

ALASKA'S MINERAL INDUSTRY 2011— Exploration Activity

by
D.J. Szumigala

Special Report 67



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS





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FRONT COVER: Grande Portage Resources Ltd. and Quaterra Resources Inc. focused their exploration efforts in 2011 on a drilling program at the Herbert Glacier gold property, approximately 15 miles north of Juneau. The partners conducted a second year of core drilling, with a total of 30 holes drilled from eight platforms. The drilling has delineated at least six main composite vein-fault structures that contain mesothermal ribbon quartz-sulfide-gold veins. Photo courtesy of Grande Portage Resources.

NOTE: Mention of any company or brand name does not constitute endorsement by any branch or employee of the State of Alaska.

Alaska's Mineral Industry 2011— Exploration Activity

by
D.J. Szumigala¹

INTRODUCTION

Alaska's mineral industry continues to grow in strength and size, based in part on the great mineral potential of the state and its strategic location. Alaska is underexplored for minerals compared to most other areas of the world and other parts of the northern Cordillera. The unmatched geologic diversity of Alaska has bestowed the state with a wide range of metallogenic settings and mineral commodities. More than 190 million acres of federal, state, and Native lands are open for mineral-related activities and mining. The discovery of several giant ore deposits in Alaska over the past 20 years, including the Pebble porphyry copper deposit (estimated to contain 80.6 billion pounds of copper, 107.4 million ounces of gold, and 5.6 billion pounds of molybdenum) and the 45-million-ounce Donlin Creek gold deposit, suggests there is great mineral potential in Alaska.

This summary of Alaska's mineral industry exploration activity for 2011 is made possible by information provided through press releases, company annual and financial reports, phone interviews, other research, and replies to questionnaires mailed by the Alaska Division of Geological & Geophysical Surveys (DGGS). This report is part of a cooperative project to track the Alaska mineral industry, conducted jointly by DGGS (Department of Natural Resources [DNR]) and the Division of Economic Development (Department of Commerce, Community & Economic Development [DCCED]).

Please note that the formatting and presentation of data in some tables differ from previous editions of this report, reflecting changes in data collected. Whenever possible, the author has worked to maintain consistency of data for seamless year-to-year comparisons. Most changes are described in footnotes in the affected tables. Currently DNR and DCCED are in the process of evaluating and updating the minerals report process and resulting publication.

ACKNOWLEDGMENTS

This report on the exploration undertaken by Alaska's mineral industry in 2011 is intended to provide current, accurate, and technically reliable information. The author thanks the companies, agencies, and individuals that responded to questionnaires or phone calls and provided information about

their activities and operations. Without their voluntary and timely information this report would not be possible. DGGS mailed mineral industry questionnaires in early 2012. Data received via questionnaire was compiled and additional information was collected through phone calls and other means of contact. Some photos and images used in this report were provided by members of the public; these contributions are greatly appreciated. Where appropriate, these contributors have been acknowledged in the text.



Photo 1. Gerry Griesel, geologist with the Minerals Section of the Alaska Division of Geological & Geophysical Surveys, measures foliation and lineation in complexly folded metamorphic rock near Moran Dome, Tanana Quadrangle. The group conducted geologic mapping and geochemical sampling in the eastern Moran area during 2011, the same region covered by a previously released 653-square-mile airborne geophysical survey. Photo by David Szumigala.

ALASKA'S MINERAL INDUSTRY 2011

Mineral exploration in Alaska continued at boom levels in 2011. Table 1 and figure 1 show the estimated value of mineral exploration investments, development expenditures, and mineral industry production in Alaska between 1981 and 2011. Figures for development and production for 2011 were provided by DCCED's Division of Economic Development.

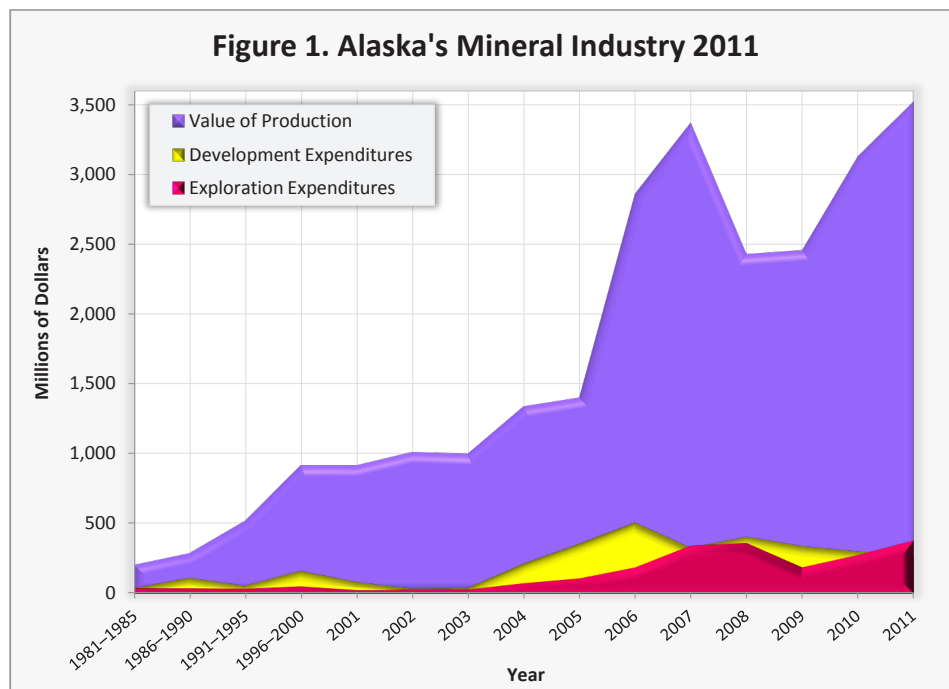
¹Zoom Alaska Geological Services, 1045 Ellesmere Dr., Fairbanks, AK 99709-5761

Table 1. Reported annual exploration and development expenditures of the mineral industry and the estimated value of mineral production in Alaska (in millions of dollars), 1981–2011. Average annual values are given for 1981–1985, 1986–1990, 1991–1995, and 1996–2000. Individual year totals are provided for 2001–2011.

