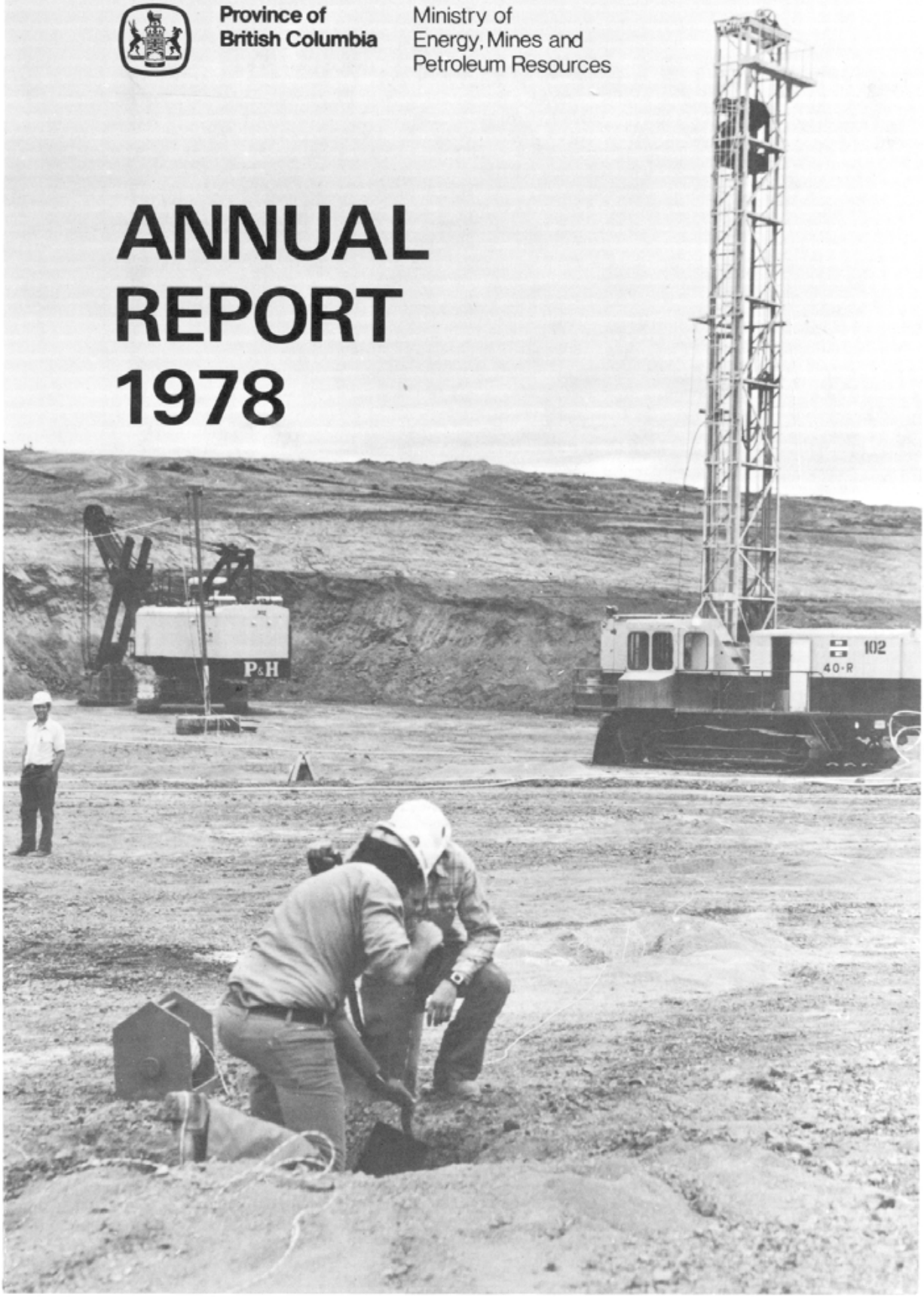
Province of
British Columbia

Ministry of
Energy, Mines and
Petroleum Resources

# ANNUAL REPORT 1978



*To the* ***Honourable*** HENRY P. BELL-IRVING, D.S.O., O.B.E., E.D.,
*Lieutenant-Governor of the Province of British Columbia.*

MAY IT PLEASE YOUR HONOUR:

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

JAMES J. HEWITT
*Minister of Energy, Mines and Petroleum Resources*

*Office* of *the Minister* of *Energy, Mines and Petroleum Resources*
*November 1979*

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## PLATES



All photographs by R E. Player except plate on page 36 by G, Nordin.

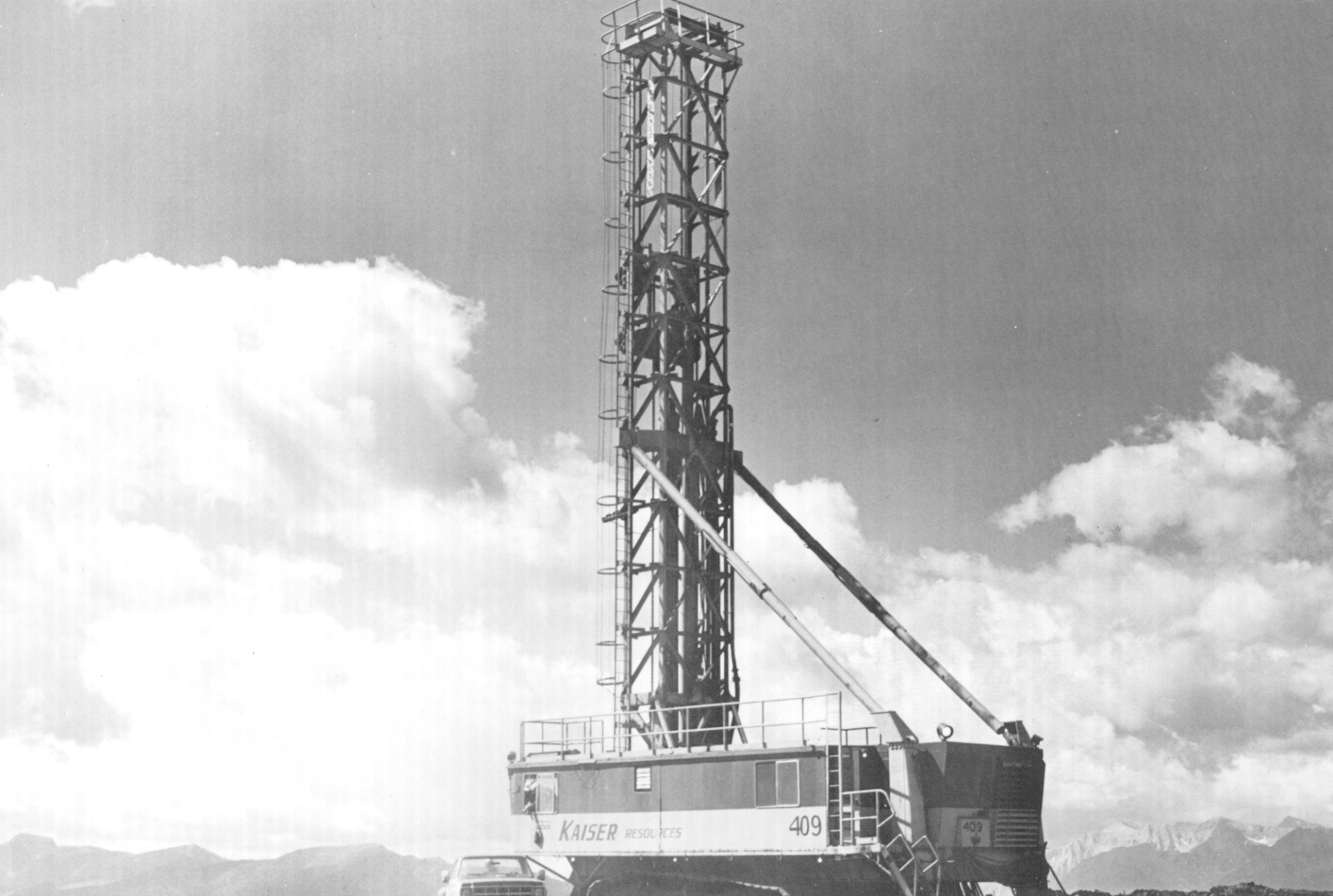
# FOREWORD

The Annual Report of the Ministry for 1978 follows the format of the 1976 Report. 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 Annual Report of the Minister of Mines and Petroleum Resources until this report. In December 1978 the Ministry was enlarged and a reorganization started so that the report is now that of the Minister of Energy, Mines and Petroleum Resources.

In 1969 geological and technical reports previously published as part of the Annual Report were published separately as Geology, ***Exploration and Mining in British Columbia.*** Starting in 1975, this technical volume has been divided into separate reports that are issued as they are prepared, and eventually bound together. Detailed information on mine safety, fatal accidents, dangerous occurrences, etc., was included in the Annual Report until 1973, for 1974 was issued separately, and subsequently forms part of the separate ***volume Mining in British Columbia.***

The Annual Report for 1978 contains four chapters-a general review of the mineral and petroleum industries, a chapter on the activities of the Ministry, one on the statistics of the mineral industry, and one on the performance of the petroleum industry.

The change in mandate of the Ministry occurred so late in the year that no substantial changes occurred within the calendar year, hence energy aspects except those traditionally part of the Ministry are not reflected in the report.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# The Mining and Petroleum Industries in 1978

CHAPTER1

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# INTRODUCTION

By A. SUTHERLAND BROWN

The value of mineral production in British Columbia nearly reached $2 billion, continuing a real growth above the inflation rate. Production was $1.986, billion or an increase of 11.1 per cent over 1977. However, much of the growth was the result of better commodity prices and exchange rates rather than increased production.

The top 10 commodities in 1978 in order of value were copper, natural gas, coal, molybdenum, crude oil, sand and gravel, cement, zinc, lead, and lode gold. Changes in relative position among these commodities are minor. Copper again assumed the top place that it generally has occupied since displacing zinc in 1966. Asbestos dropped out of the top 10 because of the long strike at Cassiar. Structural material commodities-sand and gravel, and cement--each moved two places forward, relegating zinc to eighth place. Gold occupied tenth place, the first time for many years. British Columbia's Canada's leading producer of copper, molybdenum, and coal, and a major contributor to Canada's production of natural gas, lead, tic, asbestos, cement, gold, and silver. The mineral production of 1978 is shown in detail in Table l-1 compared to 1977, and the production in 1978 is diagrammed on Figure l-1.

All major sectors of the mining and petroleum industries experienced growth except industrial minerals. The latter showed a significant decrease because of the drop in asbestos production. Structural materials showed the greatest growth. The total value and percentage change for the various sectors are as follows:

| | 1978 Value $ | Change Per cent |
|---|---|---|
| Metals | 891 778 518 | +14.8 |
| Petroleum and natural gas | 582 969 834 | +5.9 |
| Coal | 381 895 241 | +16.1 |
| Structural materials | 142 341 826 | +23.1 |
| Industrial minerals | 59 471 361 | -24.9 |

Actually 15 of the listed commodities were subject to some decrease in the quantity of material produced but only eight showed a decrease in value. In major commodities, copper, molybdenum, zinc, sand and gravel, asbestos, crude oil, and natural gas all showed some decrease in quantity produced, while gold, iron concentrate, gypsum, jade, sulphur, cement, and coal showed significant increases.

The growth of mineral industry and the changing proportion contributed by the various sectors is illustrated by two diagrams. Figure l-2 shows the growth in total value in actual dollars and in deflated dollars. Figure l-3 shows the relative proportion contributed by the various sectors. In both diagrams these trends are shown in five-year increments to 1970 and yearly thereafter. Figure 1-2 shows that growth has been fairly steady, with an average increase of about $80 million per year since 1965. Comparison of the figures reveals major shifts in trends and allows growth comparisons of specific commodity sectors. The important changes illustrated are as follows:

(1) A dominance of metals throughout the whole period, but a fairly constant decrease in importance since 1935.

(2) The collapse of the coal industry between 1945 and 1970, related significantly to the conversion of railways to oil.

(3) Compensating rapid growth of petroleum and natural gas between 1955 and 1965.

## *Table 1-1—Mineral Production of British Columbia, 1977 and 1978*

| | 1977 | | 1978 | |
|---|---|---|---|---|
| | Quantity | Value | Quantity | Value |
| ***Metals*** | | | | |
| Units | | $ | | $ |
| Antimony kg | 596 207 | 2 519 739 | 459 521 | 2 083 895 |
| Bismuth kg | 18 540 | 187 612 | 28 172 | 166 452 |
| Cadmium kg | 320 711 | 1 720 051 | 253 803 | 1 186 320 |
| Copper kg | 275 224 115 | 384 736 661 | 273 692 676 | 431 694 395 |
| Gold— | | | | |
| placer g | 46 170 | 289 075 | 36 515 | 295 001 |
| lode, fine g | 5 906 336 | 31 301 931 | 6 542 332 | 47 951 880 |
| Iron concentrates t | 445 317 | 7 362 345 | 615 569 | 11 597 462 |
| Lead kg | 78 172 646 | 42 316 293 | 81 064 539 | 51 640 564 |
| Molybdenum kg | 15 521 970 | 142 057 947 | 13 055 203 | 167 714 272 |
| Silver g | 241 503 007 | 37 934 098 | 227 271 890 | 45 071 509 |
| Tin kg | 187 478 | 1 912 300 | 261 863 | 3 675 508 |
| Zinc kg | 103 780 228 | 61 301 001 | 95 618 111 | 52 048 701 |
| Others | ..... | 397 654 | ..... | 4 652 559 |
| Subtotals | ..... | 714 036 707 | ..... | 819 778 518 |
| ***Industrial Minerals*** | | | | |
| Asbestos t | 97 033 | 69 729 205 | 68 766 | 47 066 170 |
| Diatomite t | 1 239 | 49 595 | 2 184 | 59 346 |
| Fluxes t | 28 624 | 95 461 | 22 475 | 56 894 |
| Granules t | 29 551 | 1 238 485 | 26 849 | 1 186 160 |
| Gypsum and gypsite t | 653 126 | 2 357 488 | 733 080 | 3 110 695 |
| Jade kg | 266 621 | 825 523 | 488 759 | 1 422 018 |
| Sulphur t | 248 892 | 3 871 660 | 322 181 | 5 647 993 |
| Others | ..... | 1 017 682 | ..... | 922 085 |
| Subtotals | ..... | 79 185 099 | ..... | 59 471 361 |
| ***Structural Materials*** | | | | |
| Cement t | 909 522 | 42 705 320 | 1 020 065 | 56 140 564 |
| Clay products | ..... | 4 909 799 | ..... | 6 282 560 |
| Lime and limestone t | 2 231 166 | 5 861 614 | 2 512 867 | 7 263 312 |
| Rubble, riprap, and crushed rock t | 2 464 503 | 7 309 536 | 2 841 920 | 8 410 065 |
| Sand and gravel t | 52 994 528 | 54 809 121 | 38 315 952 | 64 227 295 |
| Building-stone t | 4 535 | 55 602 | 405 | 18 030 |
| Subtotals | ..... | 115 650 992 | ..... | 142 341 826 |
| ***Coal*** | | | | |
| Coal—sold and used t | 8 424 181 | 328 846 883 | 9 463 920 | 381 895 241 |
| Total solid minerals | ..... | 1 237 719 681 | ..... | 1 403 486 946 |
| ***Petroleum and Natural Gas*** | | | | |
| Crude oil $m^3$ | 2 200 303 | 132 859 085 | 2 004 699 | 145 005 524 |
| Field condensate $m^3$ | 24 465 | 1 477 248 | 25 386 | 1 836 217 |
| Plant condensate $m^3$ | 180 267 | 9 751 058 | 155 503 | 10 269 861 |
| Subtotals | ..... | 144 087 391 | ..... | 157 111 602 |
| Natural gas to pipeline $10^3m^3$ | 8 895 663 | 396 601 354 | 8 003 029 | 401 373 236 |
| Butane $m^3$ | 111 357 | 5 358 167 | 106 580 | 13 360 454 |
| Propane $m^3$ | 91 297 | 4 392 944 | 85 732 | 11 124 542 |
| Subtotals | ..... | 406 352 465 | ..... | 425 858 232 |
| Total petroleum and natural gas | ..... | 550 439 856 | ..... | 582 969 834 |
| Grand totals | ..... | 1 788 159 537 | ..... | 1 986 456 780 |

CONVERSION TABLE

| Metric | Symbol | |
|---|---|---|
| Tonnes | t | ÷ .90718=short tons. |
| Kilograms | kg | ÷ .45359=pounds. |
| Grams | g | ÷ 31.103=troy ounces. |
| Cubic metres | $m^3$ | × 6.29=barrels. |
| Thousand cubic metres | $10^3m^3$ | × 35.49373=thousand standard cubic feet. |

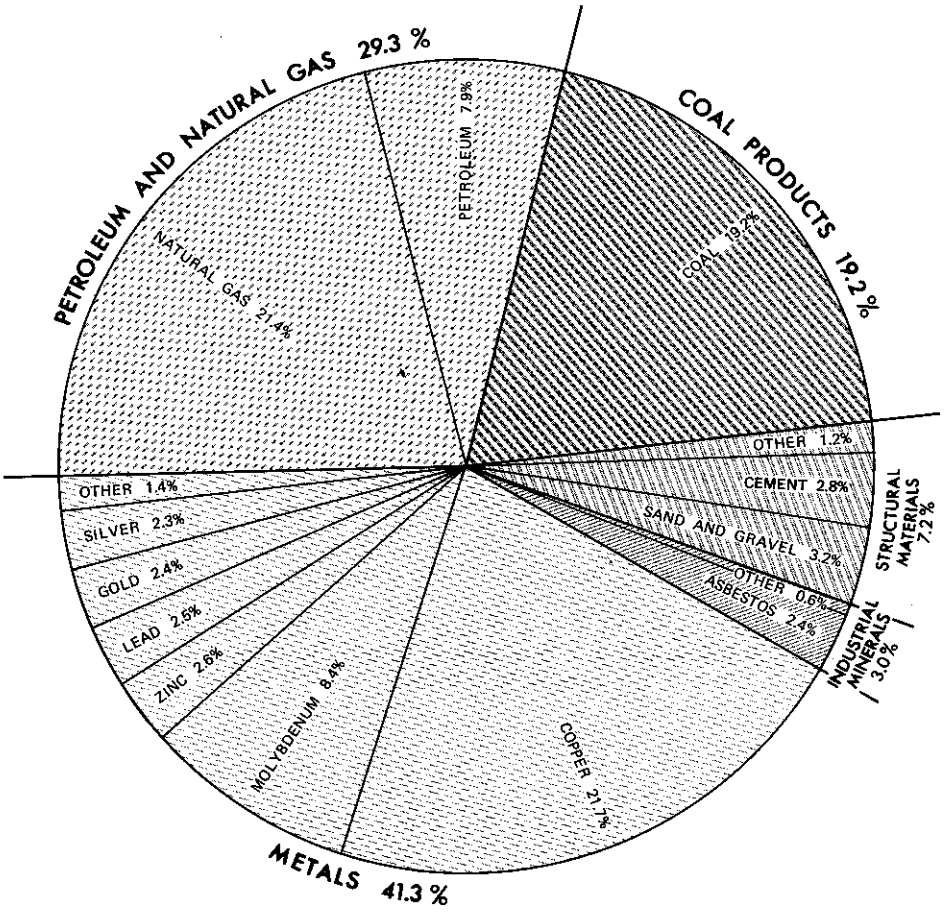



**Figure 1-1—Major mineral commodities produced in 1978 by value.**

(4) Regeneration of significant coal production related to growth of export markets from metallurgical coals in the early 1970's.

(5) Surge in value of metals related to copper and molybdenum production in 1972 and 1973 when the major porphyry-deposit open-pit mines came on stream.

(6) The increase in value of natural gas in 1975 and 1976.

(7) The relative decrease in importance of metals, dropping below 50 per cent of the total for the first time in 1975.

(8) The major changes in proportion starting in 1973 levelled out in 1976 and the proportions have remained stable through 1978.

The value of the production of the various sectors is shown throughout their history of production on a log graph, Figure 3-1.

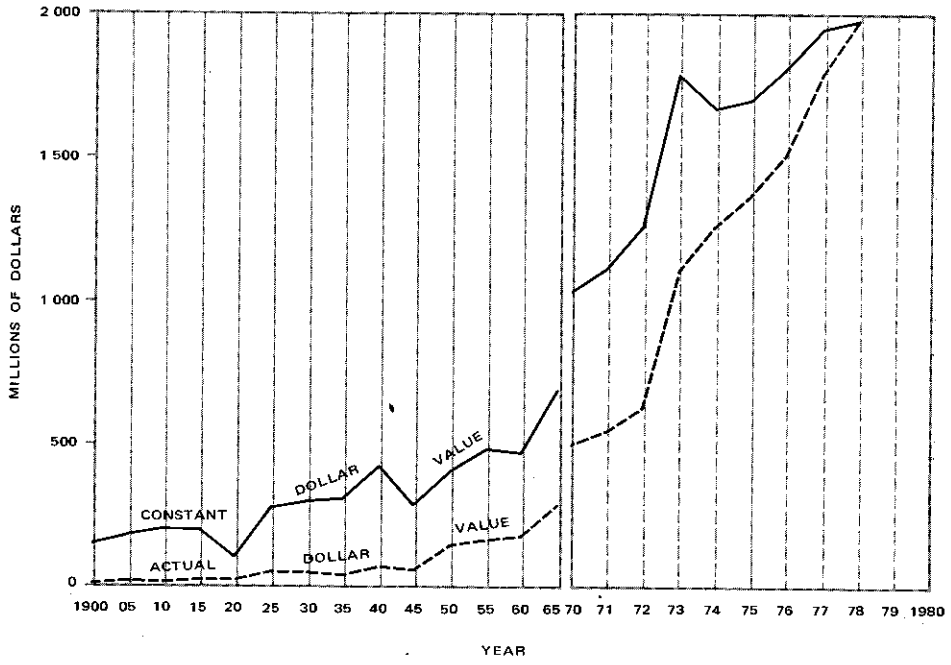



Figure 1-2—Growth of the mineral industry in total value in actual dollars and deflated dollars.

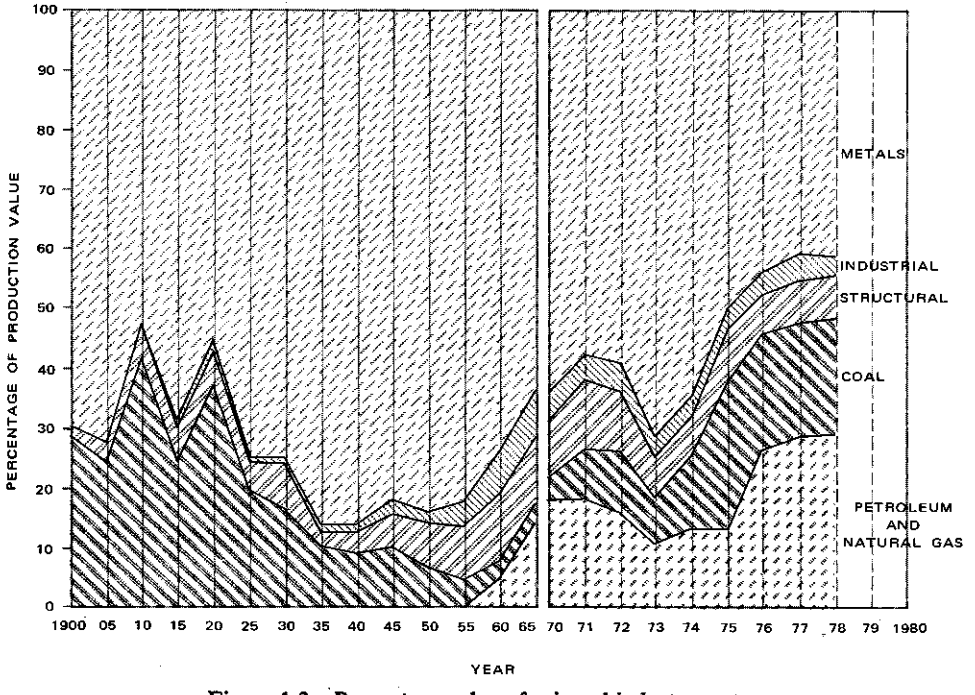



Figure 1-3—Percentage value of mineral industry sectors.

## REVENUE TO THE CROWN

Direct revenue to the Provincial Government in 1978 from the mining and petroleum industries is as shown on Figure 1-4.

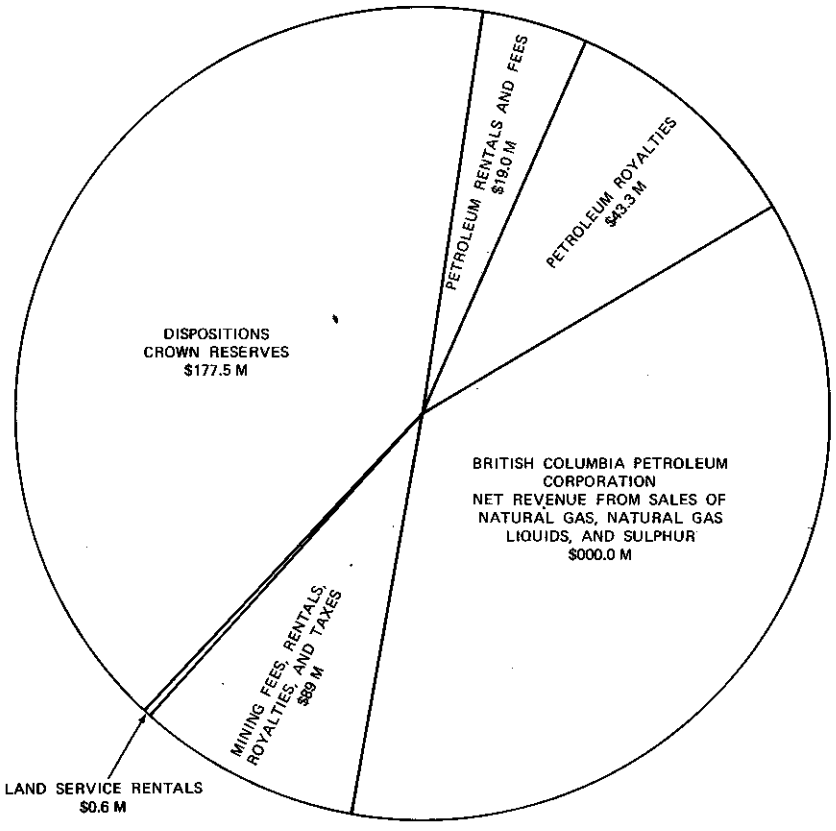



Figure 1-4—Direct revenue to the Provincial Government from the mineral and petroleum industries, 1978.

*Table 1-2—Direct Revenue to the Provincial Government From the Mineral and Petroleum Industries, 1978*

| | $ |
|---|---|
| Petroleum Industry— | |
| Crown reserves—disposition | 177 459 648 |
| Rentals and fees | 19 048 999 |
| Crown royalties | 43 339 456 |
| British Columbia Petroleum Corporation— | |
| Net revenue from sales | 159 400 000 |
| Mining Industry— | |
| Claims, fees, and rentals | 2 842 497 |
| Royalties | 5 851 562 |
| Mineral taxes | 30 391 018 |
| Land Service— | |
| Rentals and royalties on structural materials | 636 360 |
| Total | 438 969 540 |

# THE MINING INDUSTRY IN 1978

By A. SUTHERLAND BROWN AND W. P. WILSON

The total value of solid minerals set another new record, $1.4 billion, up 13.4 per cent from 1977. This was achieved in the face of slight declines in output of most major metals, industrial minerals, and structural materials. Increased commodity prices, favourable currency exchange rates, and a 12.3-per-cent increase in coal production more than made up the difference.

Table l-1 and Figure l-l show the quantity and value of solid minerals produced in 1978 and the table compares these with production in 1977. The ratios of the various sectors of the mining industry are as follows: Metals, 58.5 per cent; coal, 27.2 per cent; structural materials, 10.1 per cent; and industrial minerals, 4.2 per cent. The only significant change from 1977 was a nearly 2-per-cent drop *in* the proportion shared by industrial minerals caused by the drop in asbestos production.

## METALS

The growth and long-term trends of the quantities of major base metals produced are shown on Figure l-5 on a linear graph. These, plus gold and silver, are shown on a log graph on Figure 3-2.

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 on Figure 1-5 but are on Figure 3-2. Their history since the decline in the forties increasingly has been related to by-product origin related to production of base metals at massive sulphide and porphyry deposits. The graphs of these principal metals show all are down slightly in quantity except lead and gold.

In 1978 conditions for copper producers improved significantly for the first time for many years. Copper price, having been low since the sharp peak of 1974, advanced significantly during the year. Favourable currency exchange rates and a lowering of world copper stocks also added to the improved market and the increased value of production. Copper, at $431.7 million, contributed 52.7 per cent of the value of metals produced and 30.8 per cent of the value of all minerals. The quantity of production was down because of the closure of the Granduc mine in mid-year and a prolonged strike at the Gibraltar mine that started May 26 and continued beyond the year-end. However the Afton, which started up late in 1977, had a full year's production and the smelter started producing blister copper early in 1978.

Molybdenum markets continued to be very strong, and the value of production in British Columbia rose 18.1 per cent to $167.7 million, more than three times the value of zinc, the thiid most valuable metal. The quantity produced, however, was down 2.5 million kilograms or 15.9 per cent.

Zinc production was also down 7.9 per cent, and the value at $52 million was down 15.1 per cent due to continuing difficult market conditions and the lowest prices since the beginning of 1975.

Lead remained in fourth position, with a value of $51.6 million, nearly equal to zinc. Unlike the other major metals, production quantity was up 3.7 per cent

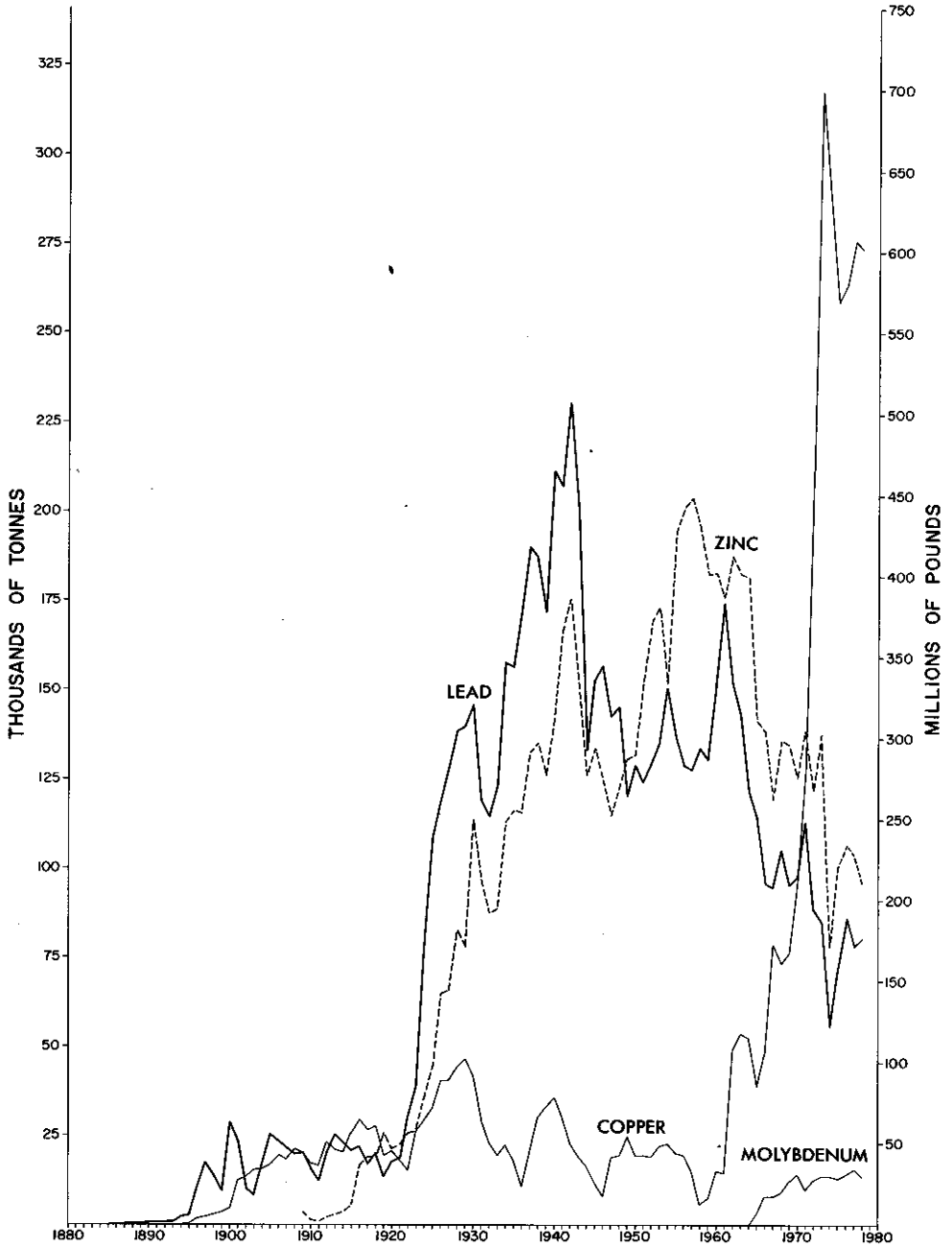



Figure 1-5—Quantities of major metals produced, 1885–1978.

and, with markets continuing fairly strong from the preceding year and with the price rising, the value was up 22 per cent.

Gold (lode) surpassed silver in value for the first time since 1960, to become the fifth most valuable metal. Production was up 10.6 per cent to 6 542 332 grams with a value of $47.9 million. This resulted largely from the sizable new production from Afton mine. In addition the price of gold advanced from $173.18 (U.S.) per ounce in January to $207.85 (U.S.) in December with the result that the value of production was up 53.3 per cent to $47.9 million.

Silver value was up 19.0 per cent to $45.1 million although production was down 6 per cent. This resulted from the significant price increases during the year from $4.39 (U.S.) per ounce in January to $5.92 (U.S.) in December.

Iron concentrate production was up 38.2 per cent over 1977. This was a significant portion of the production of former years, although now almost entirely the product of one mine, Tasu (Wesfrob). The value of production was $11.6 million.

Of the minor metals, tin was up significantly for the second straight year (39.7 per cent above 1977) to 261 863 kilograms with a value of $3.7 million; bismuth production was up but both antimony and cadmium were down.

### COAL

Coal ranked third in value after copper and natural gas. Production was up 12.3 per cent to 9.5 million tonnes and value was up 16.1 per cent to $381.9 million.

### INDUSTRIAL MINERALS

Production value of industrial minerals dropped 24.9 per cent to $59.5 million because the most valuable commodity, asbestos, produced in British Columbia only at the Cassiar mine, was subject to a strike from September 15 to beyond the end of 1978. Only 68 760 tonnes of asbestos was produced, compared to 79 033 tonnes in 1977.

Other important industrial minerals had increased production and value in 1978 but in aggregate were only a small part of the drop in value of the values of the asbestos production. Gypsum, jade, and sulphur production quantities were all up with an aggregate value of more than $10 million in 1978.

### STRUCTURAL MATERIALS

Production and value of all structural materials were up significantly for the tenth year in a row, and the value of $142.3 million was up 23.1 per cent over 1977. All commodities were up except building stone. Sand and gravel at $64.2 million and cement at $56.1 million, the two most important structural materials, were both up significantly. They advanced to become respectively sixth and seventh most valuable commodities in the Province, following crude oil and leading zinc for the first time.

## PROVINCIAL REVENUE FROM MINING COMPANIES

Direct revenue to the Provincial Government in 1978, derived from the mining sector of the mineral industry, is shown in Table l-3. The amount for mineral royalties shown is the amount collected after adjustments for 1977. 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 minerals and structural materials were collected by the Lands Service of the Ministry of Environment. The total revenue is about $40 million, approximately the same as 1977.

***Table I-3-Revenue From Mineral Resources, 1978***

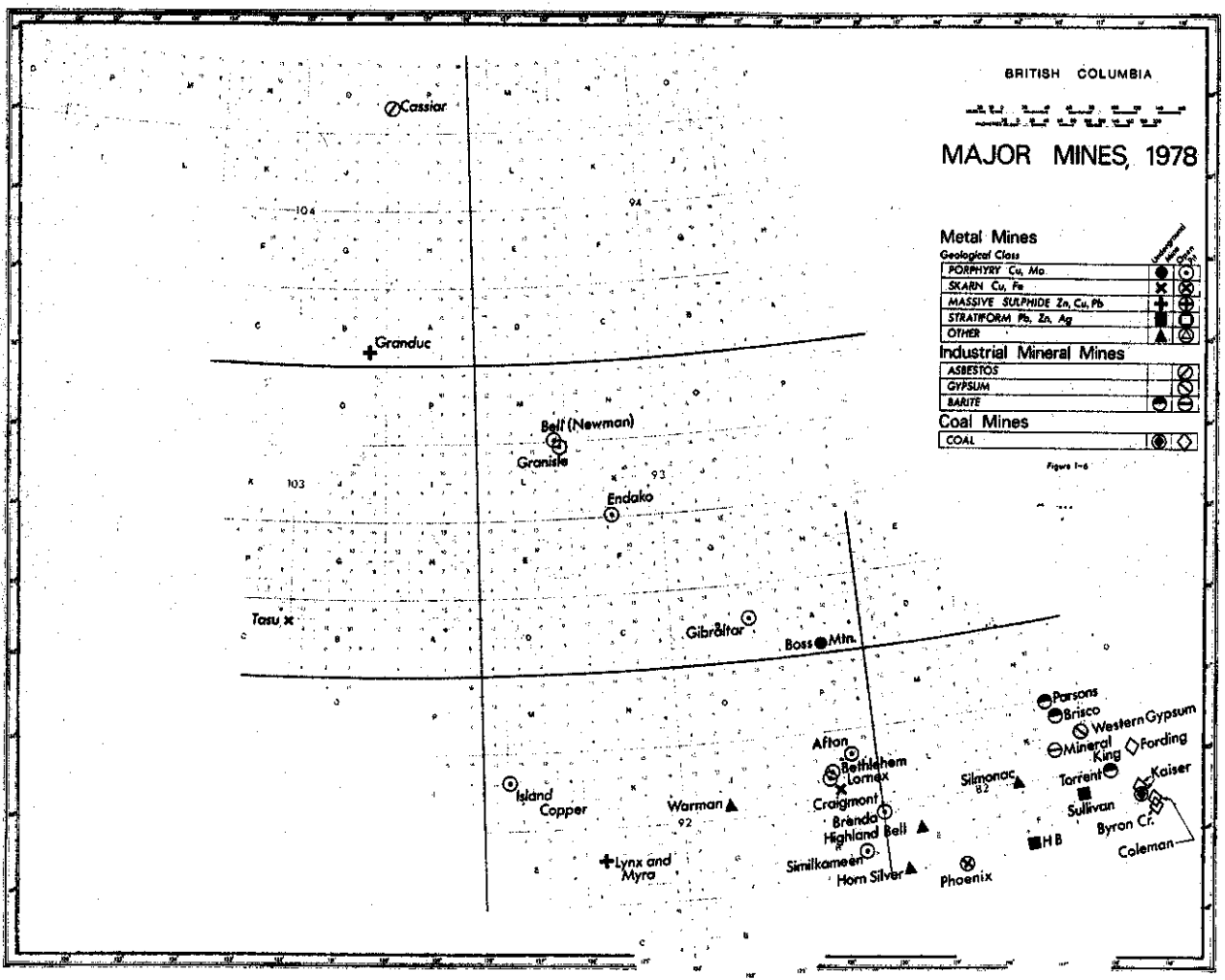
| | $ |
|---|---|
| Claims | 1 705 924.52 |
| Coal licence fees and rentals collected | 1 136 572.00 |
| Coal royalties | 5 030 739.19 |
| Iron ore royalties | 121506.53 |
| Mineral land taxes | 8 162 797.44 |
| Mineral resource taxes | 8 922 897.92 |
| Mineral royalties | 699 316.19 |
| Mining taxes | 13 305 323.01 |
| Rental and royalties on industrial minerals and structural materials (Lands Service) | 636 360.07 |
| Total | 39 721 436.87 |

## EXPENDITURES BY MINING COMPANIES

Major expenditures in 1978 by companies involved in exploration, development, and mining of metals, minerals, and coal are shown in Table 1-4. No major new plants were in process of major expenditure in 1978 so that the expenditures represent ongoing projects or early stages of new projects.

***Table 1-4—Expenditures (Mining Companies), 1978***

| | $ | $ |
|---|---|---|
| Capital expenditures | 36 122 284 | |
| Exploration and development | 104 721 116 | |
| | | 140 843 400 |
| Mining operations (metals, minerals, coal) | | 453 928 938 |
| Mining operations (structural materials) | | 63 079 924 |
| Repair expenditures | | 123 818 077 |
| Total | | 781 670 339 |




*Mines in British Columbia Which Produced More Than 1 000 Tonnes of Ore in 1978*

| 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. | 15th Floor, 1066 W. Hastings St., Box 12524, Vancouver V6E 3X1 | Box 490, Grand Forks (Mining ended in 1976). |
| Horn Silver | Ag, Pb, Zn, Cu | 82E/4E | 140 | U | Dankoe Mines Limited | 2002, 1177 W. Hastings St., Vancouver V6E 2K3 | Box 190, Keremeos. |
| 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. |
| 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. |
| Lynx, Myra | Zn, Cu, Ag, Pb, Au, Cd | 92F 12E | 900 | O | Western Mines Ltd. | Room 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, Au | 92I 6E | 40 900 | O | Lornex Mining Corp. Ltd. | 510, 580 Granville St., Vancouver V6C 1W8 | Box 1500, Logan Lake V0K 1W0. |
| Bethlehem | Cu, Ag, Au | 92I 7W | 16 800 | O | Bethlehem Copper Corp. | 2100, 1055 W. Hastings St., Vancouver V6E 2H8 | Box 520, Ashcroft. |
| Afton | Cu | 92I 10E | 6 350 | O | Afton Mines Ltd. | 1199 W. Hastings St., Vancouver V6E 2K3 | Box 937, Kamloops. |
| 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 2S7 | 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 | Placer Development Ltd.—Endako Div. | 700, 1030 W. Georgia St., Vancouver V6E 3A8 | Endako. |
| Granisle | Cu, Au, Ag | 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 | Westfrob Mines Ltd. (Tasu) | 500, 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. |
| *Industrial Mineral Open Pits and Quarry* | | | | | | | |
| Torrent | Barite | 82G/13W | ..... | U | Mountain Minerals Ltd. | Box 700, Lethbridge, Alta. | Box 603, Invermere. |
| 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. |
| Parsons | Barite | 82N/2E | ..... | U | Mountain Minerals Ltd. | Box 700, Lethbridge, Alta. | Box 603, Invermere. |
| Cassiar | Asbestos | 104P, 5W | 3 630 | O | Cassiar Asbestos Corp. Ltd. | 2080, 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. | 2680, 1177, W. Hastings St., Vancouver V6E 2L1 | Box 2000, Sparwood. |
| Fording (Cloue Creek and Greenhill) | Coal | 82J/2W | 17 000 | O | Fording Coal Ltd. | 200, 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.

## MINING AND TREATMENT

### METAL MINES

Metal mining prospered more in 1978 than for a considerable period previously because world stockpiles were reduced, over capacity was largely eliminated so that prices rose as a result. In addition, Canada's relative position was enhanced by favourable currency exchange with our metal trading partners. Almost all metals except zinc participated in the strengthening of markets. However, a number of factors held production of many metals to about what they were in 1977. Nevertheless, the dollar value of metals produced rose 14.8 per cent during the year to a new record of $819.8 million.

In 1978, 42 mines produced an aggregate of 87 724 973 tonnes of ore which was concentrated or shipped directly to a smelter (see Tables 3-12 and 3-13). This contrasts with 41 mines in 1977 which produced 90 287 570 tonnes of ore. Thus aggregate tonnage was reduced by 2.8 per cent in 1978. Of the 42 mines, 22 produced more than 1 000 tonnes and these are shown on Figure 1-6 classified as to product, geological type, and whether open pit or underground.

In 1978, 12 mines produced more than 1 million tonnes. These large mines produced an aggregate of 84 668 967 tonnes or 96.5 per cent of the ore mined. Ten of the large mines are open-pit operations, including in order of output, Lornex, Island Copper, Endako, Brenda, Siilkameen, Bethlehem, Gibraltar, Bell, Granisle, and Afton. The two others, Sullivan and Craigmont, are underground mines. In aggregate these produced about 4 million tonnes or 4.6 per cent of the total tonnage. In regard to geological type, all 10 large open-pit mines are porphyry deposits of copper and/or molybdenum. Of the large underground mines, the Sullivan is a silver-lead-zinc mine of stratiform type whereas Craigmont is a copper-iron skarn deposit.

Some changes occurred in the list of large mines since 1977. Afton appeared on the list for the first time as it reached rated capacity. Production at Tasu and Granduc dropped just below 1 million tonnes in 1978 so are not included. Granduc produced only until June when it was closed and later sold.

Six intermediate mines operated in 1978, each of which produced between 100 000 and 1 000 000 tonnes. Besides Granduc and Tasu, these include the Lynx and Myra, Boss Mountain, Phoenix, and HB. Strictly speaking, Phoenix closed as a mine but continued producing from the low-grade stockpile. All operating medium mines are underground mines. Granduc and Lynx and Myra are massive sulphide deposits, Tasu and Phoenix skarn deposits, Boss Mountain a porphyry molybdenum deposit, and HB a stratiform lead-zinc deposit. The aggregate tonnage of medium mines was 2 881 231 tonnes or 3.3 per cent of the total.

There were four small mines with production between 1000 and 100 000 tonnes a year. These are. all underground mines producing from vein deposits whose principal values are. in silver or gold and silver with by-product base metals. The mines in order of production tonnage are the Warman (Northair), Highland Bell, Horn Silver, and Siionac.

Changes during 1978 did not include opening of any new major mines but two mines closed, one. it appears temporarily. The HB mine near Salmo exhausted its reserves and closed in August after mining about 6.7 million tonnes mainly between 1955 and 1966 and again from 1973 to 1978. The Granduc mine near Stewart ceased operations in June but was under investigation with regard to purchase by Esso Minerals before the end of the year. Among small mines the Astra (Van

Silver) closed but the Scranton, Bluebird, and Ottawa, all of which produced more than 1 000 tonnes in 1977, produced less in 1978.

Concentrating

In 1978, 29 concentrators operated (see Table 3-12). Six treated copper ore, five copper-molybdenum, 13 lead-zinc-(silver-gold), two molybdenum, two copper-iron, and one copper-lead-zinc ores. Bethlehem started operating a new molybdenum circuit during the year reflecting the increased price of this metal. The old circuit operated in 1964–66. Many of the lead-zinc-silver concentrators are old ones in the Slocan with a small throughput. The Phoenix mill continued producing from low-grade stockpile but closed finally in October 1978. The HB concentrator was closed and moth-balled for possible custom work in the future.

***Smelting, Refining, and Destination of Concentrates***

Most of the lead-zinc concentrates produced in the Province are smelted and refined here as well as some from outside the Province, but, for the first time since the closure of the Anyox smelter in 1933, copper was smelted within British Columbia. The Afton rotary top-blown converter started continuous operations in March 1978, producing 5 995 tonnes of blister copper. This unique smelter near Kamloops is operated by Teck Corporation in conjunction with the Afton Porphyry copper mine which produces low sulphur concentrates. The Trail lead-zinc smelter and refinery of Cominco Ltd. was continued with its modernization to improve environmental aspects and productivity. Molybdenum concentrates are also processed at Endako where both molybdic trioxide and ferromolybdenum are both produced.

The smelter at Trail received concentrates and scrap from a number of sources-principally company mines within the Province (Sullivan and HB), the Pine Point in the Northwest Territories, and custom sources both inside and outside the Province. The smelter received 138 170 tonnes of lead concentrates and 134 980 tonnes of zinc concentrates from the Sullivan and HB mines, and 10 760 tonnes of lead concentrates and 5 210 tonnes of zinc concentrates from other British Columbia mines. The total value of concentrates, including by-product metal from British Columbia treated at Trail, was $130 177 040 or 15.9 per cent of metal production of the Province in 1978.

Endako shipped products containing 6 030 967 kilograms of molybdenum. Of this, 10 176 tonnes was molybdic trioxide, and 200 tonnes was ferro-molybdenum.

The proportions of the total value of metal production going to the various destinations are. not known accurately but are approximately as follows: Smelted or treated in British Columbia, $134.2 million (16.4 per cent); shipped to other parts of Canada, $58.0 million (7.1 per cent); exported to Japan, $420.1 million (51.2 per cent); exported to the United States, $68.0 million (8.3 per cent); exported to Europe, $128.4 million ( 15.7 per cent) ; other or unattributed, $11 .1 million (1.3 per cent).

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

Copper concentrates produced in British Columbia were shipped to the following destinations: Eastern Canada, 80 622 tonnes; the United States, 26 972 tonnes; Japan, 770 684 tonnes; Germany, 36 733 tonnes; elsewhere, 59 916 tonnes.

Details of the disposition of molybdenum (13 055 203 kilograms valued at $167 714 272) are not precisely ascertainable but from known sales, almost 44 per

cent of the total was shipped to Europe and about 28 per cent to Japan. The balance was disposed of to many other countries and eastern Canada.

Zinc concentrates, produced but not smelted in British Columbia, totalled 30 918 tonnes, of which 27 551 tonnes were shipped to the United States and 3 367 tonnes shipped to Japan.

Iron concentrates produced in British Columbia were sold to the following markets: Japan, 371 711 tonnes; the United States, 152 602 tonnes; Australia, 30 668 tonnes; Canada, 61088 tonnes.

Lead concentrates, produced but not smelted in British Columbia, totalled 598 tonnes and were shipped to the United States.

### NON-METALLIC MINES

Industrial minerals in British Columbia with production value greater than $1 million include asbestos, sulphur, gypsum, jade, and granules (see Table l-l). Asbestos is by far the most important, its production value of $47.1 million representing 79 per cent of the total for all industrial mineral production. Asbestos production is entirely from the Cassiar mine which was on strike from September 15, 1978, until January 15, 1979. Sulphur is produced entirely as a by-product, chiefly from Cominco Ltd.'s roasting operations, but also from sour gas production in the Peace River. Gypsum is produced chiefly at the Windermere quarry at Westroc Industries Limited (733 080 tonnes). Granules are produced in many small quantities but production was dominated by the International Marble & Stone Company Ltd. with a plant at Sirdar near Creston. In 1978 production of jade again exceeded $1 million. Production came from many sources but the main mines are. working *in situ* nephrite at Mount Ogden (Continental Jade Ltd.), east of Dease Lake (Cry Lake Minerals Ltd. and Nephro-Jade Canada Ltd.), and at the Cassiar asbestos mine.

Barite, an important industrial mineral, not specifically listed in Table 1-1, was produced by Mountain Minerals Limited from three small underground mines near Brisco, Parson, and Torrent and tailings from the Mineral King mine at Toby Creek, all in the East Kootenays.

The dominant structural materials produced are sand and gravel, cement, limestone, clay products, and riprap, crushed rock, and building stone. Individual mines and quarries are not shown on Figure l-6. Many of these products are produced at a large number of small quarries, some of which have very intermittent production. Limestone production is dominated by four mines (Ideal, Imperial, Vananda, and Domtar) on Texada Island. The Cobble Hill quarry (British Columbia Cement Company Limited) on Vancouver Island is being phased out. Significant operations are also located at Harper Ranch near Kamloops (Canada Cement Lafarge Ltd.), Ptarmigan Creek near Quesnel (Quesnel Redi-Mix Cement Co. Ltd.), and Pavilion Lake (Steel Brothers Canada Limited).

Clay and shale production in British Columbia is dominated by Clayburn Industries Ltd.'s pit and plant near Abbotsford, with lesser production by Haney Brick and Tile Limited, east of Haney.

### COAL

Coal is the third most valuable mineral commodity to British Columbia, following copper and natural gas, and improved its position *vis-à-vis* these products in 1978. Although coal is widely distributed in the Province, the major producing mines are at present concentrated in the Crowsnest Coalfield of southeast British

Columbia. They are represented by five symbols on Figure l-6 for (1) Fording Coal Limited's two open pits, (2) Kaiser Resources Ltd.'s open-pit complex (Harmer Ridge), (3) Kaiser's two underground mines (Balmer North and Hydraulic), (4) Coleman Collieries Limited's Tent Mountain open-pit mine, and (5) Byron Creek Collieries Limited's open pit. The only other producing coal mine is Bulkley Valley Collieries Limited's mine at Telkwa which was a very minor producer of thermal coal. The Sukunka colliery of BP Minerals Limited near Chetwynd operated to test mining methods during part of the year. Production for Kaiser's and Fording's mines arc consolidated in Table 3-8B so that only five operations arc shown. Kaiser Resources Ltd. and Fording Coal Liited produced 94 per cent of the coal mined in the Province in 1978.

Some salient facts about coal production in 1978 are as follows:

(1) Coal production was up significantly to 9 463 920 tonnes, a new record, 6 per cent above the previous record in 1975.
(2) Clean coal output was up 6 per cent to 9 093 048 tonnes.
(3) The value of coal sold and used was $381 895 241, up 16.1 per cent to a new record.
(4) About 93.4 per cent of raw coal produced in 1978 comes from surface mining operations, Virtually unchanged since 1977.
(5) About 89 per cent of raw coal produced was metallurgical coal.
(6) The percentage of clean to raw coal remain&d at 74 per cent.

The diversification of markets started in 1977 continued in 1978. Although coal sales to Japan increased to over 7 million tonnes, up 2.2 per cent, they now represent only 74.2 per cent of total production. Shipments to many countries were up and Spain, Italy, Sweden, and Taiwan were new recipients. Major shipments were as follows:

| | Tonnes |
|---|---|
| Korea | 471 368 |
| Denmark | 284 408 |
| Romania | 241706 |
| Brazil | 190 792 |
| Belgium | 132 351 |
| Spain | 123 886 |
| Italy | 93 304 |
| Sweden | 52 159 |
| Mexico | 41 822 |
| Taiwan | 26 756 |
| Argentina | 18 389 |
| United States | 3 791 |

Shipments in Canada were up 61.6 per cent, with 344 722 tonnes to Ontario Hydro, 56 956 tonnes to Manitoba, and 120 tonnes to Nova Scotia. Use in British Columbia was up also with 292 005 tonnes used for coke, an increase of 93.4 per cent but other uses dropped about 3 per cent to 62 437 tonnes.

## EXPLORATION

Exploration during 1978 showed a significant increase over the previous year, the third year in sequence this has occurred. All the indices used by the Ministry to measure exploration effort were up in 1978, except total geophysics. Programs were generally at more mature stages than in 1977 so expenditures, especially in metals exploration, increased significantly. Exploration for uranium in particular

progressed to the stage where extensive drilling occurred. In contrast coal exploration was only up slightly and that for industrial minerals and structural materials was down from the very high figure of 1977.

*Table 1-5—Indices of Metal Exploration*

| | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|
| | $ | $ | $ | $ |
| Exploration expenditure | 22 100 000 | 27 183 927 | 26 177 389 | 29 475 341 |
| Claims recorded | 11 751* | 28 970* | 37 151* | 37 242* |
| Certificates of work | 39 403 | 36 729 | 39 711 | 65 705 |
| Free miners certificates— | | | | |
| Individual | 8 484 | 7 826 | 7 566 | 9 444 |
| Companies | 562 | 555 | 520 | 531 |
| Number of properties | 409 | 433 | 564 | 647 |
| Total drilling (metres) | 92 802 | 97 277 | 110 303.6 | 154 177 |
| Total geophysical surveys (kilometres) | 4 835 | 4 267 | 14 623.5 | 9 135.5 |

* Unit modified grid system.

## METALLIC MINERALS

The indices of metal exploration are indicated in Table l-5 compared to the three previous years. All indices are up except kilometres of geophysical surveys. Total expenditure was up 12.6 per cent; claims recorded, +0.2 per cent; certificates of work, +65 per cent; individual free miners certificates, +25 per cent; and companies, +2 per cent; number of properties receiving work, + 18 per cent; total drilling, +40 per cent; and total geophysical surveys, -37.5 per cent. The last index although down from 1977 was more than double the previous two years. This slight decrease plus the large increase in drilling indicates maturing of exploration programs and principally those related to uranium. The number of free miners' certificates extant has been decreasing steadily for the last five years until the significant reversal of this trend in 1978.

The metals most sought in 1978 appeared to be molybdenum, uranium, tungsten, and tin. A notable feature of the 1978 exploration scene was the relatively low level of porphyry copper investigations, a reflection of depressed world copper prices over the past three years. However, exploration and development of massive sulphide deposits containing copper, zinc, gold, and silver increased over 1977.

The most active metal exploration areas in the Province included, from north to south: The Surprise Lake-Atlin area (uranium, tungsten/tin), Kechika–Gataga Rivers of the northern Rocky Mountains (stratiform lead/zinc), Fraser Lake–Vanderhoof and Central Interior (uranium), Barkerville area (placer gold), North Thompson River area (stratiform copper), Highland Valley-Aspen Grove area (porphyry molybdenum/copper), and the southeast Okanagan-Boundary area (uranium).

Massive sulphide prospects explored in 1978 included two in tbe Coast Range: the Nifty near Bella Coola, drilled by Pan Ocean, and Maggie Mines' property near Howe Sound north of Vancouver, drilled by Canex Placer. Regional exploration was conducted in the Omineca area northwest of Prince George and near Barrière Lakes north of Kamloops where several prospects in Paleozoic rocks were drilled. One of these programs disclosed interesting copper mineralization in acid volcanic rocks on the Chu Chua property, owned by the Vestor group of companies and under option to Craigmont.

Lead/zinc deposits explored in southeast British Columbia included the Vine deposit at Moyie Lake, drilled by Cominco, and the Cottonbelt Shuswap-type deposit, drilled by Metallgesellschaft.

Significant lead/zinc/barite deposits in Upper Devonian/Mississippian black shale sequences in the Kechika River area of northeast British Columbia attracted considerable attention. Gataga Joint Venture conducted a major drilling program at Driftpile Creek and Cyprus Anvil drilled a similar deposit to the southeast. Also in northern British Columbia, exploration drilling continued on the Suzie property where galena and sphalerite occur in dolomitized limestone.

One of the most active exploration areas in the Province was in the Atlin-Jennings River-Cassiar area where considerable effort was directed to the search for tungsten and tin. Three types of tin occurrences are known in the part of northwest British Columbia and adjacent Yukon. Cassiterite occurs in the gold placer creeks east of Atlin which drain the Surprise Lake batholith which hosts quartz/wolframite veins with tin as a minor constituent. Minor tin is associated with scheelite at the Adanac molybdenum property, and in skarns in the general area.

At Trout Lake, 56 kilometres southeast of Revelstoke, drilling of a significant molybdenum discovery by Newmont and Esso Minerals is continuing to further define a reported 275-metre intersection of 0.40 per cent $MoS_2$. An underground exploration program is under consideration for 1979.

Exploration programs for gold and silver included Toumigan Mining's drilling and underground work at Big Missouri north of Stewart, and projects by several companies on gold mineralization on Porcher and Banks Islands south of Prince Rupert and on the Queen Charlotte Islands.

***Government Programs to Encourage Exploration***

Ongoing geological programs include regional mapping in areas of mineral potential and studies directed to the better understanding of ore deposits. Related programs include reconnaissance geochemical surveys in selected areas, principally through the three-year Federal/Provincial Uranium Reconnaissance Program (URP) which was completed in 1978. This program involved the collection of stream sediments and waters at a sample site density of one per 13 square kilometres. Waters are analysed for fluorine and uranium and sediments for uranium and up to 11 other elements. To the end of 1978, six 1:250 000 map sheets have been published, including live in southeastern British Columbia and the Atlin sheet in the northwestern part of the Province. The 1978 sampling program included the Jennings River–McDame map-area east of Atlin, and survey results were made available in the spring of 1979 (see Fig. 2-2).

The 1978 Accelerated Mineral Development Program, funded by $5 million made available through Bill ***5, Revenue Surplus of 1976–77 Appropriation Act, 1978,*** included an Accelerated Geochemical Survey of ***two*** map-areas in west-central British Columbia. This program is modelled after the Uranium Reconnaissance Program except that sample site density was one per 8 square kilometres. Data from this program were to be released in the late spring of 1979.

The Accelerated Mineral Development Program also expanded existing Ministry programs including Prospectors' Assistance, funds for mineral roads, and mine sites reclamation. In addition, funds were made available to assist with labour costs for underground mine development and property exploration, and for the Mineral Exploration Incentive Program which reimbursed junior mining companies

and prospectors for one third of field expenditures up to a maximum of $50 000. Details of the Accelerated Mineral Development Program are given in Chapter 2 (pp. 43-4s )

***Major Exploration Activity***

Nine properties were reported as completing programs exceeding more than 3 000 metres of drilling or 300 metres of underground development. These non-producing properties, defined as conducting major exploration by the above criteria, are listed below.

BANK, WALLER (Hecate Gold Corporation), 103G/8E—a replacement gold deposit in shear zones on the west coast of Banks Island, a 427-metre decline.

JEFF (Imperial Oil Limited), 104I/1W—a bedded, massive copper/zinc sulphide deposit at the head of Kutcho Creek, 130 kilometres east of Dease Lake, 8 933 metres of diamond drilling.

Nu, ELK (Placer Development Limited), 93K/3E—west end of Endako molybdenum porphyry deposit, 10 797 metres of percussion drilling and 5 053 metres of diamond drilling.

IDAHO (Carolin Mines Ltd.), 92H/11W—a disseminated gold deposit near Hope, 6 155 metres of underground diamond drilling.

SULLIVAN MINE AREA (Cominco Ltd.), 82F/9E; 82G/12W—stratabound iron/lead/zinc sulphide lens at Kimberley, 4865.9 metres of surface diamond drilling and 1 000 metres of underground diamond drilling.

BLIZZARD (Norcen Energy Resources Limited), 82E/10W—uranium in loosely consolidated sediments underlying Tertiary plateau basalt at Lassie Lake, Beaverdell area, 294 diamond-drill holes, 15 000 metres and 47 rotary holes, 2 000 metres.

TROUT LAKE (Newmont Exploration of Canada Limited), 82K/12E—molybdenum porphyry deposit 4 kilometres west of Trout Lake village, five diamond-drill holes, 4 298 metres.

PR (Gold Fields Mining Corporation), 39A/12W—copper porphyry, 8 kilometres west of Quesnel Forks, percussion drilling, 4063 metres and diamond drilling, 1 596 metres.

NED (Granges Exploration Aktiebolag), 93F/6—a zinc/lead/silver/gold deposit in rhyolite at the east end of Capoose Lake, 63 percussion drill holes, 3 688.1 metres.

***Development and Feasibility Studies***

Development of previously explored deposits increased significantly in 1978.

The Sam Goosly copper/silver deposit south of Smithers was optioned from Equity Mining/Kennco by Canex Placer in mid-year. Additional development drilling and metallurgical studies are under way pending a production decision. Esso Minerals continued drilling the significant Kutcho massive sulphide deposit in northwest British Columbia, part of which is held by Sumitomo who have reported at least 9 million tonnes of good grade copper/zinc mineralization.

Underground development and mill construction went on at the Nu-Energy gold deposit near Cassiar where production and mill tune-up started in December 1978. Feasibility studies continued at the Carolin gold property near Hope. A major drilling program was continued by Amax on Logtung, a significant stockwork tungsten/molybdenum property on the British Columbia/Yukon border.

Two potentially economic types of uranium deposit have been identified in British Columbia. Rexspar is a volcanogenic deposit in which uranium minerals and fluorite occur in Paleozoic trachytic volcanic rocks. The Blizzard, southeast of Kelowna, is a basal or paleo-stream channel deposit in which secondary uranium minerals are contained in poorly consolidated Tertiary sediments preserved beneath a Pliocene basalt cap. Continued drilling of this deposit, owned by Lacana and under option to Norcen, has indicated the presence of 1.9 million tonnes of 0.17 per cent $U_3O_8$.

## NON-METALLIC MINERALS

Costs of exploration and development for industrial minerals, structural materials, and placer in 1978 decreased from $559065 to $459280. However, the 1977 figure was abnormally high due to major capital costs that year, and the 1978 figure still represents a dramatic increase over expenditures of previous years.

The following major projects took place in 1978. Barite exploration was concentrated in the northeastern Rockies and the East Kootenays. The Letain asbestos prospect near Kutcho Creek was explored by 4500 metres of diamond drilling. Exploration for gypsum near Canal Flats, limestone near Terrace and at Holberg Inlet, talc near Hope, and phosphate near Fernie continued on a small scale. Laboratory testing, feasibility studies, and development work on a mica property near Valemount, perlite prospects near the Empire Valley and at Uncha Lake, and on a silica property near Golden were indicative of renewed interest in these commodities.

## 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 cords, of Late Cretaceous and Tertiary age, occur in widely scattered areas of British Columbia. Size and economic potential of most of these, including reserves in the former coal-mining areas of Vancouver Island, are comparatively small, although they are of potential value for power development as energy costs continue to increase. An exception of the foregoing is the Hat Creek property, which is a Tertiary lignite of limited areal extent but of remarkable thickness, and possibly the coals of the Groundhog Coalfield of north-central British Columbia.

### *Coal Exploration*

On February 10, 1978, the moritorium on the issuance of coal licences ended, resulting in the granting of 1 036 coal licences, totalling 257 960 hectares in the Province, bringing the total to 501 076 hectares comprising 2 103 coal licences, thus doubling the area of coal lands held. In addition, there were a further 525 coal licence applications, totalling 95 510 hectares, being considered at the end of the year. There were no coal licences surrendered. Unfortunately most of the coal licences were issued well on in the field season, thus allowing little time for exploration generated from acquisition in 1978. Nevertheless, coal exploration was up marginally in 1978 with a total of $19 800 923.

Activity in the Peace River again was very intensive and greater than in the Crowsnest. Other significant activity occurred at Hat Creek, Comox, Similkameen, and Telkwa Coalfields.

Programs with greater than 3 000 metres of total drilling took place at the following properties, from south to north:

*Crowsnest Coalfield*

MICHEL (Kaiser Resources Ltd.)-71 rotary drill holes, 9 550 metres; seven adits.

LINE CREEK (Shell Canada Resources Limited)—19 diamond-drill holes, *4 747* metres; 12 rotary drill holes, 3 079 metres; four adits.

GREENHILLS (Kaiser Resources Ltd.)-two diamond-drill holes, 560 metres; 19 rotary drill holes, 2 850 metres; two adits.

Hat *Creek Coalfield*

HAT CREEK (British Columbia Hydro and Power Authority)-28 diamond-drill holes, 7 323 metres; seven rotary drill holes, 882 metres.

