus bids amounting to $43 226 441.93 an increase of $30 477 193.73 from the previous year. A total of 433 parcels was offered, with bids acceptable on 304 parcels covering 2 425 802 acres. The average price per acre was $17.81, which is an increase of $7.02 per acre over 1975. The average bonus price per acre was respectively—permits, $13.81; leases, $90.03; and drilling reservations, $18.96.

During the year, 28 geophysical licences were issued or renewed, an increase of 15 over 1975. One Unit Agreement was approved.

A total of 114 notices of commencement of exploratory work was recorded, an increase of 43 from the previous year. These notices are required prior to the

commencement of any geological or geophysical exploration for petroleum and natural gas.

As of December 31, 1976, 20 190 964 acres or approximately 31 548 square miles, an increase of 507 594 acres over the 1975 total of Crown petroleum and natural gas rights issued under the *Petroleum and Natural Gas Act, 1965* were held in good standing by operators ranging from small independent companies to major international ones. The form of title held, total number issued, and acreage of each case were as follows:

Form of Title	Number	Acreage
Permits	418	13 252 878
Natural gas licences	1	7 175
Drilling reservations	54	525 151
Leases (all types)	3 515	6 405 760
Total		20 190 964

During 1976 the following transactions were completed:

1. PERMITS—		
Issued		79
Renewed		292
Converted to lease		40
Cancelled		50
Transferred (assigned)		87
2. DRILLING RESERVATIONS—		
Issued		37
Renewed		8
Converted to lease		8
Cancelled		10
Transferred (assigned)		14
3. LEASES—		
Issued		413
Annual rental paid		2 664
Renewed for 10-year term		48
Extended under penalty		140
Extended NOT under penalty		220
Cancelled		248
Transferred (assigned)		483
4. NATURAL GAS LICENCES—		
Issued		1
Renewed		*Nil*
Converted to lease		1
Cancelled		1
Transferred (assigned)		*Nil*

5. CROWN SALES—	Number Advertised	Number Sold
Permits	91	79
Drilling reservations	53	37
Leases	289	188
Total	433	304

6. GEOPHYSICAL LICENCES—Issued	28
7. NOTICES OF COMMENCEMENT OF EXPLORATORY WORK—	
Approved	114

8. AFFIDAVITS OF WORK—Approved
   Permits 65
   Leases 9
9. MISCELLANEOUS RECORDINGS (mergers, grouping notices, etc.)—Approved 525
10. CERTIFICATES PREPARED for Inspection Division, Mineral Resources Branch 450
11. UNIT AGREEMENTS—Approved 1

MINERAL REVENUE

The assessment and collection of mineral royalties, mineral land taxes, mineral resource tax, and petroleum and natural gas royalties are the responsibility of the Mineral Revenue Division. Authority for the assessment and collection of these revenues is set out under the *Coal Act, Mineral Land Tax Act, Mineral Royalties Act, Mineral Resource Tax Act, Petroleum and Natural Gas Act, 1965,* and Iron Ore Royalty Agreements which are drawn pursuant to the provisions of the *Mineral Act.*

The Mineral Revenue Division reports directly to the Deputy Minister. The Division, which is under the direction of W. W. Ross, assisted by B. A. Garrison, is composed of three operating sections—the petroleum and mineral accounting sections, which are under the supervision of A. R. Lockwood, Acting Divisional Accountant, and the Mineral Titles Search Section, which is under the supervision of N. D. Smith. The Division's operating complement of 25 was reduced to 22 during 1976 due to the elimination of staff for the Vancouver, Prince George, and Prince Rupert District Title offices. Three of the remaining 22 established positions were vacant as at December 31, 1976.

During the past year, operations of the Division have been hampered due to staff turnover and difficulties in replacement.

A short review of the royalty and tax statutes, together with the related regulations administered by the Division during the year, is as follows:

COAL ROYALTIES

These royalties are assessed under the provisions of the Coal Royalty Regulations drawn pursuant to the provisions of the *Coal Act.* Under these regulations coal is classified as either metallurgical coal which has a free swelling index of 4 or more and thermal coal which has a free swelling index of less than 4.

The 1976 coal royalty rate was $1.50 per long ton of metallurgical coal and 75 cents per ton of thermal coal. Coal royalty collections during the year were $2 502 202 on reported coal production of 1 668 135 long tons from two producers. The details of monthly revenue collections for coal are set out under Table 2-5.

MINERAL ACT ROYALTIES

Iron Ore Royalty Agreements are in effect covering two producing iron mines. Under the provisions of these agreements, $182 314 was collected during the 1976 calendar year on a production of 729 260 long tons of iron concentrate. The monthly collections under this royalty heading are set out in Table 2-5.

MINERAL LAND TAXES

Freehold mineral rights are subject to the assessment of a mineral land tax in accordance with the provisions of the *Mineral Land Tax Act.* This Act has a

three-level tax structure consisting of undesignated mineral land, production areas, and production tracts. The 1976 mineral land tax assessment notices issued on May 1, 1976, covered 1 039 103.67 acres of mineral land under 3 259 tax folios. This represents a net increase of 230 tax folios and 150 346.63 acres over the mineral land tax roll at May 1, 1975.

A summary of the 1976 mineral land tax assessment roll as at May 1, 1976, is as follows:

Table 2-4—Mineral Land Tax Assessment Roll

Classification of Mineral Land	Number of Folios	Acreage	Tax Assessed	Tax Collected
		$	$	$
Non-designated	3 209	997 799.29	369 465.02	342 638.75
Production areas	16	3 341.69	8 714.45	8 039.63
Production tracts	34	37 962.69	24 005 968.76	23 726 365.01
Interest	.....	.....	5 356.84	5 356.84
Delinquent taxes	.....	.....	.....	.....
Totals	3 259	1 039 103.67	24 389 505.07	24 082 400.23

The *Mineral Land Tax Act* also contains a provision whereby an owner of mineral land may elect to surrender his mineral land rather than pay the tax assessed. In conformance with this provision, 11 surrenders were processed covering approximately 1 484 acres. During the 1976 calendar year the Mineral Titles Search Section completed a total of 42 315 titles searches which were for purposes of roll additions, forfeitures, surrenders, and escheatments. These searches resulted in 958 parcels of mineral land being added to the roll during the year.

Forfeitures for nonpayment of taxes during the year were processed covering 130 lots with a combined acreage of 33 201.24. Also, a review of the roll data was undertaken which indicated that several corporate entities holding title under the Mineral Land Tax Roll had been struck from the register of the Registrar of Companies which, in turn, resulted in the issuance of 17 Vesting Certificates under the provisions of the *Escheats Act* covering mineral lands totalling 3 840.39 acres.

The Division completed 39 audits during the year which resulted in revised mineral land tax assessments of $13 651 556.21 as compared to the original assessments of $14 762 196.53, giving rise to a net credit to industry of $1 110 640.32.

Mineral Royalties

The *Mineral Royalties Act* and related regulations provide for the assessment of a royalty on designated minerals which are produced from production instruments held under the provisions of the *Mineral Act, Placer Mining Act,* or *Coal Act.* This Act provides for a royalty of 5 per cent on the basic value of a designated mineral together with a surcharge up until April 1, 1976. The *Mineral Royalties Act* is repealed, effective January 1, 1977.

Molybdenum and iron were the only minerals subject to a surcharge during the 1976 calendar year.

The total revenue collected for the year under this revenue heading was $11 409 768, with the monthly details being provided in Table 2-5. The royalties actually assessed for the calendar year, based on December 31, 1976, returns, totalled $12 155 080 as reflected in Table 2-6.

Seven audits were completed during the year resulting in revised royalty assessment of $2 891 944.52 as opposed to the original royalty assessment of $3 178 191.77, giving rise to a net credit to industry of $286 247.25.

Table 2-5—Mineral Revenue Division Revenue Collections, 1976

Month	Gas	Oil	Products	Penalties	Total Petroleum and Natural Gas Royalties	Iron Ore Royalty Agreements	Coal Act	Mineral Royalties Act	Total Mineral Royalties	Mineral Land Tax Act	Total Mineral Land Taxes and Royalties	Total Divisional Revenue
	$	$	$	$	$	$	$	$	$	$	$	$
January	96 899.64	4 168 735.75	83 377.26	.....	4 349 012.65	6 167.17	342 070.50	1 142 139.38	1,490 377.05	(310.72)	1 490 066.33	5 839 078.98
February	58 423.16	248 078.16	.....	.....	306 501.32	179.69	391 665.00	1 049 070.10	1 440 914.79	12 382.25	1 453 297.04	1 759 798.36
March	65 154.36	6 494 263.69	110 051.52	.....	6 669 469.57	23 321.02	151 051.50	647 073.63	821 446.15	214 990.84	1 036 436.99	7 705 906.56
April	17 517.94	3 634 683.07	60 369.70	.....	3 712 570.71	21 568.95	320 920.50	1 072 558.48	1 415 047.93	3 591.23	1 418 639.16	5 131 209.87
May	12 375.18	2 850 386.24	27 652.88	80.00	2 890 494.30	13 505.43	240 193 35	1 183 706.73	1 437 405.51	21 471.30	1 458 876.81	4 349 371.11
June	2 077.42	2 179 603.35	46 443.12	60.00	2 228 183.89	10 756.88	.....	811 626.48	822 383.36	105 415.98	927 799.34	3 155 983.23
July	18 144.32	4 326 843.51	48 867.05	.....	4 393 854.88	26 018.33	.....	722 462.71	748 481.04	12 739 149.66	13 487 630.70	17 881 485.58
August	8 143.59	4 098 694.98	43 065.03	50.00	4 149 953.60	575.64	.....	730 854.45	731 430.09	10 186 969.43	10 918 399.52	15 068 353.12
September	8 508.84	4 118 988.62	84 097.49	30.00	4 211 624.95	35 854.14	.....	1 139 978.25	1 175 832.39	25 399.90	1 201 232.29	5 412 857.24
October	9 021.56	3 907 266.51	69 568.72	330.00	3 986 186.79	14 049.71	487 880.10	989 001.76	1 490 931.57	475.33	1 491 406.90	5 477 593.69
November	12 736.33	3 748 117.05	59 070.08	.....	3 819 923.46	12 316.94	250 619.76	1 027 699.74	1 290 636.44	(930 864.59)	359 771.85	4 179 695.31
December	14 748.09	3 956 795.18	83 884.80	.....	4 055 428.07	18 000.58	317 801.07	893 596.03	1 229 397.68	49 546.71	1 278 944.39	5 334 372.46
1976 totals	323 750.43	43 732 456.11	716 447.65	550.00	44 773 204.19	182 314.48	2 502 201.78	11 409 767.74	14 094 284.00	22 428 217.32	36 522 501.32	81 295 705.51
1975 totals	2 848 929.60	44 782 489.47	569 521.01	800.00	48 201 740.08	185 283.60	3 644 267.91	5 016 838.24	8 846 389.75	15 416 461.09	24 262 850.84	72 464 590.92
1974 totals	3 288 296.85	45 300 184.21	51 181.21	649.20	48 640 311.47	155 925.04	1 361 081.25	12 979 098.52	14 496 104.81	2 640 022.84	17 136 127.65	65 776 439.12
Cumulative totals	6 460 976.88	133 815 129.79	1 337 149.87	1 999.20	141 615 255.74	523 523.12	7 507 550.94	29 405 704.50	37 436 778.56	40 484 701.25	77 921 479.81	219 536 735.55

Table 2-6—Mineral Royalties Act Royalties Assessed, 1976

	Quantity	Net Value	Basic Royalty	Surcharge Royalty	Total	Rate of Royalty	Royalty Per Unit
		$	$	$	$	Per Cent	$
Copper ..... lb.	417 250 553	181 623 546	7 264 776	.....	7 264 776	4.00	0.017
Gold ..... oz.	53 364	9 469 074	438 006	.....	438 006	4.63	8.208
Silver ..... oz.	2 270 543	6 556 111	274 101	.....	274 101	4.18	.121
Molybdenum ..... lb.	30 430 295	79 812 246	3 563 533	452 218	4 015 751	5.03	.132
Lead ..... lb.	4 764 458	646 283	24 359	.....	24 359	3.77	.005
Zinc ..... lb.	14 216 523	2 147 532	101 401	.....	101 401	4.72	.007
Cadmium ..... lb.	69 125	33 570	1 201	.....	1 201	3.58	.017
Iron ..... ton	25 202	551 735	27 587	7 898	35 485	6.43	1.408
	.....	280 840 097	11 694 964	460 116	12 155 080	4.33	.....

PETROLEUM AND NATURAL GAS ROYALTIES

Petroleum and natural gas royalties are assessed on all petroleum and natural gas, including sulphur, natural gas liquid produced from Crown lands held under the provisions of the *Petroleum and Natural Gas Act, 1965,* with the provision that natural gas and natural gas byproducts produced and sold under contract with the British Columbia Petroleum Corporation are exempt from the payment of royalty.

Under the royalty regulations oil is classified as either old oil (that is, oil produced from a well completed prior to October 31, 1975) or new oil (that is, oil produced from a well completed subsequent to October 31, 1975).

The rate of royalty on new oil is lower than the rate applicable to old oil; however, old oil earns one 75-cent exploration credit for each barrel produced which, in turn, can be redeemed by performance of exploratory work to the value of $100 for each credit redeemed. This incentive program is comparable to the gas credit program offered by the British Columbia Petroleum Corporation.

On December 8, 1976, Order in Council 3562 was approved, which amended the royalty rates on both old and new oil, effective January 1, 1977. A comparison of the new and old rates on production are as follows:

Old oil—

New rate: 0–500 barrels = 20 per cent of production; greater than 500 barrels = 100 barrels plus 40 per cent of the excess over 500 barrels per month.

Old rate: 0–500 barrels = 25 per cent of production; greater than 500 barrels = 125 barrels plus 55 per cent of the excess over 500 barrels per month.

New oil—

New rate: 0–1 000 barrels = production squared divided by 6 667, greater than 1 000 barrels = 150 barrels plus 30 per cent of the production in excess of 1 000 barrels per month.

Old rate: 0–500 barrels = 15 per cent of production; greater than 500 barrels = 75 barrels plus 33 per cent of production in excess of 500 barrels per month.

During 1976, petroleum and natural gas royalty revenue collections were as follows:

	$
Natural gas royalties	323 750[1]
Crude petroleum royalties	43 732 456
Natural gas byproducts royalties	716 448
Late filing penalties	550
Total	44 773 204

[1] The bulk of British Columbia gas production is sold under contract to the British Columbia Petroleum Corporation and, as such, is not subject to the imposition of royalty.

Details of the revenue collected will be found in Table 2-5.

The status of the oil credit unit suspense account as at December 31, 1976, is as follows:

	$
Balance forward from 1975	81 552.75
Credits established during the year	11 722 754.73
Credits redeemed during the year	2 107 651.50
Balance remaining at December 31, 1976	9 696 655.98

Mineral Resource Tax Act

This Act came into effect in June of 1976 and becomes operative for the 1976 fiscal years of any corporation or individual producing minerals as defined under the provisions of the *Mineral Act*. The Act provides for a tax of 17½ per cent of mining profits and allows for the deduction of normal operating expenses, capital cost allowances, exploration expenses, development expenses, earned depletion, and a processing allowance in determining taxable income.

ADMINISTRATIVE SERVICES

This Division was not fully implemented during the year as no Director was appointed. As a result, the components reported either directly to the Deputy Minister, as with Personnel and Accounts, or to the Deputy Minister through a committee, as with Library and Publications.

Personnel

The Ministry personnel statistics for 1976 were as follows:

Permanent employees	240
Appointments	42
Resignations	24
Retirements	3
In-service transfers	6
Promotions and reclassifications	12
Temporary employees	5
Temporary employees under WIG '76	14
Temporary employees under summer field program	22

There was a change in the Personnel Office as Mrs. Pennie Hepworth replaced Mrs. Sharon Belfie as Personnel Clerk.

R. E. Moss, Personnel Officer for the Ministry, and Mrs. Hepworth were kept very active as the Ministry administers five component agreements, namely:

Administrative Support—Clerks, Clerk-Typists, and Clerk-Stenographers.

Administrative, Fiscal and Regulatory—Administrative Officers and Audit Accountants.

Environment, Resource, and Conservation—Laboratory Technicians.

Educational and Scientific Services—Laboratory Scientists, Economists, and Research Officers.

Engineering, Technical, and Inspectional—Technical Assistants, Technicians, Engineering Aides, Engineering Assistants, and Co-ordinators (Rescue Training).

The Personnel Office was also involved with the MEG Plan for the Management Executive Group employees and the OSB Plan for the British Columbia professional employees in the Ministry.

Accounts Section

Accounts Section, under Mrs. Sharon Bone, was responsible for the preparation and control of Ministry estimates, payroll, the costing and facilitation of Ministry purchases, and the acquisition and maintenance of vehicles and equipment. Several functions handled in 1975 by the section were transferred, including space allocation and acquisition to the Associate Deputy Minister, Petroleum Resources Branch, and mail and central filing system to Central Records Office, Mineral Resources Branch.

Library

The Ministry library located at Room 430, Douglas Building, Victoria, consists of close to 15 000 volumes. It is one of the oldest and largest separate libraries in the Provincial Government and constitutes a significant resource which provides geological and technical information for staff, other Government ministries, and the public. It is administered by the Library Committee under the direction of J. S. Poyen, Chairman, and supervised by Sharon Ferris. The Ministry library co-operates with the Legislative Library, which carries out the indexing and some other functions.

On recommendation from the Committee, new additional shelving was added to the library to facilitate expansion, a proper reading room was set up, and a general reorganization and cleaning of material was commenced.

Publications

Publications Section includes publication preparation and dispatch and consists of Mrs. Rosalyn J. Moir, Assistant Editor, and three assistants—one primarily involved with manuscript typing and two primarily with dispatch. The Section personnel are technically part of the Geological Division, which originates most of the manuscripts for publication. Chairman of the Publication Committee is Dr. A. Sutherland Brown.

In addition to publications primarily the responsibility of the Geological Division, Mineral Resources Branch, and listed on page A 40, the Ministry issued the following publications of general interest in 1976: *Annual Report of the Minister of Mines and Petroleum Resources, 1975; Coal in British Columbia, A Technical Appraisal; Summary of Operations, Petroleum Resources Branch, 1976.*

A list of publications of the Ministry is available on request to the Petroleum Resources Branch or to the Chief Geologist, Mineral Resources Branch, Ministry of Mines and Petroleum Resources, Douglas Building, Victoria V8V 1X4.

Publications that are in print may be obtained from the Ministry of Mines and Petroleum Resources in Victoria and from the Geological Survey of Canada, 100 West Pender Street, Vancouver. Current publications may also be obtained from the Gold Commissioner's office, Room 320, 890 West Pender Street, Vancouver.

Publications are available for reference use in the Ministry Library, Room 430, Douglas Building, Victoria; in the reading room of the Geological Survey of Canada, 100 West Pender Street, Vancouver; in the offices of the Inspector of Mines in Nelson and Prince Rupert; as well as in some public libraries.

Rock and mineral sets are available for sale in small numbers for schools or prospecting courses. Information regarding them may be obtained from the Chief Geologist, Mineral Resources Branch, Douglas Building, Victoria V8V 1X4.

Mineral Resource Statistics

CHAPTER 3

CONTENTS

INTRODUCTION

The statistics of the mineral industry are collected, compiled, and tabulated for this Report by the Economics and Planning Division of the Mineral Resources Branch.

In the interests of uniformity and to avoid duplication of effort, beginning with the statistics for 1925, Statistics Canada and the Provincial ministries have co-operated in collecting and processing mineral statistics.

Producers of metals, industrial minerals, structural materials, coal, and petroleum and natural gas are requested to submit returns in duplicate on forms prepared for use by the Province and by Statistics Canada.

As far as possible, both organizations follow the same practice in processing the data. The final compilation by Statistics Canada is usually published considerably later than the *Annual Report of the Minister of Mines and Petroleum Resources* for British Columbia. Differences between the values of production published by the two organizations arise mainly because Statistics Canada uses average prices considered applicable to the total Canadian production, whereas the British Columbia mining statistician uses prices considered applicable to British Columbia production.

Peat, classified as a fuel by Statistics Canada, is not included in the British Columbia statistics of mineral production, being regarded as neither a fuel nor a mineral.

The statistics of the petroleum industry are collected, compiled, and tabulated for this Report by the Petroleum Resources Branch.

METHODS OF COMPUTING PRODUCTION

The tabulated statistics are arranged so as to facilitate comparison of the production records for the various mining divisions, and from year to year. From time to time, revisions have been made to figures published in earlier reports as additional data became available or errors became known.

Data are obtained from the certified returns made by the producers of metals, industrial minerals and structural materials, and coal, and are augmented by data obtained from custom smelters. For petroleum, natural gas, and liquid by-products, production figures supplied by the Petroleum Resources Branch of the Ministry of Mines and Petroleum Resources are compiled from the monthly disposition reports and the Crown royalty statement filed with the Ministry by the producers.

Values are in Canadian funds. Metric weights are used throughout.

METALS

Average Prices

The prices used in the valuation of current and past production of gold, silver, copper, lead, and zinc are shown in the table on page A 76.

Prior to 1974 the price of gold used was the average Canadian Mint buying-price for fine gold.

The price used for placer gold originally was established arbitrarily at $17 per ounce, when the price of fine gold was $20.67 per ounce. Between 1931 and 1962 the price was proportionately increased with the continuously changing price of fine gold. Since 1962, Canadian Mint reports giving the fine-gold content have been

available for all but a very small part of the placer gold produced, and until 1973 the average price listed is derived by dividing ounces of placer gold into total amount received. Starting in 1974 the price used for the valuation of gold, lode and placer, is the amount received by the producer.

Prior to 1949 the prices used for silver, copper, lead, and zinc were the average prices at the markets indicated in the table on page A 66, converted into Canadian funds. The abbreviations in the table are Mont.=Montreal; N.Y.=New York; Lon.=London; E. St. L.=East St. Louis; and U.S.=United States.

Starting in 1949 the price of silver, copper, lead, and zinc were average United States prices converted into Canadian funds. Average monthly prices were supplied by Statistics Canada from figures published in the Metal Markets section of *Metals Week*. Specifically, for silver it was the New York price; for lead it was the New York price; for zinc it was the price at East St. Louis of Prime Western; for copper it was the United States export refinery price. Commencing in 1970 the copper price is the average of prices received by the various British Columbia shippers and since 1974 this applies also to gold, silver, lead, zinc, and cadmium.

For antimony and bismuth the average producers' price to consumers is used. For nickel the price used is the Canadian price set by the International Nickel Company of Canada Ltd. The value per tonne of the iron ore used in making pig iron at Kimberley was an arbitrary figure, being the average of several ores of comparable grade at their points of export from British Columbia.

Gross and Net Content

The gross content of a metal in ore, concentrate, or bullion is the amount of the metal calculated from an assay of the material, and the gross metal contents are the sum of individual metal assay contents. The net contents are the gross contents less smelter and refinery losses.

In past years there have been different methods used in calculating net contents, particularly in the case of one metal contained in the concentrate of another. The method established in 1963 is outlined in the following table. For example, the net content of silver in copper concentrates is 98 per cent of the gross content, of cadmium in zinc concentrates is 70 per cent of the gross content, etc. Commencing in 1974 the quantities represent the actual net quantities or metals paid for.

	Lead Concentrates	Zinc Concentrates	Copper Concentrates	Copper-Nickel Concentrates	Copper Matte
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
Silver	98	98	98	—	98
Copper	*Less* 26 lb./ton		*Less* 10 lb./ton	85	*Less* 10 lb./ton
Lead	98	50	—	—	50
Zinc	50	90	—	—	—
Cadmium	—	70	—	—	—
Nickel	—	—	—	88	—

Value of Production

For indium, iron concentrate, mercury, molybdenum, rhenium, and tin the value of production is the amount received by the shippers.

For gold, silver, copper, lead, zinc, antimony, bismuth, cadmium, some iron concentrate, and nickel the value of production was calculated from the assay content of the ore, concentrate, or bullion less appropriate smelter losses, and an

average price per unit of weight. The 1974 values represent the settlement values received by the producers for the respective metals.

Prior to 1925 the value of gold and copper produced was calculated by using their true average prices and, in addition, for copper the smelter loss was taken into account.

The value of other metals was calculated from the gross metal content of ores or concentrates by using a metal price which was an arbitrary percentage of the average price, as follows: Silver, 95 per cent; lead, 90 per cent; and zinc, 85 per cent.

It is these percentages of the average price that are listed in the table on page A 76.

For 1925 to 1973 the values had been calculated by using the true average price (*see* page A 76) and the net metal contents in accordance with the procedures adopted by Statistics Canada and the Ministry of Mines and Petroleum Resources.

Since 1974 the total quantity and value of metal production include the quantities paid for to the mines, and the smelter and refinery production that can be attributed to the mines but is not paid for. The quantity and value paid for to the mines, excluding outward transportation costs, smelting and refining costs, penalties and deductions, are shown separately for comparative purposes.

INDUSTRIAL MINERALS AND STRUCTURAL MATERIALS

The values of production of industrial minerals and structural materials are approximately the amounts received at the point of origin.

COAL

The value of production of coal is calculated using a price per tonne which is the weighted average of the f.o.b. prices at the mine for the coal sold.

PETROLEUM AND NATURAL GAS

The values of production of natural gas, natural gas liquid by-products, and petroleum including condensate/pentanes plus are the amounts received for the products at the well-head.

NOTES OF PRODUCTS LISTED IN THE TABLES

Antimony—Antimony metal was produced at the Trail smelter from 1939 to 1944; since 1944 it has been marketed alloyed with lead. The antimony is a by-product of silver-lead ores. In 1907 the first recorded antimonial ore mined in British Columbia was shipped from the Slocan area to England. Since then other out-of-Province shipments have originated in the Bridge River, North Lardeau, Slocan, Spillimacheen, and Stuart Lake areas. In Table 3-7C the antimony assigned to individual mining divisions is the reported content of ore exported to foreign smelters; the antimony "not assigned" is that recovered at the Trail smelter from various ores received there. *See* Tables 3-1, 3-3, and 3-7C.

Arsenious oxide—Arsenious oxide was recovered at foreign smelters from arsenical gold ores from Hedley between 1917 and 1931, and in 1942, and from the Victoria property on Rocher Déboulé Mountain in 1928. No production has been recorded since 1942. *See* Tables 3-1 and 3-7D.

Asbestos — British Columbia has produced asbestos since 1952 when the Cassiar mine was opened. All British Columbia production consists of chrysotile

from the Cassiar mine near the Yukon boundary. This deposit is noted for its high percentage of valuable long fibre and for the low iron content of the fibre. The original claims were located at Cassiar in 1950, and the first fibre was shipped two years later. The fibre is milled from the ore at Cassiar and mostly shipped by truck to Whitehorse, and then moved by rail to tidewater at Skagway. From 1953 to 1961 the fibre was valued at the shipping point in North Vancouver, but beginning in 1962 it has been valued at the mine, and values for the preceding years have been recalculated on that basis. *See* Tables 3-1, 3-3, and 3-7D.

Barite—Barite production began in 1940 and has been continuous since then, coming from several operations in the upper Columbia River valley. Some barite is mined from lode deposits and the rest is recovered from the mill-tailings ponds of the former Silver Giant and Mineral King silver-lead-zinc mines. *See* Table 3-7D.

Bentonite—Small amounts of bentonite were produced between 1926 and 1944 from deposits in the coal measures near Princeton. There has been no production since 1944. *See* Tables 3-1 and 3-7D.

Bismuth—Since 1929 the Trail smelter has produced bismuth. It is a by-product of lead refining and thus the production cannot be assigned to specific properties or mining divisions. *See* Tables 3-1, 3-3, and 3-7C.

Brick—*See* Clay and shale products.

Building-stone—Dimensional stone for building purposes is quarried when required from a granite deposit on Nelson Island and an andesite deposit on Haddington Island. Other stone close to local markets is quarried periodically or as needed for special building projects. *See* Tables 3-1, 3-3, and 3-7E.

Butane—Butane is recovered as a by-product at the gas-processing plant at Taylor and at oil refineries. *See* Tables 3-1, 3-3, and 3-7A.

Cadmium—Cadmium has been recovered as a by-product at the Trail zinc refinery since 1928. It occurs in variable amounts in the sphalerite of most British Columbia silver-lead-zinc ores. In Table 3-7C the cadmium assigned to individual mining divisions is the reported content of custom shipments to the Trail and foreign smelters; that "not assigned" is the remainder of the reported estimated recovery at the Trail smelter from British Columbia concentrates. *See* Tables 3-1, 3-3, and 3-7C.

Cement—Cement is manufactured from carefully proportioned mixtures of limestone, gypsum, and other mineral materials. It has been produced in British Columbia since 1905. Present producers are British Columbia Cement Company Limited, with a 490 000 tonnes-per-year plant at Bamberton, and Canada Cement Lafarge Ltd., with a 476 000 tonnes-per-year plant on Lulu Island and a 191 000 tonnes-per-year plant at Kamloops. *See* Tables 3-1, 3-3, and 3-7E.

Chromite—Two shipments of chromite are on record, 608 tonnes from Cascade in 1918 and 114 tonnes from Scottie Creek in 1929. *See* Tables 3-1 and 3-7C.

Clay and shale products — These include brick, blocks, tile, pipe, pottery, lightweight aggregate, and pozzolan manufactured from British Columbia clays and shales. Common red-burning clays and shales are widespread in the Province, but better grade clays are rare. The first recorded production was of bricks at Craigflower in 1853 and since then plants have operated in most towns and cities for short periods. Local surface clay is used at Haney to make common red brick, tile, and flower pots. Shale and fireclay from Abbotsford Mountain are used to make firebrick, facebrick, sewer pipe, flue lining, and special fireclay shapes in plants at Kilgard, Abbotsford, and South Vancouver. A plant at Quesnel makes pozzolan from burnt shale quarried south of Quesnel. Several hobby and art

potteries and a sanitary-ware plant are in operation, but these use mainly imported raw materials and their production is not included in the tables *See* Tables 3-1, 3-3, and 3-7E.

Coal—Coal is almost as closely associated with British Columbia's earliest history as is placer gold. Coal was discovered at Suquash on Vancouver Island in 1835 and at Nanaimo in 1850. The yearly value of coal production passed that of placer gold in 1883 and contributed a major part of the total mineral wealth for the next 30 years.

First production, by mining divisions: Cariboo, 1942; Fort Steele, 1898; Kamloops, 1893; Liard, 1923; Nanaimo, 1836; Nicola, 1907; Omineca, 1918; Osoyoos, 1926; Similkameen, 1909; and Skeena, 1912.

The Nanaimo and Comox fields produced virtually all of the coal until production started from the Crowsnest field in 1898. The Crowsnest field contains coking-coal and prospered in the early years of smelting and railroad-building. Mining started in the Nicola-Princeton coalfield in 1907, at Telkwa in 1918, and on the Peace River in 1923. The Nanaimo field was exhausted in 1953 when the last large mines closed, and only small operations on remnants were left. The colliery at Merritt closed in 1945 and at Coalmont in 1940. The closing of the large mine at Tsable River in 1966, and the last small one, near Wellington in 1968, marked the end of continuous production from the important Vancouver Island deposits. Recent exploration indicates the possibility of renewed coal mining on the island.

Undeveloped fields include basins in the foothills of the Rocky Mountains south of the Peace River, the Groundhog basin in north central British Columbia, the Hat Creek basin west of Ashcroft, and Sage Creek basin southeast of Fernie.

The enormous requirements for coking-coal in Japan created intense exploration in various areas of British Columbia since 1968. The signing of large contracts with the Japanese resulted in preparations for production at several deposits in the East Kootenays. First shipments to Japan via special port facilities at North Vancouver and Roberts Bank began in 1970.

All the coal produced, including that used in making coke, is shown as primary mine production. Quantity from 1836 to 1909 is gross mine output and includes material lost in picking and washing. From 1910 the quantity is the amount sold and used, which includes sales to retail and wholesale dealers, industrial users, and company employees; coal used under company boilers, including steam locomotives; and coal used in making coke. *See* Tables 3-1, 3-3, 3-7A, 3-8A, and 3-8B.

Cobalt—In 1928 a recovery of 1,730 pounds of cobalt was made from a shipment of arsenical gold ore from the Victoria mine on Rocher Déboulé Mountain. From 1971 to 1973, cobalt was shipped from the Pride of Emory mine at Hope. *See* Tables 3-1 and 3-7C.

Coke—Coke is made from special types of coal. It has been produced in British Columbia since 1895. Being a manufactured product, its value does not contribute to the total mineral production as shown in Table 3-1. Up to 1966, coke statistics had been included in the Annual Report as Table 3-9, but this table has been discontinued. The coal used in making coke is still recorded in Table 3-8B.

Condensate—(*a*) *Field*—Field condensate is the liquid hydrocarbons separated and recovered from natural gas in the field before gas processing. (*b*) *Plant*—Plant condensate is the hydrocarbon liquid extracted from natural gas at gas-processing plants. *See* Tables 3-1, 3-3, and 3-7A.

Copper—Most of the copper concentrates are shipped to Japanese, Eastern Canadian, and American smelters because no copper smelter has operated in British

Columbia since 1935. Small amounts of gold and silver are commonly present and add value to the ore. Most of the smelting in British Columbia in early years was done on ore shipped direct from the mines without concentration, but modern practice is to concentrate the ore first.

Ore was smelted in British Columbia first in 1896 at Nelson (from Silver King mine) and at Trail (from Rossland mines), and four and five years later at Grand Forks (from Phoenix mine) and Greenwood (from Mother Lode mine). Later, small smelters were built in the Boundary district and on Vancouver and Texada Islands, and in 1914 the Anyox smelter was blown in. Copper-smelting ceased in the Boundary district in 1919, at Trail in 1929, and at Anyox in 1935. British Columbia copper concentrates were then smelted mainly at Tacoma, and since 1961 have gone chiefly to Japan.

Most of the production has come from southern British Columbia—from Britannia, Copper Mountain, Greenwood, Highland Valley, Merritt, Nelson, Rossland, Texada Island, and Vancouver Island, although a sizeable amount came from Anyox and some from Tulsequah. During the 1960's, exploration for copper became intense, interest being especially directed toward finding very large, low-grade deposits suitable for open-pit mining. This activity has resulted in the establishment of operating mines at Merritt (Craigmont) in 1961, in Highland Valley (Bethlehem) in 1962, on Babine Lake (Granisle) in 1966, near Peachland (Brenda) in 1970, Stewart (Granduc) and near Port Hardy (Island Copper) in 1971, near Babine Lake (Bell), McLeese Lake (Gibraltar), Highland Valley (Lornex), and Princeton (Ingerbelle) in 1972. *See* Table 3-12 for a complete list of copper producers.

Some of these mines produce molybdenum as a by-product, for example, Brenda, Lornex, and Island Copper. Copper is also produced as a by-product of iron mining at Tasu Sound, Queen Charlotte Islands (Wesfrob), and on Texada Island (Texada), and with ores containing zinc, gold, silver, and lead at Buttle Lake (Lynx and Myra, Western Mines).

Copper has been the most valuable single commodity of the industry since 1966. Production in 1976 was 263.6 million kilograms. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

Crude oil—Production of crude oil in British Columbia began in 1955 from the Fort St. John field, but was not significant until late in 1961, when the oil pipeline was built to connect the oil-gathering terminal at Taylor to the Trans Mountain Oil Pipe Line Company pipeline near Kamloops. In 1976, oil was produced from 39 separate fields, of which the Boundary Lake, Peejay, Milligan Creek, and Inga fields were the most productive.

In Tables 3-1, 3-3, and 3-7A, quantities given prior to 1962 under "petroleum, crude" are total sales, but since 1962 the field and plant condensates are listed separately.

Diatomite—Relatively large deposits of diatomite are found near the Fraser River in the Quesnel area, and small deposits are widespread throughout the Province. Small amounts of diatomite have been shipped from Quesnel periodically since 1928. A plant to process the material is located in Quesnel. *See* Table 3-7D.

Fluorite (fluorspar)—Between 1918 and 1929, fluorite was mined at the Rock Candy mine north of Grand Forks for use in the Trail lead refinery. From 1958 to 1968, small quantities were produced as a by-product at the Oliver silica quarry. *See* Table 3-7D.

Flux—Silica and limestone are added to smelter furnaces as flux to combine with impurities in the ore and from a slag which separates from the valuable metal. In the past, silica was shipped from Grand Forks, Oliver, and the Sheep Creek area.

Today, silica from near Kamloops and limestone, chiefly from Texada Island, are produced for flux. Quantities have been recorded since 1911. *See* Tables 3-1, 3-3, and 3-7D.

Gold, lode—Gold has played an important part in mining in the Province. The first discovery of lode gold was on Moresby Island in 1852, when some gold was recovered from a small quartz vein. The first stamp mill was built in the Cariboo in 1876, and it seems certain that some arrastras (primitive grinding-mills) were built even earlier. These and other early attempts were short-lived, and the successful milling of gold ores began about 1890 in the southern part of the Province. By 1900 the value of gold production was second only to that of coal. At the start of World War II, gold-mining attained a peak yearly value of more than $22 million, but since the war it has dwindled until developments in the 1970's.

In the early years, lode gold came mostly from the camps of Rossland, Nelson, McKinney, Fairview, Hedley, and also from the copper and other ores of the Boundary district. A somewhat later major producer was the Premier mine at Stewart. In the 1930's the price of gold increased and the value of production soared, new discoveries were made and old mines were revived. The principal gold camps, in order of output of gold, have been Bridge River, Rossland, Portland Canal, Hedley, Wells, and Sheep Creek. In 1971 the Bralorne mine in Bridge River closed.

With the closing of the Bralorne mine, most of the lode gold is produced as a by-product of copper, copper-zinc-silver, and other base metal mining. Because of the volume of this production the amount of gold produced is still at a fairly high level, and with the significant rise in the price of gold in the 1970's the value of production has exceeded the peaks reached during the era of gold mines in the 1930's. *See* Tables 3-1, 3-3, 3-6, and 3-7B. *See* Table 3-12 for a complete list of current producers.

Gold, placer—The early explorations and settlement of the Province followed rapidly on the discovery of gold-bearing placer creeks throughout the country. The first placer-miners came in 1858 to mine the lower Fraser River bars upstream from Yale.

The year of greatest placer-gold production was 1863, shortly after the discovery of the placer in the Cariboo. Another peak year in 1875 marked the discovery of placer on creeks in the Cassiar. A minor peak year was occasioned by the discovery of placer gold in the Granite Creek in the Tulameen in 1885. A high level of production ensued after 1899, when the Atlin placers reached their peak output. Other important placer-gold camps were established at Goldstream, Fort Steele, Rock Creek, Omineca River, and Quesnel River. The last important strike was made on Cedar Creek in 1921, and coarse gold was found on Squaw Creek in 1927 and on Wheaton Creek in 1932.

Mining in the old placer camps revived during the 1930's under the stimulus of an increase in the price of fine gold from $20.67 per ounce to $35 per ounce in United States funds. Since World War II, placer-mining declined under conditions of steadily rising costs and a fixed price for gold but is showing signs of revival in response to a freely floating gold price since 1972. Since 1858, more than 163 000 kilograms valued at $97.8 million has been recovered.

A substantial part of the production, including much of the gold recovered from the Fraser River upstream from Yale (in the present New Westminster, Kamloops, and Lillooet Mining Divisions) and much of the early Cariboo production, was mined before the original organization of the Department of Mines in 1874. Consequently, the amounts recorded are based on early estimates and cannot be accurately assigned to individual mining divisions.

The first year of production for major placer-producing mining divisions was Atlin, 1898; Cariboo, 1859; Liard, 1873; Lillooet, 1858; Omineca, 1869.

In 1965, changes were made in the allocation of placer gold in the New Westminster and Similkameen Mining Divisions and "not assigned," to reconcile those figures with data incorporated in Bulletin 28, *Placer Gold Production of British Columbia.* *See* Tables 3-1, 3-3, 3-6, and 3-7A.

Granules—Rock chips used for bird grits, exposed aggregate, roofing, stucco dash, terrazzo, etc., have been produced in constantly increasing quantities since 1930. Plants operate in Burnaby and near Grand Forks, Sirdar, Vananda, and Armstrong. *See* Tables 3-1, 3-3, and 3-7D.

Gypsum and gypsite—Production of gypsum and gypsite has been recorded since 1911. Between 1925 and 1956, more than 907 000 tonnes were shipped from Falkland and some was quarried near Cranbrook and Windermere. Since 1956, nearly all production has come from Windermere. *See* Tables 3-1, 3-3, and 3-7D.