Year	Exploration Expenditures	Development Expenditures	Value of Production
1981–1985	\$37.5	\$36.3	\$204.7
1986–1990	\$36.2	\$109.6	\$288.6
1991–1995	\$33.2	\$55.3	\$520.1
1996–2000	\$49.4	\$158.7	\$917.4
2001	\$23.8	\$81.2	\$917.3
2002	\$26.5	\$34.0	\$1,012.8
2003	\$27.6	\$39.1	\$1,000.7
2004	\$70.8	\$209.1	\$1,338.7
2005	\$103.9	\$347.9	\$1,401.6
2006	\$178.9	\$495.7	\$2,858.2
2007	\$329.1	\$318.8	\$3,367.0
2008	\$347.3	\$396.2	\$2,427.1
2009	\$180.0	\$330.8	\$2,455.6
2010	\$264.4	\$293.3	\$3,126.8
2011	\$365.1	\$271.9 ¹	\$3,518.1 ¹

¹ Development Expenditures and Production Value for 2011 provided by Division of Economic Development (oral communication)

Source: Alaska's Mineral Industry reports, published annually by DNR's Division of Geological & Geophysical Surveys and DCCED's Division of Economic Development



Exploration expenditures for 2011 were at least \$365.1 million, up more than \$100 million (and nearly 40 percent) from the 2010 value of \$264.4 million. This marked the seventh consecutive year with exploration expenditures exceeding \$100 million, and set a new record for annual mineral exploration expenditures. Alaska mineral exploration expenditures account for approximately one-third of the annual total mineral exploration expenditures in the United States.

Forty-two Alaska projects had exploration budgets of \$1 million or more and 39 additional projects expended \$100,000 or more in 2011. Most exploration funds were from Canadian sources. Exploration projects spanned the state.

Mineral Exploration Employment

The Alaska Department of Labor & Workforce Development (DLWD) collects wage and employment data for Alaska. However, mineral industry employment, especially mineral exploration employment, is not identified as a unique group in the DLWD data. Mineral industry employment is grouped by the DLWD with the engineering, environmental, or construction industries. The DLWD data also does not include the self-employed, such as the majority of placer operators. Consequently, mining's contributions to employment and earnings in Alaska are likely underestimated.

Employment information collected during the preparation of this report is incomplete. However, it is estimated that the mineral exploration employment for 2011 is similar to numbers reported for 2008 and 2010, two years with high values for mineral exploration investment. That is, mineral exploration employment in 2011 is likely in the range of 520 to 550 positions (annual full-time-equivalent employment, based on calculating a 260-day work year).

Mineral Exploration

Exploration expenditures in Alaska set a new record in 2011. Increased exploration expenditures generally followed worldwide trends. The increase in many mineral commodity prices in 2010 and 2011 and the improvement in the overall worldwide economy expanded the amount of venture

capital available for mineral exploration. Available helicopters, drill rigs, and other equipment and supplies essential to mineral exploration were in high demand during 2011.

Figure 2 shows a graph of mineral exploration expenditures in Alaska from 1956 to 2011. Annual exploration expenditures are shown as both raw values (not adjusted for inflation) and adjusted values (inflation-adjusted to 2011 dollars). Exploration expenditures over the last several years have exceeded any previous era of mineral exploration in Alaska. Table 2 lists exploration expenditures by commodity, while figure 3 shows the data graphically.

Exploration was conducted in Alaska for a wide variety of metals and mineralization styles during 2011. Gold, grouped with other precious metals, remained a major exploration commodity, with 51.0 percent of total exploration expenditures, but exploration expenditures for deposits with a mixed

Figure 2. Expenditures for Mineral Exploration in Alaska, 1956–2011

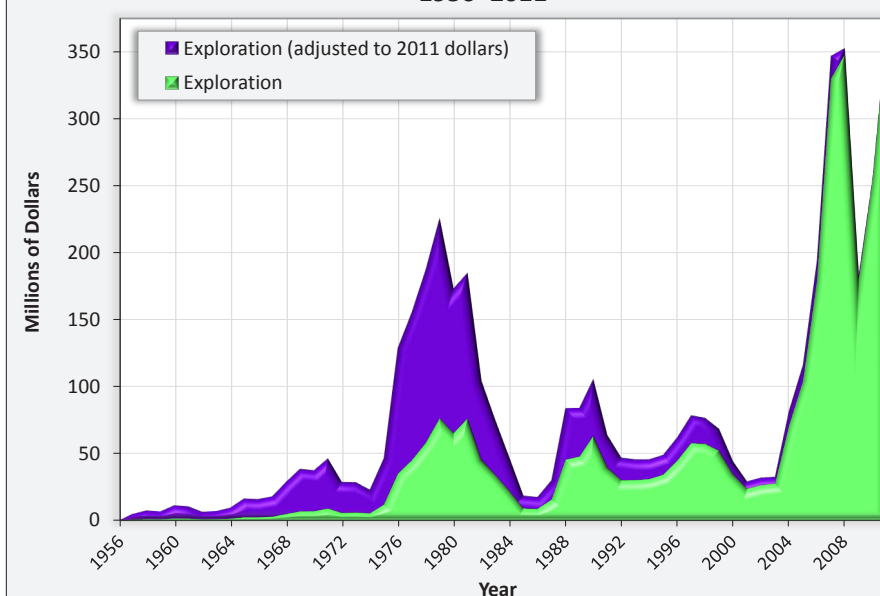
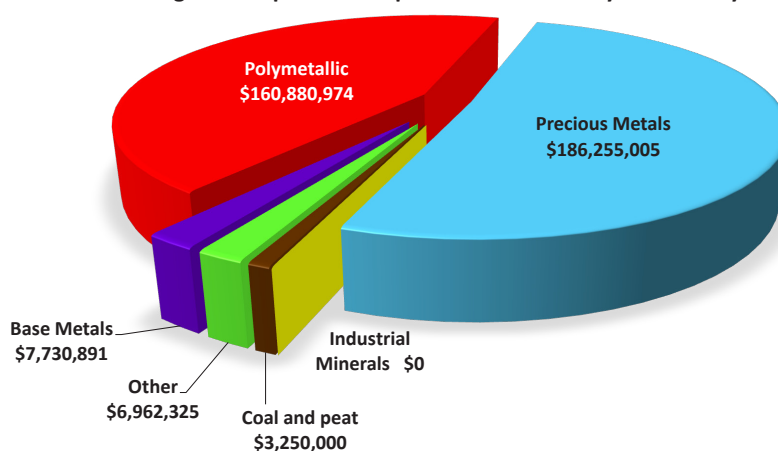


Figure 3. Exploration Expenditures in 2011 by Commodity



group of metals (polymetallic) were also very strong, and accounted for 44.1 percent of total exploration expenditures. Platinum-group-element (PGE) exploration expenditures in 2011 were down, to slightly more than half the expenditures of 2010, but still more than the average annual PGE expenditures from 2001 through 2009. A large increase in expenditures for rare-earth elements largely accounted for the more than doubling of expenditures for “other” commodities, which also includes commodities such as uranium, tin, diamonds, placer, industrial minerals, and coal.

