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ALASKA'S MINERAL INDUSTRY 2007: A SUMMARY

by

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**Division of Geological & Geophysical Surveys
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INTRODUCTION

Alaska's mineral industry continued its robust growth from 2006 through 2007 primarily due to continued strong metal prices. Mineral production from Alaska's existing mines remained strong. Two new lode mines began production in 2007, and two gold development projects may begin production in 2008. Exploration activities for a wide variety of commodities continued across all regions of Alaska and new discoveries were announced.

Total value of Alaska's mineral industry attained a new record, with approximately \$3.95 billion as a total of exploration and development expenditures and production value. Table 1 shows the estimated annual value of the mineral industry in Alaska between 1981 and 2007, as divided between exploration and development investments, and the gross value of the mineral products. The total value of Alaska's mineral industry increased 12 percent from the 2006 value of \$3.53 billion. 2007 was the twelfth consecutive year with a total value above \$1 billion, the sixth consecutive with production value above \$1 billion, and the first year with production value above \$3 billion. This moved Alaska to 5th place in production value among the states according to the U.S. Geological Survey. Exploration expenditures also set new records in 2007, with the first year above \$300 million in exploration expenditures and the third consecutive year with more than \$100 million expended for exploration. Development expenditures dropped from the record value set in 2006, but still continued the fourth year of expenditures exceeding \$200 million.

This summary of Alaska's mineral industry activity for 2007 is made possible by information provided through press releases, annual reports, phone interviews, and replies to questionnaires mailed by the Alaska Division of Geological & Geophysical Surveys (DGGS). The final report will be available later in the year after further compilation of information, particularly for placer mining and industrial minerals. This report is part of a cooperative venture between DGGS and the Division of Mining, Land & Water (DMLW) in the Department of Natural Resources (DNR) and

the Office of Economic Development in the Department of Commerce, Community & Economic Development (Commerce). The estimates used in this summary are generally conservative because data have not yet been completely reported. This summary and data contained within it will be superseded by DGGS Special Report 62 to be published later in 2008.

Table 1. Total value of the mineral industry in Alaska by year (in millions of dollars U.S.)

	Exploration (expenditure)	Development (expenditure)	Production (value)	Total (calculated)
1981	76.3	24.7	188.6	289.6
1982	45.6	41.6	196.4	283.6
1983	34.1	27.9	212.4	274.4
1984	22.3	53.4	199.4	275.1
1985	9.2	34.1	226.6	269.9
1986	8.9	24.3	198.5	231.7
1987	15.7	100.3	202.4	318.4
1988	45.5	275.0	232.2	552.7
1989	47.8	134.3	277.0	459.1
1990	63.3	14.3	533.0	610.6
1991	39.9	25.6	546.5	612.0
1992	30.2	29.6	560.8	620.6
1993	30.3	27.7	448.7	506.7
1994	31.1	45.0	507.5	583.6
1995	34.3	148.6	537.2	720.1
1996	44.7	394.0	590.4	1,029.1
1997	57.8	168.4	936.2	1,162.4
1998	57.3	55.4	921.2	1,033.9
1999	52.3	33.8	1,032.9	1,119.0
2000	34.9	141.7	1,106.4	1,283.0
2001	23.8	81.2	917.3	1,022.3
2002	26.5	34.0	1,012.8	1,073.3
2003	27.6	39.2	1,000.7	1,067.5
2004	70.8	209.1	1,338.7	1,618.6
2005	103.8	347.9	1,401.6	1,853.3
2006	178.9	495.7	2,858.2	3,532.8
2007	318.9	308.9	3,319.8	3,947.6
Total	1,531.8	3,315.7	21,503.4	26,350.9

Source: Alaska's Mineral Industry reports published annually by DGGS/Commerce.

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EMPLOYMENT

Table 2 lists estimated employment in the Alaska minerals industry for the past eight years. Total minerals industry employment in 2007 is estimated to be 3,247 full-time-equivalent jobs, a decrease of almost 300 jobs from the estimated 2006 total of 3,523 jobs. As expected, the number of jobs in the development sector decreased significantly following completion of initial construction of the Pogo gold mine. It is expected that the number of jobs in the development sector will continue to decline for 2008 because the development phases of the Rock Creek and Kensington projects are nearly complete. The significant decrease in employment in the sand and gravel and rock production sectors is believed to be a mix of a slight decrease in employment and a lack of employment information. With more complete data, especially for the sand and gravel mining sectors, the number of 2007 jobs might rise slightly. The rise in exploration expenditures is reflected in the increase in exploration employment from 2003 through 2007. The number of jobs in the lode gold production sector will increase as the Rock Creek Mine, and possibly the Kensington Mine, begins full commercial production in 2008. Higher gold prices may also spur more placer gold mining and employment, but higher fuel and energy prices, along with increased costs of other commodities, have dampened positive reactions to high metal prices.

EXPLORATION

Exploration expenditures in Alaska during 2007 were more than \$318 million, 78 percent higher than the \$178.9 million spent in 2006. Figure 1 shows the location of the most significant exploration projects in Alaska during the year. Increased exploration expenditures in Alaska mirror increased worldwide mineral exploration budgets. The increases in worldwide exploration expenditures resulted from a combination of increased spending by major mining companies, a significant reduction in the negative influence of industry consolidation from peak years 2000 and 2001, and higher spending by junior mining companies in response to stronger gold and base-metal prices. The stronger Canadian dollar and attractive tax incentives for investors in Canada-based projects likely limited even more investment in Alaska.

Exploration occurred across Alaska, but more than \$178 million (or 55 percent of the exploration funds) were spent in southwestern Alaska. At least 75 exploration projects in Alaska spent more than \$100,000 each in 2007, and 30 exploration projects spent more than \$1 million each. Total drill footage should easily exceed the 2006 total of 835,795 feet. As in years past, most exploration funds (>80 percent) were from Canadian sources.

Two advanced exploration projects, Pebble and Donlin Creek, accounted for most of the exploration expenditures and drill footage in 2007. The Pebble copper-gold porphyry project in southwestern Alaska, with resources of 82 million ounces of gold, 67 billion pounds of copper, and 5.2

Table 2. *Estimated Alaska mine employment, 2000–2007*

	2000	2001	2002	2003	2004	2005	2006	2007
Gold/silver mining								
Placer	470	176	148	82	64	86	242	213
Lode	274	337	413	325	433	411	704	795
Polymetallic mining	275	275	262	295	265	250	245	315
Base Metals mining	556	559	580	388	508	449	457	457
Recreational mining	250	210	180	175	175	175	45	54
Sand & Gravel mining	603	556	702	349	567	400	337	213
Rock	150	137	177	35	475	148	104	26
Coal	121	121	100	65	90	95	95	102
Peat ^a	36	32	21	20	5	6	11	11
Tin, jade, soapstone, ceramics, platinum	20	20	20	20	0	0	0	0
Mineral development	345	333	135	64	283	498	848	648
Mineral exploration	83	79	86	88	184	303	435	413
TOTAL	3,183	2,835	2,824	1,906	3,049	2,821	3,523	3,247

^aPartial - man-days mostly included in sand & gravel numbers.

Reported man-days are divided by 260 to obtain average annual employment unless actual average annual employment numbers are provided.

billion pounds of molybdenum, is a joint-venture project of Northern Dynasty Minerals Ltd. and Anglo American PLC, and was the largest exploration project in 2007. The 33.7-million-ounce Donlin Creek intrusion-hosted gold project in southwestern Alaska is a joint venture of Barrick Gold Corp., NovaGold Resources, Inc., and Calista Corp.