Hydromagnesite—Small shipments of hydromagnesite were made from Atlin between 1904 and 1916 and from Clinton in 1921. *See* Tables 3-1 and 3-7D.

Indium—Production of indium as a by-product of zinc-refining at the Trail smelter began in 1942. Production figures have not been disclosed since 1958.

Iron—Iron ore was produced in small quantities as early as 1885, commonly under special circumstances or as test shipment. Steady production started in 1951 with shipments of magnetite concentrates to Japan from Vancouver and Texada Islands.

Most of the known iron-ore deposits are magnetite, and occur in the coastal area. On the average they are low in grade and need to be concentrated. Producing mines have operated on Texada Island, at Benson Lake and Zeballos on Vancouver Island, and at Tasu and Jedway on Moresby Island. At Texada Island copper is a by-product of iron-mining, and in the Coast Copper mine at Benson Lake iron was a by-product of copper-mining. The latest operation, and to date the largest, is that of Wesfrob Mines Limited at Tasu, begun at the end of 1967; copper is produced as a by-product.

From January 1961 to August 1972, calcined iron sulphide from the tailings of the Sullivan mine was used for making pig iron at Kimberley. This was the first manufacture of pig iron in British Columbia. The iron occurs as pyrrhotite and pyrite in the lead-zinc ore of the Sullivan mine. In the process of milling, the lead and zinc minerals are separated for shipment to the Trail smelter, and the iron sulphides are separated from the waste rock. Over the years a stockpile has been built containing a reserve of about 18 million tonnes of iron ore.

The sulphur was removed in making pig iron and was converted to sulphuric acid, which was used in making fertilizer. A plant built at Kimberley converted the pig iron to steel, and a fabricating plant was acquired in Vancouver. The iron smelter at Kimberley closed in August 1972. The entire production, credited to the Fort Steele Mining Division in Table 3-7C, is of calcine. *See* Tables 3-1, 3-3, 3-6, and 3-7C.

Iron oxide—Iron oxide, ochre, and bog iron were mined as early as 1918 from several occurrences, but mainly from limonite deposits north of Squamish. None has been produced since 1950. *See* Tables 3-1 and 3-7D.

Jade (nephrite)—Production of jade (nephrite) has been recorded only since 1959 despite there being several years of significant production prior to that date. The jade is recovered from bedrock occurrences on Mount Ogden and near Dease Lake and as alluvial boulders from the Fraser River; the Bridge River and its

tributaries, Marshall, Hell, and Cadwallader Creeks; O'Ne-ell, Ogden, Kwanika, and Wheaton Creeks. *See* Tables 3-1, 3-3, and 3-7D.

Lead—Lead was the most valuable single commodity for many years, but it was surpassed in value of annual production by zinc in 1950, by copper in 1966, and in total production by zinc in 1966. Lead and zinc usually occur together in nature although not necessarily in equal amounts in a single deposit. Zinc is the more abundant metal, but lead ore usually is more valuable than zinc ore because it contains more silver as a by-product. For a long time British Columbia produced almost all of Canada's lead, but now produces about 34 per cent of the total. Most of the concentrated ore is smelted and the metal refined at Trail, but some concentrate is shipped to American smelters.

Almost all of British Columbia's lead comes from the southeastern part of the Province. The Sullivan mine at Kimberley is now producing about 88 per cent of the Province's lead and has produced about 86 per cent of the grand total. This is one of the largest mines in the world and supports the great metallurgical works at Trail. Other mines are at Pend-d'Oreille River, North Kootenay Lake, Slocan, and southwest of Golden. In northwestern British Columbia less important parts of the total output have come from Tulsequah, the Premier mine, and several small mines in the general region of Hazelton. *See* Table 3-12 for the current lead producers.

A small amount of high-grade lead ore is shipped directly to the smelter, but most of the ore is concentrated by flotation and the zinc content is separated from the lead. All output from the Sullivan and other mines in British Columbia owned by Cominco Ltd. goes to the Trail smelter, but part of the output of other mines goes to American smelters. Lead was first produced in 1887, and the total production amounts to approximately 7.7 million tonnes.

In 1958, revisions were made in some yearly totals for lead to adjust them for recovery of lead from slag treated at the Trail smelter. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

Limestone—Besides being used for flux and granules (where it is recorded separately), limestone is used in agriculture, cement manufacture, the pulp and paper industry, and for making lime. It has been produced since 1886. Quarries now operate at Cobble Hill, near Prince George, at Kamloops, and on the north end of Texada Island. *See* Tables 3-1, 3-3, and 3-7E.

Magnesium—In 1941 and 1942, Cominco Ltd. produced magnesium from magnesite mined from a large deposit at Marysville. *See* Tables 3-1 and 3-7C.

Magnesium sulphate—Magnesium sulphate was recovered in minor amounts at various times between 1915 and 1942 from small alkali lakes near Basque, Clinton, and Osoyoos. *See* Tables 3-1 and 3-7D.

Manganese—From 1918 to 1920, manganese ore was shipped from a bog deposit near Kaslo and from Hill 60 near Cowichan Lake, and in 1956 a test shipment was made from Olalla. *See* Tables 3-1 and 3-7C.

Mercury—Mercury was first produced near Savona in 1895. Since then small amounts have been recovered from the same area and from the Bridge River district. The main production to date was between 1940 and 1944 from the Pinchi Lake and Takla mines near Fort St. James. In 1968 the Pinchi Lake mine reopened and continued in operation until 1975 when it closed because of market situations. *See* Tables 3-1 and 3-7C.

Mica—No sheet mica has been produced commercially in British Columbia. Between 1932 and 1961, small amounts of mica schist for grinding were mined near Albreda, Armstrong, Oliver, Prince Rupert, and Sicamous. *See* Tables 3-1 and 3-7D.

Molybdenum—Molybdenum ore in small amounts was produced from high-grade deposits between 1914 and 1918. Recently, mining of large low-grade molybdenum and copper-molybdenum deposits has increased production to the point that molybdenum now ranks second in importance in annual value of metals produced in British Columbia. The upswing began when the Bethlehem mine recovered by-product molybdenum from 1964 and 1966. In 1965 the Endako and Boss Mountain mines, followed by the Coxey in 1966, and British Columbia Molybdenum mine in 1967, all began operations as straight molybdenum producers. The Boss Mountain mine closed in 1971 and reopened late in 1973. In 1970 the Brenda mine, a combined copper-molybdenum producer, started operating, and Island Copper in 1971, and Lornex in 1972. *See* Tables 3-1, 3-3, 3-6, and 3-7C.

Natro-alunite—In 1912 and 1913, 363 tonnes of natro-alunite were mined from a small low-grade deposit at Kyuquot Sound. There has been no subsequent production. *See* Tables 3-1 and 3-7D.

Natural gas—Commercial production of natural gas began in 1954 to supply the community of Fort St. John. In 1957 the gas plant at Taylor and the pipeline to serve British Columbia and the northwestern United States was completed. The daily average volume of production in 1975 was 1.14 billion cubic feet. In 1976 there were 76 gas-fields producing both associated and nonassociated gas, of which the Clarke Lake, Yoyo, and Sierra were the most productive.

The production shown in Tables 3-1, 3-3, and 3-7A is the total amount sold of residential gas from processing plants plus dry and associated gas from the gas-gathering system; that is, the quantity delivered to the main transmission-line. The quantity is net after deducting gas used on leases, metering difference, and gas used or lost in the cleaning plant. The quantity is reported as millions of cubic metres at standard conditions (99.2 kPa, (kilopascals) pressure, 15°C temperature, up to and including the year 1960, and thereafter 101.3 kPa pressure, 15°C temperature).

Full details of gross well output, other production, delivery, and sales are given in the tables in chapter 4.

Nickel—One mine, the Pride of Emory near Hope, shipped nickel ore in 1936 and 1937 and began continuous production in 1958. From 1960 to 1974, bulk copper and nickel concentrates have been shipped to Japan and Alberta respectively for smelting. The mine closed in August 1974. *See* Tables 3-1, 3-3, and 3-7C.

Palladium—Palladium was recovered in 1928, 1929, and 1930 as a by-product of the Trail refinery and is presumed to have originated in copper concentrates shipped to the smelter from the Copper Mountain mine. *See* Tables 3-1 and 3-7C.

Perlite—In 1953 a test shipment of 1 009 tonnes was made from a quarry on François Lake. There has been no further production. *See* Tables 3-1 and 3-7D.

Petroleum, crude—*See* Crude oil.

Phosphate rock—Between 1927 and 1933, Cominco Ltd. produced 3 485 tonnes of phosphate rock for test purposes, but the grade proved to be too low for commercial use. More test shipments were made in 1964, but there has been no commercial production. *See* Tables 3-1 and 3-7D.

Platinum—Platinum has been produced intermittently from placer streams in small amounts since 1887, mostly from the Tulameen and Similkameen Rivers. Placer platinum also has been recovered from Pine, Thibert, McConnell, Rainbow, Tranquille, Rock, and Government Creeks; from Quesnel, Fraser, Cottonwood,

Peace, and Coquihalla Rivers; and from beach placers on Graham Island. Some platinum recovered between 1928 and 1930 as a by-product at the Trail refinery is presumed to have originated in copper concentrates shipped to the smelter from the Copper Mountain mine. *See* Tables 3-1, 3-3, and 3-7C.

Propane—Propane is recovered from gas-processing plants at Taylor and Boundary Lake, and at oil refineries. *See* Tables 3-1, 3-3, and 3-7A.

Rhenium—Rhenium occurs in significant quantities only with molybdenite associated with porphyry copper deposits. It was first produced in 1972 by the Island Copper Mine and is extracted as rhenium oxide from fumes produced during roasting of the molybdenite concentrate.

Rock—Production of rubble, riprap, and crushed rock has been recorded since 1909. *See* Tables 3-1, 3-3, and 3-7E.

Sand and gravel—Sand and gravel are used as aggregate in concrete work. The output varies from year to year according to the level of activity in the construction industry. *See* Tables 3-1, 3-3, and 3-7E.

Selenium—The only recorded production of selenium, 332 kilograms, was in 1931 from the refining of blister copper from the Anyox smelter. *See* Tables 3-1 and 3-7C.

Silver—Silver is recovered from silver ores or as a by-product of other ores. Most of it is refined in Trail, and some is exported in concentrated ores of copper, lead, and zinc to American and Japanese smelters. Silver bullion was produced by the Torbrit mine from 1949 to 1959.

Invariably some silver is associated with galena, so that even low-grade lead ores, if mined in quantity, produce a significant amount of silver. Some silver is recovered from gold ores and some from copper ores, and although the silver in such ores is usually no more than a fraction of an ounce per ton, even that amount is important in a large-tonnage operation.

Production of silver began in 1887 from silver-copper and silver-lead ores in the Kootenays and has continued in this area to the present. Now, most of the silver is a by-product of lead-zinc ores and nearly all is refined at Trail, although some is exported with concentrates to American and Japanese smelters. Today the greatest single source of silver is the Sullivan mine, which has been in production since 1900. By 1974 the Sullivan mine has accounted for 47 per cent of the total silver production of the Province. A significant total amount is contributed by the Lynx, Silmonac, Phoenix, Bethlehem, Granisle, Brenda, and Granduc mines. Table 3-12 details the current silver production. The only steady producer that is strictly a silver mine is the Highland Bell mine at Beaverdell, in operation since 1922. A former important mine, the Premier near Stewart, produced more than 1.3 million kilograms of silver between 1918 and 1968. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

Sodium carbonate—Sodium carbonate was recovered between 1921 and 1949 from alkali lakes in the Clinton area and around Kamloops. There has been no further production. *See* Tables 3-1 and 3-7D.

Stone (*see* Building-stone)—Cut stone for building purposes is prepared from rock produced at quarries in various parts of the Province when required. Two of the most productive quarries have operated on Haddington and Nelson Islands. *See* Tables 3-1, 3-3, and 3-7E.

Structural materials—In Table 3-7E the value of $5,972,171 for unclassified materials is the total for structural materials in the period 1886–1919 that cannot be allotted to particular classes of structural materials or assigned to mining divisions, and includes $726,323 shown against 1896 in Table 3-2 that includes unclassified structural materials in that and previous years not assignable to particular

years. The figure $3,180,828 in Table 3-7E under "Other Clay Products" is the value in the period 1886–1910 that cannot be allotted to particular clay products or assigned to mining divisions. *See* Tables 3-1, 3-2, 3-3, 3-7A, and 3-7E.

Sulphur—The production of sulphur has been recorded since 1916. From 1916 to 1927 the amounts include the sulphur content of pyrite shipped. From 1928 the amounts include the estimated sulphur content of pyrite shipped, plus the sulphur contained in sulphuric acid made from waste smelter gases. The sulphur content of pyrrhotite roasted at the Kimberley fertilizer plant is included since 1953. Since 1958, elemental sulphur recovered from the Canadian Occidental Petroleum Ltd. plant at Taylor has been included. *See* Tables 3-1, 3-3, and 3-7D.

Talc—Between 1916 and 1936, talc was quarried at Leech River and at Anderson Lake to make dust for asphalt roofing. There has been no production since 1936. *See* Tables 3-1 and 3-7G.

Tin—Tin, as cassiterite, is a by-product of the Sullivan mine, where it has been produced since 1941. Tin is also produced in a lead-tin alloy at the Trail smelter. *See* Tables 3-1, 3-3, and 3-7C.

Tungsten—Tungsten, very largely as scheelite concentrates, was produced from 1937 to 1958, first from the Columbia Tungstens (Hardscrabble) mine in the Cariboo in 1937 and during World War II from the Red Rose mine near Hazelton and the Emerald mine near Salmo. The Red Rose closed in 1954 and the Emerald in 1958. Small amounts of scheelite have been produced from the Bridge River, Revelstoke, and other areas where demand was high. In 1970, production began from the Invincible mine near Salmo, which closed in 1973.

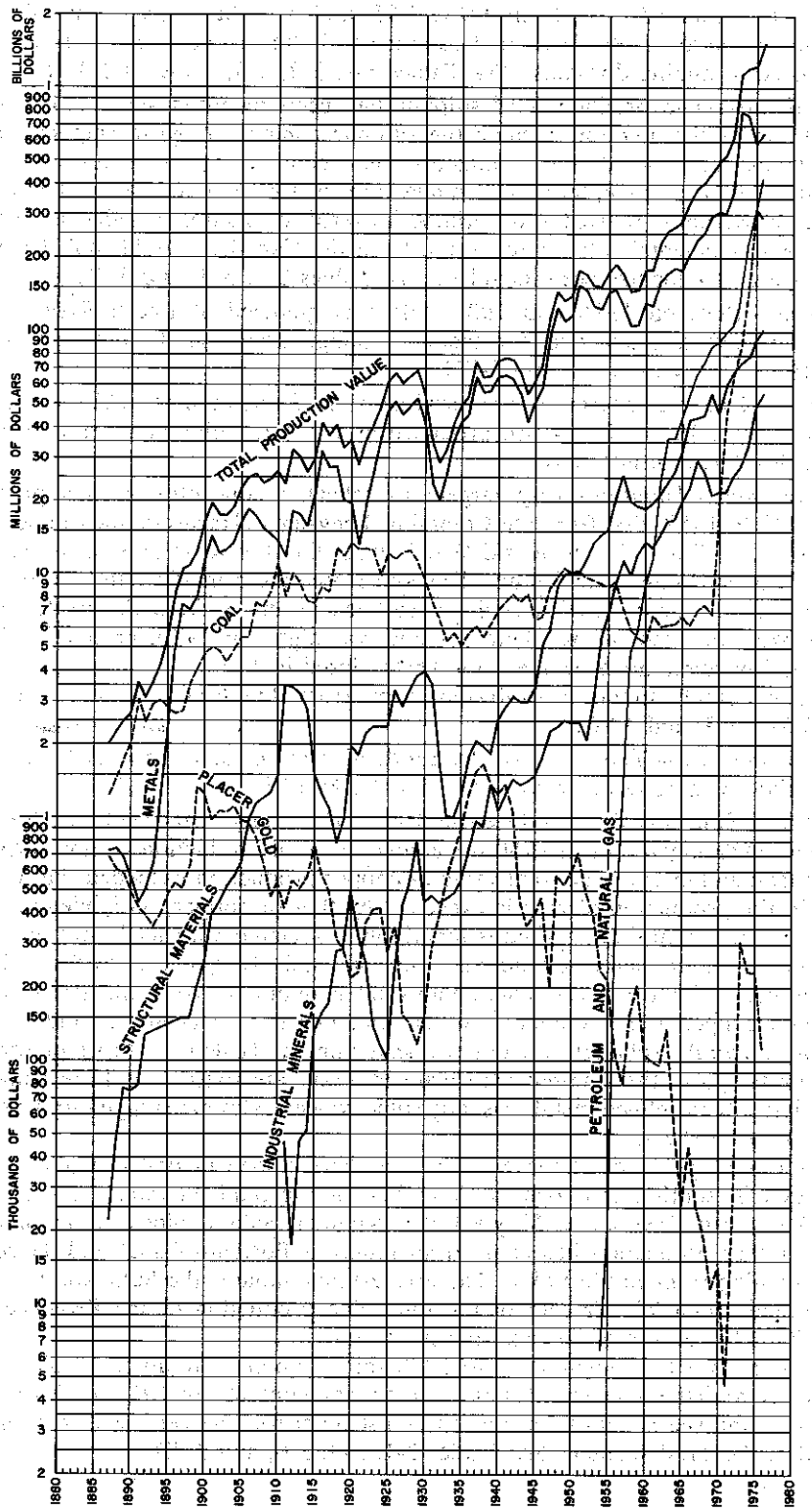
A very small amount of wolframite came from Boulder Creek near Atlin. *See* Tables 3-1, 3-3, and 3-7C.

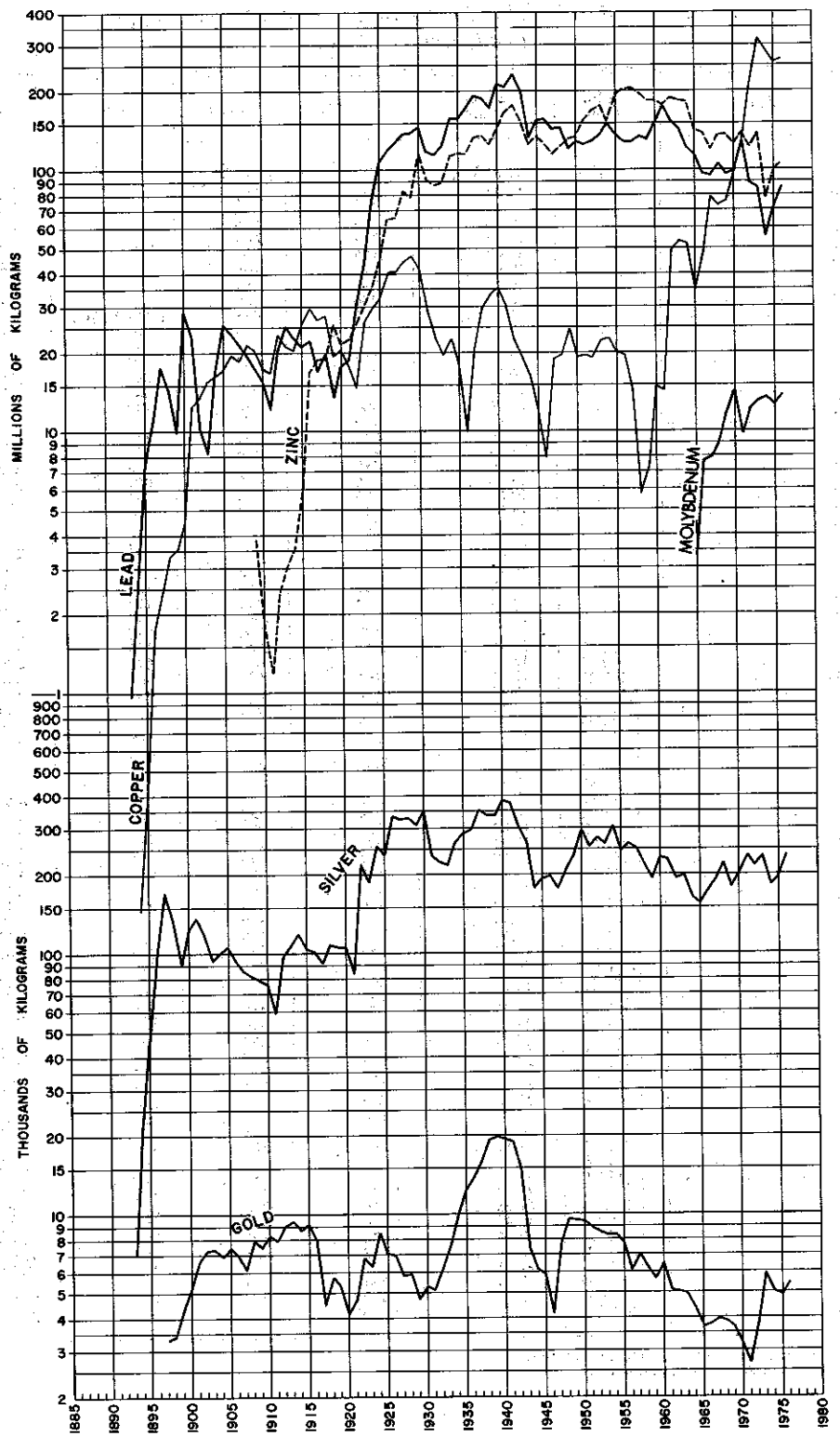
Volcanic ash—The only recorded production of volcanic ash is 27 tonnes from the Cariboo Mining Division in 1954. *See* Table 3-7D.

Zinc—Zinc was first produced in 1905. For many years lead was the most valuable single metal, but in 1950 the annual value of production of zinc surpassed that of lead and in 1966 the total value of copper production exceeded that of zinc. In 1976 the production of zinc is exceeded by that of copper, molybdenum, coal, crude oil, and natural gas. Zinc is invariably associated with lead, and most ores are mined for their combined values in zinc, lead, and silver, and rarely for their zinc content alone. Some zinc ores contain a valuable amount of gold, and zinc is associated with copper at Lynx mine. Modern practice is to concentrate and separate the zinc mineral (sphalerite) from the lead mineral (galena). Most of the zinc concentrates go to the zinc-recovery plant at Trail, are roasted, and are converted electrolytically to refined metal. Usually some concentrates are shipped to American or Japanese smelters.

About 85 per cent of the zinc that has been mined in British Columbia has originated in southeastern British Columbia, at the Sullivan mine, and at mines near Ainsworth, Invermere, Moyie Lake, Riondel, Salmo, Slocan, and Spillimacheen. Other production has come from mines at Portland Canal and Tulsequah and is coming from Buttle Lake. The greatest zinc mine is the Sullivan, which has contributed about 73 per cent of the total zinc production of the Province. *See* Table 3-12 for details of current zinc producers.

Records for the period 1905 to 1908 show shipments totalling 17 096 tonnes of zinc ore and zinc concentrates of unstated zinc content. In 1918, revisions were made to some yearly totals for zinc to adjust them for recovery of zinc from slag treated at the Trail smelter. *See* Tables 3-1, 3-3, 3-6, and 3-7B.


BILLIONS OF DOLLARS
MILLIONS OF DOLLARS
THOUSANDS OF DOLLARS
TOTAL PRODUCTION VALUE
COAL
METALS
PLACER GOLD
STRUCTURAL MATERIALS
INDUSTRIAL MINERALS
PETROLEUM AND NATURAL GAS
1880
1885
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980


MILLIONS OF KILOGRAMS
400
300
200
150
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
LEAD
ZINC
MOLYBDENUM
COPPER
SILVER
GOLD
THOUSANDS OF KILOGRAMS
900
800
700
600
500
400
300
200
150
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
1885
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980

Prices[1] Used in Valuing Production of Gold, Silver, Copper, Lead, Zinc, and Coal

Year	Gold, Fine	Silver, Fine	Copper	Lead	Zinc	Coal
	$/kg	$/kg	$/kg	$/kg	$/kg	$/t
1901	664.57	18.01 N.Y	0.355 N.Y.	0.057 N.Y.	.....	2.92
1902	,,	15.93 ,,	.258 ,,	.081 ,,	.....	2.90
1903	,,	16.33 ,,	.292 ,,	.084 ,,	.....	2.94
1904	,,	17.16 ,,	.283 ,,	.086 ,,	.....	2.89
1905	,,	16.50 ,,	.344 ,,	.094 ,,	.....	2.98
1906	,,	20.40 ,,	.425 ,,	.106 ,,	.....	2.88
1907	,,	19.95 ,,	.441 ,,	.106 ,,	.....	3.38
1908	,,	16.15 ,,	.291 ,,	.083 ,,	.....	3.43
1909	,,	15.73 ,,	.286 ,,	.085 ,,	.....	3.52
1910	,,	16.34 ,,	.281 ,,	.088 ,,	0.101 E. St. L.	3.69
1911	,,	16.28 ,,	.273 ,,	.088 ,,	.108 ,,	3.51
1912	,,	18.58 ,,	.360 ,,	.089 ,,	.130 ,,	3.70
1913	,,	18.26 ,,	.337 ,,	.087 ,,	.106 ,,	3.74
1914	,,	16.75 ,,	.300 ,,	.077 ,,	.097 ,,	3.69
1915	,,	15.18 ,,	.381 ,,	.092 ,,	.248 ,,	3.78
1916	,,	20.06 ,,	.600 ,,	.136 ,,	.240 ,,	3.80
1917	,,	24.87 ,,	.599 ,,	.174 ,,	.167 ,,	3.84
1918	,,	29.56 ,,	.543 ,,	.147 ,,	.153 ,,	5.50
1919	,,	33.94 ,,	.412 ,,	.114 ,,	.138 ,,	5.42
1920	,,	30.80 ,,	.385 ,,	.158 ,,	.144 ,,	5.20
1921	,,	19.14 ,,	.276 ,,	.090 ,,	.087 ,,	5.30
1922	,,	20.62 ,,	.295 ,,	.114 ,,	.107 ,,	5.20
1923	,,	19.81 ,,	.318 ,,	.144 ,,	.124 ,,	5.30
1924	,,	20.40 ,,	.287 ,,	.161 ,,	.119 ,,	5.39
1925	,,	22.21 ,,	.310 ,,	.173 Lond.	.174 Lond.	5.28
1926	,,	19.97 ,,	.304 ,,	.149 ,,	.163 ,,	5.34
1927	,,	18.12 ,,	.285 ,,	.116 ,,	.137 ,,	5.30
1928	,,	18.70 ,,	.321 ,,	.101 ,,	.121 ,,	5.19
1929	,,	17.04 ,,	.399 ,,	.111 ,,	.119 ,,	5.22
1930	,,	12.27 ,,	.286 ,,	.087 ,,	.079 ,,	5.21
1931	,,	9.23 ,,	.179 ,,	.060 ,,	.056 ,,	4.80
1932	754.59	10.18 ,,	.141 Lond.	.047 ,,	.053 ,,	4.45
1933	919.53	12.16 ,,	.164 ,,	.053 ,,	.071 ,,	4.30
1934	1,109.22	15.26 ,,	.164 ,,	.054 ,,	.067 ,,	4.41
1935	1,131.40	20.83 ,,	.172 ,,	.069 ,,	.068 ,,	4.35
1936	1,126.26	14.51 ,,	.209 ,,	.086 ,,	.073 ,,	4.66
1937	1,124.97	14.43 ,,	.288 ,,	.113 ,,	.108 ,,	4.68
1938	1,131.08	13.98 ,,	.220 ,,	.074 ,,	.068 ,,	4.42
1939	1,161.95	13.02 ,,	.223 ,,	.070 ,,	.068 ,,	4.43
1940	1,237.82	12.30 ,,	.222 ,,	.074 ,,	.075 ,,	4.70
1941	1,237.82	12.30 ,,	.222 ,,	.074 ,,	.075 ,,	4.57
1942	1,237.82	13.24 ,,	.222 ,,	.074 ,,	.075 ,,	4.55
1943	1,237.82	14.55 ,,	.259 ,,	.083 ,,	.088 ,,	4.60
1944	1,237.82	13.83 ,,	.265 ,,	.099 ,,	.095 ,,	4.68
1945	1,237.82	15.11 ,,	.277 ,,	.110 ,,	.142 ,,	4.67
1946	1,181.56	26.89 ,,	.282 ,,	.149 ,,	.172 ,,	5.16
1947	1,125.29	23.15 ,,	.450 ,,	.301 ,,	.248 ,,	5.64
1948	1,125.29	24.11 Mont.	.493 U.S.	.398 ,,	.307 ,,	6.71
1949	1,157.44	23.87 U.S.	.440 ,,	.348 U.S.	.292 U.S.	7.18
1950	1,223.35	25.93 ,,	.517 ,,	.319 ,,	.332 ,,	7.09
1951	1,184.77	30.40 ,,	.611 ,,	.406 ,,	.439 ,,	7.12
1952	1,101.82	26.74 ,,	.685 ,,	.355 ,,	.350 ,,	7.65
1953	1,106.65	26.93 ,,	.669 ,,	.292 ,,	.235 ,,	7.58
1954	1,095.39	26.68 ,,	.642 ,,	.302 ,,	.230 ,,	7.72
1955	1,109.86	28.25 ,,	.844 ,,	.329 ,,	.267 ,,	7.43
1956	1,107.29	28.73 ,,	.877 ,,	.347 ,,	.293 ,,	7.26
1957	1,078.67	27.99 ,,	.574 ,,	.310 ,,	.246 ,,	7.45
1958	1,092.50	27.79 ,,	.516 ,,	.259 ,,	.221 ,,	8.21
1959	1,079.32	28.12 ,,	.611 ,,	.257 ,,	.242 ,,	8.74
1960	1,091.53	28.50 ,,	.639 ,,	.256 ,,	.277 ,,	7.32
1961	1,140.08	30.12 ,,	.620 ,,	.243 ,,	.258 ,,	8.16
1962	1,202.78	37.30 ,,	.672 ,,	.227 ,,	.274 ,,	8.19
1963	1,213.71	44.36 ,,	.676 ,,	.265 ,,	.290 ,,	8.08
1964	1,213.71	44.84 ,,	.737 ,,	.323 ,,	.323 ,,	7.65
1965	1,213.07	44.81 ,,	.846 ,,	.380 ,,	.345 ,,	7.75
1966	1,212.42	44.79 ,,	1.176 ,,	.359 ,,	.344 ,,	8.02
1967	1,214.03	53.73 ,,	1.125 ,,	.333 ,,	.329 ,,	8.54
1968	1,212.42	74.29 ,,	1.195 ,,	.321 ,,	.312 ,,	8.72
1969	1,211.78	61.96 ,,	1.470 ,,	.354 ,,	.347 ,,	8.82
1970	1,175.45	59.46 ,,	1.294[2]	.360 ,,	.353 ,,	8.16
1971	1,136.22	50.14 ,,	1.030[2]	.308 ,,	.359 ,,	11.06
1972	1,849.34	53.48 ,,	.989[2]	.328 ,,	.388 ,,	12.08
1973	3,131.85	82.51 ,,	1.835[2]	.359 ,,	.455 ,,	12.71
1974	5,348.68[2]	156.53[2]	1.884[2]	.427[2]	.767[2]	19.93
1975	5,204.66[2]	155.60[2]	1.283[2]	.346[2]	.808[2]	35.53
1976	*4,035.14*[2]	*135.71*[2]	*1.438*[2]	*.384*[2]	*.615*[2]	*39.63*

[1] *See* page A 62 for detailed explanation.
[2] *See* page A 63 for explanation.

Table 3-1—Mineral Production: Total to Date, Past Year, and Latest Year

Products[1]	Total Quantity to Date[2]	Total Value to Date	Quantity, 1975	Value, 1975	Quantity, 1976	Value, 1976
Metals		$		$		$
Antimony kg	26 083 986	22,720,683	364 045	1,467,928	447 001	1,636,871
Bismuth kg	3 214 539	15,645,621	19 163	261,931	20 261	226,462
Cadmium kg	19 908 071	84,083,854	320 923	1,971,035	356 422	1,530,800
Chromite t	722	32,295				
Cobalt kg	114 484	376,661				
Copper kg	3 398 531 632	3,287,676,222	258 497 599	331,693,850	263 618 197	378,984,941
Gold—						
placer kg	163 098	97,880,802	44	232,204	26	115,613
lode, fine kg	557 024	605,553,128	4 819	25,082,494	5 393	21,761,502
Iron concentrates t	32 036 222	324,218,673	1 299 215	15,245,902	1 255 277	14,760,526
Lead kg	7 676 695 704	1,522,606,093	70 603 483	24,450,158	84 407 582	32,796,533
Magnesium kg	92 819	88,184				
Manganese t	1 564	32,668				
Mercury[3] kg	1 891 974	10,447,358				
Molybdenum kg	131 601 686	562,570,475	13 026 627	71,201,391	14 088 686	94,109,138
Nickel kg	23 337 783	51,698,754				
Palladium kg	23	30,462				
Platinum kg	44	135,008				
Selenium kg	232	1,389				
Silver kg	16 401 912	487,734,598	196 306	30,545,947	239 721	32,532,836
Tin kg	8 969 261	19,755,795	32 511	200,669	102 262	712,912
Tungsten (WO_3) kg	9 090 002	48,068,016				
Zinc kg	7 222 799 406	1,755,022,918	99 668 230	80,572,872	106 498 987	65,499,108
Others		57,290,568		3,695,987		2,083,161
Totals		8,953,670,225		586,622,368		646,750,403
Industrial Minerals						
Arsenious oxide kg	9 986 428	273,201				
Asbestos t	1 343 805	345,181,523	76 771	37,849,743	70 433	40,727,296
Bentonite t	718	16,858				
Fluxes t	3 885 503	8,254,083	39 589	174,824	11 378	33,263
Granules t	541 160	11,534,351	33 316	1,144,968	31 476	1,219,884
Gypsum and gypsite t	6 133 362	25,155,884	474 387	1,751,799	556 134	4,434,471
Hydromagnesite t	2 044	27,536				
Iron oxide and ochre t	16 427	155,050				
Jade kg	1 124 873	3,237,794	110 437	414,123	483 796	1,535,030
Magnesium sulphate t	12 604	254,352				
Mica kg	5 815 954	185,818				
Natro-alunite t	474	9,398				
Perlite t	1 009	11,120				
Phosphate rock t	3 485	16,894				
Sodium carbonate t	9 518	118,983				
Sulphur t	8 121 190	117,278,247	246 079	5,738,134	231 704	4,296,189
Talc t	984	34,871				
Others		8,688,212		1,594,011		671,009
Totals		520,434,175		48,667,602		52,917,142
Structural Materials						
Cement t	16 896 957	373,871,725	915 293	31,681,722	846 548	34,973,746
Clay products		114,731,641		6,593,189		6,995,917
Lime and limestone t		77,992,739	1 976 415	4,349,800	2 173 831	5,610,063
Rubble, riprap, crushed rock t		81,419,082	4 103 452	8,723,448	2 485 215	5,205,973
Sand and gravel t		470,809,226	28 945 523	39,575,457	36 073 618	48,138,635
Building-stone t	1 057 772	9,277,418	53	4,395	657	14,314
Not assigned		5,972,171				
Totals		1,134,074,002		90,928,011		100,938,648
Coal						
Coal—sold and used t	172 374 958	1,606,480,862	8 924 816	317,111,744	7 537 695	298,683,679
Petroleum and Natural Gas						
Crude oil m^3	44 131 753	862,685,457	2 269 898	94,229,725	2 367 450	116,595,050
Field condensate m^3	168 831	4,046,732	16 094	668,092	18 309	901,711
Plant condensate m^3	2 768 143	21,156,955	185 272	6,525,837	167 576	7,198,957
Natural gas to pipeline $10^6 m^3$	108 779	951,643,124	9 236	214,733,528	8 800	287,997,059
Butane m^3	1 327 722	9,416,658	106 427	2,577,205	109 781	4,591,832
Propane m^3	1 046 339	7,444,531	81 975	1,985,087	88 195	3,688,955
Totals		1,856,393,457		320,719,474		420,973,564
Grand totals		14,071,052,721		1,364,049,199		1,520,263,436

[1] *See* notes on individual products listed alphabetically on pages A 64 to A 73.
[2] *See* page A 10 for conversion table to old system.
[3] From 1968, excludes production which is confidential.