Figure 4 shows 2011 Alaska exploration expenditures by deposit type. Granite/intrusion-related gold deposits were the major exploration target in 2011, with slightly less than

\$145 million in expenditures. Almost \$121.9 million were spent on copper–gold porphyry systems (grouped with polymetallic deposits in table 2) and more than \$31.4 million were spent on various gold–quartz vein deposits. Exploration expenditures for base-metal-rich, polymetallic massive-sulfide deposits increased dramatically from the \$29.3 million spent in 2010, to almost \$49.9 million in 2011, but still less than the almost \$59.4 million spent in 2007. Nearly \$4.4 million was spent exploring for PGE–nickel–copper ultramafic-hosted deposits and almost \$12.5 million were spent on rare-earth element, diamond, tin, coal, placer gold, and other deposit types, including significant expenditures exploring for iron–titanium-rich beach placer deposits.

Table 2. Reported exploration expenditures in Alaska by commodity, 1981–2011.

	Base metals	Polymetallic ^a	Precious metals ^b	Industrial Minerals	Coal and peat	Other ^c	Total
1981	\$ 28,262,200	N/A	\$ 35,273,200	\$ 10,300,000	\$ 2,341,000	\$ 127,000	\$ 76,303,400
1982	31,757,900	N/A	10,944,100	--	2,900,000	15,300	45,617,300
1983	9,758,760	N/A	20,897,555	2,068,300	1,338,454	70,000	34,133,069
1984	4,720,596	N/A	14,948,554	270,000	2,065,000	279,500	22,283,650
1985	2,397,600	N/A	6,482,400	--	270,000	--	9,150,000
1986	1,847,660	N/A	6,107,084	170,000	790,000	--	8,914,744
1987	2,523,350	N/A	11,743,711	286,000	1,150,000	31,000	15,734,061
1988	1,208,000	N/A	41,370,600	160,200	2,730,000	--	45,468,800
1989	3,503,000	N/A	43,205,300	125,000	924,296	5,000	47,762,596
1990	5,282,200	N/A	57,185,394	370,000	321,000	97,000	63,255,594
1991	4,789,500	N/A	34,422,039	92,000	603,000	2,000	39,908,539
1992	1,116,000	3,560,000	25,083,000	25,000	425,000	--	30,209,000
1993	910,000	5,676,743	23,382,246	163,500	--	125,000	30,257,489
1994	600,000	8,099,054	18,815,560	225,000	2,554,000	810,000	31,103,614
1995	2,770,000	10,550,000	20,883,100	100,000	--	3,000	34,306,100
1996	1,100,000	11,983,364	31,238,600	400,000	--	--	44,721,964
1997	1,700,000	22,347,000	32,960,500	80,000	720,000	--	57,807,500
1998	1,000,000	13,727,000	42,441,000	12,000	87,000	--	57,267,000
1999	3,869,000	3,168,000	44,891,000	1,000	--	410,000	52,339,000
2000	8,545,000	3,933,000	21,579,000	58,500	--	736,100	34,851,600
2001	4,810,000	1,977,000	15,820,000	50,000	10,000	1,106,000	23,773,000
2002	1,700,000	5,162,000	17,342,000	185,000	--	2,113,000	26,502,000
2003	262,000	7,081,000	19,726,000	--	W	533,000	27,602,000
2004	3,100,000	40,237,000	26,954,000	213,000	50,000	258,000	70,812,000
2005	1,764,000	54,271,000	46,255,000	142,000	--	1,463,000	103,895,000
2006	5,069,000	81,073,000	89,793,000	20,000	2,394,000	580,000	178,929,000
2007	38,888,000	123,487,500	155,601,400	42,500	7,675,000	3,447,000	329,141,400
2008	30,116,000	163,030,000	134,885,000	--	W	19,238,000	347,269,000
2009	3,862,715	85,871,529	84,020,531	17,850	W	6,193,518	179,966,143
2010	6,392,519	122,955,321	125,364,382	19,000	6,520,200	3,104,199	264,355,621
2011	7,730,891	160,880,974	186,255,005	--	3,250,000	6,962,325	365,079,195
TOTAL	\$ 221,355,891	\$ 929,070,485	\$ 1,445,870,261	\$ 15,595,850	\$ 39,117,950	\$ 47,708,942	\$ 2,698,719,379

^a Polymetallic deposits considered a separate category for the first time in 1992

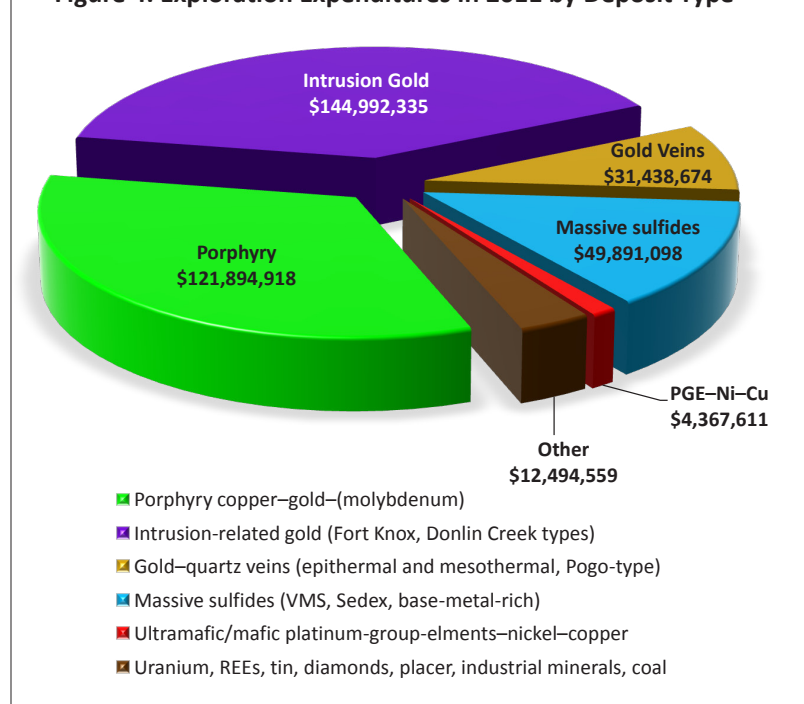
^b Approximately \$4.4M spent on platinum-group-element exploration during 2011 (\$8.1M in 2010, \$4.1M in 2009, \$3.2M in 2008, \$3.0M in 2007, \$1.4M in 2006, \$4.4M in 2005, \$3.4M in 2004, \$2.4M in 2003, \$650,000 in 2002, \$2M in 2001).

