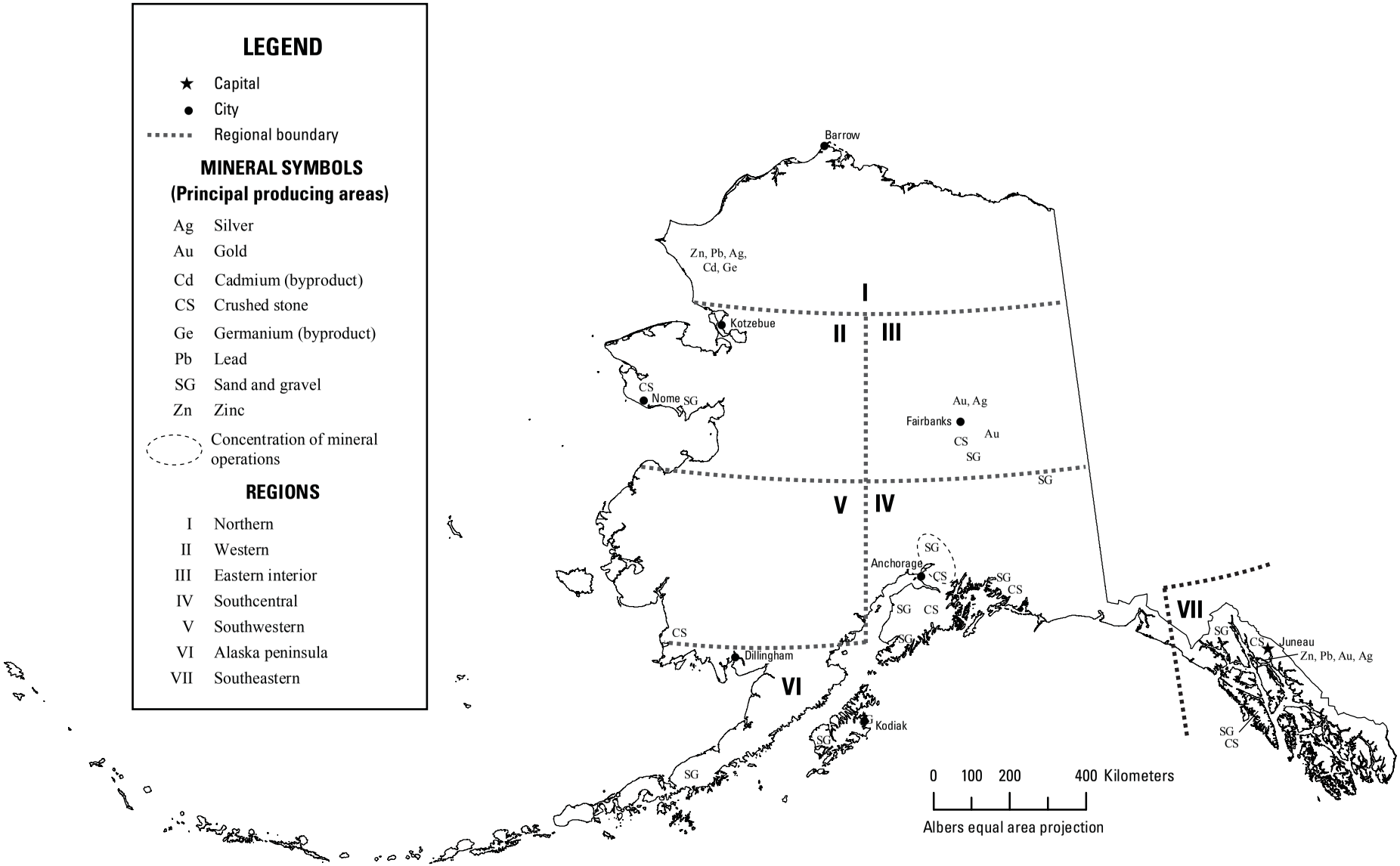
2008 Minerals Yearbook

ALASKA

U.S. Department of the Interior
U.S. Geological Survey

July 2012

ALASKA



Source: Alaska Division of Geological and Geophysical Surveys//U.S. Geological Survey (2008).

The Mineral Industry of Alaska

In 2008, Alaska's nonfuel raw mineral production was valued at $2.64 billion, based upon annual U.S. Geological Survey (USGS) data. This was a decrease of $900 million (or 25%) from the State's total nonfuel mineral value for 2007. The State dropped to eighth from sixth among the 50 States in total nonfuel mineral production value and accounted for about 4% of the U.S. total value. Per capita, the State led the Nation in the value of its mineral industry's nonfuel mineral production; with a population of 688,000, the value of production was about $3,840 per capita.