Table 3-2—Total Value of Mineral Production, 1836–1976

Year	Metals	Industrial Minerals	Structural Materials	Coal	Petroleum and Natural Gas	Total
	$	$	$	$	$	$
1836–86	52,808,750	———	43,650	10,758,565	———	63,610,965
1887	729,381	———	22,168	1,240,080	———	1,991,629
1888	745,794	———	46,432	1,467,903	———	2,260,129
1889	685,512	———	77,517	1,739,490	———	2,502,519
1890	572,884	———	75,201	2,034,420	———	2,682,505
1891	447,136	———	79,475	3,087,291	———	3,613,902
1892	511,075	———	129,234	2,479,005	———	3,119,314
1893	659,969	———	———	2,934,882	———	3,594,851
1894	1,191,728	———	———	3,038,859	———	4,230,587
1895	2,834,629	———	———	2,824,687	———	5,659,316
1896	4,973,769	———	726,323	2,693,961	———	8,394,053
1897	7,575,262	———	150,000	2,734,522	———	10,459,784
1898	7,176,870	———	150,000	3,582,595	———	10,909,465
1899	8,107,509	———	200,000	4,126,803	———	12,434,312
1900	11,360,546	———	250,000	4,744,530	———	16,355,076
1901	14,258,455	———	400,000	5,016,398	———	19,674,853
1902	12,163,561	———	450,000	4,832,257	———	17,445,818
1903	12,640,083	———	525,000	4,332,297	———	17,497,380
1904	13,424,755	2,400	575,000	4,953,024	———	18,955,179
1905	16,289,165	———	660,800	5,511,861	———	22,461,826
1906	18,449,602	———	982,900	5,548,044	———	24,980,546
1907	17,101,305	———	1,149,400	7,637,713	———	25,888,418
1908	15,227,991	———	1,200,000	7,356,866	———	23,784,857
1909	14,668,141	———	1,270,559	8,574,884	———	24,513,584
1910	13,768,731	———	1,500,000	11,108,335	———	26,377,066
1911	11,880,062	46,345	3,500,917	8,071,747	———	23,499,071
1912	18,218,266	17,500	3,436,222	10,786,812	———	32,458,800
1913	17,701,432	46,446	3,249,605	9,197,460	———	30,194,943
1914	15,790,727	51,810	2,794,107	7,745,847	———	26,382,491
1915	20,765,212	133,114	1,509,235	7,114,178	———	29,521,739
1916	32,092,648	150,718	1,247,912	8,900,675	———	42,391,953
1917	27,299,934	174,107	1,097,900	8,484,343	———	37,056,284
1918	27,957,302	281,131	783,280	12,833,994	———	41,855,707
1919	20,058,217	289,426	980,790	11,975,671	———	33,304,104
1920	19,687,532	508,601	1,962,824	13,450,169	———	35,609,126
1921	13,160,417	330,503	1,808,392	12,836,013	———	28,135,325
1922	19,605,401	251,922	2,469,967	12,880,060	———	35,207,350
1923	25,769,215	140,409	2,742,388	12,678,548	———	41,330,560
1924	35,959,566	116,932	2,764,013	9,911,935	———	48,752,446
1925	46,480,742	101,319	2,766,838	12,168,905	———	61,517,804
1926	51,867,792	223,748	3,335,885	11,650,180	———	67,077,605
1927	45,134,289	437,729	2,879,160	12,269,135	———	60,720,313
1928	48,640,158	544,192	3,409,142	12,633,510	———	65,227,002
1929	52,805,345	807,502	3,820,732	11,256,260	———	68,689,839
1930	41,785,380	457,225	4,085,105	9,435,650	———	55,763,360
1931	23,530,469	480,319	3,538,519	7,684,155	———	35,233,462
1932	20,129,869	447,495	1,705,708	6,523,644	———	28,806,716
1933	25,777,723	460,683	1,025,586	5,375,171	———	32,639,163
1934	35,177,224	486,554	1,018,719	5,725,133	———	42,407,630
1935	42,006,618	543,583	1,238,718	5,048,864	———	48,837,783
1936	45,889,944	724,362	1,796,677	5,722,502	———	54,133,485
1937	65,224,245	976,171	2,098,339	6,139,920	———	74,438,675
1938	55,959,713	916,841	1,974,976	5,565,069	———	64,416,599
1939	56,216,049	1,381,720	1,832,464	6,280,956	———	65,711,189
1940	64,332,166	1,073,023	2,534,840	7,088,265	———	75,028,294
1941	65,807,630	1,253,561	2,845,262	7,660,000	———	77,566,453
1942	63,626,140	1,434,382	3,173,635	8,237,172	———	76,471,329
1943	55,005,394	1,378,337	3,025,255	7,742,030	———	67,151,016
1944	42,095,013	1,419,248	3,010,088	8,217,966	———	54,742,315
1945	50,673,592	1,497,720	3,401,229	6,454,360	———	62,026,901
1946	58,834,747	1,783,010	5,199,563	6,732,470	———	72,549,790
1947	95,729,867	2,275,972	5,896,803	8,680,440	———	112,583,082
1948	124,091,753	2,358,877	8,968,222	9,765,395	———	145,184,247
1949	110,219,917	2,500,799	9,955,790	10,549,924	———	133,226,430
1950	117,166,836	2,462,340	10,246,939	10,119,303	———	139,995,418

Table 3-2—Total Value of Mineral Production, 1836–1976—Continued

Year	Metals	Industrial Minerals	Structural Materials	Coal	Petroleum and Natural Gas	Total
	$	$	$	$	$	$
1951	153,598,411	2,493,840	10,606,048	10,169,617	.....	176,867,916
1952	147,857,523	2,181,464	11,596,961	9,729,739	.....	171,365,687
1953	126,755,705	3,002,673	13,555,038	9,528,279	.....	152,841.695
1954	123,834,286	5,504,114	14,395,174	9,154,544	6,545	152,894,663
1955	142,609,505	6,939,490	15,299,254	8,986,501	18,610	173,853,360
1956	149,441,246	9,172,792	20,573,631	9,346,518	319,465	188,853,652
1957	125,353,920	11,474,050	25,626,939	7,340,339	1,197,581	170,992,829
1958	104,251,112	9,958,768	19,999,576	5,937,860	4,806,233	144,953,549
1959	105,076,530	12,110,286	19,025,209	5,472,064	5,967,128	147,651,217
1960	130,304,373	13,762,102	18,829,989	5,242,223	9,226,646	177,365,333
1961	128,565,774	12,948,308	19,878,921	6,802,134	11,612,184	179,807,321
1962	159,627,293	14,304,214	21,366,265	6,133,986	27,939,726	229,371,484
1963	172,852,866	16,510,898	23,882,190	6,237,997	36,379,636	255,863,587
1964	180,926,329	16,989,469	26,428,939	6,327,678	36,466,753	267,139,168
1965	177,101,733	20,409,649	32,325,714	6,713,590	44,101,662	280,652,348
1966	208,664,003	22,865,324	43,780,272	6,196,219	54,274,187	335,780,005
1967	235,865,318	29,364,065	44,011,488	7,045,341	67,096,286	383,382,498
1968	250,912,026	26,056,782	45,189,476	7,588,989	75,281,215	405,028,488
1969	294,881,114	20,492,943	55,441,528	6,817,155	86,756,009	464,388,749
1970	309,981,470	22,020,359	46,104,071	19,559,669	90,974,467	488,640,036
1971	301,059,951	21,909,767	59,940,333	45,801,936	99,251,158	527,963,145
1972	372,032,770	25,764,120	66,745,698	66,030,210	105,644,978	636,217,776
1973	795,617,596	27,969,664	73,720,831	87,976,105	124,104,445	1,109,388,641
1974	764,599,451	33,676,214	78,088,393	154,593,643	233,275,505	1,264,233,206
1975	586,622,368	48,667,602	90,928,011	317,111,744	320,719,474	1,364,049,199
1976	646,750,403	52,917,142	100,938,648	298,683,679	420,973,564	1,520,263,436
Totals	8,953,670,225	520,434,175	1,134,074,002	1,606,480,862	1,856,393,457	14,071,052,721

Table 3-3—Mineral Production for the 10 Years, 1967–76

Description	1967		1968		1969		1970		1971	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals		$		$		$		$		$
Antimony kg	575 010	671,874	526 146	614,779	371 999	508,476	329 521	1,104,040	146 748	243,614
Bismuth kg	64 640	572,878	94 248	868,533	28 344	288,070	59 935	828,486	37 431	388,674
Cadmium kg	451 034	2,784,222	608 462	3,823,095	517 607	4,016,788	426 062	3,343,944	470 243	2,011,223
Cobalt kg	.....	.....	.....	.....	.....	.....	.....	.....	51 503	103,099
Copper kg	78 352 932	88,135,172	73 024 968	87,284,148	75 937 956	111,592,416	96 329 694	124,657,958	127 286 040	131,037,918
Gold—placer kg	28	25,632	21	19,571	12	11,720	15	14,185	6	4,647
lode, fine kg	3 924	4,763,688	3 854	4,672,242	3 654	4,427,506	3 135	3,685,476	2 668	3,031,844
Iron concentrates t	1 954 468	20,820,765	1 900 311	21,437,569	1 882 266	19,787,845	1 704 650	17,391,883	1 750 738	18,153,612
Lead kg	94 406 546	31,432,079	105 063 971	32,782,257	95 286 815	33,693,539	97 448 607	35,096,021	112 865 575	34,711,408
Molybdenum kg	7 945 782	31,183,064	8 980 988	32,552,722	12 064 350	47,999,442	14 186 706	52,561,796	9 926 694	36,954,846
Nickel kg	1 896 388	3,946,715	1 504 631	3,372,225	1 351 304	3,396,208	1 545 927	4,703,320	1 153 742	3,497,420
Silver kg	192 240	10,328,695	221 791	16,475,795	179 170	11,100,491	202 521	12,041,181	238 670	11,968,046
Tin kg	198 584	621,682	162 472	497,885	130 828	470,136	119 619	421,946	144 695	421,079
Tungsten (WO_3) kg	.....	.....	.....	.....	.....	.....	.....	.....	605 909	3,012,540
Zinc kg	119 217 472	39,248,539	135 803 151	43,550,181	134 565 200	46,639,024	125 005 208	44,111,055	138 549 629	49,745,789
Others	.....	1,330,313	.....	2,961,024	.....	10,949,453	.....	10,020,179	.....	5,774,192
Totals	.....	235,865,318	.....	250,912,026	.....	294,881,114	.....	309,981,470	.....	301,059,951
Industrial Minerals										
Asbestos t	83 635	18,273,220	67 736	14,833,891	72 926	14,871,334	78 680	16,033,827	79 032	17,800,406
Fluxes (quartz, limestone) t	43 592	221,212	38 337	157,679	20 268	81,917	28 690	106,533	24 258	98,426
Granules (quartz, limestone, granite) t	28 379	305,655	27 430	436,928	31 521	654,701	20 275	526,491	26 524	519,192
Gypsum and gypsite t	208 691	691,592	223 506	689,847	254 821	764,032	245 180	736,635	312 791	930,348
Jade kg	9 144	24,341	22 233	105,670	11 944	42,635	119 114	250,256	76 094	196,332
Sulphur t	285 299	9,654,603	290 770	9,650,285	316,717	3,824,593	305 194	3,957,542	261 691	2,147,778
Others	.....	193,442	.....	182,482	.....	253,731	.....	409,075	.....	217,285
Totals	.....	29,364,065	.....	26,056,782	.....	20,492,943	.....	22,020,359	.....	21,909,767
Structural Materials										
Cement t	644 077	13,581,850	595 439	13,634,166	721 744	16,604,688	546 025	13,485,549	822 329	21,629,385
Clay products	.....	3,945,207	.....	4,388,505	.....	4,550,546	.....	4,714,368	.....	5,981,785
Lime and limestone t	1 492 541	2,822,138	1 829 684	3,337,277	1 734 420	3,237,032	1 694 237	3,204,076	1 650 658	3,037,222
Rubble, riprap, and crushed rock t	2 075 090	2,967,195	3 071 450	3,524,439	3 407 875	4,456,211	2 442 384	3,018,242	3 327 758	3,670,583
Sand and gravel t	21 056 325	20,643,673	20 562 107	20,271,723	26 428 476	26,553,699	21 006 650	21,679,387	26 598 612	25,612,396
Building-stone t	3 245	51,425	1 500	33,366	1 975	39,352	159	2,449	2 057	8,962
Totals	.....	44,011,488	.....	45,189,476	.....	55,441,528	.....	46,104,071	.....	59,940,333
Coal										
Sold and used t	824 436	7,045,341	870 180	7,588,989	773 226	6,817,155	2 398 635	19,559,669	4 141 496	45,801,936
Petroleum and Natural Gas										
Crude oil m^3	3 125 181	44,748,477	3 521 783	50,082,837	4 023 815	58,176,213	4 032 130	60,405,941	3 999 185	66,471,856
Field condensate m^3	6 450	92,357	8 611	122,408	12 425	180,520	17 052	277,829	17 331	287,781
Plant condensate m^3	161 541	267,941	152 670	247,455	150 104	263,278	159 489	253,009	177 137	293,287
Natural gas delivered to pipeline 10^6m^3	5 596	21,667,136	6 318	24,531,445	7 219	27,897,585	7 679	29,804,411	7 685	31,946,372
Butane m^3	93 505	188,197	83 875	168,814	66 385	133,613	49 074	98,772	50 590	101,822
Propane m^3	65 672	132,178	63 723	128,256	52 069	104,800	66 828	134,505	74 547	150,040
Totals	.....	67,096,286	.....	75,281,215	.....	86,756,009	.....	90,974,467	.....	99,251,158
Grand totals	.....	383,382,498	.....	405,028,488	.....	464,388,749	.....	488,640,036	.....	527,963,145

Table 3-3—Mineral Production for the 10 Years, 1967–76—Continued

Description	1972		1973		1974		1975		1976	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals		$		$		$		$		$
Antimony kg	308 260	419,042	753 110	1,192,118	221 238	879,897	364 045	1,467,928	447 001	1,636,871
Bismuth kg	42 556	324,617	1 293	13,058	33 711	680,771	19 163	261,931	20 261	226,462
Cadmium kg	315 540	1,759,995	367 761	2,951,236	195 979	1,532,096	320 923	1,971,035	356 422	1,530,800
Cobalt kg	70 642	155,739	18 555	117,403						
Copper kg	211 832 288	209,403,822	317 603 055	582,803,251	287 547 048	541,644,913	258 497 599	331,693,850	263 618 197	378,984,941
Gold—placer kg	21	26,905	119	311,524	145	232,512	44	232,204	26	115,613
lode, fine kg	3 783	6,995,448	5 785	18,117,268	5 001	26,749,083	4 819	25,082,494	5 393	21,761,502
Iron concentrates t	1 139 698	11,642,379	1 420 160	12,906,063	1 306 930	12,742,227	1 299 215	15,245,902	1 255 277	14,760,526
Lead kg	88 109 663	28,896,566	84 890 924	30,477,936	55 252 692	23,333,016	70 603 483	24,450,158	85 407 582	32,796,533
Molybdenum kg	12 719 391	43,260,349	13 785 264	51,851,509	13 789 825	60,791,552	13 026 627	71,201,391	14 088 686	94,109,138
Nickel kg	1 469 851	4,601,486	1 119 221	3,775,232	688 656	2,351,406				
Silver kg	215 420	11,519,660	236 987	19,552,997	181 696	28,440,365	196 306	30,545,947	239 721	32,532,836
Tin kg	159 230	473 908	138 221	597,265	143 816	1,150,722	32 511	200,669	102 262	712,912
Tungsten (WO_3) kg	577 509	2,167,663	640 378	4,224,062						
Zinc kg	121 719 968	47,172,894	137 380 768	62,564,751	77 733 732	59,582,753	99 668 230	80,572,872	106 498 987	65,499,108
Others		3,212,297		4,161,923		4,488,138		3,695,987		2,083,161
Totals		372,032,770		795,617,596		764,599,451		586,622,368		646,750,403
Industrial Minerals										
Asbestos t	95 986	20,870,241	98 852	21,102,892	83 403	27,398,900	76 771	37,849,743	70 433	40,727,296
Fluxes (quartz, limestone) t	28 667	59,246	41 937	106,371	34 451	206,049	39 589	174,824	11 378	33,263
Granules (quartz, limestone, granite) t	33 709	757,924	31 135	857,643	31 546	1,025,615	33 316	1,144,968	31 476	1,219,884
Gypsum and gypsite t	352 272	1,087,196	331 347	1,114,009	400 338	1,412,157	474 387	1,751,799	556 134	4,434,471
Jade kg	110 551	235,218	69 967	306,808	3 510	18,613	110 437	414,123	483 796	1,535,030
Sulphur t	270 074	2,306,933	286 701	4,187,387	206 646	3,068,507	246 079	5,738,134	231 704	4,296,189
Others		447,362		294,554		546,373		1,594,011		671,009
Totals		25,764,120		27,969,664		33,676,214		48,667,602		52,917,142
Structural Materials										
Cement t	808 230	21,014,112	862 521	24,935,624	890 372	25,828,823	915 293	31,681,722	846 548	34,973,746
Clay products		5,263,749		5,590,290		6,615,128		6,593,189		6,995,917
Lime and limestone t	1 838 227	3,357,927	1 954 008	3,633,370	2 097 909	4,297,547	1 976 415	4,349,800	2 173 831	5,610,063
Rubble, riprap, and crushed rock t	3 013 438	4,032,548	2 579 122	4,160,009	2 691 473	5,715,219	4 103 452	8,723,448	2 485 215	5,205,973
Sand and gravel t	31 593 921	33,076,196	30 811 402	35,379,590	31 440 908	35,611,346	28 945 523	39,575,457	36 073 618	48,138,635
Building-stone t	176	1,166	729	21,448	452	20,330	53	4,395	657	14,314
Totals		66,745,698		73,720,831		78,088,393		90,928,011		100,938,648
Coal										
Sold and used t	5 466 846	66,030,210	6 924 733	87,976,105	7 757 440	154,593,643	8 924 816	317,111,744	7 537 695	298,683,679
Petroleum and Natural Gas										
Crude oil m^3	3 788 849	63,166,717	3 368 902	68,306,032	3 012 501	103,335,328	2 269 898	94,229,725	2 367 450	116,595,050
Field condensate m^3	16 619	277,069	20 114	407,807	16 561	568,075	16 094	668,092	18 309	901,711
Plant condensate m^3	161 854	327,820	180 088	222,463	178 534	924,549	185 272	6,525,837	167 576	7,198,957
Natural gas delivered to pipeline $10^6 m^3$	9 939	41,616,824	10 789	54,762,105	9 017	128,018,726	9 236	214,733,528	8 800	287,997,059
Butane m^3	54 200	106,533	109 057	212,640	105 426	232,085	106 427	2,577,205	109 781	4,591,832
Propane m^3	76 323	150,015	99 188	193,398	89 373	196,742	81 975	1,985,087	88 195	3,688,955
Totals		105,644,978		124,104,445		233,275,505		320,719,474		420,973,564
Grand totals		636,217,776		1,109,388,641		1,264,233,206		1,364,049,199		1,520,263,436

Table 3-4—Comparison of Total Quantity and Value of Production, and Quantity and Value of Production Paid for to Mines

Metals	1976 Total Production		1976 Production Paid for to Mines	
	Quantity	Value	Quantity	Value
		$		$
Antimony kg	447 001	1,636,871	———	———
Bismuth kg	20 261	226,462	———	———
Cadmium kg	356 422	1,530,800	———	256,124
Copper kg	263 618 197	378,984,941	263 484 402	275,318,922
Gold—placer kg	26	115,613	26	115,613
lode, fine kg	5 393	21,761,502	5 368	16,761,694
Iron concentrates t	1 255 277	14,760,526	1 238 789	14,478,604
Lead kg	85 407 582	32,796,533	77 281 986	23,186,868
Molybdenum kg	14 088 686	94,109,138	14 088 686	92,370,245
Silver kg	239 721	32,532,836	210 011	23,247,958
Tin kg	102 262	712,912	66 183	467,130
Zinc kg	106 498 987	65,499,108	90 569 371	39,638,229
Others	———	2,083,161	———	906,820
Totals	———	646,750,403	———	486,748,207

NOTE—For metals, the total quantity and value of production include the quantities paid for to the mines, and the smelter and refinery production that can be attributed to the mines but is not paid for. The quantity and value paid for to the mines, excluding outward transportation costs, smelting and refining costs, penalties and deductions, are shown separately for comparative purposes.

Table 3-5—Exploration and Development Expenditures, 1974, 1975, and 1976

	Physical Work and Surveys	Administration, Overhead, Land Costs, Etc.	Construction, Machinery and Equipment, Other Capital Costs	Totals
A. Exploration on Undeclared Mines	$	$	$	$
Metal mines—				
1974	18,773,326	6,525,878	128,144	25,427,348
1975	16,366,152	5,298,367	442,327	22,106,846
1976	20,437,180	6,365,331	381,416	27,183,927
Coal mines—				
1974	3,450,746	884,849	18,958	4,354,553
1975	9,955,507	3,057,843	———	13,013,350
1976	9,234,269	3,678,893	———	12,913,162
Others—				
1974	42,706	11,134	———	53,840
1975	90,025	35,679	———	125,704
1976	73,453	47,760	———	121,213
Totals—				
1974	22,266,778	7,421,861	147,102	29,835,741
1975	26,411,684	8,391,889	442,327	35,245,900
1976	29,744,902	10,091,984	381,416	40,218,302
B. Exploration on Declared or Operating Mines				
Metal mines—				
1974	2,652,243	762,224	278,500	3,692,967
1975	2,792,378	3,090,135	———	5,882,513
1976	8,359,413	83,304	———	8,442,717
Coal mines—				
1974	488,308	104,259	———	592,567
1975	1,000,000	———	———	1,000,000
1976	665,000	28,000	———	693,000
Others—				
1974	4,236	———	———	4,236
1975	36,242	2,700	———	38,942
1976	214,081	30,000	———	244,081
Totals—				
1974	3,144,787	866,483	278,500	4,289,770
1975	3,828,620	3,092,835	———	6,921,455
1976	9,238,494	141,304	———	9,379,798
C. Development on Declared Mines				
Metal mines—				
1974	1,280,513	1,028,199	1,985,000	4,293,712
1975	———	57,166	840,344	897,510
1976	512,197	974,985	12,447,569	13,934,751
Coal mines—				
1974	320,098	256,055	111,500	687,653
1975	———	———	———	———
1976	1,425,312	583,304	———	2,008,616
Others—				
1974	23,242	37,988	2,883,584	2,944,814
1975	———	———	———	———
1976	———	3,155	18,001,500	18,004,655
Totals—				
1974	1,623,853	1,322,242	4,980,084	7,926,179
1975	———	57,166	840,344	897,510
1976	1,937,509	1,561,444	30,449,069	33,948,022
D. Development of Operating Mines				
Metal mines—				
1974	20,933,501	1,722,680	46,732,326	69,388,507
1975	9,013,375	5,804,924	24,548,602	39,366,901
1976	6,937,229	404,226	41,881,126	49,222,581
Coal mines—				
1974	9,027,818	———	16,607,506	25,635,324
1975	3,300,000	———	59,000,000	62,300,000
1976	16,043,383	55,377	20,767,397	36,866,157
Others—				
1974	6,198,552	146,182	16,606,229	22,950,963
1975	17,350,175	124,860	18,077,384	35,552,419
1976	58,980	79,300	1,389,956	1,528,236
Totals—				
1974	36,159,871	1,868,862	79,946,061	117,974,794
1975	29,663,550	5,929,784	101,625,986	137,219,320
1976	23,039,592	538,903	64,038,479	87,616,974

Table 3-6—Production of Gold, Silver, Copper, Lead, Zinc, Molybdenum, and Iron Concentrates, 1858–1976

Year	Gold (Placer)		Gold (Fine)		Silver		Copper	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	kg	$	kg	$	kg	$	kg	$
1858–90	100 978.533	55,192,163			6 876.531	214,152		
1891–1900	11 703.748	6,397,183	19 682.165	12,858,353	700 977.829	13,561,194	16 064 375	4,365,210
1901–10	15 787.261	8,628,660	72 224.836	47,998,179	971 114.910	16,973,507	172 344 737	56,384,783
1911	779.441	426,000	7 110.675	4,725,512	58 858.198	958,293	16 750 016	4,571,644
1912	1 016.446	555,500	8 008.898	5,322,442	97 417.955	1,810,045	23 340 171	8,408,513
1913	933.090	510,000	8 467.916	5,627,595	107 798.519	1,968,606	21 073 930	7,094,489
1914	1 033.864	565,000	7 687.729	5,109,008	112 038.605	1,876,736	20 415 949	6,121,319
1915	1 408.655	770,000	7 776.403	5,167,934	104 708.436	1,588,991	25 817 619	9,835,500
1916	1 062.167	580,500	6 902.751	4,587,333	102 699.711	2,059,739	29 655 426	17,784,494
1917	907.585	496,000	3 562.009	2,367,191	91 107.405	2,265,749	26 765 241	16,038,256
1918	585.358	320,000	5 121.855	3,403,811	108 803.644	3,215,870	27 888 416	15,143,449
1919	524.086	286,500	4 740.906	3,150,644	105 847.210	3,592,673	19 259 132	7,939,896
1920	405.583	221,600	3 733.853	2,481,392	105 061.237	3,235,980	20 360 601	7,832,899
1921	426.733	233,200	4 222.699	2,804,197	83 150.418	1,591,201	17 706 790	4,879,624
1922	674.624	368,800	6 153.915	4,089,684	220 872.076	4,554,781	14 678 125	4,329,754
1923	768.555	420,000	5 575.057	3,704,994	187 643.964	3,718,129	26 181 346	8,323,266
1924	769.799	420,750	7 704.711	5,120,535	259 454.010	5,292,184	29 413 222	8,442,870
1925	512.453	280,092	6 522.890	4,335,069	238 088.613	5,286,818	32 797 475	10,153,269
1926	650.426	355,503	6 264.984	4,163,859	334 312.337	6,675,606	40 523 625	12,324,421
1927	285.868	156,247	5 536.365	3,679,601	325 654.164	5,902,043	40 461 530	11,525,011
1928	262.012	143,208	5 619.130	3,734,609	330 536.775	6,182,461	44 410 233	14,265,242
1929	217.192	118,711	4 516.871	3,002,020	309 791.230	5,278,194	46 626 180	18,612,850
1930	278.527	152,235	5 002.482	3,324,975	352 342.964	4,322,185	41 894 588	11,990,466
1931	534.225	291,992	4 545.175	3,020,837	234 837.945	2,254,979	29 090 879	5,365,690
1932	634.501	395,542	5 649.891	4,263,389	222 406.822	2,264,729	22 955 299	3,228,892
1933	744.233	562,787	6 954.289	6,394,645	218 397.615	2,656,526	19 572 164	3,216,701
1934	783.205	714,431	9 244.309	10,253,952	267 920.527	4,088,280	22 521 530	3,683,662
1935	961.985	895,058	11 363.263	12,856,419	288 323.068	6,005,996	17 884 241	3,073,428
1936	1 349.528	1,249,940	12 583.590	14,172,367	296 944.198	4,308,330	9 830 071	2,053,828
1937	1 684.321	1,558,245	14 331.671	16,122,767	351 630.830	5,073,962	20 891 260	6,023,411
1938	1 796.478	1,671,015	17 340.607	19,613,624	337 827.661	4,722,288	29 832 572	6,558,575
1939	1 547.250	1,478,492	18 267.912	21,226,957	336 577.786	4,381,365	33 227 590	7,392,862
1940	1 215.101	1,236,928	18 149.347	22,461,516	383 436.042	4,715,315	35 371 049	7,865,085
1941	1 361.534	1,385,962	17 760.622	21,984,501	378 700.797	4,658,545	30 134 516	6,700,693
1942	1 023.413	1,041,772	13 825.843	17,113,943	301 011.133	4,080,775	22 723 823	5,052,856
1943	454.104	462,270	6 979.607	8,639,516	265 193.820	3,858,496	19 190 263	4,971,132
1944	355.601	361,977	5 804.815	7,185,332	177 453.003	2,453,293	16 465 584	4,356,070
1945	391.556	398,591	5 454.626	6,751,860	191 510.720	2,893,934	11 726 375	3,244,472
1946	489.219	475,361	3 658.086	4,322,241	197 994.264	5,324,959	7 938 069	2,240,070
1947	216.757	200,585	7 566.800	8,514,870	177 550.262	4,110,092	18 952 769	8,519,741
1948	632.386	585,200	8 902.612	10,018,050	209 016.328	5,040,101	19 515 886	9,616,174
1949	556.308	529,524	8 969.981	10,382,256	237 559.178	5,671,082	24 882 500	10,956,550
1950	595.125	598,717	8 832.723	10,805,553	295 772.610	7,667,950	19 147 001	9,889,458
1951	736.861	717,911	8 126.405	9,627,947	255 632.882	7,770,983	19 617 612	11,980,155
1952	545.982	494,756	7 955.805	8,765,889	274 042.530	7,326,803	19 053 280	13,054,893
1953	443.062	403,230	7 886.228	8,727,294	260 606.407	7,019,272	22 235 441	14,869,544
1954	270.098	238,967	8 036.642	8,803,279	305 630.613	8,154,145	22 747 578	14,599,693
1955	238.436	217,614	7 541.762	8,370,306	245 811.643	6,942,995	20 065 928	16,932,549
1956	120.213	109,450	5 963.782	6,603,628	261 423.017	7,511,866	19 667 923	17,251,872
1957	91.318	80,990	6 948.504	7,495,170	252 847.111	7,077,166	14 237 029	8,170,465
1958	175.732	157,871	6 044.992	6,604,149	218 998.027	6,086,854	5 741 837	2,964,529
1959	235.450	208,973	5 385.360	5,812,511	192 779.535	5,421,417	7 363 374	4,497,991
1960	119.653	107,418	6 394.155	6,979,441	231 612.937	6,600,183	14 997 694	9,583,724
1961	106.248	99,884	4 970.913	5,667,253	229 353.429	6,909,140	14 375 361	8,965,149
1962	103.106	96,697	4 940.712	5,942,101	192 521.474	7,181,907	49 431 850	33,209,215
1963	143.696	135,411	4 820.312	5,850,458	199 764.616	8,861,050	53 635 704	36,238,007
1964	57.292	55,191	4 307.361	5,227,884	163 901.675	7,348,938	52 414 456	38,609,136
1965	26.935	25,053	3 642.908	4,419,089	154 646.729	6,929,793	38 644 540	32,696,081
1966	47.743	44,632	3 717.057	4,505,646	172 594.622	7,729,939	47 990 080	56,438,255
1967	27.713	25,632	3 923.861	4,763,688	192 239.525	10,328,695	78 352 932	88,135,172
1968	20.839	19,571	3 853.537	4,672,242	221 791.325	16,475,795	73 024 968	87,284,148
1969	12.410	11,720	3 654.012	4,427,506	179 169.889	11,100,491	75 937 956	111,592,416
1970	15.272	14,185	3 135.462	3,685,476	202 521.462	12,041,181	96 329 694	124,657,958
1971	5.505	4,647	2 668.046	3,031,844	238 670.301	11,968,046	127 286 040	131,037,918
1972	21.492	26,905	3 782.871	6,995,448	215 420.498	11,519,660	211 832 288	209,403,822
1973	119.156	311,524	5 784.723	18,117,268	236 987.318	19,552,997	317 603 055	582,803,251
1974	45.162	232,512	5 001.082	26,749,083	181 695.950	28,440,365	287 547 048	541,644,913
1975	43.744	232,204	4 819.241	25,082,494	196 305.885	30,545,947	258 497 599	331,693,850
1976	26.064	115,613	5 393.477	21,761,502	239 720.882	32,532,836	263 618 197	378,984,941
Totals	163 098.018	97,880,802	557 024.079	605,553,128	16 401 911.632	487,734,598	3 398 531 632	3,287,676,222

Table 3-6—Production of Gold, Silver, Copper, Lead, Zinc, Molybdenum, and Iron Concentrates, 1858–1976—Continued

Year	Lead		Zinc		Molybdenum		Iron Concentrates	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	kg	$	kg	$	kg	$	t	$
1858–90	473 729	45,527					27 097	70,879
1891–1900	93 002 804	7,581,619					11 820	45,602
1901–10	184 989 089	17,033,102	5 753 423	894,169			17 738	68,436
1911	12 189 051	1,069,521	1 195 003	129,092				
1912	20 353 243	1,805,627	2 430 462	316,139				
1913	25 112 864	2,175,832	3 065 710	324,421				
1914	22 963 016	1,771,877	3 568 151	346,125	901	662		
1915	21 093 563	1,939,200	5 888 705	1,460,524	1 641	2,000		
1916	22 102 314	3,007,462	16 859 478	4,043,985	5 598	20,560		
1917	16 922 293	2,951,020	18 982 067	3,166,259	3 167	11,636		
1918	19 912 447	2,928,107	18 947 777	2,899,040	436	1,840	907	5,000
1919	13 370 004	1,526,855	25 735 631	3,540,429			1 116	6,150
1920	17 840 247	2,816,115	21 413 198	3,077,979			1 335	7,360
1921	18 779 664	1,693,354	22 416 133	1,952,065			916	5,050
1922	30 593 731	3,480,306	25 921 103	2,777,322			1 089	3,600
1923	43 845 439	6,321,770	26 464 465	3,278,903			220	1,337
1924	77 284 697	12,415,917	35 893 017	4,266,741				
1925	107 908 698	18,670,329	44 568 438	7,754,450				
1926	119 305 027	17,757,535	64 807 554	10,586,610				
1927	128 364 347	14,874,292	65 872 809	8,996,135				
1928	138 408 812	13,961,412	82 445 946	9,984,613			18	
1929	139 705 336	15,555,189	78 061 406	9,268,792				
1930	145 966 952	12,638,198	113 614 910	9,017,005				
1931	118 796 232	7,097,812	91 657 703	5,160,911				
1932	114 308 115	5,326,432	87 143 752	4,621,641				
1933	123 235 512	6,497,719	88 887 198	6,291,416				
1934	157 562 183	8,461,859	113 013 038	7,584,199				
1935	156 156 723	10,785,930	116 227 650	7,940,850				
1936	171 444 146	14,790,028	115 475 574	8,439,373				
1937	190 107 902	21,417,049	132 081 905	14,274,245				
1938	187 323 227	13,810,024	135 395 388	9,172,822				
1939	171 794 338	12,002,390	126 283 585	8,544,375				
1940	211 758 089	15,695,467	141 529 456	10,643,026				
1941	207 218 262	15,358,976	166 861 962	12,548,031				
1942	230 060 714	17,052,054	175 646 590	13,208,636				
1943	199 196 604	16,485,902	152 474 485	13,446,018				
1944	132 866 893	13,181,530	126 126 765	11,956,725				
1945	152 849 156	16,848,823	133 714 538	18,984,581				
1946	156 879 853	23,345,731	124 406 109	21,420,484				
1947	142 306 192	42,887,313	114 761 068	28,412,593				
1948	145 165 821	57,734,770	122 610 001	37,654,211			616	3,735
1949	120 373 215	41,929,866	130 736 145	38,181,214			4 964	27,579
1950	128 830 683	41,052,905	131 697 238	43,769,392				
1951	124 037 181	50,316,015	153 091 761	67,164,754			102 997	790,000
1952	129 250 197	45,936,692	169 130 882	59,189,656			816 898	5,474,924
1953	135 004 129	39,481,244	173 407 848	40,810,618			899 240	6,763,105
1954	150 807 088	45,482,505	151 555 559	34,805,755			486 018	3,733,891
1955	137 241 656	45,161,245	194 680 177	52,048,909			554 223	3,228,756
1956	128 691 681	44,702,619	201 327 284	58,934,801			335 616	2,190,847
1957	127 732 462	39,568,086	203 787 462	50,206,681			324 174	2,200,637
1958	133 615 439	34,627,075	195 952 146	43,234,839			571 769	4,193,442
1959	130 372 360	33,542,306	182 498 693	44,169,198			770 421	6,363,848
1960	151 321 570	38,661,912	182 977 897	50,656,726	2 456	9,500	1 052 651	10,292,847
1961	174 307 617	42,313,569	175 970 780	45,370,891			1 211 147	12,082,540
1962	152 080 806	34,537,454	187 528 084	51,356,376			1 627 342	18,326,911
1963	142 869 197	37,834,714	182 734 698	53,069,163			1 869 009	20,746,424
1964	121 896 644	39,402,293	181 797 313	58,648,561	12 812	47,063	1 816 684	20,419,487
1965	113 480 794	43,149,171	141 179 547	48,666,933	3 306 274	12,405,344	1 964 410	21,498,581
1966	95 929 798	34,436,934	138 401 395	47,666,540	7 754 088	27,606,061	1 952 074	20,778,934
1967	94 406 546	31,432,079	119 217 472	39,248,539	7 945 782	31,183,064	1 954 468	20,820,765
1968	105 063 971	32,782,257	135 803 151	43,550,181	8 980 988	32,552,722	1 900 311	21,437,569
1969	95 286 815	33,693,539	134 565 199	46,639,024	12 064 350	47,999,442	1 882 266	19,787,845
1970	97 448 607	35,096,021	125 005 208	44,111,055	14 186 706	52,561,796	1 704 650	17,391,883
1971	112 865 575	34,711,408	138 549 629	49,745,789	9 926 694	36,954,846	1 750 738	18,153,612
1972	88 109 663	28,896,566	121 719 968	47,172,894	12 719 391	43,260,349	1 139 698	11,642,379
1973	84 890 924	30,477,936	137 380 768	62,564,751	13 785 264	51,851,509	1 420 160	12,906,063
1974	55 252 692	23,333,016	77 733 732	59,582,753	13 789 825	60,791,552	1 306 930	12,742,227
1975	70 603 483	24,450,158	99 668 230	80,572,87?	13 026 627	71,201,391	1 299 215	15,245,902
1976	85 407 582	32,796,533	106 498 987	65,499,108	14 088 686	94,109,138	1 255 277	14,760,526
Totals	7 676 695 704	1,522,606,093	7 222 799 406	1,755,022,918	131 601 686	562,570,475	32 036 222	324,218,673

Divisions, 1975 and 1976, and Total to Date

Coal		Petroleum and Natural Gas						Division Total
		Crude Oil and Condensates		Natural Gas Delivered to Pipeline		Butane and Propane		
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
t	$	m³	$	Mm³	$	M³	$	$
								22,142,910
								23,559,627
								241,787,966
								150,238
								111,350
								56,259,920
								61,196,787
								47,503,747
263	1,100							477,733,221
								412,036
								392,525
								6,037,032
8 909 438	316,716,363							402,343,858
7 537 481	**298,679,369**							**374,351,014**
97 499 386	1,269,686,080							3,905,374,766
								2,369,034
								6,316,486
								93,724,546
								10,047,894
								9,632,063
								239,752,269
								103,478,687
								147,449,846
13 687	59,765							799,120,430
15 060	390,116	2 471 264	101,423,654	9 236	214,733,528	188 405	4,562,292	362,321,148
		2 553 335	**124,695,718**	**8 800**	**287,997,059**	**197 976**	**8,280,787**	**465,499,649**
131 923	1,515,507	47 068 727	887,889,143	108 779	951,643,124	2 374 061	16,861,190	2,262,486,339
								196,845
								226,208
								154,405,862
								84,248,726
								93,293,922
67 425 673	301,144,744							1,013,098,940
								12,163,245
								9,171,215
								414,783,028
								20,395,362
								19,086,386
								318,020,413
								29,493,758
								29,805,732
2 657 660	11,080,836							366,503,861
318	5,265							82,172,937
214	**4,310**							**80,860,899**
456 464	3,433,981							674,592,608
								45,837,584
								52,219,231
1 018	5,008							341,309,334
								166,401
								227,105
								19,622,579
								21,015,991
								39,241,646
4 188 851	19,553,725							291,903,781
								38,330,660
								40,306,492
33	116							638,568,593
								1,634,306
								2,823,502
								284,037,037
								295,716
								235,012
								94,714,826
								15,596,171
								19,011,175
								498,562,069
								1,887,627
								2,909,290
								15,473,010
								19,776,028
								25,562,105
								320,076,611
								26,375,250
								30,467,209
								543,103,680
8 924 816	317,111,744	2 471 264	101,423,654	9 236	214,733,528	188,405	4,562,292	1,364,049,199
7 537 695	**298,683,679**	**2 553 335**	**124,695,718**	**8 800**	**287,997,059**	**197 976**	**8,280,787**	**1,520,263,436**
172 374 958	1,606,480,862	47 068 727	887,889,143	108 779	951,643,124	2 374 061	16,861,190	14,071,052,721

Table 3-7B—Production of Lode Gold, Silver, Copper, Lead, and Zinc by Mining Divisions, 1975 and 1976, and Total to Date

Division	Period	Lode Gold		Silver		Copper		Lead		Zinc		Division Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
		kg	$	kg	$	kg	$	kg	$	kg	$	$
Alberni	1975	509.000	2,566,499	29 578.300	4,107,670	2 231 001	2,418,864	2 649 451	793,757	14 408 308	11,491,157	21,372,947
	1976	**555.251**	**1,897,363**	**33 036.860**	**3,874,407**	**2 346 014**	**3,378,710**	**2 638 386**	**1,295,781**	**15 010 424**	**12,321,603**	**22,767,814**
	To date	14 041.045	23,968,681	218 220.701	20,518,890	41 452 247	51,850,463	14 105 861	5,437,711	165 390 913	80,684,681	182,460,426
Atlin	1975	.466	2,165	297.189	41,058			14 054	4,646			47,869
	1976	**.591**	**2,525**	**399.767**	**54,074**	**113**	**95**	**24 193**	**10,883**	**2 410**	**1,117**	**68,694**
	To date	10 706.647	12,131,576	105 785.004	2,997,652	11 239 012	8,160,361	10 818 897	3,453,882	41 309 830	10,865,614	37,609,085
Cariboo	1975			4 894.959	781,612	39 272 913	48,620,794					49,402,406
	1976			**3 008.842**	**396,246**	**25 075 472**	**35,077,468**					**35,473,714**
	To date	37 393.618	43,347,296	16 443.099	1,931,801	189 014 533	288,924,778	11 890	3,993	230	20	334,207,888
Clinton	1975											
	1976											
	To date	727.499	827,328	982.419	14,237	26 103	5,905	88	7			847,477
Fort Steele	1975	.986	4,892	64 231.899	10,758,342			61 899 110	21,572,692	61 996 053	49,842,164	82,178,090
	1976			**74 321.893**	**10,077,491**			**70 544 712**	**26,762,684**	**63 182 263**	**36,263,963**	**73,104,138**
	To date	390.707	749,363	7 859 508.323	214,592,334	7 163 855	12,534,149	6 448 444 866	1,240,335,598	4 901 051 993	1,086,757,757	2,554,969,201
Golden	1975	.062	277	1 026.181	136,125	732	588	193 122	60,611	173 304	137,987	335,588
	1976	**2.706**	**10,440**	**4 659.261**	**629,163**			**853 128**	**338,550**	**1 093 821**	**602,870**	**1,581,023**
	To date	13.965	25,415	143 464.112	4,916,789	532 092	367,849	117 941 422	26,284,798	152 317 374	33,353,037	65,047,888
Greenwood	1975	374.035	1,742,243	14 188.101	2,041,858	4 031 709	5,858,078	145 062	50,962	138 362	102,467	9,795,617
	1976	**364.309**	**1,347,141**	**14 071.587**	**1,924,937**	**4 143 566**	**6,021,035**	**158 383**	**63,299**	**162 831**	**90,342**	**9,446,754**
	To date	43 237.203	38,767,459	1 373 497.594	41,160,332	270 194 524	148,778,655	11 617 499	2,686,855	11 422 297	2,626,863	234,020,164
Kamloops	1975	25.081	147,506	14 347.064	2,188,691	70 014 608	87,178,673	69 709	24,370	3 708	2,453	89,541,693
	1976	**74.274**	**297,546**	**19 824.243**	**2,876,764**	**83 452 124**	**126,378,343**	**5 100**	**2,024**	**1 219**	**672**	**129,555,349**
	To date	2 229.040	3,076,991	125 188.638	12,235,537	495 291 750	692,058,675	327 989	74,651	208 891	35,333	707,481,187
Liard	1975											
	1976											
	To date	3.546	4,120	33.809	1,416	13 570 392	19,147,861	7 428	2,736	804	286	19,156,419
Lillooet	1975											
	1976											
	To date	130 188.721	147,358,931	30 728.738	719,635	181	41	28 355	2,548	7	2	148,081,157
Nanaimo	1975	1 684.912	8,866,380	9 416.184	1,455,317	46 893 324	60,197,094					70,518,791
	1976	**1 403.865**	**6,418,660**	**10 188.752**	**1,595,630**	**48 125 758**	**69,354,228**					**77,368,518**
	To date	14 671.347	37,290,767	101 127.174	7,639,649	292 677 970	408,059,518					452,989,934
Nelson	1975	3.421	18,317	545.298	82,595			1 511 260	521,886	11 169 716	9,485,927	10,108,725
	1976			**287.952**	**38,560**			**1 668 388**	**629,736**	**9 884 708**	**6,153,747**	**6,822,043**
	To date	41 732.201	42,060,269	323 438.014	9,019,999	6 765 479	1,689,196	238 045 543	67,862,724	669 319 408	214,489,178	335,121,366
New Westminster	1975											
	1976											
	To date	139.093	114,376	470.246	7,729	11 333 143	11,553,105	12 893	1,119	5 786	481	11,676,810
Nicola	1975	18.164	72,386			19 697 153	28,455,593					28,527,979
	1976	**7.029**	**(3,485)**			**20 187 156**	**28,878,841**					**28,870,356**
	To date	343.221	396,312	8 598.518	135,632	311 613 938	347,919,998	1 016 721	91,282	146 913	10,977	348,554,201
Omineca	1975	1 181.385	5,887,331	4 362.693	607,289	32 313 682	40,336,614	7 347	2,933	6 075	5,027	46,839,194
	1976	**647.222**	**2,437,785**	**4 443.499**	**626,619**	**20 601 004**	**28,713,627**	**12 977**	**5,029**	**10 757**	**5,238**	**31,788,298**
	To date	7 976.457	24,425,096	360 552.134	12,830,322	195 482 725	278,486,642	13 804 667	3,927,570	19 604 676	6,180,760	325,850,390