^c Includes uranium, tin, rare-earth elements, diamonds, magnetite sands, and tantalum

N/A = Not available

-- Not reported

W = Withheld; data included in “Other” column

Figure 4. Exploration Expenditures in 2011 by Deposit Type

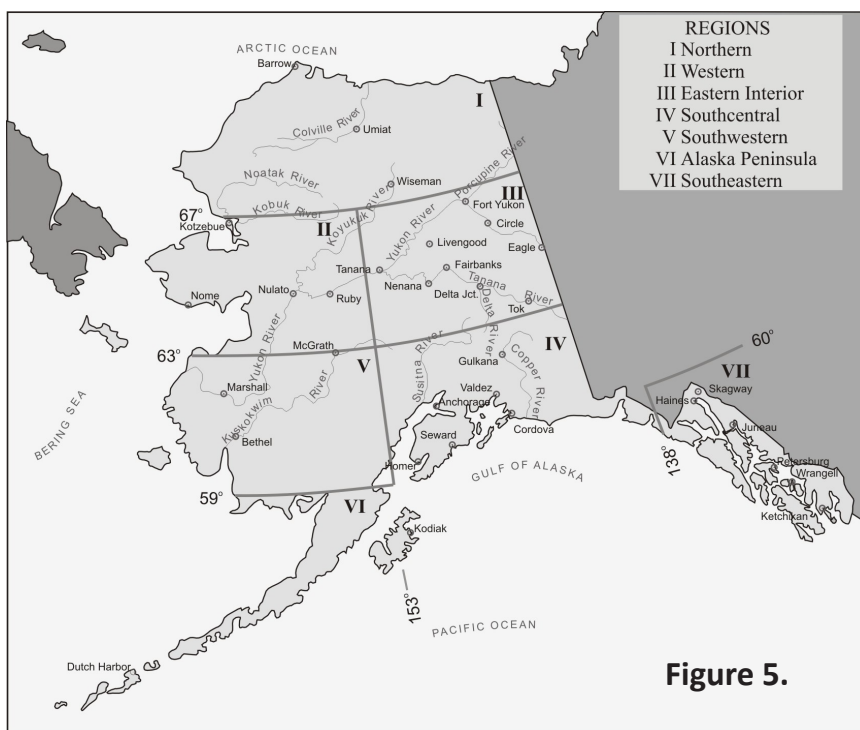
Analysis of 2011 mineral exploration expenditures indicates 39.7 percent of funds were spent exploring for intrusion-related gold deposits, 33.4 percent were spent looking for porphyry copper-gold-molybdenum deposits, 13.7 percent for various types of massive-sulfide deposits, 8.6 percent for gold vein deposits, and the remainder for a wide variety of deposit types. These percentages do not significantly differ from 2010 values except for a drop in porphyry deposit expenditures and an increase in intrusion-related gold deposit expenditures.

For purposes of this report, Alaska has been divided into seven geographic regions, shown in figure 5. Exploration was distributed across Alaska, as shown in table 3 and figure 6, but more than \$142.8 million (or 39 percent of the exploration funds) were spent in southwestern Alaska and \$111.4 million were spent in the eastern interior region. Exploration expenditures increased in all regions of the state during 2011, with the sharpest percentage increase, 149.7 percent, in the Alaska Peninsula region. The northern, eastern, and Alaska Peninsula regions saw a doubling of exploration expenditures in 2011 from 2010 levels. Exploration expenditures in the south-central region

lagged behind all other regions for 2011, decreasing 2 percent from 2010 expenditures.

Drilling was conducted during all phases of mining (exploration, development, and production) on various projects in Alaska during 2011. Most of the drilling was conducted during the exploration phases of the programs, but the total footages reported also include development drilling for some projects. Table 4 lists companies with a significant drilling program in Alaska during 2011, and table 5, table 6, and figure 7 summarize drilling activities by region and type of drilling. Drilling totals for 2011 were 883,272 feet of core drilling, 175,181 feet of reverse-circulation and sonic drilling, and 3,150 feet of placer churn/auger drilling. There was also drilling for coal exploration, but those footages are not reported to maintain confidentiality. Placer drilling is likely under-reported. About 46 percent of the drilling footage in 2011 was on mineral projects in the eastern interior of Alaska.

Three advanced exploration projects, Pebble, Donlin Creek, and Livengood, accounted for more than 55 percent of the exploration expenditures in 2011. The Pebble copper-gold porphyry project in southwestern Alaska, with resources of 80.6 billion pounds of copper, 107.4 million ounces of gold, and 5.6 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

**Figure 5.**

2011. The 45-million-ounce Donlin Creek intrusion-hosted gold deposit, with a resource of 633 million tons at an average grade of 0.065 ounces of gold per ton, is a joint-venture project in southwestern Alaska with partners Barrick Gold Corp., NovaGold Resources Inc., and Calista Corp. The Livengood project in the eastern interior region northwest

of Fairbanks is being explored by International Tower Hill Mines Ltd., and a 2011 preliminary economic analysis study indicates the Money Knob intrusion-related deposit has a measured and indicated resource of 1.03 billion tons grading 0.016 ounces of gold per ton and contains 16.5 million ounces of gold, with a total resource of 1.31 billion tons at an average grade of 0.016 ounces of gold per ton, containing 20.6 million ounces of gold.

Other advanced exploration projects with defined mineral resources include the Niblack volcanogenic massive sulfide project in southeastern Alaska, the Whistler project in the south-central region, the Ambler and Lik projects in the northern region, and the LWM project in the eastern interior region. Heatherdale Resources announced updated resources for the Niblack deposit. The Lookout deposit now has an indicated resource of 6.22 million tons averaging 0.95 percent copper, 0.05 ounces of gold per ton, 0.86 ounces of silver per ton, and 1.73 percent zinc. The Lookout deposit contains an additional inferred resource of 2.61 million tons averaging 0.73 percent copper, 0.041 ounces of gold per ton, 0.63 ounces of silver per ton and 1.17 percent zinc. The adjacent Trio deposit has an inferred resource of 1.12 million tons averaging 1 percent copper, 0.032 ounces of gold per ton, 0.48 ounces of silver per ton, and 1.56 percent zinc.