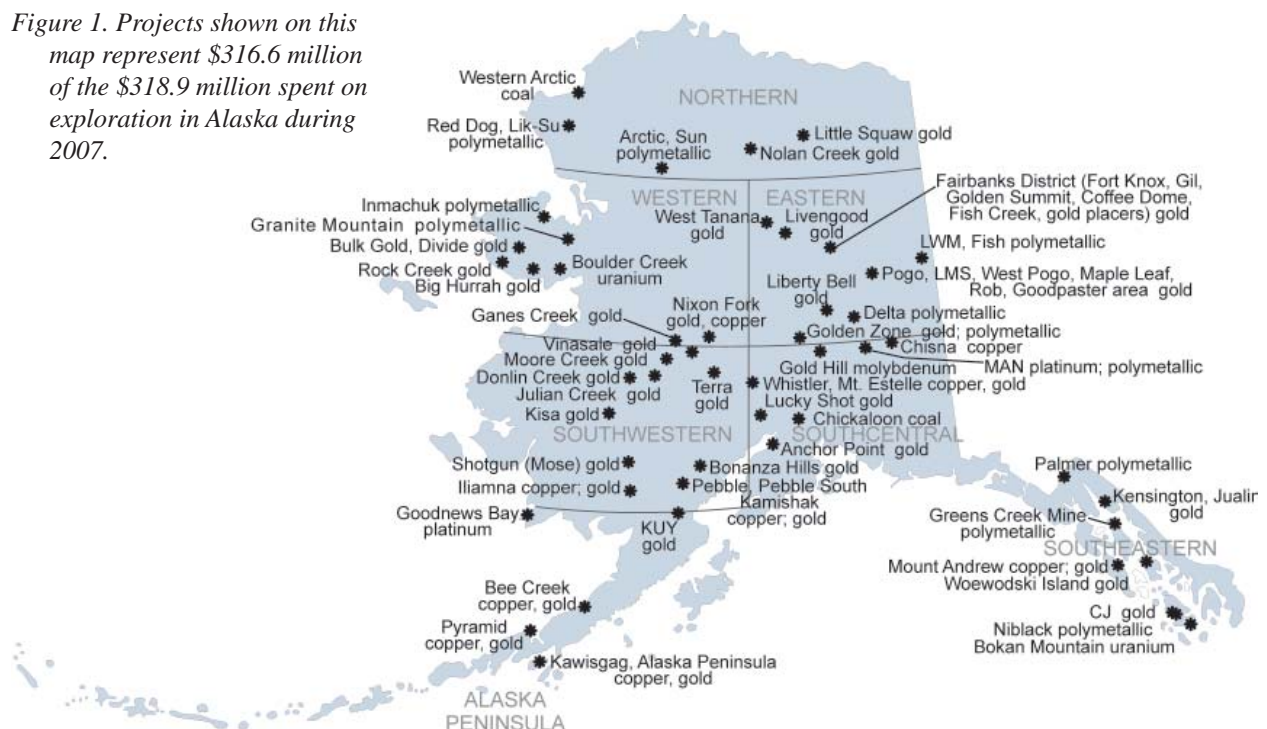
A wide variety of metals and mineralization styles were explored for in Alaska during 2007. Copper-gold porphyry projects in southwestern Alaska include the Whistler, Kawisgag, Mount Estelle, Pebble South, and Chisna projects. Continued exploration around the Fort Knox and Greens Creek mines made discoveries that extended mine resources. Exploration for intrusion-related gold deposits in southwestern and Interior Alaska continued at the Livengood, Liberty Bell, Gold Hill, Kisa, and Vinasale projects. Work on high-grade gold-quartz veins was conducted at the Terra, Pogo, Lucky Shot, Golden Summit, Rob, Maple Leaf, Ganes Creek, Blue Quartz, and Little Squaw projects. Base-metal exploration was conducted at the Red Dog, Lik-Su, Arctic, and Sun SEDEX and volcanogenic massive sulfide (VMS) properties in the Brooks Range, at the Greens Creek Mine, the Palmer and Niblack properties in southeastern Alaska, and at the LWM project in the eastern Interior region. Platinum and associated metals exploration continued at the MAN project in the Alaska Range and in the Goodnews Bay area. Other exploration continued for uranium (Boulder Creek, Bokan Mountain), diamonds (Yenlo Hills), placer gold (Little Squaw), and coal (Point Lay).

Northern Region

Silverado Gold Mines Ltd. continued placer and lode mineral exploration programs concurrent with underground drift mining activities at the Nolan Creek placer gold mine. During 2007, more than 6,000 feet of reverse-circulation (RC) drilling in approximately 90 drill holes was completed at the Jack London Bench, a possible extension of the Mary’s East deposit to the north, and eastern extensions of the Ogden–Eureka Bench, where buried channels might be found. Lode surface exploration completed during 2007 included the expansion of the VLF-EM geophysical survey and soil grid in the generalized area known as the ‘Solomon Shear Zone’; and a VLF-EM geophysical survey and soil grid in the ‘Fortress’ vein–fault area of gold-bearing quartz veins between Nolan Creek and Hammond River. Twelve drill holes totaling 2,715 feet tested the swarm of thin, multiple spaced, stibnite–quartz veins and veinlets on Pingle Bench north of Smith Creek. Seven holes totaling 2,301 feet tested the Workman’s bench stibnite–quartz zone. Sample results include gold values as high as 5.22 ounces of gold per ton and antimony values as high as 48.07 percent.

Zazu Metals Corp. concluded an agreement with GCO Minerals Co. and purchased a 50 percent interest in the Lik deposit near the Red Dog Mine, with the remaining interest held by Teck Cominco Ltd. Zazu completed an 11-hole diamond drilling program with an aggregate depth of 4,574 feet. The drilling confirmed previous drilling results, filled in some portions of the deposit, and provided samples for metallurgical testing.

Figure 1. Projects shown on this map represent \$316.6 million of the \$318.9 million spent on exploration in Alaska during 2007.



Andover Ventures Inc. continued exploration of the Sun volcanogenic massive sulfide occurrences, including a 20-hole diamond drilling program totaling 14,750 feet. Drill results include massive sulfide mineralization in 39 horizons ranging in thickness from 5 to more than 100 feet in 19 of 20 holes. The 39 horizons encountered averaged more than 22 feet in thickness of massive and semi-massive mineralization to a depth of 820 feet and a strike length of 4,600 feet. Average grade was 1.5 percent copper, 1.0 percent lead, 3.85 percent zinc, 1.84 ounces of silver per ton and 0.008 ounces of gold per ton. Andover reported intersecting a new thicker zone, averaging 116 feet in depth in the three holes from the southernmost fence. This extends the main Sun deposit some 500 meters to the south and leaves it open in that direction.

Little Squaw Gold Mining Co. drilled 15,550 feet in 111 reverse-circulation placer drill holes, distributed on 11 drill lines spaced 500 feet apart. A total of 3,110 drill samples were collected. Drilling identified at least 7.5 million cubic yards of mineralized material in the Little Squaw Creek drainage. The pay horizon was intersected in 73 holes and averaged \$14.85 per cubic yard over a thickness of 83 feet using a gold price of \$600 per ounce, or \$22.27 per cubic yard at \$900 per ounce gold. Lateral limits and overall grade of the gold-bearing gravels containing the potentially economic "pay horizon" have not been fully delineated and other drainage systems remain to be tested. Lode exploration during 2007 on the Little Squaw property included soil and rock geochemical sampling, ground magnetic surveys, geological mapping, and extensive excavator trenching.

Teck Cominco Ltd. continued exploration for additional SEDEX deposits in the Red Dog area. Drilling intersected encouraging sulfide intervals that warrant additional drilling in 2008.

BHP Billiton Ltd. drilled the coalfields in the western Arctic on Arctic Slope Regional Corp. land. BHP drilled nine holes to test the thickness of the coal seams and evaluate the quality of the coal in the historic Kuchiak Mine area that Arctic Slope tested in 1994. BHP also began environmental baseline studies and initiated cleanup activities at the Kuchiak Mine in 2007.

Western Region

NovaGold Resources Inc. completed 33,532 feet of reverse-circulation drilling focused on exploration leases around the Rock Creek Mine, including significant work on the Saddle deposit. Drilling around the pit margin at Rock Creek continues to show positive results indicating potential resource expansion. At Big Hurrah, an extensive soil sample program identified at least three significant new gold-in-soil targets for further evaluation.

NovaGold continued exploration at their Ambler property in the southern Brooks Range. The 2007 program included

nearly 10,000 feet of core drilling in five holes. Two holes about 0.3 miles north of the Arctic deposit intersected a deeper limb of the complex fold containing the Arctic massive sulfide deposit, and up to 33 feet of weak mineralization and chlorite-talc alteration. SRK Consulting (US) Inc. was contracted to upgrade the historical Ambler resource to an NI 43-101 compliant estimate. The Ambler project is estimated to contain an indicated resource of 1.5 billion pounds of copper, 2.2 billion pounds of zinc, and 0.4 million ounces of gold, with an additional inferred resource of 0.9 billion pounds of copper, 1.3 billion pounds of zinc, and 0.3 million ounces of gold. The indicated resource contains 18.51 million tons with an average grade of 4.14 percent copper, 6.03 percent zinc, and 0.023 ounces of gold per ton. The inferred resource contains 13.11 million tons with an average grade of 3.56 percent copper, 4.99 percent zinc, and 0.020 ounces of gold per ton. The average metal content exceeds 8 percent copper equivalent, as calculated by NovaGold.

NovaGold also continued exploration on the Kugruk property, near the historic Independence Mine on the northern Seward Peninsula. Work in 2007 followed up targets identified in a 2006 airborne electromagnetic survey.

Mystery Creek Resources Inc., a wholly owned subsidiary of St. Andrew Goldfields Ltd., continued underground and surface exploration drilling at the Nixon Fork project.

Full Metal Minerals Ltd. and Triex Minerals Corp. completed first-pass drilling at the Boulder Creek uranium deposit, with 2,920 feet of drilling in eight holes. No new and continuous zones of significant radioactivity were intersected. Concurrent regional exploration discovered new uranium mineralization, named the Fireweed occurrence, located to the north in Death Valley. The regional program focused on two areas with strong airborne radiometric anomalies, and geologic settings similar to that of the Boulder Creek deposit. A total of 73 line-miles and 1,790 soil samples were collected at McCarthy Marsh, 18 miles west of Boulder Creek, and 13 line-miles and 230 soil samples were collected over the new Fireweed occurrence 15 miles north along-strike from Boulder Creek. A ground magnetic susceptibility survey was completed over the entire McCarthy Marsh grid, and a portion of the Fireweed grid. Detailed mapping and scintillometer prospecting were done in both areas. A total of 129 biogeochemical samples were also collected from these two grid areas.