The State's leading nonfuel mineral commodities in 2008 were, by value, zinc and gold followed by lead and silver. These four mineral commodities accounted for more than 95% of the total value of Alaska's nonfuel mineral production. The largest increases in value took place in gold and construction sand and gravel. A modest increase in the quantity of gold produced resulted in a significant increase in the value of Alaska's gold production. The unit value of gold rose by almost 25% (George, 2010). The quantity of silver produced decreased slightly but the value of the State's silver production increased as a result of higher prices. In the industrial minerals sector, the value in crushed stone production increased by $100,000 (0.2%) (table 1).

In 2008, Alaska continued to rank first in the production of cadmium, silver, and zinc in the country. The State produced about 78% of all the cadmium in the country (of seven producing States). Alaska produced about 46% of all silver produced in the country (of 10 producing States) and the State produced almost 79% of all the zinc produced in the country (of seven producing States). The State rose to second from third of 11 gold-producing States, rose from 23d to 19th in the production of natural gemstones, and remained second in the production of lead (of 5 producing States). Alaska was a producer of significant quantities of construction sand and gravel.

The following narrative was derived from the annual publication of the Alaska Division of Geological and Geophysical Surveys (DGGS) (Szumigala and others, 2008). The DGGS, in cooperation with the Alaska Department of Commerce, Community and Economic Development, Office of Economic Development and Minerals, compiled the data, which are based on DGGS surveys and estimates and may differ from USGS production figures as reported to and estimated by the USGS.

Exploration, Development, and Drilling Activities

Nonfuel mineral exploration expenditures during 2008 were approximately $337 million, 4.8% more than the $321.5 million spent in 2007. About half of the exploration expenditures ($163 million) were directed toward porphyry copper-gold deposits; more than $95.5 million was spent on intrusion-related gold deposits and more than $35.7 million was spent on various gold-quartz vein deposits. The sharp decrease in exploration expenditures for base-metal-rich, polymetallic massive-sulfide deposits was notable with $30.1 million spent in 2008, compared to almost $59.4 million spent in 2007. Exploration projects were conducted across the entire State, although $229 million of expenditures were directed toward projects in southwestern Alaska. Two advanced exploration projects, Pebble and Donlin Creek, accounted for more than 60% of the exploration expenditures and drill footage in 2008. During 2008, 3,898 new State mining claims [186,000 hectares (ha)], 24 new State prospecting sites (1,550 ha), and 3,001 new Federal claims (24,300 ha) were staked. State claim staking decreased more than 50% from 2007 levels, while the number of new Federal mining claims more than tripled from 2007 to 2008. The number of active Federal claims reached its highest level in 16 years during 2008. The amount of land in Alaska under claim decreased approximately 13% from 2007 to 2008, with approximately 1.7 million ha of land covered by claims and prospecting sites in 2008. Alaska had 11,732 active Federal and 44,392 active State mining claims in 2008.

Several large blocks of mining claims were staked in 2008. Alaska Gold Co., a subsidiary of NovaGold Resources Inc., staked 500 more 65-ha State mining claims covering 32,000 ha on the Seward Peninsula in the vicinity of the Darby Mountains and west of Candle in the Koyuk-Kugruk drainages. Geohedral LLC staked 2,383 Federal mining claims in the Yakutat area. Barrick Gold Exploration Inc. staked 134 65-ha State mining claims in the Granite Creek area of the Iditarod Quadrangle. Anglo American Exploration (USA) Inc. staked 156 65-ha State mining claims in the Styx River area of the Alaska Range.

The development sector of the mining phase as used in this report refers to building infrastructure or activities that facilitate production of mineral products. Development expenditures refer to actual expenditures at mines as well as sustaining capital. Sustaining capital includes equipment replacement and rebuilding, facility upgrades, and other expenditures that must be amortized or depreciated in accordance with tax laws. Reported and estimated development expenditures in 2008 were approximately $396.2 million, a 24.3% increase from the 2007 value of $318.8 million. A total of 33 projects reported development expenditures for 2008.

Alaska Peninsula Region

New Gold Inc. continued work on Bristol Bay Native Corp. lands at the Port Moller and Chignik projects. Alaska Earth Sciences assisted with reconnaissance mapping, geochemical sampling, and ground magnetic traverses of the Mallard Duck Bay prospect and preliminary reconnaissance mapping, sampling, and ground magnetic surveys of other less-explored mineral prospects in the greater Chignik region, including Marshinlak Creek, Warner Bay, Castle Bay, and Thompson Valley. New Gold terminated its option agreement with Full Metal Minerals on the Port Moller and Chignik projects in

late 2008; limited development activity was reported for this region in 2008. One company reported $70,000 in development expenditures and one employee in this region in 2008.