Ucore Rare Metals Inc. announced an inferred mineral resource for the Bokan Mountain rare-earth-element deposit near Ketchikan in southeastern Alaska of 4.08 million tons grading 0.75 percent total rare-earth oxides, consisting of 38.6 percent heavy rare-earth oxides, for a total of 60.3 million pounds total rare-earth oxides using a 0.5 percent total rare-earth oxides cutoff.

Freemgold Ventures Ltd. reported an updated resource estimate on the Golden Summit project near Fairbanks. The Dolphin zone contains an indicated resource of 16.37 million tons averaging 0.019 ounces of gold per ton, for 316,000 ounces of gold. The Dolphin zone has an additional inferred resource of 55.66 million tons averaging 0.018 ounces of gold per ton, for 991,000 ounces of gold.

NovaGold Resources Inc. announced new estimated mineral resources for the Arctic deposit in the southern Brooks Range, with 18.5 million tons of indicated mineral resource grading 4.1 percent copper and

Figure 6. Exploration Expenditures in 2011 by Region

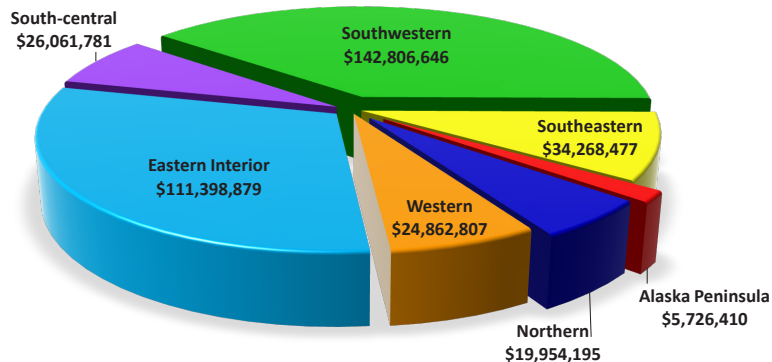
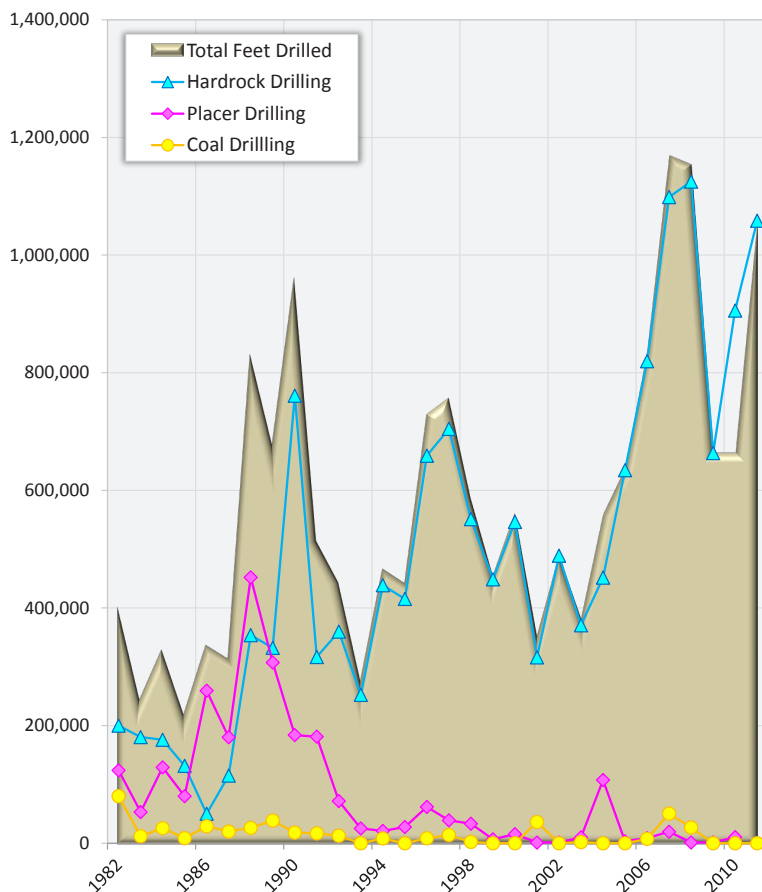


Figure 7. Drilling Footage Reported in Alaska, 1982–2011



6.0 percent zinc, and 13.3 million tons of inferred mineral resource grading 3.5 percent copper and 4.9 percent zinc. Total contained metals based on indicated mineral resources are 1.5 billion pounds of copper, 2.2 billion pounds of zinc, 450,000 ounces of gold, 32 million ounces of silver, and 350 million pounds of lead. An additional inferred mineral resource totals 940 million pounds of copper, 1.3 billion pounds of zinc, 260,000 ounces of gold, 19 million ounces of silver, and 212 million pounds of lead.

Table 7 lists the lode exploration projects that were active during 2011. Copper–gold porphyry exploration projects for 2011 include the Whistler, Big Chunk, Pyramid, and

Golden Zone projects. Exploration for intrusion-related gold deposits continued at the Fort Knox, Donlin Creek, Livenood, Colorado Creek, Estelle, Chisna, Vinasale, Gil, Uncle Sam, Richardson, Circle, and Rolling Thunder projects. Work on high-grade gold–quartz veins was conducted at the Kensington, Pogo, Lucky Shot, Money Rock, WP, Bluff, Council, LMS, Terra, Chandalar, Herbert Glacier, Tetlin, Unga, and Golden Summit projects. Base-metal exploration was conducted at the Red Dog and Lik SEDEX properties, at the Greens Creek, Palmer, Ambler, Sun, and Niblack VMS properties, LWM and Bornite carbonate-hosted properties, and at the Besshi-type Caribou Dome copper project.