Osoyoos	1975	335.756	1,958,915	17 787.059	2,848,128	14 500 282	18,137,957	9 532	3,546	15 814	8,365	22,956,911
	1976	**457.090**	**1,912,757**	**18 267.289**	**2,559,957**	**13 942 134**	**19,711,264**	**10 120**	**4,317**	**12 867**	**5,682**	**24,193,977**
	To date	53 098,295	55,915,245	167 346.829	14,214,894	101 044 799	137,385,503	247 783	78,858	145 827	53,534	207,648,034
Revelstoke	1975	.....	.....	46.343	6,706	.....	.....	902	358	.....	.....	7,064
	1976	.....	.....	**16.111**	**2,176**	.....	.....	**806**	**320**	**1 698**	**936**	**3,432**
	To date	1 163,532	1,081,981	128 317.043	2,821,365	69 710	51,037	16 406 534	3,876,057	12,314 288	3,317,157	11,147,597
Similkameen	1975	495.191	2,750,271	1 678.380	282,543	12 299 516	17,864,568	.....	.....	.....	.....	20,897,382
	1976	**1 043.475**	**4,127,500**	**3 291.008**	**639,914**	**23 519 501**	**34,123,808**	.....	.....	.....	.....	**38,891,222**
	To date	9 401,069	21,430,067	145 740.104	4,478,119	354 267 188	240,576,654	178 550	15,137	36 494	5,258	266,505,235
Skeena	1975	171.077	1,064,783	10 402.560	1,619,223	17 043 167	22,380,651	2 274	1,622	6 141	2,202	25,068,481
	1976	**173.959**	**697,660**	**11 191.326**	**1,517,879**	**17 006 336**	**27,009,172**	**3 148**	**1,355**	**2 395**	**1,320**	**29,227,386**
	To date	77 756.700	67,553,763	2 263 689.574	55,015,423	478 489 748	340,969,785	27 222 556	5,441,759	7 810 070	2,545,509	471,526,239
Slocan	1975	5.010	22,565	6 723.799	949,457	3	2	638 915	215,143	511 628	403,363	1,590,530
	1976	**21.896**	**87,318**	**8 867.201**	**1,201,994**	**68**	**59**	**1 041 345**	**411,982**	**846 882**	**589,403**	**2,290,761**
	To date	562.500	620,505	2 449 268.158	59,268,688	6 268	1,922	513 934 105	108,025,367	433 427 824	107,349,258	275,265,740
Trail Creek	1975	5.707	28,925	1 051.157	152,095	.....	.....	31 113	10,974	26 619	17,606	209,600
	1976	**11.788**	**45,434**	**282.136**	**37,221**	.....	.....	**6 603**	**2,827**	**7 689**	**4,149**	**89,631**
	To date	92 872.671	63,484,005	116 390.848	2,392,660	55 592 776	18,245,404	136 599	38,170	144 836	61,622	84,221,861
Vancouver	1975	11.592	64,791	5.041	1,090	68 809	104,583	.....	.....	483	258	170,722
	1976	**604.984**	**2,387,104**	**3 666.048**	**485,839**	**85 156**	**128,862**	**302 807**	**145,324**	**346 024**	**208,239**	**3,356,368**
	To date	16 170.878	18,737,041	178 309.767	5,053,745	506 899 661	242,837,462	8 725 986	2,028,840	108 456 095	31,182,970	299,840,058
Vernon	1975	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1976	**.124**	**480**	**187.583**	**25,331**	.....	.....	**11 890**	**4,719**	**3 383**	**1,865**	**32,395**
	To date	165.094	180,789	2 209.620	140,058	297	100	86 363	29,276	33 511	11,299	361,522
Victoria	1975	.809	4,160	9.144	1,352	52 661	77,053	.....	.....	.....	.....	82,565
	1976	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	To date	1 375.126	1,236,495	29 477.992	654,486	29 773 660	22,579,154	95 298	19,848	1 618 731	283,923	24,773,906
Not assigned	1975	(24.313)	(119,912)	15 713.625	2,484,796	78 039	67,738	3 431 632	1,186,658	11 212 019	9,073,887	12,693,167
	1976	**24.914**	**100,274**	**29 709.524**	**3,968,634**	**133 795**	**209,429**	**8 125 596**	**3,117,753**	**15 929 616**	**9,246,957**	**16,643,047**
	To date	669.409	769,257	253 128.174	14,973,206	26 029 581	15,492,005	253 450 811	52,887,327	698 032 608	175,107,399	259,229,194
Totals	1975	4 819.241	25,082,494	196 305.885	30,545,947	258 497 599	331,693,850	70 608 483	24,450,158	99 668 230	80,572,872	492,345,321
	1976	**5 393.477**	**21,761,502**	**239 720.882**	**32,532,836**	**263 618 197**	**378,984,941**	**85 407 582**	**32,796,533**	**106 498 987**	**65,499,106**	**531,574,920**
	To date	557 024.079	605,553,128	16 401 911.632	487,734,598	3 398 531 632	3,287,676,222	7 676 695 704	1,522,606,093	7 222 799 406	1,755,022,918	7,658,592,959

Table 3-7C—Production of Miscellaneous Metals by Mining Divisions, 1975 and 1976, and Total to Date

Division	Period	Antimony		Bismuth		Cadmium		Chromite		Iron Concentrates		Manganese		Mercury[1]	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		kg	$	kg	$	kg	$	t	$	t	$	t	$	kg	$
Alberni	1975					23 864	169,675								
	1976					**24 676**	**74,233**								
	To date					504 348	3,347,411			4 293 517	49,634,711				
Atlin	1975														
	1976														
	To date					144 791	561,762								
Cariboo	1975														
	1976														
	To date														
Clinton	1975														
	1976														
	To date							114	900						
Fort Steele	1975									17 726	208,883				
	1976									**16 488**	**190,838**				
	To date					1 542 022	10,046,486			1 280 770	14,555,179				
Golden	1975					523	2,297								
	1976					**3 601**	**15,878**								
	To date	18 172	14,906			259 096	1,185,297								
Greenwood	1975					463	3,206								
	1976					**560**	**2,630**								
	To date					36 274	174,583	608	31,395						
Kamloops	1975														
	1976														
	To date					54	371			19 202	95,851			4 984	5,795
Liard	1975														
	1976														
	To date														
Lillooet	1975														
	1976														
	To date	6 108	4,321											4 187	41,304
Nanaimo	1975									296 250	3,482,483				
	1976									**368 412**	**4,252,370**				
	To date									15 872 978	152,633,981				
Nelson	1975					48 182	297,937								
	1976					**41 761**	**182,752**								
	To date					3 996 445	19,526,432								
New Westminster	1975														
	1976														
	To date														
Nicola	1975									38 520	825,292				
	1976									**32 564**	**705,561**				
	To date									217 476	4,255,124				
Omineca	1975														
	1976														
	To date	53 697	21,882			135 245	628,342							1 882 803	10,400,259

Osoyoos	1975														
	1976														
	To date											15			
Revelstoke	1975														
	1976														
	To date	4 261	3,455			46 997	176,102								
Similkameen	1975														
	1976														
	To date														
Skeena	1975									946 719	10,729,244				
	1976									**837 813**	**9,611,757**				
	To date					64 360	316,764			10 351 780	103,041,902				
Slocan	1975					2 195	13,800								
	1976					**5 096**	**29,245**								
	To date	14 453	8,133			1 231 871	5,809,842					491	8,160		
Trail Creek	1975														
	1976														
	To date					52	210			499	1,925				
Vancouver	1975														
	1976					**526**	**2,753**								
	To date					257 261	1,206,076								
Vernon	1975														
	1976														
	To date					86	532								
Victoria	1975														
	1976														
	To date					3 175	10,929					1 058	24,508		
Not assigned	1975	364 045	1,467,928	19 163	261,931	250 696	1,484,120								
	1976	**447 001**	**1,636,871**	**20 261**	**226,462**	**280 202**	**1,229,309**								
	To date	25 987 295	22,667,986	3 214 539	15,645,621	11 685 994	41,074,715								
Totals	1975	364 045	1,467,928	19 163	261,931	320 923	1,971,035			1 299 215	15,245,902				
	1976	447 001	1,636,871	**20 261**	**226,462**	**356 422**	**1,530,800**			**1 255 277**	**14,760,526**				
	To date	26 083 986	22,720,683	3 214 539	15,645,621	19 908 071	84,083,854	722	32 295	32 036 222	324,218,673	1 564	32,668	1 891 974	10,447,358

[1] From 1968, excludes production which is confidential.

Table 3-7C—Production of Miscellaneous Metals by Mining Divisions, 1975 and 1976, and Total to Date—Continued

Division	Period	Molybdenum		Nickel		Palladium		Platinum		Tin		Tungsten (WO_3)		Other, Value	Division Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value		
		kg	$	kg	$	kg	$	kg	$	kg	$	kg	$	$	$
Alberni	1975														169,675
	1976														**74,233**
	To date														52,982,122
Atlin	1975														
	1976														
	To date														
Cariboo	1975	1 345 674	7,265,310									132	360		562,122
	1976	**1 022 697**	**7,047,577**												7,265,310
	To date	11 510 718	49,151,804					1.885	2,299			12 564	21,431		**7,047,577**
Clinton	1975														49,175,534
	1976														
	To date														
Fort Steele	1975									24 868	156,688				900
	1976									**66 183**	**467,130**				365,571
	To date									8 800 610	18,673,233			88,1841	**667,968**
Golden	1975														43,381,082
	1976														2,297
	To date														**15,878**
Greenwood	1975														1,200,203
	1976														3,206
	To date														**2,630**
Kamloops	1975	1 427 463	5,288,631												205,978
	1976	**1 715 590**	**7,756,045**												5,288,631
	To date	6 507 209	23,785,253												**7,756,045**
Liard	1975														23,887,270
	1976														
	To date							.062	79						
Lillooet	1975														79
	1976														
	To date	666	2,440					.093	113			14 675	37,921		
Nanaimo	1975	615 313	2,697,745												86,099
	1976	**878,072**	**4,474,950**												6,180,228
	To date	2 665 159	10,363,964												**8,727,320**
Nelson	1975														162,997,945
	1976														297,937
	To date	6 820	18,378									8 056 095	43,304,576		**182,752**
New Westminster	1975														62,849,386
	1976														
	To date			23 337 783	51,698,754									376,2412	
Nicola	1975														52,074,995
	1976														825,292
	To date														**705,561**
Omineca	1975	5 564 104	33,915,245												4,255,124
	1976	**6 766 374**	**47,573,476**												33,915,245
	To date	70 403 028	309,922,898					.093	154			1 002 839	4,697,710	4202	**47,573,476**
															325,671,665

Osoyoos	1975	4 074 073	22,034,460												22,034,460
	1976	**3 705 953**	**27,257,090**												**27,257,090**
	To date	27 191 011	120,902,088												120,902,088
Revelstoke	1975														
	1976														
	To date	1 190 714	4,167,573									3 531	5,687		4,352,817
Similkameen	1975														
	1976														
	To date							40.030	129,186						129,186
Skeena	1975														10,729,244
	1976														**9,611,757**
	To date	10 470 935	37,732,288									166	331	1,389[3]	141,092,674
Slocan	1975														13,800
	1976														**23,245**
	To date														5,826,135
Trail Creek	1975														
	1976														
	To date	1 652 970	6,514,289			23 296	30,462	1.649	3,177						6,550,063
Vancouver	1975														
	1976														**2,753**
	To date														1,206,076
Vernon	1975														
	1976														
	To date	2 456	9,500												10,032
Victoria	1975														
	1976														
	To date														35,437
Not assigned	1975									7 643	43,981			3,695,987	6,953,947
	1976									**36 079**	**245,782**			**2,083,161**	**5,421,585**
	To date									168 651	1,082,562			57,290,568	137,761,452
Totals	1975	13 026 627	71,201,391							32 511	200,669			3,695,987	94,044,843
	1976	**14 088 686**	**94,109,138**							**102 262**	**712,912**			**2,083,161**	**115,059,870**
	To date	131 601 686	562,570,475	23 337 783	51,698,754	23 296	30,462	43.762	135,008	8 969 261	19,755,795	9 090 002	48,068,016	57,756,802	1,197,196,464

[1] Magnesium, page 70. [2] Cobalt, page 66. [3] Selenium, page 72.

Table 3-7D—Production of Industrial Minerals by

Division	Period	Asbestos		Barite[1]		Diatomite		Fluxes (Quartz and Limestone)		Granules (Quartz, Limestone, and Granite)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		t	$	t	$	t	$	t	$	t	$
Alberni	1975										
	1976										
	To date										
Atlin	1975										
	1976										
	To date										
Cariboo	1975					5 847	229,483				
	1976					**2 737**	**182,159**				
	To date					21 343	745,563			44	168
Clinton	1975										
	1976										
	To date										
Fort Steele	1975										
	1976										
	To date			7	80						
Golden	1975										
	1976										
	To date			398 388	4,489,227			2 956	12,612		
Greenwood	1975										
	1976										
	To date							1 624 308	1,540,319	181	4,000
Kamloops	1975										
	1976										
	To date									567	12,230
Liard	1975	76 771	37,849,743								
	1976	**70 433**	**40,727,296**								
	To date	1 343 805	345,181,523								
Lillooet	1975										
	1976										
	To date										
Nanaimo	1975							35 914	174,824	2 325	96 279
	1976							**11 378**	**33,263**	**2 856**	**110,520**
	To date							971 159	1,909,480	28 773	666,501
Nelson	1975									23 394	885,083
	1976									**26 720**	**1,058,002**
	To date							6 895	8,174	176 662	5,764,054
New Westminster	1975										
	1976										
	To date									99 490	1,611,625
Nicola	1975										
	1976										
	To date										
Omineca	1975									26	2,103
	1976									**18**	**1,390**
	To date									79	6,189
Osoyoos	1975									3 300	59,984
	1976									**576**	**14,212**
	To date							728 113	3,699,031	192 505	2,702,935
Similkameen	1975										
	1976										
	To date										
Skeena	1975										
	1976										
	To date							545 232	1,050,722		
Vancouver	1975										
	1976										
	To date									26 936	418,606
Vernon	1975									4 271	101,519
	1976									**1 306**	**35,760**
	To date							2 903	30,400	7 210	190,963
Victoria	1975										
	1976										
	To date							262	3,345	8,713	157,080
Not assigned	1975										
	1976										
	To date										
Totals	1975	76 771	37,849,743			5 847	229,483	35 914	174,824	33 316	1,144,968
	1976	**70 433**	**40,727,296**			2 737	181,159	**11 378**	**33,263**	**31 476**	**1,219,884**
	To date	1 343 805	345,181,523	398 395	4,489,307	21 343	745,563	3 881 828	8,254,083	541 160	11,534,351

[1] From 1972, excludes production which is confidential.
Other: *See* notes on individual minerals listed alphabetically on pages A 64 to A 73.

[2] Natro-alunite.
[3] Hydromagnesite.
[4] Volcanic ash.
[5] Magnesium sulphate.
[6] Sodium carbonate.
[7] Phosphate rock.

Mining Divisions, 1975 and 1976, and Total to Date

Gypsum and Gypsite		Jade		Mica		Sulphur		Other, Value	Division Total
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value		
t	$	kg	$	t	$	t	$	$	$
								9,3982	9,398
								20,3253	20,325
									229,483
									182,159
				4 542 160	143,012			3004	889,043
792	6,236							156,1913 5 6	162,427
						86 062	1,992,228		1,992,228
						64 978	**1,138,853**		**1,138,853**
102 400	298,834					1 331 494	24,465,094	16,8947	24,780,892
474 387	1,751,799								1,751,799
556 134	**4,434,471**								**4,434,471**
4 896 580	18,515,896							1,2768 9	23,019,011
								783,57810	2,327,897
1 131 179	6,323,178			192 640	2,075			2 03,0555 6	6,540,538
		1 458	8,590			34 405	838,162		38,696,495
		364 278	**1,309,840**			**34 405**	**838,162**		**42,875,298**
		388 678	1,391,441			914 340	18,755,939		365,328,903
		253,391	467,966					5,1299	473,095
									271,103
									143,783
									2,575,981
									885,083
									1,058,002
								55,9018	5,828,129
									1,611,625
2 184	10,050								10,050
		108 979	405,533						407,636
		119 518	**225,190**						**226,580**
		482 804	1,378,387					11,46011 12	1,396,036
									59,984
									14,212
				720 664	25,938			306,5335 10 11	6,734,437
227	1,700							16,85813	18,558
				287 689	10,815	37 761	178,678		1,240,215
						623 773	6,550,969	97,3898	7,066,964
									101,519
									35,760
				72 801	3,978				225,341
								30,2269	190,651
						125 612	2,907,744	1,364,528	4,272,272
						132 321	**2,319,174**	**488,850**	**2,808,024**
						5 213 822	67,327,567	2,657,092	69,984,659
474 387	1,751,799	110 437	414,123			246 079	5,738,134	1,364,528	48,667,602
556 134	**4,434,471**	**483 796**	**1,535,030**			**231 704**	**4,296,189**	**488,850**	**52,917,142**
6 133 362	25,155,884	1 124 873	3,237,794	5 815 954	185,818	8 121 190	117,278,247	4,371,605	520,434,175

8 Iron oxide and ochre.
9 Talc.
10 Fluorspar.
11 Arsenious oxide.
12 Perlite.
13 Bentonite.

Table 3-7E—Production of Structural Materials by Mining Divisions, 1975 and 1976, and Total to Date

Division	Period	Cement	Lime and Limestone	Building-stone	Rubble, Riprap, and Crushed Rock	Sand and Gravel	Clay Products	Unclassified Material	Division Total
		$	$	$	$	$	$	$	$
Alberni	1975				146	600,142			600,288
	1976					**717,580**			**717,580**
	To date				346,659	5,956,108			6,302,767
Atlin	1975					4,164			4,164
	1976					**3,275**			**3,275**
	To date		1,108		102,453	242,119			345,680
Cariboo	1975		332,564		2,139,774	1,757,699			4,230,037
	1976		**577,452**		**1,684,141**	**2,476,542**			**4,738,135**
	To date		2,648,276		7,738,633	28,384,487	332,457		39,103,853
Clinton	1975				13,068	398,968			412,036
	1976					**392,525**			**392,525**
	To date				1,872,224	2,910,935			4,783,159
Fort Steele	1975				184,619	903,350			1,087,969
	1976					**770,686**			**770,686**
	To date		43,873	71,941	2,955,311	8,998,381	15,918		12,085,424
Golden	1975				10,260	269,090			279,350
	1976					**285,114**			**285,114**
	To date		1,000	50,840	255,923	4,010,254	128,159		4,446,176
Greenwood	1975					249,071			249,071
	1976					**182,679**			**182,679**
	To date		42,560	161,020	278,474	2,479,231	121,283		3,082,568
Kamloops	1975	5,970,918			1,367,948	1,309,497			8,648,363
	1976	**7,286,060**			**906,620**	**1,945,772**			**10,138,452**
	To date	27,994,946	25,067	19,800	13,508,421	18,926,272	72,379		60,546,885
Liard	1975				326,649	2,187,657			2,514,306
	1976					**1,650,024**			**1,650,024**
	To date				2,127,808	16,710,763			18,838,571
Lillooet	1975		161,019		19,820	15,000			195,839
	1976		**216,139**		**2,595**	**7,474**			**226,208**
	To date		377,258	2,000	1,122,818	2,334,989			3,837,065
Nanaimo	1975		3,302,182		1,137,942	2,838,480			7,278,604
	1976		**3,860,294**		**461,499**	**2,732,508**			**7,054,301**
	To date		65,411,716	3,450,735	5,306,340	18,023,253	1,178,992		93,371,036
Nelson	1975		459,986	200	8,830	402,484			871,500
	1976		**549,724**		**2,770**	**555,924**			**1,108,418**
	To date		2,376,895	437,138	589,571	7,469,543	21,974		10,895,121
New Westminster	1975		63,000		2,668,374	11,069,807	6,593,189		20,394,370
	1976		**67,000**		**741,137**	**11,282,332**	**6,995,917**		**19,086,386**
	To date		3,524,910	20,974	23,712,292	127,259,114	97,542,791		252,060,081
Nicola	1975					140,487			140,487
	1976					**229,815**			**229,815**
	To date			8,000	187,994	2,402,892			2,598,886
Omineca	1975		5,121	70	258,765	738,921			1,002,877
	1976		**3,991**	**341**	**112,001**	**1,151,902**			**1,268,235**
	To date		29,860	411	2,902,778	13,795,813	5,274		16,734,136
Osoyoos	1975					786,229			786,229
	1976					**753,952**			**753,952**
	To date		43,774	33,018	355,349	5,582,160			6,014,301
Revelstoke	1975			4,125	4,125	151,087			159,337
	1976			**11,750**	**2,000**	**209,923**			**223,673**
	To date		1,000	35,170	763,153	3,158,365			3,957,688
Similkameen	1975				55,044	63,565			118,609
	1976					**350,424**			**350,424**
	To date	10,500	11,571	24,000	712,341	4,047,106	13,355		4,818,873
Skeena	1975				524,259	2,008,676			2,532,935
	1976				**163,229**	**1,304,120**			**1,467,349**
	To date		1,645,300	144,000	4,283,246	18,517,985	13,249		24,603,780
Slocan	1975					29,976			29,976
	1976					**509,496**			**509,496**
	To date		1,000	115,143	157,323	2,662,299			2,935,765
Trail Creek	1975					86,116			86,116
	1976					**145,381**			**145,381**
	To date		32,500	85,520	381,393	3,419,229			3,918,642
Vancouver	1975	10,328,746			2,681	5,094,022			15,425,449
	1976	**9,549,544**				**6,102,510**			**15,652,054**
	To date	106,687,474	40,885	4,012,560	8,681,796	69,932,358	1,088,592		190,443,665
Vernon	1975					1,785,644			1,785,644
	1976		**304,917**	**2,223**		**2,533,995**			**2,841,135**
	To date		351,416	100,075	403,649	13,786,372	161,254		14,802,766
Victoria	1975	15,382,658	25,928		1,144	4,284,333			19,693,463
	1976	**18,138,142**	**30,546**		**981**	**7,392,436**			**25,562,105**
	To date	239,178,805	1,067,272	55	532,563	43,427,106	10,855,136		295,060,937
Not assigned	1975					2,400,992			2,400,992
	1976				**1,129,000**	**4,452,246**			**5,581,246**
	To date		315,498	505,018	2,140,570	46,372,092	3,180,828	5,972,171	58,486,177
Totals	1975	31,681,722	4,349,800	4,395	8,723,448	39,575,457	6,593,189		90,928,011
	1976	**34,973,746**	**5,610,063**	**14,314**	**5,205,973**	**48,138,635**	**6,995,917**		**100,938,648**
	To date	373,871,725	77,992,739	9,277,418	81,419,082	470,809,226	114,731,641	5,972,171	1,134,074,002

Table 3-8A—Production of Coal, 1836–1976

Year	Quantity[1]	Value	Year	Quantity[1]	Value
	tonnes	$		tonnes	$
1836–59	37 985	149,548	1919	2 207 659	11,975,671
1860	14 475	56,988	1920	2 587 763	13,450,169
1861	13 995	55,096	1921	2 422 455	12,836,013
1862	18 409	72,472	1922	2 473 692	12,880,060
1863	21 687	85,380	1923	2 391 998	12,678,548
1864	29 091	115,528	1924	1 839 619	9,911,935
1865	33 345	131,276	1925	2 305 337	12,168,905
1866	25 518	100,460	1926	2 182 760	11,650,180
1867	31 740	124,956	1927	2 316 408	12,269,135
1868	44 711	176,020	1928	2 431 794	12,633,510
1869	36 376	143,208	1929	2 154 607	11,256,260
1870	30 322	119,372	1930	1 809 364	9,435,650
1871	50 310	164,612	1931	1 601 600	7,684,155
1872	50 310	164,612	1932	1 464 759	6,523,644
1873	50 311	164,612	1933	1 249 347	5,375,171
1874	82 856	244,641	1934	1 297 306	5,725,133
1875	111 912	330,435	1935	1 159 721	5,048,864
1876	141 425	417,576	1936	1 226 780	5,722,502
1877	156 525	462,156	1937	1 312 003	6,139,920
1878	173 587	522,538	1938	1 259 626	5,565,069
1879	245 172	723,903	1939	1 416 184	6,280,956
1880	271 889	802,785	1940	1 507 758	7,088,265
1881	232 020	685,171	1941	1 673 516	7,660,000
1882	286 666	846,417	1942	1 810 731	8,237,172
1883	216 721	639,897	1943	1 682 591	7,742,030
1884	400 391	1,182,210	1944	1 752 626	8,217,966
1885	371 461	1,096,788	1945	1 381 654	6,454,360
1886	331 875	979,908	1946	1 305 516	6,732,470
1887	419 992	1,240,080	1947	1 538 895	8,680,440
1888	497 150	1,467,903	1948	1 455 552	9,765,395
1889	589 133	1,739,490	1949	1 470 782	10,549,924
1890	689 020	2,034,420	1950	1 427 907	10,119,303
1891	1 045 607	3,087,291	1951	1 427 513	10,169,617
1892	839 591	2,479,005	1952	1 272 150	9,729,739
1893	993 988	2,934,882	1953	1 255 662	9,528,279
1894	1 029 204	3,038,859	1954	1 186 849	9,154,544
1895	954 727	2,824,687	1955	1 209 157	8,986,501
1896	909 237	2,693,961	1956	1 285 664	9,346,518
1897	906 610	2,734,522	1957	984 886	7,340,339
1898	1 146 015	3,582,595	1958	722 490	5,937,860
1899	1 302 088	4,126,803	1959	625 964	5,472,064
1900	1 615 688	4,744,530	1960	715 455	5,242,223
1901	1 718 692	5,016,398	1961	833 827	6,802,134
1902	1 667 960	4,832,257	1962	748 731	6,133,986
1903	1 473 933	4,332,297	1963	771 594	6,237,997
1904	1 712 739	4,953,024	1964	826 737	6,327,678
1905	1 855 121	5,511,861	1965	862 513	6,713,590
1906	1 929 540	5,548,044	1966	771 848	6,196,219
1907	2 255 214	7,637,713	1967	824 436	7,045,341
1908	2 143 225	7,356,866	1968	870 180	7,588,989
1909	2 439 109	8,574,884	1969	773 226	6,817,155
1910	3 007 074	11,108,335	1970	2 398 635	19,559,669
1911	2 305 778	8,071,747	1971	4 141 496	45,801,936
1912	2 913 778	10,786,812	1972	5 466 846	66,030,210
1913	2 461 665	9,197,460	1973	6 924 733	87,976,105
1914	2 029 400	7,745,847	1974	7 757 440	154,593,643
1915	1 883 851	7,114,178	1975	8 924 816	317,111,744
1916	2 343 671	8,900,675	1976	7 537 695	298,683,679
1917	2 209 982	8,484,343	Totals	172 374 958	1,606,480,862
1918	2 336 238	12,833,994			

[1] Quantity from 1836 to 1909 is gross mine output and includes material lost in picking and washing. For 1910 and subsequent years the quantity is that sold and used.

Table 3-8B—Coal Production and Distribution by Collieries and by Mining Divisions, 1976

Mine	Raw Coal Production	Clean Coal Production	Coal Used		Sales						Total Coal Sold and Used	
			Under Companies' Boilers, Etc.	Making Coke	Canada		United States	Japan	Others	Total Sales	Amount	Value
					British Columbia	Other Provinces						
	t	t	t	t	t	t	t	t	t	t	t	$
Fort Steele Mining Division												
Byron Creek Collieries Ltd.	357 272	350 245	.....	.....	16 698	234 394	321	132 474	.....	383 887	383 887	9,189,734
Coleman Collieries Ltd.	343 467	211 077	.....	.....	.....	.....	.....	211 077	.....	211 077	211 077	7,834,429
Fording Coal Ltd.	2 401 617	1 637 551	.....	.....	.....	.....	.....	1 832 556	22 457	1 855 013	1 855 013	78,577,089
Kaiser Resources Ltd.	7 027 379	5 299 282	3 810	162 404	50 340	.....	.....	4 253 192	617 758	4 921 290	5 087 504	203,078,117
Omineca Mining Division												
Bulkley Valley Coal Ltd.	265	214	5	.....	209	.....	.....	.....	.....	209	214	4,310
Totals	10 130 000	7 498 369	3 815	162 404	67 247	234 394	321	6 429 299	640 215	7 371 476	7 537 695	298,683,679

Table 3-9—Principal Items of Expenditure, Reported for Operations of All Classes

Class	Salaries and Wages	Fuel and Electricity	Process Supplies
	$	$	$
Metal-mining	119,174,934	33,284,375	144,828,244
Exploration and development	70,369,040		
Coal	45,087,051	8,878,580	11,284,955
Petroleum and natural gas (exploration and production)	8,125,887		
Industrial minerals	11,550,007	4,615,514	3,675,303
Structural-materials industry	23,429,909	12,441,735	10,287,114
Totals, 1976	277,736,828	59,220,204	170,075,616
Totals, 1975	246,953,568	49,104,838	154,476,238
1974	272,945,078	42,381,258	140,002,685
1973	221,877,595	36,750,711	103,840,649
1972	199,351,449	31,115,621	77,092,955
1971	179,175,692	23,166,904	68,314,944
1970	172,958,282	19,116,672	59,846,370
1969	123,450,327	14,554,123	43,089,559
1968	113,459,219	13,818,326	38,760,203
1967	94,523,495	13,590,759	34,368,856
1966	93,409,528	12,283,477	28,120,179
1965	74,938,736	11,504,343	30,590,631
1964	63,624,559	10,205,861	27,629,953
1963	57,939,294	10,546,806	12,923,325
1962	55,522,171	9,505,559	14,024,799
1961	50,887,275	8,907,034	17,787,127
1960	52,694,818	7,834,728	21,496,912
1959	49,961,996	7,677,321	17,371,638
1958	48,933,560	8,080,989	15,053,036
1957	56,409,056	8,937,567	24,257,177
1956	57,266,026	9,762,777	22,036,839
1955	51,890,246	9,144,034	21,131,572
1954	48,702,746	7,128,669	19,654,724
1953	55,543,490	8,668,099	20,979,411
1952	62,256,631	8,557,845	27,024,500
1951	52,607,171	7,283,051	24,724,101
1950	42,738,035	6,775,998	17,500,663
1949	41,023,786	7,206,637	17,884,408
1948	38,813,506	6,139,470	11,532,121
1947	32,160,338	5,319,470	13,068,948
1946	26,190,200	5,427,458	8,367,705
1945	22,620,975	7,239,726	5,756,628
1944	23,131,874	5,788,671	6,138,084
1943	26,051,467	7,432,585	6,572,317
1942	26,913,160	7,066,109	6,863,398
1941	26,050,491	3,776,747	7,260,441
1940	23,391,330	3,474,721	6,962,162
1939	22,357,035	3,266,000	6,714,347
1938	22,765,711	3,396,106	6,544,500
1937	21,349,690	3,066,311	6,845,330
1936	17,887,619	2,724,144	4,434,501
1935	16,753,367	2,619,639	4,552,730

NOTE—This table has changed somewhat through the years, so that the items are not everywhere directly comparable. Prior to 1962, lode-mining referred only to gold, silver, copper, lead, and zinc. Prior to 1964, some expenditures for fuel and electricity were included with process supplies. Process supplies (except fuel) were broadened in 1964 to include "process, operating maintenance and repair supplies . . . used in the mine/mill operations; that is, explosives, chemicals, drill steel, bits, lubricants, electrical, etc. . . . not charged to Fixed Assets Account . . . provisions and supplies sold in any company-operated cafeteria or commissary." Exploration and development other than in the field of petroleum and natural gas is given, starting in 1966.

Table 3-10—Employment in the Mineral Industry, 1901–76

Year	Metals					Coal Mines			Structural Materials					
	Placer	Mines: Under	Mines: Above	Concentrates	Smelters	Total	Under	Above[1]	Total	Quarries and Pits	Plants	Industrial Materials	Exploration and Development	Petroleum and Natural Gas Exploration and Development	Total
1901	.....	2,736	1,212	.....	.....	3,948	3,041	933	3,974	.....	.....	.....	.....	.....	7,922
1902	.....	2,219	1,126	.....	.....	3,345	3,101	910	4,011	.....	.....	.....	.....	.....	7,356
1903	.....	1,662	1,088	.....	.....	2,750	3,137	1,127	4,264	.....	.....	.....	.....	.....	7,014
1904	.....	2,143	1,163	.....	.....	3,306	3,278	1,175	4,453	.....	.....	.....	.....	.....	7,759
1905	.....	2,470	1,240	.....	.....	3,710	3,127	1,280	4,407	.....	.....	.....	.....	.....	8,117
1906	.....	2,680	1,303	.....	.....	3,983	3,415	1,390	4,805	.....	.....	.....	.....	.....	8,788
1907	.....	2,704	1,239	.....	.....	3,943	2,862	907	3,769	.....	.....	.....	.....	.....	7,712
1908	.....	2,567	1,127	.....	.....	3,694	4,432	1,641	6,073	.....	.....	.....	.....	.....	9,767
1909	.....	2,184	1,070	.....	.....	3,254	4,713	1,705	6,418	.....	.....	.....	.....	.....	9,672
1910	.....	2,472	1,237	.....	.....	3,709	5,903	1,855	7,758	.....	.....	.....	.....	.....	11,467
1911	.....	2,435	1,159	.....	.....	3,594	5,212	1,661	6,873	.....	.....	.....	.....	.....	10,467
1912	.....	2,472	1,364	.....	.....	3,836	5,275	1,855	7,130	.....	.....	.....	.....	.....	10,966
1913	.....	2,773	1,505	.....	.....	4,278	4,950	1,721	6,671	.....	.....	.....	.....	.....	10,949
1914	.....	2,741	1,433	.....	.....	4,174	4,267	1,465	5,732	.....	.....	.....	.....	.....	9,906
1915	.....	2,709	1,435	.....	.....	4,144	3,708	1,283	4,991	.....	.....	.....	.....	.....	9,135
1916	.....	3,357	2,036	.....	.....	5,393	3,694	1,366	5,060	.....	.....	.....	.....	.....	10,453
1917	.....	3,290	2,198	.....	.....	5,488	3,760	1,410	5,170	.....	.....	.....	.....	.....	10,658
1918	.....	2,626	1,764	.....	.....	4,390	3,658	1,769	5,427	.....	.....	.....	.....	.....	9,817
1919	.....	2,513	1,746	.....	.....	4,259	4,145	1,821	5,966	.....	.....	.....	.....	.....	10,225
1920	.....	2,074	1,605	.....	.....	3,679	4,191	2,158	6,349	.....	.....	.....	.....	.....	10,028
1921	.....	1,355	975	.....	.....	2,330	4,722	2,163	6,885	.....	.....	.....	.....	.....	9,215
1922	.....	1,510	1,239	.....	.....	2,749	4,712	1,932	6,644	.....	.....	.....	.....	.....	9,393
1923	.....	2,102	1,516	.....	.....	3,618	4,342	1,807	6,149	.....	.....	.....	.....	.....	9,767
1924	.....	2,353	1,680	.....	.....	4,033	3,894	1,524	5,418	.....	.....	.....	.....	.....	9,451
1925	.....	2,298	2,840	.....	.....	5,138	3,828	1,615	5,443	.....	.....	.....	.....	.....	10,581
1926	299	2,606	1,735	808	2,461	7,610	3,757	1,565	5,322	493	324	124	.....	.....	14,172
1927	415	2,671	1,916	854	2,842	8,283	3,646	1,579	5,225	647	138	122	.....	.....	14,830
1928	355	2,707	2,469	911	2,748	8,835	3,814	1,520	5,334	412	368	120	.....	.....	15,424
1929	341	2,926	2,052	966	2,948	8,892	3,675	1,353	5,028	492	544	268	.....	.....	15,565
1930	425	2,316	1,260	832	3,197	7,605	3,389	1,256	4,645	843	344	170	.....	.....	14,032
1931	688	1,463	834	581	3,157	6,035	2,957	1,125	4,082	460	526	380	.....	.....	12,171
1932	874	1,355	900	542	2,036	4,833	2,628	980	3,608	536	329	344	.....	.....	10,524
1933	1,134	1,786	1,335	531	2,436	6,088	2,241	853	3,094	376	269	408	.....	.....	11,369
1934	1,122	2,796	1,729	631	2,890	8,046	2,050	843	2,893	377	187	360	.....	.....	12,985
1935	1,291	2,740	1,497	907	2,771	7,915	2,145	826	2,971	536	270	754	.....	.....	13,737
1936	1,124	2,959	1,840	720	2,678	8,197	2,015	799	2,814	931	288	825	.....	.....	14,179
1937	1,371	3,603	1,818	1,168	3,027	9,616	2,286	867	3,153	724	327	938	.....	.....	16,129
1938	1,303	3,849	2,266	919	3,158	10,192	2,088	874	2,962	900	295	369	.....	.....	16,021
1939	1,252	3,905	2,050	996	3,187	10,138	2,167	809	2,976	652	311	561	.....	.....	15,890
1940	1,004	3,923	2,104	1,048	2,944	10,019	2,175	699	2,874	827	334	647	.....	.....	15,705
1941	939	3,901	1,823	1,025	3,072	9,821	2,229	494	2,723	766	413	422	.....	.....	15,084
1942	489	2,920	1,504	960	3,555	8,939	1,892	468	2,360	842	378	262	.....	.....	13,270
1943	212	2,394	1,699	891	2,835	7,819	2,240	611	2,851	673	326	567	.....	.....	12,448
1944	255	1,896	1,825	849	2,981	7,551	2,150	689	2,839	690	351	628	.....	.....	12,314
1945	209	1,933	1,750	822	2,834	7,339	1,927	503	2,430	921	335	586	.....	.....	11,820
1946	347	1,918	1,817	672	2,813	7,220	1,773	532	2,305	827	555	679	.....	.....	11,933
1947	360	3,024	2,238	960	3,461	9,683	1,694	731	2,425	977	585	869	.....	.....	14,899
1948	348	3,143	2,429	1,126	3,884	10,582	1,594	872	2,466	1,591	656	754	.....	.....	16,397
1949	303	3,034	2,724	1,203	3,763	10,724	1,761	545	2,306	2,120	542	626	.....	.....	16,621
1950	327	3,399	2,415	1,259	3,759	10,832	1,745	516	2,261	1,916	616	660	.....	.....	16,612
1951	205	3,785	3,695	1,307	4,044	12,831	1,462	463	1,925	1,783	628	491	.....	.....	17,863
1952	230	4,171	3,923	1,516	4,120	13,730	1,280	401	1,681	1,530	557	529	.....	.....	18,257
1953	132	3,145	2,589	1,371	3,901	11,006	1,154	396	1,550	1,909	559	634	.....	.....	15,790
1954	199	2,644	2,520	1,129	3,119	9,412	1,076	358	1,434	1,861	638	584	.....	.....	14,128
1955	103	2,564	2,553	1,091	3,304	9,512	1,100	378	1,478	1,646	641	722	.....	.....	14,102
1956	105	2,637	2,827	1,043	3,339	9,846	968	398	1,366	1,598	770	854	.....	.....	14,539
1957	67	2,393	2,447	838	3,328	9,006	1,020	360	1,380	1,705	625	474	.....	.....	13,257
1958	75	1,919	1,809	625	3,081	7,434	826	260	1,086	1,483	677	446	.....	.....	11,201
1959	99	1,937	1,761	618	3,008	7,324	765	291	1,056	1,357	484	459	.....	.....	10,779
1960	86	1,782	1,959	648	3,034	7,423	894	288	1,182	1,704	557	589	.....	.....	11,541
1961	74	1,785	1,582	626	3,118	7,111	705	237	942	1,828	508	571	.....	.....	11,034
1962	35	1,677	1,976	949	3,356	7,958	548	228	776	1,523	481	517	270	.....	11,560
1963	43	1,713	2,012	850	3,239	7,814	501	247	748	909	460	528	450	.....	10,952
1964	5	1,839	1,967	822	3,281	7,909	446	267	713	1,293	444	509	772	.....	11,645
1965	2	1,752	2,019	965	3,529	8,265	405	244	649	1,079	422	639	786	441	12,283
1966	2	2,006	2,296	1,014	3,654	8,970	347	267	614	1,269	393	582	1,894	478	14,202
1967	.....	1,928	2,532	992	3,435	8,887	260	197	457	1,309	372	584	1,264	507	13,380
1968	.....	1,823	2,369	1,072	3,283	8,547	195	358	553	1,207	380	582	3,990	400	15,659
1969	7	1,794	2,470	1,099	3,468	8,831	245	455	700	1,097	549	567	4,270	416	16,437
1970	.....	2,160	3,167	1,331	3,738	10,396	242	1,033	1,275	740	647	627	4,964	437	19,086
1971	.....	2,073	3,058	1,513	3,481	10,125	444	1,013	1,457	846	794	666	4,040	495	18,423
1972	.....	1,833	3,463	1,734	3,353	10,383	214	1,771	1,985	1,116	800	527	4,201	458	19,470
1973	.....	1,704	4,005	2,394	3,390	11,493	265	1,951	2,216	898	802	667	3,392	454	19,922
1974	.....	1,509	4,239	2,352	2,767	10,867	267	2,255	2,522	895	782	646	2,848	509	19,069
1975	.....	1,100	3,619	1,983	3,733	10,435	299	2,464	2,763	826	725	705	2,931	518	18,903
1976	.....	**1,268**	**3,733**	**2,048**	**3,542**	**10,591**	**327**	**2,300**	**2,627**	**931**	**680**	**670**	**3 101**	**495**	**19,095**

[1] Commencing with 1967, does not include employment in by-product plants.