*Peace River Coalfield*

SAXON (Denison Coal Limited)-nine diamond-drill holes, 3 474 metres; 14 rotary drill holes, 929 metres.

BELCOURT (Denison Coal Limited)—16 diamond-drill holes, 5 332 metres.

MONKMAN-BELCOURT (Pacific Petroleum Ltd.)-30 diamond-drill holes, *9'647* metres: 22 rotary drill holes, 2 292 metres.

MOUNT SPIEKER [Ranger Oil (Canada) Ltd.]—18 diamond-drill holes, 12 988 metres.

SUKUNKA [BP Exploration (Canada) Ltd.]—10 diamond-drill holes, 2 551 metres; 20 rotary drill holes, 5 050 metres.

# THE PETROLEUM INDUSTRY IN 1978

By the Staff of the Petroleum Resources Branch

Drilling activity continued to increase during 1978 with the number of wells up 30 per cent over 1977 and up 390 per cent over 1975. Production of oil and gas, however, was down 9 and 10 per cent respectively due mainly to reasons other than decreased productivity, as described below. Industry's interest in Crown land acquisition remained high during the year with proceeds from sales amounting to $177.5 million compared to $125.5 million in 1977. The following are tabulations of the petroleum industry fiscal data for 1978:

*Table 1-6—Value of Production of Petroleum Industry, 1978*

| | $ |
|---|---|
| Crude oil | 145 005 524 |
| Field condensate | 1 836 217 |
| Marketable natural gas | 401 373 236 |
| Gas plant liquids | 34 754 856 |
| Total | 582 969 834 |

*Table 1-7—Provincial Revenue From Petroleum Industry, 1978*

| | $ |
|---|---|
| Rentals and fees | 19 048 999 |
| Crown reserve dispositions | 177 459 648 |
| Royalties (oil, gas, and products) | 43 339 456 |
| Gas revenue from B.C. Petroleum Corporation | 159 400 000 |
| Total | 399 248 103 |

## DRILLING

Growth in annual drilling operations and the length of the drilling season significantly increased for the third successive year. The total wells drilled was 30 per cent greater than in 1977. The footage of wells drilled as step-outs to established production was 71 per cent higher than in 1977. Wildcat footage, at locations far removed from the established pools, was up 31 per cent while development drilling within producing fields gained 6 per cent. Again, an increase in the amount of drilling during the summer months was evident as operations increased rapidly in June and continued at a high level until year-end. A shortage of available drilling rigs, especially during the winter months, imposed a constraint on the level of activity.

The total number of wells drilled was 393. Footage drilled was 2 110 948 (643 428.1 metres), an increase of over 30 per cent from the previous year. All categories of wells recorded increases over 1977. There were 202 gas wells, 71 oil wells, and 129 abandonments-up 22, 84, and 9 per cent. In addition four wells were completed as service wells and two were assigned standing status. As in previous compilations, if more than one zone is completed in a well, each productive zone is counted as one well. Fifteen multiple zone completions were made in 1978 making the total number of wells recorded as 408. Included in the count are five wells that had been drilled in previous years which were. x-entered and deepened.

All of the activity, limited to the northeastern corner of the Province, was accomplished by 71 individual drilling rigs that were owned by 34 drilling contractor firms and employed by 87 different oil companies.

On July 1, 1978, all drilling operations were converted to SI. This caused considerable confusion in field operations which continued until acceptance and experience of the system improved. At year-end only minor problems could be attributed to the conversion.

## PRODUMON

Oil production for 1978 was 12 609 176 barrels, down 9 per cent from 1977. Several incidents contributed to this decrease. A major fire in the Boundary Lake field caused a significant disruption to production as did an oil pipeline break. Another factor that adversely affected the oil production was a decrease in demand for asphaltic-type crude from Boundary Lake during the first part of the year. However, after August 1978, oil production was slightly higher than for the same period in 1977 at nearly 40 000 barrels per day.

The concentrated developments in tbe Eagle area moved the field into prominence and to fourth largest-producing oil field in the Province. The largest-producing oil fields during the year were Boundary Lake, 5 618 791 barrels; Inga, 1 349 943 barrels; Peejay, 1 123 542 barrels; and Eagle, 1 014 944 barrels.

Gas production for 1978 also decreased compared to 1977. The nonassociated raw gas production was 341051255 MCF compared to 379 599 825 MCF in 1977. Although additional gas was available from the newly connected areas of Grizzly, Velma, and Dahl, the over-all production was down 10 per cent. The use of natural gas by the domestic market was a slight 2 per cent higher while the volume delivered to export was 11 per cent down. The demand by the export market continually decreased since May and presented a problem in the marketing of the gas supply producible in the Province.

Yoyo was again the largest gas-producing field reporting 65 162 982 MCF. It was followed by Clarke Lake, 49 684 731 MCF, Sierra, 28 650 148 MCF, and Laprise Creek, 28 811 243 MCF.

In order to maintain or improve production, applications by industry to convert wells to salt-water disposal service were approved in the Dahl, Grizzly, Siphon, Velma, and Yoyo fields and in tbe Klua (2) and South Julienne areas.

Two applications by Union Oil Company for approval of modifications to the waterflood schemes in the Crash and Wildmint fields were approved. In addition, it was agreed that additional oil recovered as a result of the modifications would only be subject to new oil royalty rates.

Applications for Good Engineering Practice and the concurrent production of oil and gas were approved for the Altares Bluesky pool, Fort St. John Nancy pool, South Grizzly Unit Dunlevy pool, Pocketknife Debolt pool, Sierra Pine Point A pool, Weasel Halfway F pool, Boundary Lake North Halfway C and D pools, Buick Creek Doig pool, Fireweed b-26-D/94-A-14 Doig pool, Flatrock Halfway C pool, North Pine 6-13-85-l 8 North Pine pool, Nettle Gething pool, and Nig Creek d-53-A/94-H-4 Baldonnel pool. AU approvals were conditional on conservation of gas production.

Following the issuance of an order by the Miter requiring conservation of solution gas produced from wells in the Eagle Belloy oil pools, a number of oil wells in the Belloy F pool were shut-in to await installation of recovery facilities.

## OPERATION PROBLEMS IN THE FIELD

During 1978, no major oil spills occurred at field production facilities; however, one pipeline incident and one wellhead mishap are worthy of mention.

The only major pipeline spill which this section monitored occurred when the S-inch Norcen pipeline in the Wildmint field ruptured due to stress that had been imposed on the pipe during road construction in the fall of 1977. The rupture point was approximately 20 metres from the north side of the East Milligan Creek. Oil spill equipment was installed at a control point on the main Milligan Creek, and by using booms, skimmers, and associated equipment, the majority of the estimated 2 100 barrels spilled was recovered.

The second incident of note occurred at the well GPD Eagle 6-22-84-18, in the newly developed Eagle oil field. It appeared that the 100-barrel oil spill was due to the fact that both the master valve and the wing valve on the wellhead had been opened to about four turns of the valve wheel. The reason for these valves being opened is not known, but appeared to be a deliberate act of vandalism. Due to quick actions taken by both the landowner and by Norcen Energy Resources Limited, a major oil spill was averted. Cleanup operations took place immediately and minimal damage was incurred.

During 1978 no major incidents occurred at drilling sites. One near accident took place at Nuggett Drilling Rig No. 3 during September 1978 when, due to instability of the lease surface, anchor lies were pulled out and the derrick toppled. No damage was done to the blowout preventor system, and the well was safely shut in. After removal of old rig debris, another rig was moved on and drilling operations were concluded.

A fire occurred during August 1978 at Texaco Boundary Lake A battery. The cause of the fire, which totally destroyed the header house and separator building, was attributed to sparks igniting the flow of oil and gas when the cast top blew off a check valve on one of the group oil separators. Oil production at this battery, which normally runs at 6 000 barrels of oil per day, was regained to about 90 per cent by the use of temporary field headers and by tieing in the field satellites directly to the treaters.

## EXPLORATION AND DEVELOPMENT

Exploratory and development drilling activity for the 1978 calendar year set a new record high with a total of 393 wells drilled and re-entered compared to 310 wells drilled and re-entered in the previous corresponding period (Fig. 4-20). The over-all drilling program was slightly weighted in favour of exploratory over development activity with 203 and 190 assigned to each classification respectively. Approximately 75 per cent of this total activity took place within the general Fort St. John area.

Exploratory drilling (wildcats and outsteps) carried out in all areas of the northeastern sector of the Province, with exception of the Liard Plateau, resulted in 21 oil completions and 97 gas completions, for an over-all success ratio of 58 per cent. A further breakdown of this activity shows that 65 wells resulted in extensions to established reserves, 5 in New Pool oil discoveries and 48 in New Pool gas discoveries.

All of the oil and 28 of the New Pool gas discoveries were made in the Mesozoic rock sequences of the Fort St. John area. The remaining 20 gas discoveries were completed in the Mesozoic and Paleozoic sedimentary rocks of the general Fort Nelson and Foothills Belt areas. For the most part the Cretaceous and Triassic horizons were the favoured objectives in the southern areas with the Middle Devonian reefs the primary horizon of interest in the northern area.

None of the successful exploratory wells completed in 1978 can be given major gas discovery status. However, several of the Middle Devonian reef wells drilled in the Sierra South area encountered substantial gas reserves. New Pool discoveries in the Fort St. John area resulted in minimal additions to reserves while those wells completed to the south along the Grizzly–Sukunka gas trend could offer a greater volume of reserve with subsequent successful development drilling. In the area drilling is expected to maintain the current rate of high activity as a result of the completion in 1978 of the Grizzly-Cbetwynd gas transmission facility.

Development drilling activity resulted in 142 completions out of a total 190 wells drilled, for a success ratio of 75 per cent. Most of the development drilling took place within the general Fort St. John area with successful oil and gas infill and extension wells to a number of established pools. The most active areas included oil development in the Eagle and Stoddart West pools. Gas reserve development was carried out in all areas although the greater part of this activity centred in the Fort St. John area within close proximity of existing gas transmission facilities.

Geophysical activity set a new record for the year with a slight increase in crew weeks over tbe previous corresponding period (Fig. 4-21). This increase in geophysical effort would indicate a continuation of the current high drilling activity for the coming year. Geophysical crews were active over most of the prospective northeast sector of the Province, with the areas northeast of Fort Nelson and south of the Peace River receiving most of the activity. Within the Foothills Belt area the conventional type of geophysical survey was supplemented by portable crew and helicopter support programs with encouraging results. A total of 243 projects was approved during the year.

*Table 1-8—Oil Discoveries, 1978*

| Well Authorization No. | Well Name | Location | Total Depth (Metres) | Productive Horizon |
|---|---|---|---|---|
| 4506 | CZAR et al Squirrel | 7-26-87-19 | 1 525.0 | Confidential. |
| 4508 | OIL Wolf | d-80-A/94-A-15 | 1 265.0 | Confidential. |
| 4509 | Orbit et al Montney | 11-2-87-19 | 1 555.0 | Confidential. |
| 4585 | Joffre et al Two Rivers | 7-2-83-16 | 1 587.0 | Confidential. |
| 4616 | Zephyr et al Birch | b-50-1/94-A-13 | 1 305.0 | Confidential. |

*Table 1-9—Gas Discoveries. 1978*

| Well Authorization No. | Well Name | Location | Total Depth (Metres) | Productive Horizon |
|---|---|---|---|---|
| 3915 | Skelly Getty CS Commotion | a-23-D/93-P-12 | 4 572.0 | Confidential. |
| 3924 | Chevron N Helmet | a-81-A/94-P-10 | 2 045.2 | Jean Marie. |
| 3976 | Cdn-Sup Fina Ojay | b-57-G/93-I-9 | 3 998.7 | Dunlevy. |
| 4029 | BP et al Murray | d-48-I/93-14 | 2 865.1 | Baldonnel. |
| 4043 | Pacific Burch | c-31-K/93-P-5 | 2 723.7 | Dunlevy. |
| 4138 | Sundance Nig | b-84-C/94-H-4 | 1 588.0 | Gething. |
| 4182 | Mobil Sierra | d-64-K/94-I-11 | 2 209.8 | Pine Point. |
| 4198 | Mobil Sahtaneh | d-29-L/94-I-11 | 2 329.9 | Pine Point. |
| 4202 | Mobil S Sierra | a-51-L/94-I-11 | 2 325.6 | Pine Point. |
| 4217 | Highfield Hidrogas Prespatou | c-100-A/94-H-3 | 883.9 | Notikewin. |
| 4227 | Cdn Res Dome Cons Suhm | b-5-A/94-P-4 | 1 882.2 | Slave Point. |
| 4230 | Chevron Amoco Ekwan | d-65-E/94-I-10 | 1 780.0 | Slave Point. |
| 4232 | Canhunter et al Bluebell | d-59-I/94-B-9 | 2 374.4 | Debolt. |
| 4249 | Pacific HBOG Boucher | 8-26-82-23 | 1 591.4 | Halfway. |
| 4252 | Pacific Union Kelly | b-28-I/93-P-1 | 2 452.1 | Cadotte. |

| Well Authorization No. | Well Name | Location | Total Depth (Metres) | Productive Horizon |
|---|---|---|---|---|
| 4263 | Exalta Conuco Ring | b-22-A/94-H-6 | 1 025.7 | Gething. |
| 4275 | Imp Union Uno-Tex Noel | c-34-F/93-P-8 | 2 675.5 | Dunlevy. |
| 4276 | ATAPCO PCP Klua | d-90-B/94-J-9 | 2 331.7 | Pine Point. |
| 4288 | CZAR et al Aspen | d-17-J/94-A-13 | 1 623.1 | Coplin. |
| 4309 | GEOG et al Martin | d-39-E/94-H-6 | 1 306.0 | Confidential. |
| 4316 | Cdn Res et al Dahl | a-67-C/94-H-9 | 952.5 | Bluesky. |
| 4317 | Cdn Res et al Dahl | a-9-C/94-H-9 | 1 082.0 | Bluesky. |
| 4325 | Pacific Buffalo | c-94-J/94-I-1 | 571.5 | Confidential. |
| 4328 | CZAR et al Goldenrod | b-88-C/94-A-13 | 1 770.9 | Baldonnel. |
| 4331 | Mobil et al Sierra | d-98-B/94-I-14 | 2 347.0 | Bluesky. |
| 4343 | Quintana et al Elleh | b-8-K/94-I-12 | 2 046.6 | Slave Point. |
| 4345 | Pacific et al Tooga | a-71-B/94-P-2 | 716.3 | Bluesky. |
| 4347 | Canhunter et al Beargrass | 10-4-88-25 | 1 578.9 | Halfway. |
| 4348 | Murphy Osprey | c-92-K/94-A-15 | 1 204.9 | Bluesky. |
| 4367 | Chevron Amoco Ekwan | b-56-E/94-I-10 | 517.6 | Debolt. |
| 4372 | Gulf Trutch | a-49-B/94-G-15 | 1 691.0 | Confidential. |
| 4393 | Westcoast et al Velma | d-59-L/94-H-8 | 1 219.2 | Bluesky. |
| 4400 | Imp Union-Tex Windsor | b-82-A/93-P-1 | 2 926.1 | Confidential. |
| 4402 | Turbo Ranger Pluto | 10-14-86-17 | 1 402.1 | Halfway. |
| 4404 | Ashland Numac Jeans | d-71-B/94-A-13 | 1 362.5 | Confidential. |
| 4430 | BP et al W Doe | 11-1-81-15 | 3 327.5 | Confidential. |
| 4436 | Pacific et al Laprise | d-39-E/94-H-5 | 1 267.0 | Confidential. |
| 4480 | Home Wainoco Sundown | c-34-B/93-P-10 | 3 100.0 | Confidential. |
| 4488 | Sabine Wainoco Red | 10-12-86-22 | 2 119.1 | Confidential. |
| 4492 | Home et al Farmington | 10-11-80-15 | 869.0 | Confidential. |
| 4493 | Home et al Farmington | 11-9-80-15 | 850.8 | Confidential. |
| 4514 | Cdn Res Bougie | d-11-F/94-G-15 | 3 258.0 | Confidential. |
| 4526 | Wainoco et al Tea | 6-34-84-20 | 2 140.0 | Confidential. |
| 4565 | Wainoco BCRIC Sojer | d-47-K/94-H-4 | 1 329.2 | Confidential. |
| 4571 | Canhunter Wapistan | c-A56-E/94-G-1 | 2 305.8 | Confidential. |
| 4582 | Westcoast GAO N Red | 10-27-86-21 | 2 059.7 | Confidential. |
| 4586 | Highfield et al Aspen | a-81-F/94-A-13 | 1 705.0 | Confidential. |
| 4604 | Northstar et al N Sunrise | 10-33-79-16 | 785.0 | Confidential. |

## LAND DISPOSITION

There were seven dispositions of Crown reserve petroleum and natural gas rights held during 1978. These resulted in tender bonus bids amounting to a record total of $177 458 367.82, an increase of $51 990 642.32 from the previous year. The total bonus figure of $67 293 219.34 for the January sale was a record high for any such land sale in Canada. A total of 906 parcels was offered, an increase of 120 over 1977, with bids acceptable on 739 parcels, an increase of 132 over 1977, covering 1727 588 acres (699 155 hectares), a decrease of 608 606 acres (246 303 hectares). It is of interest while the total parcels purchased increased substantially, the acreage purchased decreased substantially. This is a direct result of fewer permit parcels being offered for purchase and more lease parcels being offered and purchased.


NAHANNI

# Activity of the Ministry

**CHAPTER 2**

CONTENTS

## FIGURES



## TABLES

## HISTORY AND DEVELOPMENT

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 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, now the Geological Division of the Mineral Resources Branch. The Department took over administration of the Petroleum *and Natural* Gas Act and the Coal Act from the Department of Lands in 1953 and became the Department of Mines and Petroleum Resources in 1960. In a general name change in 1976 it became the Ministry of Mines and Petroleum Resources. On December 4, 1978, the mandate of the Ministry was enlarged to include responsibility for energy matters and it became the Ministry of Energy, Mines and Petroleum Resources. This change occurred so late in the year little action to implement it was possible, and it is scarcely reflected in the remainder of this report.

Prior to December the Ministry's mandate was to administer the laws and regulations governing the entire mineral and petroleum industries, second only to the forest industry in terms of gross value. The Ministry provided major technical services that aid in the orderly development of the Province's natural resources contained in its crustal rocks: metals, minerals, coal, petroleum, and natural gas.

Technical services include geological mapping and related research; guidance, stimulation, and monitoring of exploration; training and aid for prospectors; financial aid in the construction of mining roads; advice to small operators; information to the public; identification of rocks and minerals; promotion of safety in all operations; general betterment of working conditions; encouragement of orderly development and conservation; and maintenance and analyses of resource data. These services are provided in order that new deposits and fields may be found to maintain the industry in order that the known deposits and fields may be worked to the best advantage of the Province.

## NEW MANDATE

On December the 4th, Premier Bennett announced major changes in cabinet responsibilities and extensive reorganizational changes within Ministries. The new mandate for the enlarged Ministry of Energy, Mimes and Petroleum Resources was announced to be the development and management of *an energy* policy for the Province of British Columbia and the management of the mineral resources of the Province and conservation of the landscape associated with mining operations. The new Ministry and its mandate meant that for the first time all energy-related responsibilities will be placed under one roof. The new Minister appointed was the Honourable James J. Hewitt, the former Minister of Agriculture. The former minister, the Honourable James Chabot became Minister of Lands, Parks and Housing at the same time:

## LEGISLATION

During 1978, four Acts were passed at the Session of the Legislature that directly affect the mining and petroleum industries.

Bill *5, Revenue Surplus of 1976–77 Appropriation Act,* 1978, was designed to create new employment. Five million dollars of the total appropriation was

allocated to mineral resources. The Accelerated Mineral Development Program resulting from the appropriation is described on pages 43 to 45.

Bill 25, *Mineral* Act Clarification Act, amended sections 51 and 52 of the ***Mineral Act*** (R.S.B.C. 1960) to make it clear that rent was payable for mineral claims each year since January 1, 1974. This Act was made necessary by a decision of the Justice Richard Anderson in the case of Morris versus the Queen who found that there was no forfeiture for nonpayment of rentals on the plaintiff's mineral claims. The precedent-setting verdict, unfavourable to the Crown, created an extremely serious title problem for both the administration and the industry, requiring clarification of the original intent of the Act. The provision for payment of rent was discontinued by amendment to the Mineral ***Act*** proclaimed January 1, 1978.

Bill 27 amended the Coal ***Act.*** In addition to a number of amendments of a housekeeping nature, this Bill

(*a*) increases tbe amount of the work requirements to extend the term of a licence,

(*b*) allows for unlimited grouping of contiguous licences during first three terms of a licence and grouping of not more than 15 contiguous licences thereafter,

(*c*) changes the royalty to 3.5 per cent of the net minehead value of coal sold,

(*d*) clarifies royalty collection procedures,

(*e*) increases rentals on licences and leases,

(*f*) clarifies the issuance of leases and the issuance and renewal of holding leases, and

(*g*) converts measurements to metric.

Bill 29 amended the Petroleum ***and Natural Gas Act.*** In addition to a variety of minor amendments of a housekeeping nature, this Bill

(a) converts all units of measure to the metric system (SI),

(*b*) implements policy changes respecting new conditions on the length of time leases can be held and continued, and

(c) establishes new procedures respecting and pooling of locations for drilling, and unit agreements for production.

Some details of the recommendations are described under Activity of the Petroleum Resources Branch (pages 67 and 68).

## ORGANIZATION

The organization of the Ministry operational in 1978 was the same as in 1977 and as shown in the accompanying chart (Fig. 2-l). The only minor change was that the Publications Section, which had operated as part of the Geological Division, Mineral Resources Branch, became functional as part of the Finance and Administration Division during the year.

## APPOINTMENTS AND RETIREMENTS

The Honourable lames J. Hewitt was appointed Minister of the enlarged Ministry on December 4, 1978. He announced on December 14 that Mr. Roy Illing would be Deputy Minister of the new Ministry and Dr. James T. Fyles would be Senior Assistant Deputy Minister.

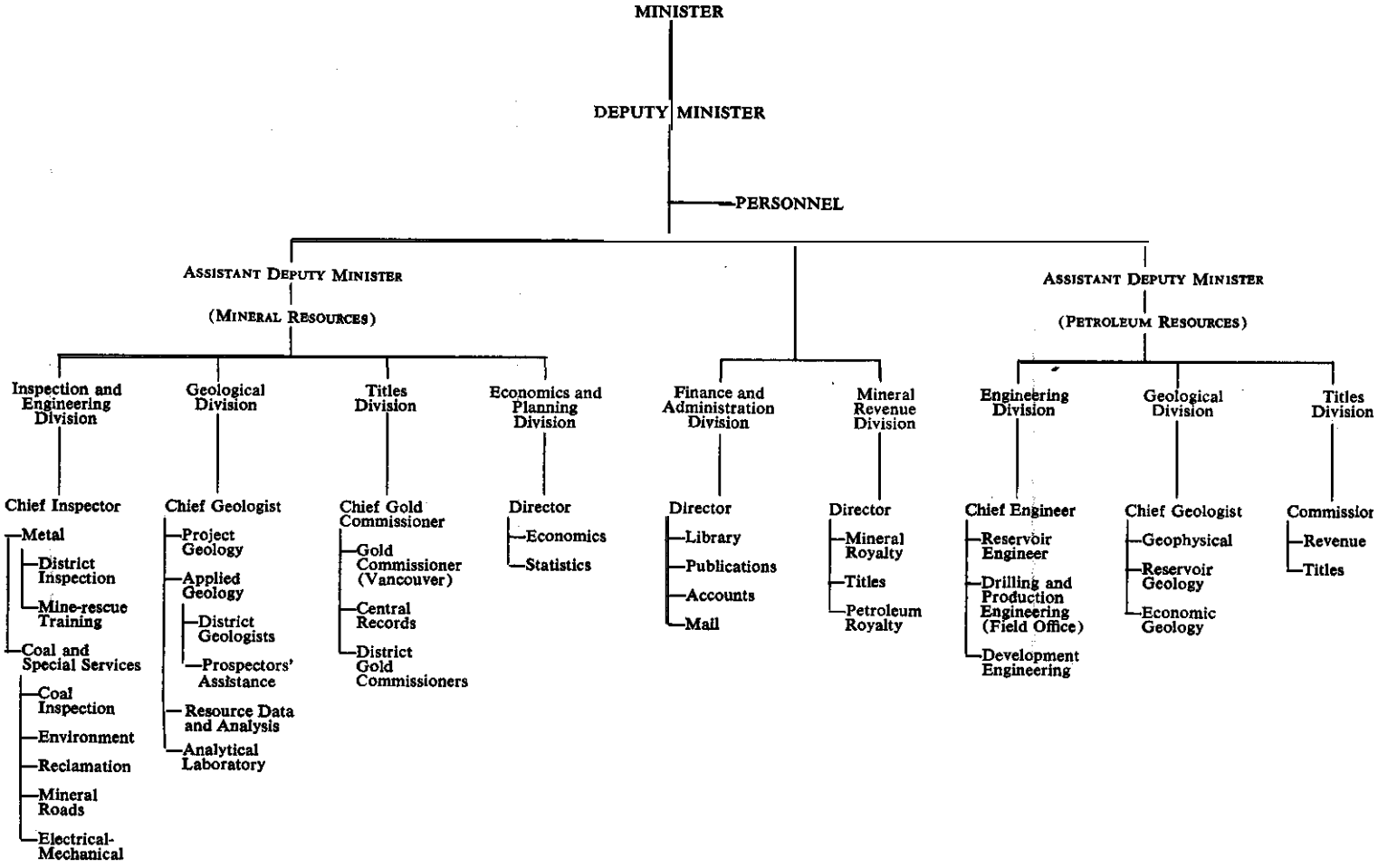



Figure t-l--Organization Chart, Ministry of Energy, Mines and Petroleum Resources, November 1978

A number of changes in staffing occurred in the Inspection and Engineering Division of the Mineral Resources Branch, as described in the section denoted to that Division. The principal change was that A. J. Richardson was appointed Deputy Chief Inspector of Mines, Metals. He had been 30 years with Cominco Ltd. in various engineering capacities previous to accepting this appointment.

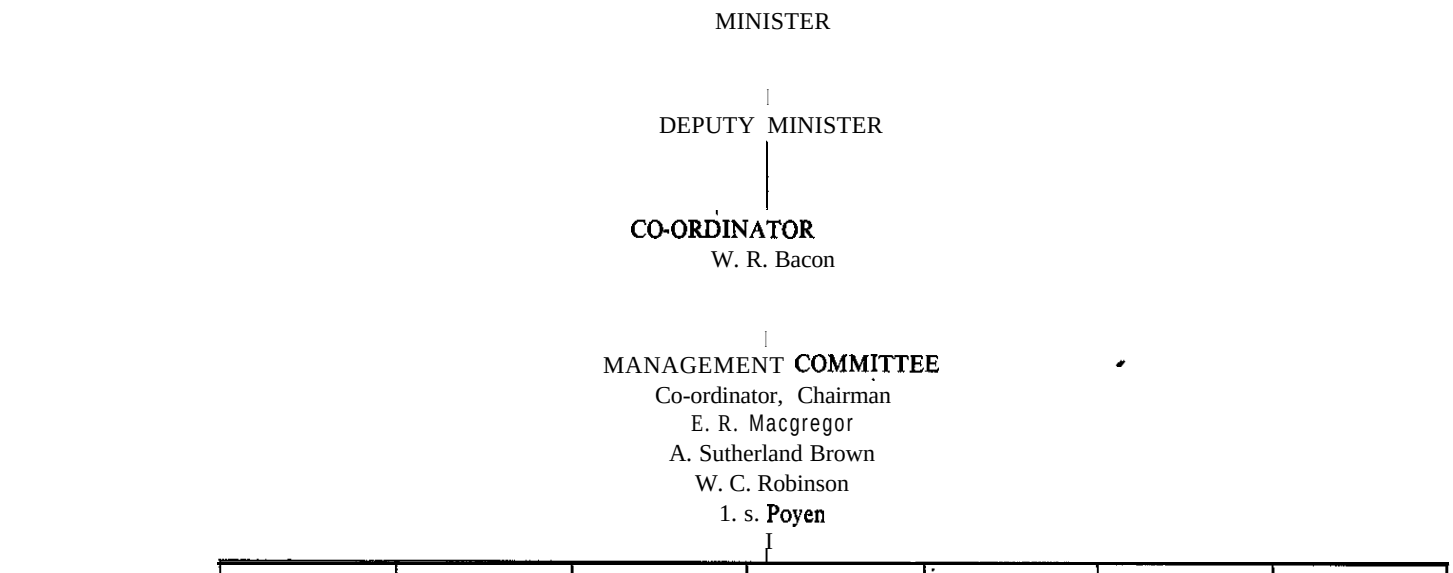
In addition, R. R. Davy, previously with the Ministry of Finance, was appointed Director, Finance and Administration, on May 1, 1978.

## ACCELERATED MINERAL DEVELOPMENT PROGRAM

On May 11 the Honourable James Chabot announced an Accelerated Mineral Development Program under Bill *5, Revenue Surplus of 1976-77 Appropriation Act,* 1978. The objective was to create new employment which will be of lasting benefit during and beyond the period of appropriation. Dr. W. R. Bacon, a well-known consulting mining geologist, was appointed Co-ordiiator of the program on May 24, 1978, and the details were quickly formulated. In essence, the Accelerated Mineral Development Program consisted of eight sub-programs of which six had relatively modest budgets but two were more than $1 000 000 each. The total budget was $5 000 000. The programs, their administration, and the original budgets are shown on Figure 2-2. Most programs either paid only labour costs of projects created to avail themselves of the funding or were aimed at direct stimulation of exploration and development. The termination of the programs was to be on March 31, 1979, so many were. not completed in the calendar year.

The largest programs were the Accelerated Mine Development and Mineral Exploration Programs, and the Mineral Road Assistance Program. It became expedient to combine the first two. The following list of grants was made to pay labour costs of new projects initiated under the Accelerated Mineral Development Program:

| | Locality | $ |
|---|---|---|
| ***Producers*** | | |
| Cassiar Asbestos Corporation Limited | Cassiar | 200 000 |
| Wesfrob Mines Limited | Tasu | 51946 |
| Western Mines Limited | Buttle Lake | 182 500 |
| Northair Mines Ltd. | Squamish | 275 000 |
| Dankoe Mines Ltd. | Keremeos | 140 000 |
| Teck Corporation Ltd. | Beaverdell | 300 000 |
| Silvana Mimes Inc.. | Sandon | 300 000 |
| Fording Coal Limited | Elkford | 50 000 |
| | | 1499 446 |
| ***Developers*** | | |
| Erickson Gold Mining Corp. | McDame Lake | 175 000 |
| Table Mountain Mines Liited | McDame Lake | 75 000 |
| Mosquito Creek Gold Miig Company Limited | Wells | 75 000 |
| Dungannon Explorations Ltd. | Slocan | 56 000 |
| Syber Mines Ltd. | ---9locan | 20000 |
| Robert Mines Ltd. | Greenwood | 51000 |
| Gold Belt Mines Inc. | Salmo | 175 000 |
| | | 627 000 |
| ***Explorers*** | | |
| Silver Standard Mines Limited | East Kootenays | 50 000 |
| St. Eugene Mining Corporation Ltd. | East Kootenays | 31562 |
| Barrier Reef Resources Ltd. -- | Black Dome Mtn. | 25 250 |
| JMT Services Corp. | Queen Charlotte Islands | 16000 |
| DuPont of Canada Exploration Limited | Queen Charlotte Islands | 8 505 |
| | | 131317 |
| Total | | 2 257 763 |
| ***Miscellaneous*** | | |
| British Columbia Museum of Mining | | 10000 |




| Program | Mineral Road Assistance | Accelerated Mine Development | Accelerated Mineral Exploration | Expanded Prospectors' Assistance | Mineral Exploration Incentive | Accelerated Geochemical Survey | Enhanced Mine Site Reclamation | Neutron Activation Analysis Facility |
|---|---|---|---|---|---|---|---|---|
| Administration | P. E. Olson | W. R. Bacon | | E. W. Grove | E. W. Grove | N. C. Carter | J. D. McDonald | W. M. Johnson |
| Budget | $1 780 000 | $1 200 000 | $600 000 | $150 000 | $500 000 | $350 000 | $200 000 | $170 000 |
| Expenditure | $1 570 000 | $2 270 000 | | $163 000 | $367 803 | $356 605 | $ 94 427 | $170 000 |

Figure 2-2. Organization, Administration, and Budget and Expenditure of the Accelerated Mineral Development Program

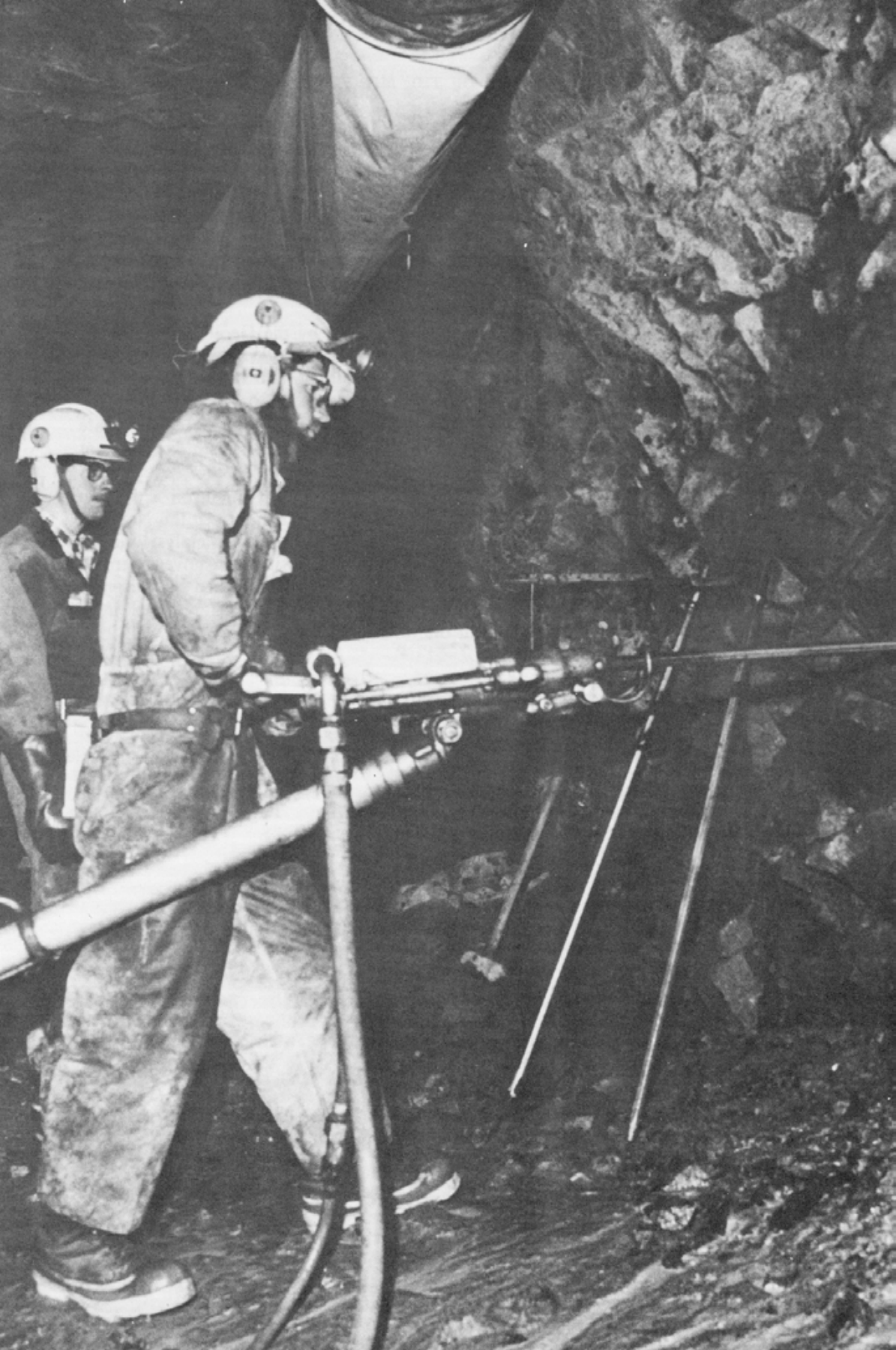
In total, these amounted to 45 per cent of the Accelerated Mineral Development Program.

The other large program was Mineral Road Assistance. This was the only program with a major component directed toward the petroleum industry. Design and site testing of a bridge across the Pine River was completed but the project was not proceeded with because of escalating costs. The funds thus released were applied to preparation of the Sierra–Yoyo access road east of Fort Nelson into the Sierra gas field. The project was continuing at the calendar year-end. In addition, the normal mining road program was augmented.

Three programs represent expansion of ones run by the Geological Division, Mineral Resources Branch. These were an expanded grant program for Prospectors' Assistance, the Accelerated Geochemical Survey, and the Mineral Exploration Incentive Program. These are described on pages 55 to 57.

The Enhanced Mine Site Reclamation Program was designed to revegetate selected old mine tailings areas and clean up abandoned mine sites. Localities at Princeton, Salmo, Phoenix, Hedley, and Jordan River were involved.

Finally, funds were provided to purchase equipment for a neutron activation facility at TRIUMF. Other funding for this development came from the National Research Council. The purpose was to create a viable commercial analysis facility at the accelerator site to service needs of industry,, university, and government in western Canada. Positions for five full-time employees were created by the grant and expansion is likely. Analysis of some of the samples from the Accelerated Geochemical Survey was carried out at the facility.



# BRANCH ACTIVITY

## MINERAL RESOURCES BRANCH

The Mineral Resources Branch, under the direction of Assistant Deputy Minister, Edwin R. Macgregor, consists of four divisions: Inspection and Engineering, Geological, Titles, and Economics and Planning.

### INSPECTION AND ENGINEERING DIVISION

Coal mines, metal times, and quarries were inspected during the year by inspectors stationed at the following listed locations. The inspectors also examined prospects, mining properties, roads and trails, and carried out special investigations under the *Mineral Act.* Dust, ventilation, and noise surveys were carried out by Environmental Control Inspectors under the supervision of S. Elias and, where necessary, recommendations were made regarding improvement to the environmental conditions. The roads and trails program was supervised by P. E. Olson. J. D. McDonald administered the reclamation sections of the Coal *Mines Regulation Act* and *the. Mines Regulation Act.* Mine-rescue training was completed under the direction of the Co-ordinators, Mine-rescue Training, for the areas in which their stations were located.

#### *Staff*

*Inspectors and Resident Engineers*

W. C. Robinson, Chief Inspector of Mines ..... Victoria
V. E. Dawson, Deputy Chief Inspector of Mines, Coal and Special Services Victoria
A. J. Richardson, Deputy Chief Inspector of Mines, Metals ..... Victoria
H. Dennis, Senior Inspector of Coal Mines ..... Victoria
T. G. Carter, Senior Inspector of Mines, Mechanical/Electrical ..... Victoria
J. Cartwright, Inspector of Mines, Electrical ..... Victoria
P. E. Olson, Senior Inspector of Mines, Mining Roads ..... Victoria
J. D. McDonald, Senior Inspector of Mines, Reclamation ..... Victoria
D. M. Galbraith, Inspector of Mines, Reclamation ..... Victoria
J. E. Errington, Inspector of Mines, Reclamation (Agrologist) ..... Victoria
S. Elias, Senior Inspector of Mines, Environmental Control ..... Vancouver
D. J. Murray, Inspector of Mines, Environmental Control ..... Vancouver
S. J. L. Miller, Inspector of Mines, Environmental Control ..... Vancouver
J. C. Ferguson, Inspector of Mines, Technician, Environmental Control Vancouver
B. M. Dudas, Inspector of Mines and Resident Engineer ..... Vancouver
W. H. Childress, Inspector of Mines, Technician ..... Vancouver
J. W. Robinson, Inspector of Mines and Resident Engineer ..... Nanaimo
H. A. Armour, Inspector of Mines, Technician ..... Nanaimo
S. J. Hunter, Inspector of Mines and Resident Engineer ..... Prince Rupert
B. Varkonyi, Inspector of Mines, Technician ..... Prince Rupert
J. F. Hutter, Inspector of Mines and Resident Engineer ..... Smithers
S. J. North, Inspector of Mines, Technician ..... Smithers
A. D. Tidsbury, Inspector of Mines and Resident Engineer ..... Prince George
T. Vaughan-Thomas, Inspector of Mines and Resident Engineer ..... Prince George
J. J. Sutherland, Inspector of Mines, Technician ..... Prince George
B. E. Warner, Inspector of Mines, Technician, Reclamation ..... Prince George
K. G. Hughes, Inspector of Mines, Technician, Mechanical ..... Prince George
D. I. R. Henderson, Inspector of Mines and Resident Engineer ..... Fernie
D. Smith, Inspector of Mines and Resident Engineer ..... Kamloops

### *Inspectors and Resident* Engineers--Continued

E. S. Sadar, Inspector of Mines and Resident Engineer ..... Kamloops
J. P. MacCulloch, Inspector of Mines and Resident Engineer ..... Kamloops
J. A. Thomson, Inspector of Mines, Technician ..... Kamloops
R. H. Heistad, Inspector of Mines, Technician, Mechanical ..... Kamloops
J. B. C. Lang, Inspector of Mines and Resident Engineer ..... Nelson
A. L. O'Bryan, Inspector of Mines, Technician, Reclamation ..... Nelson
E. J. Hall, Inspector of Mines, Technician, Reclamation ..... Fort St. John

### *Co-ordinators, Mine-rescue Training*

G. J. Lee, Senior Co-ordinator ..... Victoria
R. F. Brow ..... Nanaimo
J. E. A. Lovestrom ..... Smithers
R. J. Stevenson ..... Prince George
B. A. McConachie ..... Kamloops
E. C. Ingham ..... Nelson
P. J. Switzer ..... Fernie

### *Staff* Changes

In March, E. J. Hall joined the Ministry as Inspector-Technician, Reclamation, in the Charlie Lake office.

S. J. L. Miller joined the Ministry as Inspector, Environmental Control, in the Vancouver office in April. In the-same month B. M. Dudas transferred from Kamloops office to the. Vancouver office, to replace J. W. Robinson, who moved from there to the Nanaimo office. The vacancy created in Kamloops was filled by J. P. MacCulloch who joined the Ministry as Inspector of Mines and Resident Engineer in July.

A. J. Richardson was appointed Deputy Chief Inspector of Mines, Metals, in May.

S. J. Hunter joined the Ministry in June as Inspector of Mines in Prince Rupert.

A. Littler, Co-ordinator, Mine-rescue Training, in Fernie retired in July and was replaced in August by P. J. Switzer.

In August, H. Dennis was appointed Senior Inspector of Coal Mines in the Victoria office and T. Vaughan-Thomas joined the Ministry as Inspector of Mines and Resident Engineer in the Prince George office.

T. Carter joined the Ministry in September as Senior Inspector of Mines, Mechanical/Electrical, in the Victoria office.

In December, J. C. Ferguson joined the Ministry as Inspector-Technician, Environmental Control, in the Vancouver office.

### *Mine* Safety

The Inspection and Engineering Division has the, responsibility of enforcing the observance of the ***Mines Regulation Act*** and the ***Coal Mines Regulation Act*** by all persons working at mines in British Columbia. Additional staff were recruited to fill the posts vacated the previous year and some new posts were created and filled. A good standard of co-operation existed at the mines and active safety programs were in effect at the mines throughout 1978.

Certain supervisory grades at the mines are required to hold statutory certificates and for this purpose Boards of Examiners have been appointed from the Inspection and Engineering Division. It is the responsibility of these Boards to

conduct examinations of applicants for various certificates. These are first, second, and third class certificates of competency and open-pit shiitboss certificates under the Coal Mines *Regulation* Act and underground and open-pit shiftboss certificates under the Mines *Regulation* Act. District Inspectors continued to examine for and issue permanent miners', coal miners', and blasting certificates.

Investigations into environmental conditions at mines were continued, with particular attention being paid to the monitoring of the conditions in respect of ventilation, dust, and noise. Further efforts have been made in the industry to reduce dust and noise produced at the mines and preparation plants.

Mine *Rescue*

Mine-rescue stations, under the supervision of co-ordiiators who were qualified instructors in first aid and rescue, were maintained at Fernie, Kamloops, Nanaimo, Nelson, Prince George, and Smithers. Each station was fully equipped with sufficient self-contained, oxygen-sùpplying, breathing apparatus to maintain at least two rescue teams of six men each and other suitable rescue apparatus was also held at the stations. Some of the equipment owned by the Ministry was loaned to various mining companies to supplement their own equipment.

In 1978, the Ministry owned 59 Aerorlox three-hour liquid oxygen-breathing machines, 43 Draeger BG-174 and 60 McCaa two-hour high-pressure gaseous oxygen-breathing machines, and 64 Chemox one-hour chemical oxygen-producing machines. The equipment owned by industry was 24 Aerorlox, 55 Draeger BG-174, *30* McCaa, and 92 Chemox machines. In addition, each station and most mines had other auxiliary equipment, such as Type N gas masks, self-rescuers, gas detectors, oxygen therapy units, and first-aid equipment.

Periodic visits to mines were made by the district co-ordiiators of rescue training. During these visits they gave rescue and first-aid training to open-pit and underground employees and checked the rescue equipment in order to ensure that it was being maintained satisfactorily. In addition, training courses were given in underground, surface, and gravel-pit rescue work and first aid at other centres throughout the Province.

Instructors at the mines, trained by the Ministry co-ordinators, trained or assisted in the training of 318 persons for St. John Ambulance first-aid certificates, and 385 safety-oriented first-aid certificates. Training was also given to 98 men in underground mine-rescue work, 337 men in surface mine rescue, 20 men in gravel-pit rescue, 382 men in mine-rescue survival, and 21 in industrial first aid. Fifteen men received Surface Mine Rescue Instructors' certificates. One hundred and sixty men received advanced Miie Rescue certificates.

The four mine safety associations, sponsored by the Ministry of Energy, Mines and Petroleum Resources and the Workers' Compensation Board, continued to operate in different areas in the Province. They were aided by mining company officials, safety supervisors, inspectors of mines, mine-rescue co-ordinators, and, in some areas, local industry. The association promoted mine-rescue and first-aid training, in addition to safety education in their various districts.

The Vancouver Island Mine Safety Association held their 64th annual mine-rescue and first-aid competition in Nanaimo on May 27. The Western Mines' team, captained by H. Uhrig, won the trophy in the underground *mine-rescue* event. The Noranda Mines' Boss Mountain team, captained by B. Buys, was placed second and represented the Central British Columbia Miie Safety Association area at the Provincial meet.

The West Kootenay Mine Safety Association held their 32nd annual competition in Nelson on June 3. The Cominco's Sullivan mine team from Kimberley, captained by A. Bruemmer, won the underground mine-rescue event.

The East Kootenay Mine Safety Association held their 57th mine-rescue and first-aid competition in Kimberley on June 10. The Kaiser Resources' team from Fernie, captained by J. Peters, won the trophy.

0" May 26, and June 3 and 10, the Central British Columbia Mine Safety Association held their 30th annual mine-rescue and first-aid competition in Smithers, Ashcroft, and Princeton. The Gibraltar Mines' team, captained by P. Beaudoi", won the surface mine-rescue trophy in Ashcroft; the Kaiser Resources' team, captained by A. Gallacher, won the trophy at Princeton; and the Cassiar Asbestos' team, captained by G. Smith, placed first at Smithers.

0" June 17, the Provincial Underground and Surface Mine Rescue Competition was held in Nanaimo. The trophy winners were: I" the surface mine-rescue event, Kaiser Resources' team from Sparwood, captained by A. Gallacher; and in the underground mine-rescue event, Kaiser Resources' team from Fernie, captained by J. Peters. The underground team represented British Columbia in the Canadian meet, held in Glace Bay, Nova Scotia on June 24, 1978, where six provinces, namely British Columbia, Yukon, Northwest Territories, Alberta, Saskatchewan, and Nova Scotia, competed. The team from Alberta, captained by W. Kinnear, placed first.

The first Provincial Three-Persons' Fist-Aid event was held in Nanaimo on June 17. This event was won by the Cominco's HB mine team, captained by R. Lofstrom.

Another milestone for 1978 was the Provincial Bench Competition, in which the teams competing had to demonstrate their proficiency in the examination and testing of their apparatus prior to "se. This event was in memory of the late B. Abbott, captain of the Cominco's HB mine-rescue team of 1976, and the winner of the Canadian Mine Rescue Competition of the same year. The team from Noranda Mines' Boss Mountain team, Hendrix Lake, captained by B. Buys, won the trophy.

*Safety of Mechanical/Electrical Equipment*

A" upward trend, albeit a slow one, was experienced in the total number of underground pieces of equipment "sing fire-resistant hydraulic fluids. The legislation requiring the use of these fluids has now been in effect since January 1, 1975, and it is felt that both manufacturers and users of equipment have had a liberal amount of time allocated to them to comply with the regulation requiring their "se. It is therefore envisaged that in future. it will only be under the most exceptional circumstances that a" exemption to the "se of such fluids will be granted by the Chief Inspector.

During the year, 831 trucks were reported to be in operation at open pits and quarries. All trucks with a gross vehicular mass greater than SO tonnes are required by the Ministry to be tested annually for braking performance. Where deficiencies exist, a program designed to improve braking capability is instituted. New trucks being introduced into the Province have all show" excellent braking capability during actual tests. The world's largest haulage truck, the Terex Titan, with a load-carrying capacity well in excess of 300 tonnes, was tested during the year. This truck, having a gross vehicular mass approaching 600 tonnes, was brought to a complete stop in 102 metres from a" initial speed of approximately 58 kilometres per hour on a downgrade of 8.6 per cent. Evaluation of the truck's dependability

in relation to other trucks and compatability to existing truck and shovel capacities will probably determine future requirements for trucks of this size.

Meetings of the British Columbia Mobile Equipment Committee were attended at monthly or bimonthly intervals in an effort to evaluate the safety-related features of new and existing mobile equipment in use in the Province. In addition, the annual meeting of the Canadian Council Committee for Electrical Mechanical Miie Safety at Sudbury, Ontario, was attended by a member of the staff.

Kaiser Resources Ltd. completed construction of the surface and underground electrical installations for their new Panel 6 Hydraulic coal mine located at Michel. Systematic electrical checks were performed in readiness for the anticipated production start-up of early 1979.

The Canadian Electrical Code, Part V, "Use of Electricity in Mines," is currently being revised and will be restructured to comprise four sections as follows: General Requirements; Surface Mining; Underground Metal Mines; and Underground Coal Mines.

***Reclamation***

Reclamation is administered by the Inspection and Engineering Division, under the authority of section 11 of *the Mines Regulation Act,* and section 8 of the Coal *Mines Regulation Act.,* Its objective is to restore. lands used in mining, waste disposal, and exploration to useful purpose, compatible with the surrounding countryside.

During 1978, surface work permits were altered from a three or five-year period and are now issued on a permanent basis. An annual reclamation report is still required so that the permit can be revised at any time. A total of 47 new surface work permits (4 metal, 6 coal, 2 mineral exploration, 13 placer, 18 sand and gravel, and 4 quarries) was issued during 1978.

Reclamation progressed satisfactorily during 1978, with most of the disturbance and revegetation activity occurring in the coal-mining industry. The 34 active metal mines reported a total disturbance of 9 612 hectares, of which 315 hectares were revegetated during 1978. The three active coal operations reported a total disturbance of 2 205.9 hectares, of which 193 hectares were revegetated during 1978. The total amount revegetated since 1969 now stands at 1 072 hectares for metal mines and 775 hectares for coal mines.

The second annual Mine Reclamation Symposium was held in March 1978, sponsored by the Ministry of Energy, Mines and Petroleum Resources and the Mining Association of British Columbia. One hundred and sixty-two participants attended the three-day session and heard talks concerning the Ministry's reclamation policy and activities, reclamation planning, site preparation, and other resource problems and solutions.

During the symposium, the reclamation award for 1977 was presented to the Reclamation Research Department of Cominco Ltd. for its outstanding contribution to mine reclamation research in British Columbia. Citations were presented to Elco Mining Ltd. and Kaiser Resources Ltd.

Under the Accelerated Mineral Development Program, funded under Bill 5, the ***Revenue Surplus of 1976-77 Appropriation Act,*** 1978, the Reclamation Section of the Ministry of Energy, Mines and Petroleum Resources revegetated some of the old mine-waste disposal areas formed prior to mine reclamation legislation. Four areas were treated in the 1978/79 fiscal year: Princeton tailings, Salmo tailings, Phoenix Copper tailings, and the Hedley tailings.


BRITISH
COLUMBIA
MINISTRY OF MINES AND PETROLEUM
COAL
BRITISH COLUMBIA
DEPARTMENT OF
MINES AND
PETROLEUM
RESOURCES
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COAL
PETROLOGY

The reclamation section has conducted or commissioned several research studies and during 1978, the following reports were published:

Revegetation of Disturbances in the Northeast Coal Block, Current Activities and State-of-the-Art, 1977. Inspection and Engineering Division, Paper 1978-7.

Reclamation of Lands Disturbed by Mining. Proceedings of the Second Annual British Columbia Mine Reclamation Symposium.

Handbook of Environmental Protection and Reclamation in Coal Exploration (Draft).

*Mining and Petroleum Roads*

The Ministry of Energy, Mines and Petroleum Resources' road program was continued during 1978 under authority of *the Ministry of Mines and Petroleum Resources Act. The* purpose of the program is to encourage and assist in the development of mineral and petroleum resources in the Province.

During 1978, an expenditure of around $600 000 was made under Bill 5 to provide all-weather access to gas exploration and production areas east of Fort Nelson. This program is expected to continue for several years. Also under Bill 5, about $300 000 was spent on engineering studies and designs to provide access to a gas field between the Pine and Moberly Rivers.

In the order of $230 000 was spent during the year for the purpose of upgrading an airfield at Kutcho Creek and to build a new one in the Sturdee River area. These airstrips greatly facilitate exploration and will become even more important as mining in those areas progresses.

During the year, around $500 000 was spent to upgrade the Omineca mad, build new bridges, and improve the Takla Lake spur road. This expenditure included the cost of roadside reclamation, environmental studies, and engineering design related to the Omineca road.

About $200 000 was spent on approximately 25 smaller projects throughout the Province in improving mineral exploration access roads.

## GEOLOGICAL DIVISION

*Objectives and Organization*

Metals, non-metallic minerals, and coal are non-renewable judged by the scale of man's lifetime. The Province's needs for these commodities for our own use and for export are fulfilled only by continuous exploration and discovery. The fundamental role of the Geological Division is to facilitate the renewal process. To do this the detailed 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 geological, geochemical, and geophysical 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. To carry out these objectives, the Division is organized into four sections: Project Geology, Applied Geology, Resource Data and Analysis, and Analytical Laboratory.

*Staff*

The permanent staff on December 31, 1978, included 26 professional geoscientists, 6 chemists, 9 clerks, and 12 technicians.

A. Sutherland Brown, Ph.D., P.Eng. — Chief Geologist

Project *Geology*

N. C. Carter, Ph.D., P.Eng. — Senior Geologist
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
W. J. McMillan, 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
J. L. Armitage — Chief Draughtsman
R. E. Player — Lapidary and Photographer

*Applied Geology*

E. W. Grove, Ph.D., P.Eng. — Senior Geologist
A. F. Shepherd, B.A.Sc., P.Eng. — Geologist
G. G. Addie, M.Sc., P.Eng. — District Geologist
G. H. Klein, B.A.Sc., P.Eng. — District Geologist
T. G. Schroeter, M.Sc., P.Eng. — District Geologist
G. P. E. White, B.Sc., P.Eng. — District Geologist
R. H. Karst, B.Sc. — District Geologist
D. A. Grieve, M.Sc. — District Geologist

*Resource Data and Analysis*

J. A. Garnett, Ph.D., P.Eng. — Senior Geologist
K. E. Northcote, Ph.D., P.Eng. — Geologist
Z. D. Hora, M.Sc. — Geologist
E. V. Jackson, B.Sc., P.Eng. — Geologist
G. L. James — Systems Analyst
J. E. Forester, M.A. — Research Officer
A. Matheson, B.Sc. — Research Officer

*Analytical Laboratory*

W. M. Johnson, Ph.D. — Chief Analyst
R. F. Ralph, L.R.I.C. — Deputy Chief Analyst
B. Bhagwanani, B.Sc. — Laboratory Scientist
R. J. Hibberson, B.Sc. — Laboratory Scientist
Y. T. J. Kwong, M.Sc. — Laboratory Scientist
V. V. B. Vilkos, Ph.D. — Laboratory Scientist
M. A. Chaudhry — Laboratory Technician
F. F. Karpick — Assayer
L. E. Sheppard — Laboratory Technician

***Staff Changes***

During 1978, district coal geologists were appointed: In Charlie Lake, R. H. Karst filled this new position and supervised the coal core storage facility there; in Femie, D. A. Grieve was appointed to a similar position.

***The Work of the Division***

The distribution in 1978 of major projects and of district offices is shown on Figure 2-3.

***Project Geology***

The work of this section is devoted to geological mapping of areas important for mineral resources and regional geochemical reconnaissance surveys useful for both exploration and environmental base line studies. The section mounted 12 main field projects at a total field cost of about $250 000 and two main geochemical reconnaissance surveys at a cost of $470 000. One of the latter was a Federal/ Provincial cost-shared project, the other costing $350 000 was supported entirely by ***Bii 5,*** the ***Revenue Surplus of 1976-77 Appropriation Act, 1978.*** Salaries and other costs of the section totalled about $400 000.

The geochemical projects are done by a series of separate contracts with only planning, supervision, and control provided by the Division.

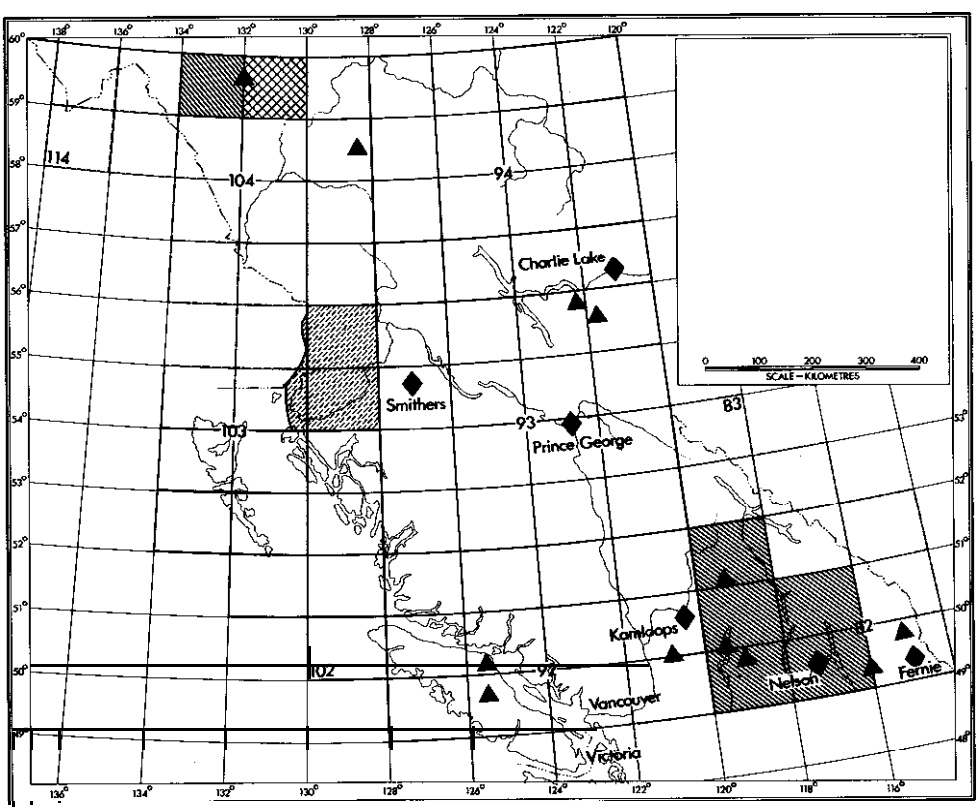


Figure 2-3—Geological and Geochemical Project Areas, District Geologist Offices, 1978.

A considerable part of the effort of the section is devoted to prospectors and small developers, and these programs were augmented in 1978 by funds from Bill 5. Over 400 students in 22 centres were enrolled in basic prospecting courses in 1978 and 34 prospectors graduated from the two-week-long advanced field school held at Selkirk College, Castlegar. Two hundred and twenty-two prospectors received grants under the ***Prospectors Assistance Act.*** In addition, a new program (Mineral Exploration Incentive Program) with a budget of $500 000 was started under Bill 5 to act as a fiscal bridge between prospecting and preliminary development. The Mineral Exploration Incentive Program provided grants up to one-third of the receipted cost of approved programs to a maximum of $50000. Forty contracts were let in 1978.

The costs of these programs were approximately as follows: Core repository and recovery, $99 000; prospector training, $20 000; Prospectors' Assistance grants, $365 000 ($163 000 from Bill 5); field programs of district geologists, $110 000; salaries and overhead, $260 000. The field studies of this section are also reported in the publication ***Geological Fieldwork*** and elsewhere but much of their work is service oriented.

***Resource Data and Analysis Section***

This section is responsible for the collection, compilation, interpretation, and distribution of exploration and development data gathered from various sources. Most of the information is readily available after 'requisite confidential periods, normally one to three years. The major files are: MINFILE, a shallow computer file of over 8 000 mineral occurrences; assessment report file, over 7 000 microfilmed reports available at reader/printers in Vancouver or Victoria; property files of historic maps and data from producers and prospects recovered from many sources and filed by NTS system; and industrial minerals reference files. In addition, a computerized coal data file is being constructed under contract jointly with the Geological Survey of Canada, and a computer file of statistics on producing mines and major prospects is underway. The annual volume, ***Exploration in British*** 'Columbia, is produced by the section coincident with its update of MINFILE.

In addition, the section administers the Portable Assessment Credit account, produces map compilations and mineral potential evaluation studies related to land-use conflicts, and advises on regulations. Field-oriented studies related to industrial minerals and structural materials are also handled by this section.

The costs of this section were approximately as follows: Field studies, $25 000; MINFILE and analyses, $65 000; coal file construction, $100 000; salaries and overhead, $200 000.

***Analytical Laboratory***—The laboratory, under Dr. W. M. Johnson, is responsible for a complete range of analytical services for the Division geologists and prospector grantees as well as some services to other government agencies. The laboratory also runs control samples and handles the chemical data for the British Columbia geochemical surveys. The Chief Analyst is also responsible for assayer examinations for the Province. In 1978, the Chief Analyst was largely responsible for the Ministry's funding under Bill 5 of a $170 000 grant to Novatrack Ltd. to help create a neutron activation facility at the TRIUMF cyclotron at the University of British Columbia.

The facilities include X-ray fluorescence, atomic absorption and emission spectrography, X-ray diffraction, gamma ray spectrometry, and mineral separation. Capability in traditional wet analytical chemistry still exists. Instrument output is fully computerized.

The Analytical Laboratory had a productive year in 1978 in terms of both output and method development.

Method Development-The hydride generation method for arsenic, tin, selenium, tellurium, antimony, and other metals was investigated and used for arsenic very successfully. Work was done on a standard reference uranium ore. The Laboratory reported value was 7.07 per cent uranium as compared with the consensus value of 7.09 per cent. Further work *was* done on the use of a mercury amalgam as a means of concentrating gold for subsequent measurement by atomic absorption spectrometry.

Output-Wet Chemical and X-ray Fluorescence Laboratory: There are 539 results on 179 samples submitted by prospectors, 3 348 results on 993 samples from prospector grantees, and 12 276 results on 2 440 samples submitted by Ministry personnel. This represents a total of 16 728 results on 3 605 samples.

Emission Spectrographic Laboratory: There were 43 770 semi-quantitative determinations on 1 459 samples of which 7 200 were reported. In addition, there were 565 quantitative determinations.

X-ray Diffraction Laboratory: There. were 533 mineral identifications made, clay mineralogy studies were done on 3 11 samples, 100 quartz and R.I., and 116 semi-quantitative zeolite determinations were made. In addition, work was done with both Dr. Pearson and Dr. McMillan on co-operative projects in coal and zeolite metamorphism respectively.

Sample Comminution: There was a total of 3 370 samples received and prepared for analytical work, 2 200 from geologists and 1 170 from prospectors and prospector grantees.

Mineral Separation: There were 46 mineral separations made, one of which required a separation into 20 fractions.

Two assayer examinations were held with a total of 13 examinees writing. Three certificates of efficiency were awarded for the May examination and, at the date of this writing, no decision has been made for the examinees for the December examination.

Costs of the laboratory were: Materials and supplies, $62 000; salaries and overhead, $200 000.

### *Publications*

During 1978 supervision of the Ministry Publications Section was handed over to Finance and Administration Division. Publications prepared by the Division include the following:

Prepared yearly:

***Geological Fieldwork-a*** preliminary account of work of the Division published as soon as possible after completion. Now published as part of the paper series of the Ministry.

***Geology in British*** Columbia-a fuller treatment augmented by laboratory and office studies and usually a year or so after completion.

***Exploration in British Columbia-a*** report that summarizes and collates all known exploration in the Province based on reports filled out jointly by the Division and industry personnel.

At irregular intervals:

***Bulletins***—these are. generally the result of three or four years' work and commonly of areas of significant mineral potential. In 1978 two were published:

Bulletin 68—*An Analysis of Distribution of Mineral Occurrences in British Columbia* by A. J. Sinclair, H. R. Wynne-Edwards, and A. Sutherland Brown.

Bulletin 70—*Geology and Mineral Occurrences of the Southern Hogem Batholith,* by J. A. Garnett.

***Preliminary Maps,*** usually white prints issued as soon as compilations are complete with brief accompanying notes. In 1978, the following four were issued:

Map 27—*Geology Map of the Crowsnest Coalfield, West Part,* by D. E. Pearson and D. A. Grieve (part of NTS 82G; scale-l :10 000).

Map 28—*Geology Map of the Estella–Kootenay King Area,* by Trygve Höy (NTS 82G/12 and 13; scale—1:25 000; approximately 240 square kilometres)

Map 29—*Geology of the East Okanagan Uranium Area (Kelowna to Beaverdell), South-Central British Columbia,* by P. A. Christopher (NTS 82F/10W, 11E, 14E, and 15W; scale-l:50 000).

Map 30—*Geology of the Guichon Creek Batholith,* by W. J. McMillan, (NTS 92I/2W, 6E, 7W, 10W, 11E, and small areas of 14E and 15W; scales-l : 100 000 and 1: 25 000).