Eastern Interior Region

International Tower Hill Mines Ltd. focused on the Livengood gold project northwest of Fairbanks. Mineralization in the Money Knob deposit forms strata-bound and crosscutting bodies in a large thrust-faulted and recumbently folded sedimentary and volcanic sequence. The main body of mineralization lies within a 1.6-kilometer (km)-wide, 5.6-km-long, northeast-trending belt. This large structural zone contained a series of dikes, sills, and plugs that are believed to be related to the gold mineralization. The company drilled 116 holes in a resource-definition grid pattern and excavated approximately 457 meters (m) of trenches to define the high-grade Core Area, which has mineralization averaging almost 1.03 grams per metric ton (g/t) (0.030 troy ounces/short ton) (oz/T) gold over a 1,500-m strike length and 490-to-880-m width. A resource defined in October, based on a 0.51-g/t (0.015-oz/T) gold cutoff, includes an indicated 69.5 Mt 76.6 million short tons (MT) containing 58,000 kg (1.86 million troy ounces) of gold and an inferred resource of 87.8 Mt (96.8 MT) containing 67,500 kg (2.17 million troy ounces) of gold. Freegold Ventures Ltd. completed approximately 12,400 m of rotary air-blast drilling in 1,347 holes and 26 core drilling holes totaling 3,100 m, covering a large area of the Golden Summit project on Cleary Summit near Fairbanks. Significant drill results along the Cleary Hill vein system include 92 m grading 0.93 g/t (0.027 oz/T) gold, 31 m grading 1.58 g/t (0.046 oz/T) gold, and 17 m grading 6.31 g/t (0.184 oz/T) gold. Only approximately 12 kg (400 troy ounces) of gold was recovered due to plant configuration problems and overgrinding of material. Interpretation of preliminary assays suggests that the bulk-sampling program confirmed the existence of bulk-minable mineralization at potentially economic grades. Fairbanks Gold Mining Inc., a subsidiary of Kinross Gold Corp., in joint venture with Teryl Resources Corp. on the Gil property, collected 103 Bombardier-mounted auger soil samples at the Last Chance area and drilled nine reverse circulation drill holes totaling 1,400 m at the Sourdough Ridge area. Drill targets were gold-mineralized calc-silicate horizons and quartz veins. The highest-grade drill results in hole GVR08-505 were 8 m assaying 0.62 g/t (0.018 oz/T) gold from 36-to-44-m depth and 12 m assaying 2.09 g/t (0.061 oz/T) gold from 114-to-126-m depth. MAX Resource Corp. completed a 10-hole diamond drill program totaling 2,300 m at the Gold Hill porphyry molybdenum-copper-gold project during 2008. Drilling expanded the identified mineralized system to the north and northeast. Significant drill results include 184 m of 0.026% molybdenum and 0.04% copper from surface to 184-m depth in hole DDH-08-01, 204 m of 0.032% molybdenum and 0.04% copper in hole DDH-08-05 with 53 m of 0.053% molybdenum (Mo) from 117-to-171-m depth in hole DDH-08-05, 30 m of 0.071% Mo from 46-to-76-m depth in hole DDH-08-06, and 15 m of 0.121% Mo from 260-to-270-m depth in hole DDH-08-08. Full Metal Minerals conducted surface exploration and drilling at the LWM polymetallic carbonate replacement prospect near Chicken. Mineralization occurs within dolomitized marble host rock, with the primary zone located adjacent to a fault zone. Exploration work included collecting 72 rock samples and 990 soil samples for geochemical analysis. During 2008, 47 drill holes totaling 11,300 m were completed at LWM, with massive to semimassive sphalerite-galena-chalcopyrite mineralization intersected in most holes. Step-out and infill holes were completed on 50-m centers along strike and down-dip. The widest mineralized intercept was in hole LWM08-32, with 16.7 m averaging 14.46% zinc, 11% lead, and 217 g/t (6.34 oz/T) silver. The most significant mineralized intercept was in hole LWM08-33, with 3.9 m averaging 17.9% zinc, 11.8% lead, 0.33% copper, and 236 g/t (6.87 oz/T) silver.