NOTE—These figures refer only to company employees and do not include the many employees of contracting firms.

Table 3-11—Employment at Major Metal and Coal Mines, 1976

	Tonnes		Days Operating Mill	Average Number Employed[1]					
	Mined	Milled		Administrative, Etc.	Mine		Mill	Others	Total
					Surface	Underground			
Metal Mines									
Anaconda Canada Ltd. (Britannia)[2]	.....	.....	.....	5	1	.....	.....	6	12
Bethlehem Copper Corp. (Bethlehem)	7 031 578	6 763 838	366	21	207	.....	120	31	379
Brenda Mines Ltd. (Brenda)	10 182 642	10 047 565	366	114	151	.....	171	.....	436
Canex Placer Ltd. (Endako)	10 948 030	8 520 235	353	131	144	.....	302	.....	577
Cominco Ltd. (HB)	374 163	374 163	337	28	27	64	12	.....	131
Cominco Ltd. (Sullivan)	2 124 886	2 124 886	366	129	80	582	290	.....	1,081
Craigmont Mines Ltd. (Craigmont)	1 767 514	1 763 219	360	89	124	152	44	.....	409
Dankoe Mines Ltd. (Horn Silver)	23 667	20 936	298	7	4	17	8	.....	36
Dusty Mac Mines Ltd. (Dusty Mac)	19 396	53 335[3]	160	3	13	.....	.....	.....	16
Gibraltar Mines Ltd. (Gibraltar)	10 955 903	7 672 296	366	125	73	.....	156	.....	354
Granby Mining Corp. (Phoenix)	183 633	965 845	366	22	35	.....	43	.....	100
Granisle Copper Ltd. (Granisle)	3 932 981	4 008 222	342	69	130	.....	113	.....	312
Kam-Kotia-Burkam Joint Venture (Silmonac)	17 818	16 694	247	1	4	22	9	.....	36
Lornex Mining Corp. Ltd. (Lornex)	14 731 696	15 436 575	363	108	353	.....	241	.....	702
Newmont Mines Ltd. (Granduc Operating Division)	1 315 905	1 315 905	366	110	70	111	33	.....	324
Newmont Mines Ltd. (Similkameen Division)	6 355 874	6 355 874	366	81	171	.....	80	.....	332
Noranda Mines Ltd. (Bell)	1 544 895	1 925 246	161	85	18	.....	56	.....	159
Noranda Mines Ltd. (Boss Mountain)	564 376	564 036	356	43	39	55	24	.....	161
Northair Mines Ltd. (Warman)	54 565	47 553	240	18	12	32	11	.....	73
Teck Corporation Ltd. (Highland Bell)	34 447	34 447	355	7	4	16	9	.....	36
Texada Mines Ltd. (Texada)	841 962	848 477	252	16	57	53	34	.....	160
Utah Mines Ltd. (Island Copper)	12 182 566	12 246 566	366	159	430	.....	170	.....	759
Wesfrob Mines Ltd. (Tasu)	1 572 524	1 572 524	278	49	17	7	101	7	181
Western Mines Ltd. (Lynx and Myra)	269 293	269 293	318	53	52	157	21	.....	283
Total metal mines	.....	.....	.....	1,473	2,216	1,268	2,048	44	7,049
Coal Mines									
Byron Creek Collieries	357 272	.....	366	16	3	.....	4	.....	23
Coleman Collieries Ltd.	343 467	.....	366[4]	.....	3[4]	.....	.....	.....	3
Fording Coal Ltd.	2 401 617	.....	233	172	295	.....	67	.....	534
Kaiser Resources Ltd.	7 027 379	.....	303	493	1,070	327	177	.....	2,067
Total coal mines	.....	.....	.....	681	1,371	327	248	.....	2,627

[1] The average number of employed includes wage-earners and salaried employees. The average is obtained by adding the monthly figures and dividing by 12, irrespective of the number of months worked.

[2] Copper precipitate produced incidental to treatment of water as required by Pollution Control Branch.

[3] Custom milling done by Dankoe Mines Ltd.

[4] Estimated.

Table 3-12—Metal Production, 1976

Property or Mine	Location of Mine	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Content					
					Gold	Silver	Copper	Lead	Zinc	Cadmium
Alberni Mining Division			t		kg	kg	kg	kg	kg	kg
Lynx and Myra	Buttle Lake	Western Mines Ltd.	269 293	Copper concentrates, 8 830 t; lead concentrates, 7 093 t; zinc concentrates, 31 653 t	695.494	40 435.642	2 953 251	3 586 262	18 987 531	72 800
Atlin Mining Division										
Atlin-Ruffner	Atlin	Atlin Silver Corp.	1 610	Lead concentrates, 64 t	.678	429.843	376	34 455	4 017	.....
Cariboo Mining Division										
Boss Mountain Mine	Big Timothy Mountain	Noranda Mines Ltd. (Boss Mountain Division)	564 036	Molybdenite concentrates, 1 843 t containing 1 022 697 kg of molybdenum	.....	.....	.....	.....	.....	.....
Gibraltar Mine	McLeese Lake	Gibraltar Mines Ltd.	7 672 296[1]	Copper concentrates, 101 772 t	.....	3 343.168	26 142 438	.....	.....	.....
Clinton Mining Division										
Nil	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Steele Mining Division										
Sullivan Mine	Kimberley	Cominco Ltd.	2 124 886	Lead concentrates, 109 140 t; zinc concentrates, 151 636 t; tin concentrates, 125 t containing 66 183 kg of tin	.....	84 586.817	.....	77 065 578	77 435 404	.....
Golden Mining Division										
Ruth Vermont	Spillimacheen	Consolidated Columbia River Mines Ltd.	60 725[2]	Lead concentrates, 1 504 t; zinc concentrates, 2 244 t	2.830	5 025.312	14 435	949 099	1 276 240	9 003
Greenwood Mining Division										
Burnt Basin	Paulson	Donna Mines Ltd. and Alvija Mines Ltd.	573	Lead concentrates, 33 t; zinc concentrates, 56 t	.....	35.209	.....	18 714	27 897	142
Highland Bell Mine	Beaverdell	Teck Corporation Ltd.	34 447	Lead concentrates, 733 t; zinc concentrates, 299 t; jig concentrates, 103 t	5.536	11 583.379	.....	147 978	186 168	1 219
Phoenix Mine	Greenwood	Granby Mining Corp., Phoenix Copper Division	965 845	Copper concentrates, 15 435 t	364.620	3 261.367	4 231 760	.....	.....	.....
Skomac	Greenwood	Robert Mines Ltd.	548	Crude ore	1.327	221.355	.....	16 122	8 651	.....
Kamloops Mining Division										
Bethlehem	Highland Valley	Bethlehem Copper Corp.	6 763 838	Copper concentrates, 64 781 t	57.230	4 618.236	23 006 380	.....	.....	.....
Lornex Mine	Highland Valley	Lornex Mining Corp. Ltd.	15 436 575	Copper concentrates, 204 020 t; molybdenite concentrates, 3 133 t, containing 1 715 590 kg of molybdenum	26.851	17 316.751	68 313 748	.....	.....	.....
Spar 1 and Spar 2	Adams Plateau	Panex Mining Ltd.	181	Crude ore	.062	91.567	291	5 667	2 438	.....

Liard Mining Division										
Nil										
Lillooet Mining Division										
Nil										
Nanaimo Mining Division										
Island Copper Mine	Rupert Inlet	Utah Mines Ltd.	12 246 885	Copper concentrates, 213 588 t; molybdenite concentrates, 2 145 t, containing 878 072 kg of molybdenum; rhenium shipments are confidential	1 416.959	9 983.690	48 956 470			
Texada Mine	Texada Island	Texada Mines Ltd.	848 477	Iron concentrates, 368 412 t; copper concentrates, 6 394 t	33.687	1 337.149	1 332 202			
Nelson Mining Division										
HB	Salmo	Cominco Ltd.	374 163	Lead concentrates, 5 082 t; zinc concentrates, 23 106 t	.684	937.071	274	2 036 925	12 796 512	104 523
Mohawk No. 1	Salmo	J. Eimer, Creston	40	Crude ore		4.945		1 030	30	12
New Westminster Mining Division										
Nil										
Nicola Mining Division										
Craigmont Mine	Merritt	Craigmont Mines Ltd.	1 763 219	Copper concentrates, 74 310 t; iron concentrates, 32 564 t	7.838		21 107 071			
Omineca Mining Division										
Bell Mine (Newman)	Babine Lake	Noranda Mines Ltd. (Bell Copper Division)	1 925 246	Copper concentrates, 25 748 t	295.292	823.265	6 651 253			
Endako Mine	Endako	Canex Placer Ltd. (Endako Mines Division)	8 520 235	Molybdenite concentrates, 1 098 t; molybdic tri-oxide, 9 771; ferro-molybdenum, 288 t; total content 6 766 374 kg of molybdenum						
Granisle Mine	Babine Lake	Granisle Copper Ltd.	4 008 222	Copper concentrates, 45 482 t	408.227	4 549.902	14 672 658			
Silver Standard Mine	Hazelton	George Braun, New Hazelton	152	Crude ore	.746	255.791	245	8 842	12 759	
Tetra (Moricetown Silver)	Smithers	Paul Kindrat, Smithers	189	Crude ore	.317	485.767		7 145	6 240	
Osoyoos Mining Division										
Brenda Mine	Brenda Lake	Brenda Mines Ltd.	10 047 565	Copper concentrates, 51 854 t; molybdenite concentrates, 6 514 t; molybdic oxide, 132 t; total content, 3 705 953 kg of molybdenum	123.697	7 891.360	14 562 834			
Dusty Mac	Okanagan Falls	Dusty Mac Mines Ltd.	53 335	Gold-silver concentrates, 636 t	364.336	6 210.336	1 692	1 053		
Hill	Osoyoos	D. C. Baxter, West Vancouver	3	Crude ore	.031	.029		3	3	
Horn Silver Mine	Keremeos	Dankoe Mines Ltd.	20 936	Silver concentrates, 661 t	20.292	6 988.937	4 127	17 657	22 143	
Susie	Oliver	Hem Mines Ltd.	3 039	Crude ore	12.535	233.273	943	10 995	4 295	

[1] Includes 172 356 t from Cuisson Lake Mine.
[2] Estimated.

Table 3-12—Metal Production, 1976—Continued

Property or Mine	Location of Mine	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Content					
					Gold	Silver	Copper	Lead	Zinc	Cadmium
			t		kg	kg	kg	kg	kg	kg
Revelstoke Mining Division										
Lucky Boy	Trout Lake	A. Marlow, Ferguson	24	Crude ore		17.884	49	1 675	1 887	
Similkameen Mining Division										
Similkameen Mine (Ingerbelle)	Princeton	Newmont Mines Ltd. (Similkameen Division)	6 355 874	Copper concentrates, 91 211 t	1 198.523	4 814.153	25 045 931			
Skeena Mining Division										
Granduc Mine	Stewart	Newmont Mines Ltd. (Granduc Operating Division)	1 315 905	Copper concentrates, 54 894 t	154.800	10 373.566	15 569 210			
Oxedental and Terminus	Stewart	N. Benkovich, Stewart	39	Crude ore	.425	32.106	120	2 628	2 164	
Silbak Premier	Premier	Spring Investments Ltd.	73	Crude ore	2.115	62.984		1 903	2 541	
Tasu	Tasu Sound	Wesfrob Mines Ltd.	1 572 524	Iron concentrates, 837 813 t; copper concentrates, 11 641 t	59.002	2 406.781	2 265 207			
Slocan Mining Division										
Arkansas	Ainsworth	D. Bialkoski, Slocan	39	Crude ore		4.541		1 127	4 079	
Arlington	Slocan	Selmon Resources Ltd.	21	Lead concentrates salvaged from dump	.062	170.258		6 680	4 185	
Bluebell	Riondell	D. Pearce, Nelson	119	Salvaged zinc concentrates and tailings		18.475		6 099	20 471	
Bosun	New Denver	A. E. Avison, Kamloops	13	Crude ore		8.958		546	1 959	
Chief	Mt. Rupple	N. Block, Nelson	3	Crude ore	.018	16.773	9	167	7	
Enterprise	Enterprise Creek	T. Mazar, Calgary	28	Crude ore		15.676		541	826	
Gladstone	New Denver	W. Turley, Kaslo	9	Crude ore		41.056		3 493	1 933	
Hewitt	Silverton	F. Pho, New Denver	855	Lead concentrates, 41 t; zinc concentrates, 89 t		325.493		24 039	47 632	332
Jesse	Silverton	R. Leighton, Sorrento	24	Crude ore		6.127		188	70	
Leo No. 1 and No. 2 Fraction	New Denver	E.M.U. Enterprises	3	Crude ore		3.390		79	51	
Lucky Boy	Kaslo	L. Garland, Kaslo	2	Crude ore		11.353		1 942	94	
Lucky Spot	Silverton	J. Nesbitt and S. Berisoff, Silverton	44	Crude ore		141.674		11 059	8 458	
Moose	Silverton	D. Pengally, Silverton	9	Crude ore		16.111		3 553	1 352	
Ottawa	Springer Creek	C. Thickett, Slocan	1 348	Silver concentrates, 13 t; crude ore, 11 t	.018	999.402	226	1 623	1 169	
Panama, Silver Glance	New Denver	United Hearne Resources Ltd.	184	Crude ore	.063	162.451		919	736	
Scranton	Kaslo	Star Syndicate	4 767	Lead concentrates, 295 t; zinc concentrates, 348 t; crude ore, 73 t	25.162	573.944	77	223 705	196 361	4 041

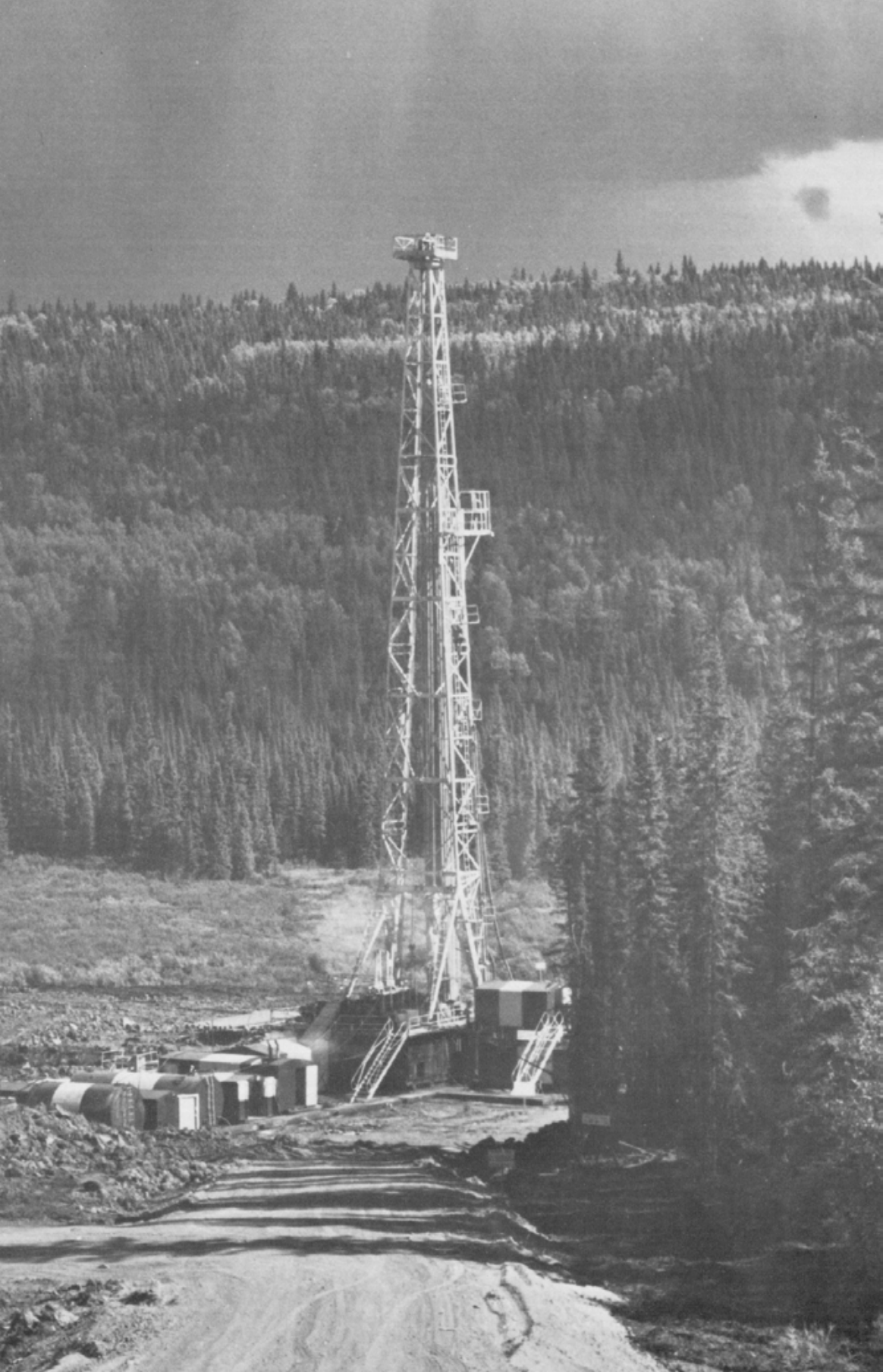
Table 3-12—Metal Production, 1976—Continued

Property or Mine	Location of Mine	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Content					
					Gold	Silver	Copper	Lead	Zinc	Cadmium
Slocan Mining Division—Continued			t		kg	kg	kg	kg	kg	kg
Silmonac (Minniehaha)	Slocan Lake	Kam-Kotia and Burkam Joint Venture	16 694	Lead concentrates, 1 412 t; zinc concentrates, 1 240 t		7 408.703		836 172	743 490	4 643
Victor	New Denver	E. Pederson, New Denver	16	Crude ore	.171	63.699		10 691	358	
White Water	Retallick	P. Leonowicz and D. Bialkoski, New Denver	43	Crude ore	.062	54.535		4 846	11 190	
Trail Creek Mining Division										
Blue Bird	Rossland	Standonray Mines Ltd.	474	Crude ore	.696	307.772		13 205	15 378	
Midnight	Rossland	Sand Mines Ltd.	509	Crude ore	12.939	11.850	425	1 305	583	
Vancouver Mining Division										
Britannia Mine	Howe Sound	Anaconda Canada Ltd.	292	Copper precipitate			90 124			
Warman (Northair)	Callaghan Creek	Northair Mines Ltd.	47 553	Lead concentrates, 876 t; zinc concentrates, 846 t; dross bars[3]	620.131	3 864.112		340 681	411 021	1 782
Vernon Mining Division										
Chaput	Lumby	Saddle Mountain Resources	454	Lead concentrates, 41 t	.156	206.057	654	12 746	5 485	
Kingfisher	Mabel Lake	Union Oil Co. of Canada Ltd.	12	Crude ore		.187		830	1 157	
Victoria Mining Division										
Nil										

[3] Gold and silver bullion recovered from the treatment of base metals.

Table 3-13—Destination of British Columbia Concentrates in 1976

	Lead	Zinc	Copper	Iron
	t	t	t	t
Trail	125 531	178 654	———	———
Other Canadian	———	———	105 819	48 989
United States	907	12 211	144 921	155 097
Japan	———	———	668 347	1 021 951
Other foreign	———	20 771	51 165	29 240
Totals	126 438	211 636	970 252	1 255 277



Petroleum and Natural Gas Statistics

CHAPTER 4

CONTENTS

Chapter 4 is a series of tables and figures providing important information on the petroleum industry operations in 1976. It complements the review of the industry in Chapter 1 and the work of the Ministry reported in Chapter 2.

Table 4-1—Acreage of Crown Petroleum and Natural Gas Rights Held, 1967–76

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Petroleum and natural gas permits	23 214 363	32 622 739	31 893 990	21 379 461	18 726 137	19 891 946	17 410 475	16 227 862	13 292 568	13 252 878
Petroleum and natural gas leases	10 596 352	10 029 674	8 837 265	7 765 668	7 226 320	6 493 633	6 196 570	6 405 086	5 574 381	5 899 025
Natural gas licences	.....	.....	.....	.....	.....	.....	20 781	15 565	7 809	7 175
Natural gas leases	549 218	518 826	475 419	472 964	471 919	470 260	479 754	479 960	487 739	503 555
Petroleum leases	644	644	.....	.....	1 284	1 284	1 284	1 284	3 180	3 180
Drilling reservations	462 138	384 925	350 546	292 402	337 656	452 079	419 878	360 807	317 693	525 151
Totals	34 822 715	43 556 808	41 557 220	29 910 495	26 763 316	27 309 202	24 528 742	23 490 564	19 683 370	20 190 964

Petroleum and Natural Gas Revenue, 1947–76

	Cumulative, 1947–67	1968	1969	1970	1971	1972	1973	1974	1975	1976	Cumulative, 1947–76
Rentals and Fees	$	$	$	$	$	$	$	$	$	$	$
Permits	41 363 303	1 184 457	1 772 064	1 426 448	1 615 619	1 729 829	1 524 431	2 224 111	2 150 965	2 114 161	57 105 388
Drilling reservations	905 059	87 759	79 796	48 156	79 120	107 537	77 344	85 481	75 635	124 196	1 670 083
Natural gas licences	65 254	.....	.....	.....	.....	.....	803	8 057	4 155	3 838	82 107
Leases (all)	52 571 979	9 349 480	8 488 114	7 699 844	7 733 584	6 976 517	6 500 830	9 678 015	10 242 543	11 925 123	131 166 029
Total rentals	94 905 595	10 621 696	10 339 974	9 174 448	9 428 323	8 813 883	8 103 408	11 995 664	12 473 298	14 167 318	190 023 607
Crown Reserve Disposition Bonuses											
Permits	33 613 011	9 554 004	16 516 392	9 506 074	14 688 570	13 818 020	7 877 134	15 434 510	6 623 647	27 548 820	155 180 182
Drilling reservations	23 441 432	1 785 527	1 394 215	1 825 404	2 486 763	3 011 025	3 108 092	2 669 318	2 708 463	6 152 419	48 582 658
Leases	55 717 683	3 737 489	3 735 845	5 008 323	5 101 918	3 666 617	6 791 215	4 851 506	3 417 137	9 525 202	101 461 935
Crown reserve disposition Total	112 772 126	15 077 020	21 646 452	16 339 801	22 186 251	20 495 662	17 776 441	22 955 334	12 749 247	43 226 441	305 224 775
Crown Royalties											
Gas	14 189 073	3 217 227	3 730 634	3 948 356	4 209 793	5 580 434	6 061 250	2 843 329	2 848 930	173 315	46 802 341
Oil	26 391 841	7 667 405	9 017 352	9 483 937	10 415 656	9 845 125	14 543 621	48 296 036	44 782 489	43 925 220	224 378 682
Processed products	869 666	50 762	48 847	42 314	42 517	44 379	42 675	134 180	570 321	711 810	2 557 471
Gas revenue from BCPC	.....	.....	.....	.....	.....	.....	.....	26 000 000	172 150 000	149 850 000	348 000 000
Crown royalties total	41 450 580	10 945 394	12 796 833	13 474 607	14 667 966	15 469 938	20 647 546	77 273 545	220 351 740	194 660 345	621 738 494
Miscellaneous fees	245 037	17 955	19 625	21 843	35 604	42 775	27 028	19 104	18 541	32 248	479 760
Total petroleum and natural gas revenue	249 373 338	36 662 065	44 802 884	39 010 699	46 318 144	44 822 258	46 554 423	112 243 647	245 592 826	252 086 352	1 117 466 636

Table 4-2—Established Hydrocarbon and Byproducts Reserves, December 31, 1976

	Crude Oil, MSTB	Raw Gas, BSCF	Residue Gas, BSCF	Residue Gas, BSCF (Basic 1 000 BTU/SCF)	Propane, MSTB	Butanes, MSTB	Pentanes Plus, MSTB	Sulphur, MLT
Original hydrocarbon in place	1 213 818.0	16 188.1	.....	.....	.....	.....	.....	.....
Ultimate recovery, current estimate	432 486.7	13 237.3	11 466.7	11 958.4	15 631.2	22 738.0	44 133.4	8 095.6
Cumulative production to December 31, 1975	262 622.4	4 332.9	3 823.9	4 023.7	6 978.1	9 895.6	19 694.5	1 474.9
Reserves estimated at December 31, 1975	179 509.7[1]	7 993.0	6 927.3	7 202.3	7 873.7	11 907.1	22 907.9	4 360.5
Drilling in 1976	+2 822.0	+515.5	+443.5	+458.3	+399.8	+661.6	+1 112.6	+320.7
Revisions in 1976	−12 467.4[1]	+395.9	+272.0	+274.1	+379.6	+273.7	+418.4	+1 939.5
Production in 1976	−14 887.2	−384.9	−333.2[2]	−346.3[2]	−599.3[3]	−688.5[3]	−990.2[3]	−153.7[3]
Production adjustment to 1975	+3.9	.....	.....	.....	.....	.....	.....	.....
Reserves at December 31, 1976	154 981.0	8 519.5	7 309.6	7 588.4	8 053.8	12 153.9	23 448.7	6 467.0

NOTES—

MSTB=Thousand stock tank barrels, where one barrel contains 34.9723 Canadian gallons.
BSCF=Billion standard cubic feet at 14.65 psia and 60°F.
MLT=Thousand long tons.

[1] (Proved + 50 per cent probable) of 1975=Established 1975.

[2] Based on raw gas production and estimated shrinkage from gas analyses.

[3] Based on estimated by-products recoverable and all plant facilities operating (Fort Nelson sulphur extraction commenced December 1976). Actually extracted quantities of propane, butanes, pentanes plus, and sulphur were 554.7 MSTB, 690.5 MSTB, 1 054.0 MSTB, and 70.0 MLT respectively. In addition, 115.2 MSTB of pentanes plus were removed at the wellhead.

Table 4-3—Wells Drilled and Drilling, 1976

Well Authorization No.	Well Name	Date Spudded	Date Rig Released	Total Depth (Feet)	Status at December 31, 1976
3821	AEG N Cache b-82-I	Nov. 16, 1976	Dec. 3, 1976	5 218	Dunlevy gas.
3775	AEG LL&E Saturn 10-13-87-22	July 11, 1976	Aug. 2, 1976	6 820	Abandoned—dry.
3712	APL CanPlac Sunlite Helmet a-6-F	Feb. 2, 1976	Feb. 24, 1976	6 140	Jean Marie gas.
3717	ARCo Maxhamish b-21-K	Feb. 9, 1976	Apr. 4, 1976	7 520	Mattson gas.
3759	ATAPCO et al Janis d-8-J	Mar. 28, 1976	.....	.....	Drilling.
3882	Ashland et al Birch a-67-E	Dec. 29, 1976	.....	.....	Drilling.
3824	Ashland Numac Fireweed b-22-G	Nov. 7, 1976	Nov. 22, 1976	4 550	Abandoned—dry.
3803	Ashland Numac Fireweed b-8-H	Nov. 1, 1976	Nov. 13, 1976	4 440	Dunlevy oil.
3752	Ashland et al Helmet a-85-G	Mar. 11, 1976	Apr. 1, 1976	6 138	Multiple Jean Marie and Slave Point gas.
3855	Ashland Numac Jeans d-77-B	Dec. 28, 1976	.....	.....	Drilling.
3688	Ashland Voyager Montney 6-25-86-19	Jan. 10, 1976	Jan. 29, 1976	4 980	Abandoned—dry.
3781	Ashland Rigel 6-27-87-16	July 28, 1976	Aug. 9, 1976	4 354	Abandoned—dry.
3691	Atkinson Cdn Res et al Helmet a-1-F	Jan. 10, 1976	Jan. 29, 1976	6 475	Abandoned—dry.
3682	BP et al Beatton d-22-K	Dec. 26, 1975	Jan. 11, 1976	3 750	Abandoned—dry.
3681	BP et al W Beatton d-94-E	Jan. 15, 1976	Jan. 23, 1976	3 410	Abandoned—dry.
3699	BP GAO Birley d-91-I	Jan. 25, 1976	Feb. 7, 1976	4 058	Bluesky gas.
3706	BP Ethyl Dot d-11-I	Feb. 11, 1976	Feb. 26, 1976	4 480	A Marker gas.
3683	BP Sun et al N Gote d-93-D	Feb. 3, 1976	Mar. 15, 1976	7 752	Abandoned—dry.
3793	BP Sukunka b-65-B	Sept. 21, 1976	.....	.....	Drilling.
3658	BP E Sukunka b-19-A	Jan. 27, 1976	July 26, 1976	11 855	Baldonnel gas.
3773	BP E Sukunka b-59-A	Sept. 2, 1976	.....	.....	Drilling.
3656	BP et al Tuchodi c-92-J	Jan. 14, 1976	May 23, 1976	10 823	Abandoned—dry.
3698	Baysel Union Kelly d-51-J	Mar. 9, 1976	Aug. 14, 1976	9 620	Abandoned—dry.
3740	Baysel ARCo Mink d-99-A	Mar. 15, 1976	Mar. 25, 1976	4 156	Abandoned—dry.
3771	CZAR et al Birch a-89-E	July 23, 1976	Aug. 3, 1976	4 000	Bluesky gas.
3807	CZAR et al Birch d-A99-E	Oct. 17, 1976	Oct. 25, 1976	3 713	Finished drilling.
3808	CZAR et al Blueberry A11-19-88-24	Nov. 22, 1976	Dec. 3, 1976	4 259	Multiple Bluesky and Dunlevy gas.
3758	CZAR et al Fireweed a-81-A	Mar. 25, 1976	Apr. 5, 1976	4 155	Multiple Bluesky and Dunlevy gas.
3805	CZAR et al Fireweed a-89-D	Oct. 15, 1976	Oct. 29, 1976	3 930	Dunlevy gas.
3819	CZAR et al Monias 10-5-82-21	Nov. 8, 1976	Dec. 9, 1976	4 940	Halfway gas.
3764	CZAR et al Monias 6-16-82-21	June 10, 1976	July 3, 1976	4 912	Halfway gas.
3797	Canhunter et al Altares a-23-A	Oct. 30, 1976	Dec. 19, 1976	7 000	Halfway gas.
3762	Canhunter Bubbles a-9-A	July 21, 1976	Aug. 8, 1976	5 390	Halfway gas.
3792	Canhunter et al S Julienne b-82-L	Sept. 16, 1976	Nov. 9, 1976	8 632	Debolt gas.
3790	Canhunter GAO Town a-27-J	Sept. 1, 1976	Oct. 3, 1976	7 085	Abandoned—dry.
3704	Canhunter Nemco Town b-90-J	Jan. 26, 1976	Mar. 9, 1976	5 933	Halfway gas.
3753	Canhunter Nemco Town d-91-K	Mar. 8, 1976	Apr. 2, 1976	6 008	Multiple Baldonnel and Halfway gas.
3612	Cdn Res et al Adsett d-97-B	Nov. 18, 1975	Jan. 2, 1976	8 705	Abandoned—dry.
3692	Cdn Res E Kotcho d-43-H	Feb. 1, 1976	Feb. 25, 1976	6 543	Abandoned—dry.
3693	Cdn Res et al E Kotcho b-A68-H	Jan. 11, 1976	Jan. 26, 1976	2 025	Bluesky gas.

3747	Cdn Res Union et al E Kotcho a-5-J	Feb. 29, 1976	Apr. 4, 1976	6 599	Slave Point gas.
3665	Cdn Res Union et al E Kotcho d-7-J	Dec. 15, 1975	Jan. 29, 1976	6 500	Slave Point gas.
3865	Cdn Res et al E Kotcho b-41-J	Dec. 21, 1976	.....	.....	Drilling.
3666	Cdn Res et al E Kotcho a-42-J	Dec. 10, 1975	Jan. 17, 1976	6 610	Slave Point gas.
3711	Cdn Res et al Mouse b-82-H	Feb. 10, 1976	Feb. 18, 1976	2 390	Abandoned—dry.
3697	Cdn Res et al Petitot b-65-D	Mar. 6, 1976	Apr. 3, 1976	6 705	Abandoned—dry.
3788	Cdn Sup Inga A8-5-88-23	Sept. 3, 1976	Sept. 18, 1976	5 520 —	Inga oil.
3776	Champlin Flatrock 6-25-84-16	July 19, 1976	Aug. 6, 1976	4 900	Abandoned—dry.
3829	Chaut Dunbar Charlie 11-21-84-19	Nov. 24, 1976	Dec. 18, 1976	6 322	Abandoned—dry.
3844	Chevron N Cabin c-74-F	Dec. 31, 1976	.....	.....	Drilling.
3652	Chevron W Clarke d-99-F	Dec. 14, 1975	Feb. 1, 1976	7 250	Abandoned—dry.
3678	Chevron N Helmet b-22-B	Feb. 11, 1976	Mar. 14, 1976	6 810	Jean Marie gas.
3677	Chevron N Helmet c-74-B	Jan. 19, 1976	Feb. 20, 1976	6 909	Abandoned—dry.
3654	Chevron SOBC Helmet c-97-B	Jan. 2, 1976	Feb. 6, 1976	6 143	Slave Point gas.
3675	Chevron SOBC Helmet d-9-E	Jan. 12, 1976	Feb. 24, 1976	6 282	Abandoned—dry.
3653	Chevron SOBC Helmet b-15-G	Dec. 19, 1975	Jan. 21, 1976	6 115	Slave Point gas.
3655	Chevron SOBC Helmet a-47-G	Jan. 25, 1976	Feb. 15, 1976	6 115	Slave Point gas.
3679	Chevron N Helmet d-6-H	Jan. 21, 1976	Feb. 29, 1976	6 742	Abandoned—dry.
3676	Chevron SOBC Kyklo d-26-K	Feb. 14, 1976	Mar. 23, 1976	6 110	Slave Point gas.
3680	Chevron Peggo d-69-D	Jan. 11, 1976	Feb. 6, 1976	6 296	Abandoned—dry.
3881	Coseka Wescent Buick c-74-E	Dec. 31, 1976	.....	.....	Drilling.
3708	Coseka et al Gundy a-44-A	Jan. 27, 1976	Feb. 15, 1976	4 800	Baldonnel gas.
3734	Coseka et al Gundy a-90-A	Feb. 18, 1976	Mar. 11, 1976	5 500	Baldonnel gas.
3833	Coseka et al Gundy c-91-B	Dec. 14, 1976	Dec. 26, 1976	4 530	Baldonnel gas.
3724	Coseka et al Neptune d-84-G	Feb. 27, 1976	Mar. 24, 1976	7 313	Abandoned—dry.
3828	Coseka et al Silverberry 6-14-88-21	Nov. 16, 1976	Dec. 9, 1976	6 100	Abandoned—dry.
3671	Coseka et al Velma d-79-E	Jan. 11, 1976	Jan. 22, 1976	3 700 —	Charlie Lake oil.
3713	Coseka et al Velma d-19-L	Feb. 5, 1976	Feb. 17, 1976	3 580	Gething gas.
3640	Decalta Fina Chowade d-8-A	Dec. 2, 1975	Mar. 30, 1976	9 987	Doig gas.
3714	Dome Antelope a-61-L	Feb. 27, 1976	Mar. 8, 1976	3 545	Abandoned—dry.
3719	Dome Black a-5-K	Feb. 18, 1976	Mar. 1, 1976	4 050	Abandoned—dry.
3720	Dome Buick c-12-G	Mar. 4, 1976	Mar. 12, 1976	3 730	Multiple Bluesky and Lower Dunlevy gas.
3780	Dome Buick a-63-G	Sept. 13, 1976	Sept. 25, 1976	3 645 —	Confidential oil well.
3756	Dome CanDel N Buick b-48-F	Mar. 14, 1976	Mar. 23, 1976	3 980	Bluesky gas.
3800	Dome CZAR W Buick b-64-E	Oct. 14, 1976	Oct. 23, 1976	3 790	Bluesky gas.
3722	Dome et al Dahl a-89-H	Mar. 13, 1976	Mar. 22, 1976	3 940	Bluesky gas.
3749	Dome et al Drake b-62-E	Mar. 10, 1976	Mar. 19, 1976	3 500	Dunlevy gas.
3632	Dome Laprise d-72-A	Jan. 31, 1976	Feb. 16, 1976	4 392	Baldonnel gas.
3631	Dome Laprise a-12-H	Jan. 22, 1976	Jan. 30, 1976	4 534	Baldonnel gas.
3633	Dome Laprise a-42-H	Dec. 30, 1975	Jan. 21, 1976	4 500	Charlie Lake gas.
3750	Dome et al Laurel d-19-C	Mar. 20, 1976	Mar. 30, 1976	3 669	Gething gas.
3783	Dome Nig a-1-H	Aug. 16, 1976	Sept. 5, 1976	4 305	Baldonnel gas.
3725	Dome et al Peggo b-76-A	Feb. 20, 1976	Mar. 9, 1976	6 580	Abandoned—dry.
3715	Dome CanDel Sahdoanah c-40-E	Feb. 22, 1976	Mar. 12, 1976	2 200	Abandoned—dry.
3721	Dome Thetlaandoa d-35-C	Mar. 15, 1976	Mar. 27, 1976	1 870	Debolt gas.
3757	Dome Velma a-89-D	Mar. 23, 1976	Mar. 30, 1976	3 750	Gething gas.