Other map series issued included:

Joint Federal/Provincial. geochemical reconnaissance maps from the Uranium Reconnaissance Program of 82 F and K in the Kootenays and 104N Atlii.

Mineral Deposit/Land Use maps were issued of southeast British Columbia, that is, Victoria (92B/C), Vancouver (92G), Pemberton (92J), and Bute Inlet (92K).

In addition, regularly updated maps in the following series are available:

***Mineral Inventory Maps,*** issued as ozalid prints, show location and commodities of all known mineral deposits.

***Assessment Report Index Maps*** show the location and number of reports accepted for assessment credit by the Ministry.

No open file reports nor aeromagnetic maps were issued during 1978.

The Division was involved in the publication of a booklet ***Minerals in British Columbia,*** by Angus M. Gunn of the University of British Columbia. This was intended to inform the public about the metal and energy minerals industries.

### TITLES DIVISION

The Titles Division of the Mineral Resources Branch is under the direction of the Chief Gold Commissioner and is responsible for the administration of the Provincial laws relating to the acquisition of minerals and coal.

#### *Staff*

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

Gold Commissioners and Sub-recorders are appointed for the 24 Mining Divisions throughout the Province and their duties are specified in writing by the Chief Gold Commissioner.

*Table 2-1—Gold Commissioners and Claim Inspectors*

| Mining Division | Phone | Location of Office | Name |
|---|---|---|---|
| Alberni | 723-3501 | 4515 Elizabeth Street, Port Alberni V9Y 6L5 | W. G. Mundell |
| Atlin | 651-7577 | Box 100, Atlin V0W 1A0 | E. J. Johnstone |
| Cariboo | 992-5591 | 102, 350 Barlow Avenue, Quesnel V2J 2C1 | R. Campbell |
| Clinton | 459-2268/69 | Box 70, Clinton V0K 1K0 | W. R. Anderson |
| Fort Steele | 489-2311 | 102—11th Avenue South, Cranbrook V1C 2P2 | W. L. Draper |
| Golden | 344-5221/22 | Box 39, Golden V0A 1H0 | J. Olson |
| Greenwood | 442-8642 | Box 850, Grand Forks V0H 1H0 | S. Matsuo |
| Kamloops | 372-5233 | Court House, Kamloops V2C 1E5 | N. R. Blake |
| Liard | 387-6246/55 | 411 Douglas Building, Parliament Buildings, Victoria V8V 1X4 | E. A. H. Mitchell |
| Lillooet | 256-7548 | Box 70, Lillooet V0K 1V0 | M. Sakakibara |
| Nanaimo | 754-2111 | Courthouse, Nanaimo V9R 5J1 | R. H. Archibald |
| Nelson | 352-2211 | Box 730, Nelson V1L 5R4 | H. S. Tatchell |
| New Westminster | 525-0375 | 100, 403 Sixth Street, New Westminster V3L 3B1 | T. P. McKinnon |
| Nicola | 378-9944 | Box 339, Merritt V0K 2B0 | L. P. Lean |
| Omineca | 847-4411 | Box 340, Smithers V0J 2N0 | A. W. Milton |
| Osoyoos | 493-1719 | Courthouse, Penticton V2A 5A5 | L. D. Sands |
| Revelstoke | 837-3222 | Box 380, Revelstoke V0E 2S0 | D. G. B. Roberts |
| Similkameen | 295-6957 | Box 9, Princeton V0X 1W0 | W. L. Marshall |
| Skeena | 624-2121 | Courthouse, Prince Rupert V8J 1B7 | I. Williams |
| Slocan | 353-2338 | Box 850, Kaslo V0G 1M0 | Mrs. J. James |
| Trail Creek | 362-7324 | Box 910, Rossland V0G 1Y0 | A. D. Sherwood |
| Vancouver | 688-2208 | 800 Hornby Street, Vancouver V6Z 2C5 | D. Doyle |
| Vernon | 545-2387 | Courthouse, Vernon V1T 4W5 | N. A. Nelson |
| Victoria | 387-6246/55 | 411 Douglas Building, Parliament Buildings, Victoria V8V 1X4 | E. A. H. Mitchell |

*Claim Inspectors*

D. Lieutard, 401, 350 Barlow Avenue, Quesnel V2J 2C1.
R. T. Morgan, Box 877, Smithers V0J 2N0.
F. A. Reyes, 800 Homby Street, Vancouver V6Z 2C5.
H. S. Turner, 212, 2985 Airport Drive, Kamloops V2B 7W8.

The recording of locations and of work on mineral claims as required pursuant to the provisions of the Mineral Act, and the recording of work on placer leases as required under the ***Placer Mining Act,*** must be made at the office of the Gold Commissioner for the Mining Division in which the claim or lease is located. The statistics for the Gold Commissioner's office are shown on Table 2-2.

***Central Records Office (Victoria and Vancouver)***

Copies of records of mineral claims and 2-post claims recorded in the offices of Gold Commissioners are forwarded to the office of the Chief Gold Commissioner daily, while transcripts of all other recording in the offices of the Gold Commissioners are sent twice monthly.

Information concerning claims and leases and the ownership and standing of claims and leases in any Mining Division may be obtained from the Gold Commissioner for the Mining Division in which the property is situated or from the Ministry's offices, Room 411, Douglas Building, Victoria, and 800 Homby Street, Vancouver, the office of the Gold Commissioner.

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 regular office hours in Victoria and at the office of the Gold Commissioner in Vancouver. The position of mineral claims held by record and of placer leases is plotted from details supplied by the locators. Prints of mineral and placer titles reference maps at a scale of 1:50 000 may be obtained from the Victoria and Vancouver offices.

Appointed officials in the office of the Gold Commissioner at Victoria and the Gold Commissioner at Vancouver act as Sub-recorders for all Mining Divisions.

## *Table 2-2—Gold Commissioner's Office Statistics*

| Mining Division | Free Miners' Certificate | | Lode Mining | | | | | | Placer Mining | | | | | Revenue | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Individual | Company | Mineral Claims Units | Work Numbers | Cash in Lieu | Bills of Sale, Etc. | Mining Leases Issued | Lease Rentals | Lease Issued | | Cash in Lieu | Bills of Sale, Etc. | Extensions | Free Miners Certificate | Mining Receipts | Total |
| | | | | | $ | | | $ | | | $ | | | $ | $ | $ |
| Alberni | 90 | 3 | 276 | 574 | 4 950 | 23 | ..... | 1 990 | 2 | ..... | ..... | ..... | | 1 180 | 13 605.50 | 14 785.50 |
| Atlin | 158 | 2 | 2 358 | 2 529 | 23 760 | 32 | ..... | 366 | 17 | 134 | 3 900 | 29 | 1 | 1 335 | 63 242.50 | 64 577.50 |
| Cariboo | 1 289 | 5 | 2 093 | 4 021 | 32 780 | 71 | ..... | 9 544 | 201 | 478 | 4 900 | 84 | 7 | 7 450 | 121 306.84 | 128 756.84 |
| Clinton | 56 | ..... | 1 351 | 421 | 49 500 | 24 | ..... | 104 | 8 | 34 | ..... | 3 | | 255 | 16 165.63 | 16 420.63 |
| Fort Steele | 272 | 4 | 1 369 | 5 950 | 18 370 | 62 | ..... | 2 488 | 11 | 49 | ..... | ..... | 1 | 2 445 | 67 715.00 | 70 160.00 |
| Golden | 133 | 8 | 358 | 1 099 | 17 600 | 27 | ..... | 1 028 | 9 | 1 | 300 | 1 | | 3 005 | 30 180.20 | 33 185.20 |
| Greenwood | 163 | 4 | 4 315 | 3 976 | 31 680 | 86 | ..... | 6 108 | 3 | 15 | 100 | 4 | | 2 050 | 90 620.50 | 92 670.50 |
| Kamloops | 575 | 13 | 4 546 | 9 246 | 35 310 | 141 | ..... | 16 082 | 8 | 16 | 300 | 1 | | 6 380 | 132 523.00 | 138 903.00 |
| Liard | 233 | 1 | 1 553 | 5 886 | 74 910 | 89 | ..... | 3 664 | 43 | 109 | ..... | 12 | | 1 440 | 145 637.50 | 147 077.50 |
| Lillooet | 111 | 5 | 487 | 1 093 | 12 430 | 25 | ..... | 2 118 | 7 | 26 | 300 | 18 | 1 | 1 855 | 29 719.00 | 31 574.00 |
| Nanaimo | 261 | 2 | 490 | 1 317 | 8 030 | 21 | ..... | 824 | ..... | ..... | ..... | 1 | | 1 720 | 34 899.90 | 36 619.90 |
| Nelson | 328 | 5 | 1 067 | 795 | 3 190 | 51 | ..... | 896 | 3 | 4 | ..... | 1 | | 2 570 | 21 318.00 | 23 888.00 |
| New Westminster | 803 | 10 | 632 | 1 587 | 13 200 | 38 | ..... | 2 162 | 17 | 42 | 600 | 4 | | 6 420 | 37 777.50 | 44 197.50 |
| Nicola | 74 | 1 | 779 | 3 645 | 4 180 | 64 | ..... | 1 488 | ..... | ..... | ..... | ..... | | 730 | 34 119.00 | 34 849.00 |
| Omineca | 413 | 4 | 6 124 | 9 633 | 63 910 | 214 | ..... | 21 336 | 15 | 50 | 1 500 | 13 | 1 | 4 166 | 198 559.50 | 202 725.50 |
| Osoyoos | 268 | 4 | 1 584 | 2 053 | 33 880 | 29 | ..... | 7 870 | | | | ..... | | 2 415 | 61 083.00 | 63 498.00 |
| Revelstoke | 125 | 3 | 778 | 2 018 | 40 480 | 41 | ..... | 998 | 2 | 9 | 50 | ..... | | 1 160 | 64 081.00 | 65 241.00 |
| Similkameen | 158 | 3 | 762 | 1 521 | 19 030 | 31 | ..... | 6 346 | 32 | 82 | ..... | 16 | | 1 730 | 45 679.00 | 47 409.00 |
| Skeena | 240 | 2 | 1 105 | 2 713 | 51 480 | 35 | ..... | 4 128 | ..... | 8 | ... | 1 | | 1 440 | 90 074.84 | 91 514.84 |
| Slocan | 197 | 8 | 1 990 | 973 | 17 380 | 71 | ..... | 5 234 | ..... | 2 | ... | ... | | 3 675 | 43 607.00 | 47 282.00 |
| Trail Creek | 61 | 4 | 941 | 485 | 1 980 | 14 | ..... | 698 | ..... | ..... | ... | ... | | 1 820 | 11 621.50 | 13 441.50 |
| Vancouver | 2 371 | 331 | 501 | 902 | 11 670 | 35 | ..... | 1 972 | | ..... | ... | ... | | 133 145 | 43 715.45 | 176 860.45 |
| Vernon | 462 | 4 | 1 308 | 2 554 | 11 770 | 59 | ..... | 654 | 5 | 12 | ... | ... | | 3 145 | 33 760.65 | 36 905.65 |
| Victoria | 603 | 105 | 475 | 714 | 1 980 | 16 | ..... | 80 | 14 | 10 | 200 | 6 | | 41 995 | 41 386.51 | 83 381.51 |
| Total, 1978 | 9 444 | 531 | 37 242 | 65 705 | 583 450 | 1 299 | ..... | 98 178 | 397 | 1 081 | 12 200 | 205 | 11 | 233 526 | 1 472 398.52 | 1 705 924.52 |
| Total, 1977 | 7 566 | 520 | 37 151 | 39 711 | 384 500 | 782 | 1 | 105 412 | 146 | 928 | 31 325 | 102 | 50 | 221 546 | 2 013 668.39 | 2 234 051.14 |

*Mineral and Placer Title Maps*

The initial program of redrawing mineral titles reference maps which are produced for the public on a scale of 1:50 000 was completed in 1977 and the entire Province is now available at this scale. A new mapping program on the same scale using superior Ottawa base maps has been commenced. These maps will show contours and should be of great assistance to the prospector.

During 1978, 15 new mineral titles reference maps were drawn.

Five hundred and four applications were received for placer leases under a new system, established in 1975 with the proclamation of *a new Placer Mining Act,* of only accepting applications for leases in designated placer areas.

Mineral Claims Inspectors are based at Kamloops, Smithers, Vancouver, and Quesnel. Their duties include checking the locations of mineral claims to correlate them with the plotted position of the claims, determining the validity of the staking under the Mineral *Act* and the *Placer Mining* Act and regulations, investigation of possible misuse of mineral claims, and investigations of disputes. In order to fulfill the objectives of providing claim-hold& with firm title and maintaining accurate and up-to-date records, the activities of the inspectors have increased with the use of the modified grid system.

During 1978 as a result of seven complaints. under section 50 (formerly section 80) of the Mineral Act, seven mineral claims were cancelled. Two complaints were dismissed.

The Gold Commissioner's office in Vancouver is now equipped with a microfilm reader which will allow the general public to view technical reports. The Xerox machine will print these reports at a nominal cost. The Vancouver office should now become a greater source of information for the mining community.

*Coal*

The Coal Administrator is responsible to the Chief Gold Commissioner for the daily administration of the Coal *Act.* This involves reviewing applications for coal licences and leases and maintenance of records of title.

The statistics related to coal licences for 1978 are shown in Table 2-3.

*Table 2-3—Statistics for Coal Licences, 1978*

| | |
|---|---|
| Number of coal licences issued | 793 |
| Approximate area of coal licences issued | 205 000 hectares |
| Annual rental | $1 046 517.00 |
| Application fees | 6 190.00 |
| Cash in lieu of work | 77 460.00 |
| Miscellaneous fees | 6 405.00 |

**ECONOMICS AND PLANNING** DIVISION

*Objectives*

The Division provides economic and financial analyses pertaining to Provincial mineral sector policy, legislation, and planning and also collects, maintains, and disseminates comprehensive statistical data in support of Ministry resource management responsibilities.

staff

The professional staff of the Division as at December 31, 1978, was as follows:

J. S. Poyen ..... Director
F. C. Basham ..... Assistant Director
J. F. Clancy ..... Senior Research Officer
W. P. Wilson ..... Mining Statistician
D. R. Ramage ..... Financial Analyst

***Review* of *Activities***

The Division's mineral statistics service, in addition to its normal activities of collection, analysis, and reporting of mineral statistical information, continued with a project which will result in the computerization of most data now assembled on a manual basis. A monthly metal mine data input program was mounted, and the introduction of reporting and tabular output computer reports is scheduled for late 1979. Economic and financial analyses projects in 1978 included the initiation of a project to develop a financial/economic analysis model (MINSIM) for metal miniig projects in the Province. This analytical tool will contribute to Government benefit-cost evaluations of new ***miniig*** projects,

Staff in the group also participated in a major analysis of mineral taxation impacts on mining in the Province. This work led to the publication of a joint Federal/Provincial report on mineral taxation which was endorsed by Mines and Finance Ministers in November 1978.

The Division's responsibility for coal project economic appraisals was applied to a number of potential developments in the northeast and southeast areas of the Province. Such appraisals are required under ***the Guidelines*** for ***Coal Development*** in order to assist the Government in identifying the economic effects of such projects and in the evaluation of public sector infrastructure investments made in support of mining projects. Staff in the group also proceeded on enhancements to the computer model (COALMOD) used to conduct these evaluations.

Other major Division contributions included participation in a resource management study for sand and gravel, development of a computerized metal price data base, and research and analysis of compensation/mitigation policy pertinent to the mining sector.

The responsibility of the statistical section is, on a monthly and annual basis, to mail out, collect, edit, compile, and organize mineral statistics as required for the Annual Report and other intergovernmental uses. In order to reduce the reporting burden on the industry, these surveys are done on behalf of Statistics Canada and the Department of Energy, Mines and Resources, Ottawa. 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 represents the Government of British Columbia on such committees. The Task Force on Mineral Valuation has made a thorough review of all major mineral surveys in use throughout Canada in a continuing effort to obtain the most meaningful statistics available and at the same time avoid duplication. An internal project is underway which ultimately will computerize most of the data received from the Monthly and 'Annual Survey of Mines.

## PETROLEUM RESOURCES BRANCH

### ORGANIZATION

The Petroleum Resources Branch, under the general direction of Assistant Deputy Minister J. D. Lineham, Chief of the Branch, administers the Petroleum and Natural Gas Act 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.

#### *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, 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 the 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 consists of two sections, under the direction of Chief Geologist W. M. Young, and is responsible for all geological activities of the Petroleum Resources Branch. The Division is accountable for the collection, compilation, and assessment of geological and related information concerned with the exploration for and development of petroleum resources within producing and nonproducing areas of the Province; assisting in the framing of development procedures to ensure conservation and the best returns from these resources; estimating the remaining undiscovered petroleum resources used for the prediction in forecasts of oil and gas production; and providing data and opinions to attract, assist, and encourage industry in the development of the Province's petroleum resources.

The Economic Geology Section, under the supervision of Senior Economic Geologist J. A. Hudson, is responsible for the co-ordination and direction of projects concerned with regional mapping and the assessment of undiscovered petroleum resources.

The Reservoir Geology Section, under the supervision of Senior Reservoir Geologist R. Stewart, is responsible for the co-ordination and direction of projects concerned with the detailed mapping and assessment of discovered petroleum resources.

### *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 tbe Petroleum *and Natural Gas Act* relating to and affecting title to Crown petroleum and natural gas rights. The Division administers the 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 Titles 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, 1978, the professional and senior staff included the following:

Assistant 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
W. Duncan ..... Administrative Supervisor
B. T. Barber, P.Eng. ..... Senior Reservoir Engineer
P. S. Attariwala, P.Eng. ..... Reservoir Engineer
L. Pepperdine, P.Eng. ..... Reservoir Engineer
P. K. Huus ..... Reservoir Technician

J. H. Burt ..... Reservoir Technician
D. L. Johnson, P.Eng. ..... District Engineer
D. E. Krezanoski, P.Eng. ..... Field Engineer
D. A. Selby ..... Field Technician
G. T. Mohler ..... Field Technician
J. L. Withers ..... Field Technician
B. Baraniski ..... Field Technician
G. L. Holland ..... Field Technician
R. W. Nyffeler ..... Field Technician
G. German ..... 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
J. J. English ..... Reservoir Geologist
J. A. Hudson, P.Eng. ..... Senior Economic Geologist
K. A. McAdam ..... Economic Geologist

*Titles Division*

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

*Staff Changes*

In the Engineering Division, D. Krezanoski and R. Nyffeler joined the District staff at Charlie Lake as Field Engineer and Field Technician respectively. W. Duncan joined the Victoria staff as Administrative Supervisor.

In the Geological Division, D. Dewar, Economic Geologist, resigned to join industry and J. J. English joined the Branch as a Reservoir Geologist.

## HIGHLIGHTS OF THE PETROLEUM RESOURCES BRANCH ACTIVITIES

This section describes the highlights of both the technical and administrative work carried out by the various parts of the Branch during 1978.

*Legislation*

The ***Petroleum and Natural*** Gas ***Act*** was amended, in part, to make minor housekeeping changes, to convert all units of measure to the metric system (SI), and to provide for the. following:

(a) entry of land for the purposes of the ***Underground Storage Act,*** 1964 to be obtained by application to the Mediation and Arbitration Board established under the ***Petroleum and Natural Gas Act;***

(*b*) greater flexibility in the approval for locations for drilling wells on permits and subsequent leasing of locations;

(*c*) reduction of the term of leases from 10 to 5 years for designated areas considered workable for most of the year;

*(d)* reversion to the Crown of rights to oil and gas in a lease below the base of the deepest known commercial production. This stratigraphic reversion is effective at the end of the initial term of a lease or January 1, 1985;

(*e*) a lease, at the end of its initial term, may be continued only for the spacing area on which a commercial well is located and for such

other spacing areas as may be drained by the well. The remainder of the original lease converts to the Crown;

(*f*) for continuation of a lease beyond its initial term when drilling is being performed to the satisfaction of the Minister;

(*g*) continuation of a lease term under penalty reduced from four years to five years with increased penalties;

(h) in the event of a dispute concerning pooling, the Branch may invite submissions from interested parties rather than hold a hearing;

(*i*) the spacing, pooling, and licensing of all wells in the Province, including any wells located on freehold lands, must comply with the provisions of the Act and regulations;

(*j*) the disposal of Crown reserve oil sand, oil sand products, oil shale, and oil shale products under such terms and conditions as determined by the Minister;

(k) to prevent waste and for the approval of schemes to maximize production of oil and gas;

(I) the Minister may order the unitization of an area provided that at least two-thirds of the working interest owners in the area, who have agreed in writing to a proposed plan of unit operations, have made application for a unitization order.

In addition to the above, the Drilling and Production Regulations issued under the Act were amended to convert all measurements and numerical data into SI (metric) units. For many months before this conversion, meetings had been held with representatives from other oil-producing provinces in an attempt to develop common petroleum industry operating standards for all jurisdictions. Uniformity was achieved except when special circumstances made this impractical.

### *Mediation and Arbitration Board*

CHAIRMAN: Glen B. Pomeroy
VICE-CHAIRMAN: Cecil Ruddell
MEMBER: John Martin

The Mediation and Arbitration Board, established under the authority of the ***Petroleum and Natural Gas Act,*** grants rights of entry to oil and gas companies over alienated lands, and determines conditions of entry and compensation there fore. The Act provides for a process of mediation by a member of the Board appointed by the Chairman. 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 the responsibility to review and set compensation on leases and previous Board orders of more than five years' duration, and to terminate rights of entry when an operator has ceased to use occupied lands.

In 1978, 68 field inspections were carried out by the Board. The Board made 36 entry orders, and held eight arbitration hearings to set compensation. The Board met 94 times during the year to deal with general Board matters and specific concerns of the public.

### *Engineering Division*

The high level of petroleum activity in 1978 imposed a heavy regulatory and administrative work load on the Division. In addition to these more routine duties, the Division also had many dealings with other Crown agencies and presented

submissions to the British Columbia Energy Commission Hearings and to two hearings held by the National Energy Board.

Important projects completed by the Division during the year included the complete conversion of appropriate legislation to SI (metric) standards, the design of engineering requirements for Government approval of underground gas storage projects, participation with other jurisdictions and industry in the standardization of reserves terminology, and the introduction of a procedure for Ministry participation in petroleum road maintenance and construction. These items are described more fully in the following summaries of work carried out by the three sections of the Engineering Division.

***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, drilled, and produced 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 1978 there were 466 well authorizations issued, an increase of 24 per cent over 1977. Throughout the life of a well, the status, well name, and classification may be changed as circumstances require. During the year statuses were changed on 121 occasions, well names on 117, and well classifications on 35.

In addition to comprehensive well data records, all geological and geophysical reports submitted for work credits as well as the Branch correspondence files of the three Divisions are maintained by the section. The program to microfilm all significant full-sized documents for security purposes and to establish a library in microfiche format was continued. At the end of 1978 the first 3 500 well data files were in this library with plans to have some of the technical staff use this format on a trial basis. This scheme will be employed for records a few years old but the later documents will be used in the full size until entered into the system. Two items not included in this plan are the Daily Drilling Reports and the full-scale logs.

The changeover of measurements to SI for drilling operations was put into effect on July 1, 1978 and at the beginning of 1979 all measurements related to production and transportation will be converted. AU Government-issued forms were reprinted and distributed to the industry to meet these deadlines while conversion of the relevant computer programs was near completion at year-end.

Each drilling and service rig operating in the Province must have a valid Rig Licence. During 1978, 88 licences were renewed while 34 new ones were issued.

***Drilling and Production Engineering***—This section is located in the district office at Charlie Lake in northeast British Columbia. During 1978, approximately 162,710 miles were driven by the field staff of this section to enforce at the field level requirements of the Drilling and Production Regulations and the Geophysical Regulations, both made pursuant to ***the Petroleum and Natural Gas Act.***

The year began with six regular field technicians on staff but, due to the heavy work load imposed by unusually high drilling and subsequent production operations, the staff complement was increased by the addition of a field engineer and another field technician. During the year increased emphasis was placed on inspections at oil and gas production facilities to ensure compliance with gas conservation orders and to attend to reduce needless flaring of oil and gas. Such inspections were carried out on 609 different occasions at oil and gas battery facilities.

To check the accuracy and reliability of gas measurement equipment, gas production was monitored closely with fast meter checks being done on 631 occasions and complete meter checks being made on another 431 occasions.

To ensure the reliability and to augment data received by our Victoria Reservoir Engineering Section, 145 static pressure gradients were run, 18 gas well flow tests were witnessed, and six oil well production tests were witnessed. Further in keeping with Branch policy that all surface pressure elements be calibrated to the Provincial standard, which is maintained at the Charlie Lake office, 1 492 such calibrations were performed during 1978.

Geophysical field activity increased greatly during 1978, with 176 seismic field inspections being made compared to 64 during 1977.

The high level of drilling activity which had started in 1977 carried forward throughout 1978, and as an indication of the activity there were, after a short spring breakup during April and May, an average 33 **active** wells each month from June. to the end of October 1978.

During 1978, 403 wells were spudded and in the course of 781 inspections on active drilling sites emphasis was placed on ensuring that the drilling rigs, both those that had been previously working in the Province and those ones newly in, were mechanically acceptable to Branch standards.

This section continued its involvement with the Northeastern British Columbia Oil Spill Co-operative, taking an active part in all meetings and training exercises. This involvement was recognized during 1978, when the Branch was asked to become an associate member of the PROSCARAC (Prairie Regional Oil Spill Containment and Recovery Advisory Committee) established under the auspices of the Canadian Petroleum Association.

*Reservoir* Engineering--An important responsibility of the Reservoir Engineering Section is to estimate on a continuing basis the oil and gas reserves in British Columbia. Estimates as of December 31, 1978 are shown in Table 4-3 and are summarized below.

| | | |
|---|---|---|
| Oil, established | 185 930 MSTB | 29 546 $10^3m^3$ |
| Natural gas, established— | | |
| Raw | 8 719 BSCF | 245 635 $10^6m^3$ |
| Marketable | 7 105 BSCF | 200 173 $10^6m^3$ |
| Natural gas liquids— | | |
| Propane | 8 289 MSTB | 1316 $10^3m^3$ |
| Butane | 12 535 MSTB | 1991 $10^3m^3$ |
| Pentanes plus | 24 258 MSTB | 3 855 $10^3m^3$ |
| Sulphur | 7 558 MLT | 7 679 10% |

It may be observed from Table 4-3 that the oil reserves have increased 19.1 MMSTB (3.0 $10^6m^3$) from last year. Additions due to drilling and revisions were 16.7 MMSTB (2.6 $10^6m^3$) and 15.0 MMSTB (2.4 $10^6m^3$) respectively. Production reduced the reserves by 12.6 MMSTB (2.0 $10^6m^3$).

Raw gas reserves at the end of 1978 were 0.45 TSCF (12 600 $10^6m^3$) higher than last year. Additions due to drilling and revisions were 0.75 TSCF (21 100 $10^6m^3$) and 0.05 TSCF (1 400 $10^6m^3$) respectively. Production reduced the reserves by 0.35 TSCF (9 900 $10^6m^3$).

The Branch has adopted a revised method for the determination of established marketable gas reserves. This method consists of accumulating initial established reserves of raw gas, cumulative production, and remaining established reserves by plants (operating, planned, or anticipated) and applying to these volumes actual shrinkage values from field production to marketable gas volumes at the tailgate

of the plant. These shrinkage values were derived by averaging data for the four years, 1974 to 1977. In previous years volumes of raw gas were converted to volumes of "residue" gas by allowing for theoretical volume reductions due to removal of acid gases in processing plants and, also, removal of certain percentages of liquid hydrocarbons in the Fort St. John plant. It should be noted, therefore, that volumes of "residue" gas published in past years should not be directly compared to volume of marketable gas shown in Table 4-3.

British Columbia took part during the year in a task force on Uniform Reserve Terminology consisting of representatives from the western producing provinces, the National Energy Board, and industry. This task force was set up by the Interprovincial Advisory Committee on Energy (IPACE) to develop a set of terms which could be acceptable to all sections of the petroleum business in Canada for the reporting of reserve estimates. After a series of meetings unanimity was reached by the task force on terms to be proposed for general application. These were subsequently accepted by the Ministry and will be adopted by all British Columbia Government agencies involved in the estimation of oil and gas reserves.

An estimate of established remaining reserves and producibility by years for the period 1978 to 2002 of raw and residue natural gas and natural gas liquids, together with estimates of future discoveries, was included in the Ministry's submission to the British Columbia Energy Commission's Oil and Gas Price Inquiry in June 1978. Also included were estimates of established remaining reserves and producibility by years for the period. 1978 to 1995 of crude oil together with estimates of future discoveries, modifications to existing waterfloods, and tertiary recovery.

An estimate of established remaining reserves and producibility by years for the period 1978 to 1995 of crude oil and pentanes plus together with estimates of future discoveries, modifications to existing waterfloods, and tertiary recovery was prepared for inclusion in the Province's submission to the National Energy Board at a hearing into "Canadian Oil Supply and Requirements" during May to June 1978. An estimate of established remaining reserves and producibility by years for the period 1978 to 2000 of raw and marketable natural gas together with estimates of future discoveries was prepared for inclusion in the Province's submission to the National Energy Board at a hearing into "Natural Gas Supply and Demand" during October to November 1978.

The estimates presented to the National Energy Board indicate that daily oil producibility from established reserves and future discoveries may decline from 37.3 MSTB in 1978 to 11.9 MSTB in 1995; daily producibility of pentanes plus is expected to remain constant at about 3.3 MSTB through 1980 and then decline to about 1.3 MSTB in 1995. Annual producibility of raw natural gas is predicted to increase from 391 BSCF in 1978 to 496 BSCF in 1983 and remain essentially constant in the 475- to 500-BSCF range through 2000.

A review of the literature dealing with underground storage was undertaken for the purpose of establishing a procedural guide for industry when making application for approval of a scheme of underground hydrocarbon storage in an aquifer under the ***Underground*** Storage ***Act,*** 1964. The information needed by the Branch to enable it to evaluate an application and make recommendations to the Minister has now been determined and these requirements will be published in the next update of the Procedural Handbook.

*Geological Division*

*Economic Geology*—The published subsurface mapping series of the northeastern sedimentary basin area was updated and revised to include released information as of April 30, 1978. This subsurface coverage, which includes most of the major producing horizons, is available on both a 1: 100 000 and 1:250 000 mapping scale. The latter scale is a composite of eight map sheets and therefore provides a broad regional perspective of the mapped horizon.

A new 1: 100 OOO-scale drillstem test and penetration compilation map series started in 1977 was completed during the year with released information posted as of April 30, 1978. These maps show 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 withii 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.

The section was very active in assisting other Divisions, Ministries, Crown agencies, and the public in matters concerning regional geology and estimates of the remaining undiscovered petroleum resources. Frequent meetings were held with various industry representatives to discuss aspects of geology, geophysics, and the petroleum resource potential of the northeastern producing area.

Reservoir *Geology*—As a result of a record year in drilling activity, the Reservoir Geology Section carried. out a demanding program of assessment and mapping in detail all oil and gas accumulations encountered by the drill. Structural, stratigraphic, and reservoir geologic data made available through drilling were used as the basis for new and revision-type map work, reservoir studies, evaluation of reserves, and the control of remedial work, cycling, repressuring, and secondary recovery projects.

During the year substantial changes resulted from new drilling and studies in the following pools and corresponding hydrocarbon-bearing rock unit(s) : Boundary Lake North-Halfway, Buick Creek—Dunlevy and Doig, Buick Creek North—Bluesky, Cabin—Slave Point, Cache Creek-Coplin and Halfway, Dahl—Bluesky, Eagle West-Belloy, Fireweed—Dunlevy, Fort St. John-Charlie Lake, Kotcho Lake East—Slave Point, Pocketknife—Debolt, Sierra-Pine Point, Silver—Bluesky, Stoddart—Cecil, Stoddard West-Belloy, and Wilder-Halfway.

The most significant change as a result of development drilling took place in the Stoddart West-Belloy oil pool which was extended to include approximately 1 457 hectares of productive area. Other noteworthy extensive successes included the Halfway and Baldonnel gas in the Sundown and Ojay areas respectively.

Several new fields encompassing previous single and double well pools were designated as Altares, Birch, Goose, Gundy Creek West, and Klua as a replacement of Clarke Lake South, Thetlaandoa North, and Wolverine. The outlines of all designated fields and pools are revised on a quarterly basis.

A considerable amount of time was employed in assessing the volumetric oil and gas reserves of wells as a basis in determining production allowables. Controversy with industry over assigned reservoir parameters was frequent with noteworthy examples in the Devonian carbonates where the operator was reluctant to penetrate the complete gas-bearing interval. Other problem areas were encountered at Eagle West and Stoddart West as a result of questionable rock lithology in wells which did not have a complete core recovery over the whole of the productive zone.

As a result of the above problems, the section conducted special studies on the Devonian reef distribution in the Yoyo, Sierra, Junior and Ekwan area, and the Belloy rock lithology in the Eagle West and Stoddart West oil pools. The inter-relationship of tight Devonian reef, porous reef, and shale deposits was determined from structure, isopach, and cross-sectional displays. This mapping was then used in conjunction with reservoir pressure depth plots as a means of estimating the over-all gas-bearing interval in wells which did not penetrate the gas/water interface. Belloy cored data from the Eagle. West and Stoddart West oil pools were used in constructing density plots, core porosity-log porosity cross-plots, and porosity-permeability cross-plots for the purpose of assigning net oil pays within sections containing variable rock lithologies.

Routine assistance was provided in advising other Divisions with geological evaluations and assessments of Crown lands posted for disposal of petroleum and natural gas rights; petroleum and natural gas lease extension renewals; the reclassification of wells for the purpose of confidentiality of information and new pool discovery status; geological appraisal concerning industry production schemes; and the disposal of water production.

*Titles Division*

One of the basic responsibilities of the Titles Division is to issue licences permitting a company to carry out geophysical exploration. During the year 34 geophysical licences were issued or renewed, an increase of 12 from 1977. One Unit Agreement was approved. A total of 258 notices of commencement of exploratory work was recorded, an increase of 94 from the previous year. These notices are required prior to the commencement of any geological and geophysical exploration for petroleum and natural gas. With the exception of one program done in the Queen Charlotte Islands and one in the Fraser Valley, all geophysical activity was undertaken in the northeast corner of the Province. During the year 378 geophysical crew weeks were worked and approximately 13 744 kilometres of line recorded resulting in an increase of 99 crew weeks and 5 389 kilometres of line over that of 1977.

During the year the mapping section continued with the ongoing program of updating and converting base maps to 1:50 000 scale. Of particular interest were the seismic road and trail maps which are updated on a daily basis using a base with the topography screened so these maps become very useful in the field when determining the location of lines for new seismic programs.

In addition to its normal activities, the. Division spent considerable *time.* assisting in special projects with other Ministries in matters relating to petroleum tenure rights and lands. Very frequent meetings were held with various industry representatives concerning tenure to petroleum and natural gas rights, Crown sales, and their administration under the terms of the Petroleum *and Natural* Gas *Act* and regulations.

One of the major projects of the Division was the selection, description, terms of the licence agreement, and evaluation of the petroleum and natural gas rights transferred to the British Columbia Resources Investment Corporation. By the end of the year three permits had been issued to British Columbia Resources Investment Corporation and one well had been drilled. In addition, several seismic programs were in progress over licensed lands.

During the year two permits were issued for oil sand and oil shale exploration in Graham Island. By the end of the year drilling was in progress on these permits.

The Division was involved in discussions and preparation of amendments to the Petroleum and *Natural Gas* Act which became effective on July 1, 1978. Many changes were of a housekeeping nature but substantial amendments were made involving the tenure and continuation of a lease term.

By the end of the year, approval was given to add two clerical positions to the staff of the Division to assist in processing the very heavy volume of work created as a result of 1978 being the year of record-breaking interest in land acquisition, exploration, and drilling. As of December 31, 1978, 21,873,776 acres (8 852 317 hectares) or approximately 34,178 square miles, an increase of 862,642 acres (349 111 hectares) over the 1977 total of Crown petroleum and natural gas rights issued under the ***Petroleum and Natural Gas*** Act 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 | Hectares |
|---|---|---|---|
| Permits | 421 | 12,496,271 | 5 057 241 |
| Natural gas licences | 2 | 18,678 | 7 559 |
| Drilling reservations | 107 | 1,052,921 | 426 117 |
| Lease (all types) | 5 056 | 8,305,906 | 3 361400 |
| Totals | | 21,873,776 | 8 852 317 |

During 1978 the following transactions were completed:

1. PERMITS—

| | |
|---|---|
| Issued* | 40 |
| Renewed | 304 |
| Converted to lease | 43 |
| Cancelled | 45 |
| Transferred (assigned) | 34 |

2. DRILLING RESERVATIONS—

| | |
|---|---|
| Issued | 52 |
| Renewed | 50 |
| Converted to lease | 34 |
| Cancelled | 34 |
| Transferred (assigned) | 12 |

3. LEASES—

| | |
|---|---|
| Issued | 939 |
| Annual rental paid | 3 260 |
| Renewed for IO-year term† | 39 |
| Extended under penalty† | 86 |
| Extended NOT under penalty† | 219 |
| Cancelled | 37 |
| Transferred (assigned) | 659 |

4. NATURAL GAS LICENCES‡—

| | |
|---|---|
| Issued | 3 |
| Renewed | *Nil* |
| Converted to lease | 1 |
| Cancelled | 2 |
| Transferred (assigned) | Nil |

* Includes three BCRIC permits.
† From January 1, 1978 to June 30, 1978 only.
‡ From July 1, 1978 to December 31, 1978: Leases continued, 110; leases continued with penalty, 83

| 5. CROWN SALES— | Number Advertised | Numbe Sold |
|---|---|---|
| Permits | 35 | 35 |
| Drilling reservations | 59 | 52 |
| Leases | 812 | 652 |
| Totals | 906 | 739 |
| 6. GEOPHYSICAL LICENCES—Issued | | 34 |
| 7. NOTICE OF COMMENCEMENT OF EXPLORATORY WORK— Approved | | 258 |
| 8. AFFIDAVITS OF WORK—Approved | | |
| Permits | | 86 |
| Leases | | 18 |
| 9. MISCELLANEOUS RECORDINGS (mergers, grouping notices, etc.)—Approved§ | | 2 400 |
| 10. UNIT AGREEMENTS-Approved | | 1 |

§ Estimated.

## MINERAL REVENUE DIVISION

The Mineral Revenue Division is responsible for the assessment and collection of royalties and resource taxes imposed on metallic and non-metallic minerals, the development of which is subject to the administrative jurisdiction of the Ministry of Energy, Mines and Petroleum Resources. To execute its assigned responsibilities, the Division has a staff of 21 permanent employees and one temporary employee. Under the direction of W. W. Ross, it is organized into five functional areas as follows: The Mineral and Petroleum Accounting sections, under B. A. Garrison, Assistant Director; the Mineral Titles Section, under N. D. Smith, Chief Titles Officer, who reports directly to Mr. Garrison; the External Audit Section, under A. R. Lockwood; and the staff stenographic services, under Mrs. J. Skrypnick, both of whom report to Mr. Ross. Primary responsibilities of the Division which have not changed during the year are outlined in the 1977 Annual Report. This report is confined to summarizing 1978 performance.

### COAL ROYALTY REGULATIONS UNDER THE COAL ACT

*On* June 29, 1978, the Coal *Amendment Act, 1978,* was given royal assent. Under the Act, section 29 was amended to provide a royalty based on 3.5 per cent of the minehead value of coal produced and sold, rather than the flat rate royalties of $1.50 per ton for metallurgical coal, and 75 cents per ton for thermal coal. B.C. Regulation 290/78 was approved and ordered on July 13, 1978, to initiate the new provisions of section 29 of the Act.

During 1978, 2 805 225 tonnes of coal was reported as shipped and sold which yielded royalty payments of $4 222 054.58; however, an audit of production for the period 1974-1977 resulted in increased tonnages subject to the payment of royalty, and accounted for an additional collection of $808 682.61 for total receipts from Crown coal during the year of $5 030 737.19.

### IRON ORE ROYALTY AGREEMENTS UNDER THE MINERAL ACT

Two producers were subject to the payment of a royalty of $1 .OO per long dry ton of contained iron in iron concentrates produced and sold during 1978. The royalty provisions deem a concentrate to have an iron content of 50 per cent, and

allows a credit against royalty payments of 50 per cent of the royalty payable where exploration work has been performed. During 1978, 486,026.057 long dry tons of iron concentrates with a deemed iron content of 243,013.029 long dry tons was reported as shipped and sold which yielded royalty payments of $121 506.53.

MINERAL LAND TAX ACT

The *Mineral Land Tax* Act, which imposes a tax on the ownership of freehold mineral rights, was converted to metric standards during the year. The basic tax under the Act ranges from 62 cents per hectare to $2.47 per hectare with a minimum assessment of $10.00 depending upon total area held by an owner. Where land is designated as a "Production Area," the basic assessment becomes $4.94 per hectare, and if the land is designated as a "Production Tract," a mill rate assessment, not exceeding 25 mills is applied to the assessed value of the production tract in addition to the basic charge. of $4.94 per hectare. During 1978, the only designated production tracts subject to a mill rate assessment of 12.5 mills were those tracts which produced coal, petroleum, or natural gas during the year.

Mineral land tax assessment notices for 1978 were issued by May 1 on a total of 521647.42 hectares under 6 124 folios. This represents increases of 1 182 folios *or 24* per cent and 23 929.68 hectares or 5 per cent over the 1977 mineral land tax assessment roll. A summary of the 1978 mineral land tax assessment roll and the related taxes assessed and collected are reflected in the following table:

*Table 2-4—Mineral Land Tax Assessment Roll*

| Classification of Mineral Land | Number of Folios | Hectares | Tax Assessed | Taxes Forgiven on Agricultural Land | Tax Collected |
|---|---|---|---|---|---|
| | | | $ | $ | $ |
| Non-designated | 6 060 | 503 465.73 | 330 623.42 | 82 763.04 | 288 841.45 |
| Production areas | 53 | 14 156.41 | 69 932.67 | ..... | 59 850.91 |
| Production tracts | 11 | 4 025.28 | 7 966 148.91 | ..... | 7 814 105.08 |
| Interest | ..... | ..... | 3 270.27 | ..... | (1) |
| Delinquent taxes | ..... | ..... | 46 957.65 | ..... | (1) |
| Totals | 6 124 | 521 647.42 | 8 416 932.92 | 82 763.04 | 8 162 797.44 |

1 Interest and delinquent tax collections included in tax collected for each classification.

During 1978, the Mineral Titles Section carried out 27 767 title searches including 2 694 special search requests for the Water Resources Branch of the former Ministry of the Environment. As a result of the searching activities, 2 024 parcels covering 93 024.04 hectares were added to the roll, and five surrenders covering 124.71 hectares were processed. Preliminary searches were also completed to facilitate the surrender of mineral rights in the "lieu lands" of the Esquimalt and Nanaimo Railway Belt located north of title 7434A. It is anticipated that this surrender will be completed in 1979. The Division also processed forfeitures on 97 folios covering 167 lots for a total of 3 471.83 hectares.

Audits were completed on nine mines which resulted in a reduction of $9 331 600 in assessed values, and a tax adjustment of $116 645.00.

Professor John Bedford Evans resigned as Chairman of the Mineral Land Tax Review Board in December to take up a position in Australia. Fortunately, actions before the Board have been adjourned *sine die pending the* final disposition of an appeal on the Honourable Mr. Justice Berger's findings on specific questions of law put to the Supreme Court of British Columbia by the Mineral Land Tax Review Board. The rulings were sought as tbe result of an appeal before the Board, and a consolidated action before tbe Supreme Court. On December 5, 1978, the Honourable Mr. Justice Berger pronounced his judgment finding that:

The effect of these reasons is to uphold tbe validity of the regulations under which assessments have been made. The administrator has the power now under the Act and regulations to make assessments on production tracts, and these assessments may be r&o-active. But the assessment made against production tracts before the coming into force of the Amending Act-l refer to the assessments in issue in these proceedings-have no legal force and effect, and no tax can be levied under them. All moneys paid by the companies under these assessments must be returned.

An appeal has been initiated on the Honourable Mr. Justice Berger's decision, but it is not likely that tbis will be dealt with until late 1979.

### MINERAL ROYALTIES ACT

This Act was repealed as of January 1, 1977; however, six audits remained at the close of 1977, and these have now been completed with additional assessments of $372 641. Also, the Crown was successful in its claim against Consolidated Churchill Copper Corporation Ltd. for delinquent royalties, and collected $336 637.78 on that account. Total net revenue received during the year under this Act was $699 316.19.

### MINERAL RESOURCE TAX ACT

*The Mineral Resource Tax Acr* imposes a 17.5-per-cent tax on the profits earned from the operation of a mine, within the Province, which produces minerals as defined under the *Mineral Act.* A review of annual returns indicated that 38 returns were filed for fiscal years ending in 1977, and that net aggregate income was $53 367 407.33 which resulted in a gross tax payable of $11 112 995.52 which, after deduction of allowed royalty credits of $2 847 218.46, paid for the 1976 calendar year, yielded a net tax payable of $8 265 777.06. Actual revenue collections for the year under the Act were $8 922 987.92. The Audit section reviewed 25 of the annual returns submitted and issued 19 assessment notices for a net credit adjustment of $114 826.26.

### PETROLEUM AND NATURAL GAS ROYALTIES

Petroleum and natural gas production from Crown lands is subject to the payment of a royalty under the Petroleum and Natural Gas Royalty Regulations, with the proviso that any gas sold under contract to the British Columbia Petroleum Corporation is exempt from the payment of royalty. The revenue collections for the year are as follows:

*Table 2-6—Petroleum and Natural Gas Revenue Collection, 1978*

| | $ |
|---|---|
| Natural gas royalties | 72 729.14 |
| Crude petroleum royalties | 42 191 349.49 |
| Natural gas by-product royalties | 1074 867.41 |
| Penalties | 510.00 |
| Total | 43 339 456.04 |

Tbe petroleum exploration incentive program was terminated in 1978; however, any established credits may be redeemed in accordance with the provisions as previously specified. The transactions completed during the year for oil credits are reflected in the following statement.

## *Table 2-5—Mineral Revenue Collections, 1978*

| Month | Petroleum and Natural Gas Royalties | | | | | Mineral Resource Royalties and Taxes | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gas | Oil | Products | Penalties | Total | Iron Ore Royalty Agreement | Coal Act Royalties | Mineral Royalties Act | Total Royalties | Mineral Land Tax Act | Mineral Resource Tax Act | Total Mineral Royalties and Taxes | Total Divisional Revenue |
| | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| January | 10 324.41 | 3 854 224.48 | 95 960.92 | ..... | 3 960 509.81 | 67.68 | 230 764.00 | ..... | 230 831.68 | 231.26 | 735 549.19 | 966 612.13 | 4 927 121.94 |
| February | 3 812.57 | 4 870 515.67 | 176 961.13 | 430.00 | 5 051 719.37 | 286.69 | 325 580.00 | ..... | 325 866.69 | 2 048.72 | 504 000.00 | 831 915.41 | 5 883 634.78 |
| March | 11 245.43 | 3 462 645.69 | 72 735.10 | ..... | 3 546 626.22 | 12 133.69 | 256 024.50 | 7 152.49 | 275 310.68 | 2 313.39 | 501 500.00 | 779 124.07 | 4 325 750.29 |
| April | 5 808.45 | 2 767 740.17 | 67 332.52 | ..... | 2 840 881.14 | 15 345.97 | 305 940.00 | ..... | 321 285.97 | 173.45 | 792 089.64 | 1 113 549.06 | 3 954 430.20 |
| May | 4 961.48 | 3 453 670.26 | 82 036.66 | 80.00 | 3 540 748.40 | 12 213.17 | 262 200.00 | ..... | 274 413.17 | 30 069.21 | 53 000.00 | 357 482.38 | 3 898 230.78 |
| June | 4 896.96 | 2 586 197.05 | 65 839.85 | ..... | 2 656 933.86 | 6 913.63 | 503 537.00 | ..... | 510 450.63 | 42 771.12 | 3 284 884.76 | 3 838 106.51 | 6 495 040.37 |
| July | 4 114.63 | 3 412 663.41 | 60 575.71 | ..... | 3 477 353.75 | 17 125.62 | 247 584.00 | ..... | 264 709.62 | 7 782 561.88 | 518 573.87 | 8 565 845.37 | 12 043 199.12 |
| August | 3 588.80 | 2 126 159.13 | 5 207.85 | ..... | 2 134 955.78 | 8 405.41 | 341 058.00 | ..... | 349 463.41 | 247 215.09 | 514 828.00 | 1 081 506.50 | 3 216 462.28 |
| September | 3 148.77 | 4 061 040.76 | 140 137.47 | ..... | 4 204 327.00 | 19 684.84 | 341 518.00 | (9 962.37) | 351 240.47 | 12 333.11 | 514 828.00 | 878 401.58 | 5 082 728.58 |
| October | 4 319.82 | 3 896 498.35 | 100 050.31 | ..... | 4 000 868.48 | 17 252.42 | 371 337.08 | 336 637.78 | 725 227.28 | 308.23 | 466 500.00 | 1 192 035.51 | 5 192 903.99 |
| November | 9 695.59 | 4 036 215.92 | 109 629.14 | ..... | 4 155 540.65 | 7 181.06 | 1 507 642.61 | ..... | 1 514 823.67 | 70 025.22 | 570 644.46 | 2 155 493.35 | 6 311 034.00 |
| December | 6 812.23 | 3 663 778.60 | 98 400.75 | ..... | 3 768 991.58 | 4 896.35 | 337 552.00 | 365 488.29 | 707 936.64 | 2 746.76 | 466 500.00 | 1 177 183.40 | 4 946 174.98 |
| 1978 totals | 72 729.14 | 42 191 349.49 | 1 074 867.41 | 510.00 | 43 339 456.04 | 121 506.53 | 5 030 737.19 | 699 316.19 | 5 851 559.91 | 8 162 797.44 | 8 922 897.92 | 22 937 255.27 | 66 276 711.31 |
| 1977 totals | 180 951.50 | 41 015 470.45 | 887 907.66 | 890.00 | 42 085 219.61 | 126 653.28 | 3 347 551.80 | 2 507 896.90 | 5 982 101.98 | 8 307 272.87 | 9 655 342.29 | 23 944 717.14 | 66 029 936.75 |
| 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 | 6 714 657.52 | 217 021 949.73 | 3 299 924.94 | 3 399.20 | 227 039 931.39 | 771 682.93 | 15 885 839.93 | 32 612 917.59 | 49 270 440.45 | 56 954 771.56 | 18 578 240.21 | 124 803 452.22 | 351 843 383.61 |

*Table 2-7—Oil Credits Transactions, 1978*

| | Credits | Value $ |
|---|---|---|
| Balance brought forward from 1977 | 9 699 092 | 7 274 319.00 |
| Credits established during the year | 1 800 261 | 1350 195.75 |
| Credits redeemed during the year | 9 909 087 | 7 431 815.25 |
| Credit expired during the year | - | |
| | 1 590 266 | 1 192 699.50 |

MINES ASSESSORS' CONFERENCE

On January 25 to 27, 1978, the Province hosted a conference of Provincial mines assessors in Victoria. The meeting afforded the assessors an opportunity to discuss administrative problems, and to compare the administrative procedures employed within different Provincial jurisdictions. A transcript of the proceedings was prepared, and copy was provided for each delegate. The assessors felt that the conference was very successful, and should be held on a regular basis so that they can be made fully aware of the implication for changes made in other jurisdictions.

## FINANCE AND ADMINISTRATIVE DIVISION

The Director of Finance and Administration, Robert R. Davy, was appointed May 1, 1978. Reporting to the Director are the Accounts Section, Publications, Library, and Mailing Services. The Director reports directly to the Deputy Minister.

### ACCOUNTS SECTION

This section is under control of the Director. Mrs. Maureen Lundquist, who had assumed temporary responsibility of the section until the Director was appointed, won a competition with the Ministry of Finance and left in November. During the year Mary-Ellen Tonge was appointed to head Accounts Payable. The several functions of the section are the preparation of Ministry estimates, payroll administration, administering payment of suppliers' accounts and travel claims, costing and facilitating of purchases of the Ministry through the Purchasing Commission, and other administrative accounting responsibilities.

### LIBRARY

The Ministry Library, located at Room 430, Douglas Building, Victoria, is administered by the Director and supervised by Sharon Ferris. The Library provides geological and technical information for the staff, other Ministries, industry, and the public.

The Library is the depository for all publications of the Ministry. Other holdings include reports of the geological surveys and mines' branches of Canada, the United States, and other foreign nations. Government reports and maps total approximately 16 000 in number. There are approximately 1 850 texts and reference books. Audio visual equipment is also stored in the Library for staff use. Special collections comprising of proceedings and guidebooks from international geological congresses, and annual reports of the mining and petroleum companies are also held by the Library.

An estimated 2 100 requests for information were dealt with in 1978 and 115 inter-library loan requests were made for staff members. Indexing of government serial publications was continued.

PUBLICATIONS

The Publications section is administered by the Director and supervised by Mrs. Rosalyn J. Moir. Responsibilities include publication preparation for the Ministry, maintaining indexes and publication lists, disseminating press releases, and dispatch of the ever-increasing requests for information from other governmental agencies, universities, industry, and the public. Approximately 8 000 communiques were handled during tbe year.

The Publication Committee, composed of a representative from each Division, is chaired by Dr. A. Sutherland Brown who administered the section until the appointment of the Director on May 1. This Committee met at irregular intervals throughout the year.

Publications that are in print may be obtained from the Ministry, Room 414, Douglas Building, 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, 800 Homby Street, Vancouver.

Publications are available for reference use in the Ministry Library, in the Reading Room of the Geological Survey of Canada, in the offices of the Inspector of Mines in Nelson and Prince Rupert, as well as in certain libraries.

Separate lists of publications are available for the Mineral Resources Branch and the Petroleum Resources Branch on request to the Publications Section, Ministry of Energy, Mines and Petroleum Resources, Room 414, Douglas Building, Victoria V8V 1X4. Mailing lists are maintained for all those interested in receiving notification of the release of new publications.

## PERSONNEL

There were no stat? changes in the Personnel office during 1978.

The Management Classification and Compensation Plan was completed, and Personnel continued input to an over-all Licensed Professional Officer Plan as well as representing the Ministry on management negotiations. Throughout 1978 more than 26 stat? were enrolled in training courses.

The Ministry Personnel statistics for 1978 are as follows:

| | |
|---|---|
| Number of permanent employees | 261 |
| Number of appointments | 30 |
| Number of resignations | 4 |
| Number of retirements | 3 |
| Number of in-service transfers | 3 |
| Number of promotions and reclassifications | 17 |
| Number of temporary employees | 43 |
| Number of temporary employees under WIG 1978 | 15 |
| Number of temporary employees under summer program | 47 |

# 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 Energy, 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 Energy, 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 100.

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 tine 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 102, converted into Canadian foods. 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 foods. 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 Inco Limited. 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 tbe 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 tbe 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. Since 1974 the 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 100.

For 1925 to 1973 the values had been calculated by using the true average price (see page 100) and the net metal contents in accordance with the procedures adopted by Statistics Canada and the Ministry of Energy, 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 MINERAL's 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;

## MINERAL AND PETROLEUM PRODUCTS IN BRITISH COLUMBIA

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 now most is shipped by truck to Stewart. 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 has been mined from lode deposits and the rest 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, 3-7A, and 4-16.

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%@ 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 Inland Cement Industries Ltd., with a 907 180 tonnes-per-year plant on Tilbury Island, and 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-l 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 nor&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-l and 3-7C.

Coke-Coke is made from special types of coal. It has been produced in British Colombia since 1895. Being a manufactured product, its value does not contribute to the total mineral production as shown in Table 3-l. Up to 1966, coke statistics had been included in the Annual Report at 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, 3-7A, and 4-16.

Copper-From 1935 to 1978 no copper smelter operated in British Columbia and most of the copper concentrates were shipped to Japanese, eastern Canadian, and American smelters. In 1978, Afton Mines Ltd. started producing blister copper from its own concentrates. Most of the smelting in British Colombia in early years was done on ore shipped directly from the mines without concentration, but modem practice is to concentrate the ore first. Small amounts of gold and silver are commonly present and add value to the ore.

Ore was smelted in British Colombia 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 Britisli Columbia-from Britannia, Copper Mountain, Greenwood, Highland Valley, Merritt, Nelson, Rossland, Texada Island, and Vancouver Island, although a sizable amount came from Anyox and some from Tulsequah. During the 1960's, exploration for copper be came intense, interest being especially did toward finding very large, l&v-grade deposits suitable for open-pit mining. This activity has resulted in the establish-

ment 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)—closed mid-1978, near Port Hardy (Island Copper) in 1971, near Babiie Lake (Bell), McLeese Lake (Gibraltar), Highland Valley (Lornex), Princeton (Ingerbelle) in 1972, and near Kamloops (Afton) in 1977. See Table 3-12 for a complete list of copper producers.

Some of these mines produce molybdenum as a by-product, for example, Bethlehem, Brenda, Lornex, Gibraltar, and Island Copper. Copper is also produced as a by-product of iron mining at Tasu Sound, Queen Charlotte Islands (Wesfrob), 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 except in 1977 when it was surpassed marginally by natural gas. 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 1978, oil was produced from 36 separate fields, of which the Boundary Lake, Inga, Peejay, and Eagle 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. Table 4-16 incorporates all revisions since. the commencement of production.

*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 Morseby 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 at 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 161 181 000 grams valued at $98.5 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-l 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 Morseby Island. At Texada Island copper was 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, by molybdenum in 1969, 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 26 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 99.9 per cent of the Province's lead and has produced about 85.4 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, southwestern British Columbia, and Vancouver Island. 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 7.8 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-l 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 19.56 a test shipment was made from Olalla. See Tables 3-l 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-l 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-l 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 to 1966, commencing again in 1978. 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. The Coxey and British Columbia Molybdenum mines closed in 1971 and 1972 respectively. In 1970 the Brenda mine, a combined copper-molybdenum producer, started operating, and Island Copper in 1971, and Lornex in 1972, while Gibraltar ceased molybdenum production in 1975 but re-commenced in 1977. 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 1978 there were 83 gas-fields producing both associated and non-associated gas, of which the Yoyo, Clarke Lake, Sierra, and La Prise Creek, were the most productive.

The production shown in Tables 3-1, 3-3, 3-7A, and 4-16, in 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.

Niobium-Niobium was produced from placer deposits on Vowell and Malloy Creeks in the Bugaboo area in 1956. A test shipment of 8 187 tonnes of gravel was shipped by St. Eugene Mining Corporation Limited to Quebec Metallurgical Industries. The placer contained a variety of minerals, including pyrochlore and uraninite. Recovery from the test shipment was as follows: 104.39 kilograms of niobium and 146.29 kilograms of uranium and thorium.

*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-l 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 3485 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, 3-7A, and 4-16.

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 is 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-l 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.

Some silver is associated with galena, while other is recovered from gold and 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 1978 the Sullivan mine has accounted for 46 per cent of the total silver production of the Province. A significant total amount is contributed by the Lynx, Lomex, Warman, Island Copper, Horn Silver, Silmonac, 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-l 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. Tbe sulphur content of pyrrhotite roasted at the Kimberley fertilizer plant is included since 1953. Elemental sulphur has been recovered from the Westcoast Transmission Co. Ltd. plant at Taylor since 1958 and the Fort Nelson plant of Petrosul International Ltd. since 1978. See Tables 3-1, 3-3, and 3-7D.

T&-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.

Thorium--See Niobium.

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.

Uranium--See Niobium.

*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 1977 the production of zinc was exceeded by that of copper, molybdenum, asbestos, 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. Modem 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 electronically to refined metal. Usually some concentrates are shipped to American or Japanese smelters.

About 8.5 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 and Callaghan Creek. 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.

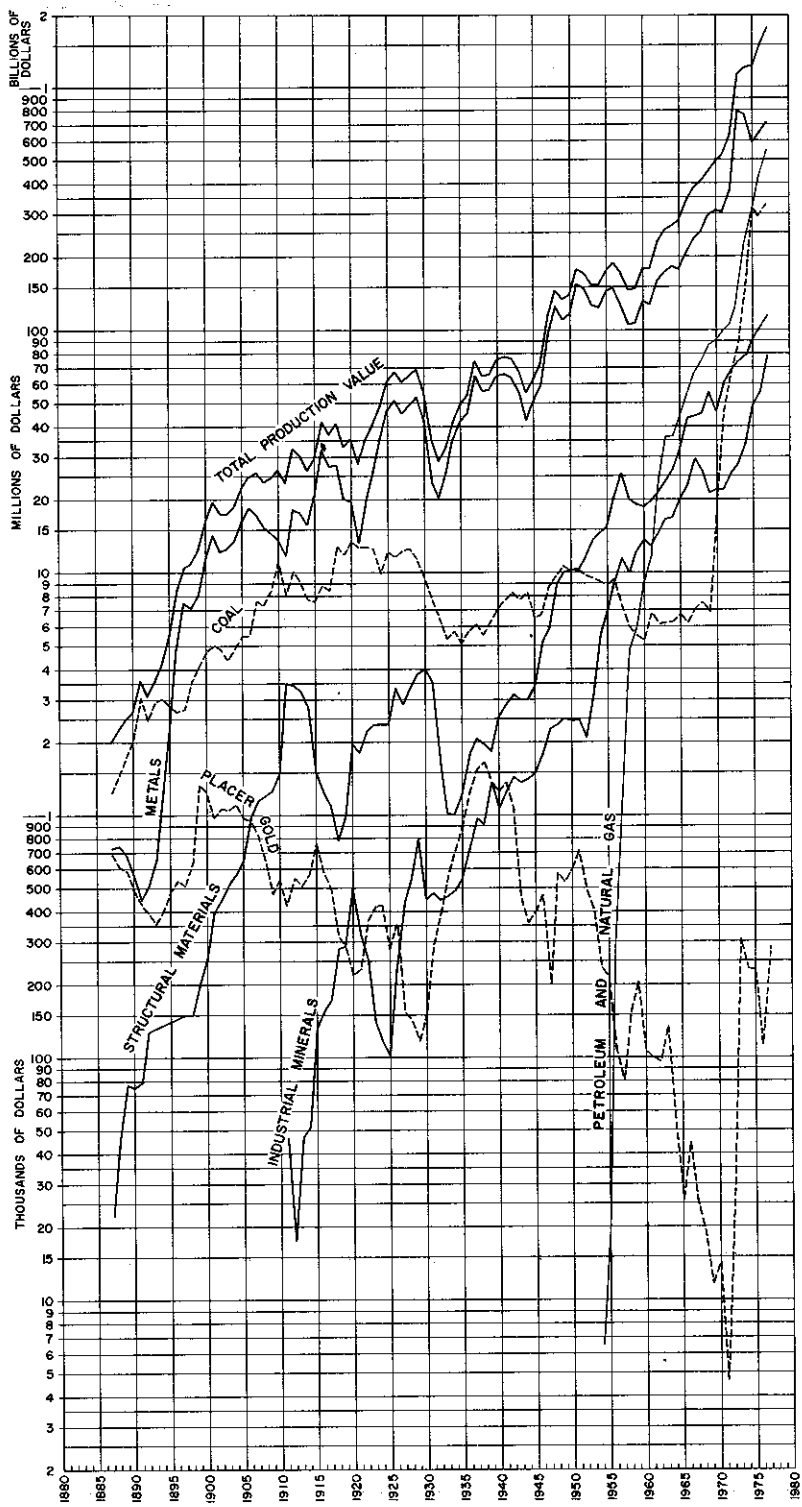


Figure 3-1—Value of mineral production, 1887–1978.

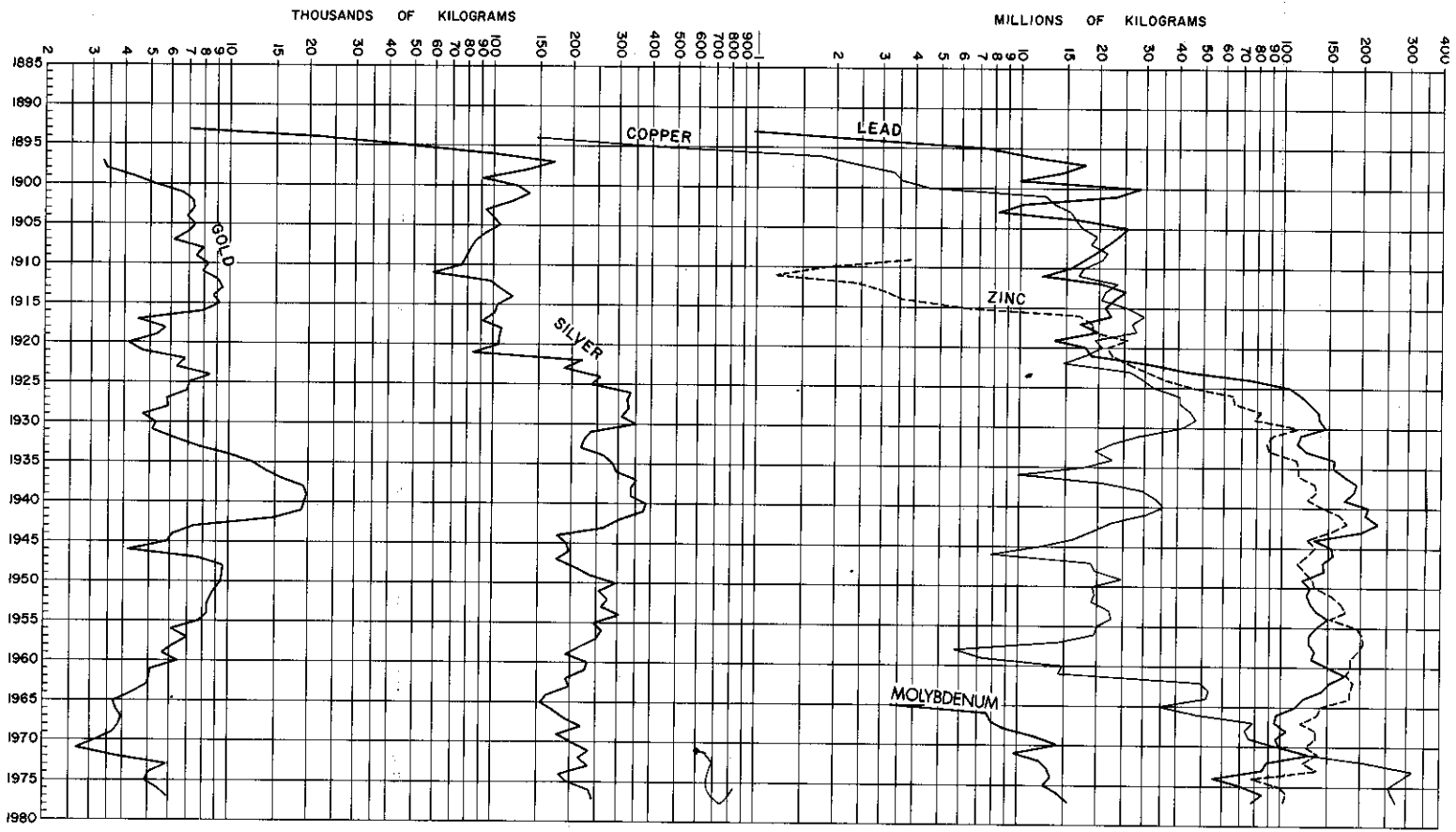


Figure 3-2—Production quantities of gold, silver, copper, lead, zinc, and molybdenum, 1893–1978.