Millrock Resources Inc. formed a joint venture with NPN Investment Group to explore the Divide property on the Seward Peninsula. Five holes totaling 1,841 feet were drilled to test an 8,000-foot-long and 2,000-foot-wide soil anomaly. Drilling highlights include 29.5 feet grading 0.044 ounces of gold per ton in hole DIV-07-03, 10 feet grading 0.29 ounces of gold per ton in hole DIV-07-04, and 27 feet grading 0.169 ounces of gold per ton in hole DIV-07-05.

Millrock also has the option to earn a 60 percent interest in the Inmachuk property from Full Metal Minerals. Drilling focused on the Hannum zone, where a 2,500-foot program consisting of five holes was planned to explore for carbonate-hosted silver–lead–zinc mineralization.

Andover worked on the Bulk Gold property 22 miles north of Nome. Andover drilled seven holes at Bulk Gold in 2007, totaling about 2,100 feet. The drilling focused on testing the down-dip potential of the old Hed & Strand vein in hole BG-07-01 as well as the 5,000-foot-long Dorothy Creek soil anomaly in holes BG-07-05 and BG-07-07. Drilling results for BG-07-05 contained a 48-foot intercept of 0.03 ounces of gold per ton and BG-07-07 had a 34.6-foot intercept of 0.017 ounces of gold per ton.

Freegold Ventures optioned the Vinasale gold property near McGrath from Doyon Ltd., an Alaskan Native regional corporation, and staked additional claims adjacent to the property. Exploration included the collection of stream silt and pan-concentrate samples and flying a 1,090-line-mile high-resolution electromagnetic and magnetic geophysical survey over the project area.

Gold Crest Mines, Inc. explored for gold mineralization hosted in quartz–carbonate–clay altered, stockwork veined and brecciated carbonaceous schist and carbonate at the Kelly Creek Project, about 90 miles northwest of Nome, under an exploration lease and option to purchase agreement with Greatland Exploration Ltd. The 2007 program included collection of more than 330 rock, soil, and stream sediment samples. This work expanded two known prospects and discovered three new prospect areas.

Great Basin Gold optioned the Ganes Creek gold property and conducted an extensive trenching program. Approximately 32,000 feet of trenching was completed with a D-7 Caterpillar and an Ex-160 excavator.

Eastern Region

Kinross Gold Inc. continued mine site exploration at Fort Knox Mine by drilling for a possible Phase 7 mine expansion. The exploration contributed 1.2 million ounces of gold to year-end reserves.

Freegold Ventures Ltd. conducted a 679-hole, 40,100-foot drill program that resulted in the discovery of new high-grade veins and bulk tonnage shear zones on its Golden Summit project near Fairbanks. Shallow, closely spaced holes were drilled during the year in 18 different fences. These fences were oriented to provide cross sections through the 5,000-foot-long by 2,000-foot-wide zone of mineralization previously identified by surface trenching in 2005 and 2006 and with the first bulk sampling conducted in late 2006. The 2007 drilling also identified multiple, parallel zones of lower grade mineralization over widths from 100 to 600 feet wide, which are traceable from fence to fence across the open ended, mile-long zone. Gold grades compare favorably to the average mill feed grade

at Fort Knox Mine in 2006. Freegold also continued the bulk sampling program, and permitted and constructed a 1,200-ton–per-day portable gravity circuit in order to recover the gold from the bulk samples.

Freegold also worked on the Rob property in the Goodpaster area. High-grade gold mineralization was intersected in all eight core holes (1,529 feet of drilling) drilled into the Gray Lead vein (including 0.846 ounces of gold per ton over 13 feet and 0.586 ounces of gold per ton over 13.5 feet). Gold mineralization is in sugary-textured quartz veins, containing fine-grained bismuthinite and arsenopyrite, within a biotite augen gneiss host rock. Nine holes totaling 1,985 feet were drilled at the O'Reely Vein and intersected non-mineralized or weakly mineralized (anomalous gold with values up to 0.061 ounces of gold per ton over 3 feet, and 0.027 ounces of gold over 17 feet) quartz veins hosted in altered biotite granodiorite.

International Tower Hill Mines Ltd. is earning a 60 percent interest from Anglo Gold in the LMS project. The LMS project is located along the Pogo Mine winter access road approximately 9 miles from the paved Richardson Highway.

International Tower Hill completed an extensive, deep auger drill soil sampling program across the LMS property, discovered two previously unknown areas of mineralization (at Liscum and NW Camp) and better defined the known NW and South Ridge anomalies. International Tower Hill completed an initial mineral resource estimate for the Camp Zone deposit at its LMS project near Delta Junction. Gold mineralization within the Camp Zone is associated with a siliceous breccia horizon within a schist unit. The independent study determined an initial inferred gold resource of 167,000 ounces of gold at a cutoff grade of 0.009 ounces of gold per ton with an average grade of 0.026 ounces of gold per ton.

International Tower Hill discovered a potential large, bulk tonnage, road-accessible gold deposit on its Liven-good project northwest of Fairbanks. Drilling results to date have outlined an open-ended zone of gold mineralization approximately 1.2 miles long and more than 0.3 miles wide, with an average mineralization thickness of 915 feet exceeding 0.007 ounces of gold per ton. Mineralization is stratabound, primarily hosted in a folded sequence of volcanic and calcareous sedimentary rocks and averages 0.025 ounces of gold per ton. The new sediment-hosted mineralization is characterized by decalcification, chaotic fracturing, strong oxidation, and pervasive silicification. The highest grade areas of these new zones are associated with strong decalcification and commonly contain stibnite. Based on the highly encouraging 2007 results, International Tower Hill outlined an approximate 150-hole drill program for 2008.

International Tower Hill also worked on the Chisna project in the Chistochina area north of the Glenn Highway.

Exploration identified two new porphyry systems with associated gold–copper mineralization. Preliminary work had anomalous gold and copper values from surface soil and rock chip sampling over an area of approximately 0.4 square miles centered on a partially exposed mineralized porphyry system. Initial rock samples from this area average 0.085 ounces of gold per ton and 0.68 percent copper. The average assay of 246 rock samples taken over a 2.75 square mile area in the Chisna SE area was 0.011 ounces of gold per ton, 0.041 ounces of silver per ton, and 0.08 percent copper.

International Tower Hill continued work on the Coffee Dome project on Cleary Summit. Work in 2007 defined a number of high-grade gold veins in trenches and three large gold-in-soil anomalies along a 2.5-mile trend. International Tower Hill also signed a two-stage exploration agreement with option to lease with the University of Alaska for approximately 3,200 acres of land lying to the north of the existing Coffee Dome project.

International Tower Hill drilled its West Tanana project held under lease from Doyon Ltd. Highlights include a 4-inch-wide quartz vein with visible gold in quartz within a 1-foot drill interval assaying 0.45 ounces of gold per ton and a broader breccia zone returning 0.07 ounces of gold per ton over 14 feet.

Full Metal Minerals Ltd. drilled the Fish and LWM prospects on the 40 Mile property. All six holes intersected carbonate replacement deposit style massive sulfide mineralization. Drill hole LWM07-17 returned a 43-foot intersection grading 13.3 percent zinc, 4.64 ounces of silver per ton, 9.5 percent lead, and 0.3 percent copper of carbonate replacement style massive sulfide mineralization. The hole was drilled 130 feet west of hole LWM07-04, which intersected 146.3 feet grading 15.9 percent zinc, 5.3 percent lead, and 2.23 ounces of silver per ton. Both drilling and ground magnetic geophysics data suggest that the carbonate package hosting the massive sulfide mineralization dips toward the south and trends toward Full Metal's Fish prospect, 4 miles to the northeast. Three step-out drill holes were completed at the Fish zinc–silver oxide, carbonate replacement prospect on the 40 Mile property. The deepest hole drilled at Fish (Hole Fish07-09), attempted to intersect primary sulfides, however this hole encountered 26.4 feet averaging 12.3 percent zinc in mineralized material that was still oxidized. Full Metal also collected surface samples from the Eva, Drumstick, and Oscar prospects.

Rubicon Minerals Corp. acquired a large area of mining claims around the Pogo Mine and also optioned nearby claims from Rimfire Minerals Corp. Prospecting identified a 1-square-mile area known as the Maple Leaf showing with 17 percent of samples (total 114 rock samples to date) containing an average of 0.15 ounces of gold per ton. Mineralization is characterized by sugary-textured quartz veins

and, locally, stockwork veins associated with intrusive and country rock (gneisses) containing trace to 2 percent sulfides characterized by arsenopyrite \pm bismuthinite \pm molybdenite and, locally, visible gold. Weakly anomalous gold mineralization was encountered in a four-hole drilling program at the Maple Leaf showing. Rubicon also identified two new areas, the American Eagle and Tourmaline Ridge, with gold anomalies in rock samples. Results from a four-hole drill program at the Cal-Surf property include an intercept of 0.065 ounces of gold over 8.2 feet. Hole CN07-01, drilled to test the California North gold and arsenic soil geochemical anomaly, intersected quartz vein mineralization at a depth of 238 feet and averaged 0.035 ounces of gold per ton over a 24.3-foot width.