Table 4-3—Wells Drilled and Drilling, 1976—Continued

Well Authorization No.	Well Name	Date Spudded	Date Rig Released	Total Depth (Feet)	Status at December 31, 1976
3705	Dome et al Velma d-31-H	Feb. 1, 1976	Feb. 11, 1976	3 750	Abandoned—dry.
3816	Dome et al Wilder 6-35-83-20	Oct. 25, 1976	Nov. 14, 1976	5 020	Abandoned—dry.
3663	Elf et al Boudreau 10-3-84-21	Dec. 8, 1975	Jan. 3, 1976	4 876	Finished drilling.
3832	Exalta et al Ladyfern d-71-G	Dec. 29, 1976	.....	.....	Drilling.
3837	Gulf Trutch b-65-J	Dec. 17, 1976	.....	.....	Drilling.
3701	Homestead et al Green c-55-I	Feb. 11, 1976	Mar. 3, 1976	4 219	Abandoned—dry.
3786	Huber Cdn-Sup Total Nig a-43-A	Sept. 8, 1976	Sept. 20, 1976	4 366	Baldonnel gas.
3746	Huber Cdn-Sup Total Nig d-53-A	Mar. 19, 1976	Apr. 2, 1976	4 275	Abandoned—dry.
3745	Huber Cdn-Sup Total Nig d-93-A	Feb. 26, 1976	Mar. 16, 1976	4 330	Baldonnel gas.
3755	Imp Tricentral Golata 7-31-83-15	May 7, 1976	July 7, 1976	10 960	Abandoned—dry.
3730	Imp Dome et al Junior d-11-E	Feb. 24, 1976	Mar. 31, 1976	5 223	Abandoned—dry.
3686	Imp Junior b-82-K	Jan. 20, 1976	Feb. 20, 1976	6 703	Slave Point gas.
3647	Imp Laprise c-38-I	Dec. 12, 1975	Jan. 13, 1976	4 403	Abandoned—dry.
3649	Imp et al Mica 11-34-81-14	Dec. 12, 1975	Feb. 28, 1976	12 154	Confidential oil.
3801	Kilo Dome Buick c-14-H	Oct. 8, 1976	Oct. 15, 1976	3 850	Dunlevy gas.
3838	Kilo Buick a-67-I	Dec. 7, 1976	Dec. 24, 1976	4 604	Multiple Dunlevy gas and Confidential oil.
3695	Lamar Hunt Dodger b-6-E	Jan. 23, 1976	Feb. 29, 1976	7 350	Abandoned—dry.
3751	Mesa S Clarke a-5-K	Feb. 29, 1976	Mar. 23, 1976	6 972	Abandoned—dry.
3858	Mobil Sahtaneh a-45-I	Dec. 31, 1976	.....	.....	Drilling.
3685	Mobil Sahtaneh d-86-J	Jan. 17, 1976	Mar. 21, 1976	7 799	Slave Point gas.
3854	Mobil Sierra d-90-C	Dec. 17, 1976	.....	.....	Drilling.
3667	Mobil Sierra c-97-C	Jan. 9, 1976	Apr. 14, 1976	7 450	Pine Point gas.
3804	Monsanto Cecil 6-7-84-17	Oct. 14, 1976	Nov. 28, 1976	5 525	Confidential oil well.
3846	Monsanto Ashland Cecil 6-32-84-17	Dec. 9, 1976	Dec. 24, 1976	4 575	Abandoned—dry.
3806	Monsanto Cecil 6-6-85-17	Oct. 17, 1976	Nov. 5, 1976	4 892	Cecil oil.
3867	Monsanto GPOG Cecil 6-7-85-17	Dec. 18, 1976	.....	.....	Drilling.
3739	Murphy et al Cabin b-22-A	Feb. 21, 1976	Mar. 23, 1976	7 380	Abandoned—dry.
3772	Norcen Pembina Attachie 11-26-84-23	July 16, 1976	Aug. 25, 1976	4 825	Pingel gas.
3696	Pacific ARCo Beavertail d-79-B	Jan. 12, 1976	Jan. 22, 1976	4 218	Gething gas.
3834	Pacific HB Brenot a-15-G	Dec. 12, 1976	.....	.....	Drilling.
3732	Pacific GAO Cabin a-92-C	Feb. 12, 1976	Mar. 11, 1976	7 173	Abandoned—dry.
269	Pacific et al Charlie 13-5-84-18	Oct. 30, 1976	Dec. 21, 1976	11 028	Abandoned—dry.
3742	Pacific ARCo Currant c-12-C	Mar. 13, 1976	Mar. 25, 1976	4 090	Abandoned—dry.
3731	Pacific et al Flatrock 6-20-84-16	June 10, 1976	June 29, 1976	4 900	Abandoned—dry.
3815	Pacific WP Ft St John A7-5-83-17	Oct. 24, 1976	Nov. 6, 1976	2 864	Abandoned—dry.
3728	Pacific WP Ft St John SE 14-33-82-17	May 26, 1976	June 10, 1976	4 180	Siphon gas.
238	Pacific et al Graham c-53-D	Dec. 9, 1976	.....	.....	Drilling.
3820	Pacific Canhunter Grewatsch d-99-B	Nov. 9, 1976	Dec. 6, 1976	5 390	Baldonnel Gas.
3690	Pacific Helmet d-73-L	Jan. 15, 1976	Feb. 6, 1976	5 855	Slave Point gas.
3673	Pacific Murdale 10-34-87-20	Dec. 22, 1975	Jan. 8, 1976	5 070	Abandoned—dry.

3872	Pacific Nig a-1-B	Dec. 29, 1976	.....	.....	Drilling.
3718	Pacific W Nig b-6-C	Feb. 9, 1976	Feb. 23, 1976	4 640	Abandoned—dry.
3729	Pacific Osprey a-45-J	Feb. 15, 1976	Feb. 25, 1976	3 986	Halfway gas.
3827	Pacific et al Peejay a-80-E	Nov. 17, 1976	Nov. 27, 1976	3 906	Abandoned—dry.
3669	Pacific et al Peejay d-A33-I	Jan. 9, 1976	Jan. 18, 1976	3 490	Baldonnel gas.
3798	Pacific WP Pingel 6-21-81-17	Oct. 3, 1976	Oct. 17, 1976	3 665	Abandoned—dry.
3779	Pacific Westcoast Pingel 6-27-81-18	July 28, 1976	Aug. 24, 1976	3 460	Bluesky gas.
3738	Pacific Racoon d-53-F	Mar. 12, 1976	Mar. 24, 1976	4 111	Abandoned—dry.
258	Pacific Red Creek 10-22-85-21	Mar. 13, 1976	Mar. 25, 1976	5 434	Abandoned—dry.
3664	Pacific Red Creek 11-8-86-21	Jan. 10, 1976	Feb. 1, 1976	5 572	Halfway gas.
3723	Pacific Stoddart A6-16-86-19	Feb. 27, 1976	Mar. 7, 1976	4 300 ~	Cecil oil.
3726	Pacific ARCo Weasel c-60-A	Mar. 26, 1976	Apr. 3, 1976	3 710	Abandoned—dry.
3741	Pacific ARCo Wolf d-94-B	July 25, 1976	Aug. 4, 1976	4 130 ~	Halfway oil.
3789	Pacific ARCo Wolf d-4-G	Sept. 18, 1976	Sept. 28, 1976	4 093	Abandoned—dry.
3727	Pacific et al Wolverine d-13-G	Feb. 29, 1976	Mar. 9, 1976	3 970	Abandoned—dry.
3659	Pacific Yoyo c-32-I	Jan. 21, 1976	Mar. 2, 1976	7 227	Pine Point gas.
3660	Pacific Yoyo c-36-I	Dec. 8, 1975	Jan. 17, 1976	6 982	Slave Point gas.
3650	Pacific Yoyo d-A13-L	Nov. 27, 1975	Jan. 9, 1976	7 310	Pine Point gas.
3839	Paloma Squirrel 10-28-87-19	Dec. 10, 1976	Dec. 23, 1976	5 070	Abandoned—dry.
3866	Pangaea et al Nig a-83-J	Dec. 21, 1976	.....	.....	Drilling.
3689	Pembina Oak 7-11-87-18	Jan. 17, 1976	Feb. 9, 1976	4 842	Abandoned—dry.
3736	Pembina Pickell c-100-L	Mar. 22, 1976	Apr. 3, 1976	4 161	Halfway gas.
3768	Pembina et al Rigel a-47-K	June 18, 1976	June 28, 1976	3 766	Dunlevy gas.
3763	Pembina Rigel b-48-K	May 23, 1976	June 3, 1976	3 797	Dunlevy gas.
3716	Pembina Rigel c-58-K	Feb. 11, 1976	Feb. 22, 1976	3 744	Dunlevy gas.
3737	Petromark RR Clarke a-29-L	Mar. 2, 1976	Apr. 5, 1976	7 162	Slave Point gas.
3818	Petromark E Rigel A6-21-88-16	Nov. 8, 1976	Nov. 17, 1976	3 546	Finished drilling.
3674	Phillips BP Mesa Tenaka c-32-L	Jan. 27, 1976	Mar. 20, 1976	8 430	Abandoned—dry.
3814	Quasar Mobil Flatbed c-76-D	Nov. 18, 1976	.....	.....	Drilling.
3586	Quasar Union Onion c-69-H	Dec. 8, 1975	Mar. 21, 1976	8 194	Abandoned—dry.
3845	Quintana Clarke a-17-K	Dec. 18, 1976	.....	.....	Drilling.
3684	Quintana PCP S Helmet c-61-C	Jan. 4, 1976	Feb. 2, 1976	6 235	Slave Point gas.
3702	Quintana Frio W Petitot b-49-L	Feb. 9, 1976	Mar. 19, 1976	7 831	Abandoned—dry.
3637	Quintana HBOG Roger a-30-A	Dec. 9, 1975	Jan. 12, 1976	6 735	Pine Point gas.
3813	SOC et al Fireweed b-44-A	Dec. 14, 1976	Dec. 23, 1976	4 138	Dunlevy gas.
3809	SOC et al Inga b-68-B	Nov. 24, 1976	Dec. 11, 1976	4 331	Dunlevy gas.
3784	Sceptre et al E Siphon 10-28-86-15	Sept. 22, 1976	Sept. 29, 1976	3 900	Bluesky gas.
3782	Scurry CanPlac Eagle 14-27-84-18	Aug. 25, 1976	Sept. 14, 1976	6 050 ~	Siphon oil.
3802	Scurry CanPlac W Eagle 6-36-84-19	Oct. 15, 1976	Nov. 7, 1976	6 190 ~	Belloy oil.
3822	Scurry Murphy Eagle 6-3-85-18	Nov. 10, 1976	Nov. 30, 1976	6 070	Belloy gas.
3825	Sparrow Decalta et al Snyder d-39-K	Nov. 12, 1976	Nov. 22, 1976	4 171	Abandoned—dry.
3672	Star et al Sierra d-35-F	Jan. 29, 1976	Feb. 6, 1976	2 096	Abandoned—dry.
3794	Sundance N Blueberry d-73-H	Sept. 10, 1976	Nov. 10, 1976	7 600	Abandoned—dry.
3765	Sundance et al Flatrock 10-17-85-15	June 16, 1976	July 1, 1976	4 800	Halfway gas.
3823	Sundance et al Red Creek 6-23-85-21	Nov. 15, 1976	Dec. 4, 1976	5 550	Abandoned—dry.
3777	Texex Siphon 11-29-86-16	Sept. 6, 1976	Sept. 20, 1976	4 552	Multiple Dunlevy and Halfway gas.
3643	Texex et al Tsea c-18-C	Mar. 4, 1976	Apr. 1, 1976	7 167	Abandoned—dry.

Table 4-3—Wells Drilled and Drilling, 1976—Continued

Well Authorization No.	Well Name	Date Spudded	Date Rig Released	Total Depth (Feet)	Status at December 31, 1976
3644	Texex et al Tsea c-48-K	Dec. 20, 1975	Feb. 27, 1976	7 900	Water Disposal.
3851	Total et al Helmet c-60-G	Dec. 28, 1976	.....	.....	Drilling.
3703	Total et al Helmet a-35-K	Feb. 9, 1976	Mar. 6, 1976	5 952	Slave Point gas.
3735	Total Nig a-29-A	June 19, 1976	July 4, 1976	4 488	Baldonnel gas.
3769	Total Fina Teal 7-20-87-22	July 27, 1976	Aug. 27, 1976	6 950	Abandoned—dry.
3795	Union et al Caribou b-70-G	Oct. 15, 1976	Dec. 3, 1976	7 253	Debolt gas.
3796	Union et al Caribou b-10-J	Dec. 12, 1976	.....	.....	Drilling.
3700	Union Tennaco Crest b-56-C	Mar. 12, 1976	Apr. 5, 1976	7 817	Abandoned—dry.
3785	Union Kahta c-38-K	Aug. 31, 1976	Oct. 2, 1976	7 835	Abandoned—dry.
3770	Wescent et al Red Creek 11-15-85-21	July 7, 1976	July 28, 1976	5 136	Multiple Confidential oil and Halfway gas.
3848	Westcoast et al Black a-45-F	Dec. 28, 1976	.....	.....	Drilling.
3778	Westcoast et al Bougie a-9-F	July 27, 1976	Sept. 5, 1976	5 900	Abandoned—dry.
3707	Westcoast Canhunter Elm b-24-F	Feb. 7, 1976	Feb. 17, 1976	3 950	Abandoned—dry.
3733	Westcoast et al Kimea b-7-L	Feb. 15, 1976	Mar. 26, 1976	6 880	Slave Point gas.
3670	Westcoast Diasham Kyklo a-34-F	Dec. 18, 1975	Feb. 4, 1976	6 350	Abandoned—dry.
3857	Westcoast Mesa Kyklo a-47-I	Dec. 15, 1976	Dec. 24, 1976	1 710	Debolt gas.
3743	Westcoast Numac Silver b-6-B	Mar. 2, 1976	Mar. 11, 1976	3 901	Disposal well.
3694	Westcoast Numac Silver b-8-B	Jan. 7, 1976	Jan. 20, 1976	3 910	Bluesky gas.
3657	Westcoast Numac Silver c-16-C	Dec. 14, 1975	Jan. 1, 1976	3 600	Bluesky gas.
3744	Westcoast Numac Silver c-20-C	Feb. 21, 1976	Mar. 1, 1976	3 700	Bluesky gas.
3835	Westcoast Numac Silver a-23-C	Dec. 9, 1976	Dec. 22, 1976	4 215	Multiple Bluesky gas and Confidential gas.
3687	Westcoast et al Tommy b-42-A	Jan. 23, 1976	Feb. 5, 1976	3 596	Abandoned—dry.
3774	Woods Cache 10-16-88-22	July 11, 1976	July 26, 1976	5 334	Abandoned—dry.
3812	Woods Wainoco Stoddart 6-13-86-19	Oct. 26, 1976	Nov. 10, 1976	6 060	Belloy gas.
3869	Woods Two Rivers 6-3-83-16	Dec. 20, 1976	.....	.....	Drilling.

Table 4-4—Summary of Drilling and Production Statistics, 1976

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Well authorizations—													
Issued	25	32	11	1	1	12	9	9	5	21	15	54	195
Cancelled	----	----	3	1	1	----	----	----	----	----	----	----	5
Wells spudded	34	32	24	----	3	5	12	3	12	13	15	25	178
Rigs operated (during month)	34	38	37	13	5	9	15	13	12	14	20	29	521
Rigs operated (at month-end)	30	31	14	2	4	6	11	4	6	13	15	23	----
Development footage	73 892	54 032	103 599	40 030	----	16 643	10 246	4 130	32 786	3 930	39 090	37 032	415 410
Exploratory outpost footage	22 088	48 559	33 612	6 705	----	----	21 479	23 014	3 645	18 438	25 119	36 274	238 933
Exploratory wildcat footage	14 662	64 703	78 629	19 492	10 823	----	15 760	27 305	5 900	11 500	9 257	16 402	274 433
Total footage drilled	110 642	167 294	215 840	66 227	10 823	16 643	47 485	54 449	42 331	33,868	73 466	89 708	928 776
Wells abandoned	8	14	20	3	1	1	2	5	2	3	6	6	71
Service wells	----	1	1	----	----	----	----	----	----	----	----	----	2
Finished drilling wells	1	----	----	----	----	----	----	----	----	1	1	----	3
Oil wells completed	1	1	1	----	----	----	1	1	3	----	4	1	13
Producible oil wells	692	693	693	694	694	694	695	695	696	697	699	702	----
Producing oil wells	481	496	504	482	492	503	479	492	518	512	523	522	----
Production in barrels	1 275 289	1 249 344	1 330 976	1 102 705	1 227 195	1 186 601	1 287 908	1 294 776	1 219 282	1 182 410	1 239 854	1 294 471	14 890 811
Average daily production	41 138	43 080	43 935	36 757	39 587	39 553	41 545	41 767	40 643	38 142	41 328	41 757	----
Gas wells completed	13	15	20	10	----	3	5	4	5	3	3	14	95
Producible gas wells	977	983	992	1 007	1 015	1 026	1 026	1 029	1 031	1 040	1 043	1 049	----
Producing gas wells	353	334	369	362	370	376	316	333	345	382	392	395	----
Production in MSCF[2]	34 942 058	31 925 947	34 306 247	33 440 626	32 716 012	27 908 487	22 622 362	24 045 934	25 675 883	35 766 365	34 513 719	34 701 627	372 565 267
Average daily production	1 127 163	1 100 895	1 106 653	1 114 687	1 055 355	930 283	729 754	775 675	855 863	1 153 754	1 150 457	1 119 407	----

[1] Rigs operated during 1975.
[2] Nonassociated gas production only.

NOTE—Each zone of a multiple completion is counted as one well.

Table 4-5—Monthly Crude-oil Production by Fields and Pools, 1976

(Quantities in barrels)

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Aitken Creek—Gething	32 242	30 482	32 125	31 746	35 372	32 874	22 688	28 896	31 724	32 224	24 605	31 002	365 980
Bear Flat—North Pine	1 934	1 750	1 752	.....	1 634	1 856	1 804	1 801	1 623	1 717	2 260	1 994	20 125
Beatton River—Halfway	30 151	32 945	35 343	31 408	27 615	25 253	30 484	27 123	33 392	24 050	26 192	29 940	353 896
Beatton River West—Bluesky	25 532	24 029	22 863	21 473	22 960	21 510	22 207	19 334	26 579	29 821	30 829	29 966	297 103
Beaverdam—Halfway[1]	143	123	113	113	137	151	105	145	119	103	148	94	1 494
Blueberry—Debolt	30 642	29 740	32 630	29 516	31 445	12 377	11 731	26 475	13 181	17 292	29 204	26 788	291 021
Boundary Lake—													
Baldonnel[1]	.....	.....	455	.....	.....	.....	.....	.....	.....	.....	.....	.....	455
Cecil	908	939	802	450	642	748	844	792	730	702	682	604	8 843
Boundary Lake	574 159	562 538	603 562	426 043	516 302	565 471	606 766	622 018	601 255	557 020	592 214	611 533	6 838 881
Halfway	7 160	6 247	7 063	6 051	6 228	5 206	4 630	6 658	5 869	5 613	5 310	5 875	71 910
Field totals	582 227	569 724	611 882	432 544	523 172	571 425	612 240	629 468	607 854	563 335	598 206	618 012	6 920 089
Boundary Lake North—													
Halfway	1 152	1 334	1 393	965	1 207	1 076	1 389	768	1 314	1 312	1 208	1 670	14 788
Halfway[1]	1 229	1 251	1 398	1 091	1 018	568	1 178	472	1 053	834	549	474	11 115
Field totals	2 381	2 585	2 791	2 056	2 225	1 644	2 567	1 240	2 367	2 146	1 757	2 144	25 903
Buick Creek—													
Bluesky[1]	46	47	24	3	11	65	49	71	64	116	117	137	750
Dunlevy	1 501	1 574	833	.....	228	246	252	244	246	222	139	.....	5 485
Dunlevy[1]	821	745	891	555	745	706	564	603	649	789	730	603	8 401
Field totals	2 368	2 366	1 748	558	984	1 017	865	918	959	1 127	986	740	14 636
Bulrush—Halfway	2 064	1 857	1 872	2 741	3 424	2 445	3 061	2 986	2 664	2 937	2 664	2 956	31 671
Cecil Lake—													
Cecil[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	242	242
North Pine	2 803	2 269	2 638	201	3 035	2 251	2 904	2 174	4 302	2 815	1 857	1 199	28 448
Confidential	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 837	5 155	6 992
Field totals	2 803	2 269	2 638	201	3 035	2 251	2 904	2 174	4 302	2 815	3 694	6 596	35 682
Crush—Halfway	23 629	22 974	26 297	23 093	22 984	21 999	23 952	20 983	17 301	20 499	18 957	18 938	261 606
Currant—Halfway	20 348	18 965	19 802	17 088	17 228	18 157	17 901	14 503	13 281	14 858	9 906	9 864	191 901
Eagle—													
Siphon	.....	.....	.....	.....	.....	.....	.....	.....	.....	178	2 650	1 903	4 731
Belloy	14 740	14 217	13 966	7 670	12 347	13 309	10 924	10 288	10 648	10 767	6 589	8 565	134 030
Field totals	14 740	14 217	13 966	7 670	12 347	13 309	10 924	10 288	10 648	10 945	9 239	10 468	138 761
Fireweed—Dunlevy[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 771	1 292	1 283	4 346
Flatrock—													
Boundary Lake	367	309	336	232	182	66	288	341	234	206	251	227	3 039
Halfway[1]	1 316	1 347	1 331	1 219	773	999	770	610	911	1 005	965	1 162	12 408
Field totals	1 683	1 656	1 667	1 451	955	1 065	1 058	951	1 145	1 211	1 216	1 389	15 447

Fort St. John—Pingel	3 631	3 434	3 567	3 657	3 455	3 466	759	3 959	3 178	3 006	2 774	2 866	37 752
Inga—Inga	133 233	138 756	141 983	155 824	147 649	133 769	151 833	147 564	132 385	94 221	141 939	149 895	1 669 051
Jedney—													
Baldonnel[1]	115	71	89	88	80	89	51	59	96	110	119	81	1 048
Halfway[1]	38	23	33	30	25	28	23	15	28	33	32	39	347
Field totals	153	94	122	118	105	117	74	74	124	143	151	120	1 395
Milligan—Halfway	88 601	82 861	95 964	89 597	93 923	81 039	102 478	95 635	88 035	89 927	86 691	84 900	1 079 651
Milligan West—Halfway[1]		42	45	76	119	109	35	70	32	42	25	12	607
Nig Creek—													
Baldonnel	346	767	807	454	459	468	484	367	314	379	681	432	5 958
Baldonnel[1]				87	59			11	19				176
Field totals	346	767	807	541	518	468	484	378	333	379	681	432	6 134
Oak—													
Cecil[1]					194	590	631	41	342	205	325	66	2 394
Halfway	9 704	7 271	10 190		10 605	7 117	11 184	8 433	9 270	11 414	8 737	7 002	100 927
Halfway[1]					590	1 440	3 304	1 784	3 782	3 904	2 775	201	17 780
Field totals	9 704	7 271	10 190		11 389	9 147	15 119	10 258	13 394	15 523	11 837	7 269	121 101
Osprey—Halfway	1 921	1 959	2 239	1 951	2 175	2 089	2 390	661	2 366	1 836	2 384	3 009	24 980
Peejay—													
Halfway	148 131	145 014	153 295	143 926	151 169	144 100	144 247	143 161	132 946	146 531	134 655	138 573	1 725 748
Halfway[1]	74	53	85	68	62	50	15			25		17	449
Field totals	148 205	145 067	153 380	143 994	151 231	144 150	144 262	143 161	132 946	146 556	134 655	138 590	1 726 197
Red Creek—Confidential									761	740	5 628	3 440	10 569
Rigel—													
Dunlevy	3 754	3 345	3 101	904	3 410	2 685	3 760	2 583	3 346	3 032	3 471	3 751	37 142
Dunlevy[1]	41	29	16		53	93							232
Field totals	3 795	3 374	3 117	904	3 463	2 778	3 760	2 583	3 346	3 032	3 471	3 751	37 374
Silverberry—Coplin[1]	224	222	158	182	172	200	184	117	228	136	149	115	2 087
Siphon—													
Dunlevy[1]	186	146	118	51	57	51	43	56	39	27	52	43	869
Siphon[1]	210	242	306	274	265	307	210	193	276	180	351	255	3 069
Halfway[1]	565	539	560	469	481	450	478	396	373	236	462	374	5 383
Field totals	961	927	984	794	803	808	731	645	688	443	865	672	9 321
Siphon East—Bluesky[1]	134	88	146		210	80	15	13	42	50	101	121	1 000
Stoddart—													
Cecil	373	230	344		192	342	225	573	166	141		285	2 871
Belloy	1 642	2 449	2 089	743	2 231	1 635	2 578	2 389	2 436	2 593	1 975	2 566	25 326
Confidential												1 152	1 152
Field totals	2 015	2 679	2 433	743	2 423	1 977	2 803	2 962	2 602	2 734	1 975	4 003	29 349

[1] Condensate.

Table 4-5—Monthly Crude-oil Production by Fields and Pools, 1976—Continued

(Quantities in barrels)

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Stoddart West—Belloy[1]	2 698	2 959	2 856	3 412	2 647	2 874	2 648	2 366	3 312	2 789	3 121	3 195	34 877
Velma—Confidential		484	781										1 265
Weasel—Halfway	86 698	85 506	87 211	83 030	84 297	65 032	82 656	83 767	54 951	79 531	70 091	79 122	941 892
Weasel West—Halfway	7 157	6 443	6 814	6 758	6 748	4 774	6 013	3 614	5 245	5 868	6 467	6 804	72 705
Wildmint—Halfway	11 692	9 636	8 338	9 243	10 492	9 117	10 301	10 494	11 357	10 491	9 210	9 491	119 862
Willow—													
Gething	278	723	937	1 477	1 618	831	1 166	1 171	1 141	1 534	1 480	1 384	13 740
Halfway[1]	97	127	159	218	70	175	96	217	85	203	149	429	2 025
Field totals	375	850	1 096	1 695	1 688	1 006	1 262	1 388	1 226	1 737	1 629	1 813	15 765
Wolf—Halfway	5 275	5 238	5 935	5 323	5 200	4 532	4 180	2 754	4 416	6 710	5 041	6 091	60 695
Woodrush—Halfway[1]			1										1
Other areas—													
Gething	2 397	2 027	3 013	333								2 522	10 292
Halfway	1 124	1 032	1 091	808	739	761	734	684	629	696	522	491	9 311
Halfway[1]	120												120
Belloy[1]	380	340	332	215	436	101	390	320	215	259	298	200	3 486
Confidential							1 095	1 583	1 997	1 527	754	2 516	9 472
Field totals	4 021	3 399	4 436	1 356	1 175	862	2 219	2 587	2 841	2 482	1 574	5 729	32 681
Totals—													
Crude	1 275 289	1 249 344	1 330 976	1 102 705	1 227 195	1 186 601	1 287 908	1 294 776	1 219 282	1 182 410	1 239 854	1 294 471	14 890 811
Condensate	8 437	8 394	9 116	8 151	8 204	9 126	10 789	7 559	11 665	12 817	11 760	9 143	115 161
Crude and condensate	1 283 726	1 257 738	1 340 092	1 110 856	1 235 399	1 195 727	1 298 697	1 302 335	1 230 947	1 195 227	1 251 614	1 303 614	15 005 972

[1] Condensate.

Table 4-6—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1976

(Volumes in MSCF at 14.65 psia and 60°F.)

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Aitken—													
Gething		5 955											5 955
Gething[1]	191 020	182 393	232 205	161 961	165 585	139 816	84 027	149 120	172 863	156 596	174 904	211 947	2 022 437
Field totals	191 020	188 348	232 205	161 961	165 585	139 816	84 027	149 120	172 863	156 596	174 904	211 947	2 028 392
Bear Flat—North Pine[1]	17 136	15 314	12 044		15 753	19 364	19 260	19 196	17 725	17 520	22 502	22 765	198 579
Beatton River—Halfway[1]	9 320	13 939	12 496	7 612	8 392	6 087	9 130	7 338	9 642	7 466	6 913	11 913	110 248
Beatton River West—Bluesky[1]	7 097	6 953	7 222	6 175	6 044	7 789	8 714	6 776	7 493	8 089	12 079	8 627	93 058
Beaverdam—Halfway	83 799	66 550	62 783	80 486	82 272	75 481	80 982	78 754	68 342	52 736	73 172	52 981	858 338
Beaver River—Nahanni	663 458	522 920	550 411	491 566	418 485	369 522	435 817	926 857	926 946	850 585	379 401	290 705	6 826 673
Beavertail—Gething	339 413	312 641	336 015	328 572	322 385	300 180	211 971	179 413	228 551	305 909	333 823	329 017	3 527 890
Beg—													
Baldonnel	283 447	251 188	270 619	268 026	269 223	174 016	53 512			195 469	289 075	294 503	2 349 078
Halfway	190 711	174 773	193 491	185 982	260 985	224 920	188 483	120 741	113 544	247 752	241 122	273 582	2 416 086
Field totals	474 158	425 961	464 110	454 008	530 208	398 936	241 995	120 741	113 544	443 221	530 197	568 085	4 765 164
Blueberry—													
Dunlevy	75 255	67 780	72 416	60 491	63 062	56 517	56 661	73 883	70 614	58 016	73 096	71 545	799 336
Debolt[1]	66 790	59 670	76 112	53 086	60 970	36 780	102 540	108 519	106 091	82 239	86 236	90 101	929 134
Field totals	142 045	127 450	148 528	113 577	124 032	93 297	159 201	182 402	176 705	140 255	159 332	161 646	1 728 470
Blueberry West—Baldonnel	33 574	31 568	33 280	30 877	37 234	29 007	29 346	31 341	25 544	14 100			295 871
Boundary Lake—													
Gething	46 096	33 789	26 164	7 532	248			8 775	24 627	12 243	18 830	67 439	245 743
Baldonnel	82 435	84 371	78 852	68 144	75 005	67 002	13 321	46 016	87 768	80 674	78 862	39 937	802 387
Cecil[1]	410	382	389	352	387	327	402	419	343	309	311	329	4 360
Boundary Lake[1]	235 516	251 895	276 031	188 897	193 112	237 546	253 644	280 142	269 794	231 022	264 938	274 556	2 957 093
Basal Boundary	3 563	17 109	12 898	5 618	5 488	1 518	754	6 833	13 531	5 734	4 818	11 716	89 580
Halfway[1]	6 256	6 122	6 724	5 106	4 988	4 653	4 081	7 024	5 674	4 970	4 462	4 330	64 390
Field totals	374 276	393 668	401 058	275 649	279 228	311 046	272 202	349 209	401 737	334 952	372 221	398 307	4 163 553
Boundary Lake North—													
Halfway	225 547	203 493	211 015	169 033	175 514	152 734	186 297	122 415	145 851	139 785	109 821	96 025	1 937 530
Halfway[1]	804	1 724	2 104	913	2 040	1 448	1 936	1 742	2 601	2 664	2 453	3 037	23 466
Field totals	226 351	205 217	213 119	169 946	177 554	154 182	188 233	124 157	148 452	142 449	112 274	99 062	1 960 996
Bubbles—													
Baldonnel	220 073	188 297	180 968	181 540	65 516	29 879			2 122	242 206	250 258	236 413	1 597 272
Halfway									2 515				2 515
Field totals	220 073	188 297	180 968	181 540	65 516	29 879			4 637	242 206	250 258	236 413	1 599 787

[1] Associated gas.

Table 4-6—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1976—Continued

(Volumes in MSCF at 14.65 psia and 60°F.)

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Buick Creek—													
Bluesky	135 805	125 232	138 819	116 410	114 727	88 400	108 108	91 852	139 383	137 259	134 847	135 558	1 466 400
Dunlevy	931 926	821 423	912 215	878 366	874 541	713 401	720 071	591 864	586 531	837 140	816 218	825 407	9 509 103
Dunlevy[1]	12 862	19 191	7 660	.....	2 132	1 405	1 602	1 433	1 459	1 378	1 183	.....	50 305
Field totals	1 080 593	965 846	1 058 694	994 776	991 400	803 206	829 781	685 149	727 373	975 777	952 248	960 965	11 025 808
Buick Creek North—													
Bluesky	22 358	27 003	27 913	25 441	21 705	13 742	3 254	26 628	35 601	36 579	30 483	39 527	310 234
Dunlevy	137 200	134 378	149 941	145 734	164 873	69 543	.....	86 239	134 469	148 702	142 878	133 269	1 447 226
Field totals	159 558	161 381	177 854	171 175	186 578	83 285	3 254	112 867	170 070	185 281	173 361	172 796	1 757 460
Buick Creek West—													
Dunlevy	186 210	174 780	186 471	176 528	141 340	64 273	.....	105 130	121 293	188 330	156 208	139 102	1 639 665
Baldonnel	.....	9 134	11 967	6 487	8 163	4 424	.....	5 408	-6 238	5 670	7 369	5 245	70 105
Field totals	186 210	183 914	198 438	183 015	149 503	68 697	.....	110 538	127 531	194 000	163 577	144 347	1 709 770
Bulrush—Halfway[1]	7 755	7 423	7 841	58 975	79 547	54 435	78 666	73 324	71 955	76 644	68 318	72 663	657 546
Cabin—Slave Point	313 781	278 249	252 287	295 407	317 226	318 391	336 703	331 074	300 295	299 395	303 981	316 565	3 663 354
Cache Creek—Coplin—													
Coplin	.....	.....	.....	.....	.....	.....	.....	.....	.....	56 188	102 509	95 195	253 892
Halfway	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 118	75 559	80 677
Field totals	.....	.....	.....	.....	.....	.....	.....	.....	.....	56 188	107 627	170 754	334 569
Cecil Lake—													
Cecil	.....	.....	.....	.....	140 067	78 094	99 965	93 644	94 427	95 488	39 334	13 684	654 703
North Pine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 530	.....	5 530
North Pine[1]	9 654	7 781	10 622	692	8 053	4 638	5 643	9 311	16 133	12 628	9 636	6 340	101 131
Halfway	.....	.....	.....	.....	.....	40 333	23 858	.....	17 998	18 166	1 470	31 855	133 680
Confidential[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	318	1 013	1 331
Field totals	9 654	7 781	10 622	692	148 120	123 065	129 466	102 955	128 558	126 282	56 288	52 892	896 375
Clarke Lake—Slave Point	8 214 080	7 405 655	7 797 246	7 385 968	6 858 600	6 445 294	5 084 379	5 608 407	6 121 269	6 825 235	6 276 040	6 204 105	80 226 278
Clarke Lake South—Slave Point	333 797	291 455	314 150	318 527	336 233	266 654	231 848	129 340	279 682	304 656	296 679	309 950	3 412 971
Crush—Halfway[1]	21 324	21 590	26 119	23 247	25 477	26 015	26 680	27 124	25 239	27 073	23 876	24 727	298 491
Currant—Halfway[1]	6 727	9 959	10 691	15 371	15 932	18 213	23 095	24 556	29 459	35 156	29 057	27 017	245 233
Currant West—Halfway	.....	.....	.....	20 922	98 391	76 044	69 873	89 134	87 486	81 856	89 539	96 282	709 527
Eagle—													
Siphon[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	130	2 742	1 092	3 964
Belloy[1]	22 147	27 684	21 401	20 338	20 098	20 537	20 849	21 366	16 296	21 148	16 569	13 990	242 423
Field totals	22 147	27 684	21 401	20 338	20 098	20 537	20 849	21 366	16 296	21 278	19 311	15 082	246 387

Farrell Creek—													
Charlie Lake	43 241	39 782	40 324	39 291	60 909	47 263	.....	.....	.....	.....	.....	.....	270 810
Halfway	30 702	29 785	30 863	29 404	28 688	21 415	.....	.....	.....	.....	.....	.....	170 857
Field totals	73 943	69 567	71 187	68 695	89 597	68 678	.....	.....	.....	.....	.....	.....	441 667
Fireweed—													
Bluesky	.....	.....	.....	10 679	14 750	9 661	19 180	17 820	17 535	14 896	12 158	75 702	192 381
Dunlevy	247 605	.....	249 808	209 143	215 682	195 643	194 684	224 548	179 876	310 839	328 758	268 285	2 624 871
Debolt	10 336	.....	6 248	6 793	617	.....	.....	.....	.....	.....	.....	.....	23 994
Confidential	.....	.....	.....	.....	.....	.....	.....	144 283	143 359	134 658	189 787	190 761	802 848
Field totals	257 941	.....	256 056	226 615	231 049	205 304	213 864	386 651	340 770	460 393	530 703	534 748	3 644 094
Flatrock—													
Boundary Lake[1]	924	893	56	4	.....	.....	16	113	864	889	1 105	887	5 751
Halfway	191 007	207 188	188 175	170 278	107 484	120 260	116 074	108 125	116 592	127 418	111 002	149 499	1 713 102
Field totals	191 931	208 081	188 231	170 282	107 484	120 260	116 090	108 238	117 456	128 307	112 107	150 386	1 718 853
Fort St. John—													
Baldonnel	115 843	101 284	110 370	120 982	36 471	55 748	21 596	6 553	139 006	130 586	114 158	126 453	1 079 050
Pingel[1]	18 454	15 497	16 634	16 242	15 887	15 516	4 589	19 626	17 945	16 674	15 759	17 256	190 079
Halfway	169 557	143 488	163 529	99 042	141 447	125 607	88 909	78 469	101 035	145 390	147 095	155 609	1 559 177
Belloy	22 150	18 326	20 813	28 629	7 599	18 201	6 329	2 245	34 348	29 287	20 775	21 332	230 034
Field totals	326 004	278 595	311 346	264 895	201 404	215 072	121 423	106 893	292 334	321 937	297 787	320 650	3 058 340
Fort St. John SE.—													
Baldonnel	42 987	42 200	39 968	22 437	20 087	18 394	16 936	34 269	10 642	6 495	44 871	45 091	344 377
Siphon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22 908	22 908
Halfway	46 450	52 937	43 100	25 805	24 701	29 922	14 972	36 585	12 428	7 398	56 581	53 144	404 023
Belloy	81 781	80 460	73 071	29 071	31 948	48 370	22 733	61 594	19 261	10 773	85 808	94 481	639 351
Field totals	171 218	175 597	156 139	77 313	76 736	96 686	54 641	132 448	42 331	24 666	187 260	215 624	1 410 659
Gote—Sulphur Point	183 347	149 415	168 843	112 454	121 993	131 962	115 633	42 877	.....	3 754	139 733	137 744	1 307 755
Grizzly—Dunlevy	.....	.....	.....	.....	.....	.....	.....	.....	.....	86 000	103 000	.....	189 000
Grizzly North—													
Dunlevy	.....	.....	.....	.....	.....	.....	.....	.....	.....	57 000	13 000	.....	70 000
Halfway	.....	.....	.....	.....	.....	.....	.....	.....	.....	140 500	8 000	.....	148 500
Field totals	.....	.....	.....	.....	.....	.....	.....	.....	.....	197 500	21 000	.....	218 500
Gundy Creek—Baldonnel	241 058	211 836	182 319	155 223	162 051	118 818	158 483	88 922	131 178	125 115	126 388	127 844	1 829 235
Helmet—Slave Point	46 460	100 492	.....	444 970	1 351 621	1 301 650	1 355 944	1 201 393	1 314 997	1 389 243	1 262 565	1 289 656	11 058 991
Inga—													
Dunlevy	64 803	.....	62 020	58 500	61 486	22 635	40 327	41 819	35 250	32 462	25 281	33 671	478 254
Inga	360 467	330 966	367 762	332 906	308 348	273 095	213 139	319 415	232 832	325 921	319 162	463 055	3 847 068
Inga[2]	223 299	201 784	214 456	212 714	216 977	202 658	205 253	216 735	204 968	156 826	204 934	216 124	2 476 728
Field totals	648 569	532 750	644 238	604 120	586 811	498 388	458 719	577 969	473 050	515 209	549 377	712 850	6 802 050
Jedney—													
Baldonnel	655 599	568 020	631 623	612 027	636 914	539 650	450 819	339 631	99 134	566 307	588 219	642 544	6 330 487
Halfway	470 606	380 784	493 510	444 241	465 701	283 652	244 923	175 745	69 396	331 697	501 633	519 313	4 381 201
Field totals	1 126 205	948 804	1 125 133	1 056 268	1 102 615	823 302	695 742	515 376	168 530	898 004	1 089 852	1 161 857	10 711 688

[1] Associated gas.

Table 4-6—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1976—Continued

(Volumes in MSCF at 14.65 psia and 60°F.)