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

| Year | Gold, Fine | Silver, Fine | Copper | Lead | Zinc | Coal |
|---|---|---|---|---|---|---|
| | $/g | $/g | $/kg | $/kg | $/kg | $/t |
| 1901 | 0.66457 | 0.01801 N.Y. | 0.355 N.Y. | 0.057 N.Y. | ..... | 2.92 |
| 1902 | " | .01593 " | .258 " | .081 " | ..... | 2.90 |
| 1903 | " | .01633 " | .292 " | .084 " | ..... | 2.94 |
| 1904 | " | .01716 " | .283 " | .086 " | ..... | 2.89 |
| 1905 | " | .01650 " | .344 " | .094 " | ..... | 2.98 |
| 1906 | " | .02040 " | .425 " | .106 " | ..... | 2.88 |
| 1907 | " | .01995 " | .441 " | .106 " | ..... | 3.38 |
| 1908 | " | .01615 " | .291 " | .083 " | ..... | 3.43 |
| 1909 | " | .01573 " | .286 " | .085 " | ..... | 3.52 |
| 1910 | " | .01634 " | .281 " | .088 " | 0.101 E. St. L. | 3.69 |
| 1911 | " | .01628 " | .273 " | .088 " | .108 " | 3.51 |
| 1912 | " | .01858 " | .360 " | .089 " | .130 " | 3.70 |
| 1913 | " | .01826 " | .337 " | .087 " | .106 " | 3.74 |
| 1914 | " | .01675 " | .300 " | .077 " | .097 " | 3.69 |
| 1915 | " | .01518 " | .381 " | .092 " | .248 " | 3.78 |
| 1916 | " | .02006 " | .600 " | .136 " | .240 " | 3.80 |
| 1917 | " | .02487 " | .599 " | .174 " | .167 " | 3.84 |
| 1918 | " | .02956 " | .543 " | .147 " | .153 " | 5.50 |
| 1919 | " | .03394 " | .412 " | .114 " | .138 " | 5.42 |
| 1920 | " | .03080 " | .385 " | .158 " | .144 " | 5.20 |
| 1921 | " | .01914 " | .276 " | .090 " | .087 " | 5.30 |
| 1922 | " | .02062 " | .295 " | .114 " | .107 " | 5.20 |
| 1923 | " | .01981 " | .318 " | .144 " | .124 " | 5.30 |
| 1924 | " | .02040 " | .287 " | .161 " | .119 " | 5.39 |
| 1925 | " | .02221 " | .310 " | .173 Lond. | .174 Lond. | 5.28 |
| 1926 | " | .01997 " | .304 " | .149 " | .163 " | 5.34 |
| 1927 | " | .01812 " | .285 " | .116 " | .137 " | 5.30 |
| 1928 | " | .01870 " | .321 " | .101 " | .121 " | 5.19 |
| 1929 | " | .01704 " | .399 " | .111 " | .119 " | 5.22 |
| 1930 | " | .01227 " | .286 " | .087 " | .079 " | 5.21 |
| 1931 | " | .00923 " | .179 " | .060 " | .056 " | 4.80 |
| 1932 | .75459 | .01018 " | .141 Lond. | .047 " | .053 " | 4.45 |
| 1933 | .91953 | .01216 " | .164 " | .053 " | .071 " | 4.30 |
| 1934 | 1.10922 | .01526 " | .164 " | .054 " | .067 " | 4.41 |
| 1935 | 1.13140 | .02083 " | .172 " | .069 " | .068 " | 4.35 |
| 1936 | 1.12626 | .01451 " | .209 " | .086 " | .073 " | 4.66 |
| 1937 | 1.12497 | .01443 " | .288 " | .113 " | .108 " | 4.68 |
| 1938 | 1.13108 | .01398 " | .220 " | .074 " | .068 " | 4.42 |
| 1939 | 1.16195 | .01302 " | .223 " | .070 " | .068 " | 4.43 |
| 1940 | 1.23782 | .01230 " | .222 " | .074 " | .075 " | 4.70 |
| 1941 | 1.23782 | .01230 " | .222 " | .074 " | .075 " | 4.57 |
| 1942 | 1.23782 | .01324 " | .222 " | .074 " | .075 " | 4.55 |
| 1943 | 1.23782 | .01455 " | .259 " | .083 " | .088 " | 4.60 |
| 1944 | 1.23782 | .01383 " | .265 " | .099 " | .095 " | 4.68 |
| 1945 | 1.23782 | .01511 " | .277 " | .110 " | .142 " | 4.67 |
| 1946 | 1.18156 | .02689 " | .282 " | .149 " | .172 " | 5.16 |
| 1947 | 1.12529 | .02315 " | .450 " | .301 " | .248 " | 5.64 |
| 1948 | 1.12529 | .02411 Mont. | .493 U.S. | .398 " | .307 " | 6.71 |
| 1949 | 1.15744 | .02387 U.S. | .440 " | .348 U.S. | .292 U.S. | 7.18 |
| 1950 | 1.22335 | .02593 " | .517 " | .319 " | .332 " | 7.09 |
| 1951 | 1.18477 | .03040 " | .611 " | .406 " | .439 " | 7.12 |
| 1952 | 1.10182 | .02674 " | .685 " | .355 " | .350 " | 7.65 |
| 1953 | 1.10665 | .02693 " | .669 " | .292 " | .235 " | 7.58 |
| 1954 | 1.09539 | .02668 " | .642 " | .302 " | .230 " | 7.72 |
| 1955 | 1.10986 | .02825 " | .844 " | .329 " | .267 " | 7.43 |
| 1956 | 1.10729 | .02873 " | .877 " | .347 " | .293 " | 7.26 |
| 1957 | 1.07867 | .02799 " | .574 " | .310 " | .246 " | 7.45 |
| 1958 | 1.09250 | .02779 " | .516 " | .259 " | .221 " | 8.21 |
| 1959 | 1.07932 | .02812 " | .611 " | .257 " | .242 " | 8.74 |
| 1960 | 1.09153 | .02850 " | .639 " | .256 " | .277 " | 7.32 |
| 1961 | 1.14008 | .03012 " | .620 " | .243 " | .258 " | 8.16 |
| 1962 | 1.20278 | .03730 " | .672 " | .227 " | .274 " | 8.19 |
| 1963 | 1.21371 | .04436 " | .676 " | .265 " | .290 " | 8.08 |
| 1964 | 1.21371 | .04484 " | .737 " | .323 " | .323 " | 7.65 |
| 1965 | 1.21307 | .04481 " | .846 " | .380 " | .345 " | 7.75 |
| 1966 | 1.21242 | .04479 " | 1.176 " | .359 " | .344 " | 8.02 |
| 1967 | 1.21403 | .05373 " | 1.125 " | .333 " | .329 " | 8.54 |
| 1968 | 1.21242 | .07429 " | 1.195 " | .321 " | .312 " | 8.72 |
| 1969 | 1.21178 | .06196 " | 1.470 " | .354 " | .347 " | 8.82 |
| 1970 | 1.17545 | .05946 " | 1.294[2] | .360 " | .353 " | 8.16 |
| 1971 | 1.13622 | .05014 " | 1.030[2] | .308 " | .359 " | 11.06 |
| 1972 | 1.84934 | .05348 " | .9892 | .328 " | .388 " | 12.08 |
| 1973 | 3.13185 | .08251 " | 1.8352 | .359 " | .455 " | 12.71 |
| 1974 | 5.348682 | .156532 | 1.8842 | .42222 | .76722 | 19.93 |
| 1975 | 5.204662 | .155602 | 1.2832 | .3462 | .8082 | 35.53 |
| 1976 | 4.035142 | .135712 | 1.4382 | .3842 | .6152 | 39.63 |
| 1977 | 5.299722 | .157072 | 1.3982 | .5412 | .5912 | 39.04 |
| 1978 | *7.329482* | *.198322* | *1.5772* | *.6372* | *.5442* | *40.35* |

[1] *See* page 84 for detailed explanation.
[2] *See* page 85 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, 1977 | Value, 1977 | Quantity, 1978 | Value, 1978 |
|---|---|---|---|---|---|---|
| | | $ | | $ | | $ |
| ***Metals*** | | | | | | |
| Antimony ..... kg | 27 139 714 | 27,324,317 | 596 207 | 2,519,739 | 459 521 | 2,083,895 |
| Bismuth ..... kg | 3 261 251 | 15,999,685 | 18 540 | 187,612 | 28 172 | 166,452 |
| Cadmium ..... kg | 20 482 585 | 86,990,225 | 320 711 | 1,720,051 | 253 803 | 1,186,320 |
| Chromite ..... t | 722 | 32,295 | ..... | ..... | ..... | ..... |
| Cobalt ..... kg | 114 484 | 376,661 | ..... | ..... | ..... | ..... |
| Copper ..... kg | 3 947 448 423 | 4,104,107,278 | 275 224 115 | 384,736,661 | 273 692 676 | 431,694,395 |
| Gold— | | | | | | |
| placer ..... g | 163 180 703 | 98,464,878 | 46 170 | 289,075 | 36 515 | 295,001 |
| lode, fine ..... g | 569 472 747 | 684,806,939 | 5 906 336 | 31,301,931 | 6 542 332 | 47,951,880 |
| Iron concentrates ..... t | 33 103 733 | 343,206,456 | 445 317 | 7,362,345 | 615 569 | 11,597,462 |
| Lead ..... kg | 7 835 932 889 | 1,616,562,950 | 78 172 646 | 42,316,293 | 81 064 539 | 51,640,564 |
| Magnesium ..... kg | 92 819 | 88,184 | ..... | ..... | ..... | ..... |
| Manganese ..... t | 1 564 | 32,668 | ..... | ..... | ..... | ..... |
| Mercury ..... kg | 6 094 387 | 49,218,263 | ..... | ..... | ..... | ..... |
| Molybdenum ..... kg | 160 179 063 | 872,342,694 | 15 521 970 | 142,057,947 | 13 055 203 | 167,714,272 |
| Nickel ..... kg | 23 337 783 | 51,698,754 | ..... | ..... | ..... | ..... |
| Palladium ..... g | 23 296 | 30,462 | ..... | ..... | ..... | ..... |
| Platinum ..... g | 43 762 | 135,008 | ..... | ..... | ..... | ..... |
| Selenium ..... kg | 332 | 1,389 | ..... | ..... | ..... | ..... |
| Silver ..... g | 16 870 686 529 | 570,740,205 | 241 503 007 | 37,934,098 | 227 271 890 | 45,071,509 |
| Tin ..... kg | 9 418 602 | 25,343,603 | 187 478 | 1,912,300 | 261 863 | 3,675,508 |
| Tungsten ($WO_3$) ..... kg | 9 090 002 | 48,068,016 | ..... | ..... | ..... | ..... |
| Zinc ..... kg | 7 422 197 745 | 1,868,372,620 | 103 780 228 | 61,301,001 | 95 618 111 | 52,048,701 |
| Others ..... | ..... | 23,569,876 | ..... | 397,654 | ..... | 4,652,559 |
| Totals ..... | ..... | 10,487,513,426 | ..... | 714,036,707 | ..... | 819,778,518 |
| ***Industrial Minerals*** | | | | | | |
| Arsenious oxide ..... kg | 9 987 789 | 273,201 | ..... | ..... | ..... | ..... |
| Asbestos ..... t | 1 509 114 | 461,976,898 | 97 033 | 69,729,205 | 68 266 | 47,066,170 |
| Bentonite ..... t | 718 | 16,858 | ..... | ..... | ..... | ..... |
| Fluxes ..... t | 3 932 927 | 8,406,438 | 28 624 | 95,461 | 22 475 | 56,894 |
| Granules ..... t | 597 560 | 13,958,996 | 29 551 | 1,238,485 | 26 849 | 1,186,160 |
| Gypsum and gypsite ..... t | 7 519 568 | 30,624,067 | 653 126 | 2,357,488 | 733 080 | 3,110,695 |
| Hydromagnesite ..... t | 2 044 | 27,536 | ..... | ..... | ..... | ..... |
| Iron oxide and ochre ..... t | 16 427 | 155,050 | ..... | ..... | ..... | ..... |
| Jade ..... kg | 1 880 253 | 5,485,335 | 266 621 | 825,523 | 488 759 | 1,422,018 |
| 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 | 8 692 263 | 126,797,900 | 248 892 | 3,871,660 | 322 181 | 5,647,993 |
| Talc ..... t | 984 | 34,871 | ..... | ..... | ..... | ..... |
| Others ..... | ..... | 10,736,920 | ..... | 1,067,277 | ..... | 981,431 |
| Totals ..... | ..... | 659,090,635 | ..... | 79,185,099 | ..... | 59,471,361 |
| ***Structural Materials*** | | | | | | |
| Cement ..... t | 18 826 544 | 472,717,609 | 909 522 | 42,705,320 | 1 020 065 | 56,140,564 |
| Clay products ..... | ..... | 125,924,000 | ..... | 4,909,799 | ..... | 6,282,560 |
| Lime and limestone ..... t | ..... | 91,117,665 | 2 231 166 | 5,861,614 | 2 512 867 | 7,263,312 |
| Rubble, riprap, crushed rock ..... t | ..... | 97,138,683 | 2 464 503 | 7,309,536 | 2 841 920 | 8,410,065 |
| Sand and gravel ..... t | ..... | 589,845,642 | 53 994 528 | 54,809,121 | 38 315 952 | 64,227,295 |
| Building-stone ..... t | 1 058 177 | 9,351,050 | 4 535 | 55,602 | 405 | 18,030 |
| Not assigned ..... | ..... | 5,972,171 | ..... | ..... | ..... | ..... |
| Totals ..... | ..... | 1,392,066,820 | ..... | 115,650,992 | ..... | 142,341,826 |
| ***Coal*** | | | | | | |
| Coal—sold and used ..... t | 190 263 059 | 2,317,222,986 | 8 424 181 | 328,846,883 | 9 463 920 | 381,895,241 |
| ***Petroleum and Natural Gas*** | | | | | | |
| Crude oil ..... $m^3$ | 48 336 755 | 1,140,550,066 | 2 200 303 | 132,859,085 | 2 004 699 | 145,005,524 |
| Field condensate ..... $m^3$ | 218 682 | 7,360,197 | 24 465 | 1,477,248 | 25 386 | 1,836,217 |
| Plant condensate ..... $m^3$ | 3 103 913 | 41,177,874 | 180 267 | 9,751,058 | 155 503 | 10,269,861 |
| Natural gas to pipeline $10^3m^3$ | 125 677 472 | 1,749,617,714 | 8 895 663 | 396,601,354 | 8 003 029 | 401,373,236 |
| Butane ..... $m^3$ | 1 545 659 | 28,135,279 | 111 357 | 5,358,167 | 106 580 | 13,360,454 |
| Propane ..... $m^3$ | 1 223 368 | 22,962,017 | 91 297 | 4,392,944 | 85 732 | 11,124,542 |
| Totals ..... | ..... | 2,989,803,147 | ..... | 550,439,856 | ..... | 582,969,834 |
| Grand totals ..... | ..... | 17,845,697,014 | ..... | 1,788,159,537 | ..... | 1,986,456,780 |

[1] *See* notes on individual products listed alphabetically on pages 87 to 97.
[2] *See* page 12 for conversion table to old system.

*Table 3-2—Total Value of Mineral Production, 1836–1978*

| 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, 1836–1978*—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 | 586,650,344 | 48,667,602 | 90,928,011 | 317,111,744 | 320,719,474 | 1,364,077,175 |
| 1976 | 646,750,403 | 52,917,142 | 100,938,648 | 298,683,679 | 420,973,564 | 1,520,263,436 |
| 1977 | 714,036,707 | 79,185,099 | 115,650,992 | 328,846,883 | 550,439,856 | 1,788,159,537 |
| 1978 | 819,778,518 | 59,471,361 | 142,341,826 | 381,895,241 | 582,969,834 | 1,986,456,780 |
| Totals | 10,487,513,426 | 659,090,635 | 1,392,066,820 | 2,317,222,986 | 2,989,803,147 | 17,845,697,014 |

## Table 3-3—Mineral Production for the 10 Years, 1969–1978

| Description | 1969 | | 1970 | | 1971 | | 1972 | | 1973 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| *Metals* | | $ | | $ | | $ | | $ | | $ |
| Antimony kg | 371 999 | 508,476 | 329 521 | 1,104,040 | 146 748 | 243,614 | 308 260 | 419,042 | 753 110 | 1,192,118 |
| Bismuth kg | 28 344 | 288,070 | 59 935 | 828,486 | 37 431 | 388,674 | 42 556 | 324,617 | 1 293 | 13,058 |
| Cadmium kg | 517 607 | 4,016,788 | 426 062 | 3,343,944 | 470 243 | 2,011,223 | 315 540 | 1,759,995 | 367 761 | 2,951,236 |
| Cobalt kg | | | | | 51 503 | 103,099 | 70 642 | 155,739 | 18 555 | 117,403 |
| Copper kg | 75 937 956 | 111,592,416 | 96 329 694 | 124,657,958 | 127 286 040 | 131,037,918 | 211 832 288 | 209,403,822 | 317 603 055 | 582,803,251 |
| Gold—placer g | 12 410 | 11,720 | 15 272 | 14,185 | 5 505 | 4,647 | 21 492 | 26,905 | 119 156 | 311,524 |
| lode, fine g | 3 654 012 | 4,427,506 | 3 135 462 | 3,685,476 | 2 668 046 | 3,031,844 | 3 782 871 | 6,995,448 | 5 784 723 | 18,117,268 |
| Iron concentrates t | 1 882 266 | 19,787,845 | 1 704 650 | 17,391,883 | 1 750 738 | 18,153,612 | 1 139 698 | 11,642,379 | 1 420 160 | 12,906,063 |
| Lead kg | 95 286 815 | 33,693,539 | 97 448 607 | 35,096,021 | 112 865 575 | 34,711,408 | 88 109 663 | 28,896,566 | 84 890 924 | 30 477,936 |
| Molybdenum kg | 12 064 350 | 47,999,442 | 14 186 706 | 52,561,796 | 9 926 694 | 36,954,846 | 12 719 391 | 43,260,349 | 13 785 264 | 51,851,509 |
| Nickel kg | 1 351 304 | 3,396,208 | 1 545 927 | 4,703,320 | 1 153 742 | 3,497,420 | 1 469 851 | 4,601,486 | 1 119 221 | 3,775,232 |
| Silver g | 179 169 889 | 11,100,491 | 202 521 462 | 12,041,181 | 238 670 301 | 11,968,046 | 215 420 498 | 11,519,660 | 236 987 318 | 19,552,997 |
| Tin kg | 130 828 | 470,136 | 119 619 | 421,946 | 144 695 | 421,079 | 159 230 | 473,908 | 138 221 | 597,265 |
| Tungsten ($WO_3$) kg | | | | | 605 909 | 3,012,540 | 577 509 | 2,167,663 | 640 378 | 4,224,062 |
| Zinc kg | 134 565 200 | 46,639,024 | 125 005 208 | 44,111,055 | 138 549 629 | 49,745,789 | 121 719 968 | 47,172,894 | 137 380 768 | 62,564,751 |
| Others | | 10,949,453 | | 10,020,179 | | 5,774,192 | | 3,212,297 | | 4,161,923 |
| Subtotals | | 294,881,114 | | 309,981,470 | | 301,059,951 | | 372,032,770 | | 795,617,596 |
| *Industrial Minerals* | | | | | | | | | | |
| Asbestos t | 72 926 | 14,871,334 | 78 680 | 16,033,827 | 79 032 | 17,800,406 | 95 986 | 20,870,241 | 98 852 | 21,102,892 |
| Diatomite t | 319 | 4,913 | 1 158 | 26,567 | 1 406 | 37,830 | 1 338 | 52,073 | 513 | 9,526 |
| Fluxes (quartz, limestone) t | 20 268 | 81,917 | 28 690 | 106,533 | 24 258 | 98,426 | 28 667 | 59,246 | 41 937 | 106,371 |
| Granules (quartz, limestone, granite) t | 31 521 | 654,701 | 20 275 | 526,491 | 26 524 | 519,192 | 33 709 | 757,924 | 31 135 | 857,643 |
| Gypsum and gypsite t | 254 821 | 764,032 | 245 180 | 736,635 | 312 791 | 930,348 | 352 272 | 1,087,196 | 331 347 | 1,114,009 |
| Jade kg | 11 944 | 42,635 | 119 114 | 250,256 | 76 094 | 196,332 | 110 551 | 235,218 | 69 967 | 306,808 |
| Sulphur t | 316 717 | 3,824,593 | 305 194 | 3,957,542 | 261 691 | 2,147,778 | 270 074 | 2,306,933 | 286 701 | 4,187,387 |
| Others | | 248,818 | | 382,508 | | 179,455 | | 395,289 | | 285,028 |
| Subtotals | | 20,492,943 | | 22,020,359 | | 21,909,767 | | 25,764,120 | | 27,969,664 |
| *Structural Materials* | | | | | | | | | | |
| Cement t | 721 744 | 16,604,688 | 546 025 | 13,485,549 | 822 329 | 21,629,385 | 808 230 | 21,014,112 | 862 521 | 24,935,624 |
| Clay products | | 4,550,546 | | 4,714,368 | | 5,981,785 | | 5,263,749 | | 5,590,290 |
| Lime and limestone t | 1 734 420 | 3,237,032 | 1 694 237 | 3,204,076 | 1 650 658 | 3,037,222 | 1 838 227 | 3,357,927 | 1 954 008 | 3,633,870 |
| Rubble, riprap, and crushed rock t | 3 407 875 | 4,456,211 | 2 442 384 | 3,018,242 | 3 327 758 | 3,670,583 | 3 013 438 | 4,032,548 | 2 579 122 | 4,160,009 |
| Sand and gravel t | 26 428 476 | 26,553,699 | 21 006 650 | 21,679,387 | 26 598 612 | 25,612,396 | 31 593 921 | 33,076,196 | 30 811 402 | 35,379,590 |
| Building-stone t | 1 975 | 39,352 | 159 | 2,449 | 2 057 | 8,962 | 176 | 1,166 | 729 | 21,448 |
| Subtotals | | 55,441,528 | | 46,104,071 | | 59,940,333 | | 66,745,698 | | 73,720,831 |
| *Coal* | | | | | | | | | | |
| Sold and used t | 773 226 | 6,817,155 | 2 398 635 | 19,559,669 | 4 141 496 | 45,801,936 | 5 466 846 | 66,030,210 | 6 924 733 | 87,976,105 |
| Total solid minerals | | 377,632,740 | | 397,665,569 | | 428,711,987 | | 530,572,798 | | 985,284,196 |
| *Petroleum and Natural Gas* | | | | | | | | | | |
| Crude oil $m^3$ | 4 023 815 | 58,176,213 | 4 032 130 | 60,405,941 | 3 999 185 | 66,471,856 | 3 788 849 | 63,166,717 | 3 368 902 | 68,306,032 |
| Field condensate $m^3$ | 12 425 | 180,520 | 17 052 | 277,829 | 17 331 | 287,781 | 16 619 | 277,069 | 20 114 | 407,807 |
| Plant condensate $m^3$ | 150 104 | 263,278 | 159 489 | 253,009 | 177 137 | 293,287 | 161 854 | 327,820 | 180 088 | 222,463 |
| Natural gas delivered to pipeline $10^3m^3$ | 7 218 831 | 27,897,585 | 7 678 940 | 29,804,411 | 7 685 055 | 31,946,372 | 9 939 498 | 41,616,824 | 10 789 269 | 54,762,105 |
| Butane $m^3$ | 66 385 | 133,613 | 49 074 | 98,772 | 50 590 | 101,822 | 54 200 | 106,533 | 109 057 | 212,640 |
| Propane $m^3$ | 52 069 | 104,800 | 66 828 | 134,505 | 74 547 | 150,040 | 76 323 | 150,015 | 99 188 | 193,398 |
| Total petroleum and natural gas | | 86,756,009 | | 90,974,467 | | 99,251,158 | | 105,644,978 | | 124,104,445 |
| Grand totals | | 464,388,749 | | 488,640,036 | | 527,963,145 | | 636,217,776 | | 1,109,388,641 |

## *Table 3-3—Mineral Production for the 10 Years, 1969–1978*—Continued

| Description | 1974 | | 1975 | | 1976 | | 1977 | | 1978 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| ***Metals*** | | $ | | $ | | $ | | $ | | $ |
| Antimony kg | 221 238 | 879,897 | 364 045 | 1,467,928 | 447 001 | 1,636,871 | 596 207 | 2,519,739 | 459 521 | 2,083,895 |
| Bismuth kg | 33 711 | 680,771 | 19 163 | 261,931 | 20 261 | 226,462 | 18 540 | 187,612 | 28 172 | 166,452 |
| Cadmium kg | 195 979 | 1,532,096 | 320 923 | 1,971,035 | 356 422 | 1,530,800 | 320 711 | 1,720,051 | 253 803 | 1,186,320 |
| Cobalt kg | | | | | | | | | | |
| Copper kg | 287 547 048 | 541,644,913 | 258 497 599 | 331,693,850 | 263 618 197 | 378,984,941 | 275 224 115 | 384,736,661 | 273 692 676 | 431,694,395 |
| Gold—placer g | 45 162 | 232,512 | 43 744 | 232,204 | 26 064 | 115,613 | 46 170 | 289,075 | 36 515 | 295,001 |
| lode, fine g | 5 001 082 | 26,749,083 | 4 819 241 | 25,082,494 | 5 393 477 | 21,761,502 | 5 906 336 | 31,301,931 | 6 542 332 | 47,951,880 |
| Iron concentrates t | 1 306 930 | 12,742,227 | 1 305 840 | 15,273,878 | 1 255 277 | 14,760,526 | 445 317 | 7,362,345 | 615 569 | 11,597,462 |
| Lead kg | 55 252 692 | 23,333,016 | 70 603 483 | 24,450,158 | 85 407 582 | 32,796,533 | 78 172 646 | 42,316,293 | 81 064 539 | 51,640,564 |
| Molybdenum kg | 13 789 825 | 60,791,552 | 13 026 627 | 71,201,391 | 14 088 686 | 94,109,138 | 15 521 970 | 142,057,947 | 13 055 203 | 167,714,272 |
| Nickel kg | 688 656 | 2,351,406 | | | | | | | | |
| Silver g | 181 695 950 | 28,440,365 | 196 305 885 | 30,545,947 | 239 720 882 | 32,532,836 | 241 503 007 | 37,934,098 | 227 271 890 | 45,071,509 |
| Tin kg | 143 816 | 1,150,722 | 32 511 | 200,669 | 102 262 | 712,912 | 187 478 | 1,912,300 | 261 863 | 3,675,508 |
| Tungsten ($WO_3$) kg | | | | | | | | | | |
| Zinc kg | 77 733 732 | 59,582,753 | 99 668 230 | 80,572,872 | 106 498 987 | 65,499,108 | 103 780 228 | 61,301,001 | 95 618 111 | 52,048,701 |
| Others | | 4,488,138 | | 3,695,987 | | 2,083,161 | | 397,654 | | 4,652,559 |
| Subtotals | | 764,599,451 | | 586,650,344 | | 646,750,403 | | 714,036,707 | | 819,778,518 |
| ***Industrial Minerals*** | | | | | | | | | | |
| Asbestos t | 83 403 | 27,398,900 | 76 771 | 37,849,743 | 90 443 | 40,727,296 | 97 033 | 69,729,205 | 68 266 | 47,066,170 |
| Diatomite t | 1 593 | 32,600 | 5 847 | 229,483 | 2 737 | 182,159 | 1 239 | 49,595 | 2 184 | 59,346 |
| Fluxes (quartz, limestone) t | 34 451 | 206,049 | 35 914 | 174,824 | 11 378 | 33,263 | 28 624 | 95,461 | 22 475 | 56,894 |
| Granules (quartz, limestone, granite) t | 31 546 | 1,025,615 | 33 316 | 1,144,968 | 31 476 | 1,219,884 | 29 551 | 1,238,485 | 26 849 | 1,186,160 |
| Gypsum and gypsite t | 400 338 | 1,412,157 | 474 387 | 1,751,799 | 556 134 | 4,434,471 | 653 126 | 2,357,488 | 733 080 | 3,110,695 |
| Jade kg | 3 510 | 18,613 | 110 437 | 414,123 | 483 796 | 1,535,030 | 266 621 | 825,523 | 488 759 | 1,422,018 |
| Sulphur t | 206 646 | 3,068,507 | 246 079 | 5,738,134 | 231 704 | 4,296,189 | 248 892 | 3,871,660 | 322 181 | 5,647,993 |
| Others | | 513,773 | | 1,364,528 | | 488,850 | | 1,017,682 | | 922,085 |
| Subtotals | | 33,676,214 | | 48,667,602 | | 52,917,142 | | 79,185,099 | | 59,471,361 |
| ***Structural Materials*** | | | | | | | | | | |
| Cement t | 890 372 | 25,828,823 | 915 293 | 31,681,722 | 846 548 | 34,973,746 | 909 522 | 42,705,320 | 1 020 065 | 56,140,564 |
| Clay products | | 6,615,128 | | 6,593,189 | | 6,995,917 | | 4,909,799 | | 6,282,560 |
| Lime and limestone t | 2 097 909 | 4,297,547 | 1 976 415 | 4,349,800 | 2 173 831 | 5,610,063 | 2 231 166 | 5,861,614 | 2 512 867 | 7,263,312 |
| Rubble, riprap, and crushed rock t | 2 691 473 | 5,715,219 | 4 103 452 | 8,723,448 | 2 485 215 | 5,205,973 | 2 464 503 | 7,309,536 | 2 841 920 | 8,410,065 |
| Sand and gravel t | 31 440 908 | 35,611,346 | 28 945 523 | 39,575,457 | 36 073 618 | 48,138,635 | 53 994 528 | 54,809,121 | 38 315 952 | 64,227,295 |
| Building-stone t | 452 | 20,330 | 53 | 4,395 | 657 | 14,314 | 4 535 | 55,602 | 405 | 18,030 |
| Subtotals | | 78,088,393 | | 90,928,011 | | 100,938,648 | | 115,650,992 | | 142,341,826 |
| ***Coal*** | | | | | | | | | | |
| Sold and used t | 7 757 440 | 154,593,643 | 8 924 816 | 317,111,744 | 7 537 695 | 298,683,679 | 8 424 181 | 328,846,883 | 9 463 920 | 381,895,241 |
| Total solid minerals | | 1,030,957,701 | | 1,043,357,701 | | 1,099,289,872 | | 1,237,719,681 | | 1,403,486,946 |
| ***Petroleum and Natural Gas*** | | | | | | | | | | |
| Crude oil $m^3$ | 3 012 501 | 103,335,328 | 2 269 898 | 94,229,725 | 2 367 450 | 116,595,050 | 2 200 303 | 132,859,085 | 2 004 699 | 145,005,524 |
| Field condensate $m^3$ | 16 561 | 568,075 | 16 094 | 668,092 | 18 309 | 901,711 | 24 465 | 1,477,248 | 25 386 | 1,836,217 |
| Plant condensate $m^3$ | 178,534 | 924,549 | 185 272 | 6,525,837 | 167 576 | 7,198,957 | 180 267 | 9,751,058 | 155 503 | 10,269,861 |
| Natural gas delivered to pipeline $10^3m^3$ | 9 016 996 | 128,018,726 | 9 236 489 | 214,733,528 | 8 799 508 | 287,997,059 | 8 895 663 | 396,601,354 | 8 003 029 | 401,373,236 |
| Butane $m^3$ | 105 426 | 232,085 | 106 427 | 2,577,205 | 109 781 | 4,591,832 | 111 357 | 5,358,167 | 106 580 | 13,360,454 |
| Propane $m^3$ | 89 373 | 196,742 | 81 975 | 1,985,087 | 88 195 | 3,688,955 | 91 297 | 4,392,944 | 85 732 | 11,124,542 |
| Total petroleum and natural gas | | 233,275,505 | | 320,719,474 | | 420,973,564 | | 550,439,856 | | 425,858,232 |
| Grand totals | | 1,264,233,206 | | 1,364,077,175 | | 1,520,263,436 | | 1,788,159,537 | | 1,986,456,780 |

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

| Metals | 1978 Total Production | | 1978 Production Paid for to Mines | |
|---|---|---|---|---|
| | Quantity | Value | Quantity | Value |
| | | $ | | $ |
| Antimony kg | 459 521 | 2,083,895 | ..... | ..... |
| Bismuth kg | 28 172 | 166,452 | ..... | ..... |
| Cadmium kg | 253 803 | 1,186,320 | 56 370 | 146,582 |
| Copper kg | 273 692 676 | 431,694,395 | 273 632 023 | 301,119,740 |
| Gold—placer g | 36 515 | 295,001 | 36 515 | 295,001 |
| lode, fine g | 6 542 332 | 47,951,880 | 6 542 332 | 36,287,607 |
| Iron concentrates t | 615 569 | 11,597,462 | 615 569 | 11,597,462 |
| Lead kg | 81 064 539 | 51,640,564 | 81 064 539 | 46,547,809 |
| Molybdenum kg | 13 055 203 | 167,714,272 | 13 055 203 | 166,617,307 |
| Silver g | 227 271 890 | 45,071,509 | 227 000 410 | 36,409,036 |
| Tin kg | 261 863 | 3,675,508 | 227 957 | 3,135,822 |
| Zinc kg | 95 618 111 | 52,048,701 | 75 998 700 | 26,257,729 |
| Others | ..... | 4,652,559 | ..... | 968,911 |
| Totals | ..... | 819,778,518 | ..... | 629,383,006 |

NOTE—For metals, the total quantity and value of production include the quantities paid for to the mines, and the smelter and refining 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, 1974–1978*

| | 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 |
| 1977 | 19,097,099 | 6,974,231 | 106,059 | 26,177,389 |
| 1978 | 22,724,774 | 5,715,214 | 1,035,353 | 29,475,341 |
| 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 |
| 1977 | 14,741,425 | 4,797,788 | ..... | 19,539,213 |
| 1978 | 15,289,351 | 4,511,572 | ..... | 19,800,923 |
| Others— | | | | |
| 1974 | 42,706 | 11,134 | ..... | 53,840 |
| 1975 | 90,025 | 35,679 | ..... | 125,704 |
| 1976 | 73,453 | 47,760 | ..... | 121,213 |
| 1977 | 327,113 | 9,860 | 222,092 | 559,065 |
| 1978 | 342,100 | 117,180 | ..... | 459,280 |
| 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 | 318,416 | 40,218,302 |
| 1977 | 34,165,637 | 11,781,879 | 328,151 | 46,275,667 |
| 1978 | 38,356,225 | 10,343,966 | 1,035,353 | 49,735,544 |
| *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 |
| 1977 | 2,988,366 | 2,020,259 | ..... | 5,008,625 |
| 1978 | 6,562,912 | 1,729,402 | ..... | 8,292,314 |
| Coal mines— | | | | |
| 1974 | 488,308 | 104,259 | ..... | 592,567 |
| 1975 | 1,000,000 | ..... | ..... | 1,000,000 |
| 1976 | 665,000 | 28,000 | ..... | 693,000 |
| 1977 | 5,978,043 | 25,115,000 | ..... | 31,093,043 |
| 1978 | 4,052,774 | 510,612 | ..... | 4,563,386 |

*Table 3-5—Exploration and Development Expenditures, 1974–1978*—Continued

| | Physical Work and Surveys | Administration, Overhead, Land Costs, Etc. | Construction, Machinery and Equipment, Other Capital Costs | Totals |
|---|---|---|---|---|
| *B. Exploration on Declared or Operating Mines*—Continued | $ | $ | $ | $ |
| Others— | | | | |
| 1974 | 4,236 | | | 4,236 |
| 1975 | 36,242 | 2,700 | | 38,942 |
| 1976 | 214,081 | 30,000 | | 244,081 |
| 1977 | 106,896 | 403,300 | | 510,196 |
| 1978 | 12,025 | | 36,604 | 48,629 |
| 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 |
| 1977 | 9,073,305 | 27,538,559 | | 36,611,864 |
| 1978 | 10,693,030 | 2,240,014 | | 12,867,725 |
| *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 |
| 1977 | 380,419 | 1,132,316 | 33,672,153 | 35,184,888 |
| 1978 | 133,335 | 895,892 | | 1,029,227 |
| Coal mines— | | | | |
| 1974 | 320,098 | 256,055 | 111,500 | 687,653 |
| 1975 | | | | |
| 1976 | 1,425,312 | 583,304 | | 2,008,616 |
| 1977 | 1,725,484 | 247,313 | | 1,972,797 |
| 1978 | 30,957 | 38,910 | | 69,867 |
| Others— | | | | |
| 1974 | 23,242 | 37,988 | 2,883,584 | 2,944,814 |
| 1975 | | | | |
| 1976 | | 3,155 | 18,001,500 | 18,004,655 |
| 1977 | 64,689 | 708 | 40,000 | 105,397 |
| 1978 | 7,045 | 2,159 | 10,000 | 19,204 |
| 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 |
| 1977 | 2,170,592 | 1,380,337 | 33,712,153 | 37,263,082 |
| 1978 | 171,337 | 936,961 | 10,000 | 1,118,298 |
| *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 |
| 1977 | 14,491,378 | 1,722,479 | 45,859,006 | 62,072,863 |
| 1978 | 10,424,872 | 575,164 | 17,908,816 | 28,908,852 |
| 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 |
| 1977 | 30,466,894 | | 25,943,377 | 56,410,271 |
| 1978 | 31,222,528 | | 15,621,757 | 46,844,285 |
| 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 |
| 1977 | 432,731 | 108,500 | 931,521 | 1,472,752 |
| 1978 | 102,248 | 9,579 | 1,220,265 | 1,332,092 |
| 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 |
| 1977 | 45,391,003 | 1,830,979 | 72,733,904 | 119,955,886 |
| 1978 | 41,749,648 | 584,743 | 35,076,931 | 77,121,833 |

*Table 3-6—Production of Gold, Silver, Copper, Lead, Zinc, Molybdenum, and Iron Concentrates, 1858–1978*

| Year | Gold (Placer) | | Gold (Fine) | | Silver | | Copper | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| | g | $ | g | $ | g | $ | 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 |
| 1901–1910 | 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 | 4,506,646 | 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 |
| 1977 | 46 170 | 289,075 | 5 906 336 | 31,301,931 | 241 503 007 | 37,934,098 | 275 224 115 | 384,736,661 |
| 1978 | 36 515 | 295,001 | 6 542 332 | 47,951,880 | 227 271 890 | 45,071,509 | 273 692 676 | 431,694,395 |
| Totals | 163 180 703 | 98,464,878 | 569 472 747 | 684,806,939 | 16 870 686 529 | 570,740,205 | 3 947 448 423 | 4,104,107,278 |

*Table 3-6—Production of Gold, Silver, Copper, Lead, Zinc, Molybdenum, and Iron Concentrates, 1858–1978*—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 |
| 1901–1910 | 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 | 3 371 | 11,636 | | |
| 1918 | 19 912 447 | 2,928,107 | 18 947 777 | 2,899,040 | 435 | 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 | 7,940,860 | | | | |
| 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 | 80,572,872 | 13 026 627 | 71,201,391 | 1 305 840 | 15,273,878 |
| 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 |
| 1977 | 78 172 646 | 42,316,293 | 103 780 228 | 61,301,001 | 15 521 970 | 142,057,947 | 445 317 | 7,362,345 |
| 1978 | 81 064 539 | 51,640,564 | 95 618 111 | 52,048,701 | 13 055 203 | 167,714,272 | 615 569 | 11,597,462 |
| Totals | 7 835 932 889 | 1,616,562,950 | 7 422 197 745 | 1,868,372,620 | 160 179 063 | 872,342,694 | 33 103 733 | 343,206,456 |

*Table 3-7A—Mineral Production by Mining*

| Division | Period | Placer Gold | | Metals | Industrial Minerals | Structural Materials |
|---|---|---|---|---|---|---|
| | | Quantity | Value | | | |
| | | g | $ | $ | $ | $ |
| Alberni | 1977 | | | 22,364,704 | | 528,778 |
| | **1978** | | | **24,988,615** | | **1,016,069** |
| | To date | 50 294 | 33,253 | 282,795,867 | 9,398 | 7,847,614 |
| Atlin | 1977 | 28,039 | 189,278 | | | 22,281 |
| | **1978** | **3 328** | **26,880** | | | **17,542** |
| | To date | 22 983 970 | 17,938,866 | 38,171,207 | 20,325 | 385,503 |
| Cariboo | 1977 | 10 775 | 66,818 | 66,680,425 | 49,595 | 7,608,803 |
| | **1978** | **9 611** | **78,621** | **41,934,799** | **59,346** | **4,665,784** |
| | To date | 81 264 411 | 54,501,242 | 491,998,646 | 997,984 | 51,378,450 |
| Clinton | 1977 | | | | | 1,322,916 |
| | **1978** | | | | | **1,775,423** |
| | To date | 316 349 | 243,069 | 848,377 | 162,427 | 7,881,498 |
| Fort Steele | 1977 | | | 86,408,253 | 1,113,986 | 1,431,994 |
| | **1978** | | | **102,876,534** | **1,531,236** | **854,961** |
| | To date | 639 241 | 472,087 | 2,787,635,070 | 27,426,114 | 14,372,379 |
| Golden | 1977 | | | | 2,357,488 | 235,703 |
| | **1978** | | | **36,541** | **3,110,695** | **99,744** |
| | To date | 14 587 | 11,268 | 66,284,632 | 28,487,194 | 4,781,623 |
| Greenwood | 1977 | | | 7,433,120 | 900 | 433,332 |
| | **1978** | | | **3,621,966** | **23,339** | **249,802** |
| | To date | 157 817 | 115,662 | 245,281,228 | 2,352,136 | 3,765,702 |
| Kamloops | 1977 | | | 135,399,441 | | 12,195,844 |
| | **1978** | | | **179,822,359** | | **13,310,737** |
| | To date | 858 287 | 604,785 | 1,046,590,757 | 6,540,538 | 86,053,466 |
| Liard | 1977 | | | | 71,131,574 | 2,025,368 |
| | **1978** | **591** | **4,750** | | **50,028,356** | **4,541,797** |
| | To date | 1 565 303 | 1,258,153 | 19,156,498 | 486,488,833 | 25,405,736 |
| Lillooet | 1977 | 1 884 | 9,407 | | | 258,442 |
| | **1978** | | | **106,590** | | **310,803** |
| | To date | 2 893 348 | 1,937,853 | 148,273,846 | 473,095 | 4,406,310 |
| Nanaimo | 1977 | | | 81,969,046 | 206,109 | 7,901,541 |
| | **1978** | | | **102,917,596** | **56,894** | **10,592,097** |
| | To date | 26 935 | 19,300 | 800,873,941 | 2,838,984 | 111,864,674 |
| Nelson | 1977 | | | 7,020,924 | 1,099,488 | 1,344,182 |
| | **1978** | | | **4,195,459** | **1,139,304** | **1,694,028** |
| | To date | 111 535 | 89,026 | 409,187,135 | 8,066,921 | 13,933,331 |
| New Westminster | 1977 | | | | | 18,932,498 |
| | **1978** | **31** | **250** | | | **22,012,397** |
| | To date | 975 418 | 597,152 | 63,751,805 | 1,611,625 | 293,004,976 |
| Nicola | 1977 | | | 25,566,841 | | 340,793 |
| | **1978** | | | **41,065,672** | | **163,101** |
| | To date | 7 278 | 4,764 | 419,470,394 | 10,050 | 3,102,780 |
| Omineca | 1977 | | | 124,587,817 | 116,095 | 1,228,568 |
| | **1978** | **342** | **2,750** | **139,006,311** | **48,689** | **1,027,152** |
| | To date | 1 756 007 | 1,509,150 | 953,887,088 | 1,560,820 | 18,989,856 |
| Osoyoos | 1977 | | | 62,327,867 | 25,577 | 836,846 |
| | **1978** | | | **74,146,136** | **22,100** | **501,870** |
| | To date | 7 465 | 5,466 | 465,033,625 | 6,782,114 | 7,353,017 |
| Revelstoke | 1977 | | | | | 396,364 |
| | **1978** | | | | | **269,539** |
| | To date | 235 823 | 164,477 | 15,500,414 | | 4,623,591 |
| Similkameen | 1977 | | | 32,553,805 | | 850,292 |
| | **1978** | | | **40,878,260** | | **347,514** |
| | To date | 1 415 404 | 878,204 | 340,066,486 | 18,558 | 6,016,679 |
| Skeena | 1977 | | | 29,939,818 | | 2,597,402 |
| | **1978** | | | **37,248,519** | | **1,725,272** |
| | To date | 143 167 | 105,569 | 679,807,250 | 1,240,215 | 28,926,454 |
| Slocan | 1977 | | | 3,216,040 | | 260,557 |
| | **1978** | | | **2,604,889** | | **93,820** |
| | To date | 11 384 | 9,397 | 286,912,804 | | 3,290,142 |
| Trail Creek | 1977 | | | 132,717 | | 299,452 |
| | **1978** | | | **82,734** | | **1,735,319** |
| | To date | 26 469 | 24,260 | 90,987,375 | | 5,953,413 |
| Vancouver | 1977 | | | 8,860,795 | | 20,828,514 |
| | **1978** | | | **8,815,561** | | **28,366,072** |
| | To date | 5 661 | 5,306 | 318,722,490 | 7,066,964 | 239,638,251 |
| Vernon | 1977 | | | | | 2,683,196 |
| | **1978** | | | **9,360** | | **1,788,720** |
| | To date | 85 058 | 73,349 | 371,414 | 225,341 | 19,274,682 |
| Victoria | 1977 | | | | | 27,602,612 |
| | **1978** | | | **2,943** | | **32,120,435** |
| | To date | 19 533 | 15,680 | 24,812,286 | 190,651 | 354,783,984 |
| Not assigned | 1977 | 5 472 | 23,572 | 19,286,019 | 3,084,287 | 3,484,714 |
| | **1978** | **22 612** | **181,750** | **15,122,173** | **3,451,402** | **13,061,818** |
| | To date | 47 609 959 | 17,847,540 | 392,627,913 | 76,520,348 | 75,032,709 |
| Totals | 1977 | 46 170 | 289,075 | 713,747,632 | 79,185,099 | 115,650,992 |
| | **1978** | **36 515** | **295,001** | **819,483,517** | **59,471,361** | **142,341,326** |
| | To date | 163 180 703 | 98,464,878 | 10,389,048,548 | 659,090,635 | 1,392,066,820 |

*Divisions, 1977 and 1978, 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 | $ | 10$^3$m$^3$ | $ | m3 | $ | $ |
| | | | | | | | | 22,893,482 |
| | | | | | | | | **26,004,684** |
| | | | | | | | | 290,686,132 |
| | | | | | | | | 211,559 |
| | | | | | | | | **44,422** |
| | | | | | | | | 56,515,901 |
| | | | | | | | | 74,405,641 |
| | | | | | | | | **46,738,560** |
| 263 | 1,100 | | | | | | | 598,877,422 |
| | | | | | | | | 1,322,916 |
| | | | | | | | | **1,775,423** |
| 8 423 950 | 328,841,783 | | | | | | | 9,135,371 |
| **9 463 648** | **381,888,469** | | | | | | | 417,796,016 |
| 115 386 984 | 1,980,416,332 | | | | | | | **487,151,200** |
| | | | | | | | | 4,810,321,982 |
| | | | | | | | | 2,593,191 |
| | | | | | | | | **3,246,980** |
| | | | | | | | | 99,564,717 |
| | | | | | | | | 7,867,352 |
| | | | | | | | | **3,895,107** |
| | | | | | | | | 251,514,728 |
| | | | | | | | | 147,595,285 |
| | | | | | | | | **193,133,596** |
| 13 687 | 59,765 | | | | | | | 1,139,849,311 |
| | | 2 405 035 | 144,087,391 | 8 895 663 | 396,601,354 | 202 654 | 9,751,111 | 623,596,798 |
| | | **2 185 588** | **157,111,602** | **8 003 029** | **401,373,236** | **192 312** | **24,484,996** | **637,544,737** |
| 131 923 | 1,515,507 | 51 659 350 | 1,189,088,137 | 125 677 472 | 1,749,617,714 | 2 769 027 | 51,097,296 | 3,523,627,874 |
| | | | | | | | | 267,849 |
| | | | | | | | | **417,393** |
| | | | | | | | | 155,091,104 |
| | | | | | | | | 90,076,696 |
| | | | | | | | | **113,566,587** |
| 67 425 673 | 301,144,744 | | | | | | | 1,216,741,643 |
| | | | | | | | | 9,464,594 |
| | | | | | | | | **7,028,791** |
| | | | | | | | | 431,276,413 |
| | | | | | | | | 18,932,498 |
| | | | | | | | | **22,012,647** |
| | | | | | | | | 358,965,558 |
| | | | | | | | | 25,907,634 |
| | | | | | | | | **41,228,773** |
| 2 657 660 | 11,080,836 | | | | | | | 433,668,824 |
| 231 | 5,100 | | | | | | | 125,937,580 |
| **272** | **6,772** | | | | | | | **140,091,874** |
| 456 967 | 3,445,853 | | | | | | | 979,392,767 |
| | | | | | | | | 63,190,290 |
| | | | | | | | | **74,670,106** |
| 1 018 | 5,008 | | | | | | | 479,179,230 |
| | | | | | | | | 396,364 |
| | | | | | | | | **269,539** |
| | | | | | | | | 20,288,482 |
| | | | | | | | | 33,404,097 |
| | | | | | | | | **41,225,774** |
| 4 188 851 | 19,553,725 | | | | | | | 366,533,652 |
| | | | | | | | | 32,537,220 |
| | | | | | | | | **38,973,791** |
| 33 | 116 | | | | | | | 710,079,604 |
| | | | | | | | | 3,476,597 |
| | | | | | | | | **2,698,709** |
| | | | | | | | | 290,212,343 |
| | | | | | | | | 432,169 |
| | | | | | | | | **1,818,053** |
| | | | | | | | | 96,965,048 |
| | | | | | | | | 29,689,309 |
| | | | | | | | | **37,181,633** |
| | | | | | | | | 565,433,011 |
| | | | | | | | | 2,683,196 |
| | | | | | | | | **1,798,080** |
| | | | | | | | | 19,944,786 |
| | | | | | | | | 27,602,612 |
| | | | | | | | | **32,123,378** |
| | | | | | | | | 379,802,601 |
| | | | | | | | | 25,878,592 |
| | | | | | | | | **31,817,143** |
| | | | | | | | | 562,028,510 |
| 8 424 181 | 328,846,883 | 2 405 035 | 144,087,391 | 8 895 663 | 396,601,354 | 202 654 | 9,751,111 | 1,788,159,537 |
| **9 463 920** | **381,895,241** | **2 185 588** | **157,111,602** | **8 003 029** | **401,373,236** | **192 312** | **24,484,996** | **1,986,456,780** |
| 190 263 059 | 2,317,222,986 | 51 659 350 | 1,189,088,137 | 125 677 472 | 1,749,617,714 | 2 769 027 | 51,097,296 | 17,845,697,014 |

*Table 3–7B—Production of Lode Gold, Silver, Copper, Lead, and Zinc by Mining Divisions, 1977 and 1978, and Total to Date*

| Division | Period | Lode Gold | | Silver | | Copper | | Lead | | Zinc | | Division Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | |
| | | g | $ | g | $ | kg | $ | kg | $ | kg | $ | $ |
| Alberni | 1977 | 527 351 | 2,579,181 | 28 421 579 | 4,372,906 | 2 402 259 | 2,874,364 | 2 519 178 | 1,293,494 | 14 759 757 | 11,081,341 | 22,201,286 |
| | **1978** | **605 420** | **4,121,668** | **29 431 680** | **5,435,156** | **3 000 193** | **3,802,301** | **2 364 683** | **1,387,099** | **14 872 224** | **10,111,375** | **24,857,599** |
| | To date | 15 173 816 | 30,669,530 | 276 073 960 | 30,326,952 | 46 854 699 | 58,527,128 | 18 989 722 | 8,118,304 | 195 022 894 | 101,877,397 | 229,519,311 |
| Atlin | 1977 | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | |
| | 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 | 1977 | | | 2 979 170 | 526,163 | 38 595 779 | 55,837,221 | | | | | 56,363,384 |
| | **1978** | | | **2 867 758** | **612,970** | **18 835 185** | **29,339,407** | | | | | **29,952,377** |
| | To date | 37 393 613 | 43,347,296 | 22 290 027 | 3,070,934 | 246 445 497 | 374,101,406 | 11 890 | 3,998 | 230 | 20 | 420,523,649 |
| Clinton | 1977 | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | |
| | To date | 727 499 | 827,328 | 982 419 | 14,237 | 26 103 | 5,905 | 88 | 7 | | | 847,477 |
| Fort Steele | 1977 | | | 79 114 182 | 12,145,695 | | | 68 300 790 | 36,866,630 | 62 812 003 | 35,298,445 | 84,310,770 |
| | **1978** | | | **102 608 113** | **19,987,927** | | | **80 961 213** | **51,795,162** | **52 286 179** | **27,509,538** | **99,292,627** |
| | To date | 390 707 | 749,363 | 8 041 225 618 | 246,725,956 | 7 163 855 | 12,534,149 | 6 597 706 869 | 1,328,997,390 | 5 016 150 175 | 1,149,565,740 | 2,738,572,598 |
| Golden | 1977 | | | | | | | | | | | |
| | **1978** | | | **66 031** | **14,242** | | | **12 083** | **9,057** | **20 446** | **13,013** | **36,312** |
| | To date | 13 965 | 25,415 | 143 530 143 | 4,931,031 | 532 092 | 367,849 | 117 953 505 | 26,293,855 | 152 337 820 | 33,466,050 | 65,084,200 |
| Greenwood | 1977 | 261 359 | 1,489,066 | 12 836 551 | 2,016,898 | 2 576 877 | 3,865,152 | 110 765 | 61,128 | 99 888 | 49,446 | 7,431,690 |
| | **1978** | **64 352** | **430,899** | **10 888 321** | **2,172,005** | **581 146** | **906,571** | **93 926** | **60,529** | **102 993** | **50,751** | **3,620,755** |
| | To date | 43 562 914 | 40,637,424 | 1 397 222 466 | 45,349,235 | 273 352 547 | 153,550,378 | 11 822 190 | 2,808,512 | 11 625 178 | 2,727,060 | 245,072,609 |
| Kamloops | 1977 | 106 807 | 581,202 | 24 614 634 | 3,996,954 | 87 318 138 | 118,518,238 | 59 386 | 32,731 | 33 349 | 16,174 | 123,145,299 |
| | **1978** | **1 109 879** | **8,595,976** | **27 414 961** | **5,787,702** | **94 121 838** | **146,155,242** | | | | | **160,538,920** |
| | To date | 3 445 726 | 12,254,169 | 177 218 233 | 22,020,193 | 676 731 726 | 956,732,155 | 387 375 | 107,382 | 242,240 | 51,507 | 991,165,406 |
| Liard | 1977 | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | |
| | 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 | 1977 | | | | | | | | | | | |
| | **1978** | **13 934** | **106,240** | **1 742** | **350** | | | | | | | **106,590** |
| | To date | 130 197 655 | 147,465,171 | 30 730 480 | 719,985 | 181 | 41 | 28 355 | 2,548 | 7 | 2 | 148,187,747 |
| Nanaimo | 1977 | 1 443 988 | 7,558,331 | 8 729 275 | 1,541,477 | 44 722 108 | 64,889,992 | | | | | 73,989,800 |
| | **1978** | **1 293 208** | **9,968,983** | **9 362 470** | **2,110,717** | **48 466 230** | **91,382,719** | | | | | **93,462,399** |
| | To date | 17 418 548 | 54,818,061 | 119 218 919 | 11,291,843 | 385 866 308 | 554,332,229 | | | | | 620,442,133 |
| Nelson | 1977 | 809 | 4,204 | 391 120 | 62,028 | | | 1 580 379 | 847,685 | 10 500 285 | 5,900,189 | 6,814,106 |
| | **1978** | | | **249 415** | **39,771** | | | **1 202 688** | **700,689** | **6 962 555** | **3,328,215** | **4,069,675** |
| | To date | 41 733 010 | 42,064,473 | 324 078 549 | 9,121,798 | 6 765 479 | 1,689,196 | 240 828 610 | 69,411,098 | 686 782 248 | 223,718,582 | 346,005,147 |
| New Westminster | 1977 | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | |
| | 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 | 1977 | | | | | 16 933 541 | 24,624,499 | | | | | 24,624,499 |
| | **1978** | | | | | **25 173 621** | **40,126,034** | | | | | **40,126,034** |
| | To date | 343 221 | 396,312 | 8 598 518 | 135,632 | 353 721 100 | 412,670,581 | 1 016 721 | 91,282 | 146 913 | 10,977 | 413,304,734 |
| Omineca | 1977 | 1 171 650 | 6,347,079 | 5 461 967 | 894,927 | 32 160 141 | 42,993,226 | 9 579 | 5,280 | 9 409 | 4,563 | 50,245,075 |
| | **1978** | **1 113 056** | **8,413,612** | **3 937 235** | **815,374** | **30 794 069** | **50,550,297** | **2 378** | **1,784** | **3 891** | **2,402** | **59,783,469** |
| | To date | 10 261 163 | 39,185,787 | 369 951 336 | 14,540,623 | 258 436 935 | 372,030,165 | 13 816 624 | 3,934,634 | 19 617 976 | 6,187,725 | 435,878,934 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Osoyoos | 1977 | 107 399 | 550,029 | 15 253 595 | 2,429,781 | 15 490 255 | 22,170,354 | 11 602 | 6,489 | 15 990 | 6,168 | 25,162,821 |
| | **1978** | **122 639** | **924,324** | **13 541 437** | **2,787,539** | **13 545 457** | **22,652,512** | **9 918** | **6,366** | **16 165** | **5,523** | **26,376,264** |
| | To date | 53 828 333 | 57,389,598 | 196 141 861 | 19,432,214 | 130 080 511 | 182,208,369 | 296 303 | 91,713 | 177 982 | 65,225 | 259,187,119 |
| Revelstoke | 1977 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | **1978** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | To date | 1 163 532 | 1,081,981 | 128 317 043 | 2,821,865 | 69 710 | 51,037 | 16 406 534 | 8,876,057 | 12 814 288 | 8,817,157 | 11,147,597 |
| Similkameen | 1977 | 847 246 | 4,660,443 | 3 456 476 | 532,814 | 19 730 380 | 27,360,548 | ..... | ..... | ..... | ..... | 32,553,805 |
| | **1978** | **1 012 466** | **7,040,384** | **3 083 303** | **586,077** | **23 748 609** | **33,251,799** | ..... | ..... | ..... | ..... | **40,878,260** |
| | To date | 11 260 811 | 33,130,894 | 152 279 883 | 5,597,010 | 397 744 177 | 301,189,001 | 178 550 | 15,137 | 36 494 | 5,258 | 339,937,300 |
| Skeena | 1977 | 154 085 | 983,100 | 10 147 136 | 1,689,657 | 14 960 957 | 21,133,979 | 6 866 | 3,780 | 3 046 | 1,342 | 23,811,858 |
| | **1978** | **159 403** | **1,521,659** | **9 566 928** | **2,067,748** | **15 325 225** | **23,369,465** | **14 029** | **10,511** | **9 602** | **5,875** | **26,975,258** |
| | To date | 78 070 188 | 70,058,522 | 2 283 403 638 | 58,772,828 | 508 775 980 | 385,473,229 | 27 243 451 | 5,456,050 | 7 822 718 | 2,552,726 | 522,313,355 |
| Slocan | 1977 | 28 334 | 164,045 | 10 519 812 | 1,656,306 | 136 | 111 | 1 234 959 | 810,664 | 866 458 | 571,516 | 3,202,642 |
| | **1978** | **3 173** | **23,035** | **8 344 064** | **1,654,119** | **87** | **100** | **881 852** | **560,023** | **576 913** | **357,945** | **2 595,222** |
| | To date | 594 007 | 807,585 | 2 468 132 034 | 62,579,118 | 6 491 | 2,133 | 516 050 916 | 109,896,054 | 434 871 195 | 108,278,719 | 281,063,604 |
| Trail Creek | 1977 | 2 831 | 15,951 | 528 285 | 85,989 | ..... | ..... | 26 814 | 16,127 | 29 865 | 14,650 | 132,717 |
| | **1978** | **1 897** | **13,616** | **261 390** | **50,277** | ..... | ..... | **12 216** | **7,363** | **23 342** | **11,478** | **82,734** |
| | To date | 92 877 400 | 68,513,572 | 117 180 523 | 2,528,926 | 55 592 776 | 18,245,404 | 175 629 | 61,660 | 198 043 | 87,750 | 84,437,312 |
| Vancouver | 1977 | 1 185 864 | 6,070,222 | 9 648 057 | 1,433,890 | 53 251 | 80,043 | 1 171 697 | 673,842 | 1 096 020 | 602,798 | 8,860,795 |
| | **1978** | **1 039 182** | **6,799,359** | **5 333 052** | **885,589** | **40 369** | **36,704** | **1 005 908** | **603,925** | **1 124 390** | **486,984** | **8,815,561** |
| | To date | 18 395 424 | 31,606,622 | 193 295 876 | 7,376,224 | 506 993 281 | 242,954,209 | 10 903 591 | 3,306,607 | 110 676 505 | 32,272,752 | 317,516,414 |
| Vernon | 1977 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | **1978** | **156** | **1,125** | **37 106** | **8,235** | ..... | ..... | ..... | ..... | ..... | ..... | **9,360** |
| | To date | 165 250 | 181,914 | 2 246 726 | 148,293 | 297 | 100 | 86 363 | 29,276 | 33 511 | 11,299 | 370,882 |
| Victoria | 1977 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | **1978** | **31** | **225** | **404** | **81** | **1 994** | **2,637** | ..... | ..... | ..... | ..... | **2,943** |
| | To date | 1 375 157 | 1,236,720 | 29 478 396 | 654,567 | 29 775 654 | 22,581,791 | 95 298 | 19,848 | 1 618 731 | 283,923 | 24,776,849 |
| Not assigned | 1977 | 68 613 | 349,078 | 29 401 168 | 4,548,613 | 280 293 | 388,934 | 3 140 631 | 1,698,443 | 13 554 158 | 7,754,369 | 14,739,437 |
| | **1978** | **—1 494** | **—9,205** | **271 480** | **52,630** | **60 653** | **118,607** | **—5 496 355** | **—3,501,944** | **19 619 411** | **10,164,602** | **6,824,690** |
| | To date | 736 527 | 1,109,130 | 282 800 822 | 19,574,449 | 26 370 527 | 15,999,546 | 251 095 087 | 51,083,806 | 731 206 177 | 193,026,870 | 280,793,301 |
| Totals | 1977 | 5 906 336 | 31,301,931 | 241 503 007 | 37,934,098 | 275 224 115 | 384,736,661 | 78 172 646 | 42,316,293 | 103 780 228 | 61,301,001 | 557,589,984 |
| | **1978** | **6 542 332** | **47,951,880** | **227 271 880** | **45,071,509** | **273 692 676** | **431,694,395** | **81 064 539** | **51,640,564** | **95 618 111** | **52,048,701** | **628,407,049** |
| | To date | 569 472 747 | 684,806,939 | 16 870 686 529 | 570,740,205 | 3 947 448 423 | 4,104,107,278 | 7 835 932 889 | 1,616,562,950 | 7 422 197 745 | 1,868,372,620 | 8,844,589,992 |

## *Table 3-7C—Production of Miscellaneous Metals by Mining Divisions, 1977 and 1978, 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 | 1977 | | | | | 28 781 | 163,418 | | | | | | | | |
| | **1978** | | | | | **26 872** | **131,016** | | | | | | | | |
| | To date | | | | | 560 001 | 3,641,845 | | | 4 293 517 | 49,634,711 | | | | |
| Atlin | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | 144 791 | 561,762 | | | | | | | | |
| Cariboo | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | | | | |
| Clinton | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | 114 | 900 | | | | | | |
| Fort Steele | 1977 | | | | | | | | | 21 763 | 292,043 | | | | |
| | **1978** | | | | | | | | | **25 459** | **384,563** | | | | |
| | To date | | | | | 1 542 022 | 10,064,486 | | | 1 327 992 | 15,281,785 | | | | |
| Golden | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | **66** | **229** | | | | | | | | |
| | To date | 18 172 | 14,906 | | | 259 162 | 1,185,526 | | | | | | | | |
| Greenwood | 1977 | | | | | 259 | 1,430 | | | | | | | | |
| | **1978** | | | | | **350** | **1,211** | | | | | | | | |
| | To date | | | | | 36 883 | 177,224 | 608 | 31,395 | | | | | | |
| Kamloops | 1977 | | | | | 45 | 270 | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | 99 | 641 | | | 19 202 | 95,851 | | | 4 984 | 5,795 |
| Liard | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | | | | |
| Lillooet | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | 6 108 | 4,321 | | | | | | | | | | | 4 187 | 41,804 |
| Nanaimo | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | | | 15 872 977 | 152,633,401 | | | | |
| Nelson | 1977 | | | | | 36 949 | 206,818 | | | | | | | | |
| | **1978** | | | | | **26 568** | **125,784** | | | | | | | | |
| | To date | | | | | 4 059 962 | 19,859,034 | | | | | | | | |
| New Westminster | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | | | | |
| Nicola | 1977 | | | | | | | | | 39 245 | 942,342 | | | | |
| | **1978** | | | | | | | | | **35 696** | **939,838** | | | | |
| | To date | | | | | | | | | 299 041 | 6,165,660 | | | | |
| Omineca | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | 53 697 | 21,882 | | | 135 245 | 628,342 | | | | | | | 6 085 216 | 49,171,164 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Osoyoos | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | 15 | | | |
| Revelstoke | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | 4 261 | 3,455 | | | 46 997 | 176,102 | | | | | | | | |
| Similkameen | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | | | | |
| Skeena | 1977 | | | | | | | | | 384 309 | 6,127,960 | | | | |
| | **1978** | | | | | | | | | **554 414** | **10,273,261** | | | | |
| | To date | | | | | 64 360 | 316,764 | | | 11 290 505 | 119,443,123 | | | | |
| Slocan | 1977 | | | | | 4 506 | 13,398 | | | | | | | | |
| | **1978** | | | | | **2 514** | **9,667** | | | | | | | | |
| | To date | 14 453 | 8,133 | | | 1 238 891 | 5,832,907 | | | | | 491 | 8,160 | | |
| Trail Creek | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | 52 | 210 | | | 499 | 1,925 | | | | |
| Vancouver | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | 257 261 | 1,206,076 | | | | | | | | |
| Vernon | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | 86 | 532 | | | | | | | | |
| Victoria | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | 3 175 | 10,929 | | | | | 1 058 | 24,508 | | |
| Not assigned | 1977 | 596 207 | 2,519,739 | 18 540 | 187,612 | 250 171 | 1,334,717 | | | | | | | | |
| | **1978** | **459 521** | **2,083,895** | **28 172** | **166,452** | **197 433** | **918,413** | | | | | | | | |
| | To date | 27 043 023 | 27,271,620 | 3 261 251 | 15,999,685 | 12 133 598 | 43,327,845 | | | | | | | | |
| Totals | 1977 | 596 207 | 2,519,739 | 18 540 | 187,612 | 320 711 | 1,720,051 | | | 445 317 | 7,362,345 | | | | |
| | **1978** | **459 521** | **2,083,895** | **28 172** | **166,452** | **253 803** | **1,186,320** | | | **615 569** | **11,597,462** | | | | |
| | To date | 27 139 714 | 27,824,317 | 3 261 251 | 15,999,685 | 20 482 585 | 86,990,225 | 722 | 32,295 | 33 103 733 | 343,206,456 | 1 564 | 32,668 | 6 094 387 | 49,218,263 |

*Table 3-7C—Production of Miscellaneous Metals by Mining Divisions, 1977 and 1978, 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 | $ | g | $ | kg | $ | kg | $ | $ | $ |
| Alberni | 1977 | | | | | | | | | | | | | | 163,418 |
| | **1978** | | | | | | | | | | | | | | **131,016** |
| | To date | | | | | | | | | | | | | | 53,276,556 |
| Atlin | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | 132 | 360 | | 562,122 |
| Cariboo | 1977 | 1 129 768 | 10,317,041 | | | | | | | | | | | | 10,317,041 |
| | **1978** | **883 690** | **11,982,422** | | | | | | | | | | | | **11,982,422** |
| | To date | 13 524 177 | 71,451,267 | | | | | 1 835 | 2,299 | | | 12 564 | 21,431 | | 71,474,997 |
| Clinton | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | | | | 900 |
| Fort Steele | 1977 | | | | | | | | | 177 009 | 1,805,440 | | | | 2,097,483 |
| | **1978** | | | | | | | | | **227 957** | **3,199,344** | | | | **3,583,907** |
| | To date | | | | | | | | | 9 205 576 | 23,678,017 | | | 88,1841 | 49,062,472 |
| Golden | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | **229** |
| | To date | | | | | | | | | | | | | | 1,200,432 |
| Greenwood | 1977 | | | | | | | | | | | | | | 1,480 |
| | **1978** | | | | | | | | | | | | | | **1,211** |
| | To date | | | | | | | | | | | | | | 208,619 |
| Kamloops | 1977 | 1 846 837 | 12,253,872 | | | | | | | | | | | | 12,254,142 |
| | **1978** | **1 998 132** | **19,283,939** | | | | | | | | | | | | **19,283,939** |
| | To date | 10 352 178 | 55,323,064 | | | | | | | | | | | | 55,425,351 |
| Liard | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | | | | | 62 | 79 | | | | | | 79 |
| Lillooet | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | 666 | 2,440 | | | | | 93 | 113 | | | 14 675 | 37,921 | | 86,099 |
| Nanaimo | 1977 | 987 627 | 7,979,246 | | | | | | | | | | | | 7,979,246 |
| | **1978** | **859 104** | **9,455,197** | | | | | | | | | | | | **9,455,197** |
| | To date | 4 511 890 | 27,798,407 | | | | | | | | | | | | 180,481,808 |
| Nelson | 1977 | | | | | | | | | | | | | | 206,818 |
| | **1978** | | | | | | | | | | | | | | **125,784** |
| | To date | 6 819 | 18,378 | | | | | | | | | 8 056 095 | 43,304,576 | | 63,181,988 |
| New Westminster | 1977 | | | | | | | | | | | | | | |
| | **1978** | | | | | | | | | | | | | | |
| | To date | | | 23 337 783 | 51,698,754 | | | | | | | | | 376,2412 | 52,074,995 |
| Nicola | 1977 | | | | | | | | | | | | | | 942,342 |
| | **1978** | | | | | | | | | | | | | | **939,638** |
| | To date | | | | | | | | | | | | | | 6,165,660 |
| Omineca | 1977 | 7 691 235 | 74,342,742 | | | | | | | | | | | | 74,342,742 |
| | **1978** | **6 030 967** | **79,222,842** | | | | | | | | | | | | **79,222,842** |
| | To date | 84 125 229 | 463,488,482 | | | | | 93 | 154 | | | 1 002 839 | 4,697,710 | 4202 | 518,008,154 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Osoyoos | 1977 | 3 866 503 | 37,165,046 | | | | | | | | | | | | 37,165,046 |
| | 1978 | 3 283 310 | 47,769,872 | | | | | | | | | | | | 47,769,872 |
| | To date | 34 343 485 | 205,846,506 | | | | | | | | | | | | 205,846,506 |
| Revelstoke | 1977 | | | | | | | | | | | | | | |
| | 1978 | | | | | | | | | | | | | | |
| | To date | 1 190 713 | 4,167,573 | | | | | | | | | 3 531 | 5,687 | | 4,352,817 |
| Similkameen | 1977 | | | | | | | | | | | | | | |
| | 1978 | | | | | | | | | | | | | | |
| | To date | | | | | | | 40 030 | 129,186 | | | | | | 129,186 |
| Skeena | 1977 | | | | | | | | | | | | | | 6,127,960 |
| | 1978 | | | | | | | | | | | | | | 10,273,261 |
| | To date | 10 470 935 | 37,782,288 | | | | | | | | | 166 | 331 | 1,3893 | 157,493,895 |
| Slocan | 1977 | | | | | | | | | | | | | | 13,398 |
| | 1978 | | | | | | | | | | | | | | 9,667 |
| | To date | | | | | | | | | | | | | | 5,849,200 |
| Trail Creek | 1977 | | | | | | | | | | | | | | |
| | 1978 | | | | | | | | | | | | | | |
| | To date | 1 652 970 | 6,514,289 | | | 23 296 | 30,462 | 1 649 | 3,177 | | | | | | 6,550,068 |
| Vancouver | 1977 | | | | | | | | | | | | | | |
| | 1978 | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | | | | 1,206,076 |
| Vernon | 1977 | | | | | | | | | | | | | | |
| | 1978 | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | | | | 532 |
| Victoria | 1977 | | | | | | | | | | | | | | |
| | 1978 | | | | | | | | | | | | | | |
| | To date | | | | | | | | | | | | | | 35,437 |
| Not assigned | 1977 | | | | | | | | | 10 469 | 106,860 | | | 397,654 | 4,546,582 |
| | 1978 | | | | | | | | | 33 906 | 476,164 | | | 4,652,559 | 8,297,483 |
| | To date | | | | | | | | | 213 026 | 1,665,586 | | | 23,569,876 | 111,834,612 |
| Totals | 1977 | 15 521 970 | 142,057,947 | | | | | | | 187 478 | 1,912,300 | | | 397,654 | 156,157,648 |
| | 1978 | 13 055 203 | 167,714,272 | | | | | | | 261 863 | 3,675,505 | | | 4,652,559 | 191,076,468 |
| | To date | 160 179 062 | 872,342,694 | 23 337 783 | 51,698,754 | 23 296 | 30,462 | 43 762 | 135,008 | 9 418 602 | 25,343,603 | 9 090 002 | 48,068,016 | 24,036,110 | 1,544,458,556 |

[1] Magnesium, page 93. [2] Cobalt, page 89. [3] Selenium, page 95.