Teck-Pogo Inc. carried out an exploration and drilling program on the Pogo property. A helicopter-supported, two-rig drill program completed 20 holes totaling 11,400 m. There were 18 holes (10,200 m) drilled on the Pogo mill site lease and 2 holes at the Chorizo prospect. Underground exploration drilling at the Pogo Mine included 16 holes totaling 4,100 m. No drill results were released. Rubicon Minerals Corp. conducted a property-wide reconnaissance exploration program in the Pogo area, including geologic mapping, prospecting, and soil sampling with limited drilling. Australian Mineral Fields Ltd. optioned the Tushtena gold project near Tok from Alaska-based Tushtena Resources Inc., with the right to earn an 80% interest in the property by spending $5 million within 5 years of the agreement execution and an additional 5% upon completion of a bankable feasibility study. Historic rock chip samples from outcropping quartz-arsenopyrite-carbonate veins with visible gold assayed up to 1,450 g/t (42.3 oz/T) gold. Historic work at the Discovery Zone identified a 1-km-long soil anomaly with greater than 250 parts per billion gold and a coincident greater than 500 parts per million arsenic. Silverado Gold Mines Ltd. completed a mineral resource estimate for its Ester Dome property near Fairbanks. The study estimates an indicated resource of 573,000 t (631,600 T) containing 3,940 kg (126,700 troy ounces) of gold and an inferred resource of 2.31 Mt (2.55 MT) containing 6,660 kg (214,100 troy ounces) of gold. All reclamation work was completed on the Ester Dome property and work continued to complete closure of the Grant Mill tailings pond.

Total construction and other capitalized expenditures allocated to the eastern interior region amounted to $151.9 million in 2008 compared with $50.2 million in 2007, an increase of $101.7 million, up 200% from that of 2007. The eastern interior region had the highest regional development spending in 2008, with a total of 14 projects reporting development activity. Pogo Mine, an underground gold mine operated by Teck-Pogo Inc., is a joint venture between Sumitomo Metal Mining Co. Ltd. (51%), Sumitomo Corp. (9%), and Teck Cominco Alaska Inc. (40%). Capital expenditures at the project during 2008 exceeded $24.75 million. According to Teck-Pogo Inc., a continued focus on underground development is required to open up the additional ore headings needed to reach the full production rate of 2,300 t/d. Fort Knox gold mine is owned and operated by Fairbanks Gold Mining Inc., a wholly owned subsidiary of Kinross Gold Corp. (USA). Fort Knox Mine includes the main Fort Knox

open pit mine, the mill and tailings storage facility, and the Walter Creek heap leach facility. The True North open pit mine is currently in care-and-maintenance status. Fort Knox is located within the Fairbanks North Star Borough, approximately 40 km northeast of Fairbanks. Construction of the 146-million-metric-ton (Mt)-capacity Walter Creek heap leach facility began October 2007. Development expenditures at Fort Knox Mine amounted to $126.6 million during 2008 compared with $30 million in 2007. Efforts during 2008 included stripping for mining phases 6 and 7, construction of the Walter Creek heap leach facility, upgrading of the mill crusher, upgrading of the administrative building and the mine dispatch system, purchase of one new power shovel and six new haulage trucks, and mine equipment rebuilds.

Northern Region

Teck Cominco Alaska Inc. continued its exploration and drilling program for polymetallic sedimentary-hosted massive sulfide deposits in the area surrounding the Red Dog Mine. Teck drilled 8,800 m of core in 12 holes. Teck also continued an exploration program for a local source of natural gas near the Red Dog Mine. Teck spent $10.8 million on their energy exploration program. BHP Billiton Ltd. completed a second year of exploration at the Western Arctic Coal Project drilling under a 5-year exploration agreement with Arctic Slope Regional Corp. The 2008 field program included a caribou monitoring program; mobilization and planned spring caching; significant site improvements, including camp expansion, runway upgrades and ongoing site clean-up; and exploration drilling, field reconnaissance, and baseline environmental activities. Two drills completed 8,200 m in 20 holes. Drilling results were not released. Goldrich Mining Co., formerly Little Squaw Gold Mining Co., staked 12 mining claims, completed about 305 m of trenching, collected 160 rock and channel samples for geochemical analysis, conducted limited soil sampling, and completed geologic mapping at the Little Squaw property. Road and airstrip infrastructure was also improved. An independent technical data assessment was commissioned and released. The assessment concluded that Little Squaw Creek goldbearing gravels contain a minimum of 6,740 kg (216,602 troy ounces) of recoverable placer gold within a global resource of 7,580 kg (243,621 troy ounces).