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Julienne Creek—													
Baldonnel	5 819	4 629	.....	6 719	14 793	7 573	12 337	8 688	9 234	.....	.....	.....	69 792
Halfway	37 490	37 317	40 528	34 915	33 898	25 874	16 318	6 999	36 658	35 299	32 587	34 606	372 489
Field totals	43 309	41 946	40 528	41 634	48 691	33 447	28 655	15 687	45 892	35 299	32 587	34 606	442 281
Kobes—Townsend—													
Dunlevy	21 436	22 356	23 950	21 175	20 773	17 472	10 444	7 077	8 240	12 038	8 613	14 992	188 566
Charlie Lake	41 650	37 381	43 737	38 628	40 786	36 970	19 304	7 372	20 475	28 181	26 470	20 300	361 254
Halfway	183 838	241 806	251 088	243 570	243 089	220 198	175 951	94 822	65 020	241 689	247 579	236 833	2 445 483
Debolt	62 055	71 063	71 063	57 869	64 193	40 007	4 074	13 210	31 462	74 488	70 779	74 261	634 524
Field totals	308 979	372 606	389 838	361 242	368 841	314 647	209 773	122 481	125 197	356 396	353 441	346 386	3 629 827
Kotcho Lake—Slave Point	271 348	236 165	255 835	224 622	109 010	171 555	227 632	246 418	184 346	151 365	.....	113 847	2 192 143
Kotcho Lake East—													
Bluesky	.....	.....	.....	.....	.....	78 528	55 844	63 798	24 399	41 978	80 680	78 708	423 935
Slave Point	83 189	88 187	74 500	246 136	517 826	335 537	435 975	426 074	324 063	461 839	407 090	491 882	3 892 298
Field totals	83 189	88 187	74 500	246 136	517 826	414 065	491 819	489 872	348 462	503 817	487 770	570 590	4 316 233
LaGarde—Dunlevy	50 401	1 538	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51 939
Laprise—Baldonnel	2 244 454	1 998 675	2 246 108	2 182 123	2 226 700	1 664 043	241 734	265 426	940 047	2 103 040	2 218 294	2 252 376	20 583 020
Louise—Slave Point	83 197	68 646	65 966	68 201	58 533	46 880	64 748	62 153	56 289	63 337	61 003	68 486	767 439
Milligan Creek—													
Gething	13 755	9 612	10 138	7 369	8 053	7 043	11 446	6 532	6 753	4 363	6 083	5 594	96 741
Halfway[1]	49 256	43 829	50 679	45 932	49 050	35 869	54 657	48 210	39 319	49 837	56 096	48 524	571 258
Field totals	63 011	53 441	60 817	53 301	57 103	42 912	66 103	54 742	46 072	54 200	62 179	54 118	667 999
Milligan Creek West—Halfway	48 978	96 429	44 739	66 440	86 221	56 774	39 609	50 428	32 479	32 039	26 051	5 725	585 912
Nig Creek—													
Baldonnel	924 868	860 598	829 953	866 641	792 639	614 385	748 167	717 924	483 172	816 663	801 353	830 648	9 287 011
Baldonnel[1]	340	395	356	562	390	447	550	460	553	374	159	481	5 067
Field totals	925 208	860 993	830 309	867 203	793 029	614 832	748 717	718 384	483 725	817 037	801 512	831 129	9 292 078
North Pine—North Pine	.....	.....	.....	.....	15 801	30 497	12 297	46 729	45 565	41 529	46 678	46 176	285 272
Oak—													
Cecil	.....	.....	.....	.....	14 090	25 040	12 453	1 006	6 092	3 834	3 863	10	66 388
Halfway	.....	.....	.....	36 979	183 074	247 300	289 186	258 607	319 942	281 689	242 133	164 148	2 023 058
Halfway[1]	4 602	4 242	4 812	.....	3 767	3 037	4 718	3 518	6 902	10 109	7 590	6 960	60 257
Field totals	4 602	4 242	4 812	36 979	200 931	275 377	306 357	263 131	332 936	295 632	253 586	171 118	2 149 703
Osprey—Halfway[1]	4 044	3 285	4 079	3 187	3 806	3 255	4 548	1 827	5 540	2 903	2 873	6 260	45 607
Parkland—Wabamum	381 650	363 585	382 301	340 745	392 112	376 227	386 496	379 932	359 079	381 884	368 383	338 122	4 450 516
Peejay—													
Gething	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32 767	30 611	63 378
Halfway	130 584	150 454	122 437	122 101	117 090	100 818	110 311	109 760	105 629	111 041	145 327	157 560	1 483 112

Halfway[1]	50 800	51 605	55 960	50 131	54 027	50 078	51 085	49 804	47 433	51 465	48 836	50 202	611 426
Confidential											57 978	72 240	130 218
Field totals	181 384	202 059	178 397	172 232	171 117	150 896	161 396	159 564	153 062	162 506	284 908	310 613	2 288 134
Petitot River—Slave Point	214 044	200 566	232 632	260 389	269 942	254 979	263 051	263 451	209 948	218 376	213 614	226 389	2 827 381
Red Creek—													
Halfway									8 133				8 133
Confidential[1]									686	451	13 624	15 694	30 455
Field totals									8 819	451	13 624	15 694	38 588
Rigel—													
Bluesky	14 292	12 921	13 790	13 234	11 769	8 478	6 935	13 240	9 637	10 364	10 208	10 746	135 614
Dunlevy	1 319 576	1 168 034	1 335 767	1 299 068	1 145 896	864 028	832 201	1 231 997	1 269 457	1 265 522	1 168 205	1 269 784	14 169 535
Dunlevy[1]	48 213	43 693	25 375	27 343	26 830	28 745	37 088	29 652	29 244	30 556	36 136	42 312	405 187
Lower Dunlevy	57 488	47 804	24 103	6 869									136 264
Field totals	1 439 569	1 272 452	1 399 035	1 346 514	1 184 495	901 251	876 224	1 274 889	1 308 338	1 306 442	1 214 549	1 322 842	14 846 600
Sierra—Pine Point	3 518 007	3 313 493	3 289 305	2 994 753	2 410 642	1 486 946	1 330 846	1 759 000	1 957 580	3 277 107	3 003 556	3 240 778	31 582 013
Silverberry—Coplin	181 805	158 930	155 923	134 506	145 924	104 704	130 175	122 268	118 445	98 649	98 451	95 812	1 545 592
Siphon—													
Dunlevy	461 499	408 886	316 052	274 749	287 312	235 650	308 735	233 367	283 807	278 980	281 323	267 380	3 637 740
Siphon	129 985	131 585	138 662	118 916	129 747	107 714	126 635	97 300	114 928	118 179	95 755	73 027	1 382 433
Halfway	159 105	166 620	173 486	163 472	170 319	148 898	180 789	138 428	165 991	162 409	145 111	138 407	1 913 035
Field totals	750 589	707 091	628 200	557 137	587 378	492 262	616 159	469 095	564 726	559 568	522 189	478 814	6 933 208
Siphon East—Bluesky	229 913	223 075	215 301	282 022	200 794	233 300	243 593	211 711	259 471	347 745	207 650	225 780	2 880 355
Sukunka—Baldonnel									51 670		87 000		138 670
Stoddart—													
Cecil[1]	3 252	1 709	2 381		1 613	2 264	1 550	4 802	1 329	620		2 318	21 838
Belloy	925 879	879 210	866 410	847 488	854 718	631 107	851 075	912 882	821 875	821 331	838 131	830 235	10 080 341
Belloy[1]	13 217	13 178	13 031	10 305	13 421	8 439	9 201	17 745	10 209	10 188	11 101	14 220	144 255
Confidential[1]												3 421	3 421
Field totals	942 348	894 097	881 822	857 793	869 752	641 810	861 826	935 429	833 413	832 139	849 232	850 194	10 249 855
Stoddart West—Belloy	228 033	227 538	223 392	204 678	215 370	206 097	228 982	194 792	249 018	238 186	248 059	271 322	2 735 467
Sunrise—Cadotte	42 582	40 061	40 419	30 225	32 007	29 686	32 560	31 909	29 886	26 847	26 077	25 375	387 634
Town—													
Baldonnel										455		4 126	4 581
Halfway	74 041	62 735	60 717	56 458	53 384	52 315	37 849	44 445	54 405	58 182	39 215	57 254	651 000
Field totals	74 041	62 735	60 717	56 458	53 384	52 315	37 849	44 445	54 405	58 637	39 215	61 380	655 581
Tsea—Slave Point			66 526	180 294	75 093				32 973	45 158	31 736	13 463	445 243
Two Rivers—													
Baldonnel	13 894	13 060	14 026	160 604	79 443	76 817	59 919	144 197	135 262				697 222
Halfway	154 089	149 282	158 807	12 847	7 171	2 566				144 745	136 975	145 723	912 205
Field totals	167 983	162 342	172 833	173 451	86 614	79 383	59 919	144 197	135 262	144 745	136 975	145 723	1 609 427
Velma—Confidential[1]		360	778										1 138
Weasel—													
Baldonnel	1 895	2 194	2 540	2 309	2 075	736	1 394	1 412	1 034	1 658	985	1 513	19 745
Halfway[1]	38 170	35 854	39 226	37 616	37 965	29 314	37 015	34 675	22 504	32 294	25 622	43 760	414 015
Field totals	40 065	38 048	41 766	39 925	40 040	30 050	38 409	36 087	23 538	33 952	26 607	45 273	433 760

[1] Associated gas.

Table 4-6—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1976—Continued

(Volumes in MSCF at 14.65 psia and 60°F.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Weasel West—Halfway[1]	3 697	3 269	3 295	3 249	3 405	2 685	3 381	1 886	2 645	2 946	3 292	3 641	37 391
Wilder—													
Halfway	307 933	275 585	299 223	263 090	291 043	226 452	205 055	223 920	267 904	193 009	268 815	272 825	3 094 854
Belloy		20 717	15 836	14 273	13 612	12 571	13 396	10 675	9 410	9 435	8 692	4 755	133 372
Field totals	307 933	296 302	315 059	277 363	304 655	239 023	218 451	234 595	277 314	202 444	277 507	277 580	3 228 226
Wildmint—													
Bluesky	6 611	6 073	7 187	5 714	5 986	5 216	6 431	6 294	5 446	5 844	5 677	6 740	73 219
Halfway	815	10 083	4 804	1 298	58	7 353	4 981	642	2 694	4 436	6 143	1 779	45 086
Halfway[1]	21 370	26 569	17 985	22 453	33 411	40 005	27 145	25 515	26 774	32 045	21 116	40 880	335 268
Field totals	28 796	42 725	29 976	29 465	39 455	52 574	38 557	32 451	34 914	42 325	32 936	49 399	453 573
Willow—													
Gething[1]	2 329	3 792	5 963	9 197	8 923	6 670	7 534	7 446	6 004	10 117	10 242	10 128	88 345
Halfway	240 875	215 203	227 203	234 248	213 559	186 139	172 746	161 687	199 204	203 566	206 188	197 189	2 457 807
Field totals	243 204	218 995	233 166	243 445	222 482	192 809	180 280	169 133	205 208	213 683	216 430	207 317	2 546 152
Wolf—Halfway[1]	8 283	5 799	6 806	6 639	7 152	6 127	7 395	2 295	5 535	8 701	5 884	8 101	78 717
Woodrush—Halfway			4 840										4 840
Yoyo—													
Bluesky		1 438											1 438
Slave Point											150 575		150 575
Pine Point	6 410 606	6 167 877	7 152 476	6 892 797	6 140 017	5 485 680	3 311 902	3 758 114	3 852 963	7 640 654	7 249 717	7 425 823	71 488 626
Field totals	6 410 606	6 169 315	7 152 476	6 892 797	6 140 017	5 485 680	3 311 902	3 758 114	3 852 963	7 640 654	7 400 292	7 425 823	71 640 639
Other areas—													
Gething[1]	4 077	5 033	7 242	798								3 064	20 214
Dunlevy	82 917	17 295	87 347	128 625	160 438	147 774	179 883	123 152	240 339	325 403	271 609	265 039	2 029 821
Baldonnel						14 543	32				124 400		138 975
Halfway	20 000										53 835	41 440	115 275
Halfway[1]	12 532	12 131	14 114	10 671	11 131	11 587	11 446	11 042	11 135	12 359	9 342	9 104	136 594
Belloy	14 935	12 035	13 309	9 490	9 726	7 666	9 846	9 342	5 418	9 396	7 002	6 429	114 594
Pine Point		20 500											20 500
Confidential			11 554	87 423	198 281	243 781	190 045	277 559	149 522	158 821	200 548	114 219	1 631 753
Confidential[1]							441	1 360	2 254	1 742	758	1 885	8 440
Field totals	134 461	66 994	133 566	237 007	379 576	425 351	391 693	422 455	408 668	507 721	667 494	441 180	4 216 166
Totals—													
Nonassociated	34 942 058	31 925 947	34 306 247	33 443 604	32 712 787	27 905 232	22 619 266	24 422 780	25 856 860	35 766 365	34 527 418	34 872 735	373 301 299
Associated	1 121 677	1 104 937	1 192 889	999 768	1 096 265	1 025 749	1 107 881	1 214 101	1 194 610	1 116 128	1 200 966	1 319 669	13 694 640
Totals	36 063 735	33 030 884	35 499 136	34 443 372	33 809 052	28 930 981	23 727 147	25 636 881	27 051 470	36 882 493	35 728 384	36 192 404	386 995 939

[1] Associated gas.

Table 4-7—Monthly Supply and Disposition of Crude Oil/Pentanes Plus, 1976

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production—													
Crude oil	1 275 289	1 249 344	1 330 976	1 102 705	1 227 195	1 186 601	1 287 908	1 294 776	1 219 282	1 182 410	1 239 854	1 294 471	14 890 811
Field condensate	8 437	8 394	9 116	8 151	8 204	9 126	10 789	7 559	11 665	12 817	11 760	9 143	115 161
Plant condensate	93 297	84 059	100 182	105 015	98 565	81 188	64 088	65 157	68 616	91 234	98 585	104 034	1 054 020
Total British Columbia	1 377 023	1 341 797	1 440 274	1 215 871	1 333 964	1 276 915	1 362 785	1 367 492	1 299 563	1 286 461	1 350 199	1 407 648	16 059 992
Alberta imports—													
Pipeline	6 978 500	6 026 908	6 540 469	6 052 657	6 500 500	6 686 606	5 408 980	5 447 285	5 553 725	5 567 858	5 525 196	5 816 265	72 104 949
Rail	12 510	11 479	5 109	4 193	8 089	7 484	11 302	13 491	8 746	16 114	16 769	10 975	125 261
Total Alberta	6 991 010	6 038 387	6 545 578	6 056 850	6 508 589	6 694 090	5 420 282	5 460 776	5 562 471	5 583 972	5 541 965	5 827 240	72 231 210
Total supply	8 368 033	7 380 184	7 985 852	7 272 721	7 842 553	7 971 005	6 783 067	6 828 268	6 862 034	6 870 433	6 892 164	7 234 888	88 291 202
Disposition													
Inventory changes—													
Field	5 066	7 875	—8 703	4 538	—7 299	—5 468	3 539	—1 653	—5 700	12	2 557	1 971	—3 265
Plant	11 642	418	—2 171	—2 542	—13 438	—5 493	—24 650	2 582	2 717	20 307	21 712	12 261	23 345
Transporters	103 205	—314 643	138 708	—113 773	184 271	216 943	—462 860	—96 188	—74 792	472 991	—11 371	—372 329	—229 838
Totals	119 913	—306 350	127 834	—111 777	163 534	305 982	—483 971	—95 259	—77 775	493 310	12 898	—358 097	—209 758
Losses and adjustments—													
Field	1 649	—279	—37	.....	—18	.....	—891	.....	—147	—470	—9	254	52
Plant	2 501	4 798	4 860	4 787	6 949	7 468	4 165	543	3 304	1 434	4 491	2 381	47 681
Transporters	10 260	—3 512	—12 383	24 044	22 825	—9 183	—1 994	14 421	18 142	—5 249	—8 505	—1 706	47 160
Totals	14 410	1 007	—7 560	28 831	29 756	—1 715	1 280	14 964	21 299	—4 285	—4 023	929	94 893
Transfers	28 714	33 385	38 714	57 988	57 832	56 320	41 267	39 469	40 795	46 957	50 200	41 590	533 231
Deliveries—													
To British Columbia refineries—													
British Columbia production	1 346 720	1 253 413	1 402 464	1 230 913	1 231 706	1 330 399	1 582 447	1 463 435	1 367 204	1 259 264	1 257 890	1 596 503	16 322 358
Alberta production	3 330 920	3 081 302	2 858 257	3 331 549	3 433 337	3 240 473	2 870 035	3 065 344	2 821 184	2 823 161	3 147 323	3 664 689	37 667 574
Totals	4 677 640	4 334 715	4 260 721	4 562 462	4 665 043	4 570 872	4 452 482	4 528 779	4 188 388	4 082 425	4 405 213	5 261 192	53 989 932
To export—													
British Columbia production	79 235	71 703	51 060	39 405	36 521	24 659	36 493	14 657	11 794	17 786	15 722	34 509	433 544
Alberta production	3 459 154	3 248 339	3 509 660	2 691 828	2 875 842	3 015 268	2 702 143	2 310 167	2 674 828	2 222 453	2 410 448	2 262 002	33 382 132
Totals	3 538 389	3 320 042	3 560 720	2 731 233	2 912 363	3 039 927	2 738 636	2 324 824	2 686 622	2 240 239	2 426 170	2 296 511	33 815 676
Reporting adjustment	—11 033	—2 615	5 423	3 984	14 025	—381	33 373	15 491	2 705	11 787	1 706	—7 237	67 228
Total disposition	8 368 033	7 380 184	7 985 852	7 272 721	7 842 553	7 971 005	6 783 067	6 828 268	6 862 034	6 870 433	6 892 164	7 234 888	88 291 202

Table 4-7—Monthly Supply and Disposition of Crude Oil/Pentanes Plus, 1976—Continued

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
British Columbia Refineries													
Receipts—													
British Columbia crude	1 319 851	1 398 952	2 737 339	1 285 050	1 176 628	1 317 667	1 599 296	1 457 457	1 301 616	1 286 484	1 315 074	1 603 888	17 799 302
British Columbia condensate	28 714	33 385	38 714	57 988	57 832	56 320	41 267	39 469	40 795	46 957	50 200	41 590	533 231
Totals	1 348 565	1 432 337	2 776 053	1 343 038	1 234 460	1 373 987	1 640 563	1 496 926	1 342 411	1 333 441	1 365 274	1 645 478	18 332 533
Alberta crude	3 330 920	3 081 302	1 602 540	3 069 926	3 142 471	2 973 799	2 591 665	2 851 689	2 618 645	2 621 559	2 955 218	3 361 750	34 201 484
Alberta condensate	4 263	2 682	.....	181 132	290 866	272 920	289 482	227 174	209 152	215 564	206 960	313 047	2 213 242
Totals	3 335 183	3 083 984	1 602 540	3 251 058	3 433 337	3 246 719	2 881 147	3 078 863	2 827 797	2 837 123	3 162 178	3 674 797	36 414 726
Total receipts	4 683 748	4 516 321	4 378 593	4 594 096	4 667 797	4 620 706	4 521 710	4 575 789	4 170 208	4 170 564	4 527 452	5 320 275	54 747 259
Disposition													
Inventory changes	24 140	148 776	20 002	64 094	—1 137	49 752	—59 151	—76 216	—172 717	41 444	—18 514	211 965	232 438
Losses and adjustments	171	192	254	—2 220	—98	—451	—2 147	567	—1 361	—1 614	92	—2 477	—9 092
Refinery runs—													
British Columbia production	1 382 981	1 141 354	2 729 241	1 491 084	1 228 583	1 202 358	1 696 624	1 610 656	1 459 374	1 328 565	1 294 938	1 519 068	18 084 826
Alberta production	3 276 456	3 225 999	1 629 096	3 041 138	3 440 449	3 369 047	2 886 384	3 040 782	2 884 912	2 802 169	3 250 936	3 591 719	36 439 087
Totals	4 659 437	4 367 353	4 358 337	4 532 222	4 669 032	4 571 405	4 583 008	4 651 438	4 344 286	4 130 734	4 545 874	5 110 787	54 523 913
Total disposition	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54 747 259

Table 4-8—Monthly Supply and Disposition of Natural Gas, 1976

(Volumes in MSCF at 14.65 psia and 60°F)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production—													
Nonassociated gas	34 942 058	31 925 947	34 306 247	33 440 626	32 719 417	27 908 487	22 622 362	24 440 030	25 856 930	35 766 365	35 500 095	34 872 735	373 301 299
Associated gas	1 121 677	1 104 937	1 192 889	999 768	1 089 455	1 022 494	1 107 881	1 196 851	1 194 602	1 116 128	1 228 289	1 319 669	13 694 640
Less injected	189 235	185 071	228 013	199 744	237 628	192 170	160 513	222 205	249 165	226 055	242 756	284 285	2 616 840
Net British Columbia production	35 874 500	32 845 813	35 271 123	34 240 650	33 571 244	28 738 811	23 569 730	25 414 676	26 802 367	36 656 438	35 485 628	35 908 119	384 379 099
Imports—													
Alberta	1 445 403	2 027 462	2 831 560	2 608 468	1 509 900	1 493 462	540 728	921 103	1 102 326	2 388 685	2 771 740	3 091 761	22 732 598
Northwest Territories	3 094 443	2 971 120	3 107 354	2 916 416	2 958 709	2 776 129	1 632 611	1 937 542	1 995 154	2 703 587	2 630 236	2 684 107	31 407 408
Yukon	123 197	105 445	102 071	79 912	85 526	76 769	62 569	46 522	42 981	33 813	45 989	51 597	856 391
Total imports	4 663 043	5 104 027	6 040 985	5 604 796	4 554 135	4 346 360	2 235 908	2 905 167	3 140 461	5 126 085	5 447 965	5 827 465	54 996 397
Total supply	40 537 543	37 949 840	41 312 108	39 845 446	38 125 379	33 085 171	25 805 638	28 319 843	29 942 828	41 782 523	40 933 593	41 735 584	439 375 496
Disposition													
Flared—													
Field	367 902	531 224	379 917	213 071	227 701	295 099	242 602	210 682	295 575	670 470	639 894	319 544	4 393 681
Plant	3 410					548	408	1 257				12 125	17 748
Gathering systems	16 738	3 004	1 629	4 552	3 334	8 280	66	63 417	47	338	106	86	101 597
Totals	388 050	534 228	381 546	217 623	231 035	303 927	243 076	275 356	295 622	670 808	640 000	331 755	4 513 026
Fuel—													
Field	281 974	235 517	248 340	213 081	226 219	212 845	201 780	201 963	184 366	211 103	210 678	254 920	2 682 786
Plant	1 360 891	1 293 625	1 443 525	1 339 504	1 391 373	1 272 930	1 234 893	1 367 955	1 365 661	1 523 008	1 636 738	1 717 685	16 947 788
Compressor	29 525	26 602	28 129	25 850	21 342	23 398	7 390	8 091	2 016	18 853	24 418	28 458	244 072
Totals	1 672 390	1 555 744	1 719 994	1 578 435	1 638 934	1 509 173	1 444 063	1 578 009	1 552 043	1 752 964	1 871 834	2 001 063	19 874 646
Line pack changes	—7 872	5 742	—5 040	23 859	14 033	—23 630	5 169	13 526	—4 197	—12 620	3 662	2 438	15 070
Losses and adjustments—													
Field	601 131	579 020	594 913	807 012	614 689	668 495	627 253	475 932	—90 059	1 870 161	758 787	754 022	8 261 356
Plant	878 667	392 862	468 372	422 206	482 943	575 568	93 164	295 173	282 200	571 408	450 423	460 045	5 373 031
Gathering systems	26 161	8 169	63 580	80 218	45 321	—3 003	—47 009	—40 454	45 314	49 104	73 961	98 706	400 068
Totals	1 505 959	980 051	1 126 865	1 309 436	1 142 953	1 241 060	673 408	730 651	237 455	2 490 673	1 283 171	1 312 773	14 034 455
Processing shrinkage	3 842 597	3 647 865	3 921 006	3 704 132	3 604 568	3 121 716	2 406 669	2 605 260	2 800 213	3 628 199	3 633 298	3 756 735	40 672 258
Available marketable gas in NEBC	33 226 104	31 571 573	34 218 486	33 058 514	31 657 051	26 959 758	21 048 391	23 092 637	25 203 811	33 281 934	33 548 271	34 409 388	361 275 918
Reporting adjustment	—89 685	—345 363	—50 749	—46 553	—163 195	—26 833	—15 138	24 404	—142 119	—29 435	—46 643	—78 568	—1 009 877

Table 4-8—Monthly Supply and Disposition of Natural Gas, 1976—Continued

(Volumes in MSCF at 14.65 psia and 60°F)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
British Columbia Transporters Supply													
Available marketable gas in NEBC	33 226 104	31 571 573	34 218 486	33 058 514	31 657 051	26 959 758	21 048 391	23 092 637	25 203 811	33 281 934	33 548 271	34 409 388	361 275 918
Imports to SEBC—													
Alberta	41 079 473	38 985 577	41 212 864	39 362 933	36 855 174	36 298 693	36 559 648	37 420 546	34 333 356	37 161 683	37 013 165	39 717 245	456 000 357
Total supply	74 305 577	70 557 150	75 431 350	72 421 447	68 512 225	63 258 451	57 608 039	60 513 183	59 537 167	70 443 617	70 561 436	74 126 633	817 276 275
Disposition													
Fuel	1 758 804	1 704 974	1 842 448	1 669 001	1 434 369	1 245 584	855 156	1 013 088	1 062 448	1 625 081	1 665 960	1 704 042	17 580 955
Losses and adjustments	—294 992	131 560	—42 756	103 169	81 158	17 055	302 670	425 755	180 055	247 975	268 258	227 430	1 647 337
Line pack changes	—57 353	—24 937	—16 104	188 588	—246 977	—20 348	83 986	—19 952	91 634	—88 195	—3 026	—14 832	—127 516
Deliveries to British Columbia distributors—													
North	417 585	395 544	330 705	203 550	146 081	129 191	123 382	126 841	149 778	230 018	303 959	425 153	2 981 787
Interior	6 041 084	5 779 150	6 088 120	4 487 848	4 528 499	4 370 770	3 895 357	3 810 696	4 141 564	4 799 540	5 506 176	5 798 504	59 247 308
Lower Mainland	9 679 721	9 155 597	8 984 120	6 570 417	5 519 400	4 413 144	3 444 031	3 855 370	4 094 733	6 259 069	7 944 215	9 009 907	78 929 724
Totals	16 138 390	15 330 291	15 402 945	11 261 815	10 193 980	8 913 105	7 462 770	7 792 907	8 386 075	11 288 627	13 754 350	15 233 564	141 158 819
Export—													
From NEBC	16 974 769	15 804 280	18 454 096	21 058 437	21 020 897	17 584 824	13 440 433	15 006 077	16 473 204	21 132 064	18 983 405	18 490 062	214 422 548
From SEBC	39 802 901	37 638 266	39 820 299	38 163 071	36 014 091	35 524 442	35 473 897	36 306 656	33 349 978	36 266 237	35 897 260	38 440 919	442 698 017
Totals	56 777 670	53 442 546	58 274 395	59 221 508	57 034 988	53 109 266	48 914 330	51 312 733	49 823 182	57 398 301	54 880 665	56 930 981	657 120 565
Reporting adjustments	—16 942	—27 284	—29 578	—22 634	14 707	—6 211	—10 873	—11 348	—6 227	—28 172	—4 771	45 448	—103 885
Total disposition	74 305 577	70 557 150	75 431 350	72 421 447	68 512 225	63 258 451	57 608 039	60 513 183	59 537 167	70 443 617	70 561 436	74 126 633	817 276 275
British Columbia Distributors													
Receipts—													
From transporters	16 234 179	15 429 981	15 505 181	11 373 689	10 264 374	8 968 559	7 510 618	7 843 702	8 511 823	11 684 181	14 080 146	15 400 640	142 807 073
From storage	6 509	12 485	476 502	8 372	.....	.....	.....	.....	.....	.....	8 962	.....	512 830
Other receipts	901	1 494	1 845	2 581	1 191	622	524	827	580	597	682	1 559	13 403
Total receipts	16 241 589	15 443 960	15 983 528	11 384 642	10 265 565	8 969 181	7 511 142	7 844 529	8 512 403	11 684 778	14 089 790	15 402 199	143 333 306
Disposition													
Fuel	46 922	52 246	46 480	41 749	31 464	37 115	21 296	23 020	30 392	36 261	47 594	53 425	467 964
Losses and adjustments	—90 493	—56 836	989 220	—2 156 691	—1 384 312	—849 375	8 124	993 124	—622 846	1 567 565	2 385 905	1 751 938	2 535 323
Line pack changes	—668	50	29 737	—23 926	17 667	—2 876	—27 220	487	23 494	46 014	26 697	—11 195	78 261

To storage	.....	.....	.....	.....	66 915	103 708	104 902	99 883	93 070	31 405	.....	8 393	508 276
Sales—													
Residential	5 888 638	5 620 419	4 718 672	4 615 529	3 238 105	2 411 557	1 456 926	1 137 625	1 524 721	1 941 742	2 923 965	4 314 783	39 792 682
Commercial	4 839 337	4 465 522	4 122 011	3 726 016	2 818 411	2 186 783	1 123 005	753 488	2 219 403	2 258 335	2 923 660	3 758 186	35 194 157
Industrial	5 398 257	5 198 541	5 697 557	5 132 969	5 436 278	5 035 138	4 786 997	4 788 489	5 203 235	5 738 962	5 725 712	5 463 924	63 606 059
Electric power	159 596	164 018	379 851	48 996	41 037	47 131	37 112	48 413	40 934	64 494	56 257	62 745	1 150 584
Total sales	16 285 828	15 448 500	14 918 091	13 523 510	11 533 831	9 680 609	7 404 040	6 728 015	8 988 293	10 003 533	11 629 594	13 599 638	139 743 482
Total disposition	16 241 589	15 443 960	15 983 528	11 384 642	10 265 565	8 969 181	7 511 142	7 844 529	8 512 403	11 684 778	14 089 790	15 402 199	143 333 306

Table 4-9—Monthly Supply and Disposition of Propane, 1976

(Quantities in barrels at 34.9723 Canadian gallons at 60°F)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production—													
Plant	46 449	39 923	51 302	40 423	41 904	43 544	46 260	45 485	46 202	47 565	53 040	52 633	554 730
Refinery	53 690	47 110	34 246	44 607	43 976	33 717	39 002	40 775	39 542	32 995	40 184	53 591	503 435
Totals	100 139	87 033	85 548	85 030	85 880	77 261	85 262	86 260	85 744	80 560	93 224	106 224	1 058 165
Alberta imports	298 900	240 318	419 304	342 004	335 953	369 471	340 341	340 312	274 172	308 772	325 280	257 444	3 852 271
Total supply	399 039	327 351	504 852	427 034	421 833	446 732	425 603	426 572	359 916	389 332	418 504	363 668	4 910 436
Disposition													
Inventory change	—3 668	6 590	3 886	—9 979	12 285	—8 164	7 508	—3 844	—6 413	—898	1 842	78	—777
Fuel	772	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	722
Losses and adjustments	869	—870	13	1 425	833	1 058	972	1 042	1 499	194	9 141	—5 931	10 245
Sales of British Columbia production—													
British Columbia	82 022	73 918	50 768	63 406	46 553	52 966	49 227	52 864	58 725	58 731	64 393	93 911	747 484
Alberta	6 434	434	134	.....	1 627	13 407	.....	.....	.....	334	.....	.....	22 370
Northwest Territories	884	920	1 376	432	.....	615	.....	.....	71	461	1 240	1 557	7 556
United States	12 826	6 041	29 371	29 746	24 582	17 379	27 555	36 198	31 862	21 738	16 608	16 609	270 515
Total British Columbia	102 166	81 313	81 649	93 584	72 762	84 367	76 782	89 062	90 658	81 264	82 241	112 077	1 047 925
Sales of Alberta production—													
British Columbia	86 188	69 633	110 300	47 101	48 534	35 645	25 768	29 757	45 337	59 815	82 265	75 570	715 913
Offshore	212 712	170 685	309 004	294 903	287 419	333 826	314 573	310 555	228 835	248 957	243 015	181 874	3 136 358
Total Alberta	298 900	240 318	419 304	342 004	335 953	369 471	340 341	340 312	274 172	308 772	325 280	257 444	3 852 271
Total sales	401 066	321 631	500 953	435 588	408 715	453 838	417 123	429 374	364 830	390 036	407 521	369 521	4 900 196
Total disposition	399 039	327 351	504 852	427 034	421 833	446 732	425 603	426 572	359 916	389 332	418 504	363 668	4 910 436

Table 4-10—Monthly Supply and Disposition of Butane, 1976

(Quantities in barrels at 34.9723 Canadian gallons at 60°F)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production—													
Plant	67 755	51 944	58 637	52 767	56 748	48 112	50 033	57 609	60 968	64 823	61 857	59 248	690 501
Refinery	35 707	52 748	55 699	51 530	52 061	63 161	49 264	73 992	58 798	28 552	25 220	50 277	597 009
Totals	103 462	104 692	114 336	104 297	108 809	111 273	99 297	131 601	119 766	93 375	87 077	109 025	1 287 010
Alberta imports	7 013	5 237	13 363	5 598	5 014	6 071	1 626	4 595	3 245	8 794	10 103	5 864	76 523
Total supply	110 475	109 929	127 699	109 895	113 823	117 344	100 923	136 196	123 011	102 169	97 180	115 389	1 364 033
Disposition													
Inventory change	4 031	8 565	3 628	—13 285	1 549	—1 390	—7 589	8 311	—4 189	5 382	—263	1 445	6 195
Gasoline enrichment	21 616	18 109	17 351	15 977	10 640	7 136	11 771	12 608	20 771	21 983	22 194	20 011	200 167
Losses and adjustments	1 232	—1 231	—1	.....	1	—1	.....	1	187	1	6 179	—5 365	1 003
Sales of British Columbia production—													
British Columbia	42 586	57 460	55 114	52 758	48 786	66 609	62 092	77 654	72 960	31 504	32 847	57 220	657 590
Alberta	6 343	2 609	19 157	14 033	26 097	1 461	.....	.....	774	.....	.....	.....	70 474
United States	27 654	19 180	19 087	34 814	21 736	37 458	33 023	33 027	29 263	34 505	26 120	36 214	352 081
Totals	76 583	79 249	93 358	101 605	96 619	105 528	95 115	110 681	102 997	66 009	58 967	93 434	1 080 145
Sales of Alberta production—													
British Columbia	7 013	5 237	13 363	5 598	5 014	6 071	1 626	4 595	3 245	8 794	10 103	5 864	76 523
Total sales	83 596	84 486	106 721	107 203	101 633	111 599	96 741	115 276	106 242	74 803	69 070	99 298	1 156 668
Total disposition	110 475	109 929	127 699	109 895	113 823	117 344	100 923	136 196	123 011	102 169	97 180	115 389	1 364 033

Monthly Supply and Disposition of Sulphur, 1976

(Quantities in long tons.)

Supply													
British Columbia production	5 927	5 295	5 805	5 602	5 678	4 332	4 165	3 552	4 165	5 267	5 858	14 394	70 040
Disposition													
Inventory change	4 432	3 610	4 295	3 315	2 248	2 431	802	2 198	1 623	1 965	3 400	10 982	41 301
Losses and adjustments	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sales—													
North America	1 029	846	754	1 561	1 199	1 054	765	1 122	1 318	922	986	1 237	12 793
Offshore	466	839	756	726	2 231	847	2 598	232	1 224	2 380	1 472	2 175	15 946
Totals	1 495	1 685	1 510	2 287	3 430	1 901	3 363	1 354	2 542	3 302	2 458	3 412	28 739
Total disposition	5 927	5 295	5 805	5 602	5 678	4 332	4 165	3 552	4 165	5 267	5 858	14 394	70 040

Table 4-11—Crude-oil Pipelines, 1976

Company	Fields Served	Size and Mileage of Main and Lateral Lines		Pumping-stations		Present Capacity (Bbl./Day)	Gathering Mileage	Throughput (Bbl./Day)	Storage Capacity (Bbl.)
		Size (In.)	Mileage	Number	Capacity (Bbl./Day)				
Blueberry-Taylor Pipeline Co.	Aitken Creek, Blueberry	12¾	2.2	....	.....	.....	.....	.....	.....
		8⅝	62.8	1	5 000	12 000	37.4	2 281	65 000
	Fort St. John	.....	.....	....	.....	.....	.....	117	.....
	Inga	6⅝	1.7	1	12 500	12 500	.....	4 417	1 000
	Stoddart	.....	.....	....	.....	.....	.....	92	.....
CDC Oil & Gas Limited	Inga	6⅝	3.2	....	.....	.....	.....	.....	.....
		4½	8.7	1	10 000	10 000	13.9	4 000	.....
		3½	2.0	1	1 600	.....	.....	.....	.....
Trans-Prairie Pipelines Ltd.	Beatton River, Beatton River West, Boundary Lake, Bulrush, Currant, Milligan Creek, Osprey, Peejay, Weasel, Wildmint, Willow, Wolf	3½	24.5	1	36 000	52 000[1]	84.6	38 385	160 000
		4½	109.0	2	45 000	45 000[2]	.....	.....	.....
		6⅝	42.9	....	.....	.....	.....	.....	.....
		8⅝	104.0	....	.....	.....	.....	.....	.....
		12¾	39.1	....	.....	.....	.....	.....	.....
Westcoast Petroleum Ltd.	.....	12	505.0	12	70 000	70 000	.....	33 915	586 000

[1] Boundary Lake.
[2] Terminal to Westcoast Petroleum Ltd.

Table 4-12—Crude-oil Refineries, 1976

Name	Location	Type	Year of First Operation	Source of Crude	Crude-oil Capacity (Bbl. per Calendar Day	Storage Capacity (Bbl.)	Cracking-plant Units	Cracking Capacity (Bbl. per Calendar Day)	Other Units
Chevron Canada Ltd.	North Burnaby	Comp.	1936	B.C. and Alberta	35 000	1 613 200	Catalytic-fluid	8 100	Catalytic polymerization, catalytic reformer, lube-oil blending plant, asphalt.
Gulf Oil Canada Limited	Kamloops	Comp.	1954	B.C.	7 700	627 000	Catalytic-fluid	2 260	Catalytic polymerization, catalytic reformer, distillate, desulphurization, merox, asphalt, naphtha.
Gulf Oil Canada Limited	Port Moody	Comp.	1958	B.C. and Alberta	37 200	1 754 000	Catalytic-fluid	9 500	Catalytic reformer, distillate, desulphurization, alkylation-sulphuric acid, naphtha–desulphurization, merox, sulphur.
Husky Oil Ltd.	Prince George	Comp.	1967	B.C.	7 700	675 000			Unifiner, reformer, asphalt.
Imperial Oil Enterprises Ltd.	Ioco	Comp.	1915	B.C. and Alberta	40 200	3 055 000	Catalytic-fluid	11 800	Catalytic polymerization, powerformer, toluene extraction, sulphur, LPG plant, desulphurization.
Pacific Petroleums Ltd.	Taylor	Comp.	1960	B.C.	14 300	1 100 000	Catalytic-fluid	4 650	H.F. alkylation, asphalt, pentane splitter, platformer unifiner, HDS unit, DDS unit.
Shell Canada Limited	Shellburn	Comp.	1932	B.C. and Alberta	22 000	2 455 300	Catalytic-fluid	6 000	Catalytic polymerization, platformer, vacuum flashing, solvent fractionation, distillate hydrotreater, sulphur recovery.

Symbols: SA—skimming, asphalt; Comp.—complete.