*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 | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | | |
| Atlin | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | | |
| Cariboo | 1977 | | | | | 1 239 | 49,595 | | | | |
| | **1978** | | | | | **2 184** | **59,346** | | | | |
| | To date | | | | | 24 766 | 854,504 | | | 44 | 168 |
| Clinton | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | | |
| Fort Steele | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | 7 | 80 | | | | | | |
| Golden | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | 398 388 | 4,489,227 | | | 2 956 | 12,612 | | |
| Greenwood | 1977 | | | | | | | | | 41 | 900 |
| | **1978** | | | | | | | | | **711** | **23,339** |
| | To date | | | | | | | 1 624 308 | 1,540,319 | 933 | 28,239 |
| Kamloops | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | 567 | 12,230 |
| Liard | 1977 | 97 033 | 69,729,205 | | | | | | | | |
| | **1978** | **68 266** | **47,066,170** | | | | | | | | |
| | To date | 1 509 114 | 461,976,898 | | | | | | | | |
| Lillooet | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | | |
| Nanaimo | 1977 | | | | | | | 28 624 | 95,461 | 2 733 | 110,648 |
| | **1978** | | | | | | | **22 475** | **56,894** | | |
| | To date | | | | | | | 1 022 258 | 2,061,835 | 31 506 | 777,149 |
| Nelson | 1977 | | | | | | | | | 25 836 | 1,099,488 |
| | **1978** | | | | | | | | | **25 327** | **1,139,304** |
| | To date | | | | | | | 6 895 | 8,174 | 227 825 | 8,002,846 |
| New Westminster | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | 99 490 | 1,611,625 |
| Nicola | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | | |
| Omineca | 1977 | | | | | | | | | 24 | 1,872 |
| | **1978** | | | | | | | | | **20** | **1,417** |
| | To date | | | | | | | | | 123 | 9,478 |
| Osoyoos | 1977 | | | | | | | | | 917 | 25,577 |
| | **1978** | | | | | | | | | **791** | **22,100** |
| | To date | | | | | | | 728 113 | 3,699,031 | 194 213 | 2,750,612 |
| Similkameen | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | | |
| Skeena | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | 545 232 | 1,050,722 | | |
| Vancouver | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | 26 936 | 418,606 |
| Vernon | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | 2 903 | 30,400 | 7 210 | 190,963 |
| Victoria | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | 262 | 3,345 | 8 713 | 157,080 |
| Not assigned | 1977 | | | | | | | | | | |
| | **1978** | | | | | | | | | | |
| | To date | | | | | | | | | | |
| Totals | 1977 | 97 033 | 69,729,205 | | | 1 239 | 49,595 | 28 624 | 95,461 | 29 551 | 1,238,485 |
| | **1978** | **68 266** | **47,066,170** | | | **2 184** | **59,346** | **22 475** | **56,894** | **26 849** | **1,186,160** |
| | To date | 1 509 114 | 461,976,898 | 398 395 | 4,489,307 | 24 766 | 854,504 | 3 932 927 | 8,406,438 | 597 560 | 13,958,996 |

[1] From 1972, excludes production which is confidential.
Other: *See* notes on individual materials listed alphabetically on pages 87 to 97.

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

*Mining Divisions, 1977 and 1978, 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 |
| | | | | | | | | | 49,595 |
| | | | | | | | | | **59,348** |
| | | | | 4 542 160 | 143,012 | | | 3004 | 997,984 |
| | | | | | | | | | |
| 792 | 6,236 | | | | | | | 156,1913 5 6 | 162,427 |
| | | | | | | 74,582 | 1,113,986 | | 1,113,986 |
| | | | | | | **87 752** | **1,531,236** | | **1,531,236** |
| 102 400 | 298,824 | | | | | 1 493 828 | 27,110,316 | 16,8947 | 27,426,114 |
| 653 126 | 2,357,488 | | | | | | | | 2,357,488 |
| **733 080** | **3,110,695** | | | | | | | | **3,110,695** |
| 6 282 786 | 23,984,079 | | | | | | | 1,2768 9 | 28,487,194 |
| | | | | | | | | | 900 |
| | | | | | | | | | **23,339** |
| | | | | | | | | 783,57810 | 2,352,136 |
| | | | | | | | | | |
| 1 131 179 | 6,323,178 | | | 192 640 | 2,075 | | | 203,0555 6 | 6,540,538 |
| | | 228 337 | 711,300 | | | 35 950 | 691,069 | | 71,131,574 |
| | | **451 908** | **1,374,746** | | | **89 480** | **1,587,440** | | **50,028,356** |
| | | 1 068 923 | 3,477,487 | | | 1 039 770 | 21,034,448 | | 486,488,832 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | 253 391 | 467,966 | | | | | 5,1299 | 473,095 |
| | | | | | | | | | 206,109 |
| | | | | | | | | | **56,894** |
| | | | | | | | | | 2,838,984 |
| | | | | | | | | | 1,099,488 |
| | | | | | | | | | **1,139,304** |
| | | | | | | | | 55,9018 | 8,066,921 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | 1,611,625 |
| | | | | | | | | | |
| 2 184 | 10,050 | | | | | | | | 10,050 |
| | | 38 284 | 114,223 | | | | | | 116,095 |
| | | **36 851** | **47,272** | | | | | | **48,689** |
| | | 557 939 | 1,539,882 | | | | | 11,46011 12 | 1,560,820 |
| | | | | | | | | | 25,577 |
| | | | | | | | | | **22,100** |
| | | | | 720 664 | 25,938 | | | 306,5335 10 11 | 6,782,114 |
| | | | | | | | | | |
| | | | | | | | | | |
| 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 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | 72 801 | 3,978 | | | | 225,341 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | 30,2269 | 190,651 |
| | | | | | | 138 360 | 2,066,605 | 1,017,682 | 3,084,287 |
| | | | | | | **144 949** | **2,529,317** | **922,085** | **3,451,402** |
| | | | | | | 5 497 131 | 71,923,489 | 4,596,859 | 76,520,348 |
| 653 126 | 2,357,488 | 266 621 | 825,523 | | | 248 892 | 3,871,660 | 1,017,682 | 79,185,099 |
| **733 080** | **3,110,695** | **488 759** | **1,422,018** | | | **322 181** | **5,647,993** | **922,085** | **59,471,361** |
| 7 519 568 | 30,624,067 | 1 880 253 | 5,485,335 | 5 815 954 | 185,818 | 8 692 263 | 126,797,900 | 6,311,372 | 659,090,635 |

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, 1977 and 1978, 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 | 1977 | | | | | 528,778 | | | 528,778 |
| | **1978** | | | | | **1,016,069** | | | **1,016,069** |
| | To date | | | | 346,659 | 7,500,955 | | | 7,847,614 |
| Atlin | 1977 | | | | | 22,281 | | | 22,281 |
| | **1978** | | | | | **17,542** | | | **17,542** |
| | To date | | 1,108 | | 102,453 | 281,942 | | | 385,503 |
| Cariboo | 1977 | | 557,035 | | 1,733,660 | 5,318,108 | | | 7,608,803 |
| | **1978** | | **469,780** | | **2,004,453** | **2,191,561** | | | **4,665,794** |
| | To date | | 3,675,091 | | 11,476,746 | 35,894,156 | 332,457 | | 51,378,450 |
| Clinton | 1977 | | | | 3,906 | 1,319,010 | | | 1,322,916 |
| | **1978** | | | | **1,323,000** | **452,423** | | | **1,775,423** |
| | To date | | | | 3,199,130 | 4,682,368 | | | 7,881,498 |
| Fort Steele | 1977 | | | | | 1,431,994 | | | 1,431,994 |
| | **1978** | | | | **20,000** | **834,961** | | | **854,961** |
| | To date | | 43,873 | 71,941 | 2,975,311 | 11,265,336 | 15,918 | | 14,372,379 |
| Golden | 1977 | | | | | 235,703 | | | 235,703 |
| | **1978** | | | | | **99,744** | | | **99,744** |
| | To date | | 1,000 | 50,840 | 255,923 | 4,345,701 | 128,159 | | 4,781,623 |
| Greenwood | 1977 | | | | | 433,332 | | | 433,332 |
| | **1978** | | **8,261** | | | **241,541** | | | **249,802** |
| | To date | | 50,821 | 161,020 | 278,474 | 3,154,104 | 121,283 | | 3,765,702 |
| Kamloops | 1977 | 8,136,745 | | | 2,167,475 | 1,891,624 | | | 12,195,844 |
| | **1978** | **9,067,294** | | | **1,544,504** | **2,698,939** | | | **13,310,737** |
| | To date | 45,198,985 | 25,067 | 19,800 | 17,220,400 | 23,516,835 | 72,379 | | 86,053,466 |
| Liard | 1977 | | | | 36,000 | 1,989,368 | | | 2,025,368 |
| | **1978** | | | | **459,000** | **4,082,797** | | | **4,541,797** |
| | To date | | | | 2,622,808 | 22,782,928 | | | 25,405,736 |
| Lillooet | 1977 | | 246,672 | | | 11,770 | | | 258,442 |
| | **1978** | | **303,150** | | | **7,653** | | | **310,803** |
| | To date | | 927,080 | 2,000 | 1,122,818 | 2,354,412 | | | 4,406,310 |
| Nanaimo | 1977 | | 4,282,416 | | 595,568 | 3,023,557 | | | 7,901,541 |
| | **1978** | | **5,419,687** | | **1,679,297** | **3,493,113** | | | **10,592,097** |
| | To date | | 75,113,819 | 3,450,735 | 7,581,205 | 24,539,923 | 1,178,992 | | 111,864,674 |
| Nelson | 1977 | | 670,922 | | | 673,260 | | | 1,344,182 |
| | **1978** | | **929,653** | | **1,455** | **762,920** | | | **1,694,028** |
| | To date | | 3,977,470 | 437,138 | 591,026 | 8,905,723 | 21,974 | | 13,933,331 |
| New Westminster | 1977 | | 69,800 | | 1,259,367 | 12,693,532 | 4,909,799 | | 18,932,498 |
| | **1978** | | **86,172** | | **845,288** | **14,798,377** | **6,282,560** | | **22,012,397** |
| | To date | | 3,680,882 | 20,974 | 25,816,947 | 154,751,023 | 108,735,150 | | 293,004,976 |
| Nicola | 1977 | | | | | 340,793 | | | 340,793 |
| | **1978** | | | | | **163,101** | | | **163,101** |
| | To date | | | 8,000 | 187,994 | 2,906,786 | | | 3,102,780 |
| Omineca | 1977 | | 3,091 | 60 | 42,285 | 1,183,132 | | | 1,228,568 |
| | **1978** | | **4,278** | **105** | **6,420** | **1,016,349** | | | **1,027,152** |
| | To date | | 37,229 | 576 | 2,951,483 | 15,995,294 | 5,274 | | 18,989,856 |
| Osoyoos | 1977 | | | | | 836,846 | | | 836,846 |
| | **1978** | | | | | **501,870** | | | **501,870** |
| | To date | | 43,774 | 33,018 | 355,349 | 6,920,876 | | | 7,353,017 |
| Revelstoke | 1977 | | | 14,250 | 10,000 | 372,114 | | | 396,364 |
| | **1978** | | | **17,925** | **600** | **251,014** | | | **269,539** |
| | To date | | 1,000 | 67,345 | 773,753 | 3,781,493 | | | 4,623,591 |
| Similkameen | 1977 | | | | | 850,292 | | | 850,292 |
| | **1978** | | | | | **347,514** | | | **347,514** |
| | To date | 10,500 | 11,571 | 24,000 | 712,341 | 5,244,912 | 13,355 | | 6,016,679 |
| Skeena | 1977 | | | | 722,001 | 1,875,401 | | | 2,597,402 |
| | **1978** | | | | **526,048** | **1,199,224** | | | **1,725,272** |
| | To date | | 1,645,300 | 144,000 | 5,531,295 | 21,592,610 | 13,249 | | 28,926,454 |
| Slocan | 1977 | | | | | 260,557 | | | 260,557 |
| | **1978** | | | | | **93,820** | | | **93,820** |
| | To date | | 1,000 | 115,143 | 157,323 | 3,016,676 | | | 3,290,142 |
| Trail Creek | 1977 | | | | | 299,452 | | | 299,452 |
| | **1978** | | | | | **1,735,319** | | | **1,735,319** |
| | To date | | 32,500 | 85,520 | 381,393 | 5,454,000 | | | 5,953,413 |
| Vancouver | 1977 | 14,585,523 | | | | 6,242,991 | | | 20,828,514 |
| | **1978** | **21,947,739** | | | | **6,419,333** | | | **28,366,072** |
| | To date | 143,220,736 | 40,885 | 4,012,560 | 8,681,796 | 82,593,682 | 1,088,592 | | 239,638,251 |
| Vernon | 1977 | | | 41,292 | | 2,641,904 | | | 2,683,196 |
| | **1978** | | | | | **1,788,720** | | | **1,788,720** |
| | To date | | 351,416 | 141,367 | 403,649 | 18,216,996 | 161,254 | | 19,274,682 |
| Victoria | 1977 | 19,983,052 | 31,678 | | | 7,587,882 | | | 27,602,612 |
| | **1978** | **25,125,581** | **42,331** | | | **6,952,573** | | | **32,120,485** |
| | To date | 284,287,388 | 1,141,281 | 55 | 532,563 | 57,967,561 | 10,855,136 | | 354,783,984 |
| Not assigned | 1977 | | | | 739,274 | 2,745,440 | | | 3,484,714 |
| | **1978** | | | | | **13,061,818** | | | **13,061,818** |
| | To date | | 315,498 | 505,018 | 2,879,844 | 62,179,350 | 3,180,828 | 5,972,171 | 75,032,709 |
| Totals | 1977 | 42,705,320 | 5,861,614 | 55,602 | 7,309,536 | 54,809,121 | 4,909,799 | | 115,650,992 |
| | **1978** | **56,140,564** | **7,263,312** | **18,030** | **8,410,065** | **64,227,295** | **6,282,560** | | **142,341,826** |
| | To date | 472,717,609 | 91,117,665 | 9,351,050 | 97,138,683 | 589,845,642 | 125,924,000 | 5,972,171 | 1,392,066,820 |

## *Table 3-8A—Production of Coal, 1836–1978*

| 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 | 10,785,812 | 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 | 1977 | 8 424 181 | 328,846,883 |
| 1918 | 2 336 238 | 12,833,994 | 1978 | 9 463 920 | 381,895,241 |
| | | | Totals | 190 263 059 | 2,317,222,986 |

[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, 1978*

| 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. | 540 657 | 519 171 | ..... | ..... | 13 071 | 401 678 | ..... | 108 531 | ..... | 523 280 | 523 280 | 12,654,559 |
| Coleman Collieries Ltd. | 247 152 | 120 787 | ..... | ..... | ..... | ..... | ..... | 120 787 | ..... | 120 787 | 120 787 | 5,167,578 |
| Fording Coal Ltd. | 4 223 002 | 2 790 011 | ..... | ..... | ..... | ..... | ..... | 2 669 692 | 140 510 | 2 810 202 | 2 810 202 | 121,540,688 |
| Kaiser Resources Ltd. | 7 368 096 | 5 662 807 | 7 666 | 292 005 | 49 101 | 120 | 3 791 | 4 120 265 | 1 536 431 | 5 709 708 | 6 009 379 | 242,525,644 |
| *Omineca Mining Division* | | | | | | | | | | | | |
| Bulkley Valley Coal Ltd. | 308 | 272 | 7 | ..... | 265 | ..... | ..... | ..... | ..... | 265 | 272 | 6,772 |
| Totals | 11 379 215 | 9 093 048 | 7 673 | 292 005 | 62 437 | 401 798 | 3 791 | 7 019 275 | 1 676 941 | 9 164 242 | 9 463 920 | 381,895,241 |

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

| Class | Salaries and Wages | Fuel and Electricity | Process Supplies |
|---|---|---|---|
| | $ | $ | $ |
| Metal-mining | 135,853,137 | 47,060,849 | 159,461,138 |
| Exploration and development | 82,099,007 | | |
| Coal | 65,643,694 | 14,644,287 | 14,083,909 |
| Petroleum and natural gas (exploration and production) | 9,946,457 | | |
| Industrial minerals | 11,611,228 | 3,750,361 | 1,820,335 |
| Structural-materials industry | 29,982,587 | 19,329,629 | 13,767,708 |
| Totals, 1978 | 335,136,110 | 84,785,126 | 189,133,090 |
| 1977 | 337,382,149 | 71,149,313 | 192,025,357 |
| 1976 | 277,736,828 | 59,220,204 | 170,075,616 |
| 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, 1901–1978*

| Year | Metals | | | | | | Coal Mines | | | Structural Materials | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Placer | Mines | | Concentrates | Smelters | Total | Under | Above[1] | Total | Quarries and Pits | Plants | Industrial Materials | Exploration and Development | Petroleum and Natural Gas Exploration and Development | Total |
| | | Under | Above | | | | | | | | | | | | |
| 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 | 8,288 | 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 | 681 | 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 | 1,580 | 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 | 2,558 | 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 |
| 1977 | ..... | 1,208 | 3,768 | 2,224 | 3,590 | 10,790 | 312 | 2,556 | 2,868 | 1,380 | 626 | 766 | 3,537 | 490 | 20,457 |
| **1978** | ..... | **1,009** | **3,874** | **2,029** | **3,838** | **10,750** | **377** | **2,606** | **2,983** | **1,645** | **491** | **618** | **3,232** | **496** | **20,215** |

[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, 1978*

| | Tonnes | | Days Operating Mill | Average Number Employed[1] | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mined | Milled | | Administrative, Etc. | Mine | | Mill | Others | Total |
| | | | | | Surface | Underground | | | |
| ***Metal Mines*** | | | | | | | | | |
| Afton Mines Ltd. (Afton) | 3 484 846 | 2 456 757 | 365 | 92 | 76 | ..... | 21 | 89 | 278 |
| Bethlehem Copper Corp. (Bethlehem) | 6 572 018 | 6 490 726 | 343 | 27 | 145 | ..... | 129 | 20 | 321 |
| Brenda Mines Ltd. (Brenda) | 10 002 567 | 9 995 736 | 364 | 121 | 173 | ..... | 177 | 4 | 475 |
| Cominco Ltd. (HB)[2] | 200 888 | 200 888 | 202 | 16 | 14 | 28 | 8 | ..... | 66 |
| Cominco Ltd. (Sullivan) | 2 058 304 | 2 107 869 | 346 | 196 | ..... | 482 | 203 | 85 | 966 |
| Craigmont Mines Ltd. (Craigmont) | 1 885 916 | 1 899 934 | 361 | 65 | 110 | 95 | 38 | ..... | 308 |
| Dankoe Mines Ltd. (Horn Silver) | 28 677 | 28 677 | 247 | 8 | 5 | 25 | 3 | ..... | 41 |
| Gibraltar Mines Ltd. (Gibraltar) | 7 363 580 | 5 135 655 | 145 | 119 | 53 | ..... | 114 | ..... | 286 |
| Granby Mining Corp. (Phoenix)[3] | ..... | 237 801 | 207 | 2 | 6 | ..... | 11 | ..... | 19 |
| Granisle Copper Ltd. (Granisle) | 4 621 464 | 4 549 265 | 365 | 85 | 136 | ..... | 128 | ..... | 349 |
| Lornex Mining Corp. Ltd. (Lornex) | 15 865 501 | 15 927 064 | 365 | 95 | 382 | ..... | 278 | ..... | 755 |
| Newmont Mines Ltd. (Granduc Operating Division)[4] | 722 782 | 741 648 | 129 | 54 | 41 | 59 | 30 | ..... | 184 |
| Newmont Mines Ltd. (Similkameen Division) | 6 906 996 | 6 779 045 | 365 | 70 | 162 | ..... | 77 | ..... | 309 |
| Noranda Mines Ltd. (Bell) | 4 080 296 | 4 470 070 | 365 | 82 | 52 | ..... | 143 | ..... | 277 |
| Noranda Mines Ltd. (Boss Mountain) | 541 928 | 541 928 | 354 | 60 | 49 | 58 | 32 | ..... | 199 |
| Northair Mines Ltd. (Warman) | 89 486 | 93 397 | 356 | 24 | ..... | 53 | 17 | 22 | 116 |
| Placer Development Ltd. (Endako Mining Division) | 10 603 873 | 10 656 643 | 347 | 150 | 137 | ..... | 337 | ..... | 624 |
| Silvana Mines Ltd. (Silmonac) | 15 967 | 15 967 | 365 | 8 | 8 | 19 | 9 | 2 | 46 |
| Teck Corp. Ltd. (Highland Bell) | 35 280 | 35 280 | 355 | 9 | ..... | 23 | 9 | 7 | 48 |
| Utah Mines Ltd. (Island Copper) | 13 209 595 | 14 200 203 | 364 | 163 | 524 | ..... | 171 | ..... | 858 |
| Wesfrob Mines Ltd. (Tasu) | 889 933 | 889 933 | 329 | 45 | ..... | 30 | 75 | ..... | 150 |
| Western Mines Ltd. (Lynx and Myra) | 269 033 | 269 033 | 313 | 46 | ..... | 137 | 19 | 35 | 237 |
| Total metal mines | ..... | ..... | ..... | 1,537 | 2,073 | 1,009 | 2,069 | 264 | 6,912 |
| ***Coal Mines*** | | | | | | | | | |
| Byron Creek Collieries Ltd. | 595 975 | ..... | 365 | 24 | 45 | ..... | 9 | ..... | 78 |
| Coleman Collieries Ltd. | 247 152 | ..... | 365 | ..... | 30[4] | ..... | ..... | ..... | 30 |
| Fording Coal Ltd. | 4 223 002 | ..... | 365 | 231 | 639 | ..... | 191 | ..... | 1,061 |
| Kaiser Resources Ltd. | 7 368 096 | ..... | 365 | 465 | 790 | 377 | 182 | ..... | 1,814 |
| Total coal mines | ..... | ..... | ..... | 720 | 1,504 | 377 | 382 | ..... | 2,983 |

[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] Production ceased August 17, 1978.

[3] Production ceased June 30, 1978.

[4] Estimated.

## Table 3-12—Metal Production, 1978

| 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 | | g | g | kg | kg | kg | kg |
| *Alberni Mining Division* | | | | | | | | | | |
| Lynx and Myra | Buttle Lake | Western Mines Ltd. | 269 033 | Copper concentrates, 11 485 t; lead concentrates, 6 463 t; zinc concentrates, 32 400 t | 628 094 | 36 150 053 | 3 294 888 | 2 768 914 | 18 003 921 | 71 704 |
| *Atlin Mining Division* | | | | | | | | | | |
| Nil | | | | | | | | | | |
| *Cariboo Mining Division* | | | | | | | | | | |
| Boss Mountain | Big Timothy Mountain | Noranda Mines Ltd. (Boss Mountain Div.) | 541 928 | Molybdenite concentrates, 1 384 t containing 764 516 kg of molybdenum | | | | | | |
| Gibraltar | McLeese Lake | Gibraltar Mines Ltd. | 5 135 655 | Copper concentrates, 74 705 t; molybdenite concentrates, 238 t containing 119 174 kg of molybdenum | | 3 265 628 | 19 713 622 | | | |
| *Clinton Mining Division* | | | | | | | | | | |
| Nil | | | | | | | | | | |
| *Fort Steele Mining Division* | | | | | | | | | | |
| Sullivan | Kimberley | Cominco Ltd. | 2 107 869 | Lead concentrates, 134 270 t; zinc concentrates, 119 716 t; tin concentrates, 561 t containing 236 339 kg of tin | | 114 039 181 | | 88 863 212 | 64 417 720 | |
| *Golden Mining Division* | | | | | | | | | | |
| Ruth Vermont | Spillimacheen | Ruth Vermont Mines Ltd. | 62 | Clean-up; lead concentrates, 20 t; zinc concentrates, 42 t | | 75 083 | 384 | 13 600 | 21 901 | 166 |
| *Greenwood Mining Division* | | | | | | | | | | |
| Highland Bell | Beaverdell | Teck Corporation Ltd. | 35 280 | Lead concentrates, 439 t; zinc concentrates, 403 t; jig concentrates, 121 t | 4 012 | 11 333 062 | 865 | 105 933 | 139 279 | 977 |
| Phoenix | Greenwood | Granby Mining Corp. (Phoenix Copper Div.) | 237 801 | Copper concentrates, 2 645 t | 120 555 | 924 599 | 912 728 | | | |
| *Kamloops Mining Division* | | | | | | | | | | |
| Afton | Kamloops | Afton Mines Ltd. | 2 456 757 | Copper concentrates, 18 176 t; blister copper, 5 995 t | 1 022 791 | 5 524 701 | 15 429 468 | | | |
| Bethlehem | Highland Valley | Bethlehem Copper Corp. | 6 490 726 | Copper concentrates, 41 580 t; molybdenite concentrates, 269 t containing 133 777 kg of molybdenum | 124 661 | 7 299 470 | 18 312 007 | | | |
| Lornex | Highland Valley | Lornex Mining Corp. Ltd. | 15 927 064 | Copper concentrates, 208 799 t; molybdenite concentrates, 3 459 t containing 1 864 355 kg of molybdenum | | 17 486 200 | 63 114 028 | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Liard Mining Division* | | | | | | | | | | |
| Nil | | | | | | | | | | |
| *Lillooet Mining Division* | | | | | | | | | | |
| Bralorne | Bridge River | Nelson Machinery Co. Ltd. | 149 | Clean-up | 14 992 | 4 976 | | 150 | 150 | |
| *Nanaimo Mining Division* | | | | | | | | | | |
| Island Copper | Rupert Inlet | Utah Mines Ltd. | 14 200 203 | Copper concentrates, 218 515 t; molybdenite concentrates, 2 087 t containing 859 104 kg of molybdenum; rhenium shipments are confidential | 1 345 360 | 10 402 740 | 50 653 152 | | | |
| *Nelson Mining Division* | | | | | | | | | | |
| HB | Salmo | Cominco Ltd. | 200 888 | Lead concentrates, 3 900 t; zinc concentrates, 15 264 t | | 827 713 | | 1 451 180 | 8 381 566 | 67 298 |
| *New Westminster Mining Division* | | | | | | | | | | |
| Nil | | | | | | | | | | |
| *Nicola Mining Division* | | | | | | | | | | |
| Craigmont | Merritt | Craigmont Mines Ltd. | 1 899 934 | Copper concentrates, 93 082 t; iron concentrates, 33 183 t; coarse iron, 2 513 t | | | 26 290 618 | | | |
| *Omineca Mining Division* | | | | | | | | | | |
| Bell (Newman) | Babine Lake | Noranda Mines Ltd. (Bell Copper Div.) | 4 470 070 | Copper concentrates, 64 464 t | 763 299 | 2 210 148 | 17 144 917 | | | |
| Endako | Endako | Placer Development Ltd. (Endako Mines Div.) | 10 656 643 | Molybdic tri-oxide, 10 176 t; ferro-molybdenum, 200 t; total content, 6 030 967 kg of molybdenum | | | | | | |
| Golden Eagle | Topley | V. G. Finch and R. Williams, Smithers | 3 | Crude ore | 9 | 10 404 | | 317 | 140 | |
| Granisle | Babine Lake | Granisle Copper Ltd. | 4 549 265 | Copper concentrates, 47 366 t | 467 571 | 4 819 410 | 14 851 373 | | | |
| Silver Standard | Hazelton | George Braun, Hazelton | 57 | Crude ore | 187 | 78 286 | 138 | 2 811 | 4 016 | |
| Sunrise Silver | Hazelton | M. Kryger, Smithers | 26 | Crude ore | | 19 377 | | 1 642 | 2 356 | |
| *Osoyoos Mining Division* | | | | | | | | | | |
| Brenda | Brenda Lake | Brenda Mines Ltd. | 9 995 736 | Copper concentrates, 46 880 t; molybdenite concentrates, 5 820 t containing 3 310 663 kg of molybdenum | 111 629 | 7 140 191 | 14 072 630 | | | |
| Horn Silver | Keremeos | Dankoe Mines Ltd. | 28 677 | Bulk concentrates, 979 t; jig concentrates, 97 t | 23 949 | 7 569 195 | 5 518 | 21 091 | 27 927 | |
| *Revelstoke Mining Division* | | | | | | | | | | |
| Nil | | | | | | | | | | |
| *Similkameen Mining Division* | | | | | | | | | | |
| Similkameen (Ingerbelle) | Princeton | Newmont Mines Ltd. (Similkameen Div.) | 6 779 045 | Copper concentrates, 88 964 t | 1 152 926 | 4 347 297 | 24 725 222 | | | |
| *Skeena Mining Division* | | | | | | | | | | |
| Granduc | Stewart | Newmont Mines Ltd. (Granduc Operating Div.) | 741 648 | Copper concentrates, 52 268 t | 160 460 | 9 056 914 | 14 780 100 | | | |

## *Table 3-12—Metal Production, 1978*—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 | | g | g | kg | kg | kg | kg |
| Premier | Stewart | Spring Investments Ltd. | 245 | Clean-up; lead concentrates, 58 t; ore, 187 t | 9 144 | 312 212 | 98 | 17 915 | 15 035 | |
| Tasu | Tasu Sound | Wesfrob Mines Ltd. | 889 933 | Iron concentrates, 554 414 t; copper concentrates, 5 989 t | 28 397 | 1 198 647 | 1 175 609 | | | |
| Troy | Stewart | Nick Benkovich, Stewart | 22 | Crude ore | 370 | 5 038 | | 420 | 641 | |
| *Slocan Mining Division* | | | | | | | | | | |
| Arlington | Slocan | R. S. Reilly and D. P. Bialkoski, Slocan, and Selmon Resources Ltd. | 17 | Lead concentrates, 17 t; dump clean-up | | 84 569 | | 5 946 | 3 647 | |
| Colonial | Sandon | N. Sibilleau, North Surrey | 2 | Crude ore | | 8 802 | | 1 895 | 82 | |
| Corinth | Sandon | Corinthian Mines Ltd. | 7 | Crude ore | | 1 680 | | 443 | 1 350 | |
| Grey Copper (Blue Bird) | Cody | G. Sipos, Kaslo | 19 | Crude ore | | 6 096 | | 671 | 4 993 | |
| Little Tim | Slocan City | D. Nebor, Slocan | 54 | Lead concentrates, 2 t | | 54 710 | | 646 | 386 | |
| Mammoth | Silverton | D. Pengelly, Silverton | 15 | Lead concentrates, 5 t; zinc concentrates, 10 t | | 16 982 | | 3 784 | 5 279 | |
| Ottawa | Springer Creek | C. Thickett, Slocan | 496 | Silver concentrates, 7 t; crude ore, 42 t | | 1 372 047 | 234 | 647 | 335 | |
| Pilot Bay | Pilot Bay | D. Pearce, Nelson | 8 | Smelter clean-up; lead concentrates, 2 t; zinc concentrates, 6 t | | 1 275 | | 527 | 3 746 | |
| Queen Bess (Idaho) | Sandon | I. T. Steenhoff, New Denver | 8 | Crude ore | 10 | 43 389 | | 6 284 | 135 | |
| Scranton | Kaslo | Hem Mines Ltd. | 114 | Lead concentrates, 56 t; zinc concentrates, 58 t | 5 381 | 109 669 | | 41 112 | 32 651 | 681 |
| Silmonac (Minnehaha) | Slocan Lake | Silvana Mines Ltd. | 15 967 | Lead concentrates, 1 460 t; zinc concentrates, 972 t | | 7 579 024 | | 883 758 | 638 881 | 3 724 |
| *Trail Creek Mining Division* | | | | | | | | | | |
| Bluebird | Rossland | Standonray Mines Ltd. | 130 | Lead concentrates, 54 t; zinc concentrates, 76 t | 560 | 280 860 | | 13 755 | 29 385 | |
| Golden Drip | Rossland | J. A. Ruelle and L. G. McLellan, Rossland | 16 | Crude ore | 1 711 | 1 213 | | 34 | 17 | |
| *Vancouver Mining Division* | | | | | | | | | | |
| Warman (Northair) | Callaghan Creek | Northair Mines Ltd. | 93 397 | Lead concentrates, 2 782 t; zinc concentrates, 2 161 t; dore bars | 1 069 386 | 5 708 023 | 100 930 | 1 140 032 | 1 464 364 | |
| *Vernon Mining Division* | | | | | | | | | | |
| Silver Bell | Cherry Creek | Cheyenne Mines Ltd. | 14 | Crude ore | 311 | 43 171 | | 700 | 252 | |
| *Victoria Mining Division* | | | | | | | | | | |
| Sunro | Jordan River | Dison International Ltd. | (1) | Copper concentrates, 9 t | 31 | 435 | 2 143 | | | |

[1] Disposal of stockpile.

*Table 3-13—Destination of British Columbia Concentrates in 1978*

| | Lead | Zinc | Copper | Iron |
|---|---|---|---|---|
| | t | t | t | t |
| Trail | 148 930 | 140 190 | 80 622 | 61 088 |
| Other Canadian | 598 | 27 551 | 26 972 | 152 602 |
| United States | | 3 367 | 770 684 | 371 211 |
| Japan | | | 96 649 | 30 668 |
| Other foreign | | | | |
| Totals | 149 528 | 171 108 | 974 927 | 615 569 |

# 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 1978. 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, 1969–1978*

| | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | Acres | Acres | Acres | Acres | Acres | Acres | Acres | Acres | Acres |
| Petroleum and natural gas permits | 31,893,990 | 21,379,461 | 18,726,137 | 19,891,946 | 17,410,475 | 16,227,862 | 13,292,568 | 13,252,878 | 12,929,825 | 12,496,271 |
| Petroleum and natural gas leases | 8,837,265 | 7,765,668 | 7,226,320 | 6,493,633 | 6,196,570 | 6,405,086 | 5,574,381 | 5,899,025 | 7,194,899 | 7,759,188 |
| Natural gas licences | ------ | ------ | ------ | ------ | 20,781 | 15,565 | 7,809 | 7,175 | 36,374 | 18,678 |
| Natural gas leases | 475,419 | 472,964 | 471,919 | 470,260 | 479,754 | 479,960 | 487,739 | 503,555 | 516,721 | 565,967 |
| Petroleum leases | ------ | ------ | 1,284 | 1,284 | 1,284 | 1,284 | 3,180 | 3,180 | 3,180 | 3,835 |
| Drilling reservations | 350,546 | 292,402 | 337,656 | 452,079 | 419,878 | 360,807 | 317,693 | 525,151 | 836,870 | 1,052,921 |
| Totals | 41,557,220 | 29,910,495 | 26,763,316 | 27,309,202 | 24,528,742 | 23,490,564 | 19,683,370 | 20,190,964 | 21,517,869 | 21,873,776 |

## *Table 4-2—Petroleum and Natural Gas Revenue, 1947–1978*

| | 1947–69 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1947–78 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Rentals and Fees* | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| Permits | 44 319 824 | 1 426 448 | 1 615 619 | 1 729 829 | 1 524 431 | 2 224 111 | 2 150 965 | 2 114 161 | 2 128 190 | 1 882 589 | 61 116 167 |
| Drilling reservations | 1 072 614 | 48 156 | 79 120 | 107 537 | 77 344 | 85 481 | 75 635 | 124 196 | 172 078 | 266 654 | 2 108 815 |
| Natural gas licences | 68 254 | ------ | ------ | ------ | 803 | 8 057 | 4 155 | 3 838 | ------ | 47 502 | 132 609 |
| Leases (all) | 70 409 573 | 7 699 844 | 7 733 584 | 6 976 517 | 6 500 830 | 9.678 015 | 10 242 543 | 11 925 123 | 13 680 926 | 16 782 862 | 161 629 817 |
| Total rentals | 115 870 265 | 9 174 448 | 9 428 323 | 8 813 883 | 8 103 408 | 11 995 664 | 12 473 298 | 14 167 318 | 15 981 194 | 18 979 607 | 224 987 408 |
| *Crown Reserve Disposition Bonuses* | | | | | | | | | | | |
| Permits | 59 683 407 | 9 506 074 | 14 688 570 | 13 818 020 | 7 877 134 | 15 434 510 | 6 623 647 | 27 548 820 | 60 017 393 | 49 518 449 | 264 716 024 |
| Drilling reservations | 26 621 174 | 1 825 404 | 2 486 763 | 3 011 025 | 3 108 092 | 2 669 318 | 2 708 463 | 6 152 419 | 30 633 861 | 64 467 213 | 143 683 732 |
| Leases | 63 191 017 | 5 008 323 | 5 101 918 | 3 666 617 | 6 791 215 | 4 851 506 | 3 417 137 | 9 525 202 | 34 816 472 | 63 473 986 | 199 752 393 |
| Crown reserve disposition totals | 149 495 598 | 16 339 801 | 22 186 251 | 20 495 662 | 17 776 441 | 22 955 334 | 12 749 247 | 43 226 441 | 125 467 726 | 177 459 648 | 608 152 149 |
| *Crown Royalties* | | | | | | | | | | | |
| Gas | 21 136 934 | 3 948 356 | 4 209 793 | 5 580 434 | 6 061 250 | 2 843 329 | 2 848 930 | 173 315 | 180 951 | 72 728 | 47 056 020 |
| Oil | 43 086 598 | 9 483 937 | 10 415 656 | 9 845 125 | 14 543 621 | 48 296 036 | 44 782 489 | 43 925 220 | 41 015 470 | 42 191 350 | 307 585 502 |
| Processed products and penalties | 969 275 | 42 314 | 42 517 | 44 379 | 42 675 | 134 180 | 570 321 | 711 810 | 888 799 | 1 075 378 | 4 521 648 |
| Gas revenue from B.C. Petroleum Corp. | ------ | ------ | ------ | ------ | ------ | 26 000 000 | 172 150 000 | 149 850 000 | 174 250 000 | 159 400 000 | 681 650 000 |
| Crown royalties totals | 65 192 807 | 13 474 607 | 14 667 966 | 15 469 938 | 20 647 546 | 77 273 545 | 220 351 740 | 194 660 345 | 216 335 220 | 202 739 456 | 1 040 813 170 |
| Miscellaneous fees | 282 617 | 21 843 | 35 604 | 42 775 | 27 028 | 19 104 | 18 541 | 32 248 | 64 583 | 69 392 | 613 735 |
| Total petroleum and natural gas revenue | 330 841 287 | 39 010 699 | 46 318 144 | 44 822 258 | 46 654 423 | 112 243 647 | 245 592 826 | 252 086 352 | 357 848 723 | 399 248 103 | 1 874 566 462 |

## *Table 4-3—Established Hydrocarbon and Byproduct Reserves, December 31, 1978*

**December 31, 1978**

| | Crude Oil, MSTB | Raw Gas, BSCF | Marketable Gas, BSCF[1] | Propanes, MSTB[2] | Butanes, MSTB[2] | Pentanes, MSTB[2] | Sulphur, MLT[2] |
|---|---|---|---|---|---|---|---|
| Original hydrocarbon in place | 1 414 198.4 | 17 954.6 | ------ | ------ | ------ | ------ | ------ |
| Initial reserves, current estimate | 489 747.9 | 14 181.0 | 11 582.4 | 16 720.3 | 24 367.4 | 47 412.6 | 9 475.9 |
| Cumulative production to December 31, 1977 | 291 307.0 | 5 109.6 | 4 191.7 | 8 021.1 | 11 231.6 | 22 006.0 | 1 787.7 |
| Remaining reserves estimated at December 31, 1977 | 166 810.3 | 8 270.1 | 6 744.0 | 7 890.6 | 11 956.3 | 23 038.1 | 7 256.3 |
| Drilling in 1978 | +16 677.6 | +752.1 | +599.1 | +566.8 | +836.8 | +1 659.2 | +778.0 |
| Revisions in 1978 | +14 953.0 | +49.2 | +47.6 | +241.8 | +342.7 | +709.3 | −346.1 |
| Production in 1978 | −12 609.2 | −352.9 | −285.8 | −410.6 | −600.5 | −1 149.1 | −130.7 |
| Production adjustment | +98.5 | ------ | ------ | ------ | ------ | ------ | ------ |
| Remaining reserves at December 31, 1978 | 185 930.2 | 8 718.5 | 7 104.9 | 8 288.6 | 12 535.3 | 24 257.5 | 7 557.5 |

**NOTES –**

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

[1] Figures in this column are estimates of marketable gas, i.e., the gas available to the transmission line after removal of acid gases and a percentage of liquid hydrocarbons.

[2] Figures in these columns are estimates based on average gas analyses and estimated plant recoveries. Actual recoveries of propane, butane, pentanes, and sulphur were 539.9, 670.4, 1 137.8 MSTB, and 99.9 MLT respectively.

## *Table 4-4—Wells Drilled and Drilling, 1978*

| Well Authorization Number | Well Name | Date Spudded | Date Rig Released | 1978 Depth | Status at December 31, 1978 |
|---|---|---|---|---|---|
| 4390 | ATAPCO HBOG Klua c-38-G | 78 03 15 | 78 04 17 | 2 344.5 | Debolt gas. |
| 4276 | ATAPCO PCP Klua d-90-B | 78 02 01 | 78 03 10 | 2 331.7 | Pine Point gas. |
| 4281 | AmMin Hyperion b-29-J | 78 02 10 | 78 02 23 | 655.3 | Abandoned-dry. |
| 4271 | AmMin Tattoo d-92-J | 78 01 16 | 78 03 20 | 2 005.0 | Abandoned-dry. |
| 4238 | AmMin Thetlaandoa b-26-C | 77 12 31 | 78 01 23 | 557.8 | Debolt gas. |
| 4250 | AmMin Thetlaandoa d-33-C | 78 01 24 | 78 02 08 | 549.3 | Abandoned-dry. |
| 4438 | Anadarko et al Boudreau 7-8-84-21 | 78 07 26 | 78 09 07 | 2 048.0 | Halfway gas. |
| 4422 | Anadarko et al Buick d-45-I | 78 11 28 | ------ | ------ | Drilling. |
| 4207 | Aquit et al Donnamarie a-93-C | 77 12 28 | 78 02 20 | 1 859.3 | Abandoned-dry. |
| 4435 | Ashland et al Birch d-37-E | 78 06 12 | 78 07 08 | 1 209.8 | Dunlevy gas. |
| 4224 | Ashland et al W Buick c-96-E | 78 01 17 | 78 01 28 | 1 214.6 | Bluesky gas. |
| 4620 | Ashland et al Fireweed d-37-G | 78 11 17 | 78 12 01 | 1 360.0 | Dunlevy gas. |
| 4499 | Ashland Numac Fireweed d-91-B | 78 07 28 | 78 08 09 | 1 326.0 | Dunlevy gas. |
| 4484 | Ashland Numac Fireweed b-4-G | 78 07 14 | 78 07 26 | 1 368.0 | Dunlevy gas. |
| 4404 | Ashland Numac Jeans d-71-B | 78 06 08 | 78 06 24 | 1 362.5 | Dunlevy gas. |
| 4549 | Ashland Numac Jeans d-13-G | 78 09 19 | 78 10 01 | 1 329.0 | Dunlevy gas. |
| 4599 | Ashland et al La Garde 6-2-88-15 | 78 10 30 | 78 11 13 | 1 384.0 | Abandoned-dry. |
| 4262 | Ashland et al Mariposa 6-10-88-19 | 78 01 19 | 78 02 07 | 1 508.5 | Abandoned-dry. |
| 4432 | Ashland et al Pocketknife d-1-I | 78 11 04 | ------ | ------ | Drilling. |
| 4467 | Ashland Numac Red Creek 10-16-85-21 | 78 06 26 | 78 08 09 | 1 661.2 | Doig oil and Halfway gas. |
| 4580 | Ashland Stoddart 11-20-86-19 | 78 10 08 | 78 10 26 | 1 836.0 | Charlie Lake oil and Belloy gas. |
| 3987 | BP AEG Bullmoose a-22-E | 77 12 04 | 78 06 25 | 3 551.0 | Abandoned-dry. |
| 4430 | BP et al W Doe 11-1-81-15 | 78 06 07 | 78 08 31 | 3 327.6 | Bluesky and Wabamun gas. |
| 3947 | BP et al Leselleh b-86-F | 78 01 23 | 78 03 08 | 2 432.6 | Abandoned-dry. |
| 4029 | BP et al Murray d-48-I | 77 08 23 | 78 01 26 | 2 865.1 | Baldonnel gas. |
| 4431 | BP AEG W Sukunka c-45-J | 78 07 01 | ------ | ------ | Drilling. |
| 4330 | BP et al N Tenaka d-26-D | 78 02 08 | 78 03 14 | 2 563.4 | Abandoned-dry. |
| 4285 | BVX Focus et al Fireweed b-6-A | 78 03 25 | 78 04 28 | 2 039.7 | Baldonnel gas. |
| 4415 | BVX Focus Fireweed b-28-D | 78 06 16 | 78 07 09 | 1 688.0 | Abandoned-dry. |
| 4118 | BVX Sun et al Lily b-7-J | 78 01 02 | 78 04 21 | 2 651.8 | Debolt gas. |
| 4319 | BVX et al Nogah c-74-D | 78 02 11 | 78 03 18 | 2 087.9 | Abandoned-dry. |
| 4210 | Baay et al Otter 6-31-88-15 | 77 02 30 | 78 01 10 | 1 273.5 | Gething gas. |
| 4577 | Baay et al Otter 11-32-88-15 | 78 09 21 | 78 10 31 | 1 273.0 | Dunlevy gas. |
| 4570 | Baay et al Otter 9-36-88-16 | 78 10 05 | 78 10 19 | 1 275.0 | Halfway gas. |
| 4458 | Baay Seagull Wilder 10-18-83-19 | 78 07 31 | 78 10 14 | 1 982.0 | Halfway gas. |
| 4427 | Brent BXL W Flatrock 10-26-84-17 | 78 10 16 | 78 11 31 | 1 903.0 | Halfway gas. |
| 4997 | CDCOG et al Dahl d-33-J | 78 01 13 | 78 02 02 | 1 206.4 | Bluesky gas. |

## Table 4-4—Wells Drilled and Drilling, 1978 – Continued

| Well Authorization Number | Well Name | Date Spudded | Date Rig Released | 1978 Depth | Status at December 31, 1978 |
|---|---|---|---|---|---|
| 4270 | CDCOG et al Dahl a-41-J | 78 02 27 | 78 03 11 | 1 213.1 | Bluesky gas. |
| 4261 | CDCOG et al Dahl d-73-J | 78 02 07 | 78 02 14 | 1 147.6 | Bluesky gas. |
| 4225 | CDCOG et al Tooga a-77-F | 78 01 04 | 78 02 14 | 2 127.5 | Abandoned-dry. |
| 4308 | CDCOG Woodrush d-93-H | 78 02 17 | 78 02 25 | 1 125.3 | Halfway gas. |
| 4455 | CEGO et al W Stoddart 7-26-87-21 | 78 06 26 | 78 07 31 | 2 100.0 | Abandoned-dry. |
| 4288 | CZAR et al Aspen d-17-J | 78 01 16 | 78 02 05 | 1 623.1 | Coplin gas. |
| 4651 | CZAR et al Aspen c-40-J | 78 11 30 | 78 12 29 | 1 674.0 | Coplin gas. |
| 4375 | CZAR et al Aspen d-73-K | 78 08 04 | 78 09 09 | 1 675.0 | Abandoned-dry. |
| 4594 | CZAR et al Birch b-26-I | 78 10 24 | 78 11 08 | 1 316.0 | Baldonnel gas. |
| 4203 | CZAR et al Birch d-77-I | 77 12 16 | 78 01 11 | 1 311.6 | Baldonnel gas. |
| 4512 | CZAR et al Birch b-88-I | 78 11 11 | 78 11 25 | 1 348.5 | Baldonnel gas. |
| 4610 | CZAR et al Callisto 10-1-83-21 | 78 11 27 | 78 12 29 | 1 500.0 | Halfway gas. |
| 4622 | CZAR et al Callisto 7-16-83-21 | 78 10 25 | 78 11 24 | 1 625.0 | Halfway gas. |
| 4282 | CZAR Orbit Evergreen c-32-B | 78 01 24 | 78 02 03 | 1 200.9 | Abandoned-dry. |
| 4369 | CZAR Orbit Fina Fireweed b-26-D | 78 03 14 | 78 04 04 | 1 709.1 | Dunlevy gas and Dolg oil. |
| 4150 | CZAR et al Fireweed b-68-D | 78 06 28 | 78 07 31 | 2 090.0 | Bluesky and Dunlevy gas. |
| 4563 | CZAR et al Flatrock 7-19-85-15 | 78 09 23 | 78 10 17 | 1 544.0 | Abandoned-dry. |
| 4445 | CZAR et al E Flatrock 10-9-84-15 | 78 06 03 | 78 06 21 | 1 508.8 | Abandoned-dry. |
| 4447 | CZAR et al E Flatrock 10-28-84-15 | 78 06 10 | 78 06 23 | 1 609.6 | Abandoned-dry. |
| 4328 | CZAR et al Goldenrod b-88-C | 78 02 09 | 78 03 18 | 1 770.9 | Baldonnel gas. |
| 4329 | CZAR et al Goldenrod b-24-F | 78 09 24 | 78 10 20 | 1 783.0 | Baldonnel gas. |
| 4405 | CZAR Lochiel Fireweed d-39-D | 78 05 12 | 78 06 04 | 1 685.0 | Dunlevy gas. |
| 4334 | CZAR et al Maple a-27-E | 78 02 07 | 78 02 24 | 1 313.7 | Abandoned-dry. |
| 4465 | CZAR et al Maple d-31-H | 78 06 24 | 78 07 12 | 1 350.0 | Abandoned-dry. |
| 4349 | CZAR Ashland Maple d-33-H | 78 02 27 | 78 03 11 | 1 214.0 | Dunlevy gas. |
| 4466 | CZAR et al Oval 7-27-86-14 | 78 07 05 | 78 07 24 | 1 460.0 | Gething gas. |
| 4219 | CZAR et al Oval 10-28-86-14 | 78 01 01 | 78 01 19 | 1 417.3 | Halfway gas. |
| 4495 | CZAR et al Pluto 10-32-85-16 | 78 07 17 | 78 08 18 | 1 825.0 | Abandoned-dry. |
| 4506 | CZAR et al Squirrel 7-26-87-19 | 78 08 24 | 78 09 16 | 1 525.0 | Coplin oil. |
| 4627 | CZAR et al Squirrel 14-35-87-19 | 78 11 23 | 78 12 11 | 1 512.0 | Abandoned-dry. |
| 4678 | Cairn et al Oak 14-31-85-17 | 78 12 09 | 78 12 24 | 1 410.0 | Coplin oil. |
| 4497 | Calco et al Stoddart 11-7-86-18 | 78 08 23 | 78 09 13 | 1 842.0 | Belloy gas. |
| 4592 | Can Del Scurry Falcon d-11-D | 78 12 09 | 78 12 28 | 1 188.0 | Abandoned-dry. |
| 4347 | Canhunter et al Beargrass 10-4-88-25 | 78 03 07 | 78 04 19 | 1 578.9 | Halfway gas. |
| 4194 | Canhunter et al Bernadet 7-19-87-24 | 77 12 07 | 78 08 13 | 1 868.4 | Dunlevy and Halfway gas. |
| 4557 | Canhunter et al Bernadet 10-11-88-25 | 78 09 30 | 78 12 19 | 1 930.0 | Halfway gas. |

| | | | | | |
|---|---|---|---|---|---|
| 4569 | Canhunter Blair a-65-E | 78 12 14 | ------ | ------ | Drilling. |
| 4232 | Canhunter et al Bluebell d-69-I | 78 01 08 | 78 03 11 | 2 374.4 | Debolt gas. |
| 4268 | Canhunter et al Graham b-90-K | 78 02 04 | 78 06 11 | 3 170.0 | Dunlevy gas. |
| 4286 | Canhunter et al Gundy a-63-G | 78 03 14 | 78 05 28 | 2 393.0 | Belloy gas. |
| 4144 | Canhunter N Julienne a-89-D | 77 11 08 | 78 01 25 | 2 688.3 | Halfway gas. |
| 4460 | Canhunter Kobes c-56-A | 78 08 23 | 78 09 16 | 1 223.2 | Dunlevy gas. |
| 4205 | Canhunter W Kobes c-74-B | 78 01 04 | 78 03 07 | 2 560.3 | Abandoned-dry. |
| 4398 | Canhunter Moose b-24-B | 78 10 15 | ------ | ------ | Drilling. |
| 4517 | Canhunter et al Squaw c-74-E | 78 11 06 | ------ | ------ | Drilling. |
| 4487 | Canhunter N Townsend c-54-J | 78 08 04 | 78 10 03 | 2 389.0 | Debolt gas. |
| 4571 | Canhunter Wapistan c-A56-E | 78 10 03 | 78 12 07 | 2 305.8 | Debolt gas. |
| 4464 | Canhunter Wapistan c-56-E | 78 07 24 | 78 09 15 | 1 249.0 | Abandoned-dry. |
| 3876 | Canso HB Gleam c-56-D (re-entry) | 77 01 10 | 78 02 09 | 1.5 | Abandoned-dry. |
| 4216 | Canso BP Silver c-76-L | 77 12 18 | 78 01 11 | 1 290.8 | Halfway gas. |
| 4514 | Cdn Res Bougie d-11-F | 78 09 10 | 78 12 18 | 3 258.0 | Debolt and Slave Point gas. |
| 4256 | Cdn Res et al Dahl a-1-A | 78 01 25 | 78 02 02 | 1 050.0 | Bluesky gas. |
| 4241 | Cdn Res et al Dahl d-19-A | 77 12 29 | 78 01 04 | 1 034.8 | Bluesky gas. |
| 4253 | Cdn Res et al Dahl b-24-A | 78 01 08 | 78 01 22 | 1 023.0 | Abandoned. |
| 4255 | Cdn Res et al Dahl a-41-A | 78 01 06 | 78 01 17 | 999.7 | Bluesky gas. |
| 4235 | Cdn Res et al Dahl c-56-A | 77 12 27 | 78 01 04 | 976.9 | Abandoned. |
| 4370 | Cdn Res et al Dahl b-62-A | 78 03 01 | 78 03 22 | 1 356.4 | Water disposal. |
| 4254 | Cdn Res et al Dahl a-83-A | 78 01 31 | 78 02 06 | 946.4 | Bluesky gas. |
| 4317 | Cdn Res et al Dahl a-9-C | 78 02 17 | 78 02 26 | 1 082.0 | Bluesky gas. |
| 4316 | Cdn Res et al Dahl a-67-C | 78 02 07 | 78 02 15 | 952.5 | Bluesky gas. |
| 4304 | Cdn Res et al Dahl a-5-D | 78 02 10 | 78 02 17 | 1 024.1 | Bluesky gas. |
| 4307 | Cdn Res et Dahl a-45-D | 78 02 18 | 78 02 25 | 996.7 | Bluesky gas. |
| 4306 | Cdn Res et al Dahl d-73-D | 78 02 08 | 78 02 16 | 981.7 | Bluesky gas. |
| 4258 | Cdn Res et al Dahl d-15-H | 78 01 28 | 78 02 05 | 951.0 | Bluesky gas. |
| 4257 | Cdn Res et al Dahl d-19-H | 78 01 20 | 78 01 27 | 952.2 | Abandoned-dry. |
| 4351 | Cdn Res et al Hoss b-2-J | 78 02 10 | 78 03 03 | 2 033.0 | Abandoned-dry. |
| 4353 | Cdn Res et al E Kotcho b-71-E | 78 02 14 | 78 03 19 | 1 985.8 | Abandoned-dry. |
| 4227 | Cdn Res Dome Cons Suhn b-5-A | 78 12 31 | 78 02 02 | 1 888.2 | Slave Point gas. |
| 4228 | Cdn Res et al S Suhn b-42-I | 77 12 26 | 78 02 04 | 1 820.3 | Abandoned-dry. |
| 3976 | Cdn-Sup Fina Ojay b-57-G | 78 07 27 | 78 04 03 | 3 998.7 | Dunlevy gas. |
| 4300 | Chaut Dunbar Beaverdam a-27-L | 78 01 26 | 78 02 09 | 1 164.6 | Halfway gas. |
| 4389 | Chaut Dunbar Currant c-74-K | 78 03 10 | 78 03 20 | 1 235.3 | Abandoned-dry. |
| 4659 | Chaut et al Eagle 15-19-84-18 | 78 12 31 | ------ | ------ | Drilling. |
| 4595 | Chaut et al Eagle 7-30-84-18 | 78 11 03 | 78 11 28 | 1 784.2 | Belloy oil. |
| 4177 | Chaut et al Eagle 16-30-84-18 | 77 12 05 | 78 01 09 | 1 872.4 | Belloy oil. |
| 4293 | Chaut Dunbar Melanie b-88-K | 78 02 25 | 78 05 08 | 1 222.2 | Abandoned-dry. |
| 4291 | Chaut Dunbar Peejay d-93-E | 78 02 11 | 78 02 23 | 1 174.4 | Abandoned-dry. |
| 4450 | Chaut et al Stoddart 6-29-86-19 | 78 07 05 | 78 07 17 | 1 340.0 | Abandoned-dry. |
| 4222 | Chevron Cabin b-6-K | 78 01 08 | 78 02 25 | 2 167.1 | Slave Point gas. |
| 4367 | Chevron Amoco Ekwan b-56-E | 78 03 16 | 78 03 29 | 517.6 | Mississippian gas. |