Table 3. *Reported exploration expenditures and employment in Alaska, 2011.*

	Northern	Western	Eastern Interior	South-central	South-western	South-eastern	Alaska Peninsula	Total
Exploration expenditures								
Placer	\$ 12,600	\$ 410,860	\$ 1,616,644	\$ 104,250	\$ 93,700	\$ 42,100	\$ 361,121	\$ 2,641,275
Lode	19,941,595	24,451,947	109,782,235	25,957,531	142,712,946	34,226,377	5,365,289	362,437,920
TOTAL	\$19,954,195	\$24,862,807	\$111,398,879	\$26,061,781	\$142,806,646	\$34,268,477	\$5,726,410	\$365,079,195
Companies reporting ^a	16	52	95	44	32	19	8	223

^aSome companies were active in several areas.

Table 4. *Companies reporting significant drilling programs in Alaska, 2011.*

Agnico–Eagle USA Ltd./Miranda Gold Corp.	International Tower Hill Mines Ltd. (Talon Gold)
Alix Resources Corp.	Kinross Gold Corp. (Fairbanks Gold Mining Inc.)
Andover Mining Corp.	Kiska Metals Corp.
Antofagasta Minerals	McEwen Mining Inc. (U.S. Gold Corp.)
Caribou King Resources Corp.	Millrock Resources Inc.
Cedar Mountain Exploration	NovaGold Resources Inc.
Coeur Inc.	Ocean Park Venture Corp.
Contango ORE Co.	Pebble Limited Partnership (Northern Dynasty Minerals Ltd. and Anglo American PLC)
Cook Inlet Regional Corp. (CIRI)	Pure Nickel Inc.
Corvus Gold Inc.	Radius Gold Inc.
Crescent Resources Corp.	Redstar Gold Corp.
Fire River Gold Corp.	Rhyolite Resources Ltd.
First Star Resources Inc.	Sumitomo Metal Mining Co. Ltd.
Freegold Ventures Ltd.	Sumitomo Metal Mining Pogo LLC
Full Metal Minerals Ltd.	Teck Alaska Inc.
Full Metal Zinc Ltd.	Terra Mining Corp.
Georgetown Capital	Ucore Rare Metals Inc.
Goldrich Mining Co.	Usibelli Coal Mine Inc.
Grande Portage Resources Ltd.	Zazu Metals Corp.
Heatherdale Resources Ltd.	
Hecla Mining Co.	

Platinum and associated metals exploration continued at the MAN project. Other exploration continued for rare-earth elements (Bokan Mountain, Salmon Bay, Ray Mountains), gold–copper skarns (Nixon Fork, Kelly Creek, Kugruk), iron–titanium–gold sands (Alaska Sands), gold–antimony veins (Tushtena), and coal (Jumbo Dome, Wishbone Hill, Tyonek, Stone Horn Ridge).

There were also many active placer gold operations in most regions of the state that conducted variable amounts of exploration, but expenditures on individual placer projects

were generally much less than spending on lode exploration projects.

The Minerals Section of the Alaska Division of Geological & Geophysical Surveys conducted geologic mapping in the Moran area north of the Yukon River west of Tanana and released helicopter-borne geophysical surveys for the Iditarod and Ladue areas of southwestern and eastern Alaska. Government-generated geologic maps, geophysical data, and Alaska minerals information are posted at <http://www.dggs.alaska.gov/> and <http://AKGeology.info>.

Table 5. Drilling footage by region in Alaska, 2011.

Type of drilling	Northern	Western	Eastern Interior	South-central	South-western	South-eastern	Alaska Peninsula	Total
Placer subtotal	--	150	--	--	3,000	--	--	3,150
Coal subtotal	--	--	^a	^a	--	--	--	^a
Hardrock core	55,680	84,115	352,221	119,467	43,526	213,046	15,217	883,272
Hardrock rotary	--	--	141,801	8,000	25,380	--	--	175,181
Hardrock subtotal	55,680	84,115	494,022	127,467	68,906	213,046	15,217	1,058,453
TOTAL (feet)	55,680	84,265	494,022	127,467	71,906	213,046	15,217	1,061,603

-- = Not reported.

Drill footages do not include sand and gravel drilling.

^aCoal drilling included in hardrock rotary drill footage to maintain confidentiality of information.



Photo 2. Helicopter-supported core drilling in the Delta mineral belt. Heatherdale Resources Ltd. acquired an interest in the Delta Project, in east-central Alaska, during 2011. Heatherdale conducted exploration for volcanogenic massive-sulfide (VMS) mineralization, sampling six outcrops and 30 copper-, zinc-, and lead-bearing massive-sulfide boulders with associated gold and silver values. The company also drilled three holes that tested the extent of the massive-sulfide mineralization. Photo courtesy of Heatherdale Resources.

Table 6. Drilling footage reported in Alaska, 1982–2011.

Year	Placer Exploration	Placer Thawing	TOTAL PLACER	TOTAL COAL	Hardrock Core ^a	Hardrock Rotary ^a	TOTAL HARDROCK	TOTAL FEET
1982	30,000	94,000	124,000	80,000	--	--	200,000	404,000
1983	23,000	30,000	53,000	12,000	--	--	180,500	245,500
1984	31,000	98,000	129,000	25,700	--	--	176,000	330,700
1985	46,000	34,000	80,000	8,700	--	--	131,700	220,400
1986	32,400	227,000	259,400	28,800	--	--	50,200	338,400
1987	50,250	130,000	180,250	19,900	95,600	19,500	115,100	315,250
1988	152,000	300,000	452,000	26,150	223,630	130,230	353,860	832,010
1989	97,250	210,000	307,250	38,670	242,440	89,790	332,230	678,150
1990	78,930	105,000	183,930	18,195	648,600	112,355	760,955	963,080
1991	51,247	130,000	181,247	16,894	205,805	110,850	316,655	514,796
1992	6,740	65,000	71,740	12,875	211,812	148,022	359,834	444,449
1993	25,216	--	25,216	--	124,325	127,990	252,315	277,531
1994	21,000	--	21,000	8,168	347,018	91,692	438,710	467,878
1995	27,570	--	27,570	--	363,690	51,795	415,485	443,055
1996	61,780	--	61,780	8,500	524,330	134,527	658,857	729,137
1997	38,980	--	38,980	13,998	523,676	180,834	704,510	757,488
1998	33,250	--	33,250	2,300	505,408	45,670	551,078	586,628
1999	6,727	--	6,727	--	369,863	78,934	448,797	455,524
2000	15,480	--	15,480	--	418,630	127,638	546,268	561,748
2001	1,100	--	1,100	36,151	240,318	75,750	316,068	353,319
2002	1,250	--	1,250	--	385,290	103,612	488,902	490,152
2003	10,108	--	10,108	2,000	270,456	100,178	370,634	382,742
2004	107,526	--	107,526	--	415,628	36,024	451,652	559,178
2005	3,360	--	3,360	--	592,497	41,780	634,277	637,637
2006	8,759	--	8,759	7,500	765,363	54,173	819,536	835,795
2007	19,575	--	19,575	50,539	830,478	268,112	1,098,590	1,168,704
2008	1,216	--	1,216	26,869	874,634	250,278	1,124,912	1,152,997
2009	1,244	--	1,244	W	403,275	260,059	663,334	664,578
2010	10,427	--	10,427	W	688,911	216,768	905,679	664,578
2011	3,150	--	3,150	W	883,272	175,181	1,058,453	1,061,603

^aCore and rotary drilling not differentiated prior to 1987.

