Open-File Report 96-513-A. Significant metalliferous and selected non-metalliferous lode deposits and placer districts for the Russian Far East, Alaska, and the Canadian Cordillera, by Warren J. Nokleberg, Thomas K. Bundtzen, Kenneth M. Dawson, Roman A. Eremin, Nikolai A. Goryachev, Richard D. Koch, Vladimir V. Ratkin, Ilya S. Rozenblum, Vladimir I. Shpikerman, and Yuri F. Frolov, Mary E. Gorodinsky, Vladimir D. Melnikov, Nikolai V. Ognyanov, Eugene D. Petrachenko, Rimma I.Petrachenko, Anany I. Pozdeev, Katherina V. Ross, Douglas H. Wood, Donald Grybeck, Alexander I. Khanchuck, Lidiya I. Kovbas, Ivan Ya. Nekrasov, and Anatoloy A. Sidorov, 1996, 385 p.

This report is a written tabular compilation of the significant metalliferous and selected non-metalliferous lode deposits and placer districts of the Russian Far East, Alaska, and the Canadian Cordillera. The report provides detailed summaries of the important features of the significant lode deposits and placer districts along with a summary of mineral deposit models, and a bibliography of cited references. Data are provided for 1,079 significant lode deposits and 158 significant placer districts of the region. This version of the report is issued on standard paper (Open-File Report 96-513-A).

A subsequent digital version will be issued on CD-ROM (Open-File Report 96-513-B). The digital version will contain the introduction, description of mineral deposit models, and bibliography of cited references in ASCII (TXT) and RTF (Rich-Text Format) formats, and the mineral-deposit and placer district tables in dBase 3/4, FileMaker Pro 2.0, and tab-delineated text (TXT) formats. Minimum requirements for part B are: IBM PC 386 or compatible, minimum of 1.0 Mb RAM, and 8 megabytes of storage; ability to read a standard-format CD-ROM, DOS 6.0 or higher, CD-ROM drive, or an Apple Macintosh with a Super Drive, CD-ROM drive, and Apple File Exchange software to convert PC files to Macintosh files.

U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

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SIGNIFICANT METALLIFEROUS AND SELECTED NON-METALLIFEROUS LODE DEPOSITS AND PLACER DISTRICTS FOR THE RUSSIAN FAR EAST, ALASKA, AND THE CANADIAN CORDILLERA

By

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INTRODUCTION

This report is a written tabular compilation of the significant metalliferous and selected non-metalliferous lode deposits and placer districts of the Russian Far East, Alaska, and the Canadian Cordillera. The report provides detailed summaries of the important features of the significant lode deposits and placer districts along with a summary of mineral deposit models, and a bibliography of cited references. Data are provided herein for 1,079 significant lode deposits and 158 significant placer districts of the region. The tabular data are provided in Table 1 for significant lode deposits, and in Table 2 for significant placer districts at the end of report. Alphabetical indices of the tabular data are provided after Tables 1 and 2.

The Alaskan and Canadian mineral deposit data are derived from revisions of Dawson (1984), Nokleberg and others (1987, 1993, 1994a, b), from new unpublished data of the authors, and from recent publications. The Russian Far East mineral deposit data represent new compilations by the Russian authors using cited references and unpublished data of the authors.

This report is published in two versions, a paper version (Open-File Report 96-513-A) and a digital version (CD-ROM) (Open-File Report 96-513-B). This report is one of a series of studies on the mineral deposits, metallogenic belts, bedrock geology, and tectonics of the Russian Far East, Alaska, and the Canadian Cordillera. Published companion studies are: (1) a report on the metallogenesis of mainland Alaska and the Russian Northeast (Nokleberg and others, 1993); and (2) a tectonostratigraphic terrane map of the Circum-North Pacific (Nokleberg and others, 1994c). A companion version of this report is being published in digital format on floppy disks.

METALLOGENIC AND TECTONIC DEFINITIONS

The following key definitions are provided.

Deposit. A general term for any lode or placer mineral occurrence, mineral deposit, prospect, and (or) mine.

Metallogenic belt. A geologic unit (area) that either contains or is favorable for a group of coeval and genetically-related, significant lode and placer deposit models.

Mine. A site where valuable minerals have been extracted.

Mineral deposit. A site where concentrations of potentially valuable minerals for which grade and tonnage estimates have been made.

Mineral occurrence. A site of potentially valuable minerals on which no visible exploration has occurred, or for which no grade and tonnage estimates have been made.

Overlap assemblage. A postaccretion unit of sedimentary or igneous rocks deposited on, or intruded into, two or more adjacent terranes (Jones and others, 1983; Howell and others, 1985; Nokleberg and others, 1994c). The sedimentary and volcanic parts either depositionally overlie, or are interpreted to have originally depositionally overlain, two or more adjacent terranes, or terranes and the craton margin. Overlapping plutonic rocks, which may be coeval and genetically related to overlap volcanic rocks, link or stitch together adjacent terranes, or a terrane and a craton margin.

Prospect. A site of potentially valuable minerals in which excavation has occurred.

Significant mineral deposit. A mine, mineral deposit, prospect, or occurrence that is judged as important for the metallogenesis of a geographic region.

Terrane. A fault-bounded geologic entity or fragment that is characterized by a distinctive geologic history that differs markedly from that of adjacent terranes (Jones and others, 1983; Howell and others, 1985; Nokleberg and others, 1994c). Constitutes a physical entity, i.e., a stratigraphic succession bounded by faults, inferred faults, or an intensely-deformed structural complex bounded by faults. Some terranes may be displaced (faulted) facies of other terranes.

LODE AND PLACER MINERAL DEPOSIT MODELS

Classification of Mineral Deposits

Metalliferous and selected non-metalliferous lode and placer deposits in this report are classified into various models or types described below. This classification of mineral deposits was derived mainly from the mineral deposit types of Eckstrand (1984), Cox and Singer (1986), Nokleberg and others (1987, 1993, 1994a, b), cited references for specific models, and unpublished data of the

Russian authors. The lode deposit types are grouped according to host rock lithologies and (or) origin. Lode deposit types that share a common origin, such as contact metasomatic deposits, or porphyry deposits, are grouped together under a single heading.

The mineral deposit types used in this report consist of both descriptive and genetic information that is systematically arranged to describe the essential properties of a class of mineral deposits. Some types are descriptive (empirical), in which instance the various attributes are recognized as essential, even though their relationships are unknown. An example of a descriptive mineral deposit type is the basaltic Cu type in which the empirical datum of a geologic association of Cu sulfides with relatively Cu-rich metabasalt or greenstone is the essential attribute. Other types are genetic (theoretical), in which case the attributes are related through some fundamental concept. An example is the W skarn deposit type in which case the genetic process of contact metasomatism is the essential attribute. For additional information on the methodology of mineral deposit types, the reader is referred to the discussions by Eckstrand (1984) and Cox and Singer (1986). For each deposit type, the principal references are listed in parentheses.

Deposits Related to Marine Felsic to Mafic Extrusive Rocks

Kuroko Zn-Pb-Cu massive sulfide (Ag, Au, Cd, Sn, Sb, Bi, barite) (D.A. Singer in Cox and Singer, 1986; Franklin, 1993)

This deposit type consists of volcanogenic massive to disseminated sulfides that occur in felsic to intermediate marine volcanic, pyroclastic, and bedded sedimentary rocks. The deposit minerals are mainly pyrite, chalcopyrite, sphalerite, and lesser galena, tetrahedrite, tennantite, and magnetite. Local alteration to zeolites, montmorillonite, silica, chlorite, and sericite may occur. The volcanic rocks are mainly rhyolite and dacite flows and tuff with subordinate basalt and andesite. Deposits commonly associated with subvolcanic intrusions that focus heat and provide energy for circulating hydrothermal fluids and leaching reactions. Strata above intrusions display extensive high-temperature alteration, including metal depletion, extreme alkali modification, and silicification. Deposits may be associated with major units of epiclastic breccia and with local growth faults, either rift or caldera-collapse faults. Alteration pipes may develop in portions of faults that immediately underlie the deposits. The depositional environment is mainly hot springs related to marine volcanism in island arcs or in extensional regimes behind island arcs.

Besshi Cu-Zn massive sulfide (Cu, Zn, Ag) (D.P. Cox in Cox and Singer, 1986; Slack, 1993)

This deposit type consists of thin sheet-like bodies of massive to well-laminated pyrite, pyrrhotite, and chalcopyrite and sphalerite, and lesser sulfide minerals, within thinly laminated clastic sedimentary rocks, basalt, and mafic tuff. Lesser minerals are magnetite, galena, bornite, and tetrahedrite, with gangue quartz, carbonates, albite, white mica, and chlorite. The rock types are mainly marine clastic sedimentary rocks, basaltic and less commonly andesitic tuff and breccia, and local black shale and red chert. Wall rocks may include sericite- and chlorite-rich schist, coticule, tourmalinite, and albite that common form strata-bound lenses or envelopes around the massive sulfide deposit, or may extend as much as five to ten meters into the adjacent host rocks. Coticule, tourmalinite, and albite may occur as stratiform layers that may extend laterally hundreds of meters beyond the massive sulfide deposit. These wall rocks form by hydrothermal alteration and (or) chemical sedimentation coeval with deposition of massive sulfide. Alteration is sometimes difficult to recognize because of metamorphism. Deposits typically form stratiform lenses and sheetlike accumulations of semi-massive to massive sulfide. Footwall feeder zones may occur. The depositional environment is interpreted as submarine hot springs related to the deeper zones of submarine basaltic volcanism along spreading oceanic ridges, possibly in areas where a spreading oceanic ridge occurs near a continental margin that is supplying clastic detritus.

Cyprus Cu-Zn-Ag massive sulfide (Au, Pb, Cd, Sn) (D.A. Singer in Cox and Singer, 1986)

This deposit type consists of massive sulfides in pillow basalt. The deposit minerals are mainly pyrite, chalcopyrite, sphalerite, and lesser marcasite and pyrrhotite. The sulfides occur in pillow basalt that is associated with tectonized dunite, harzburgite, gabbro, sheeted diabase dikes, and fine-grained sedimentary rocks, all part of an ophiolite assemblage. Beneath the massive sulfides is sometimes stockwork pyrite, pyrrhotite, minor chalcopyrite, and sphalerite. The sulfide minerals are sometimes brecciated and recemented. Alteration in the stringer zone consists of abundant quartz, chalcedony, chlorite, and lesser illite and calcite. Some deposits are overlain by Fe-rich and Mn-poor ochre. The depositional environment consists of submarine hot springs along an axial graben in oceanic or back-arc spreading ridges, or hot springs related to submarine volcanoes in seamounts.

Volcanogenic Mn (R.A. Koski in Cox and Singer, 1986)

This deposit type consists of sheets and lenses of hausmannite-rhodochrosite, rhodochrosite, and oxidized braunite in intercalated shales, jasper, marine basalt flows, and mafic tuff. The host-volcanic rocks differ from normal tholeiite basalt in being relatively rich in potassium, sodium, and titanium. The deposits generally occur in sequences with abundant chert, rather than in sequences dominated by volcanic rocks. The deposits are often associated with volcanogenic Fe deposits, and sometimes contain complexly-oxidized ferromanganese minerals. The depositional environment is presumably related to hot springs associated with marine basaltic magmatism. No relation exists between zones of Mn-minerals and volcanic edifices.

Volcanogenic Fe (Shekhorkina, 1976)

This deposit type consists of sheeted magnetite, and rarely magnetite-hematite or magnetite-hydroxide that occur in interlayered dark-gray jasper, shale, sandstone, and sedimentary breccia that contain subordinate subalkaline mafic extrusive rocks.. Associated minerals are pyrite, pyrrhotite, chalcopyrite, arsenopyrite, and other sulfide minerals. Quartz is the dominant gangue mineral, along with Fe-rich chlorite, calcite, and gypsum. The depositional environment is presumably related to hot springs associated with marine mafic volcanism.

Deposits Related to Subaerial Extrusive Rocks

Au-Ag epithermal vein (D.L. Mosier and others in Cox and Singer, 1986; Sillitoe, 1993a)

This deposit type consists of quartz-adularia, and quartz-adularia-carbonate veins with a wide variety of minerals, including Au- and Ag-sulfosalts, pyrite, chalcopyrite, argentite, galena, sphalerite, cinnabar, and stibnite. Associated minerals include electrum, chalcopyrite, Cu- and Ag-sulfosalts, with lesser tellurides, bornite, barite, and fluorite. Alteration minerals include quartz, kaolinite, montmorillonite, illite, and zeolites. One class of epithermal vein deposits, such as those at Creede, Colorado and Dukat, Russian Northeast, has high concentrations of Pb, Zn, and Ag, sometimes high Cu and low Au; another class, such as those at Sado, Japan, has high Au, moderate to low Ag, sometimes high Cu, and generally low Pb and Zn concentrations. For both groups, the host volcanic rock composition ranges from subalkalic andesite to rhyolite. Some deposits are observed or inferred to overlie subvolcanic Cu-Au, Cu-Mo, or Sn magmatic-rock-related deposits. Deposits may be overlain by barren, acid-leached zones, or silicified horizons. The depositional environment is intermediate to felsic volcanic arcs and centers developed over miogeosynclinal rocks (Creede-type) or older volcanic and plutonic rocks (Sado-type).

Volcanic-hosted Hg (Plamennoe type) (Kuznetsov, 1974; Babkin, 1975)

This deposit type consists of massive to disseminated, veinlet-disseminated and brecciated cinnabar occurring either in: (1) in bed-like, lens-like and irregular bodies mostly in felsic and to a lesser extent, in intermediate and mafic volcanic horizons; or (2) at the contacts of subvolcanic intrusive and volcanic rocks. In addition to cinnabar, the deposit minerals commonly include stibnite, pyrite, and marcasite, with subordinate or rare arsenopyrite, hematite, Pb-, Zn-, and Cu-sulfides, and tetrahedrite, schwatzite, Ag-sulfosalts, gold, realgar, and native mercury. The gangue minerals are mainly quartz, chalcedony, sericite, hydromica, kaolinite, dickite, alunite, carbonate, chlorite, and solid bitumen. Cinnabar and associated minerals commonly occur in multiple layers. Wallrocks may be propylitically altered to quartz, sericite, kaolinite, and epidote. Native mercury is deposited mainly during intense alteration, and, to a lesser extent, by filling of open fissures and voids. This deposit type may be a variety of the epithermal quartz-alunite Au deposit type of Berger (1986). The depositional environment is generally the tectonic boundaries of major volcanic depressions and calderas.

Hot spring Hg (J.J. Rytuba in Cox and Singer, 1986)

This deposit type consists of cinnabar, antimony, pyrite, and minor marcasite and native mercury in veins and in disseminations in graywacke, shale, andesite and basalt flows, andesite tuff and tuff breccia, and diabase dikes. Various alteration minerals such as kaolinite, alunite, Fe oxides, and native sulfur occur above the paleo-groundwater table; pyrite, zeolites, potassium feldspar, chlorite, and quartz occur below the paleo-groundwater table. The tectonic setting is continental-margin rifting associated with small-volume mafic to intermediate volcanism. The depositional environment is fault and fracture systems near paleo ground-water table in areas of former hot springs.

Silica-carbonate Hg (Kuznetsov, 1974; Voevodin and others 1979; J.J. Rytuba in Cox and Singer 1986)

This deposit type consists of cinnabar and associated minerals at the contact between serpentinite and graywacke. The Russian equivalent for this deposit type is listwandite. The deposit minerals are mainly common Hg-minerals, including cinnabar, and native mercury, along with stibnite, pyrite, realgar, orpiment, native arsenic, sometimes Ni-and Co-minerals, and sometimes W-minerals, including tungstenite, scheelite, and wolframite. Gangue minerals are mainly dolomite, breunnerite and ankerite in association with quartz, opal, chalcedony, calcite, dickite, and talc. Massive, veinlet, and disseminated minerals commonly occur in irregular lens-like bodies and veins in crush belts and mylonite zones, and in adjacent sedimentary rocks. Cinnabar mineralization is closely associated with silica-carbonate and argillic alteration. The depositional environment consists of zones of normal faults, perhaps superposed on older thrusts, that contain lenses of serpentinite, ultramafic rocks, and graywacke.

Volcanic-hosted Sb (Au, Ag, As) vein (Berger, 1978)

This deposit type consists of veins, stockwork, and irregular mineralized zones that occur in felsic to intermediate volcanic sequences, intercalated volcaniclastic sedimentary rocks, flows, hypabyssal dikes and sills, and shallow parts of fractured granitic intrusions. The principal deposit mineral is stibnite with accessory arsenopyrite, pyrite, marcasite, berthierite, chalcopyrite, sphalerite, galena, native silver, native gold, native arsenic, cinnabar, realgar, orpiment, jamesonite, tetrahedrite-tennantite, Ag-sulfosalts, carbonate minerals, barite, fluorite, sericite, adularia, and clay minerals. Gangue minerals are mainly chalcedony, quartz and opal. Argillic hydrothermal alteration is common; other alterations may include carbonate minerals, pyrite, and zeolites. Associated volcanic rocks are generally of highly differentiated calc-alkalic composition. Mineralization commonly occurs on the flanks of subaerial volcanoes. Deposit type often occurs at the periphery of volcanic structures that host associated gold-silver, disseminated gold-sulfide, and mercury deposits. The depositional environment is subaerial, calc-alkaline volcanic flows and shallow intrusions.

Rhyolite-hosted Sn (B.L Reed and others in Cox and Singer, 1986)

This deposit type consists of cassiterite and wood tin that occur in discontinuous veinlets and stockworks, and in disseminations in rhyolite-flow dome complexes. Accessory minerals include topaz, fluorite, bixbyite, pseudobrookite, and beryl. Besides cassiterite and wood tin, the deposit minerals also include hematite, cristobalite, fluorite, tridymite, opal, chalcedony, adularia and zeolites. The associated wall-rock alteration minerals are generally cristobalite, fluorite, smectite, kaolinite and alunite. The host rhyolites commonly contain more than 75 percent silica and are enriched with potassium. Mineralization is controlled by fractured and brecciated zones occurring in the most permeable upper portions of flow-dome complexes. The depositional environment is regions of felsic volcanism erupted onto continental crust.

Sulfur-sulfide (S, FeS_2) (Vlasov, 1976)

This deposit type consists of three subtypes: (1) surficial sulfur deposited from gases and solutions; (2) lacustrine deposits formed in volcanic craters; and (3) most valuable economically, replacement deposits formed as metasomatic sheets and as irregular bodies in porous and fractured rocks. All three subtypes are genetically and spatially associated with andesite. The deposit minerals are generally diverse and consist mainly of sulfur and pyrite with lesser variable realgar, orpiment, metacinnabar, stibnite, sphalerite, and molybdenite. Sulfide content increases with the depth grading into massive sulfides. Host rocks are generally hydrothermally altered.

Stratiform Deposits in Fine-Grained Clastic and Siliceous Sedimentary Rocks

Sedimentary exhalative (SEDEX) Zn-Pb-Ag (J.A. Briskey in Cox and Singer, 1986; Goodfellow and others, 1993)

This deposit type consists of stratiform, massive to disseminated sulfides and barite occurring in sheet-like or lens-like tabular bodies that are interbedded with euxinic marine sedimentary rocks including dark shale, siltstone, chert, and sandstone. Many deposits form in half-graben basins, are asymmetrical zoned, and range in form from mound-shaped vent complexes to flanking, interbedded hydrothermal, biogenic, and epiclastic sedimentary accumulations. Generally occur in basinal sediments that cap thick, continental syn-rift sequences of coarse-grained clastic rocks. Sometimes close temporal and in many cases, spatial association with alkaline and tholeiitic basaltic rocks, dikes, and sills that indicate associated hydrothermal activity is related to high-level magmas. The deposit minerals include pyrite, pyrrhotite, sphalerite, galena, and barite, and rare celesite and chalcopyrite. Extensive hydrothermal alteration may occur near vents, including stockwork and disseminated sulfides, silica, albite, and chlorite. The depositional environment consists of marine epicratonal embayments and intracratonic basins with smaller local restricted basins.

Bedded barite (G.J. Orris in Cox and Singer, 1986)

This deposit type consists of stratiform, massive, and nodular barite interbedded with marine cherty and calcareous sedimentary rocks, mainly dark chert, shale, mudstone, and dolomite. The deposit type is often associated with sedimentary exhalative Zn-Pb or kuroko massive sulfide deposits (both described above). Alteration consists of secondary barite veining and local, weak to moderate sericite replacement. Associated minerals include minor witherite, pyrite, galena, and sphalerite. Also associated are phosphate nodules. The depositional environment consists of epicratonal marine basins or embayments, often with smaller local restricted basins.

Stratabound deposits in Coarse Clastic sedimentary Rocks and Subaerial Basalts

Sediment-hosted Cu (Kupferschiefer and Redbed) (Bogdanov and others, 1973; Eckstrand, 1984; D.P. Cox in Cox and Singer, 1986)

This deposit type consists of disseminated to less prevalent veinlet sulfide ores that occur in lens-like and layered bodies in red clastic sedimentary rocks, including shale, siltstone, and sandstone, that are often intercalated with basalts. The main deposit minerals are bornite, chalcocite, hematite, with rare chalcopyrite as large crystals, metasomatic veinlets, and clastic grains. Wall-rock alteration consists of disappearance of red color of host rocks, and occurrence of quartz-carbonate-sulfide veinlets. The latter are sometimes abundantly associated with low-grade contact or greenschist facies regional metamorphism. Weathering results in development of green sinter and malachite and azurite crusts. The depositional environment is epicontinental, shallow marine basins that occur on passive continental margin shelfs, or adjacent to volcanic island arcs. This deposit type is commonly associated with Cu-bearing. island arc trachybasalts (shoshonites) formed at or near rift zones.

Basaltic Cu (Dzhalkan type) (Eckstrand, 1984; Kutyrev, 1984; D.P. Cox in Cox and Singer, 1986)

This deposit type consists of stratabound disseminated Cu minerals in basalt lavas erupted into shallow coastal marine basins, and more seldomly onto the subaerial parts of oceanic volcanic islands. The volcanic rocks are generally interbedded with red sandstone, conglomerate and siltstone. The basalts lavas are generally potassic or alkalic and may include shoshonites and trachybasalts. Major deposit minerals are bornite, chalcopyrite, chalcocite, pyrite and native copper. These minerals occur both in the matrix of, and as amygdules in the porous roofs of basalt flows, and in veinlets within the basalts. The wallrocks are altered mainly to epidote, calcite, chlorite and zeolites. The deposit type is often associated with sediment-hosted Cu deposit type (Kupferschiefer and Redbed, described above). The depositional environment is epicontinental, shallow marine basins that occur on passive or rifted continental margin shelfs, or adjacent to oceanic volcanic islands. The depositional environment includes porous roof of basalt flows and synvolcanic fissures.

Clastic sediment-hosted Hg (Nikitovka type) (Kuznetsov, 1974; Babkin, 1975)

This deposit type consists of cinnabar and associated minerals that occur in lenses, stockworks, and other structures in flysch sequences composed of siltstone, shale, and conglomerate. Ore bodies include stockworks, lenses, bed-like and irregular bodies, and simple and complex veins in fault zones. Mineralization is controlled by sets of fractures, and by feathering major faults in anticlinal structures and dome-like uplifts. The deposit type usually contains several ore horizons. Deposit minerals are mainly cinnabar with subordinate stibnite, realgar, orpiment, various other sulfide minerals and sulfosalts, and native arsenic and native mercury. Gangue minerals are mainly quartz, chalcedony quartz, carbonate minerals, and dickite. Wall rocks may be altered to quartz, argillite, and carbonate minerals. Associated igneous rocks are mainly felsic and intermediate dikes. Mineralization is interpreted to have formed from low-temperature hydrothermal fluids that were related to either deep magmatic chambers or to low-grade regional metamorphism. In many parts of Russia, clastic sediment-hosted Hg deposits commonly occur in rift environments in cratonal areas. However, in the Russian Far East, this model is also applied to Hg deposits that occur in clastic sedimentary rocks that are part of volcanic arc sequences.

Sandstone-hosted U (C.E. Turner-Peterson and C.A. Hodges in Cox and Singer, 1986)

This deposit type consists of concentrations of uranium oxides and related minerals in localized, reduced environments in medium- to coarse-grained feldspathic or tuffaceous sandstone, arkose, mudstone, and conglomerate. The depositional environment is continental basin margins, fluvial channels, fluvial fans, or stable coastal plain, sometimes with nearby felsic plutons or felsic volcanic rocks. The deposit minerals include pitchblende, coffinite, carnotite, and pyrite.

Deposits in Carbonate and Chemical-Sedimentary Rocks

Kipushi Cu-Pb-Zn (D.P. Cox and L.R.. Bernstein in Cox and Singer, 1986)

This deposit type consists of stratabound, massive sulfides hosted mainly in dolomitic breccia. Generally no rocks of unequivocal igneous origin are related to the deposit. The deposit minerals include pyrite, bornite, chalcocite, chalcopyrite, carrollite, sphalerite, and tennantite with minor reinerite and germanite. Local alteration to dolomite, siderite, and silica may occur. The depositional environment consists mainly of high fluid flow along faults or karst(?)-breccia zones.

Southeast Missouri Pb-Zn (J.A. Briskey in Cox and Singer, 1986; Leach and Sangster, 1993)

This deposit type consists of stratabound, carbonate-hosted deposits of Pb-, Zn-, and Cu-sulfide minerals in rocks having primary and secondary porosity, commonly related to reefs on paleotopographic highs. This deposit type is also referred to as the Mississippi Valley type. The deposits are hosted mainly in dolomite, but are locally hosted in sandstone, conglomerate, and calcareous shale. The deposit minerals are mainly galena, sphalerite, chalcopyrite, pyrite, and marcasite, with minor siegenite, bornite, tennantite, barite, bravoite, digenite, covellite, arsenopyrite and other associated sulfide minerals. Alteration consists of regional dolomitization, extensive carbonate dissolution, and development of residual shale. The deposit minerals occur at interfaces between gray and tan dolomite, and also in traps at interfaces between permeable and impermeable units. Deposits do not normally display internal mineralogical or chemical zoning. The deposits commonly occur at the margins of clastic basins, generally in undeformed orogenic foreland carbonate platforms. Some occur in carbonate sequences in foreland thrust belts bordering foredeeps. Fewer are associated with rift zones. The depositional environment is areas of shallow-water marine carbonates, with prominent facies control by reefs growing on the flanks of paleotopographic basement highs.

Korean Pb-Zn massive sulfide (V.V. Ratkin, this study)

This deposit type consists of Pb- and Zn-sulfide minerals in carbonate rocks. The host rocks are mainly limestone, dolomite, and lesser marl. The deposit minerals are mainly pyrite, galena, sphalerite, fluorite, and magnetite. The deposit minerals occur mainly as lenses and beds conformable to bedding in host rocks. Magnetite also forms layers that are interbedded with sulfide minerals, fluorite, and carbonate minerals. Little to no hydrothermal alteration occurs; mainly diagenetic alteration occurs in carbonates and associated rocks. The deposit type is intermediate between the sedimentary exhalative Pb-Zn and Southeast Missouri Pb-Zn deposit types. Examples in the Russian Southeast are the Voznesenskoe and Chernyshevskoe mines. The depositional environment is typically Late Proterozoic to Early Paleozoic carbonate-rich sedimentary rocks in basins that overlap folded metamorphic complexes of the Sino-Korean shield.

Ironstone (Superior Fe) (Kosygin and Kulish, 1984;

R.A. Eremin and V.I. Shpikerman, this study; W.F. Cannon in Cox and Singer, 1986)

Chemical-sedimentary subtype (Kosygin and Kulish, 1984). This subtype consists of sheet-like horizons of magnetite and hematite-magnetite in clastic carbonate rocks that are associated with chert, quartz-sericite-chlorite schist, and dolomite. The deposits occur in early Paleozoic sedimentary rocks formed in basins overlying Precambrian granitic and metamorphic complexes. This subtype is a Paleozoic analog of itabirites.

Prikolyma subtype (R.A. Eremin and V.I. Shpikerman, this study). This subtype consists of Fe and Ti minerals that occur in bed-like and lens-like bodies in sandstone grit and conglomerate. The deposit minerals are mainly clastic hematite, magnetite, ilmenite, and zircon grains that form concentrations that range up to 50 to 60 percent of the hosting clastic quartz, and feldspar-quartz sandstone beds. Bedded clastic rocks exhibit parallel-, cross-, and wavy-bedding. Ferruginous sandstones are sometimes interlayered with carbonate rocks, which sometimes form rich iron deposits. Conformable and crossing bodies of massive and brecciated hematite ores also occur in regional metamorphosed carbonate rocks. The deposit type is interpreted as ancient lithified sea beach placers that are often highly metamorphosed and deformed.

Stratabound W (Austrian Alps-type) (Denisenko and others, 1986; Rundquist and Denisenko, 1986; V.I. Shpikerman, this study)

This deposit type consists of stratabound, thin veinlet, and disseminated scheelite ores that occur in bedded carbonaceous calcareous siltstone and argillite, commonly metamorphosed to phyllite and greenschist. Igneous rocks are generally lacking, except for scarce metamorphosed basalt sills. The deposit minerals are mainly scheelite, pyrite, with lesser realgar, galena and chalcopyrite. The deposit minerals are concentrated in carbonaceous calcareous siltstone beds surrounded by shale or mudstone beds. The deposit minerals may also occur along minor crossing faults, and in associated calcite and quartz veinlets. W is geochemically associated with Sb, Hg, and As. The deposit type is interpreted as forming during metamorphism of carbonaceous sedimentary rocks initially enriched with W.

Carbonate-hosted Hg (Khaidarkan type) (Babkin, 1975; Fedorchuk, 1983)

This deposit type consists mainly of cinnabar in veinlets and in disseminations that occur in stratabound bodies in dolomite breccia and to a lesser extent in limestone breccia. The host rocks are reef and shelf limestones that formed in carbonate reefs and shelf areas of passive continental margins. The host rocks are subsequently altered to dolomite and brecciated during diagenesis and karst-formation. Mineralization is confined to deep fault zones and is localized under impermeable clay layers. Magmatic rocks are rare diabase sills. The deposit minerals are cinnabar and lesser pyrite, sphalerite, stibnite, and anthraxolite, and rare galena and fluorite. Wall-rock alteration consists of jasperoid, and quartz and calcite veinlets. The depositional environment is artesian thermal water with possible deep sources of Hg.

Stratiform Zr (Algama Type) (Zalishchak and others, 1991; Bagdasarov and others, 1990; Nekrasov and Korzhinskaya, 1991)

This deposit type consists of hydrozircon and baddeleyite in lenses and veins that occur mainly in a layer of cavernous dolomite marble that ranges up to about 40 m thick. The ore occurs as breccia composed of fragments of metamorphic quartz and dolomite cemented by an aggregate of hydrozircon and baddeleyite. Baddeleyite also occurs as loose aggregates formed by weathering of primary ore. Some caverns in the dolomite contain colloform, sinter-type aggregates of hydrozircon and baddeleyite, but breccia ores predominate. The cavern walls are coated with metamorphic quartz. The host dolomite is not hydrothermally altered. The one large deposit of this type occurs in the northern part of the Khabarovsk province and is hosted mainly in subhorizontal dolomite marble that, along with other miogeoclinal sedimentary rocks, form the Late Proterozoic and Early Paleozoic sedimentary cover of the Stanovoy block of the North Asian Craton. The origin of the deposit is speculative. According B. Zalischak (written commun., 1992) the deposit formed by discharge of hydrothermal solution along a layer of porous dolomite. A sudden pressure fall resulted in a blast. An U-Pb isotopic age of about 100 Ma was obtain for hydrozircon (J.N. Aleinikoff, written commun., 1993).

Sedimentary phosphorite (Shkolnik, 1973)

This deposit type consists of breccia composed of phosphorite, quartz, dolomite, and calcite that are closely associated with calcareous marine reef complexes. The reef complexes occur in sequences of jasper, shale, siltstone, and mafic volcanic rocks. Phosphorite breccias formed along the reef shelf and consist of fragments of primary phosphorite, limestone, and dolomite, and rarely jasper, volcanic rocks, chert, and shale. Primary phosphorite is rare and occurs as lenses of a coquina composed of inarticulate brachiopods and partly by trilobites that posses with phosphate-bearing shells. The boundaries of deposits are complex and are defined by the occurrence of phosphorite fragments in breccias. The length of the deposits ranges from a few tens of meters to several kilometers; the thickness ranges from 0.5 to 40 meters. The deposits are generally complex and discontinuous. The deposit type occurs mainly in the Galam terrane in the Russian Southeast and is associated with volcanogenic Mn and Fe deposits. The principal phosphorite deposits in the Galam terrane are the North-Shantary, Ir-Nimiiskoe, Nelkanskoe, and Lagapskoe deposits.

Deposits Related to Calc-Alkaline and Alkaline Granitic Intrusions- Veins and Replacements

Polymetallic veins (D.P. Cox in Cox and Singer, 1986; N.A. Goryachev, this study)

This deposit type consists of quartz-carbonate veins often with Ag-bearing minerals, gold, and associated base-metal sulfides. The veins are related to hypabyssal intrusions in sedimentary and metamorphic terranes, or to metamorphic fluids forming during waning regional metamorphism. The associated intrusions range in composition from calcalkaline to alkaline and occur in dike swarms, hypabyssal intrusions, small to moderate size intermediate to granitic plutons, locally associated with andesite to rhyolite flows. The deposit minerals include pyrite, and sphalerite, sometimes with chalcopyrite, galena, arsenopyrite, tetrahedrite, Ag sulfosalts, native gold, electrum, and argentite. Alteration consists of wide propylitic zones, and narrow sericite and argillite zones. The depositional environment is near-surface fractures and breccias within thermal aureoles of small to moderate-size intrusions, including within the intrusions.

In the Russian Northeast, polymetallic veins are divided into: (1) Au-polymetallic veins that contain gold and Pb-Zn-Cu sulfide minerals and arsenopyrite; (2) polymetallic veins with varying amounts of cassiterite and (or) stannite with abundant Fe, Pb, Zn, and Cu sulfide minerals; and (3) Ag-polymetallic veins enriched with galena, and Ag and Pb sulfosalts. In this region, polymetallic veins occur: (1) mainly in flysch or olistostromes in Mesozoic accretionary wedges; or (2) sometimes in postaccretionary volcanic rocks. Polymetallic veins are analogs of skarn deposits and occur where noncalcareous clastic rocks dominate instead of carbonate rocks.

Sb-Au veins (simple Sb deposits) (J.D. Bliss and G.A. Orris in Cox and Singer, 1986; Nokleberg and others, 1987)

This deposit type consists of massive to disseminated stibnite and lesser gold in quartz-carbonate veins, pods, and stockworks that occur in or adjacent to brecciated or sheared fault zones, in sedimentary, volcanic and metamorphic rocks, adjacent to granitic plutons, in contact aureoles around granitic plutons, and peripheries of granodiorite, granite, and monzonite plutons. Some Sb-Au vein deposits grade into polymetallic vein deposits. Associated minerals are mainly arsenopyrite, chalcopyrite, and tetrahedrite, and sometimes cinnabar, galena, and sulfosalts. Alteration minerals are mainly quartz, sericite, and clay minerals. Associated granitic plutons are often strongly peraluminous. The depositional environment is faults and shear zones, epizonal fractures adjacent to or within the margins of epizonal granitic plutons.

Sn quartz veins (Rudny Gory or Replacement Sn) (Kosygin and Kulish, 1984; W.D. Sinclair and R.V. Kirkham in Eckstrand, 1984; B.L. Reed in Cox and Singer, 1986; Lugov, 1986)

This deposit type consists of simple and complex infilling and replacement veins, vein systems, and stockworks that occur in the apices of collisional mesozonal and hypabyssal granitoid plutons, and above granitic domes. The host rocks are commonly metamorphosed shale, sandstone, and sometimes carbonate rocks. This deposit type is commonly associated with multiple intrusions of biotite, two-mica, alkalic, alaskite granites. Granite, pegmatite and aplite dikes are common. Volatiles are dominated by fluorine, and boron content of granites is low. The deposits tend to occur within or above the apices of granitic cusps and ridges. The deposit minerals are cassiterite, wolframite, albite, muscovite, topaz, fluorite, arsenopyrite and löllingite. Less common are potassium feldspar, tourmaline, beryl, scheelite, molybdenite, Ta-Ni-minerals, Bi-minerals, pyrrhotite, sphalerite, galena, and chalcopyrite. Complex Sn-W ores are dominate. Quartz is the dominant gangue mineral. The dominant wall rock alteration is formation of greisen. The deposit type is associated with Sn-greisen and Sn-skarn, wolframite-quartz veins, and U and F deposits.

Sn silicate-sulfide veins (Cornish type) (Kosygin and Kulish, 1984; W.D. Sinclair and R.V. Kirkham in Eckstrand, 1984; Lugov, 1986; B.L. Reed in Cox and Singer, 1986)

This deposit type consists of fissure veins, mineralized zones, stockworks, and pipe-like bodies related to multiple granitoid plutons, and to isolated small intrusions of gabbro-diorite, quartz diorite, and potassic alaskite granites. Late-stage tourmaline-bearing granites and pegmatites also occur. The deposit type commonly occurs in late orogenic to post-orogenic settings. Sn mineralization is commonly fault-controlled, and occurs near and above intrusive rocks. The deposit minerals are mainly tourmaline, chlorite, and quartz, with lesser cassiterite, pyrrhotite, pyrite, chalcopyrite, galena, sphalerite, arsenopyrite, wolframite, scheelite, bismuthinite, axinite, fluorite, muscovite, sericite, stannite, sulfostannates, Pb-, Sb-, Cu- and Ag-sulfosalts, gold, silver, stibnite, calcite, and clay minerals. Alteration minerals are tourmaline, muscovite, quartz, and chlorite. The deposit type includes tourmaline and chlorite subtypes. The upper and lower portions of ore vein systems are dominated by sulfides, and silicates and quartz, respectively.

Sn polymetallic veins (Southern Bolivian type) (Lugov, 1986; Yukio Togashi in Cox and Singer, 1986)

This deposit type consists of cassiterite and associated minerals in veins, stockworks, mineralized zones and breccia pipes. The deposits are controlled by sets of regional faults and fractures in subvolcanic and volcanic structures. Associated igneous rocks are hypabyssal and subvolcanic diorite, granodiorite, and hypabyssal-andesite intrusions, and felsic, intermediate, and mafic dikes. The deposit minerals are cassiterite, pyrrhotite, pyrite, stannite, sphalerite, galena, chalcopyrite, wolframite, tetrahedrite, tennantite, Bi-minerals, sulfostannates, arsenopyrite, Pb-, Au-, and Sb- sulfosalts, with subordinate quartz, Mn-Fe carbonate minerals, sericite, and kaolinite. Tourmaline and chlorite may also occur. This deposit type may also include Sn-Ag deposits containing freibergite, pyrargyrite, polybasite, andorite, stephanite, argentite, argyrodite, canfieldite and others. The principal wall-rock alterations are sericite, chlorite, quartz, kaolinite, and alunite. The deposit type is associated with Sn-silicate-sulfide and Ag polymetallic vein, rhyolite-hosted Sn, porphyry Sn, and Au-Ag epithermal vein deposits. The depositional environment is fissures in and around felsic, continental marginal volcanic arcs. Mineralization occurs in volcanic rocks above intrusions, but may be far-removed from granitic rocks.

Co-arsenide polymetallic veins (Borisenko and others, 1984; (R.A. Eremin and V.I. Shpikerman, this study)

This deposit type consists of quartz-tourmaline and quartz-chlorite veins containing Co, As, Bi, and Ag and Au minerals. The veins are associated with hypabyssal intrusions varying from diorite to granite, and widespread albitized granite-porphyry dikes. Mineralization occurs in: (1) fractures and in brecciated zones in siltstone, shale, and sandstone; (2) contact metamorphic aureoles around intrusions or, more seldom, in intrusions; and (3) sometimes greisen and skarn. The deposits are often confined to cross-faults. The deposit minerals are arsenopyrite, pyrite, pyrrhotite, löllingite, cobaltite, skutterudite, smaltite, glaucodot, chloantite, bismuthinite, and Au-, Ag-, Pb-, and Bi-tellurides and selenides. Vein gangue minerals are quartz, chlorite, tourmaline, calcite, fluorite, and adularia.

Carbonatite-related Ta, Nb, REE stockwork and vein (Smirnov, 1982; Dawson and Curie, 1984)

This deposit type consists of stockworks, metasomatic veins, and lenses with various Ta-Nb and REE minerals. The ore minerals include pyrochlore, betafite, bastnasite, parisite, monazite, columbite, chevkinite, yttrialite, melanocerite, yttrotitanite, hydrothorite, and zircon. Ore mineralization is often associated with alkaline metasomatic rocks (fenite) that alter alkaline granite and syenite. The stockworks, vein, and lenses are associated with alkaline igneous complexes that presumably include carbonatite at depth. The igneous complexes include large zoned batholiths, zoned stocks, alkalic dikes series, and carbonate veins. The zoned batholiths and stocks generally contain two or more of the following lithologies: pyroxenite, gabbro, urtites, ijolite, foyaite, nephelinite, alkaline syenite, granite, and various carbonatites. Zonation commonly consists of carbonatites in the center, medial zones of ultramafic rocks, and peripheral zones of ijolite and nepheline syenite. Locally the zonation sequence may be reversed or more complex. The carbonatites generally consist of various assemblages of augite-diopside-calcite, forsterite-calcite, aegirine-dolomite, aegirine-ankerite, calcite, ankerite, and other minerals. This type of deposit is interpreted as having formed during craton rifting, or within terranes that formed by rifting of cratons.

Deposits Related to Calc-Alkaline and Alkaline

Granitic Intrusions - Skarns and Greisens

Cu (±Fe, Au, Ag, Mo) skarn (contact metasomatic) (D.P. Cox and T.G. Theodore in Cox and Singer, 1986)

This deposit type consists of chalcopyrite, magnetite, and pyrrhotite in calc-silicate skarns that replace carbonate rocks along intrusive contacts with plutons ranging in composition from quartz diorite to granite, and from diorite to syenite. Zn-Pb-rich skarns tend to occur farther from the intrusion; Cu- and Au-rich skarns tend to occur closer to the intrusion. Associated minerals are pyrite, hematite, galena, molybdenite, sphalerite, and scheelite. Mineralization is multistage, with several stages of mineral deposition. The deposit type is commonly associated with porphyry Cu-Mo deposits. The depositional environment is mainly calcareous sedimentary sequences intruded by felsic to intermediate granitic plutons.

Zn-Pb (±Ag, Cu, W) skarn (contact metasomatic) and associated Manto replacement deposits (D.P. Cox in Cox and Singer, 1986)

This deposit type consists of sphalerite and galena in calc-silicate skarns that replace carbonate rocks along intrusive contacts with plutons varying in composition from quartz diorite to granite, and from diorite to syenite. Zn-Pb-rich skarns tend to occur farther from the intrusion relative to Cu- and Au-rich skarns. Associated minerals are pyrite, chalcopyrite, hematite, magnetite, bornite, arsenopyrite, and pyrrhotite. Metasomatic replacements consist of a wide variety of calc-silicate and related minerals. In the Russian Far East, the deposit type generally occurs at a considerable distance from source granitic intrusions, at the contacts of limestones with siltstones and felsic volcanic rocks. Ore bodies are rather narrow, but may extend down dip to 1 km. The deposits are controlled by ring faults around volcanic-tectonic depressions. The depositional environment is mainly calcareous sedimentary sequences intruded by felsic to intermediate granitic plutons.

Au, Co, and As skarn (Nekrasov and Gamyanin, 1962; Bakharev and others, 1988; N.A. Goryachev, this study)

This deposit type forms along the contacts between siltstone and marble beds during contact metamorphism near intrusions of granodiorite and granite. The skarn is typically composed of pyroxene, grossularite-andradite garnet, and lesser axinite and scapolite. The ore bodies consist of small masses of sulfoarsenides and arsenides along with gersdorffite, arsenopyrite, lollingite, and cobaltite. Native gold occurs in association with bismuth and Te-minerals, including native bismuth, joseites, hedlyite, and bismuthine. Gold grade ranges up to 20 g/t; size is usually less than 0.1 mm, and fineness ranges from 640 to 999.

W skarn and greisen (adapted from D.P. Cox in Cox and Singer, 1986)

This deposit type consists of scheelite in calc-silicate skarns that replace carbonate rocks along or near intrusive contacts of quartz diorite to granite plutons. Associated minerals are molybdenite, pyrrhotite, sphalerite, chalcopyrite, bornite, pyrite, and magnetite. Metasomatic replacements consist of a wide variety of calc-silicate and related minerals. In the Russian Far East, scheelite typically occurs in quartz-topaz and quartz-mica greisen that formed during replacement of older skarns. The depositional environment is along contacts and in roof pendants in batholiths, and in contact metamorphic aureoles of stocks that intrude carbonate rocks.

Fe (±Au, Cu, W, Sn) skarn (D.P. Cox in Cox and Singer, 1986)

This deposit type consists of magnetite and (or) Fe sulfides in calc-silicate skarn that replace carbonate rocks or calcareous clastic rocks along intrusive contacts with diorite, granodiorite, granite, and coeval volcanic rocks. The chief associated mineral is chalcopyrite. Metasomatic replacements consist of a wide variety of calc-silicate and related minerals. The depositional environment is calcareous sedimentary sequences intruded by granitic or siliceous volcanic stocks.

Sn greisen and skarn (B.L. Reed in Cox and Singer, 1986)

These two deposit types commonly occur in the same area, and may grade into one another. The Sn greisen deposit type consists of disseminated cassiterite, cassiterite-bearing veinlets, and Sn sulfosalts in stockworks, lenses, pipes, and breccia in granite altered to greisen, mainly biotite and (or) muscovite leucogranite emplaced in a mesozonal to deep volcanic environment. Sn greisens are generally postmagmatic and are associated with late-stage, fractionated granitic magmas. Associated minerals include molybdenite, arsenopyrite, beryl, scheelite, and wolframite. Alteration minerals consist of incipient to massive replacement by quartz, muscovite, tourmaline, and fluorite.

The Sn skarn deposit type consists of Sn, W, and Be minerals in skarns, veins, stockworks, and greisen near intrusive contacts between generally epizonal(?) granitic plutons and limestone. The deposit minerals include cassiterite, sometimes with scheelite, sphalerite, chalcopyrite, pyrrhotite, magnetite, and fluorite. Alteration consists of greisen near granite margins, and metasomatic andradite, idocrase, amphibole, chlorite, chrysoberyl, and mica in skarn.

Sn-B (Fe) Skarn (Ludwigtite type) (Lisitsin, 1984; V.I. Shpikerman, this study)

This deposit consists of metasomatic replacement of dolomite by mainly ludwigite and magnetite adjacent to granitic plutons thereby forming Sn-B (Fe) magnesium skarn deposits. Ludwigite forms up to 70 to 80 percent of some ore bodies, and Sn occurs as an isomorphic admixture in ludwigite. Other minerals in the magnesian skarns include magnetite, suanit (Mg_2B_4O), ascharite, kotoite, datolite, harkerite, monticellite, fluroborite, clinohumite, calcite, periclase, forsterite, diopside, vesuvianite, brucite, garnet, axinite, phlogopite, serpentine, spinel, and talc. Interlayered limestone is metasomatically replaced by pyroxene-garnet-calcite skarn that is commonly altered to greisen thereby forming Sn skarn composed of cassiterite, scheelite, pyrrhotite, arsenopyrite, sphalerite, chalcopyrite, and löllingite. The magnesium and associated calcic skarn ore bodies generally form near highly irregular (convoluted) contacts of granite plutons, and in large xenoliths of carbonate rocks. Most granitic rocks associated with these deposits are interpreted as having formed in collision environments.

Boron skarn (datolite type) (Nosenko and others, 1990; Ratkin, and others, 1992; Ratkin and Watson, 1993)

This deposit type consists of a boron skarn composed of danburite and datolite that is associated with garnet-hedenbergite-wollastonite skarn. The boron-bearing skarn is interpreted as having formed during successive metasomatic replacement of limestone with silicates (wollastonite, grossularite-andradite, and hedenbergite) and subsequently by borosilicates (danburite, datolite, and axinite), quartz, and calcite. The deposit is characterized by thin-banded wollastonite that forms kidney-shaped aggregates of pyroxene and datolite that formed the walls of paleohydrothermal cavities in limestone. The hydrothermal cavities occur to depths of up to 500 m from the paleosurface, above a zone of a metasomatic wollastonite and grossularite. The central part of these cavities (0.5 to 50.0 m across) was filled with danburite druses. Danburite was decomposed after the second (boron) metasomatic event, and remobilized boron was redeposited at higher paleogypsometric levels as datolite associated with garnet-hedenbergite skarn. The origin of neighboring Pb-Zn deposits is related to these late skarns. Boron isotopic data indicate the source for boron solutions was a deep-seated granitoid intrusion. The formation of early grossular-wollastonite skarns, thin-banded wollastonite aggregates with datolite, and danburite accumulations occurred, by geological data, at depths, simultaneous to the formation of postaccretion ignimbrite sequence, overlying the accretionary wedge. The geologic setting for the deposit is large tectonic lens of limestone, with lateral dimensions of 0.5 by 2.0 km, in an accretionary wedge containing a highly-deformed matrix of siltstone and sandstone matrix. The accretionary wedge is overlain by felsic volcanic rocks. The one example of this deposit is the large Dalnegorsk B mine in the Russia Southeast that constitutes the main source of boron in Russia.

Fluorite greisen (Govorov, 1977)

The deposit type consists of fine-grained, dark-violet rock composed of fluorite (63 to 66%) and micaceous minerals, mainly muscovite (25 to 35%), along with lesser ephesite and phlogopite. Subordinate minerals are (in decreasing order) tourmaline, sellaite, cassiterite, topaz, sulfides, and quartz. The ore bodies occur as veins and concordant to limestone layers as lenticular and flame-shape bodies, consist of apocarbonate greisens. The deposit type occur in limestone intruded by lithium-fluorine S-type granites. Metasomatic rocks, replacing limestone, occur at and above the contact with granitic intrusions. Pegmatoid-type muscovite-quartz veins with molybdenite-cassiterite-salite, vesuvianite-salite-andradite, and scapolite skarn also occur near intrusive contacts and are interpreted as having formed prior the formation of fluorite-mica greisen. Geologic setting is thick clastic limestone sequences that formed along an active continental margin. Boron isotopic composition of tourmaline indicate a primary evaporite source (V. Ratkin, written commun., 1994) suggesting that deep-seated evaporites in the zone of granitic magma generation were the source of fluorine. Scarce quartz and the absence of paragenetic calcite suggest an extremely high activity of fluorine in silica-poor solutions. The deposit closest to this type in Alaska is at Lost River. The largest deposit of this type in the southern Far East Russia is at Voznesenka that constitutes the largest known Russian fluorspar deposit.

Deposits Related to Calc-Alkaline and Alkaline Granitic Intrusions-

Porphyry and Granitic Plutons-Hosted Deposits

Porphyry Cu-Mo (Au, Ag) (D.P. Cox in Cox and Singer, 1986; Titley, 1993)

This deposit type consists of stockwork veinlets and veins of quartz, chalcopyrite, and molybdenite in or near porphyritic intermediate to felsic intrusions. The veinlets and veins contain mainly quartz and carbonate minerals. The intrusions occur mainly in stocks and breccia pipes that intrude granitic, volcanic, or sedimentary rocks. Associated minerals are pyrite and peripheral sphalerite, galena, and gold. Alteration minerals consist of quartz, K-feldspar, and biotite or chlorite. Most deposits exhibit varying amounts of hypogene alteration, including sodic, potassic, and phyllic alteration. Alteration is systematic, but variable between districts. Supergene alteration is a key factor in the initial discovery of deposits. The host igneous rocks are felsic and calc-alkalic. Widespread, episodic development of abundant joints in intrusions and wall rocks. The depositional environment is high-level intrusive porphyries that are contemporaneous with abundant dikes, faults, and breccia pipes that formed in the evolution of andesite stratovolcanoes. The tectonic environment is mainly weakly to strongly alkalic granitic plutons emplaced in back-arc settings of subduction zones.

Porphyry Mo (±W, Sn, Bi) (T.G. Theodore in Cox and Singer, 1986; Carten and others, 1993)

The porphyry Mo deposit type consists of quartz-molybdenite stockwork veinlets in granitic porphyries and adjacent country rock. The porphyries range in composition from tonalite to granodiorite to monzogranite. Associated minerals are pyrite, scheelite, chalcopyrite, and tetrahedrite. Alteration consists of potassic grading outward to propylitic, sometimes with phyllic and argillic overprints. Deposit type divided into two associations: (1) high-grade, rift-related deposits with fluorine-rich, highly evolved rhyolitic stocks that belong to a high-silica rhyolite-alkalic suite; and (2) low-grade, arc-related deposits accompanied by fluorine-poor, calc-alkalic stocks or plutons that belong to a differentiated monzogranite suite. The high-grade, fluorine-rich deposits are also associated with intraplate alkaline igneous rocks. The depositional environment for porphyry Mo deposits is epizonal levels of a thick continental crust.

Porphyry Sn (B.L. Reed in Cox and Singer, 1986; Evstrakhin, 1988; Menzie and others, 1992; R.A. Eremin, this study)

This deposit type consists of mainly cassiterite and associated minerals in stockworks, veinlets, and disseminations that occur in veins, pipes, and shoots. The deposit minerals are cassiterite, quartz, pyrrhotite, pyrite, arsenopyrite, chalcopyrite, sphalerite, galena, stannite, wolframite, muscovite, chlorite, tourmaline, albite, adularia, siderite, rhodochrosite, calcite, topaz, fluorite, sulfostannates, and Ag and Bi minerals. Mineralization occurs in shallow complex multiphase granitic plutons, granitic porphyry stocks, subvolcanic and volcanic rhyolite breccias, and also in coeval volcanic rocks and surrounding clastic rocks. Associated features are magmatic-hydrothermal breccias, and extensive metasomatic propylitic alteration along with formation of quartz, tourmaline, sulfide minerals, and sericite. Some deposits exhibit a quartz-tourmaline core with a peripheral zone of sericite. The deposit type is often associated with Sn- and Ag-bearing polymetallic veins. Other features of this deposit type are complex ore composition, variable mineral composition, extensive development of stockworks, extensive metasomatic alteration, both veinlet and disseminated. The depositional environment is mainly volcanic-plutonic igneous arcs formed on continental crust. For simplicity, this deposit type also includes Sn deposits that occur in granitic plutonic rocks. This type of granitoid-hosted Sn deposit may eventually be defined as a new mineral deposit type.

Granitoid-related Au (R.I. Thorpe and J.M. Franklin, in Eckstrand, 1984; Sidorov and Rozenblum, 1989; Aksenova, 1990; Gamyanin and Goryachev, 1990, 1991; Sillitoe, 1993b; N.A. Goryachev, this study)

This deposit type consists of two subtypes: (1) porphyry Au; and (2) Au-REE quartz vein. The porphyry Au subtype consists of fissure veins, en-echelon vein systems, and veinlet-stockwork zones with disseminated gold and sulfide minerals that occur generally in complex small granitic intrusions in volcanic-plutonic complexes. The deposit minerals are native gold, Au-bearing tellurides and sulfide minerals, with accessory quartz, tourmaline, muscovite, sericite, chlorite, feldspar, carbonate minerals, and fluorite. Disseminated sulfide minerals in wall rocks, especially arsenopyrite, are commonly enriched in Au and Ag. Alteration to greisen is common with formation of quartz, sericite, tourmaline, chlorite. Plutonic rock composition includes gabbro, diorite, granodiorite, and granite of both calc-alkalic and sub-alkalic compositions. The deposits are associated with composite porphyry stocks of steep, cylindrical form that commonly intrude coeval volcanic piles. Stocks and associated volcanic rocks range in composition from low-potassium calc-alkalic through high-potassium calc-alkalic to potassic alkalic. The deposits may occur as disseminations within granitic plutons, at apices of plutons, or in contact metamorphic aureoles. The deposit type displays systematic mineralogy and chemical environment; and is often associated with polymetallic vein deposits with disseminated Au-bearing sulfide minerals, Au-bearing epithermal vein, and porphyry deposits. Advanced argillic alteration is widespread in shallow parts of deposit. Underlying sericitic alteration is typically minor. In Alaska and the Canadian Cordillera, the depositional environment is tentatively interpreted as subduction-related, epizonal plutons intruded into miogeoclinal sedimentary rocks that in some cases were regionally metamorphosed and deformed before intrusion.

The Au-REE quartz vein subtype, common in the Russian Northeast, consists of quartz veins and stockworks that occur in the apical portions of small granodiorite and granite plutons, and rarely in contact metamorphosed rocks above the plutons. The quartz veins and stockworks are dominated by quartz along with muscovite, tourmaline, and K-feldspar. The main deposit minerals are gold, arsenopyrite and Co-arsenopyrite, lollingite, wolframite, scheelite, pyrrhotite, and niccolite. Native gold is associated with bismuth and Bi-Te-minerals. Au-Ag telluride minerals are scarce. The host rocks exhibit incipient alteration to greisen with occurrence of quartz, white mica, carbonate minerals, and chlorite. The quartz veins and stockworks are often associated with post-contact metamorphic Au-quartz and Sn-W-quartz veins.

Felsic plutonic U-REE (Nokleberg and others, 1987)

This deposit type consists of disseminated uranium minerals, thorium minerals, and REE-minerals in fissure veins and alkalic granite dikes in or along the margins of alkalic and peralkalic granitic plutons, or in granitic plutons, including granite, alkalic granite, granodiorite, syenite, and monzonite. The deposit minerals include allanite, thorite, uraninite, bastnaesite, monazite, uranothorianite, and xenotime, sometimes with galena and fluorite. The depositional environment is mainly the margins of epizonal to mesozonal granitic plutons.

W veins (Kosygin and Kulish, 1984; D.P. Cox and W.C. Bagby in Cox and Singer, 1986)

This deposit type consists mainly of massive and disseminated wolframite and molybdenite in quartz veins. Other deposit minerals are bismuthinite, pyrite, pyrrhotite, arsenopyrite, bornite, chalcopyrite, scheelite, cassiterite, beryl, and fluorite. The veins occur in the upper level, apices of granitic plutons, including alaskite, and in peripheral, contact metamorphosed sandstone and shale. Associated hydrothermal alteration includes formation of greisen, albite, chlorite, and tourmaline. The depositional environment is tensional fractures in epizonal granitoid plutons that intruded, and in some cases formed from anatectic melting of continental crust. The deposit type is sometimes associated with Sn-W vein, Mo-W vein, and Sn greisen deposits.

Deposits Related to Mafic and Ultramafic Rocks

Zoned mafic-ultramafic Cr-PGE (±Cu, Ni, Au, Co, Ti, or Fe) (Alaskan PGE) (N.J Page and Floyd Gray in Cox and Singer, 1986)

This deposit type consists of crosscutting ultramafic to mafic plutons with approximately concentric zoning that contain chromite, native PGE, PGE minerals and alloys, and Ti-V magnetite. The deposit minerals include combinations of chromite, PGE minerals and alloys, pentlandite, pyrrhotite, Ti-V magnetite, bornite, and chalcopyrite. In most areas of Alaska, the depositional environment consists of intermediate-level intrusion of mafic and (or) ultramafic plutons that are interpreted as the deeper-level magmatic roots to island-arc volcanoes.

Zoned ultramafic, mafic, felsic, and alkalic PGE-Cr and apatite-Ti (Marakushev and others, 1990)

This deposit type consists of veinlets, disseminations, and zones of hydrothermal metasomatic alteration in dunites associated with ultramafic to mafic alkalic-potassic intrusions. PGE minerals are associated with, and are intergrown with chromite and olivine. In metasomatic zones, where chromium pyroxene occurs, PGE minerals are intergrown with magnetite, pyroxene, and phlogopite. The major PGE mineral is ferroplatinum with inclusions of iridosmine. Accessory sulfide and arsenide minerals also occur, including cooperite, sperrylite, hollingworthite, konderite, inaglyite, laurite-euclimanite, and others. In associated pyroxene-hornblende gabbro and pyroxenites intrusions, apatite-Ti minerals may also occur, including disseminated apatite, titanomagnetite, ilmenite, and local PGE minerals. Weathered pyroxenites could be a raw material for vermiculite. The depositional environment is the intermediate-level intrusion of mafic and (or) ultramafic plutons that are interpreted as the magmatic roots to island-arc volcanoes.

Anorthosite apatite-Ti-Fe (Kosygin and Kulish, 1984; Force in Cox and Singer, 1986)

This deposit type occurs in anorthosite plutons composed of andesine and andesine-labradorite. The anorthosite plutons are highly-alkalic and are associated with gabbro, ferrodiorite, syenite, alkalic granite, and sometimes mangerite that intrude granulite-facies country rocks. The principal deposit minerals are apatite, titanomagnetite, and ilmenite that occur either as: (1) disseminations near melanocratic gabbro, pyroxenites, and dunites along the margins of the anorthosite plutons; or (2) rich apatite (nelsonite) veins that occur in tectonically weak zones. Associated minerals are lesser ilmenite and magnetite. The depositional environment is intrusion into the lower crust under hot, dry conditions.

Gabbroic Ni-Cu (synorogenic-synvolcanic; irregular gabbro pipes and stocks) (N.J Page in Cox and Singer, 1986)

This deposit type consists of massive lenses, matrix, and disseminated sulfides in small to medium-size composite mafic and ultramafic intrusions in metamorphic belts of metasedimentary and metavolcanic rocks. The deposit minerals include pyrrhotite, pentlandite, and chalcopyrite, sometimes with pyrite, Ti- or Cr-magnetite, and PGE minerals and alloys. Accessory Co-minerals also occur in some deposits. In most areas of Alaska, the depositional environment consists of post-metamorphic and post-deformational, intermediate-level intrusion of norite, gabbro-norite, and ultramafic rocks.

Podiform Cr (J.P. Albers in Cox and Singer, 1986)

This deposit type consists of podlike masses of chromite in the ultramafic parts of ophiolite complexes, locally intensely faulted and dismembered. The host rock types are mainly dunite and harzburgite, commonly serpentinized. The depositional environment consists of magmatic cumulates in elongate magma pockets. Associated minerals are magnetite and PGE-minerals and alloys.

Hornblende-Peridotite Cu-Ni (Shcheka and Chubarov, 1987)

This deposit type consists of pentlandite, Zn-bearing chrome spinel, pyrrhotite, chalcopyrite, and bornite that occur in veinlets and as disseminations in hornblendite-peridotite-norite-diorite intrusions. A paragenetic sequence of magmatic amphibole, olivine commonly garnet indicate formation at great depth. The host intrusions are characterized by graphite and native iron, and subordinate aluminum and magnesium-free chromite that indicate reducing crystallization conditions. Examples are the Kvinum, Shanuch, and Kuvalorog deposits in the southern Kamchatka Peninsula.

Serpentine-hosted asbestos (N.J Page in Cox and Singer, 1986)

This deposit type consists of chrysotile asbestos developed in stockworks in serpentinized ultramafic rocks. The depositional environment is usually an ophiolite sequence, sometimes with later deformation of igneous intrusion. Associated minerals are magnetite, brucite, talc, and tremolite.

Deposits Related to Regionally Metamorphosed Rocks

Au quartz veins (includes concordant vein, and shear zone Au) (B.R. Berger in Cox and Singer, 1986)

This deposit type includes low-sulfide Au quartz vein, turbidite-hosted, concordant vein, and shear zone Au deposits types and consists of gold in massive, persistent quartz veins in regionally metamorphosed volcanic rocks, metamorphosed graywacke, chert, and shale. The veins are generally late synmetamorphic to postmetamorphic and locally cut granitic rocks. Associated minerals are minor pyrite, galena, sphalerite, chalcopyrite, arsenopyrite, and pyrrhotite. Alteration minerals include quartz, siderite, albite, and carbonate minerals. The depositional environment is low-grade metamorphic belts.

Disseminated Au-sulfide (Maiskoe type) (Sidorov, 1987)

This deposit type consists of fine-grained, disseminated sulfide minerals with subordinate veinlets and veins that occur in deformed and metamorphosed clastic metasedimentary rocks, mainly black shale. Gold occurs mainly in finely-dispersed sulfide minerals, mainly in acicular arsenopyrite, and Au-rich pyrite. Other deposit minerals are subordinate pyrrhotite, sphalerite, galena, chalcopyrite, various sulfosalts, quartz, and stibnite. Quartz-stibnite is the latest-formed assemblage. The deposits occur at the base of volcanic arcs in orogenic zones, and are controlled by extensive ductile shear zones, complex folds, and dome structures. Host rocks generally exhibit greenschist facies metamorphism. No relation exists between deposit type and granitic intrusions, except for local dikes. This deposit type may be associated with epithermal vein, granitoid-related Au, polymetallic vein, and various Sb and Hg deposits. The deposits type is interpreted to have formed from deep-seated, reducing, hydrothermal-metamorphic fluids.

Clastic sediment-hosted Sb-Au (Berger, 1978, 1993)

This deposit type consists of stibnite and associated minerals that occur in simple and complex ladder and reticulate veins and veinlets, sometimes with subconformable disseminations. The main ore minerals are stibnite, berthierite, pyrite, arsenopyrite, and gold, with subordinate sphalerite, galena, chalcopyrite, tetrahedrite, chalostibite, scheelite, sphalerite, galena, tetrahedrite, pyrrhotite, marcasite, gudmundite, gersdorffite, native antimony, and native silver. Gangue minerals are mainly quartz and lesser ankerite, and lesser calcite, dolomite, siderite, sericite, and gypsum. Wall rocks are altered to varying combinations of quartz, carbonate, sericite, and pyrite. The host rocks for this deposit are: (1) Archean greenschist derived from mafic and ultramafic volcanic and volcaniclastic rocks; (2) interbedded carbonaceous black shale and volcanogenic-clastic rocks; or (3) to a lesser extent, retrogressively-metamorphosed granitic rocks. The deposit type occurs mainly in linear zones of folding and mylonites associated with regional strike-slip faults. Deposit type is associated with low-grade greenschist facies regional metamorphism; this association suggests a hydrothermal-metamorphic origin. The depositional environment is strongly-deformed fold belts developed along the former intracratonic rift troughs. The deposit type may also be associated with Au-quartz vein deposits.

Cu-Ag quartz vein (vein Cu) (Nokleberg and others, 1987)

This deposit type consists of Cu sulfides and accessory Ag in quartz veins and disseminations in weakly regionally metamorphosed mafic igneous rocks, mainly basalt and gabbro, and in lesser andesite and dacite. The veins are generally late-stage metamorphic. The deposit minerals include chalcopyrite, bornite, lesser chalcocite, and rare native copper. Alteration minerals include epidote, chlorite, actinolite, albite, quartz, and zeolites. The depositional environment is low-grade metamorphic belts.

Kennecott Cu (adapted from basaltic Cu deposit type by D.P. Cox in Cox and Singer, 1986, and from Nokleberg and others, 1987)

This deposit type consists of Cu-sulfides in large pipes and lenses in carbonate rocks within a few tens of meters of disconformably underlying subaerial basalt. Subsequent subaerial erosion of Cu-bearing basalt, and low-grade regional metamorphism may concentrate Cu-sulfides into pipes and lenses. The deposit minerals are chalcocite and lesser bornite, chalcopyrite, other Cu sulfide minerals, and oxidized Cu minerals. Alteration minerals are sometimes obscured by, or may include, malachite, azurite, metamorphic chlorite, actinolite, epidote, albite, quartz, zeolites, and secondary dolomite. The depositional environment consists of subaerial basalt overlain by mixed shallow marine and nearshore carbonate sedimentary rocks, including sabkha-facies carbonate rocks.

Deposits Related to Surficial Processes: Placer, Paleoplacer, and Laterite Deposits

Placer deposits are classified primarily by metals and secondarily by sedimentary processes. The principal sedimentary processes are fluvial and glaciofluvial, shoreline, and eluvial or residual. Fluvial and glaciofluvial deposits form where river velocities lessen at hydraulic flexures, on the inside of meanders, below rapids and falls, and beneath boulders. Shoreline deposits form in areas of strandline accumulations that are caused by shoreline drift, beach storms, wind, and wave actions. Eluvial and residual deposits form by the mechanical and (or) chemical disintegration of bedrock in the general absence of the concentrating force of water.

Placer and paleoplacer Au (W.E. Yeend in Cox and Singer, 1986)

This deposit type consists of elemental gold as grains and rarely as nuggets in gravel, sand, silt, and clay, and their consolidated equivalents in alluvial, beach, eolian, and rarely in glacial deposits. The major deposit minerals are gold, sometimes with attached quartz, magnetite or ilmenite. The depositional environment is high-energy alluvial where gradients flatten and river velocities lessen as at the inside of meanders, below rapids and falls, beneath boulders, and in shoreline areas where the winnowing action of surf causes gold concentrations found in raised, present, or submerged beaches.

Placer Sn (Nokleberg and others, 1987)

This deposit type consists of mainly cassiterite and elemental gold in grains in gravel, sand, silt, and clay, and their consolidated equivalents, mainly in alluvial deposits. The depositional environment is similar to that of placer Au deposits.

Placer PGE-Au (W.E. Yeend and N.J Page in Cox and Singer, 1986)

This deposit type consists of PGE minerals and alloys in grains in gravel, sand, silt, and clay, and their consolidated equivalents in alluvial, beach, eolian, and rarely in glacial deposits. In some areas, placer Au and placer PGE deposits occur together. The major deposit minerals are Pt-group alloys, Os-Ir alloys, magnetite, chromite, and ilmenite. The depositional environment is high-energy alluvial where gradients flatten and river velocities lessen as at the inside of meanders, below rapids and falls, beneath boulders, and in shoreline areas where the winnowing action of surf causes PGE and gold concentrations in raised, present, or submerged beaches.

Placer Ti (E.R. Force in Cox and Singer, 1986)

This deposit type consists of ilmenite and other heavy minerals concentrated by beach processes and enriched by weathering. The hosting sediment types are medium- to fine-grained sand in dune, beach, and inlet deposits. The depositional environment is a stable coastal region receiving sediment from bedrock regions. The major deposit minerals are low-Fe ilmenite, sometimes with rutile, zircon, and gold.

CLASSIFICATION OF LODE MINERAL DEPOSITS INTO METALLOGENIC BELTS

This study classifies the lode mineral deposits of the Russian Far East, Alaska, and the Canadian Cordillera into metallogenic belts according to known significant mineral deposits, mineral deposit types, tectonic setting, and tectonic environment. This classification uses the following subdivision of deposits, based on tectonic setting: (1) pre-accretionary deposits that formed early in the geologic history of each tectono-stratigraphic terrane and are thereby unique to each terrane; (2) (syn)accretionary deposits that formed during periods of major structural juxtaposition, regional deformation, and penetrative deformation that generally occurred during collision of now adjacent terranes; and (3) post-accretionary deposits that formed late in the geologic history of groups of terranes, and generally occur in two or more adjacent terranes. The metallogenic belts defined in this report are based on the significant deposits of the region which were selected to be representative of the metallogeny of the region. Other, less well-defined metallogenic belts may be defined for larger groups of relatively small mineral deposits.

The major tectonic environments used to characterize metallogenic belts in this study are: (1) accretionary wedge; (2) continental-margin arc; (3) continental rift; (4) island arc; (5) metamorphic; (6) oceanic crust, seamount, and ophiolite; and (7) subduction zone. Definitions of these environments are provided above. The tectonic classifications of lode mineral deposits is currently a topic of considerable debate (Sawkins, 1990); however classification of lode mineral deposits by mineral deposit types and tectonic environment can be extremely useful. These classifications can be used for regional mineral exploration and assessment, for research on the critical or distinguishing characteristics of metallogenic belts, and for synthesizing of metallogenic and tectonic models. To describe the metallogenic belts of the region, the significant lode deposits are classified both according to mineral deposit type and tectonic environment.

EXPLANATION OF TABLES ON SIGNIFICANT LODE DEPOSITS AND PLACER DISTRICTS

Tabular Descriptions for Sizes of Lode Deposits

Size categories for lode mineral deposits, adapted from Guild (1981), are listed below. These size categories define the terms *world class, large, medium, and small.* These size categories are used mainly in the parts of Table 1 on the lode deposits in the Russian Far East where specific tonnage and grade data are not yet available. The *small* category may include occurrences of unknown size. Units are metric tons of metal or mineral contained, unless otherwise specified.

Metal	World Class >	Large >	Medium >	< Small
Antimony		50,000	5,000	
Barite ($BaSO_4$)		5,000,000	50,000	
Chromium (Cr_2O_3)		1,000,000	10,000	
Cobalt		20,000	1,000	
Copper	5 million	1,000,000	50,000	
Gold		500	25	
Iron (ore)		100,000,000	5,000,000	
Lead	5 million	1,000,000	50,000	
Magnesium ($MgCO_3$)		10,000,000	100,000	
Manganese (tons of 40% Mn)		10,000,000	100,000	
Mercury (flasks)		500,000	10,000	
Molybdenum	500,000	200,000	5,000	
Nickel	1 million	500,000	25,000	
Niobium-Tantalum (R_20_5)		100,000	1,000	
Platinum group		500	25	
Pyrite (FeS_2)		20,000,000	200,000	
Rare earths (RE_20_3)		1,000,000	1,000	
Silver		10,000	500	
Tin		100,000	5,000	
Titanium ($Ti0_2$)		10,000,000	1,000,000	
Tungsten	30,000	10,000	500	
Vanadium	30,000	10,000	500	
Zinc	5 million	1,000,000	50,000	

Descriptions of Headings for Tabular Descriptions for Significant Lode Deposits and Placer Districts

Map Number, Name, Major Metals

Map number refers to a specific deposit in a given region. Lode deposits and placer districts are numbered separately within individual quadrants bounded by integer values of 4° of latitude and 6° of longitude (Sheets 1-7). The quadrants are numbered from west to east, and are lettered from south to north. A latitude and longitude location is stated for each deposit in degrees and minutes. Names of lode deposits are derived from published sources or common usage. In some cases, two deposits are grouped together and both names are given. In other cases, an alternate name is given in parentheses. Major metals are the known potentially valuable metals reported for each deposit, and are listed in order of decreasing abundance and(or) value, and are shown by standard chemical symbols.

Lode Deposit Type

Type of lode deposit, or lode deposit model is an interpretation that was made by examining the summary of the deposit and then classifying the deposit using the deposit models previously described. The type is queried where insufficient description precludes precise determination. For a few deposits, either the closest two deposit models are listed, or else a short description is given in parentheses.

Summary with References

The summary is a brief description of the major features of the deposit. Where known, the major economic minerals, gangue minerals, and the deposit form are stated. Form of deposit denotes the physical aspect of a deposit, whether, for example, a vein, disseminated mineral grains, or masses of minerals. Form is descriptive, and is distinct from genetic terms such as "contact metasomatic" or "volcanogenic," which imply origin or history. Because lode deposits may be geologically complex, a deposit may contain more than one form, and certain forms may be gradational. Where known, estimates of tonnage and grade are listed, or else the terms small, medium, or large size, and low-, medium-, or high-grade are used. Tonnages are listed in tonnes (metric tons). Grades are stated either in percent (%), for abundant metals, or in grams per tonne (g/t) for scarce and precious metals. In many deposits, the only available information is on the grade(s) of grab samples. The metric system (SI) is used for all volume and weight measurements. If publicly known, the length, width, and depth of the deposit are stated. Additional information on the host rocks and their relation to the deposit are also stated. Information on extent of underground or surface workings and on the period of mining or development is given, if known. Sources of information, stated at the end of each summary, are the references and oral or written communications used to compile the data for each deposit. Unpublished data gathered expressly for this report are indicated by the terms "written communication" or "oral communication."

Tabular Descriptions for Significant Placer Districts

Table headings for deposits in placer districts are described only for headings differing from those for lode deposits. In Alaska, data are compiled for only those important districts with over 31,300 g (1,000 oz) gold production, whereas in the Russian Far East, data are compiled for only large (major) districts. District refers to the name of a group of geologically and geographically related placer deposits, as derived from published sources or from general usage. In some cases, two or more districts are grouped together and both names are given. In other cases, an alternate name is given in parentheses. Type refers to the placer deposit type as determined by examining the description of the district and then classifying using one of the deposit models described above. Economic and significant heavy minerals are reported for each district, listed in order of decreasing abundance.

Abbreviations in Tables

Standard chemical symbols: for example, Au, gold; Cu, copper; Fe, iron; U, uranium
PGE: Platinum-group elements--minerals and alloys
REE: Rare-earth elements
mm, cm, m, km: millimeter, centimeter, meter, kilometer
g, kg, t: gram, kilogram, metric ton
g/t, g/m^3: grams per metric ton, grams per cubic meter
tonne: metric ton
%: percent
sq: square

Conversion Factors for Tables

The following conversion factors were used to convert weight and volume from U.S. Customary to metric quantities:

1 cubic yard = 0.765 cubic meter
1 troy ounce per short ton = 34.29 grams per metric ton
1 part per million = 1 gram per metric ton
1 pound = 0.454 kilogram
1 troy ounce = 31.10 grams
1 short ton = 0.907 metric ton
1 flask (76.0 pounds mercury) = 34.7 kilograms

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GEOLOGICAL SURVEY OF CANADA

TABLE 1. SIGNIFICANT METALLIFEROUS AND SELECTED NON-METALLIFEROUS LODE MINERAL DEPOSITS OF THE RUSSIAN FAR EAST, ALASKA, AND THE CANADIAN CORDILLERA

By

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Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
K52-01 42°54'N 130°54'E	Slavyanovskoe Laoelin	As As quartz vein	Small.

Consists of a series of north-south-striking, elongate quartz veins hosted in Paleozoic (Silurian?) mica-graphite schist and metasandstone. Quartz veins, up to 4 to 5 m thick, can traced for several hundred m. Arsenopyrite is the dominant ore mineral, and occurs both as disseminations and as lenticular accumulations in quartz. Minor galena also occurs Lenses of sphalerite also occur conformable to bedding of the metasedimentary rocks. The genesis of the deposit is questionable. Vein formation is interpreted as related to Cretaceous accretion and associated metamorphism of Paleozoic island arc volcanic and associated sedimentary rocks.

A.F. Frizh, written commun., 1932; N.E. Gritsenko, written commun., 1958; V.V. Ratkin, this study.

K53-01 43°36'N 133°45'E	Skalistoe Samarka	Mo W Porphyry Mo	Small. Average grade of 0.02-0.2% Mo, 0.15-2.8% W_2O_3.

Consists of molybdenite, pyrite, and wolframite that occur as thin veinlets and small masses in lenticular quartz and quartz-sericite zones up to 10 m thick. Local chlorite-sericite alternation and some garnet-amphibole skarn. Ore bodies are traced to a depth of 100 m. Deposit is hosted along contact of a hypabyssal stock of Paleogene granite porphyry and occurs both within and outside the pluton, between the country-rock and a miarolitic phase of the granite. Granite porphyry intrudes Jurassic turbidite deposits.

Pokalov, 1972.

K53-02 43°37'N 134°15'E	Nizhnee Luzhkinsky	Sn, Pb, Zn Sn polymetallic vein	Small. Average grade of 0.002-0.02% Pb; 0.33-1.53% Sn; 2.0% Zn. Mined in 1970's.

Consists of Pb, Zn, Cu, and Fe sulfides and cassiterite that occur in the central parts of altered zones that contain tourmaline-chlorite-quartz and tourmaline-chlorite-quartz-hydrosericite alteration. Altered zones occur in mineralized fracture zones that are located along the margin of a caldera formed of intermediate composition, Late Cretaceous volcanic and interlayered volcanic-sedimentary rocks that exhibit intense propylitic and biotite alteration.

Petrachenko, 1974.

K53-03 43°35'N 134°28'E	Shcherbakovskoe Taukha	Pb, Zn Sn Polymetallic vein	Small. Average grade of 3-5% Pb;1-4% Sn; 2-9% Zn.

Consists of northeast-trending, steeply-dipping, elongate (up to 300 m) veins, from 0.1 to 1.5 m thick that occur in Early Cretaceous sandstone and siltstone. Major ore minerals are sphalerite, galena, pyrrhotite, pyrite, and marcasite. Gangue minerals are quartz and calcite. Galena-sphalerite-pyrrhotite aggregates dominate and commonly occur along schistosity with pyrrhotite and sphalerite boudins coated by lenticular galena envelopes. Fractured sulfide ores are filled with sulfide-carbonate cement that contains jamesonite and secondary galena and sphalerite. Greisen-like cassiterite-bearing topaz-fluorite-mica veinlets cut sulfide ore. No definite relationships between mineralization and granitic intrusions is observed. Deposit includes small bodies of pre-ore gabbro and felsic and andesitic dikes that are genetically related to Late Cretaceous volcanic rocks that surround the deposit.

Radkevich and others, 1960.

K53-04 43°35'N 134°42'E	Fasolnoe Taukha	Pb, Zn Sn Polymetallic vein	Small. Average gradeof 0.1-30.0% Pb; 0.01-0.3% Sn; 0.1% Zn.

Consists of small en-echelon veins within a northwest-striking zone in a sequence of Upper Cretaceous (Cenomanian-Turonian) felsic volcanic rocks. Ore minerals are magnetite, sphalerite, galena, pyrrhotite, pyrite, arsenopyrite, cassiterite, valleriite, and cubanite. Host volcanic rocks are intensely altered to chlorite minerals with local garnet. Magnetite and cassiterite are closely associated with chloritic alteration.

Radkevich and others, 1960.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
K53-05 43°25'N 134°20'E	Soyuz Taukha	Ag, Au Au-Ag epithermal vein	Small. Average grade of 1.27 g/t Au; 127.9 g/t Ag.

Consists of veins, veinlet zones, and adularia-quartz, quartz, and mica-quartz bodies with sulfides and sulfosalts. Gold occurs in a quartz-adularia-argentite-sulfosalt assemblage. Quartz-sulfide veinlets lack gold. Deposit hosted by argillic-altered calc-alkalic, Late Cretaceous (Senonian, 88-65 Ma) rhyolite and related tuff. Ore bodies occur along faults. No relationship with intrusive rocks is observed.

E.D. Petrachenko, written commun., 1975.

K53-06 43°06'N 133°43'E	Benevskoe Samarka	W W skarn	Small. Average grade of 0.44 to 3.15% W_2O_3.

Consists of two zones containing skarn and hydrothermal alteration that contain approximately 30 ore bodies ranging from a few m to 200 m long and from 0.6 to 6 m thick. Skarns consist of magnetite, garnet, pyroxene-garnet, garnet-epidote, and garnet-orthoclase types. Scheelite is dominant ore mineral, with minor magnetite, arsenopyrite, pyrite, and rare cassiterite. Gangue minerals are quartz, feldspar, amphibole, epidote, biotite, and tourmaline. Late stages alterations consist of quartz-sericite and zeolitie.Late-stage quartz-feldspar and quartz-amphibole overgrowths replace skarn and contain nest-like veinlets and disseminated ore minerals. Skarns occur in veins and lenses that are located along the contact of Early Cretaceous biotite alaskite, granite porphyry, and granodiorite. Granitic rocks intrude sandstone and siltstone that are part of a Middle and Late Jurassic accretionary wedge complex is cut by numerous dikes of aplite, diorite and basalt porphyry, quartz diorite, granite porphyry, and granodiorite porphyry.

V.D. Shlemchenko and others, written commun., 1983.

K53-07 42°54'N 132°29'E	Krinichnoe Sergeevka	Au Granitoid-related Au	Small. Contains up to 2.8 g/t Au and up to 171 g/t Ag.

Consists of gold-pyrite-quartz, and quartz-carbonate zones in a Late Cretaceous granitic pluton that intrudes metamorphosed Paleozoic volcanic and sedimentary rocks. Sulfide-poor gold-pyrite-quartz occurs in ore bodies of variable shape and size.

S.M. Rodionov, written commun., 1991.

K53-08 42°44'N 132°20'E	Askold Sergeevka	Au Granitoid-related Au	Medium. Average grade of 5.9-7.6 g/t Au.

Consists of a gold-quartz vein stockwork in a greisenized Mesozoic granite that intrudes Paleozoic volcanic and sedimentary rocks. Deposit prospected to depths of more than 100 m.

M.I. Efimova and others, written commun., 1971; Efimova and others, 1978.

K53-09 42°58'N 132°57'E	Balykovskoe Sergeevka	Au Granitoid-related Au	Small

Consists of: (1) Ore-bearing thrust zones with gold-pyrite-quartz veins; and (2) quartz veins with galena, sphalerite, and silver. Deposit formed in two stages. Deposit occurs in Late Cretaceous granite that surrounds and intrudes early Cambrian gabbroic rocks of the Sergeevka Complex with a U-Pb age of 527 Ma (John Aleinikoff, unpublished data, 1985). Fineness of gold is 600.

Petrachenko (this study)

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			
K53-10 42°52'N 132°50'E	Progress Sergeevka	Au Granitoid-related Au	Medium. Average grade of 5.89 g/t Au.

Consists of sulfide-poor pyrite-arsenopyrite-gold-quartz veins, small veinlets, poorly mineralized fracture zones, zones of mylonite, and zones altered to metasomatic carbonate-chlorite-sericite rocks. Deposit hosted in a Late Cretaceous granitic pluton that cuts a sequence of granitic-gabbro rocks of Sergeevka Complex with a Cambrian age of 500 to 527 Ma (J.N. Aleinikoff, wrtten commun., 1992). The deposit is prospected to depths of a few tens m. This lode is also the source for placer Au deposits.

A.N. Rodionov, written commun., 1991.

K53-11 42°54'N 133°28'E	Porozhistoe Sergeevka	Au Granitoid-related Au	Small. Average grade of 5.39 g/t Au.

Consists of sulfide-poor gold disseminations and veins in cataclastic and schistose zones that occur in metamorphosed gabbroic rocks of the Cambrian Sergeevka Complex. Main sulfide minerals are pyrite, pyrrhotite, and chalcopyrite. Gangue minerals are quartz, biotite, sericite, chlorite, and carbonate minerals. Gold occurs as disseminations in chlorite-bearing gabbroic rocks and also as thin veins and veinlet networks. Deposit associated with Late Cretaceous granitic plutons in the area.

I.I. Fatianov and others, written commun., 1988.

K55-01 43°53'N 145°36'E	Golovninskoe Kuril	S, FeS Sulfur-sulfide.	Small. Contains an estimated few tens of thousands tonnes averaging 10-25% S.

Consists of sulfur-bearing bodies, approximately 4 m thick and containing 20-25% S that are deposited at the floor of boiling lake in the caldera of Holocene Golovnin volcano, and near fumarolic vents at the foot of extrusive domes. Sulfur ooze overlies sediments rich in melnikovite (FeS_2, amorphous pyrite) and poor in sulfur (up to 10% S). Quaternary age of mineralization.

Vlasov, 1977.

L52-01 44°34'N 131°27'E	Komissarovskoe (Vorob'eva plad) Laoelin-Grodekovsk	Au, Ag Au-Ag epithermal vein	Small. Average grade of 1.92 g/t Au and 49-52 g/t Ag.

Consists of low-grade gold-silver-pyrite and minor galena and sphalerite that occur in metasomatic sericite-biotite-quartz bodies, fracture zones, and short veins. Deposit hosted in dacitevolcanic rocks, presumably part of a Permian volcanic sequence. Very low grade gold also occurs short quartz veins in a n associated Permian sedimentary sequence that are conformable to bedding, and also folded and cross-cutting. Mineralization formed in areas of higher carbon contents in thin-bedded siltstone and argillite.

A.N. Rodionov, written commun., 1991.

L52-02 44°12'N 131°06'E	Baikal Laoelin-Grodekovsk	Cu, Mo Au Porphyry Cu-Mo	Small. Because the ore is highly oxidized, a low Cu content of 0.01%. Average grade of about 0.01% Mo.

Consists of veinlets and disseminations along contacts of gabbro-diorite and gabbro-syenite, both within and adjacent to the intrusive rocks. Deposit occurs in an area of 150-200 m2 in hydrothermally altered, biotite-K-feldspar rock that is surrounded by epidote-chlorite propylitic alteration. Ore minerals are chalcopyrite, bornite, pyrite, and molybdenite. The hydrothermally altered areas exhibit anomalous gold. Host rocks are metamorphosed Silurian and Devonian sedimentary and siliceous volcanic rocks, and Permian(?), subalkaline, gabbro-diorite, gabbro-syenite, and granite porphyry that intrude the sedimentary sequence. The gabbro-diorite is highly alkaline, and the gabbro-syenite and granite porphyry that host the deposit are K-enriched.

Petrachenko and Petrachenko, 1985.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
L52-03 44°17'N 131°24'E	Zolotoi Stream (Sofie-Alekseevskoe) Laoelin	Au Au quartz vein	Small. Average grade of1.3 g/t Au; 5 g/t Ag.

Consists of zones of thin pyrite-gold-quartz veins, disseminated gold, and coarse-grained pyrite in volcanic rocks with chlorite and carbonate alteration with local course-grained pyrite. Deposit hosted in a Late Permian volcano-sedimentary sequence.

E.D. Petrachenko, written commun., 1985.

L53-01 47°58'N 136°11'E	Khvoshchovoe Samarka	Cu, Mo Porphyry Cu-Mo	Small. Average grade of 0.02 to 0.4% Cu, 0.01 to 0.20% Mo, 0.01 to 0.09% W.

Consists of zones of veinlets and disseminations associated with intense metasomatic alteration composed of biotite, microcline, argillite, sericite, quartz, and carbonate. Deposit hosted in a Cretaceous amphibole-biotite granodiorite and biotite granite that intrudes Jurassic sandstone and siltstone. Intrusive and sedimentary rocks are crosscut by aplite, granodiorite porphyry, and diorite porphyry dikes presumably related to porphyry copper deposit. Ore minerals occur in all hydrothermally-altered rock except carbonate. Ore minerals are pyrite, chalcopyrite, molybdenite, scheelite, wolframite, magnetite, hematite, sphalerite, galena, and pyrrhotite. Deposit occurs in a 10 km^2 circular structure around the granitic rocks.

V.B. Shuvalov, written commun., 1986.

L53-02 47°36'N 136°15'E	Kafen Samarka	Cu, Mo Porphyry Cu-Mo	Small.

Consists of linear zones of quartz alteration with disseminated sulfides that occur around numerous granitic apophyses. Ore minerals are pyrite, chalcopyrite, and molybdenite. Ore veins occur at the margin of granitic body and partly in host rocks, within a zone of intense greizenization and silicification. Deposit surrounded by a sulfide aureole and hosted in granite and granodiorite porphyry that form part of Early Cretaceous Khingan series with an earlier magmatic stage is represented by dikes of gabbro-diorite. Country rocks are Late Permian sandstone, siltstone, basalt, and basaltic tuff that are contact metamorphosed to hornfels.

V.P. Bredikhin, written commun., 1979.

L53-03 47°17'N 136°13'E	Katenskoe Ariadny	Ti Zoned mafic-ultramafic Ti	Large

Consists of disseminated ilmenite in pyroxene-hornblende gabbro and olivine gabbro of early Cretaceous age. Contains local lenticular bodies that several tens of meters thick and at least 1 km long.

Scheka and others, 1991.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-04 47°06'N 135°04'E	Malakhitovoe Samarka	Cu, Mo Porphyry Cu-Mo	Small. Average grade of 0.1 to 1.6% Cu in stockwork and up to 0.5% Cu in breccia zone.

Occurs in a circular aureole of hydrothermally altered rocks with dimensions of 200 x 200 m occurs over an intrusive dome. Successive mineral assemblages are: (1) quartz-biotite-actinolite with pyroxene and epidote; (2) quartz-biotite-actinolite; (3) quartz-biotite-sericite (± chlorite); and (4) quartz-hydromica (with carbonate). A stockwork contains the first three facies and consists of a thick network of quartz-epidote-actinolite veinlets and lenses up to 2-3 cm thick with chalcopyrite, bornite, and pyrite. Heavily fractured and brecciated chert and siltstone were prospected by drill holes to the depth of 100 m. Ore minerals in breccia zones are chalcopyrite, bornite, molybdenite, pyrite, rarely pyrrhotite, cubanite, arsenopyrite, galena, and sphalerite. Carbonate veinlets with chalcopyrite also occur. Deposit occurs at northwest margin of a volcano-tectonic depression that contains a lower structural stage of Early Cretaceous sandstone interlayered with siltstone and shale that grades upwards into conglomerate and sandstone that is overlain by Paleogene andesite and basaltic andesite lava and lava breccia. Local intrusive rocks consist of dike-like bodies of calc-alkaline andesite porphyry, regarded as tongues of a dome-like subvolcanic intrusion.

Petrachenko and Petrachenko, 1985.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-05 46°57'N 134°27'E	Lermontovsky Samarka	W Au W skarn and greisen	Large. Average grade of 0.67-3% W_2O_3.

Consists of lenticular, sheeted, and nest-like skarn bodies that occur at the top of an Early Cretaceous granitic stock along contacts with bedded limestone. Ore bodies range from 40-80 to 500-640 m long and 1 to 78 m thick. Deposit was formed in three stages: (1) skarn (diopside, hedenbergite, hornblende, wollastonite, and garnet) replacement of limestone and of biotite hornfels formed from sandstone; (2) hydrothermal alteration of granitic rocks, hornfels, and skarn to greisen; and (3) sulfide minerals. Two types of greisen occur: (1) quartz-albite-muscovite; and (2) scheelite-muscovite-apatite-mica-quartz. Pyrrhotite dominates among sulfides; arsenopyrite, pyrite, marcasite, and scheelite are subordinate. Sulfide minerals are either superimposed on scheelite-bearing greisen or occur separately in veins. Deposit also contains silver-telluride-bismuth (polymetallic ore) and gold-telluride-bismuth (pyrrhotite ore) zones. Tungsten occurs in all parts of deposit, although the largest accumulations of scheelite occur in muscovite and lesser biotite, and phlogopite greisen, quartz veins, and a metasomatic feldspathic rock. Host Early Cretaceous granitic rocks are highly aluminous, low in alkalies and calcium, and contain elevated levels fluorine and phosphorus.

Gvozdev, 1984.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-06 46°32'N 136°26'E	Verkhnezolotoe Luzhkinsky	Cu, Sn W, As, Zn Porphyry Cu	Small. Average grade of 3 g/t Au, 86 g/t Ag, 0.35-2.27% Cu, 0.69% Pb, and 0.26% Sn.

Occurs at the side of a volcano-tectonic depression which is filled with trachyandesitic flows overlain by dellenite-rhyolite tuff and other extrusive rocks of Late Cretaceous (Turonian to Santonian) age. Deposit are cut by dikes of andesite and basaltic porphyry, dacite, diorite stocks, and separate granodiorite porphyry dikes; all of which are parts of a Late Cretaceous volcano-plutonic complex. A Cu stockwork is related to a diorite stock; stockwork boundaries coincide with the aureole of biotite alteration, which is overprinted by epidote-actinolite and chlorite-carbonate propylitic alteration that extends to periphery of stock. Distribution of ore is irregular. Disseminated ore locally contains rich ore in zones of heavily fractured rocks. Chalcopyrite and marcasite are the dominant ore minerals, with minor sphalerite, galena, molybdenite, and cassiterite. Richest ore is associated with tin, copper, and locally tungsten minerals. Zone of oxidized ore up to 20-30 m deep caps the deposit.

Orlovsky and others, 1988.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-07 46°28'N 135°53'E	Vostok-2 Luzhkinsky	W W skarn	Large. Average grade of 0.65% Cu; 1.64% W_2O_3. Mined since 1980's.

Consists of steeply-dipping skarn as veins and sheet-like bodies that occur at the contacts of a large olistolith of Carboniferous to Permian limestone which is in a matrix of Jurassic clastic rocks. Some ore bodies fill fractures in the Jurassic clastic rocks. Skarn also occurs in quartz-sericite hydrothermally altered rocks that envelope a plagiogranite-granodiorite stock. Some skarn bodies occur wholly within intrusive rocks. The deposit was formed in several stages. An early stage consists mainly of pyroxene, plagioclase, amphibole, and garnet. A n intermediate stage altered both skarn and intrusive rocks and formed quartz-feldspar-muscovite (chlorite, biotite) greisen with scheelite, apatite, and minor arsenopyrite, pyrrhotite, and chalcopyrite. A late stage of scheelite and quartz was succeeded by low temperature scheelite-arsenopyrite. Plagiogranite dated at approximately 110 ma by K-Ar isotopic studies; deposit is interpreted as about the same age.

Stepanov, 1977; Rostovsky and others, 1987.

L53-08 46°05'N 135°45'E	Tigrinoe Luzhkinsky	Sn, W, Ta, Nb, In Mo, Zn, Bi Sn-W greisen	Medium. Average grade of 0.14% Sn and 0.045% W_2O_3,

Consists of a complex Sn-W deposit defined by: (1) a stockwork of quartz-topaz-micaceous greisen along the contact of a Li-F granite pluton; (2) a linear stockwork consisting of a thick network of veinlets (5-10 to 70 veinlets per meter) of parallel north-south-trending quartz-topaz veins from 3 to 100 cm thick . Veins are hosted in contact metamorphosed sedimentary rocks adjacent to the granite pluton; and (3) a sulfide breccia pipe containing rock fragments of the stockwork and greisen cemented by quartz with lesser carbonate, fluorite, and sulfides. Three stages of mineralization are distinguished: (1) early quartz-molybdenite-bismuthinite; (2) middle REE greisen of wolframite-cassiterite with high contents of Sc, Ni, and Ta; and (3) late hydrothermal quartz-fluorite-carbonate-sulfide veins. In, Cd, Ag, and Se are enriched in sulfides in the two last stages. K-Ar age of the lithium-fluorine granite is 90 Ma ± 5%.

Korostelev and others, 1990; Gonevchuk and Gonevchuk, 1991.

L53-09 46°20'N 136°34'E	Yantarnoe Luzhkinsky	Sn Porphyry Sn	Small. Average grade of 0.1-2.17% Cu, 0.03-1.02% Pb, 7.3% Sn, and 0.7-2.22% Zn.

Consists of veinlets and disseminations of cassiterite and sulfide minerals in a pipe-like body and a volcanic breccia composed of trachyandesite and rhyolite that intrude Early Cretaceous clastic sedimentary rocks. Early mineralization was associated with rhyolite in the pipe-like body and volcanic breccia and produced mainly pyrite and chalcopyrite. The major part of deposit formed after the intrusion of explosive breccia of the deposit and consists of metasomatic quartz-chlorite, quartz-sericite, and quartz-chlorite-sericite alterations that contain a sulfide-free cassiterite-chlorite-quartz assemblage, and a Sn-polymetallic assemblage rich with galena, sphalerite, and chalcopyrite. Host igneous rocks are spatially related to Paleocene volcanic vents with K-Ar isotopic age of about 65 Ma.

Rodionov, 1988.

L53-10 46°10'N 136°30'E	Zvezdnoe Luzhkinsky	Sn Cu, Pb, Zn Porphyry Sn	Small. Average grade of 2.56% Pb; 0.53% Sn; 2.16% Zn.

Consists of a neck of Late Cretaceous(?) to Paleocene subvolcanic rhyolite with numerous (up to 40%) miarolitic cavities filled with a quartz-cassiterite aggregate. Rhyolite altered to sericite and contains finely disseminated cassiterite. Cassiterite-sulfide veins also occur in Early Cretaceous clastic rocks around the intrusion. Galena and quartz-galena with cassiterite and stannite are dominant in the upper part of the deposit, and sphalerite-chalcopyrite-pyrrhotite with cassiterite ore predominate in deeper part of deposit.

Rodionov, 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
L53-11 46°22'N 137°41'E	Salyut Kema	Au, Ag Au-Ag epithermal vein	Small. Average grade of 1.75 g/t Au.

Consists of teeply-dipping veins and veinlets within alteration zones. Veins range from 0.1 to 1.5 m thick; zones range from 0.3 to 40-50 m thick. Deposit formed in several stages including: (1) sulfide-poor gold-pyrite-quartz, argentite-adularia-quartz veins; and (2) sulfide-rich Cu polymetallic veins. Major minerals are argentite, sphalerite, native silver and gold, quartz, adularia, fluorite, and chlorite, with subordinate galena, chalcopyrite, hematite, pyrargyrite, and acanthite. Ore has high Ag and F content. Hydrothermal alteration consists of hydromica-chlorite, chlorite-carbonate, and argillite. Host rocks are Late Cretaceous to Paleogene felsic tuff, tuffite, and minor andesite. Deposit presumably related to the extrusion of late-stage subalkaline rhyolite.

A.N. Rodionov, written commun., 1983.

L53-12 46°11'N 137°55'E	Glinyanoe Kema	Au, Ag Au-Ag epithermal vein	Small. Average grade of 8.3 g/t Au, and 122 g/t Ag.

Consists of adularia-quartz, sericite-chlorite-quartz, and carbonate-chlorite-quartz mineralized veins and zones that contain pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, argentite, acanthite, silver tellurides, and native gold and silver. Veins and zones occur in altered, silicified volcanic rocks that overlie Late Cretaceous (Santonian) felsic volcanic rocks. Deposit interpreted to have occurred in four stages: (1) gold-pyrite-quartz, (2) quartz-hydromica and quartz-carbonate, (3) gold-silver, and (4) quartz-chlorite-adularia with silver sulfosalts. Age of the deposit is interpreted as Late Cretaceous to Paleogene

A.N. Rodionov, written commun., 1986.

L53-13 46°04'N 137°49'E	Nesterovskoe Kema	Cu Mo, Ag Porphyry Cu	Small.

Consists of a 50 x 200 m aureole of hydrothermally altered rocks in a mineralized stock. Dominant alteration is quartz-sericite. Ore minerals are pyrite, chalcopyrite, sphalerite, and molybdenite. Malachite occurs in oxidation zone. Ag content increases with depth. Deposit occurs in a fault zone cutting granodiorite and host rocks. Zone contains vein and disseminated Cu minerals. Ore occurs to depths of several tens of m. Deposit occurs 6 km inland from the Sea of Japan in volcanic rocks cut by Late Cretaceous and Paleogene intrusions. The area contains numerous andesite and dacite extrusions.

Petrachenko and others, 1989.

L53-14 45°39'N 135°25'E	Zabytoe Luzhkinsky	W, Sn, Bi W-Sn greisen	Medium. Average grade of 0.01-0.1% Sn; 0.01-12.61% W_2O_3.

Consists of complex tin-bismuth-tungsten minerals related to a Late Cretaceous granitic stock. The upper part of the stock consists of leucogranite with biotite granite and granite porphyry. The lower part consists of granite and aplite which contain lithium micas with late-stage protolithionite and less abundant zinnwaldite. Deposit consists of quartz veins from 3 to 15 m thick and metasomatic zones in granite greisen and hornfels. Quartz-wolframite, quartz-sulfide, and quartz-carbonate stages are identified. Quartz-wolframite stage consists of quartz, wolframite, molybdenite, beryl, cassiterite, and sulfides. Quartz-sulfide ore consists of quartz-arsenopyrite-pyrrhotite-sphalerite and quartz-pyrite-sphalerite-galena with bismuth sulfosalts, bismuthine, and native bismuth. Deposit contains high levels of Li and Rb. Deposit is zoned with Ni-Rb-W minerals in the central portion of the stock and later-stage sulfide-tungsten ore at the periphery. Mo and Be contents increase with depth.

P.G. Korostelev and others, written commun., 1987; Gvozdev and others, 1990.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

L53-15 45°46'N 135°58'E	Zimnee Luzhkinsky	Sn, Pb, Zn Sn polymetallic vein	Small. Average grade of 0.1-3.0% Cu, 3.18% Pb, 0.59% Sn, and4.09% Zn.

Consists of mineralized breccia, breccia- and fracture-filling veins, zones of closely spaced veinlets, and pockets that occur in fracture zones. Sn polymetallic ore bodies have strike lengths up to 1200 m, extend extensvely down dip, and vary in thickness from several tenths of a meter to several tens of meters. Deposit occurs near a granodiorite body and contains mainly pyrrhotite, pyrite, arsenopyrite, sphalerite, stannite, and cassiterite. Ore far from the granodiorite and in the upper part of veins is mostly galena with fine-grained cassiterite. Near the granodiorite, ore consists of breccia-bearing fragments of tin-sulfide minerals that are cemented by a quartz-micaceous (greisen) aggregate with arsenopyrite and cassiterite. The K-Ar age of altered rocks associated with the Sn-polymetallic ores is 75 Ma. Age of greisen assemblage is approximately 50 Ma as determined by K-Ar isotopic study of the granodiorite. The deposit exhibits regional metamorphism and cataclasis.

P.G. Korostelev and others, written commun., 1980; Nazarova, 1983.

L53-16 45°40'N 136°08'E	Dalnetayozhnoe Luzhkinsky	Sn, Pb, Zn Sn polymetallic vein	Small. Average grade of 1.53% Pb; , 0.53% Sn; , 2.58% Zn.

Consists of mineralized fracture zones that contain irregularly distributed veinlets, pockets, and disseminations in Lower Cretaceous flyschoid sandstone and siltstone. About 30 ore bodies occur in north-south-trending fracture zones, possibly up to 1 km long. Dominant ore minerals are pyrrhotite, pyrite, sphalerite, stannite, and cassiterite, with minor galena, chalcopyrite, and arsenopyrite. Gangue minerals are quartz, carbonates, chlorite, and sericite.

P.G. Korostelev and others, written commun., 1980.

L53-17 45°30'N 136°39'E	Tayozhnoe Kema	Ag Au Ag epithermal vein	Medium. Average grade of 50-2000 g/t Ag and 1 g/t Au. Mined since 1980's.

Consists of steeply-dipping quartz veins that occur along northwest to north-south fractures that cut coarse-grained, Early Cretaceous sandstone. Veins are 100 to 500 m long and 0.5 to 2 m thick, and also occur laterally under the contact between sandstone and overlying 50-m-thick section of Late Cretaceous felsic volcanic rocks. Ore minerals occur within the veins, and in metasomatic zones along the sub-horizontal contact between veins and overlying volcanic rocks. Major Ag-bearing minerals are Ag sulfosalts and sulfides. Pyrite and arsenopyrite are rare and formed before Ag-bearing minerals. In the upper part of veins, Ag occurs in tetrahedrite, freibergite, stephanite, pyrargyrite, and polybasite. At middle depths, Ag occurs in acanthite and stephanite dominate, along with argentopyrite and allargentum also occur. Acanthite dominates at depth. Deposit assumed to be related to a Paleocene rhyolite volcano-plutonic assemblage.

A.N. Rodionov and others, written commun., 1976; Logvenchev and others, in press.

L53-18 45°18'N 133°38'E	Ussuri deposits Kabarga	Fe Ironstone	Small. Average grade of 23.8-38.6% Fe.

Consists of a group of deposits with sheeted magnetite and hematite-magnetite bodies that occur in Early Cambrian clastic-carbonate rocks that overlie Early Cambrian dolomite. Iron ore occurs in chert and interlayered quartz-sericite-chlorite, quartz-sericite schist, and dolomite and along chert contacts. Upper part of ore-bearing zone is oxidized, and manganese ore (dominantly pyrolusite) occurs in oxidized zone in addition to iron ore. Mineralogic and geochemical studies suggest an exhalative-sedimentary origin.

Denisova, 1990.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
L53-19 45°13'N 134°28'E	Ariadnoe Ariadny	Ti Pt Zoned mafic-ultramafic Ti	Large. Average grade of 1.0-11.8% TiO_2; 0.086% V_2O_5.

Consists of abundant disseminated ilmenite that occurs in layers in pyroxene-hornblende gabbro and pyroxenite layered intrusions. Ilmenite layers are several tens of m thick and several hundred m long. K-Ar isotopic age of 160 to 170 Ma for ore-bearing intrusions. Ilmenite contains rare platinoid inclusions.

Scheka and Vrzhosek, 1985.

L53-20 45°05'N 134°35'E	Skrytoe Samarka	W W skarn	Small. Average grade of 0.1-0.88% W_2O_3.

Scheelite occurs in: (1) zones of quartz-epidote-feldspar hydrothermally altered rocks; zones range from several cm to several m thick; and (2) feldspar-quartz veins in skarn and hornfels. Skarn types are amphibole-plagioclase, garnet, pyroxene-plagioclase, and wollastonite. Ore zones and veins occur as sheets and consist of quartz, epidote, feldspar, chlorite, sericite, calcite; and rarely apatite, prehnite, fluorite, sphene, pyrrhotite, arsenopyrite, sphalerite, and scheelite skarn. Scheelite is concentrated in quartz-chlorite-sericite zones. Feldspar-quartz veins contain scheelite, arsenopyrite, and apatite; as well as minor amounts of tourmaline, pyrrhotite, bismuthinite, native bismuth, and fluorite. Quartz-pyrite veinlets with calcite and chlorite cut the tungsten zones and veins. Thin veins of quartz-muscovite greisen occur to a depth of approximately 230 m. Age of deposit unknown, is probably Early Cretaceous, and similar to Vostok 2, Lermontovsky, and Benevskoe deposits. Host rocks are Jurassic siltstone and sandstone, Paleozoic chert, spilite, and limestone.

V.I. Gvozdev and others, written commun., 1988.

L53-21 45°08'N 135°02'E	Malinovskoe Luzhkinsky	Cu Au Porphyry Cu	Small. Average grade of 0.6-12.9 g/t Au; 0.42-4.5% Cu. Not mined.

Deposits consists of veinlet and disseminated minerals in syenite. Ore minerals are chalcopyrite, pyrite, pyrrhotite, marcasite, arsenopyrite, gold, bismuthinite, glaucodot, and sphalerite; with minor argentite, freibergite, galena, cinnabar, and enargite. Scheelite and wolframite occur locally. Chalcopyrite content in veins decreases and arsenopyrite increases with depth. Mineralization occurs in several phases. Locally, veinlets and disseminated copper minerals associated with quartz-sericite alteration. Epidote-chlorite-carbonate propylitic alteration is widespread in the area. Host rocks altered to quartz-sericite rock. Au-sulfide mineralization younger than Cu mineralization and is associated with biotite-K-feldspar propylitic and sericitic alteration. Cu veins occur along contacts both within and outside the intrusive complex. Quartz-sulfide veins and lenses have variable thickness. Deposit occurs in syenite and monzodiorite that are part of a small intrusive complex of Late Cretaceous (Cenomanian-Turonian) gabbro-diorite, monzodiorite, and syenite intruded into fractures in Early Cretaceous sedimentary rocks. Country rocks are contact metamorphosed, although intrusive contacts are mostly tectonic. Associated monzodiorite exhibits K-feldspar and biotitie alteration. Intrusive rocks are of calc-alkaline and subalkaline series with high alumina content.

Petrachenko and others, 1991.

L53-22 44°45'N 135°21'E	Yuzhnoe Luzhkinsky	Pb, Zn, Ag Sn, Cd Polymetallic vein	Medium. Average grade of 349 g/t Ag; 6.78% Pb; 0.95% Sb; 0.16-1.2% Sn; 9.8% Zn. Mined for Ag from 1970's to present.

Main vein occurs in a syncline in Early Cretaceous biotite siltstone intercalated with coarse-grained sandstone. Vein ranges from 0.5 to 1.4 m thick, has been traced for 1.6 km, and prospected to the depth of 900 m. Ore contains Zn, Pb, Ag, Cd, and Bi minerals. Sn occurs at deep levels. Three major ore-bearing assemblages occur: (1) axinite-pyroxene-garnet; (2) quartz-sulfide; and (3) carbonate-silicate-sulfide. From top downward, vertically zoned mineral assemblages these: (1) sulfosalt-sulfide (Sb-Pb-Ag), (2) sulfide (galena-sphalerite-pyrrhotite), (3) quartz-arsenopyrite with hexagonal pyrrhotite, and chalcopyrite and cassiterite. At deep levels of the eastern flank of the ore body is a Sn-polymetallic deposit (Sn-Ag-Pb). Deposit related to a subalkaline monzonite-diorite stock with K-Ar isotopic age of 75 to 98 Ma. Veins cut the stock and the sedimentary rocks hosting stock.

Vasilenko and Strizhkova, 1987.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-23 44°39'N 134°39'E	Zarechnoe Luzhkinsky	Cu Porphyry Cu	Small. Average grade of 0.05 g/t Au; 0.02-0.9% Cu.

Occurs in a 400 x 800 m elongate stockwork that is spatially related to fractured andesite flows. Deposit exhibits intense propylitic alteration (actinolite, epidote, biotite, and chlorite) with fine veinlets, disseminations, and small pockets of chalcopyrite, chalcocite, bornite, cuprite, pyrite, and arsenopyrite. Deposit occurs in a Late Mesozoic andesite-trachyandesite volcanic sequence in the Central Fault zone that occurs between the Samarka and Zhuravlevsky terranes.

Petrachenko and Petrachenko, 1985.

L53-24 44°38'N 135°20'E	Smirnovskoe Luzhkinsky	Pb, Zn, Sn Ag Polymetallic vein	Medium. Average grade of 69 g/t Ag, 2.69% Pb, 0.41% Sn, 3.52% Zn. Mined for Ag from 1950's to about 1993.

Consists of (1) cassiterite and sulfide minerals in shear zones, and (2) quartz vein and greisen. Cassiterite and sulfide minerals occur in a series of en echelon shear zones along a regional fault. Host rocks are weakly propylitized Early Cretaceous (Valanginian) flysch. Shear zones range from 0.5 to 2.10 m thick, are up to 2 km long, and extend down dip at least 960 m. In addition to Zn, Pb, and Sn, deposit contains lesser Ag, In, and Cd. A zonal succession of mineral assemblages, from top downwards, consists of: (1) carbonate-sulfosalt-sulfide; (2) quartz-sulfide; (3) quartz-arsenopyrite-cassiterite; and (4) pyrrhotite. K-Ar isotopic age of 80 Ma on nearby intrusive monzonite interpreted as age of deposit. Quartz vein and greisen consists of metasomatic quartz-muscovite and quartz-topaz-fluorite zones and veins with Pb and Zn sulfides, and cassiterite. Zones range up to 6 m width in cavities. K-Ar isotopic age of 45 to 60 Ma for greisen. Formation of greisen related to a complex of small high-K monzonite-diorite intrusions at Yushnoe.

Vasilenko and Strizhkova, 1987.

L53-25 44°21'N 135°10'E	Vysokogorskoe Luzhkinsky	Sn Sn silicate-sulfide vein	Medium. Average content of 1.0% Sn. Mined from 1960's to present. Largest mine in Kavalerova area.

Consists of quartz-chlorite-cassiterite, quartz-sulfide-cassiterite, and sulfide-cassiterite veins and mineralized fracture zones in Early Cretaceous olistostrome partially overlain by Late Cretaceous felsic volcanic rocks. Sn mineralization related to the areas of quartz-tourmaline alteration about 5-6 m thick. Average thickness of veins and mineralized zones is 1.2 to 1.4 m, with lengths of 400 to 500 m. Ore traced to a depth of 700 m. In addition to cassiterite, deposit contains chalcopyrite, arsenopyrite, pyrrhotite; and rarely galena and sphalerite. Sulfosalts of bismuth and silver are common.

Litavrina and Kosenko, 1978; Ryabchenko, 1983.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
L53-26 44°25'N 135°30'E	Partizanskoe (Soviet 2, Svetliy Otvod) Taukha	Pb, Zn Ag Pb-Zn skarn	Medium. Average grade of 67.6 g/t Ag; 1.5-3% Pb; 0.6-4% Zn. Mined from 1950's to present.

Consists of numerous, small, steeply-dipping skarn bodies at the contact of a Triassic limestone olistolith encased in Early Cretaceous clastic rocks. Skarns merge and form a single deposit about 400 m below the surface, and pinch out at a depth of approximately 600 m. Ore and skarn assemblages are vertically zoned; higher temperature assemblages occur deeper. Massive, densely disseminated silver-lead-zinc ore (Pb/Zn about 1.0) occurs above quartz-calcite aggregate in the upper part of ore body. Massive, densely disseminated lead-zinc ore (Pb/Zn about 0.8) is associated with Mn-hedenbergite skarn and occurs at middle depths. And disseminated zinc ore (Pb/Zn about 0.5) occurs in ilvaite-garnet-hedenbergite skarn in the lower part. Galena and sphalerite are dominant ore minerals; chalcopyrite and arsenopyrite are common; minor magnetite, pyrrhotite, and marcasite also occur. Silver-bearing minerals are sulfosalts of Ag and Sb in the upper part of the deposit and galena in the lower part. Galena contains silver as a solid solution of matildite. The age of mineralization is bracketed between 60 and 70 Ma by basalt dikes, with K/Ar isotopic ages of 60-70 Ma, that cut the ore body at the contact of olistolith, and by the lower part of the overlying volcanic strata, with K/Ar ages of 70-80 Ma, which are cut by ore body. The deposit consists of four or more related ore bodies that occur over about 5 km strike length, including the Soviet 2, Partizansk East, Partizansk West, and Svetliyotvod ore bodies. The underground workings for this group of deposits have a total length of about 11 km.

Ratkin, Simanenko, and Logvenchev, 1991.

L53-27 44°29'N 135°35'E	Dalnegorsk Taukha	B Boron skarn	World class. Mined from 1970's to present. Produces over 90% of all borates in Russia.

Deposit occurs as a thick skarn zone formed in a large, upturned olistolith of bedded Triassic limestone enclosed in Early Cretaceous clastic sedimentary rocks. The skarn extends to a depth of approximately 1 km, where it is cut off by a granitic intrusion. Skarn formed in two stages, with second-stage skarn over-printing earlier skarn. The two stages of skarn formation are separated in time by the intrusion of intermediate-composition magmatic bodies (with approximate K/Ar ages of 70 Ma). The first stage consists of grossular-wollastonite skarn and concentrically zoned, finely banded aggregates with numerous finely crystalline datolite and druse-like accumulations of danburite crystals in paleohydrothermal cavities. The second stage skarn consists predominantly of long, radiated hedenbergite and andradite with coarsely-crystalline datolite, danburite, quartz, axinite, and calcite. An Ar-Ar age for orthoclase indicates the age of the late-stage skarn assemblage is 57 Ma. The silicate mineralogy of the skarns is similar to that in lead-zinc skarn deposits in this same region. B isotopic studies indicate a magmatic source for boron (Ratkin and Watson, 1993). The deposit is very large and had been mined from 1970's to present. The Dalnegorsk open-pit mine is prospected to the depth of 1 km. The silicate mineralogy of the skarns is similar to that in lead-zinc skarn deposits in this same region.

Ratkin, 1991; Ratkin and Watson, 1993; P.Layer, V.Ivanov, and T.Bundtzen, written commun., 1994.

L53-28 44°35'N 135°40'E	Nikolaevskoe Taukha	Pb, Zn Ag Pb-Zn Skarn	Medium. Average grade of 62 g/t Ag; 1.5-8.7% Pb; 1.36-10.5% Zn. Mined from 1970's to present. Main shaft about 500 m deep.

Consists of large, layered ore bodies formed in a giant olistolith of Triassic limestone that is part of an Early Cretaceous accretionary-fold complex. The skarn occurs at the contacts of limestone with hosting siltstone and sandstone, and with overlying felsic volcanic rocks of a Late Cretaceous to Paleogene post accretionary sequence. Small ore bodies also occur in limestone blocks in the volcanic rocks that were torn off the underlying basement. The ore minerals are dominantly galena and sphalerite that replace an earlier hedenbergite skarn near the surface, and, at depth, replace a garnet-hedenbergite skarn. Subordinate ore minerals are chalcopyrite, arsenopyrite, pyrite, pyrrhotite, fluorite, and silver sulfosalts. K/Ar isotopic studies indicate that the age of mineralization bracketed between 60 and 80 Ma. A 60 K/Ar Ma isotopic age is obtained for an unmineralized basalt dike that cuts the mineralized zone, and a K/Ar age of 70-80 Ma is obtained for a mineralized ignimbrite that overlies the olistolith. .

Garbuzov and others, 1987; V.V. Ratkin, this study.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-29 44°39'N 136°12'E	Plastun Taukha	Cu Porphyry Cu	Small. Associated skarn contains 30-350 g/t Ag; 0.3-0.8% Cu.

Consists of veinlets and disseminations from 100 to 150 m thick, with sulfide-bearing zones from 15 to 20 m thick. Ore minerals are pyrite and chalcopyrite, with subordinate arsenopyrite, sphalerite, and galena. Deposit hosted in Upper Cretaceous (Cenomanian-Turonian) felsic volcanic rocks. Alteration consists of chlorite, epidote, quartz, and sericite. Deposit occurs at the flank of caldera filled with Upper Cretaceous to Paleocene (Maastrichtian-Danian) volcanic rocks. Underlying sedimentary rocks of the Early Cretaceous accretionary-fold complex include lenticular skarns up to 10 m long and 1.0 to 1.5 m thick with disseminated magnetite, chalcopyrite, pyrite, and pyrrhotite.

Mikhailov, 1989.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-30 44°28'N 134°08'E	Koksharovskoe Ariadny	Ti P Zoned mafic-ultramafic Ti	Large. Average grade of 1.0-10% P_2O_5; 3.3-4.5% TiO_2.

Consists of disseminated ilmenite, magnetite, and apatite in a hornblende and biotite pyroxenite with a K-Ar isotopic age of 160 Ma. Minor PGE present. Intrusive rocks are weathered. Weathered pyroxenite may have economic concentrations of vermiculite.

Scheka and others, 1991.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-31 44°25'N 134°47'E	Arsenyevsky Luzhkinsky	Sn Pb, Zn, W, Ag Sn silicate-sulfide vein	Medium. Average grade of 2-3% Sn. Locally up to 20-25% Sn, Also contains from 0.1-0.5% WO_3 , 1-2% Pb and Zn , and a few hundred ppm Ag. Mined since 1970's.

Deposit consists of a series of parallel, steeply-dipping Sn quartz veins up to 1000 m along strike and 600-700 m down dip. Veins are commonly 10 to 20 cm thick, with maximum thickness of 1 to 2 m. Ore mineral assemblages are vertically zoned. From the top downwards assemblages are: (1) quartz-cassiterite; (2) quartz-arsenopyrite-pyrrhotite; (3) polymetallic; and (4) arsenopyrite-pyrrhotite. Late-stage alteration consists of quartz-fluorite-carbonate, with sizable amounts of huebnerite. Deposit associated with 60 Ma rhyolite dikes that exhibit quartz-sericite autometasomatism, with local miarolithic cavities filled with cassiterite.

Rub and others, 1974; Radkevich and others, 1980.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-32 44°28'N 134°59'E	Khrustalnoe Luzhkinsky	Sn Pb, W, Ag Sn silicate-sulfide vein	Medium. Average grade of 0.8-1.7% Pb; 0.22% Sn; up to 11.8% Zn. Mined during 1950's and 1960's.

Deposit consists of 70 to 80 steeply-dipping ore veins with dominantly north-south and northwest trends. Veins extend for up to 1 to 3 km along strike and up for 500 to 600 m down dip; with an average thickness of 0.15 to 0.20 cm. The major mineral assemblages occur in a zonal pattern. At deep levels are quartz-cassiterite and early quartz-sulfide with arsenopyrite, pyrrhotite, chalcopyrite, sphalerite, and stannite. At shallow levers are late-stage quartz-sulfide containing galena and sphalerite. Tourmaline alteration of wall rock occurs at deep levels, and chlorite alteration occurs at shallow levels.

Radkevich and others, 1980.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
L53-33 44°24'N 135°58'E	Krasnogorskoe Taukha	Pb, Zn Ag Polymetallic vein	Medium. Average grade of 62 g/t Ag, 5 % Pb, 0.26 % Sn, and 6.77 % Zn.

Consists of steeply-dipping quartz-sulfide veins, up to several hundred m length along strike and from 0.2 to 1.5 m thick, that cut a sequence of Late Cretaceous (Cenomanian to Turonian) ash flow tuff. Sphalerite and galena are the dominant ore minerals; the flanks of veins contain pyrite-marcasite-pyrrhotite, with lesser antimony-silver sulfosalts. At the deeper levels of the ore bodies, galena contains up to several percent silver and bismuth as matildite. The volcanic rocks adjacent to the polymetallic veins are altered to quartz and chlorite. In the core of the veins, chlorite, manganous calcite, rhodochrosite, rhodonite, and spessartine occur with quartz gangue. The veins occur near an Upper Cretaceous-Paleocene (Maastrichtian to Danian) volcanic vent. The vent breccia also contains disseminated sphalerite, galena, and cassiterite. The veins formed immediately after mineralization of vent breccia, with an approximate age K/Ar isotopic age of 65 Ma.

Ratkin and others, 1990.

L53-34 44°26'N 135°49'E	Lidovskoe Taukha	Pb, Zn Pb-Zn polymetallic vein	Medium. Average grade of 7.8% Pb; 6.4% Zn. Mined since 1950's.

Consists of gently-dipping (approximately 30°) sulfide veins that cut Early Cretaceous siltstone and sandstone. Most veins contain galena and sphalerite, with subordinate nonmetallic minerals. Deposit forme in two stages: (1) quartz, muscovite, chlorite, arsenopyrite, pyrite, and cassiterite; and (2) pyrrhotite, sphalerite, galena, chalcopyrite, stannite, carbonates, and chlorite. Quartz-calcite veinlets with minor sulfides were emplaced during the later stage, after the intrusion of basaltic dikes. Some ore bodies, whose composition is similar to that of the vein ore, are saddle-shaped; with ore overlying the gently-dipping upper surfaces of granodiorite bodies. Granodiorite was altered by autometasomatism. Age of granodiorite and associated ore is 69 to 72 Ma (K/Ar).

Govorov, 1977; Ratkin and others, 1990.

L53-35 44°18'N 132°08'E	Voznesenka-I Voznesenka	Zn Korean Zn massive sulfide	Medium. Average grade of 4% Zn.

Consists of massive and thick-banded sphalerite and magnetite-sphalerite layers in bedded Early Cambrian limestone. Ore bodies are lenticular, 1-2 m thick, 20 to 100 m long, and occur in dolomitic limestone and marl. Sulfide bodies and host rocks are folded and reigonally metamorphosed. Sulfide bodies locally altered to skarn and greisen during emplacement of a Silurian granitic stock that intrudes the carbonate unit.

Androsov and Ratkin, 1990.

L53-36 44°11'N 132°08'E	Voznesenka-II Yaroslavka	Fluorite Fluorite greisen	Large. 450 million tons fluorite ore averaging 30-35% CaF_2. Mined since 1960's. Currently largest producer of fluorite in Russia.

Fluorite ore occurs above the apex of a 1.5 km wide intrusion of Late Cambrian (512-475 Ma) Li-F alaskite granite. Deposit interpreted as forming during metasomatic replacement of Early Cambrian, black organic limestone resulting in alteration to greisen. Deposit and vein greisen occurs along a north-south-trending fault. Muscovite-fluorite aggregate occurs at the periphery of the ore zone whereas vein greisen occurs in the middle of the zone. Greisen is often brecciated, showing a two-stage origin. Fragments of breccia consist of mica-fluorite, fluoritized limestone, greisen, and granite altered to greisen. Fragments are cemented by quartz-topaz-micaceous-fluorite aggregate during the second stage.

Androsov and Ratkin, 1990.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

L53-37	Yaroslavskoe	Sn	Medium. Average grade of 0.52% Sn. Mined during 1950's to 1970's.
44°16'N	Yaroslavka	Sn greisen	
132°13'E			

Consists of greisen that mainly replaces skarn, limestone, and schist; and to lesser extent granite and granite porphyry. Sn-bearing quartz and quartz-tourmaline veins are related replacement of skarn by greisen are classified into: (1) mineralized fracture zones,(2) ore veins, (3) veinlets and ore pods, and (4) saddle-shaped and sheeted ore. Sn ores are classified into three types based on mineral associations: (1) tourmaline-quartz; (2) tourmaline-fluorite; and (3) sulfide-tourmaline-quartz with subordinate cassiterite-polymetallic and chlorite-sulfides. The sulfide minerals are dominantly pyrite, arsenopyrite, galena, and sphalerite. Deposit occurs along the contact of a Early Paleozoic biotite granite (approximately 400 Ma), intruding a Lower Cambrian shale, siltstone, sandstone, and limestone. The pre-ore pyroxene-scapolite, vesuvianite-garnet, and epidote-amphibole skarn occurs in limestone and shale along the granite contacts, and in rare limestone inclusions within the granite.

Govorov, 1977.

L53-38	Chernyshevskoe	Zn, Pb	Small. Average grade of 1.5-6.5% Pb and 0.7-2.5% Zn.
44°24'N	Voznesenka	Korean Zn massive sulfide	
133°17'E			

Consists of sheeted pyrrhotite-arsenopyrite-pyrite-galena-sphalerite bodies that occur at the contact of a limestone sequence with overlying Early Cambrian siltstone. Rare conformable zones of disseminated sulfide mineralization occur within the limestone away from the contact. Sulfide bodies are 1 to 2 m thick, with a surface exposure 100 to 200 m long. Deposit were drilled to a depth of about 100 m.

Bazhanov, 1988.

L53-39	Lazurnoe	Cu, Mo	Small. Contains up to 3 g/t Au; 0.3-0.6% Cu; 0.008-0.2% Mo.
44°06'N	Luzhkinsky	Porphyry Cu-Mo	
134°24'E			

Consists of a stockwork of veinlets and disseminated ore in an asymmetric semi-ring; around the hypabyssal body. Chalcopyrite, bornite, pyrite, sphalerite, and molybdenite occur to a depth of 300 m. Sulfide minerals associated with propylitic alteration (epidote, chlorite, sericite, and carbonate), and weak silicification and K-feldspar alteration of veinlets. Quartz-carbonate veins with sulfides occur at surface. The porphyry stockwork zone is 500 x 60 m, with an average concentration of approximately 0.15% Cu. Deposit related to hypabyssal Late Cretaceous gabbro-monzonite and monzodiorite that intrude Lower Cretaceous sedimentary rocks adjacent to the Central Deep Fault. Mineralized stock intruded by granodiorite which contains a Au-sulfide occurrence.

R.I. Petrachenko and V.G. Gonevchuk, written commun., 1984; Petrachenko, Gonevchuk, and Petrachenko, 1987.

L54-01	Yagodnoe	Au, Ag	Small. Average grade of 4.28 g/t Au; 49.3 g/t Ag.
47°09'N	Kema	Pb, Cu, Zn	
138°35'E		Au-Ag epithermal vein	

Occurs in thin zones, up to 1 km long, of hydrothermally altered quartz and chlorite rock with superimposed Au-polymetallic deposit that contains galena and sphalerite, with minor chalcopyrite, Ag sulfides, and molybdenite. Zones are associated with Paleocene (Danian) intrusions of diorite-quartz diorite and granodiorite-granite that intrude Late Cretaceous granite.

R.I. Petrachenko, written commun., 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
L54-02 47°06'N 138°06'E	Burmatovskoe Kema	Au, Ag Au-Ag epithermal vein	Small. Average grade of 0.8-8.4 g/t Au; 10-61 g/t Ag.

Consists of Au-Ag replacement of Paleocene age that occurs as lenticular metasomatic zones of varying mineralogy: (1) hydromica-quartz; (2) sericite-chlorite-quartz; and (3) carbonate-quartz. Local skarn and propylite composed of magnetite, hematite, and chalcopyrite. Ore zones are several hundred m long. Au/Ag ratio is 1:1 to 1:100 and higher. Ore minerals, which comprise up to 10% of the rock, are gold, silver, argentite, proustite, polybasite, and pyrargyrite. Deposit not explored at depth. Host rocks are Late Cretaceous felsic tuff, tuffite, tuffaceous sandstone, and andesite that are intruded by Paleocene rhyolite and dacite.

Rodionov and Kuznetsov, 1984.

L54-03 46°58'N 138°09'E	Sukhoe Kema	Au, Ag Au-Ag epithermal vein	Small

Consists of carbonate-quartz, adularia-quartz, and chlorite-quartz veins that contain gold, silver, polybasite, pyrargyrite, proustite, galena, sphalerite, chalcopyrite, and pyrite. Hydromica-quartz alteration zones are associated with ore-bearing veins. Au/Ag ratio ranges from 1:15 to 1:40. Veins are 5 cm to 2.5 m thick and several tens to several hundred m long. Veinlet zones have no clear boundaries. Deposit hosted in altered Late Cretaceous tuff and rhyolitic lava. Ore veins and zones are related to the extrusions and dikes of Paleocene (Danian) andesite.