Rhyolite Resources Ltd. completed a three-hole 912-foot diamond drill program on the Super Cub target area of the Delta property. The program tested a gravity geophysical anomaly defined in 2006, as well as the extension of siliceous-pyritic schist material found in outcrop. No significant mineralization was encountered. Rhyolite also staked 18 mineral claims at the White Gold property.

MAX Resource Corp. drilled the Gold Hill property in the Valdez Creek area with a five-hole program to test a broad molybdenum–copper–gold and geophysical magnetic anomaly. Hole DH-07-01 assayed a total of 0.048 percent molybdenum disulfide over the entire core length of 965 feet, with the best interval of 250 feet of 0.080 percent molybdenum disulfide beginning at 260 feet downhole. Copper mineralization occurs as chalcopyrite. Drill hole DH-07-03 returned 0.058 percent molybdenum disulfide over a core length of 1,000 feet, which included a higher grade intercept of 0.18 percent molybdenum disulfide (0.107 percent molybdenum) over 45 feet. Drill hole DH-07-05 had 0.0466 percent molybdenum disulfide over a core length of 822 feet, which included a higher grade intercept of 352 feet of 0.0706 percent molybdenum disulfide.

Metallica Resources conducted exploration at the Liberty Bell gold project in the western Bonfield mining district. Drilling is planned in 2008.

Southcentral Region

Geoinformatics Exploration announced the initial independent mineral resource estimate at its Whistler project near Rainy Pass. The indicated resource is estimated at 33.06 million tons grading 0.025 ounces of gold per ton, 0.072 ounces of silver per ton, and 0.24 percent copper, containing 840,000 ounces of gold, 2.37 million ounces of silver, and 159 million pounds of copper. The inferred resource is estimated at 147.7 million tons grading 0.019 ounces of gold per ton, 0.064 ounces of silver per ton, and 0.20 percent copper, containing 2.74 million ounces of gold, 9.44 million ounces of silver, and 573 million pounds of copper. In 2007, Geoinformatics completed seven drill

holes, totaling 10,900 feet, on the Whistler Zone. Drill results include the identification of a new copper-rich area within the Whistler Zone that is interpreted to be a new high-grade zone or a western extension of the Main Zone. Drillhole WH-07-02 successfully established a western extension to the Whistler Zone and intersected a new high-grade adjunct to the Main Zone, recording some of the highest grades seen to date at Whistler, including 433 feet grading 0.016 ounces of gold per ton, 0.16 percent copper, 0.021 ounces of silver per ton, and 154 feet grading 0.047 ounces of gold per ton, 0.40 percent copper, and 0.060 ounces of silver per ton.

International Tower Hill Mines completed a preliminary exploration program on the South Estelle project, held under option from Hidefield Gold PLC. High-grade gold mineralization was found at the Shoeshine, Train, and Portage prospects. The Shoeshine vein system, generally hosted in the Mount Estelle monzonite batholith, has a currently defined strike length in excess of 2,300 feet containing numerous high-grade chip samples, including one quartz-sulfide vein sample with 6.94 ounces of gold per ton and 11.35 ounces of silver per ton, and a 1-foot-wide channel sample with 3.67 ounces of gold per ton.

Nevada Star Resource Corp. joined Pure Nickel Inc. in a reverse takeover in March. Pure Nickel continued exploration in the MAN area focused on the Alpha and Beta complexes with a program consisting of a helicopter-borne versatile time-domain electromagnetic (VTEM) and magnetometer survey, followed by a soil-sampling program. Thirteen targets were drilled on the Alpha Complex in 15 holes. Drilling intersected disseminated to small bleb sulfides within picritic to gabbroic rocks in all the holes over a 12-mile strike length. The disseminated sulfide mineralization occurs over thick intervals, ranging from 254 feet thick in hole MANPNI-07-001 to 1,069 feet thick in hole MANPNI-07-8. Geochemical results include an average of 0.26 percent nickel, 0.12 percent copper, 139 parts per billion palladium, and 62 parts per billion platinum from the disseminated zone in drill hole MAN-PNI-001.

Full Metal Minerals dropped their exploration permit to explore for coal on Alaska Mental Health Trust Authority land near Chickaloon. The land had previously been mined for high-grade coking-grade coal and may contain up to 30 million tons of coal. Local residents had protested any exploration work in the area.

Full Metal Minerals tested three of four known fault blocks at the Lucky Shot property during a 45,000-foot drill program, extending continuous gold mineralization to more than 1.5 miles along strike and 2,300 feet down-dip. Hole C07-92 from the Murphy zone returned 3.2 feet grading 1.59 ounces of gold per ton. Best intercepts from holes C07-105, 110, and 112 at the near-surface Coleman zone returned 3 feet grading 0.505 ounces of gold per ton, 1.6 feet grading 2.09 ounces of gold per ton and 1.6 feet

grading 0.621 ounces of gold per ton, respectively. Full Metal began permitting and feasibility studies in 2007 and plans to complete feasibility studies in 2008 as well as begin underground exploration and rehabilitation.

Hemis Corp. acquired Aspen Exploration Corp.'s Anchor Point gold project in the Cook Inlet area. A preliminary oceanographic survey indicated that the water depth was less than 35 feet in many of the areas of interest. A geophysical survey consisting of a fathometer, side-scan sonar, and a sparker survey was conducted by Watson Geophysics. The goal of the sparker survey was to image the shallow subsurface sediments. Concurrently, a shallow coring program was conducted by Kinnetic Labs using a Vibracore® drill rig. Ultimately, cores were recovered from 11 of the 15 target areas, with gravel encountered in nine holes.

Pacific North West Capital Corp. sampled outcrops and mapped nickel, copper, and platinum-group-element mineralization hosted in dunite and lherzolite within the Tonsina Ultramafic Complex on the Tonsina property. The Tonsina project is part of a reconnaissance agreement with Stillwater Mining Co. Sulfide-bearing outcrop grab samples contain up to 0.97 percent nickel and 0.58 percent copper. Chip channel samples of chromite and sulfide-bearing outcrop contain up to 0.025 ounces of platinum per ton and 0.032 ounces of palladium per ton over a 6.4-foot interval.

Southwestern Region

Northern Dynasty Minerals Ltd.'s Pebble property, near Iliamna in southwestern Alaska, was Alaska's largest exploration project in 2007. Recent discoveries of copper, gold, and molybdenum metal resources at the Pebble property have outlined a possible open-pit resource at the Pebble West Deposit and a likely underground resource at the Pebble East Deposit. Exploration in 2007 concentrated on drilling the Pebble East deposit. Announced metal resources for the Pebble deposit total 74 billion pounds of copper, 87 million ounces of gold, and more than 5.2 billion pounds of molybdenum, making this the second-largest "porphyry copper" deposit in the world. During 2007, a wholly owned subsidiary of Anglo American PLC became a 50 percent partner on the Pebble Project, with a total stage investment commitment of \$1.425 billion. The companies formed the Pebble Partnership to continue the project forward. Drilling continued in 2007 with up to nine drill rigs; 157,000 feet of core drilling was completed in 36 holes. Drilling continued to intersect long intervals of higher grade copper-gold-molybdenum mineralization and drill results established a very high level of deposit continuity. Hole 7359 intersected 2,228 feet grading 1.42 percent copper equivalent comprising 0.92 percent copper, 0.015 ounces of gold per ton, and 0.035 percent molybdenum; hole 7374 intersected 2,449 feet grading 1.19 percent

copper equivalent comprising 0.61 percent copper, 0.012 ounces of gold per ton, and 0.056 percent molybdenum; and hole 7386 intersected 2,570 feet grading 1.17 percent copper equivalent comprising 0.66 percent copper, 0.011 ounces of gold per ton, and 0.049 percent molybdenum.

Preliminary mining engineering activities designed to assess Pebble East as a high-volume, low-cost underground mine continued through 2007 at the Pebble Project. Pre-feasibility-level metallurgical and comminution testwork on Pebble East mineralization continued in 2007. Environmental and socioeconomic baseline data studies continued and expanded the geographic scope of investigations to support Pebble East planning. This work was undertaken by more than 45 independent consulting firms. The Pebble Partnership facilitated 430 meetings with project stakeholders throughout Alaska. More than 140 local people from more than 16 communities in the Bristol Bay area were employed at the Pebble project last year, and significant expenditures were made on local goods, services, and salaries.

NovaGold Resources Inc. reported results from 498,688 feet of drilling completed in 2006 and 2007 at the Donlin Creek gold deposit. The exploration averaged 220 feet of mineralization per hole, grading 0.105 ounces of gold per ton. In excess of 230,000 feet of drilling was completed in 2007. The two best drill intersections were hole DH-1556 with 981 feet grading 0.153 ounces of gold per ton and DH-1564 with 1,010 feet grading 0.134 ounces of gold per ton; both holes extend mineralization beyond the current pit model boundaries. NovaGold and Barrick ended a bitter, year-long battle in November when the two companies agreed to advance the project as equal partners. NovaGold Resources announced that the measured and indicated resource for the Donlin Creek project increased by 77 percent to 29.4 million ounces of gold, successfully converting a majority of the inferred resources to the measured and indicated category. New inferred gold resources are 3.46 million ounces. Environmental baseline data collection, in addition to a wide range of engineering work, was completed in support of the feasibility study.