-- = Not reported.

W = withheld for confidentiality, included in hardrock rotary

Table 7. 2011 Alaska mineral exploration projects

Mining company	Property	Region ^a	Metal	Deposit Type	2011 Drilling
Agnico-Eagle USA Ltd.	Ester Dome	EI	Gold	Gold vein	Y
Alix Resources Corp.	Money Rock, Goodpaster	EI	Gold	Gold vein	
CA Gold LLC	Rusty Creek, Valdez Creek mining district	EI	Placer gold	Placer gold	
Caribou Copper Resources Ltd.	Caribou Dome	EI	Copper	Massive sulfides (VMS, sedex)	Y
Contango ORE Co.	Tetlin, Tok claims	EI	Copper, gold	Porphyry copper	Y
Crescent Resources Corp.	Uncle Sam, Recon	EI	Gold	Intrusion-related gold	Y
Endurance Gold Corp.	Vana and McCord claims, Livengood	EI	Gold	Intrusion-related gold	
First Star Resources Inc.	LMS	EI	Gold, silver	Gold vein	Y
First Star Resources Inc.	WP (West Pogo)	EI	Gold, silver	Gold vein	
Freegold Ventures Ltd.	Golden Summit	EI	Gold	Gold vein	Y
Freegold Ventures Ltd.	Rob	EI	Gold	Gold vein	
Full Metal Minerals Ltd.	Fortymile	EI	Polymetallic	Massive sulfides (VMS, sedex)	
Full Metal Minerals Ltd.	Rolling Thunder	EI	Gold	Gold vein	
Full Metal Minerals Ltd.	Circle	EI	Gold	Gold vein	
Full Metal Zinc Ltd.	LWM	EI	Polymetallic	Carbonate replacement	Y
Georgetown Capital/Full Metal Minerals	Tanacross/Oreo property	EI	Polymetallic	Massive sulfides (VMS, sedex)	Y
Heatherdale Resources Ltd.	Delta	EI	Polymetallic	Massive sulfides (VMS, sedex)	
International Tower Hill Mines Ltd.	Livengood/Money Knob	EI	Gold	Intrusion-related gold	Y
Kinross Gold Inc. (Kinross Fort Knox)	Fort Knox	EI	Gold	Intrusion-related gold	Y
Kinross Gold Inc. (Kinross Fort Knox)	Gil	EI	Gold	Skarn/intrusion gold	Y
Kinross Gold Inc. (Kinross Fort Knox)	PB claims, Porcupine Creek, Circle	EI	Gold	Gold vein	
Linux Gold Corp.	Trout and Coho claims	EI	Gold	Gold vein	
McEwen Mining Inc.	Richardson	EI	Gold	Intrusion-related gold	Y
Millrock Resources Inc.	Napoleon, Fortymile	EI	Gold	Intrusion-related gold	
Miranda Gold Corp.	Ester Dome	EI	Gold	Gold vein	Y
Ocean Park Ventures/Corvus Gold Inc.	Chisna	EI	Copper, gold	Porphyry copper	Y
On-Line Exploration Services	Sam	EI	Gold	Gold vein	
Precious Metals Exploration Corp.	Money Rock, Goodpaster	EI	Gold	Gold vein	
Rhyolite Resources Ltd.	Paxson	EI	Polymetallic	Massive sulfides (VMS, sedex)	Y
Select Resources Corp.	Shorty Creek	EI	Gold	Intrusion-related gold	
Senator Minerals Inc.	Taurus	EI	Copper, gold	Porphyry copper	
Silverado Mines Inc.	Ester Dome	EI	Gold	Gold vein	
Silverado Mines Inc.	Eagle Creek	EI	Gold	Gold vein	
Sumitomo Metal Mining Co. Ltd.	Mon Project, Stone Boy	EI	Gold	Gold vein	Y
Sumitomo Metal Mining Pogo LLC	Pogo	EI	Gold	Gold vein	Y
Teryl Resources Corp.	West Ridge	EI	Gold	Intrusion-related gold	
Triton Gold Ltd./Panoramic Resources Ltd.	Tushtena (Stibnite Creek)	EI	Gold	Gold–stibnite vein	
Ucore Rare Metals Inc.	Ray Mountains	EI	REE	Intrusion hosted	Y
Usibelli Coal Mine Inc.	Usibelli – Jumbo Dome	EI	Coal	Coal	Y
Andover Mining Corp.	Sun, Ambler	N	Base metals	Massive sulfides (VMS, sedex)	Y
Goldrich Mining Co.	Chandalar	N	Gold	Gold vein	Y
NovaGold Resources Inc.	Ambler, Arctic	N	Polymetallic	Massive sulfides (VMS, sedex)	Y
NovaGold Resources Inc.	Bornite	N	Copper, silver	Carbonate replacement	Y
Silverado Gold Mines Ltd.	Nolan Creek	N	Gold	Gold vein	
Teck Alaska Inc.	Red Dog area	N	Base metals	Massive sulfides (VMS, sedex)	Y
TintinaGold Resources Inc.	Baird Mountain	N	Base metals	Massive sulfides (VMS, sedex)	

^aRegions are abbreviated as follows: EI = Eastern Interior; N = Northern; SC = South-central; SE = Southeast; SW = Southwest; W = West; AP = Alaska Peninsula