Table 4-13—Natural Gas Pipelines, 1976

Company	Source of Natural Gas	Transmission-lines		Compressor Stations		Present Daily Capacity (MSCF)	Gathering and Distribution Lines		Areas Served by Distributors
		Size (In.)	Mileage	Number	Horse-power		Size (In.)	Mileage	
British Columbia Hydro and Power Authority	Westcoast Transmission Co. Ltd.	30	38.8	....	.....	562 000	.....	3 925.5	
		24	19.2	....	.....	.....	.....	.....	
		20	47.1	....	.....	.....	.....	.....	Lower Mainland of British Columbia.
		18	37.5	....	.....	.....	.....	.....	
		16	17.2	....	.....	.....	.....	.....	
		12	58.2	....	.....	.....	.....	.....	
		10	14.9	....	.....	.....	.....	.....	
		8	26.1	....	.....	.....	.....	.....	
		6	27.7	....	.....	.....	.....	.....	
		4	13.0	....	.....	.....	.....	.....	
Columbia Natural Gas Ltd.	Alberta and Southern Gas Co. Ltd.	8	55.0	....	.....	85 500	8	1.8	Cranbrook, Fernie, Kimberley, Creston, Sparwood, Elk Valley, Skookumchuk, Elko, Elkford, and Yahk.
		6	70.7	....	.....	.....	6	4.7	
	Westcoast Transmission Co. Ltd.	4	20.2	....	.....	.....	4	10.2	
		3	28.1	....	.....	.....	3	21.8	
		2	0.5	....	.....	.....	2	45.8	
		....	.....	....	.....	.....	1¼	62.4	
		....	.....	....	.....	.....	¾	128.0	
		....	.....	....	.....	.....	⅝	3.8	
Gas Trunk Line of British Columbia	Beg field	....	.....	....	.....	.....	16	27.4	To Westcoast Transmission Co. Ltd.
		....	.....	....	.....	.....	6⅝	5.9	
	Boundary Lake field	....	.....	....	.....	.....	16	31.4	
		....	.....	....	.....	.....	6⅝	2.9	
	Jedney and Bubbles fields	....	.....	....	.....	.....	12¾	31.5	
		....	.....	....	.....	.....	10¾	7.0	
	Laprise Creek field	....	.....	....	.....	.....	12¾	23.8	
	Nig Creek field	....	.....	1	1 800	.....	16	28.3	
Inland Natural Gas Co. Ltd.	Westcoast Transmission Co. Ltd.	12	357.4	1	2 200	200 000	8	279.1	Peace River, Prince George, Cariboo, Thompson, Okanagan, and Kootenay areas.
		10	119.1	1	2 200	.....	6	20.7	
		8	25.7	1	1 100	.....	4	616.1	
	Alberta and Southern Gas Co. Ltd.	6	108.6	....	.....	.....	3	90.9	
		4	144.5	....	.....	.....	2	195.4	
		3	70.0	....	.....	.....	1½	39.8	
		2	70.7	....	.....	.....	1¼	12.4	
		1¼	1.3	....	.....	.....	.....	.....	
Northland Utilities (B.C.) Ltd.	Peace River Transmission Co.	3	2.0	....	.....	10 900	10	0.4	Dawson Creek, Pouce Coupe, and Rolla.
		2	0.4	....	.....	.....	8	1.6	
		1¼	3.2	....	.....	.....	6	2.7	
		....	.....	....	.....	.....	4	12.6	

		---	-----	---	-------	-------	3	5.4	
		---	-----	---	-------	-------	2	25.7	
		---	-----	---	-------	-------	1¼	16.2	
		---	-----	---	-------	-------	¾	0.6	
Pacific Northern Gas Ltd.	Westcoast Transmission Co. Ltd.	10¾	274.3	2	3 150	54 000	6	2.5	Vanderhoof, Fraser Lake, Burns Lake, Smithers, Terrace, Prince Rupert, Kitimat, Houston, Fort St. James.
		8⅝	92.4	---	-------	-------	4	10.5	
		6⅝	36.0	---	-------	-------	3	17.7	
		4½	14.0	---	-------	-------	2	46.3	
		3½	43.7	---	-------	-------	1¼	34.2	
		2⅞	17.8	---	-------	-------	¾	23.6	
		2⅜	28.4	---	-------	-------	½	0.1	
		1⅜	4.0	---	-------	-------	------	-------	
Plains Western Gas & Electric Co. Ltd.	Westcoast Transmission Co. Ltd.	6	0.3	---	-------	12 000	4	14.1	Fort St. John, Taylor, Grandhaven, Charlie Lake, Airport, Baldonnel.
		4	20.9	---	-------	-------	3	3.6	
		3	4.6	---	-------	-------	2½	1.5	
		2	2.0	---	-------	-------	2	52.5	
		---	-----	---	-------	-------	1½	3.1	
		---	-----	---	-------	-------	1¼	0.1	
		---	-----	---	-------	-------	1	11.3	
		---	-----	---	-------	-------	¾	4.8	
Westcoast Transmission Co. Ltd.	Alberta	26	32.5	---	-------	215 000	------	-------	
	Taylor-Willow Flats	30	76.3	---	-------	-------	------	-------	
	Willow Flats-Huntingdon	30	570.3	13	279 640	1 360 000	------	-------	
		36	464.0	---	-------	-------	------	-------	
	Alaska Highway system	---	-----	---	-------	-------	26	37.5	
		---	-----	---	-------	-------	20	18.1	
		---	-----	---	-------	-------	18	17.9	
		---	-----	---	-------	-------	12¾	9.9	
	Beaver River	24	110.9	1	39 000	270 000	------	-------	
	Blueberry West field	---	-----	---	-------	-------	8⅝	6.7	
	Boundary Lake field	---	-----	1	4 000	-------	16	0.5	
	Bubbles field	---	-----	1	660	-------	------	-------	
	Buick Creek field	---	-----	---	-------	-------	26	1.8	
		---	-----	---	-------	-------	10¾	7.3	
	Buick Creek East field	---	-----	---	-------	-------	8⅝	6.6	
	Buick Creek West field	---	-----	1	1 980	-------	20	16.2	
	Cache Creek field	---	-----	---	-------	-------	6	8.6	
	Charlie Lake field	---	-----	---	-------	-------	6⅝	2.3	
	Clarke Lake field	---	-----	---	-------	-------	16	16.4	
	Dawson Creek field	---	-----	---	-------	-------	8⅝	5.4	
	Fireweed field	---	-----	---	-------	-------	10¾	15.3	
		---	-----	---	-------	-------	6⅝	4.2	
		---	-----	---	-------	-------	3½	5.0	
	Flatrock field	---	-----	---	-------	-------	3½	5.0	
	Fort St. John field	---	-----	3	1 980	-------	18	7.8	
		---	-----	---	-------	-------	10¾	0.9	
		---	-----	---	-------	-------	8⅝	0.7	

Table 4-13—Natural Gas Pipelines, 1976—Continued

Company	Source of Natural Gas	Transmission-lines		Compressor Stations		Present Daily Capacity (MSCF)	Gathering and Distribution Lines		Areas Served by Distributors
		Size (In.)	Mileage	Number	Horse-power		Size (In.)	Mileage	
Westcoast Transmission Co. Ltd. —*Continued*	Fort St. John Southeast field	12	7.0	----	.....	.....	12¾	4.0	
	Fort Nelson plant	30	220.8	4	93 400	858 000	.....	.....	
	Fort Nelson-Willow Flats	36	44.5	----	.....	.....	.....	.....	
	Gundy Creek field	----	.....	----	.....	.....	10¾	6.1	
	Helmet field	----	.....	----	.....	.....	16	31.4	
		----	.....	----	.....	.....	10	12.6	
		----	.....	----	.....	.....	8	3.6	
	Kobes-Townsend field	----	.....	1	6 000	.....	12¾	18.9	
		----	.....	----	.....	.....	8⅝	5.5	
	Kotcho Lake field	----	.....	----	.....	.....	12	9.7	
	Kotcho Lake East field	----	.....	----	.....	.....	10¾	11.5	
	Laprise Creek field	----	.....	1	5 160	.....	6⅝	2.5	
	Milligan-Peejay system	----	.....	1	4 000	.....	12	32.2	
		----	.....	----	.....	.....	10¾	23.4	
		----	.....	----	.....	.....	8⅝	13.2	
		----	.....	----	.....	.....	6⅝	6.8	
	Montney field	----	.....	----	.....	.....	4½	7.4	
	Nig Creek field	----	.....	----	.....	.....	6⅝	2.4	
	Oak field	----	.....	----	.....	.....	16	20.7	
		----	.....	----	.....	.....	6	0.9	
	Parkland field	----	.....	----	.....	.....	8⅝	6.7	
	Petitot-Louise system	----	.....	----	.....	.....	10¾	11.8	
		----	.....	----	.....	.....	12¾	15.8	
		----	.....	----	.....	.....	16	6.5	
		----	.....	----	.....	.....	20	25.9	
	Red Creek field	----	.....	----	.....	.....	4½	2.9	
	Rigel field	----	.....	1	6 800	.....	12¾	11.1	
		----	.....	1	1 400	.....	10¾	11.5	
	Rigel North field	----	.....	----	.....	.....	6	6.6	
	Sierra field	----	.....	----	.....	.....	12	6.8	
		----	.....	----	.....	.....	16	6.8	
	Stoddart field	----	.....	1	1 400	.....	8⅝	6.3	
	Yoyo field	----	.....	----	.....	.....	24	48.0	

Table 4-14—Gas-processing Plants, 1976

Operator	Location	Fields Served	Plant Type	Year of First Operation	Plant Capacity Million SCF/Day		Natural Gas	Residual Gas to—
					In	Out		
Amoco Canada Petroleum Limited	Units 68, 69, Block J, N.T.S. Map 94-N-16	Beaver River	Dehydration	1971	247	239.5		Westcoast Transmission Co. Ltd.
Imperial Oil Limited	SE. ¼ Sec. 2, Tp. 85, R. 14, W6M	Boundary Lake	Inlet separator, M.E.A. absorption treating, gylcol absorption dehydration, combined refrigeration and oil absorption natural gas liquid recovery distillation	1964	21	17	Pentanes plus, propane-butane mix	Westcoast Transmission Co. Ltd.
Mobil Oil of Canada Ltd.	Unit 91, Block D, N.T.S. Map 94-I-14	Sierra	Inlet separator, dry desiccant dehydration	1969	127	125		Westcoast Transmission Co. Ltd.
Pacific Petroleum Ltd.	Sec. 36, Tp. 82, R. 18, W6M	All British Columbia producing gasfields except Parkland, Dawson Creek, Boundary Lake, Sierra Clarke Lake, Yoyo, and Beaver River	Inlet separator, M.E.A. treating, dry desiccant dehydration, oil absorption, distillation	1957	500	455	Condensate, pentanes plus, propane, butanes	Westcoast Transmission Co. Ltd.
Westcoast Transmission Co. Ltd.	NW. ¼ Sec. 10, Tp. 85, R. 14, W6M	Boundary Lake	M.E.A. absorption, dehydration	1961	9.4	8.9	Condensate	Westcoast Transmission Co. Ltd.
Westcoast Transmission Co. Ltd.	Unit 85, Block G, N.T.S. Map 94-J-10	Beaver River, Clarke Lake, Yoyo, Helmet, Louise, Petitot	Potassium carbonate, M.E.A. D.E.A. absorption, dehydration	1965	1,096	910		Westcoast Transmission Co. Ltd.

Table 4-15—Sulphur Plants, 1976

Name	Location	Raw Material	Principal Product	Year of First Operation	Capacity (Long Tons per Day)
Westcoast Transmission Co. Ltd.	Taylor	Hydrogen sulphide	Sulphur	1957	260
Westcoast Transmission Co. Ltd.	Fort Nelson	Hydrogen sulphide	Sulphur	1976	400

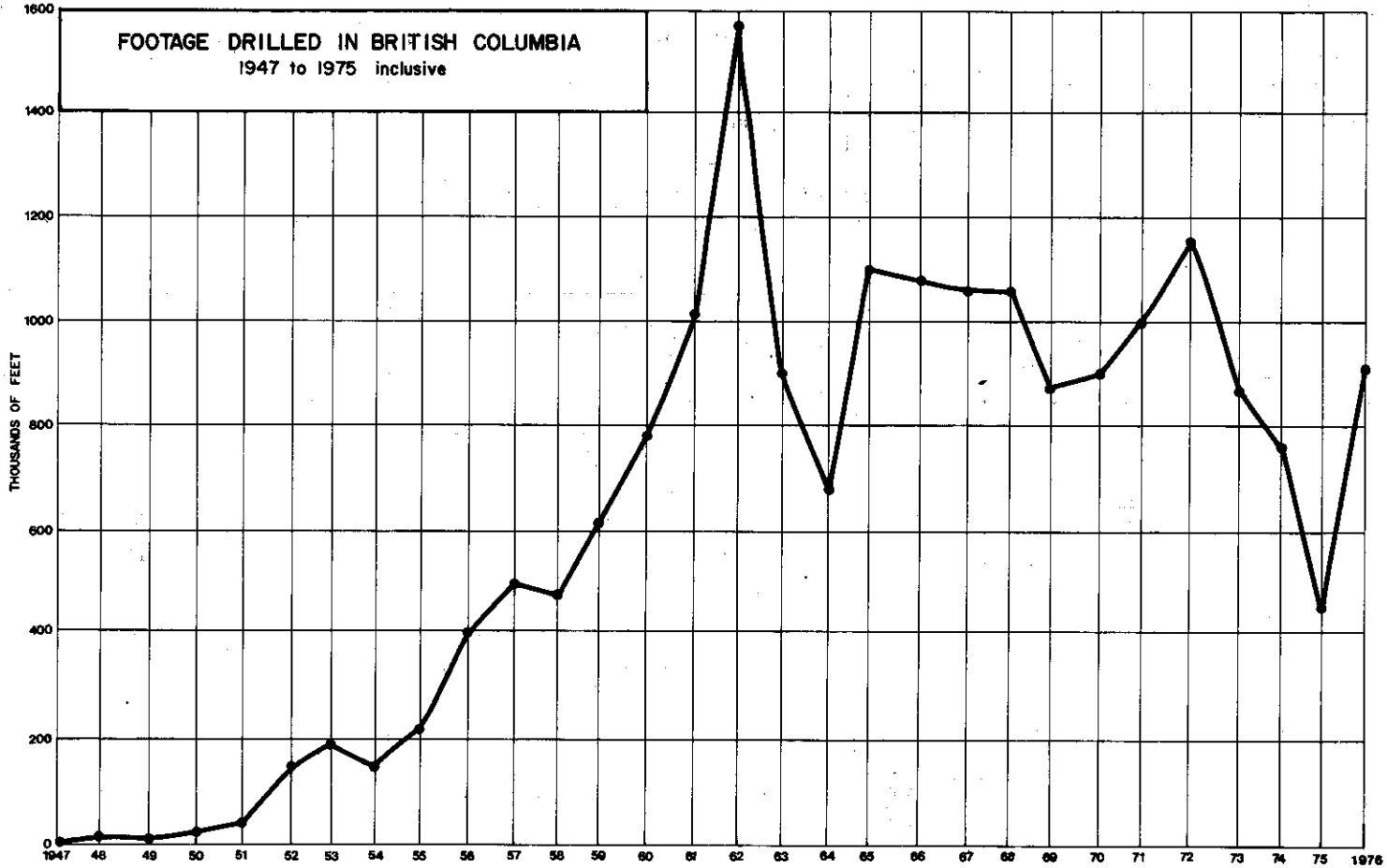

FOOTAGE DRILLED IN BRITISH COLUMBIA
1947 to 1975 inclusive
THOUSANDS OF FEET
0
200
400
600
800
1000
1200
1400
1600
1947
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
1976

Figure 4-1

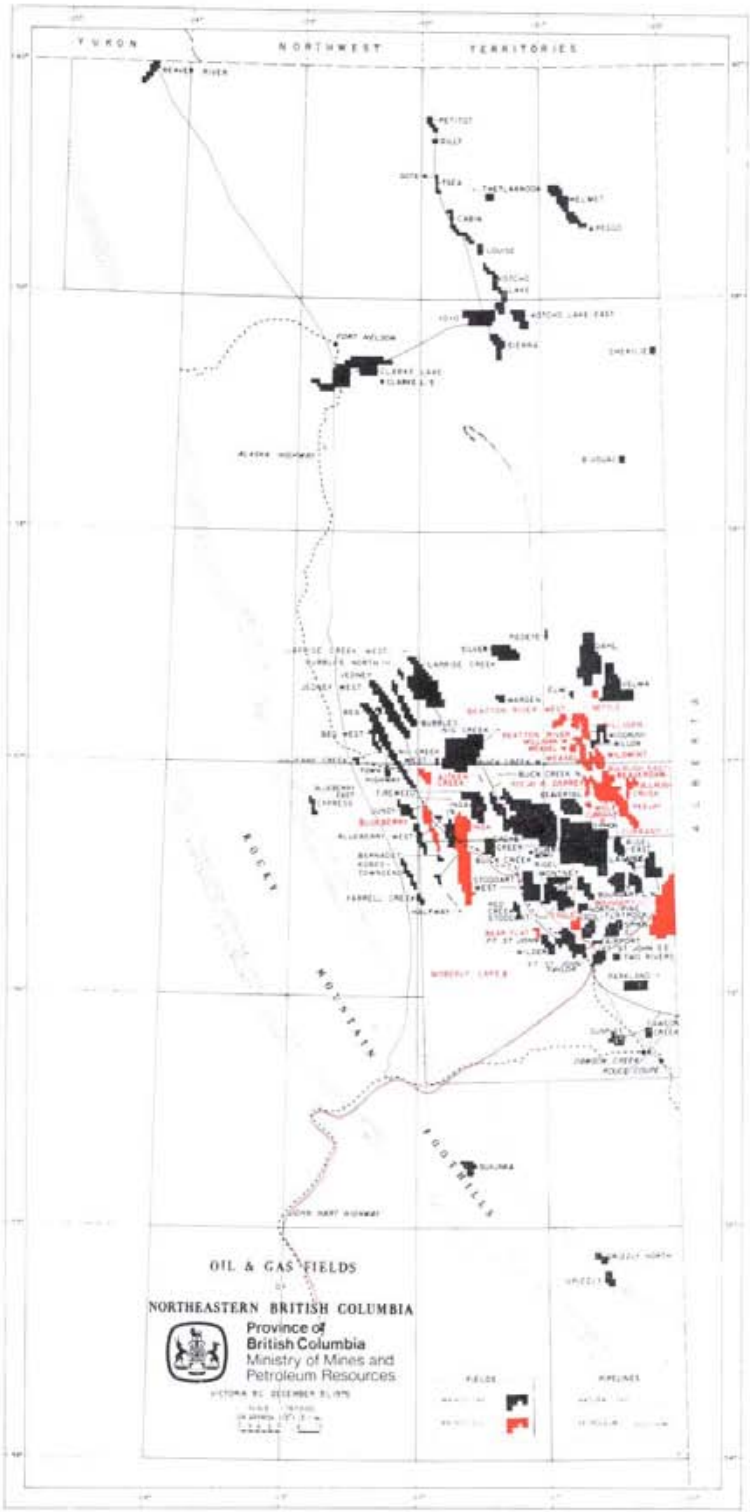

YUKON
NORTHWEST TERRITORIES
ROCKY
MOUNTAIN
FOOTHILLS
OIL & GAS FIELDS
OF
NORTHEASTERN BRITISH COLUMBIA
Province of
British Columbia
Ministry of Mines and
Petroleum Resources

Figure 4-2

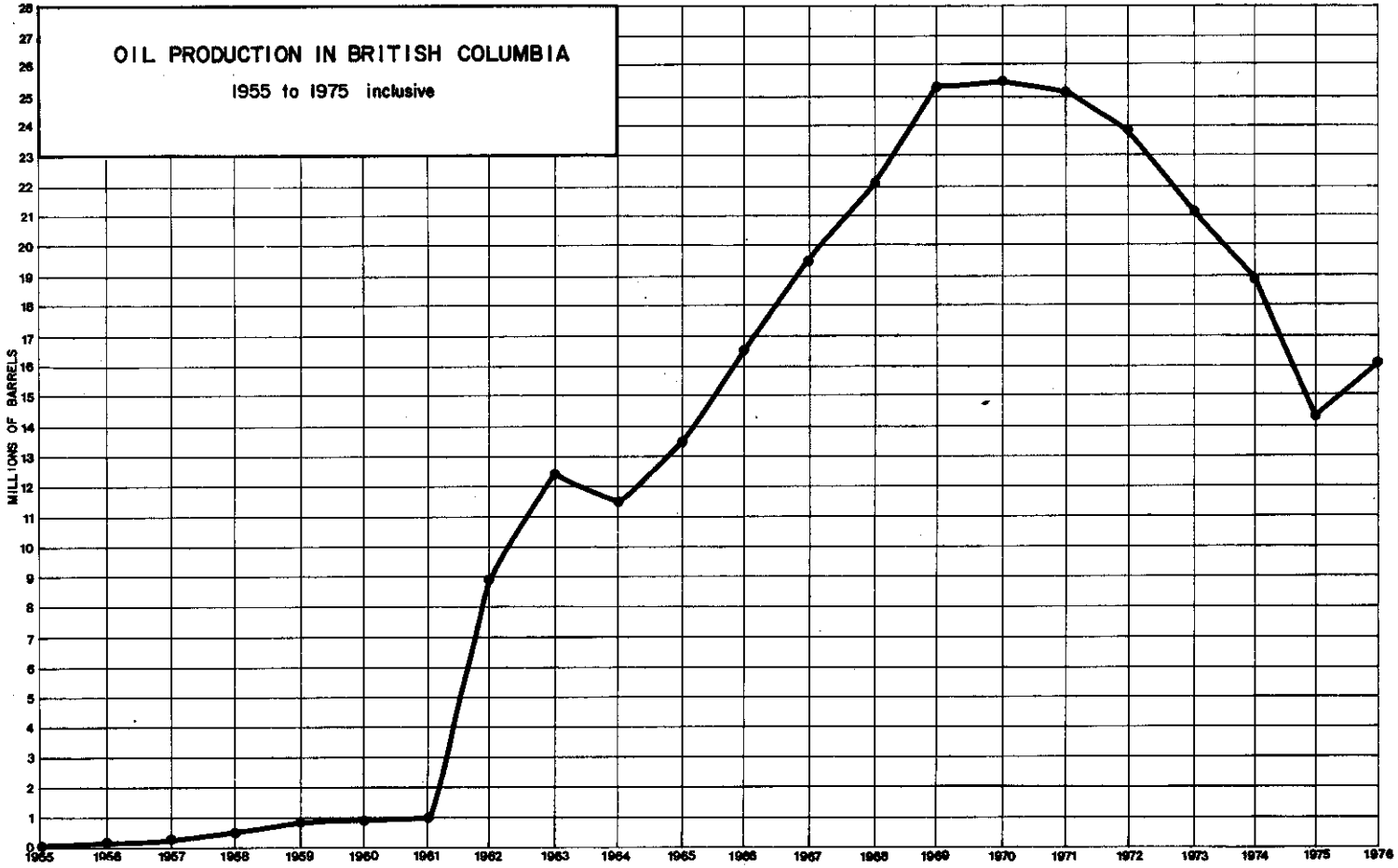

OIL PRODUCTION IN BRITISH COLUMBIA
1955 to 1975 inclusive
MILLIONS OF BARRELS
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976

Figure 4-3

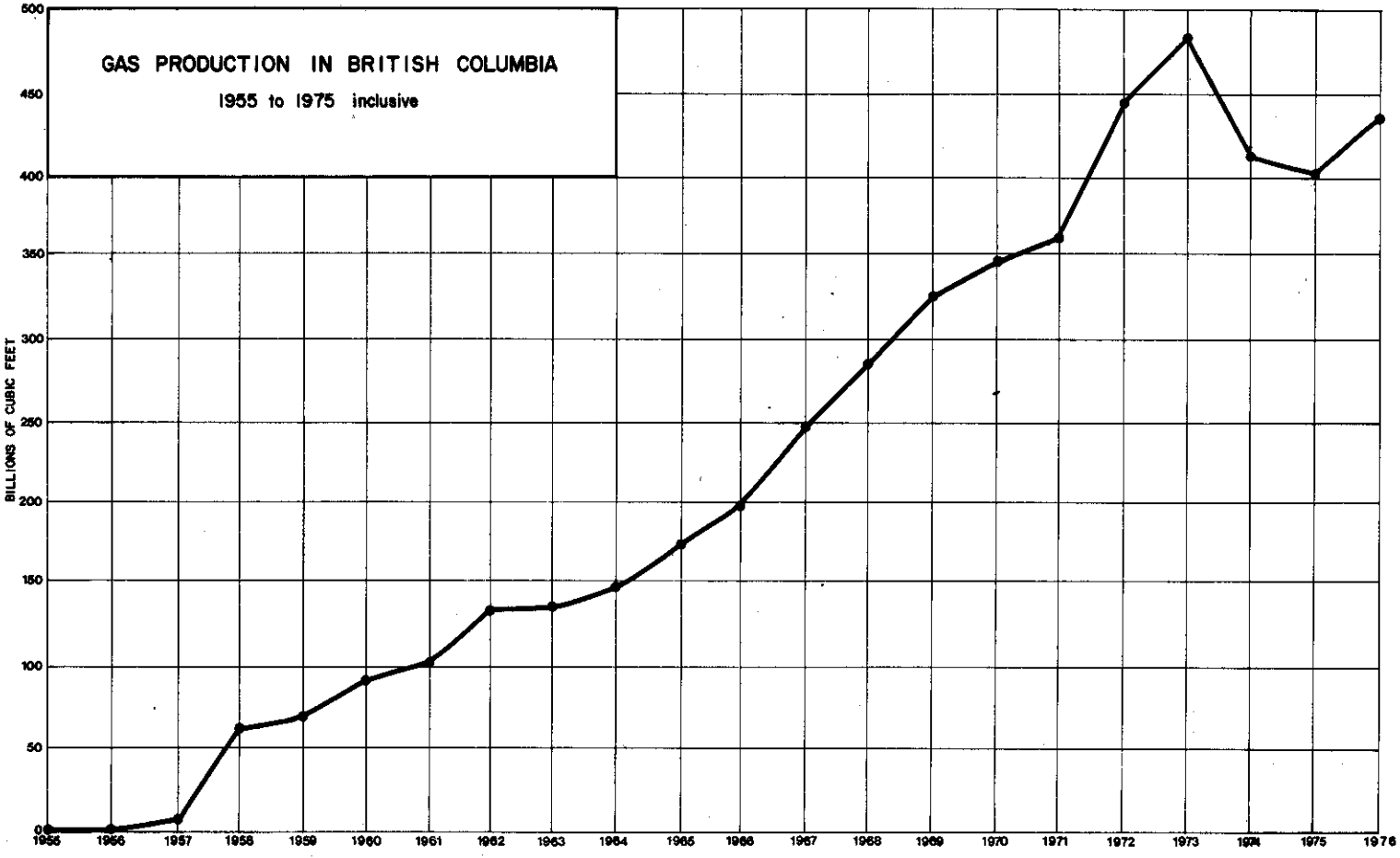

GAS PRODUCTION IN BRITISH COLUMBIA
1955 to 1975 inclusive
BILLIONS OF CUBIC FEET
500
450
400
350
300
250
200
150
100
50
0
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976

Figure 4-4

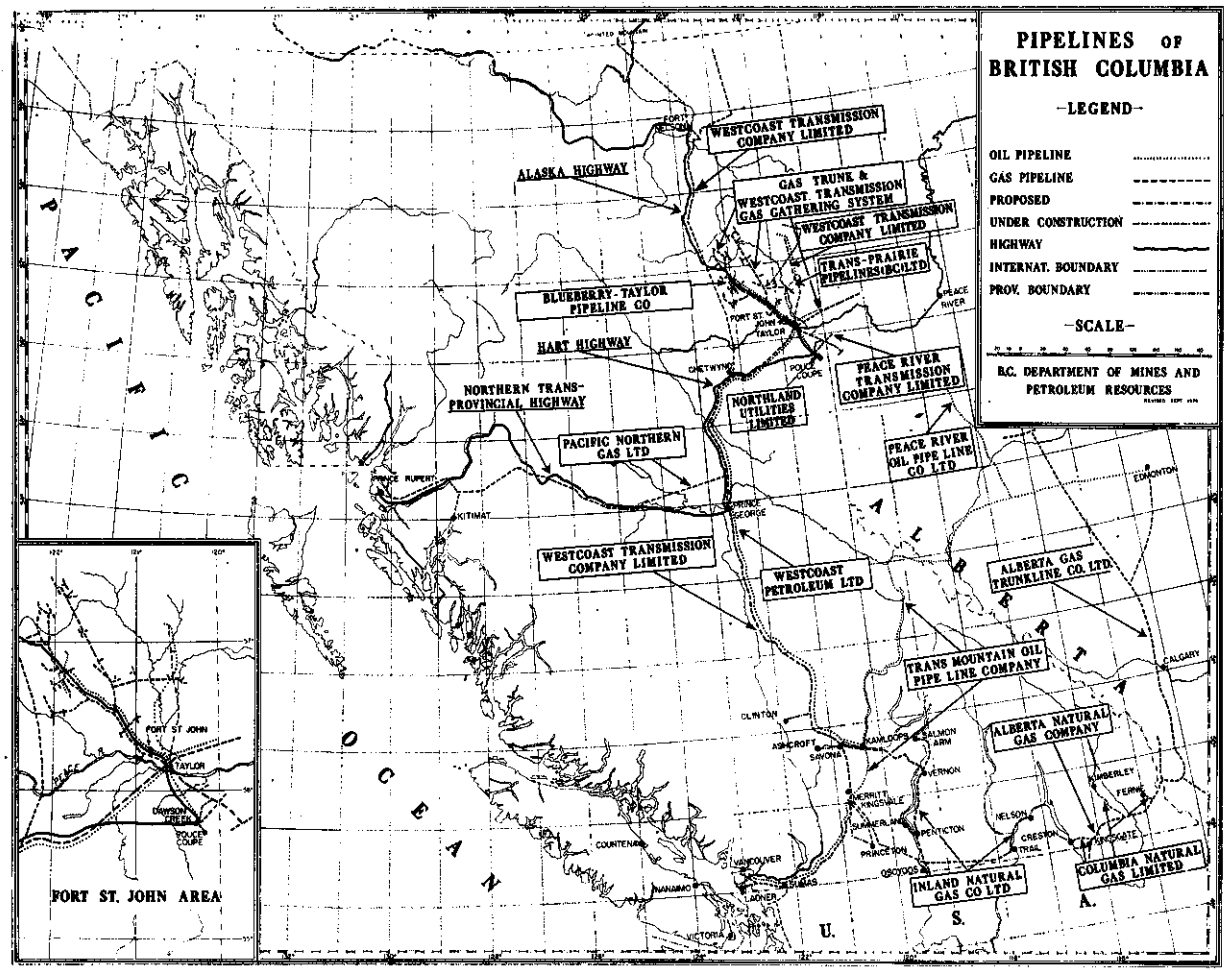

PIPELINES OF BRITISH COLUMBIA
-LEGEND-
OIL PIPELINE
GAS PIPELINE
PROPOSED
UNDER CONSTRUCTION
HIGHWAY
INTERNAT. BOUNDARY
PROV. BOUNDARY
-SCALE-
B.C. DEPARTMENT OF MINES AND PETROLEUM RESOURCES
PACIFIC OCEAN
ALBERTA
WESTCOAST TRANSMISSION COMPANY LIMITED
ALASKA HIGHWAY
GAS TRUNK & WESTCOAST TRANSMISSION GAS GATHERING SYSTEM
WESTCOAST TRANSMISSION COMPANY LIMITED
TRANS-PRAIRIE PIPELINES (B.C.) LTD
BLUEBERRY-TAYLOR PIPELINE CO
HART HIGHWAY
NORTHERN TRANS-PROVINCIAL HIGHWAY
PACIFIC NORTHERN GAS LTD
NORTHLAND UTILITIES LIMITED
PEACE RIVER TRANSMISSION COMPANY LIMITED
PEACE RIVER OIL PIPE LINE CO LTD
WESTCOAST TRANSMISSION COMPANY LIMITED
WESTCOAST PETROLEUM LTD
ALBERTA GAS TRUNKLINE CO. LTD.
TRANS MOUNTAIN OIL PIPE LINE COMPANY
ALBERTA NATURAL GAS COMPANY
INLAND NATURAL GAS CO LTD
COLUMBIA NATURAL GAS LIMITED
FORT ST. JOHN AREA
FORT ST JOHN
TAYLOR
DAWSON CREEK
POUCE COUPE
PRINCE RUPERT
KITIMAT
PRINCE GEORGE
DAWSON CREEK
GRETWYN
POUCE COUPE
PEACE RIVER
EDMONTON
CALGARY
CLINTON
ASHCROFT
SAVONA
KAMLOOPS
SALMON ARM
VERNON
MERRITT
PENTICTON
PRINCETON
OSOYOOS
NELSON
CRESTON
TRAIL
KIMBERLEY
FERNIE
COUTENAY
VANCOUVER
NANAIMO
VICTORIA
LADNER
U.S.A.

Figure 4-5

Directory

(as at December 31, 1977)

Hon. J. R. Chabot (Minister)	Parliament Buildings	387-3576
Dr. J. T. Fyles (Deputy Minister)	Room 406, Douglas Building	387-4262
P. D. Meyers (Solicitor for Ministry)	102, 1016 Langley Street	387-5680
[Vacant] (Executive Assistant)	Parliament Buildings	387-3576

ADMINISTRATIVE SERVICES DIVISION

[*Vacant*] (Director)	Room 435, Douglas Building	387-6243
N. K. Gillespie (Personnel Officer)	Room 428, Douglas Building	387-5765
[*Vacant*] (Information)	Room 435, Douglas Building	387-6243
Rosalyn J. Moir (Assistant Editor)	Room 422, Douglas Building	387-5975
Library	Room 430, Douglas Building	387-6407

MINERAL REVENUE DIVISION

W. W. M. Ross (Director)	Room 442, Douglas Building	387-6991
Bruce Garrison (Assistant Director)	Room 442, Douglas Building	387-6991

MINERAL RESOURCES BRANCH

E. R. Macgregor (Assistant Deputy Minister)	Room 409, Douglas Building	387-5489

INSPECTION AND ENGINEERING DIVISION

Victoria Office:

W. C. Robinson (Chief Inspector)	1837 Fort Street	387-3781
V. E. Dawson (Deputy Chief Inspector)—Coal	1837 Fort Street	387-3782
[Vacant] (Deputy Chief Inspector)—Metals	1837 Fort Street	387-3782
J. Cartwright (Electrical Inspector)	1837 Fort Street	387-3781
G. J. Lee (Senior Mine Rescue Co-ordinator)	1837 Fort Street	387-6254
J. D. McDonald (Senior Reclamation Inspector)	1837 Fort Street	387-3179
D. M. Galbraith (Reclamation Inspector)	1837 Fort Street	387-3630
J. C. Errington (Reclamation Inspector)	1837 Fort Street	387-3630
P. E. Olson (Engineer), Mining Roads and Chairman, Mineral Development Committee	1837 Fort Street	387-6254

Vancouver Office:

[Vacant] (Inspector)	2747 E. Hastings Street, Vancouver V5K 1Z8	254-7171/72
S. Elias (Inspector-Environmental Control)	2747 E. Hastings Street, Vancouver V5K 1Z8	254-7171/72

Kamloops Office:

D. Smith (Inspector)	101, 2985 Airport Drive, Kamloops V2B 7W8	376-7201
E. Sadar (Inspector)	101, 2985 Airport Drive, Kamloops V2B 7W8	376-7201
B. M. Dudas (Inspector)	101, 2985 Airport Drive, Kamloops V2B 7W8	376-7201

Nelson Office: J. B. C. Lang (Inspector)	310 Ward Street, Nelson V1L 5W4	352-2211 ext. 213/342
Fernie Office: D. I. R. Henderson (Inspector)	Box 1290, Fernie	423-6222 (Operator)

INSPECTION AND ENGINEERING DIVISION—*Continued*

Nanaimo Office: J. W. Robinson (Inspector)	2226 Brotherstone Road, Nanaimo V9S 3M8	758-2342
Prince Rupert Office: [*Vacant*] (Inspector)	Box 758, Prince Rupert V8J 3S1	624-2121 ext. 202
Smithers Office: J. F. Hutter (Inspector)	Box 877, Smithers V0J 2N0	847-4411 ext. 212/245
Prince George Office: A. D. Tidsbury (Inspector)	1652 Quinn Street, Prince George V2N 1X3	562-8131 ext. 322/323

GEOLOGICAL DIVISION

Dr. A. Sutherland Brown (Chief Geologist)	Room 418, Douglas Building	387-5975

ANALYTICAL LABORATORY

Dr. W. M. Johnson (Chief Analyst)	541 Superior Street	387-6249
P. F. Ralph (Deputy Chief Analyst)	541 Superior Street	387-6249

PROJECT GEOLOGY

Dr. N. C. Carter (Senior Geologist)	Room 418, Douglas Building	387-5975

Geologists

R. D. Gilchrist	626 Supetior Street	387-5068
Dr. T. Höy	626 Superior Street	387-5068
Dr. W. J. McMillan	626 Superior Street	387-5068
Dr. A. Panteleyev	626 Superior Street	387-5068
Dr. V. A. Preto	626 Superior Street	387-5068
Dr. P. A. Christopher	630 Superior Street	387-5068
Dr. B. N. Church	630 Superior Street	387-5068
Dr. G. E. P. Eastwood	630 Superior Street	387-5068
Dr. K. E. Northcote	630 Superior Street	387-5068
Dr. D. E. Pearson	630 Superior Street	387-5068

RESOURCE DATA

Dr. J. A. Garnett (Senior Geologist)	Room 418, Douglas Building	387-5975

Geologists

Special Projects: [Vacant]	Room 416, Douglas Building	387-5975
Industrial Minerals: Z. D. Hora	626 Superior Street	387-5068
Mineral Inventory:		
E. V. Jackson	Room 427, Douglas Building	387-5975
G. L. James	Room 421, Douglas Building	387-5975
J. E. Forester	Room 421, Douglas Building	387-5975
Coal Inventory: A. Matheson	630 Superior Street	387-5068

APPLIED GEOLOGY AND PROSPECTORS' ASSISTANCE

Dr. E. W. Grove (Senior Geologist)	Room 30, Douglas Building	387-5579
A. F. Shepherd	Room 30, Douglas Building	387-5538

District Geologists

Kamloops: Gordon White	101, 2958 Airport Drive	387-7201
Nelson: George Addie	310 Ward Street	352-2211 (Local 213)
Prince George: Gerry Klein	1652 Quinn Street	562-8131 (Local 322 or 323)
Smithers: T. Schroeter	Box 877, V0J 2N0	847-4411 (Local 277)

TITLES DIVISION

E. J. Bowles (Chief Gold Commissioner)	Room 409, Douglas Building	387-7201
R. Rutherford (Deputy Chief Gold Commissioner)	Room 433, Douglas Building	387-5517
D. I. Doyle (Gold Commissioner, Vancouver)	890 W. Pender Street, Vancouver	668-2672
E. A. Mitchell (Mining Recorder)	Room 411, Douglas Building	387-6255
A. R. Corner (Coal Administrator)	Room 411, Douglas Building	387-5687

Mineral Claims Inspectors

Vancouver: F. A. Reyes	320, 890 W. Pender Street, Vancouver	668-2672
Kamloops: H. Turner	212, 2985 Airport Drive	554-1445
Quesnel: D. Lieutard	401, 350 Barlow Avenue	7751-260
Smithers: R. Morgan	Box 877, V0J 2N0	776-278

ECONOMICS AND PLANNING DIVISION

J. S. Poyen (Director)	Third Floor, 1005 Broad Street	387-3787
F. C. Basham (Deputy Director)	Third Floor, 1005 Broad Street	387-3787
W. P. Wilson (Statistician)	Third Floor, 1005 Broad Street	387-3787

PETROLEUM RESOURCES BRANCH

J. D. Lineham (Associate Deputy Minister, Chief of Branch)	Rooms 404, 405, Douglas Building	387-3485, 387-6256

ENGINEERING DIVISION

A. G. T. Weaver (Chief Engineer)	Room 436A, Douglas Building	387-5993
B. T. Barber (Senior Reservoir Engineer)	Room 436, Douglas Building	387-5993
P. K. Huus (Reservoir Engineering Technician)	Room 403, Douglas Building	387-5993
W. L. Ingram (Senior Development Engineer)	Room 401, Douglas Building	387-5993
M. B. Hamersley (Development Engineering Technician)	Room 401, Douglas Building	387-5993
D. L. Johnson (District Engineer)	Box 6880, Fort St. John	758-6906

GEOLOGICAL DIVISION

W. M. Young (Chief Geologist)	Room 402A, Douglas Building	387-5993
R. Stewart (Senior Reservoir Geologist)	Room 440, Douglas Building	387-5993
J. A. Hudson (Senior Economic Geologist)	Room 442, Douglas Building	387-5993

TITLES DIVISION

R. E. Moss (Commissioner)	Room 446, Douglas Building	387-3333
W. J. Quinn (Assistant Commissioner)	Room 445, Douglas Building	387-3334

Printed by K. M. MacDonald, Printer to the Queen's Most Excellent Majesty
in right of the Province of British Columbia.
1977

3,730-977-2561