## Table 4-4—Wells Drilled and Drilling, 1978 — Continued

| Well Authorization Number | Well Name | Date Spudded | Date Rig Released | 1978 Depth | Status at December 31, 1978 |
|---|---|---|---|---|---|
| 4230 | Chevron Amoco Ekwan d-65-E | 78 01 24 | 78 03 14 | 1 780.0 | Slave Point gas. |
| 4688 | Chevron Amoco Ekwan d-48-F | 78 12 29 | ------ | ------ | Drilling. |
| 4220 | Chevron CCL Imp Helmet a-66-G | 78 01 11 | 78 02 11 | 1 855.3 | Slave Point gas. |
| 3924 | Chevron N Helmet a-81-A | 78 02 16 | 78 03 03 | 2 045.2 | Jean Marie gas. |
| 4310 | Chevron CCI Kykis d-95-F | 78 12 15 | ------ | ------ | Drilling. |
| 4292 | Chevron W Milo c-40-H | 78 02 06 | ------ | ------ | Drilling. |
| 4161 | Coseka et al W Gundy a-24-B | 78 01 15 | 78 02 03 | 1 250.0 | Dunlevy and Baldonnel gas. |
| 4040 | DWOG et al Snyder c-40-K | 78 06 14 | 78 06 25 | 1 258.8 | Dunlevy gas. |
| 4195 | Decalta et al Buick c-54-D | 78 03 13 | 78 03 21 | 1 109.5 | Abandoned-dry. |
| 4429 | Decalta et al Buick 11-33-88-20 | 78 09 21 | 78 10 12 | 1 457.0 | Abandoned-dry. |
| 4248 | Dome et al Antelope a-89-L | 78 01 06 | 78 01 22 | 1 117.1 | Abandoned-dry. |
| 4589 | Dome N Buick d-79-F | 78 10 22 | 78 11 09 | 1 455.1 | Dunlevy gas. |
| 4641 | Dome HB Buick b-10-H | 78 12 04 | 78 12 19 | 1 183.0 | Bluesky gas. |
| 4421 | Dome Buick a-29-H | 78 06 11 | 78 06 23 | 1 090.0 | Dunlevy gas. |
| 4551 | Dome Buick b-48-H | 78 09 14 | 78 09 26 | 1 137.0 | Dunlevy gas. |
| 4522 | Dome Buick b-50-H | 78 08 30 | 78 09 10 | 1 120.0 | Baldonnel gas. |
| 4649 | Dome et al Doe 6-15-81-14 | 78 12 15 | ------ | ------ | Drilling. |
| 4397 | Dome Donis c-98-C | 78 03 16 | 78 03 25 | 1 188.7 | Abandoned-dry. |
| 4186 | Dome Amoco Dunedin c-95-L | 78 01 24 | 78 04 08 | 2 292.1 | Abandoned-dry. |
| 4680 | Dome et al Ekwan c-44-G | 78 12 29 | ------ | ------ | Drilling. |
| 4566 | Dome et al Fireweed d-79-A | 78 11 12 | 78 12 01 | 1 381.0 | Baldonnel gas. |
| 4503 | Dome et al Fireweed d-69-E | 78 08 02 | 78 08 23 | 1 415.0 | Baldonnel gas and Dunlevy oil. |
| 4496 | Dome et al Fireweed d-39-H | 78 09 29 | 78 10 19 | 1 355.0 | Dunlevy oil. |
| 4425 | Dome Ft St John SE 10-18-83-17 | 78 05 30 | 78 06 29 | 2 015.3 | Abandoned-dry. |
| 4476 | Dome et al Martin c-34-E | 78 07 13 | 78 07 30 | 1 284.0 | Bluesky gas. |
| 4655 | Dome et al Martin d-55-E | 79 12 29 | ------ | ------ | Drilling. |
| 4294 | Dome Amoco Silver b-10-C | 78 02 12 | 78 02 20 | 1 150.0 | Bluesky gas. |
| 4296 | Dome Amoco Silver c-32-D | 78 02 22 | 78 02 28 | 1 082.0 | Bluesky gas. |
| 4386 | Dome Siphon 7-6-87-15 | 78 03 28 | 78 04 10 | 1 371.6 | Abandoned-dry. |
| 4387 | Dome Siphon A10-12-87-16 | 78 03 06 | 78 03 13 | 1 200.9 | Baldonnel and Siphon gas. |
| 4185 | Dome Total Tupper 6-10-77-14 | 77 11 29 | 78 02 06 | 3 073.9 | Abandoned-dry. |
| 4295 | Dome et al Velma b-88-D | 78 01 24 | 78 02 08 | 1 112.5 | Water disposal. |
| 4419 | Dome Woodrush b-44-H | 78 06 26 | 78 07 07 | 1 131.0 | Abandoned-dry. |
| 4583 | Esso et al Mica 14-4-82-14 | 78 10 20 | 78 11 03 | 1 510.0 | Abandoned-dry. |
| 4201 | Exalta Conuco et al Cabin b-44-B | 78 01 19 | 78 02 20 | 2 196.7 | Abandoned-dry. |
| 4264 | Exalta Conuco W Hostli b-81-E | 78 02 25 | 78 03 28 | 2 014.7 | Abandoned-dry. |

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|---|---|---|---|---|---|
| 4199 | Exalta Conuco Ladyfern c-52-G | 78 01 24 | 78 01 30 | 1 112.5 | Abandoned-dry. |
| 4200 | Exalta Conuco Ladyfern b-68-H | 78 02 04 | 78 02 10 | 1 010.4 | Bluesky gas. |
| 4263 | Exalta Conuco Ring b-22-A | 78 02 16 | 78 02 26 | 1 025.7 | Gething gas. |
| 4340 | Exalta Conuco Slave b-68-I | 78 03 02 | 78 03 22 | 1 463.0 | Gething gas. |
| 4454 | Fina Orbit CZAR Fireweed b-6-D | 78 06 21 | 78 07 17 | 1 695.0 | Dunlevy gas and Dolg oil. |
| 4374 | Focus Scurry Eagle 6-14-85-19 | 78 03 30 | 78 04 22 | 1 912.6 | Belloy oil. |
| 4373 | Focus et al Mallard 6-8-85-19 | 78 04 25 | 78 05 21 | 2 001.0 | Belloy oil. |
| 4479 | Focus et al Stoddart 14-32-85-19 | 78 08 02 | 78 08 26 | 1 930.6 | Abandoned-dry. |
| 4520 | Focus et al Stoddart 6-28-86-19 | 78 08 24 | 78 09 25 | 1 862.0 | Abandoned-dry. |
| 4559 | Focus et al Stoddart 6-29-85-19 | 78 09 26 | 78 10 27 | 1 982.0 | Belloy oil. |
| 4524 | Focus Scurry Stoddart A8-14-85-19 | 78 08 30 | 78 09 21 | 1 859.0 | Belloy oil. |
| 4472 | Focus Scurry Stoddart 16-15-85-19 | 78 07 02 | 78 07 28 | 1 905.0 | Belloy oil. |
| 4426 | Focus Scurry Stoddart 6-27-85-20 | 78 06 01 | 78 06 28 | 1 983.0 | Belloy oil. |
| 4468 | Focus Cherokee W Stoddart 6-15-87-20 | 78 07 01 | 78 07 26 | 1 955.0 | Belloy gas. |
| 4346 | GAO Ashland Mike d-72-H | 78 02 28 | 78 03 14 | 1 249.7 | Abandoned-dry. |
| 4269 | GAO CS Silver d-77-J | 78 02 10 | 78 02 26 | 1 278.9 | Abandoned-dry. |
| 4461 | GAO Stoddart 6-35-85-20 | 78 06 23 | 78 07 23 | 1 944.6 | Belloy oil. |
| 4528 | GAO W Stoddart 6-26-85-20 | 78 08 30 | 78 09 27 | 1 945.0 | Belloy oil. |
| 4541 | GAO W Stoddart 16-26-85-20 | 78 09 29 | 78 10 30 | 1 959.0 | Belloy oil. |
| 3958 | GAO BP Yoyo c-56-L | 77 03 08 | 78 01 26 | 2 254.0 | Abandoned-dry. |
| 4601 | GEOG et al Boudreau 10-14-84-21 | 78 10 31 | 78 11 28 | 1 688.0 | Dolg gas. |
| 4652 | GEOG Boundary 16-36-83-15 | 78 12 01 | 78 12 15 | 1 330.0 | Abandoned-dry. |
| 4417 | GEOG S Boundary 6-33-83-15 | 78 09 14 | 78 09 05 | 1 540.0 | Abandoned-dry. |
| 4684 | GEOG et al Martin 6-23-H | 78 12 29 | ------ | ------ | Drilling. |
| 4309 | GEOG et al Martin d-39-E | 78 07 28 | 78 08 11 | 1 306.0 | Baldonnel gas. |
| 4500 | GPD Eagle 14-32-84-18 | 78 08 20 | 78 09 16 | 1 944.0 | Belloy oil. |
| 4448 | GPD Murphy Eagle 6-5-85-18 | 78 07 13 | 78 08 07 | 1 951.6 | Belloy oil. |
| 4554 | GPD Murphy Eagle 8-5-85-18 | 78 09 14 | 78 10 10 | 1 897.0 | Belloy oil. |
| 4544 | GPD Murphy Eagle 14-5-85-18 | 78 10 12 | 78 10 28 | 1 950.0 | Belloy oil. |
| 4239 | Getty Skelly Petitot b-84-D | 78 02 25 | 78 03 30 | 2 077.2 | Abandoned-dry. |
| 4156 | Gulf POOC Butler a-65-C | 77 12 13 | 78 02 13 | 1 923.3 | Abandoned-dry. |
| 4326 | Gulf Cheves b-23-G | 78 02 22 | 78 06 07 | 2 962.7 | Standing. |
| 4643 | Gulf BCRIC Cheves c-82-B | 79 01 18 | ------ | ------ | Drilling. |
| 4226 | Gulf Conroy d-35-A | 78 01 28 | 78 02 12 | 1 204.0 | Abandoned-dry. |
| 4208 | Gulf Conroy a-81-B | 78 02 16 | 78 03 01 | 1 133.9 | Abandoned-dry. |
| 4170 | Gulf Peppermint d-37-E | 77 12 19 | 78 01 28 | 1 648.4 | Abandoned-dry. |
| 4358 | Gulf Peppermint b-90-F | 78 03 04 | 78 03 23 | 1 545.3 | Abandoned-dry. |
| 4449 | Gulf Dome Norcen Thunder a-38-I | 78 08 04 | ------ | ------ | Drilling. |
| 4372 | Gulf Trutch a-49-B | 78 05 16 | 78 06 11 | 1 691.0 | Debolt gas. |
| 4092 | HB et al Pocketknife c-38-L | 77 11 25 | 78 02 20 | 1 716.9 | Abandoned-dry. |
| 4609 | HB et al N Pocketknife d-50-D | 78 11 24 | ------ | ------ | Drilling. |
| 3031 | Heritage Yoyo b-4-I (re-entry) | 71 12 22 | 78 03 21 | 36.6 | Water disposal. |
| 4586 | Highfield et al Aspen a-81-F | 78 10 20 | 78 11 18 | 1 705.0 | Baldonnel gas. |
| 4547 | Highfield et al Beavertail c-12-F | 78 10 10 | 78 10 30 | 1 306.0 | Dunlevy gas. |

## Table 4-4—Wells Drilled and Drilling, 1978 – Continued

| Well Authorization Number | Well Name | Date Spudded | Date Rig Released | 1978 Depth | Status at December 31, 1978 |
|---|---|---|---|---|---|
| 4593 | Highfield et al Boudreau 11-19-83-21 | 78 11 02 | 78 12 07 | 1 625.0 | Halfway gas. |
| 4410 | Highfield et al N Cache b-62-I | 78 06 16 | 78 07 16 | 1 664.2 | Doig gas. |
| 4530 | Highfield et al N Cache c-80-L | 78 09 05 | 78 10 06 | 1 650.0 | Doig gas. |
| 4451 | Highfield Hidrogas Maple b-42-E | 78 08 17 | 78 09 08 | 1 359.0 | Abandoned-dry. |
| 4217 | Highfield Hidrogas Prespatou c-100-E | 78 03 21 | 78 03 27 | 883.9 | Notikewin gas. |
| 4433 | Highfield Two Rivers A14-32-82-16 | 78 08 12 | 78 08 29 | 1 382.0 | Abandoned-dry. |
| 4171 | Highfield et al Wargen c-54-C | 78 01 14 | 78 01 26 | 1 302.4 | Abandoned-dry. |
| 4600 | Home et al Blackhawk a-91-D | 78 12 07 | ------ | ------ | Drilling. |
| 4493 | Home et al Farmington 11-9-80-15 | 78 08 04 | 78 08 15 | 850.8 | Cadotte gas. |
| 4492 | Home et al Farmington 10-11-80-15 | 78 07 19 | 78 07 30 | 869.0 | Cadotte gas. |
| 4480 | Home Wainoco Sundown c-34-B | 78 07 31 | 78 11 11 | 3 100.0 | Halfway gas. |
| 4611 | Huber Flatrock 6-3-85-16 | 78 11 05 | 78 11 22 | 1 519.1 | Abandoned-dry. |
| 4621 | Huber Cdn-Sup Total Nig b-22-A | 78 12 18 | ------ | ------ | Drilling. |
| 4546 | ICG Shelter Inga 11-34-87-23 | 78 09 18 | 78 10 04 | 1 448.5 | Gething gas. |
| 4575 | ICG Shelter Teal 6-32-86-22 | 78 11 19 | 78 12 30 | 2 163.0 | Abandoned-dry. |
| 4206 | IOE et al Red Creek 11-25-85-22 | 77 12 11 | 78 02 01 | 1 789.8 | Abandoned-dry. |
| 4236 | IOE Pac Inga 11-17-87-23 | 78 02 04 | 78 03 07 | 1 662.4 | Baldonnel gas. |
| 3945 | Imp Fina Altares a-3-H | 77 10 23 | 78 01 17 | 2 039.1 | Bluesky gas. |
| 4538 | Imp et al Boundary 11-2-85-14 | 78 10 01 | 78 10 19 | 1 280.0 | Boundary oil. |
| 4452 | Imp Pac Westcoast Eagle 16-26-84-19 | 78 06 22 | 78 07 24 | 1 927.0 | Belloy oil. |
| 4469 | Imp Pac Westcoast Eagle 16-10-85-19 | 78 07 26 | 78 08 25 | 1 987.0 | Abandoned-dry. |
| 4470 | Imp et al Ft St John 16-18-84-18 | 78 08 28 | 78 09 28 | 1 900.0 | Belloy oil. |
| 3908 | Imp Junior c-81-C | 77 02 23 | 78 01 28 | 1 930.3 | Slave Point gas. |
| 4434 | Imp Kelly a-85-G | 78 07 02 | 78 10 26 | 3 445.0 | Abandoned-dry. |
| 4333 | Imp et al Mica 8-33-81-14 | 78 03 09 | 78 03 27 | 1 569.7 | Mica oil. |
| 4086 | Imp et al Mica 6-35-81-14 | 78 06 07 | 78 06 20 | 1 575.2 | Abandoned-dry. |
| 4418 | Imp et al Mica 16-33-81-14 | 78 05 19 | 78 06 05 | 1 774.0 | Mica oil. |
| 4399 | Imp et al Mica 8-34-81-14 | 78 05 02 | 78 05 18 | 1 581.9 | Mica oil. |
| 4066 | Imp et al Mica 6-35-81-14 | 78 06 07 | 78 06 20 | 1 575.2 | Abandoned-dry. |
| 4482 | Imp et al Mica 6-4-82-14 | 78 11 05 | 78 12 01 | 1 605.0 | Mica oil. |
| 4275 | Imp Union Uno-Tex Noel c-34-F | 78 01 18 | 78 03 14 | 2 675.5 | Dunlevy gas. |
| 4400 | Imp Union Uno-Tex Windsor b-82-A | 78 05 20 | 78 08 02 | 2 926.1 | Fahler gas. |
| 4413 | Imp Union Uno-Tex Windsor a-89-A | 78 08 10 | 78 11 28 | 3 153.0 | Abandoned-dry. |
| 4498 | Imp Union Uno-Tex Windsor b-2-B | 78 12 15 | ------ | ------ | Drilling. |
| 4672 | Joffre et al E Bulrush d-13-K | 78 12 11 | ------ | ------ | Drilling. |
| 4642 | Joffre et al Goose 10-22-84-21 | 78 12 05 | 78 12 24 | 1 550.0 | Charlie Lake gas. |
| 4585 | Joffre et al Two Rivers 7-2-83-16 | 78 11 27 | 78 12 24 | 1 587.0 | Halfway oil. |

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| 4446 | Kilo et al Buick a-41-D | 78 06 24 | 78 06 30 | 1 107.0 | Dunlevy gas. |
| 4344 | Kilo et al Buick d-51-D | 78 03 05 | 78 03 13 | 1 099.4 | Dunlevy gas. |
| 4667 | Kilo et al Bulrush c-20-K | 78 12 29 | ------ | ------ | Drilling. |
| 4510 | Kilo et al Cache d-35-L | 78 08 24 | 78 09 13 | 1 635.2 | Abandoned-dry. |
| 4639 | Kilo Currant d-97-K | 78 12 10 | 78 12 22 | 1 240.0 | Abandoned-dry. |
| 4534 | Kilo Crush d-37-F | 78 09 16 | 78 09 28 | 1 181.0 | Abandoned-dry. |
| 4457 | Kilo et al N Pine 6-13-85-18 | 78 07 04 | 78 08 08 | 1 938.0 | North Pine oil. |
| 4392 | Kilo N Pine 6-28-85-18 | 78 03 15 | 78 04 07 | 1 844.0 | Belloy gas. |
| 4215 | Kilo et al S Wargen b-10-J | 77 12 29 | 78 01 12 | 1 313.7 | Abandoned-dry. |
| 4625 | Ladd Osborn d-33-L | 78 11 22 | 78 12 08 | 1 290.0 | Baldonnel gas. |
| 4608 | Landbank et al Boundary 10-8-86-14 | 78 11 04 | 78 11 18 | 1 401.0 | Halfway oil. |
| 4401 | Melaar Stoddart 7-3-86-19 | 78 04 04 | 78 04 24 | 1 841.9 | Belloy gas. |
| 4237 | Mobil Fontas d-96-F | 78 01 19 | 78 02 27 | 2 193.7 | Abandoned-dry. |
| 4324 | Mobil Kykis b-15-B | 78 02 14 | 78 03 29 | 2 347.0 | Abandoned-dry. |
| 4613 | Mobil Kykis b-39-B | 78 11 25 | ------ | ------ | Drilling. |
| 4640 | Mobil Sahtaneh a-8-B | 78 12 07 | ------ | ------ | Drilling. |
| 4198 | Mobil Sahtaneh d-29-L | 78 01 04 | 78 03 14 | 2 329.9 | Pine Point gas. |
| 4332 | Mobil Sahtaneh d-95-I | 78 03 04 | 78 03 12 | 721.2 | Abandoned-dry. |
| 4560 | Mobil Sierra a-20-C | 78 10 15 | 78 12 05 | 2 180.0 | Pine Point gas. |
| 4202 | Mobil S Sierra a-51-L | 78 01 14 | 78 03 14 | 2 325.6 | Pine Point gas. |
| 4182 | Mobil S Sierra d-64-K | 77 12 05 | 78 02 06 | 2 209.8 | Pine Point gas. |
| 4193 | Mobil Sierra a-76-C | 77 12 13 | 78 02 05 | 2 055.6 | Pine Point gas. |
| 4331 | Mobil et al E Sunset d-98-B | 78 02 11 | 78 03 25 | 2 347.0 | Bluesky gas. |
| 4660 | Mobil E Yoyo b-97-F | 78 12 16 | ------ | ------ | Drilling. |
| 4348 | Murphy Osprey c-92-K | 78 03 15 | 78 03 30 | 1 204.9 | Bluesky gas. |
| 4615 | Norcen Eagle 16-32-84-18 | 78 11 26 | 78 12 22 | 1 925.0 | Lower Belloy gas. |
| 4637 | Norcen Murphy Eagle 16-5-85-18 | 78 12 31 | ------ | ------ | Drilling. |
| 3893 | Norcen Medana d-99-F | 78 01 13 | 78 02 05 | 1 553.0 | Abandoned-dry. |
| 4440 | Norcen BP Two Rivers 10-1-83-16 | 78 06 07 | 78 07 10 | 2 104.0 | Abandoned-dry. |
| 4356 | Northstar et al N Boundary 6-5-88-14 | 78 06 30 | 78 07 17 | 1 358.0 | Abandoned-dry. |
| 4486 | Northstar et al Buick b-4-G | 78 06 21 | 78 08 02 | 1 212.0 | Bluesky gas. |
| 4489 | Northstar et al N Buick d-31-F | 78 11 29 | 78 12 16 | 1 245.0 | Dunlevy gas. |
| 4681 | Northstar Ft St John 6-25-83-18 | 78 12 21 | ------ | ------ | Drilling. |
| 4516 | Northstar et al Siphon 6-25-86-17 | 78 08 29 | 78 09 21 | 1 403.0 | Siphon gas. |
| 4604 | Northstar et al N Sunrise 10-33-79-16 | 78 11 11 | 78 11 23 | 785.0 | Cadotte gas. |
| 4442 | OIL Bulrush d-66-F | 78 06 16 | 78 06 28 | 1 154.6 | Abandoned-dry. |
| 4242 | OIL Bulrush d-86-F | 78 06 02 | 78 06 12 | 1 140.0 | Abandoned-dry. |
| 4192 | OIL et al W Buick d-37-G | 77 12 04 | 78 01 08 | 1 190.0 | Abandoned-dry. |
| 4337 | OIL et al Niteal c-32-I | 78 03 02 | 78 03 18 | 778.1 | Abandoned-dry. |
| 4473 | OIL et al Silverberry 10-2-88-20 | 78 08 09 | 78 08 26 | 1 455.0 | Abandoned-dry. |
| 4508 | OIL Wolf d-80-A | 78 09 01 | 78 12 27 | 1 265.0 | Halfway oil. |
| 4564 | Orbit et al N Boundary 7-22-87-14 | 78 12 28 | ------ | ------ | Drilling. |
| 4406 | Orbit et al Flatrock 10-18-84-15 | 78 03 25 | 78 04 09 | 1 520.0 | Abandoned-dry. |
| 4509 | Orbit et al Montney 11-2-87-19 | 78 08 04 | 78 08 24 | 1 555.0 | Halfway oil. |

## Table 4-4—Wells Drilled and Drilling, 1978 – Continued

| Well Authorization Number | Well Name | Date Spudded | Date Rig Released | 1978 Depth | Status at December 31, 1978 |
|---|---|---|---|---|---|
| 4420 | Orbit et al Rigel 10-32-87-17 | 78 05 31 | 78 06 12 | 1 365.8 | Dunlevy gas. |
| 4381 | PCP Gulf Bivouac d-99-C | 78 03 03 | 78 03 12 | 563.9 | Debolt gas. |
| 4711 | PCP Murphy Elm c-94-C | 78 12 30 | ------ | ------ | Drilling. |
| 4284 | PCP Milligan d-75-J | 78 02 11 | 78 02 24 | 1 164.3 | Abandoned-dry. |
| 4246 | PCP Willow c-98-H | 78 01 16 | 78 02 09 | 1 402.4 | Gething gas. |
| 4515 | Pacific WP Airport 5-3-84-17 | 78 08 12 | 78 09 15 | 1 970.5 | Halfway oil. |
| 4490 | Pacific HB Boucher 7-11-82-23 | 78 08 23 | 78 10 02 | 1 606.0 | Halfway gas. |
| 4249 | Pacific HBOG Boucher 8-26-82-23 | 78 01 02 | 78 01 27 | 1 591.4 | Halfway gas. |
| 4325 | Pacific Buffalo c-94-J | 78 02 01 | 78 02 15 | 571.5 | Gething gas. |
| 4378 | Pacific WP N Buick d-33-F | 78 05 08 | 78 05 24 | 1 483.5 | Dunlevy gas. |
| 4444 | Pacific et al W Buick c-74-C | 78 07 01 | 78 07 13 | 1 240.6 | Abandoned-dry. |
| 4043 | Pacific Burch c-31-K | 77 10 01 | 78 01 08 | 2 723.7 | Dunlevy gas. |
| 4543 | Pacific Imp Clarke a-75-L | 78 11 05 | 78 12 13 | 1 915.0 | Slave Point gas. |
| 4612 | Pacific Imp Clarke a-92-L | 78 12 17 | ------ | ------ | Drilling. |
| 4395 | Pacific et al Dahl c-100-H | 78 03 19 | 78 03 29 | 1 225.9 | Bluesky and Halfway gas. |
| 4471 | Pacific et al Fireweed d-91-A | 78 07 17 | 78 07 27 | 1 222.0 | Dunlevy oil. |
| 4439 | Pacific WP Ft St John 7-14-84-19 | 78 06 03 | 78 07 06 | 2 049.8 | North Pine gas and Halfway gas. |
| 4391 | Pacific Gutah a-87-C | 78 03 06 | 78 03 16 | 998.5 | Abandoned-dry. |
| 4252 | Pacific Union Kelly b-28-I | 78 12 28 | 78 02 12 | 2 452.1 | Cadotte gas. |
| 4311 | Pacific Kestrel d-51-K | 78 02 18 | 78 03 07 | 1 226.8 | Abandoned-dry. |
| 4591 | Pacific et al Laprise c-72-E | 78 10 26 | 78 11 22 | 1 215.0 | Baldonnel gas. |
| 4436 | Pacific et al Laprise d-93-E | 78 08 03 | 78 08 17 | 1 267.0 | Baldonnel gas. |
| 4414 | Pacific et al Ojay c-12-L | 78 07 24 | 78 12 08 | 3 517.0 | Baldonnel gas. |
| 4354 | Pacific Prespatou d-51-A | 78 03 10 | 78 03 26 | 1 200.9 | Bluesky gas. |
| 4323 | Pacific Redeye d-97-B | 78 02 01 | 78 02 14 | 1 173.5 | Abandoned-dry. |
| 4523 | Pacific et al Siphon 12-27-86-16 | 78 10 08 | 78 10 20 | 1 166.0 | Dunlevy gas. |
| 4475 | Pacific Stoddart A11-18-86-19 | 78 07 09 | 78 07 23 | 1 333.8 | Abandoned-dry. |
| 4259 | Pacific et al Suhm d-73-D | 78 01 16 | 78 01 25 | 533.4 | Abandoned-dry. |
| 4345 | Pacific et al Tooga a-71-B | 78 02 20 | 78 02 28 | 716.3 | Detrital gas. |
| 4474 | Pacific PEX Weasel d-53-B | 78 07 13 | 78 07 27 | 1 180.0 | Abandoned-dry. |
| 4240 | Pacific GAO Yoyo c-20-L | 78 01 19 | 78 03 02 | 2 197.0 | Pine Point gas. |
| 3660 | Pacific Yoyo c-36-I (re-entry) | 75 12 08 | 78 01 14 | 92.7 | Slave Point and Pine Point gas. |
| 4157 | Petromark HG Goose 10-18-85-21 | 78 01 07 | 78 02 03 | 1 780.0 | North Pine gas. |
| 4289 | Petromark Canhunter E Osborn b-46-J | 78 02 09 | 78 02 21 | 1 127.8 | Baldonnel oil. |
| 4371 | Petromark HG et Red 7-3-86-21 | 78 03 02 | 78 03 23 | 1 713.0 | Abandoned-dry. |
| 4122 | Petromark HG Stoddart 6-35-86-20 | 77 11 30 | 78 01 01 | 1 926.3 | Abandoned-dry. |

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| 4581 | Petrorep et al Boundary 10-18-87-13 | 78 10 25 | 78 11 16 | 1 485.4 | Bluesky gas. |
| 4327 | Petrorep W Stoddart 7-33-86-20 | 78 05 28 | 78 06 21 | 1 638.0 | Abandoned-dry. |
| 3932 | Quasar Chevron et al Etsho d-77-J | 78 02 22 | 78 01 30 | 2 737.1 | Abandoned-dry. |
| 4081 | Quasar Grizzly d-13-A | 78 10 23 | 78 03 14 | 2 813.0 | Dunlevy gas. |
| 4550 | Quasar N Grizzly d-41-G | 78 12 17 | ------ | ------ | Drilling. |
| 4136 | Quasar N Grizzly c-74-G | 78 09 04 | ------ | ------ | Drilling. |
| 4542 | Quasar et al Murray a-89-E | 78 09 27 | ------ | ------ | Drilling. |
| 4168 | Quasar Wolverine c-20-C | 78 03 21 | 78 10 18 | 3 371.7 | Dunlevy gas. |
| 4221 | Quasar Pacific Wolverine b-64-L | 78 05 21 | ------ | ------ | Drilling. |
| 4555 | Quasar et al Wolverine d-77-K | 78 10 15 | ------ | ------ | Drilling. |
| 4343 | Quintana et al Elleh h-8-K | 78 02 10 | 78 03 20 | 2 040.6 | Slave Point gas. |
| 4702 | Quintana PCP Helmet a-32-C | 78 12 19 | ------ | ------ | Drilling. |
| 4211 | Quintana et al Klua c-14-F | 78 12 30 | 78 02 05 | 2 045.2 | Slave Point gas. |
| 2955 | Quintana et al Klua a-35-F (re-entry) | 78 07 24 | 78 02 17 | 26.5 | Water disposal. |
| 4654 | Ranger Turbo Osborn 6-34-88-15 | 78 11 30 | 78 12 14 | 1 280.0 | Gething gas. |
| 4607 | Rem et al Two Rivers 3-27-83-16 | 78 11 24 | ------ | ------ | Drilling. |
| 4502 | Remington et al Boundary 7-4-86-14 | 78 08 03 | 78 08 17 | 1 430.0 | Halfway gas. |
| 4553 | Remington et al Cache 10-17-88-22 | 78 09 21 | 78 10 19 | 1 658.0 | Doig gas. |
| 4507 | Renaissance et al Buick b-44-I | 78 08 07 | 78 08 19 | 1 201.0 | Dunlevy gas. |
| 4441 | Renaissance et al N Pine 11-36-85-18 | 78 06 01 | 78 07 03 | 1 754.7 | Abandoned-dry. |
| 4518 | Renaissance et al Rigel d-15-C | 78 09 21 | 78 10 03 | 1 341.0 | Dunlevy gas. |
| 4315 | Riva Ladyfern c-18-L | 78 03 14 | 78 03 24 | 1 082.0 | Abandoned-dry. |
| 4191 | Sabine Wainoco Numac Fox 11-11-86-21 | 77 12 14 | 78 01 25 | 2 053.4 | Abandoned-dry. |
| 4488 | Sabine Wainoco Red 10-12-86-22 | 78 08 26 | 78 10 25 | 2 119.1 | Halfway gas. |
| 4412 | Sceptre et al E Siphon 11-14-86-15 | 78 06 08 | 78 06 30 | 1 463.0 | Abandoned-dry. |
| 4603 | Scurry CEGO Eagle 6-20-84-18 | 78 12 17 | ------ | ------ | Drilling. |
| 4494 | Scurry CEGO Eagle 14-22-84-18 | 78 07 31 | 78 08 24 | 1 869.0 | Belloy oil. |
| 4382 | Scurry CEGO Eagle 8-31-84-18 | 78 03 11 | 78 04 02 | 1 880.6 | Belloy oil. |
| 4574 | Scurry CEGO Eagle 14-31-84-18 | 78 10 13 | 78 11 15 | 1 871.1 | Belloy oil. |
| 4187 | Scurry CEGO Eagle 15-25-84-14 | 78 12 10 | 78 01 17 | 1 874.5 | Belloy oil. |
| 4339 | Scurry CEGO Eagle 16-36-84-19 | 78 08 03 | 78 08 29 | 1 863.6 | Belloy oil. |
| 4596 | Scurry CEGO Eagle 8-6-85-18 | 78 03 20 | 78 04 08 | 1 913.3 | Belloy oil. |
| 4383 | Scurry CEGO Eagle 16-6-85-18 | 78 03 20 | 78 04 08 | 1 919.3 | Belloy oil. |
| 4287 | Scurry CEGO Eagle 6-7-85-18 | 78 01 18 | 78 02 08 | 1 892.8 | Belloy oil. |
| 4385 | Scurry CEGO Eagle 16-7-85-18 | 78 05 30 | 78 06 24 | 1 937.0 | Belloy oil. |
| 4188 | Scurry CEGO Eagle 15-1-85-19 | 78 01 26 | 78 02 08 | 1 865.4 | Belloy oil. |
| 4631 | Scurry CEGO Eagle 16-2-85-19 | 78 11 25 | 78 12 13 | 1 893.6 | Belloy oil. |
| 4422 | Scurry CEGO Eagle 16-11-85-19 | 78 05 30 | 78 06 23 | 1 883.7 | Belloy oil. |
| 4453 | Scurry CEGO Eagle 16-12-85-19 | 78 06 25 | 78 07 18 | 1 857.0 | Belloy oil. |
| 4363 | Scurry et al W Inga 10-32-86-24 | 78 02 19 | 78 03 16 | 1 685.5 | Abandoned-dry. |
| 4536 | Scurry et al Red Creek 6-18-85-20 | 78 09 01 | 78 10 08 | 2 117.0 | Standing. |
| 4423 | Scurry et al Red Creek 6-13-85-21 | 78 05 27 | 78 06 23 | 2 121.4 | Abandoned-dry. |
| 4511 | Scurry et al Stoddart 16-22-85-20 | 78 08 15 | 78 09 07 | 1 931.0 | Belloy oil. |
| 4320 | Scurry et al Stoddart 6-33-85-20 | 78 02 06 | 78 03 02 | 2 041.3 | Belloy oil. |

*Table 4-4—Wells Drilled and Drilling, 1978 – Continued*

| Well Authorization Number | Well Name | Date Spudded | Date Rig Released | 1978 Depth | Status at December 31, 1978 |
|---|---|---|---|---|---|
| 4357 | Scurry et al Stoddart 6-34-85-20 | 78 02 14 | 78 03 08 | 1 983.3 | Belloy oil. |
| 4513 | Scurry et al W Stoddart 16-23-85-20 | 78 08 15 | 78 09 07 | 1 948.0 | Belloy oil. |
| 4545 | Scurry et al W Stoddart 16-27-85-20 | 78 09 15 | 78 10 08 | 1 913.9 | Belloy oil. |
| 4578 | Scurry et al W Stoddart 8-34-85-20 | 78 10 08 | 78 10 31 | 1 911.0 | Belloy oil. |
| 4535 | Scurry et al W Stoddart 16-34-85-20 | 78 09 14 | 78 10 06 | 1 900.0 | Belloy oil. |
| 4602 | Scurry et al W Stoddart 14-34-85-20 | 78 11 04 | 78 11 23 | 1 943.0 | Belloy oil. |
| 4424 | Scurry et al W Stoddart 6-4-86-20 | 78 07 20 | 78 08 12 | 1 967.0 | Belloy oil. |
| 4290 | Shell Foxglove d-68-A | 78 02 17 | 78 03 23 | 2 788.9 | Abandoned-dry. |
| 3917 | Shell Quintana Jackfish b-64-K | 78 12 29 | 78 02 09 | 2 420.7 | Abandoned-dry. |
| 4163 | Shell Klikerran 10-23-77-14 | 78 11 09 | 78 01 16 | 2 798.9 | Abandoned-dry. |
| 4223 | Shell Ootata b-48-L | 78 01 29 | 78 04 03 | 2 926.4 | Abandoned-dry. |
| 4519 | Siebens CZAR et al Buick 10-29-88-29 | 78 10 06 | 78 11 16 | 1 854.0 | Charlie Lake gas. |
| 4521 | Signalta et al W Buick b-A50-C | 78 10 07 | 78 10 17 | 1 124.0 | Dunlevy gas. |
| 4597 | Signalta OIL Nig d-91-G | 78 11 22 | 78 12 22 | 1 394.0 | Abandoned-dry. |
| 4267 | Signalta et al Stoddart 7-26-86-20 | 78 07 20 | 78 08 15 | 1 946.0 | Abandoned-dry. |
| 3915 | Skelly Getty C S Commotion a-23-D | 78 06 15 | 78 05 17 | 4 572.0 | Baldonnel gas. |
| 4411 | Skelly Getty C S Commotion c-29-C | 78 06 17 | ------ | ------ | Drilling. |
| 4428 | Skye et al Buick d-36-I | 78 07 19 | 78 08 08 | 1 414.5 | Abandoned-dry. |
| 4416 | Sundance Airport 6-36-83-18 | 78 05 05 | 78 05 24 | 1 588.0 | North Pine oil. |
| 4478 | Sundance et al Nig b-44-C | 78 08 27 | 78 09 15 | 1 597.0 | Dunlevy gas. |
| 4139 | Sundance Nig b-84-C | 77 12 01 | 78 01 01 | 1 588.0 | Gething and North Pine gas. |
| 4588 | Texaco et al Boundary 4-28-85-14 | 78 11 23 | 78 12 04 | 1 311.5 | Boundary Lake oil. |
| 4589 | Texaco et al Boundary 11-21-85-14 | 78 12 07 | 78 12 17 | 1 335.0 | Boundary Lake oil. |
| 4265 | Texex Dahl c-74-J | 78 02 28 | 78 03 08 | 1 109.5 | Bluesky gas. |
| 4213 | Texex Sliver a-7-C | 78 03 11 | 78 03 21 | 1 223.8 | Bluesky gas. |
| 4525 | Tri Star et al Laprise b-70-C | 78 09 17 | 78 10 05 | 1 267.0 | Baldonnel gas. |
| 4409 | Turbo et al Gopher 10-26-85-16 | 78 06 01 | 78 07 04 | 1 854.4 | Belloy gas. |
| 4408 | Turbo et al Gopher 11-33-85-16 | 78 10 18 | 78 12 29 | 3 057.0 | Abandoned-dry. |
| 4402 | Turbo Ranger Pluto 10-14-86-17 | 78 03 28 | 78 04 15 | 1 402.1 | Halfway gas. |
| 4532 | Union W Buick a-61-E | 78 10 06 | 78 10 16 | 1 252.0 | Dunlevy gas. |
| 4529 | Union W Buick d-71-E | 78 10 18 | 78 10 29 | 1 215.0 | Dunlevy oil. |
| 4364 | Union et al Crush b-59-F | 78 11 01 | 78 11 11 | 1 180.0 | Halfway oil. |
| 4606 | Union et al Wildmint c-56-A | 78 11 13 | 78 11 21 | 1 152.8 | Halfway oil. |
| 4365 | Union HB Woodrush c-52-H | 78 11 23 | 78 12 02 | 1 125.0 | Halfway gas. |
| 4096 | Uno—Tex BP Notsah b-7-L | 77 12 17 | 78 02 15 | 3 124.0 | Abandoned-dry. |
| 4403 | Weinoco et al Cache b-48-L | 78 06 17 | 78 07 27 | 1 645.0 | Coplin gas. |

| | | | | | |
|---|---|---|---|---|---|
| 4576 | Wainoco et al Coplin 4-3-86-23 | 78 10 11 | 78 11 07 | 1 737.8 | Abandoned-dry. |
| 4298 | Wainoco et al Dahl b-68-H | 78 03 17 | 78 03 25 | 1 204.0 | Bluesky gas. |
| 4297 | Wainoco et al Dahl b-84-G | 78 03 06 | 78 03 15 | 1 200.9 | Bluesky gas. |
| 4260 | Wainoco Ft St John 16-23-84-19 | 78 05 28 | 78 06 26 | 1 929.1 | Belloy oil. |
| 2503 | Wainoco et al Moberly 10-22-82-22 (re-entry) | 78 02 23 | 78 08 30 | 1 596.7 | Halfway gas. |
| 4189 | Wainoco Monias 6-22-82-21 | 77 12 28 | 78 01 18 | 1 482.9 | Halfway gas. |
| 4277 | Wainoco Monias 11-24-82-21 | 78 06 30 | 78 08 01 | 1 560.0 | Halfway gas. |
| 4605 | Wainoco Sabine Numac Red 10-30-86-21 | 78 11 12 | 78 12 24 | 2 085.0 | Belloy gas. |
| 4565 | Wainoco BCRIC Sojer a-47-K | 78 10 30 | 78 11 22 | 1 329.2 | Baldonnel gas. |
| 4526 | Wainoco et al Tea 6-34-84-20 | 78 09 02 | 78 10 07 | 2 140.0 | Belloy gas. |
| 4617 | Westburne et al Wildmint d-78-A | 78 12 22 | 78 12 06 | 1 155.0 | Abandoned-dry. |
| 4540 | Westcoast et al Goose 2-28-84-21 | 78 09 08 | 78 10 15 | 1 575.0 | Doig gas. |
| 4650 | Westcoast Ft St John SE 10-30-82-17 | 78 12 04 | ------ | ------ | Drilling. |
| 4214 | Westcoast Numac Pickell b-30-D | 77 12 28 | 78 01 10 | 1 287.6 | Abandoned-dry. |
| 4477 | Westcoast et al Progress 6-1-97-16 | 78 08 09 | 78 10 17 | 2 637.0 | Abandoned-dry. |
| 4582 | Westcoast GAO N Red 10-27-86-21 | 78 10 18 | 78 11 28 | 2 059.7 | Dunlevy gas. |
| 4234 | Westcoast et al Redeye a-83-I | 78 02 06 | 78 02 17 | 1 204.0 | Abandoned-dry. |
| 4179 | Westcoast et al N Snyder c-83-K | 78 12 17 | 78 01 31 | 1 743.5 | Abandoned-dry. |
| 4359 | Westcoast et al Temple d-57-I | 78 02 20 | 78 03 05 | 1 150.6 | Halfway gas. |
| 4393 | Westcoast et al Velma d-59-L | 78 03 09 | 78 03 17 | 1 219.2 | Bluesky gas. |
| 4614 | Wilshire et al Conroy b-84-D | 78 11 21 | 78 12 05 | 1 368.0 | Abandoned-dry. |
| 4314 | Wincan et al Dahl a-21-G | 78 03 01 | 78 03 10 | 1 197.9 | Bluesky gas. |
| 4244 | Wincan et al Dahl a-41-G | 78 01 17 | 78 01 28 | 1 188.7 | Bluesky gas. |
| 4313 | Wincan et al Dahl b-44-G | 78 02 17 | 78 02 27 | 1 197.9 | Bluesky gas. |
| 4251 | Wincan et al Dahl d-A91-J | 78 01 05 | 78 01 14 | 1 066.8 | Bluesky gas. |
| 4467 | Woods Ashland Beavertail d-95-D | 78 06 28 | 78 07 10 | 1 333.0 | Abandoned-dry. |
| 4485 | Woods Boudreau 11-9-84-21 | 78 07 21 | 78 08 20 | 1 370.0 | Halfway gas. |
| 4491 | Woods N Julienne d-A33-H | 78 10 23 | 78 11 05 | 638.0 | Abandoned-junked. |
| 4618 | Woods N Julienne d-B33-H | 78 11 08 | ------ | ------ | Drilling. |
| 4174 | Woods Wainoco Monias 6-26-82-21 | 78 12 28 | 78 01 22 | 1 484.7 | Halfway gas. |
| 4559 | Woods Wainoco Monias 7-34-82-21 | 78 09 24 | 78 10 21 | 1 510.0 | Halfway gas. |
| 4561 | Woods et al Oak 14-32-85-17 | 78 09 29 | 78 10 17 | 1 472.0 | Abandoned-dry. |
| 4626 | Woods Wainoco Oak 11-26-86-18 | 78 11 19 | 78 12 05 | 1 469.9 | Abandoned-dry. |
| 4443 | Woods Anadarko Siphon 10-36-86-17 | 78 06 05 | 78 06 24 | 1 388.7 | Abandoned-dry. |
| 4377 | Woods N Siphon 11-25-87-16 | 78 03 22 | 78 04 06 | 1 303.0 | Dunlevy gas. |
| 4437 | Woods W Stoddart 6-7-86-20 | 78 05 31 | 78 06 29 | 2 059.0 | Belloy oil. |
| 4463 | Woods W Stoddart 8-7-86-20 | 78 07 01 | 78 08 03 | 2 041.0 | Abandoned-dry. |
| 4407 | Woods W Stoddart 8-13-86-21 | 78 04 04 | 78 04 30 | 2 008.3 | Belloy oil. |
| 4593 | Woods Dome S Wilder 6-10-83-20 | 78 10 26 | 78 11 15 | 1 552.0 | Abandoned-oil. |
| 4616 | Zephyr et al Birch b-50-I | 78 11 13 | 78 12 05 | 1 305.0 | Baldonnel oil. |
| 4245 | Zephyr et al Black a-27-F | 78 12 12 | ------ | ----- | Drilling. |

## *Table 4-5—Summary of Drilling and Production Statistics, 1978*

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well authorizations issued | 79 | 45 | 21 | 11 | 25 | 42 | 22 | 38 | 28 | 34 | 59 | 62 | 466 |
| Well authorizations cancelled | 2 | ----- | 1 | ----- | ----- | ----- | ----- | 2 | ----- | 4 | 6 | 2 | 17 |
| Wells spudded | 46 | 54 | 41 | 3 | 17 | 35 | 30 | 35 | 26 | 34 | 43 | 32 | 396 |
| Rigs operated (during month) | 65 | 65 | 23 | 25 | 22 | 36 | 38 | 42 | 43 | 44 | 53 | 57 | 71[1] |
| Rigs operating (at month end) | 54 | 50 | 7 | 7 | 18 | 27 | 28 | 35 | 38 | 34 | 43 | 42 | ----- |
| Metres drilled— | | | | | | | | | | | | | |
| Development | 16 476.0 | 25 471.5 | 30 774.1 | 14 490.5 | 3 065.4 | 22 047.7 | 25 536.7 | 31 802.5 | 17 188.4 | 38 658.3 | 18 709.7 | 25 872.0 | 270 092.8 |
| Exploratory outpost | 27 236.6 | 28 322.6 | 43 065.5 | 12 058.5 | 5 982.0 | 16 604.0 | 21 936.5 | 11 650.3 | 19 162.5 | 18 107.8 | 24 796.7 | 21 685.8 | 250 608.8 |
| Exploratory wildcat | 17 955.2 | 29 912.5 | 22 585.9 | 10 005.7 | 4 572.0 | 7 772.1 | ----- | 4 232.1 | 1 525.0 | 7 888.0 | 3 153.0 | 13 325.0 | 122 726.5 |
| Totals | 61 667.8 | 83 706.6 | 96 425.5 | 36 554.7 | 13 619.4 | 46 423.8 | 47 473.2 | 47 684.9 | 37 875.9 | 64 454.1 | 46 659.4 | 60 882.8 | 643 428.1 |
| Oil wells* | 2 | 3 | 3 | 5 | 3 | 6 | 7 | 8 | 8 | 11 | 7 | 8 | 71 |
| Gas wells* | 23 | 31 | 33 | 10 | 3 | 8 | 14 | 16 | 8 | 21 | 15 | 20 | 202 |
| Abandoned wells | 17 | 24 | 24 | 4 | ----- | 11 | 12 | 9 | 7 | 5 | 7 | 9 | 129 |
| Service wells | ----- | 2 | 2 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 4 |
| Standing wells | ----- | ----- | ----- | ----- | ----- | 1 | ----- | ----- | ----- | 1 | ----- | ----- | 2 |
| Totals | 42 | 60 | 62 | 19 | 6 | 26 | 33 | 33 | 23 | 38 | 29 | 37 | 408 |
| Producible oil wells | 735 | 737 | 742 | 744 | 748 | 753 | 758 | 766 | 775 | 785 | 790 | 798 | ----- |
| Producing oil wells | 528 | 511 | 512 | 491 | 491 | 544 | 541 | 557 | 559 | 565 | 556 | 554 | ----- |
| Production in barrels | 1 097 476 | 952 196 | 1 009 591 | 1 009 550 | 864 577 | 1 089 171 | 774 273 | 1 161 621 | 1 167 826 | 1 186 089 | 1 134 363 | 1 169 272 | 12 609 176[3] |
| Average daily production | 35 402 | 34 007 | 32 567 | 33 652 | 27 890 | 36 306 | 24 977 | 37 472 | 38 928 | 38 261 | 37 812 | 37 718 | ----- |
| Producible gas wells | 1 271 | 1 298 | 1 329 | 1 339 | 1 349 | 1 360 | 1 376 | 1 393 | 1 400 | 1 421 | 1 438 | 1 465 | ----- |
| Producing gas wells | 460 | 474 | 476 | 473 | 468 | 461 | 426 | 321 | 407 | 508 | 560 | 572 | ----- |
| Production in MSCF[2] | 36 346 739 | 32 041 954 | 32 704 445 | 28 589 083 | 25 167 652 | 18 597 906 | 19 498 833 | 20 944 907 | 21 909 376 | 26 481 580 | 35 930 639 | 41 072 001 | 341 051 255[3] |
| Average daily production | 1 172 475 | 1 144 356 | 1 054 982 | 952 969 | 812 505 | 619 930 | 628 995 | 675 642 | 730 313 | 854 245 | 1 197 688 | 1 324 903 | ----- |

### SUMMARY FOR 1978

| *Drilled* | |
|---|---|
| Locations drilled | 388 |
| Multizone wells | 15 |
| Re-entries | 5 |
| Total | 408 |

| *Completions* | |
|---|---|
| Oil wells* | 71 |
| Gas wells* | 202 |
| Service wells | 4 |
| Standing | 2 |
| Abandoned | 129 |
| Total | 408 |

[1] Rigs operated during 1977.

[2] Nonassociated gas production only.

[3] Year-end amendments not included.

*Each zone of a multizone well is counted as one well.

## *Table 4-6—Monthly Crude-Oil and Condensate Production by Fields and Pools, 1978*

| Field and Pool | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aitken Creek— | | | | | | | | | | | | | |
| Gething | 12 495 | 19 309 | 25 926 | 21 428 | 25 225 | 22 043 | 12 523 | 23 181 | 20 365 | 20 624 | 15 555 | 24 731 | 243 405 |
| Gething[1] | 650 | 1 060 | 1 710 | 1 675 | 1 406 | 1 081 | 852 | 901 | 1 655 | 1 657 | 1 791 | 1 888 | 16 336 |
| Field totals | 13 145 | 20 389 | 27 636 | 23 103 | 26 631 | 23 124 | 13 375 | 24 081 | 22 020 | 22 281 | 17 346 | 26 619 | 259 741 |
| Bear Flat—North Pine | 2 439 | 2 162 | 2 270 | 2 200 | 1 858 | 1 985 | 1 950 | 1 954 | 1 777 | 2 054 | 1 931 | 1 979 | 24 562 |
| Beatton River—Halfway | 32 122 | 20 640 | 13 506 | 28 353 | 32 007 | 30 306 | 19 754 | 27 986 | 29 066 | 31 783 | 27 429 | 31 339 | 324 291 |
| Beatton River West—Bluesky | 26 669 | 24 465 | 25 301 | 22 303 | 23 006 | 17 010 | 11 062 | 19 588 | 22 206 | 23 242 | 26 297 | 19 433 | 260 582 |
| Blueberry—Debolt | 17 502 | 15 032 | 20 657 | 18 589 | 22 573 | 39 287 | 37 112 | 40 728 | 20 162 | 42 723 | 39 458 | 40 523 | 354 346 |
| Boundary Lake— | | | | | | | | | | | | | |
| Baldonnel[1] | 84 | 67 | 55 | 45 | 57 | 27 | 33 | 52 | 74 | 72 | 55 | 171 | 792 |
| Cecil | 515 | 612 | 846 | 772 | 744 | 617 | 360 | 451 | 560 | 497 | 518 | 495 | 6 987 |
| Boundary Lake | 520 352 | 413 406 | 400 470 | 428 218 | 285 811 | 552 124 | 349 665 | 547 279 | 539 277 | 498 479 | 505 167 | 506 178 | 5 546 426 |
| Halfway | 5 384 | 5 296 | 3 363 | 4 291 | 4 224 | 5 586 | 2 856 | 7 468 | 7 165 | 5 450 | 7 360 | 6 935 | 65 378 |
| Halfway[1] | 3 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 3 |
| Field totals | 526 338 | 419 381 | 404 734 | 433 326 | 290 836 | 558 354 | 352 914 | 555 250 | 547 076 | 504 498 | 513 100 | 513 779 | 5 619 586 |
| Boundary Lake North— | | | | | | | | | | | | | |
| Halfway | 896 | 975 | 792 | 1 072 | 804 | 1 312 | 1 247 | 851 | 1 326 | 1 431 | 1 369 | 1 212 | 13 287 |
| Halfway[1] | 689 | 277 | 1 000 | 728 | 526 | 372 | ----- | ----- | ----- | 143 | 1 087 | 553 | 5 375 |
| Field totals | 1 585 | 1 252 | 1 792 | 1 800 | 1 330 | 1 684 | 1 247 | 851 | 1 326 | 1 574 | 2 466 | 1 765 | 18 662 |
| Buick Creek— | | | | | | | | | | | | | |
| Bluesky[1] | 190 | 38 | 162 | 19 | 4 | 26 | ----- | ----- | 19 | 3 | 35 | 14 | 510 |
| Dunlevy | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 188 | 184 | 211 | 228 | ----- | 811 |
| Dunlevy[1] | 956 | 535 | 631 | 657 | 275 | 246 | 940 | 1 520 | 1 598 | 2 038 | 2 008 | 2 040 | 13 444 |
| Doig | 464 | 8 761 | 4 297 | ----- | ----- | 2 324 | 4 198 | 4 398 | 7 060 | 7 613 | 8 673 | 4 386 | 52 174 |
| Field totals | 1 610 | 9 334 | 5 090 | 676 | 279 | 2 596 | 5 138 | 6 106 | 8 861 | 9 865 | 10 944 | 6 440 | 66 939 |
| Bullrush—Halfway | 2 710 | 2 519 | 7 407 | 7 179 | 4 539 | 5 646 | 5 341 | 4 761 | 4 372 | 2 798 | 1 654 | 2 143 | 51 069 |
| Cache Creek—Halfway[1] | 170 | 77 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 247 |
| Cecil Lake— | | | | | | | | | | | | | |
| Cecil | 1 826 | 5 812 | 4 113 | ----- | 5 057 | 5 504 | 3 554 | 3 157 | 3 246 | 3 299 | 3 197 | 3 307 | 42 072 |
| North Pine | 4 317 | 2 187 | 1 283 | 635 | 336 | 566 | 653 | 644 | 1 662 | 1 971 | 1 743 | 1 698 | 17 695 |
| Field totals | 6 143 | 7 999 | 5 396 | 635 | 5 393 | 6 070 | 4 027 | 3 801 | 4 908 | 5 270 | 4 940 | 5 005 | 59 767 |
| Crush—Halfway | 6 712 | 5 588 | 6 827 | 4 568 | 4 862 | 3 757 | 1 968 | 3 877 | 2 960 | 3 120 | 4 134 | 4 197 | 52 570 |
| Currant—Halfway | 6 069 | 4 518 | 3 869 | 3 365 | 6 039 | 3 482 | 3 072 | 4 261 | 4 849 | 3 262 | 3 369 | 2 749 | 48 904 |
| Dahl—Bluesky[1] | ----- | ----- | 25 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 25 |
| Eagle— | | | | | | | | | | | | | |
| Siphon | 1 014 | 976 | 121 | ----- | ----- | 210 | 651 | 750 | 1 112 | 751 | 779 | 722 | 7 086 |
| Belloy | 58 357 | 52 533 | 64 498 | 59 284 | 58 578 | 81 470 | 61 486 | 111 166 | 121 725 | 134 822 | 103 370 | 100 569 | 1 007 858 |
| Field totals | 59 371 | 53 509 | 64 619 | 59 284 | 58 578 | 81 680 | 62 137 | 111 916 | 122 837 | 136 573 | 104 149 | 101 291 | 1 014 944 |
| Fireweed— | | | | | | | | | | | | | |
| Dunlevy | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 085 | 666 | 1 513 | 3 264 |
| Dunlevy[1] | 883 | 1 037 | 960 | 623 | 600 | 166 | 62 | 23 | 25 | 10 | 12 | 200 | 4 601 |
| Field totals | 883 | 1 037 | 960 | 623 | 600 | 166 | 62 | 23 | 25 | 1 095 | 678 | 1 713 | 7 865 |

[1]Condensate

## *Table 4-6—Monthly Crude-Oil and Condensate Production by Fields and Pools, 1978 — Continued*

| Field and Pool | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flatrock— | | | | | | | | | | | | | |
| Boundary Lake | ----- | ----- | ----- | ----- | ----- | 470 | 187 | 147 | 123 | 157 | 95 | 207 | 1 386 |
| Halfway | 2 383 | 4 909 | 4 813 | 1 117 | 571 | 3 290 | 3 290 | 3 238 | 3 001 | 653 | 1 006 | 3 119 | 31 389 |
| Field totals | 2 383 | 4 909 | 4 813 | 1 117 | 571 | 3 760 | 3 477 | 3 385 | 3 124 | 810 | 1 101 | 3 326 | 32 775 |
| Fort St. John—Pingel | 3 019 | 2 604 | 4 637 | 4 764 | 3 601 | 5 890 | 5 362 | 4 937 | 5 135 | 3 439 | 4 816 | 6 044 | 54 248 |
| Inga—Inga | 130 170 | 121 932 | 128 027 | 128 582 | 119 730 | 93 026 | 83 441 | 112 474 | 105 898 | 114 569 | 105 697 | 128 137 | 1 372 583 |
| Jedney— | | | | | | | | | | | | | |
| Baldonnel[1] | 86 | 67 | 77 | 57 | 57 | 31 | 60 | ----- | ----- | 119 | 89 | 124 | 767 |
| Halfway[1] | 34 | 27 | 23 | 16 | 12 | ----- | 14 | ----- | ----- | 37 | 57 | 39 | 259 |
| Field totals | 120 | 94 | 100 | 73 | 69 | 31 | 74 | ----- | ----- | 156 | 146 | 163 | 1 026 |
| Laprise Creek—Baldonnel[1] | 100 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 100 |
| Mica— | | | | | | | | | | | | | |
| Boundary Lake | 879 | 486 | 549 | 533 | 501 | 465 | 93 | 348 | 473 | 464 | 148 | 224 | 5 163 |
| Mica | 1 720 | 1 385 | 1 569 | 1 378 | 1 607 | 1 694 | 2 182 | 6 412 | 4 607 | 5 098 | 5 199 | 4 434 | 37 285 |
| Field totals | 2 599 | 1 871 | 2 118 | 1 911 | 2 108 | 2 159 | 2 275 | 6 760 | 5 080 | 5 562 | 5 347 | 4 658 | 42 448 |
| Mike—Gething | 3 638 | 3 391 | 2 402 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 2 131 | 3 608 | 15 170 |
| Milligan—Halfway | 39 452 | 36 698 | 44 696 | 44 878 | 39 032 | 27 922 | 32 609 | 38 672 | 39 118 | 43 590 | 43 193 | 47 108 | 476 968 |
| Nig Creek— | | | | | | | | | | | | | |
| Baldonnel | ----- | ----- | ----- | ----- | ----- | ----- | 354 | 19 | 390 | 75 | ----- | ----- | 838 |
| Baldonnel[1] | ----- | 483 | 265 | 152 | 642 | 500 | 435 | 424 | 612 | 454 | 209 | 49 | 4 225 |
| Field totals | ----- | 483 | 265 | 152 | 642 | 500 | 789 | 443 | 1 002 | 529 | 209 | 49 | 5 063 |
| North Pine—North Pine | ----- | 42 | ----- | ----- | ----- | ----- | ----- | 427 | 2 344 | 558 | ----- | ----- | 3 371 |
| Oak— | | | | | | | | | | | | | |
| Cecil[1] | 120 | 215 | 230 | 271 | 209 | ----- | ----- | ----- | ----- | ----- | 117 | 196 | 1 358 |
| Halfway | 7 150 | 4 060 | 2 969 | 8 450 | 9 709 | 10 493 | 5 957 | 11 575 | 10 407 | 10 052 | 9 366 | 6 850 | 97 038 |
| Halfway[1] | 3 719 | 3 119 | 3 662 | 2 046 | 2 006 | 5 037 | 2 794 | ----- | ----- | 2 601 | 4 390 | 4 161 | 33 535 |
| Field totals | 10 989 | 7 394 | 6 861 | 10 767 | 11 924 | 15 530 | 8 751 | 11 575 | 10 407 | 12 653 | 13 873 | 11 207 | 131 931 |
| Osprey-Halfway | 2 531 | 3 223 | 2 977 | 2 333 | 1 539 | 2 070 | 1 535 | 983 | 1 364 | 2 071 | 2 243 | 1 007 | 23 876 |
| Peejay— | | | | | | | | | | | | | |
| Halfway | 101 528 | 96 721 | 113 055 | 104 494 | 102 845 | 87 345 | 50 389 | 89 711 | 92 766 | 99 813 | 93 046 | 91 829 | 1 123 542 |
| Halfway[1] | 86 | 16 | ----- | 38 | 7 | 54 | 6 | ----- | ----- | ----- | ----- | ----- | 207 |
| Field totals | 101 614 | 96 737 | 113 055 | 104 532 | 102 852 | 87 399 | 50 395 | 89 711 | 92 766 | 99 813 | 93 046 | 91 829 | 1 123 749 |
| Peejay West—Halfway | 1 871 | 2 013 | 2 570 | 2 082 | 2 028 | 2 391 | 1 768 | 2 824 | 2 118 | 4 436 | 2 974 | 1 156 | 28 231 |
| Rigel—Dunlevy | 2 901 | 2 687 | 3 147 | 2 644 | 2 774 | 2 886 | 3 006 | 2 895 | 2 841 | 2 830 | 1 398 | 1 423 | 31 432 |
| Silverberry—Coplin[1] | 95 | 110 | 122 | 102 | 42 | 82 | 109 | ----- | ----- | 400 | ----- | 156 | 1 218 |
| Siphon— | | | | | | | | | | | | | |
| Dunlevy[1] | 95 | 229 | 157 | 66 | 50 | ----- | 17 | ----- | ----- | 86 | 58 | 54 | 812 |
| Siphon[1] | 8 | 41 | 61 | 22 | 17 | ----- | 33 | ----- | ----- | 85 | 63 | 69 | 399 |
| Halfway[1] | 371 | 127 | 111 | 160 | 82 | ----- | 32 | ----- | ----- | 159 | 125 | 131 | 1 298 |
| Field totals | 474 | 397 | 329 | 248 | 149 | ----- | 82 | ----- | ----- | 330 | 246 | 254 | 2 509 |
| Siphon East—Bluesky[1] | 79 | 99 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 91 | ----- | ----- | 269 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stoddart– | | | | | | | | | | | | | |
| Cecil | 2 817 | 2 878 | 2 038 | 2 257 | 2 524 | 3 778 | 3 385 | 2 713 | 2 887 | 2 809 | 2 622 | 1 849 | 32 557 |
| Belloy | 2 110 | 1 862 | 2 121 | 1 331 | 1 501 | 2 059 | 2 139 | 2 061 | 1 688 | 2 030 | 1 802 | 1 695 | 22 399 |
| Belloy[1] | 75 | 93 | 59 | 70 | 146 | 38 | 293 | 205 | 277 | 195 | 157 | 129 | 1737 |
| Field totals | 5 002 | 4 833 | 4 218 | 3 658 | 4 171 | 5 875 | 5 817 | 4 979 | 4 852 | 5 034 | 4 581 | 3 673 | 56 693 |
| Stoddart South–Confidential | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2 151 | 2 151 |
| Stoddart West– | | | | | | | | | | | | | |
| Belloy | 1 100 | 1 742 | 3 374 | 1 561 | 1 636 | 3 520 | 2 954 | 7 548 | 6 449 | 13 207 | 16 841 | 27 712 | 87 644 |
| Belloy[1] | 3 098 | 2 651 | 3 337 | 2 713 | 2 969 | 2 408 | 2 330 | 1 655 | 2 445 | 2 166 | 2 794 | 2 194 | 30 760 |
| Field totals | 4 198 | 4 393 | 6 711 | 4 274 | 4 605 | 5 928 | 5 284 | 9 203 | 8 894 | 15 373 | 19 635 | 29 906 | 118 404 |
| Velma–Charlie Lake | 140 | ..... | 290 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 430 |
| Weasel–Halfway | 73 663 | 58 210 | 69 263 | 72 185 | 73 287 | 43 070 | 38 229 | 48 539 | 59 882 | 66 822 | 62 481 | 60 190 | 735 801 |
| Weasel West–Halfway | 6 177 | 7 440 | 8 038 | 6 701 | 7 822 | 2 622 | ..... | ..... | 2 913 | 7 690 | 8 299 | 7 389 | 65 091 |
| Wildmint–Halfway | 13 060 | 15 908 | 20 122 | 18 430 | 17 744 | 17 972 | 12 673 | 19 699 | 19 619 | 16 683 | 15 658 | 13 505 | 201 073 |
| Willow– | | | | | | | | | | | | | |
| Gething | 1 204 | 842 | 843 | 511 | 457 | 409 | 748 | 246 | 481 | 1 026 | 1 230 | 1 368 | 9 365 |
| Halfway[1] | 297 | 131 | 174 | 54 | 109 | 99 | ..... | ..... | ..... | 52 | ..... | 233 | 1 149 |
| Field totals | 1 501 | 973 | 1 017 | 565 | 566 | 508 | 748 | 246 | 481 | 1 078 | 1 230 | 1 601 | 10 514 |
| Wolf–Halfway | 4 119 | 2 294 | 2 668 | 1 865 | 2 674 | 2 512 | 2 359 | 3 040 | 4 799 | 4 370 | 6 507 | 6 674 | 43 881 |
| Other Areas– | | | | | | | | | | | | | |
| Bluesky[1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Gething[1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| North Pine | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| North Pine[1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Halfway | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 161 | ..... | 1 527 | 2 070 |
| Dolg | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1 316 | 425 | ..... | ..... | ..... | 1 741 |
| Confidential | ..... | ..... | 17 | ..... | ..... | 2 482 | 5 503 | 603 | ..... | 1 133 | 1 657 | 927 | 12 322 |
| Field totals | ..... | ..... | 17 | ..... | ..... | 2 482 | 5 503 | 1 919 | 425 | 1 133 | 1 657 | 2 034 | 16 133 |
| Totals– | | | | | | | | | | | | | |
| Crude | 1 100 415 | 952 196 | 1 000 468 | 1 003 254 | 865 478 | 1 088 079 | 774 117 | 1 162 876 | 1 168 365 | 1 186 120 | 1 138 342 | 1 269 272 | 12 609 176 |
| Condensate | 14 010 | 14 879 | 19 057 | 15 053 | 11 159 | 11 828 | 10 483 | 5 190 | 7 280 | 14 152 | 18 330 | 18 444 | 159 671 |
| Crude and condensate | 1 114 425 | 967 075 | 1 019 525 | 1 018 307 | 876 637 | 1 099 907 | 784 600 | 1 168 066 | 1 175 645 | 1 200 272 | 1 156 672 | 1 187 716 | 12 768 847 |