A.N. Rodionov, written commun., 1986.

L54-04 47°04'N 142°56'E	Bereznyakovskoe Aniva-Nabil	Mn Volcanogenic Mn	Small. Ranges from 1 to 24% Mn.

Consists of several small quartz-rhodonite lenses, with surficial pyrolusite and psilomelane in a weathered zone. Deposit occurs conformably to early to middle Paleozoic metamorphic rocks. Ore bodies are small, with dimentsions of 0.6 x 25 to 1 x 120 m.

V.D. Sidorenko, 1974.

L54-05 46°33'N 143°30'E	Burea River Unassigned	W W greisen(?)	Small. Contains up to 1% W .

Consists of veinlets disseminations of scheelite that are associated with quartz-mica alteration in a zone of hydrothermally altered Paleogene granitic rocks that intrude Jurassic and Cretaceous volcanic rocks and chert.

Sidorenko, 1974.

L54-06 46°18'N 143°26'E	Novikovskoe Aniva-Nabil	Cu, Zn, Pb Zn, Pb Cyprus massive sulfide(?)	Small. Average grade of 1% Cu, 0.1% Zn, and 0.1% Pb.

Consists of sulfide disseminations in propylitic-altered mafic volcanic rocks. Dominant metallic minerals are chalcopyrite and pyrite with subordinate galena, bornite, tetrahedrite, chalcocite and covellite. Hydrothermal alteration consists of quartz, sericite, and carbonate. Disseminations occur in zones that range from 0.1 to 0.7 m thick. Deposit hosted in a Tertiary(?) chert- and olcaniclastic rock sequence. Deposit interpreted as forming during sea floor volcanism.

Sidorenko, 1974.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

L55-01	Krishtofovich Volcano	S, FeS_2	Medium. Contains up to 35% S.
45°47'N	Kuril	Sulfur-sulfide	
149°43'E			

Sulfur occurs in pods and in disseminations that are associated with quartz-kaolinite and alunite-quartz hydrothermal alteration of flows and tuff of the Krishtofovich volcano on southern part of Urup island. Deposit occurs in the inner walls of the caldera. Massive unleached ore contains up to 35% S and forms a pipe-like body with plan dimensions of 100 x 350 m. Ore contains sulfur (up to 30%), pyrite, melnikovite (2-5%), opal, and quartz. In some places, deposit occurs as massive sulfur. Age of mineralization interpreted as Pleistocene and Quaternary.

Znamensky, 1972.

L55-02	Tet'yaevskoe	Cu, Zn, Pb	Medium. Ore contains 0.12-7.8% Cu, up to 2.7% Zn, and 0.06-2.8% Pb.
45°41'N	Kuril	Cu-Pb-Zn polymetallic vein	
149°35'E			

Consists of veinlets, disseminations, and quartz-sulfide veins that occur in hydrothermally altered siliceous rocks, and in silicified and sericite-altered volcanic and sedimentary rocks. Ore minerals are pyrite, chalcopyrite, sphalerite, and galena. Sphalerite is rich in Cd and Ge, pyrite contains Au inclusions. Area of deposit approximately 20 km^2; with uneven depth. Deposit contains fracture zones. Deposit age interpreted as Middle Miocene.

Vlasov, 1977.

L55-03	Sof'ya	Au	Small. Average grade of 0.2% Pb, up to 0.1% Cu, up to 0.12% Zn, and approximately 1 g/t Au.
45°27'N	Kuril	Au epithermal vein	
148°43'E			

Consists of linear and spaced stockwork composed of variable-trending quartz-pyrite veinlets containing barite, apatite, and adularia. Stockwork occurs along a northwest trending fracture zone. Host rocks are silicified and contain disseminated pyrite and sphalerite. Metasomatic zoning consists of the successive assemblages: (1) quartz-adularia±montmorillonite; (2) chlorite-montmorillonite; and (3) albite-chlorite-carbonate. Ore bodies up to 0.5 m thick. Occurs over an area of approximately 2 km^2 in intermediate tuff and volcanic rocks. Deposit is Late Miocene in age.

R.I. Petrachenko, written commun., 1980.

L55-04	Reidovskoe	Mo	Small. Locally contains up to 1.0% Mo.
45°12'N	Kuril	Porphyry Mo	
148°12'E			

Consists of fine disseminations and veinlets of molybdenite in altered tuffaceous rocks of intermediate and mafic composition. Rocks are silicified and contain diaspore, pyrophyllite, sericite, alunite, and dickite. Mineralized and altered rocks extend to depths of over 400 m. Ore mineral, in addition to molybdenite, include pyrite, marcasite, sphalerite, and chalcopyrite. Pliocene diorite stocks and dikes are interpreted as source of mineralizing fluids. Age of deposit interpreted as Pliocene and Quaternary.

Petrachenko and Petrachenko, 1989.

L55-05	Sernaya River	Au, Zn, Cu	Small. Ore contains up to 0.2% Zn, 0.01-0.2% Cu, 0.02-0.05% V, 0.005-0.1% Mo, and 0.8-1 g/t Au.
45°10'N	Kuril	Au epithermal vein	
148°02'E			

Consists of a series of closely spaced quartz-adularia-sulfide and quartz-adularia veinlets up to 15 to 20 cm thick, composed of barite and zeolite. Veinlets occur along intersections of circular and radial faults. Ore minerals are cleiophane, chalcopyrite, pyrite, ilsemannite, and silver suflosalts. Hydrothermal alteration assemblages are chlorite-sericite, chlorite-montmorillonite, and quartz-adularia-montmorillonite. Temperature of ore-bearing quartz deposition was 250°C. Deposit occurs at the foot of Baransky volcano, in Miocene to Pliocene tuff and tuffaceous conglomerate, at the periphery of a modern hydrothermal system. Age of mineralization interpreted as Pliocene.

R.I. Petrachenko, written commun., 1978.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
L55-06 45°01'N 147°54'E	Vysokoe Kuril	S, FeS_2 Sulfur-sulfide	Medium. Ore contains 25-30% S, and about 10,000 tonnes of S.

Consists of poorly consolidated fumarole and hot springs deposits that occur in the crater of and on the slopes of Machekha volcano. Fumarole and hot spring deposits cemented and partly replaced by sulfur. Kaolinite and opal occur in addition to sulfur. Age of mineralization interpreted as Holocene.

Vlasov, 1971.

L55-07 44°56'N 147°30'E	Novoe Kuril	S, FeS_2 Mo Sulfur-sulfide	Large. Contains up to 20-80% S and up to 0.5% MoS_2. Contains about 5 million tonnes sulfur.

Consists of sulfur bodies that occur in hydrothermally altered silicified rock, along with opalite, alunite, and kaolinite. Altered rocks contain sulfur, but highest concentrations sufur are associated with opalite, silicified rock, and alunite. Secondary minerals are barite, gypsum, marcasite, pyrite (up to 15%), and molybdenite. Deposit occurs in a flat-lying sequence, about 500 to 400 m thick, of andesite, andesite-basalt, and related tuff that crops out along scarps of a 2 km-wide erosional depression. Some ore bodies are controlled by faults. Age of mineralization interpreted as Pliocene and Quaternary.

Petrachenko, 1967.

L55-08 44°37'N 147°22'E	Rudnikovskoe Kuril	Sn, Pb, Zn Sn silicate-sulfide vein	Small. Average grade of 0.03-0.4% Sn .

Consists of disseminated pyrite, sphalerite, chalcopyrite, and cassiterite; and quartz-chlorite veinlets with cassiterite in siliceous, chloritized, and epidotized hypabyssal diorite. Sn content varies from 0.03 to 0.4% across mineralized zones that range up to 20 m wide and up to 50 m long. A few galena veins also. Deposit age interpreted as early Miocene.

Petrachenko, 1973.

L55-09 44°19'N 146°05'E	Prasolovskoe Kuril	Au, Ag Au-Ag epithermal vein.	Medium. Mined before 1990's.

Consists of veins that mostly dip steeply and range from 2-3 m thick, with a few up to 10 m thick. Veins consist mainly of banded metacolloidal gold, telluride, and quartz veins that contain up to 1-3% ore minerals. Deposit vertically zoned. From bottom to top, assemblages are: (1) gold-cassiterite-quartz; (2) polysulfide-quartz; (2) gold-telluride-quartz; and (3) gold-adularia (carbonate)-quartz. Dominant ore minerals are pyrite, chalcopyrite, bornite, chalcocite, covellite, and sphalerite. Arsenopyrite, molybdenite, cassiterite, galena, argentite, native silver, gold, hessite, naumannite, and goldfieldite are also abundant. Limonite, covellite, malachite, and azurite occur in an oxidized zone. Deposit explored to a depth of over 200 m. An area 1.5 by 0.5 km is propylitically altered and impregnated with pyrite as well as numerous quartz veinlets with epidote, sericite, adularia, chlorite, calcite, and rare barite. Earlier veinlet and disseminations are related to Miocene intrusions. Later Au-Ag minerals is related to the Pliocene volcano-plutonic complex. Deposit is associated with Pliocene plagiogranite and quartz diorite that intrude early and middle Miocene pyroclastic green tuff deposits.

Danchenko, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
L55-10 44°12'N 145°58'E	Valentinovskoe Kuril	Cu, Pb, Zn Kuroko Cu-Pb-Zn massive sulfide	Small. Average grade of 1% Cu, 1.5-1.7% Pb, and 10-13% Zn in fine-grained ore, and locally up to 4% Cu, 10-16% Zn, and 1-1.7% Pb.

Consists of two steeply-dipping, thin, lens-like deposits, up to 150 m long. Two deposit types exist. (1) most common type composed of massive, fine-grained sphalerite, galena, chalcopyrite, chalcocite, tetrahedrite, melnikovite, barite, gypsum, quartz, chalcedony, chlorite, sericite, and calcite; contains approximately 1% Cu, 1.5-1.7% Pb, and 10-13% Zn; and (2) less common ore type consists of pyrite, sphalerite, and chalcopyrite with galena and other sulfides; contains up to 4% Cu, 10 - 16% Zn, and 1 - 1.7% Pb. Deposit occurs in Early Miocene rhyolite, dacite, andesite, and andesitic tuff with chert layers. Host rocks are propylitized or sericitized, and are part of a submarine tuff complex.

Neverov, 1964.

L55-11 44°01'N 145°45'E	Spiridonovskoe Kuril	Sn, Pb, Zn Sn polymetallic vein	Small. Contains up to 0.13% Sn.

Consists of disseminated pyrite, galena, sphalerite, and stannite that occur in chlorite-sericite-K-feldspar-quartz altered rocks. Disseminations occur in fracture zones in rhyolite-dacite lava flows. Deposit age interpreted as Pliocene.

Petrachenko, 1978.

L56-01 46°58'N 152°04'E	Dushnoe Kuril	Cu, Zn, Pb Cu-Pb-Zn polymetallic vein	Small

Consists of polymetallic veins and steaks in an area about a few tens of m long that consist of disseminated chalcopyrite, sphalerite, galena, and pyrite that occur in light-colored, argillized rocks. Hydrothermal alteration associated with sulfides. Deposit hosted in Late Miocene pyroclastic rocks along Srednyaa Bay and Dushnaya Bay on Simushir Island. Deposit age interpreted as Pliocene(?).

Sidorenko, 1974.

M09-01 50°43'N 127°58'W	Red Dog Island Porphyry	Cu Ag Porphyry Cu	Medium. Reserve of 41.1 million tonnes grading 0.26% Cu, 0.34 g/t Au.

Consists of chalcopyrite and bornite that occur as disseminations and as fracture fillings in hornfels and associated with magnetite in siliceous breccia. Molybdenite occurs in lesser quantities in fractures and quartz-sericite veins that occur along shear zones. Host rocks are Lower Jurassic Bonanza Group tuffs metamorphosed to hornfels at contacts, with silicification and hydrothermal alteration. K-Ar date of 144 ± 5 Ma of the associated Island Plutonic Suite yields an approximate age of mineralization. Deposit age interepreted as Late Jurassic.

B.C. Minfile, 1989; EMR Canada, 1989; Mining Review, 1992.

M09-02 50°37'N 127°31'W	Island Copper (Rupert Inlet) Island Porphyry	Cu, Mo, Au Porphyry Cu-Mo	Large. Production and reserves of 257 million tonnes grading 0.52% Cu, 0.22 g/t Au.

Consists of pyrite, chalcopyrite and molybdenite that occur as fracture fillings and disseminations. Chalcopyrite and galena occur in minor amounts peripheral to the pyrite and chalcopyrite mineralization. Deposit occurs in two parts; the main body on the hanging wall of the dike is tabular shaped, from 60 to 180 meters wide, 1700 meters long and 300 meters deep with a strike of 290°Az and dipping 60°N parallel to the dike. The footwall zone is not as well defined as the hanging wall zone. Hosted in Lower Jurassic Bonanza Group andesitic and basaltic tuffs that are intruded by a quartz feldspar porphyry dike. A K-Ar age of 154 ± 6 Ma from nearby rocks of the Island Plutonic Suite gives an approximate age of mineralization. Deposit age interpereted as Late Jurassic.

Cargill and others, 1976; B.C. Minfile, 1989; EMR Canada, 1989.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M09-03 50°23'N 127°15'W	Benson Area (Empire, Coast Copper) Island Porphyry	Cu, Fe Au Cu-Fe skarn	Medium. Production and reserves of 3.0 million tonnes grading 1.56% Cu, 26.6% Fe, 1.4 g/t Au.

Consists of magnetite and chalcopyrite with minor bornite and pyrrhotite that occur as skarn replacement bodies along the northwest-striking and moderately west-dipping contact between Quatsino Formation limestone and Karmutsen Formation, both part of the Upper Triassic Vancouver Group. Low-grade gold and silver values are associated with chalcopyrite that occurs as veinlets and disseminations in sill-like lenses, in calc-silicate skarn and massive magnetite. Production between 1962 and 1973 from the Empire and Old Sport orebodies was 2,657,593 tonnes yielding 1.5 % Cu, 27.14% Fe, 1.47 g/t Au and 4.41 g/t Ag. Deposit age interpreted as Jurassic.

Sangster, 1969; B.C. Minfile, 1989.

M09-04 50°03'N 126°50'W	Zeballos Iron (Ford) Island Porphyry	Fe Fe skarn	Medium. Reserves of 2.268 Mt grading 7.9% Fe2O3.

Consists of magnetite that occurs as a 21-meter thick and 400 meter long, northeast-striking, northwest-dipping tabular replacement body formed along the contact between Upper Triassic Quatsino Limestone of the Vancouver Group and tuff of the Lower Jurassic Bonanza Group. Host rocks form a roof pendant surrounded by granodiorite and hornblende diorite of the Early to Middle Jurassic Island Plutonic Suite. Production, both open pit initially and later underground, between 1962 and 1969 was 1,187 tonnes Fe. Pre-production reserves in 1959 were 2.268 million tonnes grading 47.9% magnetite, with additional possible reserves of 450,000 tonnes at similar grade. Deposit age interpreted as Early to Middle Jurassic.

Sangster, 1969; B.C. Minfile, 1989.

M10-01 51°28'N 123°38'W	Fish Lake Fish Lake-Bralorne	Cu, Au Ag, Mo, Zn Porphyry Cu-Mo	Large. Reserves of 675 million tonnes grading 0.24% Cu, 0.43 g/t Au.

Consists of pyrite and chalcopyrite with minor molybdenite, bornite, sphalerite and tetrahedrite that occur in stockwork veins and as disseminations in a Late Cretaceous quartz-diorite porphyry and adjacent contact metamorphosed Lower Cretaceous sedimentary and volcanic rocks. Principal orebody (Cu >0.25%) is ovoid shaped with dimensions of 450 meters by 250 meters. A whole rock isotopic date of 77.2 ± 2.8 Ma yields a deposit age of Late Cretaceous age.

Wolfhard, 1976; B.C. Minfile, 1991; EMR Canada, 1989; McMillan, 1991; Taseko Mines Ltd., news release, May 4, 1993.

M10-02 51°23'N 120°04'W	Chu Chua Kootenay-Shuswap	Cu, Zn, Au, Ag Co Cyprus massive sulfide	Medium. Reserves of 2.5 million tonnes grading 2% Cu, 0.5% Zn, 0.5 g/t Au, 9 g/t Ag.

Consists of pyrite with chalcopyrite and minor sphalerite that occur in two major and several smaller stratiform massive sulfide lenses associated with pyritic, cherty sediments and pillowed basalt of the Upper Paleozoic (Devonian to Permian) Fennel Formation. Chalcopyrite and sphalerite occur interstitially to pyrite. Basalt locally extensively altered to talc and carbonate in satructures interpreted as vents. Open-pit geological reserves of 1.043 million tonnes grading 2.97% Cu with a 3:1 stripping ratio and a 1% Cu cut-off were reported in 1989. Deposit age interpreted as Upper Paleozoic.

Schiarizza and Preto, 1987; B.C. Minfile, 1990; EMR Canada, 1989; Hoy, 1991.

M10-03 51°03'N 122°49'W	Tungsten Queen (Silverquick, Manitou) Tyaughton-Yalakom	Hg W, Sb, Au Silica-carbonate Hg	Medium. Reserves of 1.5 million tonnes grading 0.4% Hg.

Consists of cinnabar in disseminated grains, streaks, small lenses and smears on fault surfaces in brecciated Upper Jurassic to Lower Cretaceous conglomerate at Silverquick occurrence, and in shear zones in amygdaloidal volcanics at the Manitou (Empire) occurrence. Deposit age interoreted as Eocene(?).

B.C. Minfile, 1985; EMR Canada, 1989; Schiarrizza and others, 1990.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M10-04 51°08'N 122°37'W	Poison Mountain (Copper Giant) Fish Lake-Bralorne	Cu, Mo Ag, Au Porphyry Cu-Mo	Medium. Reserves of 180 million tonnes grading 0.31% Cu, 0.007% Mo, 0.14g/t Au, 40g/t Ag.

Consists of pyrite, chalcopyrite, molybdenite and bornite that occur in veinlets, fracture fillings and disseminations. Deposit hosted mainly in and near the perimeter of the core of a zoned Eocene intrusive, hosted by greywacke and grit of Upper Jurassic-Lower Cretaceous Relay Mountain Group. Intrusive core is hornblende-quartz monzonite porphyry. Deposit age interpreted as Eocene(?).

Seraphim and Rainboth, 1976; EMR Canada, 1989; McMillan, 1991; George Cross Newsletter no. 65, April 2, 1993.

M10-05 50°47'N 122°49'W	Bralorne, Pioneer (Bridge River Area) Fish Lake-Bralorne	Au W, Sb Au-Sb polymetallic vein	Medium. Production and reserves of 8.34 million tonnes grading 16.2 g/t Au.

Consists of gold in quartz veins (fracture fillings) with pyrite, arsenopyrite and scheelite. Veins range from 1.5 to 2 meters wide and are hosted in Permo-Triassic diorite, gabbro and greenstone in a steeply dipping north-trending shear zone (Cadwallader Break) and associated with Late Cretaceous (86-91 Ma) porphyry dikes. Significant production occurred in two major deposits, the Bralorne and Pioneer mines. Production from the Bralorne mine from 1899 to 1971 was 81.1 tonnes Au from 5.0 million tonnes milled and production from the Pioneer mine between 1908 and 1960 was 40.4 tonnes Au from 2.4 million tonnes milled. Proven ore probable reserves for Bralorne above and below the 1000 m level are 965,000 tonnes grading 9.3 g/t Au. Deposit age interpreted as Late Cretaceous.

B.C. Minfile, 1985; EMR Canada, 1989; Leitch and others, 1989; B.C. Minfile, 1991.

M10-06 50°55'N 121°25'W	Maggie (Bonaparte River) Fish Lake-Bralorne	Cu, Mo Porphyry Cu-Mo	Medium. Reserves of 181 million tonnes grading 0.28% Cu, 0.029% MoS2.

Consists of chalcopyrite and molybdenite that occur as fine disseminations in quartz veins and in host rock and as narrow veinlets within or bordering quartz and to lesser degree calcite veins. Potassic and phyllic alteration assemblages overlap in the zones of high grade ore; phyllic and argillic assemblages are associated with lower grade ore. Principal host rock is quartz monzonite of the Tertiary (61 Ma) Maggie Stock. Part of deposit occurs within Upper Paleozoic and Lower Mesozoic Cache Creek Group metasedimentary and metavolcanic rocks. Deposit age interpreted as Paleocene.

Miller, 1976; EMR Canada,1989, MR 223; B.C. Minfile, 1990; Mining Review, 1992;

M10-07 50°23'N 122°45'W	Owl Creek district Owl Creek	Cu, Mo Porphyry Cu-Mo	Medium. Estimated 10 to 20 million tonnes grading 0.3% to 0.4% Cu, 0.03% MoS2.

Consists of several zones of chalcopyrite, molybdenite and pyrite with minor bornite that occur as blebs, disseminations and fracture fillings. Deposit hosted in Jurassic to Tertiary quartz diorite and feldspar porphyry intrusives of the Coast Plutonic Complex and in propylitic and argillic altered and dioritized volcanic rocks of the Upper Triassic Cadwallader Group. Deposit age interpreted as Tertiary.

BCGS, 1970; Mahoney, 1977; EMR Canada, 1989; B.C. Minfile, 1991.

M10-08 50°30'N 120°59'W	Bethlehem-JA Guichon	Cu, Mo Porphyry Cu-Mo	Large. Production and reserves of 430 million tonnes grading 0.45% Cu.

Bethlehem deposits (Jersey, East Jersey, Huestis, Iona and JA) consist of chalcopyrite, bornite, specularite and molybdenite with minor magnetite and chalcocite as fracture fillings and to a lesser degree as disseminations hosted within granodioritic and quartz dioritic phases of the Late Triassic-Early Jurassic Guichon Creek Batholith. Reserves for the JA are 286 million tonnes at 0.43% Cu and 0.017% MoS2. Reserves and production for the remaining Bethlehem deposits are 144 million tonnes at 0.50% Cu and 0.013 g/t Au. Deposit age interpreted as Early Jurassic (199 Ma).

Briskey and Bellamy, 1976; B.C. Minfile, 1988; McMillan, 1985, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M10-09 50°29'N 121°03'W	Valley Copper Guichon	Cu, Mo Porphyry Cu-Mo	Large. Production and reserves of 716 million tonnes grading approximately 0.47% Cu, 0.006% Mo.

Consists of disseminated chalcopyrite (potassic alteration) and bornite (phyllic alteration) with minor digenite, covellite, pyrite, pyrrhotite, molybdenite, sphalerite and galena. Deposit hosted in granodiorite and quartz monzonite of the Bethsaida phase of the Guichon Creek Batholith (204 Ma). Minor amounts of iron-antimony sulfide (gudmundite) and native gold have also been reported. An oxidized halo of ranging in thickness from 0.3 to 100 meters consists of limonite, malachite, pyrolusite, digenite, native copper and tenorite . The average thickness of the oxidized zone is 33 meters. Deposit age interpreted as Early Jurassic.

Osatenko and Jones, 1976; McMillan, 1985, 1991; B.C. Minfile, 1989; Highland Valley Copper Ltd., annual report, 1991.

M10-10 50°27'N 121°03'W	Lornex Guichon	Cu, Mo Porphyry Cu-Mo	Large. Production and reserves of 530 million tonnes grading approximately 0.37% Cu, 0.014% Mo.

Consists of chalcopyrite, bornite, molybdenite and pyrite as fracture fillings and coatings hosted. Deposit hosted in granodiorite of the Skeena phase of the Guichon Creek Batholith (204 Ma) and pre-mineralization quartz porphyry dike related to the Bethsaida phase. Western edge of the orebody is faulted off, and the extension is probably represented by the Valley Copper deposit 2.5 km north. Deposit age interpreted as Early Jurassic.

Waldner and others, 1976; McMillan, 1985, 1991; B.C. Minfile, 1991; Highland Valley Copper Ltd., 1991.

M10-11 50°26'N 120°60'W	Highmont (Gnawed Mountain) Guichon	Cu, Mo Porphyry Cu-Mo	Medium. Production and reserves of 123 million tonnes grading 0.23% Cu, 0.006 g/t Au, 0.021% Mo.

Consists of four large, low-grade mineralized zones and three smaller zones at the southern end of the Highland Valley porphyry copper district. Ore minerals consist of chalcopyrite, bornite and molybdenite in veins and fractures with minor disseminated chalcopyrite hosted in quartz diorite of the Skeena phase and quartz monzonite of the Bethsaida phase of the Guichon Creek Batholith (204 Ma). Deposit age interpreted as Early Jurassic.

Reed and Jambour, 1976; McMillan, 1985, 1991; B.C. Minfile, 1991.

M10-12 50°40'N 120°31'W	Iron Mask Area (Afton, Ajax) Copper Mountain (South)	Cu Au Porphyry Cu-Au	Medium. Production and reserves of 66 million tonnes grading 0.77% Cu, 0.56 g/t Au.

Major porphyry Cu-Au deposits at Afton and Ajax (West and East) are hosted in Iron Mask Batholith that contains several shallow, open-pit, alkaline intrusive-related, porphyry Cu-Au deposits. Afton Mine is a tabular-shaped deposit hosted hosted in fractured diorite of the Cherry Creek pluton (U-Pb zircon age of 207 Ma) with a deeply penetrating supergene zone characterized by the presence of native copper and lesser chalcocite. The hypogene zone at Afton mine consists of chalcopyrite, bornite and pyrite mineralization in fractures. Ajax deposit, located 10 km southeast of Afton Mine near the southwestern edge of the batholith, occurs at the intersection of two major dioritic phases of the batholith, the Sugarloaf diorite and the hybrid diorite. Ore minerals are pyrite and chalcopyrite with trace amounts of bornite, chalcocite and molybdenite. Deposits ages interpreted as Early Jurassic.

Kwong, 1987; B.C. Minfile, 1990; McMillan, 1991; Ross and others, 1992, 1993.

M10-13 50°03'N 124°39'W	O.K. Gambier	Cu, Mo Zn Porphyry Cu-Mo	Medium. Reserves of150 million tonnes grading 0.39% Cu, 0.024% MoS2.

Consists of chalcopyrite, molybdenite and pyrite with minor sphalerite and bornite that occur in fractures, as quartz stringers, irregular veinlets, blebs and as disseminations. Deposit hosted primarily in granodiorite of the Coast Plutonic Complex adjacent to an elliptical quartz monzonite body. Intrusives ages range from Jurassic to Tertiary, mineralization is Late Cretaceous. Deposit age interpreted as Late Cretaceous.

Meyer and others, 1976; B.C. Minfile, 1988; EMR Canada, 1989; Mining Review, 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M10-14 50°13'N 120°56'W	Craigmont Guichon	Cu, Fe Au, Ag Cu-Fe skarn	Medium. Production and reserves of 34.9 million tonnes grading 1.21% Cu, 19.6% Fe.

Consists of magnetite, hematite and chalcopyrite that occur as massive pods, lenses and disseminations within a calc-silicate skarn assemblage that replaces carbonates. Host rocks part of the Triassic Nicola Group that occurs the southern boundary of the Lower Jurassic Guichon Batholith. Production between 1962 and 1982 was 33.4 million tonnes grading 1.21% Cu, 0.002 g/t Au and 0.007 g/t Ag. Reserves are estimated at 1.5 million tonnes grading 1.13% Cu. A 500,000 tonne stockpile of magnetite ore exists, from which approximately 45,000 tonnes per year are shipped to coalfields for use in heavy media separation. Deposit age interpreted as Early Jurassic.

Morrison, 1980; B.C. Minfile, 1983, 1988; Dawson and others, 1991.

M10-15 49°34'N 125°36'W	Westmin (Buttle Lake-Myra, Lynx, H-W, Battle) Mount Sicker	Zn, Cu, Ag, Au Pb, Ba Kuroko Zn-Cu massive sulfide	Large. Production and reserves of 30.3 million tonnes grading 2.23g/t Au, 54.5g/t Ag, 2.12% Cu, 7.1% Zn.

Consists of massive sphalerite, chalcopyrite, pyrite and lesser galena and barite with minor tennantite, bornite, pyrrhotite, digenite, covellite and stromeyerite that occur in a number of lenses along an east-west trend. Deposit hosted within Late Devonian Myra Formation felsic volcanics of the Sicker Group. Deposits occur at two stratigraphic levels; the H-W horizon at the base of the Myra Formation, and the Lynx-Myra-Price horizon in the central portion of the Myra Formation. Stratigraphic footwall of >300 m of basaltic andesite is intensely altered to quartz-sericite-pyrite under the H-W deposit. Recent exploration by Westmin Resources Ltd., has extended reserves by finding new orebodies at both stratigraphic horizons and by re-evaluating sulfide clast-bearing breccias. Deposit age interpreted as Upper Devonian.

B.C. Minfile, 1990; Juras and Pearson, 1991; Hoy, 1991; George Cross Newsletter no. 30, February 12, 1993.

M10-16 49°45'N 124°33'W	Texada (Vananda, Marble Bay, etc.) Island Porphyry	Cu, Au, Ag Cu-Au skarn	Medium. Produced 393,190 tonnes grading 6.2% Cu, 2.3 g/t Au, 9.9 g/t Ag.

Consists of chalcopyrite and bornite that occur in irregular pipe-like bodies in several copper skarn deposits in the northern portion of Texada Island. Deposit hosted within limestonesof the Upper Triassic Quatsino Formation and occurs along contacts with Middle to Late Jurassic dioritic intrusions of the Island Suite. Main producers of the Vananda area were the Marble Bay, Copper Queen, Cornell and Little Billie mines where, between 1896 and 1952, 393,190 tonnes of production yielded 897 kg of Au, 3.9 tonnes of Ag and 2,438 tonnes of Cu. Drill indicated reserves at the Little Billie deposit are reported as 181,400 tonnes grading 11.1 g/t Au, 34.3 g/t Ag, and 2.0% Cu. Deposit age interpreted as Jurassic.

B.C. Minfile, 1983, 1990; Vananda Gold Ltd., annual report,1992; Webster and Ray, 1990; Ray and Webster, 1991.

M10-17 49°43'N 124°33'W	Texada Iron Island Porphyry	Fe Cu, Ag, Au, Zn Fe skarn	Medium. Produced 17.6 million tonnes grading 61% Fe.

Consists of massive magnetite skarn mineralization that occurs as replacement bodies at the Prescott, Yellow Kid, and Paxton mines. Deposits hosted within limestones of the Upper Triassic Quatsino Formation at or near contacts with quartz monzonite of the Middle Jurassic Gillies Stock (U-Pb zircon date of 178 Ma). Massive magnetite is associated with garnet, pyroxene, epidote, amphibole, minor calcite and sporadic pyrite and pyrrhotite. Rare arsenopyrite and sphalerite also occur. Recent sampling of Fe-skarn magnetite from the Texada Iron Mines with values of 3.14% Cu, 46.6 g/t Ag and 2.8 g/t Au. Deposit age interpreted as Middle Jurassic.

Sangster, 1969; B.C. Minfile, 1990; Webster and Ray, 1990.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
M10-18 49°31'N 123°22'W	Gambier Island Gambier	Cu, Mo Zn, Pb Porphyry Cu-Mo	Medium. Reserves of 114 million tonnes grading 0.29% Cu, 0.018% MoS2.

Consists of pyrite, chalcopyrite and molybdenite that occur as disseminations, fracture fillings and veinlets. Deposit hosted in early Tertiary quartz porphyry intrusive of the Coast Plutonic Complex and adjacent volcanics of the Cretaceous Gambier Group. Tertiary intrusive rocks form a 500 meter diameter, northwest trending oval-shaped stock. Deposit occurs in a broad arcuate zone 200 meters wide and 1200 meters long. Deposit age interpreted as early Tertiary.

EMR Canada, 1989; B.C. Minfile, 1990; Mining Review, 1990.

M10-19 49°37'N 123°08'W	Britannia Britannia	Cu, Zn Ag, Au Kuroko Cu-Zn massive sulfide	Medium. Production and reserves of 49.3 million tonnes grading 2.8%Cu, .32g/t Au, 3.78g/t Ag, 0.26% Zn.

Consists of massive pyrite, chalcopyrite, sphalerite with minor galena, tennantite, tetrahedrite, barite and fluorite that occur in numerous discrete, concentrically zoned siliceous ore bodies. Deposits hosted in a deformed roof pendant of Lower Cretaceous metavolcanic rocks of the Gambier Overlap Assemblage enclosed within granodiorite of the Coast Plutonic Complex. Principal host rocks are foliated pyroclastic rocks of dacitic to andesitic composition. During the period from 1905 to 1974 the Britannia Mine produced 47,884,558 tonnes of ore from which 15.3 tonnes Au, 180.8 tonnes Ag, 517 tonnes Cu, 15.6 tonnes Pb and 125.3 tonnes Zn were recovered. Measured and drill-indicated reserves are 1.57 million tonnes grading 1.9% Cu remain. Deposit age interpreted as Early Cretaceous.

Payne and others, 1980; B.C. Minfile, 1983, 1990; EMR Canada, 1989; Dawson and others, 1991.

M10-20 49°43'N 121°43'W	Clear Creek (Gem) Owl Creek	Mo Cu, Zn, W, Bi Porphyry Mo	Medium. Reserves of 15.9 million tonnes grading 0.07% Mo.

Consists of molybdenite with minor pyrite and sphalerite that occur in quartz and calcite veins and as fracture fillings. Deposit occurs in an arcuate zone in and surrounding an Oligocene quartz monzonite stock (Gem Stock, K-Ar age of 35 Ma). Other host rocks are quartz diorite and granodiorite of the mid-Cretaceous Spuzzum pluton and schist and gneiss of the Cretaceous Settler Schist. Deposit age interpreted as Oligocene.

EMR Canada, 1989; B.C. Minfile, 1992.

M10-21 49°39'N 120°32'W	Axe (Summers Creek, Axe) Guichon	Cu Mo Porphyry Cu-Mo	Medium. Estimated 57.5 million tonnes grading: 0.5% Cu.

Consists of disseminated chalcopyrite, pyrite and molybdenite with minor chalcocite that occur as disseminations and fracture fillings in mafic volcanics of the Upper Triassic Nicola Group associated with felsic and mafic Jurassic granodiorite intrusives. Alteration is potassic and argillic with quartz-sericite alteration also reported. Three zones are explored, the South Zone, West Zone and Adit Zone. Reserve estimates uncertain due to poor core recovery. Deposit age interpreted Jurassic.

Northern Miner, September, 1973; Ney and Hollister, 1976; B.C. Minfile, 1985; EMR Canada, 1989;

M10-22 49°45'N 120°28'W	Primer (North Zone) Guichon	Cu, Fe Porphyry Cu	Medium. Reserves of 23 million tonnes grading 0.20% Cu.

Consists of chalcopyrite and pyrite that occur with magnetite and quartz as fracture fillings. Deposit hosted in Jurassic feldspar porphyry which intrudes Triassic Nicola Group volcanics. Deposit age interpreted as Jurassic.

Ney and Hollister, 1976; B.C. Minfile, 1985; EMR Canada, 1989.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M10-23	Brenda (Peachland Area)	Cu, Mo	Large. Production and reserves of 164.0 million tonnes grading 0.16% Cu, 0.04% Mo, 0.031 g/t Au, 0.63g/t Ag.
49°53'N	Guichon	Ag, Au, Zn	
120°00'W		Porphyry Cu-Mo	

Consists of chalcopyrite and molybdenite with minor pyrite and magnetite occur within veins and fractures. Deposit hosted in granodiorite and quartz diorite of the Middle Jurassic Brenda Stock. Mineralization occuring during at least five stages of vein emplacement, each with unique attitudes and overall mineralogy developed in fractures. Grade is a function of fracture density and mineralogy of the veins. Potassic alteration (K-feldspar and biotite) accompanies sulfide mineralization. K-Ar hornblende age of 176 Ma for the Brenda Stock and K-Ar biotite age of 146 Ma (latest Jurassic) interpreted as age of deposit.

Soregaroli and Whittford, 1976; B.C. Minfile, 1985, 1990; McMillan, 1991.

M10-24	Catface	Cu	Medium. Reserves of 181 grading 0.45% Cu, 0.05 g/t Au.
49°15'N	Catface	Au, Mo	
125°59'W		Porphyry Cu-Mo	

Consists of chalcopyrite, bornite, chalcocite, pyrite, pyrrhotite and molybdenite that occur in fractures and quartz veinlets. Deposit hosted in quartz monzonite and quartz diorite of the Eocene Catface Suite, and by meta-basalt of uncertain origin, either Upper Triassic Karmutsen Formation or Paleozoic Sicker Group. K-Ar biotite age of 48 ± 12 Ma for the Catface Intrusive Suite interpreted as Eocene age of deposit.

McDougall, 1976; B.C. Minfile, 1990; Dawson and others, 1991; Mining Review, 1992.

M10-25	Kennedy Lake (Brynnor)	Fe	Medium. Produced 4.48 million tonnes grading 68.3% Fe.
49°03'N	Island Porphyry	Fe skarn	
125°26'W			

Consists of magnetite skarn replacement of Upper Triassic Quatsino limestone along a stratigraphic contact with interbedded tuff. Skarn occurs adjacent to an intrusive contact with quartz diorite of the Early to Middle Jurassic Island Suite. Pyrite and pyrrhotite occur in trace quantities within the magnetite. Two orebodies occur: the main body, which was mined by open pit between 1962 and 1968; and a second body located east-southeast of the open pit. Reserve data not available, but are probably sufficient to allow the classification of the Brynnor deposit as a medium size deposit (>5 million tonnes contained metal). Deposit age interpreted as Early to Middle Jurassic.

Sangster, 1969; B.C. Minfile, 1983, 1988.

M10-26	Lynn Creek	Zn, Pb	Medium. Reserves of 272,000 tonnes grading 9.0% Zn (average), variable Ag.
49°25'N	Gambier	Ag, Cu	
123°04'W		Zn-Pb skarn	

Consists of sphalerite, galena, pyrrhotite, chalcopyrite and pyrite in quartz veins and calc-silicate skarn. Deposit hosted in shear zones in a roof pendant of Jurassic to Cretaceous metasedimentary and metavolcanic rocks of the Gambier Group enclosed within diorite of the Coast Plutonic Complex. Ag ranges up to 68.6 g/t, Zn up to 20%. Deposit age interpreted as Late Cretaceous-Tertiary.

Western Miner, no. 112, p. 32-34, 1963; Northern Miner, October 31, 1963; B.C. Minfile, 1985, 1989; EMR Canada, 1989.

M10-27	Seneca (Harrison)	Zn, Cu, Pb, Ag	Medium. Reserves of 1.50 million tonnes grading 3.57% Zn, 41.13 g/t Ag, 0.82 g/t Au.
49°19'N	Unassigned	Au, Ba	
121°57'W		Kuroko Zn-Cu-Pb massive sulfide	

Consists of sphalerite, chalcopyrite, pyrite, galena and barite that occur as massive stratiform bodies. Hosted in felsic tuffs and coarse pyroclastics and overlain by andesite flows of the Jurassic Harrison Lake Formation. Reserves also contain 0.63% Cu and 0.15% Pb. Deposit age interpreted as Jurassic.

B.C. Minfile, 1988; Dawson, and others, 1991; International Curator Resources Ltd., new release, November, 1991.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
M10-28 49°29'N 121°31'W	Giant Nickel (Pride of Emory) Unassigned	Ni, Cu Au, PGE Gabbroic Ni-Cu	Medium. Produced 4.3 million tones grading 0.77% Ni, 0.33% Cu, 0.68 g/t Au.

Consists of seventeen deposits that occur in three types of pipe-like orebodies. Deposits extend 3 km along strike. Deposits consist of: (1) zoned, with disseminated pyrrhotite, pentlandite and chalcopyrite that show evidence of forming by magmatic segregation; (2) Massive pyrrhotite, pentlandite and chalcopyrite confined to fault and contact zones; and (3) narrow vein-like tabular bodies with limited orel. Chromite occurs in sulfides in at least one orebody. Twenty-eight orebodies are known with production from twenty-two. Deposits hosted in an elongated stock-like ultramafic body interpreted as earliest phase of the mainly dioritic Spuzzum Pluton (95-120 Ma). Maximum grades are 2.6% Ni, 0.9% Cu, 1.0% Cr, 0.1% Co, 0.68 g/t Au, 2 g/t Pt and 7.2 g/t Pd. Proven and probable reserves are 5.07 million tonnes grading 0.4% Ni and 0.14% Cu. Deposit age interpreted as Cretaceous.

Aho, 1956; Clark, 1969; Christopher and Robinson, 1975; B.C. Minfile, 1985, 1989; Dawson and others, 1991.

M10-29 49°10'N 121°01'W	Giant Copper (Canam, A.M.) Fish Lake-Bralorne	Cu, Mo Au, Ag Porphyry Cu-Mo	Medium. Reserves of 22.9 million tonnes grading 0.75% Cu, 0.41 g/t Au, 12 g/t Ag.

Consists of chalcopyrite, pyrrhotite, pyrite and arsenopyrite that occur in a vertical, elongate, pipe-like body that intrudes metasedimentary and metavolcanic rocks of the Jurassic Dewdney Creek Group. Host rocks intruded locally by quartz diorite of the Invermay stock. A copper equivalent (CuE) of 1.21% is estimated for a potential open pit mine (one of three proposed by operators, Bethlehem Resources Ltd.) with a stripping ratio of 4.5:1. Uraninite and monazite are reported. Deposit age interpreted as Cretaceous.

B.C. Minfile, 1985, 1990; EMR Canada, 1989; Bethlehem Resources Ltd., annual report, 1990.

M10-30 49°28'N 120°50'W	Lodestone Mountain Area Copper Mountain (South)	Fe, V PGE Zoned mafic-ultramafic Fe-V	Medium. Reserves of 81.65 million tonnes grading 17.56% Fe.

Consists of titaniferous magnetite and ilmenite that occur in pods and lenses and as disseminated grains in pyroxenite of the Tulameen layered mafic-ultramafic (Alaskan type) complex. Deposit primairly by magmatic differentiation. Minor Pt reported. Report Ti content of magnetite of 1%. An additional 249 million tons of possible and inferred ore is estimated. Deposit age interpreted as Early Jurassic.

Findlay, 1969a, b; B.C. Minfile, 1985, 1988; St. Louis and others, 1986; EMR Canada, 1989.

M10-31 49°20'N 120°32'W	Copper Mountain (Ingerbelle, etc.) Copper Mountain (South)	Cu Au, Ag, PGE Porphyry Cu-Au	Large. Production, resource, and reserves of 435 million tonnes grading 0.44%Cu, 0.14 g/t Au.

Consists of chalcopyrite and bornite that occur as disseminations and in stockworks in Late Triassic alkaline intrusive rocks of the Copper Mountain Suite and similar aged volcanic and volcaniclastic rocks of the Nicola Group. This and similar deposits in the Copper Mountain area occur along a northwest trend for over 4 km. Main orebodies are the Copper Mountain, Pits 1-3, Ingerbelle East, Ingerbelle, Virginia and Alabama. Production, to 1994, of 108 Mt of ore yielded 770,000 t Cu and 21.8 t Au. Reserves are 127 million tonnes of 0.38% Cu, 0.16 g/t Au and 0.63 g/t Ag. Resources of 200 Mt at 0.4% Cu equivalent, are estimated. Deposit age interpreted as Early Jurassic.

Fahrni and others, 1976; B.C. Minfile, 1990; McMillan, 1991; P. Holbeck, Cordilleran Roundup, written commun., 1995.

M10-32 49°22'N 120°02'W	Hedley Camp (Nickel Plate, Mascot, etc) Guichon	Au, Ag Cu, Co, Zn Au skarn	Medium. Reserves of 5.07 million tonnes grading 3.0 g/t Au, 2.5 g/t Ag, 0.1% Cu.

Consists of pyrrhotite, arsenopyrite, pyrite, chalcopyrite and sphalerite with trace galena, native Bi, native Au, electrum, tetrahedrite, native Cu, molybdenite and cobaltite. Hosted in calc-silicate skarn associated with contact metamorphism of limestone of the eastern sedimentary facies of the Upper Triassic Nicola Group adjacent to the Early Jurassic Hedley diorite and gabbro intrusives. Production (1904-1991) from 8.43 Mt ore was 62.68 t Au and 14.74 t Ag from Nickel Plate, Mascot, French, Goodhope and Canty. Deposit age interpreted as Early Jurassic.

B.C. Minfile, 1990; Ray and Webster, 1991; Ettlinger and others, 1992; Ray and others, 1993; Ray and Dawson, 1994.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M10-33 48°52'N 123°47'W	Mt.Sicker Area (Lenora-Tyee, Twin J, Lara, Mount Sicker	Cu, Zn, Ag Au, Pb, Ba Kuroko Zn-Pb-Cu massive sulfide	Medium. Production and reserves of 33.5 million tonnes grading 0.78% Cu, 20.23 g/t Ag, 1.25 g/t Au.

Consists of massive pyrite, chalcopyrite, sphalerite, galena with barite hosted in felsic volcanic tuffs of the McLaughlin Ridge Formation (Sicker Group). Reserves and production for the Lenora-Tyee-Twin J deposit are 594,852 tonnes grading 2.46% Cu, 3.85% Zn, 0.37% Pb, 117.0 g/t Ag and 2.5 g/t Au. Reserves for the Lara deposit are 529,000 tonnes grading 1.01% Cu, 5.87% Zn, 1.22% Pb, 100.1 g/t Ag and 4.73 g/t Au. Reserves for the Copper Canyon deposit are 32.4 million tonnes grading 0.75% Cu, 8.57 g/t Ag and 1.17 g/t Au. Deposit age interpreted as Late Devonian.

EMR Canada, 1989; B.C. Minfile, 1990; Dawson and others, 1991; Hoy, 1991.

M10-34 48°27'N 124°02'W	Jordan River (Sunro) Unassigned	Cu, Ag, Au Mo Gabbroic Cu	Medium. Production and reserves of 2.8 million tonnes grading 1.24% Cu, 1.7g/t Ag, .67g/t Au.

Consists of calcopyrite, pyrrhotite, pyrite and minor molybdenite with trace pentlandite, native copper and cubanite. Deposit hosted in shear zones within Eocene Metchosin Volcanics associated with and adjacent to gabbro dikes. Minor ore minerals also occur in the gabbro dikes. Production between 1962 and 1974 was 1,329,034 tonnes with processing of 2,262,651 g of Ag, 899,273 g of Au and 13,754,271 kg of copper. Reserves of 1.47 million tonnes grading 1.43% Cu. Deposit age interpreted as Eocene.

Stevenson, 1950; B.C. Minfile, 1983, 1990.

M10-35 49°57'N 124°21'W	Hi-Mars (Lewis Lake) Gambier	Cu, Mo Porphyry Cu-Mo	Medium. Estimated 82 million tonnes 0.3% Cu, minor Mo.

Consists of chalcopyrite and molybdenite that occur as disseminations and fracture fillings in granodiorite of the Coast Plutonic Complex. Companion silicificic and potassic alteration. Deposit age interpreted as Late Cretaceous.

BCDM GEM 1972, p.272; George Cross Newsletter no. 49, March 10, 1978.

M11-01 51°47'N 118°57'W	Ruddock Creek Monashee	Zn, Pb, Ag F, Ba Sedimentary exhalative Zn-Pb	Medium. Reserves of approximately 5.0 million tonnes grading 7.5% Zn, 2.5% Pb.

Consists of three mineralized zones with banded sphalerite, pyrrhotite, galena, pyrite and minor chalcopyrite and local barite and fluorite occur as discontinuous folded lenses and layers over a strike length of several kilometers. Hosted in schist, calc-silicate gneiss, quartzite and marble of Late Proterozoic age. Deposit age interpreted as Late Proterozoic.

Hoy, 1982a; B.C. Minfile, 1986; Dawson and others, 1991.

M11-02 51°34'N 119°54'W	Rexspar (Birch Island) Kootenay-Shuswap	U, F, Sr, REE, Th Felsic plutonic U-REE	Medium. Reserves of 1.1 million tonnes grading 1.55% U3O8 , 30% CaF.

Consists of three zones of uranium-thorium-fluorite and one zone of fluorite. Zones occur in an alkalic volcanic succession of probable Late Paleozoic age. Mineralization probably syngenetic with the host rocks and derived from deuteric, volatile-rich fluids associated with the later stages of the alkalic plutonic-volcanic igneous activity. Commercial grades of uranium mineralization are associated with fluorphlogopite-pyrite replacement of trachytic alkali-feldspar porphyry. Fluorite reserves of 1.36 million tonnes of 30% CaF. Deposit age interpreted as Mississippian.

Northern Miner, September 6, 1977; Preto, 1978; B.C. Minfile, 1985; R.T. Bell, written commun., 1992; Mining Review, 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M11-03 51°31'N 119°49'W	Harper Creek Kootenay-Shuswap	Cu, Ag, Au Mo,Pb,Zn Cyprus massive sulfide	Medium. Reserves of 96 million tonnes grading 0.41%Cu, 2.5g/t Ag, 0.04g/t Au, .016% Mo.

Consists of disseminated pyrite, pyrrhotite and chalcopyrite with minor molybdenite, galena, sphalerite, and tetrahedrite that occur in tabular zones. Hosted in mafic metavolcanics and quartz-sericite phyllites of the Devonian Eagle Bay Formation. Deposit is stratabound at a regional scale. Locally, mineralization crosses bedding and schistosity. Skarn origin suggested (Schiarizza and Preto, 1987) with a relation to Devonian intrusive rocks, now metamorphosed to orthogneiss. Deposit consists of two parts: (1) the East Zone with reserves of 42.5 million tonnes grading 0.39% Cu, 2.4 g/t Ag, and 0.044 g/t Au; and (2) the West Zone with reserves of 53.5 million tonnes grading 0.42% Cu, 2.6 g/t Ag and 0.047 g/t Au. Deposit age interpreted as Devonian(?).

B.C. Minfile, 1987, 1989; Preto and Schiarizza, 1985; Schiarizza and Preto, 1987; Mining Review, 1992.

M11-04 51°27'N 118°49'W	Cottonbelt Monashee	Pb, Zn, Ag Cu, Mo Sedimentary exhalative Pb-Zn	Medium. Reserves of 725,760 tonnes grading 6% Pb, 5% Zn, 60 g/t Ag.

Consists of coarse grained sphalerite, magnetite, galena and minor pyrrhotite and molybdenite in a dark green calc-silicate assemblage of garnet, diopside, calcite, dolomite and quartz that occur parallel to bedding. Hosted in calcareous metasedimentary rocks in layers up to 2 m thick and occurs intermittently over a strike length of 5 km. Deposit age interpreted as Late Proterozoic.

Hoy, 1982a; B.C. Minfile, 1987; MacIntyre, 1991.

M11-05 51°38'N 118°26'W	Goldstream (Pat) Kootenay-Shuswap	Cu, Zn, Ag Besshi massive sulfice	Medium. Reserves of 3.2 million tonnes grading 4.5% Cu, 3.1% Zn, 20 g/t Ag.

Consists of massive pyrrhotite, chalcopyrite and sphalerite often exhibiting gneissic texture with sub-rounded quartz, phyllite and carbonate inclusions. Deposit occurs as a thin, conformable sheet (400 x 1500 x 1-3m thick) and as several other horizons in sericite qquartzite and calcareous and chloritic phyllite in the lower Index Formation of the Cambrian Lardeau Group. Host metavolcanic-phyllite unit consists of mafic tholeiitic volcanics, massive greenstone, chloritic phyllite, ultramafic pods and dark calcareous to pelitic schist. 427,886 tonnes of ore were mined in 1983 and 1984 averaging 8.9 g/t Au, 4.43% Cu and 0.12% Zn. Production restarted in 1992. Reserves at the start of 1994 were 1 million tonnes grading 4.3% Cu, 2.9 % Zn, and 12 g/t Ag. Deposit age interpreted as Cambrian.

Hoy, 1979, 1991; B.C. Minfile, 1987.

M11-06 51°09'N 119°49'W	Rea Gold (Hilton) Kootenay-Shuswap	Ag, Pb, Zn, Au, Cu Kuroko Zn-Pb-Cu massive sulfide	Medium. Reserves of 376,385 tonnes grading 76g/t Ag, 2.2% Pb, 2.3% Zn, 6.1g/t Au, 0.5% Cu.

Consists of two massive sulfide (pyrite, arsenopyrite, sphalerite, galena, chalcopyrite, and tetrahedrite) and barite lenses. Hosted in a succession of Upper Devonian to Lower Carboniferous mafic to intermediate volcanic and volcaniclastic rocks with minor associated chert and phyllite (Eagle Bay Formation). Gold occurs in the massive sulfides and in barite and in informally-named "footwall" stockwork zone. Deposit age interpreted as Devonian and Carboniferous.

Hoy and Goutier, 1986; B.C. Minfile, 1987; Hoy, 1991.

M11-07 51°07'N 119°50'W	Homestake (Squaam Bay) Kootenay-Shuswap	Ag, Pb, Zn, Au, Cu, Ba Kuroko Zn-Pb-Cu massive sulfide	Medium. Reserves of 919,420 tonnes grading 248g/t Ag, 2.5% Pb, 4% Zn, 0.55% Cu.

Consists of two tabular sulfide-barite horizons that occur in intensely quartz-sericite-pyrite altered sericite schist derived from felsic (tuffaceous units of andesite, dacite and rhyolite) of the Devonian Eagle Bay Formation. Sulfides include tetrahedrite, galena, sphalerite, pyrite and chalcopyrite. Deposit overlain by intermediate to felsic volcanics of Eagle Bay Formation. Rea Gold volcanogenic deposit occurs in same unit about 4 km to northwest. Reserves include 275,500 tonnes grading 36.7% Ba. Deposit age interpreted as Late Devonian.

Hoy and Goutier, 1986; B.C. Minfile, 1989; Dawson and others, 1991; Hoy, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M11-08 51°08'N 118°28'W	Mount Copeland Monashee	Mo Pb, Zn, Cu Porphyry Mo	Medium. Reserves of 180,000 grading 1.82% MoS2 and production of 171,145 tonnes grading 0.75% MoS2.

Consists of molybdenite, pyrite, pyrrhotite, bornite, chalcopyrite and galena that occur along the northern boundary of a large mass of nepheline syenite gneiss flanking the southern boundary of the Frenchman's Cap Dome, one of several gneissic domes flanking the eastern margin of the Shuswap Metamorphic Complex. Deposit hosted in irregular lenses of aplite and pegmatitic syenite. U-Pb zircon isotopic age of 773 Ma. Deposit age interpreted as Late Proterozoic.

McMillan, 1973; Okulitch and others, 1981; B.C. Minfile, 1986.

M11-09 51°08'N 118°25'W	River Jordan (King Fissure) Monashee	Pb, Zn, Ag Sedimentary exhalative Zn-Pb	Medium. Reserves of 2.6 million tonnes grading 5.1% Pb, 5.6% Zn, 35 g/t Ag.

Consists of stratabound layers and lenses (1 to 6-m thick) of fine grained sphalerite and pyrrhotite with eye-shaped lenses of watery grey quartz and scattered grains of pyrite and galena. Deposit hosted in Late Proterozoic, amphibolite-grade calc-silicate gneiss, quartzite and marble of the Monashee metamorphic complex. Deposit age interpreted as Late Proterozoic.

Hoy, 1982a; B.C. Minfile, 1985; MacIntyre, 1991.

M11-10 51°15'N 118°07'W	Mastadon (J&L) Kootenay	Zn, Pb, Au, Ag Sedimentary exhalative Pb-Zn (?)	Medium. Production and reserves of 12.27 million tonnes grading 4.9% Zn, 2.3% Pb, 62 g/t Ag, 7.83 g/t Au.

Consists of pyrite, arsenopyrite, sphalerite, galena and sulfosalts that occur in bands, lenses and stringers from 0.1 to 12 meters wide. Hanging wall part of deposit consists of disseminated sphalerite, galena and pyrite; footwall part of deposit consists of massive arsenopyrite, sphalerite and pyrite. Ore minerals are concentrated along the contact between phyllite and limestone. Gold is refractory and associated with arsenopyrite. Deposit hosted in Lower Cambrian Hamill Formation quartzite and Badshot Formation limestones with limestone forming the footwall for deposit. Deposit origin is poorly understood. Deposit age interpreted as Early Cambrian.

Cordilleran Geology and Exploration Roundup, 1990; Mining Review, 1992.

M11-11 51°25'N 116°26'W	Monarch (Kicking Horse) Cathedral	Zn, Pb, Ag Southeast Missouri Pb-Zn	Medium. Production and reserves of 820,000 tonnes grading 5.63% Pb, 8.85% Zn, 31 g/t Ag.

Consists of argentiferous galena, sphalerite and pyrite that occur in vertical,north-south-striking fissures along the east limb of an anticline. Hosted in partially brecciated and dolomitized limestone of Middle Cambrian Cathedral Formation. Mineralization extends along a strike length of over 1370 meters. Deposit age interpreted as Middle Cambrian.

Hedley, 1950; Hoy, 1982a; B.C. Minfile, 1985.

M11-12 51°01'N 116°39'W	Parson Southern Rocky Mountain	Ba Ba vein	Medium. Production of 75,000 tonnes (1957 to 1988). Grade not available.

Consists of barite that occurs in two parallel fissure veins approximately 100 meters apart. Deposit occurs in quartzite underlain by shale and dolomite of the Lower Cambrian St. Piran and Lake Louise Formations. Veins are exposed over a strike length of over 60 meters and have a maximum thickness of 10 meters. Deposit was initially mined in an open pit, but has been developed underground since 1957. Deposit age interpreted as Early Cambrian.

B.C. Minfile, 1985, 1991; Leitch, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M11-13 50°38'N 117°36'W	Trout Lake Bayonne	Mo W, Cu, Pb, Zn Porphyry Mo	Medium. Reserves of 50 million tonnes grading 0.23% MoS2.

Consists of molybdenite and pyrite in quartz veins; in addition, pyrrhotite, scheelite, chalcopyrite and quartz and lesser galena, sphalerite and tetrahedrite occur in peripheral skarns. Deposit hosted mainly in limestone, schist and quartzite of the Lower Paleozoic Lardeau Group. Minor part of deposit occurs as disseminations in altered granodiorite that is interpreted as equivalent to Jurassic to Cretaceous Kuskanax Batholith located nearby to the west and southwest. Deposit interpreted as Jurassic to Cretaceous.

Boyle and Leitch, 1982; B.C. Minfile, 1985.

M11-14 50°50'N 116°20'W	Brisco Area Southern Rocky Mountain	Ba, Mg Ba vein and breccia	Medium. Production of 140,323 (1947-73) grading 98.25% BaSO4.

Consists of barite that occurs as a north-striking breccia zone in dolomite of the Lower Paleozoic Beaverfoot-Brisco Formation. Deposit occurs on the east limb of a northwest-trending syncline cut by numerous faults of varying size. Barite also occurs locally in the Proterozoic Mount Nelson Formation as narrow veins. Deposit age interpreted as Ordovician.

British Columbia Ministry of Mines, Annual Report, 1964; Reesor, 1973; B.C. Minfile, 1985.

M11-15 50°29'N 118°03'W	Big Ledge (Pingston Creek) Monashee	Zn, Pb Sedimentary exhalative Zn-Pb	Medium. Reserves of 6.5 million tonnes grading 4% Zn.

Consists of sphalerite, pyrrhotite galena and pyrite in lenses. Hosted in a dark, pyrrhotite and pyrite-rich, graphitic, calcareous schist that occurs along strike for approximately 10 km. Schist part of paragneiss that is interpreted to be the amphibolite-grade metamorphic equivalent of the Late Proterozoic Windermere Group. Deposit age interpreted as Late Proterozoic.

Hoy, 1982a; B.C. Minfile, 1985.

M11-16 50°47'N 115°41'W	Mount Brussilof (Baymag) Southern Rocky Mountain	Magnesite Stratabound Mg	Large. Reserves of 40.7 million tonnes grading 92.4% to 95% MgO.

Consists of magnesite replacements of Middle Cambrian carbonate rocks of the Cathedral Formation. Replacements form an irregular lens approximately 790 x 500 x 120 m. Deposit age interpreted as Middle Cambrian.

Grant, 1987; B.C. Minfile, 1991; Simandl and Hancock, 1991.

M11-17 50°22'N 116°57'W	Duncan Lake Area Kootenay	Pb, Zn Sedimentary exhalative Zn-Pb	Medium. Reserves of 2.76 million tonnes grading 3.3% Pb, 3.1% Zn.

Consists of galena, sphalerite and pyrite with minor pyrrhotite that occur in at least eight zones as bands, lenses and veins located preferentially in hinges of folds. Hosted in dolomites of the Lower Cambrian Badshot Formation. Reserves are for the Duncan #6 ore zone. Deposit age interpreted as Early Cambrian.

Hoy, 1982a; B.C. Minfile, 1985.

M11-18 50°29'N 115°52'W	Windermere Creek (Western Gypsum) Southern Rocky Mountain	Gypsum Strataform gypsum	Medium. Production and reserves of 10.8 million tonnes grading 83-93% CaSO4.

Consists of gypsum and anhydrite that occur along the basal contact of the Devonian Burnais Formation composed of carbonate rocks. Production of 6.8 million tonnes are for four open-pit operations, the Windermere 1 to 4 pits, between 1947 and 1991. Reserves of 4 million tonnes grading 80% CaSO4 are quoted for the Elkhorn zone that occurs about 400 meters south of the Windermere zone. Deposit age interpreted as Devonian.

B.C. Minfile, 1986, 1991; BCGS, 1991.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
M11-19 50°34'N 115°16'W	Kootenay River Gypsum Southern Rocky Mountain	Gypsum Strataform gypsum	Medium. Size not available. Grades of more than 80% $BaSO_4$.

Summary and References

Consists of gypsum that occurs along the basal contact of the Devonian Bernais Formation composed of carbonate rocks. Deposit age interpreted as Devonian.

B.C. Minfile, 1991.

M11-20 50°03'N 117°43'W	Millie Mack Nelson	Au, Ag Pb, Zn Au-Ag polymetallic vein	Medium. Reserves of 18.1 million tonnes grading 2.06 g/t Au, 68.6 g/t Ag.

Consists of galena, tetrahedrite and sphalerite with minor arsenopyrite and native gold that occur in broken quartz veins hosted in graphitic slate and andesite of the Lower Jurassic Slocan Group of the Quesnellia terrane. Porphyritic intrusive rocks occur nearby. Deposit age interpreted as Eocene.

Western Miner, no. 11, p. 38, 1964; B.C. Minfile, 1985; Mining Review, 1990.

M11-21 49°56'N 117°18'W	Silverton District (Sandon, Silver Ridge) Nelson	Ag, Pb, Zn Cd Ag polymetallic vein	Medium. Produced approximately 3.5 million tonnes grading 500 g/t Ag, 6% Pb (approximately).

Consists mainly of sphalerite and galena disseminations and rare masses that occur in quartz veins within quartzites and argillites north of the contact of the Jurassic Nelson Batholith, and also within granitic rocks of the batholith south of the contact. Recent isotopic studies suggests an Eocene age for mineralized quartz veins in the district (Beaudoin and others, 1992). District includes numerous small operations, including those in and around Sandon and Silverton. District produced more than 1,800 tonnes of Ag between the 1890's and present. Deposit age interpreted as Eocene(?).

Goldsmith and Sinclair, 1983; B.C. Minfile, 1985; Beaudoin and others, 1992.

M11-22 49°43'N 116°55'W	Ainsworth District Nelson	Zn, Pb, Ag Ag polymetallic vein	Medium. Produced 698,751 tonnes grading 7.9% Pb, 253.2 g/t Ag.

Consists of sphalerite and galena with lesser tetrahedrite that occur in quartz veins hosted by metasedimentary rocks of the Milford (Carboniferous), Kaslo (Triassic) and Slocan (Jurassic) Groups. Recent isotopic studies suggest an Eocene age for quartz vein mineralization in the Ainsworth and Slocan areas (Kootenay Range). Coordinates are based on one of 75 occurrences listed for the Ainsworth camp. Deposit age interpreted as Eocene(?).

Goldsmith and Sinclair, 1983; B.C. Minfile, 1985; Beaudoin and others, 1992.

M11-23 49°46'N 116°52'W	Riondel (Blue Bell) Nelson	Zn, Pb, Ag Cu, Cd, Au Zn-Pb-Ag skarn and manto	Medium. Produced 4.82 million tonnes and reserves of 0.35 million tonnes grading 6.3% Zn, 5.2% Pb, 45 g/t Ag.

Consists of sphalerite, galena, pyrrhotite, pyrite, arsenopyrite, chalcopyrite and knebelite that occur in replacement bodies and in veins controlled by bedding, fractures and open anticlinal culminations. Hosted in limestone of the Paleozoic Lardeau Series near Mesozoic intrusive rocks of the Fry Creek Batholith. Recently published isotopic studies suggests an Eocene age for mineralization in the district which includes the Riondel deposit. Deposit age interpreted as Eocene(?).

B.C. Minfile, 1985, 1988; Hoy, 1980, 1982a; Nelson, 1991; Beaudoin and others, 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M11-24 50°20'N 116°25'W	Mineral King Bayonne	Zn, Pb, Ag Cu, Cd, Ba Zn-Pb skarn and manto	Medium. Produced 2.1 million tonnes grading 4.12% Zn, 1.70% Pb, 24.8 g/t Ag.

Consists of sphalerite, galena and pyrite with bournonite (PbCuSbS3) and rare meneghinite that occur in steeply dipping pipes or along steeply dipping shears associated with a synclinal wedge between two faults. Hosted in Middle Proterozoic Mount Nelson Formation composed of dolomite and dolomitic quartzite. Deposit mined between 1928 and 1974. Current reserves of 72,576 tonnes grading 34.3 g/t Ag, 2.5% Pb and 4.5% Zn. Deposit age interpreted as mid-Cretaceous.

Fyles, 1960; Hoy, 1982a; B.C. Minfile, 1985, 1991; Dawson and others, 1991.

M11-25 50°03'N 115°31'W	Lussier River (United Gypsum) Southern Rocky Mountain	Gypsum Strataform gypsum	Medium. Estimated 7 milion tonnes grading 100% gypsum.

Consists of gypsum that occurs as evaporite beds underlying carbonate rocks of the Devonian Burnais Formation. Minor sulphur occurs locally. Selenite occurs in fractures and faults. Deposit age interpreted as Devonian.

B.C. Minfile, 1991.

M11-26 49°38'N 118°55'W	Lassie Lake Area (Blizzard) Nelson	U Paleoplacer U	Medium. Reserves of 2.1 million tonnes (containing 4000 tonnes U) grading 0.227% U3O8.

Consists of autunite and saleeite that occur in paleostream channels in Paleogene continental sedimentary rocks or basins that overly quartz monzonite of Cretaceous Valhalla Pluton. Uranium minerals occur in oxidized facies of coarse-grained fluvial sedimentary rocks and in disseminated organic material in reduced, fine-grained sedimentary rocks. Deposit age interpreted as Eocene.

Sawyer and others, 1981; B.C. Minfile, 1985.

M11-27 49°31'N 119°10'W	Carmi Moly Nelson	Mo, Cu U, F Porphyry Mo	Medium. Reserves of 44.5 million tonnes grading 0.13% Mo.

Consists of molybdenite and chalcopyrite that are disseminated in brecciated Lower Jurassic granodiorite that has been intruded by Eocene quartz monzonite porphyry (with a 50 Ma isotopic age) that also contains part of deposit. Deposit occurs within a 2-km diameter annular-shaped pyritic zone. Deposit age interpreted as Eocene.

B.C. Minfile, 1985; Dawson and others, 1991.

M11-28 49°26'N 119°03'W	Highland Bell (Beaverdell) Nelson	Ag, Pb, Zn Au, Cu, Cd Ag polymetallic vein	Medium. Produced 941,644 tonnes (1901-1992) grading 1060 g/t Ag, 1.14% Pb, 1.37% Zn.

Consists of sphalerite, pyrite, galena, arsenopyrite, chalcopyrite and minor pyrargarite in quartz-calcite veins that occur along a northeast-trending, 3 km by 800 meter belt on the west slope of Mt. Wallace. Majority of production (1166 tonnes of Ag) from a Upper and Lower Lass vein system that occurs in granodiorite of the Jurassic West Kettle Batholith and adjacent turbidite rocks and pyroclastics of the Permian Wallace Formation. Heat source for the mineralized veins interpreted as quartz monzonite of the Eocene Beaverdell Stock with a 50 Ma isotopic age. Deposit age interpreted as Eocene.

Watson and others, 1982; B.C. Minfile, 1985, 1989.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
M11-29 49°43'N 116°00'W	Sullivan (Kimberley) Purcell	Pb, Zn, Ag Cd, Sn Southeast Missouri Pb-Zn	Large (world class). Production and reserves of 162 million tonnes grading 6.6% Pb, 5.7% Zn, Ag 68 g/t.

Consists of a laminated sulfide assemblage of galena, sphalerite and pyrite that has undergone metamorphic recrystallization and tectonically induced mechanical and chemical remobilization. Deposit located near a north-trending rift axis at an intersection with the east-west-trending, proto-Kimberley fault. Sulfide deposition initially predated the Mine Sill, and was accompanied by extensive boron (tourmaline) alteration of marine sedimentary origin. Ongoing hydrothermal activity from marine brines generated successive chlorite-pyrrhotite-muscovite and albite-chlorite-pyrite-sericite-calcite assemblages in ore zone and hanging wall and footwall, all coincident with gabbro dikes and sills. Deposit hosted conformably within folded Middle Proterozoic turbidites of the Lower Aldridge formation of the Purcell Supergroup. Turbidites fill an intracontinental extensional rift marine basin and are intercalated with tholeiitic Moyie Sills 1467+3 Ma (zircon U/Pb) old. Deposit age interpreted as Middle Proterozoic.

Leitch and Turner, 1991, 1992; J. Lydon and Sullivan Team, Cordilleran Geology and Exploration Roundup, Vancouver, p. 6-7, 1995.

M11-30 49°36'N 115°58'W	Marysville Southern Rocky Mountain	Magnesite Strataform magnesite	Large (estimated). Tonnage not available. Grade of 40 to 45% MgO.

Consists of conformable, interbedded magnesite that is hosted within quartzites of the upper 100 m of the Lower Cambrian Cranbrook Formation Thickest bed ranges up to approximately 15 meters thick, exposed over strike length of 5.5 km. Deposit age interpreted as Early Cambrian.

B.C. Minfile, 1986, 1991; Grant, 1987.

M11-31 49°05'N 118°36'W	Phoenix-Greenwood District Bayonne	Cu, Au, Ag, Fe Cu-Au skarn	Medium. Production and reserves of 34.0 Mt grading 0.8% Cu, 1.1 g/t Au, 15 g/t Ag.

Consists of chalcopyrite, pyrite, pyrrhotite, magnetite plus minor sphalerite and galena that occur in a garnet-rich calc-silicate skarn assemblage of andradite, clinozoisite, diopside and quartz. Skarn hosted by Triassic carbonate, clastic, and volcanic rocks of Quesnellia terrane in proximity to contacts with Middle Jurassic and mid-Cretaceous granitoid intrusive rocks. Production figures are for 1893 to 1985, and include 270,000 tonnes Cu, 36 tonnes Au, and 117 tonnes Ag. Deposit age interpreted as Middle Jurassic to Early Cretaceous.

B.C. Minfile, 1985; Church, 1986; Schroeter and Lane, 1991.

M11-32 49°01'N 118°10'W	Castle Mountain (Mastadon, Mabel) Unassigned	Ni, Cr Podiform Cr-Ni	Large. Inferred resource of 354.7 million tonnes grading 0.24% Ni.

Consists of lenses and disseminations of chromite in an intensely serpentinized Cretaceous dunite dike that intrudes andesite and latite of the Early Jurassic Rossland Group. Deposit occurs about 400 meters from the intrusive contact with gneissic biotite granite of the Nelson Batholith. A large body of low-grade nickel mineralization occurs at some depth below the surface within serpentinized rock. Ni minerals include nickeliferous magnetite, fine grained millerite and pentlandite. Deposit age interpreted as Cretaceous.

BCGS, 1979; B.C. Minfile, 1983.

M11-33 49°05'N 117°50'W	Red Mountain Moly (Coxey, Novelty, Nevada) Bayonne	Mo Au, Cu, W, Bi, Ag Mo skarn	Medium. Production and reserves of 1.31 million tonnes grading 0.20% MoS2.

Consists of molybdenite, pyrrhotite, chalcopyrite, arsenopyrite, scheelite, pyrite, magnetite, bismuthinite, galena and sphalerite that occur in veins, disseminations and shears within skarn and hornfelsed siltstone and breccia of the Pennsylvanian to Permian Mount Roberts Formation adjacent to contacts with Jurassic Trail Pluton. Pyroxene-epidote-biotite skarn with minor garnet hosts a coarse-grained assemblage of molybdenite, lesser pyrite and sporadic scheelite adjacent to porphyritic quartz diorite sills and dikes related to the Trail Pluton. Reserves in 1985 were 245,000 tonnes grading 0.22% Mo. Deposit age interpreted as Jurassic.

B.C. Minfile, 1991; Ray and Webster, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M11-34 49°05'N 117°49'W	Rossland (Le Roi, War Eagle) Rossland	Au, Ag Cu Au-Ag polymetallic vein	Medium. Produced 7.62 million tonnes grading 15.2 g/t Au, 19 g/t Ag.

Gold deposits are divided into three types, North belt, Main veins and South belt. Most production (>80%) from the Rossland Camp was from the Le Roi, Center Star, Nickel Plate, War Eagle and Josie ore bodies that occur in the central portion of the Rossland Camp in the Main vein system (98% of Rossland Camp production). Main vein consists of pyrrhotite and chalcopyrite in a gangue of quartz and calcite, 1% Cu (avg) in ore. Main vein system consists of a series of en echelon veins that dip steeply north and strike of 070° between two large north-trending lamprophyre dikes. Structural control of veins is inferred by growth faults that were active during deposition of Rossland Group. Total production from Rossland Camp between 1894 and 1941 was 84 tonnes of gold and 105 tonnes of silver. Deposits of the Rossland Camp are hosted preferentially in mafic volcanics of the Elise Formation of the Early Jurassic Rossland Group. Deposit age interpreted as Jurassic.

Dawson and others, 1991; B.C. Minfile, 1991; Schroeter and Lane, 1991; Hoy and Dunne, 1992.

M11-35 49°18'N 117°11'W	Ymir-Erie Creek (Yankee Girl) Rossland	Au, Ag Pb, Zn Au-Ag polymetallic vein	Medium. Produced 713,461 tonnes grading 12.4 g/t Au, 62.12 g/t Ag.

Consists of pyrite, galena, sphalerite and native gold, in a gangue of quartz, calcite and siderite. Deposits occur along northeast-trending, northwest-dipping shear zones in folded metasedimentary rocks of the Triassic Ymir and lower Jurassic Rossland Groups. Deposits occur near contacts with Jurassic Nelson intrusive rocks. Deposit age interpreted as Jurassic.

Hoy and Andrew, 1988; Little, 1960; B.C. Minfile, 1991; Schroeter and Lane, 1991.

M11-36 49°09'N 117°12'W	H.B. (Zincton) Kootenay	Zn, Pb, Ag Cd, Au Sedimentary exhalative Pb-Zn	Medium. Produced 6.7 milion tonnes grading 3.91% Zn, 0.74% Pb, 4.42 g/t Ag.

Consists of pyrite and sphalerite that occur in narrow bands, irregular lenses or disseminations in dolomite of the Lower Cambrian Reeves Formation. Local cross-zones contain fine-grained massive sulfides that commonly occur as matrix in a coarse breccia. Breccia zones are related to thrust faults and are interpreted as secondary structures. Much of the dolomite in the West orebody is altered to talc. Deposit age interpreted as Early Cambrian.

Fyles, 1970; Sangster, 1986; B.C. Minfile, 1991; MacIntyre, 1991; Hoy, 1982b.

M11-37 49°08'N 117°08'W	Sheep Creek Area (Kootenay Belle, etc.) Rossland	Au, Ag, Pb, Zn Cu, W Au-Ag polymetallic vein	Medium. Production and reserves of 1.8 million tonnes grading 15 g/t Au, 6 g/t Ag (approximately).

Consists of pyrite, sphalerite, galena, chalcopyrite and galena that occur in quartz veins within quartzite, argillite, and argillaceous quartzite of the Nevada and Nugget members of the Quartzite Range Formation. Veins controlled by northeast-trending faults that are particularly productive where they cross the axes of two north-trending anticlines. Deposit age interpreted as Jurassic(?).

B.C. Minfile, 1991; Panteleyev, 1991; Schroeter and Lane, 1991.

M11-38 49°06'N 117°14'W	Emerald-Invincible Bayonne	W. Mo W skarn	Medium. Produced 1.4 million tonnes grading 1.3% WO3.

Consists of scheelite, wolframite, molybdenite, pyrrhotite, pyrite and chalcopyrite that generally occur as disseminations, but locally occur as massive with pyrite and pyrrhotite. Deposit hoste in Lower Cambrian Laib Formation along the contact of the Reeves Member Limestone with the Emerald Member argillite, as well as along the contact of the limestone with Cretaceous Emerald and Dodger Stocks. Garnet, diopside, tourmaline, powellite, calcite, biotite, K-feldspar and sericite alteration is predominant; kaolinite, tremolite and silica alteration also reported. Production figures are approximate, but 7,416 tonnes of concentrate from the Emerald Tungsten, Feeney and Dodger workings have been reported and grade 0.5% to 1.5%. Deposit age is mid-Cretaceous.

Mulligan, 1984; B.C. Minfile, 1991; Ray and Webster, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M11-39 49°06'N 117°13'W	Jersey Kootenay	Zn, Pb, Ag Cd Sedimentary exhalative Pb-Zn	Medium. Produced 7.7 million tonnes grading 3.49% Zn, 1.65% Pb, 3.08 g/t Ag.

Consists of fine grained sphalerite and galena with pyrite, pyrrhotite and minor arsenopyrite in five ore bands ranging from 0.30 to 9 meters thick. Sulfides occur more abundantly in fold troughs relative to fold crests. Cadmium is associated with sphalerite, silver with galena. Classified as carbonate-hosted sedimentary exhalative deposits of Kootenay Arc type that are hosted within the folded Reeves Member dolomites of the Lower Cambrian Laib Formation. Alternate skarn genesis of some deposits is proposed. Deposit age interpreted as Early Cambrian.

Fyles, 1970; Hoy, 1982a; Sangster, 1986; MacIntyre, 1991; Dawson, 1995.

M11-40 49°02'N 117°21'W	Reeves-MacDonald (Reemac) Kootenay	Zn, Pb, Ag Cd, Cu, Ga, Ge Southeast Missouri Pb-Zn	Medium. Produced 5.9 million tonnes grading 3.48% Zn, 1.38% Pb, 3.39 g/t Ag.

Consists of banded honey-colored sphalerite, pyrite and galena, and locally contorted and brecciated, that occur as sratabound massive sulfides on limb of an anticlinal fold in dolomitized limestone of the Lower Cambrian Laib Formation. Past producer from 1912 to 1978. Reserves in 1978 of 36,287 tonnes of 0.1% Pb. Deposit age interpreted as Early Cambrian.

Fyles and Hewlett, 1959; Hoy, 1982b; Sangster, 1986; B.C. Minfile, 1991;

M11-41 49°17'N 115°50'W	Moyie (St. Eugene) Purcell	Pb, Ag Zn, Au Ag polymetallic vein	Medium. Produced 1.5 million tonnes grading 7.74% Pb. Reserves grading 125.1g/t Ag, 0.05 g/t Au, 1% Zn.

Consists og galena, sphalerite, pyrite, pyrrhotite and magnetite in quartz veins that are hosted by turbidites of the Middle Proterozoic Middle Aldridge Formation. Sulfides occur along an east-west striking fracture zone that dips 70 degrees south. Fracture zone crosses axial plane of a large, regional-scale, northeast-plunging anticline. Production occurred between 1899 and 1929. Deposit age interpereted as Middle Proterozoic.

Mathews, 1944; B.C. Minfile, 1983, 1986; Schroeter and Lane, 1991.

M11-42 49°24'N 115°49'W	Vine Purcell	Pb, Zn, Ag, Au Ag-Au polymetallic vein	Medium. Reserves of 1.37 million tonnes grading 4.65% Pb, 2.39% Zn, 50 g/t Ag, 1.8 g/t Au.

Consists of a steeply dipping, pyrrhotite-rich polymetallic Ag-Au vein that occurs along a fault in siltstone and wacke of the lower and middle Aldridge formation. Vein is mineralized over at least 1 km of strike and to a depth of 800 m. A Moyie gabbro dike closely follows the fault-vein structure. Deposit minerals are pyrrhotite, sphalerite and galena that are intergrown in a quartz-calcite gangue. Alteration minerals that occur in and adjacent to the vein are sericite, calcite, chlorite, quartz and minor albite. Vein and gabbro dike occupy the same stratigraphic interval as the nearby Sullivan deposit. Deposit age itnerpreted as Middle Proterozoic.

Hoy and Pighin, 1995.

M52-01 48°59'N 131°15'E	Khingan Khingan	Sn Sn greisen	Medium. Average content of 0.6-0.7% Sn. Mined since 1960's.

Deposit consists of over 15 ore zones that range from 10 to 50 m across and 100 to 400 to 500 m depth that occur in an symmetrical breccia zone about 250-300 m across. Breccia zone is traced to depths of over 1200 m. At the upper levels of the deposit, the breccia is replaced by chlorite, and at the depths of 700 to 800 m, the breccia is replaced by quartz-muscovite (sericite)-topaz greisen. Ore assemblage is quartz-fluorite-cassiterite. Arsenopyrite, marcasite, loellingite, chalcopyrite, and bismuth minerals are subordinate. Deposit is of hypabyssal origin and occurs in a pipe-shaped ore bodies of hydrothermal explosion breccia that cut a sequence of felsic volcanic rocks. The deposit is interpreted as related to subalkaline potassium granite with K-Ar isotopic ages of 80-90 Ma.

Ognyanov, 1986.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M52-02 49°09'N 131°25'E	Dzhalinda Khingan	Sn In Rhyolite-hosted Sn	Small. Contains up to 30% Sn and up to 0.5% In.

Consists of irregular ore pods that are emplaced in rhyolite that is intensely altered to beresite (quartz, sericite, and pyrite). Deposit is located over a vertical interval of 10 to 20 m, in a volcanic vent and in the immediately adjacent rhyolite cover. Volume of deposit less than 100-150 m^3. Sn occurs in cassiterite (wood tin) and associated with quartz, along with minor pyrite and arsenopyrite. In occurs in dzhalindite that forms intergrowths in wood tin. Deposit is genetically related to the volcanic rocks with K-Ar isotopic ages of 90-95 Ma old.

Ognyanov, 1986.

M52-03 48°37'N 131°30'E	Verkhnebidzhanskoe Khingan	Sn Sn quartz vein	Small. Average grade of 0.3-2.0% Sn.

Consists of metasomatic quartz-sulfide lenses that range from 50 to 80 m length along strike, and extend up to 70 m downdip with a maximum thickness of 10 to 12 m. The deposit extends for about 1,300 m. Predominante late-stage ore minerals are mainly sulfosalts (boulangerite, jamesonite). Subordinate, earlier-stage ore-minerals are quartz, cassiterite, and arsenopyrite. Alteration minerals include talc, calcite, siderite, and dolomite. Both the sedimentary and volcanic rocks are extremely rich in Sn (up to 10 clarkes). A Late Cretaceous rhyolite porphyry stock, that contains geochemically anomalous Sn (about 0.005%), is interpreted as the source for the vein Sn that formed during hydrothermal alteration. Deposit hosted in Late Proterozoic dolomite adjacent to a rhyolite porphyry stock, and occurs at a tectonic contact of the dolomite with Late Proterozoic schist.

Ognyanov, 1986.

M52-04 48°39'N 131°53'E	Yuzhno-Khingan South Khingan	Fe Ironstone	Medium

Consists of several stratiform iron deposits that occur in the lower portion of the Early Cambrian Khingan series composed of interbedded cherty, carbonaceous, and micaceous shale, siltstone, dolomite sandstone, limestone, ferruginous quartzite, manganese ore, sedimentary breccia, and conglomerate. Braunite-haussmanite-rhodochrosite ore occurs in beds 2 to 9 m thick in the lower part of the series. Fe- and Mn-bearing beds occur in the middle part of the Khingan series and consists of magnetite, hematite, and magnetite-hematite quartzites that are interlayered with chlorite-dolomite breccia, Quartzites occur in beds from 18 to 26 m thick that are overlain by dolomite that is overlain in turn by shale, limestone, and dolomite. Deposit is of exhalative-sedimentary origin.

V.A. Yarmolyuk and A.P. Glushkov, written commun., 1966.

M53-01 51°30'N 133°55'E	Ippatinskoe Badzhal-Ezop	Sn Sn quartz vein	Small. Average grade of 0.31% Sn and 0.19% WO_3 in 6 largest veins.

Consists of veins and selvages in the northern part of a large granitic body. 65 known veins range in thickness from 2 cm to 2 m, with strike lengths up to 290 m, and are prospected to a depth of 100 m. Veins occur in a north-south-trending zone that is 3,000 m long and up to 300 m wide. Deposit contains minor Cu, Ph, Sb, Pb, and Au. Ore minerals are cassiterite, wolframite, arsenopyrite, along with rare chalcopyrite, pyrite, scheelite, sphalerite, and molybdenite; and very rare bismuthinite and beryl. Gangue minerals are quartz, muscovite, feldspar, fluorite, and rare tourmaline. Deposit is related to fine-grained leucogranite, with K-Ar isotopic age of 75 to 90 Ma.

Ognyanov, 1986.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

M53-02 50°26'N 134°15'E	Pravourmiiskoe Badzhal-Ezop	Sn W, Cu Sn greisen	Medium. Average grade of 0.1-5 % Sn, 0.05% WO_3 , and 0.5% Cu.

Consists of disseminations and in veins that occur in a linear area over 1500 m long, 5 to 25 m thick, and extends several hundred m down dip. In addition to Sn, W, and Cu; Bi, Pb, and Sb are present. Earler ore assemblage, of quartz-topaz-cassiterite with fluorite, followed by quartz-arsenopyrite-chalcopyrite, and quartz-tourmaline with cassiterite and stibnite. Gangue composed of quartz-siderophyllite (zwitters) with quartz-topaz greisen. Deposit hosted in Late Cretaceous felsic volcanic rocks that overlie the large, shallow, granite and leucogranite of Verkhneurmiisky batholith. Deposit occurs along an east-west-trending thrust fault with small offset. Deposit is genetically related to Verkhneurmiisky granite and eucogranite complex with K-Ar isotooic ages of 75 to 85 Ma.

Ognyanov, 1986.

M53-03 50°33'N 135°14'E	Loshadinayagriva (Main) Badzhal-Ezop	Sn W Sn quartz vein	Small. Average grade of 0.3 to 1.5% Sn, and up to 0.1% WO_3 .

Consists of quartz-albite-muscovite hydrothermally altered rocks, with ore minerals in both quartz-tourmaline lenses and quartz. Ore assemblages are: (1) cassiterite-quartz with wolframite and arsenopyrite; and (2) quartz-sulfide (galena-sphalerite-chalcopyrite, stannite, and stibnite). Sulfides are very minor. Deposit occurs in steeply-dipping north-south zone along a left-lateral strike-slip fault and associated tensional fractures. Zones are 920 m long, vary from 1 to 2 to 10 to 12 m thick along the main fault, and extend from 480 and 600 m along tensional fractures. Deposit contains Sn, Cu, Pb, Zn, and Sb (a few tenths of a percent), and W. Deposit related to a 75 to 85 Ma (K/Ar) diorite-granodiorite-monzonitic complex.

Ognyanov, 1986.

M53-04 50°48'N 136°16'E	Solnechnoe Badzhal-Ezop	Sn W, Cu Sn quartz vein	Medium. Average grade of 0.56% Sn, 0.05% W, and 0.1% Cu. Mined since 1960's(?). Mostly exhausted.

Consists of highly altered quartz-tourmaline veins with numerous apophyses is related to a long north-south, left-lateral, strike-slip fault. Deposit varies from 0.5 to 15 m thick, 800 m long, and extends to the depth more than 500 m below the surface. Five vertically-zoned mineral assemblages are distinguished, from bottom to top: (1) quartz-tourmaline; (2) quartz-arsenopyrite-cassiterite with wolframite, bismuthinite, and scheelite; (3) quartz-sulfide (pyrrhotite, chalcopyrite, and marcasite); (4) quartz-galena-sphalerite; and (5) quartz-carbonate. Deposit is closely related to a K-rich granite phase of a gabbro-diorite-granodiorite complex with K-Ar isotopic ages of 75 to 80 Ma.

Ognyanov, 1986.

M53-05 50°41'N 136°08'E	Kapral Badzhal-Ezop	Mo Cu, Sn Porphyry Mo	Small. Contains up to 0.2% Cu, and up to 0.2% W.

Consists of quartz-sulfide veinlets and veins, and disseminations of pyrite, pyrrhotite, molybdenite, chalcopyrite, sphalerite, galena, wolframite, and Bi minerals across an area of approximately 0.3 km^2. Cu and W contents increase with depth. Deposit hosted in brecciated and altered host rocks and explored over an area 3 by 12 km. Deposit occurs along a fault zone at the margin of an intrusive dome and associated with Late Cretaceous sodic-pyroxene bearing granitic rock. Deposit occurs along contacts between granite and surrounding Late Jurassic volcanic and sedimentary rocks. Country rock is altered to quartz-sericite-chlorite, and locally to greisen.

Gonevchuk and Gonevchuk, 1980, 1983.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M53-06 50°41'N 136°21'E	Festivalnoe Badzhal-Ezop	Sn W, Cu, Bi, In, Ag Sn quartz vein	Medium. Average grade of 0.4 to 1.0% Sn, 0.15%, WO_3, 0.9% Cu, 0.04% Bi, and up to several tens g/t Au. Mined since 1960's.

Deposit contains twenty-six veins associated with zones of quartz-tourmaline alteration. Ore bodies are up to 1 km long, and generally 3 to 7 m thick; with some up to 20 to 30 m thick. Ore is complex, containing Sn, W , Cu, Bi, Ag, and economic levels of In. Quartz-tourmalineforms earlier mineral assemblage that grades upward into: (1) quartz-cassiterite with arsenopyrite; (2) quartz-pyrrhotite-chalcopyrite with stannite, fluorite, and magnetite; and (3) quartz-galena-sphalerite; and quartz-fluorite-calcite. Host rocks are generally altered to quartz-sericite with quartz-chlorite alteration in the upper parts of the deposit. Largest ore bodies are controlled by a north-south-trending, left-lateral, strike-slip fault. Mineralization is spatially related to the potassium-rich granite phase of a gabbro-diorite-granodiorite complex with K-Ar isotopic age of 70 to 90 Ma. However, age of mineralization interpreted as 70 to 75 Ma.

Ognyanov, 1986.

M54-01 50°38'N 142°27'E	Yasnoe Sakhalin Island	Hg Silica-carbonate Hg	Small

Consists of veinlets and pods of cinnabar associated with quartz and pyrite alteration. Hosted in fractured and mylonitic zones in Late Paleozoic to Mesozoic jasper, basalt, and shale.

Sidorenko, 1974.

M54-02 50°33'N 142°32'E	In' River Sakhalin Island	W, Hg, Cu Ag, Au Volcanic-hosted Hg	Small. Average grade of 0.01 to 0.03% W.

Consists of disseminations and veinlets that occur in quartz, quartz-sericite, and kaolinite-sericite-carbonate altered rocks. Ore minerals are pyrite, marcasite, scheelite, chalcopyrite, galena, sphalerite, cinnabar, realgar, and electrum. Mid- and low-temperature propylitic alterations form outer facies of the hydrothermal alteration aureole. Deposit is controlled by fracture zones in strongly silicified Neogene volcanic and subvolcanic mafic- and intermediate-composition rocks.

Sidorenko, 1974.

M54-03 50°11'N 143°04'E	Langeriiskoe Central Sakhalin	Au Au quartz vein	Small

Consists of lenticular bodies of fractured rock, and of quartz-sulfide veins that are controlled by zones of folding. Deposit hosted in Permian and Triassic spilite and graywacke, Jurassic-Early Cretaceous slate, and Cenozoic volcanic rocks and chert.

V.Ya Danchenko, written commun., 1987.

M54-04 50°09'N 143°23'E	Svetlovskoe Sakhalin Island	Hg Silica-carbonate Hg	Small. Low Hg content.

Occurs in fracture zones at contacts of gabbro with serpentinite. Gabbro are altered to listwanite. Mercury either replaces quartz and carbonate in listwanite or forms pods of rich ore. Average Hg content in the listwanite is low, generally a few hundredth of a percent.

Sidorenko, 1974.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M54-05 49°58'N 143°35'E	Lyukamskoe Aniva-Nabil	Mn Volcanogenic Mn	Small. Average grade of 3 to 20% Mn, locally up to 50%.

Occurs in jasper and limestone lenses hosted in a Jurassic and Cretaceous volcanic sequence. Sheet-like ore bodies consist of hematite-rhodonite-quartz and rhodochrosite-quartz that are accompanied by surficial pyrolusite and psilomelane veinlets.

Sidorenko, 1974.

M54-06 49°44'N 143°12'E	Ostrinskoe Sakhalin Island	Hg Silica-carbonate Hg	Small. Up to several percent Hg.

Hosted in jasper, basalt, and shale of Late Proterozoic or possibly Mesozoic age. Occurs as veinlets in fracture zones and jasper beds, disseminations, and cinnabar gouge. Mineralized zones are up to 600 m long and 10 to 15 m thick.

Sidorenko, 1974.

M54-07 48°52'N 142°38'E	Inskoe Sakhalin Island	Hg Au, W Volcanic-hosted Hg	Small. From a few tenths of a percent to a few percent Hg.

Consists of a mercury-bearing opalitic complex defined by zones of hydrothermally altered rock with disseminated cinnabar, realgar, pyrite, marcasite, chalcopyrite, galena, sphalerite, scheelite, and gold. Hosted in altered Neogene quartzite and volcanic rocks. Hg-bearing zones range from 1 to 10 m thick, with few to 30 to 35 m, and are up to 300 m long.

Sidorenko, 1974.

M54-08 49°20'N 138°47'E	Mopau Kema	Sn Porphyry Sn	Small. Average grade of 0.3% Sn.

Consists of lenticular zones in quartz-sericite rocks. Zones contain abundant veinlets of quartz-cassiterite, cassiterite-quartz-feldspar, quartz- cassiterite-chlorite, and quartz-cassiterite-arsenopyrite-chlorite. Veinlets range from paper-thin to 0.5 cm thick, locally up to 10 cm thick. Where closely-spaced, veinlets form an intricate stockworks up to 100 m across with high Sn content. Zones are over 400 m long, several tens of m thick. Some zones occur at contacts with diabase porphyry dikes. Deposit extends to depths of more than 200 m. Ore is sulfide poor and is easily concentrated. Deposit hosted in a series of closely-spaced volcanic vents of rhyodacite breccia that is cut by intrusions of felsite porphyry and dikes of quartz porphyry. Ore associated with a deep-seated felsic pluton. Age of mineralization interpreted as Late Cretaceous to Paleogene.

Finashin, 1959; Usenko and Chebotarev, 1973.

M54-09 48°34'N 138°35'E	Nochnoe Kema	Cu Pb, Zn Porphyry Cu	Small

Consists of a stockwork defined by a thick network of sulfide or quartz-sulfide veinlets containing pyrite, chalcopyrite, bornite, and covellite as disseminations and in small, massive pods. Galena, sphalerite, arsenopyrite, sulfosalts, and molybdenite occur sporadically. Outer parts of the metasomatic aureole are mostly pyrite-bearing. Azurite and malachite were observed in the oxidation zone with limonite alteration. Deposit has not been explored at depth. Deposit related to a Late Cretaceous and Paleogene granite porphyry stock that grades into rhyolite at the periphery. Deposit confined to stock. Concentrically zoned structure of the intrusion contains a hydrothermal alteration pattern that grades from the center to the periphery from quartz-sericite-biotite-feldspars to quartz-sericite rocks. Host clastic rocks exhibit argillic alteratin at the contact with rhyolite. The alteration aureole is 400 by 600 m thick.

Gavrilov and Mamaev, 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
M54-10 48°12'N 138°12'E	Sukhoi Creek Kema	Cu, Mo W, Au Porphyry Cu-Mo	Small. Up to 0.2% Cu and 0.01% Mo.

Occurs in stockworks that are several hundred m in diameter and in altered zones. Polymetallic ore dominates in some stocksworks. Ore minerals are chalcopyrite, molybdenite, sphalerite, galena, cassiterite, scheelite, and pyrite. Significant Au and Ag values occur. Deposit hosted in Early Cretaceous sedimentary rocks that are overlain by Late Cretaceous volcanic rocks and are crosscut by ore-bearing granitic intrusions with a K-Ar isotopic age of 73 Ma. Mineralization is related to several granodiorite and granite stocks that are intensely hydrothermally altered. Quartz-sericite alteration and medium-temperature epidote-prehnite-chlorite propylitic alteration occur at the core and grade into micaceous-chlorite-carbonate propylite at the periphery. Granite is locally altered to quartz-muscovite greisen with tourmaline and sphene, and in a few places into a peculiar garnet-phlogopite rock with apatite. Host siltstone and sandstone are altered to orthoclase-actinolite-chlorite hornfels and the felsic extrusive rocks are altered to quartz and phyllite. Deposit not explored at depth.

Petrachenko and others, 1988.

M54-11 48°06'N 138°38'E	Moinskoe Kema	Mo Cu, Zn Porphyry Mo	Small. Up to 0.3% Cu and 0.3% Mo.

Consists of chalcopyrite, sphalerite, galena, molybdenite, and rare ferberite that occur in zones of veinlets, disseminations, and veins. Zones contain galena, sphalerite, and molybdenite that are up to 3 m thick. Deposit occurs along a north-west trending fault zone about 3 km long that cuts a granite porphyry stock. Granite prophyliticaIly altered to quartz, sericite, chlorite, and sulfide along feather joints. Quartz-sulfide and sulfide veinlets and thin veins occur in hydrothermally altered rocks. Disseminated pyrite occurs in altered rocks and in surrounding veins. Polymetallic ores occur mostly at the periphery of the stock. Deposit hosted in hypabyssal Late Cretaceous granite porphyry stock with numerous xenoliths of intrusive and metamorphic rocks and garnet nodules. A leucocratic medium-grained granite body forms the central part of the pluton. Granitic rocks are oversaturated with alumina and contain moderate alkalies. Deposit not explored at depth.

Pertachenko and others, 1988.

M55-01 49°43'N 144°03'E	Russkoe Schmidt and Terpeniya Peninsulas	Cr Podiform Cr	Small. Up to 1 g/t Pt, up to 0.12 g/t Pd, and up to 3.8 g/t Ag.

Consists of chromite in small lenses and veinlets up to 3 m long in serpentinized periodtite. In addition to chrome spinels, deposit contains platinum, palladium, and silver. Hosted in Late Cretaceous volcanic and sedimentary rocks that are cut by small bodies of serpentinized peridotite. Occurs in the East Sakhalin Mountains.

Sidorenko, 1974.

M55-02 49°31'N 144°01'E	Rys'e Aniva-Nabil	Cu, Pb, Zn Cyprus massive sulfide	Small. Average grade of 0.5-1% Cu, 0.1-0.2% Pb, and 0.1-0.2% Zn.

Consists of a series of zones from 0.1 to 0.5 m thick that contain pyrite, chalcopyrite, sphalerite, galena, quartz, sericite, and chlorite. Hosted in Early Cretaceous clastic volcanic rocks and chert in the East Sakhalin Mountains.

Sidorenko, 1974.

M56-01 50°10'N 155°28'E	Carpinsky Caldera Kuril	Mo Porphyry Mo	Small. Less then 0.01% Mo.

Consists of molybdenite that occurs as disseminations and in fine streaks in andesitic lava flows and tuff that display argillic and alunitie alteration. Deposit has dimensions of 100 by 150 m and occurs adjacent to dacite lava. Cinnabar occurs in addition to molybdenite. Mineralization age interpreted as Pliocene to Quaternary.

Petrachenko, 1978; Petrachenko and Petrachenko, 1978.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
M57-01 / 50°44'N / 156°16'E	Koshkina / Kuril	Cu, Zn, Pb / Polymetallic vein	Small

Deposit consists of bodies up to 200 m long that occur in hydrothermally altered rock adjacent to a granoidiorite and diorite intrusion. Bodies consist of closely-spaced sericite and hydromica veins and veinlets of variable composition. Veins and veinlets composed of quartz-tourmaline, quartz-chlorite-sericite, chlorite-carbonate with zeolite, and quartz-chlorite-epidote. Ore minerals are chalcopyrite, cleiophane, galena, stibnite, realgar, orpiment, arsenopyrite, pyrite, marcasite, hematite, and magnetite. Polymetallic and Sb-As ores are spatially separated and display different types of alteration. Mineralogy and metal content vary widely. Host rocks are propylitized up to epidote-chlorite facies, and are silicified. Propylitized granodiorite and diorite crops out in the middle part of the mineralized area. Alteration formed by sulfate and halogene-acid hydrothermal solutions. Deposit occurs at the northern part of Shumshu Island in an area of approximately 5 km^2 in heavily altered Early-Middle Miocene volcanic rocks that are cut by numerous extrusive and intrusive rocks, all part of a volcano-plutonic complex. Age of mineralization interpreted as late Miocene(?).

Petrachenko, 1978.

M57-02 / 50°38'N / 156°03'E	Ebeko / Kuril	S, FeS_2 / Sulfur-sulfide	Medium. Contains up to 20 to 45% S.

Consists of three deposit types: (1) native sulfur in fumarole deposits on the slopes of Ebeko Volcano; (2) sulfur ooze in lacustrine deposits in craters; and (3) disseminated metasomatic deposits of sulfur-sulfide ore in altered andesite and tuff, containing 20 to 45% S. In addition to S, ore minerals are pyrite, marcasite, quartz, kaolinite, alunite, pyrophyllite, barite, illite, and opal. Deposit occurs over an area of approximately 20 km^2 on the slopes of Ebeko volcano. Largest deposit areas are 100 to 150 m long and 10 to 15 m thick. Mineralization is related to fumerole and hydrothermal activity of Ebeko andesitic stratovolcano.

Vlasov, 1971.

M57-03 / 50°30'N / 156°02'E	Zaozernoe / Kuril	S, FeS_2 / Sulfur-sulfide	Medium. Average content of 20-70% S.

Deposit consists of three types: (1) sublimated; (2) sulfur flows; and (3) disseminated-metasomatic. First and second types form irregular bodies that are a few tens of m long, from 5 to 6 m thick, and contain 50-70% S. Ten of these ore bodies are explored. Two occurrences of the third ore type exist, are up to 15 m thick and 100 m length along strike, and are related to bodies of siliceous and opalized agglomerate and psephitic tuff. Some pipe-like bodies of sulfur-bearing quartz rock occur that are 1.5 to 2 m across and contain 20 to 35% sulfur. Ore minerals are opal (45-50%), kaolinite (10-15%), alunite (15-20%), and pyrite. In the other parts of caldera aresheet-like bodies consisting of quartz-opal, quartz-alunite, quartz, and opal-kaolinite sulfur-sulfide that occur in hydromica-pyrite rock. Vertical extent of deposit is up to 150 m. Deposit occurs in solfataric fields of the Zaozernaya caldera and the Bilibin andesitic volcano. Age of mineralization interpreted as Pliocene to Quaternary.

Vlasov and Petrachenko, 1965.

M57-04 / 50°24'N / 156°02'E	Rifovoe / Kuril	Au, Zn, Pb / Au-Pb-Zn epithermal vein	Small. Average grade of 35% Zn and 17% Pb, and up to 1.5 g/t Au.

Consists of several zones, each a few m thick, that occur in tectonic breccia. Zones consist of a series of parallel, steeply-dipping veinlets and veins up to 15 m thick. Ore minerals are sphalerite, galena, chalcopyrite, pyrite, and marcasite. Gangue minerals are quartz, barite, sericite, adularia, and rarely opal. Veinlets and veins are bordered by an aureole of disseminated sulfides. Alteration of host rocks is zoned, and consist, from the core outward of quartz, quartz-adularia-montmorillonite, and albite-chlorite with carbonate. Temperature of ore deposition of 220 to 240°C. Host rocks are heavily altered by fumerole and hydrothermal activity. Deposit occurs in cliffs along the Pacific coast, over an area of approximately 0.8 km^2, in Pliocene volcanic rocks that are intruded by diorite porphyry and trachyandesite dikes. Age of mineralization interpreted as Pliocene.

Petrachenko, 1976.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

N03-01 53°45'N 166°10'W	Sedanka (Biorka) Alaska Peninsula and Aleutian Islands	Zn, Pb, Cu Au, Ag Polymetallic vein	Average grade of 6.8% Zn, 0.45% Cu, 0.29% Pb, 1.37g/t Au, 48 g/t Ag

Consists of disseminated sphalerite and pyrite, with minor galena and chalcopyrite along a fault zone striking east-northeast and dipping moderately south. Quartz and ankerite gangue. Fault zone with sulfides at least 1,000 m long, and up to 80 m thick. Hanging wall is Tertiary diorite, footwall is greenstone.

Webber and others, 1946.

N04-01 55°57'N 159°24'W	Kawisgag (Ivanof) Alaska Peninsula and Aleutian Islands	Cu, Mo, Au Porphyry Cu and (or) polymetallic vein	Grab samples with 0.2 to 1.0% Cu, up to 0.024% Mo, and 0.23 to 0.4 g/t Au. Small tonnage

Area of intense sericitic and weaker potassic alteration over an area of about 200 by 700 m in nonmarine fluvial volcanic sandstone and conglomerate of the lower Tertiary Tolstoi Formation and black siltstone of the Upper Cretaceous Hoodoo(?) Formation. Minor propylitic alteration on periphery. Sedimentary rocks intruded small stocks and dikes. Alteration overprinted on contact-metamorphic aureoles around stocks. Iron-stained area of about 2.5 km^2.

R.F. Robinson, written commun., 1975; Frederic H. Wilson and Robert L. Detterman, written commun., 1985

N04-02 55°35'N 161°16'W	Canoe Bay Alaska Peninsula and Aleutian Islands	Au, Ag Hg, As, Pb, Zn Au-Ag epithermal vein	No data

Quartz-cemented breccia with gold in altered late Tertiary or Quaternary felsic intrusive and extrusive rocks consisting of rhyolite to rhyodacite porphyry, and vent, explosion, and lithic breccia. Associated crystal tuff, and andesite to dacite dikes. Core of deposit is marked by sericite, pyrite, argillic, and silica alteration grading outward into weak propylitic alteration. Anomalous soil and rock values of Au, Ag, Hg, As, Pb, and Zn. Intrusive rocks intrude shale, sandstone, and conglomerate of the Cretaceous Hoodoo(?) Formation.

Gary L. Andersen, written commun., 1984; Frederic H. Wilson, written commun., 1985

N04-03 55°37'N 160°41'W	Pyramid Alaska Peninsula and Aleutian Islands	Cu, Au Mo Porphyry Cu	Estimated 110 million tonnes grading 0.4% Cu, 0.03% Mo,and trace of Au

Disseminated molybdenite and chalcopyrite(?) in iron-stained dacite porphyry stocks and dikes of late Tertiary age. Zonal alteration pattern with core of secondary biotite and about 3 to 10% magnetite, grading outward to envelope of quartz-sericite alteration. Peripheral sericite filled fractures adjacent to stock. Local oxidation and supergene enrichment blanket up to 100 m thick, mainly of chalcocite and covellite. Deposit centered on 3 sq km area within stock. Several smaller stocks nearby. Stocks intrudes fine-grained clastic rocks of the Upper Cretaceous Hoodoo Formation, and Paleocene or Eocene to Oligocene Stepovak(?) or Tolstoi(?) Formation. Sedimentary rocks contact metamorphosed adjacent to stock.

Armstong and others, 1976; Hollister, 1978; Wilson and Cox, 1983; Gary L. Anderson, written commun., 1984; Robert L. Detterman, oral commun., 1986

N04-04 55°34'N 160°27'W	San Diego Bay Alaska Peninsula and Aleutian Islands	Ag, Au, Cu, Pb, Zn Au-Ag epithermal vein(?)	No data

Area of propylitic, and local argillic or silicic alteration in middle Tertiary dacite flows, associated with Fe-stained area of 61 km^2. Rock samples from altered area contain 0.5% to 5.0% pyrite. Numerous small quartz veins with anomalous Ag and Au, and minor Cu-, Pb-, and Zn-sulfides. Quartz veins in altered middle Tertiary dacite. Veins and altered area may be upper part of porphyry Cu deposit.

Gary L. Andersen, written commun., 1984

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N04-05 55°11'N 160°40'W	Aquila Alaska Peninsula and Aleutian Islands	Au, Ag Au-Ag epithermal vein	Grab samples with up to 7.8 g/t Au, 27 g/t Ag

Quartz fissure vein system with gold in Tertiary andesite flows and tuffs. Veins extend up to 2,700 m and occur along northeast-striking regional fractures, a few kilometers apart, and parallel to similar fractures that host the Apollo-Sitka deposit. Deposit restricted to small ore shoots occurring at intersections of veins or where veins abruptly change strike. Argillic and silicic alteration generally restricted to narrow envelopes around individual quartz veins.

Gary L. Andersen, written commun., 1984

N04-06 55°12'N 160°37'W	Apollo-Sitka Alaska Peninsula and Aleutian Islands	Au, Ag, Pb, Zn, Cu Au-Ag epithermal vein	Produced about 3.3 million g Au from 435,000 tonnes ore grading 7.7 g/t Au. Estimated 163,000 tonnes remaining. Portions of drill core with up to 7.3 g/t Au, 240 g/t Ag

Quartz-calcite-orthoclase veins and silicified zones with gold, galena, sphalerite, chalcopyrite, and native copper. Veins and zones occur in intensely developed, northeast-striking fracture systems that extend to at least 420 m below surface. At least eight major vein-fracture systems. Veins range from a few centimeters to 7 m wide. Higher grade parts of deposit occur in tensional flexures in the vein-fracture system. Abundant quartz comb structures and euhedral crystal druses indicate vein formation at shallow depths. Hosted in extensively propylitically altered Tertiary tuff and intermediate volcanic rocks. Main production from 1894 to 1906. About 5,100 m of underground workings. Considerable exploration activity from late 1980's to the present.

Martin, 1905, Brown, 1947

N04-07 55°12'N 160°35'W	Shumagin Alaska Peninsula and Aleutian Islands	Au, Ag Au-Ag epithermal vein	Estimated 540,000 tonnes grading 10.3 g/t Au, 34.3 g/t Ag; includes 256,000 tonnes grading 14.6 g/t Au and 54.9 g/t Ag

Quartz fissure system with gold hosted in middle Tertiary (Miocene?) andesitic volcanic rocks. Estimated tonnage in area 2,700 m long, 610 m wide, and 120 m deep. Fissure system occurs on same northeast-southwest-trending structure as Aquila deposit. Extensive drilling in 1982 and 1983 and some activity since.

Gary L. Anderson, written commun., 1985

N08-01 55°48'N 132°12'W	Union Bay (Cleveland Peninsula) Klukwan-Duke	Fe, V, Ti, Cr, PGE Zoned mafic-ultramafic Cr-PGE	Large. Estimated 1,000 million tonnes grading 18 to 20% Fe; also numerous chromite andpossible V occurrences. Grab grade 0.093 g/t Pt, 0.20 g/t Pd.

Consists of magnetite and chromite that are disseminated in dunite, and chromite, and also occur as discontinuous stringers in dunite. Deposit hosted in a mid-Cretaceous, concentrically zoned mafic-ultramafic complex with a dunite core, named the Union Bay ultramafic pluton. Magnetite and chromite are primary segregations. PGE occur with chromite and magnetite in dunite. Hand-picked specimens of chromite average 0.093 g/t Pt, 0.200 g/t Pd, 0.062 g/t Rh and 0.215 g/t Ir. Dunite occurs in pipe and lopolith in center of the ultramafic pluton that intrudes Upper Jurassic and Lower Cretaceous flysch of Gravina-Nutzotin overlap assemblage. Peridotite also occurs with dunite; pyroxenite and hornblende pyroxenite occur on periphery of pluton.

Ruckmick and Noble, 1959; Berg, 1984; Brew and others, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N08-02 55°31'N 132°18'W	Kasaan Peninsula (Mount Andrew) Prince of Wales Island	Cu, Fe Au, Ag Cu-Fe skarn	Produced about 245,000 tonnes ore containing 5.81 million kg Cu, 215,800 g Au, 1.74 million g Ag. Contains an estimated 2.7 million tonnes grading 2.37% Cu, 0.88 g/t Au, 7.1 g/t Ag.

Consists of irregular to tabular masses of magnetite, chalcopyrite, and pyrite in gangue of calcite and calc-silicate skarn that occur in about 30 bodies along a 20-km-long belt. Skarns occur mainly along contacts between lower Paleozoic calcareous metasedimentary rocks and mafic metavolcanic rocks of the Descon Formation adjacent to irregular dikes, sills, and plugs of Ordovician or Silurian diorite, quartz monzodiorite, and mafic dikes. Skarns to north are generally dominated by epidote-quartz endoskarn and pyroxene-garnet-epidote exoskarn with chalcopyrite, magnetite, and calcite. Skarns to south generally consists of hornblende, magnetite, chalcopyrite, and pyrite with low Ag and Au. Considerable mining at various skarns. Several episodes of exploration. Extensive underground workings.

Warner and others, 1961; Berg, 1984; Myers, 1985; Brew and others, 1991.

N08-03 54°55'N 132°08'W	Bokan Mountain (Ross-Adams) Western-Southeastern Alaska	U, Th, Be, Nb, Pb, REE Felsic plutonic U-REE	Medium. Produced about 109,000 tonnes grading about 1% U3O8; Th not recovered

Consists of disseminated U, Th, REE, and niobate minerals, including uranothorite, uranoan thorianite, uraninite, xenotime, allanite, monazite, pyrite, galena, zircon, and fluorite in irregular, steeply dipping pipe of Jurassic peralkaline granite. Most of ore produced from crudely cigar-shaped upper part of pluton. Central zone grades outward into normal granite. Associated pegmatite and vein REE, Nb, Th, and U deposits in outer parts of granite or adjacent country rock that consists of early Paleozoic metamorphosed granitic and sedimentary rocks of Alexander terrane. Intermittent mining from 1955 to about 1971.

MacKevett, 1963; Statz, 1977; Thompson and others, 1982; Lancelot and de Saint-Andre, 1982; Armstrong, 1985; Edward M. MacKevett, Jr., written commun., 1986; J. Dean Warner, written commun., 1987; Thompson, 1988; Warner and Barker, 1989; Brew and others, 1991; Berg, 1984.

N08-04 53°32'N 132°13'W	Cinola (Specogna, Babe) Unassigned	Au Hg Au epithermal vein	Medium. Reserves of 24.8 million tonnes grading 2.47 g/t Au.

Consists of gold with pyrite, marcasite, chalcopyrite and cinnabar that occur in silicified zones associated with Miocene rhyolite porphyry dike intruded along a faulted contact between Cretaceous shale and Late Tertiary coarse-grained clastic sedimentary rocks. Silicification and mineralization are partly contemporaneous with clastic sedimentation, with 55% of deposit hosted in clastics, 2% in Cretaceous sediments 13% in rhyolite and 30% in polymictic hydrothermal breccias. Deposit age interpreted as Miocene.

B.C. Minfile, 1989; EMR Canada, 1989; Christie, 1989; Mining Review, 1992.

N08-05 52°46'N 132°03'W	Tasu Sound (Wesfrob, Tasu, Garnet) Island Porphyry	Fe, Cu Fe skarn	Medium. Produced 22.6 million tonnes and reserves of 5.5 million tonnes grading 53.4% Fe, 0.26% Cu, 6.1 g/t Au.

Consists of massive magnetite-chalcopyrite skarn that is hosted in amygdaloidal greenstone of the Upper Triassic Karmutsen Group or near contacts with the Jurassic San Cristobal hornblende diorite pluton of the Island Suite. Deposit age interpreted as Middle Jurassic.

Sutherland Brown, 1968; EMR Canada, 1989; Dawson and others, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

N08-06 55°38'N 132°34'W	Salt Chuck Prince of Wales Island	Cu, Pd, Pt, Au Zoned mafic-ultramaficCu-Au-PGE	Produced about 300,000 tonnes of 0.95% Cu, 1.2 g/t Au, 5.8 g/t Ag, 2.2 g/t PGE; mainly Pd and Pt. Produced 610,400 g PGE. Grab samples with up to to 0.57 g/t Pt, 1 g/t Pd

Irregularly and randomly distributed veinlets of bornite, with minor chalcopyrite, chalcocite, covellite, native copper, and magmatic magnetite. Sulfides and oxides occur as disseminations and along cracks and fractures in pipe-like late Paleozoic or Mesozoic gabbro-clinopyroxenite stock intruding Silurian metagraywacke of Alexander terrane. Clinopyroxenite and gabbro grade irregularly into one another. Bornite forms principal sulfide; occurs mainly as interstitial grains in clinopyroxenite in amounts up to 15 percent. Extensive development of late magmatic or hydrothermal epidote veins in gabbro and clinopyroxenite. K-Ar age of 429 Ma for low-K, altered biotite from clinopyroxenite. Deposit probably magmatic, but there is some to considerable hydrothermal deposition or remobilization of sulfides. Mined from 1907 to 1941 from considerable underground workings and glory hole.

Howard, 1935; Gault, 1945; Donald Grybeck and David A. Brew, written commun., 1985; Loney and others, 1987

N08-07 55°28'N 132°42'W	Dawson Prince of Wales Island	Au Cu, Pb, Zn Polymetallic vein	Probably produced several ten thousand g Au and Ag each, and minor Pb. Estimated 40,000 tonnes grading 34.3 g/t Au remain

Consists of several parallel quartz veins in zone up to about 7 m wide. Most gold concentrated along contacts of veins and lower(?) Paleozoic black graphitic slate of Alexander terrane. Scattered pyrite, sphalerite, chalcopyrite, and galena in veins. Mined from 1900 to 1948 from several sites to a depth of at least 181 m. Some surface activity and drilling in the 1980's.

Wright and Wright, 1908; Harris, 1985

N08-08 55°18'N 132°23'W	Khayyam Alexander	Cu, Au Ag, Zn Kuroko massive sulfide	Produced about 6.4 million kg Cu, 40,120 g Au, and 53,200 g Ag, from 205,000 tonnes ore. Channel samples with up to 5.25% Cu, 6.9 g/t Au, 106 g/t Ag

Irregular, elongate, nearly vertical lenses of massive pyrite, with minor chalcopyrite, sphalerite, pyrrhotite, hematite, gahnite, and magnetite. Gangue of quartz, calcite, epidote, garnet, and chlorite. Seven stacked sulfide lenses up to 70 m long and 6 m thick. Lenses conformable to enclosing felsic to mafic metavolcanic host rocks of the pre-Middle Ordovician Wales Group in the Alexander terrane. Coarse fragmental textures in metavolcanic host rocks. Intense chlorite alteration in footwall below sulfide lenses. Lateral gradation between sulfide lenses and enclosing schist. Several hundred meters of underground workings. Principal mining from 1901 to 1907.

Fosse, 1946; Barrie, 1984a, b, 1988

N08-09 55°15'N 132°37'W	Jumbo district Western-Southeastern Alaska	Fe, Ag, Au, Cu, Mo Cu-Au skarn	Jumbo: Estimated 280,000 tonnes of 45% Fe, 0.73% Cu. Produced 4.6 million kg Cu, 220,000 g Au, and 2.73 million g Ag from 111,503 tonnes ore

District includes major deposit at Jumbo, and several small deposits including ones at Magnetite Cliff, Copper Mountain, and Corbin, and lesser deposits at Upper Magnetite, Gonnason, Houghton, Green Monster, Hetta, and Corbin. Deposits all within a few kilometers of Jumbo deposit. Deposits occur in or adjacent to lower Paleozoic marble and pelitic metasedimentary rocks of the Wales Group, intruded by mid-Cretaceous hornblende-biotite granodiorite (concordant hornblende and biotite K-Ar ages of 103 m.y.). Jumbo deposit: chalcopyrite, magnetite, sphalerite, and molybdenite in skarn at contact between marble and Early Cretaceous granodiorite stock. Gangue is mainly diopside and garnet. More than 3.2 km of underground workings. By far the largest deposit in the district, with major production. Magnetite Cliff: 25-m-thick shell of magnetite that mantles Early Cretaceous granodiorite in contact with garnet-diopside skarn. Skarn contains 2% to 3% chalcopyrite, resources are estimated at 335,600 tonnes of 46% Fe and 0.77% Cu. Production from 1902 to 1922. Copper Mountain: Scattered chalcopyrite and copper carbonate occurrences in diopside endoskarn with veins and masses of epidote, garnet, magnetite, and scapolite near granodiorite. Produced 101,800 kg Cu, 321,300 g Ag, and 4,510 g Au between 1902 and 1907. About 410 m of tunnels and shafts.

Kennedy, 1953; Herreid and others, 1978

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N08-10 55°11'N 132°23'W	Moonshine Alexander	Ag, Pb Zn, Cu Carbonate-hosted massive sulfide	Produced up to 46,500 g Ag. Grab samples with 20 to 83% Pb, 411 to 1,030 g/t Ag

Massive galena with sphalerite, and minor chalcopyrite, and accessory pyrite in well-defined fissure veins and lenses up to a few meters wide in a dolomitized breccia that obliquely cuts across marble and metasedimentary rocks. Wall rocks part of the pre-Middle Ordovician Wales Group in Alexander terrane. Gangue of quartz, siderite, and calcite. Diabase dikes locally cut veins and wall rocks. Several tunnels and shafts. Minor production between 1900 and 1909.

Wright, 1909; Herreid and others, 1978

N08-11 55°03'N 132°38'W	Lime Point Alexander	Ba Bedded barite	Estimated 4,500 tonnes grading 91% barite

Lenses of barite up to 2 m thick are interlayered with the pre-Middle Ordovician dolomitic marble of the Wales Group. Rocks faulted and folded; and andesite dikes intruded along faults. One short adit. Test shipments; no production.

Twenhofel and others, 1949; Herreid and others, 1978

N08-12 55°04'N 132°09'W	Niblack Alexander	Cu, Au, Ag Kuroko massive sulfide	Produced about 636,000 kg Cu, 34,200 g Au, 466,500 g Ag. Contains 6 m thick ore zones with 4.9% Cu, 8.0% Zn, and 9.2 g/t Au

Lenticular masses and disseminations of chalcopyrite, pyrite, and lesser sphalerite, galena, hematite, and magnetite in mainly quartz-sericite schist derived from pre-Ordovician(?) felsic volcanic or volcaniclastic rocks. Felsic metavolcanic rocks interlayered with intermediate to mafic metavolcanic rocks and lesser slate. Host rocks part of the pre-Middle Ordovician Paleozoic Wales Group in Alexander terrane. Workings consist of a 100-m shaft and about 1.6 km of underground workings. Main mining from 1902 to 1909. Recent development.

Herreid, 1964; W.C. Block, written commun., 1989

N08-13 53°49'N 132°01'W	McLean Arm district Prince of Wales Island	Co, Mo Porphyry Co-Mo	Higher grade veins and strockwork range from 0.4-5.6% Cu, 0.01-0.08% Mo, and 2.1-11.0 g/t Au. Anomalous Ag, Pt, Bi, Te, and base metals also occur. Possible 40 million tonnes ore at Apex.

Consists of a group of stockworks and veins at Polson, Ickis, Veta, Apex, and Stone Rcck vein. Stockworks and veins occur mainly along joints and faults that strike north-northeast or west-northwest and dip steeply. Stockworks, veins, joints, and faults interpreted as related to a concentric alteration zone of about 5 km^2 area that contains a carbonate-albite center and an albite-sericite rim. Stockworks and veins hosted in northwest-trending belt of middle Paleozoic, multi-phase plutonic complex of pyroxenite, syenite, and quartz monzonite. Central part of complex containing the deposits is mainly syenite. Altered, mineralized synenite at Stone Rock Bay has a U-Pb zircon isotopic age of 436 Ma. Plutons intrude clastic rocks of the Descon Formation, part of the Alexander terrane, on the southern tip of Prince of Wales Island.

MacKevett, 1963; F.D. Forgeron and L.W. Leroy written commun., 1971; Nokleberg and others, 1995.

N08-14 55°39'N 132°00'W	Gold Standard (Helm Bay) Juneau	Au Au quartz vein	Probably produced a few ten thousand g Au

Two sets of quartz veins with less than 1% gold, pyrite, galena, and tetradymite. Principal vein about 300 m long and up to 2 m thick cuts metamorphosed upper Mesozoic phyllitic flysch and andesite tuff of Gravina-Nutzotin belt. Most ore came from older set of veins that are parallel to foliation of host rocks. Younger veins that parallel strike, but dip in opposite, direction contain little gold.

Wright and Wright, 1908

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-01 55°55'N 129°56'W	Prosperity-Porter Idaho Skeena	Ag, Pb, Zn Ag-Pb-Zn polymetallic vein	Medium. Reserves of 826,277 tonnes grading 669 g/t Ag, 5% Pb+Zn.

Summary and References

Consists of galena, sphalerite, tetrahedrite and native silver that occur in narrow, irregular quartz veins in volcanics of the Jurassic Hazelton Assemblage, adjacent to the Eocene Hyder biotite granodiorite pluton Production in 1922-50 totaled 2.36 million oz Ag. Deposit age interpreted as Eocene.

Alldrick, 1985; Alldrick and others, 1987; Prime Equities Inc., 1991; Schroeter and Lane, 1991.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-02 55°57'N 129°42'W	Red Mountain Texas Creek	Au, Ag Zn, Pb, Cu, Te, Bi Au-Ag polymetallic vein	Medium. Reserves of 2.5 million tonnes grading 12.8 g/t Au, 28.6 g/t Ag.

Consists of densely disseminated pyrite veinlets that are enveloped by variable amounts of pyrrhotite and sphalerite plus minor amounts of chalcopyrite, arsenopyrite, galena and tetrahedrite. Alteration assemblages include sericite, K-feldspar, tourmaline and propylitic assemblages. High gold values are associated with semi-massive, coarse grained pyrite. Gold occurs as native metal, electrum and tellurides. Deposit contains twelve surface showings and three underground zones that are associated with the brecciated, sericitized and pyritized contact zone between the Lower Jurassic Goldslide quartz monzonite-granodiorite-diorite pluton and Lower Jurassic bimodal volcanic and volcaniclastic rocks of the Hazelton Group. Deposit age interpreted as Early Jurassic.

Northern Miner, February 22, 1993; Greig and others, 1994; Bray, 1994.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-03 55°44'N 129°33'W	Alice Arm Silver (Dolly Varden, North Star, Wolf, Coast	Ag, Pb, Zn Kuroko Zn-Pb-Cu massive sulfide	Medium. Production and reserves of 2.91 million tonnes grading 390 g/t Ag, 0.53% Pb, 0.82% Zn.

Consists of pyrite, sphalerite, galena, tetrahedrite, pyrargyrite and some native silver that occur in four deposits (Dolly Varden, North Star, Wolf and Toric). Deposits interpreted as structurally displaced portions of a once continuous siliceous baritic volcanogenic massive sulfide zone in Lower Jurassic volcanics (Hazelton?) within a roof pendant of the Coast Plutonic Complex. Production from the Torbit (Toric) mine between 1928 and 1959 was 1.27 million tonnes grading 456 g/t Ag and 0.39% Pb. Current reserves for the Dolly Varden, North Star, Torbit, and Wolf are 1.55 million tonnes grading 0.53% Pb, 0.82% Zn and 326 g/t Ag. Deposit age interpreted as Early Jurassic.

Devlin and Godwin, 1986; EMR Canada, 1989; Mining Review, 1992.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-04 55°24'N 130°29'W	Quartz Hill Central-Southeastern Alaska	Mo Porphyry Mo	Large. Estimated 1,700 million tonnes of 0.136% MoS_2. Estimate 444 million tonnes with 0.219% MoS_2 near surface.

Consists of a stockwork of molybdenite-bearing, randomly oriented quartz veins, and fractures, and disseminated molybdenite that are distributed throughout a multiply altered hypabyssal stock with an outcrop area of several square kilometers. Stock consists of a shallow-level, multi-phase complex of granite porphyry, quartz porphyry, microgranite, and aplite of late Oligocene or early Miocene age. Stock intrudes the central granitic belt of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Traces of uranium in accessory minerals in the porphyry. K-Ar age of hypabyssal granitic rocks about 27 m.y.

Hudson and others, 1979; Berg, 1984; P.R. Smith and J.E. Stephens, written commun., 1985; Brew and others, 1991.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-05 55°27'N 129°50'W	Anyox Area (Hidden Creek, Bonanza) Coast	Cu, Ag, Au Fe Cyprus massive sulfide	Medium. Production and reserves of 26.7 million tonnes grading 1.48% Cu, 9.6 g/t Ag, 0.17 g/t Au.

Consists of chalcopyrite, pyrrhotite and pyrite that occur as pipe-like and sheet-like lenses within metamorphosed roof pendants of Early to Middle Jurassic pillowed tholeiitic volcanic and sedimentary rocks. Roof pendant is underlain by granitoids of the Coast Plutonic Complex. Production from the Hidden Creek and Bonanza orebodies of 22.4 million tonnes with recoveries of 1.50% Cu, 9.61 g/t Ag and 0.17 g/t Au. Similar copper and precious metal grades are reported for reserves. Deposit age interpreted as Early and Middle Jurassic.

Sharp, 1980; Grove, 1986; EMR Canada, 1989; Hoy, 1991; Smith, 1993.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-06 55°35'N 129°24'W	Ajax Skeena	Mo Zn, Pb, Cu, Ag Porphyry Mo	Large. Reserves of 178.5 million tonnes grading 0.121% MoS2.

Consists of molybdenum in quartz-vein stockwork that is hosted in Eocene quartz monzonite porphyry of Alice Arm Intrusions and adjacent hornfels zone in Jurassic argillaceous rocks. Deposit occurs in four small, closely spaced plutons. Total reserves of 417.3 million tonnes grading 0.09% MoS2 with a very high stripping ratio. A biotite K-Ar age of 54.0 Ma ± 3 Ma age is reported. Deposit age interpreted as Eocene.

Christopher and Carter, 1976; Soregaroli and Sutherland Brown, 1976; B.C. Minfile, 1989; EMR Canada, 1989.

N09-07 55°28'N 129°20'W	Bell Moly (Alice Arm) Skeena	Mo, W Porphyry Mo	Medium. Reserves of 106 million tonnes grading 0.09% MoS2.

Consists of molybdenite and minor scheelite that occur in quartz vein stockwork in Eocene quartz monzonite porphyry of the Alice Arm Intrusions and biotite hornfels in Jurassic metasedimentary and metavolcanic rocks. Deposit occurs in a crescent-shaped zone around the eastern portion of the Eocene stock. Deposit age interpreted as Eocene.

Carter, 1982; EMR Canada, 1989.

N09-08 55°25'N 129°26'W	Roundy Creek Skeena	Mo Porphyry Mo	Medium. Reserves of 8.4 million tonnes grading 0.15% MoS2.

Deposit occurs in three zones: the Roundy Creek Zone that lies east of a major fault within quartz stockwork and as fracture fillings; and the Sunshine Creek and High Grade Zones that lie west of the fault and occur as lens-like zones mainly in alaskite dikes. Host rocks are quartz monzonite porphyry of the Eocene Alice Arm Intrusions and argillites and siltstones of the Late Jurassic Bowser Assemblage. K-Ar age for the Alice Arm Intrusion of 52.5 Ma and 53.5 Ma. Deposit age interpreted as Eocene.

Christopher and Carter, 1976; Soregaroli and Sutherland Brown, 1976; Carter, 1982; B.C. Minfile, 1989; EMR Canada, 1989.