International Tower Hill holds a 60 percent joint venture interest in the Terra project, with the balance held by AngloGold Ashanti (U.S.A.) Exploration Inc. Drilling, including 11 holes in 2007 at the Ben Zone, and other exploration work define a high-grade gold-quartz epithermal vein system from the Ben Vein area as well as a new high-grade vein system in the Ice area 2 miles to the south. An independent study determined an initial inferred resource estimate of 168,000 ounces of gold and 318,000 ounces of silver at a cutoff grade of 0.146 ounces of gold per ton having an average grade of 0.356 ounces of gold per ton, and 0.674 ounces of silver per ton over an average 7.55-foot width.

International Tower Hill also identified a 5-mile-long

belt of precious-metal-rich massive sulfide mineralization related to Cretaceous intrusive rocks in the region. The BMP project targets copper-silver mineralization hosted in Paleozoic sedimentary rocks in the Farewell district. A very unusual style of skarn mineralization was discovered at the 6120 Prospect where the average grade of 22 outcrop samples collected was 2.1 percent copper, 0.09 ounces of gold per ton, 0.87 ounces of silver per ton, 0.14 percent nickel, and 0.06 percent cobalt.

Andover Ventures has several properties in the Iliamna Lake region under option from Bristol Bay Native Corp. and held in a joint-venture with NPN Investment Group. Historic drill core from the Kemuk iron prospect was re-logged and analyzed during the spring of 2007, but no significant platinum-group-element mineralized zones were detected. Andover conducted first-pass geologic and geochemical examination at the Samuelsen, Chilikat West, and Chilikat East prospects.

Andover Ventures optioned the KUY, Fog, and Kamishak properties to Alix Resources Corp. Four core holes totaling 2,602 feet were drilled at KUY in August with holes KUY-08-07 and KUY-09-07 encountering significant clay (kaolinite?) alteration in dacitic rocks with up to 15 percent pyrite with disseminated chalcopyrite and veinlets. Induced polarization (IP) and resistivity surveys at the Kamishak property in 2007 detected significant anomalous zones outside of previous drilled areas.

Gold Crest Mines Inc. completed a total of 3,102 feet of diamond drilling in six drill holes at the Kisa property. Broad zones of weak to moderate alteration and low-grade mineralization in sedimentary and intrusive lithologies were observed in holes K07-2 through K07-6. A 378.5-foot intercept averaged 0.02 ounces of gold per ton, with an included interval of 0.252 ounces of gold per ton.

Gold Crest Mines identified new mineralized dikes through mapping, sampling, and about 2,100 square miles of airborne geophysical work. The Luna claims were staked west of the Kisa claim block, as well as four additional claim blocks 45 miles northeast of the Kisa prospect. Gold mineralization is hosted in calcareous siltstone, chert, and tuffaceous sedimentary rocks, as well as in porphyritic intrusive rocks.

Pacific North West Capital Corp. geologists collected 651 grab rock outcrop samples, 26 coarse wash pan concentrate samples, and 110 auger soil samples at the Goodnews Bay platinum project, in a joint venture with Stillwater Mining Co. Rock samples assayed up to 0.067 ounces of platinum per ton at the Last Chance prospect. Soil sampling at Susie West defined a new platinum anomaly and results from outcrop sampling at the Rock Mite prospect expanded surface mineralization.

Full Metal Minerals and Highbury Projects Inc. announced a gold discovery at the Moore Creek property. Three new discoveries (Spring Zone, Troy Zone, and Bro-

ken Shovel Zone) were made during a two-phase trenching program, with the best result of 0.260 ounces of gold per ton over 36 feet at the Spring Zone.

Millrock Resources Inc. optioned and agreed to a joint venture with Liberty Star Uranium and Metals Corp. at the Bonanza Hills property. Millrock also staked 124 state mining claims on another property with similar geologic attributes about 20 miles to the south of the Bonanza Hills property, and centered on an anomalous airborne magnetic feature. Anglo American staked a much larger area abutting and to the east of the claim group.

Full Metal Minerals signed an option agreement with Freeport–McMoRan Exploration under which Freeport can earn a 60 percent interest in the Pebble South property.

TNR Gold Corp. mapped and sampled at the Shotgun property to identify drill targets along extensions of the Winchester zone.

Alaska Peninsula

Metallica Resources Inc. conducted mapping, geochemical sampling, and water sampling at Bee Creek and Kawisgag prospects.

Southeastern Region

Greens Creek Mining Co. continued surface and underground exploration programs at Greens Creek Mine. Most of the underground exploration focused on the silver-rich 5250 North Extension zone and the West Gallagher zone. In the 5250 zone, a hole was drilled 1,000 feet above and along strike of the known reserve and resource and intersected silver grades of 30 ounces per ton with 18 percent zinc and lead. The surface exploration program conducted in 2007 consisted of 17,540 feet of drilling and focused on identifying resource extensions in proximity to the current Greens Creek infrastructure, as well as identifying “mine horizon” rocks and defining target areas elsewhere on the property that could represent a whole new deposit. Drilling included work at the Little Sore, Upper Gallagher, and West Gallagher prospects. Of great significance is an intersection from a surface drill hole northeast of the current mine workings that identified multiple zones of mineralization indicative of “mine horizon” intervals.

Following a comprehensive permit review process, Niblack Mining Corp. began an underground exploration program in September 2007. Niblack planned to drive an adit approximately 6,000 feet to provide access for 30,000 feet of underground drilling at the Mammoth Zone of the Niblack property.

Ucore Uranium Inc. formed a joint venture with Landmark Minerals Inc. to acquire, through staking and option agreements with claim holders, a 100 percent interest in the Bokan Mountain uranium–rare-earth-element property. The property includes the Ross–Adams uranium deposit, with a total of 1.3 million pounds of uranium produced

at an average grade of 0.76 percent U_3O_8 during three separate production periods between 1957 and 1971. A helicopter-borne radiometric and magnetic survey was completed by Precision GeoSurveys Inc. with grid lines spaced at 320-foot intervals. Nine diamond drill holes, totaling 1,385 feet, were completed at the previously tested but unmined I&L zone. All holes intersected uranium mineralization, with the best mineralization in hole LM07-01, intersecting 164.8 feet of mineralization averaging 0.47 percent U_3O_8 and hole LM07-05, intersecting 50 feet of 0.47 percent U_3O_8 .

Constantine Metal Resources Ltd. drilled a total of 7,593 feet in seven holes at the Palmer project. Hole CMR07-09 intersected 58.9 feet of zinc–copper-rich barite-hosted sulfide mineralization in the Southwall fold limb that assayed 7.76 percent zinc, 1.03 percent copper, 0.62 percent lead, 0.027 ounces of gold per ton, and 1.97 ounces of silver per ton. Hole CMR07-07 intersected 45.90 feet of 3.79 percent copper, 7.24 percent zinc, 0.011 ounces of gold per ton, and 1.372 ounces of silver per ton, thought to be the RW horizon. Four holes were drilled at the Glacier Creek prospect.

Bravo Venture Group Inc. reported that it completed detailed gravity and three-dimensional IP geophysical surveys and two core holes totaling 1,419 feet at the East Lake volcanogenic massive sulfide target on its Woewodski Island project. Both holes (WW07-034 and -035) contained greater than 50-foot-thick downhole intervals of anomalous silver and zinc with associated anomalous, but less continuous, barium and gold values. Much of the 2007 exploration program focused on several gold prospects along the western and southern margins of Woewodski Island where 33 relatively short core holes were drilled for a total of 8,337 feet. Drilling targeted gold–quartz veins that occur within broad, up to 30-foot-thick, strongly carbonate altered shears. Quartz veins were intersected in many of these holes, and higher grade results include 13.7 feet grading 0.117 ounces of gold per ton, and 2.4 feet grading 0.210 ounces of gold per ton.

Full Metal Minerals mapped and rock and soil sampled a sediment-hosted, structurally controlled, high-grade vein system at the CJ property on Prince of Wales Island. Altair Ventures Inc. optioned the property in a joint-venture agreement and supported an 8-hole, 3,330-foot drill program. All eight holes encountered gold mineralization, spanning more than 1 mile of strike length. Best drill results include hole CJ07-01 with a 10.5-foot intercept grading 0.144 ounces of gold per ton and 0.167 ounces of silver per ton and hole CJ07-03 with a 20.5-foot intercept grading 0.080 ounces of gold per ton and 1.245 ounces of silver per ton.

Full Metal Minerals completed a 13-hole, 4,892-foot drilling program to test multiple copper–iron targets on the Mount Andrew property by stepping-out from historic

workings and from 2006 drill sites. Multiple zones of high-grade copper hosted within massive magnetite were encountered, including 72 feet averaging 1.24 percent copper and 30.3 percent iron in hole KMA07-06, 187 feet averaging 0.48 percent copper and 35.7 percent iron in hole KMA07-07, and 45.9 feet averaging 1.46 percent copper and 32.8 percent iron in hole KMA07-11.

Other work in southeastern Alaska included Quatterra Resources Inc. completing a rock chip sampling and mapping exploration program at the Herbert Glacier gold property near Juneau and Pure Nickel staking mining claims at the Salt Chuck property.