[1]Condensate

## *Table 4-7—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1978*

| Field and Pool | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Airport– | | | | | | | | | | | | | |
| Bluesky | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 33 814 | 30 846 | 14 982 | 14 878 | 6 755 | 101 275 |
| Dunlevy | ----- | ----- | ----- | ----- | ----- | 7 421 | ----- | ----- | 5 748 | 22 309 | 26 680 | 28 220 | 90 378 |
| Field totals | ----- | ----- | ----- | ----- | ----- | 7 421 | ----- | 33 814 | 36 594 | 37 291 | 41 558 | 34 975 | 191 653 |
| Aitken Creek– | | | | | | | | | | | | | |
| Gething | 64 117 | 48 469 | 96 143 | 100 462 | 11 172 | ----- | 3 564 | 119 007 | 130 551 | 47 574 | 52 520 | 91 860 | 765 439 |
| Gething[1] | 127 258 | 148 048 | 202 622 | 187 499 | 224 893 | 169 411 | 175 773 | 163 963 | 181 836 | 214 840 | 185 151 | 193 216 | 2 174 510 |
| Field totals | 191 375 | 196 517 | 298 766 | 287 961 | 236 065 | 169 411 | 179 337 | 282 970 | 312 387 | 262 414 | 237 671 | 285 076 | 2 939 949 |
| Bear Flat–North Pine[1] | 53 034 | 46 821 | 52 081 | 52 427 | 52 704 | 49 793 | 51 365 | 51 459 | 50 086 | 51 719 | 49 774 | 52 144 | 613 347 |
| Beatton River–Halfway[1] | 8 894 | 6 534 | 4 217 | 7 091 | 10 432 | 11 242 | 6 886 | 6 891 | 7 180 | 11 021 | 8 236 | 12 154 | 100 778 |
| Beatton River West–Bluesky[1] | 7 760 | 7 003 | 8 011 | 6 960 | 7 287 | 5 319 | 3 989 | 6 053 | 6 009 | 5 680 | 5 448 | 7 076 | 76 515 |
| Beaverdam–Halfway | 69 883 | 55 502 | 63 717 | 60 891 | 64 233 | 42 969 | 42 378 | 1 995 | ----- | 34 442 | 47 280 | 35 397 | 518 677 |
| Beaver River– | | | | | | | | | | | | | |
| Matteson | 137 652 | 107 803 | 134 829 | 123 244 | 99 209 | 69 652 | 55 273 | 53 874 | 32 153 | 6 261 | ----- | ----- | 819 950 |
| Banff | 17 996 | ----- | ----- | ----- | ----- | ----- | ----- | 5 488 | 1 702 | ----- | ----- | ----- | 25 186 |
| Nahanni | 44 190 | 22 800 | 49 944 | 59 785 | 136 868 | 119 219 | 92 379 | 63 979 | 36 699 | ----- | ----- | ----- | 635 863 |
| Field totals | 199 838 | 130 603 | 184 773 | 183 029 | 236 077 | 188 871 | 147 652 | 123 341 | 70 554 | 6 261 | ----- | ----- | 1 480 999 |
| Beavertail–Gething | 396 898 | 347 698 | 397 490 | 389 689 | 276 786 | 202 966 | 142 993 | 32 610 | 212 145 | 328 558 | 363 371 | 390 754 | 3 481 958 |
| Beg– | | | | | | | | | | | | | |
| Baldonnel | 287 708 | 242 624 | 271 207 | 256 263 | 117 713 | 54 840 | 85 456 | ----- | 15 508 | 145 204 | 313 618 | 289 641 | 2 078 782 |
| Halfway | 139 023 | 228 405 | 247 875 | 186 630 | 186 067 | 126 960 | 67 777 | 6 782 | 18 127 | 113 369 | 204 695 | 274 091 | 1 797 791 |
| Field totals | 426 731 | 471 029 | 519 082 | 440 893 | 303 780 | 181 790 | 153 233 | 5 782 | 33 635 | 258 573 | 518 313 | 563 732 | 3 876 573 |
| Birch– | | | | | | | | | | | | | |
| Gething | 2 500 | ----- | ----- | ----- | ----- | ----- | 17 623 | 7 722 | 13 875 | 24 761 | 17 876 | 12 501 | 96 858 |
| Baldonnel | ----- | ----- | ----- | ----- | ----- | ----- | 25 886 | 11 037 | ----- | 40 086 | 15 491 | 24 434 | 116 934 |
| Halfway | 3 000 | ----- | ----- | ----- | ----- | ----- | 31 573 | 32 020 | 16 113 | 50 875 | 43 611 | 43 791 | 220 983 |
| Field totals | 5 500 | ----- | ----- | ----- | ----- | ----- | 75 082 | 50 779 | 29 988 | 115 722 | 76 978 | 80 726 | 434 775 |
| Blueberry– | | | | | | | | | | | | | |
| Dunlevy | 67 143 | 66 249 | 72 336 | 71 914 | 69 042 | 47 008 | 43 580 | 34 298 | 25 703 | 45 074 | 49 475 | 59 023 | 650 844 |
| Debolt[1] | 157 961 | 154 004 | 120 657 | 136 058 | 56 671 | 71 269 | 68 236 | 123 077 | 76 229 | 102 449 | 84 530 | 116 377 | 1 267 518 |
| Field totals | 225 104 | 220 253 | 192 992 | 207 972 | 125 713 | 118 277 | 111 816 | 157 375 | 101 932 | 147 523 | 134 005 | 175 400 | 1 918 362 |
| Blueberry West–Baldonnel | 22 641 | 18 894 | 21 433 | 7 587 | 29 636 | 8 817 | ----- | ----- | ----- | ----- | 21 077 | 25 750 | 155 835 |
| Boundary Lake– | | | | | | | | | | | | | |
| Bluesky | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 12 334 | 10 383 | 10 966 | 33 683 |
| Gething | 53 132 | 45 920 | 53 826 | 46 384 | 52 791 | 39 945 | ----- | 23 228 | 58 748 | 63 723 | 38 226 | 51 080 | 527 003 |
| Baldonnel | 64 811 | 64 459 | 71 112 | 62 753 | 63 394 | 55 760 | ----- | 34 224 | 62 992 | 41 779 | 61 674 | 63 070 | 646 028 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boundary Lake—*Continued* | | | | | | | | | | | | | |
| Cecil[1] | 266 | 240 | 368 | 342 | 332 | 255 | 165 | 219 | 328 | 310 | 269 | 320 | 3 414 |
| Boundary Lake[1] | 231 251 | 184 828 | 194 985 | 207 108 | 153 646 | 234 760 | 180 055 | 247 594 | 263 962 | 240 117 | 230 571 | 243 800 | 2 612 677 |
| Basal Boundary | 9 775 | 9 243 | 10 453 | 9 815 | 9 821 | 7 658 | ----- | 4 873 | 9 328 | 8 717 | 7 383 | 8 972 | 96 038 |
| Halfway | 3 400 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 3 400 |
| Halfway[1] | 3 346 | 3 518 | 3 298 | 3 805 | 2 848 | 4 795 | 5 311 | 5 842 | 6 919 | 4 942 | 7 429 | 25 426 | 77 479 |
| Field totals | 365 981 | 308 208 | 334 042 | 330 207 | 282 832 | 343 173 | 185 531 | 315 980 | 402 277 | 371 922 | 355 936 | 403 634 | 3 999 722 |
| Boundary Lake North— | | | | | | | | | | | | | |
| Halfway | 109 632 | 90 721 | 138 213 | 135 670 | 108 776 | 34 007 | ----- | ----- | ----- | 43 858 | 94 342 | 80 405 | 835 654 |
| Halfway[1] | 1 791 | 1 226 | 642 | 926 | 761 | 1 275 | 1 032 | 1 391 | 1 422 | 1 750 | 1 469 | 1 196 | 14 881 |
| Field totals | 111 423 | 91 947 | 138 855 | 136 596 | 109 537 | 35 282 | 1 032 | 1 391 | 1 422 | 45 608 | 95 811 | 81 601 | 850 535 |
| Bubbles—Baldonnel | 179 635 | 154 174 | 68 876 | 165 621 | 99 970 | ----- | ----- | ----- | 24 674 | 169 497 | 262 369 | 198 001 | 1 322 817 |
| Bubbles North—Halfway | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 4 780 | ----- | ----- | 4 780 |
| Buick Creek— | | | | | | | | | | | | | |
| Bluesky | 107 601 | 95 545 | 141 713 | 161 363 | 125 736 | 20 990 | 24 130 | 81 094 | 126 911 | 116 653 | 171 690 | 141 191 | 1 314 617 |
| Gething | 22 398 | 33 380 | 31 170 | ----- | ----- | ----- | ----- | ----- | ----- | 8 899 | 4 683 | 29 217 | 129 747 |
| Dunlevy | 1 047 423 | 898 928 | 1 058 668 | 1 005 388 | 923 585 | 597 132 | 501 812 | 693 958 | 999 960 | 913 679 | 1 075 903 | 1 312 414 | 11 028 850 |
| Dunlevy[1] | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 219 | 541 | 233 | 87 | ----- | 1 080 |
| Cecil | 3 737 | 460 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 4 197 |
| Dolg[1] | 3 697 | 12 588 | 6 227 | ----- | ----- | 25 854 | 34 610 | 35 369 | 58 093 | 42 537 | 75 290 | 33 366 | 327 631 |
| Field totals | 1 184 856 | 1 040 901 | 1 237 778 | 1 166 751 | 1 049 321 | 643 976 | 560 552 | 810 640 | 1 185 505 | 1 082 001 | 1 327 653 | 1 516 188 | 12 806 122 |
| Buick Creek North— | | | | | | | | | | | | | |
| Bluesky | 116 817 | 141 849 | 129 355 | 110 053 | 129 418 | 150 750 | 129 210 | 116 920 | 134 700 | 167 452 | 154 105 | 175 989 | 1 655 618 |
| Dunlevy | 201 501 | 157 334 | 105 660 | 75 556 | 104 287 | 117 588 | 86 031 | 109 115 | 127 270 | 130 429 | 104 024 | 159 736 | 1 478 531 |
| Field totals | 318 318 | 299 183 | 235 015 | 185 609 | 233 705 | 268 338 | 215 241 | 225 035 | 261 970 | 297 881 | 258 129 | 335 725 | 3 134 149 |
| Buick Creek West— | | | | | | | | | | | | | |
| Bluesky | 241 676 | 237 710 | 280 985 | 150 572 | 132 273 | 121 252 | 127 406 | 213 071 | 260 255 | 180 744 | 175 781 | 251 988 | 2 373 713 |
| Dunlevy | 105 593 | 122 213 | 118 785 | 102 549 | 120 941 | 111 452 | 85 613 | 94 028 | 97 306 | 119 343 | 111 939 | 103 263 | 1 293 025 |
| Baldonnel | 4 317 | 2 857 | 457 | 4 319 | 6 240 | 10 420 | 6 274 | 2 664 | 12 424 | 10 723 | 14 507 | 7 927 | 83 129 |
| Field totals | 351 586 | 362 780 | 400 227 | 257 440 | 259 454 | 243 124 | 219 293 | 369 763 | 369 985 | 310 810 | 302 227 | 363 178 | 3 749 867 |
| Bulrush—Halfway[1] | 67 962 | 63 408 | 72 279 | 58 814 | 45 871 | 78 145 | 89 018 | 100 687 | 91 759 | 69 393 | 36 143 | 45 593 | 819 072 |
| Cabin—Slave Point | 319 156 | 252 057 | 308 068 | 292 125 | 214 823 | 198 867 | 173 398 | 132 644 | 173 759 | 305 713 | 282 571 | 273 997 | 2 926 998 |
| Cache Creek— | | | | | | | | | | | | | |
| Coplin | 95 895 | 80 713 | 92 788 | 57 969 | 52 459 | 47 700 | 46 195 | 50 140 | 35 481 | 40 630 | 76 449 | 88 495 | 764 914 |
| Halfway | 44 389 | 4 341 | 92 402 | 51 754 | 22 020 | 21 232 | 33 932 | ----- | ----- | 6 192 | 17 642 | ----- | 294 624 |
| Field totals | 140 284 | 85 054 | 185 190 | 109 723 | 74 479 | 68 932 | 80 127 | 50 140 | 35 481 | 47 542 | 94 091 | 88 495 | 1 059 538 |
| Cecil Lake— | | | | | | | | | | | | | |
| Cecil[1] | 509 | 1 765 | 1 292 | ----- | 1 553 | 1 746 | 1 067 | 1 099 | 1 043 | 1 036 | 989 | 1 008 | 13 107 |
| North Pine[1] | 18 431 | 3 670 | 2 238 | 437 | 69 | 244 | 377 | 133 | 3 325 | 5 038 | 5 010 | 4 195 | 43 167 |
| Field totals | 18 940 | 4 535 | 3 530 | 437 | 1 622 | 1 990 | 1 444 | 1 232 | 4 368 | 6 074 | 5 999 | 5 203 | 56 274 |

[1] Associated gas

## Table 4-7—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1978 – Continued

| Field and Pool | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clarke Lake—Slave Point | 5 373 774 | 5 388 506 | 4 482 875 | 3 628 641 | 3 678 827 | 1 854 377 | 3 742 112 | 4 576 617 | 3 779 141 | 3 291 646 | 4 834 607 | 5 253 608 | 49 684 731 |
| Crush—Halfway[1] | 17 329 | 16 634 | 19 052 | 17 761 | 9 606 | 10 079 | 9 677 | 17 099 | 13 404 | 13 191 | 10 968 | 12 946 | 167 746 |
| Currant—Halfway[1] | 27 582 | 21 372 | 12 334 | 8 462 | 24 998 | 62 002 | 2 963 | 10 345 | 13 533 | 7 676 | 37 372 | 11 825 | 240 464 |
| Currant West—Halfway | ---- | 62 631 | 61 669 | 37 770 | 24 114 | 32 789 | 24 124 | ---- | ---- | 22 816 | 65 181 | 61 796 | 392 890 |
| Dahl—Bluesky | ---- | 6 756 | 4 183 | ---- | ---- | 230 927 | 49 091 | ---- | ---- | 8 764 | 228 705 | 403 104 | 931 520 |
| Dilly—Slave Point | ---- | ---- | ---- | ---- | ---- | 81 809 | 54 176 | 26 180 | 90 874 | 78 612 | 69 964 | 83 752 | 485 367 |
| Eagle— | | | | | | | | | | | | | |
| Siphon[1] | 796 | 776 | ---- | 629 | 7 | 324 | 565 | 427 | 671 | 920 | 979 | 846 | 6 940 |
| Cecil | ---- | ---- | 30 164 | 69 419 | 39 705 | 32 424 | 31 606 | 43 731 | 56 136 | 51 092 | 51 960 | 55 227 | 461 463 |
| Belloy[1] | 44 670 | 54 738 | 75 354 | 65 068 | 62 023 | 93 987 | 69 815 | 102 047 | 98 081 | 92 321 | 94 901 | 85 119 | 938 124 |
| Lower Belloy | ---- | ---- | ---- | ---- | 3 114 | 11 414 | 15 541 | 12 995 | 11 815 | 12 103 | 10 958 | 9 788 | 87 728 |
| Field totals | 45 466 | 55 514 | 105 518 | 135 116 | 104 849 | 138 149 | 117 526 | 159 200 | 166 703 | 156 136 | 158 798 | 150 980 | 1 494 255 |
| Farrell Creek— | | | | | | | | | | | | | |
| Charlie Lake | 72 366 | 55 285 | 38 658 | 45 478 | ---- | ---- | ---- | ---- | ---- | 46 633 | 69 131 | 77 763 | 405 314 |
| Halfway | 35 475 | 29 623 | 16 313 | 30 544 | ---- | ---- | ---- | ---- | ---- | 29 667 | 36 575 | 37 120 | 215 257 |
| Field totals | 107 781 | 84 908 | 54 971 | 76 022 | ---- | ---- | ---- | ---- | ---- | 76 300 | 105 706 | 114 883 | 620 571 |
| Fireweed— | | | | | | | | | | | | | |
| Bluesky | 188 597 | 110 033 | 142 688 | 141 526 | 85 935 | 164 238 | 117 745 | 49 763 | 14 650 | 166 329 | 164 563 | 150 431 | 1 496 484 |
| Dunlevy | 421 278 | 365 467 | 392 204 | 322 028 | 328 078 | 272 907 | 270 412 | 100 935 | 115 816 | 243 381 | 435 330 | 474 021 | 3 741 857 |
| Dunlevy[1] | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 505 | 512 | 1 384 | 2 401 |
| Baldonnel | 6 584 | 10 013 | 8 530 | 2 934 | 6 995 | 8 834 | 7 670 | 5 164 | 4 983 | 8 205 | 7 351 | 6 444 | 83 707 |
| Debolt | ---- | 3 012 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 3 012 |
| Field totals | 616 459 | 488 525 | 543 422 | 466 488 | 421 008 | 445 979 | 395 827 | 155 862 | 135 449 | 418 416 | 607 746 | 632 280 | 5 327 461 |
| Flatrock— | | | | | | | | | | | | | |
| Siphon | ---- | ---- | ---- | ---- | ---- | ---- | 7 951 | ---- | ---- | 24 277 | 63 354 | 70 452 | 166 034 |
| Boundary Lake[1] | ---- | ---- | ---- | ---- | ---- | 671 | 545 | 586 | 414 | 499 | 395 | 540 | 3 650 |
| Halfway | 224 261 | 209 499 | 214 292 | 216 087 | 135 083 | 91 467 | 125 629 | ---- | 33 940 | 120 242 | 184 143 | 210 832 | 1 765 475 |
| Halfway[1] | 524 | 1 816 | 1 404 | ---- | ---- | 1 050 | 2 730 | 5 374 | 5 244 | ---- | ---- | 1 026 | 19 168 |
| Field totals | 224 785 | 211 315 | 215 696 | 216 087 | 135 083 | 93 188 | 136 855 | 5 960 | 39 598 | 145 018 | 247 892 | 282 850 | 1 954 327 |
| Flatrock West—Halfway | 61 598 | 77 651 | 38 476 | 26 007 | 36 168 | 44 226 | 39 499 | ---- | ---- | 48 504 | 99 720 | 107 887 | 577 736 |
| Fort St. John— | | | | | | | | | | | | | |
| Baldonnel | 96 527 | 11 151 | 130 226 | 107 285 | 110 060 | 116 387 | 115 074 | ---- | 11 865 | 61 539 | 111 776 | 135 927 | 1 007 817 |
| Charlie Lake[1] | 18 359 | 6 027 | 27 896 | 25 885 | 13 609 | 37 198 | 30 059 | 37 803 | 36 136 | 26 062 | 41 641 | 59 633 | 360 308 |
| Halfway | 127 667 | 85 440 | 137 783 | 130 031 | 98 917 | 124 851 | 88 880 | ---- | 27 299 | 61 732 | 96 819 | 49 869 | 1 029 294 |
| Belloy | 17 063 | 2 126 | 34 639 | 25 827 | 21 931 | 24 335 | 25 280 | ---- | 1 512 | 14 807 | 28 762 | 24 886 | 221 168 |
| Field totals | 259 616 | 104 744 | 330 544 | 289 028 | 244 517 | 362 777 | 259 293 | 37 803 | 76 812 | 164 140 | 278 998 | 270 315 | 2 618 587 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fort St. John Southeast– | | | | | | | | | | | | | |
| Baldonnel | 6 317 | 25 327 | 38 037 | 47 736 | 7 852 | 39 782 | 39 494 | ------ | ------ | 25 849 | 31 355 | 31 212 | 292 261 |
| Siphon | 32 074 | 88 395 | 74 907 | 81 312 | 13 266 | ------ | 53 830 | ------ | ------ | 39 406 | 57 243 | 76 707 | 517 140 |
| Halfway | 7 397 | 23 045 | 43 984 | 44 747 | 10 399 | 51 713 | 41 165 | ------ | ------ | 35 099 | 42 139 | 53 719 | 353 407 |
| Belloy | 29 037 | 88 708 | 91 176 | 92 121 | 14 366 | 107 075 | 114 555 | ------ | ------ | 70 756 | 70 537 | 90 878 | 769 209 |
| Field totals | 74 825 | 225 475 | 248 104 | 265 916 | 46 883 | 198 570 | 249 044 | ------ | ------ | 171 110 | 201 274 | 252 516 | 1 932 717 |
| Goose–North Pine | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 28 189 | 103 749 | 107 534 | 239 472 |
| Gote–Sulphur Point | 233 111 | 197 205 | 224 394 | 157 786 | 68 384 | 13 936 | ------ | 35 054 | 106 300 | 136 755 | 146 000 | 146 000 | 1 464 985 |
| Grizzly North–Dunlevy | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 162 783 | 162 783 |
| Grizzly South–Dunlevy | ------ | ------ | ------ | ------ | ------ | 34 780 | ------ | ------ | ------ | ------ | ------ | 687 063 | 721 843 |
| Gundy Creek– | | | | | | | | | | | | | |
| Dunlevy | 2 389 | 1 863 | ------ | 2 880 | 3 009 | 2 257 | 1 830 | ------ | ------ | ------ | 2 546 | 1 919 | 18 693 |
| Baldonnel | 102 108 | 85 079 | 74 948 | 75 668 | 82 083 | 93 579 | 77 136 | ------ | ------ | ------ | 62 225 | 80 063 | 732 889 |
| Field totals | 104 497 | 86 942 | 74 948 | 78 548 | 85 092 | 95 836 | 78 966 | ------ | ------ | ------ | 64 771 | 81 982 | 751 582 |
| Gundy Creek West– | | | | | | | | | | | | | |
| Dunlevy | ------ | 26 443 | 99 563 | 95 461 | 100 635 | 78 033 | 54 163 | 37 070 | 129 735 | 138 397 | 110 553 | 89 539 | 959 592 |
| Baldonnel | ------ | 42 275 | 94 845 | 90 504 | 85 688 | 86 901 | 69 101 | 11 819 | 108 355 | 106 476 | 68 785 | 66 906 | 831 655 |
| Field totals | ------ | 68 718 | 194 408 | 185 965 | 186 323 | 164 934 | 123 264 | 48 889 | 238 090 | 244 873 | 179 338 | 156 445 | 1 791 247 |
| Helmet– | | | | | | | | | | | | | |
| Jean Marie | 12 800 | 44 768 | 23 652 | 36 645 | 48 338 | 34 670 | 41 145 | 25 612 | 22 568 | 32 384 | 23 953 | 23 246 | 369 781 |
| Slave Point | 1 655 749 | 1 491 205 | 1 630 875 | 710 028 | 870 671 | 752 886 | 806 694 | 875 068 | 955 715 | 1 125 540 | 1 682 205 | 1 900 008 | 14 456 644 |
| Field totals | 1 668 549 | 1 535 973 | 1 654 527 | 746 673 | 919 009 | 787 556 | 847 839 | 900 680 | 978 283 | 1 157 924 | 1 706 158 | 1 923 254 | 14 826 425 |
| Inga– | | | | | | | | | | | | | |
| Dunlevy | 140 939 | 125 314 | 140 066 | 99 807 | 104 552 | 107 825 | 96 527 | 31 574 | 24 031 | 69 276 | 124 519 | 100 125 | 1 164 355 |
| Gething | ------ | 21 052 | 19 771 | 17 597 | 15 999 | 10 566 | 7 756 | 4 916 | 4 422 | 4 916 | 9 397 | 9 961 | 126 363 |
| Inga | 603 990 | 467 700 | 556 687 | 444 240 | 200 723 | 164 643 | 182 557 | ------ | 41 450 | 616 070 | 609 716 | 859 576 | 4 546 362 |
| Inga[1] | 191 264 | 178 773 | 179 187 | 192 959 | 187 898 | 145 591 | 140 831 | 181 130 | 169 351 | 173 747 | 165 908 | 192 694 | 2 099 333 |
| Coplin | 66 785 | 58 324 | 63 451 | 63 001 | 32 570 | 41 257 | 38 350 | ------ | ------ | 40 904 | 63 951 | 62 034 | 529 627 |
| Field totals | 1 001 978 | 851 163 | 958 162 | 817 604 | 541 742 | 469 882 | 465 821 | 217 620 | 239 264 | 904 913 | 973 491 | 1 024 390 | 8 466 030 |
| Jedney– | | | | | | | | | | | | | |
| Baldonnel | 617 770 | 548 728 | 581 842 | 566 826 | 278 365 | 436 917 | 451 414 | ------ | 29 884 | 372 269 | 582 860 | 563 283 | 5 030 158 |
| Halfway | 534 053 | 485 106 | 498 657 | 459 437 | 235 439 | 284 905 | 381 011 | ------ | 25 528 | 211 350 | 450 980 | 435 187 | 4 001 653 |
| Field totals | 1 151 823 | 1 033 834 | 1 080 499 | 1 026 263 | 513 804 | 721 822 | 832 425 | ------ | 55 412 | 583 619 | 1 033 840 | 998 470 | 9 031 811 |
| Julienne Creek–Halfway | 26 583 | 24 045 | 30 802 | 29 495 | 20 529 | 24 843 | 28 508 | ------ | 1 055 | 15 551 | 25 809 | 25 549 | 252 769 |
| Julienne Creek North–Debolt | ------ | ------ | ------ | ------ | ------ | ------ | 47 793 | ------ | 38 451 | 78 050 | 71 261 | 91 026 | 326 581 |
| Julienne Creek South–Debolt | ------ | 76 043 | 95 058 | 49 857 | 87 966 | 22 320 | ------ | ------ | 64 442 | 77 357 | 68 819 | 56 945 | 598 807 |
| Klua– | | | | | | | | | | | | | |
| Debolt | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 132 | 2 466 | 3 598 |
| Slave Point | 300 375 | 293 711 | 321 545 | 285 275 | 394 051 | 314 453 | 170 088 | 236 222 | 338 364 | 492 859 | 576 721 | 631 804 | 4 355 468 |
| Pine Point | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 60 860 | 60 860 |
| Confidential | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 89 430 | 159 224 | 248 654 |
| Field totals | 300 375 | 293 711 | 321 545 | 285 275 | 394 051 | 314 453 | 170 088 | 236 222 | 338 364 | 492 859 | 667 283 | 854 354 | 4 668 580 |

[1] Associated gas

## Table 4-7—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1978 – Continued

| Field and Pool | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kobes–Townsend– | | | | | | | | | | | | | |
| Duntevy | 19 785 | 18 013 | 9 670 | 16 765 | ------ | ------ | ------ | ------ | ------ | 7 680 | 14 722 | 16 202 | 102 837 |
| Charlie Lake | 14 713 | 12 678 | 7 968 | 41 051 | ------ | ------ | ------ | ------ | ------ | 28 950 | 69 645 | 64 490 | 239 495 |
| Halfway | 251 812 | 151 875 | 144 074 | 213 279 | ------ | ------ | ------ | 16 067 | 57 891 | 113 486 | 307 900 | 339 785 | 1 596 169 |
| Debolt | 70 984 | 62 943 | 69 548 | 54 758 | ------ | ------ | ------ | ------ | ------ | ------ | 21 508 | 64 912 | 344 653 |
| Field totals | 357 294 | 245 509 | 231 260 | 325 853 | ------ | ------ | ------ | 16 067 | 57 891 | 150 116 | 413 775 | 485 389 | 2 283 154 |
| Kotcho Lake–Slave Point | 197 430 | 201 426 | 300 925 | 271 239 | 285 807 | 278 397 | 281 320 | 266 219 | 291 692 | 273 083 | 300 410 | 322 471 | 3 270 419 |
| Kotcho Lake East– | | | | | | | | | | | | | |
| Bluesky | 57 106 | 61 707 | 49 039 | 58 632 | 17 695 | ------ | ------ | ------ | 5 983 | 70 921 | 41 203 | 51 280 | 413 566 |
| Slave Point | 377 746 | 432 434 | 367 688 | 488 105 | 278 611 | 150 418 | 158 541 | 164 125 | 132 056 | 274 890 | 325 953 | 296 599 | 3 407 159 |
| Field totals | 434 852 | 494 131 | 416 727 | 506 740 | 296 306 | 150 418 | 158 541 | 164 125 | 138 039 | 345 811 | 367 156 | 347 879 | 3 820 725 |
| Laprise Creek– | | | | | | | | | | | | | |
| Gething | 7 659 | 11 658 | 7 923 | 5 025 | 7 782 | 7 778 | 6 555 | 4 070 | 4 276 | 2 458 | 6 168 | ------ | 71 361 |
| Baldonnel | 2 511 459 | 2 259 892 | 2 507 502 | 2 244 971 | 2 184 423 | 1 488 101 | 1 197 146 | 1 670 258 | 2 044 391 | 1 557 870 | 1 707 633 | 2 119 943 | 23 493 589 |
| Nancy | ------ | ------ | ------ | 10 113 | 30 848 | 31 526 | 31 801 | 21 759 | 23 263 | 30 081 | 34 463 | 32 439 | 246 293 |
| Field totals | 2 519 118 | 2 271 550 | 2 515 434 | 2 260 109 | 2 223 053 | 1 527 405 | 1 235 502 | 1 696 087 | 2 071 930 | 1 590 409 | 1 748 264 | 2 152 382 | 23 811 243 |
| Louise–Slave Point | 57 782 | 50 134 | 55 200 | 58 702 | 58 290 | 55 632 | 130 | ------ | 21 682 | 68 580 | 61 534 | 63 129 | 550 795 |
| Mica– | | | | | | | | | | | | | |
| Boundary Lake[1] | 1 528 | 1 220 | 1 303 | 1 060 | 1 077 | 896 | 160 | 340 | 287 | 1 424 | 147 | 305 | 9 747 |
| Mica[1] | 1 494 | 1 249 | 1 362 | 1 050 | 1 536 | 1 518 | 2 981 | 5 179 | 3 058 | 2 874 | 6 092 | 5 058 | 32 541 |
| Field totals | 3 022 | 2 469 | 2 665 | 2 110 | 2 613 | 2 414 | 3 141 | 5 519 | 3 345 | 4 298 | 5 239 | 5 363 | 42 198 |
| Mike–Gething[1] | 2 956 | 6 232 | 6 788 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 871 | 3 937 | 20 784 |
| Milligan Creek– | | | | | | | | | | | | | |
| Gething | 5 970 | 8 075 | 7 934 | 8 345 | 6 333 | 5 384 | 3 658 | 8 257 | 4 874 | 4 172 | 5 265 | 5 168 | 73 435 |
| Halfway[1] | 13 622 | 14 233 | 16 206 | 14 622 | 11 803 | 5 478 | 8'575 | 13 646 | 13 377 | 16 183 | 13 033 | 13 616 | 154 394 |
| Field totals | 19 592 | 22 308 | 24 140 | 22 967 | 18 136 | 10 862 | 12 233 | 21 903 | 18 251 | 20 355 | 18 298 | 18 784 | 227 829 |
| Milligan Creek West–Halfway | 20 539 | 97 420 | 136 254 | 124 647 | 88 466 | 62 124 | 72 563 | 27 344 | 852 | 32 518 | 108 686 | 107 286 | 878 729 |
| Monias–Halfway | ------ | ------ | ------ | ------ | ------ | 584 345 | ------ | ------ | ------ | 17 741 | 634 769 | 842 009 | 2 078 864 |
| Montney–Confidential[1] | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 469 | ------ | ------ | 469 |
| Nettle–Halfway | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 23 270 | 23 270 |
| Nig Creek– | | | | | | | | | | | | | |
| Baldonnel | 754 515 | 666 553 | 627 928 | 640 766 | 433 060 | 328 187 | 204 761 | 432 668 | 379 795 | 560 220 | 706 725 | 752 155 | 6 487 333 |
| Baldonnel[1] | ------ | ------ | ------ | ------ | ------ | ------ | 1 674 | 471 | 1 062 | 279 | ------ | ------ | 3 486 |
| Field totals | 754 515 | 666 553 | 627 928 | 640 766 | 433 060 | 328 187 | 206 435 | 433 139 | 380 857 | 560 499 | 706 725 | 752 155 | 6 490 819 |
| North Pine–North Pine | 37 767 | 8 010 | ------ | 18 118 | 36 437 | 1 227 | 33 745 | 28 475 | 33 244 | 26 636 | 11 728 | 23 715 | 259 102 |
| North Pine–North Pine[1] | ------ | 1 782 | ------ | ------ | ------ | ------ | ------ | 632 | 10 741 | 4 605 | ------ | ------ | 17 260 |
| Field totals | 37 767 | 9 792 | ------ | 18 118 | 36 437 | 1 227 | 33 745 | 29 107 | 43 985 | 31 241 | 11 728 | 23 715 | 276 862 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oak– | | | | | | | | | | | | | |
| Cecil | 256 | 459 | 491 | 579 | 447 | ----- | ----- | ----- | ----- | ----- | 256 | 329 | 2 817 |
| Halfway | 234 992 | 188 009 | 225 406 | 185 215 | 140 964 | 249 137 | 204 469 | ----- | ----- | 141 039 | 248 205 | 220 761 | 2 038 197 |
| Halfway[1] | 5 910 | 2 838 | 2 075 | 8 011 | 13 754 | 11 431 | 7 413 | 14 435 | 13 422 | 14 533 | 13 345 | 11 823 | 118 990 |
| Field totals | 241 158 | 191 306 | 227 972 | 193 805 | 155 165 | 260 568 | 211 882 | 14 435 | 13 422 | 155 572 | 261 806 | 232 913 | 2 160 004 |
| Osprey– | | | | | | | | | | | | | |
| Bluesky | ----- | 3 093 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 5 200 | 8 293 |
| Gething | 44 585 | 42 695 | 28 080 | 739 | 25 078 | 18 510 | 25 717 | 259 | 6 468 | 14 868 | 2 736 | ----- | 209 735 |
| Halfway | 34 344 | 20 747 | 11 668 | 2 524 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 69 283 |
| Halfway[1] | 5 858 | 6 363 | 6 466 | 6 131 | 7 179 | 8 097 | 5 120 | 2 913 | 6 992 | 8 242 | 7 527 | 4 051 | 74 939 |
| Field totals | 84 787 | 72 898 | 46 214 | 9 394 | 32 257 | 26 607 | 30 837 | 3 172 | 13 460 | 23 110 | 10 263 | 9 251 | 362 250 |
| Paradise–Halfway | ----- | ----- | ----- | ----- | 22 962 | 47 071 | 39 321 | ----- | ----- | 41 046 | 57 595 | 36 318 | 244 313 |
| Parkland–Wabamun | 343 990 | 320 528 | 330 720 | 330 355 | 343 232 | 225 458 | 303 897 | 346 493 | 341 525 | 353 014 | 293 280 | 339 259 | 3 871 751 |
| Pesjay– | | | | | | | | | | | | | |
| Gething | 48 420 | 37 698 | 42 671 | 36 261 | 22 320 | 38 590 | 19 888 | 1 571 | 24 645 | 29 246 | 37 214 | 34 647 | 373 171 |
| Baldonnel | 86 474 | 68 740 | 77 014 | 56 247 | 43 812 | 21 102 | ----- | 5 315 | 45 694 | 58 593 | 80 408 | 61 646 | 605 046 |
| Halfway | 118 464 | 83 407 | 112 196 | 81 451 | 45 235 | 55 513 | 37 100 | 2 154 | 26 625 | 73 792 | 100 353 | 113 807 | 850 097 |
| Halfway[1] | 53 139 | 48 786 | 55 982 | 53 117 | 50 517 | 47 177 | 32 004 | 47 023 | 51 079 | 58 145 | 50 881 | 51 807 | 599 657 |
| Field totals | 306 497 | 238 631 | 287 863 | 227 076 | 161 884 | 162 382 | 88 992 | 56 064 | 148 043 | 219 776 | 268 856 | 261 907 | 2 427 971 |
| Pesjay West–Halfway[1] | 60 021 | 59 802 | 68 654 | 65 396 | 46 935 | 56 600 | 42 756 | 66 648 | 43 213 | 69 017 | 40 652 | 12 007 | 651 701 |
| Petitot River–Slave Point | 228 330 | 167 234 | 210 276 | 206 294 | 155 808 | 146 899 | 69 583 | 149 007 | 182 006 | 202 301 | 170 919 | 186 489 | 2 075 046 |
| Red Creek–Halfway | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 12 176 | 8 535 | 20 711 |
| Rigel– | | | | | | | | | | | | | |
| Bluesky | 10 389 | 9 342 | 10 199 | 9 399 | 8 047 | 7 939 | 7 158 | 7 570 | 8 405 | 6 315 | 7 492 | 8 966 | 101 221 |
| Dunlevy | 1 345 068 | 1 250 878 | 1 361 169 | 1 192 826 | 708 283 | 729 022 | 542 008 | 877 896 | 1 231 710 | 723 111 | 978 361 | 1 230 274 | 12 170 626 |
| Dunlevy[1] | 29 481 | 29 946 | 38 504 | 38 400 | 37 194 | 30 858 | 40 059 | 36 358 | 38 126 | 37 526 | 30 316 | 34 088 | 420 856 |
| Field totals | 1 384 958 | 1 290 166 | 1 409 872 | 1 240 625 | 753 524 | 767 819 | 589 225 | 921 824 | 1 278 241 | 766 952 | 1 016 169 | 1 273 328 | 12 692 703 |
| Rigel East–Gething | 87 147 | 75 725 | 80 201 | 53 302 | 54 335 | 39 059 | 28 346 | 40 796 | 70 071 | 65 546 | 77 287 | 89 314 | 759 129 |
| Roger–Pine Point | 975 740 | 887 008 | 942 645 | 469 621 | 570 743 | 393 977 | 356 796 | 471 523 | 515 818 | 737 114 | 889 666 | 987 100 | 8 197 051 |
| Sierra– | | | | | | | | | | | | | |
| Pine Point | 3 728 058 | 2 947 212 | 2 598 276 | 2 055 694 | 1 764 065 | 1 328 235 | 1 686 936 | 2 310 120 | 1 737 835 | 2 059 008 | 2 909 176 | 3 226 046 | 28 330 661 |
| Confidential | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 319 487 | 319 487 |
| Field totals | 3 728 058 | 2 947 212 | 2 598 276 | 2 055 694 | 1 764 065 | 1 328 235 | 1 686 936 | 2 310 120 | 1 737 835 | 2 059 008 | 2 909 176 | 3 545 533 | 28 650 148 |
| Silver– | | | | | | | | | | | | | |
| Bluesky | ----- | ----- | ----- | ----- | ----- | 168 155 | 253 | ----- | ----- | 7 526 | 316 671 | 419 006 | 911 611 |
| Halfway | ----- | ----- | ----- | ----- | ----- | 10 354 | 31 435 | 558 | ----- | ----- | 62 084 | 79 541 | 183 972 |
| Field totals | ----- | ----- | ----- | ----- | ----- | 178 509 | 31 688 | 558 | ----- | 7 526 | 378 755 | 498 547 | 1 095 583 |
| Silverberry–Coplin | 45 065 | 42 822 | 42 414 | 31 699 | 29 466 | 26 474 | 27 751 | 21 245 | 44 593 | 28 442 | 28 814 | 40 180 | 408 963 |
| Siphon– | | | | | | | | | | | | | |
| Dunlevy | 274 209 | 240 906 | 261 471 | 189 136 | 120 619 | 9 434 | 36 354 | ----- | ----- | 166 259 | 273 306 | 259 851 | 1 830 545 |
| Siphon | 48 176 | 29 635 | 34 089 | 25 747 | 18 412 | 306 | 3 822 | ----- | 1 728 | 29 860 | 45 835 | 45 970 | 283 580 |
| Halfway | 103 351 | 81 654 | 108 367 | 98 452 | 60 581 | 5 931 | 13 761 | 84 | ----- | 74 246 | 119 885 | 87 301 | 753 613 |
| Field totals | 425 736 | 352 195 | 403 927 | 313 335 | 199 612 | 15 671 | 53 937 | 84 | 1 728 | 269 365 | 439 026 | 393 122 | 2 867 738 |

[1]Associated gas

## *Table 4-7—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1978 – Continued*

| Field and Pool | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Siphon East–Bluesky | 259 947 | 260 970 | 298 459 | 187 876 | 173 714 | 21 792 | ------ | 60 660 | 85 899 | 65 671 | 145 717 | 155 606 | 1 716 311 |
| Stoddart– | | | | | | | | | | | | | |
| Baldonnel | ------ | ------ | ------ | ------ | ------ | 3 941 | 4 262 | ------ | ------ | ------ | ------ | ------ | 8 203 |
| Cecil[1] | 7 912 | 3 258 | 254 | 4 264 | 2 946 | 10 062 | 12 815 | 5 696 | 7 018 | 6 657 | 5 190 | 3 424 | 69 496 |
| Belloy | 712 827 | 512 469 | 530 989 | 927 565 | 991 880 | 632 601 | 648 966 | 730 331 | 946 883 | 846 972 | 892 552 | 978 973 | 9 352 008 |
| Belloy[1] | 3 319 | 3 069 | 3 472 | 2 367 | 1 647 | 1 978 | 2 962 | 2 831 | 2 190 | 2 643 | 2 970 | 2 435 | 31 883 |
| Field totals | 724 058 | 518 796 | 534 715 | 934 196 | 996 473 | 644 641 | 664 743 | 738 858 | 956 091 | 856 272 | 900 712 | 984 832 | 9 453 387 |
| Stoddart South–Confidential | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 350 | 350 |
| Stoddart West– | | | | | | | | | | | | | |
| Cecil | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 4 920 | 74 593 | 79 513 |
| Belloy | 236 859 | 215 734 | 196 304 | 237 286 | 231 776 | 161 354 | 199 709 | 114 433 | 196 417 | 235 628 | 291 760 | 258 858 | 2 576 118 |
| Belloy[1] | 420 | 3 807 | 6 109 | 2 267 | 886 | 5 863 | 5 754 | 8 036 | 7 540 | 11 860 | 18 892 | 38 672 | 110 106 |
| Field totals | 237 279 | 219 541 | 202 413 | 239 553 | 232 662 | 167 217 | 205 463 | 122 469 | 203 957 | 247 488 | 315 572 | 372 123 | 2 765 737 |
| Sunrise–Cadotte | ------ | ------ | 13 672 | 19 319 | 19 303 | 16 508 | 17 270 | 16 602 | 15 546 | 15 114 | 13 315 | 13 897 | 160 546 |
| Town– | | | | | | | | | | | | | |
| Baldonnel | 52 377 | 46 826 | 51 968 | 22 072 | 9 795 | 29 807 | 48 667 | ------ | ------ | 7 686 | 37 364 | 41 288 | 347 850 |
| Halfway | 88 128 | 73 448 | 76 552 | 35 279 | 52 999 | 77 761 | 57 855 | ------ | ------ | 29 850 | 79 837 | 66 282 | 637 991 |
| Field totals | 140 505 | 120 274 | 128 520 | 57 351 | 62 794 | 107 568 | 106 522 | ------ | ------ | 37 536 | 117 201 | 107 570 | 985 841 |
| Tsea–Slave Point | 96 462 | 5 267 | 43 951 | 54 749 | 118 519 | 91 815 | 103 867 | 96 816 | 111 072 | 107 751 | 102 005 | 87 674 | 1 019 948 |
| Two Rivers–Halfway | 123 214 | 111 257 | 121 246 | 120 068 | 77 396 | 44 279 | 32 520 | ------ | 17 994 | 110 674 | 99 416 | 119 148 | 977 212 |
| Velma– | | | | | | | | | | | | | |
| Gething | ------ | ------ | ------ | ------ | ------ | 150 652 | 51 909 | ------ | ------ | 18 164 | 143 200 | 248 429 | 612 354 |
| Charlie Lake[1] | 461 | ------ | 160 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 621 |
| A Marker | ------ | ------ | ------ | ------ | ------ | 36 931 | 9 414 | ------ | ------ | 1 146 | 551 | 32 141 | 80 183 |
| Field totals | 461 | ------ | 160 | ------ | ------ | 187 583 | 61 323 | ------ | ------ | 19 310 | 143 751 | 280 570 | 693 158 |
| Weasel– | | | | | | | | | | | | | |
| Baldonnel | 2 349 | 1 481 | 1 478 | 1 641 | 2 580 | 1 531 | 354 | 1 428 | 1 543 | 1 436 | 1 735 | 1 990 | 19 546 |
| Halfway[1] | 29 007 | 24 164 | 33 267 | 32 510 | 36 765 | 27 756 | 21 494 | 23 204 | 33 999 | 31 602 | 30 813 | 28 955 | 347 536 |
| Field totals | 31 356 | 25 645 | 34 745 | 34 151 | 39 345 | 29 287 | 21 848 | 24 632 | 35 542 | 33 038 | 32 548 | 30 945 | 367 082 |
| Weasel West–Halfway[1] | 3 126 | 3 132 | 3 327 | 3 034 | 3 549 | 727 | ------ | ------ | 1 269 | 2 662 | 3 615 | 3 287 | 27 728 |
| Wilder– | | | | | | | | | | | | | |
| Halfway | 200 315 | 205 818 | 270 054 | 260 354 | 178 505 | 248 300 | 110 360 | ------ | 32 380 | 275 033 | 270 643 | 271 690 | 2 323 452 |
| Belloy | 2 942 | 4 380 | 9 511 | 9 600 | 5 126 | ------ | ------ | ------ | ------ | 1 579 | 18 163 | 7 831 | 59 032 |
| Field totals | 203 257 | 210 198 | 279 565 | 269 954 | 183 631 | 248 300 | 110 360 | ------ | 32 380 | 276 612 | 288 806 | 279 521 | 2 382 484 |
| Wildmint– | | | | | | | | | | | | | |
| Bluesky | 7 942 | 5 680 | 6 983 | 6 119 | 3 626 | 4 650 | 4 868 | 5 121 | 5 618 | 7 234 | 6 171 | 6 112 | 69 024 |
| Halfway | 852 | 2 164 | 3 081 | 746 | 24 239 | 3 316 | 4 760 | 1 944 | 2 681 | 1 191 | 4 280 | 2 246 | 51 510 |
| Halfway[1] | 10 105 | 10 672 | 14 584 | 14 193 | 29 425 | 17 921 | 16 770 | 20 982 | 21 535 | 20 576 | 16 252 | 17 327 | 210 342 |
| Field totals | 18 909 | 18 516 | 23 648 | 21 058 | 57 290 | 25 887 | 26 398 | 28 047 | 29 734 | 29 001 | 26 703 | 25 685 | 330 876 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Willow– | | | | | | | | | | | | | |
| Gething[1] | 7 709 | 5 797 | 6 581 | 3 743 | 3 311 | 3 147 | 5 574 | 1 534 | 4 360 | 7 529 | 8 185 | 7 924 | 65 394 |
| Halfway | 138 956 | 118 968 | 144 364 | 59 834 | 67 528 | 26 804 | 52 221 | 8 269 | 253 | 34 152 | 115 003 | 78 326 | 844 698 |
| Field totals | 146 665 | 124 765 | 150 945 | 63 577 | 70 839 | 29 951 | 57 795 | 9 823 | 4 613 | 41 681 | 123 188 | 86 250 | 910 092 |
| Wolf–Halfway[1] | 8 637 | 7 062 | 5 320 | 2 851 | 2 799 | 2 797 | 1 919 | 1 624 | 2 555 | 2 893 | 3 644 | 9 068 | 51 169 |
| Wolverine–Dunlevy | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 91 457 | 91 457 |
| Woodrush–Halfway | 127 862 | 78 430 | ..... | 22 681 | 61 785 | 52 437 | 50 295 | 3 743 | ..... | 22 826 | 86 705 | 129 928 | 636 692 |
| Yoyo–Pine Point | 7 075 019 | 5 965 674 | 5 610 053 | 5 506 006 | 5 164 724 | 3 028 149 | 3 620 508 | 5 010 723 | 4 471 747 | 5 458 909 | 6 895 323 | 7 356 147 | 65 162 982 |
| Other Areas– | | | | | | | | | | | | | |
| Bluesky | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Gething[1] | ..... | 3 928 | 6 230 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 10 158 |
| Dunlevy | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 10 115 | 36 999 | 40 385 | 87 499 |
| Baldonnel | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Inga | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3 128 | ..... | ..... | ..... | 3 128 |
| Nancy | ..... | ..... | 3 547 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3 547 |
| North Pine[1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Halfway | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 800 | ..... | 5 205 | 6 005 |
| Doig[1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1 888 | 619 | ..... | ..... | ..... | 2 507 |
| Belloy | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1 362 | ..... | ..... | ..... | ..... | 1 362 |
| Upper Kiskatinaw | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 7 890 | 9 026 | 16 916 |
| Debolt | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Slave Point | ..... | 99 034 | ..... | ..... | 72 121 | 26 743 | 37 809 | 34 806 | 36 245 | 33 619 | 55 562 | 29 287 | 424 226 |
| Sulphur Point | ..... | ..... | ..... | ..... | 50 310 | 34 393 | 40 932 | 43 685 | 66 145 | 45 091 | 48 367 | 40 453 | 369 376 |
| Confidential | ..... | ..... | 172 892 | ..... | ..... | ..... | ..... | ..... | ..... | 11 131 | 96 809 | 66 784 | 347 616 |
| Confidential[1] | ..... | ..... | ..... | ..... | ..... | 3 200 | 17 223 | 1 887 | ..... | 918 | 3 523 | 1 970 | 28 721 |
| Field total | ..... | 102 962 | 182 669 | ..... | 122 431 | 63 336 | 95 964 | 83 628 | 106 137 | 101 674 | 249 150 | 193 110 | 1 301 061 |
| Totals– | | | | | | | | | | | | | |
| Nonassociated | 36 247 203 | 32 409 104 | 32 813 446 | 28 640 863 | 25 268 421 | 19 034 264 | 19 738 675 | 21 032 106 | 21 928 256 | 26 447 785 | 36 031 285 | 41 018 163 | 340 609 571 |
| Associated | 1 227 389 | 1 151 169 | 1 280 788 | 1 225 267 | 1 106 531 | 1 234 516 | 1 100 322 | 1 354 134 | 1 348 008 | 1 366 525 | 1 297 860 | 1 351 441 | 15 043 950 |
| Totals | 37 474 592 | 33 560 273 | 34 094 234 | 29 866 130 | 26 374 952 | 20 268 780 | 20 838 997 | 22 386 240 | 23 276 264 | 27 814 310 | 37 329 145 | 42 369 604 | 355 653 521 |

[1]Associated gas

## Table 4-8—Monthly Supply and Disposition of Crude Oil/Pentanes Plus, 1978

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Supply* | | | | | | | | | | | | | |
| British Columbia production— | | | | | | | | | | | | | |
| Crude oil | 1 097 476 | 952 196 | 1 009 591 | 1 009 550 | 864 577 | 1 089 171 | 774 273 | 1 161 621 | 1 167 826 | 1 186 089 | 1 134 363 | 1 169 272 | 12 609 176 |
| Field condensate | 13 922 | 14 747 | 18 367 | 14 610 | 11 084 | 11 732 | 10 055 | 4 673 | 6 626 | 12 096 | 16 895 | 18 444 | 159 671 |
| Plant condensate | 93 405 | 87 503 | 92 511 | 92 265 | 75 385 | 64 899 | 60 836 | 46 221 | 66 726 | 83 887 | 103 949 | 110 495 | 978 082 |
| Total British Columbia | 1 204 803 | 1 054 446 | 1 120 469 | 1 116 425 | 951 046 | 1 165 802 | 845 164 | 1 212 515 | 1 241 178 | 1 282 072 | 1 255 207 | 1 298 211 | 13 746 929 |
| Alberta imports— | | | | | | | | | | | | | |
| Pipeline | 3 728 683 | 3 920 693 | 3 318 124 | 3 282 108 | 4 431 725 | 4 197 187 | 3 037 139 | 3 488 909 | 3 947 531 | 4 171 045 | 4 159 447 | 4 652 685 | 46 335 276 |
| Rail | 6 024 | 7 155 | 5 557 | 3 509 | 530 | 5 418 | 5 221 | 4 439 | 1 469 | 2 872 | ----- | ----- | 42 194 |
| Total Alberta | 3 734 707 | 3 927 848 | 3 323 681 | 3 285 617 | 4 432 255 | 4 202 605 | 3 042 360 | 3 493 348 | 3 949 000 | 4 173 917 | 4 159 447 | 4 652 685 | 46 377 470 |
| Total supply | 4 939 510 | 4 982 294 | 4 444 150 | 4 402 042 | 5 383 301 | 5 368 407 | 3 887 524 | 4 705 863 | 5 190 178 | 5 455 989 | 5 414 654 | 5 950 896 | 60 124 399 |
| *Disposition* | | | | | | | | | | | | | |
| Inventory changes— | | | | | | | | | | | | | |
| Field | −5 547 | −1 708 | 12 226 | 3 233 | 7 484 | −9 884 | 2 572 | −7 076 | −434 | 1 619 | −7 755 | 3 769 | −12 270 |
| Plant | 12 544 | 8 608 | −1 649 | 9 890 | 2 588 | −14 572 | −8 430 | −22 804 | 29 156 | 5 033 | −494 | 11 821 | 31 695 |
| Transporters | 43 517 | 34 952 | −119 634 | 102 148 | 253 090 | 181 570 | −587 874 | −294 616 | 324 119 | 98 244 | −89 532 | 150 613 | 96 597 |
| Totals | 50 514 | 41 852 | −109 057 | 115 271 | 263 162 | 157 114 | −593 732 | −324 496 | 352 841 | 104 896 | −97 781 | 166 203 | 116 022 |
| Losses and adjustments— | | | | | | | | | | | | | |
| Field | −2 278 | 1 152 | −11 349 | −5 996 | −2 165 | −112 | −1 286 | −4 088 | −518 | ----- | 5 491 | 172 | −19 070 |
| Plant | 5 674 | 2 510 | 5 734 | 4 709 | 6 372 | 4 071 | 3 767 | 1 918 | −1 023 | 5 273 | 10 965 | 3 246 | 53 216 |
| Transporters | −2 721 | −9 550 | 1 582 | −4 11[illegible] | 9 200 | −986 | 7 655 | −2 810 | 700 | 6 361 | −2 941 | 10 358 | 12 736 |
| Totals | 675 | −5 888 | −4 033 | −5 399 | 13 407 | 2 973 | 10 136 | −4 980 | −841 | 11 634 | 13 515 | 13 776 | 46 882 |
| Transfers | 43 278 | 34 952 | 39 340 | 35 038 | 35 014 | 34 005 | 37 395 | 25 860 | 26 404 | 54 353 | 39 466 | 42 317 | 447 422 |
| Deliveries— | | | | | | | | | | | | | |
| To British Columbia refineries— | | | | | | | | | | | | | |
| British Columbia production | 1 139 758 | 1 107 231 | 1 199 720 | 1 006 372 | 936 068 | 1 183 516 | 1 148 667 | 1 262 828 | 1 215 574 | 1 338 733 | 1 409 119 | 1 465 276 | 14 425 528 |
| Alberta production | 3 164 948 | 3 369 500 | 2 789 332 | 2 881 322 | 3 767 992 | 3 754 006 | 2 912 693 | 3 451 701 | 3 199 923 | 3 406 306 | 3 459 595 | 3 656 665 | 39 813 983 |
| Totals | 4 304 706 | 4 476 731 | 3 989 052 | 3 887 694 | 4 704 060 | 4 937 522 | 4 061 360 | 4 714 529 | 4 415 497 | 4 745 039 | 4 868 714 | 5 121 941 | 54 239 511 |
| To export— | | | | | | | | | | | | | |
| British Columbia production | 24 570 | 36 413 | 47 553 | 25 463 | 36 256 | 34 256 | 29 457 | 38 420 | 11 762 | 4 909 | 46 554 | 39 232 | 374 845 |
| Alberta production | 529 430 | 399 872 | 454 208 | 334 332 | 336 871 | 235 739 | 342 422 | 330 946 | 387 224 | 581 770 | 548 095 | 578 646 | 5 059 555 |
| Totals | 554 000 | 436 285 | 501 761 | 359 795 | 373 127 | 269 995 | 371 879 | 369 366 | 398 986 | 586 679 | 594 649 | 617 878 | 5 434 400 |
| Reporting adjustment | −13 663 | −1 638 | 27 087 | 9 643 | −5 469 | −33 202 | 486 | −74 416 | −2 709 | −46 612 | −3 909 | −11 219 | −159 838 |
| Total disposition | 4 939 510 | 4 982 294 | 4 444 150 | 4 402 042 | 5 383 301 | 5 407 | 3 887 524 | 4 705 863 | 5 190 178 | 5 455 989 | 5 414 654 | 5 950 896 | 60 124 399 |

*British Columbia refineries*

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Receipts— | | | | | | | | | | | | | |
| British Columbia crude | 1 135 925 | 1 088 179 | 1 015 841 | 869 800 | 824 164 | 1 164 329 | 1 110 202 | 1 346 543 | 1 233 758 | 1 325 030 | 1 461 036 | 1 434 117 | 14 008 924 |
| British Columbia condensate | 43 278 | 34 952 | 39 340 | 35 038 | 35 014 | 39 423 | 37 395 | 25 860 | 26 404 | 54 353 | 39 466 | 42 317 | 452 840 |
| Totals | 1 179 203 | 1 123 131 | 1 055 181 | 904 838 | 859 178 | 1 203 752 | 1 147 597 | 1 372 403 | 1 260 162 | 1 379 383 | 1 500 502 | 1 476 434 | 14 461 764 |
| Alberta crude | 2 891 684 | 3 117 571 | 2 799 554 | 2 552 912 | 3 425 228 | 3 319 251 | 2 657 818 | 3 072 471 | 2 866 248 | 3 073 378 | 2 952 192 | 3 221 889 | 35 950 196 |
| Alberta condensate | 279 253 | 259 110 | 203 736 | 473 989 | 451 094 | 434 783 | 260 101 | 398 222 | 335 893 | 335 844 | 472 966 | 434 851 | 4 339 842 |
| Totals | 3 170 937 | 3 376 681 | 3 003 290 | 3 026 901 | 3 876 322 | 3 754 034 | 2 917 919 | 3 470 693 | 3 202 141 | 3 409 222 | 3 425 158 | 3 656 740 | 39 989 038 |
| Total receipts | 4 350 140 | 4 499 812 | 4 058 471 | 3 931 739 | 4 735 500 | 4 957 786 | 4 065 516 | 4 843 096 | 4 462 303 | 4 788 605 | 4 925 660 | 5 133 174 | 54 751 802 |
| *Disposition* | | | | | | | | | | | | | |
| Inventory changes | −358 696 | −117 999 | 190 616 | −95 141 | 39 191 | 156 698 | −359 538 | 241 454 | −113 158 | −94 542 | 88 418 | 74 468 | −378 229 |
| Losses and adjustments | 581 | 22 | 511 | 1 270 | −118 | 440 | −379 | 36 975 | 922 | 1 855 | 709 | 739 | 43 527 |
| Refinery runs— | | | | | | | | | | | | | |
| British Columbia production | 1 247 252 | 1 138 836 | 930 803 | 898 462 | 910 873 | 1 221 739 | 1 176 287 | 1 395 326 | 1 291 011 | 1 347 556 | 1 379 916 | 1 320 869 | 14 258 930 |
| Alberta production | 3 461 003 | 3 478 953 | 2 936 541 | 3 127 148 | 3 785 554 | 3 578 909 | 3 249 146 | 3 169 341 | 3 283 528 | 3 533 736 | 3 486 617 | 3 737 098 | 40 827 574 |
| Totals | 4 708 255 | 4 617 789 | 3 867 344 | 4 025 610 | 4 696 427 | 4 800 648 | 4 425 433 | 4 564 667 | 4 574 539 | 4 881 292 | 4 866 533 | 5 057 967 | 55 086 504 |
| Total disposition | 4 350 140 | 4 499 812 | 4 058 471 | 3 931 739 | 4 735 500 | 4 957 786 | 4 065 516 | 4 843 096 | 4 462 303 | 4 788 605 | 4 925 660 | 5 133 174 | 54 751 802 |

## *Table 4-9—Monthly Supply and Disposition of Natural Gas, 1978*

(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 | 36 346 739 | 32 041 954 | 32 704 445 | 28 589 083 | 25 187 652 | 18 597 906 | 19 498 833 | 20 944 907 | 21 909 376 | 26 481 580 | 35 930 639 | 41 072 001 | 341 051 255 |
| Associated gas | 1 159 876 | 1 151 299 | 1 279 232 | 1 227 955 | 1 086 693 | 1 219 340 | 1 085 211 | 1 242 098 | 1 340 236 | 1 205 791 | 1 252 733 | 1 297 603 | 14 633 648 |
| Less injected | −108 663 | −101 711 | −105 610 | −83 189 | −53 743 | −85 407 | −96 721 | −114 332 | −107 673 | −107 007 | −69 610 | −70 153 | −1 126 425 |
| Net British Columbia production | 37 397 952 | 33 091 542 | 33 878 067 | 29 733 849 | 26 220 602 | 19 731 839 | 20 487 323 | 22 072 673 | 23 141 939 | 27 580 364 | 37 113 762 | 42 299 451 | 354 558 478 |
| Imports— | | | | | | | | | | | | | |
| Alberta | 3 163 944 | 5 578 599 | 4 506 505 | 4 300 670 | 4 680 406 | 2 987 254 | 3 319 816 | 3 785 088 | 3 379 179 | 3 281 842 | 5 384 401 | 6 182 598 | 54 227 069 |
| Northwest Territories | 2 236 364 | 1 988 355 | 1 913 413 | 1 604 868 | 1 757 128 | 970 563 | 1 327 423 | 1 827 453 | 1 612 443 | 1 678 469 | 1 588 456 | 2 233 022 | 20 737 957 |
| Yukon | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Total imports | 5 400 308 | 7 575 954 | 6 419 918 | 5 905 538 | 6 437 534 | 3 957 817 | 4 647 239 | 5 612 541 | 4 991 622 | 4 960 311 | 6 972 857 | 8 415 620 | 74 965 026 |
| Total supply | 42 798 260 | 40 667 496 | 40 297 985 | 35 639 387 | 32 658 136 | 23 689 656 | 25 134 562 | 27 685 214 | 28 133 561 | 32 540 675 | 44 086 619 | 50 715 071 | 429 523 504 |
| *Disposition* | | | | | | | | | | | | | |
| Flared— | | | | | | | | | | | | | |
| Field | 326 602 | 350 931 | 450 551 | 228 384 | 253 818 | 343 571 | 281 210 | 459 123 | 488 738 | 305 001 | 338 556 | 302 343 | 4 281 047 |
| Gathering systems | 9 232 | 24 168 | 18 849 | 50 179 | 4 975 | 3 213 | 2 598 | 2 358 | 2 877 | ----- | 3 087 | 7 440 | 128 976 |
| Plant | 1 908 | 909 | 6 346 | 29 941 | 3 897 | 4 319 | 8 725 | 1 986 | 4 350 | 1 476 | 6 593 | 2 992 | 72 442 |
| Totals | 337 742 | 376 008 | 475 746 | 308 504 | 262 690 | 351 103 | 292 533 | 463 467 | 495 965 | 306 477 | 347 236 | 312 775 | 4 482 465 |
| Fuel— | | | | | | | | | | | | | |
| Field | 284 556 | 350 931 | 316 001 | 301 245 | 254 441 | 226 514 | 192 020 | 178 691 | 187 964 | 241 965 | 318 615 | 370 899 | 3 214 543 |
| Plant | 26 844 | 28 980 | 41 955 | 27 001 | 26 788 | 17 780 | 14 933 | 41 726 | 63 445 | −14 945 | 33 391 | 27 622 | 335 520 |
| Compressor | 1 686 071 | 1 489 261 | 1 581 973 | 1 467 747 | 1 408 931 | 1 192 374 | 1 307 107 | 1 198 339 | 1 229 854 | 1 484 495 | 1 705 412 | 1 843 191 | 17 594 755 |
| Totals | 1 997 470 | 1 869 172 | 1 939 929 | 1 795 993 | 1 690 160 | 1 436 668 | 1 514 060 | 1 418 756 | 1 481 263 | 1 711 515 | 2 057 418 | 2 241 712 | 21 144 818 |
| Line pack changes | 9 545 | −3 284 | −7 866 | 15 993 | −7 654 | −2 745 | −3 106 | 344 | 672 | 14 823 | 11 023 | 12 979 | 40 724 |
| Losses and adjustments— | | | | | | | | | | | | | |
| Field | 493 371 | 910 552 | 785 099 | 391 878 | 445 729 | 156 490 | 230 932 | 453 306 | 499 171 | 790 475 | 1 233 927 | 1 254 119 | 7 715 196 |
| Plant | 32 580 | 11 092 | 54 480 | 29 587 | 51 861 | 28 931 | 13 880 | 13 428 | 9 935 | 5 864 | ------ | ------ | 250 910 |
| Gathering system | 601 835 | 703 369 | 673 740 | 566 667 | 470 841 | 799 870 | 470 090 | 681 030 | 575 522 | 202 531 | 779 522 | 614 249 | 7 139 266 |
| Totals | 1 127 786 | 1 625 013 | 1 513 319 | 988 132 | 968 431 | 985 291 | 714 902 | 1 147 764 | 1 084 628 | 998 870 | 2 013 449 | 1 868 368 | 15 105 372 |
| Processing shrinkage | 3 874 438 | 3 284 619 | 3 184 496 | 2 799 277 | 2 559 606 | 1 805 949 | 2 182 245 | 2 338 056 | 2 205 878 | 2 694 806 | 3 663 241 | 3 942 010 | 34 535 621 |
| Available marketable gas in NEBC | 39 214 553 | 33 936 527 | 33 402 709 | 29 750 195 | 27 269 971 | 19 666 312 | 20 605 554 | 22 423 023 | 22 774 809 | 22 774 809 | 36 447 559 | 41 651 233 | 354 898 949 |
| Reporting adjustment | −440 700 | −420 559 | −210 348 | −18 707 | −85 068 | −553 976 | −171 626 | −106 196 | 90 346 | 142 538 | −435 307 | 685 994 | −684 445 |
| *British Columbia Transporters Supply* | | | | | | | | | | | | | |
| Available marketable gas in NEBC | 39 214 553 | 33 936 527 | 33 402 709 | 29 750 195 | 27 269 971 | 19 666 312 | 20 605 554 | 22 423 023 | 22 774 809 | 26 671 646 | 36 447 559 | 41 651 233 | 353 791 415 |
| Imports to SEBC— | | | | | | | | | | | | | |
| Alberta | 39 750 886 | 36 122 689 | 37 791 217 | 35 033 337 | 32 150 925 | 29 975 665 | 28 735 183 | 28 866 476 | 29 292 001 | 30 439 123 | 35 249 650 | 39 495 882 | 402 903 034 |
| Total supply | 78 965 439 | 70 059 216 | 71 193 926 | 64 783 532 | 59 420 896 | 49 641 977 | 49 340 737 | 51 289 499 | 52 066 810 | 57 110 769 | 71 697 209 | 81 147 115 | 756 694 449 |