NovaGold Resources Inc. released a resource estimate in early 2008, prepared by contractor SRK Consulting Ltd., for the Arctic deposit. The volcanogenic massive sulfide deposit in the southern Brooks Range contains an indicated resource of 16.8 Mt (18.5 MT) containing 698,000 t (769,000 T) of copper, 1,010,000 t (1,118,500 T) of zinc, 159,000 t (175,000 T) of lead, 13,900 kg (447,000 troy ounces) of gold, and 1 million kg (32.29 million troy ounces) of silver. The deposit contains an additional inferred resource of 11.9 Mt (13.1 MT) containing 425,000 t (468,500 T) of copper, 596,000 t (656,500 T) of zinc, 95,300 t (105,000 T) of lead, 8,060 kg (259,000 troy ounces) of gold, and 578,000 kg (18.58 million troy ounces) of silver. NovaGold also continued exploration on the nearby Baird Mountain property. NovaGold announced in September that it had agreed to sell 51% interest in the Ambler project and its early-stage base-metal Alaskan properties to Mantra Mining Inc. for $20 million in common shares, along with other conditions.

Total development expenditures in the northern region in 2008 amounted to $45 million, all by Teck Cominco at the Red Dog Mine, an 8.7% increase over the $41.4 million spent on development in this region in 2007. The Red Dog Mine is the world's largest zinc mine, both in terms of reserves and annual zinc production. The mine is located in northwestern Alaska, approximately 160 km north of Kotzebue and 80 km inland from the Chukchi Sea, at the southern foothills of the Brooks Range. The Red Dog Mine is operated by Teck Cominco Alaska Inc. under a 1982 operating agreement with the landowner. The mine produces lead and zinc concentrates that are trucked to a port on the coast for shipping during the summer. Projects included $4 million spent on 10,600 m of infill and evaluation drilling and permitting efforts for the Aqqaluk deposit, $15 million on primary tailings dam construction, and $26 million on sustaining capital projects. Teck Cominco Alaska Inc. and NANA Regional Corp. Inc. are proposing to continue mining operations through 2031 by extending mining activity into the Aqqaluk deposit, located adjacent to the main deposit. The Aqqaluk deposit contains 46.8 Mt (51.6 T) of reserves, with 16.7% zinc and 4.4% lead, and represents an estimated 20 years of additional mining for the region and NANA.

Southcentral Region

International Tower Hill Mines worked on the Chisna property east of Paxson. A stream-sediment geochemical survey was completed over the Canyon Creek and Slate Creek Northwest claim blocks, as well as geologic mapping and prospecting in the region. Full Metal Minerals Ltd. commenced underground rehabilitation work at the Lucky Shot property north of Anchorage after executing an extended mining lease with Alaska Hardrock Inc. Work included about 120 m of underground drifting from the historic Coleman adit to access high-grade gold mineralization in the Lucky Shot shear. Full Metal also purchased a used 181-metric-ton-per-day mill to use on the property. A 10-hole, 2,400-m drilling program was completed on the War Baby block. Geoinformatics Exploration Inc. completed an 11-hole, approximately 4,300-m drilling program at the Whistler porphyry copper-gold project near Rainy Pass. Five holes were drilled in the Whistler zone and six holes were drilled on nearby prospects, including the Raintree West prospect. The best result from the 2008 Whistler drilling was hole WH-08-08 with a 727-m intersection from the surface grading 0.48 g/t (0.014 oz/T) gold, 0.86 g/t (0.025 oz/T) silver, and 0.14% copper. Geohedral retained Norwest Corp. to supervise the exploration project along the shore of the Gulf of Alaska near Yakutat and drilled 11 holes totaling more than 305 m and ranging from 20-to-38-m depths. Millrock Resources optioned the South Estelle property from Full Metal Minerals. Millrock conducted geochemical sampling of talus fines and rocks; results indicate two large gold anomalies at the Shoeshine and Oxide Ridge occurrences. The average gold content of 24 fine samples of talus in a 213-m-by-305-m anomalous zone at the Oxide Ridge occurrence was 2.30 g/t (0.0677 oz/T) gold. Gold occurs with arsenopyrite and chalcopyrite as disseminated

grains within porphyritic plutonic rocks, and in quartz stockworks and zones of sheeted quartz veins. Pacific North West Capital Corp. completed induced polarization and ground magnetic surveys exploring for sulfide-and-chromite-enriched layers in the Tonsina Ultramafic Complex.

Southeastern Region

Hecla Mining Co. continued exploration at and near the Greens Creek Mine on Admiralty Island near Juneau. Ucore Uranium Inc.'s exploration program at the Bokan Mountain property near Ketchikan focused on expanding high-grade uranium mineralization in the I&L zone and on identifying and evaluating additional drill targets. Committee Bay Resources Ltd. acquired Niblack Mining Corp. and continued exploration at the Niblack polymetallic project on Prince of Wales Island.