DEVELOPMENT

Reported and estimated mineral development expenditures in 2007 were approximately \$308.9 million, a 37.7 percent decrease from the 2006 value of \$495.7 million. The decrease follows completion of Pogo and near completion of the Kensington projects. Rock Creek development continued near Nome. Mystery Creek completed construction at Nixon Fork and operation was commissioned in the first quarter. Significant expenditures were noted at Red Dog Mine, Fort Knox Mine, the Chuitna Coal project, Greens Creek Mine, and the Kensington project. Total employment dedicated to development amounted to 648 full-time-equivalent jobs for the year.

The Pogo gold mine, operated by Teck Pogo Inc., is a joint venture between Sumitomo Metal Mining Co. Ltd. (51 percent), Sumitomo Corp. (9 percent), and Teck Cominco Ltd. (40 percent). Pogo was declared to have reached commercial production in April 2007. However, the underground mine has not reached full capacity of 2,500 tons per day; the surface ore stockpile accumulated during the 2006 fourth quarter fire was essentially depleted. Capital expenditures at the project during 2007 were \$21 million and included upgrading of living quarters to accommodate added underground development contractor personnel and capitalization of operating losses (\$2 million)³ for the first part of 2007. A third filter press was commissioned and modifications to the filtered tailings handling system to improve paste backfilling were completed in the first quarter of 2007. At year end the company had 243 employees and an additional 88 persons employed by contractors in housekeeping and underground development.

Construction at Coeur Alaska Inc.'s Kensington underground gold mine complex in southeastern Alaska, 45 miles north of Juneau, continued through 2007, although work on the tailings facility remained suspended. Efforts included construction of the mill and supporting surface facilities and underground development. Expenditures during the year were \$92.3 million in connection with development of the mine compared to an estimate of \$77.7 million. Total development expenditures to the end of 2007 amounted to \$269.7 million. The company plans to spend \$26.2 mil-

lion on the project during 2008. Employment, including contractors, during 2007 is estimated to be 292 persons. The company believes that production could begin in 2009, subject to successful and timely resolution of the pending litigation more fully described below or upon permit modification to allow for an alternate tailings facility.

Reserves at Kensington amount to 4,418,600 tons with a grade of 0.306 ounces of gold per ton containing 1,352,100 ounces of gold. An additional resource of 4,320,000 tons containing 866,000 ounces of gold exists at the project. Coeur plans a production rate of 100,000 ounces per year at a cash cost of \$310 per ounce. The milling process will involve treating approximately 1,100 tons of ore per day and will involve primary crushing, semi-autogenous grinding (SAG) mill grinding, gravity, and flotation concentration, with about 40 percent of the tailings returned to the mine for backfill; the remaining tailings will be sent to the selected tailings disposal facility as required by the court resolution. Concentrates will be packaged and shipped off site for final gold recovery. The mine will provide about 225 direct and approximately 500 indirect full-time-equivalent jobs.

Kensington construction was started in mid 2005 upon receipt of all permits, but on September 12, 2005, non-governmental organization (NGO) lawsuits were filed against the U.S. Army Corps of Engineers (COE) and the U.S. Forest Service (USFS), resulting in suspension of construction of facilities to dispose of tailings in Lower Slate Lake on November 22, 2005. On March 29, 2006, the COE reinstated the company's Section 404 permit; however, on April 6, 2006, the lawsuit challenging the permit was reopened. On August 4, 2006, the Federal District Court in Alaska dismissed the Plaintiffs' challenge and upheld the permit. On August 7, 2006, the Plaintiffs filed a Notice of Appeal of the decision to the Ninth Circuit Court of Appeals, and on August 9, 2006, Plaintiffs additionally filed a Motion for Injunction Pending Appeal with the Circuit Court. On August 24, 2006, the Circuit Court granted a temporary injunction pending appeal, enjoining certain activities relating to the lake tailings facility. The Circuit Court further ordered an expedited briefing schedule on the merits of the legal challenge.

The parties filed their briefs by October 13, 2006, and participated in an oral argument on December 4, 2006. On May 22, 2007, the Ninth Circuit Court reversed the District Court's August 4, 2006, decision that had upheld the company's 404 permit and issued its opinion that remanded the case to the District Court with instructions to vacate the company's 404 permit as well as the USFS Record of Decision approving the general tailings disposal plan as well as the Goldbelt 404 permit to construct the Cascade Point Marine Facility. On August 20, 2007, Coeur Alaska filed a Petition for Rehearing En Banc with the Ninth Circuit Court, as did the State of Alaska and

³Teck Cominco annual report 2007.

Goldbelt, Inc. In addition, the Department of Justice, on behalf of the Corps of Engineers and USFS, filed a limited Petition for Rehearing with the Ninth Circuit panel seeking reconsideration of the mandate of the May 22, 2007, panel decision. On October 29, 2007, the Ninth Circuit denied the Petitions for Rehearing En Banc. On November 14, 2007, the Ninth Circuit granted a stay of the mandate pending further appeal to the Supreme Court, subject to the development of a reclamation plan for the lake area. The company and the State of Alaska filed Petitions for Certiorari to the Supreme Court of the United States on January 28, 2008.

NovaGold Resources, Inc. started construction on the Rock Creek/Big Hurrah projects in late August 2006. Construction continued through 2007 but was delayed due to permit challenges, resource constraints, unforeseen issues with equipment, severe weather conditions, and other factors. The Corps of Engineers suspended the 404 permit for the Rock Creek project on December 6, 2006, to review the permit evaluation and decision documents. A complaint had been filed against the Corps by a local Nome group arguing that there had not been a sufficient public process. A modified COE permit was restored on March 13, 2007, that contained additional stipulations that covered reporting and mitigation. Expenditures for mining and milling equipment and construction of facilities during 2007 were reported to be \$78.0 million. Forecast expenditures for 2008 are \$30 million. The total capital cost estimate in the feasibility study was approximately \$158 million, but, given the current status of construction, is expected to exceed this amount. Employment averaged 114 during the year. Probable reserves at Rock Creek and Big Hurrah are 8.6 million tons at a grade of 0.0379 oz/ton and 1.32 million tons at 0.140 oz/ton, respectively.

The company expects to commission the operation during 2008 and bring in \$28 million in free cash flow. The planned production rate is 7,700 tons per day to produce 100,000 ounces per year during full capacity. Employment is forecast at 160 persons.

Mystery Creek Resources, Inc., a wholly owned subsidiary of St. Andrew Goldfields Ltd., completed construction at the Nixon Fork project during the first part of the year. The company encountered ore production issues in the upper portion of the 3300 zone of the Crystal deposit. The actual geometry of the mineralized zone was found to be much different than that used in the mineral reserve estimate. On August 14, the company announced that milling operations would be shut down for about 6 weeks to perform modifications to the mill circuits. On October 10, ongoing construction of these projects, mainly the cyanide leach facility and the installation of dry stack tailings disposal system, was also suspended. Construction and other capitalized costs amounted to \$7.7 million for the year. Activity since the suspension has been directed

at redefinition of ore reserves and resources with 18,700 feet of drilling, and wrapping up construction projects. The property has been put up for sale. Employment allocated to construction and other development activity amounted to 15 full-time-equivalent positions for the year.

Capital expenditures at Red Dog Mine, owned and operated by Teck Cominco, were \$43 million during 2007. Projects included \$9 million for additional flotation capacity, \$20 million for tailings dams upgrading, \$14 million on other sustaining capital projects, and \$1.4 million on in-fill drilling at the Aqqaluk deposit. The Aqqaluk in-fill drilling amounted to 28,097 feet. Employment allocated to development activity was 65 during the year. Efforts to define a useable gas source to replace diesel power generation continued during the year.

Efforts to develop a natural gas source for power generation at Red Dog continue. After completing three holes in a five-spot pattern in the summer of 2007, the program has switched to monitoring the rate of gas production. This started by dewatering the drill holes, which was initiated this spring. Pumping will continue for a couple years to allow gas to flow to the hole and accurate monitoring of its rate of generation. Once this information is in hand the next steps will be determined.

Development expenditures at Fort Knox Mine amounted to \$30 million during 2007. The mine is operated by Fairbanks Gold Mining Co. Inc., a wholly owned subsidiary of Kinross Gold. Efforts included stripping in phase 6, construction of the Walter Creek heap leach facility, and construction of a SAG mill reject conveyor. Manpower allocation to the development effort was 43 full-time-equivalent persons for the year.

Stripping of phase 7 is scheduled to begin in the fourth quarter of 2008. Phase 7 (southwest side) contains 33.1 million tons of ore, mining of which was dependent on permitting of the heap leach facility. The Certificate of Approval to Construct a Dam was received from the Corps of Engineers on October 31, 2007. Phase 7 stripping will allow the Fort Knox pit production to continue until 2014. Stockpile material will be mined and placed on the heap leach facility until 2017.

PacRim Coal LP continued environmental, permitting, and engineering work on the Chuitna Coal project west of Anchorage on the north side of Cook Inlet. The project is being designed to include a coal export terminal at Ladd Landing, connected to the mine with a 12-mile-long covered conveyor. Mine production capacity is designed to handle 3 to 12 million tons per year. Proven reserves are reported to be 771 million tons. Twenty employees were credited to the project for 2007.