N09-09 55°25'N 129°25'W	Kitsault (BC Moly) Skeena	Mo Ag, Pb, Zn, Cu Porphyry Mo	Medium. Production and reserves of 113.3 million tonnes grading 0.184% MoS2.

Consists of molybdenite in quartz vein stockworks that are related to an Eocene quartz monzonite and quartz diorite stock that intrudes Late-Jurassic-Early Cretaceous siltstones and greywackes of the Bowser Assemblage. At least five phases of the stock are recognized. Three stages of mineralization are associated with intramineral dikes. Molybdenum-bearing rocks form a ring structure around the stock in quartz veinlets. Veinlets are cut by quartz veins, up to 3 meters wide and contain pyrite, galena, sphalerite, scheelite, chalcopyrite, tetrahedrite and pyrrhotite. K-Ar age of 53.7 ± 1.7 Ma for the porphyry. Between 1967 and 1972 production was 9.3 million tonnes grading 0.112% molybdenum. Reserves in 1989 were 104 million tonnes grading 0.19% MoS2. Deposit age interpreted as Eocene.

Woodcock and Carter, 1976; Carter, 1982; Steininger, 1985; B.C. Minfile, 1989; EMR Canada, 1989.

N09-10 55°35'N 127°29'W	Mount Thomlinson Skeena	Mo Porphyry Mo	Medium. Reserves of 40.8 million tonnes grading 0.12% MoS2.

Consists of molybdenite, chalcopyrite and pyrite occur with minor magnetite and scheelite that occur in a stockwork of veinlets near the northwest contact of a circular, Eocene quartz monzonite porphyry stock that intrudes argillaceous Jurassic sedimentary rocks. Deposit occurs predominantly within intrusive rocks along the northwest contact. Host sedimentary rocks are deformed and metamorphosed into biotite, muscovite, cordierite and andalusite-bearing schists. K-Ar isotopic age of 53.8 ± 2.2 Ma. Deposit age interpreted as Eocene.

Kirkham, 1964; Carter, 1982; EMR Canada, 1989.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
N09-11 55°08'N 127°36'W	Red Rose Bulkley	W, Au, Cu, Ag W polymetallic vein	Medium. Reserves of 20,000 tonnes grading 5% WO_3.

Consists of scheelite, ferberite, chalcopyrite, molybdenite and uraninite that occur in a shear quartz vein. Shear cuts one of three northeast-trending diorite dikes that intrude contact metamorphosed argillite and siltstone of the Red Rose Formation, near the contact with porphyritic granodiorite of the Cretaceous Rocher Deboule stock. Deposit age interpreted as Cretaceous.

EMR Canada, 1989; Dawson and others, 1991.

N09-12 55°15'N 126°10'W	Dorothy Skeena	Cu, Mo Porphyry Cu-Mo	Medium. Resource of 40.8 to 160 million tonnes grading 0.25% Cu, 0.01% MoS2.

Consists of chalcopyrite, bornite and minor molybdenite that occur in narrow quartz-filled fractures, rimmed with potassium feldspar. Deposit hosted in a 7.6 meter-wide biotite-feldspar porphyry dike of quartz diorite to granodiorite composition that occurs along the contact with Jurassic Hazelton Group volcanics and sediments. Deposit age interpreted as Late Cretaceous(?).

B.C. Minfile, 1985; EMR Canada, 1989.

N09-13 55°11'N 126°19'W	Morrison Skeena	Cu, Ag, Au Porphyry Cu-Au (Mo)	Medium. Resource of 86 million tonnes grading 0.42% Cu, 0.34 g/t Au, 3.4 g/t Ag, 0.017 Mo.

Consists of chalcopyrite and pyrite that occur in a stockwork of veinlets and fractures, and as disseminations in biotite-hornblende-plagioclase porphyry of the Eocene Babine Suite and in peripheral Jurassic sedimentary rocks. Porphyry and intruded sedimentary rocks are displaced by a fault. Deposit age interpreted as Eocene.

Carson and Jambor, 1974; Carter, 1982; EMR Canada, 1989.

N09-14 55°00'N 126°14'W	Bell Copper (Newman) Skeena	Cu, Au, Ag Porphyry Cu-Au (Mo)	Medium. Production and reserves of 71.75 million tonnes grading 0.46% Cu, 0.23 g/t Au, 0.48 g/t Ag, 0.006 Mo.

Consists of chalcopyrite and lesser bornite that occur as disseminations and in quartz lenses and stockwork veinlets. Deposit hosted in biotite-feldspar porphyry of the Eocene Babine Intrusions and the adjacent Jurassic metasedimentary rocks and metavolcanic rocks of the Hazelton Group. Two rock types are juxtaposed along the northwest-trending Newman fault. K-Ar biotite isotopic age of 51.0 Ma for porphyry interpreted as age of deposit. Ore zone exhibits pervasive potassic (mainly biotite) alteration with a surrounding concentric halo of chlorite and sericite-carbonate alteration. Alteration coincides with a two-km-wide pyrite halo that surrounds the deposit. Better copper grades occur in a 60 x 90 m-thick, flat-lying deposit which is connected to a central pipe-like zone, centered on the western contact of the intrusion. Past production was 28.7 million tonnes grading 0.46% Cu. Reserves include the Extension zone. A supergene chalcocite zone caps the deposit and extends to depths of 50 to 70 meters. Deposit age interpreted as Eocene.

Carson and Jambor, 1974; Carson and others, 1976; Noranda Inc., annual report, 1990; B.C. Minfile, 1991; Butrenchuk, 1991.

N09-15 54°57'N 126°09'W	Granisle Skeena	Cu, Au, Ag Porphyry Cu-Au (Mo)	Large. Production and reserves of 66.2 million tonnes grading 0.42% Cu, 0.12 g/t Au, 1.12 g/t Ag, 0.009 Mo.

Consists of chalcopyrite, bornite and pyrite with low grade Au and Ag and local minor molybdenite that occur in quartz-filled fractures associated with Eocene Babine porphyry intrusions (avg. isotopic age 51.2 Ma) that intrude Lower Jurassic Hazelton Group volcanic and sedimentary rocks. Deposit centered on the contact between biotite-feldspar porphyry and an earlier quartz diorite phase. A central potassic alteration zone is enveloped successively by a quartz-sericite-carbonate-pyrite zone and by a chlorite-carbonate-epidote zone. Deposit age interpreted as Eocene.

Kirkham, 1971; Carson and Jambor, 1974; Fahrni and others, 1976; EMR Canada, 1989; Dawson and others, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-16 54°49'N 127°18'W	Glacier Gulch (Hudson Bay Mountain) Bulkley	Mo W, Cu Porphyry Mo	Large. Resource of 100 Mt million tonnes grading 0.297% MoS2, 0.06% WO3.

Consists of molybdenite and minor scheelite that occur in stockwork and quartz vein swarms that are associated with a sheet-like granodiorite body and a later rhyolite porphyry plug. Igneous rocks intrude Jurassic Hazelton Group. The strongest mineralization occurs in to a crudely layered granodiorite sheet in the volcanic pile. Hydrothermal alteration patterns are irregularly developed. Deposit age interpreted as Late Cretaceous.

Kirkham, 1967; Bright and Jonson, 1976; EMR Canada, 1989; BC Minfile, 1995.

N09-17 54°49'N 126°54'W	Big Onion Skeena	Cu, Mo Porphyry Cu-Mo	Medium. Reserves of 18 million tonnes grading 0.36% Cu.

Consists of chalcopyrite, molybdenite and minor bornite that occur in a quartz stockwork and as disseminations in an Eocene pluton of the Nanika Suite and in the surrounding andesite of the Jurassic Hazelton Group. The pluton is an elongate, complex intrusion, formed of two phases, an early quartz feldspar porphyry and a core of younger quartz diorite porphyry. Highest copper grades are in the quartz diorite porphyry; highest molybdenum grades are in quartz feldspar porphyry, and the pyrite occurs in volcanic rocks. K-Ar age isotopic age of 48.7 ± 1.9 Ma obtained from a post-mineral dike. Deposit age interpreted as Eocene.

Mustard, 1976; Carter, 1982; EMR Canada, 1989.

N09-18 54°39'N 127°45'W	Serb Creek Skeena	Mo Porphyry Mo	Medium. Resource of 41.2 million tonnes grading 0.08% MoS2.

Conists of molybdenite that is widely distributed in fractures and quartz vein stockwork in the quartz monzonite core of an Eocene granodiorite stock that intrudes Hazelton Group volcanic rocks. Deposit age interpreted as Eocene.

Soregaroli and Sutherland Brown, 1976; EMR Canada, 1989; Dawson and others, 1991.

N09-19 54°02'N 126°59'W	Lucky Ship Skeena	Mo Porphyry Mo	Medium. Reserves of 18.1 million tonnes grading 0.16% MoS2.

Consists of molybdenite that occurs in a stockwork and fractures that are concentrated along the contact between two phases of an Eocene rhyolite porphyry plug that intrudes Jurassic sedimentary and volcanic rocks of the Hazelton Group. Rhyolite porphyry consists of two porphyritic and two breccia phases. Surrounding sedimentary and volcanic rocks are contact metamorphosed. Silicification and molybdenum mineralization are most intense around the younger porphyritic phase where the stockwork is developed. A pyrite halo surrounds silicification in an earlier porphyritic phase, and in breccia and the hornfels. K-Ar isotopic age of 49.9+2.3 Ma obtained from biotite in hornfels. Deposit has potential for open-pit mining. Deposit age interpreted as Eocene.

Soregaroli and Sutherland Brown, 1976; Carter, 1982; EMR Canada, 1989.

N09-20 54°01'N 126°59'W	Poplar Bulkley	Cu, Mo, Ag Porphyry Cu-Mo	Medium. Reserved of 144.1 million tonnes grading 0.368% Cu, 0.10% MoS2, 2.8 g/t Ag.

Consists of disseminated chalcopyrite and pyrite that occur in a Late Cretaceous biotite-monzonite porphyry stock. Molybdenite occurs in veins with quartz and gypsum. Porphyry stock intrudes Hazelton Group volcaniclastic and epiclastic rocks. Deposit age interpreted as Late Cretaceous.

Mesard and others, 1979; EMR Canada, 1989.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-21 54°05'N 126°44'W	Nadina (Silver Queen) Skeena	Zn, Pb, Ag, Au, Cu Ag polymetallic vein	Medium. Reserves of 1.72 million tonnes grading 6.19% Zn, 328 g/t Ag, 2.7 g/t Au.

Consists of sphalerite, galena and chalcopyrite that occur in a gangue of quartz, rhodochrosite, chalcedony and barite in Late Cretaceous andesite and altered fragmental volcanic rocks. Deposit age bracketed by porphyritic diorite and later felsite dikes and sills, similar to the Eocene Goosly Lake Intrusions. Deposit age interpreted as Eocene.

EMR Canada, 1989; Leitch and others, 1990; Dawson and others, 1991.

N09-22 54°11'N 126°16'W	Equity Silver (Sam Goosly) Skeena	Ag, Cu Au, Sb, As Ag polymetallic vein	Medium. Production and reserves of 32.1 milion tonnes grading 71.3 g/t Ag, 3.90 g/t Au.

Consists of pyrite, chalcopyrite, pyrrhotite and tetrahedrite, with minor sphalerite and galena and silver sulfosalts that are accompanied by argillic alteration. Sulfides occur in veins, disseminations, and massive sulfide replacement bodies, up to 120 m thick, that are situated in tabular fracture zones roughly parallel to stratigraphy. Reserves of 5,915,454 tonnes grading 72.01 g/t Ag, 0.82 g/t Au and 0.22% Cu. Total gold content (production + reserves) estimated as 16,936,034 g (16.9 tonnes). Deposit occurs between the two intrusives, the Cretaceous Skeena Assemblage sedimentary and pyroclastic rocks are intruded by a granitic stock (58 Ma) and a gabbro-monzonite stock (48 Ma) of the Goosly Lake Intrusions. Deposit age interpreted as Eocene.

Church, 1971; Carter, 1982; B.C. Minfile, 1988; Northern Miner, March 28,1988; Schroeter and Lane, 1991.

N09-23 53°52'N 129°31'W	Ecstall Tracy	Zn, Cu, Au, Pb, Ag, Fe Kuroko Zn-Pb-Cu massive sulfide	Medium. Reserves of 6.9 million tonnes grading 0.63% Cu, 2.6% Zn.

Consists of pyrite, chalcopyrite, sphalerite, pyrrhotite, marcasite and galena that occur as two tabular massive stratabound lenses in Paleozoic schist, quartzite and granitoid gneiss remnants of the Nisling terrane within Coast Plutonic Complex. Deposit occurs in a volcanic sequence close to a volcanic center. Intense hydrothermal alteration consists of chlorite, sericite and silica. Deposit age interpreted as Paleozoic.

Bacon, 1953; B.C. Minfile, 1989; EMR Canada, 1989; Hoy, 1991.

N09-24 53°45'N 127°41'W	Nanika (DW, New Nanik) Skeena	Cu Mo Porphyry Cu-Mo	Medium. Reserves of 18.14 million tonnes grading 0.437% Cu.

Consists of chalcopyrite, pyrite, pyrrhotite, molybdenite and bornite that occur in dacite porphyry of the Jurassic Hazelton Group. Porphyry intrudes along a faulted contact with quartz monzonite of the Eocene Nanika Suite. Sulfides occur as disseminations, fracture-fillings and veinlets. Alteration minerals in the dacite are biotite, silica and chlorite. Deposit age interpreted as Eocene.

George Cross Newsletter, no. 213, October 30, 1973; Carter, 1982; EMR Canada, 1989; B.C. Minfile, 1991.

N09-25 53°48'N 127°26'W	Berg Skeena	Cu, Mo Pb, Zn, Ag, Au Porphyry Cu-Mo	Medium. Reserves of 238 million tonnes grading 0.39% Cu, 0.05% MoS2, 2.84 g/t Ag.

Consists of chalcopyrite, molybdenite and pyrite with minor sphalerite, galena and arsenopyrite. Deposit occurs within a fine-grained stockwork of quartz-filled veinlets that are distributed in a broad asymmetrical zone around a semicircular quartz-monzonite porphyry stock of the Eocene Nanika Suite and within the peripheral hornfelsed Hazelton Group volcanic rocks. Most intense molybdenum concentrations occur in the stock, most intense copper concentrations occur 60 meter beyond the contact. A pyrite halo occurs 300 - 600 meters from the contact. Extensive oxidation, leaching and secondary enrichment is present. Deposit age interpreted as Eocene.

Panteleyev and others, 1976; Panteleyev, 1981; EMR Canada, 1989; Dawson and others 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N09-26 53°46'N 127°12'W	Whit (Whiting Creek) Skeena	Mo, Cu Porphyry Mo-Cu	Medium. Resource of 123.5 million tonnes grading 0.043% MoS2, 0.062% Cu.

Consists of pyrite, chalcopyrite and molybdenite that occur in Jurassic Hazelton Group fragmental rocks that are intruded by Late Cretaceous stocks. The largest stock is a hornblende-biotite granodiorite. Deposit occurs in veinlets and quartz stockworks in contact metamorphosed fragmental rocks and in sericite-altered porphyry. Highest Mo concentrations accompanied by quartz flooding. Deposit age interpreted as Eocene.

B.C. Minfile, 1986; EMR Canada, 1989.

N09-27 53°41'N 127°10'W	Huckleberry Bulkley	Cu, Mo Ag, Au Porphyry Cu-Mo	Medium. Reserves of 91.2 million tonnes grading 0.52% Cu , 0.014% Mo, 0.064 g/t Au, 3.1g/t Ag.

Consists of chalcopyrite and minor molybdenite that occur in fractures dominantly within contact metamorphosed and altered Jurassic Hazelton Group tuffs at contact with an Upper Cretaceous granodiorite porphyry stock of the Burkley Suite. Magnetite occasionally accompanies chalcopyrite. Potassic, pyrite and chlorite alteration haloes surround the stock. Deposit age interpreted as Late Cretaceous.

Southerland Brown, 1969; Carter, 1970; James, 1976; B.C. Minfile, 1988; EMR Canada, 1989; Mining Review, 1992; Society of Exploration Geologists Newsletter, no. 20, January, 1995, p. 26.

N09-28 53°41'N 127°03'W	Ox Lake Bulkley	Cu, Mo Au, Ag Porphyry Cu-Mo	Medium. Reserves of 17.2 million tonnes grading 0.33% Cu, 0.06% MoS2.

Consists of pyrite, chalcopyrite, hematite, magnetite, pyrrhotite and molybdenite that occur as disseminations and as stockworks in Jurassic felsic tuff, andesite tuff, sandstone and siltstone intruded by an Upper Cretaceous granodiorite stock of the Bulkley Suite. Copper minerals are dominate in the hornfels, and molybdenum minerals are dominant in the porphyry. Pyrite forms a halo extending beyond deposit. Porphyry stock has a K-Ar age isotopic date of 83.4 ± 3.2 Ma. Deposit age interpreted as Upper Cretaceous.

Sutherland Brown, 1969; Carter, 1970, 1982; Richards, 1976; EMR Canada, 1989; Dawson and others, 1991.

N09-29 53°18'N 127°00'W	Redbird Skeena	Mo Cu Porphyry Mo	Medium. Reserves of 63.5 million tonnes grading 0.17% MoS2.

Consists of molybdenite and pyrite that occur in a stockwork of quartz veinlets within peripheral concentric alteration zones of a quartz-monzonite porphyry stock of the Eocene Nanika Suite that intrudes Middle Jurassic pyroclastic rocks. Stock is dominantly one phase, and hosts a peripheral ring of molybdenum. Potassic (K-feldspar), silica-sericite, and kaolinite alteration are present. Stock has a K-Ar isotopic age 49.0 ± 2 Ma. Deposit age interpreted as Eocene.

Carter, 1982; EMR Canada, 1989; Dawson and others, 1991.

N09-30 52°25'N 131°18'W	Burnaby Iron (Jib) Island Porphyry	Fe Cu Fe skarn	Medium. Reserves of 7.26 million tonnes gradin60% Fe.

Consists of aconcordant body of magnetite that replaces the contact of Upper Triassic Kunga Group limestone and Upper Triassic Karmutsen, Vancouver Group greenstone. Both are intruded by Middle to Late Jurassic monzonitic stocks of the Burnaby Island Plutonic Suite. Stratified rocks strike northeast, dip moderately northwest, and are offset by steeply dipping northwest faults. Massive magnetite bodies grade into skarns. Sulfides are erratic and consist mainly of pyrite, with rare chalcopyrite, pyrrhotite and sphalerite. Deposit age interpreted as Middle Jurassic.

B.C. Minfile, 1992; Sutherland Brown, 1968, Anderson and Reichenbach, 1991.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

N09-31 52°18'N 131°12'W	Jedway (Magnet, Jessie) Island Porphyry	Fe Fe skarn	Medium. Pre-production reserves of 4.30 million tonnes grading 62% Fe.

Consists of replacement bands of magnetite, separated by skarn, that occur mainly basalt, conformable to bedding and also along faults. Hosted in basalt of the Upper Triassic Karmutsen Formation that is overlain by Upper Triassic Kunga Group limestone and argillite. Volcanic and sedimentary rocks intruded by greenstone, and diorite porphyry to quartz diorite of the Middle to Late Jurassic Jedway stock of the Burnaby Island Plutonic Suite, and by younger rhyolite and basaltic dikes. Skarns related to the stock. Operated from 1962-1968. Produced 3,938,682 tonnes of ore. Deposit age interpreted as Middle Jurassic.

Sutherland Brown, 1968; Anderson and Reichbach, 1991; B.C. Minfile, 1992.

N09-32 55°45'N 130°45'W	Alamo Tracy	Ag, Au, Cu, Zn Kuroko massive sulfide(?)	Grab samples and drill core with up to 0.2 to 0.7% Cu, 0.2 g/t Au, 50 g/t Ag, and minor Zn

Disseminated and vein-like(?) masses of chalcopyrite, pyrite, pyrrhotite, and sphalerite in zone up to 25 m wide in Paleozoic(?) paragneiss of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984) near foliated granodiorite.

Berg and others, 1977

N09-33 55°22'N 131°12'W	Sea Level Juneau	Au, Ag Au quartz vein	Unknown amount of gold produced in early 1900's

Quartz fissure veins with pyrite, galena, sphalerite and sparse gold in upper Paleozoic or Mesozoic schistose metatuff of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Local disseminated sulfides in wallrocks. Sulfide and gold concentrations higher where quartz vein crosscuts altered feldspar porphyry dikes. Minimum strike length of 600 m. One 36-m-deep shaft, and 363 m of horizontal workings.

Wright and Wright, 1908

N09-34 55°18'N 131°39'W	Goldstream Juneau	Au, Cu, Pb, Zn Au quartz vein	Produced several thousand tonnes ore

Quartz veins contain gold, pyrite, chalcopyrite, galena, sphalerite, and arsenopyrite. Veins cut greenschist, quartz-sericite schist, and pelitic schist of in Upper Jurassic and Lower Cretaceous Gravina-Nutzotin belt. Principal vein about 1 to 2.5 m wide. Several hundred meters of workings.

Wright and Wright, 1908

N09-35 55°18'N 131°21'W	Moth Bay Ketchikan	Cu, Zn Kuroko massive sulfide	Estimated 91,000 tonnes of 7.5% Zn and 1% Cu. Additional 181,000 tonnes of 4.5% Zn, 0.75% Cu

Discontinuous lenses and layers of massive pyrite and pyrrhotite, with minor chalcopyrite and galena. Associated with disseminated pyrite locally. Host rocks are light brown-gray, upper Paleozoic or Mesozoic muscovite-quartz-calcite schist, subordinate pelitic schist and quartz-feldspar schist, and possibly metachert. Layers and lenses of massive sulfides up to 1 m thick parallel compositional layering of schist. Host rocks part of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Several open cuts and about 230 m of underground workings.

Robinson and Twenhofel, 1953; Berg and others, 1978; Henry C. Berg, written commun., 1984

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			
N09-36 55°04'N 130°31'W	Red River Tracy	Cu, Mo Kuroko massive sulfide	No data

Disseminated grains and small masses of pyrite, pyrrhotite, magnetite, and molybdenite occurring along layering in Paleozoic(?) paragneiss intruded by pegmatite and gneissic granodiorite, of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Sulfide-bearing layers range from a few centimeters to 30 m thick.

Berg and others, 1978

N09-37 54°55'N 131°21'W	Duke Island Klukwan-Duke	Cr, PGE Zoned mafic-ultramafic Cr-PGE	Grab samples contain 0.037 g/t Pt and 0.033 g/t Pd

Disseminated to locally massive titaniferous magnetite and sparse chromite in hornblende-clinopyroxene phase of Cretaceous zoned ultramafic pluton. Ultramafic pluton intrudes early Paleozoic felsic metavolcanic rocks, early Paleozoic diorite, and Triassic gabbro of Alexander terrane.

Clark and Greenwood, 1972; Irvine, 1974; Berg and others, 1981

N10-01 55°56'N 125°26'W	Lorraine (Duckling Creek) Copper Mountain (North)	Cu Au, Mo Porphyry Cu-Mo	Medium. Resource of 9.1 million tonnes grading 0.70% Cu, 0.27 g/t Au.

Consists of two fault-bounded zones of chalcopyrite, bornite and magnetite that occur as disseminations in a syenite migmatite of the Copper Mountain Suite that intrudes monzonite and diorite of the Hogem batholith. K-Ar isotopic age of 175 ± 5 Ma for syenite intrusion and associated deposit. Sulfides are dominantly disseminated, but also occur in veins. In a Lower Zone, sulfides occur in mafic-rich lenses and are zoned from chalcopyrite + pyrite at the rim, through chalcopyrite with minor bornite to bornite with minor chalcopyrite at the core. Magnetite is common in veinlets and as an accessory mineral. An Upper Zone is similar but is highly oxidized. Copper deposition associated with high biotite and chlorite content, potassium feldspar and sericite alteration. Deposit age interpreted as Middle Jurassic.

Wilkinson and others, 1976; Garnett, 1978; B.C. Minfile, 1985; Dawson and others, 1991; EMR Canada, 1989.

N10-02 55°08'N 124°02'W	Mount Milligan Copper Mountain (North)	Cu, Au Porphyry Cu-Au	Medium. Reserves of 298.4 million tonnes grading 0.22% Cu, 0.45 g/t Au.

Consists of pyrite, chalcopyrite, bornite and magnetite that occur as disseminations and in quartz veinlets. Hosted in augite porphyritic andesite of the Witch Lake Formation of the Upper Triassic to Lower Jurassic Nicola Assemblage that is intruded by several small brecciated diorite and monzonite porphyry dikes and stocks. Deposit related to the intrusion of the MBX and Southern Star stocks. A U-Pb zircon age of 183 ± 1 Ma is obtained for the Southern Star monzonite. Cu and Au minerals associated with moderate to intense potassic alteration around intrusive contacts. Propylitic alteration is widespread and peripheral to potassic alteration. Deposit age interpreted as Middle Jurassic.

EMR Canada, 1989; Delong and others, 1991; McMillan, 1991; Gosh, 1992; Nelson and others, 1991; Barrie, 1993, E & M J , April 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N10-03 54°38'N 124°26'W	Pinchi Lake Pinchi Lake	Hg Silica-carbonate Hg	Medium. Reserves of 1.1 million tonnes grading 0.32% Hg.

Consists of cinnabar that occurs in a stockwork of thin quartz veins, replacement, lodes and breccia fillings. Hosted in marine limestone and carbonatized ultramafic rocks that occur in shears along the Pinchi Fault. Fault separates the Mississippian to Triassic Cache Creek Terrane from the Upper Triassic rocks of Quesnellia and is interpreted as providing a zone of permeability for mercury-bearing hydrothermal solutions. Ultramafic rocks, chert, argillite and greenstone are part of Cache Creek ophiolite and are intensely altered along the fault zones to an assemblage of Fe-Mg carbonates, quartz, mariposite and talc. Mineralization postdated both the Upper Triassic blueschists and Upper Cretaceous-Early Tertiary conglomerates. Production of 6000 tonnes of Hg between 1942 to 1975. Deposit age interpreted as Eocene-Oligocene(?).

Armstrong, 1949; Paterson, 1977; B.C. Minfile, 1989; EMR Canada, 1989; Dawson and others, 1991.

N10-04 54°02'N 125°07'W	Endako Francois Lake	Mo Porphyry Mo	Large. Reserves of 280.0 million tonnes grading 0.08% Mo.

Consists of molybdenite, pyrite and magnetite that occur in an elongate stockwork of quartz-sulfide veins that occur along a northwest-trending axis. Deposit hosted in quartz monzonite of the Late Jurassic Francois Lake Suite and occurs mainly along a series of en echelon east-striking veins, at or near the intersection of regional northwest and east structures. Alteration includes pervasive kaolinite and vein envelopes of potassium feldspar and sericite. Intrusive has a K-Ar isotopic age of 141 Ma. Deposit age interpreted as Late Jurassic-Early Cretaceous.

B.C. Minfile, 1989; Dawson and others, 1991; Kimura and others, 1976; Dawson and Kimura, 1972; White and others, 1970.

N10-05 53°17'N 125°10'W	Capoose Lake Skeena	Ag Pb, Zn, Cu, Au Ag-Au polymetallic vein	Large. Reserves of 28.3 million tonnes grading 36 g/t Ag, 0.91 g/t Au.

Consists of high Au and Ag concentrations associated with galena, pyrite, pyrrhotite, chalcopyrite, arsenopyrite and sphalerite that occur as disseminations, replacement of garnet, and fracture filling in Jurassic volcanic rocks of the Hazelton Group in structurally controlled zones. Volcanic rocks associated with subvolcanic porphyritic pluton of the Eocene Quanchus Suite. Deposit age interpreted as Eocene.

Church and Diakow, 1982; EMR Canada, 1989; Mining Review, 1992.

N10-06 53°05'N 121°34'W	Cariboo-Barkerville District (Aurum, Mosquito Creek, Cariboo	Au Ag Au quartz vein	Medium. Production (1933-1987) of 38-05 t Au, 5.1 t Ag, R. 401,768 t of 5.08 g/t Au. Average grade of 5.08 g/t Au.

District contains three principal mines (Cariboo Gold Quartz, Mosquito Creek, and Island Mountain Mines) that consists of quartz-sulfide veins and pyritic replacement lenses. Quartz-sulfide veins occur in phyllite and quartzite of the "Rainbow Member" usually within 100 meters of the local contact with mafic volcanic rocks and minor limestones of the "Baker Member" of the Lower Cambrian Downey Creek Formation of the Cariboo terrane. Pyrite lenses occur discontinuously in marble bands within the "Baker Member". Two sets of quartz-sulfide-Au veins are associated with major north-trending faults. Veins intrude the pyrite-Au lenses that appear to predate deformation and are interpreted to be syn-metamorphic. Producted 2.7 million tonnes ore (1933-1987), with average grade of 13.94 g/t Au, 1.87 g/t Ag. Deposit age interpreted as Middle Jurassic and Early Cretaceous.

Andrew and others, 1983; B.C. Minfile, 1989; Robert and Taylor, 1989; Schroeter and Lane, 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N10-07 52°31'N 122°16'W	Gibraltar (Pollyanna, Granite Mt) Guichon	Cu, Mo Ag, Au Porphyry Cu-Mo	Large. Production and reserves of 413 million tonnes grading 0.35% Cu, 0.016% MoS2, 0.006 g/t Au.

Consists of chalcopyrite, chalcocite, molybdenite, cuprite and bornite with minor magnetite and pyrite that occur as stockworks and fracture-filling veins. Deposit hosted in the metamorphosed and deformed Granite Mountain quartz diorite pluton of the Guichon Suite. Pluton intrudes volcanic and sedimentary rocks of the Cache Creek terrane. K-Ar age of 204 Ma ± 6 Ma (Early Jurassic) for pluton age. Multiple intrusions, deformation, greenschist facies metamorphism and mineralization are interpreted to have occurred contemporaneously with amalgamation of Cache Creek terrane with Quesnellia and Stikinia to the east and west respectively. Current reserves of 54 million tonnes grading 0.38% Cu. Deposit age interpreted as Early Jurassic.

Drummond, and others, 1976; B.C. Minfile, 1990; McMillan, 1991; Dawson and others, 1991, Gibraltar Mines Ltd., news release, March 21, 1994.

N10-08 52°34'N 121°38'W	Mt. Polley (Cariboo-Bell) Copper Mountain (South)	Cu, Au Porphyry Cu-Au	Medium. Reserves of 48 million tonnes grading 0.38% Cu, 0.55 g/t Au.

Consists of magnetite, chalcopyrite and minor pyrite that occur in several intrusive phases and three distinct breccias in an Early Jurassic pseudoleucite-bearing alkaline complex that intrudes Upper Triassic Nicola alkaline volcanic and volcaniclastic rocks of the Quesnel Trough. Some skarn and vein occurs in Nicola Group tuffite and flows. Supergene mineralization includes malachite, native copper, cuprite, chalcocite and covellite. U-Pb zircon age of (200 ± 1.5 Ma) for diorite and of monzonite porphyry. Deposit age interpreted as Early Jurassic.

EMR Canada, 1989; B.C. Minfile, 1991; McMillan, 1991; Mining Review, 1991; Gosh, 1992; Fraser and others, 1993.

N10-09 52°34'N 120°59'W	Eaglet (Quesnel Lake) Unassigned	F Ag, Zn, Pb, Mo, W F vein	Medium. Reserves of 21.8 million tonnes grading 11.5% CaF2 (w/ up to 514 g/t Ag).

Consists of fluorite in feldspar-mica gneiss of Kootenay terrane that is intruded by masses of pegmatite, aplite and granitic rock. Fluorite occurs as disseminated grains, as thin films on fractures, as veinlets and scattered veins up to 15 cm thick, and as pods and irregular masses 15 to 20 cm wide. North to northwest-trending mineralized zones dip steeply. Other ore minerals are galena, sphalerite, molybdenite, celestite, pyrite and silver. Deposit contains chlorite, sericite, and potassic alteration. Deposit age interpreted as Early Cretaceous.

Ball and Boggaram, 1985; B.C. Minfile, 1989; EMR Canada, 1989; Dawson and others, 1991.

N10-10 52°18'N 120°35'W	Frasergold (Eureka Peak, Kay, Mac) Cariboo	Au Ag, Cu, Zn, Pb Au quartz vein	Medium. Resource of 12.7 million tonnes grading 1.85 g/t Au.

Consists of disseminated pyrrhotite and pyrite (5% to 10%) with trace sphalerite, chalcopyrite, galena and coarse-grained gold that occur in deformed quartz-carbonate veins and stockwork. Occurs as stratabound bodies in porphyroblastic phyllite (locally referred to as "knotted phyllite") of the Upper Triassic Quesnel River Group. Veins are interpreted as forming early in the structural history of the area and generated by metamorphic segregation during the accretion of Quesnellia terrane to ancestral North America. The Frasergold Main Zone has been traced by drilling over a strike length of 8 km with gold deposits occurring in at least three stratigraphic horizons within the phyllite. Reserves of 12.7 million tonnes are based on a mining depth of 100 meters. Mineable reserves estimated as 3.17 million tonnes grading 1.71 g/t. Deposit age interpreted as Middle Jurassic.

Bloodgood, 1987; B.C. Minfile, 1989; Eureka Resources Inc., annual report,1990; Mining Review, 1992.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
N10-11 52°06'N 120°54'W	Boss Mountain Bayonne	Mo Porphyry Mo	Medium. Reserves of 3.84 million tonnes grading 0.135% Mo.

Summary and References

Consists of molybdenite that occurs in quartz veins, fracture zones and in collapse breccias hosted by the granodiorite phases of the composite Early Jurassic Takomkane batholith that is associated with the mid-Cretaceous Boss Mountain stock. Emplacement of the stock was accompanied by rhyolite dikes, brecciation and multiple stages of veining and Mo deposition. Pyrite forms a 1.5 km-wide halo. Alteration assemblages consists of garnet, hornblende, biotite, sericite, potassium feldspar, chlorite and talc. Produced 2.2 million tonnes grading 0.7% MoS2 between 1965 and 1982. Deposit age interpreted as mid-Cretaceous.

EMR Canada, 1989; Soregaroli and Nelson, 1976.

N11-01 53°45'N 119°53'W	Forgetmenot Pass Southern Rocky Mountain	Gypsum magnesite Stratbound gypsum	Medium. Reserves of 2.3 million tonnes grading 75% to 90% gypsum.

Consists of four concordant beds of gypsum that are hosted in Upper Triassic dolomite of the lowermost Whitehorse Formation. Beds range from 2 to 26 meters thick, occur over a 100-meter stratigraphic interval, strike northwestward, and dip from 25° to 30° southwest. Solution breccia is locally present. Potential resource of 25 to 30 million tonnes at grades similar to reserves. Deposit age interpreted as Upper Triassic.

EMR Canada, 1989; B.C. Minfile, 1991; Butrenchuk, 1991.

N51-01 55°59'N 123°54'E	Bamskoe (Chul'bango) Stanovoy	Au, Ag Au-Ag epithermal vein	Medium. Average grade of 8.4 g/t Au and 25 g/t Ag

Consists of thirty-five zones of listwanite-beresite hydrothermal alteration that occur in granite and gneiss. Altered zones contain eight Au-bearing prospects with abundant veins, pods, and small quartz and quartz-carbonate veinlets. Prospects range from 140 to 960 m long and have an average thickness of about 3 m. Deposit associated with Early Cretaceous(?) subvolcanic rhyolite and rhyodacite stock, and occurs around the periphery of stock that intrudes Late Proterozoic granite and biotite-amphibolite gneiss of the Stanovoi terrane.

A.V. Lozhnikov and others, written commun., 1989; Kurnik, 1992.

N51-02 54°19'N 122°35'E	Berezitovoe Unassigned	Zn, Pb, Au, Ag Polymetallic sufide and Au vein	Medium. Average grade of 3.3 g/t Au, 14.3 g/t Ag, 0.93% Zn , 0.57% Pb. Contains an estimated 42.3 tonnes Au, 201.0 tonnes Ag, 131.0 thousand tonnes Zn, 80 thousand tonnes Pb.

Massive Pb-Zn sulfides occur in a lenticular, northwest-striking, steeply-dipping (75-85°) zone that ranges up to 1000 m long and from 100 to 160 m thick. Polymetallic sulfide deposit hosted in Early Proterozoic gneissic granite. Sulfides metamorphosed; galena-sphalerite aggregates contains later andradite garnet and gahnite (zinc spinel). Host muscovite-quartz-potassium feldspar rock also contains metamorphic garnet. Adjacent Mesozoic igneous rocks not metamorphosed, indicating pre-Mesozoic mineralization. Au deposit occurs in narrow northeast-trending fracture zones. Au mineralization is later than polymetallic sulfide mineralization. Thin Au-bearing zones, associated with quartz-sericite altered rock, occur beyond the polymetallic sulfide deposit in gneissic granite.

A.K. Ivashchenko and A.A. Kuzin, written commun., 1982; Vakh, 1989.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

N51-03 54°27'N 124°14'E	Kirovskoe Stanovoy	Au Granitoid-related Au	Small. Mined until 1961. About 10 tonnes gold produced.

Consists of northwest-striking gold-quartz-sulfide veins hosted in an Early Cretaceous granodiorite stock. Veins commonly occur along contacts of diabase porphyry dikes that cut the granodiorite. Contacts of veins are generally sharp, although host rock is hydrothermally altered. Veins range from 0.5 to 1.0 m thick, and the surrounding altered rock ranges from 5.0 to 9.0 m thick. Sltered rocks consist mainly of quartz, albite, sericite, and hydromica; the veins str predominantly 40 to 95% quartz. Main sulfides are pyrrhotite, arsenopyrite, and chalcopyrite, with less abundant galena, sphalerite, bismuthite, and tennantite-tetrahedrite. Gold ranges up to 0.28 mm diameter. Fineness of 844 to 977. Deposit source for the placer deposits of the Dzhalinda, Yannan, and Ingagli Rivers, the largest in Far East Russia.

Gurov, 1969; G.P. Kovtonyuk, written commun., 1990.

N51-04 53°41'N 124°54'E	Burindinskoe Stanovoy	Au, Ag Au-Ag epithermal vein	Small. Average grade of 9.5 g/t Au, 42.6 g/t Ag. Reserves of about 827,400 tonnes ore. Inferred reserves of 6,230 kg gold and 38,200 kg silver.

Occurs in steeply-dipping quartz and quartz-carbonate gold-bearing veins. Veins range up to 200 m length, with an average thickness of about 10 m. Hosted in an Early Cretaceous volcanic sequence overlying the Gonzhinsky terrane of the Burea-Khanka superterrane.

V.A. Taranenko, written commun., 1991; G.P. Kovtonyuk, written commun., 1993.

N52-01 54°19'N 126°44'E	Zolotaya Gora Stanovoy	Au Au quartz vein	Small. Average grade of grade 52 g/t Au. Intermittently mined from 1917 to 1948. 2.5 tonnes gold produced.

Consists of quartz veins and zones of hydrothermally altered metamorphic rocks that occurconformably to host rock layering. Alteration is predominantly sericite-quartz and chlorite-amphibole-quartz. Main mineral assemblage is sulfides-biotite-quartz, sulfide-sericite-quartz and biotite-quartz-amphibole-chlorite. Less common is amphibole-quartz-feldspar mineral assemblages. Four successive stages of mineralization are identified: (1) magnetite-chalcopyrite-pyrrhotite-quartz; (2) gold-carbonate-sulfide; (3) zeolite; and (4) supergene. Gold occurs both in early and late quartz, and in hydrothermally-altered rocks. Gold generally forms films and fine plates in fractures. Gold concentrated in selvages of quartz and quartz-pyrite veins. Gold fineness high ((985). Deposit hosted in gneissic granite, granulite, calcareous shale, and quartzite of Stanovoi block of North Asian Craton.

Mel'nikov, 1984

N52-02 53°27'N 126°27'E	Pioneer North Bureya	Au Granitoid-related Au	Small. Average grade of 2.7 g/t Au, and 5.2 g/t Ag. Reserves of 17.1 tonnes Au, 20.1 tonnes Ag.

Consists of quartz, quartz-feldspar, quartz-tourmaline, and quartz-carbonate veins, and zones of altered quartz-potassium feldspar-sericite-albite rocks. Zones are 1 to 50 m thick, and in plan commonly branch and change trends. Ore zones are large, have low Au content and no visible boundries. Extent of deposit determined by geochemical sampling. Gold and gold-sulfide ore assemblages are distinguished. Gold assemblage consists of quartz-adularia-carbonate veins; gold-sulfide aseemblage consists of quartz veins with pyrite, galena, stibnite, and silver sulfosalts. Deposit hosted along margin of an Early Cretaceous granodiorite intrusion; both within the intrusion, and in adjacent contact metamorphosed Jurassic sandstone and siltstone.

N.E. Malyamin and V.E. Bochkareva, written commun., 1990; V.N. Akatkin, written commun., 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N52-03 53°08'N 126°17'E	Pokrovskoe North Bureya	Au, Ag Au-Ag epithermal vein	Medium. Average grade 4.4 g/t Au and 15 g/t Ag. Reserves of 15 million tonnes ore.

Consists of gently-dipping quartz veins and zones of hydrothermal alteration. Main alteration types are propilitic (albite, sericite, calcite, chlorite, and pyrite), berezite (quartz, sericite, and hydromica), and argillic (kaolinite, montmorillonite, hydromica, carbonates, quartz, and pyrite). Largest ore bodies consist of gently-dipping zones of altered rock located near the lower contact of andesitic sequence with a granodiorite porphyry sill. Hydrothermally altered rocks composed of quartz (25-85%), carbonate (2-5%), hydromica (5-12%), adularia (up to 5%), kaolinite (5-7%), and sulfides (less than 1%, mostly pyrite). Gold is fine-grained (0.0005 to 0.032 mm) and associated mainly with quartz rather than with sulfides. Silver grains (0.002 to 0.016 mm) occur in Fe hydroxide. Deposit hosted in Late Cretaceous andesite, dacitic, and tuff. that overlies a Jurassic coal-bearing sequence of sandstone, siltstone, and argillite. Deposit interpreted as forming in Late Cretaceous time.

Khomich and others, 1978; Mel'nikov, 1984; V.D. Mel'nikov, written commun., 1993; Khomich, 1990.

N52-04 53°06'N 131°50'E	Malomyr Selemdzha-Kerbi	Au Au quartz vein	Medium. Average grade of 5.0 to 12.4 g/t Au. Estimated reserves of 30-50 tonnes gold.

Consists of quartz veins and local stockworks, with an area of 12 km^2. Most (94%) of gold reserves occur in the gently-dipping Diagonalnaya zone that is about 3 km along strike and ranges from 30 to 150 m thick. Diagonalnaya zone has average grade of 1-2 g/t Au and consists of ten gently-dipping (20° to 30°) ore bodies ranging from1.0 to 28 m thick and 50 to 400 m long with an average grade of 5 to 12.4 g/t Au. Assemblages in deposit formed during five successive stages: (1) quartz breccia with abundant disseminated pyrite; (2) quartz-sulfide veinlets; (3) veinlets of chalcedony-like quartz; (4) monomineral pyrite veinlets; and (5) quartz-carbonate veinlets with pyrite. The second and third stages separated by the intrusion of dikes of Early Cretaceous granodiorite porphyry and diorite porphyry. Only pre-dike mineral assemblages contain gold. Dikes occur within ore zones and are controlled by the same fractures as ore bodies. Gold is fine-grained and ranges up to 0.02 mm. Shape of gold grains is predominatly lumpy, less commonly platy. Gold fineness ranges of 700 to 820. Typical admixtures are Fe, Ti, Cu, and Hg. Deposit hosted in Early Paleozoic quartz-micaceous rocks, shale, slate, and metasandstone of the Tukuringra-Dzhagdi terrane.

K.F. Klyzhko and V.P. Levshuk, written commun., 1982; S.G. Parada, written commun., 1984; B.D. Melnikov, written commun., 1993.

N52-05 52°43'N 129°07'E	Kamenushinskoe Gar	Cu, FeS Cu massive sulfide	Small

Consists of lenses, from 100 to 800 m long and 2 to 12 m thick, that occur conformable to bedding. Eleven ore bodies prospected to depths of 300 m. Pyrite is the most common ore mineral; however, some ore bodies consist of hematite-magnetite-pyrite ore. Chalcopyrite locally comprises up 1 to 2%. Deposit locally contact metasomatized into skarn during the intrusion of Paleozoic granite. Deposit is interpreted as of sedimentary-exhalative origin that was associated with felsic seafloor volcanism. Deposit hosted in Cambrian rhyolite of the Mamyn terrane. The rhyolite underlies a basaltic and limestone sequence that contains volcanogenic Fe (magnetite) Gar deposit.

P.N. Radchevsky, written commun., 1956 , V.V. Ratkin, this study.

N52-06 52°34'N 129°04'E	Gar Gar	Fe Volcanogenic Fe	Large. Average grade of 41.7% Fe. Estimated reserves of 389.1 million tonnes. Not mined

Consists of sheeted Fe layers, mainly magnetite, that occur in metamorphosed Early Cambrian(?) felsic and mafic volcanic and associated rocks with limestone lenses, all part of the Gar terrane. The Fe layers occur chiefly in the upper Early Cambrian(?) section, composed mainly of mafic volcanic rocks, within a section that is about 220 to 250 m thick. Most of the ore, about 75 percent, occurs within an interval ranging from 156 to 184 m thick. The deposit occurs for 4 km along strike. Deposit intruded by Early Paleozoic gabbro, diabase, and plagiogranite and is locally metamorphosed to skarn. Similar volcanogenic Fe deposis occur to the north and need further exploration.

Zimin, 1985; Zimin and Konoplev, 1989.

Deposit No. **Latitude** **Longitude**	**Deposit Name** **Metallogenic Belt**	**Major Metals** **Minor Metals** **Deposit Type**	**Grade and Tonnage**
Summary and References			

N52-07 52°19'N 128°22'E	Chagoyan Gar	Pb, Zn, Ag Stratiform Pb-Zn	Small. Average grade of 1.42% Pb, 5.16% Zn, and up to 3,000 g/t Ag. Estimated reserves of 65 thousand tonnes zinc.

Consists of a galena-sphalerite aggregate that occurs as cement between grains in sandstone, although veinlets are also common. Deposit isabout 270 m long and 1.0 m thick. Hosted in quartz-feldspar sandstone that underlies Cambrian(?) limestone and dolomite of Mamyn terrane. Galena and sphalerite are the dominant ore minerals, with subordinate pyrite, pyrrhotite, and chalcopyrite. Post-ore dikes and stocks of Early Cretaceous diorite and granodiorite cut ore bodies. The Mesozoic igneous rocks the stratiform ore bodies locally exhibit hydrothermal alteration to quartz, sericite, and tourmaline. Deposit occurs on the northern bank of the Zeya River.

I.G. Khel'vas, written commun., 1963; V.V. Ratkin, this study.

N53-01 55°38'N 133°42'E	Bogidenskoe Dzhugdzhur	Ti, P Anorthosite apatite Ti-P	Large. Average grade of 3-15% apatite averaging 5.7% P_2O_5. Contains an estimated 34.3 million tons P_2O_5. Extends to depth of 400 m.

Consists of densely disseminated and massive lenticular and sheeted bodies that occur in distinctly stratified rhythmic bands in olivine gabbro, gabbro-syenite, syenite, anorthosite, gabbro-norite, and pyroxene. The sheeted ore bodies extend for over 10 km along strike. Ore minerals are alternating massive, spotted, and disseminated apatite-ilmenite-titanium-magnetite. Apatite contains up to 2.4% F. Ti magnetite contains up to 21% TiO_2 and from 0.3 to 1.1 % V_2O_5; Ilmenite contains up to 3.1% Fe_2O_3. U-Pb isotopoic age determination on the igneous host rocks of 1,700 Ma . Deposit occurs in the upper basins of the Bogide and Soroga Rivers.

Lennikov, 1968, 1979; Panskikh and Gavrilov, 1984; Neimark and others, 1992.

N53-02 55°43'N 134°15'E	Gayumskoe Dzhugdzhur	Ti, P Anorthosite apatite Ti-P	Large. Average grade of 8.7% P_2O_5. Locally contains up to 31.6% P_2O_5. Estimated 40 million tonnes of P_2O_5.

Consists of a series of closely-spaced, veined and stock-like bodies (nelsonites) of apatite, ilmenite, titanomagnetite hosted in anorthosite that is associated with lenticular and irregular bodies of olivine gabbro, gabbro-pyroxenite, pyroxenite, and dunite. Apatite is a hydroxyl-fluorine-bearing variety, containing up to 2.75% H_2O. Titanomagnetite contains from 3.8 to 21% TiO_2. Ilmenite is fairly oxidized and contains up to 2.5% Fe_2O_3. U-Pb isotopic age determination on the igneous host rocks of 1,700 Ma. Deposit occurs in the upper reaches of the Gayum River.

Lennikov, 1968, 1979; Panskikh and Gavrilov, 1984; Neimark and others, 1992.

N53-03 55°37'N 134°30'E	Maimakanskoe Dzhugdzhur	Ti, P Anorthosite apatite Ti-P	Large. Contains an estimated 63 million tons of P_2O_5 extending to 400 m depth.

Consists of sparsely to densely disseminated, sheeted and lenticular, apatite-ilmenite-titanium magnetite ore bodies in olivine gabbro, gabbro-norite, gabbro-pyroxenite, and pyroxenite. Ore minerals are massive apatite, apatite-ilmenite, ilmenite, and apatite-ilmenite-titanium magnetite in steeply dipping (50-60°) veins (nelsonite) that are hosted in coarse-grained anorthosite. Apatite-ilmenite-titanium magnetite ore is predominate and comprised up to 80% of the deposit. Apatite contains fluorine. Titanium magnetite averages 13.6% TiO_2 and 0.37% V_2O_5. Ilmenite contains 6 to 7% Fe_2O_3. Apatite content up to 50-60% in massive and spotted apatite ore, but averages 15-20%. U-Pb isotoic age determination on the igneous host rocks of 1,700 Ma. Deposit occurs in the upper reaches of the Maimakan River near Kendeke Spring, over an area of approximately 30 km^2.

Lennikov, 1968, 1979; Panskikh and Gavrilov, 1984; Neimark and others, 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

N53-04	Dzhaninskoe	Ti, P	Large. Low grade of up to 4% P_2O_5. Contain an estimated 78 million tons of P_2O_5 to a depth of 400 m.
55°31'N	Dzhugdzhur	Anorthosite apatite Ti-P	
134°09'E			

Consists of sparsely disseminated apatite, ilmenite, and titanium magnetite in olivine melanocratic gabbro, gabbro-pyroxenite, and pyroxenite that form stock-like bodies in anorthosite. Apatite contains up to 1.14% F;. Titanium magnetite is moderately titanium-bearing with up to 10.7% TiO_2 and with 0.28 % V_2O_5. Ilmenite contains 7.8% Fe_2O_3. U-Pb isotopic age determination on the igneous host rocks of 1,700 Ma. Deposit occurs on the right bank of the Dzhana River near the mouth of the Kurung River.

Lennikov, 1968, 1979; Panskikh and Gavrilov, 1984; Neimark and others, 1992.

N53-05	North-Shantarskoe	P	Small. Average grade of less than 6-8% P_2O_5.
55°09'N	Galam	Sedimentary phosphorite	
137°35'E			

Consists of phosphorite deposits that occur in a sedimentary breccia with indistinct borders. Deposit is as much as 15-16 m thick. Deposit hosted in carbonate rocks in a sequence of chert and volcanic rocks that are partially altered to quartz-carbonate rock. Sequence occurs for approximately 8-10 km at the northeast end of Bolshoi Shantar Island.

Shkolnik, 1973.

N53-06	Nelkanskoe	P	Small. Ranges from 4 to 30% P_2O_5, averages 7-11%.
54°18'N	Galam	Sedimentary phosphorite	
134°59'E			

Consists of phosphorite sedimentary breccia that occur in a steeply-dipping sequence of jasper and volcanic rocks that are exposed in an erosional windows below gently-dipping Jurassic sedimentary rocks. Hosted in silicified dolomite and limestone. Phosphorite cannot be traced beyond altered carbonate rocks. Phosphorite beds range up to 1.8 km in length, although some are only several tens of meters long. Thickness varies from 2 to 41.4 m. Deposit drilled to almost 300 m. In addition to fragments of primary phosphorite, deposit contains fragments of silicified carbonate rocks that are generally 0.5 to 2 cm in diameter, and are cemented by phosphate and hydromica. Phosphates are radioactive.

Shkolnik, 1973.

N53-07	Ir-Nimiiskoe-2	P	Medium. Phosphorus anhydrite ranges from 3 to 12%, averages 7-8%.
54°08'N	Galam	Sedimentary phosphorite	
134°38'E			

Consists of numerous deposits of unusual phosphorites, that occur in sedimentary breccia formed at atoll fans and seamounts. Deposits occur in an area 25-30 km long and 6-8 km wide and are hosted in complex, steeply-dipping and folded rocks that represent a reef edifice. Some of the carbonate is silicified. Boundaries of deposits are gradational due to the variable amount of fragments of primary phosphorite in host dominant limestone, dolomite, and cherty carbonate, and in rare jasper, volcanic, and cherty claystone fragments. Primary phosphorites seldom occur in situ, but occur in thin beds and small lenses of coquina formed predominantly of inarticulate brachiopods with phosphate shells and some Cambrian trilobites. Phosphorite breccia occurs at different stratigraphic levels and has no clear boundaries; margin determined by sampling. Approximately 30 phosphorite layers are identified. Layers range from several tens of m to several km long, but are commonly discontinuous. Deposit generally has simple mineral composition; in addition to phosphorite contain quartz, dolomite, calcite, rare pyrite, chert, and volcanic rock fragments. Thickness of the phosphorite ranges from 0.5 to 24 m, but varies greatly even over short distances.

S.G. Kostan'yuan and others, written commun., 1973.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

N53-08	Ir-Nimiiskoe-1	Mn	Small. Average grade of 22.4% Mn.
54°09'N	Galam	Volcanogenic Mn	
134°36'E			

Consists of partly metamorphosed, steeply-dipping, lenticular and sheeted, bedded Mn bodies that occur in a diverse Lower Cambrian sequence of jasper, shale, schist, spilite, basalt, and basaltic tuff that overlays a carbonate reef complex with seamounts. Mn bodies are several tens to several hundred m long, with a thickness of 1.5 to 120 m. Bodies vary from massive and banded to thinly-banded. Mn bodies consist of oxidized braunite to hausmannite-rhodochrosite and rhodochrosite, and rhodonite-rhodochrosite. Bodies also contain quartz and minor amounts of magnetite, hematite, manganite, sulfides, piedmontite, manganophyllite, tordite, viridine, amphiboles, muscovite, and plagioclase. Mn content varies greatly, reaching 50-56% in oxidized ore and 47% in carbonate ore. P ranges from 0.01 to 0.12%, Fe up to 3%, and SiO2 9 to 70%.

Shkolnik, 1973.

N53-09	Milkanskoe	Fe	Large. Average grade of 30.9% total Fe, 29.1% soluble Fe, 2.1% Mn, 0.27% P, 0.01% S.
54°04'N	Galam	Volcanogenic Fe	
134°08'E			

Consists of several deposits in a district of 100 km^2. Deposits consists of numerous lenticular and sheeted magnetite bodies that consist of conformable, steeply-dipping bodies of complex composition. Magnetite bodies occur in a layer up to 600 m thick that consists of alternating, weakly metamorphosed Cambrian jasper, schist, shale, spilite, basalt, and basaltic tuff that is interlayered with rare sandstone, siltstone, limestone, and dolomite. Largest deposit consists of a sheeted body over 6 km long and a variable thickness of 100 to 330 m that is ntercalated with jasper and poorly mineralized schist and shale. About 2/3 of sequence is potentially economic. Individual deposits range up to 40-50 m in thickness; maximum thickness of interlayered barren rock is 25 m. Deposit was explored for 530 m downdip and exhibits constant thickness. Geophysical data indicates the deposit may extend about one km downdip. Seven smaller deposits extend 600 to 800 m along strike and contain mainly magnetite and local magnetite and hematite that is often intercalated with spherolitic siderite. Smaller deposits are finely-bedded, banded, rarely massive, have variable mineral compositions, and contain relatively abundant Fe chlorite, hydromica, stilpnomelane, muscovite, sericite, and apatite, and rare pyrite, covellite, and chalcocite.

Shkolnik, 1973.

N53-10	Lagapskoe	P	Medium. Contains from 4 to 30% anhydrous phosphorous, averages 5-7%.
53°54'N	Galam	Sedimentary phosphorite	
134°16'E			

Consists of carbonate beds that contain phosphorite-bearing breccia with Cambrian fossils. Beds are locally up to 30 m thick, but generally range from several tens of cm to 20 m. Phosphorite-bearing breccia contains fragments of primary phosphorite, dolomite, limestone, and rare jasper, schist, and shale. Carbonate is commonly completely altered to quartz. Carbonate bed intercalated with jasper, shale, schist, siltstone, spilite, basalt, and basaltic tuff.

Zagorodnykh, 1984.

N53-11	Galamskoe	Fe	Large. Average grade of 42.4% total Fe; 39.8% soluble Fe; 1.7 to 13.6% Mn and averages 6.9%; averages 0.9% P_2O_5 0.03% S.
53°37'N	Galam	Mn, P_2O_5, S	
133°56'E		Volcanogenic Fe	

Consists of six lenticular, steeply-dipping bodies in jasper beds that are contact metamorphosed zone adjacent to Late Cretaceous granite and granite porphyry. Additional undiscovered ore bodies may occur. Individual bodies range from 10 to 90 m thick, extend for up to 3 km, with beds of barren rock. Dominant ore mineral is magnetite that grades from massive to banded, brecciated, and fine-grained forms. Also occurring are minor pyrite, pyrrhotite, chalcopyrite, bornite, sphalerite, galena, arsenopyrite, actinolite, hornblende, cummingtonite, dannemorite, grunerite, olivine, chlorite, garnet, rhodonite, and apatite.

Shkolnik, 1973.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

N53-12 53°29'N 133°12'E	Gerbikanskoe Galam	Fe Volcanogenic Fe	Large. Average grade of 42-43% Fe, soluble Fe is 33-53%; average of 1.8% Mn and 9.6% P.

Consists of two zones separated by a sequence of sandstone and siltstone that consists of approximately 30 steeply-dipping sheeted and lenticular bodies composed of magnetite-hematite, magnetite, and hematite. Individual bodies are several tens of m to 5 to 7 km long, are sometimes closely spaced in an en-echelon pattern. Thickness varies from 5 to 50 m and is commonly 8 to 28 m. Fe ore varies from banded to thinly-banded, lenticular-banded, and bedded and consists of finely-dispersed hematite, magnetite, and rare pyrite and chalcopyrite.

Shkolnik, 1973.

N53-13 53°23'N 132°53'E	Kurumskoe Galam	Fe Mn, S, P_2O_5 Volcanogenic Fe	Small. Averages 42% total Fe, 40% soluble Fe, 0.8% Mn, 0.4% S, 0.85% P.

Consists of steeply-dipping, lenticular and sheeted bodies of contact metamorphosed magnetite ore that ranges from 1.5 to 2.0 km long and 15-30 m thick. Bodies occur in a band up to 4.0 km long along the contact of a Late Cretaceous granodiorite. Host rocks are mainly jasper, schist, and shale, with rare sandstone and siltstone. Ore ranges from massive to fine-banded. In addition to magnetite, bodies contain from1-2% each of ilmenite, pyrrhotite, chalcopyrite, arsenopyrite, and pyrite, along with actinolite, tremolite, chlorite, biotite-like mica, and quartz.

Shkolnik, 1973.

N53-14 53°21'N 133°24'E	Itmatinskoe Galam	Fe P_2O_5, S, Mn Volcanogenic Fe	Medium. Averages 40-43% total Fe, 39-42% soluble Fe, 0.6% P, 0.05% S, 1.5% Mn.

Deposit hosted in a steep syncline that contains up to 17 conformable, lenticular, and sheeted bodies of magnetite-hydroxide iron minerals in a zone up to 4 km long and 40 to 50 km thick. Total length of zone of bodies is 12 to 15 km and total stratigraphic thickness ranges up to 135 m. Host rocks are dark gray jasper, schist, and shale, with subordinate mafic extrusive rocks, sandstone, and sedimentary breccia. Ore varies from massive to, banded, is fine-grained, and consists of magnetite-goethite-hydrogoethite with intergrowths of martite, manganosiderite, manganite, pyrite, and Mn hydroxides. Other minerals are quartz, colloidal silica, Fe-bearing quartzite, clay minerals, calcite, gypsum, and actinolite. Magnetite/iron hydroxide ratio ranges from 1:2 to 1:8. Fe hydroxides formed from weathering.

S.G. Kostan'yuan and others, written commun., 1973.

N53-15 53°08'N 132°12'E	Poiskovoe Selemdzha-Kerbi	Au Granitoid-related Au	Small. Average grade 37.4 g/t Ag. Partly mined at surface.

Consist of northeast-trending, steeply-dipping quartz veins. Six veins are identified that occur for 400 m, and range from 0.25 m to less commonly 1.5 m thick. In addition to fine-grained gold (less than 0.5 mm), veins contain galena, pyrite, and arsenopyrite. Pyrite and arsenopyrite are gold-bearing, containing 98.22 and 26.0 g/tonne Au respectively. Host granodiorite exhibits berezitie hydrothermal alteration. Veins occur in a Late Paleozoic granodiorite that intrudes metamorphosed Paleozoic shale. Deposit interpreted as forming between Late Jurassic and Early Cretaceous. Deposit not been explored at depth.

N.S. Ostapenko and G.I. Neronsky, written commun., 1975.

N53-16 53°09'N 132°22'E	Zazubrinskoe Selemdzha-Kerbi	Au Au quartz vein	Small. Estimated reserves of 9,046 thousand tonnes ore grading 11.2 g/t Au. Mined from 1927 to 1947.

Consists of gently- and steeply-dipping quartz veins with gold (fineness 750), predominante arsenopyrite, and lesser pyrite, sphalerite, galena, chalcopyrite, cassiterite, and molybdenite. Up to 7% As. Veins are about 2.5 m thick and up to 600 m long. Steeply-dipping veins are richest in gold. Gold is fine-grained. Mineralization interpreted as forming in Late Jurassic to Early Cretaceous. Deposit hosted in quartz-micaceous schist of the Nilan subterrane (Galam terrane).

O.F. Shishkanova, written commun., 1970.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage

Summary and References

N53-17	Tokur	Au	Medium. 27.1 tonnes Au mined between 1933 and 1940.
53°09'N	Selemdzha-Kerbi	Au quartz vein	
132°49'E			

Consists of gold-bearing veins. Ore minerals comprise 3% of the veins and consist of pyrite, arsenopyrite, gold, sphalerite, galena, chalcopyrite, pyrrhotite, tetrahedrite, tennantite, and scheelite. Gangue minerals are quartz, adularia, sericite, chlorite, and calcite. Gold fineness of 650 to 800. Sphalerite and arsenopyrite increase with depth. Carbonaceous material occurs along vein margins. Vein zones normally range from 25 to 90 m thick. Veins commonly occur conformable to bedding of host rocks are are locally discordant. Veins range up to 800 m in length and vary from 0.2 to 0.7 m thick. Maximum depth of deposit is 500 m. Host rocks are argillite, sandstone, and quartzite. Diorite dikes and stocks cut the veins. Ar-Ar isotoipic study of adularia indicate an Early Cretaceous age of mineralization. Veins are hosted in a structurally deformed Middle Paleozoic sandstone-schist sequence.

Radkevich E.A., Moiseenko V.G., Molchanov P.Ya., Melnikov V.D., and Fat'yanov I.I., 1969; Eirish, 1972; Mel'nikov V.D. & Fat'yanov I.I., 1970; P.H. Layer, V. Ivanov, and T.K. Bundtzen, written commun., 1994.

N53-18	Ingagli	Au	Small.
53°04'N	Selemdzha-Kerbi	Au quartz vein	
133°22'E			

Consists of a quartz vein hosted in a Late Paleozoic stock. Vein contains quartz, gold, arsenopyrite, pyrite, chalcopyrite, and sphalerite. Gold fineness of 720.

Eirish, 1972.

N53-19	Sagurskoe	Au	Small. Average grade of 0.3 to 35.2 g/t Au. 2,940 kg gold mined from 1944 to 1956.
52°59'N	Selemdzha-Kerbi	Au quartz vein	
132°36'E			

Consists of comformable quartz veins that crosscut foliation, and dip from 30° to 60°. Veins are 0.1 to 1.0 m thick and a few m to 240 m long. About 80 veins are known. Veins contain gold (grains up to 3 mm, fineness 857), and arsenopyrite, pyrite, sphalerite, galena, sheelite, and scorodite. Gold distributed unevenly in veins; hanging walls of veins generally richer in gold. Deposit hosted in Early Paleozoic metamorphic rocks consisting of quartz-micaceous schists with less common actinolite and epidote-actinolite schist.

Eirish, 1972; B.I. Shestakov, written commun., 1988.

N53-20	Kharga	Au	Small. Intermittently mined from 1901 until 1955; 5.3 tonnes produced. Contains up to 40 g/t Au, up to 2.5 g/t Ag, and up to 0.4% WO_3.
52°57'N	Selemdzha-Kerbi	Au quartz vein	
133°38'E			

Consists of two types of veins: (1) thick veins that intrude Early Paleozoic greenstone (spilite); and (2) short, branching veins that intrude carbonaceous schist and highly altered zones in albite-micaceous-quartz schist. Veins have constant dip thickness and along strike range from 0.5 to 3 m across and up to a few hundreds of meters long. Quartz comprises up to 95 to 97% of veins. Ore minerals are gold and arsenopyrite, with minor pyrite, pyrrhotite, chalcopyrite, sphalerite, tetrahedrite, and tennantite. Scheelite occurs locally. Two generations of gold occur, early gold is 636 fine; later gold is 800 to 950 fine. Deposit cut by dikes. Thirty ore bodies are known, including both quartz veins and zones of hydrothermally altered rocks. Twenty-four bodies have been mined.

Moiseenko V.G., 1965; Eirish, 1972.

N53-21	Afanas'evskoe	Au	Small. Average grade of 6.3 g/t Au. Mined from 1929 to 1949.
52°50'N	Selemdzha-Kerbi	Au quartz vein	
133°24'E			

Consists of quartz veins and zones of hydrothermal alteration (quartz-albite-chlorite-carbonate-sulfide). Zones are up to 1100 m long; thickness rarely exceeds 2.0 m. Largest zone consists of a series of quartz veins and veinlets that occur in brecciated quartz- and chlortite-rich rock. Zone is 0.1 to 1.8 m thick and grades 10 g/tonne Au. Deposit hosted in early Paleozoic sequence of micaceous-albite-quartz, chlorite-quartz shale, and metamorphosed polymictic sandstone.

Eirish, 1972; Tsykunov Yu.P., 1981; B.D. Melnikov, written commun., 1993.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N53-22 52°42'N 133°24'E	Talaminskoe Selemdzha-Kerbi	Sb, Au Sb-Au vein	Small. Average grade of 6.94% Sb, 0.3% As, 1.5 g/t Au, 15 g/t Ag. Mined from 1938 to 1943. Produced 511 tonnes of stibnite concentrate.

Consists of quartz veins, less common quartz-calcite veins, with stibnite, pyrite, chalcopyrite, and arsenopyrite., and one vein of quartz-scheelite. Eighteen veins, dipping at 45° to 90°, have been prospected. Veins range from a few cm to 4 m thick, and from 40 to 680 m long. Prospecting occurs to 42 m depth. Deposit interpreted as forming during a Late Jurassic to Early Crtetaceous period of regional metamorphism. Deposit hosted in early Paleozoic micaceous schist of the Nilan subterrane.

A.F. Amerikantsev, written commun., 1953.

N53-23 52°28'N 134°11'E	Ezop Badzhal-Ezop	Sn Sn polymetallic vein	Small. Contains up to 0.2% Sn.

Consists mostly of sulfide-bearing veins, net-like veinlets, and disseminations. Disseminated zones range up to 18.7 m thick; veins vary from 0.1 to 2 m thick. Sulfides, including arsenopyrite and pyrrhotite, form up to 80% of the veins. Pyrite, cassiterite, sphalerite, and rare stannite and wolframite, are subordinate. Gangue minerals are quartz and tourmaline; with rare topaz. Deposit hosted in a system of east-west en echelon fracture zones in Upper Cretaceous felsic extrusive rocks. Deposit occurs along contact of the Late Cretaceous high-potassium Ezop Granite.

Usenko and Chebotarev, 1973.

N53-24 52°21'N 134°04'E	Olgakanskoe Badzhal-Ezop	Sn W, Mo, Bi Sn greisen	Small

Consists of three varieties of greisen: (1) pods and veins in granite; (2) flattened bodies in the apices of dome-like granite cusps and partly in Late Cretaceous felsic extrusive rocks; and (3) zones with late-stage, cassiterite-quartz and cassiterite-sulfide veinlets at the granite contacts. Quartz-mica greisen bodies are small, several m thick, and occur in zones up to 80 m along strike. In addition to quartz and mica, greisen contains wolframite, cassiterite, arsenopyrite; and minor molybdenite, bismuthinite, and native bismuth. Sulfide veinlets contain arsenopyrite, sphalerite, galena, chalcopyrite, and pyrite. Deposit associated with Late Cretaceous Ezop Granite.

Usenko and Chebotarev, 1973.

N54-01 54°06'N 142°57'E	Yuzhno-Tominskoe Schmidt and Terpeniya Peninsulas	Cr Podiform Cr	Small

Consists of of magnesium pyroxenite that contains disseminated and massive, lenticular magnesian chromite in zones up to 20 to 25 m long. Pyroxenite is Late Jurassic to Early Cretaceous in age and intrudes Mesozoic rocks. Deposit occurs on eastern Schmidt Peninsula .

Sidorenko, 1974.

N54-02 53°53'N 139°48'E	Mnogovershinnoe Lower Amur	Au, Ag Au-Ag epithermal vein	Medium

Consists of hydrothermally altered, adularia-sericite-quartz vein-like zones up to 800 m long that consist of a series of adularia-quartz veins and veinlets. Some veins and veinlets contain rhodonite-carbonate or lenses of skarns and sulfides. Ore minerals are pyrite, marcasite, gold, argentite, Au and Ag tellurides, galena, sphalerite, chalcopyrite, and freibergite. Ore minerals comprise up to 1% of veins. Au/Ag ratio is 1:1. Deposit hosted in Paleocene andesite-dacite that is part of a multiphase intrusion of highly alkaline granitic rocks. K/Ar isotopic studies indicate age of mineralization is 49 to 69 Ma. During formation of local Au-bearing skarns, presumably formed during intrusion of Paleogene subalkaline granite, gold was remobilized. Associated Placer Au deposits.

Zalishchak and others, 1978; Ivanov and others, 1989.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

N54-03	Belaya Gora	Au, Ag	Medium
53°23'N	Lower Amur	Hg, Cu, Pb, Zn	
140°14'E		Au-Ag epithermal Vein	

Consists of disseminations and stockworks that occur in extrusive bodies of subalkalic rhyolite-dacite and explosive breccia in an Eocene-Oligocene igneous complex. Alteration consists of quartz (50-90%), kaolinite, dickite, sericite, hydromica, and adularia. Ore minerals are gold, silver, argentite, pyrite, marcasite, chalcopyrite, sphalerite, galena, hematite, and cinnabar. Ore assemblages are gold-quartz and gold-sulfosalts-sulfide-quartz. Gold distribution is highly irregular and ore bodies do not exhibit clear boundaries. Deposit extends to depth of 100 m.

Mel'nikov, 1978

N54-04	Bukhtyanskoe	Au, Ag	Small
53°03'N	Lower Amur	Au-Ag epithermal vein	
140°29'E			

Consists of lenticular and irregular mineralized zones consist of highly altered, orthoclase-adularia-sericite-pyrite-quartz rock with numerous thin quartz veinlets ranging from 5-10 mm thick. Ore minerals are gold, pyrite, marcasite, chalcopyrite, sphalerite, galena, argentite, and molybdenite. Ore-bearing assemblages are gold-quartz and gold-sulfide-quartz. Deposit explored to a depth of 50 m. Ar-Ar isotopic study of adularia yields of age of 38 Ma for the Au-Ag veins. Deposit hosted in Eocene-Oligocene extrusive subalkaline rhyolite-dacite and explosive breccia.

Martynov and others, 1985; P.Layer, V.Ivanov, and T.Bundtzen, written commun., 1994.

N54-05	Tyrskoe	Cu	Small. Average gradc of 0.02 to 0.7% Cu; up to 2.5 g/t Au, 0.005% Mo.
52°57'N	Lower Amur	Au	
140°27'E		Porphyry Cu	

Consists of disseminated sulfides, and veinlets of quartz, quartz-sulfides, and carbonate minerals. Ore minerals are pyrite, chalcopyrite, magnetite, molybdenite, and gold. Hosted in a diorite porphyry stock that is hydrothermally altered over an area 0.5 by 20 km. Altered to orthoclase, hornblende-albite, and quartz-sericite rock. Typical of porphyry Cu deposit of the Nizne-Amur zone.

Sukhov and Rodionov, 1986.

N54-06	Bichinskoe	W, Sn	Small. Avearge grade of up to 0.2% Sn, 0.155% W, and 0.01% Mo.
52°32'N	Lower Amur	Sn greisen	
139°32'E			

Consists of a stockwork of veinlets, small veins, and greisen in granite, porphyry dikes, and homfels over an area of 0.2 km^2. Ore minerals are cassiterite and wolframite, with rare molybdenite, arsenopyrite, pyrite, pyrrhotite, chalcopyrite, sphalerite, and magnetite. Cassiterite, wolframite, molybdenite, and arsenopyrite form an early assemblage; other minerals form a later assemblage. Deposit occurs along contact of the Paleogene Chayatinsky Granitic stock with K-Ar isotopic age of 55 Ma. The hornfels is cut by granite porphyry, aplite, and spessartite dikes. Complex composedof granite porphyry and fine-grained granite. Age of mineralization interpreted as Paleogene.

Usenko and Chebotarev, 1973.

N57-01	Sukharikovskie Grebni	Au, Ag	Medium. Average grade of 7.4 g/t Au, 21.6 g/t Ag.
55°40'N	Central Kamchatka	Au-Ag epithermal vein	
158°39'E			

Consists of zones of quartz-adularia and quartz-adularia-carbonate veins that form a series of thick, long zones in a Miocene dacitic ignimbrite sequence. Some veins dip steeply, others are oblique to strike of zones. Individual veins range from 50 to 700 m long and up to 60 m thick. Zones of veins are a few km long. Host rocks are hydrothermally altered along faults, where silica-rich and quartz-sericite-hydromica assemblages are found. High Au and Ag concentrations occur in quartz-adularia veins. Veins are sulfide poor. Two main ore assemblages are gold-chalcopyrite-quartz and gold-acanthite-adularia-carbonate-quartz. K-Ar age determinations on the host ignimbrite range 6 to 13 Ma; average is about 10 Ma.

Aprelkov and Frolov, 1970; Shchepot'ev , 1989.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

N57-02 55°40'N 161°10'E	Kumroch East Kamchatka	Au, Ag, Cu, Pb, Zn Au-Ag epithermal vein	Medium. Average grade of up 15 g/t Au; up to 500 g/t Ag; about 10% Pb, 3% Zn, and 0.5% Cu. Inferred reserve of 60 tonnes Au.

Consists of steeply dipping, quartz and quartz-adularia veins and brecciated zones that occur in Paleocene clastic rocks cut by hypabyssal Miocene diorite porphyry. Host rocks are propylitiically altered and silicified. Veins range from 200 to 400 m long and 0.2 to 6.8 m thick. Ore minerals are pyrite, chalcopyrite, galena, gold, tennantite, tetrahedrite, argentite, and silver sulfosalts. Gold-sulfide-quartz and gold-sulfosalt-quartz assemblages are identified. Gangue minerals are quartz, adularia, sericite, hydromicas, montmorillonite, kaolinite, and chlorite. Au is distributed unevenly.

B.V. Oleinik and others, written commun.,1985.

N57-03 55°31'N 157°52'E	Aginskoe (Aga) Central Kamchatka	Au, Ag, Te Au-Ag epithermal vein	Medium. Estimated resource of 30-50 tonnes Au and 10-20 tonnes Ag. Average grade of 20 g/t Au.

Consists dominantly of fine-grained, chalcedony-like quartz, adularia, and hydromica with colloform banding. Ore minerals comprise 0.3 to 1.0% of veins. Major ore minerals are tellurides, including hessite, altaite, calaverite, silvanite, and petzite. A total of 55 ore minerals are identified. Fold fineness ranges from 740 to 990, and the Au/Ag ratio varies from 2:1 to 7:1. Six stages of ore deposition are identified: (1) quartz-pyrite; (2) gold-adularia-corrensite-quartz with a gold fineness of 924 to 968; (3) gold-adularia-quartz with a gold fineness of 936 to 952 at upper levels, and a gold fineness of 740 to 854 at deeper levels; (4) gold-calaverite-quartz with a gold fineness 940 to 960; (5) gold-hessite-corrensite-quartz with a gold fineness 816 to 880 and (6) quartz-zeolite-calcite. Endogenous zoning is marked by a vertical change of ore composition, texture, and structure. The concentration of tellurides and sulfides increases with depth. The deposit occurs in a volcanic caldera composed of Miocene basaltic andesite and basaltic andesite tuff. Ore occurs in fracture zones and zones of intense jointing. Ore-bearing structures consist of shear and breccia tectonic zones, which include numerous andesitic dikes and veins, lenses, and veinlets of adularia-quartz and quartz-carbonate composition. The main ore-bearing zones are the Aginskaya and Surpriz. In the main ore-bearing zones, short ore bodies merge at depth forming a gently-dipping mineralized band; complicated in the upper part by steeply-dipping ore shoots. Hydrothermal alteration, commonly propylitic, is common.

Shchepot'ev,1989.

N57-04 55°09'N 157°12'E	Shanuch Kvinumsky	Ni, Cu, Co, Au, Pt Hornblendite peridotite Cu-Ni	Small. Average grade of 4.62% Ni, 0.8% Cu, 0.24% Co, 0.3 g/t Au, 0.5 g/t Pt, 0.57 g/t Pd

Consists of two deposits that occur at the margin of a granite-granitic-gneiss dome approximately 5 km in diameter that intrude an Early Cretaceous metagabbro. One deposit, explored to a depth of 200 km, consists of a steeply-dipping pipe-like body with a northwest trend. This deposit consists of rich, massive, brecciated sulfide ore. The other deposit consists of disseminated sulfides, and sulfides in veinlets, and pods. Both deposits are presumed to join at the depth of about 200 m. Massive and brecciated ore contains an average of 4.62% Ni, 0.8% Cu, 0.24% Co, 0.3 g/t Au, 0.5 g/t Pt, and 0.57 g/t Pd. In both deposits, ore minerals are mainly pyrrhotite, pentlandite, and chalcopyrite. Deposit oxidized to a depth of about 10 m.

A.V. Ignatyev, written commun., 1979.

N57-05 55°01'N 157°38'E	Kirganik Iruneiskiy	Cu, Au Porphyry Cu	Medium. Average grade of 0.1-1% Cu and 0.2 to 0.4 g/t Au in disseminated and veinlet ore; up to to 0.8 g/t Au in oxidized ore.

Consists of zones of disseminated ore and veinlet copper and gold minerals. Ore minerals are pyrite, chalcopyrite, magnetite, bornite, chalcocite, hematite, and gold. The richest Au values occur in rich chalcocite-chalcopyrite-bornite ore with more than 1% Cu. An oxidized zone occurs in heavily fractured rocks, to a depth of 100 to 120 m, and contains up to 0.8 g/t Au. The richest ore consists of metasomatically-altered biotite-K-feldspar rock. Altered rocks containing both pyroxene and K-feldspar are essentially devoid of ore. Ore zones are generally conformable with the host rocks. Zones are steeply-dipping, exhibit biotite-K-feldspar metasomatic alteration, and occur in an area 10-15 m thick, up to 1200 m long. Deposit hosted in Late Cretaceous siliceous volcanic rocks. K-Ar isotopic age of the altered biotite-K-feldspar rocks is 65-75 Ma.

Vlasov, 1977; A.V. Ignatyev, written commun., 1980.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N57-06 55°06'N 158°13'E	Baran'evskoe Central Kamchatka	Au, Ag Au-Ag epithermal vein	Medium. Average grade of 15 g/t, Au 20-30 g/t Ag.

Consists of gold-bearing quartz-adularia veins that are associated with quartz-sericite-hydromica and diaspore-quartz alteration assemblages. Veins occur along northeast and north-south trending faults. Two ore assemblages are identified, tennantite-tetrahedrite-chalcopyrite and gold-quartz. Gold is fine-grained, and fineness ranges from 672 to 940, commonly about 770. Deposit occurs in a caldera of a Neogene volcanic complex consisting of stocks of hornblende and pyroxene-hornblende andesite and andesite-dacite. Complex is cut by hypabyssal subvolcanic andesite to dacite intrusions and dikes. Igneous rocks are propylitically altered.

Shchepot'ev, 1989.

N57-07 54°57'N 157°46'E	Oganchinskoe Central Kamchatka	Au, Ag Au-Ag epithermal vein	Small. Average grade of 10-15 g/t Au and 20-30 g/t Ag. Reserves of 2 tonnes Au.

Consists of veins and veinlets. Ore minerals are gold, galena, sphalerite, pyrite, chalcopyrite; and rare tetrahedrite, hessite, petzite, argentite, silver sulfosalts, and cinnabar. Seven mineral assemblages are distinguished, from oldest to youngest: (1) pyrite-quartz; (2) Au-quartz; (3) Au-sulfides (sphalerite and galena); (4) amethist-sulfides (sphalerite and galena); (5) wurtzite (sphalerite)-metacinnabatite; (6) cinnabar; (7) quartz-carbonate. Gold and silver occur in gold-quartz and gold-sulfide assemblages. The gold-sulfide assemblage increases with depth. Deposit exhibits both propylitic and silicifica alteration. K-Ar isotopic age of 35-36 Ma for adularia associated with deposit. Ore bodies trend northeast and are hosted occur in volcanic and hypabyssal rocks near the caldera of the Levinson-Lessing volcano, near the western contact of a Miocene granodiorite stock.

Shchepot'ev, ed., 1989

N57-08 55°03'N 158°21'E	Zolotoi Central Kamchatka	Au, Ag Au-Ag epithermal vein	Medium. Average grade of 10-125 g/t Au, 40 g/t Ag.

Consists of veins in a large northwest-trending shear zones, spaced up to 2 km apart. Richest orebodies occur in a small fault/fracture zone that trends diagonally to the main shear zones. Deposit occurs over an area of about 40 km^2. Gold is known in 100 quartz veins, but only 11 are of interest for exploration. Veins are up to 20 m thick and up to 2 km long. Mineralization occurs from about 500 to 1100 m elevation. The most carefully studied vein is 2.7 m thick, 700 m long, has a gold content of 10-125g/t, and silver content of 40 g/t. The gangue minerals are quartz (90%), calcite, hydromica, and adularia (up to 10%). Ore minerals (no more than 2%) are pyrite, chalcopyrite, galena, sphalerite, and argentite. Gold grains are 0.05-0.2 mm. Gold fineness is 720-980. Deposit hosted in Late Cretaceous volcanoclastic rocks (andesite tuff) and chert, near the contact with overlapping Miocene andesite and basalt. An economically important Au deposit in Kamchatka.

A.A. Shadrin, written commun., 1992.

N57-09 54°46'N 157°21'E	Malakhitovoe Sredinny	Cu, Mo Re Porphyry Cu-Mo	Medium. Average grade of 0.55% Cu and 0.021% Mo in oxidized zone. Contains up to 1.26% Cu and 0.1% Mo.

Consists of a Cu-Mo stockwork hosted in subalkaline granite porphyry stock. Richer part of deposit occurs along contact of stock. Both stock and the country rocks exhibit sericite, chloritie, and silica alteration and contain disseminations and veinlets of ore minerals. A central, quartz-rich core consists of silicified and K-feldspar-rich rocks with low-grade chalcopyrite-molybdenite that contains 0.03% Cu and 0.008% Mo. Quartz veinlets are up to one cm wide, rarely up to 0.4 m wide, and contain coarse-grained flakes of molybdenite. Richest part of deposit crops out over an area 200-300 by 600 m, and contains 0.4% Cu and 0.02% Mo. Oxidized zones average 0.55% Cu and 0.021% Mo; locally contains up to 1.26% Cu and 0.1% Mo. Molybdenite contains up to 600 g/t Re. Deposit size approximately 2.5 km^2.

A.V. Ignatyev, written commun., 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
N57-10 54°21'N 157°23'E	Tumannoe Sredinny	Au Au quartz vein	Small. Average grade of 0.4-2.2 g/t Au and 3 g/t Ag.

Deposit consists of a stockwork hosted in quartz phyllite interbedded with Late Paleozoic metasandstone and metasiltstone. Major ore minerals are gold, arsenopyrite, and pyrite, with rare chalcopyrite and magnetite. Mineralized zones are 30 to 115 m long and 20 to 50 m thick. Deposit probably remobilized from black shale.

D.A. Babushkin and others, written commun., 1986.

N57-11 54°04'N 157°24'E	Anomalnoe Sredinny	Ta, Nb Metamorphic REE(?)	Small. Average grade if 0.02% Ta, 0.04%Nb.

Consists of a quartz vein associated with K-feldspar and albite alteration. Deposit hosted in Proterozoic schist. Vein trends north-south and forms a steeply-dipping ore body over 1 km long, and from1 to 12.5 m thick. Ore minerals are columbite-tantalite and ilmenite-rutile, with accessory K-feldspar, albite, and rare epidote grains. K-Ar K-feldspar age for vein of 170 Ma.

D.A. Babushkin and others, written commun., 1986.

N57-12 53°58'N 157°28'E	Krasnogorskoe Central Kamchatka	Mo Porphyry Co-Mo	Small. Average grade of 0.04 to 0.1% Mo, 0.9% Cu.

Consists of a series of thin intersecting sulfide veinlets (10 to 30 per 1 m length) with pyrite, chalcopyrite, molybdenite, and pyrrhotite; as well as disseminated sulfides. Quartz veins with mostly molybdenite range up to 30 cm thick and up to tens of meters long. Ore minerals are molybdenite, chalcopyrite, and pyrite. Molybdenite contains up to 500 g/t Re. Deposit occurs along contact of Miocene diorite porphyry with Proterozoic gneiss and occurs along an east-west trending fracture zone that dips 50-80° south.

M.A. Sukharev, written commun., 1957.

N57-13 53°38'N 157°02'E	Kvinum Kvinumsky	Ni, Cu, Co, Au, Pt Gabbroic Cu-Ni	Small. Average grade of up to 1.0% Ni, 0.5% Cu, 0.03% Co, 0.5 g/t PGE.

Consists of disseminations and scattered pods of syngenetic and epigenetic breccia-like bodies. Ore minerals are pentlandite, chalcopyrite, gold, PGE, pyrrhotite, and Ni- and Co-arsenides. Hosted in pyroxenite-peridotite-norite at the base of gabbro-peridotite intrusions that occur along a thrust zone at the contact of Proterozoic schist and Late Paleozoic phyllite. Host rocks are regionally metamorphosed, ranging from chlorite-biotite subfacies of greenschist facies to epidote-amphibolite facies.

A.C. Gamovsky, written commun., 1990.

N57-14 53°28'N 157°24'E	Kuvalorog Kvinumsky	Ni, Cu, Co, Pt Hornblendite peridotite Cu-Ni	Small. Average grade of 0.1-9.8% Cu, 0.1-4.4% Ni, 0.1-0.04% Co, 0.1-6.7 g/t Pt.

Consists of steeply-dipping ore bodies in lenses and veins. Ore minerals are pyrrhotite, pentlandite, chalcopyrite, pyrite, magnetite, cobaltite, and marcasite. Hosted in lopolith-shaped multiphase Early Cretaceous Kuvalorog intrusion that includes gabbro, norite, and peridotite and intrudes Late Paleozoic and Proterozoic metamorphosed rocks.

V.P. Zotov, written commun., 1982.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

N57-15 53°26'N 158°17'E	Kitkhoi East Kamchatka	Au, Ag, Zn, Pb Au-Ag epithermal vein	Small. Average grade if 2-3 g/t Au, up to 100 g/t Ag.

Deposit consists of veins and stockworks in a zone extending tens of km. Deposit contains Au, Ag, Pb, and Zn. Major ore minerals are sphalerite, galena, chalcopyrite, and pyrite. Gangue minerals are quartz, carbonate, chlorite, epidote, rare albite, prehnite, and adularia. Ore minerals are concentrated along vein contacts in thin veinlets and disseminations. Deposit occurs on both sides of the contact of a diorite porphyry stock that intrudes Miocene volcanic rocks. Age of mineralization interpreted as Middle Miocene.

Vlasov, 1977.

N57-16 52°50'N 158°16'E	Rodnikovoe East Kamchatka	Au, Ag Au-Ag epithermal vein	Medium. Average grade of 11.3 g/t Au and 40-50 g/t Ag. Estimated reserves of 40 tonnes gold.

Consists of a major vein, and related quartz and quartz-carbonate veins and veinlets in the apical part of a gabbro-diorite intrusion. Veins and veinlets contain goldfieldite, silver sulfosalts, and argentite. Gold fineness of 400 to 600. Alteration includes propylitic, (chlorite-carbonate and epidote-chlorite), kaolinitic, quartz-hydromica alteration with montmorillonite, and silicic with quartz and pyrite. Altered rocks are laterally zoned. Deposit occurs in a complex vein system with several funnel-shaped ore shoots that narrow with depth. Shoots dip 30-50° south. Vertical extent of deposit less than 150 m. High Au concentrations (25-30 g/t) occur in upper level of deposit. Quartz-adularia veins exhibit K-Ar ages of approximately 12 Ma.

I.D. Shchepot'ev, 1989; D. Petrenko, written commun., 1991.

N57-17 52°44'N 158°24'E	Mutnovskoe East Kamchatka	Au, Ag, Cu, Zn, Pb Au-Ag epithermal vein	Medium. Average grade of up to 3 g/t Au and 10 g/t Ag. Reserves for North deposit are 1.8 million tonnes ore averaging 16 g/t Au and 315 g/t Ag. For the South deposit are 5.2 million tonnes ore averaging 12.4 g/t Au, 1300 g/t Ag, and 69,000 tonnes combined Pb and Zn.

Consists of a thick vein and some apophyses, with intervening zones of quartz veinlets. Heavily weathered zones, generally at the Southern deposit, contain quartz with10-18% sulfides. Less weathered Northern deposit is sulfide-poor and contains 0.2-2% base metals. Major ore assemblages are gold-tennantite-tetrahedrite, gold-argentite-pearsite, and chlorite-galena-sphalerite. Canfieldite, as well as the telluride minerals, hessite and altaite, also occur. Deposit is vertically zoned, with gold, tennantite, and tetrahedrite that occur in upper part of the veins, and chalcopyrite, galena, sphalerite occurring in the lower part of the veins. Deposit extends to a depth of 500 m below the surface. Hosted in the central part of a paleovolcano composed of Oligocene-Miocene mafic- and intermediate-composition volcanic rocks. Plutonic rocks consist of Miocene diorite intrusions and numerous dikes of varied composition. Age of mineralization is interpreted as Oligocene to Early Miocene.

Shchepot'ev, 1989; I.D. Petrenko, written commun., 1991; Lattanzi and others, 1995.

N57-18 52°08'N 157°54'E	Asachinskoe East Kamchatka	Au, Ag, Se Au-Ag epithermal vein	Medium. Average grade of up to 20 g/t Au, 40-50 g/t Ag. Estimated reserve of 1.56 million tonnes averaging 35 g/t Au and 62 g/t Ag.

Consists of a zone of quartz-adularia veins that occur along a north-south trending, strike-slip fault. Veins split and pinch out in tuff and andesitic lava. Ore body is a nearly flat-lying band, gently dipping to the south, and conformable to the hypabyssal host rocks. Ore exhibits colloform-banded structure. Ore minerals comprise less than 1% of the veins. Ore mineral assemblages are: gold-hydromica, gold-naumanite-polybasite, and gold-adularia-quartz. Major ore minerals are pyrite, gold, selenium polybasite, and naumanite. Deposit occurs in center of a hypabyssal dacite dome at the intersection of three large linear faults. Deposit associated with hypabyssal volcanic rocks that are inferred in cross-section. K-Ar isotopic age for adularia associated with deposit of 12 Ma.

Shchepot'ev, 1989; A.I. Pozdeev, written commun., 1991.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O04-01	Kagati Lake	Sb, Hg	No data; minor production
59°52'N 159°54'W	Southwestern Kuskokwim Mountains	Sb-Hg vein	

Stibnite, cinnabar, and quartz veinlets along joint surfaces in a stock of Late Cretaceous monzonite and granodiorite. The zone of veinlets strikes northwest-southeast, is from 10 to 600 cm thick, and is traceable for 15 m. The stock intrudes Lower Cretaceous volcaniclastic rocks of the Gemuk Group. Workings consist of several trenches and a few pits. Sporadic development from 1927 through 1981.

Sainsbury and MacKevett, 1965

O04-02	Kemuk Mountain	Fe, Ti, PGE	Estimated 2,200 million tonnes grading 15 to 17 % Fe, and 2 to 3 % TiO_2
59°44'N 157°45'W	Southwestern Alaska	Zoned mafic-ultramafic	

Buried titaniferous magnetite deposit in crudely zoned pyroxenite, interpreted as part of zoned "Alaskan-type" ultramafic pluton. Steeply-dipping, high-temperature contact metamorphic zone with adjacent Permian quartzite and limestone. Aeromagnetic survey indicates pluton about 1,500 m thick and underlies about 6 km^2 area.

Humble Oil and Refining Company, written commun., 1958; Eberlein and others, 1977; Charles C. Hawley, written commun., 1980

O04-03	Rex	Cu, Au	No data
57°12'N 157°00'W	Alaska Peninsula and Aleutian Islands	Porphyry Cu	

Stockwork of chalcopyrite, pyrite, and molybdenite in disseminations and coatings on joint surfaces in series of intensely fractured, small hypabyssal andesite stocks. Hematite zones in brecciated hornfels in contact metamorphic aureoles. Stock about 3 sq km in area. Stocks intrudes the lower Tertiary Tolstoi Formation and overlying volcanic rocks of the Meshik Formation. K-Ar ages of stocks and hydrothermal alteration range from 34 to 39 Ma. Drilling in 1977.

Thomas K. Bundtzen, written commun., 1984; Frederic H. Wilson, written commun., 1985

O04-04	Kilokak Creek	Pb, Zn	No data
57°11'N 156°24'W	Alaska Peninsula and Aleutian Islands	Polymetallic vein(?)	

Zone of alteration and sparse veins with anomalous Pb and Zn values in black siltstone of the Upper Cretaceous Hoodoo Formation, and shallow-water to nonmarine sandstone, shale, and conglomerate of the Chignik Formation, and in Eocene(?) volcanic and hornblende andesite plug. Little alteration of andesite plug; extensive disseminated pyrite in country rock surrounding plug. Zone of alteration and sparse veins on periphery of, but predates, the Pliocene Agripina Bay (granodiorite) batholith.

Frederic H. Wilson, written commun., 1985

O04-05	Mike	Mo	No data
57°03'N 157°13'W	Alaska Peninsula and Aleutian Islands	Au, Ag, Pb, Zn Porphyry Mo	

Area of intense silicic alteration, and weak propylitic and potassic alteration, with disseminated molybdenite, pyrite, and chalcopyrite on joint surfaces with local pyrite zones. Alteration and mineralization occur in fractured Pliocene dacite and rhyodacite stock intruding sandstone, conglomerate, and siltstone of the Jurassic Naknek Formation. Samples with anomalous Au, Ag, and Mo from center of altered zone, and with anomalous Pb and Zn on periphery of altered zone. K-Ar age of 3.65 Ma for stock. Drilling in 1977.

Frederic H. Wilson and Dennis P. Cox, written commun., 1985; Robert L. Detterman, oral commun., 1986

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O04-06 56°30'N 158°44'W	Cathedral Creek, Braided Creek Alaska Peninsula and Aleutian Islands	Cu, As, Zn, Pb Polymetallic vein	No data

Quartz, arsenopyrite, sphalerite, chalcopyrite, and galena in veins adjacent to various late Tertiary stocks of pyroxene andesite, hornblende andesite, and biotite dacite. Textures and field relations indicate shallow emplacement of stocks. Minor chalcopyrite and pyrite in zones of sericitic alteration of stocks and adjacent sedimentary rocks. Stocks intruded into the Chignik, Hoodoo, Tolstoi, and Meshik Formations. Stock at Cathedral, at Bee Creek (AP12, below), and others in area aligned along 65 km east-west-trending lineament that ends at Black Peak, a Holocene volcanic center.

R.F. Robinson, written commun., 1975; Cox and others, 1981; Wilson and Cox, 1983; Frederic H. Wilson, written commun., 1985

O04-07 56°14'N 158°30'W	Mallard Duck Bay Alaska Peninsula and Aleutian Islands	Cu, Mo Porphyry Cu-Mo and(or) polymetallic vein(?)	No data

Pyrite, chalcopyrite, and molybdenite veinlets in swarms concentrated along intersections of joint systems in Oligocene andesite flows, breccias, and lahars. Cut by numerous diorite dikes. Intense sericitic alteration over several square kilometers with weak propylitic alteration to northwest.

Wilson and Cox, 1983

O04-08 56°31'N 158°24'W	Bee Creek Alaska Peninsula and Aleutian Islands	Cu, Au Porphyry Cu	Grab samples contain up to 0.25% Cu, 0.01% Mo, 0.06 g/t Au. Estimated 4.5 to 9.1 million tonnes grading 0.25% Cu, 0.01% Mo, and trace Au

Disseminated chalcopyrite in arkosic sandstone near late Tertiary hypabyssal dacite stock. Zonal alteration pattern with a potassic-altered core, and a propylitically altered periphery. Sericite alteration superposed on both core and periphery. Altered part of dacite stock about 3 sq km in area. Stock intruded into the Upper Jurassic Naknek Formation.

E.D. Fields, written commun., 1977; Cox and others, 1981; Wilson and Cox, 1983; Robert L. Detterman, oral commun., 1986

O04-09 56°10'N 158°20'W	Warner Bay (Prospect Bay) Alaska Peninsula and Aleutian Islands	Cu, Mo, Pb, Zn Porphyry Cu, Polymetallic vein	Average grade of 0.3% Cu, unknown Mo grade

Disseminated molybdenite and chalcopyrite along joint surfaces in closely jointed granodiorite. Galena and sphalerite in veins parallel to main set of joints, or in distinct hematite-rich breccia zones. Occurs in several square kilometer area in the late Tertiary Devils batholith which ranges from quartz diorite to granodiorite. Little to no sericite or argillic alteration. Diatreme or breccia pipe at north end of deposit contains clasts of propylitically altered granodiorite cemented by galena, sphalerite, pyrite, calcite, and zeolites.

Atwood, 1911; Wilson and Cox, 1983; Thomas K. Bundtzen, written commun., 1984

O04-10 59°38'N 161°08'W	Canyon Creek Kilbuck	Fe Ironstone	Not estimated.

Deposits consists of rhythmically-layered hematite, magnetite, and siderite in layers up to 4 cm thick that occur in bleached Early Proterozoic quartzite (Bruce Hickok, T.K. Bundtzen, and M.L. Miller, written commun., 1992). The host rocks are mainly quartzite, garnet-biotite schist, metafelsic volcanic rocks, and amphibolite that are metamorphosed at amphibolite facies. The occurrence is about 150 m long, but is poorly exposed.

Bruce Hickok, T.K. Bundtzen, and M.L. Miller, written commun., 1992.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

O05-01 59°53'N 155°24'W	Pebble Copper Eastern-Southern Alaska	Au, Cu, Mo Porphyry Au-Cu	Inferred reserves 500 million tonnes of 0.35% Cu, 0.4 g/t Au, 0.015% Mo

Disseminated chalcopyrite, pyrite, and molybdenum, accompanied by minor to trace galena, sphalerite, and arsenopyrite in stockwork vein system. Mineralization hosted in early Tertiary granodiorite porphyry and adjacent hornfels aureole. Granodiorite is part of larger composite 40 square km volcanic-plutonic complex that includes pyroxenite, alkali gabbro, quartz monzonite, and dacite volcanic overlyers. Chemically, volcanic and plutonic rocks plot in alkali-calcic and quartz alkali fields. Sulfides were introduced during late stage intense hydrofracture episode that was preceded by potassic, silicic, and sericitic alteration events. Tourmaline breccias locally present. Two K-Ar ages on hydrothermal sericite and igneous K-Spar are 90 and 97 Ma respectively.

Phil St. George, and T.K. Bundtzen, written commun., 1991; Bruce Bouley, oral commun., 1992

O05-02 59°31'N 154°23'W	Fog Lake (Pond) Alaska Peninsula and Aleutian Islands	Au, Cu, Ag Au-Ag epithermal vein	Grab samples with up to 37 g/t Au, 5 g/t Ag, >0.5% Cu

Zone with swarms of pyrite- and chalcopyrite-bearing veinlets that cut altered quartz porphyry that intrudes Tertiary dacite tuffs, lahars, and breccias. Zone about 550 by 305 m. Veinlets are best developed at intersections of northwest-, northeast-, and east-northeast-trending structures. Envelopes of argillic alteration about 7 cm wide adjacent to veinlets. Outer, weaker propylitic alteration. To the northwest, mineralization grades into sphalerite and minor galena with anomalous Ag and Au. Quartz porphyry altered to sericite and pyrite; propylitic alteration in adjacent volcanic rocks. Dacite tuffs, lahars, and breccia, and associated agglomerate and conglomerate unconformably overlie Late Cretaceous to Paleocene(?) quartz diorite to granodiorite pluton. Andesite to dacite dikes crosscut volcanic rocks.

Reed, 1967; Gary L. Andersen, written commun., 1984

O05-03 59°16'N 154°38'W	Kuy Alaska Peninsula and Aleutian Islands	Au, Ag, Cu Au-Ag epithermal vein	No data

Quartz veins and quartz-vein breccia with gold-silver tellurides and chalcopyrite. Veins occur in gash fractures that strike west-northwest and dip steeply southeast. Fracture zone about 300 m wide and 900 m long. Veins exposed for about 90 m along strike. Abundant vugs and comb quartz. Quartz bodies form flattened rods that plunge steeply southeast. Veins and fracture system occur in dacite tuff-breccia that is the upper part of a dissected Tertiary summit caldera. Fracture zone exhibits intense argillite and pyrite alteration; silicic alteration occurs in narrow envelope surrounding quartz veins. Basement is Mesozoic(?) sedimentary rocks.

Gary L. Andersen, written commun., 1984

O05-04 59°08'N 154°40'W	Crevice Creek (McNeil) Alaska Peninsula	Au, Cu Ag, Fe Cu-Au skarn	Produced 11 tonnes from high-grade zones, with 4.5 g/t Au, 514 g/t Ag, and 17.5% Cu

At least ten epidote-garnet skarn bodies occur in limestone over a 2 km^2 area adjacent to southwest part of the Jurassic(?) granodiorite stock of Pilot Knob. Skarn bodies 3 to 800 m long and a few centimeters to 60 m wide. Magnetite-rich skarn in isolated pods in nearby metavolcanic rocks. Skarn bodies developed in limestone, chert, and argillite of the Upper Triassic Kamishak Formation and in overlying metavolcanic rocks of the Jurassic Talkeetna Formation. Local disseminated magnetite zones in epidote-garnet skarns. Largest skarn body at Sargent Creek contains epidote, garnet, actinolite, quartz, pyrite, and chalcopyrite. Lenses up to 1 m wide and 10 m long average 7% Cu. Numerous magnetic anomalies in area surrounding granodiorite stock.

Martin and Katz, 1912; Richter and Herreid, 1965

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O05-05 59°33'N 150°35'W	Nuka Bay District (Nualaska, Lost Creek, Chugach Mountains	Au Au quartz vein	Produced about 258,000 g Au; channel samples contain from 1 to 300 g/t Au

Quartz veins up to 1.0 m wide and 100 m long with sparse gold, arsenopyrite, pyrite, chalcopyrite, and galena. Veins of irregular shape with local pinching and swelling generally strike east-west, normal to regional structure. Veins mainly fissure fillings in metagraywacke and to lesser extent in phyllite of the Upper Cretaceous Valdez Group. Veins probably fill tensional cross joints formed during late stages of regional folding of host rocks. Sparse Tertiary quartz diorite dikes are cut by quartz veins. Several mines and prospects. Explored and developed from about 1909 to 1940. About 1,300 m underground workings. Minor subsequent mining activity.

Richter, 1970

O05-06 59°22'N 151°30'W	Red Mountain Kodiak Island and Border Ranges	Cr Podiform Cr	Two largest deposits are estimated to contain 87,000 tonnes of about 25 to 43% Cr_2O_3. One additional low-grade deposit with 1.13 million tonnes Cr_2O_3

Layers and lenses of chromite concentrated in several areas several hundred meters long and 60 m wide in dunite tectonite. Largest chromite layer about 190 m long and up to 1.5 m wide. More than 10 smaller ore bodies. Occurs in Early Jurassic or older dunite tectonite interlayered with subordinate pyroxenite in zones about 60 m thick. Locally abundant serpentinite, especially at contacts of bodies. Ultramafic rocks part of the Early Jurassic or older, informally named, Border Ranges ultramafic and mafic complex of Burns (1985); faulted at base. Sporadic exploration and development from about 1919 to present. Several hundred meters of underground workings and trenches. About 26,000 tonnes of ore, ranging from 38 to 42% Cr_2O_3, produced from 1943 to 1957. Nearby Windy River chromite placer deposit in glaciofluvial sand and gravel deposits downstream from Red Mountain, is estimated to contain 15.6 million m^3 with 1.33% Cr_2O_3.

Guild, 1942; Bundtzen, 1983b; Burns, 1985; Foley and Barker, 1985; Foley and others, 1985

O05-07 59°12'N 151°49'W	Claim Point Kodiak Island and Border Ranges	Cr Podiform Cr	Estimated 82,000 tonnes Cr_2O_3. Produced about 2,000 tonnes of chromite

Layers and lenses of chromite up to 60 m long and 14 m wide, over area of about 500 by 500 m, in dunite tectonite. About 14 separate deposits occur in Early Jurassic or older layered dunite tectonite. Few olivine-pyroxene dikes; locally abundant serpentinite. Ultramafic rocks part of Early Jurassic or older, informally named Border Ranges ultramafic and mafic complex of Burns (1985). Faulted at base. Explored and developed from about 1909 to 1919. Mining from 1917 to 1918. Several hundred meters of underground workings and trenches. Sporadic exploration since; most recently in mid-1980's.

Guild, 1942; Burns, 1985; Foley and Barker, 1985

O05-08 57°48'N 152°20'W	Chalet Mountain (Cornelius Creek) Chugach Mountains	W, Au, Ag Au quartz vein	Grab samples with up to 1.75% WO_3, 9.6 g/t Au, 120g/t Ag

Silicified zones and quartz veins with disseminated scheelite and gold(?) occur within a 100 by 500 m area of silicified metagraywacke of the Upper Cretaceous Kodiak Formation at Chalet Mountain, and in nearby granodiorite pluton at Anton Larsen Bay. Scheelite concentrated in silicified zones localized in calcareous-rich part of metagraywacke.

Seitz, 1963; Rose and Richter, 1967

O05-09 57°22'N 154°36'W	Halibut Bay Kodiak Island and Border Ranges	Cr Podiform Cr	Eight low-grade deposits with estimated 180,000 tonnes Cr_2O_3

Scattered small layers and lenses of chromite in dunite and subordinate clinopyroxenite tectonite in areas up to 300 m long and about 100 m wide. Ultramafic rocks part of the Early Jurassic or older, informally named Border Ranges ultramafic and mafic complex of Burns (1985), faulted at base.

Foley and Barker, 1984; Burns, 1985

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O08-01 58°59'N 136°06'W	Nunatak (Muir Inlet) Central-Southeastern Alaska	Mo Cu Porphyry Mo-Cu	Medium. Main stockwork contains estimated 2.03 million tonnes grading 0.067% Mo and 0.16% Cu; remaining stockwork contains estimated 117.5 million tonnes grading 0.026% Mo and 0.18% Cu.

Consists of numerous closely spaced molybdenite-bearing quartz veins, stockwork, and minor disseminated molybdenite in hornfels, skarn, and a mineralized fault zone that occur around a Tertiary(?) granite porphyry stock. Disseminated sulfides in granite porphyry include varying amounts of pyrite, pyrrhotite, chalcopyrite, and sparse tetrahedrite and bornite. Some massive sulfide pods occur in silicified skarn adjacent to stock in calcareous sedimentary rocks. Granite porphyry intrudes tightly folded Paleozoic metasedimentary rocks.

MacKevett and others, 1971; Brew and others, 1978, 1991; Berg, 1984.

O08-02 59°44'N 137°45'W	Windy Craggy (Alsek River Area) Alexander	Cu, Co Au, Ag Cyprus massive sulfide	Large - World Class. Reserves of 265.7 million tonnes grading 1.44% Cu, 0.070% Co, 0.20 g/t Au.

Consists of two principal massive pyrrhotite, pyrite and chalcopyrite bodies that are hosted in Upper Triassic basaltic volcanic flows and intercalated siltstone and limestone. Both zones have adjacent sulfide stringer stockworks. Stockwork more extensive at North Zone. Reserves for the North zone are 148.3 million tonnes grading 1.44% Cu, 0.066% Co, 0.23 g/t Au and 4.16 g/t Ag. Reserves for the South zone are 117.5 million tonnes grading 1.44% Cu, 0.075% Co, 0.16 g/t Au and 3.37 g/t Ag. Additional 31.7 million tonnes are reported for the Ridge and other massive sulfide zones in the Windy Craggy mountain area. Five additional stratiform Cu occurrences were discovered in the area in 1992. Deposit age interpreted as Late Triassic.

Cordilleran Geology and Exploration Roundup, 1990; EMR Canada, 1989; Harper, 1992; Schroeter & Lane, 1991; G. Harper, Massive sulphide potential of the northwestern Cordillera of British Columbia and the significance of the Alta Basin, Geddes Resources Ltd., written commun., 1992; MacIntyre and others, 1993.

O08-03 59°39'N 136°44'W	O'Connor River Unassigned	Gypsum, Anhydrite Stratabound gypsum	Medium. Reserves of 6.35 million tonnes grading 90% gypsum.

Consists three stratabound gypsum layers that occur in deformed Permian to Triassic limestone, limestone breccia, and black calcareous argillite. Reserves are for the West and Kim zones. An additional reserve for East zone is 2.5 million tonnes grading 79% gypsum. Deposit age interpreted as Permian-Triassic.

White, 1986; B.C. Minfile, 1988.

O08-04 59°43'N 133°24'W	Adanac-Adera (Ruby Creek) Surprise Lake	Mo, W U, Sn, Cu Porphyry Mo	Medium. Reserves of 182.3 million tonnes grading 0.059% MoS2.

Consists of molybdenite with accessory pyrite, fluorite, chalcopyrite, scheelite and wolframite with minor arsenopyrite that occur in a quartz-vein stockwork. Hosted by a quartz monzonite stock associated with the Late Cretaceous Surprise Lake Batholith. Siliciic and potassic alteration occur as envelopes up to several centimeters thick around quartz veins. Minor uranium occurs in the deposit. K-Ar age of 70.6 ± 3.8 Ma for Surprise Lake Batholith. Associated W-, Cu-, Sn-greisen veins and W-, Sn- (Cu, Pb, Zn) skarns occur along stock contacts with limestone of Cache Creek Assemblage. Deposit age interpreted as Late Cretaceous.

Christopher and Pinsent, 1982; B.C. Minfile, 1988; EMR Canada, 1989; Dawson and others, 1991; Mining Review, 1992.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
O08-05 59°26'N 135°53'W	Klukwan Klukwan-Duke	Fe, PGE, Ti, V Zoned mafic-ultramafic Fe-Ti	Large. Estimated 12 billion tonnes grading 13% magnetite, 1.5 to 4.4% TiO_2, and 0.2% V_2O_5. Reserves of 45 million tonnes grading 10.3 g/t Au, 0.1% Cu, 1.0 g/t Pt and 1.0 g/t Pd.

Consists of titaniferous magnetite with minor chalcopyrite, hematite, pyrite, pyrrhotite, spinel, and leucoxene that occur either as disseminations or in tabular zones in a pyroxenite body surrounded by diorite. Magnetite occurs interstitial to pyroxene and is idiomorphic against hornblende. Cretaceous pyroxenite and diorite intrude Triassic or older rocks. Best known part of the deposit is nearby Klukwan fan (Takshanuk Mountain) magnetite placer deposit that contains estimated 453 million tonnes grading 10% titaniferous magnetite. Placer deposit occurs in an alluvial fan at the foot of the mountain slope along a road below Klukwan lode deposit.

Wells and Thorne, 1953; Robertson, 1956; MacKevett and others, 1974; Wells and others, 1986; Brew and others, 1991; Berg, 1984; Wells and others, 1986.

O08-06 59°15'N 135°30'W	Haines Klukwan-Duke	Fe, Ti Zoned mafic-ultramafic Fe-Ti	Large. Reserves of greater than 1 billion tonnes grading less than 10% magnetite, 1.3% to 1.8% TiO2.

Consists of titanium-bearing magnetite that occurs as primary magmatic segregations in pyroxenite that forms part of zoned complex of the Union Bay Suite. Complex contains a pyroxenite core that surrounded by epidote-bearing granite, and intrudes metabasalt of the Taku Terrane. Deposit age interpreted as mid-Cretaceous.

Wells and others, 1986; Brew and others, 1991.

O08-07 58°55'N 136°60'W	Orange Point Alexander	Zn, Cu Ba,Pb,Ag,Au Kuroko Zn-Pb-Cu massive sulfide	Medium. Reserves of greater than 1 million tonnes grading 19% Zn, 5.2% Cu, 3.5 g/t Au, 70 g/t Ag.

Consists of pyrite, pyrrhotite, sphalerite and chalcopyrite that occur as elongated zones of massive and disseminated sulfides up to 25 meters wide and 170 meters long. Deposit hosted in Permian and (or) Triassic meta-andesite flows and tuffs. Deposit age interpreted as Permian and Triassic.

Berg, 1984; Brew and others, 1991.

O08-08 58°52'N 135°05'W	Kensington Juneau	Au Ag, Pb Au quartz vein	Produced 10,900 tonnes grading about 5.8 g/t Au. Proven and probable reserves are 7.6 million tonnes grading 5.2g/tonne Au

Stockworks of quartz veins in high-angle zones of sheared and chloritized Cretaceous quartz diorite. Veins contain mainly pyrite with some chalcopyrite and rare galena. Pyrite varies from disseminated euhedral crystals to massive veins up to 0.1 m wide. Alteration varies with intensity of veining, and is marked by chlorite, epidote, sericite, and locally K-feldspar. Gangue dominantly quartz with lesser amounts of carbonate and albite. Veins are irregular and vary from 2 to 10 cm wide. Veins generally parallel stockwork boundaries. Vein system trends generally north-south with an areal extent of 24 by 48 m and a vertical extent of 300 m. The deposit occurs in Cretaceous diorite that intrudes Upper Triassic greenstone, graywacke, and argillite of the western border of the informally named, Coast plutonic-metamorphic complex of Brew and Ford (1984). Origin of gold interpreted to be from deep-crustal metamorphic fluids. Mined from 1886 to 1924. About 1,800 m of workings.

Wright and Wright, 1908; Knopf, 1911; Eakins, 1918; Goldfarb and others, 1988, 1991; Harvey and Kirkham, 1991

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O08-08 58°52'N 135°05'W	Jualin Juneau	Au Ag, Cu, Pb Au quartz vein	Medium. Reserves of 907,000 tonnes grading 10.5 g/t Au. Produced about 1.5 million g Au

Consists of four or five major quartz fissure veins and pipe-like stockworks that contain minor gold, and considerable pyrite, chalcopyrite, galena, minor sphalerite, and secondary copper minerals. Deposit hosted in Cretaceous quartz diorite. Pyrite is dominant sulfide. Gold associated with pyrite as minute blebs in goethite rims and fracture fillings in corroded crystals. Gangue of quartz with lesser ankerite, chlorite, and sericite. Age of mineralization is interpreted as 55 Ma. Quartz diorite adjacent to veins exhibit proximal ankerite, quartz, and sericite alteration, and more widespread propylitic alteration. Quartz diorite intrudes Upper Triassic greenstone, graywacke, and argillite of Alexander terrane. More than 5,500 m of horizontal workings. Origin of gold interpreted to be from deep-crustal metamorphic fluids. Principal mining from 1895 to 1920.

Knopf, 1911; Jones and others, 1984a; Barnett, 1989; Bundtzen and others, 1990; Goldfarb and others, 1991; Brew and others, 1991; Swainbank and others, 1991.

O08-09 58°44'N 133°35'W	Tulsequah Chief (Big Bull) Coast	Zn, Cu, Au, Ag, Pb Kuroko Zn-Cu-Pb massive sulfide	Medium. Reserves of 8.8 million tonnes grading 1.21% Pb. Grade: 6.42% Zn ,1.3% Cu, 2.51 g/t Au, 106.36 g/t Ag.

Consists of massive to disseminated pyrite, sphalerite, chalcopyrite and galena with tennantite and tetrahedrite that are hosted in mafic volcanic rocks of the Upper Devonian to early Mississippian Mount Eaton series. Hanging wall composed of dacite tuffs; footwall composed of more massive andesitic flows. Alteration associated with mineralization consists of sericite-pyrite with local anastomosing quartz veins grading to pervasive silicification. Deposit contains lenses of massive sulfides up to 10 meters thick and 170 meters long. Seven conformable lenses are identified. Deformation of the lenses is intense, with at least 3 phases of deformation. Production 1951 and 1957 was 574,000 tonnes grading 1.8% Cu, 1.3% Pb, 6.7% Zn, 3.4 g/t Au and 110 g/t Ag. Deposit age interpreted as Devonian and Mississippian.

B.C. Minfile, 1989; EMR Canada, 1989; Dawson and others, 1991; Redfern Resources Ltd., summary report,1995.

O08-10 58°40'N 133°28'W	Erikson-Ashby Unassigned	Ag, Pb, Zn, Au Kuroko Zn-Pb-Ag massive sulfide and Zn Skarn	Medium. Reserves of 907,190 tonnes grading 215 g/t Ag, 2.3% Pb, 3.8% Zn, 1.7g/t Au.

Volcanogenic massive sulfides occur in Upper Cretaceous to Lower Eocene rhyolitic volcanics and associated volcaniclastic sediments and Mn-rich skarn replacement bodies in Permian (?) limestone and Paleozoic to Triassic chert, greywacke and intercalated intermediate volcanics and phyllites. Rhyolite-hosted part of deposit generally consists of lenses of pyrite and magnetite overlain by massive pyrite, sphalerite and galena. Galena and magnetite are concentrated upward in massive sulfide sections. Skarns occur as veins and replacement bodies with associated rhodochrosite and magnetite. Deposit age interpreted as Late Cretaceous-E. Tertiary.

B.C. Minfile, 1988; EMR Canada, 1989.

O08-11 58°32'N 132°47'W	Sutlahine River Area (Thorn, Kay) Surprise Lake	Cu, Mo, Ag Pb Porphyry Cu-Mo	Medium.

Consists of brecciated rhyolite contains chalcopyrite, pyrite, quartz, minor galena, barite, calcite and siderite. Chalcopyrite and molybdenite occur as disseminations and fracture fillings with quartz and orthoclase. Minor enargite, tetrahedrite, pyrite and stilbite occur in quartz veins in shear zones and in breccias. Deposit hosted in a silicic intrusive-extrusive complex of Tertiary Sloko Group, cored by a quartz feldspar porphyry intrudes the contact between pre-Upper Triassic metasedimentary rocks, and volcanic rocks, including porphyritic andesite, rhyolite and tuff of the Upper Triassic Stuhini Group. Complex is extensively altered to pyrite, hydrothermally altered. Deposit age interpreted as Early Tertiary.

B.C. Minfile, 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O08-12 58°26'N 133°22'W	Mount Ogden (Nan, Moly-Taku) Surprise Lake	Mo Zn, Cu, Ag, W Porphyry Mo	Large. Reserves of 218 million tonnes grading 0.30% MoS2.

Consists of molybdenite hosted by an alaskite-quartz monzonite stock of the Coast Plutonic Complex (Cretaceous and early Tertiary), that intrudes amphibolite-grade, metamorphosed Permian and Triassic limestones, clastic sedimentary and volcanic rocks. Country rocks locally contain skarn that contains disseminated pyrite, pyrrhotite, magnetite and traces of sphalerite and scheelite, and a white calc-silicate hornfels with calcite, and wollastonite or tremolite. Molybdenite occurs mainly in the alaskite as platy crystals in veins, in veinlets, as rosettes in vuggy quartz and as interstitial grains. Some molybdenite veins range up to 10 cm wide and occur over 30 meters. Alteration consists of quartz-sericite, with fluorite, biotite, minor pyrite and sphalerite. Deposit age interpreted as Late Cretaceous and early Tertiary.

Mining Review, 1981; B.C. Minfile, 1988; EMR Canada, 1989.

O08-13 58°18'N 134°20'W	Alaska-Juneau Juneau	Au Pb, Ag Au quartz vein	Medium. Produced 108 million g Au ,59.1 million g Ag, and 21.8 million kg Pb from 80.3 million tonnes ore. Reserves of 61.6 million tonnes grading 1.8 g/t Au

Consists of a network of lenticular quartz veins a few centimeters to 1 m thick contain sparse scattered masses of gold, pyrite, pyrrhotite, arsenopyrite, galena, with minor sphalerite, chalcopyrite, and silver. Vein lode system about 5.6 km long and 600 m wide. Deposit consists of a series of parallel quartz stringers in phyllite and schist near the contact between the Upper Triassic Perseverance Slate, in amphibolite derived from late(?) Mesozoic gabbro dikes and sills, and in the informally named Gastineau volcanics of Permian and (or) Upper Triassic age. Deposit is in the western metamorphic belt of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Most of ore occurs in quartz veins; some in adjacent altered metamorphic rocks. Metagabbro forms irregular dikes and sills. Large-volume, low-grade mine. A few hundred kilometers of underground workings and several large glory holes. Production from about 1893 to 1944. Origin of gold interpreted to be from deep-crustal metamorphic fluids, or possibly a remobilized strata-bound deposit.

Spencer, 1906; Twenhofel, 1952; Wayland, 1960; Herreid, 1962; Goldfarb and others, 1986, 1988, 1991; Newberry and Brew, 1987, 1988; Light and others, 1989; Brew and others, 1991; Alaska Mineral Industry, 1993, p.13.

O08-14 57°59'N 136°25'W	Bohemia Basin (Yakobi Island) Yakobi	Ni, Cu Gabbroic Ni-Cu	Medium. Estimated 19 million tonnes grading 0.33% Ni, 0.21% Cu, 0.01% Co

Consists of magmatic segregations, chiefly of pyrrhotite, pentlandite, and chalcopyrite. Occur in trough-like body about 45 m thick near base of basin-shaped, composite norite La Perouse lopolith of Tertiary age. Norite locally grades into gabbro and diorite. Norite stock intrudes metagraywacke, phyllite, and greenschist of the Cretaceous and Cretaceous(?) Kelp Bay Group. Considerable drilling exploration during late 1970's to early 1980's.

Kennedy and Walton, 1946; Johnson and others, 1982; Himmelberg and others, 1987, Still, 1988; Brew and others, 1991; Berg, 1984.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O08-15 58°05'N 134°38'W	Greens Creek Alexander	Ag, Zn, Au, Pb Cu,Bi,Sb Kuroko Zn-Pb-Cu massive sulfide	Medium. Reserves of 12.5 million tonnes grading 456 g/t Ag, 4.1 g/t Au, 12.8 % Zn, and 4.0 % Pb.

Consists of sphalerite, galena, chalcopyrite, and tetrahedrite in a pyrite-rich matrix in massive pods, bands, laminations, and disseminations, associated with pyrite-carbonate-chert exhalite. Hanging wall of chlorite and sericite sedimentary rocks. Footwall of black graphitic argillite. "Black ore" forms an extensive blanket deposit, and is composed of fine-grained pyrite, sphalerite, galena, and Ag-rich sulfosalts in laminations in black carbonaceous exhalite and argillite; "white ore" occurs along edges of massive pods, and is composed of minor tetrahedrite, pyrite, galena, and sphalerite in laminations, stringers, or disseminations in massive chert, carbonate rocks, or sulfate-rich exhalite. Local veins with bornite, chalcopyrite, and gold below massive sulfides. Veins may be brine conduits. Sulfides and host rocks underlain by serpentinized mafic volcanic flows and tuffs. Host rocks form Triassic suite of metasedimentary and metavolcanic rocks in Alexander terrane and apparently overlain structurally several kilometers away by fossiliferous Permian black carbonaceous metasedimentary rocks. Host rocks tightly folded into southeast-plunging, overturned antiform. Interpreted to be an exhalative marine massive sulfide deposit formed in a Triassic back-arc or wrench fault extensional basin during deposition of arc- or continent-derived clastic and volcaniclastic sediments intermixed with mafic flows and tuffs.

Dunbier and others, 1979; Drechsler and Dunbier, 1981; J. Dunbier and D. Sherkenbach, written commun., 1984; Henry C. Berg, written commun., 1984; Newberry, Brew, and Crawford, 1990; Brew and others, 1991; Wells and others, 1986; Berg, 1984.

O08-16 57°40'N 136°06'W	Chichigof, Hirst-Chichagof Baranof	Au Ag Au quartz vein	Medium. Produced about 24.6 million g Au, 1.24 million g Ag, and minor Pb and Cu from 700,000 tonnes of ore. Average grade of 7.2 g/t Au, 2.0 g/t Ag. Reserves of 91,000 tonnes grading 41.2 g/t Au in several ore bodies

Consists of tabular to lenticular quartz veins a few meters thick, extend a few hundred meters along strike, and up to a few thousand meters along plunge. Mainly ribbon quartz with minor pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, and some scheelite and tetrahedrite locally. Ore shoots localized within shear and gouge zones in Hirst and Chichagof faults, especially along undulations in the fault planes. Veins cut metagraywacke and argillite of the Cretaceous Sitka Graywacke. Production from about 1905 to 1940. Extensive underground workings on 12 levels to 1,200 m deep and 1,440 m long. Considerable drilling and exploration in the 1980's.

Reed and Coats, 1941; Still and Weir, 1981; Johnson and others, 1982; Berg, 1984; Bundtzen, Green, Deager, and Daniels, 1987; Brew and others, 1991.

O08-17 56°39'N 133°10'W	Castle Island, Kupreanof Island Alexander	Ba Zn, Pb, Ag, Cu Bedded barite, kuroko Ba-Zn-Pb-Cu massive sulfide	Medium. Produced 680,000 tonnes ore grading 90% barite. Sulfide-rich layers contain up to 5% galena and sphalerite, and 100 g/t Ag.

Castle Island: Consists of lenses of massive barite interlayered with metamorphosed Devonian or Triassic limestone, calcareous and tuffaceous clastic rocks. Sulfide-rich interbeds contain sphalerite, galena, pyrite, pyrrhotite, bornite, tetrahedrite, and chalcopyrite. Mined by surface and underwater stripping. Kupreanof Island Deposit: Consists of lenses of massive pyrite and lesser galena and sphalerite in Upper Triassic metamorphosed felsic volcanic and volcaniclastic rocks, chert, slate, and marble. Sulfide lenses up to 30 m long and 3 m wide. Complexly folded and faulted.

Berg and Grybeck, 1980; Berg, 1984; Grybeck and others, 1984; Brew and others, 1991.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

O08-18 58°42'N 133°38'W	Polaris-Taku (Whitewater) Texas Creek	Au, Ag, Cu, As, Sb Au quartz vein	Medium. Resource of 2.196 million tonnes grading 14.74 g/t Au.

Consists of native gold associated with arsenopyrite and stibnite in quartz-ankerite veins. Deposit underlain by late Paleozoic to Triass Stuhini Group volcanic and sedimentary rocks. Volcanic rocks composed of andesite and basalt flows and pyroclastic rocks host gold in that occurs in an assemblage of arsenopyrite, ankerite, sericite, pyrite, fuchsite, and stibnite. Structures hosting deposit are splays of the Tulsequah River shear zone. Production of 231,000 oz. Au from 760,000 tons of ore, with a recovered grade of 0.30 oz Au/t. Deposit age iinterpreted as Early Jurassic(?).

B.C. Minfile, 1983; Marriott, 1992; Mihalynuk and Marriott, 1992.

O08-19 58°13'N 132°17'W	Muddy Lake (Golden Bear, Totem) Texas Creek	Au Ag Au quartz vein	Medium. Reserves of 720,000 tonnes grading 5.75 g/t Au.

Consists of disseminations and fracture-fillings of extremely fine-grained pyrite that occur along fault contacts of tuffite and limestone. Deposit interpreted as a mesothermal Au-quartz veins hosted by silicified limestone, dolostone and tuff of the Permian Asitka Assemblage. Occurs in a north-trending, 20 km long fault zone. Production started in 1983. Four deposits occur on the property: Bear, Fleece, Totem and Kodiak zones. Deposit age interpreted as Early Jurassic.

Schroeter, 1987; Northern Miner, August 31,1987; Melis and Clifford, 1987; Osatenko and Britton, 1987; Dawson and others, 1991; North American Metals Corp, news release, February 1995.

O08-20 59°24'N 136°23'W	Glacier Creek Alexander	Ba, Cu, Zn Pb, Ag, Au Kuroko massive sulfide	At least 680,000 tonnes of 45% barite and up to 3% combined Cu and Zn

Fine-grained sphalerite, galena, chalcopyrite as disseminations, and in massive layers and lenses associated with metamorphosed Paleozoic and lower Mesozoic mafic pillow flows, highly altered and metamorphosed quartz-feldspar porphyry, thin phyllitic siltstone and limestone. Sparse disseminated pyrite, magnetite, and tetrahedrite. Main sulfide layers and lenses associated with lenses of sericite-talc-quartz schist as much as 180 m thick in the metamorphosed mafic volcanic rocks. Schist formed partly by alteration of mafic extrusive rocks, and partly from quartz-feldspar porphyry. Deposits up to 9 m thick and 600 m long. Sulfide layers and lenses interfoliated with beds of nearly pure barite up to 20 m thick. Sedimentary origin indicated by conformable relations between sulfide layers and bedding. Host rocks part of Alexander terrane; age of host rocks uncertain.

MacKevett and others, 1971; Hawley, 1976; Still, 1984; Still and others, 1991

O08-21 59°01'N 137°05'W	Margerie Glacier Central-Southeastern Alaska	Cu, Ag, Au Porphyry Cu and lesser polymetallic vein	Estimated 145 million tonnes of 0.02% Cu, 0.27 g/t Au, 4.5 g/t Ag

Chalcopyrite, pyrite, arsenopyrite, sphalerite, molybdenite, and minor scheelite in quartz veins in shear zones, masses of sulfide, and as disseminations in propylitically altered, Cretaceous or Tertiary porphyritic granite stock and in adjacent hornfels. Granite intrudes Permian(?) metamorphosed pelitic and volcanic rocks, and sparse marble of Alexander terrane.

Brew and others, 1978

O08-22 58°52'N 136°52'W	Reid Inlet Baranof	Au, Pb Au quartz vein	Produced 220,000 to 250,000 g Au

Zone of narrow, discontinuous, steeply dipping quartz veins up to a few hundred meters long and up to 1.1 m thick in altered Cretaceous granodiorite, contact-metamorphosed Permian(?) pelitic and volcanic rocks, and sparse marble of Alexander terrane. Veins trend north-south, northeast, and east-west.