Two major projects reported development expenditures in the southeastern region in 2008. Construction continued at the Kensington project for part of the year, and Greens Creek Mine saw ongoing development throughout the year. Development expenditures in the southeastern region totaled $66.1 million, all from the Kensington project and Greens Creek Mine. At Coeur Alaska Inc.'s Kensington underground gold mine complex in southeastern Alaska, 72 km north of Juneau, 2008 development-related expenditures were $42.15 million. Total project carrying value was $338.2 million as of December. Reserves at the Kensington deposit amounted to 5.0 Mt (5.5 MT) with a grade of 9.3 g/t (0.27 oz/T) gold and containing a total of 46,000 kg (1.478 million troy ounces) of gold. In addition, yearend mineralized material at the Kensington deposit amounted to 2.47 Mt (2,724,000 T) with a grade of 6.2 g/t (0.18 oz/T) gold. Coeur plans a production rate of 3,000 kilograms per year (100,000 troy ounces per year) at a cash cost of $310 per troy ounce. Capital expenditures at Greens Creek Mine, owned by Kennecott Greens Creek Co. (operator) and Hecla Mining Co., amounted to $24 million for 2008, not including the acquisition of the 70.3% of Kennecott's share. The expenditure was for ore development, modernization of the haulage fleet and a communications system, as well as the addition of tailings capacity.

Southwestern Region

Northern Dynasty Minerals Ltd. announced an updated mineral resource estimate for the Pebble Limited Partnership's Pebble deposit based on 476 drill holes in the Pebble West and Pebble East deposits. At a 0.30%-copper-equivalent cutoff (using defined metal ratios and metal prices for copper, gold, and molybdenum), the Pebble Deposit contains the following: 5.1 billion metric tons (Gt) [5.62 billion short tons (GT)] of measured and indicated mineral resources grading 0.77% copper equivalent, containing 22 Mt (48 billion pounds) of copper, 1.77 million kg (57 million troy ounces) of gold, and 1.32 Mt (2.9 billion pounds) of molybdenum; and 3.99 Gt (4.4 GT) of inferred mineral resources grading 0.55% copper equivalent, containing 11 Mt (24 billion pounds) of copper, 1.15 million kg (37 million troy ounces) of gold, and 862,000 t (1.9 billion pounds) of molybdenum. Northern Dynasty and the Pebble Partnership updated the mineral resource for the Pebble East deposit in late February. At a 1%-copper-equivalent cutoff, the Pebble East deposit contains inferred mineral resources of 1.51 Gt (1.67 GT) of ore with a 1.32% copper equivalent. The calculated mineral resource contains 12.2 Mt (27 billion pounds) of copper, 746,000 kg (24 million troy ounces) of gold, and 544,000 t (1.2 billion pounds) of molybdenum. The 2008 drilling program at Pebble was designed to upgrade the resource classification of a portion of the Pebble East mineral resources to an indicated category in preparation for prefeasibility mine planning studies, and to test for the outside limits of the deposit. The program also included metallurgical, geotechnical, and environmental drilling. Work included 53,500 m of core drilling in 152 holes and 82 rotary holes totaling 2,100 m. The core-drilling total included 36,000 m of drilling in 26 holes to delineate the Pebble East deposit and to provide detailed geotechnical information for mine planning purposes.

Anglo American Exploration (USA) Inc. staked State mining claims in the Styx River area near Mt. Estelle. Anglo American, with assistance from Alaska Earth Sciences, conducted geologic mapping, prospecting, and geochemical sampling. Geochemical results were not released. Pacific North West Capital Corp. explored for platinum and associated metals on the Goodnews Bay project with funding from Stillwater Mining Co. Full Metal Minerals Ltd. and Highbury Projects Inc. staked an additional 44 mining claims at the Moore Creek gold property. Sampling and mapping were completed on previously unexplored areas of the property. Full Metal Minerals optioned the Granite Creek gold property south of McGrath, completed reconnaissance exploration, and later dropped the option. Kinross Gold Corp. and Full Metal completed an extensive gold reconnaissance program in southwestern Alaska.

Two placer gold projects and one sand and gravel operation reported development activity in the southwestern region in 2008. Total expenditures were $161,000 and one full-time-equivalent position was credited to this effort.