Capital expenditures at Greens Creek Mine, owned by Kennecott Greens Creek (operator) and Hecla Mining Co., amounted to \$30,766,900 for 2007. Most of this expenditure was for development of ore. Manpower al-

located to development amounted to 44.8 persons for the year. Published reserves at Greens Creek Mine are shown in table 3.

Greens Creek Mine has historically been powered completely by on-site diesel generators. However, an agreement was reached during 2005 to purchase excess hydroelectric power from the local power company. Installation of the necessary infrastructure was completed in 2006, and use of hydroelectric power began during the third quarter of 2006. Low lake levels and increased demand in the Juneau area have combined to decrease power available to Greens Creek, and it is unlikely that Greens Creek Mine will obtain sufficient utility power until 2009.⁴

Hecla Mining Co. purchased the balance of Greens Creek Mine on February 12, 2008. The transaction, amounting to \$750 million, transferred Kennecott's (Rio Tinto) 70.27 percent interest in the project to Hecla.

PRODUCTION

A preliminary estimate of mineral production value in Alaska during 2007 is \$3,319.8 million. The estimate represents an increase in value of approximately \$461.6 million, or 16.15 percent change, over the 2006 production values. Reporting shortfalls are noted in the placer and industrial minerals sectors. When final totals are determined, the numbers are expected to increase, although there appears to be a fairly significant downturn in sand, gravel, and rock production. Metals (gold, silver, copper, lead, and zinc) account for \$3,220.0 million, coal and peat for \$48.6 million, and industrial minerals for \$51.3 million. Table 4 shows the estimated mineral production for 2004 through 2007. Significant production sites are shown in figure 2.

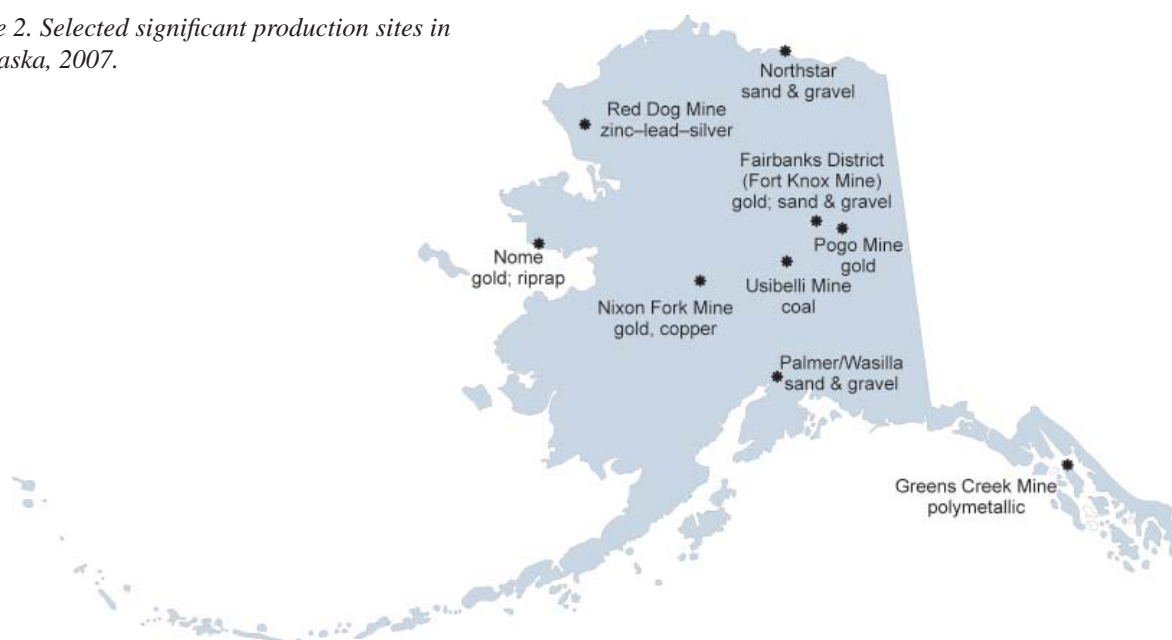
Red Dog Mine near Kotzebue in northwestern Alaska is the world's largest zinc producer, and it continued to dominate Alaska's mineral production value. Red Dog accounted for more than 70 percent of the total value of Alaska's mineral production during the year. The mine is 100 percent owned and operated by Teck Cominco Alaska Inc. under an agreement with NANA Regional Corp., an Alaskan Native corporation. The Red Dog deposit comprises a number of sedimentary-hosted exhalative (SEDEX) lead-zinc sulfide deposits hosted in Mississippian- to Pennsylvanian-age sedimentary rocks. The ore bodies are lens shaped and occur within structurally controlled (thrust fault) plates. The sulfide mineralization

Table 3. Reserves and resources at Greens Creek Mine.

Reserve/Resource	Tons	Grade			
		Silver, oz/ton	Gold, oz/ton	Lead, percent	Zinc, percent
Proven & Probable	8,455,096	13.7	0.11	3.8	10.2
Mineralized Material	347,797	5.6	0.13	3.4	7.9
Other Resources	2,266,061	14.5	0.13	4.0	10.5
TOTAL	11,068,954	13.6	0.11	3.8	10.2

SOURCE: Hecla Mining Co. annual report

Figure 2. Selected significant production sites in Alaska, 2007.



⁴Hecla Mining Co. annual report, 2007.

consists of semi-massive to massive sphalerite, pyrite, marcasite, and galena. The mining method employed is conventional drill and blast open-pit mining. The main pit has an expected life of 5 years at current rates of production (table 5).

Additional reserves have been identified in the vicinity of the processing facilities sufficient to extend the life of the operation by 15 years for a total mine life of 23 years.

The mineral processing facilities employ conventional grinding and sulfide flotation methods to produce zinc and lead concentrates. The shipping season at Red Dog is restricted to approximately 100 days per year because of sea ice conditions, and Red Dog's sales are seasonal with the majority of sales in the last 5 months of each year. Concentrate is stockpiled at the port facility and is typically shipped between July and October.

Teck reported an operating profit at the Red Dog Mine of \$819 million in 2007; this is down from 2006 which was reported to be \$1.1 billion. The project milled 3.73 million tons of ore with a zinc grade of 20.2 percent, lead grade of 6.1 percent, and silver of 3.1 ounces per ton. The project produced 633,511 tons of zinc, 146,152 tons of lead, and was credited with an estimated 11.6 million ounces of silver in 2007.

Greens Creek Mine, a Kennecott Minerals Co.–Hecla Mining Co. joint venture in southeastern Alaska, is a polymetallic, volcanogenic massive sulfide deposit (silver, zinc, lead, gold, and copper) and one of the largest silver producers in the world. It produces a silver–gold doré and sulfide concentrates containing zinc and lead.

Production at Greens Creek mill in 2007 was almost the same as in 2006. Mill throughput was 732,227 tons

Table 4. *Estimated mineral production in Alaska, 2005–2007^a*

Metals	Quantity			Estimated Values ^b		
	2005	2006	2007	2005	2006	2007
Gold (ounces) ^c	427,031	570,129	727,112	\$189,918,000	\$344,049,779	\$511,217,777
Silver (ounces)	11,670,000	16,489,394	20,200,246	85,382,000	190,415,907	270,352,014
Copper (tons) ^d	0	0	114,111	0	\$0	369,239
Lead (tons)	131,366	157,128	167,181	115,230,000	183,629,254	389,532,215
Zinc (tons)	684,462	673,967	696,115	862,108,000	2,002,971,414	2,048,451,644
Subtotal				\$1,252,638,000	\$2,721,066,354	\$3,219,922,889
Industrial Minerals						
Jade and soapstone (tons) ^e	0	0	0	0	0	0
Sand and gravel (million tons)	17	9	10	76,537,000	63,351,089	46,624,623
Rock (million tons)	3	2	1	22,547,000	23,846,024	4,655,334
Subtotal				\$99,084,000	\$87,197,113	\$51,279,957
Coal (tons)	1,402,174	1,397,500	1,357,000	49,076,000	\$48,912,500	47,495,000
Peat (cubic yards) ^f	62,532	66,500	66,500	810,000	\$1,057,500	1,057,500
Subtotal				\$49,886,000	\$49,970,000	\$48,552,500
TOTAL				\$1,401,608,000	\$2,858,233,468	\$3,319,755,346

^aProduction data from DGGS questionnaire, phone interviews with mine and quarry operators, detailed analysis of APMA's, ADOT&PF, and municipalities, Regional Corp., and federal land management agencies.

^bValues for selected metal production was based on average prices for each year; (unless other values were provided by the operator); for 2007, gold \$695.39, silver \$13.38/oz, copper \$3.24/lb, lead \$1.17/lb, zinc \$1.47/lb.

^cHardrock gold – 673,264 oz, placer production was 53,848 ounces.

^dGreens Creek has historically been credited with a small copper concentrate production; no credit was experienced for 2003 - 2007; however, Nixon Fork produced minor copper.

^eJade and soapstone - no reported production.