MacKevett and others, 1971; Brew and others, 1978

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O08-23 58°33'N 136°56'W	Brady Glacier Yakobi	Cu, Ni, PGE Gabbroic Ni-Cu	Estimated 82 to 91 million tonnes of 0.53% Ni, 0.33% Cu, 0.03% Co, minor PGE. Grab samples of 0.18 to 1.30 g/t PGE

Disseminated and lenses of pyrrhotite, pentlandite, and chalcopyrite, with rare pyrite near base of large layered Tertiary lopolith consisting mainly of gabbro with sparse peridotite; the La Perouse layered gabbro. Locally up to 10% disseminated sulfides. Deposit almost entirely beneath Brady Glacier, but exposed in small nunataks. Gabbro intrudes metagraywacke and phyllite of the Cretaceous Sitka Graywacke. Considerable drilling and exploration in 1970's, but now in National Park and work stopped short of development.

Brew and others, 1978; Czamanske and Calk, 1981; Himmelberg and Loney, 1981

O08-24 57°57'N 136°16'W	Apex and El Nido Baranof	Au, Ag Cu, Pb, W, Zn Au quartz vein	Produced about 622,000 g Au and 93,300 g Ag

Quartz fissure veins up to 2 m thick and stockworks with sparse pyrite, arsenopyrite, chalcopyrite, galena, sphalerite, tetrahedrite, and gold. Host rocks are altered Mesozoic diorite pluton and amphibolite mass within pluton. Minor sulfides in the altered diorite wall rocks. Deposit also contains disseminations, veinlets, and small masses of scheelite. Vein system symmetrical around vertical fault that bisects deposit. Pluton intrudes upper Paleozoic low-grade pelitic and intermediate volcanic rocks. About 1.6 km of workings. Production from 1912 to 1939.

Reed and Coats, 1941; Still and Weir, 1981; Johnson and others, 1982

O08-25 57°51'N 136°13'W	Cobol Baranof	Au Cu, Pb, Zn Au quartz vein	Produced about 3,100 g Au from about 120 tonnes ore

Quartz fissure vein up to 0.6 m wide with arsenopyrite, sphalerite, galena, pyrite, and chalcopyrite cuts Cretaceous(?) quartz diorite, and upper Paleozoic greenstone, quartzite, and siliceous limestone. Quartz diorite locally altered near veins.

Reed and Coats, 1941; Johnson and others, 1982

O08-26 57°47'N 136°19'W	Mirror Harbor Yakobi	Ni, Cu Co Gabbroic Ni-Cu	Largest ore body contains about 7,300 tonnes with about 1.57% Ni, 0.88% Cu, and 0.04% Co

Disseminated, intergrown pyrrhotite, pentlandite, and chalcopyrite in composite Tertiary norite stock. Sulfide pods locally. Stock intrudes contact-metamorphosed metagraywacke and phyllite of the Cretaceous Sitka Graywacke.

Pecora, 1942; Kennedy and Walton, 1946; Johnson and others, 1982

O08-27 58°15'N 134°21'W	Treadwell Juneau	Au, Ag, Pb Au quartz vein	Produced about 90.1 million g Au from 25 million tonnes ore

Large deposit with disseminated sulfides and quartz and quartz-calcite vein systems that contain sparse gold, pyrite, magnetite, molybdenite, chalcopyrite, galena, sphalerite, and tetrahedrite in shattered albite diorite dikes and sills. These intrude Jurassic(?) and Lower Cretaceous(?) slate and greenstone derived from basaltic tuff or agglomerate; part of the Treadwell Slate in the Gravina-Nutzotin belt. Some ore in zone at least 1,100 m long in slate inclusions and in adjacent wall rock. Best ore associated with abundant quartz and calcite veinlets. Deposit mined from above sea level to 790 m beneath Gastineau Channel. Four major mines connected underground. Principal mining from 1885 to 1922 when most workings flooded during a catastrophic influx of sea water. Origin of gold interpreted to be deep-crustal metamorphic fluids.

Spencer, 1905; Buddington and Chapin, 1929; Light and others, 1989; Goldfarb and others, 1991

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O08-28 57°55'N 133°37'W	Sweetheart Ridge Tracy	Ag, Au, Cu, Pb, Zn Kuroko massive sulfide	Estimated 6,600 tonnes of 7.9 g/t Au, 10.6 g/t Ag, 0.7% Cu

Strata-bound sulfide disseminations and thin, layers of massive chalcopyrite, pyrite, subordinate sphalerite, and sparse galena occur in zones up to 2 m thick in cataclastic upper Paleozoic or Mesozoic quartz-rich paragneiss and to a lesser extent in schist. Deposit occurs just west of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Scattered sulfides in veins may represent remobilized portions of strata-bound deposit.

Brew and Grybeck, 1984; Kimball and others, 1984

O08-29 57°47'N 133°28'W	Sumdum Tracy	Ag, Cu, Zn Kuroko massive sulfide(?)	Estimated 24 million tonnes grading 0.57% Cu, 0.37% Zn and 10.3 to 103 g/t Ag, assuming deposit continues beneath Sumdum Glacier.

Massive lenses and disseminated zones with pyrrhotite, pyrite, chalcopyrite, sphalerite, and lesser bornite, malachite, azurite, and galena in bodies up to 15 m wide. Zones occur parallel to layering along crest and flanks of isoclinal fold in Paleozoic or Mesozoic metasedimentary schist and gneiss at the western edge of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Sulfide-bearing veins(?) and fault breccia that may postdate strata-bound deposit and represent remobilization of the original mineralization.

MacKevett and Blake, 1963; Brew and Grybeck, 1984; Kimball and others, 1984

O08-30 57°39'N 133°27'W	Sumdum Chief Juneau	Au, Ag, Cu, Pb, Zn Au quartz vein	Produced about 750,000 g each of Ag and Au. Average grade about 13.7 g/t Au

Two quartz-calcite fissure veins with gold, auriferous pyrite, galena, sphalerite, chalcopyrite, and arsenopyrite. Uneven gold distribution, mainly in pockets where small veins intersect main veins. Veins, up to 6 m thick, occur in upper Paleozoic(?) or Mesozoic graphitic slate and marble of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Minimum of 1,820 m horizontal workings. Moderate former production. Origin of gold interpreted to be deep-crustal metamorphic fluids.

Spencer, 1906; Brew and Grybeck, 1984; Kimball and others, 1984; Goldfarb and others, 1988, 1991

O08-31 56°31'N 132°04'W	Groundhog Basin Central-Southeastern Alaska	Ag, Pb, Zn Polymetallic vein(?), Sn granite, Porphyry Mo	Estimated several hundred thousand tonnes massive sulfide ore grading 8% Zn, 1.5% Pb, 51.5 g/t Ag. Equal amounts of disseminated sulfide ore grading 2.5% Zn and 1% Pb.

Disseminated to massive pyrrhotite, sphalerite, and galena with lesser pyrite, arsenopyrite, chalcopyrite, cassiterite,and magnetite. Sulfides occur in several tabular or stratiform zones up to 1 m thick and in veins adjacent to altered Miocene granite porphyry. Zones and veins occur in upper Paleozoic or Mesozoic calc-silicate, quartz-feldspar, and hornblende-rich gneiss and schist of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). Deposits and host rocks intruded by granite porphyry and by younger quartz porphyry sills and dikes. Deposit interpreted as skarn and polymetallic vein deposit related to tin granite. Altered granite porphyry may contain 1 million tonnes of undiscovered resources containing 0.8% Sn.

Buddington, 1923; Gault and others, 1953; Grybeck and others, 1984; Newberry and Brew, 1988

O08-32 58°14'N 134°52'W	Funter Bay Klukwan-Duke	Cu, Ni, Co Gabbroic Ni-Cu	Estimated 450 to 540 thousand tonnes with 0.33 to 1% each of Cu and Ni, and 0.05 to 0.32% Co

Disseminated pyrrhotite, pentlandite, and chalcopyrite in Mesozoic olivine-hornblende gabbro at base of Late(?) Mesozoic gabbro-norite pipe. Remainder of pipe contains much less sulfide. Pipe intrudes upper Paleozoic or Triassic quartz-mica schist of Alexander terrane.

Barker, 1963b; Noel, 1966

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O09-01 59°56'N 130°20'W	Midway (Silver Tip) Cassiar	Ag, Pb, Zn Au, Sb, Bi Pb-Zn-Ag skarn and manto	Medium. Reserves of 1.18 million tonnes grading 9.6% Zn, 7.0% Pb, 410 g/t Ag.

Consists of sphalerite, galena and pyrite with minor silver, gold, antimony and bismuth minerals occur as irregular, pipe-like, open-space filling and replacement bodies. Deposit hosted by Middle Devonian McDame Group carbonates beneath a major unconformity. SEDEX Ba, Pb, and Zn deposits occur in the overlying Devonian and Mississippian Earn Group turbiditic clastic rocks. K-Ar age of 66 Ma for sericitized Earn Group sedimentary rock near quartz-feldspar porphyry dikes, about 2 km from the deposit, interpreted as age of mineralization. Deposit age interpreted as Late Cretaceous.

B.C. Minfile, 1988; Bradford and Godwin, 1988; EMR Canada, 1989.

O09-02 59°46'N 127°12'W	Leguil Creek (Letain) Liard	Ba Bedded barite	Medium. Production of about 10,000 tonnes (1987-88). Grade not available.

Consists of veins and lenses of barite that occur in a thinly bedded sequence of Lower Paleozoic shale and siltstone of Cambrian and Devonian age. Sequence gently folded into a series of northwest-trending anticlines and synclines. Three zones are identified. The main zone occurs in a braided fault zone, rarely exceeding 3.5 m thickness, and is intruded by a diorite dike. Veins in the other two zones vary from 1 to 4 meter wide, trend northeast, and are vertical. Deposit age interpreted as Devonian(?).

B.C. Minfile, 1990.

O09-03 59°27'N 126°05'W	Lower Liard (Gem, Tee, Tam) Liard	F, Ba Southeast Missouri Ba-F	Medium. Reserves of 2.4 million tonnes grading 34-73% CaF_2.

Consists of fluorite with barite, witherite, barytocalcite, quartz and calcite that occur along contact between limestone of the Middle Devonian Dunedin Formation and shale of the overlying Middle to Upper Devonian Besa River Formation. Fluorite occurs in limestone, as veins and pods, and in brecciated shale. Deposit age interpreted as Mississippian, based on fission track dating.

BCGS, 1972; B.C. Minfile, 1988; EMR Canada, 1989.

O09-04 59°21'N 129°52'W	Windy (Balsam, Star, Kuhn, Dead Goat) Surprise Lake	W, Mo Zn, Cu W skarn	Medium. Reserves of 616,500 tonnes grading 0.48% WO_3, 0.13 MoS_2.

Consists of scheelite, molybdenite, pyrite, pyrrhotite and rare magnetite form coarse disseminations interstitial to calc-silicates in massive skarn. Locally, quartz-molybdenite veins crosscut skarns. Retrograde massive pyrrhotite-sphalerite skarn replaces other skarn facies. Skarn minerals include garnet, diopside, actinolite, powellite and fluorite. Skarn occurs along the lower contacts of marble layers in the Lower Cambrian Atan and Late Proterozoic Ingenika Groups. Skarns occur adjacent to Late Cretaceous Needlepoint stocks of the Surprise Lake Suite with a K-Ar isotopic age of 72.4 Ma. Deposit age interpreted as Late Cretaceous.

Cooke and Godwin, 1985; B.C. Minfile, 1988.

O09-05 59°20'N 129°49'W	Cassiar (Mount McDame) Cassiar Asbestos	Asbestos, jade Serpentine-hosted asbestos	Large. Pre-production reserves of 55 million tonnes with high quality chrysotile.

Consists of a chrysoltile asbestos stockwork hosted in serpentinized alpine ultramafic intrusive rocks that are emplaced at the contact of Slide Mountain terrane and overlying shelf sediments of Cassiar terrane. Area is underlain by four major thrust sheets. Deposit composed of two-fibre vein type with magnetite in vein partings and in wall rocks. Pyrite and jade also occur. Production between 1953 and 1984 of 2.05 million tonnes of fibre. Deposit age uncertain.

Burgoyne, 1986; Leaming,1978; Northern Miner, December 12, 1987.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O09-06 59°21'N 129°31'W	Mt. Haskin West (Joem, Rain, Moly Zone) Surprise Lake	Mo, W Porphyry Mo-W, Mo skarn	Medium. Reserves of 11.76 million tonnes grading 0.17% MoS2.

Consists of molybdenite and lesser scheelite in a quartz-muscovite stockwork in fine- and coarse-grained monzogranite and syenogranite of the Eocene Mt. Haskin Stock and scheelite-molybdenite skarn extend into adjacent dolomitic sediments. K-Ar dating of the Mt. Haskin stock gives an age of 50.9 Ma ± 1.5 Ma. Located on the northwestern flank of Mt. Haskin. Deposit age interpreted as middle Eocene.

B.C. Minfile, 1989; EMR Canada, 1989; Gower and others, 1985.

O09-07 59°15'N 129°52'W	S.Q.E. (Storie, Casmo) Surprise Lake	Mo Porphyry Mo	Medium. Reserves of 100.5 million tonnes grading 0.129% MoS2.

Consists of pyrite and molybdenite that occur as fracture-fillings and rosettes in quartz feldspar porphyry dike-like phases of quartz monzonite of the Late Cretaceous Needlepoint Intrusions of the Surprise Lake plutonic suite. K-Ar isotopic age of 73.2 Ma ± 2.5 Ma for igneous rocks that form plugs or sheet-like dikes. Deposit related to stockwork greisen and pegmatite. Deposit age interpreted as Late Cretaceous.

Panteleyev, 1979; Bloomer, 1981; Sinclair, 1986; EMR Canada, 1989; Dawson and others, 1991; Woodsworth and others, 1991.

O09-08 58°30'N 129°09'W	Eaglehead (Eagle) Unassigned	Cu, Mo Ag, Au Porphyry Cu-Mo	Medium. Reserves of 30.0 million tonnes grading 0.41% Cu, 2.71 g/t Ag, 0.2 g/t Au, 0.0216% Mo.

Consists of chalcopyrite, bornite, molybdenite and pyrite that occur at the contact between Early Jurassic Eaglehead granodiorite of the Guichon Suite (K-Ar isotopic age of186 Ma) and Upper Triassic volcanic and sedimentary rocks of the Kutcho Creek Formation. Deposit hosted in granodiorite cut by feldspar porphyry dikes and is concentrated in steep, chlorite-rich shear zones. Alteration is dominantly phyllic and propylitic, but chalcopyrite veins exhibit potassium feldspar alternation. Malachite, chalcocite, chrysocolla, tetrahedrite, cuprite and native copper also occur. Deposit age interpereted as Early Jurassic.

Sinclair, 1986; EMR Canada, 1989; B.C. Minfile, 1990; Mining Review, 1992.

O09-09 58°15'N 129°50'W	Gnat Lake Area (June, Stikine) Galore Creek	Cu Au Porphyry Cu	Medium. Reserves of 22.7 million tonnes grading 0.44% Cu, 0.31 g/t Au.

Consists of chalcopyrite and minor bornite that occur in andesitic greenstone and porphyritic andesite of the Upper Triassic Stuhini Group. Sulfides occur as blebs, wisps, disseminations and fractures associated with, and proximal to quartz monzonite and granodiorite of the Middle to Late Jurassic Hotailuh Batholith, part of Three Sisters Suite. Carbonate alteration is widespread, sericite and silica occur in patches, chlorite and tourmaline occur in veins. All the rocks exhibit a cataclastic breccia texture. Pyrite is rare, but magnetite concentrations are common with chalcopyrite. Deposit age interpreted as Middle Jurassic.

Panteleyev, 1977; EMR Canada, 1989; B.C. Minfile, 1990; Woodsworth and others, 1991; Mining Review, 1992.

O09-10 58°20'N 128°44'W	Letain (Kutcho Creek) Unassigned	Asbestos Serpentine-hosted asbestos	Medium. Reserves of 15.7 million tonnes grading 4.7% asbestos fibre.

Consists of chrysotile cross-fibre veins that occur in variably serpentinized alpine ultramafic rocks concordant with metasedimentary and metavolcanic rocks of the French Creek subterrane of Cache Creek terrane. Deposit occurs in fracture-related veinlets in two prominent sets that strike northeast and northwest. Deposit age interpreted as Late Paleozoic(?).

Learning, 1978; Burgoyne, 1986; Northern Miner, December 12, 1987; B.C. Minfile, 1990.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
O09-11 58°12'N 128°22'W	Kutcho Creek (Sumac, Esso) Unassigned	Cu, Zn, Pb Kuroko Zn-Pb-Cu massive sulfide	Medium. Reserves of 28.5 million tonnes grading 1.42% Cu, 1.92% Zn, 35 g/t Ag, 0.37 g/t Au.

Consists of stratabound, dispersed and massive pyrite, chalcopyrite, sphalerite and bornite that occur in sedimentary and epiclastic calc-alkaline volcanic rocks of the Upper Triassic Kutcho Creek Formation, near the top of a volcaniclastic pile which overlies Cache Creek tholeiite. Ore zone footwall is a distinctive quartz-eye crystal tuff, often strongly foliated. Alteration extends 75 meters below the ore zone, and coarse-grained euhedral pyrite occurs in a zone 10 to 20 m above the ore. Deposit occurs in three lenses, separated by thin argillaceous horizons. Each lens is zoned from copper-rich at the bottom to zinc-rich at the top. Reserves include the easternmost Kutcho deposit (17 million tonnes), the central Sumac West deposit (10 million tonnes) and the westernmost Esso West deposit (1.0-1.5 million tonnes). Deposit age interpreted as Late Triassic.

Bridge and others, 1986; Thorstad and Gabrielse, 1986; B.C. Minfile, 1987; EMR Canada, 1989; Dawson and others, 1991; Mining Review, 1992.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
O09-12 57°42'N 129°48'W	Red Chris (Money) Galore Creek	Cu, Au, (Zn, Pb, Mo) Porphyry Cu-Au	Large. Reserves of 320 million tonnes grading 0.38% Cu, 0.30 g/t Au.

Consists of pyrite, chalcopyrite and rare bornite with trace molybdenite, galena and sphalerite that occur as stockworks and sheeted veins in the elongate 5 km-long porphyritic monzodiorite Red stock. The Early Jurassic monzodiorite intrudes Late Triassic alkaline volcanic and volcaniclastic rocks. An early stage of orthoclase-albite-biotite alteration, with varying quartz-sericite was followed by pervasive quartz-ankerite-sericite-pyrite alteration. Pyrite occurs as a halo to the deposit that is genetically related to east-northeast subvertical faults. Deposit age interpreted as Early Jurassic.

B.C Minfile, 1989; EMR Canada, 1989; American Bullion Minerals Ltd., news release, Jan. 1995.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
O09-13 57°22'N 130°56'W	Schaft Creek (Liard Copper) Texas Creek	Cu, Mo Porphyry Cu-Mo	Large. Reserves of 910 milion tonnes grading 0.3% Cu, 0.025% MoS2, 0.14 g/t Au.

Consists of bornite, chalcopyrite and molybdenite that in fractures, veinlets and disseminations in hydrothermally altered Triassic andesite associated with diorite and granodiorite of the Late Triassic Hickman Batholith. Granitic rocks contain only 10% of the mineralization. Quartz vein stockwork with biotite and potassium feldspar occur in a low grade core. K-Ar biotite age of 182±5 Ma. Most of deposit occurs in the intermediate zone with chlorite-sericite alteration. Epidote occurs appears near boundaries of the main deposit. Gold grade ranges from 0.11 to 0.32 g/t. Deposit age interpreted as Late Triassic.

Fox and others, 1976; B.C. Minfile, 1988; EMR Canada, 1989.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
O09-14 57°20'N 127°11'W	Toodoggone District (Lawyers) Toodoggone	Au, Ag Cu, Zn, Pb Au-Ag epithermal vein	Medium. Pre-production resource of 1.76 million tonnes grading 6.8 g/t Au, 242.7 g/t Ag.

Consists of native gold, silver and electrum occur with quartz, calcite and barite in veins, stockwork and breccia. Deposit hosted in Early Jurassic Toodoggone volcanic rocks. Production from four principal deposits, the Cheni, Chappelle, Shas, and AC. Deposit mainly occurs in intensely silicified zones within propylitic and argillic altered volcaniclastic rocks. Deposit associated associated with faults and plutons of the calc-alkaline Black Lake Suite, coeval and comagmatic with the Early Jurassic Toodoggone volcanics. Deposit age interpreted as Early Jurassic.

Schroeter, 1983; Vulimeri and others, 1986; B.C. Minfile, 1990.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O09-15 57°08'N 131°27'W	Galore Creek (Stikine Copper) Galore Creek	Cu Au, Ag, Zn, Mo Porphyry Cu-Au, Cu-Au skarn	Large. Reserves of 125 million tonnes grading 1.06% Cu, 7.7 g/t Ag, 0.4 g/t Au.

Consists of chalcopyrite, pyrite, bornite and magnetite that occur as disseminations, skarns, coarse replacements and fracture fillings in syenitic porphyry and breccias and Triassic Takla Group metasedimentary and metavolcanic rocks. Approximately 80% of deposit occurs as skarn and replacement deposits associated with contacts between syenitic intrusives and Triassic volcanic and sedimentary rocks. Alteration and lithologies are typical of alkalic porphyry deposits. A U-Pb zircon age of 210 Ma is reported for the intramineral syenite porphyry. Deposit age interpreted as Late Triassic.

Allen and others, 1976; Christopher and Carter, 1976; EMR Canada, 1989; Dawson and others, 1991; Mining Review, 1992, J. Mortensen, written commun., 1993.

O09-16 57°00'N 126°45'W	Kemess (Kemess N., Kemess S.) Copper Mountain (North)	Cu, Au Porphyry Cu-Au	Medium. Reserves of 345 million tonnes grading 0.21% Cu, 0.55 g/t Au.

Consists of pyrite, chalcopyrite, magnetite, hematite, molybdenite and digenite that occur in stockwork veinlets and fractures and as disseminations. Deposit hosted in Upper Triassic Takla Group volcanic flows and tuffaceous sedimentary rocks. Mineralization is related to the local emplacement of monzodiorite porphyry intrusives of Early Jurassic age, probably related to the Copper Mtn. Suite. Kemess deposit consists of two main zones; the Kemess North, where 44 drill hole have defined a reserve of 116 million tonnes grading 0.19% Cu and 0.38 g/t, and the Kemess South, where reserves, based on systematic drilling on 100 meter centers, are 229 million tonnes grading 0.23% Cu and 0.65 g/t Au. Deposit age interpreted as Early Jurassic.

B.C. Minfile, 1991; El Condor Resources Ltd., annual report, 1992.

O09-17 56°40'N 131°06'W	Snip (Shan) Texas Creek	Au Zn, Pb, Mo Au-Pb-Zn polymetallic vein	Medium. Production and reserves of 1.90 Mt grading 29.5 g/t Au.

Deposit occurs in a 1 meter to 10 meter thick (avg. 2.5 meters) shear-vein system that cross-cuts Lower Jurassic thick bedded greywackes and siltstones that are intruded by an orthoclase-phyric quartz monzonite stock with K-Ar isotopic age of 195 Ma. Deposit extends along strike length for 500 m as confirmed by drilling. The main Twin zone exhibits a pronounced internal banding of four ore types: (1) biotite and potassium feldspar with minor pyrite and pyrrhotite; (2) calcite, siderite, pyrite and sphalerite; (3) pyrite, pyrrhotite, arsenopyrite, sphalerite, chalcopyrite, magnetite and galena; and (4) quartz veins with lesser amounts (<2%) of the sulfides. Deposit age interpreted as Early Jurassic.

EMR Canada, 1989; Cominco Ltd., annual report,1990; Rhys and Godwin, 1992.

O09-18 56°35'N 130°41'W	Snippaker Creek (E & L) Texas Creek	Ni, Cu Pt, Pd, Au Gabbroic Ni-Cu	Medium. Reserves of 2.7 million tonnes grading 0.7% Ni, 0.8% Cu.

Consists of pyrrhotite, pentlandite and chalcopyrite that occur in Lower Jurassic Nickel Mountain olivine gabbro stock. The gabbro intrudes a thick sedimentary and volcanic sequence of the Jurassic Hazelton Assemblage which predate mid-Cretaceous deformation, and constrains the age of the gabbro to 185 to 110 Ma. Deposit occurs along the intrusion margins as irregular pipe-like zones of veins, disseminations and massive lenses. Textures indicate sulfides are magmatic. Gabbro is extensively altered to serpentinite, chlorite, amphibole, epidote, carbonate and prehnite. Deposit age interpreted as Early Jurassic.

EMR Canada, 1989; B.C. Minfile, 1990.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
O09-19 56°38'N 130°27'W	Eskay Creek-21B Zone Coast	Au, Ag, Pb, Zn, Cu Kuroko Zn-Pb-Cu massive sulfide	Medium. Reserves of 3.9 million tonnes grading 26 g/t Au, 986 g/t Ag.

Consists of sphalerite, tetrahedrite, boulangerite and bournonite with minor pyrite and galena that occur as stratabound and stratiform massive, semi-massive and disseminated layers in carbonaceous and tuffaceous mudstone of the Lower Jurassic Mount Dilworth Formation of the Hazelton Assemblage. Gold and silver occur as electrum grains (5 to 80 microns) within fractured sphalerite, commonly in contact with galena. Included in the 3.9 million tonnes reserves for the 21B zone are 1.04 million tonnes grading 63.8 g/t Au and 2567 g/t Ag. The 21A zone of the Eskay Creek property is a coeval epithermal vein deposit with reserves of 0.97 million tonnes grading 9.6 g/t Au and 127 g/t Ag. Deposit age interpreted as Middle Jurassic.

EMR Canada, 1989; B.C. Minfile, 1991; Prime Equities Inc., 1991; Ettlinger, 1992; MacDonald, 1992.

O09-20 56°30'N 130°16'W	Sulphurets (Gold Zone) Texas Creek	Au, Cu Porphyry Cu-Au	Medium. Reserves of 18.2 million tonnes grading 0.82 g/t Au, 0.35% Cu.

Consists of chalcopyrite, pyrite and lesser bornite that occur in quartz vein stockworks and as disseminations hosted in intermediate volcanics of the Lower Jurassic Unuk River Formation of the Hazelton Assemblage. The Gold Zone forms a 1.5 km northeast-trending halo surrounding the Main Copper deposit. Alteration in the Copper deposit consists of quartz-albite-pyrite-chalcopyrite. Alteration associated with gold mineralization is quartz-pyrite-sericite. Deposit age interpreted as Jurassic.

B.C. Minfile, 1989; Prime Equities Inc., 1991; MacDonald, 1992.

O09-21 56°28'N 130°16'W	Kerr (Main Zone) Texas Creek	Cu, Au, Ag Porphyry Cu-Au	Large. Reserves of 134.9 millon tonnes grading 0.76% Cu, 0.34 g/t Au.

Consists of fine sooty black chalcocite with minor chalcopyrite, native copper and pyrite that occur in siliceous breccia. Hosted in Lower to Middle Jurassic Unuk River Formation volcaniclastic and sedimentary rocks of the Hazelton Assemblage. Deposit occurs along trace of an elongated tectonic shear zone approximately 2 km long and 800 to 900 meters wide. Deposit interpreted as hypogene zone of a porphyry Cu-Au deposit in a subvolcanic environment. Deposit age interpreted as Early Jurassic.

B.C. Minfile, 1989; EMR Canada, 1989; MacDonald, 1992.

O09-22 56°28'N 130°11'W	Snowfields (Sulphurets) Texas Creek	Au, Ag Cu, Mo Au-Ag polymetallic vein	Medium. Reserves of 20 milion tonnes grading 2.7 g/t Au.

Consists of Au and Ag in foliated, chlorite-sericite altered zones that occur in Lower-Middle Jurassic volcanic, and sedimentary rocks of the Unuk River formation. Low-grade gold part of deposit, with pyrite, minor chalcopyrite and molybdenite disseminated in mafic volcanic breccia is not noticeably different from barren rock. Deposit lacks quartz veins and silicification. Deposit age interpreted as Middle Jurassic.

B.C. Minfile, 1988; MacDonald, 1992.

O09-23 56°28'N 130°12'W	Brucejack Lake (West Zone, Shore Zone) Texas Creek	Au, Ag Au-Ag polymetallic vein	Medium. Reserves of 1.44 million tonnes grading 12.9 g/t Au, 764 g/t Ag.

EConsists of eectrum that occurs in quartz veins and stockwork with pyrite, pyrargyrite, sphalerite, tetrahedrite, argentite and galena with minor chalcopyrite and sulfosalts. Deposit hosted in intensely altered (quartz-carbonate-sericite-pyrite assemblage) alkalic volcanic and associated sedimentary rocks of the Lower to Middle Jurassic Unuk River Formation of the Hazelton Assemblage. Reserves for the West Zone are 0.95 million tonnes grading 14.8 g/t Au and 677 g/t Ag; reserves for the Shore Zone (also called Near Shore Zone) are 0.49 million tonnes grading 9.2 g/t Au and 933 g/t Ag. Deposit age interpreted as Middle Jurassic.

B.C. Minfile, 1988; MacDonald, 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O09-24 56°37'N 126°41'W	Sustut Copper Sustut	Cu Basaltic Cu	Medium. Reserves of 50 million tonnes grading 1.25% Cu.

Consists of a stratabound assemblage of hematite, pyrite, chalcocite, bornite, chalcopyrite and native copper that occurs as disseminatations and as blebs and grains in the matrix of sandstone, conglomerate, tuff breccia and lahar of the Upper Triassic Takla Group. Deposit occurs in a sheet-like zone up to 76 m thick. Grade increases in finer grained units. Pyrite forms an incomplete envelope around cupiferous lenses. Hematite is ubiquitous. Deposit age interpreted as Late Triassic.

Kirkham, 1970; Harper, 1977; Wilton and Sinclair, 1988; EMR Canada, 1989; Dawson and others, 1991; Mining Review, 1992.

O09-25 56°13'N 130°21'W	Granduc (South Leduc) Coast	Cu Ag, Au, Co Besshi massive sulfide	Medium. Reserves of 32.5 million tonnes grading1.93% Cu, 7 g/t Ag, 0.13 g/t Au.

Consists of several overlapping tabular massive lenses of chalcopyrite, pyrite, pyrrhotite, magnetite, sphalerite, galena, arsenopyrite, bornite and cobaltite mineralization that occur in Upper Triassic Unuk River Formation, schistose, andesitic volcanic and gypsiferous, graphitic and calcareous sedimentary rocks. Stratified rocks intruded by Jurassic-Tertiary quartz diorite plutons and dikes. Individual ore zones range up to 10 m thick, several hundred m long, and are multiply deformed. Deposit age interpreted as Late Triassic.

Grove, 1986; B.C. Minfile, 1988; Dawson and others, 1991.

O09-26 56°03'N 130°01'W	Silbak-Premier (Premier Gold) Texas Creek	Au, Ag, Pb, Zn Au-Ag epithermal vein	Medium. Reserves of 6.1 million tonnes grading 2.33 g/t Au, 90.5 g/t Ag.

Consists of veins and stockwork in volcanic and volcaniclastic rocks of the Hazelton Assemblage that are intruded by coeval, subvolcanic quartz-K-feldspar porphyry dikes related to the Early Jurassic Texas Creek granodiorite. Pyrite, sphalerite and galena are the most abundant sulfides. Gold and silver occur in argentite and electrum. Deposit ranges from siliceous, low sulfide Au-Ag to semi-massive base metal sulfide ore. Deposit mainly hosted in the tuffaceous units and occurs as quartz-carbonate-chlorite veins. Pervasive sericite forms a halo to siliceous ore. Sulfide ore is flanked by carbonate alteration. Production between 1918 and 1987 was 56.117 tonnes of Au and 1270 tonnes of Ag from 4.237 million tonnes of ore milled. Deposit age interpreted as Early Jurassic.

Alldrick and others, 1987; Britton and Alldrick, 1988; Dawson and others, 1991; Prime Equities Inc., annual report,1991.

O09-27 56°23'N 131°23'W	North Bradfield Canal Central-Southeastern Alaska	Fe, Cu Fe skarn	Drill core averages 65% Fe and 0.1 to 0.5% Cu.

Eleven magnetite-chalcopyrite skarn bodies with sparse pyrrhotite form crude strata-bound lenses in upper Paleozoic(?) marble and paragneiss intruded by Tertiary granite of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984) intruded by Tertiary granite. Bodies range from 15 to 106 m long and 0.6 to 12 m thick.

MacKevett and Blake, 1963; Sonnevil, 1981

O09-28 56°00'N 130°04'W	Riverside Juneau	Ag, Au, Cu, Pb, W, Zn Au quartz vein or polymetallic vein	Produced about 27,200 tonnes, yielding 93,300 g Au, 3.1 million g Ag, 45,400 kg Cu, 113,500 kg Pb, 9,080 kg Zn, and 3,500 units (318,000 kg) WO_3

Disseminated galena, pyrite, tetrahedrite, pyrrhotite, chalcopyrite, sphalerite, gold, and scheelite in two large quartz veins and in the Lindeberg lode, a combined quartz vein and epigenetic replacement deposit. Veins occur either in shear zone in schist inclusion, or in mylonitic gneiss derived from the Triassic Texas Creek Granodiorite of the informally named Coast plutonic-metamorphic complex of Brew and Ford (1984). More than 1,820 m of underground workings. Production between 1925 and 1952.

Buddington, 1929; Byers and Sainsbury, 1956; Smith, 1977

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
O10-01 58°23'N 125°11'W	Churchill (Davis Keays) Churchill	Cu Cu vein	Medium. Reserves of 1.12 million tonnes; Production of 498,000 tonnes grading 3.43% Cu.

Consists of chalcopyrite in quartz-carbonate veins and stringers that occur in strongly folded Late Proterozoic dolomites and slates of the Aida Formation (with K-Ar isotopic age 780 Ma), of the Muskwa Assemblage. At least three, large north-trending diabase dikes locally intrude sedimentary rocks. The steeply dipping Magnum vein system forms a zone 100 meters wide that trends northeastward, parallel to two dikes. Grade is highly variable and discontinuous. Deposit age interpreted as Late Proterozoic.

Preto and Tidsbury, 1971; Bell, 1982; EMR Canada, 1989; B.C. Minfile, 1992; Dawson and others, 1991.

O10-02 58°05'N 125°54'W	Driftpile Creek (Saint, Roen) Gataga	Pb, Zn, Ba Sedimentary exhalative Pb-Zn	Medium. Reserves of 18.1 million tonnes grading 2.38% Pb+Zn.

Consists of three stratiform pyrite, galena, sphalerite, barite horizons that occur in siliceous black turbidites of the Upper Devonian Gunsteel Formation of the Lower Earn Group. Sedimentary rocks interpreted as a (Devonian-Mississippian clastic wedge. Massive barite occurs in 4-10 cm thick beds over stratigraphic intervals of 3-6 meters and strike length of 50 km in the Gataga district. Deposit age interpreted as Late Devonian.

MacIntyre, 1982; B.C. Minfile, 1990; EMR Canada, 1989; Insley, 1991, Paradis and others, 1995.

O10-03 57°31'N 125°09'W	Cirque (Stronsay) Gataga	Pb, Zn, Ag, Ba Sedimentary exhalative Pb-Zn	Large. Reserves of 52.2 million tonnes grading 2% Pb, 8% Zn, 47 g/t Ag.

Consists of stratiform, laminar banded, massive barite with pyrite, galena and sphalerite that occur in turbiditic shale and argillite of the Upper Devonian Gunsteel Formation. Sedimentary rocks interpreted as a Devonian-Mississippian clastic wedge. Surrounding rocks are silicified and contacts between sulfide bodies and sediments are sharp. Deposit occurs as a tapering wedge-shaped lens, about 1000 m x 300 m x (10-60 m) that consists of a barite-rich, pyritic sphalerite-galena and laminar pyritic assemblage. Deposit age interpreted as Late Devonian.

Jefferson and others, 1983; Pigage, 1986; EMR Canada, 1989; Dawson and others, 1991; Mining Review, 1992.

O10-04 57°22'N 123°52'W	Redfern L. (Egg, Foo, Be) Robb Lake	Zn, Pb Ba, F Southeast Missouri Pb-Zn	Medium (estimate).

Consists of massive barite, barite-calcite and calcite zones that occur in Dunedin Formation limestone that form aprt of a Cambrian-Devonian passive margin. Disseminated sphalerite, galena, and minor chalcopyrite occur in the silicified haloes of these zones. Sulfides also occur in calcite ± barite veins. Deposit age interpreted as Middle Devonian.

Macqueen, 1976; B.C. Minfile, 1992.

O10-05 56°57'N 123°44'W	Robb Lake Robb Lake	Zn, Pb Southeast Missouri Pb-Zn	Large. Resource of: 20.1 million tonnes grading 5.1% Pb-Zn.

Consists of sphalerite, galena and pyrite that occur primarily in tabular and lenticular zones parallel to bedding in dolomite collapse breccias of the Middle Devonian Stone Formation. Sedimentary rocks interpreted as part of a Cambrian-Devonian passive margin. Deposit occurs on the west limb crest of a large south plunging anticline. Recent figures (1992) for reserves are significantly downgraded to 5.5 million tonnes grading 7.9% Pb+Zn. Deposit age interpreted as Middle Devonian.

Taylor and others, 1975; Macqueen, 1976; BC Minfile, 1982; EMR Canada, 1989; Dawson and others, 1991; Mining Review, 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O10-06 56°27'N 123°44'W	Aley Unassigned	Nb, Phosphate, REE Carbonatite-related REE	Large. Reserves of 20 million tonnes grading 0.7% Nb.

Consists of fersmite, pyrochlore and columbite with lesser apatite and minor rutile, magnetite and zirconthat occur in the core zone of a carbonatitie complex that is cylindrical with a nearly vertical axis. Niobium exhibits zonation with columbite in the core, carbonatite and pyrochlore in the outer carbonatites, and fersmite as a transition between the two. REEs are associated with sovite (calcite carbonatite) veins. K-Ar age mica of 349 Ma ± 12 Ma. Deposit occurs in Mississippian Aley Carbonatite Complex that intrudes quartzite and mudstone of Cambrian and Silurian age juxtaposed by imbricate thrust faulting. The complex forms a rough oval approximately 3 km to 3.5 km in diameter with a rauhaugite (dolomitic) carbonatite core and an amphibolite margin. Deposit age interpreted as Mississippian.

Pell, 1986; B.C. Minfile, 1989; Mining Review, 1991.

O10-07 56°09'N 125°03'W	Wasi Lake Area (Suzie, Beveley, Regent) Ingenika	Pb, Zn, Ag, Ba Southeast Missouri Pb-Zn	Medium. Reserves of 2.82 million tonnes grading 2.24% Zn, 1.42% Pb, 36.3 g/t Ag.

Consists of galena and sphalerite that occur in veinlets and disseminated in barite masses. Deposit hosted in Late Proterozoic, Lower Cambrian, and Ordovician to Devonian dolomite. Deposit also consists of stockwork veinlets and fracture fillings in brecciated dolomite. Deposit occurs in four zones. Deposit age interpreted as Cambrian to Devonian.

EMR Canada, 1989; Ferri and others, 1992.

O10-08 57°13'N 124°29'W	Akie Gataga	Zn, Pb, Ag, Ba Sedimentary exhalative Zn-Pb	Large. Resource of 20 million tonnes grading 4% Zn, 1% Pb, 10 g/t Au.

Consists of layers of pyrite, sphalerite, galena and barite that are interlaminated with black shale of the Upper Devonian Gunsteel formation that formas part of a Devonian and Mississippian clastic wedge. Preliminary drilling in 1994 defined a zone 6-30 m thick, 1400 m long and up to 300 m deep. Deposit age interpreted as Late Devonian.

Metall Mining Corp. news release, January, 1995.

O53-01 59°56'N 137°00'E	Gornoe Ozero Khamma River	REE, Ta, Nb Carbonatite-related REE	Average grade of 0.35% REE oxides; 0.09-0.36% Nb_2O_5 ; 0.011% Ta_2O_5 .

Consists of early- and late-stage carbonatites. Early stage occurs in steep veins up to 25 m thick and to 150 m long. Veins composed of augite-diopside-calcite, forsterite-calcite, and pyrochlore-betafite. Late stage occurs in a small stock with an area of 1 km^2, composed of aegirine-dolomite, aegirine-ankerite, and ankerite along with contains bastnaesite, parisite, monazite, pyrochlore, and columbite. K-Ar isotopic ages of 280 to 350 Ma. Deposit hosted in a Late Devonian intrusive complex that is concentrically zoned and composed of 90% carbonatite along with pyroxenite, ijolite, and nepheline and alkalic syenite. Complex covers an area of 10.3 km^2. Age of mineralization interpreted as probably 290 Ma.

Elyanov, Moralov, 1973; Kobtseva, Devyatkina, written commun., 1988; Samoilov, 1991.

O53-02 59°55'N 137°48'E	Yur Allakh-Yun	Au Au quartz vein	Small. Average grade if 3.5-5.7 g/t Au.

Consists of four interbedded quartz veins that occur in a zone of meridional faults in middle Carboniferous sandstone-shale. Veins range from 0.3-0.4 m thick and are 100-500 m long. Main ore minerals are gold, arsenopyrite, galena, pyrite, and sphalerite. Ore minerals comprise up to 2% of veins. Gangue minerals are quartz, ankerite, and albite. Wallrock alteration is insignificant, but includes sericitie, silicifica, and arsenopyrite alteration.

Strona, 1960; Kobtseva, written commun., 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O53-03 59°52'N 136°47'E	Urui Sette-Daban	Pb, Zn Southeast Missouri Pb-Zn	Medium to large. Average grade of 9.9-25.6 Pb; 6.4-21.3% Zn; 6.8-200 g/t Ag; up to 10 g/t Ge.

Consists of stratified ribbon-like deposits, from 2-3 to 40 m thick and 0.5 to 1.2 km long, that occur in metamorphosed Late Proterozoic (Vendian) dolomite. Ore bodies are conformable to host rocks and strike 30-45°NW; and commonly wedge out at a depth of 30-40 m. Deposits vary from massive, pocket-stringer-disseminated, to banded. Galena and sphalerite are the main ore minerals; pyrite, maracasite, and arsenopyrite are secondary; pyrrhotite, chalcopyrite, and electrum are scarce. Calcite, quartz, and anthraxolite also occur. Deposit associated with a significant recrystallization of dolomite and formation of peculiar zebra dolomite rocks. General structural pattern of deposit controlled by monoclinal strike of sedimentary rocks to the west and by numerous post-ore faults that trend roughly east-west and strike northwest. Local Paleozoic diabase dikes in area.

Ruchkin and others, 1977; Volkodav and others, 1979; Bogovin and others, 1979; Kobtseva and Devyatkina, written commun., 1988.

O53-04 59°48'N 137°44'E	Duet Allakh-Yun	Au Au quartz vein	Medium. Average grade of 29 g/t Au.

Consists of eighteen rootless, conformable, sheet-like quartz veins that occur at different levels within an 60-80 m interval of Middle Carboniferous sandstone and siltstone that is 150 to 120 m thick. Veins occur in both the limbs and hinge of the Duet syncline, and are up to 1,600 m long and up to 0.9 m thick. Ore minerals comprise 1-3% of veins and include arsenopyrite, galena, sphalerite, and gold.

Kobtseva, written commun., 1988.

O53-05 59°43'N 136°25'E	Khamna Khamma River	REE, Nb Carbonatite-related REE	Average grade of 0.2-1.93% REE; 0.03-0.26% Nb_2O_5.

Consists of steep-lying fluorite-carbonate veins and stockworks that occur in Late Proterozoic metasomatic carbonate in the vicinity of dikes and stocks of probable Late Devonian alkalic syenite and alkalic magmatic breccia. Veins range from 0.1 to 1.5 km long and from 1.4 to 30 m thick. Individual stockworks are 100-500 km^2 in size. Disseminated mineralization also occurs. Main ore minerals are bastnaesite, parisite, and galena. U-Th-Pb isotopoic age 240 to 417 Ma for syenite.

Elyanov and Moralev, 1973; Kobtseva and Devyatkina, written commun., 1988.

O53-06 59°08'N 136°39'E	Lugun Sette-Daban	Pb, Zn Southeast Missouri Pb-Zn	Medium.

Consists of stratiform galena-sphalerite layers in Late Proterozoic (Vendian) algal dolomite. Sulfide layers range from 3 to 15 m thick. Deposit associated with bedding silicification and recrystallization of dolomite. Sulfide layers for zone that is 350 m thick. Deposit and enclosing strata occur brachyform fold.

Stavtsev, 1976; Krasny and others, 1979.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
O53-07 58°40'N 135°34'E	Algaminskoe Algama	Zr, W Carbonate-hosted Zr (Algoma type)	Large. Weathered zones containing 2.8 to 3.2% W_2O_3 and 0.5 to 40% ZrO_2.

Consists of lense-like bodies up to 1100 m long with irregular bodies of W-Zr minerals. Ore bodies range from 2, 3, and 5 m thick occur in layers of siliceous, cavenous dolomite. Layers spaced between14 and 25 m apart. Layers contain loose aggregate that is rich in baddeleyite, the principal mineral that contains the Zr and W. Weathered zones contain from 2.8 to 3.2% W_2O_3. Baddeleyite forms cryptocrystalline and colloform aggregates that fill cavities and voids in quartz-bearing dolomite. Hydrous zircon and Ca- and Fe-zirconium silicates also occur in weathered ore. Zircon dominates primary ore. Baddeleyite was deposited from oversaturated chloride-hydroxide solutions at 100-180°C. Deposit originally interpreted as of Latest Proterozoic (Vendian) age; however a recent U-Pb zircon isotopic age of 110 Ma indicates a Cretaceous age. Deposit hosted in the Yudomsky Dolomite sequence of Latest Proterozoic (Vendian) age at about 7 km from the contact of an alkalic to mafic Ingili stock.

Nekrasov and Koezhinskaya, 1991; J.N. Aleinikoff, written commun., 1993.

O53-08 58°48'N 137°38'E	Muromets Allakh-Yun	Cu, Mo, W Cu-Mo skarn	Small to medium. Average grade of up to 10% Cu, up to 0.92% WO_3, up to 0.3% Mo.

Skarn occurs in Middle Cambrian dolomite along the contact with Early Cretaceous quartz monzodiorite as a band of skarn bodies that are 1 km long and dip gently (20-40°) under the intrusion. Several ore bodies, range from 6 to 12 m thick, consist of disseminated, stringer-disseminated, and more seldom massive ore. Minor magnesian skarn in deposit consists of spinel, forsterite, phlogopite, tremolite, diopside, and serpentine. Pedominant limestone skarns consist of salite, diopside, scapolite, grossular, and andradite. Ore minerals are magnetite, chalcopyrite, molybdenite, scheelite, pyrrhotite, bornite, pyrite, galena, and sphalerite. Skarn formed several stages: (1) magnesian skarn with magnetite; (2) calcareous pyroxene-garnet skarn with magnetite and scheelite;and (3) metasomatic quartz-feldspar rocks with molybdenite and Cu sulfides. Disseminated Cu also occurs in adjacent altered quartz monzodiorite that constitutes a skarn-related porphyry Cu deposit.

Krasny, Rasskazov, 1975; Nikitin, Rasskazov, 1979.

O53-09 58°38'N 137°16'E	Malyutka Allakh-Yun	Au Au quartz vein	Small. Average grade of 0.01-98 g/t Au.

Consists of approximately east-west-trending mineralized shear zones, up to 1 km long and 0.3-3 m thick, and quartz veins up to 40 m long and 0.5 to 40 cm thick. Shear zone minerals are quartz, ankerite, barite, rutile, fluorite, hematite, pyrite, sphalerite, galena, chalcopyrite, and gold. Deposit hosted in Early Cambrian sedimentary rocks on the the southeast limb of a syncline.

Kobtseva, written commun., 1988.

O53-10 58°33'N 137°40'E	Borong Bilyakchan	Cu Sediment-hosted Cu	Small. Average grade of 0.1 to 1% Cu.

Consists of supergene minerals such as malachite, azurite, and chrysocolla that occur in fine-fissured stringers. Hosted in a bed of Late Proterozoic quartz-feldspar and polymictic sandstone that is 2 m thick and extends for 7 km.

Kogen and others, 1976; Kobtseva and Devyatkina, written commun., 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O53-11 57°33'N 134°38'E	Kondyor Kondyor	Pt Zoned mafic-ultramafic Cr-PGE	Medium

Consists of two types: (1) short lenses about 2 to 50 m long and up to few m thick with veinlet and disseminations; and (2) oval-shaped deposits, roughly equidimensional in plan, and up to 200 by 300 m in size. PGE in the first type is associated with chromite and olivine and occurs in intergrowths, small inclusions, and vesicles. Second type consists of chrome diopside, phlogopite, and magnetite with PGE forming intergrowths with magnetite, pyroxene, and rarely with phlogopite. Isoferroplatinum is the major PGE mineral. In addition to isoferroplatinum and tetraferroplatinum, second type commonly contains up to 5-8% sulfides and arsenides, including cooperite, sperrylite, hollingworthite, konderite, inaglyite, and laurite-euclimanite. Both types of deposits are cut by veins and dikes of alkalic rocks including nepheline syenite, lujavrite, ijolite, and urtite. PGE mineralization is associated with a dunite stock 6 km^2 in diameter, part of a ring-shaped, Late Proterozoic ultramafic-alkalic stock approximately 12 km^2 in area.

Marakushev and others, 1990.

O53-12 57°42'N 137°24'E	Severny Uy Bilyakchan	Cu Sediment-hosted Cu	Small. Average grade of 0.1 to 3.7% Cu.

Consists of Cu-bearing horizons, from 1 to 3 m thick that occur in Late Proterozoic (Riphean) quartz- and polymictic sandstone and siltstone. Deposit defined by fine disseminations and pockets of massive ore. Ore minerals are pyrite, chalcopyrite, bornite, chalcocite, and hematite. Cu mineralization occurs for more than 30 km along strike.

Kutyrev and others, 1986.

O53-13 57°22'N 137°13'E	Dzhagdag Bilyakchan	Cu Basaltic Cu	Small. Average grade of 0.3 to 2.94 Cu.

Mineralization occurs in two layers of Upper Proterozoic (Upper Riphean) amygdaloidal basalt, which are 90 and 60 m thick respectively, and are intercalated with tuff and sandstone. The copper-bearing horizons are 0.4-5 m thick. Ore is fine disseminated and spotted-disseminated. Ore minerals include: chalcocite, bornite, native copper, cuprite, covellite, and malachite. Copper content correlates with silver content.

Kutyrev and others, 1988.

O53-14 57°23'N 137°32'E	Maly Komui Eastern Asia-Arctic: Koni-Yablon	Cu Pb, Zn Cu skarn	Small-to-medium. Average grade of 0.1-11.0% Cu; 0.1-9.3% Zn; 0.1-4.9% Pb.

Disseminations and pockets of chalcopyrite, chalcocite, malachite, galena, and sphalerite occur in garnet-pyroxene skarn bodies along the contact between Upper Proterozoic limestone and Cretaceous granitoid bodies. Skarn forms three zones with a combined length of 1.5 km and thickness ranging from 1 to 80 m. There are no detailed studies of this deposit.

Krasny and Rasskazov, 1975; Kobtseva and Devyatkina, 1988, written commun.

O53-15 56°19'N 134°49'E	Ulkanskoe Ulkan	REE, Be, Zr Felsic plutonic REE	Data are not available

Deposit hosted in alkalic, rapakivi-type granitic stock that occurs in the Ulkansky basin containing Proterozoic and Mesozoic volcano-sedimentary and intrusive rocks. Four groups of ore minerals occur: (1) columbite, zircon, and cassiterite that occur in albitite veins; (2) cassiterite, wolframite, and chrysoberyl that occur in topaz-muscovite-biotite greisen; (3) phenakite, zircon, pyrochlore, polylithionite, chevkinite, and columbite that occur in ydrothermal molybdenite-quartz veins and with alkalic granitic pegmatite and fenite; and (4) bertrandite, helvite, genthelvite, gold, zircon, thorite, gagarinite, parisite, bastnaesite that occur in hydrothermal veins. Deposit similar to the Pikes Peak area in Colorado.

Nedashkovsky, 1984; Kirillov, 1993.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O54-01 59°56'N 138°51'E	Burgali Allakh-Yun	Mo, W Porphyry-Mo (W)	Average grade of 0.2-0.9% Mo; 0.08-1.4% W.

Consists of a quartz stockwork that extends over an area 60 by 80 m composed of veins that range from 0.5 to 40 cm thick. Veins hosted in Middle Carboniferous clastic rocks of the Ekachan suite, near the contact of Cretaceous granite intrusions. Ore minerals are molybdenite, wolframite, and cassiterite. Gangue minerals are biotite and sericite.

Rasskazov and others, 1979; Kobtseva and Devyatkina, written commun., 1988.

O54-02 59°51'N 139°01'E	Balaakkalakh, Diring-Yuryak Verkhne-Yudomsky	Sn Sn polymetallic vein	Average grade of 0.002-0.04% Sn: 0.01-0.03% W; from 1% to 10% As; up to 10 g/t Au.

Consists of three ore zones that strike northeast, are 10 to 200 m thick, and 100 to 1,100 m long. Zones consist of quartz-chlorite-sulfide stockworks and stringers. Stringers range from 0.2 to 1.5 cm thick and consists of shear zones that contain intergrown quartz, tourmaline, and arsenopyrite. Major ore minerals are arsenopyrite, wolframite, chalcopyrite, and pyrrhotite. Subordinate ore minerals are cassiterite, scheelite, galena, fahlore, and acanthite. Zones hosted in sandstone, siltstone, and conglomerate of the Middle Carboniferous Ekachan suite and also in a diorite porphyrite dike. Aeromagnetic data indicate a granitic body occurs at a depth of 50-150 m.

Rasskazov and others, 1979; Kobtseva and Devyatkina, written commun., 1988.

O54-03 59°45'N 138°11'E	Zhar Allakh-Yun	Au Au quartz vein	Small. Average grade of 4.2 g/t Au.

Consists of a quartz vein that is about 500 m long and 1.5 m thick. Vein strikes west to northwest and dips steeply (85°) to east. Ore minerals are disseminated pyrite, chalcopyrite, sphalerite, and gold that constitute up to 1% of the vein. No indications of wallrock metasomatic alteration. Vein hosted in Permian clastic rocks.

Kobtseva, written commun., 1988.

O54-04 59°41'N 141°44'E	Yurievka Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Proven reserves of 7536 kg Au. Average ore grade of 14.7 g/t Au; 9.12 tonnes Ag. Average ore grade of17.9 g/t Ag.

Consists of adularia-quartz and quartz veins with less common carbonate-quartz veins. Other vein minerals are chalcedony, barite, hydromica, chlorite, with disseminations and masses, up to 1-3%, of pyrite, pyrrhotite, sphalerite, galena, chalcopyrite, arsenopyrite, sulfosalts of silver, acanthite, and gold (fineness 600-700). Ore grade decreases with depth. Veins occur at a depth of 350 m, are 0.5 to 15 m thick, and range up to 650 m long. Deposit hosted in Early and Late Cretaceous volcanic rocks including andesite, andesite-basalt, ignimbrite, and dacite tuff, and in felsic subvolcanic bodies. Deposit occurs at the intersection of four faults.

Kobtseva, written commun., 1988.

O54-05 59°28'N 140°22'E	Krasivoe Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Veins average 4.2 g/t Au and 5.6 g/t Ag. Zones contain 15 g/t Au and 18 g/t Ag.

Consists of linear zones of stringers up to 15 m thick, and five quartz-adularia veins about 3.5 m thick. Deposit is about 2 km long and hosted in a Late Cretaceous trachyrhyolite flow or tuff and a trachybasalt dike that occur in the middle of a volcanic dome. Ore minerals are pyrite (1-3%), galena, sphalerite, chalcopyrite, cinnabar, and gold.

Kobtseva, written commun., 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O54-06 59°10'N 138°11'E	Dies Allakh-Yun	Cu Cu skarn	Average grade of 0.2-15% Cu; up to 0.8% Zn; 17.3-70 g/t Ag; 0.3-1.7 g/t Au.

Consists of garnet-diopside and garnet-epidote skarns that are 20 to 60 m thick and 400 m long. Skarns occur along the contact of Ordovician clastic and carbonate rocks and Lower- to Middle-Cretaceous granitoids that occur along a north-south-trending fault. Ore minerals occur as stringers and lenses of chalcopyrite, malachite, azurite, bismuthine, acanthite, scheelite, and galena.

Kobtseva and Devyatkina, written commun., 1988.

O54-07 58°17'N 139°06'E	Verkhnenyotskoe Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Average grade of 5.0 g/t Au; 94.0 g/t Ag.

Consists of quartz and quartz-adularia-calcite veins and linear zones of quartz stringers that are 40-50 m long, 0.5 m thick. Veins and zones composed of up to 25% disseminated galena, sphalerite, chalcopyrite, pyrite, and gold. Deposit occurs around the periphery of a paleo-caldera. Host rocks are Late Cretaceous andesite-dacite tuff, rhyolite, and granite-porphyry dikes.

Kobtseva, written commun., 1988.

O54-08 57°29'N 138°39'E	Etandzha Eastern Asia-Arctic: Koni-Yablon	Cu, Mo Porphyry Cu-Mo	Average grade of 0.02-2.0% Cu; 0.02-0.74% Mo; up to 4 g/t Au; up to 15 g/t Ag.

Consists of stringers and disseminations of molybdenite and chalcopyrite that occur in Cretaceous quartz diorite. Deposit occurs in a northeast-trending zone 400 by 200 m.

Kobtseva and Devyatkina, written commun., 1988.

O55-01 59°21'N 146°59'E	Ikrimun Eastern Asia-Arctic: Koni-Yablon	Cu, Mo Porphyry Cu-Mo	Small.

A stockwork of sulfide veinlets with abundant disseminated sulfides and rare quartz veins occurs in the middle of the Ikrimun granitic pluton of Early Cretaceous age; which intrudes Early Cretaceous rhyolitic to basaltic volcanic rocks. Ore minerals are pyrite, chalcopyrite, arsenopyrite, and magnetite; with subordinate molybdenite, ilmenite, and sphalerite. Deposits occur in silicified, sericitized, and propylitized quartz diorite, tonalite, extrusive breccia, and plagiogranite porphyry. Plutonic rocks are spatially related to a plagiogranite porphyry dike.

Skibin, 1982

O56-01 59°44'N 150°16'E	Osennee, Oksa, Usinskoe Eastern Asia-Arctic: Koni-Yablon	Mo, Cu W, Ag Porphyry Cu-Mo	Small to medium. Ranges 0.1 to 0.33% Mo and up to 0.1% Cu. Up to 5 g/t Ag.

Osennee: Crescent-shaped ore body in a north-south-trending fractured and foliated zone within the granitic rocks of the Cretaceous Magadan batholith. Ore body is more than 400 m long and about 30 m thick, with dips of 35°-65°. Host rocks are gabbro, granodiorite, subalkalic granite and syenite, granite porphyry, and lamprophyre. Molybdenite is accompanied by pyrite and lesser pyrrhotite, sphalerite, chalcopyrite, and scheelite. Molybdenite occurs in quartz, quartz-feldspar, and quartz-tourmaline veinlets and veins; disseminated in porphyry; and in veinlets in silicified, sericitized, chloritized, K-feldspathized, and pyritized rocks within a fault and in adjacent areas.
Oksa: Molybdenite is disseminated in quartz and in quartz-feldspar veinlets cutting silicified and sericitized granite porphyry and adjacent amphibole-biotite granodiorite of the Magadan batholith. Associated minerals are pyrite, with rare chalcopyrite, sphalerite, and pyrrhotite. Gold is present in the ore, and there is up to 5 g/t silver. Deposit is controlled by a zone of fracturing and schistosity that trends northwest to about north-south.
Usinskoe: Quartz, feldspar-quartz, and pegmatite veinlets contain molybdenite and locally scheelite. These minerals also occurs in veinlets and disseminated in the K-feldspathized and tourmalinized granitic rocks of the Magadan batholith. Mineralization is confined to a nearly north-south fault which controls the porphyry intrusions.

Firsov and Soboleva, written commun., 1952; Sendek, written commun., 1965

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O56-02 59°25'N 154°52'E	Yapon Eastern Asia-Arctic: Koni-Yablon	Cu Porphyry Cu	Small. Ag to 1-2 g/t.

Stockwork zone more than 20 m wide is composed of a dense network of quartz and quartz-epidote veinlets with pyrite and chalcopyrite that cut sulfidized, Middle Jurassic basalt and andesite-basalt. Disseminated veinlets contain native gold and 1-2 g/t silver.

Yaskevich and Yudina, written commun., 1972

O56-03 59°25'N 153°29'E	Nakhtandjin, Lora Eastern Asia-Arctic: Koni-Yablon	Cu Mo Porphyry Cu	Medium to large. Probable resource of 178 million tonnes grading 0.5% Cu, 0.025% Mo, and 2.1 g/t Ag.

A stockwork of sulfide, sulfide-quartz, and sulfide-chlorite-quartz veinlets associated with disseminated sulfides occurs along east-, northeast-, and northwest-trending fault zones at the southeast and northern contacts of Srednin granitic pluton. Pluton intrudes Triassic-Jurassic and Early Cretaceous volcaniclastic and volcanic rocks. Early Cretaceous tonalite, granodiorite, and explosive breccias that host the deposit are weakly sericitized and propylitized. Ore minerals are pyrite, chalcopyrite, and molybdenite, with subordinate magnetite and ilmenite. Deposit is closely associated with a pipe of explosive breccias.

Skibin, 1982; Vorob'ev, 1986 (written commun.)

O56-04 58°58'N 152°34'E	Viking Eastern Asia-Arctic: Koni-Yablon	Cu, Mo Porphyry Cu-Mo	Small.

A stockwork of sulfide, sulfide-quartz, and sulfide-feldspar-quartz veins, veinlets, and zones of disseminated sulfides, occurs in Early Cretaceous hydrothermally altered tonalite, plagiogranite, and less commonly in quartz monzonite porphyry. Granitic rocks form the core of a concentrically zoned dome made up mostly of Jurassic volcanic rocks. The ore body extends several hundred meters along strike, with a vertical extent of 350-400 m; and is parallel to the contact of a porphyry stock. An inner alteration zone consists of a podiform zone of potassic alteration; quartz-sericite and epidote-chlorite alteration occurs in the outer zone. Main ore minerals are chalcopyrite, molybdenite, magnetite, and ilmenite; with minor pyrite and chalcocite.

Skibin, 1982

O57-01 59°04'N 161°44'E	Tutkhlivayam Central Kamchatka	Au, Ag, Cu, Pb, Zn, Te, Cd Au-Ag epithermal vein	Medium. Average grade of 9.6 g/t Au, 530 g/t Ag, 2.3% Cu, 4% Pb, 0.8% Zn, 0.12% Cd, and 5.38 kg/t Te.

Consists of 27 zones of veins and veinlets distributed over length of 13 km. Zones range from 50 to 1250 m long and 0.2 to 25.5 m thick. Zones have complicated morphology and are dominantly brecciated veins that grade into veins and veinlets. Ore beds are generally up to 6 m thick. Three geochemical types ore are distinguished: gold-silver low in sulfides (gold/silver ratio of 1:50), gold-silver (1:1 to 1:2), and gold (1:0.5 and more). K metasomatism very common. Deposit occurs along closely-spaced system of linear deep faults and normal faults around a volcano-tectonic depression filled with Miocene intermediate composition volcanic rocks.

A.K. Borovtsov and others, written commun., 1980.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
O57-02 57°35'N 160°47'E	Ozernovskoe Central Kamchatka	Au, Ag, Te Au-Ag epithermal vein	Medium. Average grade of 2-20 g/t Au and 0.01-0.1% Te. Rare high-grade zones.

Consists of gold-bearing quartz-adularia veins, veinlets, and disseminations that are superimposed on various facies of hydrothermally-altered rocks. Ore formed in fracture-filling veins and veinlets, and as metasomatic replacement of earlier aggregates. Four stages of mineralization are distinguished: (1) gold-goldfieldite-quartz (fineness of 933-938); (2) tellurium-silvanite-goldfieldite-kaolinite-quartz gold 945 fine; (3) gold-hessite-hydromica-quartz (gold 894 fine); and (4) gold-adularia-hydromica-quartz (gold 643 to 679 fine). Local associated Cu-Mo sulfides and realgar-orpiment. Host rocks exhibit mainly propylitic and silicia alteration. Altered argillite, of quartz-sericite, quartz-kaolinite, and quartz-montmorillonite-hydromica facies, occurs the central part of the ore field, near the main volcanic vent. Altered rocks consist of quartz and pyrite-alunite-kaolinite-quartz assemblages that form tabular, linear, major ore bodies up to 100 m along northwest-trending fault zones. Deposit occurs in a weakly-eroded volcano composed of basaltic andesite, andesite, and dacitic pyroclastic rocks and lava.

Shchepot'ev, 1989.

O57-03 56°12'N 159°18'E	Chempura Central Kamchatka	Hg Volcanic-hosted Hg	Small. Average grade of 0.95%Hg.

Consists of disseminations or veins associated with hydrothermal alteration that occur in quartz-diorite porphyry bodies emplaced at intersections of northeast- northwest-, and east-west-trending faults. Mercury distribution is irregular; cinnabar forms major ore mineral. Other ore minerals are common pyrite and subordinate realgar, stibnite, sphalerite, and chalcopyrite. Carbonate-chlorite propylitic alteration is most common. All ore bodies are parallel to altered silicified rocks of quartz and quartz-kaolinite-hydromica assemblages. A few lense-like ore bodies are traced to a depth of approximately 100 m. Maximum thickness of lenses ranges up to 8 m. Deposit is hosted in hypabyssal quartz diorite porphyry that intrudes a Pliocene agglomerate sequence. Deposit and associated hydrothermally altered silicified rocks occur along steeply dipping faults.

Vlasov, 1977.

O58-01 58°52'N 164°02'E	Karagin group Koryak Highlands	Cu, Zn, Au, Pt, Ni, Co Gabbroic Cu	Medium. Average grade of 0.5 g/t, Au, 2-5 g/t Ag, 3-5% Cu, 0.5% Zn.

Hosted in Late Cretaceous serpentinized peridotite and serpentinite, and in a complexly faulted Late Cretaceous-Paleogene(?) spilite-siltstone sequence. Tectonic contacts occur between ultramafic and spilite-siltstone sequence. Richest part of deposit, with average content of up to 5% Cu, occurs in spilite-siltstone sequence. Deposit occurs in steeply dipping lenses extending to a depth of 200 m, determined from geophysical studies, and has maximum dimensions of 170 m length and 25 m thickness. Ore assemblages in ultramafic rocks are: (1) chalcopyrite-cubanite-pyrrhotite with pentlandite; (2) chalcopyrite-magnetite with pyrrhotite and pentlandite; and (3) magnetite-chalcopyrite-sphalerite. Average Cu content of the ultramafic rocks is 1 to 3%. In spilite-siltstone sequence, about 90% of ore consists of about equal proportions of chalcopyrite, magnetite, and pyrite; with minor sphalerite, magnetite, pentlandite, and cubanite. Relative to ore in spilite-siltstone sequence, ore in ultramafic rocks contains more magnetite, pyrrhotite, and pentlandite.

V.D. Mel'nikov, written commun., 1974.

P04-01 63°16'N 159°16'W	McLeod Southwestern Kuskokwim Mountains	Mo Porphyry Mo	Extensive chip samples grade 0.09% MoS_2 over a 350 by 30 m surface area

Platy aggregates of molybdenite in quartz veinlets in sericite core of altered Late Cretaceous to early Tertiary quartz-feldspar (granite) porphyry stock. Deposit underlain by 3-square-kilometer granite stock and associated with biotite latite dikes that intrude mid-Cretaceous graywackes. High-grade quartz-molybdenite veins up to 15 cm thick associated with nearby latite dikes in sedimentary host rocks. Pyrite-pyrrhotite-chlorite veinlets, locally comprise up to 10 percent by volume of contact metamorphosed country rock. Quartz-feldspar porphyry, and to lesser extent, biotite latite dikes exhibit intense silicic, phyllic, and hydrothermal alteration in a 300 by 1,100 m area of southern and western part of stock. Low-grade stockwork molybdenite occurs in northern part of biotite latite dike system over a 30 by 350 m area.

Mertie, 1937a, b; West, 1954; Jason Bressler, written commun., 1979; Harold Noyes, written commun., 1984

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P04-02 63°14'N 156°55'W	Mount Hurst Yukon River	Cr, PGE Podiform Cr	Grab samples contain 22.0 to 61.2% Cr_2O_3

Masses and bands of chromite in dunite layers in wehrlite tectonite. Largest of 16 chromite bands strikes north-south; pinches and swells from 10 to 800 cm over strike length of 10 m. Within bands, chromite varies from 30% to 80% by volume. Deposit truncated on north by fault. Cr:Fe ratios in six samples average 1.0. Probable source of Pt placer on Boob Creek 10 km to north. Dunite and wehrlite tectonite faulted at base; interpreted as part of intensely deformed and dismembered ophiolite occurring in klippe.

Chapman and others, 1982; Loney and Himmelberg, 1984; Roberts, 1984

P04-03 63°13'N 156°04'W	Win-Won or Cloudy Mountain Southwestern Kuskokwim Mountains	Sn, Ag, Cu Sn polymetallic vein	Grab samples with up to 2% Sn and 1,720 g/t Ag

Chalcopyrite, tetrahedrite, and cassiterite in en echelon quartz veinlet stockwork. Hosted in hornfels on northeast margin of Cretaceous(?) Cloudy Mountains volcanic field and related monzonite complex. About 4 veinlets per meter over a 100-m-wide area.

Thomas K. Bundtzen, written commun., 1984

P04-04 62°53'N 156°59'W	Cirque, Tolstoi Southwestern Kuskokwim Mountains	Cu, Ag, Sn W, Nb Polymetallic vein and porphyry Cu	Grab samples with up to 20% Cu, 1,340 g/t Ag, 0.5% Sn; locally to 0.1% Nb

Chalcopyrite, tetrahedrite, pyrite, arsenopyrite, and scheelite associated with tourmaline, axinite, and quartz occurring in (structurally) high-level, tourmaline greisen. Greisen usually along faults, or in tourmaline breccia pipes in cupolas of the Late Cretaceous Beaver Mountains (monzonite) stock. Monzonite capped by altered olivine basalt and andesite tuff.

Bundtzen and Laird, 1982

P04-05 62°57'N 156°59'W	Independence Southwestern Kuskokwim Mountains	Au Porphyry Au	Independence deposit was briefly developed in 1912. 5 kg of gold were produced from about 113 tonnes of ore. Grab samples from massive vein material at Katz deposit average 1.2 g/t Au and 35% Sb.

Consists of gold-bearing quartz-carbonate-sulfide veins and sulfide disseminations that occur in peraluminous granite porphyry of the Ganes-Yankee Creek dike swarm (Bundtzen and Laird, 1982). The dike swarm extends about 40 km. The best concentration of veins and disseminations occurs in a 4-km by 1/2 km-wide zone that is near the divide separating Ganes and Yankee Creeks, the two largest placer gold mines in the Innoko district. At the Independence deposit, disseminated arsenopyrite, pyrite, cinnabar, stibnite, and sulfosalt minerals occur in dikes and in altered sandstone of the Late Cretaceous Kuskokwim Group. Massive siderite-calcite veins occur in sandstone adjacent to the granite porphyry. The Katz deposit occurs about 2 km southwest of the Independence Mine and consists of massive stibnite-quartz-gold veins that occur along the contact zones between a granite porphyry sill and sandstone.

Bundtzen and Laird, 1982, 1983a.

P04-06 62°37'N 157°10'W	Broken Shovel, Iditarod Southwestern Kuskokwim Mountains	Ag, Pb, Sb Polymetallic vein	Estimated 14,000 tonnes with 178 g/t Ag, 0.15% Pb, 0.15% Sb

Tourmaline, tetrahedrite, arsenopyrite, and undetermined sulfosalts in quartz veins in central part of the Cretaceous Moose Creek pluton (monzonite). Veins, 1 to 3 m wide, occur in altered area marked by sericite and tourmaline about 300 by 400 m in size.

Bundtzen and Gilbert, 1983; Bundtzen and Laird, 1983a, 1988; Bundtzen and others, 1985

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P04-07 62°31'N 157°55'W	Golden Horn, Minnie Gulch, Malemute, Iditarod (Flat Southwestern Kuskokwim Mountains	Au, Ag, Sb, Hg, W Polymetallic vein or Sb-Au vein	Golden Horn: produced 479 tonnes grading 174 g/t Au, 171 g/t Ag, up to 20% WO_3. Estimated resource of about 3.15 million tonnes grading 1.3 g/t Au, 2.0 % As and 30 g/t Ag

Golden Horn: Quartz-tourmaline-calcite veins of stibnite, cinnabar, scheelite, sphalerite, Pb-Sb sulfosalts, and chalcopyrite. Stibnite and cinnabar crosscut arsenopyrite, scheelite, and silver sulfosalt mineralization. Veins occur in irregularly distributed quartz-filled shear zones in the Late Cretaceous Otter Creek pluton (monzonite), or near intrusive contacts. Vein system from 3 to 30 m wide and at least 1 km in length; occurs along 3-km-long fault zone on eastern side of pluton. Pluton intrudes graywacke and shale of Cretaceous Kuskokwim Group. Malemute and Granite: Cinnabar, arsenopyrite, pyrite, and gold in quartz-calcite zones that strike north-south to northeast occur in altered basalt west of Otter Creek pluton.

Bundtzen and Gilbert, 1983; Bundtzen and Laird, 1983a; Bundtzen and others, 1985, 1988, 1992a; Bull, 1988

P04-08 62°30'N 158°00'W	Chicken Mountain (Flat District) Southwestern Kuskokwim Mountains	Au, As, Hg, Sb, Cu, Mo Granitoid-related Au-Ag (Cu)	Estimated resource of about 14.5 million tonnes grading 1.2 g/t Au, 0.09 % Cu, 0.46% Sb

Deposit contains quartz-sulfide veinlets containing a wide variety of ore minerals including free gold, stibnite, cinnabar, arsenopyrite, chalcopyrite molybdenite, silver sulfosalts, and arsenian pyrite. Quartz veins contain (5% total) sulfides. All mineralization hosted in cupola zones of altered monzonite and syenite of Chicken Mountain stock. Earlier monzodiorite, alkali gabbro, and wehrlite phases also present. Pervasive sericite and ankerite alteration halos present. Dolomite breccia phase synchronous with major sulfide phase. Surface extent of mineralization occupies a 300 by 800 meter area; drilling indicates at least 250 meters of vertical extent. Drill results and mapping indicates a vertical temperature zonation is present with epithermal gold-mercury-antimony zones crosscutting older mesothermal gold-copper-molybdenum and arsenic-copper events. Pluton and mineralization yield coeval K-Ar ages of 70 Ma.

Bundtzen and others, 1988; 1992a; Bull, 1988; Jason Bressler, written commun., 1980; Richard Gosse, written commun., 1990

P04-09 62°15'N 158°30'W	DeCourcey Mountain Southwestern Kuskokwim Mountains	Hg, Sb, As Hot-spring Hg	Produced 1,200 flasks Hg. Grab samples contain up to 6.5% Hg

Cinnabar, minor stibnite, and traces of arsenopyrite in silica-carbonate dikes that cut sandstone and shale of Cretaceous Kuskokwim Group, and olivine basalt dated at 76 Ma. Sulfides occur usually in irregular breccia zones, or as replacement along intrusive contact. Individual ore bodies, from 0.2 to 2.0 m thick in zone 600 by 100 m in area with vertical relief of 20 m. Individual sulfide bodies rarely more than 20 m long, with common pinching and swelling. The silica dikes consist largely of quartz, carbonate, and clay minerals and probably represent altered basalt dikes.

Cady and others, 1955; Sainsbury and MacKevett, 1965; Thomas K. Bundtzen and Marti L. Miller, written commun., 1985

P04-10 62°13'N 158°15'W	Snow Gulch-Donlin Southwestern Kuskokwim Mountains	Sb, Au, As, Hg Sb-Au vein	Drill-indicated reserves of 40.4 milion tonnes containing 111, 930 Kg gold.

Stibnite, arsenopyrite, and complex arsenic sulfosalts and minor to trace cinnabar and free gold as blades, crystals and disseminations in quartz veins and shear zones associated with 4 km long sheeted dike and sill complex. At least three ages of dikes have been identified; dikes range in composition from quartz monzonite to alaskite to granite porphyry. One granite porphyry dike yields K-Ar age of 65 Ma. Mineralization usually occurs at contacts between dikes and mid-Cretaceous Kuskokwim Group flysch, but locally extensive auriferous zones up to 20 meters wide found permeating clastics and hornfels. Considerable gold found in lattice structures of arsenic minerals.

T.K. Bundtzen and M.L. Miller, written commun., 1988; Bruce Hickok and Robert Rutherford, written commun., 1990; Bundtzen and others, 1996.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

P04-11 61°46'N 158°32'W	Mission Creek, Headwall, Louise, and Owhat Prospect Southwestern Kuskokwim Mountains	Au, Ag, Cu, As Sb, Bi, Co, W, Sn, U Polymetallic vein	Inferred reserve of 225,000 tonnes grading 4.0g/tone Au,9.5% As, 0.61% Cu, 0.01% Sn, 0.2% Sb, and 0.02% Co

Sheet-like greisen veins with tourmaline, tetrahedrite, chalcopyrite, arsenopyrite, cassiterite, metazeunerite, scheelite, and axinite. Zones of en-echelon vein-greisens all trend N20-25W and dip steeply or vertically. Zones occur about 3 km along strike and are about 1 km wide. Gold occurs as both free milling grains in gangue and in lattice structures of arsenopyrite. Bismuth sulfosalts bismuthinite, aramayoite, pekoite, and gladite locally in abundant. Veins occur in zones in cupola of Late Cretaceous porphyritic quartz syenite stock. Zones up to 20 m wide. About 300 m of drifts at Mission Creek. Local numerous euhedral gangue minerals. Louise deposit contains up to 1.50% Sn.

Bundtzen and Laird, 1991

P04-12 61°45'N 157°23'W	Red Devil Southwestern Kuskokwim Mountains	Hg, Sb Clastic sediment-hosted Hg	Produced 34,745 flasks from 68,000 tonnes through 1963. Produced 4,000 flasks, 1970 to 1972. Average grade of 1.5% Hg and 2% Sb

Cinnabar and stibnite in about 20 plunging chimney-like ore bodies located along intersections of north-northwest trending silica-carbonate dikes and bedding plane faults in graywacke and shale of the Cretaceous Kuskokwim group . Ore bodies are crudely prismatic and range from a few centimeters to about 0.4 m in thickness and from 0.1 to 10 m in strike length. Ore bodies plunge along and near intersections between northeast-southwest-trending altered dikes and northwest-southeast-trending faults. Vertical zonation in deposit with pure cinnabar at surface, and increasing stibnite to cinnabar ratios at depth. At 200 m below surface, mainly stibnite and quartz with trace cinnabar. Largest and best exposed of 15 deposits in Kuskokwim mercury belt. Produced about 80 percent of Alaska mercury from 1942 to 1974. Silica-carbonate dikes composed of fine-grained calcite, chalcedony, limonite, and sericite, and subordinate quartz, hematite, and clay minerals. Relict phenocrysts replaced by calcite. Relict diabasic textures in Parks and Willis deposits to northwest. Silica-carbonate veins are interpreted as altered basalt dikes that intrude graywackes and argillite of the Cretaceous Kuskokwim Group. Approximately 3,000 m of underground workings on five levels as of 1963.

Herreid, 1962; MacKevett and Berg, 1963; H.R. Beckwith, written commun., 1965; Thomas K. Bundtzen, written commun., 1985; Miller and others, 1989; Goldfarb and others, 1990

P04-13 62°20'N 161°29'W	Wolf Mountain Southwestern Kuskokwim Mountains	U, Th, As, Nb, Mo, REE Hg Felsic plutonic U	150 meter wide zone at Little Lockwood Creek is 180 ppm U, 130 ppm Th, 290 ppm As, 0.02 % Mo, 175 ppm Nb, about 0.10 % REE, and 0.01% Hg

A circular field of andesite, dacite, and pyroclastic tuff has collapsed on an underlying composite pluton composed of granite, alaskite, and adamellite; radiometrically dated (K-Ar) at 57 Ma. This caldera complex intrudes and overlies oceanic stratigraphy of the Koyukuk terrane. Extensive ferricrete gossan and ferricrete breccias occur, mainly within high level portions of the Wolf Creek stock at 1) structurally controlled (fault) zones on Little Lockwood Creek, 2) northeast-trending fractures(?) on Tom Gray Creek, and 3) disseminated near pluton-volcanic contacts throughout the caldera complex. The only sulfides recognized in the field are arsenopyrite and cinnabar. Monazite and bastinite were also recognized. Metallogeny similar to that described in Sischu Volcanic field in northeast Medfra quadrangle (Sischu Creek deposit, WC21).

T.K. Bundtzen, written commun., 1992, Bruce Hickok and T. Turner, written commun., 1987, 1989

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P04-14 61°52'N 161°58'W	Arnold prospect Southwestern Kuskokwim Mountains	Au,Ag W,Cu,Mo Granitoid-related Au	Grab samples contain up to 97 g/t and 100 g/t Ag

The Arnold prospect consists of an approximate east-west-trending system of low sulfide polymetallic veins system that contain gold in a quartz and carbonate gangue. The sulfide minerals, that comprise less than one percent of the deposit, are disseminated chalcopyrite, molybdenite, galena, and tetrahedrite. Ore zone extends along strike for least 400 meters and ranges from 0.5 to 2m thick. The vein system occurs in or near sheared alaskite sills. A distinctive albite rhyolite dike or sill parallels the main vein system. The sills intrude Neocomian (early Early Cretaceous) greenstone derived from tholeiite metabasalt and meta-andesite. The deposit extends extends along strike for least 400 meters and ranges from 0.5 to 2 m thick. Abundant carbonate alteration occurs adjacent to the main polymetallic veins. Molybdenum anomalies occur in soils, and Mo averages about 80 ppm in the veins. Deposit is interpreted as forming from late stage hydrothermal fluid derived from Late Cretaceous or early Tertiary alaskite.

T.K. Bundtzen, written commun., 1991

P04-15 61°07'N 158°15'W	Fortyseven Creek Southwestern Kuskokwim Mountains	Au, W Polymetallic vein(?)	Grab samples with up to 17.2 g/t Au

Pyrite, arsenopyrite, gold, wolframite, jamesonite, Au-Ag tellurides, and scheelite in numerous, discontinuous quartz veins and pods in mineralized zone about 1.6 km long and 153 to 256 m wide. Veins trend northeast and dip from 50° west to 70° east. Several stockwork zones. Mineralized zone locally sheared and intruded by altered rhyolite dikes. K-Ar age of 57 Ma for white mica in veins. Subsurface drilling shows zone in lithic sandstone about 300 m wide by 4,000 m long, east of Holitna fault. Veins occur in contact metamorphosed siltstone and sandstone of the Kuskokwim Group.

Cady and others, 1955; Thomas E. Smith, written commun., 1985

P04-16 60°52'N 157°40'W	Taylor Mountains Southwestern Kuskokwim Mountains	Hg, Au As, Ag Hg-Ag epithermal vein(?)	No data

Disseminated arsenopyrite, cinnabar, pyrite, and minor gold in Late Cretaceous rhyolite over an area at least 200 by 300 m. Sparse sulfide concentrations in quartz-tourmaline veinlets in rhyolite. Sparse massive pyrite along contacts between lithic sandstone and rhyolite. Pyrite, cinnabar, and stibnite in nearby placer deposits in Taylor Creek.

Cady and others, 1955; Thomas K. Bundtzen, written commun., 1984

P04-17 60°46'N 158°46'W	Cinnabar Creek Southwestern Kuskokwim Mountains	Sb, Hg Hot-spring Hg	Produced about 525 flasks of Hg from selected high-grade ore

Stibnite and cinnabar in shear zones, disseminations, irregular veinlets, and breccias in or near silica-carbonate dikes interpreted as hydrothermally altered basalt dikes. Dikes intrude argillite and other clastic rocks of the late Paleozoic to Cretaceous Gemuk Group. Most sulfides in altered sedimentary rocks. Deposit includes Cinnabar Creek shear zone, Lucky Day, and Landau areas. Ore chutes at Cinnabar exceed 40 m long and 0.5 m wide. Several periods of small-scale mining; the last in the early 1970's from surface trenches.

Cady and others, 1955; Sainsbury and MacKevett, 1965

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P04-18 60°03'N 157°05'W	Sleitat Southwestern Kuskokwim Mountains	Sn, Ag, W, As Tin Greisen and Skarn	Inferred reserves of 25 million tonnes grading 0.20 % Sn with minor Ag, W

Cassiterite, topaz, and quartz greisen accompanied by lesser amounts of arsenopyrite, pyrite, wolframite, argentite, chalcopyrite, and galena. Two largest greisens form resistant, irregular, east-west trending, vertically dipping dike-like features that protrude through less resistant host granite. Greisens vary from less than a meter wide and 20-30 meters long to zones 20-50 meters wide and 1200 meters long. Most greisens occur at contact between biotite-muscovite granite and muscovite granite phases of Sleitat pluton. Some mineralization in surrounding hornfels aureole. Pluton crops out across an area of 1.5 km^2. A much larger 20 km^2 hornfels aureole indicates a much larger intrusive mass underlies prospect area. Pluton intrudes Mesozoic flysch of Kahiltna Terrane or Kuskokwim Group. About 735 meters of diamond drilling completed; best hole yielded 29 meters of 1.56% Sn and 28 ppm Ag. Sleitat is probably correlative with other stanniferous plutons of 55-60 Ma McKinley sequence. Ar 40-39 age determinations indicate 58-59 Ma ages for granite and 56-57 Ma for greisen event.

Burleigh, 1991; Farnstrom, 1991; T.K. Bundtzen and Paul Layer, written commun., 1991

P04-19 62°48'N 158°54'W	Fox Hills Southwestern Kuskokwim Mountains	Mo Porphyry Mo	Selected rock-chip samples contain from 0.01 to 2.0% MoS2 and up to 11 g/t Ag;

Occurs in an alkali granite pluton that contains a central phyllic and sericitic alteration zone rimmed by a thin, 50-m-wide argillic zone. In the southern part of the alteration halo are molybdenite-quartz veinlets that strike 335° in a 120 by 100 m zone. The alkali granite pluton has a surface area of about 8 km2, contains alkali amphibole, and intrudes the Late Cretaceous Kuskokwim Group in the Fox Hills, about 60 km west of Flat (Fig. 7). The phyllic and sericitic alteration zone is about 2 km2 in area and occurs in the western part of the pluton. The Fox Hills alkali granite has a K-Ar amphibole age of 62.9 Ma .

Miller and Bundtzen, 1994; Nokleberg and others, 1995a.

P04-20 62°05'N 158°48'W	Molybdenum Mountain Southwestern Kuskokwim Mountains	Mo Porphyry Mo	Selected rock samples from the Molybdenum Mountain stock contain up to 5.0% MoS2.

Consists of a stockwork of vein quartz containing massive and disseminated molybdenite, galena, and pyrite in the Molybdenum Mountain (felsic) stock, a small hypabyssal intrusion of 2 km2 area that occurs in an area about 45 km northeast of Aniak. Alteration is mainly silicic and sericitic. A large, elongate contact metamorphic aureole surrounds the Molybdenum Mountain stock and several smaller intrusions that occur about 4 to 6 km to the northeast. The stock intruded pervasively altered, Late Cretaceous flysch of the Kuskokwim Group in a large shear zone that is a splay of the Iditarod-Nixon-Fork Fault, a major dextral-slip Cenozoic fault in west-central Alaska. A K-Ar white mica age of 60.9 Ma has been obtained from the stock.

T.K. Bundtzen, unpublished data, 1987; Nokleberg and others, 1995a.

P04-21 62°54'N 156°58'W	Beaver Mountains Southwestern Kuskokwim Mountains	Cu, Au, Ag Porphyry Cu-Au	Cirque prospect: Chip-channel samples range up to 21.0% Cu, 1,000 g/t Ag, 200 ppm Sn, and 1 g/t Au. Tolstoi prospect: scattered assay values range up to 10.0% Cu, 995 g/t Ag, 2.0% As, 0.6 g/t Au, 500 ppm Sb, and 39 ppm Bi.

Consists of a variety of mineralized vein stockworks, replacements, and tourmaline breccias that contain anomalous Au, Ag, Cu, Pb, W, Sn, Nb, and As. The deposit occurs in Late Cretaceous and early Tertiary volcanic and plutonic rocks in the Beaver Mountains, about 60 km west of McGrath. The major lode prospects are found in a 15 km2 area centered on the Cirque and Tolstoi prospects (Bundtzen and Laird, 1982) that are also called the South Quartz Zone area by Szumigala (1993). The Cirque deposit consists of a series of parallel tourmaline-axinite-sulfide fracture fillings that occur in the cupola of a quartz syenite phase of the Beaver Mountains pluton. The Tolstoi deposit consists of three, pipe-shaped, sulfide-bearing, tourmaline-bearing breccia zones that occur in another part of the cupola of the Beaver Mountains pluton. These near-vertical zones, possibly breccia pipes, appear to be enveloped in a larger, 2 km2 potassic alteration halo. Szumigala (1993) interprets the porphyry copper-gold deposits in the Beaver Mountains as occurring in veins that are peripheral to classic porphyry Cu systems. A K-Ar biotite age of 70.3 Ma was obtained by Bundtzen and Laird (1982) from quartz syenite near the northern margin of the Beaver Mountains pluton.

Bundtzen and Laird, 1982; Miller and Bundtzen, 1994; Nokleberg and others, 1995z.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P04-22 62°18'N 158°24'W	Donlin Creek Southwestern Kuskokwim Mountains	Au Porphyry Au	Trenching and drilling indicate that the seven ore bodies at Carolyn, Snow, Queen, Rochelieu, Upper Lewis, Middle Lewis, and Lower Lewis contain an inferred reserve of 3,871,025 tonnes grading 3.15 g/t Au 12,225 kg gold. Exhaustive mineral resource investigations have been completed by private mining firms.

Consist of seven distinct prospects that occur along strike in an approximately 6-km-long dike and sill swarm. The prospects consist of quartz-stibnite veins in porphyry and adjacent silicified sandstone, quartz-gold replacement of phenocrysts, and thick quartz veins with disseminated quartz-sulfide zones that occur along shears and in stockworks. The sulfide minerals are mainly pyrite, stibnite, cinnabar, arsenopyrite, and sulfosalt minerals. Alteration is mainly argillic, phyllic, silicic, carbonate, and dickite, and occurs along linear shears and faults rather than as concentric halos. Au deposition accompanied As deposition; other metals show low correlation coefficients with Au.

Mertie, 1936; Decker and others, 1984; Miller and Bundtzen, 1994; R.M. Retherford and J. McAtee, written commun., 1994; Nokleberg and others, 1995a.

P04-23 62°36'N 156°08'W	Vinesale Mountain Southwestern Kuskokwim Mountains	Au Porphyry Au	Based on about 6,000 m of drilling, a central zone contains a reserve of about 16 million tonnes grading 2.14 g/t Au and accessory Ag and Sb, or about 31,000 kg of gold.

Consists of Au-Ag-Sb-Pb-As sulfide minerals that occur as disseminations, and in breccias, dolomite veins, and segregations. Mafic minerals are altered by silicification, sericitization, and propylitic replacements. The highest gold concentrations in the central zone of the deposit occur in areas of intense sericite and silica alteration. Over ninety percent of the gold is contained in sulfides and sulfosalt minerals of arsenic and antimony. Correlation coefficients are highest between Au and As (0.81). Deposit hosted in various phases of the Vinasale pluton, a multiphase, 6 km2 intrusion composed of monzonite, quartz monzonite, and granite porphyry that intruded the Late Cretaceous Kuskokwim Group. A K-Ar biotite age of 69.0 Ma from a quartz monzonite phase of the Vinasale Mountain pluton is described by Bundtzen (1986).

Bundtzen, 1986; DiMarchi, 1993; Nokleberg and others, 1995a.

P05-01 63°58'N 153°17'W	Sischu Creek Southwestern Kuskokwim Mountains	U, Th Felsic plutonic U	Grab samples with 0.002 to 0.007% U and 0.011 to 0.013% Th

Strongly radioactive U- and Th-rich Late Cretaceous and early Tertiary porphyritic sanidine rhyolite and quartz porphyry flows in two belts, each about 1.5 to 3 km wide, 6 km long. Rhyolite flows exhibit 400 to 600 cps on hand-held scintillometer. Associated rocks include mafic and intermediate volcanic piles, volcanic-plutonic complexes, silicic dikes, sills, domes, and flows, and numerous granitic stocks and plugs of 60 to 70 Ma (K-Ar).

Miller and others, 1980; Patton and Moll, 1983

P05-02 63°40'N 154°04'W	Medfra Southwestern Kuskokwim Mountains	Fe, Cu, Zn, Au Fe skarn	Estimated 12,000 cubic meters grading 85% Fe_2O_3, with traces of Cu, Au

Magnetite, very minor chalcopyrite, and sphalerite in epidote and garnet skarn. Irregular, elliptically-shaped skarn body in Ordovician dolomitized limestone of the lower Paleozoic Telsitna Formation adjacent to Late Cretaceous granite stock. Computer modeling of magnetic survey suggests 40,000 to 50,000 tonnes of magnetite.

Patton and others, 1980, 1984

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P05-03 63°29'N 154°10'W	Reef Ridge Mystic	Zn, Pb Southeast Missouri Pb-Zn	Grab samples with up to 20% Zn, 5% Pb, minor Ag. Estimated to contain about 181,000 tonnes of 15% combined Zn and Pb

Stringers of brown sphalerite and minor galena in hydrothermal breccia in carbonate rocks of the Silurian and Devonian Whirlwind Creek Formation, part of Nixon Fork terrane. Minimum strike length of 2,000 m and up to 15 m thick. Sulfides pinch and swell along strike. Best known of ten similar nearby occurrences.

Harold Noyes, written commun., 1984.

P05-04 63°14'N 154°47'W	Nixon Fork-Medfra Southwestern Kuskokwim Mountains	Au, Cu, Ag, Bi, Sn, W, Th Cu-Au skarn	Produced about 1.24 to 1.87 million g Au, and undisclosed Cu and Ag. Reserves of 85,600 tonnes grading 49.0 g/t Au with minor Bi.

Chalcopyrite, pyrite, bornite, and native bismuth occur as irregular replacement bodies in skarns in recrystallized Ordovician limestone of the Telsitna Formation. Gangue minerals include diopside, garnet, plagioclase, epidote, and apatite. Oxidized actinolite skarn with limonite, quartz, malachite, pyrite, and gold. Skarns mainly in fractures up to 1 to 4 m wide and 50 m long, usually within 40 m of intrusive contact with Late Cretaceous monzonite. A few skarns in roof pendants overlying pluton. The monzonite pluton about 10 square km near the Nixon-Iditarod fault. Additional smaller skarn veinlets in fault controlled areas away from main skarn bodies. Extensive sericitic alteration locally. Most of ore from zone of secondary enrichment that formed during alteration of primary skarn by groundwater. Lower grade sulfide-rich ore at depths greater than 60 m. About 1,300 m of underground workings to depth of 170 m. Includes Crystal, Garnet, High Grade, Main, Mespelt, Recreation, and Whalen deposits.

Martin, 1921; Brown, 1926; Jasper, 1961; Herreid, 1966; Bundtzen and Gilbert, 1983b; C. Puchner, written commun., 1991; Bundtzen and others, 1996.

P05-05 62°51'N 155°48'W	Candle Southwestern Kuskokwim Mountains	Cu, Pb, Ag Polymetallic vein or porphyry Cu?	Grab samples averaging 280 g/t Cu, 185 g/t Pb, 6.8 g/t Ag

Cinnabar, arsenopyrite, and quartz in stockworks in altered, sericite, late Cretaceous monzonite near intrusive contact with overlying altered olivine basalt. Local quartz-chalcopyrite disseminations in the pluton. Recent exploration indicates low grade auriferous quartz vein stockwork in monzonite near faulted contact with basalt. Zone up to 200 m wide and 700 m long. Central part of basalt field contains 300 by 500 m zone of disseminated sulfides. Monzonite in creek valley is weakly mineralized with gold and mercury within stockwork quartz veinlets.

Bundtzen and Laird, 1983a, b; Thomas K. Bundtzen, written commun., 1984, 1990

P05-06 63°45'N 150°25'W	Stampede East-Central Alaska	Sb Sb-Au vein	Estimated 410,000 tonnes with 10.5% Sb, minor Ag, Zn, and Au. Produced 1,570 tonnes ore

Quartz-carbonate fissure veins with stibnite, and minor pyrite and sphalerite in pods and kidneys. Massive stibnite zones up to 5 m wide. Extensive vein system localized in a 5 km long, northeast-trending fault system. Veins formed before, during, and after several periods of movement on fault. Paragenetic sequence, from older to younger: pyrite, sphalerite, and stibnite. Fault system cuts the Spruce Creek sequence which is composed of middle Paleozoic or older metasedimentary and metavolcanic rocks. Production from 1937 to 1970. About 1,000 m of underground workings on two levels.

Barker, 1963a; Bundtzen, 1981, 1983a; Thomas K. Bundtzen, written commun., 1984

P05-07 63°35'N 151°35'W	Spruce Creek East-Central Alaska	Au, Ag, Pb, Zn, Sb Polymetallic vein	Estimated 77,000 tonnes with 2.4 g/t Au, 276 g/t Ag, and 2.5% combined Pb, Zn, Sb

Quartz-carbonate fissure veins with galena, sphalerite, arsenopyrite, and gold. Veins occur along northeast-striking, steeply dipping fault zones in the Spruce Creek sequence composed of middle Paleozoic or older metasedimentary and metavolcanic rocks.

Bundtzen, 1981, 1983a; Thomas K. Bundtzen, written commun., 1984

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			
P05-08 63°34'N 150°44'W	Banjo East-Central Alaska	Au, Ag, Pb, Zn, Sb Cu Polymetallic vein	Estimated 160,000 tonnes with 13.4 g/t Au, 123 g/t Ag, 1.5% combined Pb, Zn, Sb

Quartz-carbonate fissure veins with arsenopyrite, pyrite, gold, and minor scheelite. Veins occur along northeast-southwest-striking, steeply dipping fault zones within the Spruce Creek sequence composed of middle Paleozoic or older metasedimentary and metavolcanic rocks of Yukon-Tanana terrane.

Bundtzen, 1981, 1983a; Thomas K. Bundtzen, written commun., 1984

P05-09 63°33'N 150°45'W	Quigley Ridge East-Central Alaska	Ag, Au, Pb, Zn Polymetallic vein	Estimated 380,000 tonnes with 1,300 g/t Ag, 4.8g/t Au, 6.4% Pb, and 2.3% Zn

Quartz-carbonate fissure veins with galena, sphalerite, tetrahedrite, pyrite, chalcopyrite, and siderite. Paragenetic sequence, from older to younger: arsenopyrite, pyrite, base-metal sulfides, Ag sulfosalts, stibnite, and covellite. Locally contain Ag and Pb sulfosalts. Veins occur along northeast-striking, steeply dipping fault zones in the Spruce Creek sequence composed of middle Paleozoic or older, metavolcanic and metasedimentary rocks.

Bundtzen, 1981, 1983a; Thomas K. Bundtzen, written commun., 1984

P05-10 63°25'N 151°12'W	Slate Creek, Eagles Den, Caribou Creek East-Central Alaska	Sb Ag, Zn Sb-Au vein	Estimated 64,000 tonnes grading 12.0% Sb, with minor Ag and Zn

Quartz-carbonate fissure veins mineralized mainly with stibnite, and mostly free of other sulfides common to district. Veins occur along northeast-striking, steeply dipping fault zones that cut metasedimentary and metavolcanic rocks of middle Paleozoic or older Yukon-Tanana terrane.

Bundtzen, 1981; Thomas K. Bundtzen, written commun., 1984

P05-11 62°53'N 152°08'W	Boulder Creek (Purkeypile) Southern Alaska	Sn Sn greisen(?)	Contains an estimated 136,000 kg Sn. Grab samples with up to 18% Sn, 7,900 g/t Ag

Disseminated cassiterite and sulfides in clusters of narrow, open-space fracture fillings, suggestive of stockwork deposit. Deposit occurs in calc-silicate rock, quartzite, and argillite approximately 100 to 200 m north of Tertiary biotite granite, part of the lower Tertiary McKinley plutonic sequence.

Maloney and Thomas, 1966; Conwell, 1973; Reed and others, 1978; Warner, 1985

P05-12 62°40'N 152°30'W	Shellabarger Pass Mystic	Cu, Ag, Fe, Zn Besshi massive sulfide	Estimated several hundred thousand tonnes of unknown grade. Up to 5% Cu; average of about 2% Cu, 1% Zn

Very fine grained mixture of mainly pyrite and marcasite with lesser sphalerite, chalcopyrite, galena, and pyrrhotite in a gangue of siderite, calcite, quartz, and dolomite. Sulfides and gangue occur in massive, lenticular sulfide bodies, as replacements of carbonate-rich beds, and as fracture fillings, mainly in chert and siltstone. Host rocks are Triassic and(or) Jurassic age; and consist of lower sequence of chert, dolomite, siltstone, shale, volcanic graywacke, conglomerate, aquagene tuff, and upper sequence of pillow basalt, agglomerate, and breccia. At least six individual sulfide bodies. Highest chalcopyrite concentrations in basal parts of bodies. Minor sphalerite in or near hanging walls. Main sulfide bodies may be proximal to basaltic flow fronts. Extensive hydrothermal alteration in footwall; rare to absent in hanging wall. High background Cu values of 250 to 300 g/t.

Reed and Eberlein, 1972; Bundtzen and Gilbert, 1983

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P05-13	Tin Creek	Pb, Zn, Cu	Estimated 230,000 tonnes with 16% combined Pb and Zn
62°23'N	Southern Alaska	Cu-Pb-Zn skarn	
153°38'W			

Pyroxene-rich skarn with abundant sphalerite and minor chalcopyrite, and garnet skarn with chalcopyrite and minor sphalerite; and locally abundant epidote and amphibole. Pyroxene skarn distal, and garnet skarn proximal to extensive Tertiary granodiorite dike swarm in mid-Paleozoic marble. Skarns form small, discontinuous bodies up to 3 m wide along dikes, as mantos in marble, and as irregular bodies along thrust and high-angle faults.

Herreid, 1966; Reed and Elliott, 1968a, b; Bundtzen and Gilbert, 1983; Bundtzen and others, 1982; Szumigala, 1984

P05-14	White Mountain	Hg	Chip samples contains 5 to 30% cinnabar. Produced about 3,500 flasks of Hg.
62°10'N	Southern Alaska(?)	Carbonate-hosted Hg(?)	
154°51'W			

Cinnabar in fault zones between Ordovician limestone and shale along belt about 1 km wide and 3 km long on northwest side of Farewell fault. In southern zone, cinnabar occurs as thin crystalline coatings in brecciated dolomite, as coatings on breccia fragments, and as irregular veinlets. In central zone, cinnabar is more irregular and occurs in silicified limestone and dolomite. In northern zone, rich cinnabar masses occur on both sides of major fault between middle Paleozoic shale and limestone. One area in north zone contains a massive cinnabar body up to 350 m long and 10 to 15 cm thick. Locally cinnabar occurs in small karst-like caverns in dolomitized limestone. Gangue minerals consist of dolomite, chalcedony, calcite, dickite, and limonite. Production from 1964 to 1974 when mined from a series of open pits.

Sainsbury and MacKevett, 1965; Brian K. Jones, written commun., 1984; Thomas K. Bundtzen, written commun., 1984

P05-15	Chip-Loy	Ni, Co, Cu	Estimated 9,100 tonnes of 1% Ni, 0.1% Co
62°14'N	Unassigned	Gabbroic Ni-Cu(?)	
154°20'W			

Massive to disseminated pyrrhotite, bravoite, and chalcopyrite in irregular, steeply dipping layer; occurs along contact between diabase and Ordovician shale. Other nearby Ni-Co sulfide deposits occur along contacts between diabase dikes.

Herreid, 1968; Gilbert and Solie, 1983; Bundtzen and others, 1985

P05-16	Rat Fork, Sheep Creek	Cu, Zn, Pb	Grab samples with up to 3% Cu and 10% combined Zn, Pb
62°14'N	Southern Alaska	Cu-Pb-Zn skarn	
153°48'W			

Large slivers of Cu- and Zn-rich skarn between Tertiary granodiorite dikes in a 3-km-wide dike swarm that cuts lower Paleozoic marble. Johannsenite-sphalerite skarn in marble, and chalcopyrite-rich garnet endoskarn in dikes. Local Ag-rich galena vein in marble about 0.5 km north of dike swarm. Dikes trend east-west; skarn up to 25 m wide.

Herreid, 1968; Reed and Elliott, 1968a, b; Bundtzen and others, 1982; Szumigala, 1987

P05-17	Bowser Creek	Ag, Pb, Zn	Higher grade: estimated 14,000 tonnes with 1,300 g/t Ag, and up to 10% combined Pb and Zn. Lower grade: estimated 272,000 tonnes with 20% Pb and Zn, and 100 g/t Ag
62°11'N	Southern Alaska	Pb-Zn skarn	
153°40'W			

Pyrrhotite, sphalerite, galena, and chalcopyrite in a hedenbergite-johannsenite endoskarn occurring in marble adjacent to felsic dike that cuts an early Tertiary granitic pluton. Some veins with Ag-rich galena and pyrrhotite occur within marble adjacent to skarn. Small Zn- and Cu-rich stockwork veinlets in plutons, and disseminated sulfides in plutons and endoskarn occur nearby.

Bundtzen and others, 1988; Szumigala, 1987

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P05-18 61°49'N 154°28'W	Gagaryah Mystic	Ba Sedimentary exhalative barite (Pb-Zn)	Inferred reserves of 2.3 million tonnes containing 51% barite

Nodular, laminated, composite, and massive, light gray barite in Frasnian (early Late Devonian) shale, limestone and minor chert of Mystic Terrane. Deposit has minimum strike length of 640 meters, an average thickness of 20 meters, and estimated down-dip extension of 300 meters. Gagaryah deposits contains slightly elevated levels of silver vanadium, and strontium (as celestite), but no lead or zinc. Sulfide isotopic analyses of +20 and +24 determined from nodular and massive barite respectively. Barite was deposited syngenetically into host shale basin with barite rapidly precipitating from low temperature hydrothermal fluids distal from exhalative vents.

Bundtzen and Gilbert, 1991

P05-19 60°45'N 154°30'W	Bonanza Hills Southern Alaska	Ag, Cu, Pb, Au Polymetallic vein and Porphyry Cu	At Main Saddle estimated 45,000 tonnes grading 81 g/t Ag, 0.15% Cu, 0.67% Pb, and 0.15 g/t Au

Main Saddle Deposit: tetrahedrite, arsenopyrite, galena, and chalcopyrite in quartz-limonite vein up to 3 m wide and 150 m long. Vein occurs in contact-metamorphosed dacite flow and sandstone sequence near Late Cretaceous, two-mica, hypabyssal, granite pluton. VABM Trail and Bonanza Deposits: stibnite, arsenopyrite, and gold in en echelon veinlets adjacent to dacite porphyry and quartz monzonite plutons. Extensive sericite and silicic alteration of plutonic rocks. Plutons intrude Lower Cretaceous shale and sandstone, part of regionally extensive Upper Jurassic and Lower Cretaceous flysch.

Eakins and others, 1978; Thomas K. Bundtzen, written commun., 1984; Nelson and others, 1985

P05-20 60°51'N 153°12'W	Glacier Fork Alaska Peninsula	Cu, Au Zn, Ag Cu-Zn skarn	Chip samples contain 0.76% Cu, 3.4% Zn, 0.38 g/t Au, 20g/t Ag

Layers and veinlets of disseminated and massive pyrrhotite, chalcopyrite, arsenopyrite, and sphalerite in iron-poor, garnet-rich skarn. Skarn occurs in large roof pendant over granitic pluton.

Nelson and others, 1985

P05-21 60°51'N 151°48'W	Miss Molly (Hayes Glacier) Southern Alaska	Mo Porphyry Mo	Grab and chip samples with up to 0.38% Mo, 0.16% Zn

Quartz veins with medium- to coarse-grained molybdenite, pyrite, and local fluorite. Regularly spaced, subparallel, veins 2 to 10 cm wide are spaced 2 to 10 m apart. Veins occur in two zones about 545 m long and up to 150 m wide in early Tertiary leucocratic, equigranular biotite granite stock. Veins locally fill joints and less commonly shears. Zones of hydrothermal alteration up to 0.3 m wide are marked by sericite and pyrite and occur adjacent to veins. Granite stock intrudes siltstone in an Upper Jurassic and Lower Cretaceous flysch unit. Granitic plutons nearby, yield K-Ar ages of 56 to 59 Ma.

Fernette and Cleveland, 1984

P05-22 60°17'N 154°15'W	Kijik River Southern Alaska	Cu, Mo Polymetallic vein and porphyry Cu	Grab samples with up to 0.25% Cu, and 0.17% Mo. Estimated 91 million tonnes

Large area of low-grade, disseminated sulfides in, and adjacent to early Tertiary dacite porphyry. Distinctive orange gossan over a 3 km^2 area with extensive stockwork, and zones of sericite and sulfides. Extensive propylitic and silicic alteration of dacite porphyry. Early Tertiary dacite porphyry intrudes older volcanic rocks.

Eakins and others, 1978; Nelson and others, 1985; Thomas K. Bundtzen, written commun., 1984

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P05-23 60°13'N 154°05'W	Kasna Creek (Kontrashibuna) Alaska Peninsula	Cu Au, Ag, Zn, Fe Cu-Fe skarn	Chip samples averaging 0.95% Cu, 27% Fe, and traces of Au and Ag. Grab samples with up to 0.25% Zn. Estimated 9.1 million tonnes grading 1% Cu

Skarn bodies contain specular hematite and lesser magnetite and chalcopyrite in amphibole-chlorite-calcite-quartz gangue that replaces Upper Triassic dolomite and limestone. Skarn bodies occur parallel to bedding and occur in a zone about 320 m long and 700 m wide adjacent to Jurassic tonalite. Tuffs, mafic volcanic rocks, and agglomerate associated with limestone.

Warfield and Rutledge, 1951; Reed and Lanphere, 1969; Eakins, 1970

P05-24 60°14'N 152°51'W	Magnetite Island (Tuxedni Bay) Alaska Peninsula	Fe, Ti Fe skarn	Up to several thousand tonnes in zones with 20 to 75% magnetite

Two magnetite-bearing skarn bodies replace upper Paleozoic to lower Mesozoic marble. Skarn bodies occur along northeast-striking faults in Upper Triassic marble and associated sedimentary and volcanic rocks adjacent to Jurassic quartz diorite pluton. Disseminated magnetite in hornfels of eastern deposit. Massive magnetite and garnet between marble hanging wall and hornfels footwall in western deposit.

Grantz, 1956; Detterman and Hartsock, 1966

P05-25 60°07'N 152°57'W	Johnson Prospect Talkeetna Mountains-Alaska Range	Au, Zn, Cu, Pb Kuroko massive sulfide	Estimated resource of 16,795 kg gold and 127,000 tonnes Zn; includes 453,500 tonnes grading 19 g/t Au and 9.0% Zn

Stockworks of quartz-sulfide veins and massive sulfide lenses with chalcopyrite, pyrite, sphalerite, galena, and gold. Stockwork occurs in a discordant, pipe-like body of silicified volcanic rocks. Veins also contain chlorite, sericite, anhydrite, and barite alteration minerals. Deposit occurs in volcaniclastic, pyroclastic, and volcanic rocks, part of the Portage Creek Agglomerate Member of the Lower Jurassic Talkeetna Formation. Deposit may represent deposition of sulfides directly over capped submarine vent system during Jurassic volcanic cycle. Nearby Late Jurassic quartz diorite and quartz monzonite.

R. L. Detterman, oral commun., 1984; Steefel, 1987; Madelyn Mollholyn, written commun., 1988; J. Proffett, written commun., 1991

P05-26 63°38'N 155°04'W	Von Frank Mountain Southwestern Kuskokwim Mountains	Cu, Ag Porphyry Cu-Ag	Average grade of 0.5 to 35 g/t Au and from 0.05% to 0.45% Cu; one drill hole intercepted about 45 m grading 1.2 g/t Au and 0.08% Cu.

Occurs about 100 km northeast of McGrath and consists of a stockwork in a quartz diorite and augite-rich, biotite granodiorite. These rocks occur in a down-dropped structural block along the southern limit of a volcanic-plutonic complex exposed at Von Frank Mountain. The stockwork consists of chalcopyrite, arsenopyrite, minor molybdenite, and free gold in quartz-carbonate veins in a cupola of the intrusive system. Alteration minerals include sericite, silica, and dolomite replacement zones that are similar to the Chicken Mountain porphyry Au deposit (Bundtzen and others, 1992). A K-Ar isotopic mineral age of 69.9 Ma was obtained from granitoid plutons north of the prospect (Moll et al., 1981).

J. DiMarchi, written. commun., 1994; Nokleberg and others, 1995a.

P06-01 63°54'N 148°17'W	Sheep Creek Alaska Range and Yukon-Tanana Upland	Zn, Pb, Ag, Sn Kuroko massive sulfide?	Grab samples contain up to 15% combined Pb and Zn, and 102 g/t Ag; zones up to 1 m wide with 1% Sn

Fine-grained sphalerite, galena, and pyrite in massive lenses in siliceous phyllite and metaconglomerate of the Precambrian or Paleozoic Keevy Peak Formation. Sulfide zone extends along strike for 300 m, and vertically for 200 m. Sulfide lenses isoclinally folded; may be distally associated with tuffaceous chlorite schist and metamorphosed lapilli tuff.

Gilbert and Bundtzen, 1979; Thomas K. Bundtzen, written commun., 1985

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P06-02 63°48'N 147°57'W	Anderson Mountain Alaska Range and Yukon-Tanana Upland	Cu, Pb, Zn, Ag Kuroko massive sulfide?	Average grade ofup to 19% Cu, up to 5% Pb, 28% Zn, and 171 g/t Ag.

Massive sulfide layers with pyrite, chalcopyrite, galena, sphalerite, enargite, and arsenopyrite in gangue of quartz, sericite, chlorite, calcite, barite and siderite. Hosted in metamorphosed marine tuffaceous rhyolite and metamorphosed calcareous clastic rocks correlated with the Moose Creek Member of the Mississippian Totatlanika Schist. Numerous high-angle faults. Sulfide beds appear to lie on irregular paleosurface in footwall. Domal sulfide accumulations at top of layers. Absence of footwall alteration and stringer mineralization suggests off-vent deposition. High geochemical values of As, Sb, Hg, and W may be derived from older schist basement.

Gilbert and Bundtzen, 1979; Curtis J. Freeman, written commun., 1984; T.K. Bundtzen, written commun., 1984

P06-03 63°45'N 147°22'W	WTF, Red Mountain Alaska Range and Yukon-Tanana Upland	Cu, Pb, Zn, Ag, Au Kuroko massive sulfide	At WTF, estimated 1.10 million tonnes grading 0.15% Cu, 2.5% Pb, 7.9% Zn, 270 g/t Ag, and 1.9 g/t Au

Massive pyrite, sphalerite, galena, and chalcopyrite in quartz-rich gangue occurs in felsic metavolcanic rocks derived from crystal and lapilli tuff, minor flows, and in metasedimentary rocks. Massive sulfide layers on both sides of large east-west trending syncline. The massive sulfide layers of the Red Mountain deposit occur in a proximal setting on the south limb of the anticline, within sulfide-silica exhalite up to 130 m thick. An older, southern horizon hosts sphalerite and coarse pyrite in black chlorite schist. The thin blanket of fine-grained sulfides of the WTF deposit on the north limb of the fold in a distal setting relative to the vent. Deposits occur immediately below the Sheep Creek Member and above the Mystic Creek Member of the Mississippian Totatlanika Schist.

Gilbert and Bundtzen, 1979; David R. Gaard, written commun., 1984

P06-04 63°41'N 146°39'W	Miyaoka, Hayes Glacier Alaska Range and Yukon-Tanana Upland	Cu, Pb, Zn, Au, Ag Kuroko massive sulfide	Grab samples with up to 0.92% Cu, 0.72% Pb, 0.5% Zn, 50 g/t Au, 50 g/t Ag

Zone about 13 km long and up to 0.5 km wide of massive sulfide lenses, pods, and disseminations with pyrrhotite, chalcopyrite, sparse pyrite, and sphalerite. Individual lenses and pods up to 5 m long and 1 m thick. Sulfides are in interfoliated former marine sequence of quartz mica schist, muscovite-chlorite-quartz schist, quartz-feldspar augen schist, chlorite schist, calc-schist, and marble. Host rocks derived from Devonian felsic to intermediate volcanic rocks, mainly andesite, dacite, and quartz keratophyre flows and tuffs, and Devonian or older shale, marl, and marble. Metavolcanic and metasedimentary rocks part of Yukon-Tanana terrane. Two periods of metamorphism and deformation, an older period of lower amphibolite facies, and a younger period of lower greenschist facies. Intensely deformed with locally abundant mylonite schist.

Lange and Nokleberg, 1984; Nokleberg and Lange, 1985; Lange and others, 1993

P06-05 63°36'N 146°14'W	McGinnis Glacier Alaska Range and Yukon-Tanana Upland	Zn, Cu, Pb, Ag Kuroko massive sulfide	Grab samples with up to 2.3% Zn, 0.26% Cu, 0.25% Pb, 50 g/t Ag

Disseminated to massive pods of pyrite, chalcopyrite, and sphalerite in two or three layers exposed discontinuously along a zone up to about 15 m thick and 2 km long. Individual pods up to 1 m thick. Gangue of quartz, chlorite, epidote, biotite, and actinolite. Sulfides occur in interfoliated marine sequence of metasedimentary rocks, mainly quartz schist, chlorite-quartz schist and marble, and lesser amounts of metamorphosed Devonian andesite, dacite, and keratophyre flows, tuff, and volcanic graywacke of the Yukon-Tanana terrane. Two periods of metamorphism and deformation: an older period of lower of amphibolite facies, and a younger period of lower greenschist facies. Intensely deformed with local abundant mylonite schist.

Lange and Nokleberg, 1984; Nokleberg and Lange, 1985; Lange and others, 1993

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

P06-06 63°11'N 149°55'W	Ohio Creek Southern Alaska	Sn Ag, As, Cu, Zn Sn greisen and Sn vein	Grab samples with up to 0.1% Sn, and minor Ag, As, Cu, Zn

Zone of muscovite-tourmaline greisen and quartz arsenopyrite veins in tourmaline-bearing Tertiary granite stock. Zone about 1.6 km long and 0.8 km wide. Greisen zone about 4 m thick and 45 m long occurs along contact with biotite-rich inclusion. Stock part of the lower Tertiary McKinley plutonic sequence and intrudes argillite, graywacke, and conglomerate, part of Upper Jurassic(?), Cretaceous, and lower Tertiary(?) flysch in region.

Hawley and Clark, 1974

P06-07 63°09'N 149°52'W	Ready Cash Southern Alaska	Au, Cu, Pb, Ag, Sn, Zn Polymetallic vein(?)	Chip sample with 1.4 g/t Au, 857 g/t Ag, 1.5% Cu, and 5% Pb

Arsenopyrite, chalcopyrite, and galena in quartz-arsenopyrite-sulfide veins, massive sulfide-rich veins, and disseminations along a zone at least 1.6 km long. Zone occurs in Triassic(?) limestone and pillow basalt of Chulitna region.

Hawley and Clark, 1974

P06-08 63°13'N 149°39'W	Golden Zone Southern Alaska	Au, Cu, Zn, As, Sb, Ag, Pb Polymetallic vein and Au-Ag breccia pipe or Cu-Au porphyry	Inferred reserves of 1.6 million tonnes grading 5.2 g/t Au, and 0.5 % Cu. Produced 49,169 g Au, 267,990 g Ag, 19 tonnes Cu

Auriferous arsenopyrite with minor chalcopyrite, sphalerite, and pyrite in quartz gangue, fills open spaces of breccia pipe in center of early Tertiary quartz diorite porphyry, and fractures in porphyry adjacent to breccia pipe. One zone about 125 m in diameter; high-grade ore occurs in breccia pipe approximately 75 m in diameter at surface. Abundant veins adjacent to porphyry. Porphyry, dated at 68 Ma; intrudes Permian to Jurassic sedimentary rocks of Chulitna area. Extensive exploration through much of the 1980's.

Hawley and Clark, 1974; Swainbank and others, 1977; Charles C. Hawley, written commun., 1985, 1990

P06-09 63°17'N 149°27'W	Nim, Nimbus, Silver King Southern Alaska	Au, Ag, Cu Zn, Mo, As Polymetallic vein and Porphyry Cu(?)	Nimbus and Silver King: grab samples with up to 2% Cu, 137 g/t Ag, 13 g/t Au

Nim Deposit: Veins, veinlets, and disseminations of arsenopyrite, chalcopyrite, molybdenite, and chalcocite, with some pyrite, bornite, and pyrrhotite in disseminations and fracture fillings in breccia pipes and in dikes of early Tertiary rhyolite porphyry and quartz porphyry within a body of granite porphyry. Igneous rocks intrude Triassic(?) and Jurassic(?) clastic sedimentary rocks. Deposit occurs in area about 1 km by 2 km. Nimbus and Silver King Prospects: Lenses of massive chalcopyrite, arsenopyrite, stibnite, pyrite, and sphalerite, 1 to 2 m thick, and up to 10 m long occur in brecciated early Tertiary quartz diorite porphyry dike that occurs in strand of Upper Chulitna fault.

Hawley and Clark, 1974; Swainbank and others, 1977; Richard C. Swainbank, written commun., 1985, 1988

P06-10 63°15'N 149°14'W	Coal Creek Southern Alaska	Sn, Ag, W, Zn Sn greisen(?) and Sn vein	Estimated 5 million tonnes of 0.28% Sn and about 0.5% Cu. Grab samples with up to 1.5% Sn, 148 g/t Ag

Cassiterite occurs in sheeted vein system as disseminated grains and locally high concentrations; and in minor disseminations within and above apical dome of early Tertiary granite, which intrudes older, related granite; and in thin quartz topaz-sulfide veinlets, 1 to 3 mm wide, that postdate alteration; and in stockwork veinlets. Veins vary from hairline to 1 cm width, are nearly vertical, and reach a density of 10 veins per m in the most intensely fractured zones. Veins form stockwork along fracture(?) zone in granite across area of about 4,000 m^2. Sulfides include arsenopyrite, pyrite, pyrrhotite, and sphalerite. Granite adjacent to veinlets pervasively altered to quartz, tourmaline, topaz, sericite, and minor fluorite. Granite intrudes and contact-metamorphoses Devonian argillite, graywacke, and minor limestone of Chulitna area. Granite probably part of the McKinley plutonic sequence (K-Ar ages of 55 Ma).

Reed, 1977; Warner, 1985; Gregory Thurow, written commun., 1984

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P06-16 63°13'N 146°42'W	Zackly Southern Alaska	Au, Cu, Ag Cu-Au skarn	Grab samples with up to 6.6% Cu, 4.4 g/t Au, 30 g/t Ag. Estimated 1.25 million tonnes of 2.6% Cu and 5.4 g/t Au

Disseminated chalcopyrite, bornite, pyrite, and gold in zone of andradite garnet-pyroxene skarn and adjacent sulfide bodies in contiguous marble. In Upper Triassic marble along east-west-striking contact with albitized Cretaceous quartz monzodiorite. Zone about 650 m long and about 30 m wide. Marble and diorite locally intensely faulted. Higher Au grades mainly associated with supergene(?) assemblage of malachite, limonite, chalcedony, and native copper. Gold occurs only in skarn; granitic pluton and wall rocks barren of gold. General zoning from granitic pluton to skarn with (1) brown garnet with chalcopyrite, (2) green garnet with bornite and chalcopyrite, (3) clinopyroxene and wollastonite, and (4) marble with magnetite and bornite.

Rose, 1965b; Ian M. Lange and Warren J. Nokleberg, written commun., 1984; Nokleberg and others, 1984; Rainier Newberry, written commun., 1985; Clint R. Nauman, written commun., 1985; Ford, 1987

P06-17 63°17'N 146°33'W	Kathleen-Margaret Wrangell Mountains	Cu, Ag, Au Cu-Ag quartz vein	Grab samples with up to 13% Cu, 3.2 g/t Au, 300 g/t Ag. About 1.8 tonnes ore produced

Quartz veins up to 140 m long and 3 m wide with disseminated to massive chalcopyrite, bornite, and malachite cut Upper Triassic Nikolai Greenstone. Veins strike east-west are intruded along shear zones. Some underground exploration but long dormant.

MacKevett, 1965; Nokleberg and others, 1984

P06-18 63°20'N 146°02'W	Rainy Creek District Alaska Range-Wrangell Mountains	Cu, Ag, Au Zn Cu-Ag skarn	Grab samples with up to 5.6% Cu, 300 g/t Ag, 1.2 g/t Au, 0.07% Zn

Scattered garnet-pyroxene skarn bodies that contain disseminated to small masses of chalcopyrite, and bornite, with minor sphalerite, galena, magnetite, secondary Cu-minerals, and sparse gold. Deposits occur in faulted lenses of marble of the Pennsylvanian and Permian Slana Spur Formation adjacent to late Paleozoic(?) metagabbro, metadiabase, and hypabyssal meta-andesite intrusive rocks. Local disseminated sulfides in meta-andesite. Zone of skarns up to about 10 km long and up to 5 km wide. Sulfide-bearing bodies and adjacent wall rocks locally intensely faulted.

Rose, 1966; Lange and others, 1981; Nokleberg and others, 1984; Ian M. Lange and Warren J. Nokleberg, written commun., 1984

P06-19 63°20'N 145°41'W	Rainbow Mountain Alaska Range-Wrangell Mountains	Cu, Ag Porphyry Cu	Grab samples with up to 10% Cu, 44 g/t Ag, trace Au

Zone with scattered occurrences of disseminated to small masses of chalcopyrite and pyrite, and minor sphalerite and galena in Permian meta-andesite and meta-dacite hypabyssal porphyries. Zone up to 6 km long and up to 1 km wide. Locally disseminated sulfides in metavolcanic and metasedimentary rocks near porphyries and meta-andesites.

Lange and others, 1981; Nokleberg and others, 1984; Ian M. Lange and Warren J. Nokleberg, written commun., 1985

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P06-11 62°54'N 149°57'W	Partin Creek Southern Alaska	Cu, Au, Ag Polymetallic vein or Cu-Ag quartz vein	Grab samples with up to 0.7% Cu, 63 g/t Au, 300 g/t Ag

Zone contains pyrite, arsenopyrite, pyrrhotite, and chalcopyrite in veinlets, disseminations, or vesicle fillings. Zone at least 3,000 m long and 1,000 m wide in Triassic(?) metamorphosed pillow basalt and strongly limonite-stained marble.

Hawley and Clark, 1974

P06-12 62°53'N 149°18'W	Treasure Creek Southern Alaska	Mo, Cu Au, Zn Porphyry Cu-Mo	No data

Disseminated molybdenite, chalcopyrite, arsenopyrite, sphalerite, fluorite, and epidote in silicified and sheared Tertiary granite stock, and in argillite and metagraywacke intruded by the granite. Local intense argillic alteration and limonite staining adjacent to fault and extending irregularly up to 100 m into granite stock. Argillite and metagraywacke part of regionally extensive Lower Cretaceous flysch unit. Granite stock part of the lower Tertiary McKinley plutonic sequence.

Richter, 1963; Csejtey and Miller, 1978

P06-13 60°02'N 147°51'W	Latouche, Beatson Prince William Sound	Cu, Ag, Zn Au, Pb Besshi massive sulfide(?)	Produced more than 84.4 million kg Cu from 4.5 million tonnes ore. Average ore grade about 1.7% Cu, 9.3 g/t Ag

Two major deposits and several smaller ones consisting of massive sulfide lenses and disseminations composed mainly of pyrite and pyrrhotite with minor chalcopyrite, cubanite, sphalerite, galena, silver, and gold. Gangue of quartz, sericite, and ankerite. Zone adjacent to major fault in graywacke and argillite of the lower Tertiary Orca Group. Deposits along a zone up to 120 m thick and 300 long along strike. Developed and produced mainly from about 1903 to 1934.

Johnson, 1915; Tysdal, 1978; Jansons and others, 1984; Crowe and others, 1992

P06-14 63°09'N 147°08'W	Denali (Pass Creek) Alaska Range	Cu, Ag Besshi massive sulfide?	Massive sulfide layers with abundant Cu and up to 13 g/t Ag

Stratiform bodies of very fine grained and rhythmically layered chalcopyrite and pyrite laminations in thin-bedded, shaly, carbonaceous, and limy argillite enclosed in the Upper Triassic Nikolai Greenstone. Ore body up to 166 m long and 9 m wide, and extends at least 212 m below surface. Sulfides and host rocks metamorphosed at lower greenschist facies and locally moderately folded. Several hundred meters of underground workings. Property developed from 1964 to 1969, but never put into production. Interpreted to have formed in a submarine volcanic environment of a reducing or euxinic marine basin with abundant organic matter and sulfate reducing bacteria.

Stevens, 1971; Seraphim, 1975; Smith, 1981

P06-15 63°13'N 146°48'W	Fish Lake Eastern Alaska Range	Cr, Ni, Cu, PGE Gabbroic Ni-Co	Grab samples with >0.5% Cr and 0.3% Ni

Chromite, disseminated and in wispy layers, in serpentinized olivine cumulate, and Ni-Cu-PGE sulfide minerals occuring at base of ultramafic sill. Zone up to 15 km long along strike and up to 2 km wide. Local anomalous Cu and Ni in stream-sediment and rock samples collected nearby. Olivine cumulate interpreted as comagmatic metamorphosed basalt of the Upper Triassic Nikolai Greenstone.

Nokleberg and others, 1984; Ian M. Lange and Warren J. Nokleberg, written commun., 1985; Bundtzen and others, 1996.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P06-20 63°14'N 144°10'W	Delta District Alaska Range and Yukon-Tanana Upland	Pb, Zn, Cu, Ag, Au Kuroko massive sulfide	Largest deposit contains 18 million tonnes of 0.3 to 0.7% Cu, 1 to 3% Pb, 3 to 6% Zn, 34 to 100 g/t Ag, 1 to 3.4 g/t Au

Large massive sulfide district covers about 1,000 sq km, with about 26 stratiform, transposed, and fewer replacement deposits occurring along four regional trends. Consist of varying amounts of pyrite, chalcopyrite, galena, sphalerite, and lesser malachite and bornite. Gangue mainly quartz, carbonate, and white mica. Hydrothermal alteration marked by chlorite, quartz, sericite, pyrite, and lead-silver-gold sulfides. Massive sulfides and adjacent layers with disseminated sulfides occur in zones typically 500 m long, 200 m wide, and 15 m thick. Hosted in metamorphosed Devonian spilite and keratophyre suite derived from flows, tuffs, and breccia, and metamorphosed shallow- and deep-marine sedimentary rocks; now mainly quartz schist, quartz-chlorite-feldspar schist, calc-schist, and marble of the Yukon-Tanana terrane. Numerous tholeiitic greenstone sills spatially associated with the massive sulfide bodies, and possibly genetically related to the metavolcanic suite.

Nauman and others, 1980; Lange and Nokleberg, 1984; Clint R. Nauman and Steven R. Newkirk, written commun., 1984; Ian M. Lange and Warren J. Nokleberg, written commun., 1984

P06-21 63°09'N 144°48'W	Slate Creek Alaska Range-Wrangell Mountains	Cu, Ag, Au Zn Porphyry Cu(?)	Grab samples with up to 2% Cu, 70 g/t Ag, 2 g/t Au

Zone with scattered occurrences of disseminated to small masses of chalcopyrite and pyrite, with minor sphalerite and galena in Permian(?) meta-andesite to metadacite hypabyssal porphyries. Zone about 2 km wide and up to 9 km long along strike. Disseminated sulfides locally in adjacent metavolcanic and metasedimentary rocks of the Pennsylvanian and Permian Slana Spur Formation.