Western Region

St. Andrew Goldfields Ltd. completed an underground exploration program, including drilling 129 holes totaling 9,400 m at the Nixon Fork gold-silver-copper mine near McGrath. Pacific North West Capital Inc. optioned the Nixon Fork property from St. Andrew Goldfields in December, with the right for outright purchase. Millrock Resources Inc. signed a 5-year exploration agreement with Golden Glacier Inc., a subsidiary of Bering Straits Native Corp., for the Council, Bluff, and Ungalik areas of the southern Seward Peninsula. Millrock concentrated exploration on the Bluff property east of Nome. At the Daniel's Creek prospect, Millrock drilled 396 m of a planned 1,500-m program aimed at testing historic drill results reported by BHP Minerals. Drill hole BLF1001 intersected 5.9 m of mineralization with an average grade of 1.41 g/t (0.041 oz/T) gold and hole BLF1003 intersected 1.4 m of mineralization with an average grade of 3.81 g/t (0.111 oz/T) gold. Millrock carried out initial vegetation and soil geochemical surveys in the Council area to identify lode sources of the prolific placer deposits. Millrock Resources Inc. and Alix Resources Corp.

completed geologic mapping, trenching, and drilling at the Divide gold project about 45 km north of Nome. Drilling totaled 2,700 m in 22 reverse-circulation holes, and 24 trenches were excavated with a total length of 1,200 m over gold-arsenic soil anomalies. Great Basin Gold Ltd. conducted trenching and rock chip sampling at the Ganes Creek gold property northwest of McGrath. NovaGold Resources Inc. conducted limited exploration on the Rock Creek project. Drilling consisted of 19 reverse-circulation drill holes totaling nearly 2,000 m, and 1,312 samples were tested for gold. NovaGold conducted limited exploration and staked additional claims optioned from Rosander Mining Co. at the Colorado Creek gold project northwest of McGrath. NovaGold also conducted exploration at the Kugruk project near Candle. Triex Minerals Corp. conducted limited exploration including site cleanup on the Boulder Creek and Fireweed uranium prospects near Elim. Triex and Full Metal Minerals Ltd. dropped their option on the Boulder Creek property but retained interest in nearby claims.

The western region was credited with the second-highest development expenditures for 2008. Development expenditures were reported for lode and placer projects. Four projects reported expenditures amounting to approximately $125 million for 2008, which compares to development expenditures of $97 million for 2007, an increase of 29%. NovaGold Resources continued construction of the Rock Creek Mine located near Nome; the facility was substantially completed during the year and the startup process began in September 2008. Production at Rock Creek Mine began in September, with the 6,400-t/d mill being fed at 25% capacity. The mill operated until October. Rock Creek gold mine is currently in care-and- maintenance status, pending a review of whether to recommend startup at the project. In December, Arctic Oil & Gas Corp. and Shell Trust Dredge Engineers announced that they had agreed to pool their respective interests in offshore mining leases in Norton Sound near Nome. Shell holds options over leases in offshore State waters with drill-indicated gold reserves of about 16,000 kg (500,000 troy ounces). In December, Pacific North West Capital Corp. announced that it had acquired an option to purchase a 100% interest in Mystery Creek Resources, Inc. Facilities at the Nixon Fork Mine include a 181-t/d (200-T/d) flotation plant with a gravity gold separation circuit, a sulfide flotation circuit, and a newly constructed carbon-in-leach gold-leaching circuit. Mine stockpiles amount to 2,100 t (2,315 T) of ore and approximately 116,000 t (127,868 T) of mineralized tailings.

Commodity Review

Industrial Minerals

Sand and Gravel, Construction, and Stone, Crushed.—DGGS reported that production of crushed stone was 2.3 Mt (2.5 MT) in 2008, compared with 2.0 Mt (2.2 MT) in 2007. Sand and gravel production was 11.3 Mt (12.5 MT) in 2008, down from 12.9 Mt (14.2 MT) in 2007. As noted earlier, these data are from DGGS surveys and differ from USGS production figures reported in table 1.

Metals

Gold.—The Pogo Mine was in production phase during 2008 and surpassed the Fort Knox Mine by producing 10,800 kg (347,219 troy ounces) of gold. Employment at the Pogo Mine was 385 employees. Fairbanks Gold Mining operated the Fort Knox Mine in 2008. The company produced 10,200 kg (329,105 troy ounces) of gold during the year, compared with 10,500 kg (338,459 troy ounces) produced in 2007. The Fort Knox Mine employed 445 people during 2008. The Greens Creek Mine operated by Kennecott Minerals Co., which is considered the fifth-largest primary silver producer in the world, produced about 2,090 kg (67,269 troy ounces) of gold, slightly less than the 2,120 kg (68,006 troy ounces) produced in 2007. The decrease in production at Greens Creek is reflective of a lower grade ore than in previous years. Employment at Greens Creek was a total of 336 persons. Placer gold production was estimated to be 1,765 kg (56,759 troy ounces) compared to 1,670 kg (53,849 troy ounces) in 2007. Hard-rock (lode) gold production in the State increased to a total of 23,100 kg (743,993 troy ounces) during the year, compared with 20,900 kg (673,084 troy ounces) produced in 2007.