*Disposition*

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel | 2 141 238 | 1 706 967 | 1 514 103 | 1 190 816 | 910 601 | 541 920 | 605 280 | 632 008 | 732 502 | 970 199 | 1 926 258 | 2 706 673 | 15 578 565 |
| Losses and adjustment | 104 884 | 417 343 | 122 170 | 245 739 | 56 177 | 208 835 | 21 955 | 180 888 | 6 938 | −125 628 | −105 295 | −167 976 | 966 030 |
| Line pack changes | −16 934 | 49 534 | 78 455 | 55 766 | 90 934 | −139 428 | 406 394 | 108 940 | −3 939 | 22 440 | −2 871 | −24 755 | 624 536 |
| Deliveries to British Columbia distributors— | | | | | | | | | | | | | |
| North | 486 948 | 405 588 | 353 517 | 268 956 | 190 152 | 131 942 | 115 497 | 140 851 | 175 075 | 243 828 | 319 028 | 511 696 | 3 343 078 |
| Interior | 6 748 826 | 5 804 944 | 5 283 880 | 4 467 140 | 4 219 118 | 3 434 468 | 3 705 511 | 3 834 183 | 4 010 128 | 4 911 349 | 6 349 403 | 6 971 671 | 59 740 620 |
| Lower Mainland | 9 843 811 | 8 271 559 | 7 788 176 | 6 752 559 | 5 581 116 | 3 963 100 | 3 527 366 | 3 804 699 | 4 764 149 | 6 246 089 | 9 507 468 | 10 392 990 | 80 443 082 |
| Totals | 17 079 584 | 14 482 091 | 13 425 573 | 11 488 655 | 9 990 386 | 7 529 510 | 7 348 374 | 7 779 733 | 8 949 352 | 11 401 266 | 16 175 899 | 17 876 357 | 143 526 780 |
| Export— | | | | | | | | | | | | | |
| From NEBC | 21 231 485 | 18 955 597 | 19 605 749 | 18 057 031 | 17 413 807 | 12 553 566 | 13 377 763 | 14 673 395 | 13 973 028 | 15 289 557 | 20 042 006 | 23 602 850 | 208 775 834 |
| From SEBC | 38 514 040 | 34 512 958 | 36 534 690 | 33 853 660 | 31 076 793 | 28 885 340 | 27 739 041 | 27 994 968 | 28 390 918 | 29 552 476 | 33 901 885 | 37 972 674 | 388 929 443 |
| Totals | 59 745 525 | 53 468 555 | 56 140 439 | 51 910 691 | 48 490 600 | 41 438 906 | 41 116 804 | 42 668 363 | 42 363 946 | 44 842 033 | 53 943 891 | 61 575 524 | 597 705 277 |
| Reporting adjustment | −88 858 | −65 274 | −86 814 | −108 135 | −117 802 | 62 234 | −158 070 | −80 433 | 18 011 | 459 | −240 673 | −818 708 | −1 706 739 |
| Total disposition | 78 965 439 | 70 059 216 | 71 193 926 | 64 783 532 | 59 420 896 | 49 641 977 | 49 340 737 | 51 289 499 | 52 066 810 | 57 110 769 | 71 697 209 | 81 147 115 | 756 694 449 |
| *British Columbia Distributors* | | | | | | | | | | | | | |
| Receipts— | | | | | | | | | | | | | |
| From transporters | 17 644 430 | 14 773 658 | 13 657 057 | 11 882 838 | 10 134 846 | 7 614 863 | 6 951 453 | 7 654 367 | 9 016 722 | 11 523 114 | 16 649 007 | 18 495 800 | 145 998 155 |
| From storage | 68 993 | 16 561 | 10 377 | 9 523 | ------ | 665 | ------ | ------ | ------ | ------ | ------ | 446 596 | 552 715 |
| Other receipts | 1 155 | 1 673 | 1 272 | 1 223 | 717 | ------ | 141 | 226 | 330 | 513 | 1 085 | 18 821 | 27 156 |
| Total receipts | 17 714 578 | 14 791 892 | 13 668 706 | 11 893 584 | 10 135 563 | 7 615 528 | 6 951 594 | 7 654 593 | 9 017 052 | 11 523 627 | 16 650 092 | 18 961 217 | 146 578 026 |
| *Disposition* | | | | | | | | | | | | | |
| Fuel | 55 129 | 51 607 | 31 152 | 33 323 | 9 482 | −10 810 | 27 335 | 26 142 | 19 630 | 26 535 | 43 201 | 55 779 | 369 505 |
| Losses and adjustments | 40 691 | −1 802 265 | −56 330 | −1 418 175 | −2 012 551 | −1 440 581 | −742 916 | 313 396 | 339 220 | 2 120 100 | 4 376 434 | 3 345 955 | 3 062 978 |
| Line pack changes | −6 276 | 14 757 | 1 281 | 17 232 | −3 850 | −6 101 | 1 835 | −6 091 | 4 452 | 12 975 | 100 420 | 6 051 | 136 685 |
| To storage | ------ | ------ | ------ | ------ | 61 482 | 105 225 | 23 936 | ------ | ------ | 2 347 | ------ | ------ | 192 990 |
| Transfer | 330 582 | 271 333 | 110 276 | ------ | 265 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 712 456 |
| Sales— | | | | | | | | | | | | | |
| Residential | 6 306 609 | 6 068 992 | 4 464 072 | 3 950 622 | 3 658 112 | 2 130 891 | 1 400 791 | 1 147 225 | 1 598 292 | 1 873 084 | 3 169 126 | 5 088 730 | 40 856 446 |
| Commercial | 5 623 501 | 5 120 997 | 3 938 825 | 4 127 854 | 3 183 593 | 2 144 247 | 1 746 370 | 1 472 323 | 2 085 257 | 2 220 769 | 3 528 271 | 4 855 014 | 40 047 011 |
| Industrial | 5 311 423 | 5 027 649 | 5 136 496 | 5 128 307 | 5 187 723 | 4 660 165 | 4 464 738 | 4 670 268 | 4 933 199 | 5 229 053 | 5 362 035 | 5 544 569 | 60 665 615 |
| Electric power | 52 019 | 38 822 | 42 934 | 54 421 | 41 307 | 32 492 | 29 505 | 31 330 | 37 002 | 38 774 | 70 605 | 65 129 | 534 340 |
| Total sales | 17 293 452 | 16 256 460 | 13 582 327 | 13 261 204 | 12 080 735 | 8 967 795 | 7 641 404 | 7 321 146 | 8 653 750 | 9 361 670 | 12 130 037 | 15 553 432 | 142 578 026 |
| Total disposition | 17 714 578 | 14 791 892 | 13 668 706 | 11 893 584 | 10 135 563 | 7 615 528 | 6 951 594 | 7 654 593 | 9 017 052 | 11 523 627 | 16 650 092 | 18 961 217 | 146 578 026 |

## *Table 4-10—Monthly Supply and Disposition of Propane, 1978*

(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 | 52 173 | 43 723 | 41 899 | 38 863 | 39 831 | 38 309 | 33 488 | 47 370 | 53 981 | 55 536 | 50 481 | 44 272 | 539 926 |
| Refinery | 71 545 | 67 506 | 61 787 | 48 566 | 59 312 | 64 710 | 59 319 | 54 064 | 49 689 | 57 795 | 69 903 | 73 472 | 737 638 |
| Totals | 123 718 | 111 229 | 103 686 | 87 429 | 99 143 | 103 019 | 92 807 | 101 434 | 103 640 | 113 331 | 120 384 | 117 744 | 1 277 564 |
| Alberta imports | 260 472 | 297 479 | 358 815 | 179 431 | 201 817 | 278 104 | 257 651 | 271 463 | 285 165 | 288 284 | 372 816 | 321 462 | 3 372 959 |
| Total supply | 384 190 | 408 708 | 462 501 | 266 860 | 300 960 | 381 123 | 350 458 | 372 897 | 388 805 | 401 615 | 493 200 | 439 206 | 4 650 523 |
| *Disposition* | | | | | | | | | | | | | |
| Inventory change | 4 670 | 1 117 | −2 754 | 664 | −4 259 | 2 727 | 3 722 | −3 495 | −1 541 | 923 | −825 | 3 982 | 4 931 |
| Fuel | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Losses and adjustments | 1 579 | 1 483 | 1 649 | 1 405 | 781 | 1 275 | 916 | 552 | 749 | 664 | 324 | 1 296 | 12 673 |
| Sales of British Columbia production— | | | | | | | | | | | | | |
| British Columbia | 89 482 | 80 317 | 69 215 | 29 919 | 73 648 | 77 791 | 61 676 | 80 952 | 81 232 | 94 089 | 111 759 | 110 781 | 960 861 |
| Alberta | 1 042 | ------ | ------ | 9 532 | 19 125 | ------ | 2 360 | 720 | ------ | ------ | ------ | ------ | 32 779 |
| Northwest Territories | 1 745 | 2 912 | 899 | 663 | 1 083 | ------ | 211 | 209 | ------ | 1 722 | 1 561 | 1 720 | 12 715 |
| United States | ------ | ------ | 5 296 | 20 746 | 8 765 | 14 503 | 23 922 | 22 496 | 23 200 | 15 933 | 7 565 | −35 | 142 391 |
| Offshore | 25 200 | 25 400 | 29 391 | 24 500 | ------ | 6 723 | ------ | ------ | ------ | ------ | ------ | ------ | 111 214 |
| Total British Columbia | 117 469 | 108 629 | 104 791 | 85 360 | 102 621 | 99 017 | 88 169 | 104 377 | 104 432 | 111 744 | 120 885 | 112 466 | 1 259 960 |
| Sales of Alberta production— | | | | | | | | | | | | | |
| British Columbia | 104 612 | 82 937 | 87 238 | 71 628 | 46 501 | 36 570 | 52 664 | 32 021 | 72 281 | 74 542 | 100 747 | 129 618 | 890 367 |
| Offshore | 155 860 | 214 542 | 271 577 | 107 803 | 155 316 | 242 534 | 204 987 | 239 442 | 212 884 | 213 742 | 272 069 | 191 846 | 2 482 602 |
| Total Alberta | 260 472 | 297 479 | 358 815 | 179 431 | 201 817 | 278 104 | 257 651 | 271 463 | 285 165 | 288 284 | 372 816 | 321 462 | 3 372 959 |
| Total sales | 377 941 | 406 108 | 463 606 | 264 791 | 304 438 | 377 121 | 345 820 | 376 840 | 389 597 | 400 028 | 493 701 | 433 928 | 4 632 919 |
| Total disposition | 384 190 | 408 708 | 462 501 | 266 860 | 300 960 | 381 123 | 350 458 | 372 897 | 388 805 | 401 615 | 493 200 | 439 206 | 4 650 523 |

## Table 4-11—Monthly Supply and Disposition of Butane, 1978

(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 | 58 465 | 50 308 | 54 844 | 60 253 | 56 970 | 51 803 | 51 757 | 45 564 | 57 150 | 60 039 | 58 752 | 64 464 | 670 369 |
| Refinery | 47 702 | 47 905 | 27 164 | 30 631 | 66 115 | 67 664 | 67 644 | 69 190 | 64 223 | 43 459 | 22 660 | 29 406 | 583 763 |
| Totals | 106 167 | 98 213 | 82 008 | 90 884 | 123 085 | 119 467 | 119 401 | 114 754 | 121 373 | 103 498 | 81 402 | 93 870 | 1 254 122 |
| Alberta imports | 2 273 | 209 | 6 467 | 6 407 | 1 556 | 782 | 601 | 4 543 | 1 107 | 2 364 | 9 409 | 15 792 | 51 510 |
| Total supply | 108 440 | 98 422 | 88 475 | 97 291 | 124 641 | 120 249 | 120 002 | 119 297 | 122 480 | 105 862 | 90 811 | 109 662 | 1 305 632 |
| *Disposition* | | | | | | | | | | | | | |
| Inventory change | 4 190 | −3 460 | 1 254 | 936 | 18 615 | −11 059 | 390 | −9 663 | 3 932 | −8 084 | −6 550 | 4 282 | −5 217 |
| Gasoline enrichment | 19 189 | 17 724 | 15 245 | 17 748 | 13 528 | 13 195 | 13 778 | 11 258 | 10 511 | 18 369 | 18 247 | 19 493 | 188 285 |
| Losses and adjustments | −1 | 770 | −2 | 230 | ----- | ----- | ----- | 703 | 1 | ----- | 1 | 4 | 1 706 |
| Sales of British Columbia production— | | | | | | | | | | | | | |
| British Columbia | 54 983 | 44 963 | 43 920 | 16 292 | 41 933 | 47 000 | 35 076 | 30 799 | 42 133 | 34 524 | 38 046 | 35 297 | 464 966 |
| Alberta | ----- | 6 504 | 7 683 | 10 518 | 28 953 | 48 153 | 41 527 | 49 978 | 22 576 | 27 803 | 3 032 | ----- | 246 717 |
| United States | 27 806 | 31 712 | 13 908 | 45 160 | 20 825 | 22 188 | 28 630 | 31 679 | 42 220 | 30 886 | 28 626 | 34 794 | 358 434 |
| Totals | 82 789 | 83 179 | 65 511 | 71 970 | 91 711 | 117 331 | 105 233 | 112 456 | 106 929 | 93 213 | 69 704 | 70 091 | 1 070 117 |
| Sales of Alberta production— | | | | | | | | | | | | | |
| British Columbia | 2 273 | 209 | 6 467 | 6 407 | 787 | 782 | 601 | 4 543 | 1 107 | 2 364 | 9 409 | 15 792 | 50 741 |
| Total sales | 85 062 | 83 388 | 71 978 | 78 377 | 92 498 | 118 113 | 105 834 | 116 999 | 108 036 | 95 577 | 79 113 | 85 883 | 1 120 858 |
| Total disposition | 108 440 | 98 422 | 88 475 | 97 291 | 124 641 | 120 249 | 120 002 | 119 297 | 122 480 | 105 862 | 90 811 | 109 662 | 1 305 632 |

## Table 4-12—Monthly Supply and Disposition of Sulphur, 1978

(Quantities in long tons)

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Supply* | | | | | | | | | | | | | |
| British Columbia production | 10 162 | 7 359 | 10 778 | 10 381 | 8 507 | 7 044 | 6 322 | 3 507 | 3 107 | 7 235 | 11 972 | 12 764 | 99 138 |
| *Disposition* | | | | | | | | | | | | | |
| Inventory change | 6 991 | 1 834 | 2 617 | −1 138 | −1 917 | −1 047 | −2 736 | −5 839 | −3 512 | −1 948 | 2 352 | 3 357 | 1 108 |
| Losses and adjustments | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Sales— | | | | | | | | | | | | | |
| North America | 1 582 | 3 449 | 5 802 | 6 114 | 6 613 | 4 113 | 3 856 | 5 382 | 4 462 | 5 793 | 7 105 | 7 392 | 61 663 |
| Offshore | 1 589 | 2 076 | 2 359 | 5 405 | 3 811 | 1 884 | 5 202 | 3 964 | 2 157 | 3 390 | 2 515 | 2 015 | 36 367 |
| Totals | 3 171 | 5 525 | 8 161 | 11 519 | 10 424 | 5 997 | 9 058 | 9 346 | 6 619 | 9 183 | 9 620 | 9 407 | 98 030 |
| Total disposition | 10 162 | 7 359 | 10 778 | 10 381 | 8 507 | 7 044 | 6 322 | 3 507 | 3 107 | 7 235 | 11 972 | 12 764 | 99 138 |

## *Table 4-13—Crude-Oil Pipelines, 1978*

| Company | Fields Served | Size and Mileage of Main and Lateral Lines | | Pumping-stations | | Present Capacity (Bbl./Day) | Gathering Mileage | Throughout (Bbl./Day) | Storage Capacity (Bbl.) |
|---|---|---|---|---|---|---|---|---|---|
| | | Size (In.) | Mileage | Number | Capacity (Bbl./Day) | | | | |
| Blueberry-Taylor Pipeline Co. | Aitken Creek, Blueberry | 12 3/4 | 2.2 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | 8 5/8 | 62.8 | 1 | 5 000 | 12 000 | 37.4 | 1 667 | 65 000 |
| | Fort St. John | ------ | ------ | ------ | ------ | ------ | ------ | 184 | ------ |
| | Inga | 6 5/8 | 1.7 | 1 | 12 500 | 12 500 | ------ | 4 105 | 1 000 |
| | Stoddart | ------ | ------ | ------ | ------ | ------ | ------ | 74 | ------ |
| CDC Oil & Gas Limited | Inga | 6 5/8 | 3.2 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | 4 1/2 | 8.7 | 1 | 10 000 | 10 000 | 13.9 | 4 000 | ------ |
| | | 3 1/2 | 2.0 | 1 | 1 600 | ------ | ------ | ------ | ------ |
| Norcen Pipelines Ltd. | Beatton River, Beatton River West, Boundary Lake, Bulrush, Currant, Milligan Creek, Osprey, Peejay, Weasel, Wildmint, Willow, Wolf | ------ | ------ | 1 | 36 000 | 52 000[1] | 84.6 | 36 370 | 160 000 |
| | | 4 1/2 | 77.0 | 2 | 45 000 | 45 000[2] | ------ | ------ | ------ |
| | | 6 5/8 | 42.9 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | 8 5/8 | 104.0 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | 12 3/4 | 39.1 | ------ | ------ | ------ | ------ | ------ | ------ |
| Westcoast Petroleum Ltd. | | 12 | 507.0 | 12 | 70 000 | 70 000 | ------ | 28 087 | 586 000 |

[1]Boundary Lake.

[2]Terminal to Westcoast Petroleum Ltd.

## *Table 4-14—Crude-Oil Refineries, 1978*

| 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 . . . . | Complete | 1936 | B.C. and Alberta | 35 000 | 1 946 000 | Catalytic-fluid | 8 500 | Catalytic polymerization, catalytic reformer, lube-oil blending plant, asphalt. |
| Gulf Canada Limited . . . . . | Kamloops . . . . . | Complete | 1954 | B.C. and Alberta | 9 300 | 627 000 | Catalytic-fluid | 2 790 | Catalytic polymerization, catalytic reformer, distillate, desulphurization, merox, asphalt, naphtha. |
| Gulf Canada Limited . . . . . | Port Moody . . . . . | Complete | 1958 | B.C. and Alberta | 37 200 | 1 763 000 | Catalytic-fluid | 11 400 | Catalytic reformer, distillate, desulphurization, alkylationsulphuric acid, naphtha-desulphurization, merox, sulphur. |
| Husky Oil Ltd. . . . . | Prince George . . . . . | Complete | 1967 | B.C. | 10 000 | 900 000 | Catalytic-fluid | 3 000 | Unifiner, reformer, asphalt, sulphur gas concentration. |
| Imperial Oil Limited . . . . . | Ioco . . . . . | Complete | 1915 | B.C. and Alberta | 41 200 | 3 055 000 | Catalytic-fluid | 11 800 | Catalytic polymerization, powerformer, tuluene extraction, sulphur, LPG plant, desulphurization. |
| Pacific Petroleums Ltd. . . . . | Taylor . . . . . | Complete | 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 . . . . . | Complete | 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. |

## *Table 4-15—Natural Gas Pipelines, 1978*

| 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 | Horsepower | | Size (In.) | Mileage | |
| British Columbia Hydro and Power Authority | Westcoast Transmission Co. Ltd. | 42 | 18.6 | ----- | ----- | 605 880 | ----- | 4 095.0 | Lower Mainland of British Columbia. |
| | | 30 | 38.8 | ----- | ----- | ----- | ----- | ----- | |
| | | 24 | 18.7 | ----- | ----- | ----- | ----- | ----- | |
| | | 20 | 46.8 | ----- | ----- | ----- | ----- | ----- | |
| | | 18 | 19.4 | ----- | ----- | ----- | ----- | ----- | |
| | | 16 | 17.2 | ----- | ----- | ----- | ----- | ----- | |
| | | 12 | 57.4 | ----- | ----- | ----- | ----- | ----- | |
| | | 10 | 14.9 | ----- | ----- | ----- | ----- | ----- | |
| | | 8 | 27.4 | ----- | ----- | ----- | ----- | ----- | |
| | | 6 | 30.8 | ----- | ----- | ----- | ----- | ----- | |
| | | 4 | 13.1 | ----- | ----- | ----- | ----- | ----- | |
| Columbia Natural Gas Ltd. | Alberta and Southern Gas Co. Limited | 8 | 55.5 | ----- | ----- | 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 | 9.8 | |
| | Inland Natural Gas Co. Limited | 3 | 28.1 | ----- | ----- | ----- | 3 | 24.6 | |
| | | 2 | 0.8 | ----- | ----- | ----- | 2 | 48.2 | |
| | | ----- | ----- | ----- | ----- | ----- | 1 1/4 | 66.5 | |
| | | ----- | ----- | ----- | ----- | ----- | 3/4 | 142.4 | |
| | | ----- | ----- | ----- | ----- | ----- | 5/8 | 4.3 | |
| Gas Trunk Line of British Columbia | Beg field | ----- | ----- | ----- | ----- | ----- | 16 | 27.4 | To Westcoast Transmission Co. Ltd. |
| | | ----- | ----- | ----- | ----- | ----- | 6 5/8 | 5.9 | |
| | Boundary Lake field | ----- | ----- | ----- | ----- | ----- | 16 | 31.4 | |
| | | ----- | ----- | ----- | ----- | ----- | 6 5/8 | 2.9 | |
| | Jedney and Bubbles field | ----- | ----- | ----- | ----- | ----- | 12 3/4 | 31.5 | |
| | | ----- | ----- | ----- | ----- | ----- | 10 3/4 | 7.0 | |
| | Laprise Creek field | ----- | ----- | ----- | ----- | ----- | 12 3/4 | 23.8 | |
| | Nig Creek field | ----- | ----- | 1 | 1 800 | ----- | 16 | 28.3 | |
| Inland Natural Gas Co. Limited | Westcoast Transmission Co. Ltd. | 12 | 357.5 | 3 | 2 200 | 207 000 | 8 | 12.4 | Peace River, Prince George, Cariboo, Thompson, Okanagan, and Kootenay areas. |
| | | 10 | 119.1 | ----- | ----- | ----- | 6 | 39.8 | |
| | | 8 | 33.1 | ----- | ----- | ----- | 4 | 200.1 | |
| | Alberta and Southern Gas Co. Limited | 6 | 108.4 | ----- | ----- | ----- | 3 | 90.9 | |
| | | 4 | 144.8 | ----- | ----- | ----- | 2 | 627.3 | |
| | | 3 | 70.2 | ----- | ----- | ----- | 1 1/2 | 20.7 | |
| | | 2 | 72.2 | ----- | ----- | ----- | 1 1/4 | 300.0 | |
| | | 1 1/4 | 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 | |
| | | 1 1/4 | 3.2 | ----- | ----- | ----- | 6 | 2.7 | |
| | | ----- | ----- | ----- | ----- | ----- | 4 | 12.6 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Northland Utilities (B.C.) Ltd.—*Continued* | | ----- | ----- | ----- | ----- | ----- | 3 | 5.4 | |
| | | ----- | ----- | ----- | ----- | ----- | 2 | 26.1 | |
| | | ----- | ----- | ----- | ----- | ----- | 1 1/2 | 0.4 | |
| | | ----- | ----- | ----- | ----- | ----- | 1 1/4 | 17.6 | |
| | | ----- | ----- | ----- | ----- | ----- | 3/4 | 0.6 | |
| Pacific Northern Gas Ltd. . . . . | Westcoast Transmission Co. Ltd. . . | 10 3/4 | 274.3 | 2 | 3 150 | 54 000 | 6 | 2.5 | Vanderhoof, Fraser Lake, Burns Lake, |
| | | 8 5/8 | 92.4 | ----- | ----- | ----- | 4 | 10.5 | Smithers, Terrace, Prince Rupert, |
| | | 6 5/8 | 36.0 | ----- | ----- | ----- | 3 | 20.5 | Kitimat, Houston, Fort St. James. |
| | | 4 1/2 | 14.0 | ----- | ----- | ----- | 2 | 51.0 | |
| | | 3 1/2 | 43.7 | ----- | ----- | ----- | 1 1/4 | 46.1 | |
| | | 2 7/8 | 17.8 | ----- | ----- | ----- | 3/4 | 31.4 | |
| | | 2 3/8 | 30.1 | ----- | ----- | ----- | 1/2 | 0.1 | |
| | | 1 2/3 | 4.0 | ----- | ----- | ----- | ----- | ----- | |
| Plains Western Gas & Electric Co. Ltd. . . . . | Westcoast Transmission Co. Ltd. . . | 6 | 0.3 | ----- | ----- | 12 000 | 4 | 14.5 | Fort St. John, Taylor, Grandhaven, |
| | | 4 | 20.9 | ----- | ----- | ----- | 3 | 3.6 | Charlie Lake, Airport, Baldonnel. |
| | | 3 | 4.6 | ----- | ----- | ----- | 2 1/2 | 1.5 | |
| | | 2 | 2.0 | ----- | ----- | ----- | 2 | 54.9 | |
| | | ----- | ----- | ----- | ----- | ----- | 1 1/2 | 4.5 | |
| | | ----- | ----- | ----- | ----- | ----- | 1 1/4 | 0.3 | |
| | | ----- | ----- | ----- | ----- | ----- | 1 | 12.7 | |
| | | ----- | ----- | ----- | ----- | ----- | 3/4 | 12.1 | |
| Westcoast Transmission Co. Ltd. . . . . | Alberta . . . . . | 26 | 32.5 | ----- | ----- | 215 000 | ----- | ----- | |
| | Taylor-Willow Flats . . . . . | 36 | 23.2 | ----- | ----- | ----- | ----- | ----- | |
| | | 30 | 76.3 | ----- | ----- | ----- | ----- | ----- | |
| | Willow Flats-Huntingdon . . . . . | 30 | 570.3 | 13 | 279 640 | 1 360 000 | ----- | ----- | |
| | | 36 | 465.0 | ----- | ----- | ----- | ----- | ----- | |
| | Aitken Creek . . . . . | ----- | ----- | ----- | ----- | ----- | 12 3/4 | 19.5 | |
| | Alaska Highway system . . . . . | ----- | ----- | ----- | ----- | ----- | 26 | 37.5 | |
| | | ----- | ----- | ----- | ----- | ----- | 20 | 18.1 | |
| | | ----- | ----- | ----- | ----- | ----- | 18 | 17.9 | |
| | | ----- | ----- | ----- | ----- | ----- | 12 3/4 | 9.9 | |
| | Beaver River . . . . . | 24 | 110.9 | 1 | 39 000 | 270 000 | ----- | ----- | |
| | Blueberry West field . . . . . | ----- | ----- | ----- | ----- | ----- | 8 5/8 | 6.7 | |
| | Boundary Lake field . . . . . | ----- | ----- | 1 | 4 000 | ----- | 16 | 0.5 | |
| | Bubbles field . . . . . | ----- | ----- | 1 | 660 | ----- | ----- | ----- | |
| | Buick Creek field . . . . . | ----- | ----- | ----- | ----- | ----- | 26 | 1.8 | |
| | | ----- | ----- | ----- | ----- | ----- | 10 3/4 | 7.3 | |
| | Buick Creek East field . . . . . | ----- | ----- | ----- | ----- | ----- | 8 5/8 | 6.6 | |
| | Buick Creek West field . . . . . | ----- | ----- | 1 | 1 980 | ----- | 20 | 16.2 | |
| | Bullmoose field . . . . . | ----- | ----- | ----- | ----- | ----- | 8 | 8.1 | |
| | Cache Creek field . . . . . | ----- | ----- | ----- | ----- | ----- | 6 | 8.6 | |
| | Charlie Lake field . . . . . | ----- | ----- | ----- | ----- | ----- | 6 5/8 | 2.3 | |
| | Clarke Lake field . . . . . | ----- | ----- | ----- | ----- | ----- | 16 | 27.8 | |
| | Dahl field . . . . . | ----- | ----- | ----- | ----- | ----- | ----- | 95.7 | |
| | Dawson Creek field . . . . . | ----- | ----- | ----- | ----- | ----- | 8 5/8 | 5.4 | |
| | Fireweed field . . . . . | ----- | ----- | ----- | ----- | ----- | 10 3/4 | 15.3 | |
| | Fireweed field . . . . . | ----- | ----- | ----- | ----- | ----- | 6 5/8 | 4.2 | |
| | | ----- | ----- | ----- | ----- | ----- | 3 1/2 | 5.0 | |
| | Flatrock field . . . . . | ----- | ----- | ----- | ----- | ----- | 3 1/2 | 5.0 | |

## *Table 4-15—Natural Gas Pipelines, 1978 – 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 | Horsepower | | Size (In.) | Mileage | |
| Westcoast Transmission Co. Ltd.—*Continued* | Fort St. John field | ------ | ------ | 3 | 1 980 | ------ | 18 | 7.8 | |
| | | ------ | ------ | ------ | ------ | ------ | 10 3/4 | 0.9 | |
| | | ------ | ------ | ------ | ------ | ------ | 8 5/8 | 0.7 | |
| | Fort St. John Southeast field | 12 | 7.0 | ------ | ------ | ------ | 12 3/4 | 4.0 | |
| | Fort Nelson plant | 30 | 220.8 | 4 | 93 400 | 858 000 | ------ | ------ | |
| | Fort Nelson-Willow Flats | 36 | 45.5 | ------ | ------ | ------ | ------ | ------ | |
| | Gundy Creek field | ------ | ------ | ------ | ------ | ------ | 10 3/4 | 6.1 | |
| | Grizzly field | ------ | ------ | ------ | ------ | ------ | 24 | 35.1 | |
| | | ------ | ------ | ------ | ------ | ------ | 20 | 51.4 | |
| | | ------ | ------ | ------ | ------ | ------ | 10 | 9.2 | |
| | Helmet field | ------ | ------ | ------ | ------ | ------ | 16 | 31.4 | |
| | | ------ | ------ | ------ | ------ | ------ | 10 | 12.6 | |
| | | ------ | ------ | ------ | ------ | ------ | 8 | 3.6 | |
| | Kobes-Townsend field | ------ | ------ | 1 | 6 000 | ------ | 12 3/4 | 18.9 | |
| | | ------ | ------ | ------ | ------ | ------ | 8 5/8 | 5.5 | |
| | Kotcho Lake field | ------ | ------ | ------ | ------ | ------ | 12 | 9.7 | |
| | Kotcho Lake East field | ------ | ------ | ------ | ------ | ------ | 10 3/4 | 11.5 | |
| | Laprise Creek field | ------ | ------ | 1 | 5 160 | ------ | 6 5/8 | 2.5 | |
| | Milligan-Peejay system | ------ | ------ | 1 | 4 000 | ------ | 12 | 32.2 | |
| | | ------ | ------ | ------ | ------ | ------ | 10 3/4 | 23.4 | |
| | | ------ | ------ | ------ | ------ | ------ | 8 5/8 | 13.2 | |
| | | ------ | ------ | ------ | ------ | ------ | 6 5/8 | 6.8 | |
| | Montney field | ------ | ------ | ------ | ------ | ------ | 4 1/2 | 7.4 | |
| | Nig field | ------ | ------ | ------ | ------ | ------ | 6 5/8 | 2.4 | |
| | Oak field | ------ | ------ | ------ | ------ | ------ | 16 | 20.7 | |
| | | ------ | ------ | ------ | ------ | ------ | 6 | 0.9 | |
| | Parkland field | ------ | ------ | ------ | ------ | ------ | 8 5/8 | 6.7 | |
| | Petitot-Louise system | ------ | ------ | ------ | ------ | ------ | 10 3/4 | 11.8 | |
| | | ------ | ------ | ------ | ------ | ------ | 12 3/4 | 15.8 | |
| | | ------ | ------ | ------ | ------ | ------ | 16 | 6.5 | |
| | | ------ | ------ | ------ | ------ | ------ | 20 | 25.9 | |
| | Red Creek | ------ | ------ | ------ | ------ | ------ | 4 1/2 | 7.7 | |
| | Rigel field | ------ | ------ | 1 | 6 800 | ------ | 12 3/4 | 11.1 | |
| | | ------ | ------ | 1 | 1 400 | ------ | 10 3/4 | 11.5 | |
| | Rigel North field | ------ | ------ | ------ | ------ | ------ | 6 | 6.6 | |
| | Sierra field | ------ | ------ | ------ | ------ | ------ | 12 | 6.8 | |
| | | ------ | ------ | ------ | ------ | ------ | 16 | 6.8 | |
| | Stoddart field | ------ | ------ | 1 | 1 400 | ------ | 8 5/8 | 6.3 | |
| | Yoyo field | ------ | ------ | ------ | ------ | ------ | 24 | 48.0 | |

## Table 4-16—Gas-Processing Plants, 1978

| Operator | Location | Fields Served | Plant Type | Year of First Operation | Plant Capacity Million SCF/Day In | Plant Capacity Million SCF/Day Out | Natural Gas | Residual Gas to— |
|---|---|---|---|---|---|---|---|---|
| Esso Resources Canada | S.E. ¼ Sec. 2, Tp. 85, R. 14, W6M | Boundary Lake | Inlet separator, M.E.A. absorption treating, glycol 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 and Boundary Lake that are between 56° 00′ and 58° 00′ latitude | 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. | N.W. 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 | All British Columbia producing gasfields except Sierra north of 58° 00′ latitude | Potassium carbonate, M.E.A., D.E.A. absorption, dehydration | 1965 | 1 075 | 850 | | Westcoast Transmission Co. Ltd. |

## Table 4-17—Sulphur Plants, 1978

| 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 |

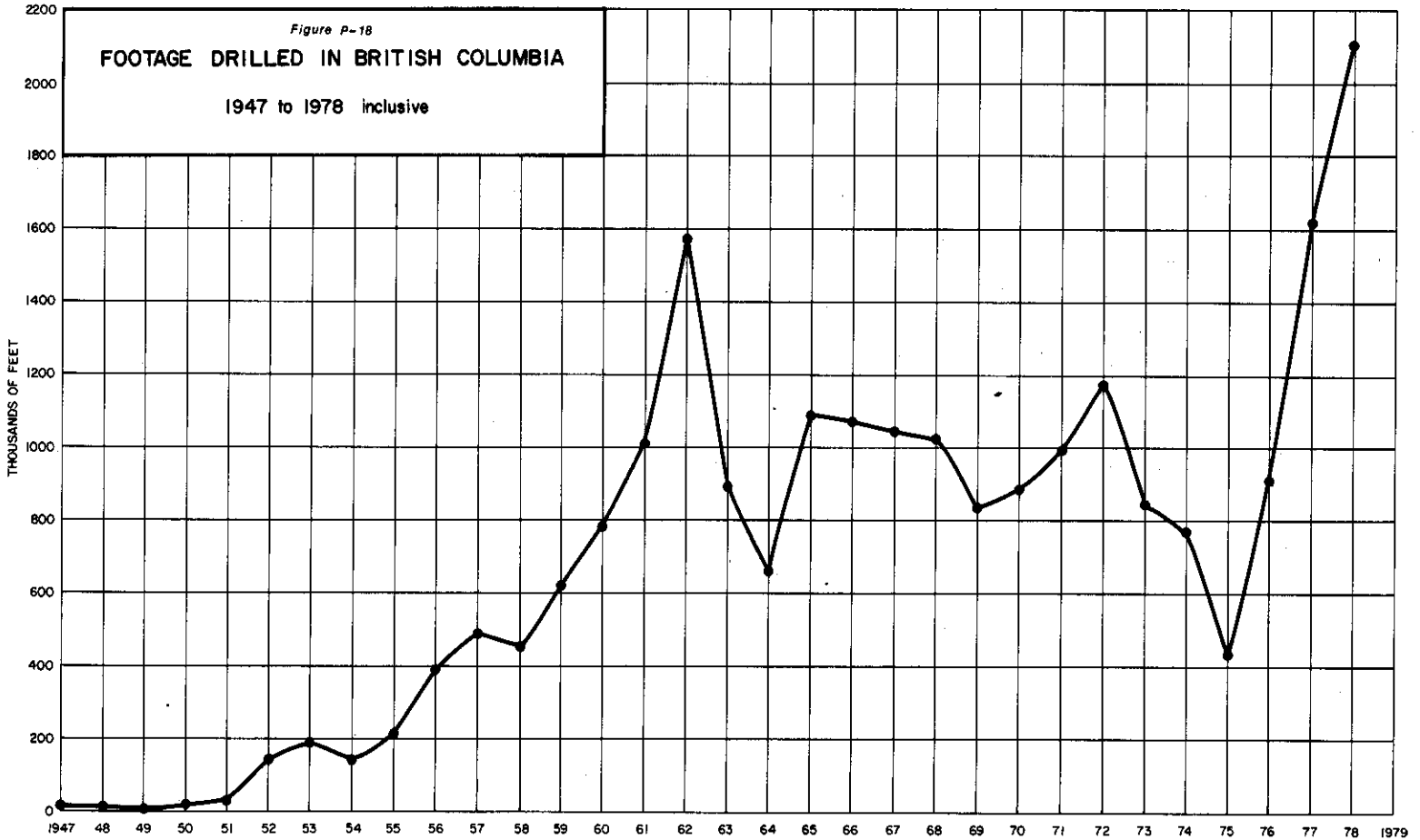


Figure 4-1—Footage Drilled in British Columbia, 1947—1978

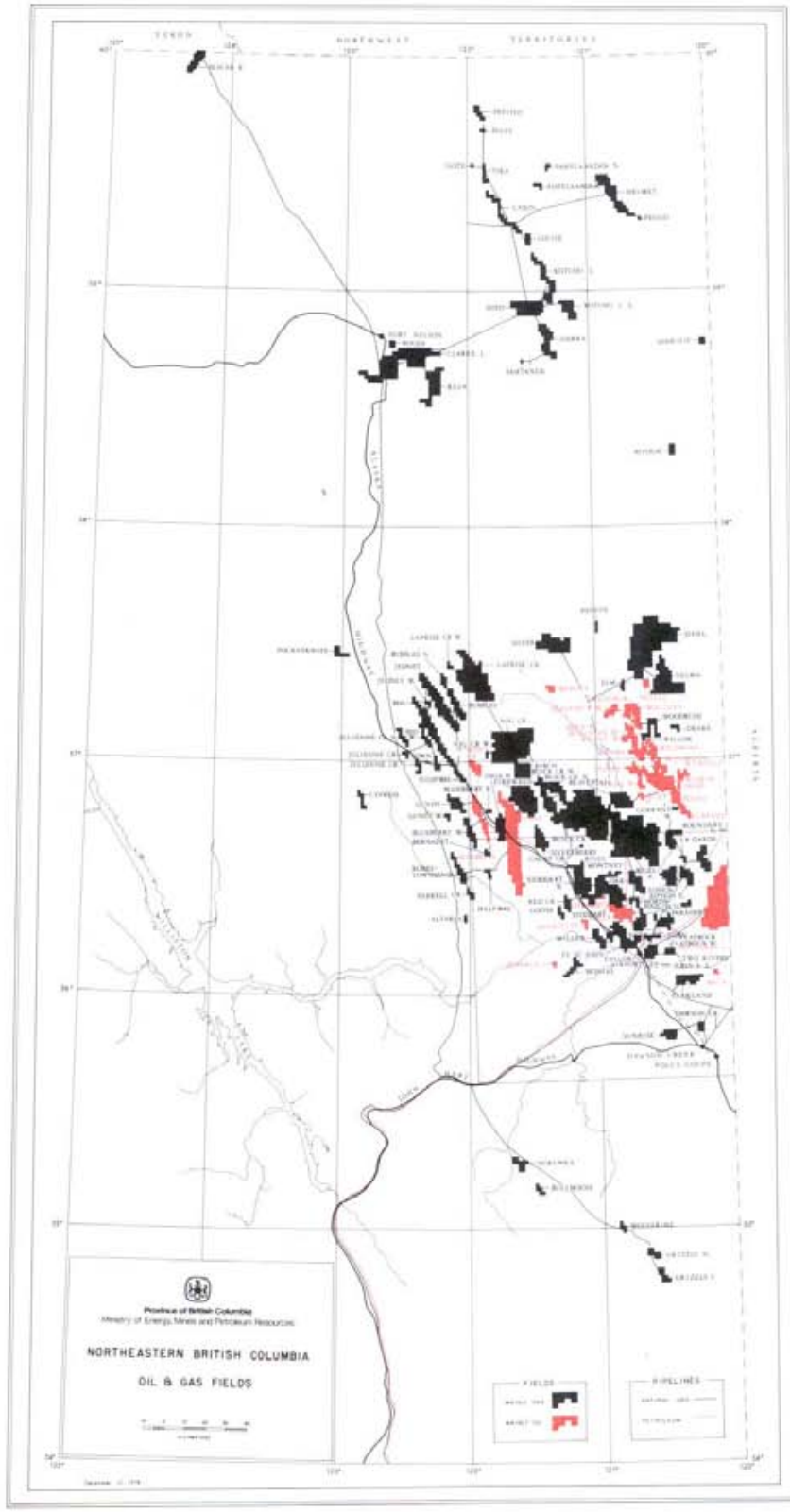


Figure 4-2—Petroleum and Natural Gas Fields in British Columbia

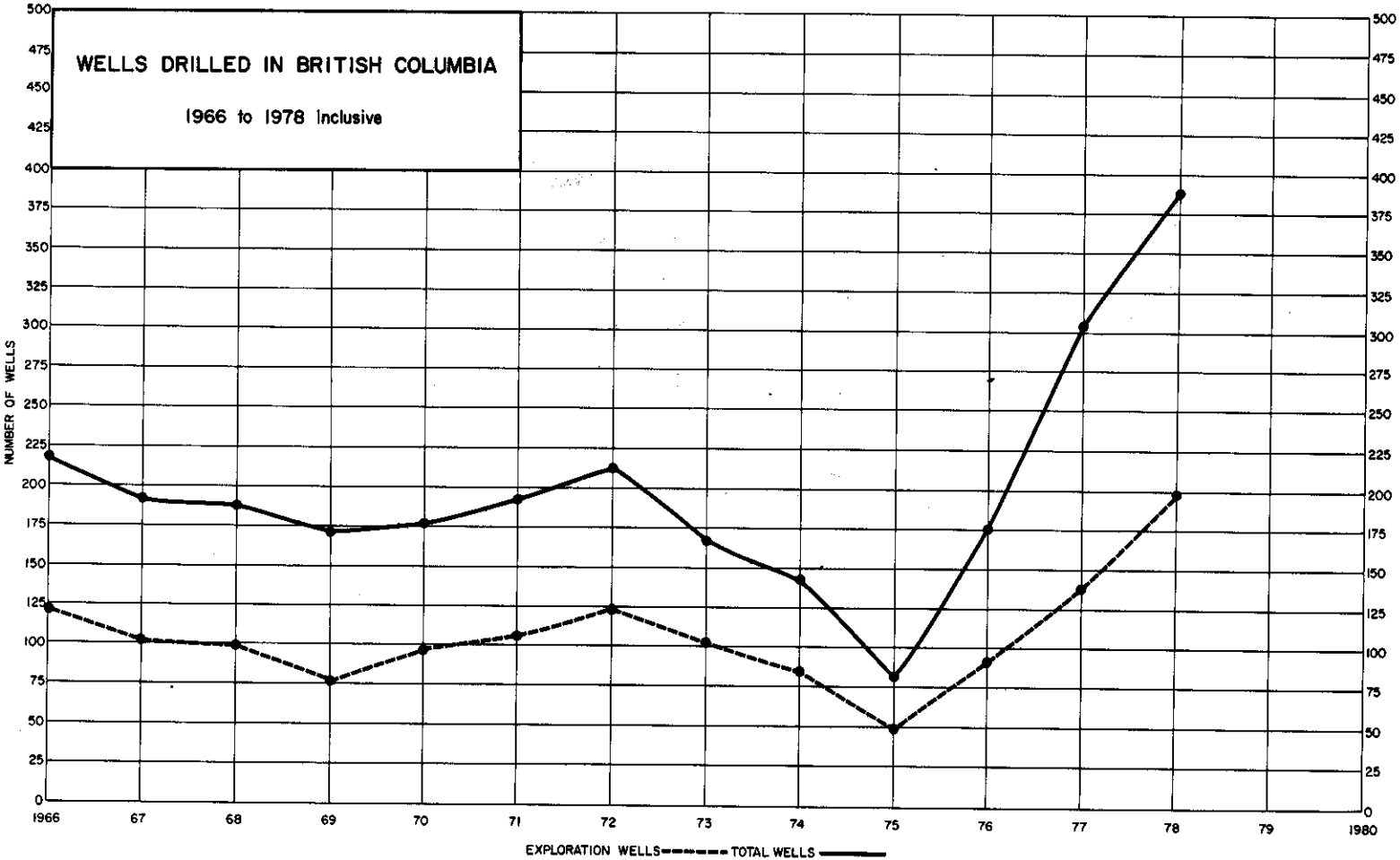


Figure 4-3—Wells Drilled in British Columbia, 1966—1978

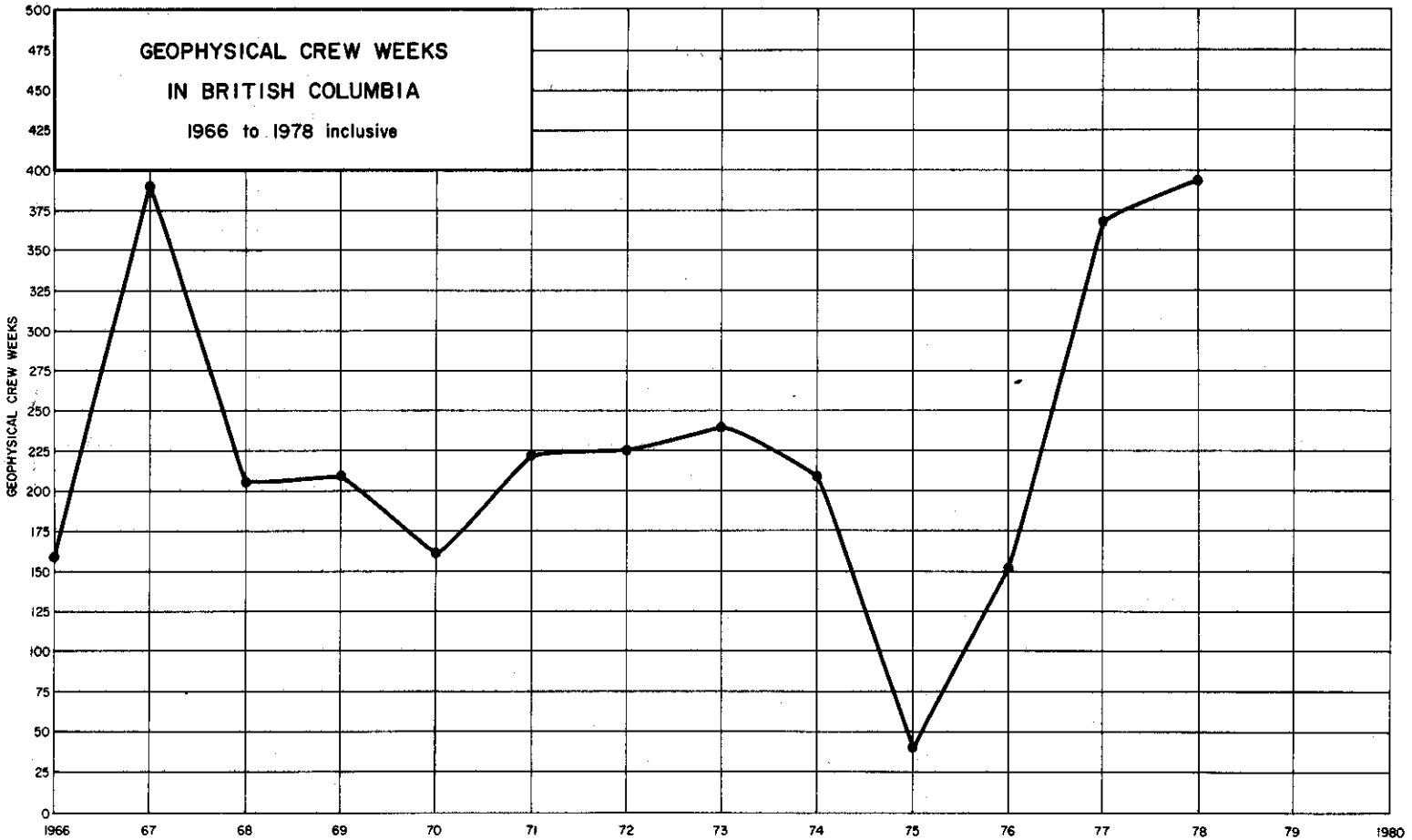


Figure 4-4—Geophysical Crew Weeks in British Columbia, 1966–1978

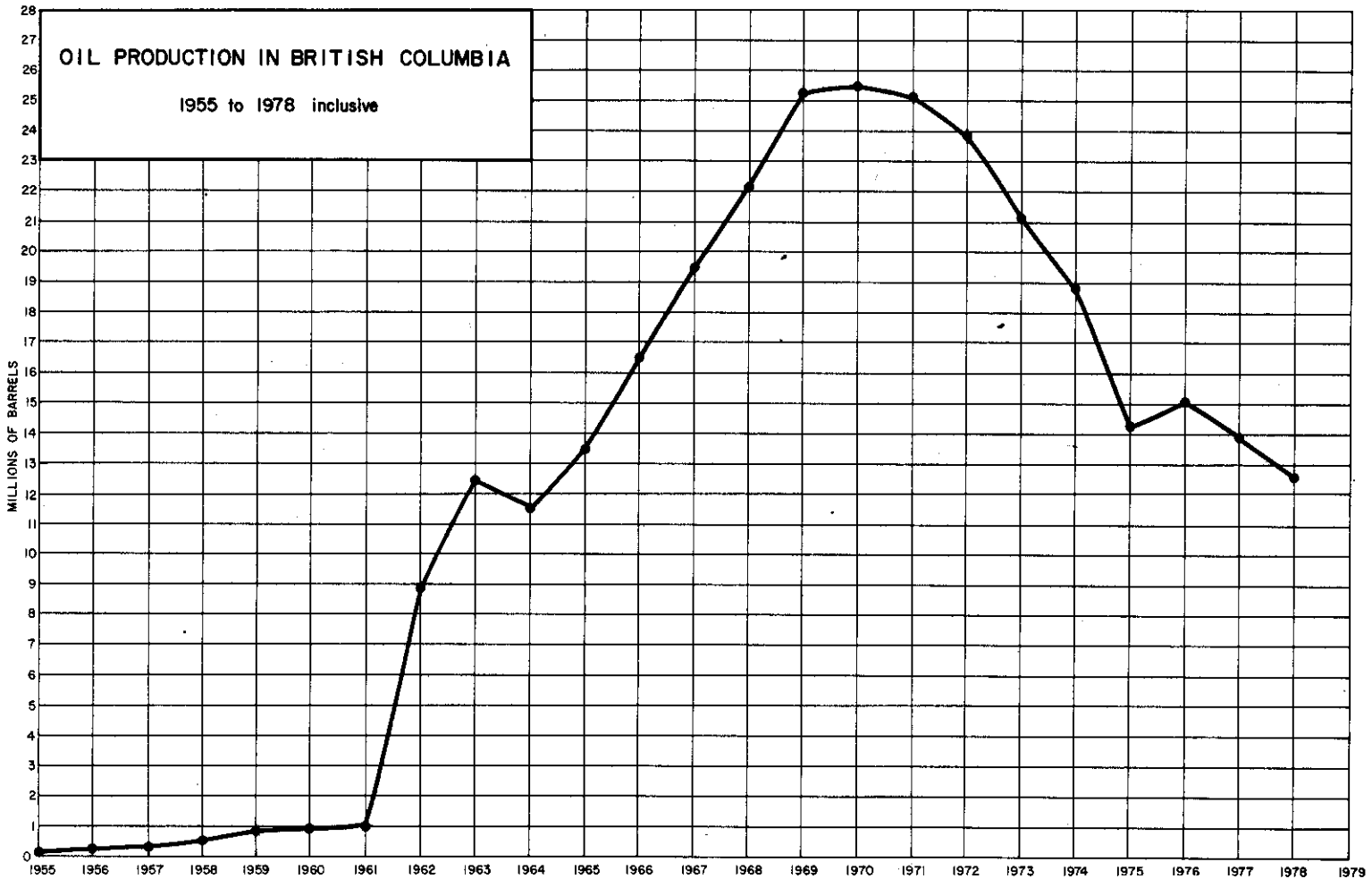


Figure 4-5—Oil Production in British Columbia, 1955—1978

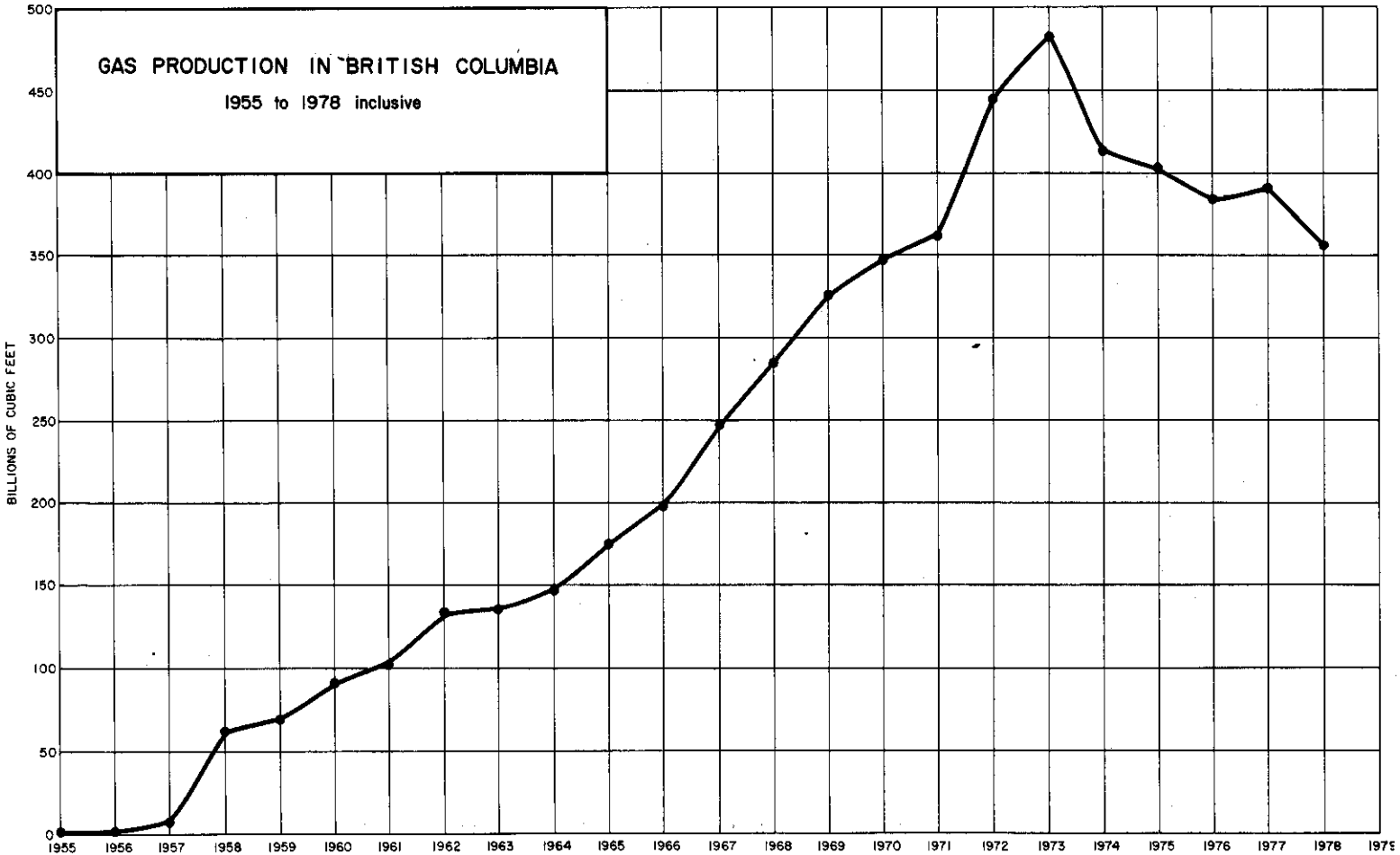


Figure 4-6—Gas Production in British Columbia, 1955—1978

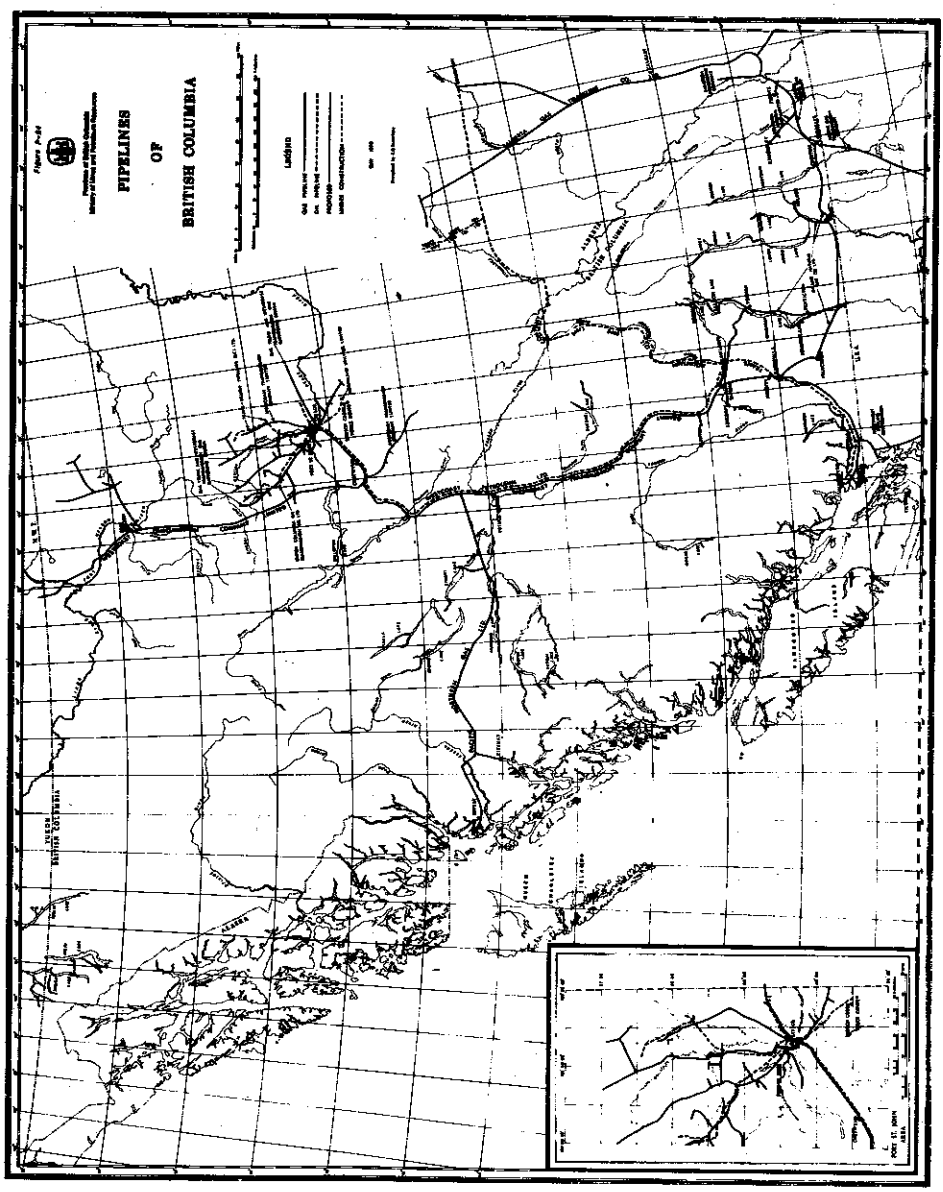


Figure 4-7—Pipelines of British Columbia

# Directory

**(as at November 30, 1979)**

| | | |
|---|---|---|
| **Hon. R. H. McClelland (Minister)** | **Room 310, Parliament Buildings** | **387-5295** |
| **R. Illing (Deputy Minister)** | **Room 406, Douglas Building** | **387-5445** |
| **Dr. James T. Fyles (Senior Assistant Deputy Minister)** | **Room 409, Douglas Building** | **387-6242** |
| **P. D. Meyers (Solicitor for Ministry)** | **609 Broughton Street** | **384-4434** |

## PERSONNEL

| | | |
|---|---|---|
| N. K. Gillespie (Director) | Room **442D,** Douglas Building | 387.3776 |
| Cathie Green (Personnel Clerk) | Room **442D,** Douglas Building | 387.3776 |

## FINANCE AND ADMINISTRATION DIVISION

| | | |
|---|---|---|
| **R. R. Davy (Director)** | **Room 434, Douglas Building** | **387-6243, 5651** |
| **Rosalyn J. Moir (Assistant Editor)** | **Room 422, Douglas Building** | **387-5496, 5631** |
| **Sharon Ferris (Library)** | **Room 430, Douglas Building** | **387-6407** |

## MINERAL REVENUE DIVISION

| | | |
|---|---|---|
| **W. W. M. Ross (Director)** | **525 Superior Street** | **387-6991** |
| **B. A. Garrison (Assistant Director)** | **525 Superior Street** | **387-6991** |

## ENERGY RESOURCES BRANCH

| | | |
|---|---|---|
| Dr. H. Swain (Assistant Deputy Minister) | 525 Superior Street | 387-1916 |
| T. France (Economist) | 525 Superior Street | 387-3787 |
| D. Horswill (Director, Energy Policy Division) | 525 Superior Street | 387-6265 |

## 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) | 525 Superior Street | 387-3781 |
| V. E. Dawson (Deputy Chief Inspector—Coal) | 525 Superior Street | 387-3781 |
| A. J. Richardson (Deputy Chief Inspector—Metal) | 525 Superior Street | 387-3781 |
| H. Dennis (Senior Coal Inspector) | 525 Superior Street | 387-3781 |
| T. Carter (Senior Mechanical/Electrical Inspector) | 525 Superior Street | 387-3781 |
| J. Cartwright (Electrical Inspector) | 525 Superior Street | 387-3781 |
| G. J. Lee (Senior Mine-rescue Co-ordinator) | 525 Superior Street | 387-3781 |
| J. D. McDonald (Senior Reclamation Inspector) | 525 Superior Street | 387-3781 |
| D. M. Galbraith (Reclamation, Inspector) | 525 Superior Street | 387-3781 |
| I. C. Errington (Reclamation Inspector) | 525 Superior Street | 387-3781 |
| P. E. Olson (Engineer)-Mining Roads | 525 Superior Street | 387-3781 |

INSPECTION AND ENGINEERING DIVISION (*Continued*)

Vancouver Office:

| | | |
|---|---|---|
| B. M. Dudas (Inspector) | 2747 East Hastings Street, V5K 1Z8 | 254-7171/72 |
| S. Elias (Inspector, Environmental Control) | 2747 East Hastings Street, V5K 1Z8 | 254-7171/72 |

Kamloops Office:

| | | |
|---|---|---|
| D. Smith (Inspector) | 101, 2985 Airport Drive, V2B 7W8 | 376-7201 |
| E. S. Sadar (Inspector) | 101, 2985 Airport Drive, V2B 7W8 | 376-7201 |
| J. MacCulloch (Inspector) | 101, 2985 Airport Drive, V2B 7W8 | 376-7201 |
| Nelson Office: J. B. C. Lang (Inspector) | 310 Ward Street, V1L 5S4 | 352-2211 ext. 213/342 |
| Fernie Office: D. I. R. Henderson (Inspector) | Box 1290, V0B 1M0 | 423-6222 |
| Nanaimo Office: J. W. Robinson (Inspector) | 2226 Brotherstone Road, V9S 3M8 | 758-2342 |
| Prince Rupert Office: [vacant] (Inspector) | Box 758, V8J 3S1 | 624-3245 ext. 202 |
| Smithers Office: S. J. Hunter (Inspector) | Box 877, V0J 2N0 | 847-4411 ext. 237/245 |
| Prince George Office: T. Vaughan-Thomas (Inspector) | 1652 Quinn Street, 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 Superior Street | 387-5068 |
| Dr. T. Höy | 626 Superior Street | 387-5068 |
| D. G. McIntyre | 626 Superior Street | 387-5068 |
| Dr. W. J. McMillan | 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. D. E. Pearson | 630 Superior Street | 387-5068 |

## RESOURCE DATA AND ANALYSIS

| | | |
|---|---|---|
| [vacant] (Senior Geologist) | Room 418, Douglas Building | 387-5975 |

*Geologists*

| | | |
|---|---|---|
| Special Projects: Dr. K. E. Northcote | Room 416, Douglas Building | 387-5975 |
| Industrial Minerals: Z. D. Hora | 630 Superior Street | 387-5068 |

## RESOURCE DATA AND ANALYSIS (*Continued*)

| | | |
|---|---|---|
| Mineral Inventory: | | |
| T. Kalnins | Room 427, Douglas Building | 387-5975 |
| J. E. Forester | Room 424, Douglas Building | 387-5975 |
| Coal Inventory: A. Matheson | 625 Superior Street | 387-6588 |
| Co-ordinator, Data Processing: G. L. James | Room 432, Douglas Building | 385-5600 |

## APPLIED GEOLOGY AND PROSPECTORS' ASSISTANCE

| | | |
|---|---|---|
| Dr. E. W. Grove (Senior Geologist) | 525 Superior Street | 387-5538 |
| A. F. Shepherd (Geologist) | 525 Superior Street | 387-5538 |

*District Geologists*

| | | |
|---|---|---|
| Fernie: D. A. Grieve | Box 1290, V0B 1M0 | 423-6222 |
| Fort St. John: R. H. Karst | Box 7438, V1J 4M9 | 785-6906 |
| Kamloops: G. P. E. White | 101, 2985 Airport Drive, V2B 7W8 | 376-7201 |
| Nelson: G. G. Addie | 310 Ward Street, V1L 5S4 | 352-2211 ext. 213 |
| Prince George: G. H. Klein | 1652 Quinn Street, V2N 1X4 | 562-8131 ext. 322/323 |
| Smithers: T. G. Schroeter | Box 877, V0J 2N0 | 847-4411 ext. 277 |

## TITLES DIVISION

| | | |
|---|---|---|
| E. J. Bowles (Chief Gold Commissioner) | Room 417, Douglas Building | 387-6245 |
| R. Rutherford (Deputy Chief Gold Commissioner) | Room 433, Douglas Building | 387-5517 |
| D. I. Doyle (Gold Commissioner, Vancouver) | 800 Hornby Street, V6Z 2C5 | 668-2672 |
| E. A. H. Mitchell (Gold Commissioner) | Room 411, Douglas Building | 387-6255, 6246 |
| A. R. Corner (Coal Administrator) | Room 411, Douglas Building | 387-5687 |

*Mineral Claims Inspectors*

| | | |
|---|---|---|
| Vancouver: F. A. Reyes | 800 Hornby Street, V6Z 2C5 | 668-2672 |
| Kamloops: H. Turner | 212, 2985 Airport Drive, V2B 7W8 | 554-1445 |
| Quesnel: D. Lieutard | 401, 350 Barlow Avenue, V2J 2C1 | 7751-260 |
| Smithers: R. Morgan | Box 877, V0J 2N0 | 776-278 |

## ECONOMICS AND PLANNING DIVISION

| | | |
|---|---|---|
| F. C. Basham (Acting Director) | 525 Superior Street | 387-3787 |
| W. P. Wilson (Statistician) | 525 Superior Street | 387-3787 |

## PETROLEUM RESOURCES BRANCH

| | | |
|---|---|---|
| J. D. Lineham (Assistant Deputy Minister, Chief of Branch) | Room 404, 405, Douglas Building | 387-3485, 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 |

ENGINEERING DIVISION *(Continued)*

M. B. Hamersley (Development Engineering Technician) ..... Room 401, Douglas Building ... 387-5993
D. L. Johnson (District Engineer) ..... Box 6880, Fort St. John, V1J 4M9 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
I. A. Hudson (Senior Economic Geologist) ..... Room 442, Douglas Building 387-5993

TITLES *DIVISION*

W. J. Quinn (Commissioner) ..... Room, 446, Douglas Building ..... 387-3333

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