Lange and others, 1981; Ian M. Lange and Warren J. Nokleberg, written commun., 1984; Nokleberg and others, 1984

P06-22 63°05'N 144°47'W	Chistochina District Alaska Range-Wrangell Mountains	Cu, Pb, Ag, Au Porphyry Cu and polymetallic vein	Grab samples with up to 20% Pb, 1.4% Cu, 21 g/t Ag, 1.4 g/t Au

Several small areas with galena, pyrite, chalcopyrite, tetrahedrite, and gold in quartz veins, small masses, and disseminations in margins of the Pennsylvanian and Permian Ahtell quartz diorite pluton and in adjacent volcanic and sedimentary rocks of the Pennsylvanian and Permian Slana Spur Formation. Quartz veins up to 10 m wide, locally contain massive barite, calcite, and cerussite over an area about 5 km long and 3 km wide. Local, small Cu-Au and Pb-Zn skarns.

Richter, 1966; Rainier J. Newberry, written commun., 1985

P06-23 63°11'N 147°16'W	Lucky Hill, Timberline Creek Maclaren	Au, Ag Au quartz vein	348,000 tonnes, averaging 7.1 g/t Au

Free gold and minor pyrite, pyrrhotite, arsenopyrite, galena, and sphalerite in sheeted quartz veins striking east-northeast and dipping steeply to the northwest. Veins occur in semischist of the Maclaren Glacier metamorphic belt. Veins also cut granodiorite at Timberline Creek. Distinctive, yellowish ankerite-carbonate assemblage occurs in veins. At Lucky Hill and Timberline Creek, Ar-Ar isotopic ages on primary micas from pluton yield emplacement age of 90-100 Ma. The age of mineralization (vein formation) is 57-63 Ma or the same age as that determined for the biotite blocking temperature in the Maclaren Glacier metamorphic belt. Because of these relations, gold mineralization is interpreted as related to regional metamorphism. Fluid inclusions are low salinity, high CO_2 types with homogenization temperatures of about 270°C.

Smith, 1981; Adams and others, 1992

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P06-24 61°45'N 149°30'W	Willow Creek District (Gold Cord, Independence, Thope, Talkeetna Mountains	Au W, As, Zn, Pb, Te Au quartz vein	Average grade of 17 to 69 g/t Au. Produced about 18.4 million g Au from 1909 to 1950.

Quartz veins with a few percent or less pyrite, chalcopyrite, magnetite, and gold; with minor arsenopyrite, sphalerite, tetrahedrite, gold tellurides, and galena. Veins average 0.3 to 1 m thick, but some up to 2 m thick. Veins occupy east-northeast and north-south-striking shear zones up to 7 m wide. Considerable alteration of wall rocks to sericite, pyrite, carbonate, and chlorite in parallel bands. Locally abundant clay-rich fault gouge along shear zones. Zone of veins in and along southern margin of Jurassic quartz diorite and younger Cretaceous and early Tertiary granitic rocks of the Talkeetna Mountains batholith, and in mica schist at the Thorpe mine. Veins interpreted as coeval with intrusion of early Tertiary adamellite pluton. District consists of several mines and many prospects, most in an area about 12.8 km long and 6.2 km wide along southern portion of batholith. Several thousand meters of underground workings. Nearly continuous mining and development from 1909 through 1942; sporadic activity from 1951 through present.

Ray, 1954; Madden-McGuire and others, 1989

P06-25 61°32'N 145°09'W	Bernard Mountain, Dust Mountain Kodiak Island and Border Ranges	Cr, PGE Podiform Cr	Four large low-grade deposits with 330,000 tonnes Cr_2O_3

Disseminations and sparse layers and lenses of chromite up to a few tens of meters long and 15 m wide in dunite tectonite. Largest deposit about 3.5 km long and 2.0 km wide, contains about 300,000 tonnes of material with 5% chromite. Sample of high-Fe chromian spinel from Dust Mountain contains up to 21 g/t PGE. Hosted in layered dunite tectonite which is part of the Early Jurassic or older, informally named Border Ranges ultramafic and mafic complex of Burns (1985); faulted at base. Local abundant serpentinite. Structural sequence from south to north composed of dunite, harzburgite, wehrlite, garnet gabbro, norite, and hornblende norite. Sporadic exploration and trenching from about 1940 to present.

Foley and others, 1984, 1985, 1992; Coleman and Burns, 1985; Burns, 1985; Newberry, 1986

P06-26 61°19'N 144°13'W	Spirit Mountain Kodiak Island and Border Ranges	Ni, Cu, Co, Ag Gabbroic Ni-Cu	At least 11,000 tonnes ranging up to 6.2 % Ni and 3.4 % Cu and 0.04 % Co. (Average 0.88 % Ni and 0.9 % Cu)

Disseminated and locally massive pyrrhotite, pyrite, chalcopyrite, pentlandite, and ullmannite (a sulphantimonide of nickel), bravoite, and minor to trace galena and sphalerite in gabbro, peridotite, and hornblendite sills and dikes that cut Mississippian Strelna Formation with an east-west trend. Ultramafic and mafic rocks may be part of the Early Jurassic or older, informally named Border Ranges ultramafic and mafic complex of Burns (1985). The sills and dikes are believed to intrude along a major thrust fault that juxtaposes a foliated quartz diorite pluton and the upper Paleozoic rocks. Deposit(s) occur as a series of lenses 1-3 m thick that extend along strike for about 2 km. Explored with trenches, pits, and two short tunnels.

Kingston and Miller, 1945; Herreid, 1970

P06-27 61°12'N 146°44'W	Gold King Chugach Mountains	Au Pb, Cu, Zn, Sb Au quartz vein	Produced about 62,000 g Au. Chip samples with up to 3.4 g/t Au and 1.3 g/t Ag

Two or more quartz fissure veins up to 1.5 m thick with gold, pyrite, galena, sphalerite, chalcopyrite, and stibnite, mainly in metagraywacke of the Upper Cretaceous Valdez Group. Sulfides compose about 3% of ore. Mineralized vein cuts small granite pluton. Graywacke locally shattered and sheared near veins. About 600 m of underground workings. Production principally between 1911 to 1924.

Johnson, 1915; Jansons and others, 1984

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

P06-28 61°07'N 146°33'W	Cliff (Port Valdez) Chugach Mountains	Au Cu, Ag, Pb, Zn, Sb Au quartz vein	Average grade from 34 to 69 g/t Au. Produced about 1,610,000 g Au from about 25,000 tonnes ore

Quartz veins up to 3 m thick and 515 m long with gold, pyrite, galena, sphalerite, arsenopyrite, and stibnite in metagraywacke and minor phyllite of the Upper Cretaceous Valdez Group. Veins in complicated system of intersecting faults. Sulfides compose about 3 to 5% percent of ore. A few thousand meters of underground workings. Production mainly from 1906 to 1940.

Johnson, 1915; Pickthorn, 1982(?); Jansons and others, 1984

P06-29 61°12'N 146°06'W	Ramsay-Rutherford Chugach Mountains	Au As, Cu, Zn, Pb Au quartz vein	Produced about 172,000 g Au. Grab samples with up to 28g/t Au

Two main quartz fissure veins up to 2 m thick and 136 m long with sparse gold, silver, pyrrhotite, pyrite, chalcopyrite, sphalerite, galena, and arsenopyrite(?) in metagraywacke of the Upper Cretaceous Valdez Group. Gangue of quartz, carbonates, and crushed country rock. More than 450 m of underground workings. Mined from about 1914 to 1935.

Johnson, 1915; Jansons and others, 1984

P06-30 61°01'N 146°16'W	Midas Prince William Sound	Cu, Ag, Au, Zn Besshi massive sulfide(?)	Average grade about 3.2% Cu, 13.7 g/t Ag, 2.1 g/t Au. Produced 1.54 million kg Cu, 471,000 g Ag, 79,000 g Au from 44,800 tonnes of ores. Estimated 56,200 tonnes of 1.6% Cu ore remain

Disseminated to massive stratiform chalcopyrite, pyrite, pyrrhotite, sphalerite, and minor galena in ore body up to 7 m thick and 300 m long. Ore bodies in phyllite and metagraywacke of the Upper Cretaceous Valdez Group. Sulfide layering parallels bedding and is folded with the host sedimentary rocks. Weak to unmineralized quartz stockwork in footwall may be feeder system for main ore body. Extensive underground workings with production between 1911 and 1919. Estimated 44,800 tonnes ore mined. Earlier workers interpreted deposit as epigenetic replacement in shear zones.

Johnson, 1915; Moffit and Fellows, 1950; Rose, 1965b; Winkler and others, 1981; Nelson and Koski, 1987; Jansons and others, 1984; Steven W. Nelson, written commun., 1986; Crowe and others, 1992

P06-31 60°54'N 146°42'W	Ellamar Prince William Sound	Cu, Au, Ag Zn Besshi massive sulfide	Produced about 7.2 million kg Cu, 1,457,000 g Au, and 5.96 million g Ag from 274,000 tonnes ore

Pyrite, pyrrhotite, chalcopyrite, cubanite, and sphalerite in disseminations and massive sulfide lenses up to 70 m thick and 150 m long in folded and sheared argillite and graywacke of the lower Tertiary Orca Group. Local diabase dikes. Explored and mined from about 1897 to 1920. A few thousand meters of workings.

Capps and Johnson, 1915; Jansons and others, 1984; Crowe and others, 1992

P06-32 60°51'N 146°33'W	Threeman, Standard Copper Prince William Sound	Cu, Au, Ag Zn Cyprus massive sulfide	About 14,500 kg Cu and byproduct Au and Ag produced at Standard Copper; 0.5 million kg Cu, 3,141 g Au, and 165,000 g Ag at Threeman

Two deposits of chalcopyrite, pyrrhotite, sphalerite, cubanite, and galena in lenticular masses and disseminations. Lenses up to about 2 m wide and 120 m long. Deposits occur in locally sheared and altered argillite, graywacke, tuff, and pillow basalt of the lower Tertiary Orca Group. Explored and mined from about 1904 to about 1918. A few thousand meters of workings.

Capps and Johnson, 1915; Jansons and others, 1984; Crowe and others, 1992

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P06-33 60°46'N 146°25'W	Fidalgo-Alaska, Schlosser Prince William Sound	Cu, Zn Besshi massive sulfide(?)	Produced about 1.89 million kg Cu from 19,440 tonnes ore. Estimated 23,000 tonnes of 3.2% Cu remain

Chalcopyrite and pyrite, with rare sphalerite and pyrrhotite occur in broad shear zones up to 90 m long. Quartz and calcite gangue. Deposits occur in intensely folded and sheared graywacke, limestone, and argillite of the lower Tertiary Orca Group. Developed and mined from 1913 to about 1920. About 750 m of underground workings.

Capps and Johnson, 1915; Jansons and others, 1984; Crowe and others, 1992

P06-34 61°02'N 149°06'W	Monarch, Jewel Chugach Mountains	Au Pb, Cu, Zn, As, Mo Au quartz vein	Produced about 154,000 g Au. Chip samples range from 10.6 to 36.7 g/t Au with about 10.6 g/t Ag

Two or more quartz veins up to 0.3 m thick with calcite, and sparse galena, chalcopyrite, sphalerite, arsenopyrite, molybdenite, gold, and silver in metagraywacke and phyllite of the Upper Cretaceous Valdez Group. Few Tertiary felsic dikes and granodiorite. Over 380 m of underground workings.

Johnson, 1915; Jansons and others, 1984

P06-35 60°57'N 148°21'W	Mineral King (Herman and Eaton) Chugach Mountains	Au Zn, Pb, Cu, As Au quartz vein	Produced about 87,000 g Au. Grab samples with up to 5.1 g/t Au and 4.5 g/t Ag. Estimated 450 tonnes ore

Quartz veins up to 2 m wide form lenses up to 22 m long with calcite, sphalerite, pyrite, galena, chalcopyrite, gold, pyrrhotite, and arsenopyrite in metagraywacke and phyllite of the Upper Cretaceous Valdez Group and in Tertiary granite. About 450 m of underground workings.

Tysdal, 1978; Jansons and others, 1984

P06-36 60°58'N 148°13'W	Granite Chugach Mountains	Au As, Cu, Pb, Sb, Zn Au quartz vein	Produced about 776,000 g Au. Estimated 1,700 tonnes ore

Fissure up to 4 m wide with brecciated phyllite and metagraywacke cemented by quartz with gold, pyrite, arsenopyrite, chalcopyrite, galena, stibnite, and sphalerite in the Upper Cretaceous Valdez Group and in Tertiary granite. Extensive development from about 1914 to about 1940.

Tysdal, 1978; Jansons and others, 1984

P06-37 60°46'N 149°33'W	Lucky Strike (Palmer Creek) Chugach Mountains	Au Cu, Pb, Ag Au quartz vein	Grab sample with 7 g/t Ag and 0.15% Pb. Produced about 172,450 g Au. Estimated 1,800 tonnes ore

Quartz vein up to 1.7 m thick with sparse gold, pyrite, chalcopyrite, sphalerite, and galena in brecciated and fractured phyllite of the Upper Cretaceous Valdez Group. Fractures normal to cleavage. Extensive development; production mainly between 1916 and 1940.

Tysdal, 1978; Jansons and others, 1984

P06-38 60°37'N 149°34'W	Alaska Oracle, Gilpatrick Chugach Mountains	Au Au quartz vein	Produced about 106,000 g Au. Estimated 1,800 tonnes ore.

Quartz veins up to 2 m thick with gold, arsenopyrite, galena, and sphalerite, and some chalcopyrite, molybdenite, and pyrrhotite. Veins in fault zones mainly in phyllite of the Upper Cretaceous Valdez Group. Wall rocks locally altered near veins, with highest grade ore in areas of most alteration. Over 200 m of underground workings. Most production from about 1933 to 1940.

Tuck, 1933; Tysdal, 1978; Jansons and others, 1984

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P06-39 60°27'N 149°18'W	Crown-Point, Kenai-Alaska Chugach Mountains	Au As, Pb, Zn Au quartz vein	Produced about 97,200 g Au. Estimated 13,600 tonnes ore

Shear zone up to 900 m long and 12 cm wide in phyllite of the Upper Cretaceous Valdez Group is filled with brecciated phyllite cemented by vuggy quartz that contains gold, arsenopyrite, galena, sphalerite, and calcite. Local quartz lenses and stringers up to 0.75 m wide. Extensive development mainly from about 1909 to 1940; over 500 m of underground workings.

Martin and others, 1915; Tysdal, 1978; Jansons and others, 1984

P06-40 60°21'N 147°39'W	Copper Bullion, Rua Cove Prince William Sound	Cu Zn Besshi massive sulfide	Estimated 1.0 million tonnes of 1.25% Cu

Lens-shaped body of pyrrhotite with minor chalcopyrite and sphalerite in sheared pillow basalt of the lower Tertiary Orca Group. Lens about 200 m long. No production.

Johnson, 1915, 1918; Stafansson and Moxham, 1946; Tysdal, 1978; Koski and others, 1985; Crowe and others, 1992

P06-41 60°20'N 147°42'W	Knight Island, Pandora Prince William Sound	Cu Zn Cyprus massive sulfide	Produced up to a few thousand tonnes ore

Two major deposits and several smaller deposits with pyrite, pyrrhotite, chalcopyrite, cubanite, sphalerite, and quartz in massive sulfide lenses and disseminations. Lenses up to 9 m thick; average 1.5 m thick. Lenses mainly at sheared contacts with host rocks. Deposits occur in pillow basalt of the lower Tertiary Orca Group. A few hundred meters of underground workings; minor production.

Moffit and Fellows, 1950; Tysdal, 1978; Jansons and others, 1984; Crowe and others, 1992

P07-01 63°53'N 143°28'W	Mosquito East-Central Alaska	Cu, Mo Porphyry Cu-Mo	No data

Disseminated chalcopyrite, molybdenite, and pyrite in hydrothermally altered Late Cretaceous to early Tertiary quartz monzonite and quartz monzonite porphyry. Granitic rocks intrude mid-Paleozoic or older schist of the Yukon-Tanana terrane.

Singer and others, 1976

P07-02 63°39'N 141°19'W	Taurus East-Central Alaska	Cu, Mo Porphyry Cu-Mo	Estimated 126 million tonnes grading 0.30 % Cu, 0.03% Mo, 0.34 g/t Au

At least three areas of mineralization and locally intense potassic, propylitic, and sericitic alteration occur along a zone of hypabyssal plutons about 13 km long and 1.6 km wide. Plutons consist of early Tertiary granite porphyry, granodiorite, and quartz latite porphyry that intrudes middle Paleozoic or older quartz-sericite schist and gneiss of Yukon-Tanana terrane. Numerous faults and shears. Ore consists of chalcopyrite, molybdenite, and pyrite in disseminations and veinlets of quartz-orthoclase-sericite, quartz-magnetite-anhydrite, quartz-sericite-pyrite-clay-fluorite, quartz-orthoclase-biotite, and of solid chalcopyrite. Magnetite-rich cores of the potassic altered, granite porphyries contain sparse sulfides. Higher concentrations of Cu and Mo sulfides occur with periphery that contains phyllic alteration. Sequence of alteration, from oldest to youngest: propylitic, potassic, phyllic, and argillic. Potassic alteration in core of plutons, propylitic and sericite alteration in periphery and adjacent wall rocks. Local tourmaline, fluorite, and replacement of chalcopyrite by chalcocite.

Edward R. Chipp, written commun., 1984; Bundtzen and others, 1992b

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P07-03 63°38'N 141°29'W	Bluff East-Central Alaska	Cu, Mo Porphyry Cu-Mo	No data

Disseminated pyrite, chalcopyrite, molybdenite, and magnetite in hypabyssal Cretaceous or early Tertiary porphyritic granite, granodiorite, and quartz porphyry. Intense hydrothermal alteration. Numerous faults and dikes. Granitic rocks intrude middle Paleozoic or older schist of the Yukon-Tanana terrane.

Singer and others, 1976; Eberlein and others, 1977

P07-04 63°22'N 142°30'W	Asarco East-Central Alaska	Cu, Mo Porphyry Cu-Mo	No data

Disseminated molybdenite and Cu-sulfides in silicified and leached, Tertiary, hypabyssal, quartz porphyry pluton that intrudes middle Paleozoic or older Yukon-Tanana terrane.

Singer and others, 1976; Helen L. Foster, written commun., 1977, in Eberlein and others, 1977

P07-05 62°44'N 138°49'W	Casino (Patton Hill) East-Central Alaska	Cu, Mo W, Au Porphyry Cu-Mo	Large. Reserves of 584 million tonnes (hypo. & supergene) grading 0.26% Cu, 0.025% MoS2, 0.31 g/t Au.

Hypogene part of deposit consists of chalcopyrite and molybdenite that are associated with phyllitic alteration (quartz+sericite+sulfide) in fine breccia, porphyritic dacite, granite and tuffaceous rocks. Igneous rocks are associated with the Late Cretaceous Mount Nansen Igneous suite (with a K-Ar isotopic age 71.3 Ma ± 2.2 Ma) that is surrounded by older unmineralized quartz monzonite and granodiorite. A supergene enrichment zone with 95 million tonnes grading 0.43% Cu, 0.031% Mo, averages 80 meters thick and contains malachite, chalcocite, covellite, native Cu, pyrite and molybdenite. Consistent gold grades in the supergene zone over large areas range from 0.3 to 0.5 g/t. An additional 31 million tonnes of oxide gold ore grading 0.62 g/t occurs in a leached cap. Deposit age interpreted as Late Cretaceous.

D. Eaton and S. Main, Archer, Cathro, and Associates, written commun., 1986; EMR Canada, 1989; Mining Review, 1992; Sinclair, 1986; Northern Miner, December 6,1993.

P07-06 62°23'N 143°00'W	Nabesna, Rambler Eastern-Southern Alaska	Au Cu, Ag, Pb, Zn, Fe Fe-Au skarn	Nabesna Mine produced about 1.66 million g Au, minor Ag and Cu. Estimated 18,000 tonnes of 34.3 g/t Au in Rambler mine.

Nabesna Mine: massive oxide-sulfide bodies, quartz-pyrite veins, and pyrite veins, all with disseminated gold in Upper Triassic Chitistone or Nizina Limestone near contact with Cretaceous monzodiorite pluton. Massive oxide-sulfide bodies chiefly pyrite and magnetite with minor chalcopyrite, galena, sphalerite, arsenopyrite, stibnite, and gold. Pyrite veins formed by replacement of limestone along pre-existing fractures and contain disseminated to small masses of chalcopyrite, galena, sphalerite, magnetite, pyrrhotite, arsenopyrite, stibnite, and gold. Large body of massive auriferous pyrrhotite and pyrite at Rambler Mine. Monzodiorite pluton has K-Ar ages of 109 and 114 Ma. Principal mining at Nabesna from about 1930 to 1941. Several hundred meters of workings. Several episodes of exploration since.

Wayland, 1943; Richter and others, 1975; Donald H. Richter, written commun., 1985; Rainer Newberry and T.K. Bundtzen, written commun., 1985

P07-07 62°12'N 142°45'W	Orange Hill, Bond Creek Eastern-Southern Alaska	Cu, Mo, Au Porphyry Cu-Mo and Cu-Au skarn	Estimated 320 million tonnes of 0.35% Cu and 0.02% Mo at Orange Hill. 500 million tonnes of 0.30% Cu and 0.02% Mo at Bond Creek.

Two similar deposits with pyrite, chalcopyrite, and minor molybdenite in quartz veinlets in the Cretaceous Nabesna pluton, a complex intrusion of granodiorite and quartz diorite intruded by granite porphyry. Abundant biotite-quartz, quartz-sericite, and chlorite-sericite-epidote alteration; late anhydrite veins. Altered areas about 1,000 by 3,000 m at Orange Hill, and 2,000 by 3,000 m at Bond Creek. Associated skarns with pyrite, chalcopyrite, bornite, and magnetite at Orange Hill, and sphalerite, pyrite, pyrrhotite, and chalcopyrite in adjacent areas. Pluton intrudes upper Paleozoic metavolcanic rocks and marble, and Upper Triassic limestone and Nikolai Greenstone.

Van Alstine and Black, 1946; Richter and others, 1975.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P07-08 62°07'N 142°50'W	Nabesna Glacier and adjacent areas. Southern Alaska?	Cu, Zn, Au Polymetallic vein(?)	No data.

Three contiguous areas with: (1) quartz veins and veinlets that contain pyrite, with minor chalcopyrite and sphalerite; (2) a zone of disseminated malachite and azurite; (3) a zone of intense alteration with breccia cemented by quartz, pyrite, chalcopyrite, and galena. Deposits occur in late Paleozoic metavolcanic porphyry and metabasalt flows of the Tetelna Volcanics; may be related to nearby Cretaceous and Tertiary granitic plutons and dikes.

Richter, 1975

P07-09 62°05'N 141°13'W	Baultoff, Horsfeld, Carl Creek Eastern-Southern Alaska	Cu Mo Porphyry Cu	Estimated 240 million tonnes of 0.2% Cu and <0.01% Mo; trace Au

Three separate areas with pyrite and chalcopyrite in veinlets and disseminated in altered Cretaceous granitic plutons composed of quartz diorite, quartz diorite porphyry, or granite porphyry. Altered areas up to 1,000 by 2,000 m with chlorite, sericite, albite, and pyrite. Local actinolite veins and disseminations. Host rocks part of the Cretaceous Klein Creek batholith and associated granitic rocks which intrude Upper Jurassic and Lower Cretaceous flysch of Gravina-Nutzotin belt.

Richter and others, 1975

P07-10 61°39'N 143°43'W	Nugget Creek Wrangell Mountains	Cu, Ag Cu-Ag quartz vein	Grab sample with >200 g/t Ag, and >2% Cu. Produced 145 tonnes ore and concentrate

Quartz vein more than 1 m thick with bornite, chalcopyrite, and pyrite. Vein occurs along fault in Upper Triassic Nikolai Greenstone. Slablike copper nugget weighing several tonnes found as float in Nugget Creek. Development and production from 1916 to 1919. More than 1,200 m underground workings. Grade decreases at depth.

MacKevett, 1976

P07-11 61°34'N 143°43'W	London and Cape Eastern-Southern Alaska	Cu, Mo, Ag Porphyry Cu-Mo	Grab samples with up to 10% Cu, 0.007% Mo, 1.5 g/t Ag. Average grade of about 0.1% Cu

Pyrite and chalcopyrite in veinlets and disseminations in locally altered Jurassic(?) granodiorite and quartz diorite. Granitic rocks intrude Lower Cretaceous sedimentary rocks. Short adit.

Moffitt and Mertie, 1923; MacKevett, 1976

P07-12 61°33'N 143°47'W	Midas (Berg Creek) Eastern-Southern Alaska	Au, Cu, Ag Cu-Au skarn	Grab samples with up to 8g/t Au, 10 g/t Ag, and 20% Cu

Disseminated to small masses of magnetite, pyrite, and chalcopyrite in quartz veins and skarns in metamorphosed Triassic Nizina Limestone adjacent to Jurassic granodiorite to quartz monzodiorite pluton. Skarn composed of magnetite and epidote with local pyrite, chalcopyrite, and gold. Two short adits.

MacKevett, 1976

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P07-13 61°31'N 142°50'W	Kennecott District Wrangell Mountains	Cu, Ag Kennecott Cu	Produced about 544 million kg Cu and 280 million g Ag from 4.3 million tonnes ore

Mainly chalcocite and covellite, with minor enargite, bornite, chalcopyrite, luzonite, and pyrite. Tennantite, sphalerite, and galena extremely rare. Local surface oxidation of sulfides to malachite and azurite. Sulfides occur mainly as large, irregular, massive, wedge-shaped bodies, mainly in dolomitic parts of the Upper Triassic Chitistone or Nizina Limestone; generally less than 100 m above the Middle and(or) Upper Triassic Nikolai Greenstone. Largest ore body (Jumbo) consists of an almost pure chalcocite and covellite mass about 110 m high, up to 18.5 m wide, and that extends 460 m along plunge. One of the most productive group of mines in Alaska from 1913 until 1938 when the ore was exhausted. More than 96 km of underground workings. Major mines in district are Jumbo, Bonanza, Erie, Mother Lode, and Green Butte. Deposits interpreted by Armstrong and MacKevett (1982) as having formed by mobilization of Cu from the underlying Nikolai Greenstone and deposited during regional metamorphism in fossil karsts of a dolomitic sabkha interface in overlying limestone. Age of deposition interpreted as Cretaceous(?).

Bateman and McLaughlin, 1920; MacKevett, 1976; Armstrong and MacKevett, 1982; Edward M. MacKevett, Jr., written commun., 1986

P07-14 61°28'N 142°41'W	Nikolai Wrangell Mountains	Cu, Ag Cu-Ag quartz vein	Grab sample with 1% Cu

Two quartz veins, each less than 1 m thick, with bornite, chalcopyrite, bornite, pyrrhotite, and secondary copper, and iron minerals. Quartz-calcite gangue. Veins in shear zone near top of the Middle and (or) Upper Triassic Nikolai Greenstone. Deposit known to natives in late 1800's. More than 100 m of underground workings. Developed in 1899 but little work since.

Moffit and Capps, 1911; Miller, 1946; MacKevett and Smith, 1968

P07-15 61°24'N 142°30'W	Westover Wrangell Mountains	Cu, Ag Kennecott Cu	Channel samples with abundant Cu, 50 g/t Ag, 0.2% As. Grab sample with >2% Cu, 50 g/t Ag, 0.2% As

Wedge-shaped pods and veins of disseminated to massive bornite-rich ore, with minor chalcocite, malachite, and chalcopyrite; in lower part of the Upper Triassic Chitistone Limestone. Largest pod 10 m long and 3 m wide. Limestone locally silicified near ore. More than 400 m of underground workings. Development and minor production from 1911 to 1920. Similar to Kennecott deposit.

Moffit and Capps, 1911; Moffit, 1918; Miller, 1946; MacKevett and Smith, 1968; MacKevett, 1976

P07-16 61°27'N 142°23'W	Nelson (Glacier Creek) Wrangell Mountains	Cu, Ag Kennecott Cu	Abundant Cu; grab samples with >2% Cu, 50 g/t Ag, 0.3% As

Stringers and discontinuous masses of disseminated to massive chalcocite and covellite with minor enargite, bornite, malachite, chalcopyrite, native copper, and pyrite in basal parts of fault block of the Upper Triassic Chitistone Limestone. Local faulting and shearing. Minor production from 1929 to 1930. Several pits, five short adits, and a few hundred meters of underground workings. Similar to Kennecott deposit.

Miller, 1946; Sainsbury, 1951; MacKevett and Smith, 1968; MacKevett, 1976; Still and others, 1991

P07-17 61°25'N 142°15'W	Erickson Wrangell Mountains	Cu Basaltic Cu	Grab samples with >2% Cu, 70 g/t Ag

Massive to disseminated native copper, tenorite, cuprite, and minor amounts of other Cu minerals in irregular masses, thin veins, and stringers in rubbly upper parts of flows, and to lesser extent, in amygdules and quartz-epidote veins in the Middle and (or) Upper Triassic Nikolai Greenstone. Most of copper fine-grained; copper masses to 27 kg. Minor production in 1917. About 100 m of underground workings.

Miller, 1946; MacKevett and Smith, 1968; MacKevett, 1976

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P07-18 61°28'N 139°31'W	Wellgreen Eastern Alaska Range	Ni, Cu, PGE Gabbroic Ni-Cu	Medium. Reserves of 50 million tonnes grading 0.36%Ni, 0.35%Cu, 0.51g/t Pt, 0.34 g/t Pd.

Consists of massive pyrrhotite, pentlandite, chalcopyrite and magnetite lenses that are scattered along the footwall contact of a steeply dipping fault zone in gabbroic rocks of the Late Triassic Quill Creek Complex. Deposit occurs within a 130 km belt of Ni-Cu-Co-PGE occurrences that are hosted in the Pennsylvanian Skolai Assemblage that includes the Canalask deposit at White River. Cu-Ni sulfides are disseminated within mafic dikes and peridotite. Production in 1972-73. Deposit age interpreted as Late Triassic.

Campbell, 1976; Hulbert and others, 1988; EMR Canada, 1989; Mining Review, 1991.

P07-19 60°59'N 138°39'W	Bullion Creek Eastern Alaska Range	Gypsum Strataform gypsum	Medium (estimate).

Consists of thick gypsum beds that occur in limestone of the Upper Triassic Nizina Formation for a length of 5 km. Small veins of chalcopyrite occur in vicinity. Deposit age interpreted as Upper Triassic.

Dawson and others, 1991; Gordey and others, 1991.

P08-01 63°55'N 135°15'W	Keno Hill (Galena Hill) Tombstone	Ag, Pb, Zn, Cd Ag polymetallic vein	Medium. Production of 4.87 million tonnes grading 1412 g/t Ag , 6.8% Pb, 4.6% Zn, 0.02 g/t Au.

Consists of argentiferous galena, freibergite, and pyrargyrite with minor polybasite, stephanite, argentite and native silver that occur as fault veins, breccias and sheeted zones. Deposit hosted predominantly within the Keno Hill Quartzite of the Early Mississippian Upper Earn Group that forms part of a Devonian- Mississippian clastic wedge. Two stages of veining occur: an earlier stage of quartz-pyrite-arsenopyrite-sulphosalts and trace gold that formed prior to movement on fault veins; and a post-fault set of siderite-galena-sphalerite-pyrite-friebergite-pyrargyrite. K-Ar isotoic age of 90 Ma age interpreted as age of deposit and may be related to granitoid intrusions of similar age north and south of Keno Hill. Between 1921 and 1988 production of 6769 t of Ag, half of which came from the Elsa, Keno No. 9, Lucky Queen, Silver King, Sadie-Ladue and Husky Mines. More than 65 ore deposits and prospects occur in the area. Deposit age interpreted as mid-Cretaceous.

Watson, 1986; EMR Canada, 1989; Lynch, 1989; Murphy and Roots, 1992; Yukon Minfile, 1992.

P08-02 64°01'N 134°28'W	Marg Dempster	Zn, Pb, Cu, Ag, Au Kuroko Zn-Pb-Cu massive sulfide	Medium. Estimated 2.097 million tonnes grading 5.0% Zn , 2.7%Pb, 1.8%Cu, 65g/t Ag, 1.2 g/t Au.

Consists of pyrite, sphalerite, chalcopyrite and galena with minor arsenopyrite and tetrahedrite that occur in a quartz and barite gangue. Deposit hosted in altered and deformed metavolcanic and metasedimentary rocks of Devonian-Mississippian age. Host rocks are tectonically interleaved with, and overlain by the Keno Hill quartzite of the Upper Earn Group, part of a Devonian and Mississippian clastic wedge. Deposit consists of four stacked massive sulfide lenses that occur at the contact of quartz-sericite-chlorite phyllite and graphitic phyllite. Deposit is banded and zoned. Deposit age interpreted as Carboniferous.

EMR Canada, 1989; Eaton, written commun., Archer, Cathro, and Associates, 1989; Yukon Minfile, 1991.

P08-03 64°10'N 133°22'W	Craig (Tara, Nadaleen Mtn) Tombstone	Pb, Zn, Ag, Au Ag polymetallic vein	Medium. Reserves of 6.1 million tonnes grading 13.3% Zn, 8.2% Pb, 106 g/t Ag.

Consists of galena and sphalerite with accessory pyrite and tetrahedrite, and rare chalcopyrite, realgar and orpiment. Deposit hosted in silicified dolomite breccia which occurs within brown-weathering and green recessive weathering Carboniferous(?) shales. Five occurences are known over a distance of 6.5 km. Ag concentrations interpreted as secondary mineralization. Reserves range up to 0.69 g/t Au. Deposit age interpreted as Cretaceous(?).

Yukon Minfile, 1990; Mining Review, 1992.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			
P08-04 62°36'N 137°15'W	Minto Copper (Def) Klotassin	Cu Au, Ag Porphyry Cu-Au	Medium. Reserves of 6.55 million tonnes grading 1.87% Cu, 0.51 g/t Au.

Consists of disseminated chalcopyrite, bornite, magnetite and pyrite with minor hessite and native gold that occur in zones of moderate to strong gneissic foliation in diorite of the Triassic Klotassin Batholith. Deposit interpreted as a metamorphosed porphyry Cu deposit. Deposit age interpreted as Late Triassic.

Pearson and Clark, 1979, EMR Canada, 1989; Minto Explorations Ltd., news release, January 25, 1994.

P08-05 62°26'N 137°37'W	Cash, (Klazan, Johnny) East-Central Alaska	Cu, Mo Porphyry Cu-Mo	Medium. Resource of 40 million tonnes grading 0.17% Cu, 0.018% MoS2, 0.2 g/t Au.

Consists of two zones of pyrite, chalcopyrite and molybdenite that occur as fracture filling, in quartz veins and as disseminations. Deposit hosted in altered Late Cretaceous Mt Nansen Group feldspar porphyry stock and adjacent Paleozoic metamorphic rocks. Reserves are for the Cash occurrence. K-Ar isotopic age of 68.2 Ma ± 1.6 Ma interpreted as age of mineralization. Deposit age interpreted as Late Cretaceous.

Sinclair, 1986; EMR Canada, 1989; Yukon Minfile, 1991.

P08-06 62°19'N 136°58'W	Granite Mountain East-Central Alaska	Cu, Mo Porphyry Cu-Mo	Medium: (estimate). Approximate grade of 1% Cu.

Consists of pyrite and chalcopyrite that occur as disseminations and in fracture veinlets, and molybdenite that occurs in quartz veinlets. Deposit hosted in hornblende diorite of the Klotassin batholith, a mid-Cretaceous granitic to dioritic stock, and along the contact between the two. Alteration varies from propylitic to argillic with potassic alteration associated with veinlet fractures. Best intersection graded 0.31% Cu for 12.2 meters. Average grade of about 1% Cu based on diamond drilling. Deposit age interpreted as Late Cretaceous.

Yukon Minfile, 1991.

P08-07 62°21'N 136°42'W	Williams Creek Klotassin	Cu Ag, Au, Mo Porphyry Cu-Au	Medium. Reserves of 10.5 million tonnes grading 1.08% Cu, 0.44 g/t Au.

Consists of chalcopyrite, bornite, pyrite and minor arsenopyrite and molybdenite that occur as interstitial grains parallel with the gneissic foliation in granodiorite of the Triassic Klotassin Batholith. Lower Jurassic regional metamorphism has destroyed much of the original features of the deposit. An oxidized zone up to 200 meters deep contains malachite and azurite replacing copper sulfides. Deposit age interpreted as Late Triassic.

Pearson and Clark, 1979; EMR Canada, 1989; Western Holdings Ltd., annual report, 1992.

P08-08 62°22'N 133°22'W	Faro (Anvil) Anvil	Zn, Pb, Ag Cu, Ba, Au Sedimentary exhalative Pb-Zn	Large. Pre-production reserves of 57.6 million tonnes grading 4.7% Zn, 3.4% Pb, 36 g/t Ag, 1 g/t Au.

Consists of massive pyrite, sphalerite, galena, pyrrhotite, chalcopyrite and marcasite with patchy barite and trace tetrahedrite, bournonite and arsenopyrite and a siliceous gangue. Deposit occurs approximately 100 meters stratigraphically below the contact between phyllite and quartzite of the Lower Cambrian Mt. Mye Formation and calcareous sedimentary rocks of the Cambrian and Ordovician Vangorda Formation . Higher grades are associated with the presence of barite. Hosted by sedimentary rocks of western Selwyn basin that are interpreted as part of a Cambrian-Devonian passive margin. Forms deposit of the Anvil district. Deposit age interprreted as Late Cambrian.

Jennings and Jilson, 1986; MacIntyre, 1991; Yukon Minfile, 1991.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P08-09 62°14'N 133°02'W	Vangorda Creek (Grum, Firth, DY) Anvil	Zn, Pb, Ag Cu, Au Sedimentary exhalative Pb-Zn	Large. Reserves of 59 million tonnes grading 5.5% Zn, 4.0% Pb, 61.4 g/t Ag, 1 g/t Au.

Consists of massive sphalerite, galena and pyrite with minor chalcopyrite and traces of tetrahedrite and arsenopyrite that occur as massive sulfide bands. Deposit hosted in the uppermost layers of the Lower Cambrian Mt. Mye Formation, immediately below the contact with carbonate-rich sedimentary rocks of the Cambrian and Ordovician Vangorda Formation interpreted as part of a Cambrian and Devonian passive margin. Deposit enclosed within an envelope of quartz-muscovite alteration. Low-grade gold values are associated with chalcopyrite in the lower part of Mt. Mye section in quartzite and siliceous phyllite. Reserves are combined data for Dy, Vangorda, Firth and Grum deposits. Deposit age interpreted as Late Cambrian.

Jennings and Jilson, 1986; MacIntyre, 1991; Yukon Minfile, 1991.

P08-10 62°13'N 133°02'W	Swim (Sea, SB) Anvil	Zn, Pb, Ag Sedimentary exhalative Pb-Zn	Medium. Reserves of 22.75 million tonnes grading 4.7% Zn, 3.8% Pb, 42 g/t Ag.

Consists of massive pyrite, pyrrhotite, sphalerite and galena with minor chalcopyrite and traces of tetrahedrite, bournonite and arsenopyrite. Deposit hosted in phyllite and quartzitie of the Lower Cambrian Mt. Mye Formation immediately below the contact with calcareous sedimentary rocks of the Cambrian and Ordovician Vangorda Formation interpreted as part of a Cambrian and Devonian passive margin. Deposit age interpreted as Late Cambrian.

Jennings and Jilson, 1986; MacIntyre, 1991; Yukon Minfile, 1991.

P08-11 61°52'N 133°23'W	Risby (Cab) Cassiar	W Cu, Mo W skarn	Large. Reserves of 3.2 million tonnes grading 0.82% WO3.

Consists of two diopside-garnet skarns that occur in Lower Cambrian carbonates that are intruded by granitic sills of the Cassiar plutonic suite. No. 1 zone has a high pyrrhotite and low chalcopyrite content. No. 2 zone, which is intruded by a sill, has higher WO3 mineralization and low sulfides. Reserves of 2.7 million tonnes grading 0.81% WO3 and an additional 500,000 tonnes grading 1% WO3. Deposit age interpreted as mid-Cretaceous.

Sinclair, 1986; EMR Canada, 1989; Yukon Minfile, 1990; Mining Review, 1992.

P08-12 61°18'N 136°55'W	Hopkins (Giltana) Whitehorse	Cu Mo, Ag, Au, W, U Cu skarn	Medium. Reserves of 600,000 tonnes grading 1.65% Cu (inferred).

Consists of mMagnetite-pyrrhotite-bornite-chalcopyrite skarn with minor molybdenite and scheelite that occur in five or more zones. Skarns hosted in calcareous metasedimentary rocks of the early Paleozoic Nasina Assemblage near contacts with mid- -Cretaceous granodiorite stocks and feldspar porphyry dikes of the Whitehorse Plutonic Suite. Some dikes contain chalcopyrite and molybdenite. Deposit age interpreted as mid-Cretaceous.

EMR Canada, 1989; Yukon Minfile, 1990.

P08-13 60°59'N 133°44'W	Red Mountain (Bug, Fox, Boswell R.) Surprise Lake	Mo Ag, W, Cu Porphyry Mo	Large. Reserves of 187 million tonnes grading 0.167% MoS2 (0.1% cut-off).

Consists of disseminated molybdenite that occurs in quartz stockwork. Deposit hosted in an altered Late Cretaceous quartz monzonite stock of the Surprise Lake Suite (K-Ar isotopic age of 87.3 Ma ± 2.0 Ma) and immediately adjacent hornfelsed argillite of the early Paleozoic Nasina Assemblage. Stock is complex with a classical alteration pattern, and is cut by barren quartz diorite. Reserves include 21.3 million tonnes grading 0.293% MoS2 using a 0.25% cut-off. Deposit age interpreted as Late Cretaceous.

Sinclair, 1986; EMR Canada, 1989; Dawson, and others, 1991; Yukon Minfile, 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

P08-14 60°37'N 135°03'W	Whitehorse Copper Belt (Little Chief, War Eagle, Whitehorse	Cu, Au, Ag Cu skarn	Medium. Production and reserves of 13.2 million tonnes grading 1.4%Cu, 0.7g/t Au, 8.9g/t Ag (approx.).

Consists of twelve calc-silicate skarns with bornite and chalcopyrite, and minor chalcopyrite, native copper, tetrahedrite and molybdenite mineralization. Skarns occur along irregular contacts between Triassic Lewes River carbonates and Cretaceous granodiorite of the Whitehorse Batholith. Production from 1898-1982 was 142,000 tonnes Cu, 7,090 kg Au and 90,000 kg Ag. Deposit age interpreted as mid-Cretaceous.

Watson, 1984; Meinert, 1986; Dawson and others, 1991; Yukon Minfile, 1991.

P09-01 63°37'N 129°40'W	Jeff (Naomi, Baroid) MacMillan Pass	Ba Sedimentary exhalative Ba	Large. Reserves of 2.2 million tonnes with specific gravity of 3.49.

Consists of barite that occurs as discrete spheres from 1 to 5 mm in diameter with internal radial crystalline structure, and as elongated radially crystalline lenses. Deposit hosted by shale of the Middle to Late Devonian Lower Earn Group that are interpreted as part of a Devonian and Mississippian clastic wedge. Barite forms an elongate tabular stratabound body that is exposed at the southeast over a strike length of 200 meters with a thickness of approximately 25 meters. Deposit age interpreted as Middle and Late Devonian.

Dawson and Orchard, 1982; Yukon Minfile, 1983.

P09-02 63°44'N 128°52'W	Gravity (BA) MacMillan Pass	Ba Sedimentary exhalative Ba	Medium (estimate).

Consists of thin, fissile, bedded barite with pyrite nodules (avg. 1 cm diameter) that occur in Middle and Late Devonian shales of the lower Earn Group that are interpreted as part of a Devonian and Mississippian clastic. Barite zone ranges up to 16 meters thick and extends for a strike length of about 650 meters. Isoclinal folding at the north end of the deposit, where fauulted, has effectively doubled the thickness to over 35 meters. Deposit age interpreted as Middle to Late Devonian.

Yukon Minfile, 1989.

P09-03 63°49'N 127°46'W	June Creek (Baldwin, Shell) Redstone	Cu, Ag Sediment-hosted Cu	Medium. Reserves of 1.4 million tonnes grading 2.8% Cu.

Consists of pyrite, chalcopyrite and bornite with minor digenite, chalcocite, covellite, malachite and azurite that occur in lensoid stratiform bodies. Deposit hosted in dolomites of the Coates Lake Group of the Windermere Supergroup. Detritus from eroded copper-bearing basalt flows of the Little Dal Group, that forms part of the underlying Redstone River Formation, are postulated as the source. Deposit age interpreted as Late Proterozoic.

Brown and Chartrand, 1983; Yukon Minfile, 1984; Jefferson and Ruelle, 1986; EMR Canada, 1989.

P09-04 63°17'N 130°33'W	Cathy ((Bar, Walt, Hess)) MacMillan Pass	Ba, (Pb, Zn, Ag) Sedimentary exhalative Ba	Medium. Reserves of 453,500 tonnes grading 100% BaSO4.

Consists of fve barite beds that occur within a 60 meter-thick, 2 km-long sequence of cherty argillite, chert, siltstone and partially baritic sandstone, minor limestone and conglomerate of the Givetian (Middle Devonian) basal unit of the Middle to Late Devonian lower Earn Group. Host rocks interpreted as part of a Devonian-Mississippian clastic wedge. Sphalerite, galena and tetrahedrite occur in witherite (barium carbonate) at the Hess zone. A rough zonation exists with brecciated witherite in the core grading outward to layers of massive barite and finally laminated barite. Deposit age interpreted as Middle Devonian.

Dawson and Orchard, 1982; Abbott, 1986; EMR Canada, 1989; Yukon Minfile, 1990.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

P09-05 63°17'N 130°09'W	MacTung (MacMillan Tungsten) Selwyn	W, Cu Mo, Zn W skarn	Large - World Class. Reserves of 57 million tonnes grading 0.96% WO3.

Consists of scheelite, pyrrhotite and minor chalcopyrite in several pyroxene-garnet skarns formed in Cambrian to Ordovician limestone and limestone breccia. Host rocks are part of a folded outer shelf carbonate-pelite sequence of a Cambrian and Devonian passive margin. Host rocks flanked and inferred to be underlain by the Late Cretaceous quartz monzonite Mactung stock (K-Ar isotopic age of 89 Ma ± 4 Ma) of the Selwyn Plutonic Suite. Hydrothermal alteration has produced three distinct, concentric skarn zones: peripheral garnet-pyroxene marble skarn; an intermediate pyroxene skarn; and a central pyroxene-pyrrhotite skarn. Deposit age interpreted as Late Cretaceous.

Atkinson and Baker, 1986; Sinclair, 1986; EMR Canada, 1989; Dawson and others, 1991; Mining Review, 1992.

P09-06 63°10'N 130°12'W	MacMillan Pass (Tom, Jason East, Jason Main) MacMillan Pass	Pb, Zn, Ag, Ba Sedimentary exhalative Pb-Zn	Large. Reserves of 23.4 million tonnes grading 7.3% Pb, 6.4% Zn, 75.7 g/t Ag.

Deposits occur in two or more stratigraphic intervals in the Middle to Late Devonian lower Earn Group, interpreted as part of a Devonian and Mississippian clastic wedge in the MacMillan Pass area. Deposits interpreted as spatially related to syndepositional faults bounding a rift-related trough filled with fine- to coarse-grained siliceous turbiditic clastics. Recent reserve figures are 9.3 million tonnes grading 7.5% Pb, 6.2% Zn and 69.4 g/t Ag for the Tom deposit, and 14.1 million tonnes grading 7.09% Pb, 6.57% Zn and 79.9 g/t Ag for the Jason deposits. Deposit age interpreted as Late Devonian.

Abbott, 1986; Dawson and Orchard, 1982; Bailes and others, 1986; Turner, 1990; MacIntyre, 1991; Mining Review, 1992.

P09-07 63°01'N 130°37'W	Tea (Brock) MacMillan Pass	Ba Sedimentary exhalative Ba	Large. Reserves of 250,000 tonnes grading 100% BaSO4 (S.G.= 4.24).

Consists of a barite-rich zone approximately 100 meters thick that occurs at the base of a shale member of the Early Mississippian upper Earn Group that is interpreted as part of a Devonian-Mississippian clastic wedge. Barite is of high quality and suited for use as drill mud with only screening. Reserves are for an open-pit mining with no strip ratio, which had limited production. Deposit age interpreted as Early Mississippian.

Dawson and Orchard, 1982; Yukon Minfile, 1991.

P09-08 63°04'N 130°12'W	Moose (Spartan, Racicot) MacMillan Pass	Ba Sedimentary exhalative Ba	Medium. Reserves of 3.0 milion tonnes grading 84% BaSO4, 12% to 14% SiO2.

Consists of finely laminated barite that occurs in two beds from 25 to 45 meters thick and exposed for 200 to 250 meters along strike. Deposit occurs near the base of a shale member of the Middle to Late Devonian lower Earn Group, immediately above an underlying chert pebble conglomerate. Host rocks interpreted as part of a Devonian and Mississippian clastic wedge). Deposit age interpreted as Late Devonian.

Dawson and Orchard, 1982; Yukon Minfile, 1991.

P09-09 62°37'N 129°46'W	Oro (Buc, Mar, Dar, Tang) MacMillan Pass	Ba Zn, Pb Sedimentary exhalative Ba	Medium. Estimated 1 million tonnes.

Consists of thinly bedded barite with minor sphalerite and galena that occur as a lens-shaped deposit 1100 meters long, 15 to 50 meters wide and up to 50 meters thick. Hosted in Middle Devonian turbiditic siltstones of the lower Earn Group that form part of a Devonian and Mississippian clastic wedge. Deposit age interpreted as Middle Devonian.

Dawson and Orchard, 1982; Yukon Minfile, 1984.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P09-10 62°34'N 129°31'W	Anniv (OP) Howards Pass	Zn, Pb Sedimentary exhalative Pb-Zn	Large. Reserves of 61 milion tonnes grading 5.4% Zn, 2.1% Pb.

Consists of sphalerite and galena that comprise saucer-shaped stratiform and stratabound bodies in Lower Silurian cyclic, rift-related carbonaceous mudstone and chert of the Ordovician to Silurian Road River Group. Host rocks interpreted as part of a Cambrian and Devonian passive margin. Deposit averages 13 meter thick (maximum 45 meters) over a 1.5 km strike length. Anniv deposit is one of three related exhalative Zn-Pb deposits of the Howards Pass Area (refer to Howards Pass). Deposit age interpreted as Early Silurian.

Morganti, 1981; Yukon Minfile, 1984; EMR Canada, 1989; MacIntyre, 1991.

P09-11 62°42'N 126°38'W	Coates Lake (Redstone) Redstone	Cu, Ag Sediment-hosted Cu	Large. Reserves of 37 million tonnes grading 3.9% Cu, 11.3 g/t Ag.

Consists of pyrite, chalcopyrite, bornite, digenite, chalcocite and covellite with secondary malachite and azurite that occur as stratabound disseminations. Deposit hosted in Late Proterozoic Coates Lake Group shallow marine algae carbonates and evaporites along a transgressive contact with underlying continental redbeds of the Redstone River formation. Deposit age interpreted as Late Proterozoic.

EMR Canada, 1989; Ruelle, 1982; Jefferson and Ruelle, 1986; Yukon Minfile, 1987; Chartrand and others, 1989.

P09-12 62°28'N 129°10'W	Howards Pass (XY) Howards Pass	Zn, Pb Sedimentary exhalative Pb-Zn	Large - World Class. Reserves of 422 million tonnes grading 5.4% Zn, 2.1% Pb.

Consists of sphalerite and galena with pyrite as stratiform and stratabound massive bodies, up to 50 meters thick and 3 to 4 km long, that occur in carbonaceous, cyclical, limy mudstone and chert of the rift-related Lower Silurian "Active Zone" of the Ordovician to Devonian Road River Group. Host rocks are interpreted as part of a Cambrian to Devonian passive margin. The Howards Pass (XY) deposit is one of three related SEDEX Zn-Pb deposits (refer to Anniv and OP) that occupy an elongate 20 km-wide sub-basin of the eastern Selwyn Basin. Deposits are interpreted as forming at the base of the continental slope about 10 km to 20 km seaward of the carbonate platform margin. Total reserves for the XY and Anniv deposits are 125 million tonnes grading 5.4% Zn, 2.1% Pb, and estimated resource for the two is about 400 million tonnes at similar grade. Deposit age interpreted as Early Silurian.

Morganti, 1981, Placer Developments Ltd., annual report, June, 1982; Yukon Minfile, 1984; Abbott and others, 1986; MacIntyre, 1991;

P09-13 62°23'N 128°37'W	Lened (Rudi, Godfrey) Selwyn	W, Cu Mo W skarn	Medium. Resource of 750,000 tonnes grading1.17% WO3.

Consists of scheelite and chalcopyrite in garnet-diopside and massive pyrrhotite skarn that replace limestone of the Cambrian to Ordovician Rabbitkettle Formation. Host rocks interpreted as part of a Cambrian to Devonian passive margin and are intruded by a mid-Cretaceous (85-92 Ma) quartz monzonite stock of the Selwyn Plutonic Suite. Deposit is best developed in an imbricate fault zone. Deposit age interpreted as mid-Cretaceous.

Yukon Minfile, 1986; Glover and Burson, 1986; EMR Canada, 1989.

P09-14 61°57'N 128°15'W	Cantung (Canada Tungsten) Selwyn	W, Cu Zn, Bi W skarn	Large - World Class. Production and reserves of 5.7 million tonnes grading 1.6% WO3, 0.2% Cu.

Consists of pyrrhotite, scheelite and chalcopyrite with minor sphalerite in diopside skarn bodies that replace two members of Lower Cambrian limestone. Host rocks are interpreted as part of a Cambrian to Devonian passive margin. Skarns related to intrusion of a Late Cretaceous quartz monzonite (K-Ar age of 94.6 Ma ± 2.6 Ma) of the Selwyn Plutonic Suite. Two deposits occur, the Pit orebody that produced 1.51 million tonnes of ore yielding 40,087 tonnes of WO3 between 1962 and 1986, and the E-Zone orebody with reserves of 4.2 million tonnes with 1.6% WO3 and 0.23% Cu with associated bismuth. Deposit age interpreted as Late Cretaceous.

Mathieson and Clark, 1984; Sinclair, 1986; EMR Canada, 1989; Yukon Minfile, 1990; Dawson and others, 1991.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P09-15 / 61°29'N / 129°24'W	Matt Berry / Frances Lake	Pb, Zn, Ag, Cu, Sb / Sedimentary exhalative Pb-Zn	Medium. Reserves of 533,434 tonnes grading 6.81% Pb, 4.8% Zn, 102.9 g/t Ag.

Summary and References

Consists of massive galena, sphalerite, pyrrhotite and chalcopyrite that occur with minor antimony-silver minerals in Paleozoic phyllite. Copper and antimony mineralization appears to be related to local Cretaceous intrusive activity and overprints folded Paleozoic sedimentary exhalative mineralization that formed along a Devonian and Mississippian passive margin. Deposit age interpreted as Devonian and Mississippian.

Ostler, 1979; Bremner and Ouellette, 1991.

P09-16 / 60°46'N / 128°51'W	Bailey (Pat) / Selwyn	W, Cu / W skarn	Medium. Reserves of 405,454 tonnes grading 1.00% WO3 (estimate).

Consists of scheelite with minor pyrrhotite and trace chalcopyrite in three pyroxene skarns that occur over a strike length of over 3 km. Skars formed along contact between Devonian limestone and a mid-Cretaceous granodiorite of the Selwyn Plutonic Suite. Limestone part of a Cambrian-Devonian passive margin. The bulk of the reserves are from the central (B) zone. Deposit age interpreted as mid-Cretaceous.

Dawson and Dick, 1978; EMR Canada, 1989; Yukon Minfile, 1990.

P09-17 / 60°30'N / 130°28'W	Logan / Cassiar	Zn, Ag / Cu, Sn / Zn-Ag polymetallic vein	Medium. Reserves of 12.3 million tonnes grading 6.17% Zn, 26 g/t Ag.

Consists of sphalerite and pyrite, lesser arsenopyrite and chalcopyrite, and rare sulfosalts and cassiterite that occur in multiple phase quartz + ankerite veins, stockworks, breccias and silicified zones that occur in highly altered granodiorite, latite and andesite dikes that intrude the Marker Lake Batholith of the Cassiar Plutonic suite. Deposit forms a tabular, fault-bounded body. Sericite, biotite and silica are the dominant alteration minerals. A high grade zone is centered over a diatreme breccia pipe. Deposit age interpreted as mid-Cretaceous.

Yukon Minfile, 1992; EMR Canada, 1989; Mining Review, 1991.

P09-18 / 60°31'N / 128°53'W	Sa Dena Hes (Mt. Hundere) / Selwyn	Pb, Zn, Ag / Pb-Zn skarn and manto	Medium. Reserves of 4.8 million tonnes grading 4% Pb, 12.7% Zn, 59 g/t Ag.

Consists of massive sphalerite and galena with trace pyrite that occur in four essentially tabular replacement zones (Jewel Box Hill, Gribbler Ridge, Burnick and Attila). Deposits hosted in Lower Cambrian phyllite and limestone that are interpreted as part of a Cambrian to Devonian passive margin. Limestone has been altered to coarse actinolite-garnet-diopside skarn at the Jewelbox Hill zone. Elsewhere copper-iron skarn with magnetite, pyrrhotite and pyrite occur. Lead to zinc ratio is 1:2 except at the Burnick zone where the ratio is 1:30. K-Ar isotopic age of 50 Ma for deposit. Although no major intrusive bodies crop out in the mine area the mid-Cretaceous Mount Billings batholith is interpreted to underlie the deposit. Deposit age interpreted as mid-Cretaceous.

Dawson and Dick, 1978, Abbott, 1981; Bremner and Ouellette, 1991; Northern Miner, October 7, 1991.

P09-19 / 60°30'N / 127°57'W	McMillan (Quartz Lake) / Selwyn	Pb, Zn, Ag / Pb-Zn skarn and manto	Medium. Reserves of 1.5 million tonnes grading 6.6% Zn, 5.5% Pb, 102 g/t Ag.

Consists of pyrite, galena and sphalerite with minor arsenopyrite, boulangerite, tetrahedrite and chalcopyrite that occur as tabular bodies, lenses and disseminations. Deposit hosted in limy quartzite and argillite of the Upper Proterozoic to Lower Cambrian Hyland Group that are interpreted as part of a Cambrian-Devonian passive margin. Deposit occurs both concordantly and discordantly to bedding. Lead isotopes age of 100 Ma age for deposit; age similar to that for nearby intrusives of the Selwyn Plutonic suite. Deposit age interpreted as mid-Cretaceous.

Morin, 1981, Vaillancourt, 1982; EMR Canada, 1989; Yukon Minfile, 1991.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

P09-20	Mel (Otter Creek)	Pb, Zn, Ba	Medium. Reserves of 5.24 million tonnes grading 2.09% Pb, 7.86% Zn, 49% $BaSO_4$.
60°21'N	Unassigned	Sedimentary exhalative Pb-Zn	
127°24'W			

Consists of irregular blobs of sphalerite, galena and pyrite that form a stratabound body. Deposit hosted in baritic limey shale at contact between Cambrian and Ordovician limestone and overlying calcareous slate or phyllite of Rabbitkettle Formation. Highest zinc values are associated with sericite-altered mudstone. Lead isotope age of Devonian age for deposit. Reserves include 725,000 tonnes to 60 m depth with comparable grades. Deposit age interpreted as either Cambrian and Ordovician or Devonian(?).

Miller and Wright, 1986; EMR Canada, 1989; Yukon Minfile, 1991.

P09-21	JC (Viola)	Sn	Medium. Reserves of 1.25 million tonnes grading 0.54% Sn.
60°12'N	Cassiar	Cu, Zn, Ag	
131°42'W		Sn skarn	

Consists of malayite, stannite, stanniferous tetrahedrite and cassiterite in hedenbergite-diopside skarn that occur along contact between Devonian and Mississippian carbonates and porphyritic quartz monzonite of the mid-Cretaceous Seagull Batholith. A pipe-like breccia of axinite-fluorite mineralization also occurs. Deposit age interpreted as mid-Cretaceous.

Layne and Spooner, 1986; EMR Canada, 1989; Yukon Minfile, 1991.

P09-22	Logtung (Logjam Creek)	W, Mo	Large. Reserves of 230 million tonnes grading 0.104% WO_3, 0.05% MoS_2.
60°01'N	Cassiar	Zn, F, Be, Cu	
131°37'W		Porphyry W-Mo	

Consists of disseminated scheelite, molybdenite and powellite with minor associated fluorite and beryl in garnet-diopside skarn, quartz vein stockwork and fractures. Deposit associated with a large quartz porphyry dike related to a nearby mid-Cretaceous quartz monzonite stock (K-Ar isotopic age of109 Ma ± 2 Ma) of the Cassiar Suite. Igneous rocks intrude Pennsylvanian chert, argillite and quartzite. Reserves include 55 million tonnes grading 0.16% WO_3 and 0.062% MoS_2. Deposit age interpreted as mid-Cretaceous.

Noble and others, 1984; Sinclair, 1986; EMR Canada, 1989; Dawson and others, 1991; Yukon Minfile, 1991.

P10-01	Wrigley (Fry Group)	Zn, Pb, Ag	Medium. Resource of 9 million tonnes grading 10% Pb-Zn, 34.3 g/t Ag (approx.).
63°10'N	Unassigned	Ba, Cu, F	
123°39'W		Southeast Missouri Pb-Zn	

Consists of galena and sphalerite with minor fluorite and tetrahedrite that occur as disseminations in and as fracture and breccia filling in limestone of the Devonian Nahanni Formation. Host rocks interpreted as part of a Cambrian and Devonian passive margin. Deposit age interpreted as Devonian.

Yukon Minfile, 1982; EMR Canada, 1989.

P10-02	Prairie Creek (Cadillac)	Pb, Zn, Ag	Large. Reserves of 6.2 million tonnes grading 13.0% Zn, 12.0% Pb, 180 g/t Ag.
61°34'N	Selwyn	Pb-Zn skarn and manto	
124°48'W			

Consists of galena and sphalerite with minor tetrahedrite and chalcopyrite that occur in quartz-carbonate gangue as lenticular zones 2.5 m to 15 m wide, dipping 45 degrees and vertical. Twelve zones occur along a strike length of about 10 km. Deposit hosted in shale and dolomite of the Middle Devonian Arnica Formation that is interpreted as part of a Cambrian and Devonian passive margin. Deeper drilling in 1992-94 intersected stratabound Pb-Zn-Ag deposit that occurs in four lenses over 22 m thick and two other zones, all hosted in the Ordovician Whittaker Formation. Deposit has characteristics of a manto, but no intrusion is known. Deposit age interpreted as Ordovician-Devonian?

EMR Canada, 1989; Yukon Minfile, 1991; San Andreas Resources Corp., news releases, 1992, 1993., 1994, 1995.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P53-01 63°38'N 136°38'E	Dzhalkan Sette-Daban	Cu Basaltic Cu	Small. Average grade of 0.3 to 4.5% Cu.

Consists of disseminated copper in Famennian basalt flows that have a total thickness of 180 m. Flows erukpted into shallow water and subaerial environments. Deposit occurs in horizons from 0.5 to 2.0 m thick in cinders and of amygdaloidal basalt that occur at the top of flows. Ore minerals are native copper and cuprite with lesser bornite, chalcocite, and chalcopyrite. Epidosite (epidote + quartz) wallrock alteration occurs locally. Ore bodies range from 0.3 to 1.0 m thick and up to 100 m long. Areas of copper mineralization are separated by unmineralized areas of up to several kilometers. Host basalts are folded, with fold limbs dipping 40 to 60°.

Kutyrev, 1984; Kutyrev and others, 1988.

P53-02 63°31'N 137°01'E	Kurpandja Sette-Daban	Cu Sediment-hosted Cu Sediment-hosted Cu	Medium. Average grade of 0.45 up to 12% Cu. Resource of approximately 500,000 tonnes Cu.

Consists of more than three stratified horizons of finely disseminated to massive copper ore that is hosted in Upper Devonian to Lower Carboniferous coastal and deltaic sandstone. Main ore minerals are chalcocite, bornite, chalcopyrite, and pyrite. Ore bodies range from 0.2 up to 4 m thick and up to 1.5 km long. Host polymictic sandstone contains pyroclasts of various types of volcanic rocks. Deposit occurs in a stratigraphic interval from 50 up to 300 m thick that is underlain by Famennian basalt that also contains copper mineralization. Deposit occurs within a major syncline that has an amplitude of up to 4 km. Ore bodies and host rocks strike at 40 to 70° on syncline limbs.

Kutyrev, 1984; Ioganson, 1988.

P53-03 63°10'N 137°51'E	Segenyakh Sette-Daban	Pb, Zn, CaF_2 Mississippi Pb, Zn Southeast Missouri Pb-Zn	No data.

Consists of concordant horizons of disseminations, stringers, and breccia layers of sphalerite and fluorite that are hosted in Late Silurian (Ludlovian) dolomitized limestone that is overlied by Prjidolian marl. Ore composed of dolomite, calcite, fluorite, sphalerite, and less common galena. Ores locally associated with metasomatic quartz, microcline, hyalophane, and pyrite. Bedded breccia contains up to 20% sphalerite and 15% fluorite. In addition to concordant breccia layers are cross-cutting breccia veins, that contain up to 70% fluorite and up to 8% sphalerite. At least two ore-bearing horizons are known that trend north-south for 10 km and dipping eastward from 40 to 60°. Distribution and concentration of mineralization is irregular.

Kutyrev, 1984.

P53-04 62°23'N 137°52'E	Onello (Lider) Allakh-Yun	Au Au quartz vein	Small. Up to 264 g/t Ag. Au grade unknown

Consists of quartz veins and stringers that are hosted in Late Devonian diabase dikes. Vein minerals are quartz, bornite, and pyrite. Veins range from 0.3 to 0.5 m thick and are short. Host dikes intrude Ordovician and Cambrian carbonate rocks.

Kokin, 1987.

P53-05 61°28'N 137°19'E	Svetly Allakh-Yun	Au Au quartz vein	Small. Average grade of 0.6-3.2 g/t Au.

Veins are hosted by Late Proterozoic (Riphean) clastic and carbonate deposits.

Kirusenko, written commun., 1963.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P53-06 61°13'N 137°50'E	Bular Allakh-Yun	Au Au quartz vein	Small. Average grade of 24 g/t Au.

Consists of disseminated galena, sphalerite, arsenopyrite, and gold in a quartz vein that is 0.8-1 m thick and up to 1,200 m long. Vein strikes N30°E and dips steeply (60-80°). Vein hosted in Lower Permian sandstone.

T.S. Kirusenko, written commun., 1964; Grinberg and others, 1970.

P53-07 60°06'N 136°45'E	Sardana Sette-Daban	Pb, Zn Southeast Missouri Pb-Zn	Medium to large. Reserves of more than 1.0 million tonnes Pb+Zn. Pb:Zn ratio of 1:3-4.

Consists of disseminated, banded, massive, and breccia and ore and stringers that occur within and adjacent to a dolomite bioherm that ranges from 50-80 m thick. Bioherm hosted in the Late Proterozoic (Upper Vendian) Yudom Formation dolomite. Ore bodies are lenticular, ribbon-like, and cylindrical in form, and are mostly confined to the overturned limb of a syncline. Limb dips eastward at 75-85°. Ore bodies range up to 40 m thick and are 200 to 300 m long at depth. Drilling indicates additional ore bodies occur at a depth of 200 tp 300 m. Most ore associated with metasomatic, sugar-textured dolomite and zebra (brown and white striped) dolomite. Main ore minerals are sphalerite, galena, calcite, and dolomite. Subordinate ore minerals are pyrite, maracasite, arsenopyrite, quartz, and anthraxolite. Oxidized ore minerals include: smithsonite, cerussite, anglesite, goethite, hydrogoethite, and aragonite. Low-grade disseminations occur in Upper Proterozoic (Upper Vendian) dolomite for many kilometers in both limbs and in the axis of a north-south-trending syncline that is 3 km wide and more than 10 km long. Dolomite of Yudom Formation is 200 m thick and transgressively overlies Upper Proterozoic (Upper Riphean) quartz and quartz-feldspar sandstone and siltstone that in turn is conformably overlain by Lower Cambrian variegated clay and carbonate rocks. Deposit intruded by sparce diabase and dolerite dikes.

Kuznetsov, 1979; Ruchkin and others, 1979; Kutyrev and others, 1989.

P54-01 63°49'N 143°38'E	Pil Yana-Kolyma	Au Au quartz vein	Small. Contains up to 1.3 kg/t Au.

Consists of quartz veins from 0.2 to 1.5 m thick and 100 to 500 m long. Veins contain ankerite, calcite, pyrite, gold, chalcopyrite, and galena. Veins intrude Late Triassic to Early Jurassic sandstone and shale and diorite porphyrite dikes. Host rocks are been contact metamorphosed.

Korostelev, written commun. 1963; Rozhkov and others, 1971.

P54-02 63°43'N 143°53'E	Ergelyakh Yana-Kolyma	Au Granitoid-related Au	Small. Average grade of 0.1-90 g/t Au; 0.02-0.8% WO_3; Locally contains up to 1.37% Bi; up to 0.4% Te; up to 2% As.

Consists of variously-oriented quartz veins and stringers that occur along the contact of an Early Cretaceous granodiorite and Upper Triassic terrigenous deposits. Quartz constitutes 90% of the veins, which also include tourmaline, muscovite, wolframite, arsenopyrite, cobaltite, niccolite, bismuth, bismuthine, gold, joseite, and other Te and Bi minerals. Ore bodies are cut by crush belts that contain comb quartz, galena, sphalerite, Ag-tetrahedrite, and pyrargyrite that are part of epithermal veins with high Ag grades, up to 200 g/t Ag.

Apeltsyn and Saveliev, 1962; Korostelev, written commun., 1963; Roshkov and others, 1971; Gamyanin, N.A. Goryachev, Bakharev, and others, written commun., 1990.

P54-03 63°35'N 143°54'E	Baryllyelakh Yana-Kolyma	Sn, W Sn greisen	Small. Average grade of up to 0.74% Sn; 0.24% WO_3.

Consists of greisen zones that occur near the contact and in the apical portion of a Late Cretaceous biotite granite intrusion. Greisen zones range up to 100 by 600 m and up to 120 m thick. Greisen composed of tourmaline, quartz, muscovite, dumortierite, andalusite, pyrophyllite with disseminated wolframite, cassiterite, molybdenite, arsenopyrite, löllingite, pyrrhotite, chalcopyrite, monazite, xenotime, and Bi minerals.

Rudich, 1958; Korostelev, written commun., 1963; Gracheva, 1974; Ganyanin and Goryachev, 1977.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P54-04 63°26'N 143°48'E	Baryllyelakh-Tsentralny Eastern Asia-Arctic: Verkhne-Kolyma	Sn, Ag Sn polymetallic vein	Small. Average grade of 0.03-11.35% Sn; 0.9% Pb; up to 2.28% Zn; up to 76 g/t Ag.

Consists of sixteen breccia zones that range from 0.3 to 20 m thick and up to 700 m long that occur in Lower Cretaceous volcanic rocks. Zones composed of quartz, chlorite, kaolinite, calcite, pyrite, cassiterite, chalcopyrite, galena, sphalerite, pyrrhotite, and other minerals. Volcanic rock exhibit chloritie and silicifica alteration. A thick oxidation zone is present.

Rudich, 1958; Korostelev, written commun. 1963.

P54-05 63°21'N 138°24'E	Senduchen Verkhoyansk-Indigirka	As, Sb Sb-As vein	Small. Average grade of 10-58% As; 2.9% Sb.

Consists of quartz-carbonate veins that contain orpiment, stibnite, realgar, arsenopyrite, sphalerite, enargite, chalcopyrite, and jamesonite. Individual orpiment concretionsrange up to 10 tons. Veins intrude dark grey Silurian limestone, range up to 3.5 m thick, and occur in a fault zone that cuts an anticline.

Korostelev, written commun., 1963.

P54-06 63°14'N 138°30'E	Stibnitovoe Verkhoyansk-Indigirka	Sb Cu, Pb, As Sb vein	Small. Average grade of up to 1.37% Sb; up to 0.81% Cu; up to 0.5% Pb; up to 0.17% As.

Consists of a vertical quartz vein that cuts Devonian limestone. Vein composed of quartz, calcite, stibnite, sphalerite, tetrahedrite, chalcostibnite, pyrite, and chalcopyrite. Vein ranges from 0.5 to 2 m thick, more than 250 m long.

Korostelev, written commun. 1963; N.A. Goryachev, written commun., 1992.

P54-07 63°01'N 140°43'E	Altaiskoe Vostochno-Verkhoyansk	Pb, Zn, Ag Sn Ag polymetallic vein	Small-to-medium. Pb:Zn ratio of 2:1.

Consists of Ag polymetallic veins, stockworks, and breccia that occur in small, steeply-dipping faults which trend northeast and occur in narrow zones in gently-dipping Permian siltstone. Fault zones and associated veins occur in the dome of a northeast-trending brachyform anticline. Late Mesozoic lamprophyre and diabase dikes are wide-spread within the deposit. Main ore minerals are sphalerite, galena, arsenopyrite, and pyrite. Lesser ore minerals are cassiterite, tetrahedrite, pyrargyrite, polybasite, and scarce owyheeite. Gangue minerals are quartz, siderite, ankerite, and calcite. Deposit formed in following stages: (1) arsenopyrite-pyrite-quartz with cassiterite and gold-bearing pyrite; (2) sphalerite-pyrite-siderite; (3) galena-ankerite-quartz; (4) galena-quartz-calcite; and (5) sphalerite (red)-jamesonite. Regional metamorphism occured between stages 2 and 3.

Indolev and Nevoisa, 1974.

P54-08 62°57'N 139°44'E	Imtachan Vostochno-Verkhoyansk	Pb, Zn, Sn Sn polymetallic vein	Small.

Consists of Sn polymetallic veins that occur in a linear, steeply-dippinging fault zone occurs in Upper Permian sandstone and shale. Main ore minerals are pyrrhotite, pyrite, sphalerite. Lesser ore minerals are galena, arsenopyrite, maracasite, cassiterite, and stannite. Gangue minerals are quartz, siderite, and mangananankerite. Deposit occurs in the dome of a plunging brachyform anticline, within the contact metamorphic aureole of an unexposed granitoid intrusion.

Indolev and Nevoisa, 1974.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

P54-09	Verkhnee Menkeche	Pb, Zn, Ag	Medium. Average grade of 2.7-11% Pb; 3.9-7.0% Zn; 138-332 g/t Ag.
62°56'N	Vostochno-Verkhoyansk	Ag polymetallic vein	
139°27'E			

Consists of abundant Ag polymetallic lens-like veins that occur in a linear steeply-dipping northeast-trending fault zone in Upper Permian sandstone, siltstone, and shale. Fault zone is about 10 km long and 1 km wide. Ore bodies occur mostly parallel to the fault zone and dip steeply (55-85°). Ore bodies ranges from hundred of meters to 3.5 km long and from 1 to 10 m (average 3 m) thick. Main ore minerals are galena, sphalerite, pyrrhotite, arsenopyrite, and pyrite. Lesser ore minerals are cassiterite, chalcopyrite, magnetite, owyheeite, pyargyrite, tetrahedrite, diaphorite, boulangerite, native silver, and gold. Gangue minerals are quartz, siderite, ankerite, and calcite. Three stages of mineralization consist of: (1) sphalerite-quartz-siderite; (2) sulphoantimonite-galena; and (3) sulfide-carbonate. Regional metamorphism occured between stages 2 and 3. Mineralized fault zone occurs along the dome of a plunging brachyform anticline. Part of deposit occurs within the contact metamorphic aureole of a Late Cretaceous granitoid intrusion that occurs as stocks and numerous dikes of granite-porphyry and granodiorite-porphyry. Lamprophyre and diabase dikes are wide-spread.

Korostolev, written commun., 1963; Indolev and Nevoisa, 1974.

P54-10	Levo-Dybin	Au, W, Bi	Average grades of up to 3% As, 7-13 g/t Au, up to 2.5% WO_3, up to 1% Bi, and up to 0.6% Te.
62°50'N	Allakh-Yun	Te	
139°35'E		Granitoid-related Au	

Consists of abundant quartz stringers, from 0.2 to 0.3 m thick, that form peculiar sheet stockworks in contact metamorphosed Upper Permian sandstone beds, that range from 5 to 20 m thick. Stringers consists of quartz (90-95%), muscovite, potassium feldspar, scheelite, molybdenite, arsenopyrite, niccolite, löllingite, pyrrhotite, bismuth, gold, bismuthine, Bi tellurides and sulfotellurides, and maldonite. Deposit occurs for 800-1,000 m along the strike of the bedding, above an Early Cretaceous granitoid body and in adjacent country rocks.

Kokin, written commun., 1978; Zubkov, 1984; N.A. Goryachev, written commun., 1993.

P54-11	Sakyryr	Zn, CaF_2	No data.
62°43'N	Sette-Daban	Southeast Missouri Pb-Zn	
138°22'E			

Consists of sphalerite and fluorite in beds and in crosscutting breccia zones that are hosted in Upper Silurian (Ludlovian) dolomitized limestone that is overlain by the Upper Sulirian Prjidolian Marl. Bedded breccias range in thickness from 8 to 45 m. Fluorite comprises up to 60% of one cross-cutting ore shoot. Mineralized dolomite zone is 5 km long.

Kutyrev, 1984.

P54-12	It-Yuryak	W	Small. Average grade of 0.05-5% WO_3.
62°42'N	Allakh-Yun	Sn	
139°38'E		W vein, Sn (W)-quartz vein	

Consists of quartz-wolframite and sulfide veins and stringers and stringer lodes that range up to 20 m thick. Ore bodies range up to 250 m long. Vein minerals are quartz, wolframite, scheelite, muscovite, cassiterite, beryl, arsenopyrite, galena, and sphalerite. Veins intrude contact metamorhosed Late Permian siltstone and are associated with minor greisen.

Korostelev, written commun., 1963; Silichev and Belozertseva, 1979; Shur, 1985.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P54-13 62°39'N 140°49'E	Khoron Verkhne-Yudomsky	Sn Pb Sn polymetallic vein	No data.

Consists in part of cross-cutting quartz and sulfide-quartz veins, stockworks, and shear zones, from 1 to 1.5 m thick and up to 1 km long. Also consists of conformable sub-sheet stockworks that occur in Permian sandstone, and associated greisen that occurs in Upper Cretaceous dikes and a grandiorite-porphryry stock with a K-Ar isotoopic age of 95-104 Ma. About 50 minerals occur. Main are minerals are quartz, tourmaline, chlorite, muscovite, carbonate, pyrrhotite, arsenopyrite, galena, sphalerite, cassiterite, stannite, bismuthine, and fluorite. Post-ore grandiorite porphyry bodies have K-Ar isotopic age of 83 Ma.

Andriyanov and others, 1984; Shur, 1985.

P54-14 62°34'N 139°19'E	Nezhdaninka Allakh-Yun	Au, Ag Au quartz vein	Large. Proven reserves of 475 tonnes Au. Estimated resources of more than 500 tonnes Au. Average minimum grade of 5 g/t Au with up to 6,748 g/t Au, and up to 8,300 g/t Ag.

Consists of disseminated gold that occurs in: (1) steeply-dipping shear zones up to 40 m thick and 5.4 km long; (2) related tension-gash quartz veins up to 200 m long and 1.2 m thick; and (3) quartz lenses within the shear zones. Vein minerals are quartz, carbonate, arsenopyrite, galena, sphalerite, scheelite, sericite, albite, chalcopyrite, tetrahedrite, lead and copper sulfosalts, stibnite, and gold. Wallrock alteration to silica, sulfides, and sericite. Quartz Ag polymetallic ore bodies cross-cut and post-date feathered quartz-veins. Deposit occurs along a deep fault that cuts the core of a doubly-plunging anticline in Upper Carboniferous to Lower Permian sandstone and shale. Deposit extends extends more than 1,000 m vertically. Workings include boreholes and seven levels of adits.

Korostolev, written commun., 1963; Silichev and Skobelev, 1970; Grinberg and others, 1970; Gamyanin and others, 1985; Gamyanin and others, written commun., 1990; Benevolsky and others, 1992.

P54-15 62°27'N 140°18'E	Zarnitsa, Kutinskoe Verkhne-Yudomsky	Pb, Zn, Ag Polymetallic vein	Medium. Average grade of 4.86-7.75% Pb, 4.1-5% Zn, and 44-326g/t Ag.

Consists of two deposits separated by 8 km. Zaritsa deposit consists of two polymetallic quartz-sulfide veins that contain galena, sphalerite, pyrite, chalcopyrite, and silver minerals. Larger vein is up to 500 m long and 6 m thick. Zaritsa veins intrude Late Cretaceous granite-porphyry and rhyolite and have a fringe of disseminated sulfides up to 20 m thick. Kutinskoe deposit consists of a vein about 3 m thick and 400 m long that is composed of quartz, pyrite, galena, sphalerite, and pyrrhotite. Kutinskoe vein intrudes contact metamorhosed Upper Permian sandstone and shale.

Korostolev, written commun., 1963.

P54-16 62°03'N 140°44'E	Khaardak Verkhne-Yudomsky	Sn Au, W, Zn Sn polymetallic vein	Small. Average grade of 0.3% Sn; up to 0.02% W; up to 0.04% Zn.

Consists of steeply-dipping shear zones that contain quartz-chlorite veins up to 8 m thick and stringers. Veins and stringers occur in a major 15 km by 2 km zone in dacite and adamellite porphyry of the Cretaceous Verkhne-Allak subvolcano. Ore bodies range up to several kilometers long and tens of meters thick. Vein and stringer minerals are quartz (20-30%), chlorite, cassiterite, hematite, sericite, fluorite, arsenopyrite, pyrite, chalcopyrite, galena, sphalerite, stannite, fahlore, and gold. Wallrocks exhibit chloritie and sericitie alteration.

Volkodav, 1978; Shur, 1985.

P54-17 61°49'N 140°15'E	Dzhaton Verkhne-Yudomsky	Pb, Zn, Ag Pb-Zn polymetallic vein	Small. Average grade of 8-9% Pb; 8-10% Zn; 100-200 g/t Ag.

Consists of sulfide veins with galena, sphalerite, pyrite, and quartz that occur in Late Permian sandstone and shale along the contact of a major subvolcanic quartz monzonite-porphyry body of Late Jurassic-to-Early Cretaceous age. Veins are 0.6 to 3.0 m thick and 300-400 m long.

Korostelev, written commun., 1963.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

P54-18	Novinka	Au	Small. Average grade of up to 90 g/t Au.
61°42'N	Allakh-Yun	Au quartz vein	
138°17'E			

Consists of a quartz vein in Permian clastic deposits. Vein ranges up to 0.9 m thick and 100 m long. Major minerals are quartz, albite, sericite, native gold (fineness 955), galena, pyrite, sphalerite, and tetrahedrite.

Bobin, 1938; Petrusevich, 1939; Grinberg and others, 1970.

P54-19	Molybdenitovy	Mo	Average grade of up to 3% Mo.
61°33'N	Eastern Asia-Arctic: Koni-Yablon	Porphyry Mo	
142°59'E			

Consists of stockwork and quartz veins with molybdenite and sparse chalcopyrite that are hosted in biotite granodiorite of the Late Cretaceous Okhoto-Kuhtui pluton. Veins range to 0.4 m thick.

Korostolev, written commun., 1963; Gamyanin, 1976.

P54-20	Guan-Ti (Arkhimed)	Mo, W	Average grade of 0.1-0.65% Mo; up to 1% WO_3; up to 0.01% Be, Sc, Ga, Bi .
61°30'N	Eastern Asia-Arctic: Koni-Yablon	Porphyry Mo	
143°51'E			

Consists of a stockwork of quartz-molybdenite veins up to 1 m thick, and quartz-feldspar-mica alteration with molybdenite. Deposit occurs in an area of 2 km^2 within a Late Cretaceous granite pluton.

Korostolev, written commun., 1963.

P54-21	Nivandzha	Pb, Zn, Ag	Small. Average grade of up to 12% Pb; up to 14% Zn; up to 100 g/t Ag.
61°33'N	Verkhne-Yudomsky	Polymetallic vein	
141°14'E			

Consists of ten polymetallic veins composed of quartz, galena, and sphalerite. Veins are up to 3 m thick and up to 700 m long. Veins occur along a northeast-trending fault zone in Permian clastic deposits.

Korostolev, written commun., 1963.

P54-22	Voskhod	Au	No data.
61°22'N	Allakh-Yun	Au quartz vein	
139°22'E			

Consists of quartz veins up to 18 m thick and up to 1,000 m long that locally grade into stringers. Veins composed of quartz, albite, carbonate, arsenopyrite, pyrite, galena, sphalerite, chalcopyrite, and gold. Veins occur in faults that cut Permian sandstone and shale. Host sandstone exhibit quartz, sericite, albite, and carbonate alteration.

Grinberg and others, 1970.

P54-23	Zaderzhnoe	Au	No data.
60°27'N	Allakh-Yun	Au quartz vein	
138°11'E			

Consists of sort veins (100-300 m long) and contortion zones, both up to 2 m thick, that generally trend east-west. Veins are composed of quartz (96-98%), carbonate minerals (1-2%), and sulfides (1-2%) including pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, and native gold (fineness 695-815). Deposit occurs in the core of an anticline formed in Early Permian black shale, argillite, and siltstone in the Anchin fault zone. Pre-ore diorite porphyrite dikes intrude sedimentary rocks. Mineralization extends vertically about 350 m.

Barakovsky, 1993.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P54-24 60°02'N 142°36'E	Khakandzhinskoe (Khakandzha) Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Medium. Reserves of 7.23 million tonnes ore grading 7 g/t Au and 312 g/t Ag.

Consists of metasomatic rocks that contain kaolinite-quartz and hydromica-quartz assemblages. Ore veins and streaks consist of quartz, adularia, hydromica, carbonate, pyrite, argentite, galena, and native silver and gold. Ore has an anomalous high Mn content and many Mn minerals. Deposit occurs in metasomatic rocks that contain a series of veins and streaks bearing gold and silver minerals, in a large fracture zone forming the contact between hypabyssal, highly-alkaline rhyolite and Early to Late Cretaceous andesite and rhyodacite. Age of mineralization interpreted as 80 to 50 Ma.

Sidorov and others, 1970.

P55-01 63°45'N 148°45'E	Uochat Urultun and Sudar Rivers	Hg Carbonate-hosted Hg	Small.

Disseminated, cinnabar-bearing veinlets occur in brecciated Lower(?) Devonian dolomite along a major north-south trending fault that separates a Devonian carbonate sequence from a Carboniferous and Permian clastic sedimentary sequence. Ore body is about 20 m long and 4 to 7 m thick. Main ore mineral is cinnabar, which occurs with calcite in masses and irregular veinlets more than 3 mm thick. Pyrite, quartz, sphalerite, and anthraxolite are present. Mineralization consisted of several stages: (1) pre-ore silicification; (2) pre-ore calcitization; (3) deposition of cinnabar and calcite; and (4) post-ore calcite. Only magmatic rocks in vicinity are Late Paleozoic diabase bodies interlayered in Carboniferous and Permian clastic sedimentary rocks.

Babkin, 1975

P55-02 63°40'N 148°42'E	Urultun Urultun and Sudar Rivers	Pb, Zn Southeast Missouri Pb-Zn	Estimated resources 23 million tonnes with average grade about 2.85% Pb, 6.74% Zn, and 10% fluorite.

Disseminated veinlets and brecciated ore occur in Lower Devonian (upper Emsian) dolomite overlain with Middle Devonian (Givetian) marl. Ore bodies are composed of dolomite, calcite, fluorite, galena, sphalerite, and anthraxolite. Barite, pyrite, and cinnabar are present locally. Quartz is absent. Mineralization formed in two stages: (1) an early sphalerite-fluorite stage which resulted in disseminated metasomatic ore, and (2) a galena-fluorite-calcite stage which resulted in brecciated and veinlet ores. Fracturing occurred between these stages. The ore-bearing dolomite sequence is up to 240 m thick along a synclinal limb of a fold that generally trends northwesterly and dips 50-70° to the northeast. The limbs of the fold are subhorizontal south of the deposit. From two to five conformable ore horizons, varying in thicknesses from 1 to 10 m, are known within this dolomite sequence; but ore bodies are sporadic within a given horizon. Ore zone extends over an area of about 20 by 4 km.

Shpikerman, 1987

P55-03 63°36'N 144°01'E	Aida Eastern Asia-Arctic: Verkhne-Kolyma	Ag, Au Au-Ag epithermal vein	Small.

Adularia-carbonate-quartz veins with pyrite, chalcopyrite, sphalerite, galena, freibergite, pyrargyrite, miargyrite, stephanite, küstelite, and native silver. Conjugate to linear zones of quartz-adularia-sericite, quartz-chlorite-kaolinite, and quartz-chlorite-carbonate altered rocks up to 30-40 m thick. Ore bodies are associated with major east-west trending faults and conjugate northeastern fissures, in hypersthene andesite of the southeastern Taryn volcanic complex.

Gamyanin, 1974

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P55-04 63°33'N 148°56'E	Terrassnoe Yasachnaya River	Pb, Zn Cu, Ag Pb-Zn skarn	Probable resource of 5.2 million tonnes ore with average grade about 1% Pb, 5% Zn, and 140 g/t Ag.

Consists of skarn with sulfide occurrences along the tectonic contact between Upper Devonian (Frasnian) limestone and Upper Paleozoic aluminous-siliceous sedimentary rocks. Deposit extends for 700 m and occurs in the bottom of a late Jurassic volcanic depression intruded by hypabyssal dikes overlying a buried Late Mesozoic granitic intrusion. Skarn is composed of hedenbergite, garnet (andradite-grossular), and ilvaite, and sphalerite. Main ore minerals are sphalerite, galena, chalcopyrite, and magnetite. Silver occurs mainly in sulfide minerals, but formed subsequent to the skarn.

Shpikerman, 1987; V.I. Shpikerman and others, written commun., 1988.

P55-05 63°29'N 149°34'E	Prizovoe Urultun and Sudar Rivers	Ba Bedded barite	Medium.

Conformable, sheet-like, steeply-dipping deposit of massive white barite in siliceous argillite and siltstone of Lower to Middle Carboniferous age. Deposit is more than 300 m long and about 30 m wide. Barite exhibits a relic sedimentary structure in the middle of the deposit. Ore horizons show evidence of bed-by-bed metasomatic replacement of the host rocks. Barite-bearing, siliceous clastic sedimentary rocks are intensely deformed and contain numerous interlayers of Late Paleozoic diabase. Host rocks have an anomalously high background content of manganese, zinc, copper, silver, and barium.

Shpikerman, written commun., 1989

P55-06 63°30'N 149°18'E	Prolivnoe Urultun and Sudar Rivers	Pb, Zn Southeast Missouri Pb-Zn	Small.

Disseminated veinlets, brecciated and banded ores, in dark-gray, diagenetic dolomites of Lower Devonian (Emsian) age. Ore minerals are galena, sphalerite, and fluorite. Two stages of mineralization can be distinguished: (1) sphalerite, which subsequently underwent strong deformation; and (2) coarsely crystalline white dolomite, calcite, fluorite, galena, and large masses of anthraxolite. Mineralized dolomite sequence is more 200 m thick and includes two conformable mineralized horizons that trend east-west. Dolomite is overlain by black carbonaceous shales of late Emsian age.

Shpikerman, 1987

P55-07 63°25'N 149°42'E	Batko Urultun and Sudar Rivers	Cu Ag, Ba Basaltic Cu	Small. Grab samples contain up to 3.1% Cu and 13.7 g/t Ag.

Disseminated and irregular masses of sulfides occur in subalkalic, amygdaloidal basalt flows up to 200 m thick, within folded red beds of Middle Devonian (Givetian) age. Ore minerals are bournonite, chalcocite, and covellite. Mineralization is confined to the tops of the basalt flows. Adjacent trachybasalt is intensely epidotized and carbonatized. Silver and barium are associated with the copper. Upper mineralized horizon is no more than 2-3 m thick.

Shpikerman and others, 1991

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P55-08	Verkhne-Khakchan	Au	Small. Proven reserves of 0.1 t Au. Inferred resource of 86 t Au. Grade ranges from 0.2 to 7.8 g/t Au. Average grade less than 2 g/t Au.
63°15'N	Yana-Kolyma	Au quartz vein	
146°14'E			

Occurs as linear zones in brecciated and silicified, Upper Permian siltstone and shale. Ore zones are controlled by northwest- and approximately east-west-trending fractures, which have diverse orientation near fault intersections. Ore bodies include lenticular and stockwork-like occurrences; areas of near-total silicification; and short, narrow quartz veins. Quartz makes up 98% of the veins with albite, carbonates, chlorite, tourmaline, sericite, pyrite, arsenopyrite, sphalerite, chalcopyrite, galena, ilmenite, tetrahedrite-tennantite, and gold (700-850 fine). Deposit is located in the vicinity of the Chai-Yurya strike-slip fault. Geology and structure are similar to that in the Natalka deposit.

Panychev, written commun., 1977

P55-09	Kontrandya	Au	Small. Ranges 1.2 to 2500 g/t Au.
63°13'N	Yana-Kolyma	Au quartz vein	
146°55'E			

Associated with a northwesterly-trending altered rhyolite dike 6 to 23 m thick. Deposit occurs in steeply folded sandstone and shale of Early Jurassic age; and is related to the Chai-Yurya strike-slip fault. Gold ore bodies occur in steeply dipping quartz veins 10-15 cm thick, which cut the dike obliquely over an area approximately 150 m long. Besides quartz, the veins contain albite, arsenopyrite, pyrite, boulangerite, and gold.

Filippov, written commun., 1944; Skornyakov, written commun., 1953

P55-10	Kuranakh-Sala	Sn	Small.
63°03'N	Eastern Asia-Arctic: Verkhne-Kolyma	Sn silicate-sulfide vein	
144°19'E			

Steeply dipping, quartz-tourmaline veins up to 1.5 m thick in a Lower Cretaceous granitic pluton are composed of cassiterite, magnetite, pyrite, arsenopyrite and chalcopyrite.

Lugov, 1986

P55-11	Taboga	Au	Small to medium. Mineralized zones contain traces to 78.9 g/t Au and quartz veins contain up to 3652 g/t Au.
63°04'N	Yana-Kolyma	Au quartz vein	
148°16'E			

About 30 mineralized zones of variable size. They are located in two en echelon structures related to the Taboga strike-slip fault zone. Quartz veinlets cement fractured Lower and Middle Jurassic shale, siltstone, and sandstone. Distinct veins are rare. Mineralized zones are several hundreds of meters long and several meters thick. They are composed of about 98% quartz with albite, carbonates, barite, arsenopyrite, pyrite, pyrrhotite, galena, bismuthite, gold and native silver. Fault which controls the deposit cuts diagonally across a northwest-trending fold structure in the sedimentary sequence, and is parallel to the western contact of a large granitic pluton.

Veldyaksov and others, written commun., 1973

P55-12	Stakhanov	Au	Small. Ranges 0.2 to 3800 g/t Au.
63°06'N	Yana-Kolyma	Au quartz vein	
147°48'E			

Lenticular quartz veins and zones of quartz veinlets occur along the walls of gently dipping dikes of hydrothermally altered rhyolite, and are partially in the dikes themselves. The two known ore bodies extend for 400-450 m. The sandstone and shale intruded by the dikes is intensely deformed and hornfelsed; deformation probably related to the Burganda strike-slip fault. Folds and dikes trend northwest. Quartz veins contain albite, ankerite, chlorite and sericite. Ore minerals are arsenopyrite, pyrite and more rarely, scheelite, galena, sphalerite, pyrrhotite, and gold, with rare cassiterite and molybdenite. Gold is associated with galena and arsenopyrite. Gold nuggets up to 2 g occur.

Skiornyakov, written commun., 1953

Deposit No. / **Latitude** / **Longitude**	**Deposit Name** / **Metallogenic Belt**	**Major Metals** / **Minor Metals** / **Deposit Type**	**Grade and Tonnage**

Summary and References

P55-13 62°56'N 148°14'E	Maldyak Yana-Kolyma	Au Au quartz vein	Small. Proven reserves of 800 kg Au. Grande anges from traces to hundreds of g/t Au.

A set of gold-bearing dikes, and zones of veins and veinlets occur in sedimentary rocks near a straight section of the Burganda strike-slip fault. The Lower Jurassic sandstone and shale host rock is deformed into small steep folds that trend northwest. Thin, en echelon dikes occur in diagonal shears. Transverse, extension fractures are filled with short and morphologically complex quartz veinlets and lenses up to 10 m thick. Major dike is up to 5 km long and is composed of propylitized and albitized basalt and rhyolite. It is cut and locally offset by an oblique set of shear fractures, which host lenticular quartz veins and reticulate albite-quartz veinlets with sulfides and rich gold ore bodies. Ore bodies are composed of quartz, albite, ankerite, calcite, sericite, chlorite, apatite, pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, tetrahedrite-tennantite, and gold.

Aleinikov, written commun., 1945; Fedotov, 1960a

P55-14 62°50'N 148°02'E	Dorozhnoe Yana-Kolyma	Au Au quartz vein	Small. Ranges 0.5 to 30,150 g/t Au.

Steeply dipping, subparallel, gold-bearing quartz veins occur for about 100-120 m in a granitic pluton which is exposed over an area about 9 km long and up to 1.5 km wide. Stock (K-Ar age of 131-134 Ma) is composed of granodiorite, biotite granite, and granite porphyry. Stock trends about east-west, across the strike of the Lower Jurassic sandstone-shale sequence it intrudes. Veins trend northeast, are complicated in form, and vary in thickness from about 0.1-2 m. Veins branch and wedge out on entering the hornfels around the granite. Ore bodies are composed of quartz, sericite (muscovite), albite, calcite, ankerite, chlorite, apatite, arsenopyrite, pyrite, galena, sphalerite, chalcopyrite, electrum; and rare high-grade gold, tetrahedrite-tennantite, and scheelite. Gold nuggets up to 800 g have been found. Gold characteristically occurs with mica and galena as linear bands parallel to vein contacts.

Firsov, 1959

P55-15 62°46'N 145°29'E	Kyurbelykh Eastern Asia-Arctic: Verkhne-Kolyma	Sn Ag Sn silicate-sulfide vein and Sn polymetallic vein	Small.

Steeply dipping, tin-bearing veins, less common linear zones of veinlets, and metasomatically altered rocks, occur near the northeastern contact of the Early Cretaceous(?) Tass-Kystabyt granitic pluton that intrudes Upper Triassic sandstone and sandy shale. Mineralized fissures generally strike east-west and north-west and are several hundreds of meters long and up to 1 m thick. Ore bodies are accompanied by weak contact metamorphism, sericitization, chloritization and, more rarely, tourmalinization. Veins are composed of quartz, tourmaline, cassiterite, arsenopyrite, pyrite, marcasite, pyrrhotite, chalcopyrite, and sphalerite, with minor galena, tetrahedrite-tennantite, argentite, stannite, bismuthinite, magnetite, hematite, ankerite, and calcite. Amount of sulfides increases away from the contact of the granitic rocks. Ore bodies are widely dispersed over the area, sometimes in clusters of 10-15 veins.

Chaikovsky, 1960; Lugov, 1986

P55-16 62°47'N 149°46'E	Shturm Yana-Kolyma	Au Au quartz vein	Small to medium. Averages about 10-12 g/t Au.

Deposit consists of sets of auriferous quartz veinlets hosted by a complicated, propylitized, albitized, silicified, and sulfidized basalt-rhyolite dike averaging 4.5 m thick and extending for over 5.5 km. Gold-quartz stockworks, irregular masses, and reticulate ore bodies are best developed where the dike is crossed by shear fractures that parallel folds in the Lower and Upper Jurassic clastic sequence intruded by the dike. Dike is broken into small blocks by shear zones. Alteration and mineralization of dike are concentrated along the shear zones. Ore minerals are quartz, albite, ankerite, sericite, paragonite, actinolite, chlorite, apatite, tourmaline, arsenopyrite, pyrite, pyrrhotite, boulangerite, gold, sphalerite, galena, chalcopyrite, scheelite, and rutile. Gold is 900-940 fine and associated with arsenopyrite, sphalerite, and galena. Gold nuggets up to 300 g have been found. Deposit is located within the Srednekan-Shturm strike-slip fault zone.

Skornyakov, written commun., 1953

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P55-17 62°45'N 148°06'E	Daika Novaya Yana-Kolyma	Au Au quartz vein	Medium. Typically ranges 0.2 to 21 g/t Au with values up to 1385 g/t Au.

Steeply dipping dike of diorite porphyry has been hydrothermally altered. Dike is sulfidized and cut by an orthogonal system of subhorizontal and subvertical quartz veinlets that contain carbonates, feldspars, disseminated arsenopyrite, pyrite, sphalerite, and gold. Dike trends northeast across a folded Jurassic sandstone-shale sequence.

Shakhtyrov, oral commun., 1991

P55-18 62°44'N 147°52'E	Svetloe, Kholodnoe Yana-Kolyma	Au Au quartz vein	Small. Proven reserves 3.6 t Au. Grade ranges from 1.0 to 100 g/t Au.

Subparallel quartz veins 600-1500 m long average 0.2-0.5 m thick, and 20-80 m apart. Veins occur as conformable bodies or in acute fractures in the limbs of an asymmetric anticline. Veins dip 70° to 85°. Ore bodies trend mainly northwest, but range from east-west to north-south. Upper Triassic and Lower Jurassic sandstone and shale is intruded by a transverse set of dikes of felsic and intermediate composition that host the auriferous quartz veinlets. Ore minerals are mainly arsenopyrite, pyrite, and galena containing gold (858 fine). Subordinate ore minerals are: sphalerite, chalcopyrite, scheelite, pyrrhotite, and native gold. Kholodnoe deposit, which occurs to the south, is made up of three sets of quartz veins and mineralized fracture zones with a northwest trend. Some veins occur within the dikes. Gold is present as very small inclusions or irregular masses.

Skornyakov, written commun., 1953; Fedotov, 1960b, 1967

P55-19 62°41'N 147°24'E	Chai-Yurya Yana-Kolyma	Au Au quartz vein	Small. Veins contain 0.4 to 425 g/t Au; mineralized zones average about 5 g/t Au.

Altered dikes of felsic to intermediate composition are cut by sets of gold-bearing quartz veins. Lenticular quartz veins occur in silicified and mineralized zones in sedimentary rocks near the dikes. Quartz veins contain albite, potassium feldspar, carbonates, and biotite. Ore minerals are pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, pyrrhotite, gold, bismuthinite, tetrahedrite, and boulangerite. Deposit occurs in Middle and Upper Triassic sandstone and shale. Ore bodies are controlled by diagonal fractures that acutely intersect the Chai-Yurya strike-slip fault zone. Veins are numerous, but they are scattered over a large area and are not large.

Skornyakov, written commun., 1953

P55-20 62°37'N 148°02'E	Chelbanya Yana-Kolyma	Au Au quartz vein	Small. Veins contain 1 to 32 g/t Au.

Steep, transverse and oblique quartz veins and veinlets occur near and in dikes of propylitized rhyolite and andesite that intrude a Lower Jurassic sandstone-shale sequence. Veins are mainly composed of quartz, albite, carbonates, and sericite; with minor arsenopyrite, pyrite, galena, gold, sphalerite, chalcopyrite, pyrrhotite, lõellingite, scheelite, hematite, fluorite, ilmenite, rutile, sphene, apatite, tourmaline, cassiterite, and epidote. Gold is present as tiny disseminations and in particles up to 5-10 mm in size. At least one vein 50 m long and 0.3 m thick, which cross cuts a dike, is economic.

Skornyakov, written commun., 1953

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

P55-21	Verkhne-Khatynnakh	Sn	Small.
62°36'N	Unassigned	Au, Ag	
149°45'E		Sn quartz vein	

Northeast-trending steeply-dipping quartz veins and veinlets form productive zones that range in thickness from 5 cm up to 0.5 m. Mineralized area is made up of intensely hornfelsed Middle Jurassic shale and sandstone, but the intrusive body responsible for alteration of the host rocks is not exposed. Ore bodies are accompanied by halos of tourmalinization, sericitization, carbonatization, and abundant disseminated arsenopyrite. Gangue minerals include quartz, tourmaline, sericite, albite, apatite, fluorite, calcite, and chlorite. Ore minerals are cassiterite, scheelite, arsenopyrite, pyrite, sphalerite, chalcopyrite, galena, gold, and sulfosalts of lead and silver.

Buryanov, written commun., 1940

P55-22	Burkhala	Au	Small. Proven reserves of 4.6 t Au. Grade ranges from 0.1 to 5261 g/t Au.
62°36'N	Yana-Kolyma	Au quartz vein	
149°04'E			

Mineralized fracture belts and folded zones up to 5 m thick, contain quartz and quartz-carbonate veins and veinlets with arsenopyrite, pyrite, and gold; and minor galena, sphalerite, pyrrhotite, and scheelite. Late veinlets contain cassiterite, topaz, and tremolite. Mineralized area is up to 2 km long and several tens of meters wide. Deposits are related to the Debin strike-slip fault zone. Structure of the deposit consists of en echelon fractures that cut the intensely deformed and sulfidized Lower and Middle Jurassic sedimentary rocks.

Skornyakov, written commun., 1953

P55-23	Tektonicheskoe	Pb, Zn, Ag, Sn	Small. Contains 0.2 to 22.7% Pb, 0.2 to 8.9% Zn, 12 to 1276 g/t Ag, 0.05 to 0.3% Sn.
62°26'N	Eastern Asia-Arctic: Verkhne-Kolyma	Pb-Zn-Ag vein	
145°15'E			

Quartz and ankerite-quartz veins of variable thickness are confined to steeply dipping fractured zones in Upper Triassic sedimentary rocks. Main ore body trends northwest for 900 m, and is 0.4-5 m thick. Ore minerals are mainly disseminated, and valued for their silver content. Veins contain galena, sphalerite, cassiterite, pyrite, arsenopyrite, pyrrhotite, chalcopyrite, jamesonite, tetrahedrite-tennantite, and argentite.

Fursikov, written commun., 1952

P55-24	Djelgala-Tyellakh	Au	Small. Ranges 1 to 100 g/t Au.
62°19'N	Yana-Kolyma	Au quartz vein	
148°50'E			

Late Jurassic silicified dikes along a set of parallel shear fractures are cut by a system of ladder and reticulate gold-bearing quartz veinlets. Deposit extends for 1-1.5 km and consists of a set of saddle-veins in the cores of anticlines composed of fine-grained sandstone. Dikes are from 100 m to 8 km long with a northwest to generally east-west trend. Individual ore bodies extend for hundreds of meters. Veins and veinlets contain albite, ankerite, tourmaline, disseminated pyrite, arsenopyrite, galena, scheelite, bismuth minerals, and gold. Area is within the hornfels zone of the Bolshoy Annachag granitic body.

Panychev, written commun., 1977

P55-25	Bulunga	Pb, Zn, Ag	Small. Contains 2.3 to 8.9% Pb, 0.57 to 4% Zn, 30 to 780 g/t Ag.
62°18'N	Eastern Asia-Arctic: Verkhne-Kolyma	Pb-Zn-Ag vein or skarn	
145°42'E			

Steeply dipping, single and branching veins up to 200 m long occur in contact-metamorphosed Middle Triassic sedimentary rocks that have been intruded by a small quartz diorite stock. Ores are composed of galena, sphalerite, chalcopyrite, pyrite, arsenopyrite, tetrahedrite-tennantite, argentite, and gold. Veins also contain anomalous tin, cadmium, indium, cobalt, and bismuth. Gangue minerals include quartz, carbonate, fluorite, and chlorite.

Rutskov, written commun., 1942; Radchenko, written commun., 1950

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P55-26 62°16'N 146°31'E	Tigrets-Industriya Eastern Asia-Arctic: Verkhne-Kolyma	Sn, Ag, Pb, Zn Sn polymetallic vein	Small.

Quartz-carbonate-sulfide, quartz-sulfide, and sulfide-quartz veins, and lenticular bodies and zones of veinlets, occur in weakly metamorphosed Upper Permian sedimentary rocks that have been cut by a Late Cretaceous granite porphyry. Ore bodies are 100-200 m long and 0.1-0.8 m thick, and are localized along northeast trending fractures. Upper Cretaceous siliceous lava flows are peripheral to the mineralized area. There are several tin and silver mineral associations in the deposit. A period of deformation separated an early quartz-cassiterite and polysulfide stage of mineralization marked by cassiterite, arsenopyrite, pyrite, chalcopyrite, sphalerite, galena, canfieldite, Fe-freibergite, stannite, and pyrargyrite, from a later selenocanfieldite-quartz stage that produced quartz, pyrite, sphalerite, galena, stannite, selenocanfieldite, and manganocalcite.

Lychagin, 1967; Plyashkevich, 1990

P55-27 62°01'N 146°45'E	Tokichan Yana-Kolyma	Au Au quartz vein	Proven reserves of 296 kg Au. Probable mineral resource of 369 kg Au. Grade ranges up to 116 g/t Au; averages 11 g/t Au.

Quartz veins and zones of veins and veinlets contain disseminated arsenopyrite, pyrite, galena, sphalerite, scheelite, and native gold. Veins occur in Upper Permian clastic rocks near the Tenka strike-slip fault zone. There are three zones of alteration: (1) an outer carbonate-albite-chlorite zone, (2) a medial sericite-chlorite-quartz zone, and (3) an inner quartz-sericite zone. Deposit occurs along a narrow northwest-trending band and is controlled by an intricate system of longitudinal and reverse faults and augen mylonite.

Gabdrakhmanov, written commun., 1969; Zhitkov, Zhitkova, and Goryushin, 1991

P55-28 61°58'N 146°60'E	Degdekan Yana-Kolyma	Au Au quartz vein	Small. Proven reserves of 5.6 t Au. Average grade of 7.3 g/t Au. Past production of 116 kg Au. Active from 1946-47.

Banded and brecciated quartz, carbonate-quartz veins, and zones of quartz veinlets, contain disseminated arsenopyrite, sphalerite, pyrite, chalcopyrite, galena, and gold, with minor tetrahedrite-tennantite, boulangerite, and scheelite. Veins overlap the contacts between propylitized dikes of intermediate and felsic composition and Upper Permian sandstone and shale. Veins also occur in fractured belts and zones of sulfidization in the sedimentary rocks. Dikes generally trend east-west and are conformable with the sedimentary sequence. Deposit is associated with the Tenka strike-slip fault zone. Dikes formed both at the same time and later than the ore bodies. The majority of the ore bodies pre-date dike intrusion. Veins in post-ore dikes of microdiorite and lamprophyre(?) show evidences of thermal metamorphism. Mineralized zones include carbonaceous shale beds 100 to 1400 m in length. Gold is 720-800 fine.

Skornyakov, written commun., 1953; Shlyapnikov, written commun., 1956

P55-29 61°56'N 146°03'E	Kharan Eastern Asia-Arctic: Verkhne-Kolyma	Sn Sn polymetallic vein	Small. High-grade ores.

Zones of chlorite-sericite-quartz veinlets trend north, northwest and northeast. Veinlets contain crystalline and colloform cassiterite, pyrrhotite, chalcopyrite, galena, sphalerite, marcasite, and arsenopyrite. Tin is confined to country rock along the southern contact of the Early to Late Cretaceous Kharan granitoid pluton; which consists of diorite and quartz diorite intruded by granite porphyry.

Lugov, 1986

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P55-30 61°49'N 146°31'E	Khenikandja Eastern Asia-Arctic: Verkhne-Kolyma	Sn Sn silicate-sulfide and Sn polymetallic vein	Small.

Steeply dipping, metasomatic veins, irregular veins and veinlets, and mineralized fracture belts, are associated with metasomatic zones and considerable feldspar. Ore bodies are 1-3 m thick and trend northwest. Tin ores are dominated by albite and cassiterite, with locally abundant adularia, anorthoclase, chlorite, quartz, calcite, tourmaline, and biotite. Metallic minerals, which were mostly deposited after the cassiterite, include galena, sphalerite, pyrite, chalcopyrite, arsenopyrite, magnetite, wolframite, stannite, bismuth, bismuthinite, and bismuth and gold tellurides. Ore bodies are hosted in Upper Cretaceous biotite porphyry, leucocratic granite, and alaskite porphyry.

Lugov, Makeev, and Potapova, 1972; Flerov, 1974

P55-31 61°45'N 149°33'E	Vetrenskoe Yana-Kolyma	Au W Au quartz vein	Small. Average grade ranges from 17 to 22 g/t Au. Proven reserves of 13.3 tonnes gold. Well explored with encouraging potential. Partly mined.

Quartz, planar and saddle veins, lenses, and reticulate and ptygmatic veinlets, occur in the central portion of a major strike-slip fault, in its secondary fractures, and in hinges of anticlines and synclines near the northwest trending Chai-Urya fault zone. Host rocks consist of Upper Triassic and Lower Jurassic shale with rare siltstone and sandstone. Some interbeds are characterized by a high content of carbon, iron, and titanium. Ore bodies are identified by sampling within the vein zones. Portions of the veins subjected to plastic deformation carry the highest gold content. Veins consist of 85 to 99% quartz, with varying amounts of iron-magnesium carbonate. Ore minerals are primarily arsenopyrite and pyrite; scheelite is also important. Minor minerals include sericite, chlorite, albite, oligoclase, galena, sphalerite, marcasite, pyrrhotite, wolframite, tetradymite, graphite, apatite, and titanium oxides. Native gold (880-890 fine) is present in quartz, and also as intergrowths with arsenopyrite and galena. Small amounts of gold occur in wall rock impregnated with sulfides.

Kalinin, 1974, 1975b; Kalinin and Panychev, 1974; Novozhilov and Sher, 1974

P55-32 61°39'N 147°41'E	Natalka Yana-Kolyma	Au Au quartz vein	Medium. Total reserves of 450 t Au. Encouraging potential. Low-grade ores average 4 g/t. Mined since 1945. Produced 75 tonnes Au and 22 tonnes Ag. Annual production of 1.5 t Au and 4 t Ag.

Zones of subparallel and reticulate quartz veinlets can be grouped into two or three systems. They converge locally along strike into podiform and platy veins. Ore minerals cement schistose, brecciated, cataclastic, and graphitized Upper Permian tuffaceous sedimentary rocks. Deposit is associated with the Tenka strike-slip fault. In plan, the ore field has an S-shaped, en echelon fault structure 7 km long, trending northwest, and bifurcates to the south. Deposit forms a steeply dipping "propeller" pattern. Deformed ore-bearing sequence is complicated by synclines and anticlines near the fault zone and abundant pre-ore and post-ore dikes of felsic to intermediate composition. Overall zone of mineralized veinlets is approximately 300 m wide, consists of zones 50-300 m long and 1-15 m thick which comprise economic ore bodies. These bodies converge in a fan-like fashion. Gangue in the veinlets are mainly composed of quartz (90-95%), albite, anorthoclase, carbonate, chlorite, and sericite; with lesser kaolinite, barite, apatite, and graphite. Ore minerals are dominated by fine-grained disseminated arsenopyrite intergrown with pyrite in wall rocks. Subordinate or rare minerals include galena, sphalerite, chalcopyrite, pyrrhotite, lõellingite ($FeAs_2$), cobaltite, bournonite, boulangerite, tetrahedrite-tennantite, scheelite, cassiterite, rutile, ilmenite, and stibnite. Fine-grained and microscopic, low-grade gold (about 750 fine) is commonly associated with arsenopyrite and galena in the veins and veinlets. A considerable proportion of the gold is intergrown in arsenopyrite in the wall rock adjacent to the veins.

Firsov, 1957a; Shilo, 1960; Voroshin and others, 1989; Goncharov, 1995.

P55-33 61°36'N 146°28'E	Porozhistoe Eastern Asia-Arctic: Verkhne-Kolyma	Sn Sn polymetallic vein	Small. 0.49-1.31 % Sn; Ag up to 112 g/t.

Steeply-dipping mineralized fracture zones and quartz veins in Lower Triassic clastic sedimentary rocks contain cassiterite, pyrite, arsenopyrite, and galena.

Lugov, 1986

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P55-34 61°32'N 147°57'E	Pavlik Yana-Kolyma	Au Au quartz vein	Medium Proven reserves of 57.6 t Au. Low-grade ore.

Lenticular zones of reticulate quartz veinlets and mineralized zones up to 2 km long and 3-15 m thick occur in Upper Permian sandstone, shale, and tuff. Ore field is an S-shaped, en echelon fault structure associated with the Tenka strike-slip fault zone. Few dikes are present. Veins and veinlets are composed mainly of quartz, with albite, ankerite, sericite, and chlorite. Ore minerals are arsenopyrite, pyrite, sphalerite, galena, chalcopyrite, pyrrhotite, and gold (790-805 fine). Gold is commonly associated with arsenopyrite.

Eremenko, written commun., 1956

P55-35 61°28'N 148°48'E	Shkolnoe Eastern Asia-Arctic: Verkhne-Kolyma	Au Bi, Te, Ag Granitoid-related Au	Medium Total reserves 32 tonnes Au. Averages 29 g/t Au and 45 g/t Ag. Has produced 17 t Au and 17 t Ag since start of mining in 1991. Annual production of 3 t Au and 3 t Ag.

An en echelon system of quartz veins trending generally east-west. Veins occur in a multiphase granitoid stock about 4 km^2 in size composed mainly of granodiorite and adamellite; that is intruded by dikes of granite-porphyry, rhyolite, pegmatite, aplite, and lamprophyre. Quartz veins are surrounded by zones of beresitic and argillic alteration; skarn- and greisen-like alteration is present locally. Mineralization occurred in two stages separated by intrusion of lamprophyre dikes: (1) gold-polymetallic stage marked by molybdenite, arsenopyrite, löellingite, native bismuth, bismuth tellurides, and native gold; (2) the most economically important stage, marked by arsenopyrite, pyrite, polymetallic sulfides, gold, electrum, freibergite, tetrahedrite, lead-antimony and silver sulfosalts, argentite, and stibnite. Gold ore bodies extend to great depth, into a large zone of complicated mineralogy, geochemistry, and structure.

Orlov and Epifanova, 1988; Voroshin and others, written commun., 1990; Palymsky and Palymskaya, 1990; Banin, 1993, written commun; Goncharov, 1995.

P55-36 61°21'N 147°56'E	Tankist Eastern Asia-Arctic: Verkhne-Kolyma	Mo Porphyry Mo	Small to medium.

Sets of reticulate and subparallel, molybdenite-quartz, molybdenite-feldspar-quartz, and quartz-molybdenite-arsenopyrite veinlets and veins, several millimeters to 30 cm thick, occur in a hypabyssal granite porphyry intrusion and hornfelsed Upper Permian sedimentary rocks. Deposit occurs near the northern contact of the Early Cretaceous Sevastopol granitic body. Disseminated molybdenite also occurs with quartz as magmatic segregations within the pluton. Associated minerals are sericite, chlorite, carbonates, epidote, fluorite, magnetite, hematite, pyrite, chalcopyrite, pyrrhotite, löellingite, sphalerite, galena, and cassiterite.

Bubnov, written commun.,1949; Tyukova, 1989

P55-37 61°25'N 148°21'E	Igumen Yana-Kolyma	Au Au quartz vein	Small.. Proven reserves of 5.8 t Au. Produced about 11.5 tonnes Au. Grade ranging 1 to 50 g/t Au, and up to several kg/t Ag. Almost completely mined out.

Steeply-dipping extensive and persistent quartz veins occur in Upper Permian sandstone, shale, and tuff along the Tenka strike-slip fault zone. Veins form a northwest-trending zone about 4 km long and 2.5 km wide, oblique to an anticline axis. Main ore bodies occur in quartz-cordierite-biotite hornfels in the gently-dipping roof of an Early Cretaceous granitic pluton. Southeastern flank of the mineralized zone is truncated by this intrusive. Both the hornfels and quartz veins contain local, post-ore skarn. Gold-bearing quartz veins are dominated by quartz, albite, iron-bearing carbonate, arsenopyrite, pyrrhotite, chalcopyrite, galena, sphalerite, and gold (765-896 fine). Near the intrusion, vein quartz was recrystallized and the native gold becomes coarser and more abundant. Some late-stage bodies have silver values.

Firsov, 1958; Bolotova, Nikolaeva and Filippov, 1982; Tyukova, 1989.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P55-38 61°15'N 149°05'E	Butugychag Yana-Kolyma	Sn U Sn quartz vein	Medium. Averages about 2.5% Sn. Almost completely mined out.

Feldspar-quartz veinlets and veins up to 1.5 m thick, and linear stockwork zones 0.2-5 m or more thick and several hundreds meters long, contain abundant cassiterite. Ore bodies trend northeast and occur in the western dome of Butugychag pluton; a Late Jurassic or Early Cretaceous(?) leucocratic porphyritic granite. Economic tin veins extend for no more than 40-85 m into the hornfels over the granite dome. Dominant minerals are quartz, albite, potassium feldspar, muscovite, cassiterite, fluorite, and ankerite. Topaz, biotite, tourmaline, arsenopyrite, pyrite, and calcite are less common. Sericite, chlorite, sphalerite, galena, wolframite, and molybdenite occur as minor intergrowths with other minerals. Carbonates and sulfides increase with depth.

Chaikovsky, 1960; Lugov, Makeev, and Potapova, 1972

P55-39 61°16'N 148°37'E	Rodionov Yana-Kolyma	Au Au quartz vein	Small. Proven reserves of 1.5 t Au. Produced about 4 tonnes Au during 1947-54. Grade ranges 1 to 2000 g/t Au.

A major gold-bearing quartz vein located on an overthrust structure, which deforms the limb of an anticline composed of Permian tuff and sedimentary rock. Thrust and fold structures are similar in strike. Upper portion of the vein dips gently, but it is steep at depth. Gently-dipping portion has numerous small, steeply dipping veinlets radiating from the hanging wall, which form a "tail" with a vertical extent of 5-8 m. Vein about 550 m along strike and varies from 5 cm to 9 m thick. Hanging wall composed of banded quartz with carbonaceous shale interbeds. Foot wall composed of sedimentary rock breccia cemented by massive quartz. Gangue minerals are feldspars, ankerite, sericite, paragonite, chlorite, and apatite. Ore minerals are pyrite, arsenopyrite, pyrrhotite, galena, sphalerite, chalcopyrite, scheelite, and native gold. Electrum, tetrahedrite-tennantite, and silver sulfosalts are also present. Weak contact metamorphism occurs with formation of diopside, hedenbergite, and actinolite. Deposit is located near the Tenka strike-slip fault zone.

Firsov, 1957b; Tyukova, 1989

P55-40 61°02'N 145°55'E	Bogatyr Eastern Asia-Arctic: Verkhne-Kolyma	Sn Sn silicate-sulfide vein	Small. Sn, 0.06-56%.

Cassiterite-bearing veins and mineralized zones of quartz-chlorite-sulfide composition in Upper Permian marine clastic rocks occur at the contact with a Late Cretaceous granite intrusion.

Lugov, 1986

P55-41 60°54'N 147°10'E	Khuren Eastern Asia-Arctic: Verkhne-Kolyma	Sn Sn polymetallic vein	Small. 0.03-1.2% Sn.

Feldspar-quartz, chlorite-quartz, and sulfide veins occur in mineralized fracture zone in contact-metamorphosed Upper Permian shale, siltstone and sandstone. Sulfides also cement the matrix of the fractured zone. Ore occurs in massive and disseminated form, and less commonly in brecciated or banded form. Main ore minerals are: arsenopyrite and pyrite; subordinate minerals are: quartz, chlorite, cassiterite, sphalerite, galena, stannite, native bismuth, and cobaltite. Ore zones strike northwest and northeast for 70 m to 900 m, with the average thickness 0.7-2.8 m. Host rocks are intruded by a small stock of greisenized granodiorite, and numerous dikes of felsic and intermediate composition.

Zakandyrin, written commun., 1952

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P55-42 60°40'N 148°05'E	Senon, Utro, Serebryanoe Eastern Asia-Arctic: Okhotsk	Ag, Au, Sb Epithermal vein and volcanic-hosted Sb vein	Small. Ranges 0.2 to 10.6 g/t Au and 20 to 900 g/t Ag. Sb content in Utro deposit is 6.7 to 58%.

Senon deposit consists of sets of subparallel, quartz and feldspar-carbonate-quartz veins with disseminated pyrite, arsenopyrite, argentite, pyrargyrite, stephanite, chalcopyrite, sphalerite, galena, hessite, bismuthinite, and marcasite along a generally east-west zone of propylitization in Upper Cretaceous andesite. Utro deposit consists of disseminated veinlets of stibnite accompanied by pyrite, marcasite, arsenopyrite, and, less common miargyrite, berthierite, dyscrasite, plagionite, sphalerite, cinnabar, native silver, and antimony; in silicified and sericitized ignimbrite. Serebryanoe deposit consists of kaolinite-sericite-quartz altered rock in a hypabyssal dacite body. Altered zone contains east-west trending veins and reticulate systems of veinlets with irregularly disseminated pyrargyrite, miargyrite, polybasite, tetrahedrite-tennantite, arsenopyrite, pyrite, sphalerite, argentite, native silver, and gold.

Markova, written commun., 1978; Zhuravlev and Garifulin, written commun., 1979; Manafov and others, written commun., 1979

P55-43 60°38'N 146°45'E	Burgagylkan Eastern Asia-Arctic: Okhotsk	Au, Ag Bi Au-Ag epithermal vein	Small to medium. Averages about 7.4 g/t Au, 800 g/t Ag, and up to 1% Bi.

Quartz, adularia-quartz, and sulfide-quartz veins and stockwork zones contain disseminated pyrite, sphalerite, galena, chalcopyrite, tetradymite, tetrahedrite, sulfosalts of silver, electrum, tellurides of gold and silver, and stibnite. Gold-silver ore bodies are confined to Upper Cretaceous propylitized andesite and agglomerate of the hypabyssal and vent facies in the margin of a caldera structure. Veins are several hundreds of meters to 2 km long and up to 15 m wide. Massive, brecciated, colloform-banded, framework-platy, and cockade ore structures are typical. Au:Ag ratio ranges from 1:30 to 1:130.

Pavlov, written commun., 1977

P55-44 60°44'N 149°22'E	Sentyabr Eastern Asia-Arctic: Okhotsk	Ag, Au Co, Bi, Te Au-Ag epithermal vein	Medium. Ranges 2 to 6273 g/t Ag and 1.4 to 787 g/t Au.

Quartz stockworks, hydrothermal breccias, and veins; with precious metals, and polymetallic and silver minerals, occur around the periphery of an intrusive dome. Host rocks are Lower Triassic siltstone and shale. Intrusive core of the dome is a Late Cretaceous multiphase stock of gabbro, granite porphyry, and porphyritic granite. Ore bodies are controlled by arcuate faults and the granite porphyry dikes which radiate from the stock. Polymetallic stage of mineralization includes quartz, fluorite, arsenopyrite, löellingite ($FeAs_2$), glaucodot [(Co,Fe)AsS], chalcopyrite, pyrrhotite, pyrite, sphalerite, galena, joseite B, and nagyagite (with low Au and Ag); all of which typically occur in hornfels near the stock. Silver stage of mineralization, characterized by argentite, stromeyerite, tetrahedrite, aguilarite, stephanite, polybasite, pyrargyrite, electrum, and küstelite, is typical of ore zones in low-grade metamorphic rocks further away from the stock. Both types of mineralization occur together in an intermediate zone.

Umitbaev, 1986

P55-45 60°09'N 149°45'E	Oira Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Small. Averages about 37 g/t Au and 51 g/t Ag. Produced 300 kg Au.

Sets of adularia-chlorite-quartz veins with disseminated pyrite, argentite, pyrargyrite, miargyrite, electrum, and nagyagite occur in three ore zones up to several hundred meters long and 0.2 to 12 m wide. Zone of ore bodies trends about east-west for 3 to 4 km, and is 1 to 2 km wide. Ore is confined to the margin of a small volcanotectonic structure resulting from a subsidence of the volcanic roof over an Upper Cretaceous granite-granodiorite pluton. Upper Cretaceous andesite and dacite that host the deposit are intensely propylitized to epidote-prehnite-chlorite and chlorite-carbonate facies. Au/Ag ratio is 1:1. Main stage of mineralization was followed by high-temperature contact-metasomatism related to the emplacement of the granitic complex. Metasomatic stage is marked by a garnet-prehnite-wollastonite-epidote assemblage containing galena, sphalerite, and chalcopyrite. Age of adularia in the Au-Ag veins is 76.0 Ma (Ar-Ar).

Skibina, written commun., 1977, Naiborodin, 1980; P.Layer, V.Ivanov, and T.Bundtzen, written commun., 1994.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P56-01 63°54'N 152°33'E	Opyt Shamanikha	Cu, Au, Pb, Zn, Ag, Au Cu-Ag quartz vein?	Probable mineral resource of 14 million tonnes grading 1.5% Cu, 1.2% Pb, 0.5% Zn, 180 g/t Ag, and up to 1 g/t Au.

Occurs as veins and zones of massive, disseminated, and brecciated veinlets. Gangue composed of quartz, calcite, dolomite, graphite, and chlorite. Ore minerals include pyrite, chalcopyrite, bornite, galena, sphalerite, cuprite, native copper, chalcocite, arsenopyrite, and electrum. Wall rock is copper-bearing, graphitic, sericite-chlorite-quartz schist of Upper Proterozoic age. Silver-bearing copper-polymetallic veins also occur in Upper Jurassic siltstone and sandstone. Deposit is located at the intersection of a Late Jurassic depression and a block of old metamorphic rocks near a barely eroded granite body. Tin content of ore increases toward the granite. Main ore body is about 2 km long; entire deposit extends northwesterly for about 3 km.

Lyaski, written commun., 1937; Erzin, written commun., 1946; Ruchkin and Tsykarev, written commun., 1984

P56-02 63°29'N 151°01'E	Datsytovoe Yasachnaya River	Cu, Ag, Bi Porphyry Cu	Small.

Consists of a stockwork of disseminated quartz-carbonate-sulfide veinlets with silver-copper-bismuth minerals that occur in a subvolcanic trachyrhyolite in the middle of a circular volcanic structure. Stockwork extends over an area of about 0.2 km^2. Pyrite is the dominate ore mineral; chalcopyrite, sphalerite, marcasite, galena, silver-lead-bismuth sulfosalts, acanthite, polybasite, and native bismuth are also present. Trachyrhyolite, which hosts the ore bodies, is silicified and sericitized. Skarn is present locally, possibly as xenoliths.

V.I. Shpikerman and Savva, written commun., 1988.

P56-03 63°27'N 154°55'E	Egorlyk Eastern Asia-Arctic: Omsukchan	Sn Sn silicate-sulfide vein	Small to medium. Partly mined out.

Approximately 200 veins form 17 ore fields with varying economic potential, over an area of about 60 km^2. They occur in porphyritic biotite granite and hybrid granodiorite of the Upper Cretaceous Egorlyk pluton. Tin minerals are confined to steeply dipping fractures that trend northwest. Veins are up to several hundreds meters long and average about 1.5 m thick. Ore is composed predominantly of quartz and tourmaline, with cassiterite and muscovite. Cassiterite occurs in masses up to 10 cm in diameter. Variable quantities of pyrite, apatite, rutile, sphene, fluorite, calcite, arsenopyrite, magnetite, hematite, wolframite, scheelite, molybdenite, pyrrhotite, chalcopyrite, galena, sphalerite, native bismuth, and marcasite are present. Wall rocks are tourmalinized and kaolinized, and less commonly chloritized and greisenized. Total vertical extent of the ore bodies is at least 400-500 m; the highest tin content is at the tops and bottoms of this interval.