Lead, Silver, and Zinc.—The Red Dog Mine produced 515,000 t (567,911 T) of zinc, 123,000 t (135,143 T) of lead, and an estimated 233,000 kg (7.5 million troy ounces) of byproduct silver in 2008. The Greens Creek Mine produced 222,000 kg (7,145,711 troy ounces) of silver compared to 269,000 kg (8,646,825 troy ounces) in 2007.

Government Programs, Activities, and Awards

The Alaska DGGS continued to be an active participant in the STATEMAP program. STATEMAP is a component of the congressionally mandated National Cooperative Geologic Mapping Program (NCGMP), through which the USGS distributes Federal funds to support geologic mapping efforts through a competitive funding process. The NCGMP has three primary components: (1) FEDMAP, which funds Federal geologic mapping projects; (2) STATEMAP, which is a matching-funds grant program with State geological surveys; and (3) EDMAP, a matching-funds grant program with universities that has a goal to train the next generation of geologic mappers. The DGGS conducted fieldwork, including geologic mapping and geochemical sampling of rock, in the Dry Creek and Tok areas. Fieldwork also included mapping approximately 500 km^2 in the eastern Bonnifield mining district, including the Dry Creek and West Tundra Flats volcanogenic massive sulfide deposits. A geochemical data report and 1:50,000-scale bedrock and comprehensive geologic maps were scheduled to be published in 2010. Mapping was conducted between Dot Lake and Tetlin Junction on the Alaska Highway as part of the Gas Pipeline Corridor Project. Project geologic maps and geochemical reports were expected to be published in 2009 and 2010. Geologists from the Mineral Resources Section of the DGGS mapped and sampled approximately 700 km^2 in the eastern Bonnifield mining district during a 31-day field season. The DGGS also conducted geologic fieldwork along the proposed gas pipeline corridor between Dot Lake and Tetlin

Junction along the Alaska Highway during 2008. Surficial and bedrock mapping were completed at a scale of 1:63,360. In 2008, DGGS surficial geologists and contractors dug and logged several trenches to determine whether recent surface deposits have been offset by fault movement. Work in 2009 was expected to continue on this project from Tetlin Junction to the Yukon Territory-Alaska border.

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TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN ALASKA[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2006		2007		2008	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones, natural	NA	13	NA	13	NA	69
Sand and gravel, construction	12,800 r	65,500 r	13,200 r	77,300 r	11,300	84,000
Stone, crushed	2,180	22,500 r	1,750 r	20,000 r	1,940	20,100
Combined values of cadmium (byproduct from zinc concentrates), gold, lead, silver, zinc	XX	2,940,000	XX	3,440,000	XX	2,540,000
Total	XX	3,030,000 r	XX	3,540,000 r	XX	2,640,000

[r]Revised. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
ALASKA: CRUSHED STONE SOLD OR USED, BY TYPE[1]

Type	2007			2008		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	1	6	$43	--	--	--
Granite	6	244	2,670	6	226	$1,340
Traprock	-- r	-- r	-- r	--	--	--
Miscellaneous stone	19 r	1,500 r	17,300 r	19	1,720	18,700
Total	XX	1,750 r	20,000 r	XX	1,940	20,100

[r]Revised. XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 3
ALASKA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2008, BY USE[1]

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	W	W
Other coarse aggregate	3	30
Coarse aggregate, graded:		
Concrete aggregate, coarse	W	W
Bituminous aggregate, coarse	W	W
Bituminous surface-treatment aggregate	W	W
Railroad ballast	W	W
Other graded coarse aggregate	1	5
Fine aggregate (-⅜ inch):		
Stone sand, concrete	W	W
Other fine aggregate	7	95
Coarse and fine aggregates:		
Graded road base or subbase	W	W
Unpaved road surfacing	91	928
Crusher run or fill or waste	W	W
Other coarse and fine aggregates	75	218
Unspecified:		
Reported	677	10,800
Estimated[2]	935	6,300
Total	1,940	20,100

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Estimated production without a breakdown by end use.

TABLE 4
ALASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2008,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products	1,330	$11,700	$8.76
Asphaltic concrete aggregates and other bituminous mixtures	345	3,220	9.34
Road base and coverings[2]	1,360	11,600	8.56
Fill	319	1,450	4.53
Snow and ice control	17	198	11.65
Filtration	14	124	8.86
Unspecified:[3]			
Reported	3,360	20,200	6.01
Estimated	4,600	36,000	7.72
Total or average	11,300	84,000	7.40

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes road and other stabilization (cement).
[3]Reported and estimated production without a breakdown by end use.