Mining company	Property	Region ¹	Metal	Deposit Type	2011 Drilling
Zazu Metals Corp.	Lik-Su	N	Base metals	Massive sulfides (VMS, sedex)	Y
Alix Resources Corp.	Golden Zone	SC	Copper, gold	Porphyry copper	Y
Brixton Metals Corp.	Kahilt (Cristo)	SC	Copper, gold	Porphyry copper	
Brixton Metals Corp.	Brix claims	SC	Copper, gold	Porphyry copper	
Cook Inlet Region Inc. (CIRI)	Stone Horn Ridge	SC	Coal	Coal	Y
Diamond Gold Corp.	Yenlo	SC	Gemstones	Diamonds	
Full Metal Minerals Ltd.	Grizzly Butte	SC	Copper, gold	Porphyry copper	
Itochu Corp.	MAN project	SC	PGE; Ni, Cu, Pb,	PGE	Y
Kiska Metals Corp.	Whistler, near Rainy Pass	SC	Copper, gold	Porphyry copper	Y
Kiska Metals Corp.	Raintree West	SC	Copper, gold	Porphyry copper	Y
Kiska Metals Corp.	Island Mountain	SC	Copper, gold	Porphyry copper	Y
Kiska Metals Corp.	Copper Joe	SC	Copper, gold	Porphyry copper	Y
Millrock Resources Inc.	Estelle	SC	Copper, gold	Porphyry copper	Y
Millrock Resources Inc.	STE claims	SC	Copper, gold	Porphyry copper	
Millrock Resources Inc.	Revelation	SC	Copper, gold	Porphyry copper	
On-Line Exploration Services	Chetthena claims	SC	Copper, gold	Porphyry copper	
On-Line Exploration Services	Molly (Miss Moly)	SC	Copper, molybdenum	Porphyry copper	
Teryl Resources Corp.	Kahiltna Terrane	SC	Copper, gold	Porphyry copper	
Usibelli Coal Mine Inc.	Wishbone Hill	SC	Coal	Coal	
Coeur Alaska Inc.	Kensington	SE	Gold	Gold vein	Y
Constantine Metal Resources Ltd.	Palmer	SE	Polymetallic	Massive sulfides (VMS, sedex)	
Contango ORE Co.	Stone Rock	SE	REE	Intrusion hosted	
Contango ORE Co.	Salmon Bay	SE	REE	Intrusion hosted	
Grande Portage Resources Ltd.	Herbert Glacier	SE	Gold	Gold vein	Y
Heatherdale Resources Ltd.	Niblack	SE	Polymetallic	Massive sulfides (VMS, sedex)	Y
Hecla Mining Co.	Greens Creek	SE	Polymetallic	Massive sulfides (VMS, sedex)	Y
Hyak Mining Co.	Crackerjack	SE	Gold	Gold vein	
Olympic Resources Group LLC/Bravo	Woewo Island	SE	Base metals	Massive sulfides (VMS, sedex)	Y
Pure Nickel Inc.	Salt Chuck	SE	PGE	PGE	
Ucore Rare Metals Inc., Landmark Alaska	Bokan Mountain	SE	REE	Intrusion hosted	Y
Blackpeak LLC	Quicksilver Prospect	SW	Gold	Intrusion-related gold	
Calista Corp.	Nyac Lode	SW	Gold	Gold vein	
DonlinGold JV	Donlin Cr	SW	Gold	Intrusion-related gold	
Freegold Ventures	Vinasale	SW	Gold	Intrusion-related gold	Y
Full Metal Minerals	Moore Creek	SW	Gold	Intrusion-related gold	
Full Metal Minerals	Pebble South	SW	Copper, gold	Porphyry copper	
Invenio Resources Corp.	Candle Hills	SW	Gold	Intrusion-related gold	
Kennecott Exploration Co.	Groundhog	SW	Copper, gold	Porphyry copper	
Liberty Star Uranium & Metals Corp	Big Chunk	SW	Copper, gold	Porphyry copper	
Millrock Resources Inc.	Humble	SW	Copper, gold	Porphyry copper	Y
Newmont Exploration Ltd.	SW region	SW	Gold	Intrusion-related gold	
North Fork LLC (Doray Minerals)	Luna, Ako, Gold Creek, Little Swift	SW	Gold	Intrusion-related gold	
Nyac Mining Co.	Nyac	SW	Gold	Intrusion-related gold	Y
Osisko Mining Corp.	Sleitat	SW	Tin	Porphyry tin	
Pebble Partnership	Pebble	SW	Copper, gold	Porphyry copper	Y
Q-Gold Resources Ltd.	Farewell Project	SW	PGE	PGE	
Terra Gold Corp.	Terra	SW	Gold	Gold vein	Y
TNR Gold Corp.	Shotgun/Moses	SW	Gold	Intrusion-related gold	
TNR Gold Corp.	Iliamna	SW	Copper, gold	Porphyry copper	
Cedar Mountain Exploration Inc.	Kelly Creek	W	Gold	Intrusion-related gold	Y
Fire River Gold Corp.	Nixon Fork	W	Gold-Copper	Intrusion-related gold	Y
Invenio Resources	Ganes Creek	W	Gold	Intrusion-related gold	
Millrock Resources Inc.	Bluff	W	Gold	Gold vein	
Millrock Resources Inc.	Council	W	Gold	Gold vein	
NANA Regional Corp.	Fairhaven-Anugi	W	Polymetallic	Massive sulfides (VMS, sedex)	

¹Regions are abbreviated as follows: EI = Eastern Interior; N = Northern; SC = South-central; SE = Southeast; SW = Southwest; W = West; AP = Alaska Peninsula

Mining company	Property	Region¹	Metal	Deposit Type	2011 Drilling
Newmont Exploration	Mysti claims, Mystery Mtns	W	Gold	Intrusion-related gold	
Next Gen Metals Inc.	Silver Chalice (Poison Creek caldera)	W	Gold, silver	Epithermal gold	
Ryan Gold Corp. (Valdez Gold Inc.)	Bluff	W	Gold	Gold vein	
Silver Predator Corp.	Illinois Creek	W	Polymetallic	Massive sulfides (VMS, sedex)	
TintinaGold Resources Inc.	Colorado Creek	W	Gold	Intrusion-related gold	
TintinaGold Resources Inc.	Kugruk Project, near Candle	W	Base metals	Massive sulfides (VMS, sedex)	
Advanced Explorations Inc.	Alaska Sands	AP	Iron, titanium, gold	Magnetite sands	
Antofagasto Minerals/Full Metal Minerals	Pyramid, Port Moller	AP	Copper, gold	Porphyry copper	Y
Redstar Gold Corp.	Unga, Shumagin	AP	Gold	Gold vein	

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NOTES