Matveenko, 1957; Erilov, 1970

P56-04 63°24'N 150°55'E	Kunarev Yasachnaya River	Pb, Zn, Cu, Ag Pb-Zn-Cu-Ag skarn	Probable mineral resource of 50 million tonnes with average grade of about 0.6% Pb, 3.8% Zn, 70 g/t Ag.

Consists of numerous lead-zinc occurrences of varying morphology. Largest skarn occurrence is in a Middle Jurassic calcareous conglomerate overlain by Middle and Upper Jurassic argillite and siltstone. Mineralized skarn is composed of hedenbergite, garnet (grossular-andradite), epidote, chlorite, quartz, calcite, galena, sphalerite, chalcopyrite, galenobismutite, matildite, stannite, bornite, cobaltite, hematite, and tetrahedrite. Disseminated metasomatic veinlet and brecciated silver ores occur in Devonian carbonate rocks in the outer part of the ore district. These ores are mainly composed of quartz, calcite, pyrite, galena, boulangerite, freibergite, owyheeite, sphalerite, pyrargyrite, acanthite, sulfoantimonides of lead, betekhtinite [$Cu_{10}(Fe,Pb)S_6$], and native silver. Disseminated silver-copper porphyry-type mineralization occurs in rhyolite and diorite in the middle of the volcanic structure. This zoning is typical of porphyry copper deposits, but mineralization at Kunarev is dominated by skarn-polymetallic ore bodies.

Shpikerman, 1987; Shpikerman and Savva, written commun., 1988

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

P56-05 63°20'N 151°05'E	Cheminskoe Yasachnaya River	Fe Cu, Pb, Zn Fe (Cu, Pb, Zn) skarn	Estimated resources 1 million tonnes with grade about 50% Fe and 10 million tonnes with grade about 0.5% Pb and 5% Zn.

Metasomatic skarn-magnetite bodies 1 to 15 m thick occur in Upper Permian limestone and siltstone along the northern contact of the Late Jurassic Bolshoy Kanyon granite body. Ores are composed of hedenbergite, ilvaite, epidote, garnet, axinite, magnetite, pyrrhotite, and chalcopyrite. Small inclusions of cobaltite and glaucodot are also present. Magnetite skarn is locally overprinted by sulfide minerals such as pyrrhotite, galena, and sphalerite.

Ruchkin and others, written commun., 1984

P56-06 63°15'N 151°05'E	Bolshoy Kanyon Darpir	Sn Sn skarn	Proven reserves 6300 tonnes Sn. Average grade 0.35% Sn.

Numerous skarn bodies occur at contacts of Permian limestone and aluminous clastic sedimentary rocks with the Late Jurassic Bolshoy Kanyon granite. Tin minerals are associated with the ultrafelsic, subalkalic granite phase of the pluton. Skarns are dominated by a pyroxene-vesuvianite-garnet association; axinite skarns are also present. Skarns are overprinted by ore stage mineralization characterized by quartz, calcite, fluorite, tourmaline, micas, sulfides, and cassiterite. Sheets and podiform ore bodies predominate. Skarn and related mineralization may be as much as 30 m thick near the apex of the granite's roof. Saddle-like occurrences of skarn up to 70 m thick are developed over low points in the roof of the granite.

Politov, 1983

P56-07 63°12'N 152°13'E	Lazo Darpir	Sn Sn silicate-sulfide vein	Active in 1940s but now mined out. Past production 13,500 tonnes Sn from ore with grade of 1.15% Sn.

Numerous veins 0.4-0.6 m thick occur in hornfelsed, Middle Jurassic clastic sedimentary rocks at the western contact of the Deryas-Yuryagin granite body. Ore bodies are related to northeast-trending fractures. Veins extend for several hundred meters along strike. Rich ores are banded or irregular in form, often with an oblique or vertical pitch. Veins are dominated by a quartz-tourmaline-pyrrhotite-calcite assemblage. Cassiterite, chlorite, pyrite, arsenopyrite, sphalerite are subordinate. Amount of scheelite increases toward the intrusion. Three major mineral associations are distinguished that correspond to three successive stages of mineralization. First stage is marked by tourmaline, quartz and cassiterite. Second stage is characterized by sulfides of iron, zinc, tin, and other minerals. Third stage is dominated by calcite. Sulfides contain the gold and silver.

Vasetsky, 1966; Politov, 1986

P56-08 63°17'N 151°23'E	Verkhne-Seimchan Darpir	Co, Bi Co-As vein	744.4 tonnes Co produced from 1950 to 1956. Average grade 0.12% Co, 0.036% Bi, 0.001% Se, up to 1 g/t Au, and up to 480 g/t Ag.

A set of veins composed mainly of quartz, iron chlorite, and tourmaline in contact metamorphosed Middle Jurassic siltstone south of the Late Jurassic Bolshoy Kanyon granite pluton. Sparse calcite, fluorite, and adularia occur in the veins. Main ore minerals are: arsenopyrite, pyrite, cobaltite, and bismuthinite. Subordinate ore minerals are: pyrrhotite, chalcopyrite, galena, native bismuth, skutterudite, chloanthite, smaltite, selenides and tellurides of silver, lead, and bismuth; and native gold. Veins are steeply-dipping, 250-1500 m long, 0.1-6 m thick, and are known to a depth of 350 m. Co content decreases at depth, and the quartz-chlorite gangue is replaced by quartz and tourmaline. Ore bodies occur along a northwest-trending fault and are confined to splays of fault.

Ruchkin and others, written commun., 1984

P56-09 63°17'N 153°13'E	Bastion Darpir	Sn Sn greisen	Small. High grade portion mined out. Average grade 2.2% Sn.

Lenticular and vein-like bodies of tin-bearing, quartz-tourmaline and quartz-muscovite greisens are several tens of centimeters to 5 m thick and 100-200 m long. They are confined to northeast fractures in Late Cretaceous porphyritic granite and granite porphyry.

Aksenova, written commun., 1957; Avdeev and Sadovsky, written commun., 1970

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P56-10 63°08'N 154°58'E	Arylakh Eastern Asia-Arctic: Omsukchan	Ag, Au Sn, Co, Bi Au-Ag epithermal vein	Medium. Grade up to 556 g/t Ag and 1 g/t Au. Reserves of 3.2 tonnes Au, 9,100 tonnes Ag.

Quartz, adularia-quartz, and quartz-sulfide veins, from several hundreds of meters to 1 km long, grade into zones of veinlets. They contain disseminated pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, argentite, pyrargyrite, freibergite, and native silver. Gold-silver minerals are locally associated with tin and cobalt-bismuth minerals. Ore bodies occur in Upper Cretaceous rhyolite and ignimbrite, in a band of subvolcanic rocks about 5-6 km wide that rims a caldera.

Grigoriev, 1978

P56-11 63°05'N 152°45'E	Chepak Darpir	Au, W, Bi Granitoid-related Au	Medium. Ranges 5 to 50 g/t Au, with values as high as 200 g/t Au. Proven reserves 30 tonnes Au averaging 7-8 g/t.

Steeply dipping, quartz-sulfide veinlets, veins, and associated alteration zones, cut intensely hornfelsed Upper Triassic sandstone and shale overlying a buried granitic pluton. Gold ore bodies are grouped into zones of northeast-trending veins. Host rocks are intruded by dikes of diorite porphyry, lamprophyre, and dolerite; and by small intrusive bodies of Late Jurassic-Early Cretaceous granite porphyry, granodiorite porphyry, dacite, and quartz syenite. Disseminated veinlets are also present in the magmatic rocks and in hornfels. Wall rocks are silicified, chloritized, and sericitized. Veins are composed mainly of quartz (30-40%), sericite, feldspars, chlorite, carbonate, apatite, arsenopyrite, lōellingite, scheelite, pyrrhotite, and pyrite. Less common or rare minerals include chalcopyrite, sphalerite, galena, bismuth, bismuthinite, marcasite, wolframite, tetrahedrite-tennantite, magnetite, ilmenite, rutile, sphene, tourmaline, epidote, and fluorite. Arsenopyrite and lōellingite make up to 20-40% of the veins. Most gold is finely dispersed in arsenopyrite, lōellingite, and pyrrhotite.

Skornyakov, written commun., 1951.

P56-12 62°59'N 151°20'E	Lyglykhtakh Urultun and Sudar Rivers	Mn Sedimentary Mn	Small. Up to 65% MnO.

Manganese minerals occur in the lower part of an Upper Permian clastic-carbonate sequence 400-750 m thick, which is generally characterized by a high geochemical background for Mn, Ba, Zn, Cu, and Ag. Ore-bearing member is up to 150-200 m thick and composed of variegated crimson, green, and black shale and siliceous shale intercalating with siltstone, tuffaceous sandstone, and organic limestone. Ore bodies are commonly podiform and conformable to bedding. Individual lenses are 0.02 to 1.5 m thick and 0.3 to 6.9 m long. Several ore horizons are present. Ore is generally stratified; but concretionary, oolitic, and spherulitic textures are sometimes present. About two-thirds of the manganese is in rhodochrosite; but pyrolusite, rhodonite, ankerite, and barite are also present. Manganese-bearing units have been metamorphosed near Late Mesozoic granitic intrusions; as a result piedmontite, apatite, and quartz occur there. Pyrolusite, psilomelane, vernadite, and limonite are present in the oxidation zone. Manganese oxide content of primary ore reaches 65%; and supergene ore reaches 57%.

Merzlyakov and Shpikerman, 1985

P56-13 62°51'N 155°11'E	Tidit Eastern Asia-Arctic: Omsukchan	Ag, Pb, Zn Ag-Pb-Zn vein, Polymetallic vein(?)	Small. Average about 3.4% Pb, 7.6% Zn, and up to 650 g/t Ag. Has been mined. Low-grade reserves remain.

Altered veins, lenses, and zones of veinlets of quartz-sulfide, chlorite-sericite-quartz, and quartz-rhodochrosite composition, locally highly altered, contain silver-bearing galena, sphalerite, chalcopyrite, pyrite, marcasite, arsenopyrite, pyrargyrite (Ag_3SbS_3), stephanite, freibergite, argentite, polybasite, proustite, famatinite, owyheeite, diaphorite, gudmundite, stannite, cassiterite, native silver, and adularia. Ore bodies are richest along the tectonic contact between a Lower Cretaceous sedimentary sequence and Upper Cretaceous ignimbrites. Mineralized fissures generally strike northeast and dip gently. Mineralized area extends for 1-3.5 km and is 10-20 m wide.

Kopytin, written commun., 1987

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

P56-14 62°48'N 155°25'E	Novy Djagyn Eastern Asia-Arctic: Omsukchan	Sn Porphyry Sn	Small. High grade portion mined out. Average grade 0.8% Sn.

A metasomatized zone up to 130 m wide, marked by a quartz-chlorite-tourmaline alteration, extends for 5 km. It includes sheets, pipe-like bodies, and veined occurrences composed mainly of cassiterite, magnetite, pyrite, hematite, chalcopyrite, arsenopyrite, muscovite, biotite, actinolite, garnet, topaz, dumortierite, and apatite. Native gold, bismuth, stannite, tetradymite, pyrrhotite, pyrophyllite, kaolinite, rutile, and orthite are minor or rare. The tourmaline-cassiterite-chlorite-quartz association is the most productive. Deposit overlies buried granitic intrusion. Lower Cretaceous conglomerate-shale-sandstone sequence that hosts the deposits is intruded by dikes of Late Cretaceous to Paleogene quartz diorite and granodiorite porphyry. Sequence is overlain by Upper Cretaceous volcanic rocks near the deposits. Host rocks are preferentially metasomatized along strike.

Bocharnikov, written commun., 1968; Flerov, 1976

P56-15 62°48'N 155°05'E	Mechta Eastern Asia-Arctic: Omsukchan	Ag, Pb, Zn As, Cu Ag-Pb-Zn vein , Polymetallic vein(?)	Medium. Average grade about 1% Pb, and 0.74% Zn, with up to 310 g/t Ag and 0.3 g/t Au.

A set of en echelon, generally north-south, arcuate fracture zones 3.5-4 km wide and 10 km long host quartz-chlorite-sulfide veins and veinlets. Area of mineralization extends south to the Maloken district. Ore bodies form a fan-like structure that branch at the upper levels. They are hosted by Upper Cretaceous, propylitized, and argillized ignimbrites. Explosion breccia and tuff is wide-spread. Main vein minerals are: silver-bearing galena, sphalerite, chalcopyrite, pyrite, arsenopyrite, freibergite, pyrargyrite, stephanite, famatinite, tennantite, argentite, quartz, chlorite, and hydromica. Subordinate minerals are: pyrrhotite, stannite, native gold and silver, feldspar, kaolinite, and carbonate. Ores are dominated by galena-sphalerite and chalcopyrite-freibergite associations.

Tkachenko and others, written commun., 1976-1979; Plyashkevich, 1986; Kopytin, written commun., 1987

P56-16 62°44'N 154°60'E	Maly Ken Eastern Asia-Arctic: Omsukchan	Sn, Ag Sn polymetallic vein	Small. Partly Mined out.

Deposit consists of metasomatic zones, mainly of quartz-chlorite-hydromica-sulfide composition, with fan-like systems of veins, veinlets, and fracture fillings. Ore body is within Upper Cretaceous volcanic rocks (ignimbrite, rhyolite, andesite, and tuff), that trend north-south and northwest, with a thickness of 60-80 m. Ore bodies are composed of quartz, chlorite, cassiterite, pyrite, arsenopyrite, lõellingite, pyrrhotite, marcasite, stannite, wolframite, galena, sphalerite, chalcopyrite, tetrahedrite-tennantite, argentite, proustite, and native silver and bismuth. Silver-bearing galena and sphalerite, and tetrahedrite-tennantite and silver sulfosalts, are especially important in the upper levels.

Pridatko and others, written commun., 1973; Lugov and others, 1974a, b; Shnaider and others, 1977

P56-17 62°40'N 150°07'E	Goletsov (Golets) Yana-Kolyma	Au Au quartz vein	Small. Average grade 20 g/t Au.

Numerous steeply-dipping quartz veins and zones of small veinlets occur in folded Lower Jurassic fine-grained sandstone, graywacke, and shale, and less commonly in folded, propylitized, mafic dikes. Veins average 5-20 cm thick, but some reach 3.5 m thick in the noses of folds. Veins extend farther down dip than along strike. Quartz veins contain small amounts of albite, ankerite, mica, chlorite, and rare disseminated arsenopyrite, galena, sphalerite, chalcopyrite, gold, and rutile. Veins are banded; sulfide accumulations are confined to carbonaceous interbeds. Deposit is located on a right-lateral, en echelon segment of the Srednekan-Shturm strike-slip fault zone.

Kuznetsov, written commun., 1937; Trushkov, written commun., 1937; Skornyakov, written commun., 1953

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			
P56-18 62°36'N 155°11'E	Dukat Eastern Asia-Arctic: Omsukchan	Ag, Au Au-Ag epithermal vein	Large. Proven reserves of 10,000 tonnes Ag and 20 tonnes Au. Hypothetical reserves 40,000 tonnes Ag. Average grade 1 g/t Au and 300 g/t Ag. Annual production 0.9 t Au and 900 t Ag.

Silver occurs in quartz-chlorite-sulfide, adularia-quartz, and rhodonite-rhodochrosite-quartz veins and zones of diverse orientation. Hydrothermally altered zones and cryptovolcanic breccia bodies are also present. Ore bodies occur in a sequence of ultrapotassic rhyolites, no older than 93 Ma (K-Ar), in the core of a volcanic dome. Top of an extensive biotite leucogranite pluton (K-Ar age 80±2 Ma) is known at depth of more than 1200 m. Ore zones are up to 1.5 km long and 100 m or more thick. Silver minerals in the ore include intermetallic compounds, simple and complex two-metal sulfides, sulfoantimonides, sulfostannites, and selenides. Acanthite, pyrargyrite, stephanite, native silver, and küstelite predominate. Galena, sphalerite, pyrite, and chalcopyrite are abundant; arsenopyrite, pyrrhotite, magnetite, tetrahedrite, boulangerite, stannite, and other minerals are less common. Mineralization occurred in three stages: (1) quartz-chlorite-sulfide, (2) quartz-adularia, and (3) quartz-rhodochrosite-rhodonite. Ore bodies of the first two stages are bordered by quartz-hydromica alteration. The third stage involved replacement of rhodochrosite by rhodonite, and the formation of skarn with garnet, helvite, epidote, albite, as a result of the intrusion of the granite pluton. Ore stages dated at 77 Ma by K-Ar. Cassiterite ore bodies are related to late tourmalinization.

Brostovskay and others, 1974; Savva and Raevskaya, 1974; Kalinin, 1975a, 1986; Raevskaya, Kalinin, and Natalenko, 1977; Sidorov, 1978; Natalenko and others, 1980; Sakharova and Bryzgalov, 1981; Sidorov and Rozenblum, 1989; Shergina and others, 1990; Pilyasov and Yadryshnikov, 1994; Goncharov, 1995.

P56-19 62°37'N 155°48'E	Podgornoe Eastern Asia-Arctic: Omsukchan	Au, Co, Bi, Te, (As) Au-Co-As vein	Small. Ranges 2.5 to 139 g/t Au and 0.2 up to 2.6% Co.

Conformable and cross-cutting podiform bodies and veins are associated with sulfidization, silicification, tourmalinization, and chloritization. Ores are composed of quartz, tourmaline, chlorite, biotite, and Co-lõellingite; with subordinate arsenopyrite, native bismuth, bismuthinite, gold, calaverite, tetradymite, molybdenite, pyrite, chalcopyrite, sphalerite, galena, tennantite, chalcocite, fluorite, and aragonite. District is located in hornfelsed Lower Cretaceous sandstone and siltstone at the contact of the Late Cretaceous Omsukchan leucocratic biotite granite and hybrid granodiorite.

Osipov, and Sidorov, 1973; Savva, written commun., 1980

P56-20 62°33'N 155°34'E	Khataren-Industrial Eastern Asia-Arctic: Omsukchan	Sn Sn silicate-sulfide vein	Small. Almost completely worked out at average grade of 1% Sn.

Several tens of banded veins, predominantly of quartz-tourmaline-cassiterite composition, occur in medium-grained biotite granite of the Late Cretaceous Omsukchan pluton. Veins are nearly vertical and trend northeast. Veins are thin, but are several hundreds of meters to 1 km or more in length. Mineralization occurred in five stages: (1) quartz-tourmaline alteration; (2) quartz-tourmaline-cassiterite, with apatite, magnetite, hematite, muscovite, siderophyllite, albite, epidote, allanite, and gadolinite (REE); (3) quartz-chlorite-cassiterite, with hematite, magnetite, xenotime, arsenopyrite, and fluorite; (4) a local sulfide stage, with pyrite, marcasite, pyrrhotite, chalcopyrite, and molybdenite; and (5) fluorite, with calcite, adularia, kaolinite minerals, and quartz. Cassiterite is commonly present as isometric and prismatic crystals of dipyramidal habit.

Lugov, Makeev, and Potapova, 1972; Lugov, 1986

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			
P56-21 62°31'N 151°04'E	Utinka Yana-Kolyma	Au Au quartz vein	Small. Discovered in 1929. Partly mined out. Ranges 0.1 to 3,923 g/t Au; ore shoots range 5 to 3,923 g/t Au. Produced 12 tonnes Au.

A Late Jurassic suite of ore-bearing dikes that extend for about 35 km cuts a Middle Jurassic sedimentary sequence at an acute angle to bedding. Sedimentary rocks are isoclinally folded into west-northwest trending structures. Main ore body extends 12 km and occurs in a steeply dipping dike, 0.4 to 1.3 m thick, of hydrothermally altered andesite porphyry. Dike intensely crushed and tectonized. Gold-bearing quartz veins form complicated, often diagonally cross-cutting, systems within the dike. Some quartz veins also cut the dikes obliquely, and continue out into the surrounding sedimentary rocks. Arsenopyrite, pyrite, and pyrrhotite make up several per cent of the veins; gold, galena, sphalerite, chalcopyrite, jamesonite, Bi-boulangerite, tetrahedrite, scheelite, marcasite, and stibnite also occur. Gold distribution is quite irregular; individual ore shoots are 5 to 30 m in strike and several hundreds of meters in width.

Yakushev, written commun., 1950; Skornyakov, written commun., 1953

P56-22 62°23'N 150°05'E	Nadezhda Yana-Kolyma	Au Au quartz vein	Small. Ranges 10.2 to 660 g/t Au.

Deposit is located near the Debin strike-slip fault zone. District occurs in an anticlinal fold with Lower to Middle Jurassic (Toarcian and Aalenian) siltstone and shale exposed in the core, and Middle Jurassic (Bajocian-Bathonian) siltstone and sandstone in the limbs. Short, lenticular quartz veins, reticulate veinlets, and silicified dikes of quartz-albite porphyry occur within elongate fracture zones up to 15 m wide. Quartz veins and veinlets contain arsenopyrite, pyrite, galena, gold, and stibnite.

Amelchenko, written commun., 1964; Zenkov and others, written commun., 1966

P56-23 62°21'N 155°49'E	Galimoe Eastern Asia-Arctic: Omsukchan	Sn, Ag Sn silicate-sulfide vein	Small. Most of reserves mined out. Average grade 0.26% Sn.

Tin occurs in conformable and cross-cutting ore bodies. Conformable, gently-dipping ore bodies are formed by replacement of Lower Cretaceous argillite and conglomerate at the contact with Early Cretaceous diorite porphyry and felsite sills. Ore is banded or massive quartz-tourmaline altered rocks with veinlets and disseminations of cassiterite, chlorite, pyrite, marcasite, arsenopyrite, wolframite stannite, chalcopyrite, sphalerite, and galena. Silver occurs native and with sulfides, tetrahedrite-tennantite, and sulfosalts. Paired mineralized layers occur at the roof and floor of the sills, connected by transverse, cross-cutting veins of similar composition; which contain the main bulk of metal. Ore bodies persist along dip.

Chaikovsky, 1960; Lugov, 1986

P56-24 62°16'N 155°26'E	Nevskoe Eastern Asia-Arctic: Omsukchan	Sn, W, Se Porphyry Sn	Small to Medium. Most of reserves mined out.

District extends north-northwest along a belt of intensely fractured Lower Cretaceous clastic sedimentary rocks. Belt is 180 to 350 m wide and separates granite of the Upper Cretaceous Nevsky pluton from extrusive late Cretaceous rhyolite to the west. Granite contact is tectonic in character. Rocks along the belt are replaced by quartz, tourmaline, pyrophyllite, kaolinite, and locally, by dumortierite and topaz. Ore bodies coincide with the most altered rocks; they are pipe-like, and strike for hundreds of meters. Ores are fine-grained, complexly intergrown, and are composed mainly of pyrophyllite, topaz, quartz, muscovite, and cassiterite. Tourmaline, chlorite, wolframite, arsenopyrite, chalcopyrite, galena, sphalerite, pyrite, pyrrhotite, marcasite, tetrahedrite-tennantite, stannite, rutile, and scheelite are wide-spread; semseyite, guanajuatite, laitakarite, silver, zunyite, apatite, fluorite and other minerals are rare. Sn content decreases with depth, as do topaz and pyrophyllite; but quartz increases.

Lugov, Makeev, and Potapova, 1972; Lugov, 1986

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

P56-25 62°22'N 152°01'E	Krokhalin Yana-Kolyma	Sb, Au Sb-Au vein (simple Sb)	Small. Ranges 0.5 to 33% Sb (average grade of 11.4% Sb), and 0.5 up to 93 g/t Au (average grade of 3.9 g/t Au).

A set of beresitized porphyry dikes with gold-antimony minerals occurs in Lower Jurassic flysch. Main ore-bearing dike can be traced for 3.5 km; it is usually about 0.7 to 1.5 m thick but some reach 15 m thick. Dike is cut by ladder veins and veinlets composed of albite, carbonate, and quartz with lenses of massive stibnite up to 2.5 m long and 1.5 m thick. Stibnite is also disseminated and in veinlets in the dike. Stibnite is associated with fine, disseminated gold, pyrite, arsenopyrite, chalcopyrite, and bournonite.

Panychev, and Fedotov, written commun., 1973

P56-26 62°20'N 152°22'E	Srednekan Yana-Kolyma	Au Au quartz vein	Medium. Low-grade ores. Sulfide concentrates from pilot mill contained up to 1736 g/t Au and 213 g/t Ag.

A suite of Late Jurassic diorite porphyry and granite porphyry dikes is cut by transverse and oblique sets of steeply-dipping to sometimes gently-dipping quartz veinlets. Dikes are broken into boudins, and are intensely fractured, altered, and tectonized. The necks between boudins are intensely sulfidized. Ore bodies are composed of quartz, albite, calcite, chlorite, sericite, siderite, arsenopyrite, pyrite, pyrrhotite, sphalerite, galena, chalcopyrite, gold, magnetite, and rutile. Gold is present in discrete masses, in dendrites, and in veinlets; masses of gold up to 3 g have been found. Deposit is located along the Srenekan-Shturm strike-slip fault zone. Suite of gold-bearing dikes obliquely cut the Lower and Middle Jurassic clastic sedimentary rock sequence, which has been deformed in steep east-west and northwest folds.

Skornyakov, written commun., 1953

P56-27 62°18'N 152°39'E	Kuzmichan Yana-Kolyma	Hg Clastic sediment-hosted Hg or hot-spring Hg?	Small.

Upper Triassic sandstone and shale are intruded by porphyritic biotite granite and related dikes of the deposit. The sedimentary and intrusive rocks are cut by northwest-, east-west-, and northeast-trending faults. Disseminated veinlets of cinnabar occur in deformed and fractured zones which trend northwest; the zones are 4-5 m thick and about 70-80 m long. Cinnabar also occurs as stockworks in fractured wall rocks. Gangue minerals are quartz, carbonate, and chalcedony. Ore minerals are cinnabar, metacinnabarite, pyrite, and marcasite.

Babkin, 1969

P56-28 62°17'N 151°58'E	Kinzhal Eastern Asia-Arctic: Okhotsk	Sn As, Zn Sn silicate-sulfide vein	Small. Sulfide-tin concentrates contain up to 14.3 g/t gold and 112.4 g/t silver.

Approximately sixty ore bodies include typical fracture-filling veins, altered veins, and mineralized breccias. They occur in hornfels and spotted cordierite-mica schist at the contact of the late Cretaceous Verkhne-Orotukan granite. Veins trend northeast with dips of 30° to 80°. They are several hundreds of meters to 1 km long, average 0.1-0.3 m thick, and locally reach 4 m thick. Tourmalitization is prominent in deformed belts and adjacent rocks. Quartz and tourmaline are the main gangue minerals. Main ore minerals are crystalline and colloform cassiterite, arsenopyrite, pyrite, sphalerite, and marcasite. Calcite, chlorite, sericite, apatite, fluorite, rutile, sphene, pyrrhotite, chalcopyrite, galena, and stannite are less common.

Matveenko, 1959

P56-29 62°16'N 151°44'E	Kamenistoe Yana-Kolyma	Au Au quartz vein	Small. Ranges 0.1 to 190 g/t Au.

Quartz veins are confined to mineralized and fractured belts in sedimentary rocks. Fractured belts average 300 m long and are 0.2-3.5 m thick. Quartz veins are 20 to 25 m long and 0.6-1 m thick. Most productive quartz vein is 140 m long and varies in thickness from 0.3 to 3.6 m. It contains disseminated arsenopyrite, pyrite, and gold. Two ore bodies have been defined.

Skornyakov, written commun., 1953

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P56-30 62°10'N 150°37'E	Yugler Yana-Kolyma	Au Au quartz vein	Small. Ore body partly mined out in 1940-50's. Produced about 1.1 tonnes Au from ore containing 12.2 g/t Au (about 90,160 tonnes of ore).

Deposit is associated with an en echelon, granite porphyry dike that intrudes Upper Triassic volcaniclastic rocks and Lower and Middle Jurassic shale and siltstone. Quartz veins with intergrown carbonates and disseminated pyrite, arsenopyrite, galena, boulangerite, and gold are confined to a one or both contacts of the dike. Veins cut the dike at an acute angle and extend some distance from it. Veins are 100-250 m long and usually are about 0.1 to 1 m thick, but may reach 3.8 m thick. Deposit is located near the Debin-Umar strike-slip fault.

Novoselov, written commun., 1964

P56-31 62°06'N 151°52'E	Laryukov Yana-Kolyma	Au As Au quartz vein	Small. Ranges trace to 371 g/t Au

A set of mineralized fracture zones with quartz veins, one of which is economic. Vein is 160 m long, up to 1.4 m thick, and is known to a depth of 40 m. Gold is concentrated in the footwall with arsenopyrite and pyrite. Ore bodies are controlled by bedding dislocations related to reverse and thrust faults. Host Lower and Middle Triassic clastic rocks have been subject to linear and branching folding that trends northeast and east-west.

Skornyakov, written commun., 1953

P56-32 62°07'N 152°08'E	Vetvisty Eastern Asia-Arctic: Okhotsk	Ag, Au Au-Ag epithermal vein	Small.

A set of silver-bearing zones with numerous veins and veinlets extends up to 2.2 km; they average 2-2.8 m thick. These occur in quartz-sericite-chlorite altered rocks developed from hornfelsed Middle Triassic shale. Main ore mineral is argentite; arsenopyrite, pyrite, and anglesite are common; and chalcopyrite, stephanite, proustite, and electrum are present. Au:Ag ratio ranges from 1:1000 to 1:5000. Mineralization occurs over the southeastern portion of the Late Cretaceous Verkhne-Orotukan granite pluton; within a circular structure about 5 km in diameter. Hypabyssal bodies and dikes of Late Cretaceous granite porphyry occur along arcuate faults bounding the south side of the structure. Bodies of Late Cretaceous and Paleogene rhyolite occur along a north-south fracture cutting the structure. Ore bodies are controlled by northwest faults and are associated with the rhyolite dikes.

Rozenblyum, oral commun., 1991

P56-33 62°04'N 155°14'E	Okhotnichie Eastern Asia-Arctic: Omsukchan	Sn W, Bi, Co Sn silicate-sulfide vein	Small. Partly mined out. Up to 59 g/t Ag and 0.4 g/t Au.

Cassiterite-quartz-chlorite veins contain small amounts of tourmaline, sericite, carbonates, and sulfides (arsenopyrite, pyrite, chalcopyrite, galena, and sphalerite). Most veins are in weakly hornfelsed, Upper Triassic sandstone, siltstone, and shale; but some are in Albian-Cenomanian andesite and tuff; especially the upper portions of the veins. Subordinate minerals are wolframite, scheelite, bismuthinite, native bismuth, tetradymite, cobaltite, safflorite, tetrahedrite-tennantite, stannite, xenotime, and orthite. Veins are structurally complex. Ore bodies occur around the periphery of a circular volcanotectonic structure, and show no relationship to the intrusive rocks. Veins generally occur in north-south fractures and their northwest splays are associated with the Omsukchan fault zone.

Lugov, 1986

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			
P56-34 62°04'N 155°42'E	Trood Eastern Asia-Arctic: Omsukchan	Sn, Pb Zn, Ag Sn polymetallic vein	Small to medium. Ranges 0.1 to 46% Sn, 50 to 4000 g/t Ag, and up to 1.6 g/t Au, 1.9% Pb, and 1.5% Zn.

Cassiterite-quartz-sulfide, sulfide-quartz, and quartz-tourmaline veins and mineralized zones extend for hundreds of meters. They are confined to steeply-dipping northwest-trending fractures along a deep fault. Host rocks are mainly Upper Cretaceous andesite flows, tuff, and tuffaceous flows; underlain by Upper Triassic clastic deposits. Granite and diorite are less significant. Area consists of a volcanic dome broken by a complex fracture pattern. Volcaniclastic rocks are interbedded with Late Cretaceous hypabyssal intrusive bodies. Sequence is intruded and metamorphosed by tin-bearing granite of the Omsukchan complex. Ore bodies are composed of pyrite, marcasite, quartz, cassiterite, arsenopyrite, hydromicas, galena, sphalerite, chlorite, siderite, chalcopyrite, calcite, tetrahedrite-tennantite, stannite, tourmaline, anatase, fluorite, pyrrhotite, brookite, and apatite. Deposits are characterized by high content of silver, indium, and cadmium.

Lugov and others, 1974a, b; Pridatko and Ananyin, 1980

P56-35 61°52'N 152°35'E	Zatessnoe Yana-Kolyma	Au Au quartz vein	Small. High-grade ore.

A set of quartz veins in a northeast-trending fractured belt. Veins are up to 700 m long and dip to the south at 40°-70°. Veins cut a gently-folded Triassic sedimentary sequence. Veins are usually no more than 20-30 cm thick and are composed of quartz, calcite, arsenopyrite, and gold. Individual gold grains may reach 8 mm in size. Gold values are high, but erratically distributed.

Gutt, written commun., 1949; Baranov, written commun., 1960

P56-36 61°51'N 155°39'E	Ircha Eastern Asia-Arctic: Omsukchan	Sn, Ag Cu Porphyry Sn	Medium. Considerable potential.

This stockwork-like deposit trends northwest in Upper Cretaceous andesite which is underlain by Jurassic tuff and sedimentary rocks. Ore zone extends for many hundreds of meters and varies in thickness from tens to hundreds of meters. Ore body is near the contact of a heterogeneous Late Cretaceous pluton composed of gabbro, diorite, and rhyolite. Jurassic rocks are weakly hornfelsed; the Upper Cretaceous andesite is propylitized. Ore bodies are en echelon systems of podiform veins, veinlets, and oblique-to-vertical pipe-like bodies. Gangue is mainly quartz, with intergrown tourmaline, chlorite, sericite, adularia, calcite, and fluorite. Ore minerals are cassiterite, arsenopyrite, chalcopyrite, pyrite, pyrrhotite; and less common wolframite, scheelite, molybdenite, bismuthinite, bismuth, stannite, teallite, marcasite, galena, sphalerite, sternbergite, freibergite, pyrargyrite, acanthite, and native silver. Cassiterite deposition was preceded by fracturing of the earlier quartz-tourmaline and quartz-chlorite altered rocks.

Ananyin, Pridatko, and Terentiev, 1980; Kuleshov, Kopytin, and Pristavko, 1984; Lugov, 1986; Plyashkevich, 1986

P56-37 61°42'N 151°32'E	Netchen-Khaya Eastern Asia-Arctic: Verkhne-Kolyma	Au, Mo, Bi Granitoid-related Au	Small to medium. Approximate resource of 70 tonnes Au.

Zones of en echelon quartz and quartz-tourmaline-sulfide veins, trend northeast in the apical portion of a Cretaceous multiphase intrusion composed of gabbro, diorite, granodiorite, porphyritic granite, and aplite. Pluton is somewhat elongated to the north, and extends over an area of about 6 by 4.5 km. Ore bodies are 100-150 m long and 1.5-2 m thick. Veins are associated with zones of greisenization. Ore minerals are arsenopyrite (which comprises up to 30% of the vein), lõellingite, pyrite, scheelite, molybdenite, tetradymite, bismuthinite, and gold. Fluorite occurs in the veins; and silver, tin, and tungsten are detected by chemical analyses.

Aksenova, 1990

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P56-38	Ossolonyn	Sn	Small.
61°43'N	Eastern Asia-Arctic: Verkhne-Kolyma	Sn greisen	
153°19'E			

Greisenized granite porphyry bodies, with zoned quartz-topaz greisen and sericitic alteration, host quartz-topaz-fluorite and quartz-fluorite-sericite veinlets containing cassiterite, arsenopyrite, pyrite, and small amounts of tourmaline, chlorite, apatite, and rutile. Ores contain notable tungsten and bismuth. Seven ore bodies trend northwest in hornfelsed Triassic sandstone and shale near the Upper Cretaceous Sredne-Buyund granite.

Matveenko, 1959

P56-39	Bokhapcha	W	Medium. Ranges 0.15 to 4.27% WO_3, with minor Au, Sn, Bi.
61°45'N	Yana-Kolyma	W vein and greisen	
150°44'E			

A linear stockwork composed of variably oriented quartz, carbonate-quartz, and feldspar-quartz veins and veinlets; quartz-muscovite, quartz-topaz, quartz-tourmaline greisens; and greisenized aplites that contain wolframite and some scheelite. Stockwork extends over an area of about 1600 m by 250 m. Wolframite occurs as thick tabular crystals and masses up to 30 cm in size. Minor or rare ore minerals include arsenopyrite, pyrite, molybdenite, cubanite, bismuthinite, and cassiterite. Ore-bearing stockwork is elongated to the northeast and occurs in hornfelsed Upper Triassic sandstone and shale at a steeply dipping contact with the northwest portion of the Lower Cretaceous Bokhapcha granite.

Chicherin, written commun., 1970, 1978; Kolesnichenko, Pristavko, and Sobolev, 1985

P56-40	Ekspeditsionnoe	Au	Small. Ranges trace to tens of g/t Au.
61°41'N	Yana-Kolyma	Au quartz vein	
150°33'E			

Quartz veins, veinlets, and mineralized fracture zones trend east-west and northeast in Upper Triassic shale, siltstone, and sandstone. Ore bodies generally extend east-west over an area about 1.8 km long and 200-300 m wide. In addition to quartz, the veins contain calcite, arsenopyrite, pyrite, and gold. Veins and mineralized zones are up to 160 m long and 1.5 thick. Ore bodies cut porphyritic dikes, which themselves intrude folds at an acute angle.

Baranov, written commun., 1949

P56-41	Maltan Stock	Au, Bi, Te	Small. Au and Ag contents variable. Samples with up to 242 g/t Au, minor Bi, W, and Co.
61°28'N	Eastern Asia-Arctic: Okhotsk	Mo	
150°52'E		Granitoid-related Au	

Deposit is associated with en echelon fracture zones in Cretaceous biotite gabbro, quartz diorite, granodiorite porphyry, and porphyritic granite; that intrude Middle and Upper Triassic sedimentary rocks. En echelon structures are 2.5 to 3 km long. Ore bodies are controlled by northeast fractures that are transverse to the fractures that control the intrusions. Mineralization consists of quartz, quartz-carbonate, and sulfide-quartz veins; tens to hundreds meters long and 10-20 cm thick. Ore minerals are arsenopyrite, löellingite, molybdenite, galena, sphalerite, pyrrhotite, pentlandite, scheelite, boulangerite, native bismuth, bismuthinite, bismuth sulfotellurides, silver tellurides, and native gold (450-1000 fine).

Kamenikhin and Shtokolova, written commun., 1986; Malinovsky, written commun., 1970; Osipov and Savva, written commun., 1975; Voroshin and others, written commun., 1990

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P56-42 61°20'N 151°36'E	Dneprov Eastern Asia-Arctic: Verkhne-Kolyma	Sn W, Mo, Bi, Au, Ag Sn silicate-sulfide vein and Sn greisen	Medium. Produced 5,000 tonnes Sn.

Tourmaline-quartz, fluorite-tourmaline, and sulfide-tourmaline veins; most of which trend approximately north-south, but some trend east-west. Veins occur with quartz-tourmaline, tourmaline-topaz, and muscovite-topaz-quartz tin-bearing greisens. Veins average about 70 m long, with a maximum length of 600 m, and they are 0.5-3 m thick. Main gangue minerals are quartz, tourmaline, topaz, fluorite, muscovite, chlorite, calcite, and albite. Main ore minerals are arsenopyrite, löellingite, cassiterite, ferberite, marmatite, chalcopyrite, pyrite, pyrrhotite, and magnetite. Minor minerals are beryl, zircon, xenotime, monazite, yttrium-bearing fluorite, apatite, siderite, stannite, galena, marcasite, jamesonite, tetrahedrite, tennantite, bismuthite, molybdenite, native bismuth, gold, silver, and colloform cassiterite. Ore bodies occur in 12 separate areas along contacts of subalkalic porphyry granite, granite porphyry, and microgranite of the Upper Cretaceous Dneprov pluton; both within and adjacent to the plutons. Main part of the tin reserves is located in granite along its margin, in a northeasterly trending band. Some mineralization occurs in hornfelsed Triassic tuff and sedimentary rocks. Freibergite and sulfides increase with depth.

Lugov and others, 1974a, b

P56-43 61°06'N 151°47'E	Kheta Eastern Asia-Arctic: Verkhne-Kolyma	Sn, Zn, Pb, Cu, Bi, Ag Sn polymetallic vein	Small. Moderate Sn content. Ag values up to 80 g/t or more.

Three pipe-like, steeply dipping, explosion breccia bodies in a volcanic neck cover about 1400 m^2. Breccia bodies occur in sericitized, kaolinized, chloritized, and silicified Upper Cretaceous rhyolite and associated tuff. Volcanic rocks are intruded by trachyrhyolite and basalt dikes. Disseminated veinlets, stockworks, and some massive cassiterite-sulfide and sulfide-stannite ores, occur within intensely fractured and hydrothermally altered pipe-like bodies, separated by weakly mineralized rock. Ore is composed of quartz, iron chlorite, siderite, fluorite, sphalerite, cassiterite, pyrite, stannite, galena, and chalcopyrite; with subordinate sericite, kaolinite, alunite, pyrrhotite, arsenopyrite, marcasite, native bismuth, native lead, tetrahedrite-tennantite, pyrargyrite, polybasite, argyrodite, canfieldite, famatinite, and argentite. Mineralization consisted of metasomatism superimposed on repeated igneous events.

Chaikovsky, 1960; Lugov, Makeev, and Potapova, 1972; Lygov and others, 1974a, b

P56-44 61°00'N 152°09'E	Suvorov Eastern Asia-Arctic: Verkhne-Kolyma	Sn Rhyolite-hosted Sn	Small.

Colloform cassiterite nodules (wood tin) are present in intensely silicified and kaolinized, fluidal rhyolite, agglomeratic vitric tuff flows, and tuff- and lava-breccia. The volcanic rocks are Upper Cretaceous in age and associated with vent facies volcanism. Cassiterite is associated with fine-grained quartz, hematite, chlorite, kaolinite, pyrite, and arsenopyrite. Ore is characterized by high iron and indium.

Lugov and others, 1974a, b; Flerov, 1974

P56-45 60°58'N 151°10'E	Zerkalnoe Eastern Asia-Arctic: Verkhne-Kolyma	Au, Ag, Bi, Te Au-Ag epithermal vein	Small. Ranges 0.4 to 39 g/t Au and 18 to 349 g/t Ag.

Zones of disseminated veinlets occur in a granite porphyry dike 400 m long and 60 m thick that intrudes a Late Cretaceous diorite pluton. Deposit consists of quartz and quartz-carbonate veinlets containing silver sulfosalts, tetradymite, petzite, hessite, electrum, arsenopyrite, galena, and sphalerite.

Ponomarev and Ivanyuk, 1988

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P56-46 / 60°58'N / 150°53'E	Agat / Eastern Asia-Arctic: Okhotsk	Au, Ag / Pb, Zn, Cu / Au-Ag epithermal vein	Small. Reserves of 3.8 tonnes Au and 70 tonnes Ag. Considerable potential. Average contents 6.5 to 11.8 g/t Au and 65 to 174 g/t Ag. Bonanza ores contain up to 30 kg/t Au.

Summary and References

Several tens of quartz, carbonate-quartz, and sulfide-quartz veins occur in sheets of propylitized Cretaceous andesite. Veins are generally simple in form; they are controlled by fissures trending northwest to north-south. Ore bodies are usually tens to hundreds of meters long, but sometimes up to 2 km in length. The ore bodies average 0.2-1 m thick, but some reach 50 m. Hydromicatization, chloritization, and silicification are typically associated with the veins, but less eroded veins are accompanied by weak adularization. Symmetrical crustification-banding and complex deformation structures are characteristic of the veins. Main gangue minerals are quartz and carbonates, including calcite, dolomite, siderite, manganese-rich siderite, rhodochrosite, and kutnahorite. Barite, chalcedony, and opal occur near the periphery of the deposit. Main ore minerals are: galena, sphalerite, chalcopyrite, marcasite, and pyrite. Arsenopyrite, pyrrhotite, tetrahedrite-tennantite, tellurides, sulfosalts of silver and other minerals are present locally. Gold occurs in the form of electrum (550-500 fine). Average sulfide content of veins is 5-10%, but locally ranges to 20-30%. A gold-sphalerite-galena-quartz assemblage is the most productive, and is present in most veins. This assemblage also contains chalcopyrite, tetrahedrite-tennantite, tellurides of gold and silver, pyrargyrite, stephanite, and argentite. The Au:Ag ratio varies from 5:1 to 1:100, and averages about 1:2-1:5.

Naborodin, written commun., 1971, 1977

P56-47 / 60°49'N / 153°32'E	Khakandya / Eastern Asia-Arctic: Koni-Yablon	Mo / Porphyry Mo	Small. Ranges 0.1 to 6.7% Mo, up to 589 g/t Ag, and up to 6.8 g/t Au.

Deposit consists of quartz veins containing molybdenite, arsenopyrite, sphalerite, and galena, and vein-like bodies of quartz-muscovite greisens cut by molybdenite veinlets. More than 20 ore bodies are known; they are about 120-180 m long and occur in greisenized Late Cretaceous granodiorite and subalkalic granite. Molybdenum is associated with polymetallic veins containing galena, sphalerite, chalcopyrite, and pyrite; and up to 589 g/t silver and 6.8 g/t gold.

Kobylyansky, written commun., 1970

P56-48 / 60°46'N / 150°16'E	Svetloe / Eastern Asia-Arctic: Verkhne-Kolyma	Sn / Sn polymetallic vein	Small.

Deposit consists of a set of steeply dipping, quartz-chlorite veins, up to 1 to 2 m thick, that cut hornfelsed Permian sandstone, shale, and tuffaceous shale. Veins contain fine-grained pyrite, chalcopyrite, and pyrrhotite. Deposit occurs in the marginal portion of a domal structure related to the intrusion of a Late Cretaceous leucogranite.

Umitbaev, 1986

P56-49 / 60°44'N / 153°28'E	Nyavlenga / Eastern Asia-Arctic: Koni-Yablon	Au, Ag / Au-Ag epithermal vein	Small. Reserves of 8.4 tonnes Au and 475 tonnes Ag. Considerable potential. Ranges 6.4 to 14.5 g/t Au and 241.5 to 431 g/t Ag.

Altered chlorite-quartz, adularia-chlorite-quartz, and quartz veins and veinlets occur in the middle of a volcanotectonic depression; at the intersection of north-south, northeast and east-west faults. Approximately 20 ore bodies, each about 10-20 m thick, occur in three zones. Two of the zones are in Lower Cretaceous propylitized andesite; and the third one is in an altered quartz-sericite-pyrophyllite rock developed from rhyolite fragmental flows. Ore textures are colloform to indistinctly banded, massive, and brecciated. Ore minerals are pyrite, sphalerite, galena, chalcopyrite, arsenopyrite, pyrrhotite, bornite, jamesonite, wittichenite, native silver, küstelite, freibergite, acanthite, stephanite, polybasite, stromeyerite, canfieldite, molybdenite, and hematite. A gold-silver-chlorite-quartz phase of mineralization is locally superimposed on a later garnet-epidote-quartz association with hematite and magnetite. Native silver in pyrite is common, and becomes coarser grained with increased thermal metamorphism. Molybdenum and polymetallic mineralization are associated with the later granitic rocks. Ar-Ar age dating of adularia in the Au-Ag vein yields an isotopic age of 94 Ma.

Bocharnikov, written commun., 1977; Bocharnikov and Ichetovkin, 1980; Savva, written commun., 1981; Demin, 1990; P.Layer, V.Ivanov, and T.Bundtzen, written commun., 1994.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P56-50 60°46'N 150°38'E	Skarnovoe Eastern Asia-Arctic: Okhotsk	Zn, Pb, Ag Pb-Zn-Ag skarn	Small.

Podiform sulfide-polymetallic ore bodies extend for several tens or hundreds of meters and are several meters thick. They are controlled by weak fractures in a Upper Triassic (Norian) limestone that has been altered to skarn. Amount of skarn decreases away from a granite pluton. Pyrrhotite skarn bodies contain varying amounts of magnetite, wollastonite, tremolite, epidote, zoisite, garnet, and carbonate. Main ore minerals are sphalerite, accompanied by galena. Silver is mainly in the galena. Skarn also contains gold and rare earth elements.

Umitbaev, 1986

P56-51 60°36'N 150°20'E	Kandychan Eastern Asia-Arctic: Verkhne-Kolyma	Sn, Ag Sn polymetallic vein	Small. Partly mined out. Produced 2,000 tonnes Sn.

Consists of groups of veins and veinlets occur in a generally north-south band more than 2 km long and 500 to 600 m wide, in Upper Cretaceous subvolcanic and flow rocks of moderately felsic to felsic composition. Volcanic rocks are propylitized, silicified, and argillized. Ore bodies consist of quartz-chlorite-cassiterite-sulfide veins with various carbonates (calcite, siderite, dolomite), sericite, hydromica, kaolinite, dickite, pyrophyllite, fluorite, and tourmaline. Sulfide minerals include stannite, pyrargyrite, hessite, and argentite; as well as pyrite, chalcopyrite, arsenopyrite, marcasite, pyrrhotite, sphalerite, galena, bornite, and covellite. Deposits are characterized by high silver, bismuth, cobalt, and gold. Sulfide veins with colloform cassiterite give way at depth to low-sulfide chlorite-quartz veins with crystalline cassiterite.

Firsov, 1972; Lugov and others, 1974a, b; Savva, written commun., 1980

P56-52 60°37'N 151°27'E	Kolkhida Eastern Asia-Arctic: Okhotsk	Ag, Au, Sn Au-Ag epithermal vein	Small.

Quartz-carbonate vein with adularia, chlorite, manganocalcite, kaolinite, pyrite, chalcopyrite, tetrahedrite-tennantite, polybasite, native silver, küstelite, argentite, stephanite, galena, sphalerite, marcasite, and cassiterite. Vein cuts hydrothermally altered Upper Cretaceous brecciated flows and tuff of rhyolite-dacite composition, near the contact with a granite porphyry dike. Au:Ag ratio is about 1:1000. Vein occurs at the southern end of a small volcanotectonic structure.

Umitbaev, 1986

P56-53 60°31'N 149°60'E	Verkhne-Seimkan Eastern Asia-Arctic: Verkhne-Kolyma	Co, Bi Co-Bi-As vein	Small.

Sets of quartz, quartz-chlorite, and quartz-tourmaline veins in hornfelsed Jurassic sedimentary rocks near the contact of the Late Cretaceous Seimkan multiphase granitic pluton. Main ore minerals are cobaltite and cobalt-bearing arsenopyrite. Subordinate minerals are chalcopyrite, galena, sphalerite, pyrite, marcasite, pyrrhotite, boulangerite, löellingite, glaucodot, bismuthinite, native bismuth, and molybdenite.

Demin, written commun., 1945; Umitbaev, 1986.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P56-54 60°26'N 150°41'E	Utessnoe Eastern Asia-Arctic: Okhotsk	Ag, Au, Hg Au-Ag epithermal vein	Small. Typical ore contains up to 5.8 g/t Au and 680 g/t Ag.

A set of discontinuous adularia-quartz veins and veinlets, with associated alteration zones, occur in a subvolcanic body of Late Cretaceous fluidal rhyolite and associated breccia. Subvolcanic intrusion is controlled by a northeast fault of the Arman volcanic collapse structure. Veins are grouped in three zones, which tend to converge at the root of a lopolith-like body. Dominant ore minerals are: pyrargyrite and stephanite; freibergite, polybasite, miargyrite, native silver, electrum, pyrite, and sulfides of copper, lead, and zinc are minor or rare. Au:Ag ratio is 1:100 or less. There is a distinct vertical metasomatic zoning. Gold-silver ore bodies occur in a quartz-adularia-hydromica zone about 300 m thick; beneath it is a zone of andesite marked by low-temperature propylitization; above the ore zone there is a sharp change to quartz-kaolinite and quartz-kaolinite-alunite alternation, with quartz containing disseminated stibnite and cinnabar. Deposit is barely eroded and was deposited near the surface; as indicated by the wide occurrence of ultrafelsic metasomatism and the preservation of a layer of subaerial ignimbrite.

Eremin, 1974

P56-55 60°14'N 150°60'E	Karamken Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Medium. Discovered in 1964. Now being mined. Produced 40 tonnes Au from 1978 to 1992. Average grade of 100 to 129 g/t Au in 1978 and 16-18 g/t Au in 1992.

Deposit consists of numerous adularia-quartz and adularia-carbonate-quartz veins more than 200 m long and more than 0.2 m thick. They are controlled by arcuate and linear faults which define and crosscut a caldera filled with Upper Cretaceous dacite, andesite-basalt, and rhyolite. Main deposit, which contains about 80-90% of the reserves, is confined to few major veins that are spatially related to a hypabyssal body cut by circular faults and composed of andesite, andesitic dacite, volcanic breccia of andesite-dacite composition, and rhyolite. Most productive veins are associated with an altered zone comprised of adularia-hydromica and quartz; and explosion and hydrothermal breccia bodies. A zone of kaolinite, alunite, and quartz alteration occurs in higher parts of the ore deposit. Ore minerals are pyrite, sphalerite, chalcopyrite, canfieldite, freibergite, tennantite, naumannite (Ag_2Se), polybasite, electrum, küstelite, native silver, and other less common sulfides, selenides, sulfostannates, and sulfosalts of silver. Au:Ag ratio is 1:3 to 1:4 in the richest portions of Glavnaya vein. Veins form in clusters, which converge at depth. Gold-canfieldite-freibergite-chalcopyrite and gold-pyrite-sphalerite zones are the most productive; at depth they are succeeded by a galena-canfieldite zone with tin-silver minerals. Ar-Ar age isotopic study of adularia in Au-Ag vein yields an age of 79 Ma.

Krasilnikov and others, 1971; Nekrasova, 1972; Goldfrid, Demin, and Krasilnikov, 1974; Nekrasova and Demin, 1977; Sidorov, 1978; P.Layer, V.Ivanov, and T.Bundtzen, 1994, written commun.

P56-56 61°10'N 153°59'E	Julietta Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Medium. Average grade of 29 g/t Au, 325 g/t Ag. Proven reserves of 18 t Au, 200 t Ag. Estimated resources of 40 t Au and about 1,000 t Ag.

Deposit consists of Au-Ag sulfide-carbonate-quartz veins located inside a large Late Cretaceous caldera. Volcanic rocks in caldera and associated subvolcanic intrusive rocks comprised of andesite, andesite-basalt, and andesite-dacite. Veins dip steeply and vary from 200 to 500 m length and from 1 to 4 m wide. Major ore minerals are native gold and silver, freibergite, polybasite, galena, sphalerite, chalcopyrite, hessite, acantite, cubanite, pyrrhotite, and naumannite. Associated minerals in adjacent metasomatically-altered volcanic rocks are ankerite, calcite, chlorite, epidote, and hydromica. Ore minerals formed in two stages, an older gold-polymetallic stage, and a younger gold-silver-sulphosalt stage.

S.F. Struzhkov, O.B. Ryzhov, and V.V. Aristov, written commun., 1994.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
P57-01	Grisha	Au, Ag	Small.
63°48'N	Kedon	Au-Ag epithermal vein	
159°28'E			

Rare, thin veins and zones of quartz veinlets extend for several tens or hundreds of meters; and are up to several meters thick. Disseminated native gold, galena, sphalerite, chalcopyrite, and high molybdenum values are present. Au:Ag ratio is 1:2 to 1:3. Ore bodies are confined to a zone just inside the northern contact of the Early Paleozoic Anmandykan pluton. The pluton is composed of alkalic syenite and nordmarkite, and lies along a northeast trending fault zone. Early Paleozoic and Late Mesozoic stages of mineralization have been identified; the latter involves the remobilization of the earlier.

Korobeinikov, oral commun., 1991

P57-02	Sedoi	Ag, Co	Small. Veins contain up to 8 g/t Au and 196 g/t Ag.
63°49'N	Eastern Asia-Arctic: Korkodon-Nayakhan	Ag-Co arsenide vein and Fe-Pb-Cu-Ag-Au skarn	
158°25'E			

Polysulfide-carbonate veins occur in conformable and cross-cutting bodies of garnet-epidote-sulfide and pyrrhotite-garnet skarn hosted in Ordovician limestone and dolomite. Some limestone layers have been replaced by hematite. Wall rocks are intruded by Late Devonian biotite granite and subsequently by hypabyssal rhyolite emplaced along the granite-limestone contact, locally forming sheets. Skarn stage of mineralization is marked by tellurides of silver, lead, and bismuth; with rare inclusions of native gold. Fracture veins related to volcanogenic mineralization are composed of calcite, manganocalcite, galena, sphalerite, and fine-grained intergrowths of proustite, stephanite, pyrargyrite, sternbergite, argentopyrite, and silver-bearing löellingite, glaucodot, and arsenopyrite. Karst development is widespread, often associated with areas notable for crustification banding that contains native silver.

Savva and Vedernikov, 1989

P57-03	Kubaka	Au, Ag	Medium. Proven reserves about 100 tonnes Au. Average about 17 g/t Au and 15.7 g/t Ag.
63°44'N	Kedon	Au-Ag epithermal vein	
160°01'E			

Veins and zones of adularia-quartz and adularia-chalcedony-hydromica-quartz veinlets containing fluorite, barite, and carbonate, occur in a northwest-trending elongate caldera 4 km in diameter. The caldera lies transverse to the northeast trend of the main regional structural elements. The caldera is rimmed by Middle to Upper Devonian volcanic rocks and volcanogenic sediments and is filled with Upper Devonian to Lower Carboniferous volcanic rocks. Gold-bearing veins occur within the caldera, localized in subvolcanic trachydacite in a stratified volcaniclastic sequence of Middle to Upper Devonian ignimbrite, pumiceous rhyolite to dacite, trachyandesite and rhyolite-dacite sills, and tephra and agglomerate tuff of various compositions. Deposits die out in the overlying Lower Carboniferous carbonaceous shale and siltstone. The most intensely mineralized veins trend about east-west and west-northwest. Dikes of Cretaceous rhyolite and alkalic basalt extend through and beyond the mineralized tectonic block. Basalt dikes cross the mineralized veins and are themselves cut by later, gold-poor quartz-carbonate veins and veinlets. Host rocks are intensely silicified, adularized, and sericitized; with the development of much hydromica. Initial stage of mineralization is marked by a gold-chalcedony association with colloidal gold (+electrum and küstelite). Later adularia-quartz stage involves coarser, recrystallized native gold and scattered, disseminated pyrite, arsenopyrite, galena, freibergite, acanthite, aguilarite, naumannite, argentopyrite, and sulfides of gold and silver in fine-grained aggregates. Native gold predominates markedly over sulfide-bound gold. Au:Ag ratio is 1:1 to 1:2. Rb-Sr isochron ages of stratified volcanic rocks and subvolcanic caldera rocks are 332-344 Ma. Post-ore alkalic basalt dikes yeilded 124-155 Ma ages by K-Ar. Ar-Ar ages on adularia from ore veins range from 110 to 175 Ma, with plateau ages ranging from 110-130 Ma. Most geologists consider the age of mineralization to be Late Devonian-Early Carboniferous because fragments of gold-bearing calcedonic quartz are found in the adjacent conglomerates which contain Lower-Middle Carboniferous fossils.

Yarantseva and Boldyrev, 1988; Savva and Vortsepnev, 1990; Stepanov and others, 1991; Banin, 1993, (oral commun.); I.N. Kotlar, 1986, (written commun.); V.V. Ivanov and P.W. Layer, 1994, (written commun.)

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P57-04 63°33'N 159°38'E	Yolochka Kedon	Au, Ag Au-Ag epithermal vein	Small.

Zone of veinlets and veins of quartz and carbonate-quartz composition that visually appear unmineralized, are accompanied by haloes of altered aplite-like rock. Ore bodies are up to 16 m thick, but the gold values are erratic. Au:Ag ratio is 1:1 to 1:3. Deposit occurs in Devonian volcanic rocks that form a volcanic dome in the Omolon massif. Archean schist underlies the volcanic rocks in the western part of the district. A large, linear body of Devonian diorite porphyry occurs along an east-west fault. Hypabyssal porphyritic dacite and dacitic brecciated flows are exposed in the middle of the dome. Deposit is related to the hypabyssal dacite.

Rozenblyum, oral commun., 1991

P57-05 63°29'N 158°50'E	Vechernee Kedon	Mo, Cu Porphyry Mo-Cu	Large. Averages 0.2% Mo, 0.2% Cu, 0.1 to 0.6 g/t Au, 2 to 10 g/t Ag.

Molybdenite-chalcopyrite quartz stockwork zone of altered pyritized, and silicified rocks with illite, occurs in mid-Paleozoic subalkalic granite that forms the core of an intrusive dome in Archean and Upper Proterozoic rocks. Richest ore bodies are confined to zones along the contacts of the granite; both within and adjacent to the pluton. Minor tungsten.

Rozenblyum, oral commun., 1991

P57-06 63°29'N 158°32'E	Skarn Eastern Asia-Arctic: Korkodon-Nayakhan	Fe W, Au, Ag Fe (±Au, Cu, W, Sn) skarn	Medium. Estimated 130 million tonnes containing 56% Fe, 2.96% MnO, 0.16% TiO_2, and minor Au and Ag.

Garnet, garnet-pyroxene, and pyroxene-clinohumite skarns contain numerous steeply-dipping, magnetite ore bodies about 300-800 m by 10-100 m in size. Massive ores are common and the ore bodies are controlled by faults. Skarn and associated deposits form a zone up to 150 m wide and about 2.2 km long around a Lower Paleozoic quartz monzonite intrusion. Skarns are succeeded by tremolite-wollastonite marble farther from the intrusion. District is mainly composed of a Riphean carbonate terrain that includes Archean migmatite with small jaspilite bodies. Magnetite skarns characteristically contain tungsten in scheelite, and gold and silver values.

Fadeev, 1975

P57-07 63°24'N 157°04'E	Khetagchan Eastern Asia-Arctic: Korkodon-Nayakhan	Au, W, Bi Granitoid-related Au	Small. Up to 20 g/t Au and up to 50-60 g/t Ag.

Zones of sulfide-quartz and sulfide-chlorite-quartz veins and veinlets up to 150 m long and 10-15 m thick occur along the contacts of an Upper Cretaceous granodiorite body; both within and adjacent to the intrusion. Ore minerals are galena, sphalerite, chalcopyrite, wolframite, pyrite, arsenopyrite, bismuthinite, native bismuth, gold, electrum, tetrahedrite-tennantite, silver sulfosalts, and argentite.

A.A. Sidorov, written commun., 1990

P57-08 63°23'N 161°42'E	Kegali Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Medium. Considerable potential.

Thick and extensive quartz, adularia-quartz, and carbonate-adularia-quartz veins and zones of veinlets in an area 2 km or more long contain disseminated pyrite, chalcopyrite, argentite, polybasite, stromeyerite, galena, sphalerite, native gold, and native silver. Veins occur in a large Lower to Upper Cretaceous, hypabyssal dacite body and in volcanic flows of intermediate to basic composition. Veins are accompanied by the haloes of illite-quartz alteration. Orientation of the ore bodies is related to sets of arcuate faults between an extrusive dome and an area of local volcanic subsidence. Au/Ag ratio is 1:3 to 1:10. Ar-Ar isotiopic studies yield an age of 79.0 Ma for the Au-Ag veins.

Peskov, written commun., 1975; P.Layer, V.Ivanov, and T.Bundtzen, written commun., 1994.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P57-09 63°21'N 158°22'E	Verkhny-Omolon Omolon	Fe Ironstone	Large. Estimated to contain 960 million tonnes of 33 to 51% Fe (average grade 40.5% Fe) and up to 0.3 g/t Au.

Sheet-like and podiform bodies of banded iron formation occur in Archean migmatite, amphibole and biotite-amphibole plagiogneiss, amphibolite, and mafic schist. Banded iron ore is composed of magnetite (45-65%), and quartz (35-55%) intergrown, with apatite and actinolite. Sulfur is absent. Ores are variously medium to coarse grained, massive, or banded. Main deposit extends for 3.5 km and averages 250 m thick in the thickest, central portion. It locally includes alternating, nearly conformable ore bodies and mineralized horizons of the country rock. The original quartzite and possibly the ironstone deposits may be derived from marine sedimentary rocks that originally contained ironstone (Superior Fe) deposits. The host rocks are extensively granitized. Rb-Sr isotopic data reveal multiple metamorphisms of the Archean basement. Granulite facies metamorphism occurred at 3.4 to 3.8 Ga; regional granitization occurred approximately at 2.0 Ga; and low grade metamorphism and deformation occurred approximately at 1.0 Ga (Zhulanova, 1990; Milov, 1991).

Gelman, Titov, and Fadeev, 1974; Fadeev, 1975; Zhulanova, 1990; Milov, 1991.

P57-10 63°07'N 159°19'E	Verkhny-Koargychan Eastern Asia-Arctic: Korkodon-Nayakhan	Au, Ag, Pb, Zn Au-Ag Polymetallic vein	Small. Samples contain up to 84.9 g/t Au, 538 g/t Ag, 15.8% Pb, 19% Zn, and 0.7% Cu.

Quartz-sulfide and quartz-carbonate-sulfide veins and sulfidized fractured zones contain massive galena, sphalerite, and pyrite, with gold and silver values. Host rock is Upper Permian limestone, and less commonly, siltstone. Ore zones strike predominantly about north-south and extend for several tens or sometimes several hundred of meters.

Vasetsky and Dorogoy, written commun., 1978

P57-11 62°60'N 160°03'E	Druchak Eastern Asia-Arctic: Okhotsk	Ag, Au Pb, Zn Au-Ag epithermal vein	Small. Samples contain 0.1 to 5.8 g/t Au, 112 to 3613 g/t Ag, and up to 1% Pb, Zn, Mo.

Steeply-dipping quartz, adularia-quartz, carbonate-quartz, and sulfide-carbonate veins 20 to 350 m long are transitional along strike into zones of sulfide-carbonate-quartz veinlets. Ore bodies occur in Upper Cretaceous extrusive rocks and strike northwest and north-northeast. Ore minerals are argentite, pyrargyrite, polybasite, pyrostilpnite, owyheeite, electrum, galena, sphalerite, chalcopyrite, tetrahedrite-tennantite, and arsenopyrite.

Lyaschenko and others, written commun., 1990

P57-12 62°41'N 159°55'E	Irbychan Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Small. Up to 12 g/t Au and 220 g/t Ag.

Gently dipping veins, lenses, and zones of veins formed in three stages: (1) an adularia-quartz stage with gold and silver values, marked by pyrite, argentite, pyrargyrite, sternbergite, and gold, (Au:Ag = 1:10); (2) a quartz stage carrying high silver values marked by pyrite, argentite, and native silver (Au/Ag = 1:300-1:500), and (3) a carbonate-quartz silver-polymetallic stage with pyrite, galena, sphalerite, and chalcopyrite. Main ore bodies occur in a hypabyssal rhyolite body along approximately east-west-trending faults. Ore bodies are several hundreds meters long. Deposit is in the margin of a circular structure dominated by Upper Cretaceous ignimbrite and subject to resurgent doming. Underlying rocks are Devonian volcanic rocks, and carbonates and clastic rocks of Permian, Triassic and Upper Jurassic age. Adularia from ore veins yeilded an Ar-Ar age of 82.8 Ma.

Zhivotnev and Litovchenko, 1977; V.V. Ivanov and P.W.Layer, 1994, written commun.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P57-13 62°35'N 157°16'E	Orlinoe Eastern Asia-Arctic: Korkodon-Nayakhan	Mo W Porphyry Mo	Small. Mo averages 0.01 to 0.03% but ranges up to 8.5%.

Steeply-dipping stockwork extending for tens of meters. It is composed of thin quartz veins and veinlets with disseminated and masses of molybdenite. Subordinate minerals are pyrite, chalcopyrite, wolframite, powellite, muscovite, fluorite, calcite, chlorite, and garnet. Molybdenum mineralization occurs in hornfelsed Upper Triassic sedimentary rocks and the Late Cretaceous granite that intrudes them.

Okhotkin, written commun., 1957

P57-14 62°32'N 159°45'E	Evenskoe Eastern Asia-Arctic: Okhotsk	Au, Ag Te, Bi Au-Ag epithermal vein	Medium. Reserves of 2.5 million tonnes grading 10 g/t Au, 250 g/t Ag. Considerable potential.

Complicated veins, altered zones with veinlets, and linear explosion-hydrothermal breccias. They occur in ignimbrite and andesite flows; and in sheets, fissured bodies, and extrusive domes of Late Cretaceous rhyolite, trachyrhyolite, rhyodacite, and dacite. Hydrothermal alteration ranges from low- and middle-temperature propylitization to highly-altered quartz-adularia-illite metasomatite. Mineralized zones are several hundred meters to 4 km long, and 5-10 m thick. Several mineral associations are recognized: (1) a gold-sulfide polymetallic association with gold and silver tellurides in epidote-quartz and quartz veins; (2) a gold-argentite association with selenides and locally stibnite in adularia-carbonate-quartz and quartz veins; (3) a gold-sulfide-sulfoantimonide association with selenides and pyrite in veins of the same composition as the previous association; and (4) a gold-sulfide-sulfoantimonide association in quartz and barite-quartz veins. Main ore minerals are gold, electrum, küstelite, native silver, argentite, polybasite-pearceite, proustite, pyrargyrite, stromeyerite, tetrahedrite-tennantite, naumannite, aguilarite, and hessite; native bismuth, iron, zinc, and copper; several polymetallic minerals are also known. Au:Ag ratio is generally about 1:20-1:30. More than ten independent ore zones occur in a circular hypabyssal complex along the northwest fault that bounds the Turomcha volcanic structure, which extends for 50 km and is approximately 7 km wide. Ar-Ar isotopic studies of adularia from vein yields an age of 78.0 Ma.

Kostyrko, Plyashkevich, and Boldyrev, 1974; Kostyrko, 1977; Kostyrko and Romanenko, 1978, 1980; Sidorov, 1978; P.Layer, V.Ivanov, and T.Bundtzen, 1994, written commun.

P57-15 62°26'N 157°35'E	Olyndja Eastern Asia-Arctic: Okhotsk	Ag, Au Au-Ag epithermal vein	Small. Ranges up to 4 g/t Au and 3 to 1079 g/t Ag.

Sets of closely spaced, approximately north-south, quartz, quartz-carbonate, and adularia-quartz veins and veinlets occur over a zone about 1 km long in silicified, kaolinized, and sulfidized Upper Cretaceous volcanic rocks. Main ore minerals are silver sulfosalts, argentite, xanthoconite, and native silver. Pyrite, chalcopyrite, and galena are minor. Zone occurs at the south side of a volcanotectonic depression formed at the intersection of northwest and nearly east-west faults.

Kuzyukov, written commun., 1977

P57-16 62°19'N 159°58'E	Aldigych Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Small. Up to 14.5 g/t Au and 98 g/t Ag.

Stockwork zones 200 to 300 m long, include short en echelon and subparallel, quartz and barite-quartz veins and veinlets containing electrum, galena, sphalerite, chalcopyrite, silver-bearing tetrahedrite, sulfosalts of silver, and stibnite. Upper Cretaceous porphyritic ignimbrite wall rock is locally altered to quartz-kaolinite and siliceous metasomatite. Some veins are confined to propylitized andesite and hypabyssal gabbro-diorite porphyry.

Kostyrko, Plyashkevich and, Boldyrev, 1974

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P57-17 62°14'N 159°11'E	Nevenrekan Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Small. Ore ranges 0.5 to 23 g/t Au and 22 to 746 g/t Ag.

Steeply-dipping quartz, adularia-quartz, carbonate-quartz, and sulfide-quartz veins and zones of veinlets up to several hundreds of meters long occur in weakly altered Upper Cretaceous ignimbrite, felsite, rhyolite, and subordinate andesite. Ore minerals are argentite, pyrargyrite, native gold, native silver, pyrite, arsenopyrite, chalcopyrite, coarse-grained disseminated galena, sphalerite, magnetite, and supergene copper minerals. Minor gangue minerals include chlorite, tourmaline, kaolinite, and amphibole. Deposits are localized at the intersection of a deep, northwest to approximately north-south-trending fault, and a system of northeast to nearly east-west fractures.

Politov, written commun., 1981

P57-18 61°40'N 161°21'E	Tikas Eastern Asia-Arctic: Koni-Yablon	Mo Porphyry Mo	Small. Veinlets and sulfidized rocks contain 1-5 g/t silver.

Irregularly disseminated molybdenite, pyrite, arsenopyrite, and galena occur in quartz and feldspar-quartz veins and veinlets in silicified, sericitized, and sulfidized sedimentary rocks near the contact of an Early Cretaceous granodiorite which is cut by thin aplite dikes. Disseminated sulfide minerals also occur in the granodiorite. Weakly hornfelsed Middle Jurassic sandstone and shale host the pluton and are also cut by sheets of gabbro and granite porphyry. Veinlets and sulfidized rocks contain 1-5 g/t silver.

Ivanov, Leonenko, and Livshits, written commun., 1966

P57-19 61°20'N 156°17'E	Spiridonych, Teply Eastern Asia-Arctic: Okhotsk	Au, Ag Au-Ag epithermal vein	Medium Samples contain from 0.7 to 16.9 g/t Au, 348.3 to 1630 g/t Au, and >1% Pb, Zn, Cu, Mn.

Bands of closely-spaced subparallel, mineralized fracture zones with veins and veinlets of quartz, epidote-chlorite-quartz, quartz-chlorite-sulfide, quartz-pyrolusite-rhodonite, and quartz-carbonate composition. Ore minerals are argentite, stromeyerite, native silver, electrum, pyrargyrite, galena, sphalerite, chalcopyrite, and bornite. Host rocks are Upper Cretaceous ignimbrite and andesite. Ore occurs in the centers of volcanic depressions and is spatially related to stocks and dikes of diorite, granodiorite, granite, andesite-bassalt and andesite. Northwest-striking veins predominate. Altered wall rock containing quartz, adularia, and illite reflects widespread mid- and low-temperature propylitization.

Kopytin, 1987, written commun., 1987; Konstantinov, 1989

P58-01 63°52'N 165°41'E	Sergeev Eastern Asia-Arctic: Koni-Yablon	Au, Ag Au-Ag epithermal vein	Medium. Grade ranges up to 1387 g/t Au, up to 8200 g/t Ag.

Steeply-dipping quartz, adularia-quartz, and carbonate-quartz veins, altered rocks, and mineralized fracture zones occur in an area of approximately 15 km^2 on the tops and limbs of an intrusive dome composed of Upper Cretaceous andesite-basalt and basalt flows that have been intruded by a central laccolith-like body composed of granodiorite and quartz monzonite porphyry cut by numerous dikes and stocks of intermediate to felsic composition. En echelon, linear and arcuate ore bodies are controlled by the intersection of a major northeast fault, a set of radial and concentric fractures, and the contacts of the hypabyssal plutons. Domal structure coincides with an aureole of intense epidote-chlorite propylitization, local areas of actinolite-epidote propylitization, and illite-quartz alteration near the veins. Mineral assemblages consist of: (1) an early, high-temperature garnet-epidote-quartz assemblage with hematite; (2) a productive adularia-quartz assemblage with pyrargyrite, acanthite, electrum, native silver, canfieldite, galena, sphalerite, chalcopyrite, bornite, pyrite, and magnetite; and (3) a later pyrite-quartz and prehnite-zeolite-carbonate assemblage. Deposits are characterized by increase in sulfides as mineralization progressed, and by the presence of tellurides. In upper horizons selenium dominates over tellurium; in the lower horizons the reverse. Alteration consists of propylitization, with local adularization, argillization, and silicification. Deposit classified as a gold-silver association, gold-selenide-tellride mineral type.

Vasilenko, Rozhkov, and Shepitsyn, 1977; V.P. Khvorostov, written commun., 1978.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P58-02	Tsirkovy	Au, Ag, Cu, W, Bi	Small.
63°33'N	Eastern Asia-Arctic: Koni-Yablon	Granitoid-related Au	
165°07'E			

Gold-silver-polymetallic veins are associated with Late Cretaceous intrusions of granodiorite porphyry, syenite-diorite, and diorite. Deposit has affinities with copper-molybdenum porphyry deposits.

V.P. Vasilenko, written commun., 1973

P58-03	Talov	Cr	Small.
61°49'N	Kuyul	Podiform Cr	
165°49'E			

Podiform and disseminated chromite occurs in serpentinite veins in serpentinized peridotite. Large boulders and pebbles of massive chromite are scattered in residual and alluvial deposits derived from the peridotite.

Mikhailov, 1961

P58-04	Tikhorechen	Cr	Small. Ranges 34% to 52% Cr_2O_3.
61°37'N	Kuyul	PGE, Ni	
164°50'E		Podiform Cr	

A band of rock debris in a serpentinite melange zone contains massive and finely disseminated chromite. Melange is 1.5-2 km wide and about 7 km long. Peridotite outcrops occur in residual deposits and contain chromite masses and lenses up to 5 m wide and 25-30 m long. Platinum and nickel are present.

Pokhialainen, written commun., 1965; Gryaznov, 1970

P58-05	Ametistovoe	Au, Ag	Medium. Proven reserves 96 tonnes Au. Average grade 16 g/t Au. Considerable potential and prospecting.
61°19'N	Central Koryak	Au-Ag epithermal vein	
164°49'E			

Deposit contains two types of ore bodies: (1) ore pipes with small subparallel veins and veinlets, and (2) steeply dipping veins and zones. The veins are hundreds of meters long and several meters thick; the zones are several tens of meters thick. The veins are composed of quartz, kaolinite-quartz, and sulfide-quartz types. The main ore minerals are gold, argentite, and küstelite. Subordinate minerals are stephanite, stibiopearceite, aguilarite, pyrargyrite, miargyrite, freibergite, naumannite, and native silver. Pyrite, galena, sphalerite, and chalcopyrite are widespread and comprise up to 20 to 30 percent of some veins. The gangue minerals are quartz, kaolinite, adularia, and chlorite. The Au:Ag ratio averages 1:3. The richest ore bodies are confined to altered rocks that contain a alteration of kaolinite, illite, and quartz superimposed on widespread epidote-chlorite-carbonate propylitic alteration. The deposit is centered on a magmatic structure that is about 5 to 6 km deep. The host volcanic rocks are Eocene and Oligocene flows with K-Ar ages of 18-24 Ma that consist mainly of andesite, andesite-basalt, andesite-dacite, and dacite. Associated are local abundant extrusive-vent and hypabyssal rocks of similar compositions. The deposit is controlled by: (1) a northwest- and nearly north-south-trending faults; (2) radial and concentric fractures; and (3) extrusive and hypabyssal bodies.

Khvorostov, 1983; V.P. Khvorostov, written commun., 1986; Benevolskyi and others, 1992

P58-06	Sprut	Ag, Au	Small.
61°21'N	Central Koryak	Au-Ag epithermal vein	
165°07'E			

Veins and zones of veinlets are confined to a system of subparallel fractures trending northwest. Veins are of kaolinite-adularia-quartz composition and contain proustite, pyrargyrite, electrum, native silver, polybasite, freibergite, and mercury-bearing tetrahedrite. Au:Ag ratio is 1:500. Host rocks are Paleogene andesite-dacite and dacite porphyry related to extrusive vents and volcanic domes.

Khvorostov and others, written commun., 1982

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P58-07 61°31'N 166°07'E	Unnei Central Koryak	Sn, Ag, Au Sn polymetallic vein	Small.

Quartz-chlorite and quartz-sulfide veins trend about north-south and northwest. They occur in zones of silicification, chloritization, and kaolinization in intricately deformed Upper Cretaceous sandstone, siltstone, and argillite. Veins contain disseminated cassiterite, stannite, pyrite, arsenopyrite, sphalerite, stibnite, proustite, pyrargyrite, and small amounts of gold. Sedimentary rocks are intruded by Paleogene granite porphyry stocks and dikes.

Rozhkov, 1969

P58-08 61°16'N 165°21'E	Ivolga Central Koryak	Ag, Sn As, Sb Epithermal vein	Small.

Quartz veins and sets of parallel veinlets generally trend north-south. They contain arsenopyrite, pyrite, marcasite, proustite, pyrargyrite, miargyrite, famatinite, argentite, stannite, and stibnite in fracture zones, zones of silicification, pyritization, and kaolinization of Paleogene felsic extrusive rocks and Upper Cretaceous marine clastic rocks. Au:Ag ratio is 1:1000 or less. Deposits are associated with a small granite porphyry stock which forms an elongate band trending north-northeast.

Rozhkov, 1969; Khvorostov and others, written commun., 1982

P58-09 61°28'N 167°10'E	Khrustal (Khrustalnoe) Central Koryak	Sn Sn polymetallic vein	Small. Average grade of 0.7%Sn.

Occurs in fracture zones up to 400 m long and 1.5 to 5 m thick in a contact-metamorphic zone subsequently altered to combinations of quartz, carbonate, sericite, chlorite, sulfide, and tourmaline. Major ore assemblage is cassiterite-quartz-chlorite. Deposit similar to Ainavetkinsky deposit, except that in the Khrustalnoe deposit, the central silicified vein zone is less distinct. Limonitie alteration is very common. Deposit hosted in Late Cretaceous stratified clastic rocks that occur in northeast-trending, complex folds and are cut by numerous faults. Stratified rocks are intruded by a small stock and dikes of diorite porphyry and granodiorite porphyry. K-Ar isotoic studies indicate an age of 30-27 Ma for the granodiorite porphyry and diorite.

Lugov, 1986.

P58-10 60°50'N 164°39'E	Reznikov Central Koryak	Sn, Ag, Au Sn polymetallic vein	Small to medium.

Tin-bearing quartz, and chlorite-quartz veins and mineralized fracture zones extend for hundreds of meters and contain cassiterite, stannite, and sulfides of iron, copper, zinc, silver, and lead. Paleogene felsic dikes and intrusions along fractures trend northwest, forming a ladder system that trends northeast. Tin-bearing bodies often occur along the contacts of diorite porphyry and granite porphyry dikes with Upper Cretaceous clastic sedimentary rocks. Ore bodies are similar to the Ainavetkin ore district in composition and structure.

Lugov and others, 1974a, b

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P58-11 60°58'N 165°17'E	Ainatvetkin Central Koryak	Sn, Ag Sn polymetallic vein	Medium. Average grade of 0.6 %Sn.

Consists of sulfide-chlorite-quartz veins and fracture zones with cassiterite that are a few hundred m long and from 1.0 to 6.0 m thick. Ore minerals are cassiterite, magnetite, pyrrhotite, chalcopyrite, galena, sphalerite, arsenopyrite, wolframite, scheelite, pyrite, stannite, canfieldite, pyrargyrite, gold, and native copper. Cassiterite-chlorite-quartz assemblage, containing up to 10% sulfides, predominates. Breccia zones with fragments of metasomatic rocks and quartz-chlorite cement with sulfides contain highest Sn content. Deposit hosted in complexly-folded Upper Cretaceous (Santonian-Campanian) sandstone and shale that is overlain by Late Eocene-Oligocene rhyolite, rhyodacite, rhyodacite tuff, and ignimbrite. Late Cretaceous clastic rocks are cut by numerous stocks, dikes, and hypabyssal granitoids of Late Paleogene age. Biotite-quartz, cordierite, and quartz-biotite-cordierite hornfels zones occur at the contacts. Hornfels subsequently altered to quartz, chlorite, and sericite.

Lugov and others, 1974; Lugov and others, 1979b; Lugov, 1986.

P58-12 60°35'N 167°49'E	Olyutor Olyutor	Hg, Sb, As Clastic sediment-hosted Hg or hot-spring Hg?	Medium. Average grade of 1.4% Hg, and ranging up to 0.4% Sb and 4 g/t Au. Estimated 700 tonnes Hg.

Deposits occur in steeply-dipping fracture zones, which radiate from a large, northeast trending fault. Host volcaniclastic rocks are of Paleogene and Neogene age and are deformed into small linear folds. Ore bodies strike for tens of meters to 600 m. Veins have numerous apophyses in the form of typical mineralized breccias, which often grade into zones of veinlets. Most productive deposits are confined to tuff. Quartz and kaolinite, and less commonly dolomite, are the main gangue minerals. Main ore mineral is cinnabar accompanied by stibnite and sometimes realgar, cementing quartz and quartz-kaolinite breccia fragments. Wall rock alteration includes weak silicification, kaolinization, and carbonatization.

Babkin, 1975; Vlasov, 1977

P58-13 60°26'N 164°23'E	Maletoivayam Olyutor	S Sulfur-sulfide	Large. Contains up to 30% S.

Consists of lower and upper occurrences that are separated by a 10 to 50 m thick bed of kaolinite-montmorillonite and quartz-kaolinite rock. Both occurrences are inclined 5 to 10° with respect to bedding in host rock. Upper ore body occurs for 1,800 m along strike, ranges from 80 to 700 m wide, and is 3 to 115 m thick. Deposit consists of sulfide-sulfur-alunite silicified rock and sulfuric silicified rock. Latter contains major native sulfur tonnage. Sulfide-sulfur-alunite silicified rock contains 18% S, 30-40% alunite, and 10% Fe sulfides. Ore zone contains up to 30% native sulfur. Native sulfur of 96-99% purity is separated by thermal reduction. About 60% potassium sulfate is also separated. Deposit occurs at the southern end of the Olyutorka volcanic belt, in the Miocene Korfovsky Formation.

Vlasov, 1977.

P59-01 64°00'N 168°34'E	Orlovka Central Koryak	Au, Zn, Cu, Hg Epithermal vein	Small.

Linear zones of quartz and quartz-carbonate veins and veinlets up to 1 m thick and 100-150 m long contain native gold, pyrite, magnetite, pyrrhotite, sphalerite, chalcopyrite, arsenopyrite, and cinnabar. Zones occur in areas of altered quartz-sericite and propylitic rock. Deposits occur in the middle of a volcanic dome consisting of Cenozoic andesite and andesite-basalt. High gold values are associated with geochemical aureoles of silver, copper, and molybdenum.

Rozenblyum, oral commun., 1991

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P59-02 63°60'N 173°52'E	Berezovaya Central Koryak	Sn Sn polymetallic vein	Small.

Quartz-tourmaline-chlorite veins and lenticular breccias with fine-grained and colloform cassiterite, occur in extensive altered zones of sulfidized tourmaline-chlorite-quartz altered rock. Main ore bodies are related to northeast-trending fractures. Host rocks are intensely deformed Cretaceous volcaniclastic and clastic sedimentary rocks that are overlain by Cenozoic extrusive rocks of intermediate to felsic composition. Sedimentary and volcanic rocks are intruded by stocks and dikes of granite porphyry and diabase, and hypabyssal bodies of Paleogene dacite and rhyolite.

Lugov and others, 1974a, b

P59-03 63°53'N 173°10'E	Agranai Central Koryak	Hg As, Sb Volcanic-hosted Hg	Small.

Sheets and lenticular zones with disseminated veinlets containing cinnabar occur in Late Paleogene rhyolite and dacite. Main minerals are quartz, kaolinite, and cinnabar. Minor minerals are opal, pyrite, stibnite, realgar, and metacinnabar.

Rozenblyum, Zincevich, and Nevretdinov, 1975

P59-04 63°33'N 171°09'E	Vaegi Anadyr	Au Au quartz vein	Small.

Consists of thin quartz and carbonate-quartz veins and veinlets that contain disseminated gold, hematite, pyrite, and chalcopyrite with spare arsenopyrite. The deposit is hosted in Paleozoic and supposed Proterozoic intermediate metavolcanic rocks. Gold-cinnabar intergrowths occur in nearby heavy mineral placers which have been mined. The deposit occurs in a nappe of early Paleozoic and possibly older metavolcanic rocks that display both greenschist facies metamorphism and extensive host rock replacement by sulfide minerals and quartz, and that may have potential for vein-disseminated gold deposits

Zakharov and V.P. Vasilenko, written commun., 1977

P59-05 63°28'N 173°51'E	Pervenets Central Koryak	Hg, As, Sb Silica-carbonate Hg	Small.

Scattered cinnabar occurs as disseminations, veinlets, and masses in a northwest trending block of fractured, silicified, and kaolinized, sandstone, siltstone, and conglomerate of Lower Cretaceous (Aptian-Albian) age. Masses and veinlets of realgar occur with the cinnabar and separately. Orpiment, metacinnabar, guadalcazarite, and stibnite are present.

Kim, 1978

P59-06 62°43'N 170°06'E	Kuibiveen Central Koryak	Mo, Cu, Au Porphyry Cu-Mo	Small to medium.

Quartz-tourmaline breccias, altered rocks, veins, and zones of linear and stockwork quartz-sulfide veinlets, are present in a nearly east-west zone about 25 km long and about 4 km wide. Deposits are associated with a Neogene complex of small intrusions and dikes of intermediate and felsic composition. Deposits occur along a fault that thrusts Upper Cretaceous siliceous sedimentary rocks over Oligocene-Miocene sandstone and conglomerate. Mineralization consists of disseminated molybdenite, arsenopyrite, chalcopyrite, galena, and native gold, in zones from tens of meters up to hundreds of meters thick.

Zakharov and V.P. Vasilenko, written commun., 1977; I.S. Rozenblyum, written commun., 1991

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

P59-07	Lalankytap	Mo, Cu	Small to medium.
62°09'N	Central Koryak	Porphyry Cu-Mo	
173°11'E			

An oval stockwork about 1.2 by 0.6 km in area contains randomly oriented quartz veinlets which contain irregularly disseminated pyrite, molybdenite, and chalcopyrite; with minor pyrrhotite, sphalerite, galena, magnetite, martite, rutile, anatase, and sphene. Ore minerals occur both in the veinlets and disseminated between them. Copper and molybdenum minerals are related to a zone of quartz-biotite (with sericite and pyrite) alteration in both a Paleogene quartz diorite and monzodiorite pluton and in Late Cretaceous flysch which both host the deposit. Pluton is bounded by a nearly east-west zone of pyritized altered rocks more than 11 km long and 1 to 4 km wide. Small amounts of gold occur in Quaternary, goethite-cemented, alluvial conglomerate near the deposit. Deposit is controlled by a nearly-east-west suture at the juncture of two major structural boundaries.

Brazhnik and Kolyasnikov, 1989; Brazhnik and Morozov, 1989

P59-08	Krassnaya Gorka	Hg	Small. Average grade 0.1% Hg, but ranges up to 1.4% Hg.
61°54'N	Central Koryak	Clastic sediment-hosted Hg or hot-spring Hg?	
168°48'E			

Saddle-shaped mercury deposits are confined to beds of Upper Cretaceous sandstone where cross-cutting fracture zones intersect the cores of gentle anticlinal folds. Cinnabar is disseminated in quartz-dickite-dolomite vein material. In addition to cinnabar, marcasite, pyrite and native arsenic are present.

Babkin, 1969

P59-09	Neptun	Hg, Sb, As	Small. Estimated to contain about 330 tonnes Hg in ore with 0.6% Hg.
61°40'N	Central Koryak	Clastic sediment-hosted Hg or hot-spring Hg?	
168°16'E			

Conformable, mineralized, northwest-trending fracture zones occur in Upper Cretaceous sandstone, siltstone, and shale. Cinnabar is associated with stibnite, and minor amounts of pyrite, marcasite, realgar, galena, sphalerite, and chalcopyrite. Ore minerals are scattered in quartz-dickite-dolomite material that cements breccia; or occur in sets of thin branching veinlets associated with quartz and carbonate.

Babkin, 1969; Tarasenko and Titov, 1970

P59-10	Snezhnoe	Cr, PGE	Small.
61°37'N	Koryak Highlands	Zoned mafic-ultramafic Cr-PGE	
171°39'E			

Natural alloys of iron and platinum occur in chromite bodies within dunite of a zoned ultramafic complex that intrudes gabbro, clinopyroxenite, wehrlite, and dunite that in turn intruded Upper Cretaceous siliceous volcanic rocks.

Kutyev and others, 1988a, b

P59-11	Lyapganai	Hg, Sb	Medium. Estimated to contain 1400 tonnes Hg in ore with 0.5 to 2.4% Hg.
61°34'N	Central Koryak	Clastic sediment-hosted Hg or hot-spring Hg?	
168°01'E			

Mineralized fracture zone in Upper Cretaceous sandstone and mudstone is cemented by quartz and dolomite with subordinate kaolinite and calcite. Cinnabar is disseminated in the vein material or coats breccia clasts as thin rims. Stibnite and pyrite are minor. Ores are disseminated to massive, brecciated, in veinlets, and in banded disseminations. Ore bodies vary in size from 0.1 to 4.2 m in width by 110 m to 420 m in length. The most promising ore bodies occur in faults trending northeast parallel to fold axes. Deposit has a peculiar high germanium content. This deposit is similar to many other Hg deposits in the Koryak upland.

Tarasenko and Titov, 1970; Babkin, 1975; Vlasov, 1977

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P59-12	Itchayvayam	Mn	Medium. Ranges 11 to 47.4% Mn.
61°24'N	Vatyn	Volcanogenic Mn	
172°20'E			

Mn mineralization is confined to the Albian-Campanian basalt-siliceous Vatyn Formation. Massive, patchy, and brecciated manganese ores form concordant, lens-like bodies 1 to 30 m long and 0.3 to 10 m thick in siliceous rocks. Main ore mineral is braunite, but pyrolusite is present locally. Manganese also occurs in veins of metamorphic origin 2 to 10 m long.

Egiazarov and others, 1965

P60-01	Chirynai	Cr, PGE	Medium.
63°27'N	Tamvatney-Mainits	Podiform Cr	
175°44'E			

Thirty chromite ore occurrences are known in the Chirynai alpine-type ultramafic body. Ore bodies occur in chains 100 to 150 m long which consist of thin lenses (up to 20-40 cm thick), masses, and schlieren of nearly massive to massive chromite. Banded zones of disseminated chromite 5 to 7 m thick and more than 50 m long are known. Chromite occurs in dunite, commonly at the contact zone between dunite and intergrown pyroxenite, dunite, and harzburgite. Accessory platinum-group minerals occur as Os, Ir, and Ru sulfides; and also as hexagonal solid solutions of ruthenium, osmium and iridium with iron, copper, and nickel. Most common PGE mineral is an iron-ruthenium solid solution. Ultramafic rocks occur in alpine-type setting.

Silkin, 1983; Dmitrenko and Mochalov, 1986; Dmitrenko and others, 1987

P60-02	Tamvatney	Hg, W, As	Large. Reserves estimated at 30,000 tonnes Hg in ore averaging 0.81% Hg.
63°29'N	Central Koryak	Silica-carbonate Hg	
174°13'E			

Cinnabar, tungstenite, wolframite, and sulfides of iron and arsenic occur in mylonitized, carbonatized, silicified, and argillized serpentinite, serpentinized peridotite, conglomerate, and coarse-grained sandstone, and argillite. Deposits are confined to the northern tectonic contact of the Tamvatney lherzolite ophiolite body that overlays a clastic rock sequence of Lower Cretaceous (Aptian-Albian) and Oligocene-Miocene ages. Ultramafic rocks are intruded by bodies of Early Cretaceous gabbronorite, Late Cretaceous plagiogranite, and Neogene andesite-basalt. Age of the deposits is assumed to be Lower Pleistocene. Main ore minerals are cinnabar, tungstenite, wolframite, huebnerite, scheelite, marcasite and pyrite. Minor minerals include metacinnabar, stibnite, realgar, orpiment, arsenopyrite, sphalerite, chalcopyrite, millerite, bravoite, chalcocite, pyrrhotite, and hematite. Relic ilmenite, chromite, magnetite, niccolite, and pentlandite are present in the serpentinite and silica-carbonate metasomatite. Gangue minerals in the veins are mainly quartz, chalcedony, magnesite, dolomite, kaolinite, dickite associated with peculiar hard and liquid bitumens, and native sulfur. Middle portion of the ore-bearing zone is made up of stockworks, masses of ore minerals, veins, and a dense network of sulfide veinlets. Zone extends for about 20 km with an average thickness of about 20-30 m.

Rozenblum and others, 1973; Babkin, 1975; Voevodin and others 1979, 1980

P60-03	Nutekin	Au, Hg	Small.
63°25'N	Anadyr	Au quartz vein	
176°52'E			

Consists of steeply-dipping quartz and quartz-carbonate veins which grade into zones of silicified and sulfidized veinlets along strike. Deposits trend northwest and are up to 500 m long. The gold-bearing veins occur in Early Mesozoic, and less frequently Early Cretaceous, clastic sedimentary rocks. The highest gold contents are in veins within Paleogene dolerite dikes. The gold is associated with rare disseminated pyrite and arsenopyrite, and is marked by high mercury content. The deposit is restricted to the axial portion of a horst-anticlinorium structure.

V.P. Vasilenko, written commun., 1977

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
P60-04 63°16'N 175°24'E	Krassnaya Gora Tamvatney-Mainits	Cr, PGE Podiform Cr	Small to medium.

Two horizons with numerous chromite bodies occur within the Krassnaya Gora alpine-type ultramafic body. Upper horizon is near the contact of dunite and an overlying intergrown pyroxenite-dunite-harzburgite assemblage; the chromite occurs in dunite bands. Podiform and schlieren occurrences of nearly massive to massive chromite extend for 35-70 m with a thickness of up to several meters. Several large podiform bodies at the base of dunite layers contain massive and concentrated chromite for 60-100 m along strike and are more than 1 m thick. A zone of disseminated chromite 22 m thick is also located there. Platinum-group metals associated with chromite occur as solid solution in the sulfides with Os, Ir, and Ru in hexagonal sites, and Ir, Os, Pt, Ru, and Rh in cubic sites. Some secondary, rare, platinum, rhodium, and palladium arsenites and sulfoarsenides are also present.

Silkin, written commun., 1983, Dmitrenko and Mochalov, 1986; Dmitrenko and others, 1987

P60-05 63°16'N 176°39'E	Ugryumoe Mainits	Cu, Zn, Pb, Au Kuroko Cu-Zn-Ag massive sulfide(?)	Small.

Massive sulfides that contain high concentrations of Cu, Zn, Pb, and Au that occur along a silicified zone up to 3 km long. The sulfides occur in a Mesozoic sequence of interbedded basalt, plagiorhyolite, tuff, and siliceous tuffaceous siltstone. The sulfide horizons consists of massive pyrite, and chalcopyrite, pyrite, and quartz. Intrusive rocks include granite, plagiogranite, and gabbro. The deposit occurs in the Hettangian and Sinemurian Lazov sequence that consists of interbedded basalt, plagiorhyolite, tuffs, and tuffaceous siltstone.

Oparin and Sushentsov, 1988

Q01-01 67°52'N 179°25'W	Chaantal Chukotka	Sn, W As Sn quartz vein and Sn greisen	Small to medium.

Sets of branching, erratic quartz veins, veinlets, and zones of greisenized rock occur within and near the West Iultin biotite granite pluton. Ore bodies trend easterly and are several tens to hundreds of meters long. Ore minerals are arsenopyrite, wolframite and cassiterite; chalcopyrite, scheelite, molybdenite, and beryl are less common. Arsenopyrite and wolframite are commonly confined to the middle portions of the quartz veins; cassiterite is confined to greisenized selvages.

Slavtsov, written commun., 1951; Tarakanov, written commun., 1958

Q01-02 67°51'N 178°44'W	Iultin Chukotka	Sn, W Sn-W polymetallic vein and greisen	Large. Discovered in 1937, mined since 1959. Average grade 0.43% Sn, 1.29% WO_3.

The deposit occurs as quartz veins, mineralized stockwork zones, and disseminated veinlets in greisen. Deposit occurs along the contact of the mid-Cretaceous Iultin granite (K-Ar age of 90-110 Ma), and is hosted by Lower and Upper Triassic sandstone and shale that has been successively subjected to contact metamorphism and metasomatism. Mineralized quartz veins with east-west and north-south trends are the most productive, but some trend northeast and northwest as well. Veins are both steeply-dipping and gently-dipping. Some ore bodies wedge out vertically. Ore bodies occur both as tungsten ore over the top of a leucogranite pluton which is about 300 m below the surface; and as tin ore in the marginal zone of the leucogranite. Approximately 65 minerals are known, the most common are quartz (95%), muscovite, fluorite, albite, cassiterite, wolframite, arsenopyrite, and löellingite. Topaz, pyrite, pyrrhotite, bismuthinite, stannite, chalcopyrite, sphalerite, galena, molybdenite, scheelite, hematite, and native silver and bismuth, are less common. Cassiterite is commonly associated with wolframite, arsenopyrite, and muscovite. Cassiterite occurs as short, columnar crystals up to 10 cm across. Large (up to 4-9 cm) and gigantic (up to 0.5 m) wolframite crystals and crystal intergrowths are present. The vertical extent of economic tin-tungsten ore bodies exceeds 900 m.

Zilbermints, 1966; Lugov, Makeev, and Potapova, 1972; Lugov, 1986

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q01-03 67°47'N 178°47'W	Lenotap Chukotka	Au Au quartz vein	Small. Ranges 0.6 to 98 g/t Au, 0.7 to 18.9 g/t Ag, and up to 1.53% WO_3.

Zones of cross-cutting and conformable quartz veins, veinlets, and silicified breccia occur in Upper Permian and Lower to Middle Triassic sandstone and shale at the contacts of Triassic gabbro-diabase sills. Ore bodies vary in length from 30 to 220 m and in thickness from 0.5 to 2 m; but locally are up to 28 m thick. Gold is associated with arsenopyrite, pyrite, galena, sphalerite, and tetrahedrite-tennanite. Quartz veins have been metamorphosed by the Iultin tin-bearing granite.

Panychev, written commun., 1977

Q01-04 67°40'N 178°06'W	Tumannoe Eastern Asia-Arctic: Chaun	Au, As, Sb Disseminated Au-sulfide	Medium. Ranges 1.4 to 76.1 g/t Au, 0.4 to 15.6 g/t Ag, up to 1% Sb.

Auriferous, fractured belts and folded zones trend about northwest and east-west in an Upper Triassic sandstone-siltsone-shale sequence. Mineralized zones are marked by a clay-mica matrix with fine disseminated sulfides; cut by thin quartz veinlets. Linear mineralized zones are often associated spatially with quartz-stibnite veins. The ore structure is associated with an intricate dome-like uplift developed where a fault intersects a syncline. Early-stage veins and veinlets with rare-earth metal minerals occur within a central granodiorite porphyry stock and the surrounding hornfels.

V.P. Vasilenko and R.A. Eremin, written commun., 1977

Q01-05 67°34'N 178°04'W	Ekug Eastern Asia-Arctic: Chaun	Sn, W As, Cu Porphyry Sn or Sn greisen	Medium. Sn ore contains 0.2 g/t Au and up to 32.7 g/t Ag. No data on reserves.

Stocks and dikes of late Cretaceous quartz porphyry are altered to tin-bearing quartz-topaz greisen in association with abundant fluorite and sericite. Subordinate mineralization consists of fractured zones and cassiterite-quartz stockworks in Upper Triassic sandstone and shale. Highly altered quartz-topaz rocks with abundant disseminated fluorite, arsenopyrite, and lesser cassiterite and wolframite, also occur in hornfelsed sedimentary rocks near the central porphyry stock; especially near radial fractures. Cassiterite is finely disseminated in greisen; larger crystals are present in quartz-sulfide veinlets. Cassiterite is typically associated with arsenopyrite, pyrite, and chalcopyrite; and less commonly with galena, sphalerite, and stannite. By-product Au and Ag occur in sulfides.

Greshilov and Kozlov, 1969; Lugov, Makeev, and Potapova, 1972; Lugov, 1986

Q01-06 67°12'N 179°09'W	Granatnoe Eastern Asia-Arctic: Chaun	Mo Porphyry Mo	Small.

Quartz veins with feldspar, muscovite, tourmaline, and chlorite up to 130 m long and up to 0.6 m thick are confined to a Cretaceous granite body. Molybdenite is present as disseminations and masses up to 3-5 cm in size. Minor chalcopyrite, arsenopyrite, pyrite, pyrrhotite, and wolframite.

Rokhlin, written commun., 1961

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q01-07 66°25'N 179°22'W	Matachingai Eastern Asia-Arctic: Chukotka	Hg Silica-carbonate Hg	Small.

Small lenses, masses, and irregular occurrences of cinnabar occur in thin monomineralic or quartz- and carbonate-bearing veinlets in serpentinite, silica-carbonate metasomatites, and less commonly in propylitized extrusive volcanic rocks. Mineralized area is in a mass of serpentinized peridotite in tectonic contact with Upper Cretaceous brecciated basalt and andesite tuff. Sheet-like bodies of ore-bearing silica-carbonate rocks are mostly steeply dipping, locally gently inclined, and are fault bounded. They form chain-like strings tens to hundreds of meters long. The altered rocks are mainly carbonate varieties and are broken by northeast-trending faults. The cinnabar ore shoots occur at these altered-zone/fault intersections. Cinnabar is mainly associated with magnesite, dolomite, and quartz; talc, chlorite, kaolinite, pyrite, chalcopyrite, arsenopyrite, marcasite and millerite are less common.

Babkin, 1975; Kim, 1978; Kopytin, 1978

Q01-08 66°24'N 178°55'W	Eruttin Eastern Asia-Arctic: Chaun	Sn Sn silicate-sulfide vein	Small to medium.

Deposit consists of a dense network of thin, quartz and quartz-tourmaline veinlets which contain fine-grained cassiterite and sulfides. The deposit occurs in a zone of intense silicification, sericitization, tourmalinization, sulfidization, and locally kaolinization, up to 2.5 km long; which is controlled by northeast fractures. High-grade tin-bearing zones are several tens to hundreds of meters long. Deposit occurs above a Late Cretaceous granitic pluton in a Lower Cretaceous andesite-dacite sequence intruded by numerous stocks and dikes of granodiorite porphyry, granite, andesite-basalt, and dolerite of Early Cretaceous to Paleogene age.

Zilbermints and Kolesnichenko, 1973; Lugov and others, 1974a, b

Q01-09 66°19'N 179°46'W	Elmaun Eastem Asia-Arctic: Chaun	Sn Sn silicate-sulfide vein	Small to medium.

Tourmaline, chlorite, and arsenopyrite-quartz veins and veinlets with cassiterite, occur in zones of chlorite and sericite-quartz alteration. Mineralized area occurs in the periphery of a caldera-like structure composed of Lower and Upper Cretaceous volcanic rocks of intermediate and felsic composition, which are intruded by Cretaceous and Paleogene hypabyssal rocks. A deeply buried intrusion is suspected. Sulfide-polymetallic bodies containing sphalerite, galena, chalcopyrite, and other minerals are prevalent in the upper portions of the deposit.

Lugov and others, 1974a, b

Q01-10 65°52'N 175°37'W	Pepenveem Eastern Asia-Arctic: Chaun	Au, Ag Cu, Pb, Zn Au-Ag epithermal vein	Medium. Ranges 0.2 to 112.3 g/t Au and 20 to 5430 g/t Ag.

Adularia-quartz and adularia-carbonate-quartz veins and veinlets occur in an altered zone up to 1 km long. Most veins are hosted in an Upper Cretaceous rhyolite-ignimbrite sequence near the periphery of a large volcanic subsidence structure. Ore bodies are controlled by widespread northwest and northeast fracturing and are associated with widespread hydrothermal alteration of Paleogene volcanic layers. The alteration includes regional propylitization and local silicification, adularization, sericitization, and kaolinization. Ore mineral associations are: (1) pyrite-arsenopyrite (Au:Ag 30:1 to 1:25); (2) chalcopyrite-galena-sphalerite with tetrahedrite-tennantite, gold, and silver (Au:Ag 1:30 to 1:50); (3) gold-pyrargyrite with argentite, polybasite, stromeyerite, and native silver (Au:Ag 1:1.5 to 1:3000); and (4) hematite. The chalcopyrite-galena-sphalerite and gold-pyrargyrite associations are the most wide-spread.

Berman and Naiborodin, 1967; Sidorov, 1978

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q01-11 65°40'N 174°06'W	Dioritovoe Eastern Asia-Arctic: Chaun	Sn Ag, Cu, Pb, Bi Sn polymetallic vein	Medium.

Tin ore bodies are confined to zones of fractured and hydrothermally altered Lower Triassic shale, sandstone, and siltstone. Ore zones vary in thickness from several meters to 150-200 m, and extends 100 m to 2.5 km along strike. The central zone consists of banded bodies up to 2-3 m thick with abundant quartz-sulfide and sulfide veinlets which contain cassiterite as cryptocrystalline aggregates, wolframite, pyrite, arsenopyrite, galena, tetrahedrite-tennantite, chalcopyrite, and sphalerite. The outer zone, a band 4-5 m wide, consists of quartz-sericite-chlorite altered rocks and a dense network of cassiterite-bearing quartz-sericite-chlorite, quartz-sulfide, and sulfide veinlets; with pyrite, arsenopyrite, chalcopyrite, and cubanite. Silver and bismuth values are high. Magmatic rocks occur within 0.5-2 km; including Early Cretaceous gabbro and gabbro-diorite dikes, hypabyssal bodies of diorite porphyry and granodiorite, Late Cretaceous rhyolite and diorite porphyry dikes, and Paleogene gabbroic dikes. Tin is assumed to be related to Late Cretaceous volcanism.

Nedomolkin, 1974; Lugov and others, 1974a, b

Q01-12 65°20'N 174°16'W	Enpylkhkan Eastern Asia-Arctic: Chaun	Pb, Zn, Cu, Ag Pb-Zn skarn	Small. Contains up to 140 g/t silver.

Disseminated, massive, and banded galena-sphalerite-chalcopyrite ore bodies occur in skarn in Paleozoic limestone above a Late Cretaceous granite porphyry. Banded pyroxene skarn is at least 40 m thick and extends for 350-400 m to the northeast.

Spirov, written commun., 1954

Q02-01 66°50'N 171°44'W	Serdtse-Kamen Eastern Asia-Arctic: Chaun	Pb, Zn, Cu, Sn, Ag Pb-Zn skarn	Small.

A set of quartz-sulfide and quartz-carbonate-sulfide veins occurs in skarn developed in Paleozoic limestone at the contact of a satellite of a Cretaceous granitic pluton. Ore is composed of pyrrhotite (25-35%), sphalerite (15-25%), galena (5-15%), and chalcopyrite (5-10%); with subordinate arsenopyrite, pyrite, cassiterite, stannite, scheelite, proustite, pyrargyrite, and gold.

Chaikovsky, 1960

Q02-02 66°22'N 172°04'W	Barin Eastern Asia-Arctic: Chaun	Ag, Zn Ag polymetallic vein and replacement	Medium. Contains 754 to 2148 g/t Ag.

Ore zone at contact between a Late Cretaceous granite-porphyry dike and mid-Paleozoic limestone. Dike trends northeast; it is about 8-10 m thick and 1 km long. Limestone is cemented by quartz with disseminated sphalerite and small amounts of copper minerals over an area 10-12 m long and 2-3 m wide.

Kryukov, written commun., 1974

Q02-03 66°16'N 172°04'W	Melyul Eastern Asia-Arctic: Chaun	Pb, Zn, Ag, (Cu) Pb-Zn-(Cu)-Ag skarn	Small. Ag up to 165 g/t.

Polymetallic occurrence composed of pyrite, galena, sphalerite, and chalcopyrite in epidote-garnet and vesuvianite-pyroxene-garnet skarn at the contact between an Early Cretaceous granitic body and Proterozoic(?) marbles.

Kryukov, written commun., 1974

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q02-04	Erulen	Sn	Small to medium.
66°09'N	Eastern Asia-Arctic: Chaun	Sn silicate-sulfide vein	
173°17'W			

Quartz-tourmaline and sulfide-quartz-tourmaline veins and veinlets 2 to 20 cm thick with disseminated cassiterite and masses of sulfides, are found in the middle of a zone of tourmaline alteration replacing brecciated granitic rocks. Also contains muscovite, fluorite, calcite, scheelite, arsenopyrite, pyrite, chalcopyrite, galena, and sphalerite. Zone of mineralization is about 3.5 km long and up to 500 m wide. Deposit occurs at the margin of a Late Cretaceous tourmaline two-mica granite pluton that intrudes Permian to Triassic clastic sedimentary rocks and Triassic gabbro.

Nedomolkin, 1974

Q02-05	Reechen	Fe, Pb, Zn, Sn	Small.
64°57'N	Eastern Asia-Arctic: Chaun	Fe-Pb-Zn-Sn skarn	
172°29'W			

Garnet-magnetite-epidote-vesuvianite skarn bodies are developed for 250-400 m at the contact between Middle Devonian limestone and phyllite, and Early Cretaceous granite. Skarn contains lenses and bands up to 2 m thick of pyrite, arsenopyrite, galena, and sphalerite. Sulfide bodies carry high tin concentrations.

Nedomolkin, 1974

Q02-06	Chechekuyum	Pb, Zn, Cu, Ni	Small.
64°36'N	Eastern Asia-Arctic: Chaun	Pb-Zn skarn	
172°45'W			

Gently dipping deposit, about 18 m thick and 30 m along strike, composed of pyrrhotite, sphalerite, galena, chalcopyrite, magnetite, pyrite, niccolite, marcasite, calcite, garnet, diopside, and quartz. Ore bodies confined to a fracture zone in skarn developed in Middle Devonian limestone, that is overlain by Upper Cretaceous felsic extrusive rocks and cut by granite porphyry and spessartite dikes. Massive and disseminated pyrrhotite ore occurs in the hanging wall. Massive galena, and less common sphalerite-galena ore, are present in the middle part of the ore body. Sparse massive sphalerite ore is prominent in the hanging wall. Skarn has sparsely disseminated ore minerals. Tin, cadmium, cobalt, bismuth, and silver are detected with chemical analyses.

Zhukov and others, written commun., 1953

Q03-01	Iyikrok Mountain	Cr	Grab samples with up to 33% Cr, and 0.2 g/t PGE. Estimated 130,000 to 350,000 tonnes chromite
67°54'N	Kobuk	Podiform Cr	
163°40'W			

Disseminated fine- to medium-grained chromite in Jurassic or older dunite and peridotite tectonite that has been locally serpentinized. Platinum observed in one sample. Zones with chromite up to 90 m wide and 305 m long in dunite. Host rocks part of the Misheguk igneous sequence. Mafic and ultramafic rocks floored by major thrust fault.

Mayfield and others, 1983; Foley and others, 1985, 1992; Foley, 1988

Q03-02	Ear Mountain area, (Winfield)	Sn, Cu, Ag, Pb, Zn	Produced several hundred tonnes Sn
65°56'N	Seward Peninsula	Sn skarn	
166°12'W			

Cassiterite, stannite, and chalcopyrite in skarn and sparse cassiterite-quartz veins along margin of Late Cretaceous multistage biotite granite stock intruded into argillaceous limestone. Highly variable contact metamorphic silicate and sulfide mineral assemblages. Tourmaline-quartz greisen veins in upper part of granite. Local occurrence of U in oxidized tourmalinized mafic dike and adjacent biotite granite. Deposit associated with with late-magmatic stage of Late Cretaceous granite about 76.7 Ma.

Killeen and Ordway, 1955; Mulligan, 1959; Sainsbury, 1972; Hudson and others, 1977; Bond, 1983; Hudson and Arth, 1983; Swanson and others, 1988

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q03-03 65°35'N 168°00'W	Cape Mountain Seward Peninsula	Sn W Sn quartz vein	Produced about 940 tonnes of Sn, mainly from placers; but very minor production from lodes

Occurrences of cassiterite, tourmaline, pyrite, pyrrhotite, fluorite, scapolite, sphalerite, and scheelite along margin of Cretaceous granite. Deposits occur in periphery of pluton, in dikes, in contact-metamorphosed and contact-metasomatized wall rocks, and in quartz veins in pluton. Cassiterite also occurs as replacement of limestone near intrusive contact. Granite intrudes Mississippian limestone, dolomitic limestone, and shale. Age of granite 78.8 Ma. Several small lode prospects and one small lode mine whose main production was from 1903 to 1909. About 9 tonnes cassiterite concentrate shipped in 1905. Probable source for Goodwin Gulch and Tin City cassiterite placer deposits. Strong cassiterite production from placers in Cope Creek and Goodwin Gulch from the mid-1970's to 1989 when placers were exhausted. Total production during this period was about 2.07 million pounds of tin.

Knopf, 1908; Steidtman and Cathcart, 1922; Mulligan, 1966; Hudson and Arth, 1983; Bundtzen and others, 1990

Q03-04 65°38'N 167°35'W	Potato Mountain Seward Peninsula	Sn Sn quartz vein	Up to a few percent Sn

Scattered veins and veinlets of quartz, clay, cassiterite, pyrite, and arsenopyrite associated with hornfelsed tin- and tourmaline-bearing Precambrian or lower Paleozoic carbonaceous phyllite, metasiltstone, and slate, all part of the slate-of-the-York region of Sainsbury. Gravity data indicate an intrusive body lying within 0.5 km of surface. One granitic dike exposed. A small dredge recovered cassiterite for many years and nonfloat placer mining continued in several creeks in the vicinity until the mid-1950's (Cobb, 1973). Limited exploration over the years including an unsuccessful attempt to drill into the top of the buried pluton in 1990.

Steidtman and Cathcart, 1922; Sainsbury, 1969; Hudson and others, 1977; Bruce M. Gamble, written commun., 1986

Q03-05 65°28'N 167°10'W	Lost River Seward Peninsula	Sn, W, F, Be Zn Cu, Pb, Ag Sn-W skarn, Sn greisen, Carbonate-replacement Sn(?)	Reserves of 25 million tonnes grading 0.15% Sn, 0.03% WO_3, 16.3% CaF_2. Produced 320 tonnes Sn

Several deposits and one mine in veins, skarns, greisens, and intrusion breccia formed above a shallow Late Cretaceous granite stock intruding thick sequence of Lower Ordovician limestone and argillaceous limestone. Early-stage andradite-idocrase skarn and later fluorite-magnetite-idocrase vein skarns altered to chlorite-carbonate assemblages that are contemporaneous with greisen formation and cassiterite deposition. Major ore minerals in skarns and greisen are cassiterite and wolframite, with lesser stannite, galena, sphalerite, pyrite, chalcopyrite, arsenopyrite, and molybdenite, and a wide variety of other contact metamorphic and alteration minerals. Age of granite 80.2 Ma. Production mostly from 1952 to 1955 from underground workings a few hundred meters deep along the Cassiterite dike. This dike is a near-vertical rhyolite dike, extensively altered to greisen over the buried granite. Similar smaller deposits nearby include tin-greisen and veins near the Tin Creek Granite and various polymetallic veins and skarns near the Brooks Mountain Granite. Large beryllium deposits peripheral to the skarns replace limestone as fluorite-white mica veins that contain diaspore, chrysoberyl, and tourmaline; probably associated with early stages of granite intrusion. Potential for carbonate-replacement tin deposit. Some placer tin recovered from creek below Lost River mine but placers now exhausted. Major exploration program in early 1970's drilled out several large Sn-W-fluorite-Be ore bodies but depressed metal prices caused cancellation of the program short of development.

Steidtman and Cathcart, 1922; Sainsbury, 1963, 1964, 1965, 1969; WGM, Incorporated, Anchorage, written commun., 1973; Dobson, 1982; Hudson and Arth, 1983; Reed, Menzie, and others, 1989

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q03-06 65°41'N 165°14'W	Kougarok Seward Peninsula	Sn, Ta, Nb Sn greisen with Ta and Nb	Average grade of 0.5% Sn; 0.01% Ta and 0.01% Nb .

Occurs in association with a buried Cretaceous granitic complex, mainly as disseminated cassiterite in quartz-tourmaline-topaz greisen, associated with disseminated tantalite-columbite in quartz-white mica greisen. Sn deposits occur in steep cylindrical pipes of greisenized granite, greisenized dikes, in greisen along roof zone of subhorizontal granite sills, and as stockwork veinlets in schist. Late Cretaceous granite dikes, sills, and plugs above the buried pluton are interpreted as subvolcanic analogues to topaz rhyolite. Granitic rocks intrude poly-deformed graphitic and calcareous quartz schist, part of the undifferentiated Nome Group of Sainsbury (1972), and probably equivalent to the pelitic schist unit of Till (1984). Extensive drilling of properties, 1979 to 1983; dormant since.

Hudson and Arth, 1983; Christopher C. Puchner, written commun., 1984; Puchner, 1985, 1986; Reid, 1987

Q03-07 65°48'N 164°32'W	Serpentine Hot Springs Seward Peninsula	Pb, Zn, As, Ag, Au, Sn Polymetallic vein	No data

Quartz veins and stringers, with disseminated limonite and pyrite, and possibly minor chalcopyrite and argentiferous galena, cut Paleozoic(?) schist composed of varying proportions of quartz, muscovite, chlorite, chloritoid, graphite, pyrite, pyrrhotite, and albite at Midnight, Humboldt, and Ferndale Creeks. Schist part of the mixed unit of Till (1984). Few thin granitic to rhyolitic dikes contain disseminated pyrite and fluorite. Deposit about 5 km from southeast margin of the Sn-bearing Cretaceous Oonatut Granite Complex. Limited exploration. Deposit exposed in trenches cut along northwest- or east-trending faults.

Hudson and others, 1977; Joseph A. Briskey, written commun., 1985

Q03-08 65°56'N 163°21'W	Hannum Creek Northwestern Brooks Range	Pb, Zn, Ag Metamorphosed sedimentary exhalative Zn-Pb?	Up to 10% Pb, 2.2% Zn, 1.4g/t Au, and 60.4 g/t Ag

Blebs, stringers, massive boulders, and disseminations of galena, pyrite, sphalerite, and barite with gangue of quartz, calcite, and limonite gangue; occurs in Paleozoic micaceous quartzite, marble, and quartz-mica-graphitic schist, all within or near exposures of crudely banded micaceous quartzite enclosed in an isolated lens of marble. Marble interbedded with early Paleozoic quartz-mica-graphite schist, part of mixed unit of Till (1984). Deposit is highly oxidized; exposure is poor. Zones of blebs, stringers, and disseminations appear conformable with bedding and banding in quartzite. Zones up to 90 m wide and extend for about 2 km along northwest-southeast trend. Two km farther southeast along strike are oxidized stringer zones or lenses of limonite, quartz, and chlorite are cut by veins and stockworks of quartz and chlorite. The stringer zones and lenses composed of interlayered marble and calcareous quartz-muscovite schist. Quartzite is interpreted as metamorphosed laminated exhalite, possibly a sedimentary exhalative Zn-Pb deposit. The thin lenses of marble are interpreted as former limestone mounds that formed near exhalative vents.

Herreid, 1965b; Joseph A. Briskey, written commun., 1985.

Q03-09 65°41'N 162°28'W	Independence Seward Peninsula	Pb, Ag Polymetallic vein	Samples contain up to 30% Pb, 5,145 g/t Ag, 3.4 g/t Au. Dump specimens average about 20 % Pb and 686 g/t Ag. Produced a few hundred tonnes ore

Oxidized pyrite, galena, sphalerite, and minor tetrahedrite in a vein now composed primarily of limonite and sheared calcite. Vein localized in a fault zone trending nearly north-south. Host rocks are sheared and schistose, micaceous and banded, Paleozoic marble, a Cretaceous granitic pluton crops out about 4 km to the northwest. Deposit exposed in open cuts 2-4 m wide over a length of 600 m. Small production in 1921 and 1922, and limited exploration during several periods since. A few hundred meters of underground workings.

Hudson and others, 1977; Joseph A. Briskey, written commun., 1985

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q03-10 65°10'N 162°37'W	Windy Creek Seward Peninsula	Mo Pb, Zn Porphyry Mo	Grab samples with up to 0.15% Mo, 0.05% Sn, 0.05% W, 0.15% Pb

Veins and stringers of quartz, pyrrhotite, pyrite, fluorite, molybdenite, galena, and sphalerite in hornblende granite of the Cretaceous(?) Windy Creek pluton. Molybdenite reported in skarn along pluton margin. Sporadic stringers and veinlets of quartz containing pyrrhotite, pyrite, and fluorite occur near dikes of altered biotite granodiorite intruding the granite. Wall rocks part of the lower Paleozoic mafic schist, and schist and marble of the mixed unit of Till (1984). Little, if any, exploration.

Miller and others, 1971; Hudson and others, 1977; Joseph A. Briskey, written commun., 1984

Q03-11 65°03'N 162°15'W	Death Valley Seward Peninsula	U Sediment-hosted U	Average grade of 0.27 % U3O8. Estimated 450,000 kg uranium oxide

Mainly meta-autunite in Paleocene continental sandstone. Sandstone occurs in marginal facies of a Tertiary sedimentary basin where nearshore coarse arkosic clasts are interbedded with coal and lacustrine deposits. Interpreted as forming when uranium-bearing oxidized groundwater moved down from Cretaceous granitic plutons to west along hydrologic gradient. U precipitated in reducing environment of coal layers. Age of deposit estimated at middle or late Tertiary.

Dickinson and Cunningham, 1984; Dickinson and others, 1987

Q03-12 65°02'N 162°41'W	Omilak area Seward Peninsula	Pb, Ag, Sb Au, Cu, Sn, As Polymetallic vein	About 300 tonnes Au-Pb ore averaging about 73% Pb and 5,000 g/t Ag produced from Omilak mine

Contains the Omilak Mine and two nearby prospects, the Foster and Omilak East. Deposits consist of lenses and gossans of argentiferous galena associated with cerussite, anglesite, pyrite, arsenopyrite, unknown tin sulfosalts(?), and traces of chalcopyrite, with highly variable amounts of calcite, dolomite, tremolite, wollastonite, and other calc-silicate minerals. Veinlets and flat lenses of stibnite also occur at the Omilak mine. Veins and gossan occur along axes and limbs of northwest-plunging folds in Paleozoic(?) marble, and in graphitic, pyrite-feldspar schist, and micaceous schist. Bleaching and silicification associated with veins and gossan. Similar small occurrences are found in an area extending about 12.6 km north from Omilak to the Windy Creek pluton. Omilak mine consist of 55-m-deep shaft, 150-m-long adit, and two working levels. Limited underground exploration prior to 1930; only limited surface trenching since. Production between 1881 and 1890.

Smith and Eakin, 1911; Herreid, 1965b; Mulligan, 1962; Hudson and others, 1977; Joseph A. Briskey, written commun., 1985; Bruce M. Gamble and Alison B. Till, written commun., 1986

Q03-13 64°40'N 165°28'W	Nome district, Mt. Distin Nome	Au Au quartz vein	Grab samples with up to 120 g/t Au, 10 g/t Ag, >0.2% As, >0.1% Sb

Quartz veins along high-angle faults with sparse disseminated gold, arsenopyrite, and sparse pyrite in gangue of quartz, minor carbonate, and plagioclase. Minor chalcopyrite, sphalerite, galena, stibnite, tetrahedrite, and scheelite. Veins range from 2 cm to 1 m wide, most less than 10 cm wide. Several veins contain up to 50 percent stibnite and minor pyrite. Veins occur along thrust faults in zone with strike length of about 6 km and up to 600 m wide. District includes MacDuffie, Sliscovitch, California Gulch, and Stipec, and Kotovic deposits in the Nome district, and many deposits in the Mt. Distin area. Faults in two regional sets trending northeast and northwest. Veins and faults occur in metasedimentary rocks of the Paleozoic mixed unit of Till (1984) and Gamble and others (1985) and in mafic schist of the Nome Group. Late Jurassic or Early Cretaceous age estimated for regional metamorphism, with vein formation during waning stages of metamorphism.

Smith, 1910; Cathcart, 1922; Gamble and others, 1985; D.L. Stevens, written commun., 1991

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

Q03-14 64°35'N 165°29'W	Rock Creek Nome	Au, Ag, W Au quartz vein	6.04 million tonnes 2.4 g/t Au; up to 0.3% W

Arsenopyrite, scheelite, galena, stibnite, and pyrite in northeast-trending sheeted quartz vein system. Surface exposures indicate mineralization extends for 1200 meters along strike and average 70 meters wide and up to 150 meters deep. Host lithologies are phyllite and schist of Paleozoic Nome Group. Fluid inclusion studies indicate ore deposition occurred in the mesothermal range (240°C-320°C). Ore minerals emplaced along selvages of quartz-host rock contacts. Deposit is believed to have formed by hydrofracturing and dewatering event during waning stages of mid-Cretaceous metamorphic event.

Ted Eggelston and R.V. Bailey, written commun., 1990-1991; Apodaca, 1992

Q03-15 64°39'N 164°14'W	Big Hurrah Nome	Au Au quartz vein	Recent assays of 25 to 65 g/t Au. Produced about 155,500 g Au, averaging about 34.3 g/t Au

Four major quartz veins, and zones of ribbon quartz 1 to 5 m thick and a few hundred meters long contain sparse gold, pyrite, and arsenopyrite, with minor scheelite, chalcopyrite, and sphalerite, in gangue of quartz, carbonate, and feldspar. Intermixed with older, concordant, non-Au-bearing, metamorphic quartz veins. Au-bearing veins range from discordant tension veins to discontinuous quartz lodes that occur in shear zones crossing foliation. Au-bearing veins range from 0.5 to 5 m wide, and extend to a depth of at least 90 m. Most veins are less than 1 m wide. Veins and zones occur in quartz-rich, Paleozoic, graphitic, quartz-mica schist or quartzite of the Nome Group (the mixed unit of Till, 1984). Up to 15 percent arsenopyrite occurs in one vein. Veins interpreted to have formed during shearing and uplift associated with metamorphic dehydration. Late Jurassic or Early Cretaceous age estimated from regional metamorphism. Production from 1903 to 1909, and 1953-1954. Shaft 75 m deep; about 550 m of underground workings. Periodically re-examined and considerable exploration during the 1980's.

Collier and others, 1908; Cathcart, 1922; Asher, 1969; Mullen, 1984; Gamble and others, 1985; Read, 1985; Read and Meinert, 1986

Q03-16 64°34'N 163°44'W	Daniels Creek, (Bluff) Nome	Au, Ag As, Sb Au quartz vein	At least 5.9 million tonnes grading 3.4 g/t Au. Grab samples with 4 to 40g/t Au, 10 g/t Ag, 4.8% As, >0.1% Sb

Sulfide poor, arsenopyrite, scheelite, and pyrite bearing, auriferous quartz pods and veins extend for about 2 km strike length in three separate mineralized zones: Daniels Creek, Koyana Creek, and the Saddle Prospect. Sheeted veins up to 75 cm wide hosted in Paleozoic marble and quartz-mica-feldspar schist of the Nome Group. Interstitial native gold in arsenopyrite-rich fractions. Two quartz veins contain up to 60 percent arsenopyrite. Mineralization was originally thought to be one or several strata-bound gold-bearing schist units; however drilling has shown that best auriferous mineralization occurs in deformed rocks along two en echelon thrust faults. Regional metamorphism probably of Late Jurassic or Early Cretaceous age; veins formed in waning stages of metamorphism. Minor underground workings; negligible production. Probable source of gold in nearby Daniels Creek placer deposit and some marine placers of the Solomon District.

Herreid, 1965a; Mulligan, 1971; Hudson and others, 1977; Gamble and others, 1985; Richard Heinze, written commun., 1990; Don Stevens, written commun., 1991

Q03-17 64°42'N 162°46'W	Eagle Creek Seward Peninsula	U, Th, REE Felsic plutonic U	Grab samples of float with up to 0.15% U3O8, 1.05% Th, and 2% REE

U-, Th-, and REE-minerals disseminated along margins of alkaline (pulaskite) dikes intruded into Cretaceous Kachauik granitic pluton, marble, and schist. Idocrase principal U-, Th-, and REE-bearing mineral. Local numerous occurrences of U- and Th-minerals in stream-sediment samples underlain by the nearby Darby pluton (granite).

West, 1953; Miller and others, 1976; Miller and Bunker, 1976

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q03-18 64°48'N 165°24'W	Monarch, Cub Bear, American Sinuk River	Fe, Mn, F Stratabound Fe-Mn	May contain up to 750,000 tonnes averaging 45% Fe and 8% Mn. Also contains anomalous Zn.

Massive segregations and lenses of goethite pseudomorphs of magnatite and pyrolusite, and very minor sphalerite and fluorite. Ore minerals generally occur parallel to flat-lying layering in calc-schist and marble of the Mount Distan sequence, part of the highly-deformed Nome Group. Extensive dolomite replacement near contacts between meta sedimentary rocks in area of deposits suggests thrust fault modification of original stratabound Fe deposits. Deposit interpreted as stratabound deposit modified by subsequent regional metamorphism and penetrative deformation. Gossan at the Monarch deposit occurs along the steeply-dipping Monarch fault.