Table 5. *Red Dog reserves as of 12/31/08 (Teck Cominco annual report, 2007)*

Commodity	Proven		Probable		Total	
	Tons	Grade %	Tons	Grade %	Tons	Grade %
Zinc	13,889,000	20.0	56,879,000	16.7	70,768,000	17.3
Lead	13,889,000	5.5	56,879,000	4.4	70,768,000	4.6

compared to a 2006 throughput of 732,176 tons. Metal production totaled 8,645,816 ounces of silver, 68,005 ounces of gold, 62,603 tons of zinc, and 21,029 tons of lead. Production numbers for 2006 were 8,865,818 ounces of silver, 62,935 ounces of gold, 59,429 tons of zinc, and 20,992 tons of lead. Manpower numbers for 2007 were 315 persons, 45 of which were reported in the development section of this report.

Fort Knox Mine, operated by Fairbanks Gold Mining Co., a wholly owned subsidiary of Kinross Gold Corp., produced 338,459 ounces of gold during 2007. This is a 1.52 percent increase from 2006's total of 333,383 ounces. Mill throughput for 2007 was 14,021,400 tons compared to 14,839,297 tons in 2006. Average recoverable grade was 0.0241 ounces per ton for 2007 compared to 0.0225 for 2006. Mining activity produced 45.98 million tons of material during the year, an average rate of 126,000 tons per day. All production was from phase 6. Ore production averaged 60,300 tons per day in 2007 compared to an average of 33,900 tons during 2006; lower grade materials were stockpiled for future heap leaching. Waste stripping amounted to 23.92 million tons compared to 35.0 million tons during 2006. Total manpower for 2007 was 395 persons.

Usibelli Coal Inc. continued production of sub-bituminous coal from its Two Bull Ridge Mine near Healy with an output of 1.357 million tons of coal. Production was lower than in 2006 by about 43,000 tons. Shipments to Glencore for Chile amounted to 308,146 tons. The mine also supplies six power plants in interior Alaska with approximately 900,000 tons annually. Employment was 95 persons during the year.

Agrium U.S. Inc. continued to progress its Blue Sky project for a coal gasification plant to feed the company's fertilizer plant on Alaska's Kenai Peninsula; Usibelli was involved by proposing to provide coal to this project. The fertilizer plant was closed in December 2007 due to lack of natural gas feedstock. A preliminary engineering design for the coal gasification plant was completed during the year. Phase one was a feasibility study for the project; the study was completed in August 2006. An announcement was released on March 13, 2008, advising discontinuation of the project; the company found that the economics were not sufficient to proceed with a gasification facility, and the plant has been mothballed.

Nixon Fork Mine, operated by Mystery Creek Resources, Inc., a wholly owned subsidiary of St. Andrew Goldfields Ltd., completed construction at the Nixon Fork project during the first part of the year and started production activity. The company encountered ore production issues in the upper portion of the 3300 zone of the Crystal deposit during the year. The actual geometry of the mineralized zone was found to be different than that used in the mineral reserve estimate. The company announced that

milling operations were shut down on August 14. Ongoing construction projects were also suspended on October 10. Production during the year amounted to 6,775 ounces of gold, 3,740 ounces of silver, and 114,111 pounds of copper. Employment at the project amounted to 69 for the year. The mine has been listed for sale.

The Pogo Mine is a joint venture with Sumitomo Metal Mining Co. Ltd (51 percent), Sumitomo Corp. (9 percent), and Teck Cominco Ltd. (40 percent). Teck Cominco is the operator of the mine, which is 90 miles southeast of Fairbanks. Pogo produced 260,000 ounces of gold during the year as opposed to a planned production of 340,000 ounces. The mine has not reached full capacity due to the construction and commissioning of the filter projects in the first quarter and poor equipment availability that impacted online time and throughput rates. The ore is extremely abrasive, and continuous improvement projects are focused on equipment reliability. Reduction of dilution in mining has been accomplished by using smaller equipment in narrow ore headings during the second half of 2007. Mill recoveries have improved and various upgrading projects are in progress, including automation of the flotation circuit, expected to be complete by the first half of 2008. Operating costs are high but improving; the average for 2007 was \$515 per ounce. Production for 2008 is expected to be between 340,000 and 360,000 ounces. Employment at year end was 243 full-time-equivalent employees and 88 contract employees.

Placer gold production is estimated to be 53,848 ounces for the year. Production for 2006 was 60,382 ounces. The Eastern Interior region continues to be the lead producer with 23,505 ounces of the total. The number of producing placer projects totals 175 compared to 201 for 2006. The operating cost is believed to have forced some new operators to discontinue operation; costs have increased faster than the gold price due primarily to fuel and its associated impacts to all costs. Silverado's Nolan Creek operation in the Brooks Range near Coldfoot produced 3,727 ounces from 18,320 cubic yards mined from underground operations on Mary's Bench. This is the only currently active underground placer mining operation in the state. Total employment in the placer industry amounted to 262, including recreational-sized operations.

Recreational mining continues to attract attention as the gold price appreciates. Production allocated to recreation mining was 1,882 ounces for 2007 compared to 1,133 ounces during 2006. Employment allocated to this sector was 54 compared to 45 for 2006 (fig. 3).

The nonmetallic (rock, sand, gravel, and peat) sector suffered loss of production during the year whether real or due to lack of reporting. This sector is very reluctant to report; however, all indications suggest a real decline in non-metallic production. The value of the industry for 2007 is currently estimated to be \$52.3 million. Employment is

estimated at 250. This compares to \$74.0 million and 442, respectively, for 2006. Continued efforts to obtain reports may increase these numbers somewhat.

GOVERNMENT ACTIONS

Geologists from the Minerals Resources Section of the Alaska Division of Geological & Geophysical Surveys (DGGS) mapped and sampled 189 square miles of the northeastern part of the Fairbanks mining district. A series of 1:50,000-scale geologic maps will be available in late 2008. This fieldwork is part of an integrated program following the airborne geophysical survey results previously released by DGGS in 2006.

The State of Alaska, through DGGS, funded and

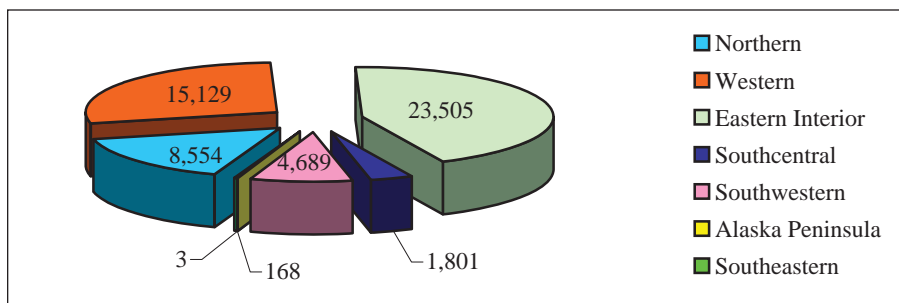


Figure 3. 2007 placer gold production—ounces by region..

acquired airborne magnetic and electromagnetic geophysical surveys for 180 square miles of the 708-square-mile Styx River survey area in the northeastern Lime Hills and northwestern Tyonek quadrangles. The surveys were conducted by Fugro Airborne Surveys Corp. and managed by Stevens Exploration Management Corp. These data, along with all historic DGGS publications and most U.S. Geological Survey publications on Alaska, are available for free download at the DGGS website (<http://www.dggs.dnr.state.ak.us>).

DGGS also acquired airborne magnetic and electromagnetic geophysical data for a 250-square-mile area of the western Fortymile mining district. The survey, funded by the U.S. Bureau of Land Management, covers parts of the Eagle and Tanacross quadrangles and focuses on federal and Native lands.

DGGS requested input from the Alaska mineral industry for the formation of a voluntary sponsor group to help financially support DGGS's mineral-resource programs. This program would be modeled after the successful energy industry sponsorship program for DGGS's energy-related field studies and supporting analyses. Participating individuals and companies would be given the opportunity to meet with DGGS personnel in the field during the work to learn of the findings. Public input concerning the scope and nature of the program is encouraged.

Governor Sarah Palin met with Cynthia Carroll, Anglo American PLC chief executive, to discuss issues surrounding the Pebble project. Anglo American executives also met with select state lawmakers. Ms. Carroll

pledged that Anglo American would drop out of the deal on the Pebble project if the wild salmon fisheries of Bristol Bay could not be protected. Ms. Carroll promised to hire locally and set up various social and education programs in the Bristol Bay region. Anglo American set up a partnership with local residents, referred to as the Bristol Bay Sustainable Fisheries Fund, to enhance the Bristol Bay fishery.

Usibelli Coal Mine Inc. was named exporter of the year by Governor Sarah Palin for its work shipping coal to South Korea and Chile.

Alaska Industrial Development & Export Authority (AIDEA) signed a 7-year agreement with Sherwood Copper Corp. in January to use the Skagway ore terminal for concentrates from its Minto Mine in the Yukon Territory, Canada. The agreement allows additional users of the terminal. After the agreement was signed, AIDEA awarded a facilities rehabilitation contract to construct a new concentrate storage building and support structures to handle Sherwood's copper concentrates. The Skagway ore terminal began receiving truckloads of high-grade copper-gold concentrates in July.



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DEPARTMENT OF COMMERCE, COMMUNITY & ECONOMIC DEVELOPMENT

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