Herreid, 1978, 1970; Bundtzen and others, 1994, 1995.

Q03-19 64°46'N 164°58'W	Aurora Creek Sinuk River	Zn, Pb, Cu, Ba, Ag, Au Kuroko massive sulfide?	Nearly 2,400 m of mineralized layers along strike; one zone in one drill core contains an average of 15.9% Zn, 1.38% Pb, 0.07 % Cu, 35% Ba, 2.6 g/t Au, 45 g/t Ag

Disseminated to massive sphalerite, galena, barite, pyrite, magnetite, and minor chalcopyrite in muscovite-feldspar metavolcanic schist of Aurora Creek sequence that is part of the Late Proterozoic and early Paleozoic Nome Group. Sulfide minerals occur for 2,400 m along strike. Explored by with limited drill cores and trenches. Intense alteration to tourmaline occurs in feldspar-rich metavolcanic schists near massife sulfides and barite occurrences. Limited sulfur isotopic analyes indicate formation in seawater-contaminated, marine volcanogenic setting. Similar, but smaller occurrences occur at nearby prospects at Nelson, Rocky Mountain Creek, and Quarry. Deposit interpreted as stratabound deposit modified by subsequent regional metamorphism and regional deformation. Aurora Creek deposit interpreted as similar to Ansil mine and related deposits in Noranda area of Quebec.

Herreid, 1968, 1970; Bundtzen and others, 1994, 1995

Q04-01 67°30'N 161°50'W	Omar Northwestern Brooks Range	Cu, Pb, Zn, Ag, Co Kipushi Cu-Pb-Zn	Grab samples with 15.3% Cu, 0.14% Pb, 0.95% Zn, and 20 g/t Ag

Disseminated to massive chalcopyrite, bornite, lesser chalcocite, minor tennantite-tetrahedrite, very minor galena, supergene copper carbonates, and iron-oxide minerals occur in veinlets, irregular stringers, or as blebs in brecciated dolomite. Gangue dolomite, calcite, and quartz with anomalously high Zn and Co. Sulfide zone about 3 km long occurs along north-northwest trending fractures. Local solution breccia and faulted and brecciated gossan. Local remobilization of sulfides into fractures. Host rocks are Ordovician to Devonian dolomite and limestone of the Baird Group; part of Kelly River allochthon. Host rocks strike north-northeast to south-southeast; dips vary from gentle to vertical. Few minor isoclinal folds.

Degenhart and others, 1978; Jansons, 1982; Mayfield and others, 1983; Inyo F. Ellersieck, written commun., 1985; Folger and Schmidt, 1986

Q04-02 67°28'N 161°35'W	Frost Northwestern Brooks Range	Cu, Zn, Pb, barite Cu-Zn-Pb-Ba vein	Estimated to contain 0.9 million tonnes barite; and possibly as much as nine million tonnes. One vein with 13.2% Zn, 0.5% Cu, and 21% barite

Chalcopyrite and galena in undulating quartz-calcite-barite veins, and lenses and pods of barite at least 30 m long by 10 m thick. Veins, lenses, and pods crosscut Ordovician to Devonian dolomite and limestone of the Baird Group for at least 1.6 km. Some calcite-barite veins surround barite lenses.

Degenhart and others, 1978; Inyo F. Ellersieck and J.M. Schmidt, written commun., 1985

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q04-03 67°18'N 157°12'W	Smucker Arctic	Cu, Zn, Pb, Ag Kuroko massive sulfide	More than 8 million tonnes with 0.8% Cu, 2.3% Pb, 6.8% Zn, 6.4 oz/t Ag, minor Au

Stratiform, disseminated fine- to medium-grained pyrite, sphalerite, galena, chalcopyrite, and owyheeite in a quartz-calcite-pyrite matrix occur over a strike length of 1,000 m and widths of up to 60 m. Deposit occurs on limb of recumbent, asymmetric antiform. Host rocks: a mafic and felsic metavolcanic sequence composed of quartz-muscovite-feldspar schist, quartz-chlorite-calcite phyllite, and porphyroclastic quartz-feldspar-muscovite schist; and an interlayered metasedimentary sequence composed of quartz-muscovite-chlorite phyllite, calc-schist, and marble. Host rocks part of the Devonian and Mississippian Ambler sequence derived from bimodal calcic and calc-alkaline volcanic rocks and impure clastic and calcareous sedimentary rocks. Deposit and host rocks subjected to greenschist-facies metamorphism. Host rocks strike west-northwest, dip moderately south, and contain abundant south-dipping, tight to isoclinal folds.

Charles M. Rubin, written commun., 1984; Rubin, 1984; Hitzman and others, 1986

Q04-04 67°11'N 156°22'W	Arctic Arctic	Zn, Cu, Pb, Ag, Au Kuroko massive sulfide	37 million tonnes with 4.0% Cu, 5.5% Zn, 0.8% Pb, 47 g/t Ag, 0.62 g/t Au

Stratiform, semimassive to massive chalcopyrite and sphalerite with lesser pyrite, minor pyrrhotite, galena, tetrahedrite, arsenopyrite, and traces of bornite, magnetite, and hematite. Deposit occurs in thick horizon with areal extent of about 900 by 1,050 m, and in two thinner horizons above main horizon. Sulfides form multiple lenses up to 15 m thick over stratigraphic interval of 6 to 80 m. Main horizon hosted in mainly graphitic pelitic schist and metarhyolite porphyry derived from submarine ash-flow tuff. Host rocks part of the Devonian and Mississippian Ambler sequence. Gangue mainly calcite, dolomite, barite, quartz, and mica. Locally abundant chlorite, phlogopite-talc-barite, and pyrite-calcite-white mica occur in hydrothermally-altered wall rocks overlying, underlying, and interlayered with sulfide mineralization. Alteration interpreted as occurring during rapid influx of cold seawater into a hot hydrothermal vent system.

Wiltse, 1975; Sichermann and others, 1976; Hitzman and others, 1982; Schmidt, 1983; Jeanine Schmidt, written commun., 1984; Schmidt, 1986, 1988; Hitzman and others, 1986

Q04-05 67°04'N 156°59'W	Ruby Creek, (Bornite) Arctic	Cu, Co, Zn, Ag Kipushi Cu-Pb-Zn	91 million tonnes grading 1.2% Cu; 4.2 million tonnes of up to 4% Cu

Strata-bound disseminated to massive chalcopyrite, bornite, chalcocite, pyrite, and minor sphalerite in brecciated dolomite and metamorphosed calcareous sedimentary rocks, part of the Devonian Bornite Marble (Hitzman and others, 1982). Local sparse carrollite, chalcopyrite, reinerite, galena, pyrrhotite, and marcasite. Large masses of dolomite breccia in matrix of dolomite, calcite, or fine-grained pyrite. Matrix of pyrite breccia locally replaced by Cu-, Zn-, and Co-sulfides. Individual zoned sulfide bodies with interior containing bornite, chalcocite, and carrollite, middle containing bornite, and chalcopyrite, and exterior containing chalcopyrite, pyrite, and peripheral pyrite. Hydrothermal mineralization extensive in dolostone bodies of biohermal and back-reef facies. Clasts of hydrothermal dolostone in breccias, possibly synsedimentary, indicate possible coeval mineralization and sedimentation. Three major hydrothermal dolomite formation events. Subsequent intense polymetamorphism to greenschist facies, and broad folding.

Runnells, 1969; Sichermann and others, 1976; Hitzman and others, 1982; Hitzman, 1983; M.W. Hitzman, written commun., 1984; Bernstein and Cox, 1986; Hitzman, 1986

Q04-06 67°01'N 156°50'W	Asbestos Mountain Kobuk	Asbestos, jade, asbestos, talc Serpentine-hosted asbestos	No data

Serpentinite with veins of cross- and slip-fiber tremolite and chrysotile; small deposits of talc, soapstone, and nephrite. About 35 tonnes tremolite mined from 1940 to 1945. Probably source of nephrite jade boulders in Dahl Creek. Part of dismembered Jurassic or older ophiolite, exposed discontinuously in klippe in the Jade Mountains-Cosmos Hills area, along the northern flank of Yukon-Koyukuk basin.

Coats, 1944; Heide and others, 1949; Roeder and Mull, 1978; Loney and Himmelberg, 1985b

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q04-07 66°16'N 157°20'W	Wheeler Creek Northwestern Koyukuk Basin	U Felsic plutonic U	Grab samples with up to 0.0125% U

Uranothorianite and gummite in small, altered, smoky quartz-rich veinlets, and in altered areas in Late Cretaceous alaskite. Deposit about 500 m long by 50 m wide.

Eakins and Forbes, 1976; Miller, 1976; Jones, 1977

Q04-08 66°15'N 156°03'W	Clear Creek Northwestern Koyukuk Basin	U Felsic plutonic U	Grab samples with up to 0.04% U, and 0.055% Th

Uraniferous nepheline syenite and bostonite dikes in Late Cretaceous andesite. Dikes within contact aureole of Late Cretaceous monzonite to granodiorite pluton of Zane Hills.

Eakin and Forbes, 1976; Miller, 1976; Jones, 1977

Q04-09 66°12'N 156°15'W	Zane Hills Northwestern Koyukuk Basin	U, Th Felsic plutonic U	Grab samples with up to 0.027% Th

Uranothorianite, betafite, uraninite, thorite, and allanite in veinlets in foliated monzonite border phase of the Late Cretaceous Zane Hills pluton. Border phase grades to syenite; biotite-hornblende granodiorite in core of pluton.

Eakin and Forbes, 1976; Miller, 1976; Jones, 1977; Miller and Elliott, 1977

Q04-10 65°30'N 161°26'W	Quartz Creek Seward Peninsula	Pb, Zn, As, Ag Polymetallic vein	Up to 15% combined Pb and Zn, and 340 g/t Ag

Disseminated to massive sulfides scattered over zone 3.2 to 8 km wide and over 29 km long in altered andesite and granite of Jurassic or Cretaceous age. Mainly argentiferous galena, sphalerite, pyrite, and arsenopyrite. Local realgar, orpiment, and tourmaline also present. Considerable exploration, including drilling, in early 1970's.

Miller and Elliott, 1969; Bundtzen and others, 1984

Q04-11 64°45'N 157°30'W	Perseverance Southwestern Kuskokwim Mountains	Pb, Ag, Sb Polymetallic vein(?)	Produced 231 tonnes of ore with average grade of 73% Pb, and 124 g/t Ag.

Coarse-grained galena, tetrahedrite, and traces of fibrous jamesonite in veins crosscutting bedding and schistosity of Paleozoic(?) chlorite-mica schist. Gangue of dolomite and minor quartz. Vein strikes northeast-southwest and dips southeast. Oxidized zones of vein contain cerussite, azurite, malachite, and stibiconite(?). Mined from 1920 to 1927, and 1981. Age of deposit unknown.

Brian K. Jones, written commun., 1984

Q04-12 64°05'N 158°00'W	Illinois Creek Southwestern Kuskokwim Mountains	Cu, Ag, Au, Pb, Zn Manto-replacement deposit (polymetallic Pn-Zn, Au)	Contains 1.54 million tonnes grading, 2.4 g/tonne Au and 70 g/t Ag

High-grade galena-sphalerite veins near contact between altered Cretaceous granite porphyry, and massive, pipe-like gossan in marble. Most of the deposit was originally a massive sulfide body in Paleozoic quartzite, now completely oxidized. Illinois Creek is one of 3 polymetallic gold-bearing gossans aligned along a 12 km long trend parallel to the Kaltag Fault, a major transcurrent fault in Western Alaska. Most of the deposit is a completely oxidized massive sulfide body in Paleozoic quartzite. Abundant sericite alteration in nearby granitic plutons which contain stockwork veinlets with chalcopyrite, galena, and detectable precious metals. Other areas with epigenetic replacement, veins, and skarn with base-metal sulfides. Area is poorly exposed. The plutonic rocks intrude middle Paleozoic and older greenschist, quartzite, limestone, and orthogneiss.

Gillerman, 1988; William W. Patton, Jr., written commun.; G. Booth, written commun., 1991

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

Q04-13 64°10'N 156°40'W	Kaiyuh Hills (Yuki River) Yukon River	Cr Podiform Cr	Estimated 15,000 to 34,000 tonnes Cr_2O_3 in one deposit. Largest deposit averages 60% Cr_2O_3 on surface

Banded and disseminated chromite from 1 cm to 1 m thick in fresh and serpentinized Jurassic(?) dunite of Kaiyuh Hills ultramafic belt. Dunite interlayered with harzburgite tectonite. Largest deposit, 1 m by 100 m, consists of massive chromite with estimated 5,000 tonnes Cr_2O_3. Lesser occurrences of banded nodular pods of chromite. Metallurgical grade chromite with 46% Cr_2O_3 present. Dunite and harzburgite tectonite faulted at base; interpreted as part of complexly deformed and dismembered ophiolite, part of Rampart ophiolite belt.

Loney and Himmelberg, 1984; Foley and others, 1984

Q05-01 67°26'N 154°07'W	Mount Igikpak and Arrigetch Peaks Brooks Range	Cu, Pb, Zn, Ag, Au, Sn, W, As Polymetallic vein, Au quartz vein, Sn skarn, Cu-Pb-Zn skarn	Grab samples with up to 55 g/t Au, 150 g/t Ag, >0.18% Sn, with commonly substantial Cu, Pb, Zn, and W values

Numerous small polymetallic vein, Au quartz veins, and skarn deposits in metasedimentary rocks adjacent to schistose Devonian granitic plutons. Wall rocks mainly Silurian and Devonian Skajit Limestone or older metasedimentary rocks. Most common deposits are: (1) quartz veins with varying amounts of galena, sphalerite, and chalcopyrite; (2) Sn skarns with disseminated cassiterite, magnetite, chalcopyrite, and arsenopyrite, in gangue of garnet, diopside, hornblende, clinozoisite, and idocrase; (3) Cu-Pb-Zn skarns with vein or sparse disseminated pyrrhotite, pyrite, chalcopyrite, galena, sphalerite, arsenopyrite, and fluorite with similar gangue as Sn skarns; and (4) areas of Fe-stained wall rocks with molybdenite and fluorite.

Grybeck and Nelson, 1981; Newberry and others, 1986

Q05-02 67°25'N 152°50'W	Ann, (Ernie Lake) Brooks Range	Pb, Zn, Ag Polymetallic vein (metamorphosed)	No data

Vein and stratabound massive galena with lesser sphalerite, bornite, chalcopyrite, and secondary malachite and azurite in marble, calc-schist, and pelitic schist. Occurs in Late Proterozoic(?) banded schist and paragneiss. Deposit occurs adjacent to the granite pluton of Ernie Lake, as do similar smaller occurrences nearby, around periphery of pluton. Deposit may be polymetallic vein, or remobilized stratabound deposit.

Grybeck, 1977; John T. Dillon, oral commun., 1986

Q05-03 67°19'N 151°14'W	Michigan Creek Arctic	As, Au, Ag, Cu, Zn, Pb Kuroko massive sulfide	Grab samples with up to 8.2% As, 8.3 g/t Au, 3.9 g/t Ag, 0.14% Cu, 0.03% Zn, 0.014% Pb

Disseminated to massive chalcopyrite and argentiferous galena in layers up to 0.1 m thick in felsic schist and in cross-cutting pyrite veins. Occurs in felsic schist, marble, and phyllite of the Devonian and Mississippian Ambler sequence.

Dillon and others, 1981; William P. Brosge and John T. Dillon, oral commun., 1986

Q05-04 67°08'N 155°52'W	BT, Jerri Creek Arctic	Cu, Zn, Pb, Ag Kuroko massive sulfide	BT: 3-4 million tonnes with 1.7% Cu, 2.6% Zn, 0.9% Pb, and 40 g/t Ag

BT deposit: disseminated to massive pyrite, chalcopyrite, sphalerite, galena, and gossan in layers 5 to 12 cm thick. Sparse tennantite and possible enargite. Gangue is quartz, muscovite, and barium feldspar. No vertical zonation. Hosted in Devonian and Mississippian pelitic schist, calc-schist, and metarhyolite ("button") schist, part of the Ambler sequence. Strike length of 2,000 m; average width of 1.5 m. Layering strikes east-west and dips 50° to 70° south. Similar occurrences in zone up to 10 km long to west, along same stratigraphic horizon. Jerri Creek deposit: Mainly disseminated and sparse massive pyrite, sphalerite, and minor chalcopyrite in layers up to 2 cm thick. Hosted in muscovite-quartz schist, actinolite-garnet-quartz schist, and marble adjacent to metarhyolite, all part of the Devonian and Mississippian Ambler sequence. Strike length of 20 km.

Hitzman, 1978, 1981; Hitzman and others, 1986

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q05-05 67°04'N 155°01'W	Sun, (Picnic Creek) Arctic	Cu, Zn, Pb, Ag, Au Kuroko massive sulfide	Average grade of 1 to 4% Pb, 6 to 12% Zn, 0.5 to 7% Cu, 103 to 343 g/t Ag. Single quartz-barite bed with 685 to 1,029 g/t Ag. Less than 3 million tonnes of ore as determined by drilling.

Stratiform, disseminated to massive sphalerite, chalcopyrite, galena, and argentiferous tetrahedrite with pyrite, arsenopyrite, and barite. Deposit occurs in at least three horizons. Upper horizon is Zn-Pb-Ag rich; middle is mainly Cu-rich; and lower is Cu-Zn rich. Host rock is metarhyolite, muscovite-quartz-feldspar schist, micaceous calc-schist, marble, and greenstone, all part of the Devonian and Mississippian Ambler sequence. Host rocks generally strike northeast and dip moderately southeast. Locally well-developed layering in metarhyolite may represent original bedding in tuff protolith. Bulk of sulfides in felsic schist; thin concordant beds of sulfides in metarhyolite. Small- and large-scale isoclinal folds in host rocks and sulfide layers.

Zdepski, 1980; Christopher D. Maars, written commun., 1984; Hitzman and others, 1986

Q05-06 67°10'N 152°30'W	Roosevelt Creek Arctic	Cu, Zn, Pb, Ag, Au Kuroko massive sulfide	No data

Disseminated(?) and massive sulfides, probably mainly chalcopyrite, sphalerite, and galena, in metavolcanic rocks and pelitic schist and marble of the Devonian and Mississippian Ambler sequence.

Grybeck, 1977; William P. Brosge and John T. Dillon, oral commun., 1986

Q05-07 66°05'N 150°55'W	Caribou Mountain, Lower Kanuti River, Holonada Yukon River	Cr Podiform Cr	Estimated 2,300 tonnes Cr_2O_3 at Caribou Mountain, 730 tonnes at Lower Kanuti River, and up to 25,000 tonnes at Holonada

Elongate belt over 100 km long contains podiform Cr deposits in Jurassic or older dunite and peridotite tectonite. Largest deposits are at Caribou Mountain, lower Kanuti River, and Holonada. Caribou Mountain: ten chromite occurrences; three containing bands of massive chromite, and magnesian chromohercynite in layers up to 3 m thick and 20 m long. Lower Kanuti River: one layer about 1.5 m wide and at least 25 m long with high-chromium chromite contains 7.5% Cr_2O_3. Holonada: ten occurrences of bands of disseminated to massive chromite several meters thick and long. One occurrence 1.5 to 3 m thick with exposed strike length of 130 m, with average grade of 20% Cr_2O_3. Four other occurrences with about 1,000 tonnes averaging 4% to 8% Cr_2O_3. Deposits at all three areas interpreted as part of complexly deformed and disrupted ophiolite, part of Yukon-Koyukuk ophiolite belt.

Patton and others, 1976; Foley and McDermott, 1983; Foley and others, 1985; Loney and Himmelberg, 1985a

Q05-08 66°37'N 150°01'W	Bonanza Creek Northeastern Koyukuk River	W, Ag, Cu W skarn	Grab samples with up to 0.89% W, 300 g/t Ag, 0.65%Cu

Scheelite, chalcopyrite, and pyrrhotite in skarn adjacent to intrusive contact with biotite granite pluton. Scheelite occurs mainly as sparse disseminated grains, associated with very sparse sulfides in garnet-pyroxene skarn and on fracture surfaces in calc-silicate schist. Local limonite staining. Local quartz-scheelite veins in calc-silicate schist, and quartz-molybdenite veins in biotite granite. Granite pluton part of the Kanuti batholith with K-Ar age of 90.6 Ma. Wall rocks include middle Paleozoic or older pelitic schist, quartz-mica schist, quartz-feldspar schist, quartzite, and calcareous quartz-mica schist. Deposit associated with marble layer, about 15 m thick, interlayered with pelitic schist. Exploration limited to several trenches.

Clautice, 1980

Q05-09 66°30'N 150°10'W	Upper Kanuti River Northeastern Koyukuk River	Pb, Zn, Ag Polymetallic or epithermal vein	Grab samples with up to 2% Pb, 0.3% Zn, and 30 g/t Ag

Disseminated pyrite, galena, and sphalerite in masses up to 5 mm in diameter occur in extensive altered gossan zone about 100 m long in silicified, locally brecciated, early Tertiary rhyolite porphyry. Rhyolite caps and probably intrudes a Cretaceous pluton of the Kanuti batholith.

Patton and Miller, 1970

Significant Lode Deposits of Russian Far East, Alaska, and Canadian Cordillera

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q05-10 65°16'N 150°25'W	Avnet (Buzby) East-Central Alaska	Mn, Ag Mn-Ag vein	Grab samples contain 0.6 to 34% Mn and up to 9.6 g/t Ag

Irregular masses of psilomelane up to almost 8 cm long occur in latticework of thin seams of quartz, and as thin surface coatings on fractured lower and middle Paleozoic chert, quartzite, limestone, dolomite, and greenstone. Exploration consists of one trench and two pits.

Thomas, 1965

Q05-11 65°02'N 150°45'W	Hot Springs Dome East-Central Alaska	Pb, Ag, Zn, Au Cu, Co Polymetallic vein	Grab samples contain about 5.8 g/t Au, up to 274 g/t Ag, 3.7% Pb, and 0.32% Zn

Six, east-west-striking veins, possibly in shear zones, in contact-metamorphosed argillite, graywacke, conglomerate, and minor conglomerate; part of Jurassic and Cretaceous flysch sequence. Veins at surface contain galena coated with anglesite and limonite. At depth, veins also contain siderite, copper carbonates, chalcopyrite, pyrrhotite, pyrite, and erythrite. Zone up to 600 m long and 9 m wide. Numerous quartz veinlets. Deposit is at contact with early Tertiary biotite granite. Exploration consists of three shallow shafts.

Maloney, 1971

Q05-12 64°45'N 155°30'W	Beaver Creek Southwestern Kuskokwim Mountains	Ag, Pb, Zn Polymetallic vein	Estimated 14,000 tonnes grading 103 g/t Ag, 0.8% Zn and 0.5% Cu; additional 19,000 tonnes grading 26.1 g/t Ag, 4.2% Pb, 0.16% Zn, 0.2% Cu

Highly oxidized zones with limonite, goethite, argentiferous galena, quartz, and sphalerite; surface occurrences of massive galena and limonite-cerussite gossan. Two zones occur for 300 m along strike, and range from 2.5 to 5 m thick. Zones separated by fractured schist and marble occur in middle Paleozoic(?) muscovite schist trending northeast-southwest and dipping steeply northwest. Deposition of sulfides controlled by metamorphic structures in host rocks. Age of deposit unknown.

Brown, 1926; Thomas, 1963; Brian K. Jones, written commun., 1984

Q05-13 66°38'N 155°55'W	Zane Hill West-Central Alaska	Cu, Au Porphyry Cu-Au	Contains up to 2.0% Cu, 0.2% Mo, and 2.4 g/t Au.

Consists of a stockwork and veins containing chalcopyrite, pyrite, trace molybdenite, and covellite most commonly in a quartz gangue. The stockwork and veins occur in a small monzonite porphyry, exposed over a 5 km2 area, that intrudes older Jurassic andesite, and also in mid-Cretaceous granodiorite. The stockwork and veins occurs in both the Jurassic andesite and in the monzonite porphyry that has K-Ar age of 81 Ma. Like the deposits at Indian and Purcell Mountains, the phyllic-argillic-propylitic alteration assemblage that is annularly distributed around the core of the monzonite porphyry. The Zane Hills deposit occurs about 4 km west of the Hog River placer deposit that has yielded about 6,842 kg of placer gold.

Miller and Ferrians, 1968; Hollister, 1978; Nokleberg and others, 1995a.

Q05-14 66°22'N 155°02'W	Indian Mountain and Purcell Mountain West-Central Alaska	Cu, Au Porphyry Cu-Au	Indian Mountain: Limited analyses range from 0.07 to 0.15% g/t Cu and 0.1 to 1.5 g/t Au. Purcell Mountain: Contains 0.07 to 0.10% Cu but no gold. Placer gold has been commercially recovered from streams draining plutons in area.

Indian Mountain: Consists mainly of tourmaline-bearing breccias with chalcopyrite. Surrounding the breccias are concentric phyllic-argillic-propylitic alteration halos. The halos surround the central parts of a quartz monzonite porphyry intrusion with a size of about 10 km2. A pyrite halo rims the intrusion outboard of the intrusion. Barite, galena, and sphalerite have also been identified at the prospect. Purcell Mountain: Consists of a porphyry copper deposit consists of stockwork veins with chalcopyrite that are also associated with the concentric phyllic-argillic-propylitic alteration halos. The halos surround the central part of a quartz monzonite porphyry intrusion with a size of about 12 km2. A pyrite halo also rims the intrusion.

Miller and Ferrians, 1968; Hollister, 1978; Nokleberg and others, 1995a.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q06-01 67°45'N 149°05'W	Jim-Montana Brooks Range	Cu, Zn, Ag, Pb Cu-Zn skarn	No data

Disseminated chalcopyrite, sphalerite, with minor galena, tennantite, and malachite stain in skarn developed in marble of the Silurian and Devonian Skajit Limestone.

Grybeck, 1977; DeYoung, 1978

Q06-02 67°36'N 149°50'W	Sukakpak Mountain Brooks Range	Au, Sb, Mo Hg Sb-Au vein	Grab samples with up to 560 g/t Au, 4.5 g/t Ag, 54% Sb, 1.7% Mo, and 0.50% Hg

Disseminated stibnite, with sparse cinnabar, gold, and molybdenite(?) in three calcite-stibnite quartz veins along a high-angle fault that cuts Devonian marble, dolomite, graphitic and calcareous quartz schist. Stibnite forms up to 60 percent of vein. Zone of veins extends for about 1 km with maximum zone width about 100 m. Local slickensides and boudins in veins suggest emplacement during movement on fault.

Dillon, 1982

Q06-03 67°38'N 149°20'W	Victor, Venus, Evelyn Lee, and Ebo Brooks Range	Cu, Ag, Mo Porphyry Cu and Cu skarn	Zones in granitic rocks up to 30 m wide contain up to 0.4% Cu. Grab samples of skarn contain up to 5.5% Cu, 0.41 g/t Au, and 0.29 g/t Ag

Veinlet and disseminated chalcopyrite, bornite, molybdenite, and pyrite in schistose Devonian granodiorite porphyry intruding Silurian and Devonian Skajit Limestone or older marble, calc-schist, and pelitic schist. Skarn in marble adjacent to plutons contain vugs with interstitial bornite, chalcopyrite, bornite, chalcocite, pyrite, magnetite, and some digenite. Skarn consists mainly of garnet, magnetite, diopside, and retrograde vein and replacement epidote, amphibole, chlorite, calcite, and quartz. Skarns were subsequently regionally metamorphosed.

DeYoung, 1978; Donald Grybeck, written commun., 1984; Newberry and others, 1986

Q06-04 67°41'N 148°49'W	Geroe Creek Brooks Range	Cu, Mo Porphyry Cu-Mo	Zones in plutons up to several m thick with up to 0.6% Cu, 0.02% Mo, and 0.1 g/t Au.

Veinlet, stockwork, and disseminated molybdenite, chalcopyrite, and pyrite with quartz, sericite, and chlorite in the Devonian Horace Mountain and Baby Creek plutons composed of metaluminous biotite-hornblende granite with local porphyritic phases. Wall rocks mainly the Silurian and Devonian Skajit Limestone and older calcareous metasedimentary rocks.

DeYoung, 1978; Newberry and others, 1986

Q06-05 67°32'N 148°15'W	Chandalar district (Mikado, Little Squaw) Southern Brooks Range	Au Au quartz vein	12,000 tonnes with 75 g/t Au at Mikado and Little Squaw mine. Estimated 45,000 tonnes grading 80 g/t Au for district

Scattered, minor arsenopyrite, galena, sphalerite, stibnite, and pyrite with gold in several quartz veins up to 3 m thick in a zone about 4.0 km long and 1.6 km wide. Veins occur along steeply dipping normal faults in Devonian or older quartz-muscovite schist, phyllite, and quartzite. Veins interpreted to have been emplaced during fault movement. More than 1,000 m of underground workings at Little Squaw and Mikado mines. Minor production and several episodes of exploration activity, notably during the 1920's and 1960's.

Chipp, 1970; DeYoung, 1978; Dillon, 1982; Ashworth, 1983; John T. Dillon, oral commun., 1986; Rose and others, 1988

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q06-06 65°23'N 149°30'W	Sawtooth Mountain East-Central Alaska	Sb Au, Ag Sb-Au vein	Grab samples from dump contains up to 46.2% Sb, 0.7 g/t Au, and 15.1 g/t Ag. Produced about 590 tonnes with 58% Sb2S3 through 1970

Massive stibnite in a vertical cylindrical lens about 3 m wide. Hosted in argillite of Late Jurassic or Early Cretaceous flysch near contact with Cretaceous granite with K-Ar age of 88.3 Ma. One shaft about 30 m deep. Most production occurred during Korean War. Minor production in 1970 and 1985.

R.M. Chapman, written commun., 1985

Q06-07 65°31'N 148°30'W	Gertrude Creek, Griffen, Ruth Creek East-Central Alaska	Au, Sb Ag, Pb Sb-Au vein	Grab samples with up to 15% Sb and 3.9 g/t Au

Quartz stringers up to 8 cm wide with pyrite, arsenopyrite, stibnite, and gold in altered diorite and silica-carbonate rock that consists of dolomite, calcite, and quartz. Hosted in middle Paleozoic greenstone, slate, calc-schist, and Cretaceous monzonite. Mineralized quartz stringers also in shear zone adjacent to serpentinite. Exploration limited to short adit and a few pits scattered across Amy Dome area.

Foster, 1968a, b; Allegro, 1984a

Q06-08 65°30'N 148°22'W	Hudson Cinnabar East-Central Alaska	Hg Hg quartz vein	Possibly minor Hg produced

Cinnabar in disseminations and quartz veins in altered Late Cretaceous to early Tertiary granite dikes and plutons intruding Ordovician to Devonian siltstone and argillite. Minor exploration over years but long dormant.

Robinson and others, 1982

Q06-09 65°37'N 146°43'W	Lime Peak East-Central Alaska	Sn, Ag, Zn, U, W Sn greisen and Sn vein	Grab samples with up to 0.16% Sn, 0.5% Cu, 0.2% Pb, 1.8% Zn, 14 g/t Ag. Estimate 50% probability of 320,000 tonnes of Sn and 10 million ounces Ag

Areas of veinlets, breccia zones, and pods of black tourmaline, and areas of chlorite, sericite, green tourmaline, and quartz alteration in early Tertiary hypabyssal, peraluminous, biotite granite pluton. Granite pluton cut by numerous felsic and minor intermediate dikes. Veins up to 0.5 m wide. Areas of veinlets, breccia zones, and tourmaline pods interpreted as deuteric alteration; areas of chlorite, sericite, and quartz interpreted as hydrothermal alteration. Anomalous high values of Sn and associated pathfinder elements (Ag, B, Bi, Mo, Pb, Zn) found in rock samples from and around pluton. Rare fluorite, topaz, pyrite, chalcopyrite, and molybdenite in altered areas. Placer cassiterite in surrounding area. Two main phases to pluton: older coarse-grained equigranular biotite granite; younger porphyritic biotite granite with fine-grained groundmass. Local miarolitic cavities in pluton. K-Ar ages of 57-66 Ma for granite associated with mineralization; intruding Cambrian(?) sandstone, shale, slate.

Menzie and others, 1983; Burton and others, 1985; W. David Menzie, written commun., 1985; Smith and others, 1987

Q06-10 65°29'N 147°05'W	Roy Creek (former Mount Prindle) East-Central Alaska	U, Th Felsic plutonic U	Drill core with up to 5 to 10% REE by volume

Thin veins with allanite, bastnaesite, monazite, thorianite, thorite, uraninite, and xenotime cut Cretaceous porphyritic biotite syenite and alkali granite. Deposit contains significant La, Ce, Nd, Pr, Y, and fluorite. Marked by hematitic alteration of wall rocks and leaching of magnetite in host rocks. Deposit and granitic rocks occur about 25 km west of Mount Prindle and intrude Cambrian(?) sandstone, quartzite, argillite, and chert.

Burton, 1981

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

Q06-11 65°21'N 146°33'W	Dempsey Pup East-Central Alaska	Sb, Au(?) Sb-Au vein or polymetallic vein(?)	Grab samples with up to 28% Sb. Produced a few hundred tonnes of low-grade ore.

Quartz vein with small lenses and stringers of stibnite and possibly gold. Hosted in middle Paleozoic or older quartz schist, mica schist, and marble of Yukon-Tanana terrane. Several short tunnels.

Killeen and Mertie, 1951

Q06-12 65°29'N 145°53'W	Table Mountain East-Central Alaska	Au Sn, Be, W Sn polymetallic vein	Grab samples with up to 140 g/t Au and 0.15% Be

A variety of types of deposits, all(?) associated with felsic igneous rocks. Pyrrhotite, arsenopyrite, minor chalcopyrite, rare enargite and sphalerite, and high Au values occur in black biotite schist and in quartz veins adjacent to fault zone intruded by a hypabyssal felsic dike. About 5 km northeast, low Au values in felsic dikes and in country rocks adjacent to an early Tertiary granite pluton, and in felsic dikes in the granite. Granite pluton crops out over 2 km^2 area. Granite and adjacent biotite schist contain high Be values. Small skarns with high W-Au values. Local quartz-tourmaline veins with pyrrhotite, arsenopyrite, scheelite, stibnite, and carbonate veins.

Burack, 1983; Foster and others, 1983; W. David Menzie, written commun., 1985; Newberry and Burns, 1988

Q06-13 65°33'N 145°15'W	Miller House East-Central Alaska	Au Au-As polymetallic vein	Grab samples with up to 3.9 g/t Au

Massive to disseminated arsenopyrite in four large and four small, iron-stained shear zones over 150 m long that cut mid-Paleozoic or older schist of Yukon-Tanana terrane. Intense alteration along zones. Possibly Early Tertiary age interpreted for deposit.

Tripp and others, 1982; Menzie and others, 1983

Q06-14 65°29'N 144°53'W	Ketchem Dome East-Central Alaska	Sn Sn greisen	Grab samples with up to 0.51% Sn

Greisen zones, up to 4 cm wide, and quartz veins in intensely altered, chloritic breccia along northern margin of the multi-phase early Tertiary, Circle (granite) pluton (K-Ar age of 60.5 Ma). Pluton intrudes mid-Paleozoic or older schist of the Yukon-Tanana terrane. Limited exploration in 1978 and 1981.

Foster and others, 1983; Menzie and others, 1983; W. David Menzie, written commun., 1984

Q06-15 65°27'N 144°50'W	Bedrock Creek East-Central Alaska	Cu, W, Th Porphyry Cu(?)	No data

Disseminated monazite with minor scheelite, pyrrhotite, garnet, ilmenite, zircon, biotite, topaz, and malachite in early Tertiary granite of the Circle pluton (K-Ar age of 60.5 Ma). Pluton intrudes middle Paleozoic or older schist of Yukon-Tanana terrane.

Nelson and others, 1954

Q06-16 65°07'N 144°38'W	Salcha River East-Central Alaska	W W skarn	No data

Scheelite occurs in discontinuous idocrase-garnet skarn, in layered calc-silicate schist, and in impure marble along contact with early Tertiary granite pluton. Schist and marble part of mid-Paleozoic or older Yukon-Tanana terrane.

Foster and others, 1983; Menzie and others, 1983; W. David Menzie, written commun., 1984

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q06-17 65°07'N 147°23'W	Fort Knox East-Central Alaska	Au, Ag, Mo Bi Granitoid-related gold	153,8 million tonnes grading 0.82 g/t Au

Free gold, bismuthinite, and minor to trace molybdenite and chalcopyrite in sulfide-poor, quartz vein stockwork. Gold is remarkable pure (980 fine) which is extremely unusual. Mineralization hosted in porphyritic granodiorite and preferentially emplaced along a steeply dipping fracture system trending North 70 degrees West. Deposit is at least 1500 meters long, 300 meters wide, and 250 meters deep and open ended at depth. Chemically, the Fort Knox pluton, which hosts the mineralization, is alkali-calcic and peraluminous. Mineralization may have occurred during late stages of emplacement of the nearby Gilmore Dome stock which is radiometrically dated at 92 Ma, or alternatively, during a younger heating event that post-dates early Mo-Bi mineralization.

Robinson and others, 1990; Arne Bakke, written commun., 1991; Bakke, 1995; Bundtzen and others, 1996.

Q06-18 65°04'N 147°25'W	Cleary Summit (Flanks of Pedro Dome) East-Central Alaska	Au, Ag Pb, Zn, Sb, As, W, Sn Polymetallic vein, Au-quartz vein	Total production estimated as 145,000 tonnes containing 10 to 55 g/t Au. True north deposit with 6.24 milion tonnes grading 2.23 g/t Au.

Quartz fissure veins from a few centimeters to a few meters thick with various proportions of gold, boulangerite, jamesonite, galena, stibnite, pyrite, arsenopyrite, tetrahedrite, and minor scheelite. Most productive veins strike northwest-southeast and dip variably to south. Cleary summit region includes 78 known lode occurrences, 30 with production. Veins in interlayered mica quartzite, graphitic schist, pelitic schist, chlorite-actinolite greenschist, calc-schist, and marble of the upper Precambrian(?) Cleary sequence, part of the mid-Paleozoic or older Yukon-Tanana terrane. Several theories of origin have been proposed. The older is that the veins are related to Cretaceous intermediate composition plutons, several of which are exposed or are proposed under the Cleary anticline. More recently, several workers have proposed that the metals and the veins were remobilized from the Cleary Sequence. The veins are the source of rich placers in creeks that drain the area. Several periods of active mining, mostly before 1941. The largest producers were the Cleary Hill and Hi-Yu mines. Persistent, though somewhat erratic, exploration since before World War I, including several major exploration projects in the 1980's.

Chapman and Foster, 1969; Metz and Halls, 1981; Smith and others, 1981; Newberry and Burns, 1988; Robinson and others, 1990; Metz, 1991; Buntzen and others, 1996.

Q06-19 64°59'N 147°21'W	Stepovich Lode East-Central Alaska	W, Au W skarn	Estimated 20,000 tonnes grading 0.5 to 3.6% WO_3. Produced about 4,000 units WO_3

Scheelite in layered skarn, or locally in zoned veins crosscutting skarn. Skarn types include scheelite-amphibole-quartz-calcite, pyroxene-garnet-scheelite, and quartz-amphibole-calcite-scheelite varieties. District includes 15 known lode tungsten prospects, four with significant production. Skarns form discontinuous bodies near, and at contact with the Gilmore Dome (granite) pluton of Late Cretaceous age. Deposit occurs in calc-schist and marble of the Cleary sequence and in interlayered amphibolite, all part of the middle Paleozoic or older Yukon-Tanana terrane. Includes Spruce Hen, Yellow Pup, and Stepovitch mines. Production between 1916-1919, 1941-1945, and 1951-1955.

Byers, 1957; Metz and Halls, 1981; Robinson, 1981; Allegro, 1984b; Robinson and others, 1990; Metz, 1991

Q06-20 65°00'N 147°49'W	Scrafford East-Central Alaska	Sb, Au Sb-Au vein	Footwall chip samples contain 1.4 to 5.7 g/t Au. Produced 906,000 kg Sb from 2,500 tonnes ore, averaging 36% Sb.

Massive stibnite along east-west-striking shear zone. Also disseminated quartz stockwork and veinlets with arsenopyrite and stibnite in feldspathic quartzite and quartz mica schist in footwall of shear zone. Barren pelitic schist and quartzite in hanging wall. Host rocks part of the upper Precambrian(?) Cleary sequence, part of the mid-Paleozoic or older Yukon-Tanana terrane. Several periods of active mining when Sb prices have been high.

Chapin, 1914, 1919; Metz and Halls, 1981; Robinson and Bundtzen, 1982; Thomas E. Smith and Paul A. Metz, written commun., 1984; Metz, 1991

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

Q06-21 64°52'N 148°05'W	Ester Dome East-Central Alaska	Au, Ag Polymetallic vein(?)	Produced 194,000 tonnes of ore with average grade of 3.0 to 80.0 g/t Au

Quartz fissure veins from a few centimeters to 5.5 m thick and up to 1,200 m long with gold, pyrite, arsenopyrite, and stibnite, and minor jamesonite, argentite, chalcocite, and covellite. Area includes 58 known lode occurrences, 27 with production. The largest deposits include Ryan Lode and the Grant and Mohawk deposits. Steeply dipping quartz veins up to a few meters thick most common; local sheared veins up to 22 m thick. Multiple episodes of quartz deposition. Veins occur in micaceous quartzite, graphitic schist, calc-schist, and marble of mid-Paleozoic or older Yukon-Tanana terrane. About 26 producing vein deposits in area. The Silver Dollar and Mohawk deposits contain an estimated 900,000 tonnes grading 3.0 g/tonne Au and 6.0 g/tonne Ag. Grant deposit has estimated 192,300 tonnes grading 12.0 g/t Au. Ryan Lode deposit has estimated 13.2 million tonnes grading 1.95 g/t Au. Several periods of production, notably in the 1930's and the 1980's. The most prominent properties are the Ryan Lode and the Grant mine; both of which are currently active. Ester Dome undoubtedly is the source for some of the rich placers located radially around it.

Hill, 1933; Thomas, 1973; R.C. Burggraf, written commun., 1989, Robinson and others, 1990; Bundtzen and others, 1996.

Q06-22 64°37'N 148°51'W	Liberty Bell Alaska Range and Yukon-Tanana Upland	Au, Ag, Cu, Bi Kuroko massive sulfide(?) or polymetallic gold vein	Estimated 91,000 tonnes with 34.3 g/t Au, 10% As, 2.0% Cu

Fine-grained arsenopyrite, chalcopyrite, pyrrhotite, and bismuthite in stringers and laminations that occur parallel to foliation. The sulfide zone reaches a maximum thickness of 10 m and is 200 m long. Layering ranges from a few centimeters to 1 m thick. Lenses and laminations parallel foliation in siliceous metavolcanic phyllite of the California Creek Member of the Mississippian(?) Totatlanika Schist, but are locally folded. Quartz-tourmaline-sulfide veins, locally with symmetrical wall rock alteration, are from 10 cm to 1 m thick and crosscut sulfide zones and adjacent schist. The sulfides occur immediately adjacent to a metamorphosed porphyry interpreted as a Paleozoic igneous plug that was contemporaneous with the volcanic rock protoliths of the Totatlanika Schist. White mica from plug yields K-Ar age of 90 Ma, which indicates the age of a regional metamorphic event in the Yukon-Tanana terrane. Quartz veins may represent either remobilized stratiform sulfides, or polymetallic veins associated with nearby Tertiary(?) plutonic rocks. Gold produced in 1930's.

Hawley, 1976; E.R. Pilgram, written commun., 1976; Gilbert and Bundtzen, 1979; Bundtzen and Gilbert, 1983; Thomas K. Bundtzen, written commun., 1985, 1989

Q06-23 64°20'N 146°22'W	Democrat (Mitchell Lode) East-Central Alaska	Au, Ag, Pb, Sb Granitoid-related gold	1989 test output was 88,000 tonnes at 2.2 g/t Au; 5.0 g/t Ag

Tetrahedrite, galena, acanthite, owyheeite, and other silver sulfosalts, and free gold with quartz in hydrothermally altered granite porphyry. Granite yields K-Ar age of 89 Ma. Strong sericite alteration halo surrounds stock, which intrudes sillimanite bearing schists of Yukon-Tanana terrane. Granite porphyry is part of 35 km long sill complex that intrudes along Richardson Lineament. Gold bullion occurs as interlocking alloys of native silver and high fineness gold that averages 67% gold and 33% silver. Silver sulfosalts locally abundant with 'bonanza' grades of up to 66,000 g/tonne silver obtained in localized mineral zones. Mineralization believed to have formed during high level emplacement of granite porphyry along Richardson Lineament.

Bundtzen and Reger, 1977; T.K. Bundtzen and R.B. Forbes, written commun., 1990

Q06-24 64°20'N 144°14'W	Blue Lead, Tibbs Creek, Gray Lead East-Central Alaska	Au, Ag, Sb Polymetallic vein or Sb-Au vein	Produced 905 g Au and 707 g Ag from 136 tonnes ore

Group of quartz veins with gold, pyrite, arsenopyrite, and stibnite. Veins pinch and swell; width ranges from 1 cm to 2.4 m, with average of 1 m. Masses of nearly pure stibnite up to 0.6 m thick and 30 m long. Veins occur in Cretaceous(?) granitic rocks intruding mid-Paleozoic or older metasedimentary rocks of the Yukon-Tanana terrane. Abundant faults and shear zones. About 240 m underground workings. Explored from about 1935 to 1941. Minor production in 1970's.

Thomas, 1970; Menzie and Foster, 1978; Robinson and others, 1982

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q07-01 66°32'N 140°17'W	Alto Fish River	Fe Stratabound Fe	Medium. Reserves of 50 million tonnes grading 55% Fe.

Consists of oolitic magnetite that occurs in a 45 meter-thick bed that is exposed along a strike length of 350 meters. Bed part of recessive weathering black shales about 50 meters above the base of the Jurassic and Lower Cretaceous Kingak Formation. Deposit age interpreted as Permian.

Norris, 1976; Yukon Minfile, 1987.

Q07-02 66°30'N 140°20'W	Rusty Springs (Termuende) Northern Cordilleran	Ag, Zn, Cu Pb, Ba Southeast Missouri Zn-Pb-Ag	Medium?

Consists of sphalerite, tetrahedrite and pyrite, and minor galena that occur in vugs, quartz-calcite veinlets and as widespread massive sulfide lenses. Deposit hosted in brecciated dolomite and shale of the Middle Devonian Ogilvie Formation near the core of an anticline. Most of deposit occurs in previously altered, vuggy dolomitized limestone, approximately 100 meters thick, that is crudely localized near a contact with unconformably overlying slates of the Mississippian Hart River Formation. Deposit age interpreted as Middle Devonian.

Yukon Minfile, 1987.

Q07-03 65°12'N 141°11'W	Three Castle Mountain Unassigned	Pb, Zn Ba Sedimentary exhalative Pb-Zn	Average grade of up to 17% Zn and 2% Pb in 3 separate deposits.

Disseminated to massive galena, sphalerite, and barite in middle to lower Upper Devonian chert, shale, and limestone of the McCann Hill chert of the North American craton margin. Area includes least three prospects: Three Castle Mountain, Pleasant Creek, and VABM Casca; other occurrences are also known. Sulfides and barite occur as disseminated to massive layers 3 to 100 cm thick in mudstone. Also occurring locally are coarser grained, sphalerite-dominated masses in carbonate breccia. Deposits interpreted as a sedimentary-exhalative deposit similar to middle Paleozoic deposits in western Brooks Ranges or in the western Alaska Range, such as the Gagaryah deposit.

Brabb and Churkin, 1969; Bundtzen and others, 1982; T.K.Bundtzen, written commun., 1992

Q07-04 64°34'N 142°11'W	Eagle C3 Fortymile	PGE Podiform Cr(?)	Grab samples contain up to 3 g/t Pt, 1.5 g/t Pd, and 0.03 g/t Rh

Anomalous PGE in two lenses of clinopyroxenite in small ultramafic body that appears to be pendant in a small Mesozoic(?) granodiorite pluton. Pyroxenite intruded by coarse-grained, irregular felsic dikes. Local hydrothermal alteration associated with felsic dikes. Anomalous PGE in altered zone and in clinopyroxenite. Only one of the 32 separate ultramafic bodies in area exhibits significant values of PGE. Clinopyroxenite may be part of deformed ophiolite of Seventymile terrane, or part of zoned mafic-ultramafic pluton.

Foster and Keith, 1974; Foster, 1975; Keith and others, 1987

Q07-05 64°31'N 142°30'W	Slate Creek (Fortymile) Fortymile	Asbestos Serpentine-hosted asbestos	Estimated 58 million tonnes grading 6.4% fiber

Antigorite with minor clinochrysotile, chrysotile, magnetite, brucite, and magnesite in serpentinized harzburgite. Chrysotile asbestos occurs in zones of fracturing near centers of thicker serpentinite, primarily as cross-fiber asbestos in randomly oriented veins about 0.5 to 1 cm thick. Veins contain alternating zones of chrysotile and magnetite, and commonly exhibit magnetite selvages. Some chrysotile altered to antigorite. Harzburgite occurs as tabular tectonic lenses, generally from 60 to 150 m thick and up to 800 m long. Ultramafic rocks part of deformed ophiolite of Seventymile terrane.

Foster and Keith, 1974; Robert K. Rogers, written commun., 1984

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

Q07-06	Shell Creek	Fe	Medium (estimate). Reserves not available. Grade approximately 29% Fe.
64°34'N	Unassigned	Ironstone	
140°20'W			

Banded ore consists of two facies: a black, slaty, magnetite facies and a grey, cherty, pyrite-pyrrhotite facies. Deposit hosted in tightly folded quartz-chlorite and quartz-mica schists of Precambrian and (or) Cambrian age. Deposit age interpreted as Precambrian to Cambrian.

Gross, 1969; Yukon Minfile, 1978.

Q07-07	Clinton Creek	Asbestos	Medium. Reserved of 6.8 million tonnes grading 4.37% fibre.
64°27'N	Fortymile	Serpentine-hosted asbestos	
140°43'W			

Consists of cross-fibre chrysotile asbestos veinlets that occur in a body of serpentinite associated with the Proterozoic/Paleozoic Nasina metasedimentary series. Approximately 0.94 million tonnes of fibre were produced from 15.9 million tonnes of ore mined between 1967 and 1978. Deposit age interpreted as Late Paleozoic?

EMR Canada, 1989.

Q07-08	Purdy	Au	Minor production
64°07'N	Yukon-Tanana Upland	Au quartz vein	
141°55'W			

Small deposit notable for large quartz-calcite fissure vein and veinlets with spectacular "lace" gold. Large vein extends about 2 m; terminated at one end by fault. Large vein completely mined-out by 1960. Vein and veinlets cut mid-Paleozoic or older metasedimentary schists of Stikinia(?) terrane. Small veins and veinlets mined in 1969 and early 1970's.

Helen L. Foster, written commun., 1984; W. David Menzie, written commun., 1985

Q07-09	Brewery Creek (Loki Gold)	Au	Medium. Reserves of 19.2 million tonnes grading 1.53 g/t Au.
64°04'N	Tombstone	Sb	
138°14'W		Sb-Au vein	

Deposit occurs along a shear zone that occurs between a sill-like body of quartz-monzonite, syenite and latite porphyry and underlying graphitic argillite, chert, sandstone, conglomerate and bedded barite of the Devonian and Mississippian Earn Group. Eight separate deposits occur over a strike length of 5.5 km. Gold occurs in fine chalcedony-pyrite-arsenopyrite stockworks within several semi-conformable sills and adjacent host rock and in the footwall sedimentary rocks. Narrow stibnite veins are common, but mainly post-date deposition of gold. About 90% of the deposit is oxidized at depths of 10-110 m. An open pit, heap-leach mine operation will start in late 1995. Deposit age interpreted as mid-Cretaceous.

Bremmer, 1990; Loki Gold Corp. news release, November 1, 1994.

Q08-01	Snake River (Crest Iron)	Fe	Large. Reserves of 5.6 billion tonnes grading 47.2% Fe.
65°15'N	Rapitan	Ironstone	
133°00'W			

Consists of a large hematite and jasper iron-formation that occurs near the base of a section of conglomeratic mudstone and diamictite of the Late Proterozoic Rapitan Group of the Windermere Supergroup. The iron formation forms a stratigraphic interval approximately 130 meters thick. The richest part of deposit occurs in the top 80 meters that contains little or no interbedded sedimentary rocks. Deposit age interpreted as Late Proterozoic.

Yeo, 1986; Stuart, 1963.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q08-02 64°39'N 136°51'W	Hart River Gillespie	Zn, Cu, Ag Pb, Au Sedimentary exhalative Zn-Cu-Pb	Medium. Reserves of 1.068 million tonnes grading 3.6%Zn. Grade: 1.45%Cu, 0.9% Pb, 49.7 g/t Ag, 1.4 g/t Au.

Consists of pyrite and pyrrhotite and minor sphalerite, galena and tetrahedrite that occur as a tabular mass along a facies change from dolomite to calcareous black argillite of the Early Proterozoic Gillespie Lake Group. Host rocks are cut by numerous diabase sills and dikes that metamorphose the dolomite to serpentinite-talc and the argillite to hornfels. Footwall is silicified and has a stockwork of sulfide veinlets, whereas the hanging wall consists of thinly layered sulfides. Deposit age interpreted as Early Proterozoic.

Morin, 1978; Yukon Minfile, 1985; Abbott,1987, 1993; EMR Canada, 1989; MacIntyre, 1991.

Q08-03 64°43'N 135°13'W	Nick Dempster	Ni, Zn, PGE Sedimentary exhalative Ni-Zn	Medium. Reserves of 900,000 tonnes grading 5.3% Ni, 0.73% Zn, 0.8 g/t PGE+Au.

Consists of pyrite, vaesite, melnikovite-type-pyrite, sphalerite and wurtzite that occur in a gangue of phosphatic-carbonaceous chert, amorphous silica and intergrown bitumen. Deposit forms a thin, conformable unit at the contact between Middle and Upper Devonian Earn Group. Host rocks are basinal sedimentary part of a Devonian and Mississippian clastic wedge exposed in an east-west trending syncline. The basin is interpreted as a local trough or embayment on the eastern margin of the Selwyn Basin. Deposit age interpreted as Middlt to Late Devonian.

Hulbert and others, 1992; Yukon Minfile, 1992.

Q08-04 64°19'N 133°45'W	Rusty Mountain (Vera, Val, Cavey) Tombstone	Ag, Pb Zn Ag-Pb-Zn polymetallic vein	Medium. Reserves of 949,640 tonnes grading 2.67% Pb, 2.62% Zn, 324 g/t Ag.

Consists of galena, sphalerite and argentiferous tetrahedrite with minor chalcopyrite, and pyrite. Deposit occurs as lenses and shoots along steeply dipping breccia zones in dolomite of the Early Proterozoic Purcell- Wernecke Assemblage and in fracture systems in Lower Paleozoic siltstones. Deposits related to intrusion of mid-Cretaceous Tombstone Plutonic suite. Deposit age interpreted as Cretaceous(?).

EMR Canada, 1989.

Q08-05 64°23'N 132°31'W	Goz Creek Area (Barrier Reef) Northern Cordilleran	Zn, Pb Ag, Cd Southeast Missouri Pb-Zn	Medium. Reserves of 2.49 million tonnes grading 11% Zn+Pb.

Consists of sphalerite with minor galena, pyrite and boulangerite that occur as fracture and breccia filling and disseminations. Deposit occurs in both stratigraphically and tectonically controlled zones in pervasively silicified sandy dolostone. Two main deposits and numerous occurrences extend for 8 km along strike of the Risky Formation of the Upper Proterozoic Backbone Ranges Group. Host rocks interpreted as part of a Cambrian-Devonian passive margin. Smithsonite occurs as weathering product of sphalerite. Deposit age interpreted as Late Proterozoic.

Dawson, 1975; EMR Canada, 1989; Dawson and others, 1991; Fritz and others, 1991.

Q08-06 64°02'N 135°46'W	Ray Gulch (Potato Hills, Mar) Tombstone	W Au, Sn, As W skarn	Large. Reserves of 7.26 million tonnes grading 0.07% WO3.

Consists of scheelite that occurs as disseminations and tabular layers in sulfide-free diopside-amphibole-epidote skarn. Deposit hosted in calcareous metasedimentary rocks and tuff of the Upper Proterozoic Hyland Group that is intruded by quartz monzonite sills that dip gently northward towards the Potato Hills Stock. Igneous rocks part of the mid-Cretaceous Tombstone Plutonic suite. Eight separate skarns occur, the lower four of which contain a high-grade zone of 3.6 million tonnes grading 0.93% WO3. Deposit age interpreted as mid-Cretaceous.

Lennan, 1986; EMR Canada, 1989; Yukon Minfile, 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q08-07	Blende (Braine)	Zn, Cu, Pb, Au, Ag	Large. Reserves of 19.6 million tonnes grading 3.04% Zn, 2.81% Pb, 56 g/t Ag, 1.6% Cu, 2.75 g/t Au.
64°25'N	Gillespie	Sedimentary exhalative Pb-Zn	
134°40'W			

Consists of pyrite, sphalerite and galena with local chalcopyrite and tetrahedrite that occur in siderite- or dolomite-quartz veins and breccia. Deposit hosted in dolomite of the Gillespie Lake Group of the Early Proterozoic Wernecke Supergroup. Mafic sills are spatially associated with mineralized veins and vein-breccias within anastomosing shear zones in competent stromatolitic dolostone. Multistage deposition may be related in part to intrusion of gabbro and diorite. Deposit age interpreted as Early Proterozoic.

Mustard and others, 1990; Yukon Minfile, 1992; NDU Resources, press release, 1993; Robinson and Godwin, 1995.

Q09-01	Gayna River	Zn, Pb	Medium. Resource of 50 million tonnes grading 4.7% Zn, 0.3% Pb.
64°56'N	Northern Cordilleran	Southeast Missouri Pb-Zn	
130°41'W			

Consists of sphalerite with minor pyrite and galena that occur in breccias and as tabular replacement bodies in Late Proterozoic shallow water carbonate of the Little Dal Group (Mackenzie Mountain Assemblage). Replacement bodies interpreted as mineralized breccias that formed as slumps over the flanks of stromatolitic reefs, and also as solution-collapse and fault-related crackle breccias. Secondary breccias are generally richest. The Gayna River district comprises some 18 deposits and more than 100 occurrences. Several deposits exceed 1 million tonnes of 10% Zn+Pb. Deposit age interpreted as Late Proterozoic.

Hewton, 1982; EMR Canada, 1989.

Q09-02	Bear-Twit	Zn, Pb	Medium. Reserves of 8 million tonnes grading 5.4% Zn, 2.6% Pb, 0.5 g/t Ag.
64°03'N	Northern Cordilleran	Ag	
129°25'W		Southeast Missouri Pb-Zn	

Consists of galena and sphalerite with minor tetrahedrite that occur in brecciated dolomitized shallow water (reef) carbonates of the Lower Devonian Whittaker, Delorme and Camsell Formations. Host rocks interpreted as part of a Cambrian to Devonian passive margin. Deposit occurs in cross-cutting fractures, breccia matrices, fossil replacement, and also as disseminations in dolomite. Deposit age interpreted as Early Devonian.

Brock 1975; Dawson, 1975; Archer Cathro and Associates, company report, 1978; EMR Canada, 1989.

Q10-01	MacKenzie Basin	Salt	Large. Reserves and grade not available.
64°25'N	Unassigned	Stratform salt	
124°45'W			

Consists of salt and associated with gypsum that occur in Cambrian, Ordovician and Silurian sedimentary rocks. Drilling for oil wells encountered four salt beds, with a total thickness of approximately 13 meters. Salt is 97% sodium chloride. Salt has not been collected from these beds, but has been collected from evaporating basins near brine springs issuing from the base of an escarpment on the Salt River. Deposit age interpreted as Paleozoic.

Camsell, 1917; Lord, 1951.

Q52-01	Syncha-I & II	Au	Contains up to 2-5 g/t Au.
67°50'N	Verkhoyansk	Au quartz vein	
128°03'E			

Consists of two deposits about 20 km apart. Au quartz veins occur in an extensive northwest-striking zone in anticlinal domes formed in calcareous sandstone and shale. Most veins are tabular, 2 to 3 m thick, and 120 to 150 m long. Veins occur both parallel to and across bedding. Also occurring are extensive, conformable, sheet-like veins that are about 2.5 m thick and to 300 m long. Also occurring are small networks of veins in shear zones that are up to 5 m thick and 300 m long. Vein gangue is mostly quartz with subordinate carbonate and chlorite. Ore minerals comprise 1% of veins, and include galena, sphalerite, chalcopyrite, pyrite, arsenopyrite, tetrahedrite(?), cassiterite, and gold. Host rocks exhibit mild silica, sericite, and carbon alteration.

Amuzinsky, 1975; Ivensen and others, 1975.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

Q52-02 67°11'N 127°45'E	Kuolanda Vostochno-Verkhoyansk	Pb, Zn, Ag Cu Ag polymetallic vein	Average grade of 20-30% Zn, 2% Pb, 1.3% Cu, up to 953 g/t Ag. Reserves of 15,000 tonnes lead, 120,000 tonnes zinc.

Consists of a mineralized breccia that contains abundant veins and stringers of massive and disseminated galena and sphalerite that are hosted in Lower Carboniferous siltstone and sandstone. Main ore mineral is sphalerite, with lesser amounts of galena and chalcopyrite. Subordinate minerals are siderite, arsenopyrite-glaucodot, pyrite-melnikovite, pyrrhotite, and native silver. Veins are divided into sulfide and quartz-sulfide types. Some veins range up to 20 m long and 0.2-0.3 m thick. Vein zones range up to up to 280 m long and from 1.5 to 10 m wide. Deposit occurs along axis of an anticline.

Ivensen and others, 1975; Tseidler, written commun., 1985.

Q52-03 67°08'N 130°41'E	Iserdek Verkhoyansk-Indigirka	Hg Clastic sediment-hosted Hg	No data.

Deposit occurs in dome of an anticline formed in Lower Permian sandstone and siltstone along cross-cutting, steeply-dipping faults, and along subconformable inter- and intra-bedded fractures. Main ore minerals are cinnabar, quartz, and dickite.

Maslennikov, 1985, written commun., 1977; Shur, 1985.

Q52-04 67°06'N 131°36'E	Betyugen Verkhoyansk-Indigirka	Sb Sb vein	Average grade of 35-40% Sb; up to 4.5% As.

Consists of small quartz-stibnite vens in gently-dipping interbed fractures. Veins range from 0.5 to 10 m thick and 30 to 200 m long. Two ore bodies predominate. Main minerals are stibnite, quartz, kaolinite, dickite, hydromica, ankerite, arsenopyrite, pyrite, and gold. Wallrocks exhibit minor sericite, kaolinite, and sulfide alteration. Deposit occurs in the Dulgalak anticline dome formed in an uniform sequence of Upper Permian siltstone.

Maslennikov, 1985, written commun.

Q52-05 66°55'N 131°01'E	Zagadka Verkhoyansk-Indigirka	Hg, Sb Clastic sediment-hosted Hg	Average grade of 0.22-6.2% Hg, 0.8-20% Pb, 2-10% Zn, 4-10% Sb, and up to 30 g/t Ag. Estimated resources of 1,718 tonnes mercury and 1,000 tonnes antimony.

Consist of cinnabar and metacinnabarite and are relatively younger than associated Sb-Au vein deposits that consist of stibnite and berthierite. The Zagadka clastic sediment-hosted Hg deposit occurs in Upper Permian sandstone and siltstone that is gentle folded and cut by steeply-dipping faults. Deposit is located a linear zone about 2.4 km long within one of the faults. Thickness and morphology of deposit is controlled by shear zones and associated feathered veins and stringers. Ore deposit is mainly cinnabar that occurs in zones that range from 0.4 to 3 m thick. Subordinate minerals are galena, sphalerite, stibnite, Pb-sulfosalts, and cassiterite. Gangue minerals are quartz, dickite, and carbonate minerals. Wall rocks exhibit dickite, quartz and carbonate alteration.

Maslennikov, written commun., 1977, 1985.

Q52-06 66°43'N 131°03'E	Zvezdochka Verkhoyansk-Indigirka	Hg Clastic sediment-hosted Hg	Medium. Average grade of 1.5-1.95% Hg; Reserve of 3712 tonnes Hg.

Consists of intercalated Triassic sandstone and siltstone deformed into small folds that strike roughly north-south. Ore bodies are 0.2 to 11 m thick, dip westerly at 70-75°, and are occur along a fault along the axis of an anticline. Outlines of ore bodies are not distinct and were found by geochemical channel sampling. Deposit hosted mostly in sandstone in the western limb of an anticline. Cinnabar is the major ore mineral; native mercury occurs at depths greater than 100 m. Other ore minerals are metacinnabarite, pyrite, maracasite, galena, sphalerite, chalcopyrite, and arsenopyrite are less wide-spread. Stibnite, gold, and silver are rare. Gangue minerals are quartz, ankerite, calcite, dickite, and kaolinite. Wallrocks exhibit intense silica, dickite, and carbon alteration.

Maslennikov, 1977; Klimov, 1979; Maslennikov, written commun., 1985; Shur, 1985.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

Q52-07	Kholbolok	Hg	Contains up to 0.62% Hg.
66°15'N	Verkhoyansk-Indigirka	Clastic sediment-hosted Hg	
131°48'E			

Deposit occurs in an anticlinal dome formed in Middle Triassic sandstone along intersections of variously-oriented faults. Deposit located by geochemical sampling. Disseminated ore occurs in silicified sandstone and metasomatic shear zones. Ore bodies range up to 15 to 20 m thick. Mjaor ore mnerals are cinnabar (5%), quartz, ankerite, and dickite. Rare ore minerals are pyrite, stibnite, realgar, orpiment, metacinnabarite, chalcopyrite, tetrahedrite, and gold are rare. Wallrocks exhibit silica and dickite alteration.

Ivensen and others, 1975; Klimov, 1979; Shur, 1985.

Q52-08	Bochiyskoe	Sn	Average grade of 0.36-0.52% Sn.
66°14'N	Verkhoyansk	Sn polymetallic vein	
129°58'E			

Deposit occurs in a sandstone bed on the eastern limb of an anticline and consists of a stringer from 8 to 10 m thick and 600 m long. Veins consist predominantly of sulfides, including chalcopyrite, pyrite, galena, arsenopyrite, sphalerite, pyrrhotite, and stannite. Other vein minerals are quartz, tourmaline, calcite, ankerite, and cassiterite. Wallrocks exhibit tourmaline, chlorite, sericite, and kaolinite alteration.

Ivensen and Proschenko, 1961.

Q52-09	Imtandzha	Sn	No data.
66°08'N	Verkhoyansk	Sn polymetallic vein	
129°36'E			

Deposit occurs in a zone of an intense fissuring up to 500 m wide, 2 km long, and along the axis of an anticline. Granodiorite porphyry dikes associated with deposit. Dikes cut polymetallic veins and in turn are cut by Sn-sulfide veins. Early-stage silver-polymetallic veins are mostly conformable. Later-stage veins are mostly cross-cutting, but are less common. Veins are 0.01 to 0.85 m thick. Major ore minerals are galena, sphalerite, and siderite. Lessor vein minerals are quartz, tetrahedrite, pyrite, arsenopyrite, and boulangerite. Later-stage veins contain quartz, chlorite, pyrite, arsenopyrite, galena, cassiterite, tourmaline, and stannite and are 0.1-0.6 m thick. Stringers range 2 to 3 m thick and are up to 1 km long.

Indolev and Nevoisa, 1974; Ivensen and Proschenko, 1961.

Q52-10	Chochimbal	Au, Ag, Pb	Range of 0.1-15 g/t Au. Average grade of 2-3 g/t Au; up to 6,000 g/t Ag; 0.1% Sb; up to 1% As; 2% Zn; 18% Pb.
65°54'N	Verkhoyansk	Polymetallic vein	
129°45'E			

Consists of shallow-dipping, and steeply-dipping crosscutting carbonate-quartz-sulfide veins that occur in the Imtandzha anticlinal dome formed in Middle Carboniferous clastic rocks. Ten known ore bodies are known. Ore bodies range from 0.1 2.8 m thick and are 400-500 m long. Major ore minerals are quartz (30-60%), siderite (20-25%), sulfides (25-30%), pyrite, arsenopyrite, Fe-sphalerite, and galena. Lesser ore minerals are chalcopyrite, pyrrhotite, tetrahedrite, bournonite, native gold (fineness 713-743), and boulangerite.

Indelev and Nevoisa, 1974; Ivensen and others, 1975; Vladimirtseva, written commun., 1985.

Q52-11	Galochka	Au	Small. Contains up to 20.5 g/t Au; up to 6.4 g/t Ag.
65°42'N	Verkhoyansk	Au quartz vein	
128°26'E			

Cnsists of quartz stringers that are 30 m wide, 170 m long. Hosted along a roughly north-south trending fault that cuts an anticlinal dome formed in Lower Permian sandstone and shale. Stringers are 0.02 to 0.1 m thick and include quartz, calcite, chlorite, sphalerite, galena, pyrite, chalcopyrite, and gold.

Vladimirtseva, written commun., 1985.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

Q52-12 65°46'N 130°35'E	Mangazeika Vostochno-Verkhoyansk	Pb, Ag Zn Ag polymetallic vein	Average grade of 75% Pb; 0.3-5% An; 500-3,938 g/t Ag; and 0.1-0.5 g/t Au. Estimated reserves of 62,375 tonnes lead, 2,900 tonnes zinc, and more than 1,000 tonnes silver. Silver mined from 1915-1922.

Consists of nine interbedded polymetallic veins that occur in Lower Permian deposits that are deformed into gently-plunging, tight folds that form a long, thin map pattern. Veins fill fissures along argillite and sandstone bed contacts. Ore bodies are conformable to bedding, 50 to 1,300 m long, and 3 cm to 1 m thick. Main ore minerals are galena and sphalerite. Minor ore minerals are pyrite, arsenopyrite, chalcopyrite, owyheeite, freibergite, diaphorite, boulangerite, pyrargyrite,miargyrite, cassiterite, stannite, and native gold, native silver, and argentite. Gangue minerals are manganosiderite, quartz, ankerite, sericite, chlorite, and tourmaline. Deposit formed in seven stages.

Indolev and Nevoisa, 1974; Tseidler, written commun., 1985.

Q52-13 65°39'N 130°36'E	Bezymyannoe Vostochno-Verkhoyansk	Ag, Pb Ag polymetallic vein	Small. Averages grade of 4,800 g/t Ag; to 41% Pb; to 3% Zn; 0.11-0.54% Sn; 0.33-4.5% As; 0.11-0.54% Cu.

Consists of twelve gentlly-dipping veins that occur near the dome of an anticline formed in Lower Permian clastic rocks. Veins occur along or inclined to bedding, along sandstone and siltstone contacts, in fissures, and in cement breccia in sandstone beds. Veins are 50 to 600 m long and 5 to 60 cm thick. Veins consist mostly of quartz and siderite. Ore minerals comprise 10 to 15% of veins. Main ore minerals are owyheeite, diaphorite, galena, and miargyrite. Subordinate minerals are freibergite, arsenopyrite, pyrite, chalcopyrite, pyrargyrite, stannite, sphalerite, cassiterite, argentite, native silver and gold, boulangerite, jamesonite, ferberite, and pyrrhotite. Deposit formed in nine stages.

Indolev and Nevoisa, 1974; Tseidler, 1985, written commun.

Q52-14 65°37'N 131°49'E	Anomalnoe Yana-Polousnen	Sn Sn silicate-sulfide vein	Average grade of 0.001-2.57% Sn.

Consists of three types of veins: (1) concordant occurrences in interbed fractures; (2) cross-cutting veins from 0.1 to 20 m thick; and (3) mineralized shear zones from 0.1 to 9 m thick. Vein zones range from 100 m to 2 km long. Main ore minerals are tourmaline, chlorite, quartz, arsenopyrite, cassiterite, wolframite, pyrite, and pyrrhotite. Lesser ore minerals are galena, Fe-sphalerite, Mn-siderite, scheelite, stannite, and tetrahedrite. Wallrocks exhibit tourmaline, silica, and chlorite alteration. Deposit occurs along western limb of an overturned syncline formed in Triassic to Early Jurassic sandstone and intercalated siltstone and conglomerate. Sedimentary rocks are contact metamorphosed from an unexposed intrusion. Pre-ore lamprophyre dikes occur within the ore field.

Ivensen and others, 1975; Shur, 1985.

Q52-15 65°30'N 129°60'E	Dyabkhanya Verkhoyansk	Au, Ag Cu, Pb, Zn Au polymetallic vein	Average grade of 3.9-11% As; up to 5.6 g/t Au; 1-4.31% Cu; 0.2-0.86% Pb; 0.49-1.48% Zn; 40-589.2 g/t Ag.

Consists of a set of sulfide-quartz veins and stringers that are hosted in Late Carboniferous and Early Permian sedimentary rocks. Deposit occurs in three zones that are 270 to 2,000 m long and 1 to 30 m wide. Stringers range from 0.15 to 0.3 m thick. Major ore minerals are pyrite, arsenopyrite, and chalcopyrite. Rare ore minerals are pyrrhotite, sphalerite, galena, and tetrahedrite. Gangue minerals are quartz and siderite. Host rocks exhibit minor carbonate and sulfide alteration.

Ivensen and others, 1975; Vladimirtseva, written commun., 1985.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q52-16 64°49'N 130°37'E	Balbuk Verkhoyansk	Pb Au, Ag Pb polymetallic vein	Average grade of 11.2% Pb. Local areas with 380-420 g/t Ag and 70-80 g/t Au.

Consists of a set of cross-cutting quartz-galena veins that occur in the dome of an anticline formed in Permian sandstone and siltstone. Main vein dips vertically, is 120 m long, and has an average thickness of 0.88 m. Vein contains swells up to 3 m thick that are spaced every 10 to 12 m. Swells form verticle columns. Breccia ores formed when host rock clasts were coated with quartz and galena. Some evidence indicates that some minerals crystallized from colloidal suspension. Veins locally consist mostly of galena (75%).

Vikhert and others, 1961.

Q53-01 67°38'N 134°47'E	Ege-Khaya Yana-Polousnen	Sn, Zn Sn polymetallic vein	Medium. Average grade of 0.1-3% Sn; 0.1-3% Zn. Limited production.

Consists of mineralized shear zones, stringers, and less common veins. Deposit occurs in zones from 0.7 to 4 m thick and up to 1 km long. Deposit dips steeply and extends to a depth of 500 m. Host rocks exhibit minor contact metamorphism and consist of Upper Triassic shale and interbedded sandstone. Major minerals are quartz, chlorite, cassiterite, sphalerite, pyrrhotite, pyrite, marcasite, siderite, and calcite. Subordinate minerals are arsenopyrite, galena, stannite, chalcopyrite, wolframite, bismuth, tourmaline, and albite. Sulfides are predominant at depth. Wallrocks exhibit chlorite, silica, and sulfide alteration.

Flerov, 1976; Shur, 1985; Spomnor and others, written commun., 1985.

Q53-02 67°33'N 137°55'E	Kysylga Dogdo-Erikit	Au, Ag Au-Ag epithermal vein	Average grade of 3.0-84.5 g/t Au, 1-37 g/t Ag; 0.01-0.1 As; 0.01-0.04% Sb; 0.002% Sn, and 0.03% Pb.

Consists of veins in a zone that varies from 0.60-1.25 m thick and up to 400 m long. Veins composed of gangue quartz and calcite with ore minerals (1-5%) of arsenopyrite, pyrite, Ag-tetrahedrite, pyrrhotite, sphalerite, galena, chalcopyrite, boulangerite, Ag-jamesonite, and gold (fineness of 638). Veins strike from roughly east-west to northeast and dip steeply to south. Veins exhibit breccia or, less commonly, comb and massive structures, and often grade into stringers. Deposit occurs in feathered fissures of a northwest-striking major fault in Late Triassic sandstone and siltstone. Host rocks exhibit linear folding and intense contact metamorphism adjacent to a granitic intrusive. Wallrocks exhibit sericite, chlorite, and feldspar alteration.

Shosin and Vishnevsky, 1984; Vladimirtseva, written commun., 1985; Nekrasov and others, 1987; Gamyanin and Goryachev, 1988.

Q53-03 67°35'N 134°06'E	Billyakh Adycha-Taryn	Sb, Au Au-Sb polymetallic vein	Contains up to 23.2% Sb.

Consists of stibnite and quartz veins, stibnite stringers, and two stockworks in the dike, adjacent to hanging wall of dike. Main ore minerals are stibnite, quartz, ankerite, calcite, gold, and dickite. Deposit occurs in an east-west trending granite-porphyry dike that intrudes Upper Triassic sandstone and siltstone deformed into a gently-plunging fold. Wallrocks exhibit sericite, silica, and sulfide alteration. A granite body is interpreted to occur at depth. The dike has a K-Ar isotopic age of 119 Ma, is 7 km long, 2-35 m thick, and dips steeply to south.

Indolev and others, 1980; Maslennikov, written commun., 1985; Shur, 1985.

Q53-04 67°17'N 133°47'E	Khoton-Khaya Yana-Polousnen	Sn Sn-polymetallic vein, Sn silicate-sulfide vein	Sn 1.2-1.8%.

Consists of steeply-dipping mineralized shear zones that average 1 to 1.5 m thick and 100 to 1,000 m long. Ore minerals are quartz, tourmaline, cassiterite, stannite, arsenopyrite, pyrite, chalcopyrite, sphalerite, galena, bismuthine, chlorite, and siderite. Wallrocks exhibit silica, tourmaline, and sulfide alteration. Deposit hosted in Upper Triassic sandstone and shale near the top of an unexposed granitic intrusion. Sedimentary rocks are contact metamorphosed and are cut by numerous dikes of granite porphyry, granodiorite porphyry, and less common diorite.

Flerov, 1976; Spomior and others, written commun., 1985.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q53-05 67°17'N 134°38'E	Kester Yana-Polousnen	Sn, Ta, Nb, Li Sn greisen	Small. Average grade of 0.3% Sn; up to 0.5% Nb_2O_5 ; up to 0.35% Li_2O . Partly mined.

Consists of greisen with major minerals of quartz, muscovite, albite, potassium feldspar, molybdenite, zinnwaldite, tourmaline, topaz, amblygonite, apatite, cassiterite, wolframite, and tantaloniobate. Also occurring are stannite, arsenopyrite, and Pb sulfosalts. Host granite exhibits intense greisen alteration and local tourmaline and sulfide alteration. Deposit exhibits an irregular shape and occurs within the margin of a stock of subalkalic alaskite granite that intrudes the Arga-Ynnakhai granodiorite pluton. Deposit dimensions are 80 by 1,200 m and is up to 60 m thick.

Flerov, 1976; Shur, 1985; Spomior and others, written commun., 1985.

Q53-06 67°09'N 134°21'E	Ulakhan-Egelyakh Yana-Polousnen	Sn Sn silicate-sulfide vein	Major. Average grade of 0.7% Sn, Pb, Zn, Cu.

Consists of shear zones, extensive veins and, stockworks that strike northeast. Ore zones average 1.6 m thick and range up to 2 km long. Minerals are quartz, chlorite, cassiterite, sphalerite, arsenopyrite, galena, chalcopyrite, siderite, fahlore, tourmaline, bismuthine, and pyrargyrite. Deposit hosted in Upper Triassic sandstone and shale that is contact metamorphosed near the contact of the Arga-Ynnak-Khai granite pluton.

Flerov, 1976; Shur and Flerov, 1979; Shur, 1985; Spomior and others, written commun., 1985.

Q53-07 67°02'N 133°60'E	Ak-Altyn Adycha-Taryn	Au Ag Au-Ag epithermal vein	Small. Average grade of 0.2-60.4 g/t Au; and 0.1-1% Ag, Hg, Pb, Sb, Zn, As, Cu.

Consists of quartz and quartz-carbonate veins, up to to 2 to 3 m thick and stringers that occur in a zone 10-30 m wide and 150 m long. Deposit is hosted in gently-dipping Middle Triassic (Ladinian) clastic rocks that are intruded by Lower Cretaceous diorite porphyrite dikes. Ore is dominated by fine-grained quartz (chalcedony) with sparse sulfides (about 1%), including galena, sphalerite, chalcopyrite, arsenopyrite, and pyrite. Gold fineness is low.

Vladimirtseva, written commun., 1985.

Q53-08 66°38'N 136°51'E	Lazo Yana-Kolyma	Au Au quartz vein	Small. Average grade of 0.1-9.1 g/t Au.

Consists of a set of en echelon quartz veins and locally a stockwork that strike northeast. Veins are 0.04 to 0.4 m thick and up to 100 m long. Density of veins ranges from 1 to 10 per one meter. Besides quartz, ore minerals are arsenopyrite, sphalerite, pyrite, chalcopyrite, tetrahedrite, galena, boulangerite, and sparce scheelite. Gold occurs irregularly with an average grade of 1.2 g/t Au in the stockwork. Wallrocks exhibit beresite alteration. Deposit occurs along limb of a syncline formed in contact metamorphosed Upper Triassic siltstone and sandstone. Sedimentary rocks are intruded by diorite porphyrite dikes and two small stock-like diorite and granodiorite plutons.

Rozhkov and others, 1964; Flerov and others, 1979;Vladimirtseva, written commun., 1987.

Q53-09 66°29'N 137°03'E	Sentachan Adycha-Taryn	Sb Sb-Au vein or clastic sediment-hosted Sb-Au	Average grade of 3.2-40.3% Sb. Localy up to 30 % Sb and 50 g/t Au. Mined. Proven reserves of 100,000 tonnes antimony

Consists of two rod-like veins, from 85 to 200 m long and 0.2-3.1 m thick, occur in shear zones that strike northwest and dip 60-80° northwest. Veins extend to at least a depth of 600 m. Main ore minerals are stibnite and quartz. Subordinate ore minerals are ankerite, muscovite, pyrite, arsenopyrite, dickite, and hydromicas. Rare minerals are sphalerite, gold, chalcostibnite, berthierite, tetrahedrite, zinkenite, jamesonite, aurostibnite, and chalcopyrite. Wallrocks exhibit quartz, carbonate, hydromica and dickite alteration. Disseminated pyrite and stibnite occur in aureoles around deposit. Deposit hosted in Upper Triassic (Norian and Rhaetian) clastic rocks that are deformed into northwest-trending, gently-plunging folds. Ore bodies occur along northwest-trending Adycha-Taryn fault zone and are conformable to folding.

Berger, 1978; Zharikov, 1978; Klimov and Indolev, 1979; Indolev and others, 1980; Maslennikov, written commun., 1985; Shur, 1985.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q53-10	Burgavli	Sn	Medium. No data.
66°28'N	Yana-Kolyma	Sn quartz vein	
137°39'E			

Consists of stockworks, mineralized shear zones and short feathered veins. Ore minerals are quartz, adularia, arsenopyrite, muscovite, cassiterite, fluorite, tourmaline, beryl, topaz, apatite, scheelite, wolframite, and bismuthine. Some ore bodies are dominated by pyrrhotite, arsenopyrite, ferruginous sphalerite, stannite, chalcopyrite, pyrite, galena, sphalerite, and siderite. Wallrocks altered to greisen along with tourmaline, and quartz alteration. Deposit occur in an east-west trending fault that cuts Middle Jurassic sandstone in a small anticline. Host rocks are contact metamorphosed over an area of 3 km^2.

Flerov, 1976; Flerov and others, 1979.

Q53-11	Delyuvialnoe	Au	Medium. Range of 0.1-75.8 g/t Au; average grade of 5 g/t Au; 0.1-3% W ; 0.01-1.1% As.
66°17'N	Yana-Kolyma	W	
136°53'E		Granitoid-related Au	

Consists of shear zones and quartz stringers that occur in a brachyanticlinal dome formed in contact metamorhosed Upper Triassic (Norian) sandstone and siltstone. Deposit comprises an area 500 by 1,500 m. Shear zones range from 1 to 20 m thick; stringers occur in zones up to 100 m thick. Shear zones and stringers occur in areas up to 250-300 m long, trend east-west, and dip 50-70°. An unexposed part of the neighboring Chenkelenyn intrusion is interpreted to occur at depth. Ore minerals are arsenopyrite, pyrite, more seldom galena, chalcopyrite, scheelite, wolframite, bismuthine, native gold (fineness 600-700), and cassiterite. Gangue minerals are mainly quartz and less common chlorite and carbonate minerals. Wallrock s exhibit chlorite and sulfide alteration.

Rozhkov and others, 1964; Flerov and others, 1979; Vladimirtseva, written commun.,1985.

Q53-12	Kere-Yuryak	Sn, W	Average grade of 0.6% Sn; 0.487% As; 0.62% W.
66°17'N	Yana-Kolyma	Sn-W greisen	
137°58'E			

Deposit occurs in apical portion of a granite pluton that intrudes an anticline formed in Middle Jurassic sandstone. Consists of stockwork veins and stringers that occur along the upper contact of the pluton. Veins and stringers are 0.1 to 2 m thick and range up to 100 m long. Outcrops of vein and stringer zones vary from 50 to 150 m wide. Major minerals are quartz, tourmaline, muscovite, arsenopyrite, cassiterite, and wolframite. Rare minerals are topaz, apatite, scheelite, tetrahedrite, pyrite, molybdenite, and bismuthine. Deposit associated with intense greisen alteration.

Flerov and others, 1979.

Q53-13	Uzlovoe	Au, Sb	Average grade of 6.64 g/t Au for one ore body, and range of 0.2-36.2 g/t Au. Average grade of 0.1-48% Sb.
66°06'N	Adycha-Taryn	Sb-Au vein or clastic sediment-hosted Sb-Au	
137°48'E			

Consists of quartz-stibnite veins and stringers that occur in mylonitc formed in Triassic rocks in the Adycha-Taryn fault. Two stringers are known, along with stibnite lenses and tabular bodies. Zones range up to 2.5 to 3 m thick and up to100 m long. Stringers are associated with disseminated sulfide aureoles. Major minerals are quartz, stibnite, arsenopyrite, and pyrite.

Maslennikov, written commun., 1985.

Q53-14	Ilin-Tas	Sn	Major. Average grade of 0.7-2.5% Sn, ; 0.3-1.0% WO_3 ; up to 10 g/t Au.
65°60'N	Yana-Polousnen	W, Au	
135°56'E		Sn silicate-sulfide vein	

Consists of complex veins and less common shear zones and stringers that occur in contact metamorphosed Upper Triassic sandstone and siltstone adjacent to the Bezymyanny granitoid pluton. Ore bodies dip steeply, range from 0.01 to 6 m thick. and are about 100 m long. Veins are most dense at a distance of 500-1,000 m from the intrusive contact. Major minerals are quartz, tourmaline, cassiterite, stannite, wolframite (ferberite), pyrrhotite, pyrite, arsenopyrite, and chalcopyrite. Also occurring are Bi and Te minerals.

Shur and Flerov, 1979; Spomior and others, written commun., 1985.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q53-15 65°56'N 135°43'E	Alys-Khaya Yana-Polousnen	Sn Co Sn polymetallic vein	No data.

Consists of complex steeply-dipping northeast-striking polymetallic veins. Zones of closely-spaced veins are common. Veins range up to 1 m thick and about 100 m long. Veins are mainly quartz and chlorite. Main ore minerals are cassiterite, stannite, Co-arsenopyrite, safflorite, and sphalerite. Rare minerals are wolframite and chalcopyrite. Deposit occurs in one limb of a north-northwest-trending anticline formed in contact metamorphosed Upper Triassic (Norian) sandstone and shale. Sedimentary rocks are intruded by rhyolite, dacite, and andesite-basalt dikes that were also contact metamorphism during intrusion of Khatakchan granodiorite.

Flerov, 1976; Shur, 1985.

Q53-16 65°46'N 134°45'E	Burgachan Yana-Polousnen	Sn Co Sn polymetallic vein	Medium. Average grade of 1.2% Sn; up to 0.34% Co.

Consists of shear zones and steep-lying complex veins that are about 1 m thick and up to 800 m long. Deposit extends more than 200 m vertically. Minerals are quartz, chlorite, cassiterite, stannite, pyrrhotite, pyrite, chalcopyrite, arsenopyrite, sphalerite, galena, sulfosalts, molybdenite, glaucodot, and bismuthine. Wallrocks exhibit to silica, chlorite, sulfide, and tourmaline alteration. Deposit hosted in Upper Triassic (Carnian) sandstone, siltstone, and argillite that are contact metamorphosed and intruded by granodiorite, diorite porphyrite, and lamprophyre dikes.

Flerov, 1976; Shur, 1985; Spomior and others, written commun., 1985.

Q53-17 65°41'N 133°29'E	Prognoz Vostochno-Verkhoyansk	Ag, Pb Ag polymetallic vein	World class. Average grade of 3% Pb; 1% Zn; up to 600 g/t Ag. Probable resource of more than 2,000 tonnes silver.

Consists of long and thin sulfide-carbonate veins that are hosted in Triassic clastic rocks. Major minerals are siderite, galena, pyrargyrite, owyheeite, and various Ag minerals, and sphalerite. Premineralization granite-porphyry dikes occur within the deposit.

Vladimirtseva, written commun., 1985; Alekseev and others, 1991.

Q53-18 65°12'N 133°59'E	Bugdogar Yana-Polousnen	Sn Pb Sn polymetallic vein	Small. Average grade of 0.01-0.2% Sn; 0.1-3% Pb; up to 0.2% W .

Consists of more than 30 shear zones with mainly quartz and sulfide minerals. Shear zones range from 1 to 8 m thick, up to 1 km long, and occupy an area of 1.5 km^2. Main ore minerals are limonite, cassiterite, wolframite, galena, arsenopyrite, and chalcopyrite. Ore partly oxidized. Deposit hosted in Middle Triassic contact metamorphosed sandstone and shale adjacent to contact of the small Bugdogar granite stock.

Tseidler, written commun., 1985.

Q53-19 64°46'N 135°44'E	Imnekan Verkhoyansk-Indigirka	Sb Sb vein	No data.

Consists of massive quartz-stibnite veins that contain up to 1% pyrite, plus arsenopyrite, galena, sphalerite, and other sulfides. Deposit spatially associated with pre-mineralization lamprophyre dikes and occurs in the dome of the Korobchataya anticline that is formed in intercalating Lower-to-Middle Triassic siltstone and sandstone. Veins occur along a zone of major, deep, longitudinal and transverse, intersecting faults, in fractures that occur diagonal to the fold axis. Veins also occur along the contacts between dikes and host rocks. Wallrocks exhibit quartz-sericite, carbonate, and silica alteration.

Klimov and Indolev, 1979.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q53-20 64°42'N 137°40'E	Singyami Verkhoyansk-Indigirka	Hg Clastic sediment-hosted Hg	No data.

Consists of cinnabar that occurs in cross-cutting and interbedded shear zones. Deposit hosted in Middle-to-Upper Triassic sandstone and siltstone that are deformed into brachyanticlines associated with faults.

Klimov, 1979.

Q53-21 64°34'N 134°49'E	Khunkhada Tompon	W, Sn W-Sn skarn	Small. Contains up to 0.25% WO_3.

Consists of sheet-like skarn bodies that occur in contact metamorphosed Upper Permian-to-Lower Triassic siltstone. Skarn bodies range from 1.4 to 3.5 m thick and from 10 to locally more than 100 m long. Major minerals are pyroxene, garnet, quartz, pyrrhotite, pyrite, arsenopyrite, chalcopyrite, and scheelite.

Natapov, written commun., 1985.

Q53-22 64°30'N 137°18'E	Erikag Tompon	Sn Sn quartz vein	No data.

Consists of sulfide-quartz veins and stringers in a zone that occurs parallel to bedding. Veins and stringers comprise an east-west trending band that dips steeply south. Major minerals are quartz, pyrite, and stannite. Subordinate minerals are arsenopyrite, löllingite, cassiterite, bismuthine, bismuth, chalcopyrite, and sphalerite. Traces of pyrargyrite, tetrahedrite, and silver occur. Wallrocks exhibit intense chlorite, sericite, and tourmaline alteration. Deposit hosted in steeply-dipping, contact metamorphosed sandstone and shale in the contact aureal of the Erikag granodiorite pluton with a K-Ar isotopic age of 125-130 Ma. Sedimentary rocks strike east-west.

Flerov and others, 1974.

Q53-23 64°17'N 137°16'E	Agylki Tompon	W, Cu W skarn	Medium to large?

Consists of scheelite skarn that occurs as layers of metamsomatized limestone in contact metamorphosed Lower Triassic argillite and siltstone. Pyroxene-garnet skarn up to 3 to 5 m thick. Three successive metasomatic mineral assemblages are identified: (1) scheelite-quartz; (2) sulfide; and (3) calcite. Most tungsten occurs in scheelite and rarely in wolframite. Main sulfide minerals are pyrrhotite and chalcopyrite. Subordinate minerals are pyrite, arsenopyrite, stannite, sphalerite, galena, native bismuth, and bismuthine. Contact metamorphosed argillite is ore-free. Deposit occurs on limbs of a brachyform anticline in the thermal aureole of an unexposed granitoid intrusion with numerous apophyses of granodiorite porphyry dikes. Deposit dips 20-35° on the anticline limbs.

Flerov, Bichus, and Korostelev, 1974.

Q54-01 67°33'N 139°14'E	Titovskoe Darpir	B Sn Sn (B) magnesian skarn	Medium to large. Average grade of 9.5% B_2O_3; 0.3% Sn.

Consists of forty ore bodies that occur in areas of magnesian skarn along the contact between the quartz monzonite phase of an Early Cretaceous granitoid intrusion and Silurian and Devonian dolomite and limestone. Skarns range from 5 cm to 20 m thick and from 50 to 1,000 m long. Main ore mineral is ludwigite that forms up to 70-80% of some ore bodies. Skarns also contain ascharite, kotoite, datolite, harkerite, monticellite, fluoborite, clinohumite, calcite, periclase, forsterite, diopside, vesuvianite, brucite, garnet, axinite, tourmaline, biotite, phlogopite, serpentine, spinel, hornblende, pyroxene, feldspar, quartz, and magnetite. Sn occurs as an isomorphous admixture in ludwigite. Ludwigite often replaced by sulfides, including pyrrhotite, sphalerite, pyrite, arsenopyrite, and chalcopyrite. Kotoite ore veins occur along margins of ludwigite bodies. Contact between the intrusion and carbonate is highly irregular. Most skarn bodies occur where the contact forms embayments into the intrusion. Deposit occurs in an area 3 by 6 km.

Dorofeev, 1979.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q54-02 67°21'N 139°27'E	Dogdo Dogdo-Erikit	Hg Barite Volcanic-hosted Hg	Small to medium. Average grade of 0.35 to 0.90% Hg.

Consists of four lenticular and podiform ore bodies that occur in strongly silicified Late Jurassic andesite-dacite tuff. Ore bodies are 20 to 100 m long and 2 to 8 m wide. Ore minerals are quartz, calcite, barite with disseminations and stringers of cinnabar, pyrite, arsenopyrite, sphalerite, galena, and chalcopyrite. Ore district is characterized by a close correlation between Hg content and barite. Deposit controlled by a northwestern thrust fault, secondary quartzite occurrences, and occurrence of ore bodies along feathering fractures of the thrust fault.

Klimov, 1979; Vladimirtseva, written commun., 1987.

Q54-03 67°11'N 138°22'E	Aleshkino Yana-Kolyma	Au Au quartz vein	Medium. Average grade of 8-45.6 g/t Au.

Consists of six quartz veins that range from 0.35 to 1 m thick and up to 160 m long, in a single shear zone. Deposit hosted in cotnact metamorphosed Late Jurassic(?) rocks at top of a major granite intrusion. Main ore minerals are arsenopyrite, pyrrhotite, chalcopyrite, sphalerite, pyrite, gold, and molybdenite. Veins occur in an minor aureole of altered rock.

Vladimirtseva, written commun., 1987.

Q54-04 66°27'N 141°09'E	Khotoidokh Chersky-Argatass	Pb, Zn, Ag Cu, Au, Barite Kuroko Pb-Zn massive sulfide	Average grade of 5.15% Pb, 14.9% Zn, 0.7% Cu, and more than 100 g/t Ag. Known resource of 180,000 t Pb, 900,000 Zn, 150,000 tonnesCu, about 1,000 tonnes Ag.

Consists of a steeply-dipping, stratiform body of massive sulfides, up to 13 m thick and 700 m long, in Upper Jurassic sedimentary and volcanic rocks. Mineralization is massive and thin-banded. Main ore minerals are pyrite, galena, chalcopyrite, tetrahedrite, and barite. High concentrations of Ag and Au occur. Wallrocks exhibit propylitic and later quartz-sericite alteration. Deposit hosted mainly in marine clastic sedimentary rocks and intercalated rhyolite lava and tuff, and minor basalt of the Kimmeridgian Dogda suite that is about4 50 m thick. Deposit underlain by rhyolite and overlain by siltstone.

Naumov, written commun. 1987; Danilov and others, 1990.

Q54-05 65°47'N 138°22'E	Uchui Yana-Kolyma	Au Au quartz vein	Small. No data.

Consists of a set of quartz veins in thin sandstone beds. Veins are short and cross-cutting with a complex morphology. Veins are up to 250 m long and 26 m thick, and locally grade into sheet stockworks that range from 10 to 20 m thick and to 150 m long. Six of the veins are of most interest. Major vein minerals are quartz, albite, carbonates, and sericite. Also occurring are small amounts of arsenopyrite, pyrrhotite, sphalerite, tetrahedrite, chalcopyrite, galena, pyrite, and gold. Disseminated arsenopyrite commonly occurs in wallrocks. Wallrocks exhibit silica, albite, and carbon alteration. Deposit hosted in Upper Triassic shale that is folded into a major anticline.

Skornyakov, written commun., 1951; Rozhkov and others, 1964.

Q54-06 65°48'N 143°27'E	Tikhon Dogdo-Erikit	Ag, Au Au-Ag epithermal vein	Small. Average grade of 30-1,257 g/t Ag; up to 10.9 g/t Au.

Consists of shear zones and stringers in metasomatically altered and silicified Cretaceous rhyolite. Deposit occurs along a northeast-striking fault. Deposit up to ten meters thick and up to hundreds of meters long. Deposit minerals are quartz, adularia, sericite, calcite, pyrite, sphalerite, galena, and dickite. Also occurring is a broad spectrum of Ag minerals, including freibergite, acanthite, pyrargyrite, miargyrite, stephanite, argentopyrite, silver, polybasite, and billingsmith. Deposit associated with quartz-sericite metasomatic facies that grades into quartz-adularia, quartz-chlorite-kaolinite, and quartz-chlorite-calcite facies.

Gamyanin, 1974; Gamyanin and Arkhipov, 1979; Nekrasov and others, 1987; Vladimirtseva, written commun., 1987.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q54-07 65°36'N 138°33'E	Tumannoe Yana-Kolyma	Au Au quartz vein	Small. Average grade of 0.1-177 g/t Au.

Consists of small, conformable quartz veins hosted in Norian siltstone. Veins composed of scheelite, galena, sphalerite, chalcopyrite, pyrite, and gold. Sulfide disseminations in in an aureole in host rocks.

Vladimirtseva, written commun., 1987.

Q54-08 65°40'N 142°07'E	Svetloe, Medvezhje Yana-Kolyma	Sn, W Sn quartz vein and greisen	Small. Average grade of 0.01-0.38% Sn; 0.4-10% WO_3 ; up to 0.1% Mo, Bi.

Consists of quartz veins and muscovite greisen zones that occur near contact of Chibagalak and Porozhnotsepin granite plutons. Vein and greisen occurs both within the plutons and the country rocks. Veins and greisen zones strike northeast, are thin and short. Greisen mainly quartz (60-80%) and muscovite (20-40%). Other minerals are chlorite and less than 10% tourmaline. Main ore mineral are wolframite, arsenopyrite, and cassiterite. Subordinate minerals are molybdenite, sphalerite, bismuthine, and native bismuth.

Shur, 1985; Vladimirtseva and Vladimirtseva, written commun., 1987.

Q54-09 65°35'N 140°59'E	Burkat Yana-Kolyma	Sn W Sn quartz vein	Small. Average grade of 0.2-15% Sn; 0.1-7% WO_3 .

Consists of seeply dipping quartz and quartz-tourmaline veins and stockworks that range from 0.6 to 2 m thick and up to 600 m long. Veins and stockworks are abundant near the contact of a the Burkat granitoid pluton and occupy an area of 3 km^2. Main ore minerals are cassiterite, with crystals to 3 cm, and wolframite. Less abundant are asenopyrite, pyrite, chalcopyrite, and bismuthine minerals. Veins associated with muscovite and tourmaline greisen aureoles.

Vladimirtseva and Vladimirtseva, written commun., 1987.

Q54-10 65°30'N 138°55'E	Darpir Yana-Kolyma	Au Au quartz vein	Small. No data.

Consists of about 70 quartz and quartz-carbonate veins hosted in Upper Triassic sandstone and shale. Most veins strike northeast and range up to 200 m long and from 0.5 to 0.8 m thick. Vein zone extends for 30 km. Vanina, Malyutka, Iskra, and Dar veins are most important and consist of lenses up to 60 to 80 m long. Ore minerals are arsenopyrite, galena, and native gold (fineness 789). Shale exhibits minor chlorite, carbon, and pyrite alteration. Sandstone locally altered to beresite.

Skornyakov, written commun., 1951.

Q54-11 65°32'N 140°18'E	Imtachan Yana-Kolyma	Au Au quartz vein	Small. No data.

Consists of two steeply-dipping, subparallel quartz veins that are 0.65 and 1.8 m thick and from 150 to 250 m long. In plan view veins cut at an acute angle a complex gabbro-diabase and granite-porphyry dike that is 33-50 m thick and dips steeply SE. Veins have apophyses from 20 to 50 m long. Ore minerals are arsenopyrite, galena, sphalerite, tetrahedrite, and native gold (fineness 845). Gabbro-diabase and grandiorite-porphyry exhibit chlorite, quartz, and beresite alteration, and contain disseminated arsenopyrite and pyrite. Alteration zones range up to 2 m thick. Deposit hosted in Upper Triassic sedimentary rocks.

S.I. Gavrikov, B.A. Onishinko, Timopheev, written commun., 1962; Goryachev, 1985; V.A. Amuzinskyi, G.S. Anisimova, and Ya.Yu. Zhdanov, written commun., 1992.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q54-12 65°28'N 140°32'E	Yukhondja Yana-Kolyma	Au Au quartz vein	No data.

Consists of two quartz veins composed of quartz, muscovite, and calcite. Veins range up to 1 m thick and 50 m long and are hosted in Upper Triassic siltstone. Ore minerals are Ag tetrahedrite, pyrite, scheelite, arsenopyrite, native gold (fineness 570-620), and very scarce galena. K-Ar isotopic age of 131 Ma for vein muscovite. Wallrocks exhibit minor beresite alteration.

Goryachev, 1981.

Q54-13 65°24'N 142°60'E	Khaptagai-Khaya Yana-Kolyma	Au Au quartz vein	Small. Average grade of 5-30 g/t Au; locally up to 3,861.4 g/t Au.

Consists of subparallel low-sulfide quartz veins and stringers that occur en echelon in the Khaptagai-Khaya granite-porphyry stock that intrudes Upper Triassic sandstone and shale. Ore minerals str arsenopyrite, pyrite, sphalerite, galena, gold sulfosalts (fineness 759), and sometimes scheelite. Later-stage quartz-stibnite veins cut the gold-quartz veins and are variously oriented. Granite-porphyry exhibits intense beresite alteration. Veins strike 20-60° northeast. Deposit contains thirty veins that range up to 1 m thick; associated stringers range up to 3 m. Veins form knee morphology with a 90° bend.

Rozhkov and others, 1971; Shur, 1985; Vladimirtseva, 1987.

Q54-14 65°15'N 143°51'E	Solkuchan (Khatys) Dogdo-Erikit	Ag, Sn Pb, Zn Sn polymetallic vein	Medium. Average grade of 200 g/t Ag, 0.04 to 2.16% Sn, 0.03 to 2.71% Pb, 0.02 to 5.85% Zn.

Consists of three steeply-dipping quartz-carbonate-sulfide veins that occur in a Early Cretaceous subvolcanic dacite stock. Veins range up to 3.4 m thick and up to 900 m long. Ore minerals are pyrite, pyrrhotite, arsenopyrite, sphalerite, galena, Ag-tetrahedrite (31-39% Ag), boulangerite, pyrargyrite, canfieldite, electrum (fineness 685), cassiterite, covellite, scorodite, cerussite, smithsonite, melnikovite, and Fe-hydroxides. Anomalous Cu, Sb, Ge, and Id occur.

Khaustova and Vladimirtseva, written commun., 1987; Nekrasov and others, 1987; Shkodzinsky and others, 1992.

Q54-15 64°57'N 141°07'E	Zhdannoe Yana-Kolyma	Au Au quartz vein	Small. Average grade of 22-95 g/t Au. Mined out.

Consists of a set of 13 interbedded veins that range from 0.1 to 3 m thick and to 500 m long. Some ore bodies occur in cross-cutting fissures. Ore minerals are arsenopyrite, pyrite, galena, sphalerite, native gold (fineness 848), and very scarce boulangerite and chalcopyrite. Pre-mineral content of quartz veins is 1 to 3%. Veins accompanied by minor wallrock alteration to bersite. Deposit occurs in the hinge of a brachyanticline at its periclinal closure and is hosted Upper Triassic (Carnian) silty shale and sandstone.

Gavrikoy and Zharova, 1963; Rozhkov and others, 1971; Vladimirtseva, written commun., 1987; V.A. Amuzinskyi, G.S. Anisimova, and Ya.Yu. Zhdanov, written commun., 1992.

Q54-16 64°48'N 141°52'E	Alyaskitovoe Yana-Kolyma	Sn, W Sn-W greisen	Small. Average grade of 0.45-1.33% WO_3 ; up to 0.38% Sn. Partly mined.

Consists of veins and greisen that occur inside and adjacent to a stock of two-mica granite that intrudes Upper Triassic sandstone and shale. Variable thickness and length. Veins occur in fissures that strike north-northeast and dip northwest at 75-85°. Veins have complex morphology with lenses that occur en echelon and that alternate with thin stringers. Main ore minerals are wolframite, cassiterite, and arsenopyrite. Gangue minerals are mainly quartz, muscovite, tourmaline, and apatite. A complex combination of sulfosalts of lead, silver, and bismuth occur in veins. Wallrocks exhibit quartz-muscovite, muscovite-apatite, and tourmaline greisen alteration

Shur, 1985; Vladimirtseva and Vladimirtseva, written commun., 1987.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q54-17 64°45'N 142°43'E	Tuora-Tas Yana-Kolyma	Au Au quartz vein	No data.

Consists of a set of small, thin veins that are hosted in Upper Triassic (Carnian) sandstone. Both cross-cutting and conformable veins occur. Veins composed of quartz, chlorite, rare carbonate, albite, and muscovite. Main ore minerals are arsenopyrite, pyrite, galena, and native gold (fineness 884). Also occurring are rare sphalerite, chalcopyrite, and scheelite. Minor beresite alteration also occurs in wallrocks that are deformed into low-amplitude folds with widths to 500 to 800 m; and are cut with numerous fissures. Diorite-porphyrite dikes also occur within the ore field.

Rozhkov and others, 1971; Shur, 1985.

Q54-18 64°45'N 143°50'E	Sokh Yana-Kolyma	Au Au quartz vein	Small. Average grade of 16.3-57.5 g/t Au; contains up to 1,745 g/t Au.

Consists of small cross-cutting and conformable gold-quartz veins that are hosted in Triassic sandstone and shale. Both cross-cutting and conformable veins occur. Main ore minerals are arsenopyrite, galena, sphalerite, and native gold (fineness 883). Chlorite and sericite also occur in veins.

Vladimirtseva, written commun., 1987; Yakutia gold occurrences atlas, 1992.

Q54-19 64°42'N 141°26'E	Bazovskoe Yana-Kolyma	Au Au quartz vein	No data.

Consists of shear zones hosted in Upper Triassic (Norian) sandstone and shale. Shear zones contain densely-packed quartz veins and stringers with different orientation and thickness. Veins and stringers dip steeply to southwest and to northeast. Shear zones range up to 100 m thick, up to several hundred meters long. Zones divided into Western, Central, and Eastern shear zones. In addition to quartz, veins contain carbonate, chlorite, and albite. Ore minerals are mainly arsenopyrite, galena, and native gold (fineness 823). Scheelite, sphalerite, and pyrite are scarce. Wallrock exhibit beresite alteration.

Snyatkov, 1958; Rozhkov and others, 1971.

Q54-20 64°30'N 138°25'E	Erel Verkhoyansk-Indigirka	Hg Clastic sediment-hosted Hg	Small. Average grade of 0.65% Hg.

Consists of three steeply-dipping ore bodies that occur in zones of brecciated Triassic sandstone that are cemented with quartz and carbonate. Ore bodies range from 2.8 to 7 m thick and up to 50 m long. Minerals include cinnabar, with less than 1% pyrite and arsenopyrite. Gold is very scarce.

Vladimirtseva, written commun., 1987.

Q54-21 64°32'N 141°43'E	Talalak Yana-Kolyma	Au Au quartz vein	Medium. Average grade of 39.6 g/t Au for vein No. 1. Partly mined.

Consists of interbedded quartz veins that range from 0.15 to 3.4 m thick and are about 100 m long. Veins vary from lens-like or platyform. Veins composed of quartz, ankerite, sericite, albite, and potassium feldspar. Ore minerals are arsenopyrite, pyrite, chalcopyrite, galena, tetrahedrite, bournonite, boulangerite, and native gold (fineness 954). Wallrocks exhibit beresite alteration. Deposit occurs in the hinge of the Talalak anticline and is hosted Upper Triassic (Lower Carnian) siltstone and shale.

Snyatkov, 1958; Arsky, 1966; Vladimirtseva, written commun.,1987; Rozhkov and others, 1971.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q54-22 64°25'N 142°19'E	Dirin-Yuryak Yana-Kolyma	Au Au quartz vein	Range of Au 0.1-3,988 g/t. Average grade of 226 g/t Au.

Consists of several veins that occur subconformable to bedding in Upper Triassic (Carnian) shale that is exposed in the hinge of an anticline. Veins range from 0.01 tp 1 m thick. Veins composed of quartz, carbonate minerals, chlorite, sericite, and albite. Main ore minerals are pyrite, arsenopyrite, galena, tetrahedrite, bournonite, and native gold (fineness 963). Sphalerite and chalcopyrite are scarce.

Snyatkov, 1958; Rozhkov and others, 1971; Vladimirtseva, written commun., 1987; Yakutia Gold Occurrences Atlas, 1992.

Q54-23 64°17'N 142°46'E	Sarylakh Adycha-Taryn	Au, Sb Sb-Au vein	Large? Average grade of up to 60% Sb; up to 10,000 g/t Au. Average minining grade of 6 % Sb and 6 g/t Au. Mined and proven reserves of 130,000 tonnes antimony.

Occurs in Adycha-Taryn fault zone. Hosted in Upper Triassic (Norian) sandstone and shale. Consists of three rod-like stibnite veins that occur in shear zones that feature along the main fault. Ore body No. 1, the major deposit, varies from 0.2 to 5 m thick and dips steeply northeast at 55-80°, and extends for several hundred m along strike and down-dip. Deposit is very complex, and ranges from massive antimony to disseminations and stringers. Deposit predominatly stibnite (40-80%) and quartz (10-60%). Rare minerals are arsenopyrite, pyrite, muscovite, ankerite, berthierite, native gold (fineness 983), native antimony, aurostibnite, chalcostibnite, and other sulfosalts. Native aluminum and chromium occur. Host rocks are intensely altered to beresite and argillite.

Anasenko and Bichok, 1970; Berger, 1978; Zharikov, 1978; Indolev and others, 1980; Shur, 1985; Vladimirtseva, written commun., 1987; Yakutia Gold Occurrences Atlas, 1992.

Q54-24 64°12'N 141°41'E	Badran Yana-Kolyma	Au Au quartz vein	No data.

Consists of a long vein that intrudes a thrust fault dips gently north-northeast at 25-27°. Thrust fault about ten m thick and occurs in folded Upper Triassic sandstone and shale. Vein exhibits complex morphology, is highly convoluted, and trails off along strike as discrete lenses. Main ore body occurs in an area where fault changes strike. Minerals are pyrite, arsenopyrite, fahlore, sulfosalts of Pb, Cu and Ag, and native gold (fineness 896-920). Gold occurs in ribbon-like forms within the vein. Deposit is highly-oxidized with Cu, Fe, and Sb sulfates.

Akhyaev and others, written commun., 1981; Amuzinsky and others, 1989; Anisimova and others, written commun., 1990; Yakutia Gold Occurrences Atlas, 1992;

Q54-25 64°13'N 140°25'E	Selerikan Verkhoyansk-Indigirka	Sb Sb vein	No data.

Deposit occurs in the Ayabin thrust fault that occurs conformable to a small northwest-trending anticline formed in Upper Norian sandstone. Ore body exhibits a complex morphology and consists of two quartz-stibnite veins that alternate with small stringers and lenses of stibnite. Pyrite is also occurs.

Indolev and Krimov, 1979.

Q54-26 64°08'N 139°52'E	Seikimyan Verkhoyansk-Indigirka	Hg Clastic sediment-hosted Hg	Average grade of up to 0.1-0.5% Hg.

Consists of stringers and disseminations. Major minerals are quartz, dickite, cinnabar, calcite, pyrite; and rare galena, sphalerite, and arsenopyrite. Deposit hosted in feathered shear and breccia zones that range from 0.4-7 by 50-200 m, in sandstone. Deposit occurs on northeastern limb of an anticline formed in Upper Triassic sandstone and siltstone. Deposit is bounded by faults that occur parallel to the major, regional Bryungadin fault.

Klimov, 1979; Vladimirtseva, written commun., 1987.

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q54-27	Sana	Au	Small. No data.
64°08'N	Yana-Kolyma	Au quartz vein	
143°04'E			

Consists of a set of small, interbedded, cross-cutting quartz veins that intrude siltstone and argillite layers in Upper Triassic sandstone. Veins range from 0.05 to 1 m thick and up to 450 m long. Three prominent veins occur; one has been prospected. Major gangue minerals are quartz, wide-spread carbonate minerals, adularia, chlorite, and albite. Major ore mineral is aresenopyrite along with pyrite, galena, gold (native 892), sphalerite, tetrahedrite, and scheelite are less wide-spread. Wallrock s altered to minor beresite and adularia.

Skornyakov, written commun., 1951; Rozhkov and others, 1971; Yakutia Gold Occurrences Atlas, 1992; Sustavov, 1993.

Q54-28	Bekkem	W	Small. Average grade of 1.56% WO_3 ; up to 0.42% Mo; 0.01-0.18% Sn.
64°04'N	Yana-Kolyma	Mo, Sn	
142°37'E		W-Mo-Sn vein and greisen	

Consists of a set of 30 subhorizontal veins that occur in the apical portion of a granite stock that intrudes Upper Triassic sandstone and shale. Veins range from 0.3 to 0.9 m thick and up to 650 m long. Major and minoer minerals are quartz, tourmaline, wolframite, arsenopyrite, molybdenite, cassiterite, scheelite, pyrite, chalcopyrite, bismuthine, and galena are predominant. Deposit is vertically zoned, with wolframite, tourmaline, and quartz occurring in the upper portion, and molybdenite, sulfides, and quartz occurring in the lower portion. Veins assocated with greisen aureoles up to 3 m thick.

Shur, 1985; Vladimirtseva and Vladimirtseva, written commun., 1987.

Q54-29	Maltan	Au, Sb	Medium. Average grade of 10.8% Sb; 8.87 g/t Au.
64°03'N	Adycha-Taryn	Sb-Au vein	
143°19'E			

Consists of lens-like veins, shear zones, and stringers that either intrude ore are subconformable to Upper Triassic siltstone. Ore bodies are about 10 m and about 100 meters long. Veins and stringers intruded by a diorite-porphyrite dike with a K-Ar isotopic age of 140 Ma. Two mineral assemblages occur: (1) an early-formed assemblage of arsenopyrite-sulfostibnite with native gold (fineness 800-900); and (2) a late-formed assemblage of stibnite-berthierite with native gold (fineness 966). Early assemblage consists of quartz and ankerite, as well as pyrite, arsenopyrite, sphalerite, chalcopyrite, galena, tetrahedrite, chalcostibite, bournonite, and jamesonite. Late assemblage consists of quartz, stibnite, and berthierite, and also pyrite, ankerite, and dickite. Wallrocks altered to beresite and younger agrillite. Altered rocks contain abundant needle, disseminated arsenopyrite.

Indolev and others, 1980; Vladimirtseva, written commun., 1987; Yakutia Gold Occurrences Atlas, 1992.

Q55-01	Shirokoe	Au, Ag	Small. Au - 1.6-4.2 g/t; Ag - 4-560 g/t.
65°36'N	Dogdo-Erikit	Au-Ag epithermal vein	
144°33'E			

Consists of a northeast-trending zone of disseminated minerals in quartz vein and silicified zone that ranges from 2 to 3 m thick and up to 700 m long. Vein intrudes Upper Jurassic(?) rhyolite. Deposit best developed in a 100-m-long zone at the southeast end of the vein. Major minerals are pyrite, goethite, and pyrargyrite. Host rhyolite is intensely silicified.

Vladimirtseva, written commun., 1987.

Q55-02	Mitrei	Au	Small.
64°57'N	Yana-Kolyma	Au quartz vein	
144°01'E			

Thin quartz veins and veinlets cut dikes of rhyolite-dacite composition, of Late Jurassic and Early Cretaceous age; now altered to beresite. Mineral associations are: arsenopyrite-pyrite-quartz; albite-muscovite with chalcopyrite and sphalerite; gold-tetrahedrite-buornonite; gold-jamesonite-zinkenite; and post-ore, quartz-carbonate-chlorite.

Rozhkov and others, 1971

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q55-03 65°13'N 148°02'E	Agyndja Rassokha	Cu Basaltic Cu and sediment-hosted Cu	Large. Average grade about 1% Cu.

Disseminated and vein-like ore bodies, and less common breccia ores, occur in red, amygdaloidal trachybasalt and sandstone of Middle to Upper Ordovician age. Ore minerals are bornite, chalcocite, chalcopyrite, covellite, and locally native copper. Copper mineralization in trachybasalt is confined to amygdules and synvolcanic fissures in the upper portion of lava flows. Ore minerals occur both as cement and as clasts in sandstone. The bottom of stratified ore bodies is commonly composed of mineralized trachybasalt overlain by copper-bearing sandstone. The deposit extends over about 100 km^2. Individual ore horizons are 1 to 30 m thick and trend northwest. Ore-bearing sequence is broken by faults of diverse orientation, including numerous thrust faults which repeat the mineralized horizons.

Shpikerman and others, 1988

Q55-04 64°32'N 149°23'E	Vesnovka Omulevka River	Cu, Pb, Zn, Ge Kipushi Cu-Pb-Zn	Small.

Vein and disseminated ore occurs in Middle Ordovician limestone, shale, and siltstone. Ore bodies trend east-west and occur as metasomatic replacements conformable to bedding. Dimensions and morphology of ore bodies are not well defined. Ore minerals include sphalerite, galena, chalcopyrite, and renierite(?). The calcareous siltstone which hosts the ore bodies is silicified and cut by calcite veins.

V.I. Shpikerman, oral commun., 1989

Q55-05 64°13'N 148°23'E	Omulev Omulevka River	W Stratabound W	Small. Average grade up to 1% WO_3.

Deposit consists of veins in Middle Ordovician black carbonaceous, calcareous siltstone. The main ore mineral is scheelite. Pyrite, antimonial realgar, orpiment, galena, and chalcopyrite are locally present. Ore minerals are restricted to a conformable, thin layer that is intricately folded along with adjacent rocks; all of which were subjected to greenschist-facies metamorphism. Outcrops of the ore-bearing sequence are confined to a core of a large, open, northwest-trending anticline. No magmatic rocks occur nearby. Mineralized area covers about 100 km^2.

Shpikerman and others, 1986

Q55-06 64°03'N 144°49'E	Khangalass Yana-Kolyma	Au Au quartz vein	Small.

Conformable and cross-cutting quartz lenses with albite, ankerite, muscovite, disseminated pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, marcasite, and gold occur in Lower and Middle Triassic sandstone and shale that has been folded into an open anticline.

Rozhkov and others, 1971

Q55-07 64°09'N 146°16'E	Tunguss Dogdo-Erikit	Au, Sb Au quartz and Sb vein	Small.

Quartz veins occur near the contact of an Upper Jurassic to Early Cretaceous granite porphyry dike. Mineral associations are: arsenopyrite-pyrite-quartz; albite-muscovite with chalcopyrite and sphalerite; tetrahedrite-bournonite; lead sulfo-antimonides with gold; and quartz-stibnite with berthierite and zinkenite; which formed during the last stage of mineralization.

Rozhkov and others, 1971

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q55-08	Darpir	Sn	Medium. Average about 0.5% Sn.
64°02'N	Darpir	Zn	
147°42'E		Sn silicate-sulfide vein	

A set of quartz-chlorite, quartz-tourmaline, and, less common quartz veins and lenses, occur in hornfelsed, Lower and Middle Jurassic clastic sedimentary rocks. Ore bodies are about 2.0-2.5 km from the contact of the Darpir granite pluton. More than 20 veins are known, most of which trend northeast and about east-west, with dips of 50-85°. Veins are up to 200 m long and 0.4 to 2.7 m thick. Ore minerals are cassiterite, sphalerite, pyrite, arsenopyrite, and locally galena, and titanomagnetite; all of which occur as disseminations and sulfide segregations in veinlets. Zinc and tin are the most important commodities. Wall rocks are commonly tourmalinized.

Klochkov and others, written commun., 1979

Q56-01	Slezovka	Pb, Zn	Small.
66°51'N	Yarkhodon	Southeast Missouri Pb-Zn	
153°54'E			

Vein, disseminated, and breccia ores occur in Middle Devonian clastic sedimentary rocks and carbonates; in association with a mineralized dolomite sequence in a synclinal fold. Deposit is made up of 5 mineralized beds, each 3-5 m thick, separated by barren interbeds 3-10 m thick. Ore minerals include galena, sphalerite, pyrite, and barite. Ore bodies are cut by quartz and calcite veinlets.

Artemov and others, written commun., 1976

Q56-02	Gornoe	Pb, Zn	Small.
66°36'N	Yarkhodon	Southeast Missouri Pb-Zn	
154°19'E			

Vein, disseminated, and breccia ores occur in clastic and carbonate rocks from a Middle Devonian continental shelf environment. Mineralization is near a tectonic contact with Upper Proterozoic sedimentary rocks. Host rocks are fossiliferous dolomite. Ore minerals include abundant galena, sphalerite, chalcopyrite, hematite, pyrite, limonite, magnetite, malachite, azurite, cerussite, wulfenite, barite, and calcite. Brachiopods are replaced with galena locally, but more often, the galena forms replacement bodies in dolomite or cement in breccia ore.

Nikolaev, written commun., 1972

Q56-03	Pobeda	Fe	Medium. Proven reserves 2.8 million tonnes Fe. Estimated resources of 18 million tonnes Fe. Grade ranges 46-70% Fe.
65°43'N	Oroek	Ironstone	
152°12'E			

Stratiform hematite occurs in Upper Proterozoic dolomitic marble in a zone of imbricated thrust faults. Gabbro and gabbro-amphibolite bodies with hematite occur along the thrust fault planes. Mineralization includes massive, brecciated, and stockwork ores. Massive ores contain up to 70% iron. Brecciated ores are composed of clasts of hematized dolomite and gabbro-amphibolite cemented by hematite. Stockwork ore forms separate halo-shaped bodies around the massive and brecciated ores. Ores also contain calcite, quartz, barite, chlorite, pyrite, chalcopyrite, galena, and malachite. Ore-bearing horizon extends for 18 km, but the best defined stratiform deposit is 150 to 600 m long and 2 to 20 m thick. Mineralized dolomite is underlain by hematitic sandstone with up to 34% iron.

Potapova, written commun., 1954; Kravchenko and others, written commun., 1979; Kats, written commun., 1979.

Q56-04	Kopach	Au	Small. Grab samples with up to 12 g/t Au, 0.3% Cu, and 0.1% Pb.
65°21'N	Shamanikha	Au quartz vein	
152°57'E			

Disseminated and vein occurs in metarhyolite and biotite-amphibole-chlorite-quartz schist of Upper Proterozoic age. Wall-rock alteration includes silicification, epidotization, and sulfidization. Ore minerals are pyrite, magnetite, hematite, goethite, and native gold. Ore bodies contain 10 to 20% quartz. Ore veins are localized along the contacts of metarhyolite bodies; both within them and in adjacent rocks. Veins vary in thickness from 8 cm to 2 m and are often associated with boudinage structures. Ore is confined to selvages of veins. Basalt dikes cut the metarhyolite bodies.

Semenov and others, written commun., 1974

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

Q56-05 64°58'N 153°04'E	Glukhariny Shamanikha	Au Au quartz vein	Small. Grab samples with up to 25 g/t Au and up to 50 g/t Ag.

Gold in quartz-chlorite-epidote schist, quartzite, and metarhyolite of Upper Proterozoic age; and in quartz-cemented breccias in these rocks. Wall rocks are metamorphosed to upper greenschist facies. Ore minerals are native gold, pyrite, galena, chalcopyrite, arsenopyrite, and hematite. Ore minerals occur in three east-west trending zones up to 1200-4000 m long and 400 to 900 m wide.

Lutskin, written commun., 1964; Semenov, written commun., 1974

Q56-06 64°54'N 152°48'E	Oroek Oroek	Cu Sediment-hosted Cu	Small. Contains 0.2 to 4% Cu (average grade of 1.0%); up to 44 g/t Ag, up to 7 g/t Au. Probable resource of 5 million tonnes Cu.

Stratiform copper deposits in an Upper Proterozoic volcaniclastic sequence 150-180 m thick. Sequence is dominated by quartzite, chlorite and graphite-chlorite shale, and phyllite. Thin conformable beds of basalt and tuffaceous rocks are present. Copper occurs as chalcocite, bornite, and chalcopyrite in the metamorphosed sandstone, siltstone, and shale. Ore-bearing sequence contains many quartz boudins with chalcopyrite, bornite, and hematite. Later cross-cutting quartz veins also contain minor malachite, chalcocite, azurite, chrysocolla, bornite, and native copper. Mineralized rocks are deformed and form an overturned, isoclinal fold whose limbs dip southeast at 40°-90°.

Volkodav and Korobitsyn, written commun., 1979

Q56-07 64°18'N 153°58'E	Rogovik Eastern Asia-Arctic: Omsukchan	Ag, Au Au-Ag epithermal vein	Medium. Contains 0.5 to 34 g/t Au and 2.7 to to 747 g/t Ag.

Area underlain by Triassic sedimentary rocks with a complicated block structure and widespread explosive (cryptovolcanic) breccias that occur in a series of graben-like depressions and cross structures. Breccias and sedimentary rocks are locally intensely altered, and contain veins and veinlets of banded quartz with adularia, argentite, and pyrargyrite with Ag and Au values.

Umitbaev, 1986

Q57-01 67°31'N 160°49'E	Dalny Oloy	Cu, Mo, Au Porphyry Cu-Mo and polymetallic vein	Small.

Stockwork made up of a network of quartz, carbonate-quartz, and quartz-sulfide veinlets 0.3-5 mm thick that contain fine-grained disseminated pyrite, pyrrhotite, chalcopyrite, and magnetite, and lesser galena, sphalerite, arsenopyrite, and molybdenite. Ore bodies occur in an Early Cretaceous intrusive complex, including syenite-diorite porphyry and quartz syenite porphyry, which intrudes Upper Triassic shale. Wall rocks adjacent to the plutonic rocks are altered to quartz and potassium feldspar, and quartz-biotite and quartz-sericite-chlorite metasomatites. Occurrences of gold and several other metals are widespread near the periphery of the plutonic complex.

Gorodinsky, Gulevich, and Titov, 1978

Q57-02 67°17'N 159°22'E	Innakh Oloy	Cu, Mo, Au Polymetallic vein and Porphyry Cu-Mo	Small.

Quartz and quartz-carbonate veins several tens of meters long contain masses and disseminations of pyrite, chalcopyrite, molybdenite, magnetite, galena, sphalerite, arsenopyrite, löellingite, tetrahedrite, and native bismuth. Gold is associated with pyrite and other sulfides, magnetite, and tetrahedrite ores. Veins occur in hornfelsed siltstone about 1.5-2 km from a Cretaceous gabbro-monzonite-syenite pluton; especially near diorite and monzodiorite dikes. Pluton itself is characterized by small stockwork zones of gold-molybdenite-pyrite-chalcopyrite deposits. Ore bodies are associated with two tectonic zones; one trends northwest, and the other about north-south.

Gorodinsky and others 1974; Goryachev and Polovinkin, 1979.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

Q57-03	Klen	Au, Ag	Medium. Grade ranges from traces up to 380.5 g/t Au and up to 1067.9 g/t Ag.
67°08'N	Oloy	Au-Ag epithermal vein	
161°13'E			

Steeply-dipping carbonate-quartz veins trending northwest are several hundreds of meters to 1300 m long. The veins contain disseminated pyrite, chalcopyrite, arsenopyrite, gold, argentite, and freibergite; in propylitized, silicified, and sericitized Cretaceous volcanic rocks. Au/Ag ratio in the ores is about 1:3.

Gorodinsky and others, 1974; Shilo and others, 1975

Q57-04	Berezovska	Pb, Zn, Cu, Ag	Small. Average 4.07% Pb, 6.89% Zn, 0.03% Cu, 250.3 g/t Ag.
66°43'N	Berezovka	Polymetallic vein and Kuroko massive sulfide	
157°21'E			

Silver-bearing concordant quartz-sulfide veins and stratiform barite-sulfide bodies occur in Upper Devonian carbonate and volcaniclastic rocks. Major sulfides are galena and sphalerite.

Gorodinsky and others, 1974; N.A. Bobrov, written commun., 1976; V.Shpikerman, this report.

Q57-05	Zet	Au, Ag	Small.
65°18'N	Kedon	Au-Ag epithermal vein	
156°57'E			

Mineralized quartz and chalcedony-quartz veins, veinlets, and breccias are transitional into quartz-carbonate-hydromica and adularia-chlorite-quartz metamorphic rocks. The vein contacts are not well defined. Disseminated and masses of pyrite, hematite, and galena are present; sphalerite, chalcopyrite, molybdenite, arsenopyrite, and pyrargyrite are less abundant. Gangue minerals include amethyst, kaolinite, and fluorite. Gold is finely dispersed in the ore; the Au/Ag ratio is 1:5. Deposit occurs in Middle to Upper Devonian dacite tuff. Gold-silver ore bodies occur within a zone that is generally about 200-250 m wide, but may be as much as 500-700 m wide if low-grade off-shoots are included. District extends northeast for 3-4 km.

Kovalchuk and others, written commun., 1969; Shamin and others, written commun., 1983

Q57-06	Medgora	Mo, Cu	Medium. Average grade of 0.1 to 0.64% Mo, 0.94 to 2.94% Cu, and 0.4 g/t Au.
65°17'N	Left Omolon	Mo-Cu skarn	
159°32'E			

Consists of disseminated veinlets containing molybdenum and copper mineralization that are associated with the Early Cretaceous Medgora granite-granodiorite intrusion. Metallic minerals are: pyrite, chalcopyrite, molybdenite, pyrrhotite, magnetite, hematite, and sphalerite. Skarn bodies associated with the intrusion are composed of garnet, pyroxene, actinolite, scapolite, calcite, quartz, chlorite, epidote, and green mica. Individual ore zones extend for 30-160 m. Copper content of the ore varies from hundredths of a percent to over 2%.

Gorodinsky, Gulevich, and Titov, 1978.

Q57-07	Olcha	Au, Ag	Medium. Grade ranges 0.5 to 273 g/t Au and 26.3 to 4978 g/t Ag. Inferred resource of approximately 50 tonnes Au.
64°57'N	Kedon	Hg, Cu, Mo	
156°26'E		Au-Ag epithermal vein	

Ore bodies consist of steeply dipping quartz, carbonate-quartz, and adularia-quartz veins and stockwork zones, which are from several tens of meters to 1300 m long. They are hosted in Middle to Late Devonian volcanic rocks of the Kedon series. Veins occur along fractures, mainly within extrusive andesite breccia of the volcanic vent facies, and more rarely, in hypabyssal dacite-porphyry bodies and felsic extrusive rocks. Ore minerals include gold (500-700 fine), chalcopyrite, argentite, polybasite, galena, sphalerite, pyrite, hematite, manganese oxides, stromeyerite, tetrahedrite, native silver, and tellurides. Gangue minerals are quartz and adularia, with lesser calcite, dolomite, rhodochrosite, and barite. Gold and silver is associated with mercury, copper, molybdenum, lead, zinc, manganese, and arsenic. Ore minerals are accompanied by propylitic and quartz-sericite alteration. Gold-silver ore bodies are controlled by arcuate faults around a volcano-tectonic depression over a basement composed of Archean metamorphic rocks and Early Paleozoic(?) carbonate and clastic sedimentary rocks. Adularia from quartz veins has been dated by K-Ar as 268 Ma and by Rb-Sr as 251 Ma. More recent K-Ar dating of adularia from gold-bearing veins yeilded an age of 318 Ma.

Zagruzina and Pokazaniev, 1975; Pokazaniev, 1976a, b; I.N. Kotlar, written commun., 1984.

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

Q57-08	Obyknovennoe	Au, Ag	Estimated about 5 tonnes Au ore averaging 29.6 g/t Au and 68 g/t Ag.
64°52'N	Kedon	Au-Ag epithermal vein	
158°39'E			

Northwest trending zones of adularia-quartz veins and veinlets in extrusive bodies of intensely silicified and sericitized, fluidal rhyolites of the Kedon series. Dominant ore minerals are galena, sphalerite, pyrite, bornite, electrum, and silver sulfosalts. The Au/Ag ratio is 1:2 or 1:3. Ore zones extend for 400 m, and are up to 120 m thick.

Burenkova, written commun., 1989

Q57-09	Bebekan	Mo, Cu	Small to medium. Average about 0.5% Mo, 0.7% Cu with minor Pb, Zn, W, Au, and Ag.
64°22'N	Left Omolon	Porphyry Cu-Mo	
160°22'E			

Stockwork of sulfide-quartz veinlets with disseminated molybdenite, chalcopyrite, pyrite, sphalerite, pyrrhotite, arsenopyrite, bornite, and covellite. Deposit occurs in an Early Cretaceous stock of porphyritic granodiorite. Ore body is confined to silicified and sericitized rocks marked by biotite, quartz, and orthoclase. Ore body is about 1.5 km by 400-500 m in size and coincides with the intrusion. A pyrite aureole extends about 1 km from the intrusion area and coincides with a zone of propylitization of the Upper Jurassic volcanic-sedimentary country rocks.

Alekseenko, Korobeinikov, and Sidorov, 1990

Q57-10	Tumannaya	Au, Ag	Small. Up to 16.7 g/t Au and 50 g/t Ag.
64°16'N	Kedon	Au-Ag epithermal vein	
160°02'E			

Quartz veins and veinlets occur in an area several hundreds of meters long and up to 20 m wide in Middle Upper Devonian volcanic rocks of the Kedon series. Veins contain disseminated pyrite, sphalerite, chalcopyrite, arsenopyrite, gold, electrum, and silver sulfosalts.

Biryukov, written commun., 1988

Q58-01	Svetlin	Au	Small. Average 5.0 to 30 g/t Au.
67°49'N	Chukotka	Au quartz vein	
167°28'E			

Deposit consists of lenticular and lenticular quartz veins tens to hundreds of meters long, and linear stockworks with disseminated arsenopyrite, pyrite, galena, sphalerite, and chalcopyrite; minor boulangerite, stibnite, and ubiquitous gold. Veins occur in altered Lower to Middle Triassic carbonaceous shale, siltstone, and sandstone; in hornfels; and in Triassic gabbro-diabase sills. About 200 en echelon veins are known along zones up to 10 km long. Gold ore bodies are confined to a fracture zone between two Early Cretaceous granitic bodies which occur at the intersections of major east-west and northwest structures.

Shavkunov and Panychev, written commun., 1977

Q58-02	Elombal, Yakor	Au, As, Sb	Small.
67°45'N	Eastern Asia-Arctic: Omsukchan	Sb-Au vein?	
165°27'E			

Numerous, generally north-south zones of fracturing, silicification, and ankeritization, contain veins and veinlets of calcedony-like quartz with gold, arsenopyrite, stibnite, native arsenic, realgar, orpiment, pyrite, and chalcopyrite. Ore bodies are confined to hypabyssal intrusions of mid-Cretaceous (K-Ar age of 97 Ma) syenite to diorite porphyry that intrude a weakly deformed Upper Triassic sandstone-shale sequence. Mineralization is controlled by a major northwest trending fault.

Aksenova, 1990

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q58-03 67°14'N 163°44'E	Asket Oloy	Cu, Mo, Au Porphyry Cu-Mo and Polymetallic vein	Small. Average about 0.5% Cu, 0.05% Mo, and 0.2 g/t Au.

Deposit consists of a stockworks of quartz-sulfide and chlorite-sulfide veinlets with disseminated pyrite and chalcopyrite, and subordinate molybdenite, magnetite, native gold, marcasite, ilmenite, sphalerite, pyrrhotite, and arsenopyrite. Ore body confined to zones of fissuring and brecciation at the contact of an Early Cretaceous diorite body that intrudes volcanic and sedimentary rocks. Copper-porphyry mineralization is associated with propylitic alteration of the host rocks. Numerous quartz and quartz-carbonate veins with gold-silver-polymetallic ore minerals are associated with the porphyry Cu-Mo body.

Gorodinsky and others, 1974; Gulevich, written commun., 1987

Q58-04 67°13'N 166°16'E	Kulpolney Eastern Asia-Arctic: Chukotka	Hg Cu, Zn, Pb, Au, Ag Volcanic-hosted Hg	Small.

Quartz, quartz-dickite, and quartz-carbonate veins, as well as breccias and altered rocks contain disseminated veinlets that include polymetallic tetrahedrite-tennantite ore bodies in spilite, gabbro-diabase, and tuffaceous and volcaniclastic rocks of Upper Jurassic age. Ore bodies are confined to the southern end of a volcanic depression related to Early Cretaceous hypabyssal intrusions and necks of intermediate to mafic composition. Ore bodies are controlled by east-west structures and a radial fracture zone. Main ore and vein minerals are Hg-tetrahedrite, tetrahedrite, quartz, dickite, and nacrite, with subordinate amounts of galena, sphalerite, chalcopyrite, pyrite, chalcocite, calcedony, chlorite, illite, ankerite, and calcite.

Kopytin, 1978

Q58-05 66°36'N 164°30'E	Peschanka Oloy	Cu, Mo, Au Porphyry Cu-Mo	Large. Estimated resources 940 million tonnes with average grade 0.51% Cu, 0.019% Mo, 0.42 g/t Au, and 1.4 g/t Ag.

Deposit is confined to the eastern portion of the Late Jurassic and Early Cretaceous Egdegkych multiphase pluton; composed of monzodiorite and quartz monzodiorite intruded by planar bodies of quartz monzonite and granodiorite porphyry. Sulfide veinlets and disseminations, with copper and molybdenum minerals, are pervasive throughout the entire elongated monzonite-granodiorite porphyry body, and extend into the wall rock. Main ore minerals are pyrite, chalcopyrite, bornite, tetrahedrite-tennantite, and molybdenite. Magnetite, hematite, sphalerite, galena, chalcocite, native gold, gold tellurides, enargite, arsenopyrite, pyrrhotite, and marcasite occur in minor amounts or are rare. Gangue minerals are quartz, carbonate, and anhydrite. Four mineral associations are distinguished: (1) molybdenite, which is associated with the quartz-sericite subzone of phyllic alteration; (2) pyrite and chalcopyrite, associated with quartz-sericite-chlorite alteration; (3) chalcopyrite, bornite, and tetrahedrite coincident with quartz-sericite and biotite alteration; and (4) polysulfide mineralization which occurs with all alteration types. Mineralization was preceded by wide-spread pyritization in the peripheral propylitic zone. Trace elements include Ag, Pb, Bi, Co, Ni, Zn, Pd, Pt, and Te.

Gorodinsky and others, 1978; Volchkov and others, 1982; Kaminskiy and Baranov, written commun., 1982; Migachev and others, 1984; Gulevich, written commun., 1987; Shpikerman and Dylevskyi, wirtten commun., 1992.

Q58-06 66°30'N 164°24'E	Vesennee Oloy	Au, Ag Au-Ag epithermal vein	Medium. Grade ranges 0.1 to 48 g/t Au and up to 300 g/t Ag.

Carbonate-quartz veins, altered veinlets, and mineralized breccias occur in structurally complex forms. Veins are controlled by northeast and approximately east-west fractures which cut northwest-trending zones of copper-porphyry bodies. Individual ore bodies extend for 150-500 m. Main gangue minerals are quartz, calcite, and rhodochrosite with subordinate adularia, dolomite, celestite, and gypsum. Ore minerals include sphalerite, galena, pyrite, chalcopyrite, tetrahedrite, tennantite, bournonite, and electrum, with minor silver sulfides and sulfosalts, stannite, and matildite. Au:Ag ratio varies from 1:5 to 1:30. Ores commonly contain trace Cu, Mo, As, Bi, Sb, Co, Ni, Mn, Cr, Cd, In, and Te. Ore bodies occur mainly in propylitized trachyandesites of an Upper Jurassic volcaniclastic sequence that is intruded by hypabyssal bodies and dikes of gabbroid rocks, syenite, granodiorite porphyry, and andesite-dacite, of Late Jurassic to Late Cretaceous ages.

Gorodinsky and others, 1974; Shilo and others, 1975; Shapovalov, 1976; Sidorov, 1978; Gulevich, written commun., 1987

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q58-07 66°28'N 166°48'E	Uralskoe Eastern Asia-Arctic: Koni-Yablon	Hg, Sb, Au, Ag Volcanic-hosted Hg	Small.

Mercury deposits are present along two northeast-trending belts associated with hypabyssal bodies of Early to Late Cretaceous granite porphyry and quartz porphyry. Deposits are hosted by sandstone and siltstone in a Lower Cretaceous volcaniclastic molasse. Individual ore zones are typically 100 m long by 20-30 wide. Ore minerals are cinnabar, metacinnabar, pyrite, arsenopyrite, chalcopyrite, hematite, silver sulfosalts, and native gold. Gangue minerals include quartz, calcedony, kaolinite, hydromica, calcite, and chlorite. Cinnabar is mainly confined to silicified and sericitized rocks as fine disseminations, powdery coatings, and thin veinlets. High concentrations of lead, zinc, antimony, molybdenum, tin, tungsten, and bismuth are characteristic of the ores. Cinnabar ore bodies are localized at the intersections of structures that trend approximately north-south and east-west.

Babkin, 1975

Q58-08 66°29'N 164°49'E	Teleneut Aluchin	Cr, Ni Podiform Cr	Small. Up to 70% chromite.

Deposit occurs in serpentinite at the south end of the Aluchin alpine-type ultramafic body. Irregularly-shaped chromite deposit extends about 1.5 km toward the north with a width of about 700 m. Chromite ores are disseminated, banded, lenticular, and sometimes massive; with a chromite content up to 70%. Disseminated pentlandite, millerite, bravoite, violarite, pyrrhotite, and chalcopyrite occur in both chromite rich and chromite poor zones, in serpentinite, and in listwänite.

Aksenova, Dovgal, and Sterligova, 1970

Q58-09 65°47'N 165°06'E	Rzhavy Central Koryak	Cu, Mo, Au Porphyry Cu-Mo	Small.

Stockwork and disseminated veinlets of pyrite, chalcopyrite, molybdenite, magnetite, pyrrhotite, and native gold are hosted by Cretaceous diorite, granodiorite, and diorite and granodiorite porphyry. Central portions of the stockworks are locally dominated by molybdenite. Peripheral zones are marked by chalcopyrite; sometimes with intergrowths of galena, sphalerite, and tetrahedrite-tennantite, especially in andesite lavas.

Gulevich, written commun., 1987

Q58-10 64°42'N 166°50'E	Irgunei Eastern Asia-Arctic: Koni-Yablon	Au, Ag Cu, Pb, Zn Au-Ag epithermal vein	Medium. Ore contains 0.2 to 68 g/t Au and 11.2 to 146 g/t Ag.

Deposits consist of adularia-quartz and adularia-carbonate-quartz veins containing electrum, silver sulfosalts and selenides, galena, sphalerite, chalcopyrite, and, more rarely, molybdenite, arsenopyrite, cinnabar, and realgar. These veins are located over a complex intrusive dome at the intersection of a northeast trending fault, the Anadyr suture, and a northwest trending fault. A large hypabyssal andesite body occurs in the center of the dome and is surrounded with smaller stocks and dikes of diorite, granodiorite porphyry, andesite-dacite, and rhyolite. Periphery of the zone is composed of sheets of Lower and Upper Cretaceous felsic and basic volcanic rocks. Veins are commonly hosted in highly altered quartz-adularia-hydromica rocks near the hypabyssal body, and are associated with radial fissuring and fault zones.

V.P. Vasilenko, written commun., 1973

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q58-11 64°32'N 165°07'E	Lastochka Eastern Asia-Arctic: Koni-Yablon	Mo Bi, Ag Mo greisen and vein	Small. Average grade of 0.03-0.1% Mo.

Consists of steeply-dipping, linear zones containing a disseminated molybdenum stockwork composed of quartz-molybdenum veins and veinlets associated with adjacent greisen. Stockwork contains from a few thousandths of a percent to 10% and more molybdenum. K-feldspar, silicat, and pyrite alteration are common. Greisen contains coarse flakes of muscovite (30-50%), quartz (50-60%), sericite, and pyrite. Molybdenite contains less than 30 g/t Re. Major ore minerals are molybdenite, galena, sphalerite, chalcopyrite, bismuthinite, and cassiterite. Less frequent are scheelite, tourmaline, and fluorite. Ore zones, containing up to few % Mo, have sharp boundaries. Away from Mo ore zones, base metal, Ag, and Bi increase as Mo decreases. Molybdenite-bearing quartz veins commonly occur within quartz-muscovite greisen. Deposit occurs along contacts of a Late Cretaceous leucocratic granite stock that also contains small bodies of pegmatite and aplite, and zones of greisen.

V.A. Faradliev, written commun., 1971; V.I. Golyakov, written commun., 1973.

Q59-01 67°60'N 170°36'E	Omrelkai Eastern Asia-Arctic: Chukotka	Hg, Sb Volcanic-hosted Hg	Small.

Ore district is composed of seven areas spaced about 1 km apart, which occur in a graben-like, east-west trending structure in late Mesozoic volcanic rocks. Ore bodies occur in steeply-dipping mineralized fracture zones in tuff of intermediate and moderately felsic composition. Deposits are spatially related to hypabyssal bodies of diorite porphyry, andesite, and basalt that form the feeders for extrusive sheets. Rocks were intensely propylitized and locally silicified, followed by pervasive superimposed pyritization. Cinnabar occurs in separate veinlets and masses but more commonly, as irregularly disseminations in the host rock, and in quartz and calcite veinlets. Cinnabar is commonly associated with pyrite, and, more rarely, stibnite.

Babkin, 1975; Kopytin, 1978

Q59-02 67°02'N 171°58'E	Enmyvaam Eastern Asia-Arctic: Anuyi-Beringovsky	Au, Ag Au-Ag epithermal vein	Small.

Zones of gold-silver veins occur in Upper Cretaceous dacite of the Snezhnin caldera. Zones are typically 1-2 km long and 100-200 m wide.

Chubarov, written commun., 1978

Q59-03 66°14'N 167°56'E	Maly Peledon Eastern Asia-Arctic: Anuyi-Beringovsky	Au, Ag Au-Ag epithermal vein	Small. Contains 0.5-13 g/t Au, and from 5 to 1850 g/t Ag.

Quartz and fluorite-quartz veins with brecciated and cockade structures occur in zones of silicified and argillized, Albian and Cenomanian andesite and rhyolite. Individual veins are tens and hundreds of meters long. Ore occurrences are confined to the southern portion of a paleocaldera. Disseminated pyrite, hematite, and streaks of manganese oxides are visible in the area. Arsenic, copper, lead, and zinc are detected in chemical analyses.

Zotov, written commun., 1970; Zotov and others, written commun., 1973

Q59-04 66°15'N 169°34'E	Gornostai Eastern Asia-Arctic: Anuyi-Beringovsky	Au, Ag Au-Ag epithermal vein	Small. Ranges 0.5 to 11.1 g/t Au, 100-1028 g/t Ag.

A fracture zone approximately 7 km long and 1.5-2 km wide crosses the core of a northwest-trending volcanic structure composed of lower Cretaceous andesite flows cut by necks and dikes of rhyolite and diorite porphyry. Silicified and propylitized volcanic rocks host more 100 veins and sets of stockworks. Vein types are: quartz, sulfide-quartz, sparse adularia-quartz, and epidote-chlorite-quartz. Veins average about 150-200 m long and 0.1-1.2 m thick. Veins are typically marked by brecciated, drusy, or cockade structures; but some are massive. Disseminated sulfides and sulfide veinlets make up 5 to 90% of the veins. Ore minerals are chalcopyrite, pyrite, galena, sphalerite, magnetite, and aikinite.

Timofeev and others, written commun., 1967; Zotov and others, written commun., 1973

Deposit No. / Latitude / Longitude / Summary and References	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Q59-05 66°11'N 171°26'E	Chineyveem Eastern Asia-Arctic: Anuyi-Beringovsky	Au, Ag Au-Ag epithermal vein	Small.

Quartz veins with disseminated galena, chalcopyrite, pyrite, tetrahedrite-tennantite, and silver sulfosalts are confined to linear zones of sulfidized and tourmalinized, hydromica-quartz altered rocks; trending nearly east-west and northeast. Gold-silver veins occur in the middle of a collapsed volcanic structure subjected to resurgent doming. Veins and highly altered rocks occur along a major fault, where it intersects the contact of a diorite-granodiorite body that intrudes Albian to Cenomanian rhyolite-dacite volcanic rocks. Veins and alteration occur in both the intrusive body and country rocks.

Kotlyar, 1986

Q59-06 65°50'N 170°08'E	Berezovogor Eastern Asia-Arctic: Koni-Yablon	Au, Ag, Pb Cu, Zn Au-Ag epithermal vein	Small.

Quartz veins, and mineralized fractured and brecciation belts 200-1000 m long, occur in propylitized andesites of Upper Cretaceous age. Ore bodies trend predominantly northwest. Typical gangue minerals are: quartz, sericite, carbonate, chlorite, and adularia. Ore minerals are: galena, chalcopyrite, sphalerite, pyrite, tetrahedrite-tennantite, gold, silver sulfosalts, molybdenite, marcasite, and hematite. Au:Ag ratio is about 1:30.

Zakharov, written commun., 1977

Q59-07 65°27'N 173°04'E	Ust-Belaya Ust-Belaya	Cr, PGE Podiform Cr	Medium. Chromite ranges to 10-30%.

Zones of closely spaced, banded chromite (10-30% chromite) occur as lenses, schlieren, and vein-like bodies of disseminated and massive chromite. Chromite occurs in layers up to 1300 m long and 400 m wide in dunite of the Ust-Belaya alpine-type ultramafic body. The chromite occurrences extend northward for 13 km along a belt more than 2 km wide.

Silkin, 1983

Q59-08 65°17'N 169°00'E	Serovskoe Eastern Asia-Arctic: Koni-Yablon	Au, Ag Au-Ag epithermal vein	Small.

Carbonate-quartz, and barite-carbonate-quartz veins containing galena, sphalerite, pyrite, chalcopyrite, pyrargyrite, and electrum occur in Late Cretaceous syenite-diorite, quartz diorite, granodiorite, and granite; which are intruded by hypabyssal intrusions of intermediate and basic composition. Au:Ag ratio is about 1:100. Veins are localized where the the Anadyr fault is cut by northward-trending fractures.

Vasilenko, 1974; Zakharov, written commun., 1977

Q59-09 64°48'N 168°36'E	Travka Eastern Asia-Arctic: Koni-Yablon	Mo Porphyry Mo	Small.

Disseminated molybdenite and pyrite occur in altered, silicified, Lower Cretaceous extrusive volcanic rocks that are related to a granodiorite-granite plutonic complex.

Nevretdinov, written commun., 1966

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage

Summary and References

Q59-10	Parkhonai	Sn	Small.
64°04'N	Central Koryak	Sn polymetallic vein and Sn silicate-sulfide vein	
173°18'E			

Numerous sericite-quartz and tourmaline-chlorite-sulfide veins, veinlets, and mineralized zones contain cassiterite, arsenopyrite, pyrrhotite, pyrite, chalcopyrite, sphalerite, galena, tetrahedrite, various silver minerals, stibnite, and considerable mercury in a Late Cretaceous flysch sequence composed of interbedded sandstone, siltstone, and argillite. Individual ore bodies extend for several hundreds of meters. Clastic rocks are intruded by small bodies and dikes of late Paleogene granite porphyry. Ore bodies are located over the periphery and middle of a volcanic dome that is controlled by a deep, concealed, northwest-trending fault.

Rozenblyum, Zincevich, and Nevretdinov, 1975; Lugov, 1986

Q59-11	Lamut	Hg	Small.
64°05'N	Central Koryak	As, Sb	
172°60'E		Volcanic-hosted Hg	

Lenticular occurrences and masses of quartz, opal, chalcedony, dolomite, dickite, and cinnabar occur in intensely silicified, kaolinized, carbonatized, and chloritized late Paleogene rhyolite, and, less commonly, in basalt and tuffite; along northeast-trending fracture zones. Subordinate ore minerals are metacinnabar, realgar, stibnite, and pyrite.

Babkin, Drabkin, and Kim, 1967; Rozenblyum, Zincevich, and Nevretdinov, 1975

Q60-01	Telekai	Sn	Medium.
67°59'N	Eastern Asia-Arctic: Chaun	Sn silicate-sulfide vein and Sn greisen	
178°05'E			

Quartz-cassiterite, quartz-cassiterite-tourmaline, and cassiterite-chlorite veins, and tin-bearing aplites and greisens, are present in the marginal zone of the Late Cretaceous Telekai granitic pluton. Ore zone extends north-west along the Chukchi fold structure. Quartz, tourmaline, muscovite, sericite, chlorite, albite, potassium feldspar, and fluorite are the main gangue minerals. Cassiterite is the main ore mineral; occurring as masses and in cross-cutting veinlets. Molybdenite, scheelite, löellingite, arsenopyrite, bismuthinite, and magnetite are present locally in some veins and zones of the ore bodies. Chalcopyrite, pyrrhotite, stannite, galena, sphalerite, wolframite, garnet, beryl, rutile, sphene, xenotime, and monazite are present in minor amounts. Mineralization began with albitization and ended with the development of low-sulfide quartz veins.

Voevodin, 1969

Q60-02	Vodorazdelnoye	Sn	Small. High grade ores.
67°55'N	Eastern Asia-Arctic: Chaun	Cu, Ni, Ag, PGE	
178°51'E		Sn silicate-sulfide vein	

Two types of ores are distinguished: (1) cassiterite-quartz-tourmaline veins in and adjacent to the Early Cretaceous Telekaigranite pluton; (2) disseminated veinlets of tin-nickel-copper mineralization with gold and accessory platinum, palladium and rhodium hosted in sericitized, silicified and tourmalinized injection migmatites which form a subhorizontal sheet-like body between the granite and overlying sedimentary rocks. The first ore body type also includes: chlorite, dolomite, and calcite; with minor pyrite, arsenopyrite, pyrrhotite, sphalerite, galena, stannite, scheelite, molybdenite, bismuthinite, and other minerals. The second type of ore bodies consist mainly of chalcopyrite and less abundant pyrrhotite and cassiterite; associated with the nickel minerals niccolite, gersdorfite, corynite, and hauchecornite. Deposit is probably related to two separate magmatic sources at different depths.

Tsvetkov, and Pospelova, 1986; Tsvetkov, 1990

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q60-03 67°47'N 179°46'E	Mymlerennet Eastern Asia-Arctic: Chaun	Sn W, Bi Sn silicate-sulfide vein	Small.

Deposit consists of elongate stockworks of closely spaced, subparallel quartz veinlets with chlorite and sericite. Ore minerals are: arsenopyrite, pyrrhotite, cassiterite, and pyrite; with lesser sphalerite, chalcopyrite, cobaltite, and tetrahedrite-tennantite. Tungsten minerals are present locally, in the association: wolframite, scheelite, bismuthinite, native bismuth, topaz, fluorite, muscovite, and albite. Host rocks are variably hornfelsed, Lower and Upper Triassic clastic rocks which are intruded by the dikes of lamprophyre, granodiorite porphyry, and diorite porphyry. Mineralized area occurs in a zone made up of thrusts and steeply dipping faults that trend northeast and northwest. The stockworks are oriented northeast.

Borodkin, and Pristavko, 1989

Q60-04 66°35'N 175°31'E	Gora Krassnaya Eastern Asia-Arctic: Koni-Yablon	Mo, Cu, Au Porphyry Cu-Mo	Small.

Zones of disseminated sulfide veinlets and auriferous quartz-carbonate and quartz-epidote-chlorite veins contain pyrite, pyrrhotite, chalcopyrite, and molybdenite in Upper Cretaceous extrusive volcanic and granitic rocks.

Zakharov and V.P. Vasilenko, written commun., 1977

Q60-05 66°28'N 177°38'E	Valunistoe Eastern Asia-Arctic: Anuyi-Beringovsky	Au, Ag Pb, Zn, Cu Au-Ag epithermal vein	Medium. Ranges 1.4 to 787 g/t Au and 2 to 6273 g/t Ag.

More than one hundred adularia-quartz, adularia-carbonate-quartz, and fluorite-quartz veins are located in zones up to 1.5 km long and 400 m wide. Ore minerals consist mainly of finely disseminated electrum, argentite, aguilarite, stromeyerite, native silver, galena, sphalerite, and chalcopyrite. A gold-argentite association is predominant in veins of the upper portions of the deposit. At depth, gold-argentite is succeeded by a gold-chalcopyrite and gold-galena-sphalerite associations. Ore bodies are confined to Upper Cretaceous volcanic rocks within a volcanic dome structure that occurs at the intersection of northwest and northeast trending faults. Wall rocks are dominated by andesite-dacite and dacite with quartz-adularia-hydromica and propylitic alteration. Quartz veins are lenticular to podiform, commonly occur en echelon, and locally pass into a stockwork of veinlets associated with hydrothermal and subvolcanic breccia. Ar-Ar isotopic studies of adularia in Au-Ag vein yields an age of 72 Ma.

Berman and Trenina, 1968; Berman, 1969; Sidorov, 1978; P.Layer, V.Ivanov, and T.Bundtzen, 1994, written commun.

Q60-06 66°22'N 177°11'E	Shakh, Zhilny Eastern Asia-Arctic: Anuyi-Beringovsky	Au, Ag Au-Ag epithermal vein	Small.

Silicified and sulfidized, auriferous zones, and quartz-polymetallic and low-sulfide adularia-quartz veins several hundreds of meters long. Deposit occurs in Upper Cretaceous propylitized, felsic volcanic rocks and underlying Paleozoic talc-chlorite-sericite, quartz-chlorite-sericite, and epidote-chlorite schists, and marble. Ore minerals are pyrite, chalcopyrite, galena, sphalerite, electrum, and argentite. Mineralized zones are controlled by a large, north-south trending fault.

Zakharov, written commun., 1977

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Q60-07 65°25'N 174°08'E	Skalistaya Pekulney	Cu Ag Basaltic Cu	Small. Cu about 1-2%.

A network of prehnite-pumpellyite-carbonate veinlets 2-20 cm thick contains disseminated copper. Veinlets consist largely (80-90%) of prehnite and low-iron pumpellyite; secondary minerals include laumontite, calcite, dolomite, chlorite, quartz, epidote, and adularia. Native copper intergrowths 0.5-8 mm in diameter are present in prehnite and pumpellyite masses and in wall rocks. Copper content of the ore is about 1-2%. Native copper contains up to 100 g/t silver. Ore bodies occur in amygdaloidal basalt and associated tuff in a Upper Jurassic to Lower Cretaceous volcaniclastic sequence that extends over an area of about 1.0 by 0.6 km. Similar occurrences of native copper are known along a belt up to 18 km long.

Shkursky and Matveenko, 1973

R01-01 68°11'N 178°55'W	Tenkergin Chukotka	W, Sn Sn quartz vein	Small.

Steeply dipping, branching quartz veins that contain wolframite, scheelite, and subordinate cassiterite cut hornfelsed Lower to Middle Triassic sandstone and shale. Quartz veins also contain sericite, clay minerals, tourmaline, and beryl. Minor ore minerals include chalcopyrite, arsenopyrite, and sphalerite.

Lugov, 1986

R01-02 68°04'N 178°19'W	Svetloe Chukotka	Sn, W Sn quartz vein	Medium. Has been mined from 1979 to present.

Deposit consists of en echelon sets of quartz veins and veinlets grouped in two zones that diverge to the southeast. Each ore zone hosts several tens of veins, which are 0.2-1.5 m thick and several hundreds of meters long; and about one hundred smaller veins. Ores are dominated by tin with abundant sulfides, over a buried stock of greisenized granite. Veins are hosted in metamorphosed Triassic sandstone and shale cut by granite porphyry and aplite dikes of the Cretaceous Iultin complex. Successive mineral associations are: (1) topaz-fluorite-muscovite stage (greisen); (2) cassiterite-wolframite-quartz stage with topaz, lõellingite, and fluorite (this stage has been the most productive); (3) arsenopyrite-quartz stage with cassiterite and native bismuth, (4) stannite-chalcopyrite stage with small amounts of bismuthinite, sphalerite, galena, pyrrhotite, and bornite; (5) scheelite-fluorite-albite stage with chlorite, pyrite, marcasite, and cassiterite; and (6) fluorite-calcite stage with kaolinite. Complex cassiterite-wolframite mineralization predominates in the upper portion of the deposit; and tungsten ores are dominant at depth.

Lugov, 1986; Kuleshov, Pristavko, and Plyashkevich, 1988.

R03-01 68°12'N 163°07'W	Lik Northwestern Brooks Range	Zn, Pb, Ag, Barite Sedimentary exhalative Zn-Pb-barite	25 million tonnes of 8.8% Zn, 3.0% Pb, and 38 g/t Ag

Disseminated and massive sphalerite, galena, pyrite, marcasite, and sparse barite in Mississippian and Pennsylvanian shale, chert, and quartz-exhalite of Kuna Formation. Main deposit in zone about 2,000 m long that extends up to 500 m downdip. Ore zones open along strike to north and south. Sulfide horizon varies from tabular to complexly folded. Long and sinuous zone of complex and brecciated textures, possibly a line of vents, occurs within center of deposit, parallel to strike. Host rocks and deposit extensively structurally imbricated with many subhorizontal thrust faults.

Forrest, 1983; Forrest and others, 1984; Forrest and Sawkins, 1987

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R03-02 68°04'N 162°50'W	Red Dog Northwestern Brooks Range	Zn, Pb, Ag, Ba Sedimentary exhalative Zn-Pb-barite	Main deposit: Reserves of 52.2 million tonnes grading 19.5% Zn, 5.3% Pb, 100 g/t Ag. Aqqaluk deposit: Reserves of 76 million tonnes grading 13.7% Zn, 3.6% Pb, 66 g/t Ag. Hilltop deposit: 14.1 million tonnes grading 10.0% Zn, 2.7% Pb, 41 g/t Ag.

Disseminated and massive sphalerite, galena, pyrite, and barite in Mississippian and Pennsylvanian shale, chert, and silica exhalite of the Kuna Formation. Deposit is 1,600 m long and up to 150 m thick. Occurs near base of formation which is locally subdivided into upper ore-bearing Ikalukrok unit and lower calcareous Kivalina unit of this locality. Latter forms stratigraphic footwall for deposits. Barite-rich lenses up to 50 m thick locally cap deposit. Sulfide minerals occur as disseminated sulfides in organic-rich siliceous shale, coarse-grained sulfide veins, fine-grained fragmental-textured to indistinctly bedded sulfides, and silica exhalite lenses. Minor hydrothermal alteration marked by silicification and decarbonatization of shale. Small propylitically altered dioritic plug or hydrothermally altered pyroxene andesite flow occurs at north end of deposit. Host rocks and deposit are extensively structurally imbricated along many subhorizontal thrust faults. Graywacke of the Cretaceous Okpikruak Formation structurally underlies deposit.

Tailleur, 1970; Plahuta, 1978; Booth, 1983; Joseph T. Plahuta, L.E. Young, J.S. Modene, and David W. Moore, written commun., 1984; Lange and others, 1985; Moore and others, 1986; Schmidt and Zierenberg, 1988; Bundtzen and others, 1996.

R04-01 68°20'N 161°52'W	Avan Kobuk	Cr, PGE Podiform Cr	Grab samples with up to 43% Cr and 0.48 g/t PGE. Estimated 290,000 to 600,000 tonnes chromite

Disseminated fine- to medium-grained chromite in Jurassic or older dunite and harzburgite tectonite, locally serpentinized. Part of dismembered ophiolite. Zones of chromite up to a few meters wide and a few hundred meters long in dunite. Intense minor folding of dunite and harzburgite layers. Host rocks part of the Misheguk igneous sequence. Mafic and ultramafic rocks floored by major thrust fault.

Roeder and Mull, 1978; Degenhart and others, 1978; Zimmerman and Soustek, 1979; Mayfield and others, 1983; Foley and others, 1985; Foley, 1988

R04-02 68°15'N 161°05'W	Misheguk Mountain Kobuk	Cr, PGE Podiform Cr	Grab samples with up to 27.5% Cr and 0.31 g/t PGE. Estimated 110,000 to 320,000 tonnes chromite

Disseminated fine- to medium-grained chromite in Jurassic or older dunite and peridotite tectonite, locally serpentinized. Part of dismembered ophiolite. Zones with chromite up to 31 by 107 m. Intense minor folding of dunite and harzburgite layers.

Roeder and Mull, 1978; Degenhart and others, 1978; Zimmerman and Soustek, 1979; Foley and others, 1985; Foley, 1988

R04-03 68°24'N 159°54'W	Nimiuktuk Northwestern Brooks Range	Barite Bedded barite	About 1.5 million tonnes barite

Massive, nearly pure barite in small isolated hill about 7 to 10 m high, 40 m wide, and 60 m long. Stratigraphic contacts not exposed; nearest units are dark shale and chert of the Mississippian and Pennsylvanian Kuna Formation and shale and graywacke of the Lower Cretaceous Okpikruak Formation. Altered Mississippian(?) andesite crops out about 180 m from barite. Size of deposit determined with model developed by gravity survey.

Mayfield and others, 1979; Barnes and others, 1982

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			
R04-04	Drenchwater	Zn, Pb, Ag	Grab samples with more than 1% Zn, 2% Pb, and 150 g/t Ag
68°34'N	Northwestern Brooks Range	Sedimentary Zn-Pb and (or) kuroko massive sulfide	
158°41'W			

Disseminated and massive sphalerite, galena, pyrite, and barite in Mississippian shale, chert, tuff, and quartz-exhalite of the Kagvik sequence. Volcanic sandstone and keratophyre locally abundant. Sulfides occur as disseminations in chert, disseminations and massive aggregates in quartz-exhalite, and as sparse, remobilized disseminations in sulfide-quartz veins crosscutting cleavage in shale and chert. Locally extensive hydrothermal alteration of chert and shale with extensive replacement by kaolinite, montmorillonite, sericite, prehnite, fluorite, actinolite, chlorite, calcite, and quartz. Deposit up to 1,800 m long and up to 50 m thick. Host rocks and deposit extensively faulted and structurally imbricated with many thrust faults dipping moderately south.

Tailleur and others, 1977; Nokleberg and Winkler, 1982; Lange and others, 1985

R04-05	Siniktanneyak Mountain	Cr, Ni, PGE	Grab samples with up to 21% Cr, 0.2% Ni, 0.07 g/t Pt, and 0.1 g/t Pd.
68°20'N	Kobuk	Podiform Cr	
158°30'W			

Disseminated fine-grained chromite in discontinuous layers, pods, and wispy layers in Jurassic or older dunite and peridotite tectonite, locally serpentinized. Intense minor folding of dunite and peridotite layers. Host rocks part of the Misheguk igneous sequence. Mafic and ultramafic rocks floored by major thrust fault.

Jansons and Baggs, 1980; Nelson and Nelson, 1982; Mayfield and others, 1983

R04-06	Story Creek	Pb, Zn, Ag, Au	Grab samples with up to 1.5 to 34% Pb, 1.5 to 50% Zn, 35 to 940 g/t Ag, and 1.2 g/t Au.
68°22'N	Northwestern Brooks Range	Pb-Zn-Au-Ag vein	
157°56'W			

Crustified sphalerite and galena in cross-cutting quartz veins in tightly folded and faulted sandstone, siltstone, and shale of the Mississippian Kayak Shale; part of Brooks Range allochthon. Maximum width of float zone about 30 to 40 m. Discontinuous mineralized float and outcrops along a linear trend about 3,000 m long across tightly folded strata, indicating origin by replacement in Late Jurassic or younger time.

Ellersieck and others, 1982; Mayfield and others, 1983; Jeanine M. Schmidt and Inyo F. Ellersieck, written commun., 1985

R04-07	Whoopee Creek	Zn, Ag, Au	Grab samples with up to 44% Zn, 458 g/t Ag, and 4.4 g/t Au
68°14'N	Northwestern Brooks Range	Zn-Ag-Au vein	
157°51'W			

Fracture zones contain siltstone breccia with matrix of galena, sphalerite, quartz and minor carbonate occurs in tightly folded and faulted sandstone, siltstone, and shale of the Mississippian Kayak Shale. Fracture zone about 6 m long. Discontinuous float or outcrops along a linear trend with minimum length of 1,500 m across tightly folded strata, indicates replacement origin in Late Jurassic or younger time.

Ellersieck and others, 1982; Inyo F. Ellersieck, written commun., 1985

R06-01	Esotuk Glacier	Pb, Zn, Sn, Cu, W	Grab samples with up to 0.03% Sn, 0.15% W
69°18'N	Brooks Range	Pb-Zn skarn and fluorite vein	
145°15'W			

Scattered, minor galena, sphalerite, malachite, cassiterite, and axinite in skarn in Devonian or older marble and calc-schist near periphery of Devonian gneissose granite. Few quartz-tourmaline veins.

Grybeck, 1977; W.P. Brosge, oral commun., 1984; Rainer Newberry, written commun., 1985

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R06-02	Porcupine Lake	Cu, Zn, Ag, F	Grab samples with up to 4.8% Cu, 0.6% Zn, and 0.2% Ag
68°48'N	Brooks Range	Polymetallic vein(?)	
146°27'W			

Veins and replacement bodies with tetrahedrite, enargite, and fluorite in a silica gangue. Occur in tuffaceous silicified limestone and minor chert breccia of the Mississippian and Pennsylvanian Lisburne Group, about 80 m below contact with the overlying Sadlerochit Group. Distribution of veins and replacement bodies in breccias is highly variable. Areas of densest veins and most mineralization occur intermittently along strike for nearly 1.6 km, and are up to about 2.4 m thick. Veins crosscut bedding at low angles. About 3 to 5 km to north, strata-bound, disseminated fluorite occurs in veins and replacement bodies for several kilometers along strike. Veins are up to 0.9 m thick and grade from 1 percent up to nearly solid fluorite. The fluorite bodies occur within a few meters of top of the Lisburne Group, near contact with the overlying Sadlerochit Group.

Barker, 1978, 1981

R07-01	Romanzof Mountains	Pb, Cu, Zn, Mo, Sn, Ag, F	Grab samples with up to 0.15% Sn
69°18'N	Brooks Range	U	
143°50'W		Polymetallic vein, Pb-Zn and possibly Sn skarn	

Numerous scattered mineral occurrences of polymetallic sulfides in Devonian(?) granite, Pb-Zn skarns, and quartz veins. Some fluorite greisen. Skarn and quartz veins occur in Precambrian marble and calc-schist of the Neruokpuk Quartzite at the periphery of the Silurian or Early Devonian Okpilak (granite) batholith. The common types of deposits are: (1) zones of disseminated galena, sphalerite, chalcopyrite and pyrite, locally with Au and Ag, in granite; (2) skarn in marble with disseminated magnetite, pyrite, pyrrhotite, sphalerite, and galena in gangue of carbonate, clinopyroxene, epidote, amphibole, beryl, tourmaline, and fluorite; (3) disseminated galena, sphalerite, chalcopyrite, and (or) molybdenite in quartz veins along sheared contact in granite; and (4) fluorite greisen in granite.

Brosge and Reiser, 1968; Grybeck, 1977; Sable, 1977; W.P. Brosge, oral commun., 1984; Newberry and others, 1986

R07-02	Bear Mountain	Mo, W	Grab samples with up to 0.8% Mo and 0.6% W
68°23'N	Brooks Range	Porphyry Mo	
142°11'W			

Molybdenite-wolframite-bearing, Tertiary rhyolite porphyry stock with cylindrical core of intrusive breccia intrudes Devonian and Mississippian sedimentary rocks, and Devonian or older metasedimentary rocks of the Neruokpuk(?) Quartzite. Stock located near perimeter of the early Tertiary granite pluton of Bear Mountain. Local rhyolite porphyry dikes and quartz porphyry and some gossan with molybdenite and galena. Zonal alteration pattern with core of sericitic and argillic alteration and outer zone of silicification. Local halo of pyrite and propylitic alteration along margin of porphyry. Exposed area approximately 1 km in diameter.

Barker and Swainbank, 1986

R07-03	Galena Creek	Cu, Zn, Pb, Ag	Grab samples with up to 21% Cu, 3.5% Zn, 1.3% Pb, 170 g/t Ag
68°23'N	Brooks Range	Polymetallic vein	
142°02'W			

Disseminated galena, sphalerite, malachite, and barite in quartz veinlets and replacement bodies in phyllite, siltstone, and greenstone of Neruokpuk(?) Quartzite of Devonian or older age. Area of veinlets and mineralization is about 760 by 1,060 m on ridge west of creek. Vein system on east side of creek up to about 2 m wide and 454 m long. Local alteration of phyllite to chlorite, epidote, and calcite. Local malachite staining in greenstone and many early Tertiary rhyolite dikes locally. Granite pluton and rhyolite breccia to east contain scattered hematite alteration and rare kaolinitization.

Brosge and Reiser, 1968; R.C. Swainbank, in Barker, 1981

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R08-01 68°29'N 136°29'W	Fish River (Big Fish, Boundary, Rapid) Fish River	Fe, P, Mn, Gems Stratabound Fe-P	Large. Resource of greater than 1 billion tonnes grading 40% Fe.

Consists of siderite and phosphatic ironstone that occur in shale within a clastic wedge of upper Lower Cretaceous (Albian) age. Deposits occurs as phosphate-siderite pellets and granules within a matrix of detrital quartz and mudstone. Rare phosphate minerals occur in epigenetic fracture veins and to a lesser degree in vugs, bedding plane partings and fault breccia. Deposit is well known as the type locality of lazulite, the official Yukon gemstone. Deposit age interpreted as Early Cretaceous.

Yukon Minfile, 1988.

R52-01 71°40'N 127°18'E	Manganiler Dzhardzhan River	Pb, Zn Mississippi Pb, Zn Southeast Missouri Pb-Zn	No data.

Consists of a layer of concordant, lenticular galena-sphalerite that occurs in Lower Cambrian dolomite. Sulfide layer ranges from 0.4 to 3.6 m thick and up to 135 m long. Disseminated sulfides replace massive, predominantly sphalerite in the lower part of the layer. Sulfides locally banded. Main ore minerals are sphalerite and lesser galena. Subordinate ore minerals are pyrite, marcasite, and smithsonite.

Natapov, 1981; Davydov and others, 1988.

R52-02 71°27'N 127°20'E	Kyongdei Dzhardzhan River	U Sediment-hosted U	Channel samples contain 0.01 to 11% U.

Consists of an uraninite crust in Upper Proterozoic (Vendian) and Lower Cambrian sandstone and limestone. U concentration increases in sulfides disseminations (pyrite and sphalerite), and in bitumen (kerite) inclusions. Deposit occurs along specific stratigraphic intervales in anticlinal domes as lens-shaped ore bodies which range from 0.3 to 2.3 m thick and from 100 to 400 m long. Length of the uranium-bearing zone is 50 km.

Arsky and others, written commun., 1963.

R52-03 70°20'N 129°33'E	Nikolaevskoe, Otkrytoe Verkhoyansk	Au Au quartz vein	No data.

Consists of conformable and cross-cutting quartz veins with gold, galena, arsenopyrite, pyrite, fahlore, sulfosalts, carbonates, and albite. Veins intrude Early Permian sandstone beds in anticlinal hinges. Veins range up to 1 km long, and 0.2 to 1 m thick, locally up to 10 m thick. Sulfides form about 1 to 2%. No observed wallrock alteration. Quartz-lined vugs occur locally.

Abel and Slezko, 1988.

R52-04 69°04'N 126°46'E	Aga-Kukan Dzhardzhan River	Pb, Zn, Cu Southeast Missouri Pb-Zn and sediment-hosted Cu	Small. Average grade of up to 1-3% Cu; 0.15 ppm Au; up to 400 ppm Ag.

Consists of disseminated galena, sphalerite, and chalcopyrite that occurs in a layer in Lower Carboniferous (Tournaisian) limestone. Layer is 40 cm thick; thickness of the hosting limestone member is 20 m. Limestone unconformably overlies cross-bedded green sandstone and red siltstone that contains disseminated malachite, azurite, covellite, chalcopyrite, and Cu- hydrocarbonate films. Cu-bearing sandstone and shale contains up to 3% Cu. Sulfide are gently folded and occur for long distances.

Melnikov and Izrailev, 1975.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

Summary and References

R52-05 68°56'N 128°24'E	Anna-Emeskhin Verkhoyansk	Au Au quartz vein	Small. Average grade of up to 20 g/t Au; up to 23% As.

Consists of eight quartz-carbonate veins that occur over an area 70 by 100 m. Veins cut a dike of Triassic diabase. Veins range up to 20 m long and up to 2 m thick. Major minerals are arsenopyrite, pyrite, galena, and chalcopyrite. Sulfides comprise 1 to 2% of veins. Diabase exhibits quartz-sericite-chlorite-albite-carbonate metasomatic alteration near veins.

Arsky and others, written commun., 1963; Ivensen and others, 1975.

R52-06 68°42'N 127°46'E	Syugyunyakh-Kende Verkhoyansk	Au Au quartz vein	Small. Average grade of 5-8 g/t Au; locally up to 20 g/t Au; up to 50 g/t Ag.

Description for two separate deposits about 20 km apart. Each deposit consists of a set of sheet-like quartz veins that range up to 0.5 m thick. Major minerals are gold, arsenopyrite, pyrite, chalcopyrite, galena, and sphalerite. Veins intrude Middle Carboniferous argillite and sandstone. Veins occur in anticlinal hinges and do not extend along either strike or dip. Sulfides comprise 1 to 3% of the veins.

Arsky, Borisov, and Lazurkin, written commun., 1963; Ivensen and others, 1975.

R52-07 68°11'N 128°11'E	Enichan-Tolono Verkhoyansk	Au Au quartz vein	Small. Average grade of 10-24 g/t Au.

Consists of a set of thin quartz veins with minor sulfides. Veins occurin zones with contorted outlines. Deposit less than 0.5 m thick and several ten of meters long.

Arsky, Borisov, and Lazurkin, written commun., 1963.

R53-01 70°42'N 134°31'E	Burguat Kular	Au Au quartz vein	Small. Average grade of up to 5-8 g/t Au ; up to 1% Pb; up to 1% Zn; up to 0.01% Ag.

Consists of lenticular veins and shear zones of quartz and carbonate-quartz that contain gold and scarce sulfides (1 to 2%) including pyrite, galena, sphalerite, and chalcopyrite. Veins strike northeast and dip steeply to southeast or northwest at 50-65°. Veins range from 0.1 to 4 m thick and up to 100 to 200 m long. Major minerals are carbonate, quartz, and sulfides, including pockets and disseminations of pyrite, arsenopyrite, galena, and other minerals. Gold is fine-grained, mostly 0.1 to 0.2 mm, with some to 3 mm. Deposit hosted in Upper Permian and Triassic sandstone and shale.

Ivensen and others, 1975.

R53-02 70°13'N 134°17'E	Dzhuotuk Kular	Au Au quartz vein	Small. Average grade of 0.1-30.0 g/t Au; more than 1% As; up to 1% Pb, Zn ; up to 0.1% Bi, Sn; up to 0.01% Ag.

Consists of more than 20 deposits of steeply-dipping shear zones and cross-cutting veins that are hosted in Upper Permian and Lower Triassic clastic rocks. Host rocks altered to silica and sulfide minerals. Individual deposits range up to 1500 m long and from 1 to 30 m thick. Major minerals are quartz, carbonate, arsenopyrite, galena and pyrite, with lesser sphalerite and chalcopyrite. Conformable and cross-cutting arsenopyrite-quartz veins range up to 1.5 m thick and up to 100 m long.

Ivensen and others, 1975.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R53-03 69°58'N 134°41'E	Tirekhtyak district (Nagornoe, Podgornoe, Kular	Sn, W Sn quartz vein	Small. Average grade of up to 5% Sn; up to 1% WO_3 ; up to 0.6% Pb; up to 1% As.

Consists of veins of tourmaline-quartz and cassiterite-scheelite-quartz; and cassiterite stringers. Major minerals are beryl, pyrrhotite, arsenopyrite, muscovite, sphalerite, and galena. Veins and stringers range from 0.01 to 1.2 m thick and up to 100 m long. Veins and stringers strike northeast and occur near the contact of the Early Cretaceous Tirekhtyak granite pluton of Early Cretaceous age. Veins and stringers intrude aplite dikes and granites and adjacent Triassic clastic rocks that are contact metamorphosed.

Ivensen and others, 1975.

R53-04 70°05'N 135°32'E	Baidakh Verkhoyansk-Indigirka	Sb Sb-Au vein	Small. Average grade of 39.9-72% Sb.

Consists of a lenticular shear zone that ranges from 0.2 to 0.5 m thick and dips steeply to the southeast at 60°. Shear zone cuts veins with a complex mineralogy. Shear zones and veins contain breccia zones and stringers. Deposit occurs in anticlinal dome formed in Middle Triassic sandstone and shale. Main minerals are stibnite, ankerite, and quartz. Rare minerals are chlorite, pyrite, arsenopyrite, chalcopyrite, cinnabar, galena, sphalerite, calcite, kaolinite, and gold. Shear zones and veins intrude diorite-porphyrite (Lower Cretaceous) and spessartite (Mid-Cretaceous) dikes. Wallrocks altered to graphite, sericite, and chlorite.

Ivensen and others, 1975; Indolev and others, 1980.

R53-05 70°01'N 133°24'E	Solur Kular	Au Granitoid-related Au	Small. Average grade of up to 10 g/t Au; 0.03-1% W; 0.07-0.1% Bi; 0.03-0.1% Sn; 0.01-0.3% Cu.

Consists of lenticular quartz and carbonate-quartz veins and shear zones that strike northeast and roughly east-west. Major minerals are arsenopyrite, pyrite, chalcopyrite, galena, wolframite, bismuth, and gold. Deposit hosted in Late Permian clastic rocks in a zone adjacent to an Early Cretaceous granite pluotn.

Ivensen and others, 1975.

R53-06 69°48'N 134°45'E	Kyuchyuss Verkhoyansk-Indigirka	Au, Hg, Sb Sb-Au-Hg vein	Large. Average grade of 4.5% As, up to 15% Sb, up to 0.6% Hg, and up to 300 g/t Au. Estimated reserves of 240 tonnes Au.

Consists of steeply-dipping reverse shear zones that range from 0.1 to 1 m thick, and veins that range from 0.1 to 0.5 m thick. Veins and shear zones consist of quartz-stibnite, cinnabar-stibnite-quartz, realgar-quartz and quartz, with varying amounts of ankerite, calcite, kaolinite, dickite, arsenopyrite, pyrite, orpiment, berthierite, sphalerite, galena, bournonite, pyrrhotite, fahlore, mercury (up to 15%), and gold. Ore minerals occur in stringers and disseminations. Veins and shear zones intrude Middle Triassic (Anisian and Ladinian) sandstone and siltstone that are part of a flysch sequence. Shear zones range up to 3 km long and, and based on drill data and data from two adit levels, extends 500 to 550 m deep. Alteration minerals are argillite, hydromica, silica, and graphite.

Ivensen and others, 1975; Indolev and others, 1980; Konyshev and others, 1993.

R53-07 69°44'N 137°00'E	Aragochan Yana-Polousnen	Pb, Zn Polymetallic vein	Small. Average grade of 5.28% Pb; 3.6% Zn.

Consists of seven sheet-like veins. Veins range from 120 to 700 m long and 0.4 to 1.13 m thick. Major minerals are quartz, calcite, siderite, galena, sphalerite, pyrite, and rare cassiterite. Veins hosted in Upper Jurassic sandstone and shale that dip 60-65° N.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R53-08 69°54'N 136°47'E	Sigilyakh Chokurdak	Sn Sn silicate-sulfide vein	Small. Average grade of 1.27% Sn.

Consists of veins that intrude contact metamorphosed Late Jurassic sandstone. Veins range from 55 to 140 m long and 0.05 to 6.8 m thick. Veins strike northwest and dip southwest at 60°. Major minerals are quartz, marcasite, pyrrhotite, chalcopyrite, galena, and sphalerite.

Arsky and others, written commun., 1963.

R53-09 69°48'N 136°40'E	Ulakhan-Sala Yana-Polousnen	Sn Sn silicate-sulfide vein	Small. Average grade of 0.84% Sn.

Consists of four quartz-tourmaline and tourmaline-chlorite-quartz veins that range from 320 to 1400 m long and 0.2 to 3.6 m wide. Major minerals are cassiterite, pyrrhotite, arsenopyrite, sphalerite, chalcopyrite, galena, wolframite, scheelite, and calcite. Veins are brecciated. Sn decreases with depth. Wallrocks altered to silica and sulfides. Veins hosted in Late Jurassic sandstone and shale are display minor contact metamorphism. Host rocks form monocline that strikes from north to east.

Arsky and others, written commun., 1963.

R53-10 69°36'N 133°07'E	Novoe Kular	Au Granitoid-related Au	Small. Average grade of 0.2-6.8% WO_3; 0.03-0.16% Sn; 0.5-5% As.

Consists of steeply-dipping, cross-cutting shear zones and lenticular veins in tension gashes. Shear zones strike northeast and dip northwest or southeast at 15-60°. Shear zones commonly several meters thick, locally to 10- to12 m, and up to 1.5 km long. Lenticular veins range from 0.1 to 2 m thick and up to 50 to 100 m long. Major minerals arequartz, wolframite, arsenopyrite, carbonates minerals, cassiterite, and gold. Deposit hosted in Upper Permian sandstone and shale near the dome of the Central-Kular anticline.

Ivensen and others, 1975.

R53-11 68°03'N 135°50'E	Argin Yana-Polousnen	Sn Sn quartz vein	Small. Average grade of up to 4.13% Sn.

Consists of a set of thin quartz veins and stringers that range from 1 to 10 cm thick. Major minerals are cassiterite, arsenopyrite, pyrrhotite, galena, wolframite, scheelite, tourmaline, and zinnwaldite. Most veins about 100-120 m long; one vein is 470 m long. Deposit hosted in an Early Cretaceous granite altered to greisen.

Arsky and others, written commun., 1963.

R54-01 71°06'N 141°43'E	Churpunnya Chokurdak	Sn Sn silicate-sulfide vein	Small. Average grade of up to 10% Sn.

Consists of shear zones, stringers, and veins with tourmaline and quartz-tourmaline; cassiterite (to 10%), sericite, maracasite, and 1-2% arsenopyrite, bismuth, bismuthine, wolframite, pyrrhotite, chalcopyrite, stannite, valleriite, siderite. Ore zones range from 0.1 to 0.7 m thick, are about one hundred meters long, and are drilled to a depth of 150 to 200 m. Deposit hosted in intensely tourmalinized and silicified rhyolite-dacite volcanic rocks and in a related Early Cretaceous granitoid stock.

Nekrasov and Pokrovsky, 1973; Flerov and Shur, 1986; Kholmogorov, written commun., 1987.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R54-02 70°10'N 140°48'E	Pavel-Chokhchurskoe Chokurdak	Sn Sn polymetallic vein and greisen	Average grade of 0.1-3% Sn; up to 1% As; up to 0.5% Cu; up to 0.1% Bi; up to 0.03% W, Mo, and Be; up to 0.01% In.

Consists of stockworks, linear stringer, and veins that range up to 800 m long, are 1.5-5 m thick, and dip 60-80°. Individual veins and stringers range up to 0.01-10 cm thick. Major minerals arequartz (30-40%), tourmaline, topaz (1-5%), fluorite (to 50%), muscovite, cassiterite, arsenopyrite (to 80%), chalcopyrite (to 5-10%), pyrite, wolframite, and bismuthine. Deposit hosted in contact metamorphosed Late Jurassic sandstone and siltstone, and in Early Cretaceous granite and granite-porphyry dikes and stocks. Deposit associated with greisen alteration.

Nekrasov and Pokrovsky, 1973; Prokhorova, Invanov, 1973.

R54-03 69°55'N 139°19'E	Ukachilkan Chokurdak	Sn Sn polymetallic vein	No data.

Consists of steeply-dipping shear zones and veins that strike about north-south and range up to 1,500 m long and up to 15-20 m thick. Major minerals are quartz, pyrrhotite, sphalerite, galena, calcite, sericite, pyrite, siderite, arsenopyrite, muscovite, marcasite, chalcopyrite, cassiterite, stannite, axinite, tourmaline, chlorite, wolframite, silver, bismuth, and sulfosalts. Deposit has a vertical extent of 350 m. Shear zones and vein occur in an anticlinal dome in contact-metamprphosed Middle to Upper Jurassic and Upper Triassic sandstone and siltstone, and Upper Jurassic and Cretaceous rhyolite and quartz diorite porphyrite dikes. Deposit ooccurs adjacent to an Upper Cretaceous granodiorite stock. Wallrocks altered to silica and sericite

Yakovlev, 1975; Flerov and Shur, 1986.

R54-04 69°49'N 138°30'E	Dalnee Yana-Polousnen	Pb, Zn Polymetallic vein	No data.

Consists of veins ranging from 0.05 to 1.0 m thick, up to 100 to 150 m long. Veins composed of quartz, manganosiderite, and galena veins with sphalerite and fahlore. Veins intrude Late Jurassic sandstone and shale that are contact-metamorphosed by Cretaceous granite stock.

Epov and Sonin,written commun., 1964.

R54-05 69°47'N 142°14'E	Altinskoe Yana-Polousnen	Pb, Zn Polymetallic vein	No data.

Consists of quartz-tourmaline veins that contain galena, sphalerite, pyrite, chalcopyrite, and arsenopyrite. Veins range up to 1 m thick and up to 350 m long. Veins intrude contact metamorphosed Middle Jurassic sandstone and Early Cretaceous granite.

Epov and Sonin, written commun., 1964.

R54-06 69°42'N 142°01'E	Odinokoe Chokurdak	Sn Sn greisen	Average grade of 0.93-3.4% Sn; up to 1% W; up to 0.1% Bi; up to 0.5% As.

Consists of disseminations and stringers. Main minerals are fluorite, topaz, siderophyllite, zinnwaldite, muscovite, quartz, kaolinite, and cassiterite. Rre minerals are bismuth, sphalerite, pyrrhotite, chalcopyrite, molybdenite, pyrite, löllingite, arsenopyrite, siderite, wolframite, galena, stannite, bornite, bismuthine, columbite, monazite, and scheelite. Sn minerals occur both in irregular, sub-equant pods and as thin, elongate, discontinuous layers. Deposit occurs near top of a stock of Cretaceous subvolcanic granite-porphyry that is about 0.4 km^2. Stock intrudes Upper Jurassic sandstone and shale. Deposit extends up to 300 m vertically. Located over the dome of the intrusion dome.

Flerov and Shur, 1986; Kholmogorov, 1989.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R54-07 69°37'N 141°45'E	Polyarnoe Yana-Polousnen	Sn, W Sn greisen and vein	No data.

Consists of quartz and quartz-topaz veins that dip gently to moderately (5-40°) near within a stock of apogranite at the top of the major Cretaceous Omchikandin leucogranite batholith. Veins range from 0.1 to 3.5 m thick, up to 300 m long, and extend up to 260 m down-dip. Main minerals are quartz, topaz, fluorite, muscovite, zinnwaldite, wolframite, cassiterite, arsenopyrite, molybdenite, tourmaline, sphalerite, galena, pyrite, chalcopyrite, stibnite, bismuth, bismuthine, and bismuth sulfosalts. Deposit associated with quartz-topaz greisen.

Nekrasov, 1962; Epov and Sonin, written commun., 1964; Flerov, 1976.

R54-08 69°15'N 139°58'E	Deputatskoe Chokurdak	Sn Sn polymetallic vein(?)	Large. Average grade of 0.3-0.7 Sn. Up to 10% Sn.

Deposit includes about 150 separate ore bodies that occur in shear zones, veins, and linear stockwork zones. Deposit ranges up to 18 m thick and up to 1400 m long. Minerals are quartz, tourmaline, chlorite, axinite, fluorite, pyrrhotite, cassiterite, chalcopyrite, pyrite, siderite, ankerite, sphalerite, galena, marcasite, wolframite, stannite, franckeite, boulangerite, bismuth, bismuthine, topaz, apatite, scheelite, and sulfosalts. Main ore bodies occur in mineralized zones that are explored to depths of more than 350 m with adits and drillholes. Wallrocks altered to silica, tourmaline, chlorite, and less common greisen and sulfides. Deposit hosted in contact metamorphosed Middle Jurassic shale and in an unexposed granite stock that is penetrated by drilling at 377 m depth. Stock has K-Ar isotopic age of 108 Ma. Pre-deposit coeval and post-deposit dikes of mafic, intermediate, and felsic intrusive rocks are wide-spread. Many polymetallic veins occur in felsic and intermediate dikes.

Flerov, 1976.

R54-09 69°10'N 141°20'E	Djaktardakh Chokurdak	Sn Sn polymetallic vein	No data.

Consists of steeply-dipping veins, stockworks, and shear zones occur over an area of 0.25 km^2. Veins range from 0.2 to 8 m thick, and are up to 750 m long. Minerals are quartz, chlorite, tourmaline, arsenopyrite, pyrrhotite, cassiterite, pyrite, calcite, siderite, fluorite, wolframite, amphibole, and epidote. Deposit occurs in contact metamorhosed Upper Triassic clastic deposits that are intruded by Upper Cretaceous monzonite and lamprophyre dikes and by a stock of Lower Cretaceous granite porphyry. Polymetallic veins controlled by dikes. Deposit extends vertically to at least 180 m. Workings consist of an adit and drill holes.

Epov and Sonin, written commun., 1964; Flerov and Shur, 1986.

R54-10 68°59'N 139°44'E	Takalkan Yana-Polousnen	Sn Sn greisen	Average grade of 0.02-1.0% Sn.

Consists of a stockwork zone that strikes nearly north-south and ranges up to 700 m long and up to 170 m wide. Stockwork includes tourmaline-muscovite-quartz and topaz-muscovite-quartz veins and stringers that range up to 0.55 m thick. Main minerals are fluorite, arsenopyrite, wolframite, cassiterite, beryl. Rare topaz-muscovite-quartz greisen bodies range up to 1.4 m thick. Deposit hosted in Cretaceous leucocratic biotite granite pluton that is intensely altered to greisen.

Nekrasov, 1962; Epov and Sonin, written commun., 1964.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R54-11 68°53'N 140°18'E	Gal-Khaya Selennyakh River	Hg Carbonate-hosted Hg	No data.

Consists of a zone of quartz-carbonate breccia and veins that occurs along the contact of Lower Silurian limestone and calcareous shale. Zone is 600 m long, 60 to 80 m wide, dips 75°, and occurs concordant to host rock bedding. Breccia and veins occur in cylindrical ore shoots, mainly in carbonate breccia cemented with calcite and quartz-calcite. Main ore mineral is cinnabar. Also present are metacinnabarite, galkhaite (Hg, Cu, Zn, Tl) (As, Sb), stibnite, realgar, orpiment, pyrite, chalcopyrite, fluorite, barite, native gold, tennantite, sphalerite, bornite, chalcocite, covellite, malachite, and azurite. Gangue minerals are quartz, calcite, dolomite, barite, dickite, kaolinite, and bitumen (anthraxolite).

Babkin, 1975.

R54-12 68°24'N 141°14'E	Tommot Tommot River	REE, Ta, Nb Carbonatite-related REE (Ta, Nb)	Grab samples contain 0.1-0.2% Y; 0.1-0.5% Zr; 0.01-0.5% Nb.

Deposit occurs in fenite, metasomatic alkalic pegmatite, and aegirine granite that intrude early Paleozoic schist adjacent to a zoned Late Devonian (?) alkalic gabbroid-syenite pluton. Pluton exhibits center-to-periphery zoning :(1) gabbro with pyroxenite lenses; (2) monzonite; (3) sodium syenite; (4) quartz syenite and granite; and (5) fenitized metamorphic shale with metasomatic aegirine granite lenses. Deposit consists of 20 ore bodies, mainly metasomatic veins and lenses that range from several cm to 25 m thick and up to several hundred meters long. Most important elements are Y, Ce, La, Ta, and Nb. Lesser elements are Zr, Tb, U, Be, Hf, Yb, Dy, Tb, Pr, Sm, Eu, Pb, and Zn. Main ore minerals are chevkenite, yttrialite, monazite, and melanocerite-caryocerite group. Less common are yttrotitantite, hydrothorite, pyrochlore, fergusonite, gadolinite, and zircon. Wall rocks metasomatically altered adjacent to dikes. U-Pb isotopic age for syenite of 368 Ma (U-Pb dating) and Ar-Ar isotopic age of 306-293 Ma.

Nekrasov, 1962; L.M. Parfenov and P.W. Layer, written commun., 1994.

R54-13 68°18'N 141°24'E	Khatynnakh-Sala Selennyakh River	Au Au quartz vein	Average grade of 0.2-2 g/t Au.

Consists of 30 veins, lenses, lenticular bodies, and stockworks. Veins generally less than 1 m thick, range from 15 to 20 m long, and less than 30 to 40 m long. Two levels of intensely sulfidized shale, from 0.4-6 m thick and up to 250 m long, also occur in the deposit. Besides pyrite and pyrrhotite, main minerals are arsenopyrite, galena, fahlore, sphalerite, and gold. Gangue minerals constitute 95% of the deposit and include quartz, albite, ankerite, barite, and fluorite. Pyrite is altered to pyrrhotite, and metamorphic actinolite, zoisite, biotite, sphene replace gangue minerals along with recrystallization of quartz. Deposit hosted in anticlinal domes and is controlled by bedding-plane faults. Most of veins and and host rocks are isoclinally folded. Host rocks are Ordovician and Silurian amphibole-mica-carbonate shale and limestone locally metamorphosed to marble. Post-deposit, Late Jurassic to Early Cretaceous diabase and diorite porphyrite dikes intrude deposit. A Late Paleozoic age is interpreted for the deposit and associated metamorphism.

Nekrasov, 1959; Nekrasov, 1962; Epov and others, written commun., 1964.

R54-14 68°12'N 141°26'E	Chistoe Selennyakh River	Pb, Zn Pb-Zn vein	No data.

Consists of a galena vein that occurs in a shear zone in Ordovician limestone that is locally metamorphosed to marble. The vein varies from 10 to 20 m thick and is about ten meters long. Major mineral is galena with lesser also pyrite, sphalerite (cleiophane), chalcopyrite, cerussite, and smithsonite. Oxidized minerals are locally abundant.

N.A. Goryachev, written commun., 1993.

Deposit No. Latitude Longitude	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
Summary and References			

R54-15 68°13'N 139°51'E	Chibagalakh Darpir	B, Sn Sn-B skarn	No data.

Consists of several tens of magnesium skarns that range from 0.2 up to 20 m thick and up to 260 m long. Skarns occur at the contact of an Early Cretaceous granitic pluton that intrudes Ordovician and Silurian dolomite and limestone. Skarn contains boron ores, and adjacent limestone altered to skarn and greisen contain tin ore. Main B minerals are suanite, ludwigite, kotoite, fluorite, magnetite, plagioclase, calcite, spinel, pyroxene, forsterite, phlogopite, clinohumite, talc, and serpentine. Sn skarn minerals are cassiterite, plagioclase, pyroxene, garnet, wollastonite, quartz, scheelite, fluorite, hornblende, epidote, calcite, chlorite, muscovite, axinite, tourmaline, pyrrhotite, arsenopyrite, magnetite, sphalerite, chalcopyrite, löllingite, and valleriite. Most skarns occur as beds, lenses, pockets, shoots, and veins. Skarns occur along contacts between the intrusion and carbonate country rock, in intrusion apophyses, along contacts between various sedimentary rocks, and in large carbonate xenoliths.

Flerov and others, 1974.

R55-01 69°30'N 149°19'E	Tuguchak-1 Yana-Polousnen	Mo Mo quartz vein	Average grade of 0.05-1.2% Mo; 0.1-0.3% As.

Consists of a set of Mo quartz veins that range from 100 to 500 m long and 0.1 to 1.3 m thick. Veins dip gently (20°) south. Veins cut Early Cretaceous granodiorite of the Ulakhan-Tass pluton.

Bakharev and others, 1988.

R55-01 69°30'N 149°19'E	Tuguchak-2 Yana-Polousnen	Au, W, Bi, Te Granitoid-related Au	Average grade of up to 10 g/t Au; up to 0.25% Bi; up to 0.08% Te.

Consists of steeply-dipping, cross-cutting quartz veins with tourmaline, muscovite, arsenopyrite, wolframite, bismuth, ikunolite, bismuthine, hedleyite, A and B joseite, and gold (fineness 400-1000). Veins range up to 1 m thick and 100 m long and strike north-south. Au quartz veins cut molybdenite-quartz veins that form Tuguchak-1 deposit. Deposit hosted in Early Cretaceous granodiorite and is associated with beresite alteration of granodiorite.

Bakharev and others, 1988.

R55-02 69°28'N 149°41'E	Arbatskoe Yana-Polousnen	Co Co skarn	Average grade of to 1% Co; up to 0.2% Mo; up to 5% As; up to 0.5% Bi.

Consists of garnet-pyroxene and pyroxene skarn with disseminated and massive sulfoarsenite. Skarn occurs in country rock along the northern contact of the Early Cretaceous Ulakhan-Tass granite pluton, mainly along contacts between marmorized limestone and contact metamorphosed Permian sandstone and shale. Main minerals are arsenopyrite, pyrrhotite, löllingite, cobaltite, glaucodot, gersdorffite, niccolite, pyrite, molybdenite, sphalerite, and galena. Lesser minerals are epidote, hastingsite, and chlorite.

Nekrasov, 1962; Bakharev and others, 1988.

R55-03 69°24'N 149°44'E	Kandidatskoe Yana-Polousnen	Au, Co, As Au skarn	Average grade of up to 55 g/t Au; up to 3% Co; up to 20% As; up to 0.5% Bi; up to 3% Zn; up to 0.5%Ni; up to 0.1% Te.

Consists of zones of garnet-pyroxene, pyroxene-wollastonite, pyroxene, and epidote-pyroxene skarn that range up to 100 to 150 m long and up to 50 m thick. Zones occur in a block of Devonian carbonate and Permian clastic rocks that occur between granodiorite of the Lower Cretaceous Ulakhan-Tass pluton and monzonite of the mid-Cretaceous Kandidatsky stock. The main (No. 1) ore body occurs as a steeply-plunging, funnel-shaped pipe of massive and disseminated ore with an outcrop area of 150 m long and up to 20 m wide. Main minerals are arsenopyrite, löllingite, pyrrhotite, molybdenite, glaucodot, cobaltite, gold, bismuth, bismuthine, maldonite, hedleyite, and A and B joseites. Gold is fine-grained (98% less than 0.08 mm), with fineness of 650-1,000. At the adit level (50 m), thickness of the ore body is half of that at surface.

Nekrasov, 1962; Bakharev and others, 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R55-04 69°26'N 144°27'E	Dokhsun Yana-Polousnen	Pb, Zn, Cu Polymetallic vein	No data.

Consists of quartz-sulfide and chlorite-quartz veins that range from 0.15 to 1.4 m thick and up to 650 m long. Main minerals are galena, sphalerite, chalcopyrite, and chalcocite. Veins cut Lower-to-Middle Jurassic sandstone and shale. Sulfides usually less than 5-10% of veins.

Epov and Sonin, written commun., 1964.

R55-05 69°19'N 149°49'E	Kondakovskoe Selennyakh River	Pb, Zn Southeast Missouri Pb-Zn	Average grade of up to 0.1% Cd, 0.05-1% Pb, 0.08-1.5% Zn, and 0.01-0.3% Sb.

Consists of broad disseminations and pockets of sulfides in Devonian limestone that is locally metamorphosed to marble. Deposit occurs along the southern contact of the Lower Cretaceous Ulakhan-Siss granodiorite pluton. Deposit forms a layer up to several hundred meters long and consists of galena-sphalerite with lesser common pyrite-tetrahedrite.

Bakharev and others, 1988.

R55-06 69°08'N 149°06'E	Polevaya Chokurdak	Au, Ag Au-Ag polymetallic vein	Average grade of up to 10 g/t Au; up to 10 g/t Ag; up 0.020-1% Pb; up 0.050-1% Zn; up 0.005-0.3% Cu; up to 0.5% Sn.

Consists of two thin, subparallel zones of intensely silicified and sericitized granodiorite and quartz diorite. Zones range from 1 to 2 m thick and up to 500 m long. Zones occur along and near the contact of an Early Cretaceous pluton that forms the core of a complex, Late Jurassic to Late Cretaceous volcanoplutonic structure. Major minerals are chalcedony-like cryptocrystalline quartz, calcite, pyrite, galena, sphalerite, chalcopyrite, and gold. Sulfide content about 2-3%.

Nekrasov, 1962; Bakharev and others, 1988.

R56-01 70°05'N 152°28'E	Khomustak Chokurdak	Sn Sn greisen	Average grade of up to 1% Sn; up to 0.2% Li; up to 1% As; up to 0.5 Bi.

Occurs in two forms. (1) Quartz-muscovite and topaz-quartz greisen with cassiterite, arsenopyrite, beryl, and fluorite that occur in altered dikes of Late Cretaceous granite. Dikes intrude contact metamorphosed Late Jurassic siltstone, are up to 15 m thick, and up to 100 m long. (2) Zones of siderophyllite-quartz, tourmaline-muscovite-quartz, siderophyllite-fluorite greisen with topaz, arsenopyrite, pyrite and cassiterite that occur in the Late Cretaceous Sredny granite pluton. Zones range from 0.5 to 5 m thick, up to 500 m long, and occur in an area of about 1 km^2. Albite-altered granite with fluorite locally forms 20% of the rock.

Bakharev and others, 1988.

R56-02 69°56'N 153°22'E	Primorskoe Chokurdak	Sn Pb, Zn, As Sn polymetallic vein	Average grade of up to 1% Sn; 0.01-5% Pb; 0.01-3% Zn; 0.005-3% As.

Consists of a set of three subparallel zones of quartz-chlorite altered areas and veins containing cassiterite, stannite, galena, sphalerite, chalcopyrite, arsenopyrite, scarce freibergite, canfieldite, muscovite, tourmaline, and fluorite. Zones range from 1-2 m thick and up to 300-500 m long. Deposit hosted in medium-grained, Early Cretaceous biotite granodiorite.

Bakharev and others, 1988.

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R56-03	Balyktaah, Ploskoe	Sn	Average grade of up to 1% Sn; up to 1% Pb; up to 0.3% Cu.
69°50'N	Yana-Polousnen	Sn greisen	
151°48'E			

Consists of nearby two deposits. Deposits consists of zones of quartz-muscovite and tourmaline-quartz greisen with fluorite, chlorite, cassiterite, galena, chalcopyrite, arsenopyrite, and pyrite. Deposits hosted in the apical portions of a Late Cretaceous granite pluton. Zones range up to 50 m thick and 100-150 m long. Sulfide content ranges up to 5%.

Bakharev and others, 1988.

R56-04	Chistoe	Au	Average grade of up to 20 g/t Au; up to 0.9% W; up to 0.5% Bi; up to 1% As.
69°43'N	Yana-Polousnen	W, Bi, Te	
150°15'E		Granitoid-related Au	

Consists of a set of quartz veins that range from 10 to 50 m long and from 0.1 to 0.5 m thick. Veins occur in two steep-lying northeast-striking shear zones that range up to to 500 m long and are hosted in contact metamorphosed Upper Jurassic sandstone and in Lower Cretaceous granodiorite stocks. Main minerals are muscovite, quartz, tourmaline, arsenopyrite, cobaltite, calcite, wolframite, native bismuth, native gold (fineness 500-1000), bismuthine, joseite (A, B, M, L types), and maldonite. Veins are associated with greisen zones that range up to 1 to 2 m wide.

Bakharev and others, 1988.

R56-05	Verkhne-Naanchan	Pb, Zn	Average grade of up to 1.5% Pb; up to 1.5% Zn; up to 0.1% Cd; up to 0.005% Sn.
69°39'N	Yana-Polousnen	Polymetallic vein	
150°41'E			

Consists of a set of en-echelon zones of veins in a Lower Cretaceous granitic pluton that displays chlorite and silica alteration. Zones are is 2 m thick and range up to about a hundred m long. Zones contain massive sulfide lenses with galena, sphalerite, pyrite, and chalcopyrite that are associated with with aureoles of disseminated sulfides and chlorite alteration.

Bakharev and others, 1988.

R56-06	Yuzhnoe	Pb, Zn	Average grade of up to 0.1% Pb; up to 1% Zn; 1-7 g/t Ag.
69°31'N	Chokurdak	Polymetallic vein	
150°42'E			

Consists of a shear zone with quartz-carbonate contains galena, pyrite, and limonite. Deposit is hosted in black Devonian limestone, adjacent to the southeast contact of a Late Cretaceous syenite intrusion. Deposit ranges up to 2 m thick and 250 m long.

Bakharev and others, 1988.

R58-01	Ichatkin	Sn	Small. Low-grade ores.
69°41'N	Eastern Asia-Arctic: Chaun	W, Zn, Pb, Sb	
163°11'E		Sn silicate-sulfide vein	

Metasomatic quartz-tourmaline veins up to 100 m long and 4-5 m thick, and morphologically complex zones up to 40 m wide, contain arsenopyrite, chalcopyrite, sphalerite, pyrrhotite, galena, scheelite, stibnite, magnetite, and cassiterite. Tin mineralization (cassiterite) is not easily recognized in hand specimen. Deposit occurs within the Early Cretaceous Ichatkin granitic body. Alteration includes kaolinization, tourmalinization, and lesser silicification, sulfidization, and greisenization. Quartz-tourmaline veins often grade into quartz-sulfide veins along strike. Deposit has not been explored below a depth of 50 m.

Zivert, written commun., 1951; Korolev, written commun., 1953

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R58-02 69°19'N 164°04'E	Kanelyveen Eastern Asia-Arctic: Anuyi-Beringovsky	Au As Granitoid-related Au	Medium. Average grade of 4.3 to 19.5 g/t Au.

Quartz and sulfide-quartz veins, stockworks, and mineralized brecciated zones contain gold, pyrite, arsenopyrite, chalcopyrite, and stibnite. Veins, stockworks, and mineralized zones occur in hornfelsed Triassic shales and sandstones in contact with Early Cretaceous diorite intrusions. Gold is commonly disseminated in arsenopyrite. Quartz-sulfide veins with tourmaline, tetradymite, chalcopyrite, molybdenite, proustite (Ag_3AsS_3) and pyrargyrite are less common. Individual veins vary in thickness and strike. Most extend for no more than 60 or 70 m, but some are up to 200 m long.

Sadovsky, written commun., 1970

R58-03 68°23'N 167°48'E	Yassnoe Eastern Asia-Arctic: Chaun	Hg Clastic sediment-hosted Hg or hot-spring Hg?	Small. Up to 3% Hg.

Cinnabar occurs in bands and lenses 0.2-0.8 m thick in zones of brecciated, silicified, and kaolinized rocks along a northeast-striking fault. Deposit occurs in sedimentary rocks that include Upper Triassic siltstone and shale and Lower Cretaceous sandstone; which are intruded by Early Cretaceous diorite, lamprophyre, and rhyolite stocks and dikes.

Babkin, 1969

R58-04 68°15'N 165°56'E	Ozernoe Chukotka	Au Au quartz vein	Small. Average grade of 19.2 to 48.1 g/t Au.

Steeply-dipping, northwest-trending quartz veins, 0.5-1.5 m thick and from 50 m to 230 m long, contain disseminated gold, arsenopyrite, and galena. Sulfide content of veins is less than 1-2%. Gold (814 fine), occurs as separate inclusions up to 4 mm in size and as intergrowths in sulfides. Gold content is rather high. Wallrock alteration includes silicification, carbonatization, and the development of epidote, zoisite, and albite. Mineral deposits occur in an Upper Triassic sedimentary sequence intruded by granite bodies and diorite porphyry dikes.

Kopytov and Vyalov, written commun., 1961

R58-05 68°11'N 166°09'E	Karalveem Chukotka	Au W Au quartz vein	Medium. Prospected and developed preparatory to mining.

Numerous longitudinal, transverse, and diagonal, steeply-dipping ladder quartz veins up to several meters thick occur in Triassic gabbro-diabase sills, especially near their contacts with Triassic sandstone and shale. The sedimentary rocks and sills are strongly contorted into narrow, steep, northwest-trending folds. Gold ore bodies are controlled by strike-slip faults associated with the folding. Host rocks exhibit greenschist facies metamorphism. Silica-carbonate alteration and sulfidization occur adjacent to ore zones. Veins are 95-97% quartz with segregations of arsenopyrite and lenses of scheelite, albite, ankerite, and muscovite. Calcite, dolomite, potassium mica, galena, native gold (780-812 fine), topaz, aquamarine, sphalerite, pyrite, and pyrrhotite are wide-spread. Gold is mainly associated with bluish-gray quartz veinlets in a matrix of coarse-grain quartz and arsenopyrite, in the upper horizons of the deposit. Near the surface, quartz veins often host druse-like intergrowths of large, well-crystallized quartz and isometric gold crystals. Coarse-grained masses of gold, and less common dendritic gold, up to 1 cm in size are characteristic of the deposit. At depth, the gold occurs mainly as fine, dispersed masses in arsenopyrite.

Olshevsky, 1974, 1976, 1984; Davidenko, 1975, 1980; Skalatsky and Yakovlev, 1983

Deposit No. / Latitude / Longitude	Deposit Name / Metallogenic Belt	Major Metals / Minor Metals / Deposit Type	Grade and Tonnage
Summary and References			

R59-01 69°49'N 171°52'E	Kekur Eastern Asia-Arctic: Chaun	Sn Bi, As, Cu Sn silicate-sulfide vein	Small. Average grade of 0.3 to 2.0% Sn.

Steeply dipping, quartz-tourmaline and quartz-topaz veins contain chlorite, muscovite, fluorite, cassiterite, pyrite, marcasite, arsenopyrite, chalcopyrite, galena, and bismuthinite. Veins vary in thickness and are related to domes of the Severny biotite granite.

Peltsman, written commun., 1988

R59-02 69°39'N 170°12'E	Valkumei Eastern Asia-Arctic: Chaun	Sn Sn silicate-sulfide vein	Large. Discovered in 1935, mined from 1941 to present. Average grade 0.4-1.2% Sn.

Simple and complex veins, mineralized zones, and less common linear stockworks, occur mainly within the marginal zone of the Late Cretaceous Pevek granite-adamellite-grandiorite pluton, and to a lesser degree in the Cretaceous sandstone and shale which host the pluton. Mineralization occurs in a north-northwest trending zone alone the contact of the pluton. Ore bodies commonly consist of a conjugate system with major north-south veins and feathered veinlets, and a zone of veins with approximately east-west and northwest trends. Seventy minerals are known from the deposits but the majority of the veins are composed dominantly of tourmaline, with quartz, chlorite, albite, arsenopyrite, cassiterite, pyrrhotite, chalcopyrite, stannite, sphalerite, stibnite, fluorite, and various carbonates. Ore bodies are vertically extensive. The cassiterite-quartz-tourmaline veins are replaced by sulfide veins at depth.

Lugov, Makeev, and Potapova, 1972; Lugov, 1986

R59-03 69°33'N 171°57'E	Pyrkakai Eastern Asia-Arctic: Chaun	Sn, W Au, Ag, Zn, Cu, Pb, Bi, In, Cd Porphyry Sn	Large. Prospected and developed preparatory to mining. Average grade 0.21% Sn.

Deposit is a linear stockwork composed of subparallel, steeply dipping sulfide-quartz veinlets. Three ore zones occur in Upper and Middle Triassic shale and subordinate sandstone. The major ore structures are north-striking fissure zones. Magmatic sequence associated with the veins includes numerous Upper to Lower Cretaceous dikes of quartz syenite, granodiorite and monzonite porphyry, diorite porphyry, and lamprophyre. Tin-bearing stockworks occur along the periphery of a deep-level granitic intrusion (the lower zone of mineralization), and above its apical portion (the upper zone). Mineralized zone is bounded by a steeply dipping contact of the pluton that extends for about 30 km along strike. Deposit has a vertical range of at least 300 m. More than 60 primary and supergene minerals are known. Quartz, muscovite, pyrrhotite, arsenopyrite, pyrite, fluorite, cassiterite, wolframite, sphalerite, and sometimes topaz and albite, are the most common minerals. In altered rocks, quartz, tourmaline, sericite, and chlorite are common. The veinlets contain 6 to 9% sulfides. The gold occurs mainly in arsenopyrite; silver is mainly associated with galena, sphalerite, and pyrite; zinc, copper, lead, indium, cadmium and bismuth also are present. Latest-formed mineralization is similar to epithermal gold-silver deposits associated with volcanic rocks.

Tsvetkov and Epifanov, 1978; Epifanov and Tsvetkov, 1980; Tsvetkov, 1984, 1990

R59-04 69°14'N 172°56'E	Sredne-Ichuveem Chukotka	Au W Au quartz vein	Small. Indiviudal samples contain from 0.2 to 400 g/t Au.

Deposit consists of sulfide-quartz, carbonate-quartz, and quartz veins, and vein-stockwork zones that generally trend north-south, but less commonly east-west. Veins are confined to a dome of a small anticline composed of Upper Triassic shale, siltstone, and sandstone. Mineralization is controlled by an east-west-trending broken zone marked by rhyolite dikes. Gold-bearing veins are confined to shale. About 60 veins and zones of ore bodies are known in an area of approximately 6 km^2. Individual veins are 20 to 100 m long with varying thickness and orientation. Zones with veins and veinlets are up to hundreds of meters long and up to 15 m thick. Sulfides make up 6-10% of the veins and consist mainly of pyrite, arsenopyrite, galena, sphalerite, and chalcopyrite; with minor but wide-spread wolframite and scheelite. Gold (850-950 fine) is disseminated as masses 2 mm up to 1.5 cm in size, and commonly associated with galena. Gold content of the veins is uneven with local high-grade concentrations.

Poznyak, written commun., 1959; Sidorov, 1966; Sosunov, written commun.,1977

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R59-05 69°01'N 172°09'E	Palyan Eastern Asia-Arctic: Chukotka	Hg Clastic sediment-hosted Hg or hot-spring Hg?	Estimated 10,117 t Hg in ore containing 0.53% Hg.

Stockworks and podiform mercury occurrences are in upper Cretaceous sandstone and shale overlying a deeply eroded, volcanic dome; now exposed as a block of volcaniclastic rock with an intrusive core. Mercury mineralization occurred in several stages and deposits formed at the intersections of major north-south and east-west faults. Localization of the ore bodies is greatly influenced by extensive layering in the volcanic rocks, and zones of tectonic disruption and explosive brecciation. More than 30 minerals are characteristic of the veinlets and disseminated ore bodies, including: quartz, dickite, dolomite, siderite, calcite, cinnabar, marcasite, pyrite, galena, sphalerite, native arsenic, realgar, and nickel minerals. Wall-rock alteration has not been identified.

Syromyatnikov, 1972; Babkin, 1975; Syromyatnikov, Dubinin, 1978

R59-06 69°02'N 173°44'E	Maiskoe Eastern Asia-Arctic: Anuyi-Beringovsky	Au, As, Sb, Ag Disseminated Au-sulfide	Medium to large? Proven reserves of 23 million tonnes with average grade 12 g/t Au.

Deposit is associated with linear shear zones that generally trend north-south, have variable strike and dip, and that are marked by distinctive cleavage, fissuring, contortion, and boudinage. Mineralization consists of veinlets and disseminated zones of gold-bearing pyrite and arsenopyrite. Ore zones are confined to the more plastic rocks such as siltstone, and silty shale, and shale in a Middle(?)- and Upper-Triassic flysch sequence. Folding and zones of plastic flowage are discordant to a plicated structure within a horst-like block, which occurs in a large domal uplift. Sedimentary rocks are intruded by dikes of quartz-feldspar porphyry, granite, granosyenite porphyry, Early Cretaceous lamprophyre (kersantite and minette), Late Cretaceous rhyolite, as well as by vein-like bodies of intrusive breccia of Okhotsk-Chukota volcanic-plutonic belt. Magmatic rocks are beresitized and kaolinized. Carbonaceous rocks are metamorphosed to phyllite. There is also weak sericitization, carbonatization, graphitization, and irregular silicification. Ore consists mainly of disseminated high-grade gold in acicular arsenopyrite and arsenic-rich pyrite. A later quartz-stibnite (with native arsenic) stage of mineralization is also widespread within the ore zones. Beyond the ore zones, veins occur mainly in sandstone dikes and consist of molybdenite-quartz and rare metal-polysulfide-quartz ore bodies accompanied by cassiterite, scheelite, wolframite, bismuth minerals, tetrahedrite-tennantite, and lead and silver sulfosalts. Gold mineralization is vertically and areally extensive.

Sidorov and others, 1978; Gavrilov, Novozhilov, and Sidorov, 1986; Olshevsky and Mezentseva, 1986; Sidorov, 1966, 1987; Benevolskyi and others, 1992

R59-07 68°59'N 172°57'E	Gora Sypuchaya Eastern Asia-Arctic: Anuyi-Beringovsky	Au Sb, As Au quartz vein and Au-sulfide disseminated	Medium. Average grade of 1 to 12,356 g/t Au.

Mineralized fractured zones, and zones of contortion and brecciation, contain axial quartz veins in deflections and limbs of small synclines and flexures. Ore bodies are confined to parallel, slight dislocations, which are mainly conformable to the Upper Triassic laminated sandstone hosting the deposit. Veins and zones of veinlets contain gold, pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, tetrahedrite, and lead sulfosalts. Stibnite is associated with disseminated gold-sulfide mineralization which contains gold-bearing pyrite and fine, acicular arsenopyrite in fractured and folded zones. Low and moderate grade deposit.

Sidorov, 1966; Fadeev and others, 1986; Volkov, 1990

R59-08 68°54'N 167°60'E	Kyttamlai Eastern Asia-Arctic: Chukotka	Hg, Sb Clastic sediment-hosted Hg or hot-spring Hg?	Small.

Mineralized zones in brecciated sandstone and sandy shale are confined to faults trending approximately east-west and northwest, which splay off a major northeast trending fault. Deposit occurs in Early Cretaceous clastic sedimentary rocks deformed into northwest-trending folds. Mercury-bearing zone, which is 200 km long and 20-30 m wide, trends northwest. Few magmatic rocks occur in the area. Mercury-bearing zones form parallel chains of ore bodies, several tens of meters apart, up to 50-100 m long and 0.4-0.5 m thick. Cinnabar and stibnite is present in quartz-carbonate, quartz, and carbonate-kaolinite vein material that cements the matrix. Disseminated ores are the most wide-spread; disseminated veinlets and cockade ore are less common.

Babkin, 1975

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R59-09 68°53'N 173°48'E	Promezhutochnoe Eastern Asia-Arctic: Anuyi-Beringovsky	Au, Ag Sb Au-Ag epithermal vein	Small. Grade ranges from traces to 887 g/t Au and up to 10,357 g/t Ag.

Ore bodies consist of: (1) quartz breccia veins with disseminated arsenopyrite, pyrite, marcasite, and silver sulfosalts; (2) quartz veins with segregations of stibnite, silver sulfosalts, and gold; (3) auriferous quartz veins with chalcopyrite, galena, sphalerite; and (4) auriferous stibnite-quartz veins. Individual ore bodies are several hundred meters long and up to 10 m thick. Veins are characterized by brecciated structures with banded quartz coating sedimentary rock clasts. Host rock is shale interbedded with fine-grained sandstone, and occurs on the limb of a broad syncline that is cut by a set of east-west trending, Late Cretaceous trachyandesite and andesite dikes, which are cut by the veins.

Sidorov, 1966, 1978

R59-10 68°34'N 168°34'E	Draznyaschy, Upryamy Eastern Asia-Arctic: Anuyi-Beringovsky	Au As, Pb, Zn Au-Ag epithermal vein	Small. Grade ranges from 15.4 to 164 g/t Au and to 10 g/t Ag.

Discontinuous, ankerite-quartz veins, less than 100 m long, and vein-like breccia bodies cemented by quartz, form an en echelon mineralized zone that extends for about 500 m. Ore bodies occur adjacent to a sedimentary rock of Upper Jurassic and Lower Cretaceous volcaniclastic and clastic sedimentary rock. Ore bodies are controlled by linear zones of fissuring and deformation that trend both northwest and northeast. Majority of the veins are confined to domed anticlines. Two productive mineral assemblages are distinguished: (1) a deeper assemblage with microcrystalline quartz, ankerite, sericite, pyrite, arsenopyrite, sphalerite, galena, bournonite, tetrahedrite-tennantite, and gold; and (2) an upper assemblage marked by finely crystalline crustified quartz, pyrite, stibnite, and gold. In quartz-cemented breccias, silver dominates over gold.

Zhukov and Pole, 1974

R59-11 68°20'N 168°34'E	Elveney Eastern Asia-Arctic: Anuyi-Beringovsky	Au, As Au sulfide disseminated	Prospective medium-size deposit with low-grade ores.

Linear mineralized shear zones in Upper Triassic sandstone contain fine grained, disseminated gold-arsenopyrite mineralization. Tungsten veins and stockworks are also present in the vicinity of the deposit.

Rozenblum and Fadeev, 1990

R59-12 68°08'N 168°51'E	Pelvuntykoinen Eastern Asia-Arctic: Anuyi-Beringovsky	Au, Bi, Te Granitoid-related Au	Small.

Quartz veins containing disseminated pyrite, arsenopyrite, native bismuth, tetradymite, and gold occur in Upper Triassic sedimentary rocks and Lower Cretaceous extrusive volcanic rocks, adjacent to a granitic pluton.

Naiborodin, 1966

R60-01 69°33'N 176°02'E	Dvoinoi Chukotka	Au Au quartz vein	No data.

Quartz, carbonate-quartz, and sulfide-quartz veins occur along silicified and sulfidized breccia zones. Veins contain gold, pyrite, chalcopyrite, galena, sphalerite, cassiterite, ilmenite, and magnetite over an area about 30 km by 20 km. Veins generally strike east-west. Most of the ore bodies occur in Devonian sandstone and shale adjacent to the Early Cretaceous Velitekenai granitic pluton. Veins and mineralized fracture zones are confined to structures radiating out from major faults which trend northwest. Gold-bearing mineralized zones are 100 to 150 m wide and up 1 km long. Sulfide content of the veins is less than 1-2% (sulfide poor).

Piankov, written commun., 1981

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage

R60-02	Ryveem	Au	Small occurrences. Minor prospecting.
69°21'N	Chukotka		
178°19'E		Au quartz vein	

Deposit consists of low-sulfide quartz-carbonate veins with disseminated pyrite, arsenopyrite, chalcopyrite, galena, sphalerite, and fine-grained gold in metamorphosed mid-Paleozoic clastic sedimentary and carbonate rocks. Ore bodies are 200-500 m long and range greatly in thickness. Mineralized area is about 1700 km^2, but the extent of mineralization is poorly known.

Pole, written commun., 1977

R60-03	Kukenei	Sn, Ag	Large. Considerable prospecting.
69°08'N	Eastern Asia-Arctic: Chaun	Cu, Pb	
174°05'E		Sn polymetallic vein	

Tin ore bodies are associated with a Cretaceous epizonal granitic pluton exposed in the middle of an intrusive dome. Host rock is mainly Upper Triassic sandstone with minor shale, intruded by granite porphyry and lamprophyre dikes. Wall rocks are intensely sericitized, tourmalinized, chloritized, and pyritized. Tin occurs mainly in veins, mineralized fractures, and northwest-trending broken zones. Both cassiterite-quartz and cassiterite-sulfide mineral assemblages are present. A cassiterite-sulfide association makes up to 70-90% of the richest ore bodies and includes arsenopyrite, fine acicular cassiterite, pyrite, marcasite, sphalerite, chalcopyrite, stannite, galena, gold, and sulfosalts of lead and silver. Silver occurs as argentite, and also as native metal and as inclusions in most of the sulfides. Near the intrusion, tin-silver mineralization changes to predominantly tin mineralization. Tin ore zones coincide with disseminated gold-sulfide minerals. Last stage of mineralization is marked by a stibnite-quartz assemblage.

Sidorov, 1966; Volkov and Dobrotin, 1990; Goncharov and others, 1990.

R60-04	Sopka Rudnaya	Au, Ag	Small. Grade ranges 8 to 17 g/t Au and 26 to 510 g/t Ag.
68°58'N	Eastern Asia-Arctic: Anuyi-Beringovsky	Sb, As	
174°03'E		Au-Ag epithermal vein	

Disseminated veinlets of adularia-hydromica-quartz composition contain kaolinite, dolomite and fine-grained, disseminated electrum, miargyrite, pyrargyrite, galena, sphalerite, chalcopyrite and argentite. Chalcedony-quartz veins contain disseminated and intergrowths and aggregates of arsenopyrite, marcasite, stibnite, and rare gold. Laminated and rhythmically-banded vein structures are typical. Ore-bearing area is composed of Lower and Upper Cretaceous felsic volcanic rocks that overlie Upper Triassic sandstone and shale. Volcanic rocks are broken by a set of northwest, and approximately east-west and north-south trending faults which are intruded by Late Cretaceous andesite-basalt hypabyssal plutons. A vertical alteration pattern is reflected in a zone of argillization and kaolinite with lenses of stibnite, that is over-printed by gold-bearing, quartz-adularia-hydromica zones and ore-bearing zones of low-temperature propylitization.

Sidorov, 1966

R60-05	Lunnoe	Sn, W	Medium.
68°49'N	Eastern Asia-Arctic: Chaun	As, Zn	
174°49'E		Sn silicate-sulfide vein	

Tin-bearing stockworks, mineralized zones, and veins occur in Middle and Upper Triassic, tourmalinized, silicified, sulfidized, sericitized, and chloritized sandstone and siltstone that overlie a buried granitic intrusion. Individual ore bodies, which are several hundred meters long, occur along fissures of diverse attitude. Ore bodies are composed of quartz, albite, tourmaline, chlorite, sericite, muscovite, fluorite, pyrite, arsenopyrite, cassiterite, stannite, galena, sphalerite, chalcopyrite, pyrrhotite, wolframite, and other minerals. Cassiterite-quartz ore bodies are the most important economically, but small amounts of wolframite, chlorite, muscovite, and tourmaline occur widely.

Lugov, 1986

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
R60-06 68°46'N 178°53'E	Kuekvun Eastern Asia-Arctic: Chaun	Au, Bi, Te, Sn, W Granitoid-related Au	Small.

Scattered quartz veins, 0.2 to 2.5 m thick and 100 to 800 m long, occur in Triassic gabbro and diabase which intrude carboniferous schist and Triassic shale; adjacent to an intermediate granitic intrusion. Veins contain tourmaline, sericite, albite, carbonates, arsenopyrite, pyrite, pyrrhotite, chalcopyrite, galena, sphalerite, tetrahedrite, cassiterite, scheelite, native bismuth, and tellurides of bismuth, gold, and silver.

Gorodinsky, Gulevich, and Nailborodin, written commun., 1977

R60-07 68°44'N 174°23'E	Shurykan Eastern Asia-Arctic: Chaun	Mo, Cu Porphyry Cu-Mo	Small.

Group of ore deposits that consist of stockworks of northeast-trending quartz, quartz-tourmaline, quartz-chlorite, and quartz-fluorite-calcite veinlets, with disseminated molybdenite, chalcopyrite, and pyrite. Ore bodies occur in hydrothermally altered diorite, granodiorite porphyry, and dacite of the Shurykan hypabyssal intrusion; which is cut by north-east trending mineralized fractures. Fine-grained disseminated sulfides are also widespread in the quartz-sericite rocks adjacent to the pluton.

Zhuravlev, written commun., 1981

R60-08 68°21'N 177°12'E	Plamennoe Eastern Asia-Arctic: Chukotka	Hg, Sb Volcanic-hosted Hg	Medium. Produced 442 tonnes Hg from high grade ore.

Conformable lenses and pods with cinnabar occur in brecciated, silicified, and sericitized rhyolite which forms a number of extrusive domes along faults. Main ore body is a sheet-like deposit about 40 m wide that extends northwest for about 180 m. Rhyolitic ignimbrite forms the hanging wall and is commonly altered to a quartz-rich rock that obscures the deposits. Ores are massive or in disseminated veinlets in areas of intense alteration. Strong mineralization extends to a depth of at least 30 m, and some mercury ore bodies extend to 100 m in depth. Cinnabar is associated with quartz, chalcedony, stibnite, pyrite, and marcasite. Stibnite dominates locally. Lower Cretaceous volcanic rocks form a dome about 4 by 5 km in size which is intruded by a Late Cretaceous diorite stock and comagmatic hypabyssal bodies and dikes of basalt, andesite, and diorite porphyry. Ore zone about 4 km by 0.5-1 km, and is bounded by a system of steeply dipping faults trending northwest and east-west.

Kopytin, 1972; Babkin, 1975

R60-09 68°06'N 176°30'E	Mramornoe Eastern Asia-Arctic: Chaun	Sn, Ag As, Cu, Pb, Zn Sn polymetallic vein	Medium.

Deposit consists of mineralized zones and stockworks with quartz, chlorite, sericite, tourmaline, and sulfides; and quartz-chlorite veins with disseminated, crystalline, and colloform cassiterite and stannite. Sulfide minerals include pyrite, marcasite, pyrrhotite, sphalerite, galena, chalcopyrite, and sparse arsenopyrite and chalcocite. Silver-sulfide and tetrahedrite-tennantite is wide-spread. Stibnite and cinnabar are present locally. Cassiterite and stannite occur with wolframite, bismuthinite, bismuth, and molybdenite in the rich ores. Ore occurrences are associated with a dome approximately 18 km in diameter composed mainly of Albian and Cenomanian ignimbrites and tuffs. Zones of veins and veinlets are controlled by northeast trending faults, closely associated with Late Cretaceous granite porphyry dikes and stocks. Ore bodies are up to 800 m long.

Rozenblyum, oral commun., 1991

Significant Lode Deposits of Russian Far East, Alaska, and Canadian Cordillera

Deposit No. Latitude Longitude Summary and References	Deposit Name Metallogenic Belt	Major Metals Minor Metals Deposit Type	Grade and Tonnage
S54-01 72°14'N 140°18'E	Chokurdakh Chokurdak	Sn Sn silicate tourmaline, Sn silicate-sulfide vein	Average grade of 0.1-3.35% Sn; up to 3% As; up to 2% Cu; up to 1% Pb; up to 0.3% Zn.

Consists of shear zones that range up to 1,500 m long and up to 15-20 m thick that strike northeast and dip steeply. Zones contain quartz-tourmaline breccias and veins with cassiterite (to 15%), arsenopyrite, chalcopyrite, pyrite, albite and sericite, siderite, and Ag sulfosalts. Zones contain alternating stringers and breccia. Distances between zones range from a few to 200 m. Deposit occupies 1.5 km^2 area. Zones associated with silica, sericite, and tourmaline alteration. Deposit hosted in Early Cretaceous sedimentary and in Early and Late Cretaceou volcanic rocks, granodiorite, diorite porphyry, and in granite-porphyry dikes.

Sorokov and Voitsekhovsky, written commun., 1961; Prokhorova, Ivanov, 1973; Nekrasov and Pokrovsky, 1973.

Alphabetical Index for Significant Lode Deposits of the Russian Far East, Alaska, and the Canadian Cordillera

Adanac-Adera (Ruby Creek)	O08-04	Porphyry Mo	Mo, W
Afanas'evskoe	N53-21	Au quartz vein	Au
Aga-Kukan	R52-04	Southeast Missouri Pb-Zn and sediment-hosted Cu	Pb, Zn, Cu
Agat	P56-46	Au-Ag epithermal vein	Au, Ag
Aginskoe (Aga)	N57-03	Au-Ag epithermal vein	Au, Ag, Te
Agranai	P59-03	Volcanic-hosted Hg	Hg
Agylki	Q53-23	W skarn	W, Cu
Agyndja	Q55-03	Basaltic Cu and sediment-hosted Cu	Cu
Aida	P55-03	Au-Ag epithermal vein	Ag, Au
Ainatvetkin	P58-11	Sn polymetallic vein	Sn, Ag
Ainsworth District	M11-22	Ag polymetallic vein	Zn, Pb, Ag
Ajax	N09-06	Porphyry Mo	Mo
Ak-Altyn	Q53-07	Au-Ag epithermal vein	Au
Akie	O10-08	Sedimentary exhalative Zn-Pb	Zn, Pb, Ag, Ba
Alamo	N09-32	Kuroko massive sulfide(?)	Ag, Au, Cu, Zn
Alaska Oracle, Gilpatrick	P06-38	Au quartz vein	Au
Alaska-Juneau	O08-13	Au quartz vein	Au
Aldigych	P57-16	Au-Ag epithermal vein	Au, Ag
Aleshkino	Q54-03	Au quartz vein	Au
Aley	O10-06	Carbonatite-related REE	Nb, Phosphate, REE
Algaminskoe	O53-07	Carbonate-hosted Zr (Algoma type)	Zr, W
Alice Arm Silver (Dolly Varden, North Star, Wolf, Toric)	N09-03	Kuroko Zn-Pb-Cu massive sulfide	Ag, Pb, Zn
Altaiskoe	P54-07	Ag polymetallic vein	Pb, Zn, Ag
Altinskoe	R54-05	Polymetallic vein	Pb, Zn
Alto	Q07-01	Stratabound Fe	Fe
Alyaskitovoe	Q54-16	Sn-W greisen	Sn, W
Alys-Khaya	Q53-15	Sn polymetallic vein	Sn
Ametistovoe	P58-05	Au-Ag epithermal vein	Au, Ag
Anderson Mountain	P06-02	Kuroko massive sulfide?	Cu, Pb, Zn, Ag
Ann, (Ernie Lake)	Q05-02	Polymetallic vein (metamorphosed)	Pb, Zn, Ag
Anna-Emeskhin	R52-05	Au quartz vein	Au
Anniv (OP)	P09-10	Sedimentary exhalative Pb-Zn	Zn, Pb
Anomalnoe	N57-11	Metamorphic REE(?)	Ta, Nb
Anomalnoe	Q52-14	Sn silicate-sulfide vein	Sn
Anyox Area (Hidden Creek, Bonanza)	N09-05	Cyprus massive sulfide	Cu, Ag, Au
Apex and El Nido	O08-24	Au quartz vein	Au, Ag
Apollo-Sitka	N04-06	Au-Ag epithermal vein	Au, Ag, Pb, Zn, Cu
Aquila	N04-05	Au-Ag epithermal vein	Au, Ag
Aragochan	R53-07	Polymetallic vein	Pb, Zn
Arbatskoe	R55-02	Co skarn	Co
Arctic	Q04-04	Kuroko massive sulfide	Zn, Cu, Pb, Ag, Au
Argin	R53-11	Sn quartz vein	Sn
Ariadnoe	L53-19	Zoned mafic-ultramafic Ti	Ti
Arnold prospect	P04-14	Granitoid-related Au	Au,Ag
Arsenyevsky	L53-31	Sn silicate-sulfide vein	Sn
Arylakh	P56-10	Au-Ag epithermal vein	Ag, Au
Asachinskoe	N57-18	Au-Ag epithermal vein	Au, Ag, Se
Asarco	P07-04	Porphyry Cu-Mo	Cu, Mo
Asbestos Mountain	Q04-06	Serpentine-hosted asbestos	Asbestos, jade, asbestos, talc
Asket	Q58-03	Porphyry Cu-Mo and Polymetallic vein	Cu, Mo, Au
Askold	K53-08	Granitoid-related Au	Au
Aurora Creek	Q03-19	Kuroko massive sulfide?	Zn, Pb, Cu, Ba, Ag, Au

Deposit Name	Deposit Number	Deposit Type	Major Metals
Avan	R04-01	Podiform Cr	Cr, PGE
Avnet (Buzby)	Q05-10	Mn-Ag vein	Mn, Ag
Axe (Summers Creek, Axe)	M10-21	Porphyry Cu-Mo	Cu
Badran	Q54-24	Au quartz vein	Au
Baidakh	R53-04	Sb-Au vein	Sb
Baikal	L52-02	Porphyry Cu-Mo	Cu, Mo
Bailey (Pat)	P09-16	W skarn	W, Cu
Balaakkalakh, Diring-Yuryak	O54-02	Sn polymetallic vein	Sn
Balbuk	Q52-16	Pb polymetallic vein	Pb
Balykovskoe	K53-09	Granitoid-related Au	Au
Balyktaah, Ploskoe	R56-03	Sn greisen	Sn
Bamskoe (Chul'bango)	N51-01	Au-Ag epithermal vein	Au, Ag
Banjo	P05-08	Polymetallic vein	Au, Ag, Pb, Zn, Sb
Baran'evskoe	N57-06	Au-Ag epithermal vein	Au, Ag
Barin	Q02-02	Ag polymetallic vein and replacement	Ag, Zn
Baryllyelakh	P54-03	Sn greisen	Sn, W
Baryllyelakh-Tsentralny	P54-04	Sn polymetallic vein	Sn, Ag
Bastion	P56-09	Sn greisen	Sn
Batko	P55-07	Basaltic Cu	Cu
Baultoff, Horsfeld, Carl Creek	P07-09	Porphyry Cu	Cu
Bazovskoe	Q54-19	Au quartz vein	Au
Bear Mountain	R07-02	Porphyry Mo	Mo, W
Bear-Twit	Q09-02	Southeast Missouri Pb-Zn	Zn, Pb
Beaver Creek	Q05-12	Polymetallic vein	Ag, Pb, Zn
Beaver Mountains	P04-21	Porphyry Cu-Au	Cu, Au, Ag
Bebekan	Q57-09	Porphyry Cu-Mo	Mo, Cu
Bedrock Creek	Q06-15	Porphyry Cu(?)	Cu, W, Th
Bee Creek	O04-08	Porphyry Cu	Cu, Au
Bekkem	Q54-28	W-Mo-Sn vein and greisen	W
Belaya Gora	N54-03	Au-Ag epithermal Vein	Au, Ag
Bell Copper (Newman)	N09-14	Porphyry Cu-Au (Mo)	Cu, Au, Ag
Bell Moly (Alice Arm)	N09-07	Porphyry Mo	Mo, W
Benevskoe	K53-06	W skarn	W
Benson Area (Empire, Coast Copper)	M09-03	Cu-Fe skarn	Cu, Fe
Berezitovoe	N51-02	Polymetallic sufide and Au vein	Zn, Pb, Au, Ag
Bereznyakovskoe	L54-04	Volcanogenic Mn	Mn
Berezovaya	P59-02	Sn polymetallic vein	Sn
Berezovogor	Q59-06	Au-Ag epithermal vein	Au, Ag, Pb
Berezovska	Q57-04	Polymetallic vein and Kuroko massive sulfide	Pb, Zn, Cu, Ag
Berg	N09-25	Porphyry Cu-Mo	Cu, Mo
Bernard Mountain, Dust Mountain	P06-25	Podiform Cr	Cr, PGE
Bethlehem-JA	M10-08	Porphyry Cu-Mo	Cu, Mo
Betyugen	Q52-04	Sb vein	Sb
Bezymyannoe	Q52-13	Ag polymetallic vein	Ag, Pb
Bichinskoe	N54-06	Sn greisen	W, Sn
Big Hurrah	Q03-15	Au quartz vein	Au
Big Ledge (Pingston Creek)	M11-15	Sedimentary exhalative Zn-Pb	Zn, Pb
Big Onion	N09-17	Porphyry Cu-Mo	Cu, Mo
Billyakh	Q53-03	Au-Sb polymetallic vein	Sb, Au
Blende (Braine)	Q08-07	Sedimentary exhalative Pb-Zn	Zn, Cu, Pb, Au, Ag
Blue Lead, Tibbs Creek, Gray Lead	Q06-24	Polymetallic vein or Sb-Au vein	Au, Ag, Sb
Bluff	P07-03	Porphyry Cu-Mo	Cu, Mo
Bochiyskoe	Q52-08	Sn polymetallic vein	Sn
Bogatyr	P55-40	Sn silicate-sulfide vein	Sn
Bogidenskoe	N53-01	Anorthosite apatite Ti-P	Ti, P
Bohemia Basin (Yakobi Island)	O08-14	Gabbroic Ni-Cu	Ni, Cu
Bokan Mountain (Ross-Adams)	N08-03	Felsic plutonic U-REE	U, Th, Be, Nb, Pb, REE

Deposit Name	Deposit Number	Deposit Type	Major Metals
Bokhapcha	P56-39	W vein and greisen	W
Bolshoy Kanyon	P56-06	Sn skarn	Sn
Bonanza Creek	Q05-08	W skarn	W, Ag, Cu
Bonanza Hills	P05-19	Polymetallic vein and Porphyry Cu	Ag, Cu, Pb, Au
Borong	O53-10	Sediment-hosted Cu	Cu
Boss Mountain	N10-11	Porphyry Mo	Mo
Boulder Creek (Purkeypile)	P05-11	Sn greisen(?)	Sn
Bowser Creek	P05-17	Pb-Zn skarn	Ag, Pb, Zn
Brady Glacier	O08-23	Gabbroic Ni-Cu	Cu, Ni, PGE
Bralorne, Pioneer (Bridge River Area)	M10-05	Au-Sb polymetallic vein	Au
Brenda (Peachland Area)	M10-23	Porphyry Cu-Mo	Cu, Mo
Brewery Creek (Loki Gold)	Q07-09	Sb-Au vein	Au
Brisco Area	M11-14	Ba vein and breccia	Ba, Mg
Britannia	M10-19	Kuroko Cu-Zn massive sulfide	Cu, Zn
Broken Shovel, Iditarod	P04-06	Polymetallic vein	Ag, Pb, Sb
Brucejack Lake (West Zone, Shore Zone)	O09-23	Au-Ag polymetallic vein	Au, Ag
BT, Jerri Creek	Q05-04	Kuroko massive sulfide	Cu, Zn, Pb, Ag
Bugdogar	Q53-18	Sn polymetallic vein	Sn
Bukhtyanskoe	N54-04	Au-Ag epithermal vein	Au, Ag
Bular	P53-06	Au quartz vein	Au
Bullion Creek	P07-19	Strataform gypsum	Gypsum
Bulunga	P55-25	Pb-Zn-Ag vein or skarn	Pb, Zn, Ag
Burea River	L54-05	W greisen(?)	W
Burgachan	Q53-16	Sn polymetallic vein	Sn
Burgagylkan	P55-43	Au-Ag epithermal vein	Au, Ag
Burgali	O54-01	Porphyry-Mo (W)	Mo, W
Burgavli	Q53-10	Sn quartz vein	Sn
Burguat	R53-01	Au quartz vein	Au
Burindinskoe	N51-04	Au-Ag epithermal vein	Au, Ag
Burkat	Q54-09	Sn quartz vein	Sn
Burkhala	P55-22	Au quartz vein	Au
Burmatovskoe	L54-02	Au-Ag epithermal vein	Au, Ag
Burnaby Iron (Jib)	N09-30	Fe skarn	Fe
Butugychag	P55-38	Sn quartz vein	Sn
Candle	P05-05	Polymetallic vein or porphyry Cu?	Cu, Pb, Ag
Canoe Bay	N04-02	Au-Ag epithermal vein	Au, Ag
Cantung (Canada Tungsten)	P09-14	W skarn	W, Cu
Canyon Creek	O04-10	Ironstone	Fe
Cape Mountain	Q03-03	Sn quartz vein	Sn
Capoose Lake	N10-05	Ag-Au polymetallic vein	Ag
Cariboo-Barkerville District (Aurum, Mosquito Creek, Island Mountain)	N10-06	Au quartz vein	Au
Caribou Mountain, Lower Kanuti River, Holonada	Q05-07	Podiform Cr	Cr
Carmi Moly	M11-27	Porphyry Mo	Mo, Cu
Carpinsky Caldera	M56-01	Porphyry Mo	Mo
Cash, (Klazan, Johnny)	P08-05	Porphyry Cu-Mo	Cu, Mo
Casino (Patton Hill)	P07-05	Porphyry Cu-Mo	Cu, Mo
Cassiar (Mount McDame)	O09-05	Serpentine-hosted asbestos	Asbestos, jade
Castle Island, Kupreanof Island	O08-17	Bedded barite, kuroko Ba-Zn-Pb-Cu massive sulfide	Ba
Castle Mountain (Mastadon, Mabel)	M11-32	Podiform Cr-Ni	Ni, Cr
Catface	M10-24	Porphyry Cu-Mo	Cu
Cathedral Creek, Braided Creek	O04-06	Polymetallic vein	Cu, As, Zn, Pb
Cathy ((Bar, Walt, Hess))	P09-04	Sedimentary exhalative Ba	Ba, (Pb, Zn, Ag)
Chaantal	Q01-01	Sn quartz vein and Sn greisen	Sn, W

Deposit Name	Deposit Number	Deposit Type	Major Metals
Chagoyan	N52-07	Stratiform Pb-Zn	Pb, Zn, Ag
Chai-Yurya	P55-19	Au quartz vein	Au
Chalet Mountain (Cornelius Creek)	O05-08	Au quartz vein	W, Au, Ag
Chandalar district (Mikado, Little Squaw)	Q06-05	Au quartz vein	Au
Chechekuyum	Q02-06	Pb-Zn skarn	Pb, Zn, Cu, Ni
Chelbanya	P55-20	Au quartz vein	Au
Chempura	O57-03	Volcanic-hosted Hg	Hg
Chepak	P56-11	Granitoid-related Au	Au, W, Bi
Cheminskoe	P56-05	Fe (Cu, Pb, Zn) skarn	Fe
Chernyshevskoe	L53-38	Korean Zn massive sulfide	Zn, Pb
Chibagalakh	R54-15	Sn-B skarn	B, Sn
Chichigof, Hirst-Chichagof	O08-16	Au quartz vein	Au
Chicken Mountain (Flat District)	P04-08	Granitoid-related Au-Ag (Cu)	Au, As, Hg, Sb, Cu, Mo
Chineyveem	Q59-05	Au-Ag epithermal vein	Au, Ag
Chip-Loy	P05-15	Gabbroic Ni-Cu(?)	Ni, Co, Cu
Chirynai	P60-01	Podiform Cr	Cr, PGE
Chistochina District	P06-22	Porphyry Cu and polymetallic vein	Cu, Pb, Ag, Au
Chistoe	R54-14	Pb-Zn vein	Pb, Zn
Chistoe	R56-04	Granitoid-related Au	Au
Chochimbal	Q52-10	Polymetallic vein	Au, Ag, Pb
Chokurdakh	S54-01	Sn silicate tourmaline, Sn silicate-sulfide vein	Sn
Chu Chua	M10-02	Cyprus massive sulfide	Cu, Zn, Au, Ag
Churchill (Davis Keays)	O10-01	Cu vein	Cu
Churpunnya	R54-01	Sn silicate-sulfide vein	Sn
Cinnabar Creek	P04-17	Hot-spring Hg	Sb, Hg
Cinola (Specogna, Babe)	N08-04	Au epithermal vein	Au
Cirque (Stronsay)	O10-03	Sedimentary exhalative Pb-Zn	Pb, Zn, Ag, Ba
Cirque, Tolstoi	P04-04	Polymetallic vein and porphyry Cu	Cu, Ag, Sn
Claim Point	O05-07	Podiform Cr	Cr
Clear Creek	Q04-08	Felsic plutonic U	U
Clear Creek (Gem)	M10-20	Porphyry Mo	Mo
Cleary Summit	Q06-18	Polymetallic vein, Au-quartz vein	Au, Ag
Cliff (Port Valdez)	P06-28	Au quartz vein	Au
Clinton Creek	Q07-07	Serpentine-hosted asbestos	Asbestos
Coal Creek	P06-10	Sn greisen(?) and Sn vein	Sn, Ag, W, Zn
Coates Lake (Redstone)	P09-11	Sediment-hosted Cu	Cu, Ag
Cobol	O08-25	Au quartz vein	Au
Copper Bullion, Rua Cove	P06-40	Besshi massive sulfide	Cu
Copper Mountain (Ingerbelle and others)	M10-31	Porphyry Cu-Au	Cu
Cottonbelt	M11-04	Sedimentary exhalative Pb-Zn	Pb, Zn, Ag
Craig (Tara, Nadaleen Mtn)	P08-03	Ag polymetallic vein	Pb, Zn, Ag, Au
Craigmont	M10-14	Cu-Fe skarn	Cu, Fe
Crevice Creek (McNeil)	O05-04	Cu-Au skarn	Au, Cu
Crown-Point, Kenai-Alaska	P06-39	Au quartz vein	Au
Daika Novaya	P55-17	Au quartz vein	Au
Dalnee	R54-04	Polymetallic vein	Pb, Zn
Dalnegorsk	L53-27	Boron skarn	B
Dalnetayozhnoe	L53-16	Sn polymetallic vein	Sn, Pb, Zn
Dalny	Q57-01	Porphyry Cu-Mo and polymetallic vein	Cu, Mo, Au
Daniels Creek, (Bluff)	Q03-16	Au quartz vein	Au, Ag
Darpir	Q54-10	Au quartz vein	Au
Darpir	Q55-08	Sn silicate-sulfide vein	Sn
Datsytovoe	P56-02	Porphyry Cu	Cu, Ag, Bi
Dawson	N08-07	Polymetallic vein	Au
Death Valley	Q03-11	Sediment-hosted U	U
DeCourcey Mountain	P04-09	Hot-spring Hg	Hg, Sb, As

Deposit Name	Deposit Number	Deposit Type	Major Metals
Degdekan	P55-28	Au quartz vein	Au
Delta District	P06-20	Kuroko massive sulfide	Pb, Zn, Cu, Ag, Au
Delyuvialnoe	Q53-11	Granitoid-related Au	Au
Democrat (Mitchell Lode)	Q06-23	Granitoid-related gold	Au, Ag, Pb, Sb
Dempsey Pup	Q06-11	Sb-Au vein or polymetallic vein(?)	Sb, Au(?)
Denali (Pass Creek)	P06-14	Besshi massive sulfide?	Cu, Ag
Deputatskoe	R54-08	Sn polymetallic vein(?)	Sn
Dies	O54-06	Cu skarn	Cu
Dioritovoe	Q01-11	Sn polymetallic vein	Sn
Dirin-Yuryak	Q54-22	Au quartz vein	Au
Djaktardakh	R54-09	Sn polymetallic vein	Sn
Djelgala-Tyellakh	P55-24	Au quartz vein	Au
Dneprov	P56-42	Sn silicate-sulfide vein and Sn greisen	Sn
Dogdo	Q54-02	Volcanic-hosted Hg	Hg
Dokhsun	R55-04	Polymetallic vein	Pb, Zn, Cu
Donlin Creek	P04-22	Porphyry Au	Au
Dorothy	N09-12	Porphyry Cu-Mo	Cu, Mo
Dorozhnoe	P55-14	Au quartz vein	Au
Draznyaschy, Upryamy	R59-10	Au-Ag epithermal vein	Au
Drenchwater	R04-04	Sedimentary Zn-Pb and (or) kuroko massive sulfide	Zn, Pb, Ag
Driftpile Creek (Saint, Roen)	O10-02	Sedimentary exhalative Pb-Zn	Pb, Zn, Ba
Druchak	P57-11	Au-Ag epithermal vein	Ag, Au
Duet	O53-04	Au quartz vein	Au
Dukat	P56-18	Au-Ag epithermal vein	Ag, Au
Duke Island	N09-37	Zoned mafic-ultramafic Cr-PGE	Cr, PGE
Duncan Lake Area	M11-17	Sedimentary exhalative Zn-Pb	Pb, Zn
Dushnoe	L56-01	Cu-Pb-Zn polymetallic vein	Cu, Zn, Pb
Dvoinoi	R60-01	Au quartz vein	Au
Dyabkhanya	Q52-15	Au polymetallic vein	Au, Ag
Dzhagdag	O53-13	Basaltic Cu	Cu
Dzhalinda	M52-02	Rhyolite-hosted Sn	Sn
Dzhalkan	P53-01	Basaltic Cu	Cu
Dzhaninskoe	N53-04	Anorthosite apatite Ti-P	Ti, P
Dzhaton	P54-17	Pb-Zn polymetallic vein	Pb, Zn, Ag
Dzhuotuk	R53-02	Au quartz vein	Au
Eagle C3	Q07-04	Podiform Cr(?)	PGE
Eagle Creek	Q03-17	Felsic plutonic U	U, Th, REE
Eaglehead (Eagle)	O09-08	Porphyry Cu-Mo	Cu, Mo
Eaglet (Quesnel Lake)	N10-09	F vein	F
Ear Mountain area, (Winfield)	Q03-02	Sn skarn	Sn, Cu, Ag, Pb, Zn
Ebeko	M57-02	Sulfur-sulfide	S, FeS2
Ecstall	N09-23	Kuroko Zn-Pb-Cu massive sulfide	Zn, Cu, Au, Pb, Ag, Fe
Ege-Khaya	Q53-01	Sn polymetallic vein	Sn, Zn
Egorlyk	P56-03	Sn silicate-sulfide vein	Sn
Ekspeditsionnoe	P56-40	Au quartz vein	Au
Ekug	Q01-05	Porphyry Sn or Sn greisen	Sn, W
Ellamar	P06-31	Besshi massive sulfide	Cu, Au, Ag
Elmaun	Q01-09	Sn silicate-sulfide vein	Sn
Elombal, Yakor	Q58-02	Sb-Au vein?	Au, As, Sb
Elveney	R59-11	Au sulfide disseminated	Au, As
Emerald-Invincible	M11-38	W skarn	W, Mo
Endako	N10-04	Porphyry Mo	Mo
Enichan-Tolono	R52-07	Au quartz vein	Au
Enmyvaam	Q59-02	Au-Ag epithermal vein	Au, Ag
Enpylkhkan	Q01-12	Pb-Zn skarn	Pb, Zn, Cu, Ag
Equity Silver (Sam Goosly)	N09-22	Ag polymetallic vein	Ag, Cu
Erel	Q54-20	Clastic sediment-hosted Hg	Hg
Ergelyakh	P54-02	Granitoid-related Au	Au
Erickson	P07-17	Basaltic Cu	Cu
Erikag	Q53-22	Sn quartz vein	Sn

Deposit Name	Deposit Number	Deposit Type	Major Metals
Erikson-Ashby	O08-10	Kuroko Zn-Pb-Ag massive sulfide and Zn Skarn	Ag, Pb, Zn, Au
Erulen	Q02-04	Sn silicate-sulfide vein	Sn
Eruttin	Q01-08	Sn silicate-sulfide vein	Sn
Eskay Creek-21B Zone	O09-19	Kuroko Zn-Pb-Cu massive sulfide	Au, Ag, Pb, Zn, Cu
Esotuk Glacier	R06-01	Pb-Zn skarn and fluorite vein	Pb, Zn, Sn, Cu, W
Ester Dome	Q06-21	Polymetallic vein(?)	Au, Ag
Etandzha	O54-08	Porphyry Cu-Mo	Cu, Mo
Evenskoe	P57-14	Au-Ag epithermal vein	Au, Ag
Ezop	N53-23	Sn polymetallic vein	Sn
Faro (Anvil)	P08-08	Sedimentary exhalative Pb-Zn	Zn, Pb, Ag
Fasolnoe	K53-04	Polymetallic vein	Pb, Zn
Festivalnoe	M53-06	Sn quartz vein	Sn
Fidalgo-Alaska, Schlosser	P06-33	Besshi massive sulfide(?)	Cu, Zn
Fish Lake	P06-15	Gabbroic Ni-Co	Cr, Ni
Fish Lake	M10-01	Porphyry Cu-Mo	Cu, Au
Fish River (Big Fish, Boundary, Rapid)	R08-01	Stratabound Fe-P	Fe, P, Mn, Gems
Fog Lake (Pond)	O05-02	Au-Ag epithermal vein	Au, Cu, Ag
Forgetmenot Pass	N11-01	Stratbound gypsum	Gypsum
Fort Knox	Q06-17	Granitoid-related gold	Au, Ag, Mo
Fortyseven Creek	P04-15	Polymetallic vein(?)	Au, W
Fox Hills	P04-19	Porphyry Mo	Mo
Frasergold (Eureka Peak, Kay, Mac)	N10-10	Au quartz vein	Au
Frost	Q04-02	Cu-Zn-Pb-Ba vein	Cu, Zn, Pb, barite
Funter Bay	O08-32	Gabbroic Ni-Cu	Cu, Ni, Co
Gagaryah	P05-18	Sedimentary exhalative barite (Pb-Zn)	Ba
Gal-Khaya	R54-11	Carbonate-hosted Hg	Hg
Galamskoe	N53-11	Volcanogenic Fe	Fe
Galena Creek	R07-03	Polymetallic vein	Cu, Zn, Pb, Ag
Galimoe	P56-23	Sn silicate-sulfide vein	Sn, Ag
Galochka	Q52-11	Au quartz vein	Au
Galore Creek (Stikine Copper)	O09-15	Porphyry Cu-Au, Cu-Au skarn	Cu
Gambier Island	M10-18	Porphyry Cu-Mo	Cu, Mo
Gar	N52-06	Volcanogenic Fe	Fe
Gayna River	Q09-01	Southeast Missouri Pb-Zn	Zn, Pb
Gayumskoe	N53-02	Anorthosite apatitie Ti-P	Ti, P
Gerbikanskoe	N53-12	Volcanogenic Fe	Fe
Geroe Creek	Q06-04	Porphyry Cu-Mo	Cu, Mo
Gertrude Creek, Griffen, Ruth Creek	Q06-07	Sb-Au vein	Au, Sb
Giant Copper (Canam, A.M.)	M10-29	Porphyry Cu-Mo	Cu, Mo
Giant Nickel (Pride of Emory)	M10-28	Gabbroic Ni-Cu	Ni, Cu
Gibraltar (Pollyanna, Granite Mt)	N10-07	Porphyry Cu-Mo	Cu, Mo
Glacier Creek	O08-20	Kuroko massive sulfide	Ba, Cu, Zn
Glacier Fork	P05-20	Cu-Zn skarn	Cu, Au
Glacier Gulch (Hudson Bay Mountain)	N09-16	Porphyry Mo	Mo
Glinyanoe	L53-12	Au-Ag epithermal vein	Au, Ag
Glukhariny	Q56-05	Au quartz vein	Au
Gnat Lake Area (June, Stikine)	O09-09	Porphyry Cu	Cu
Gold King	P06-27	Au quartz vein	Au
Gold Standard (Helm Bay)	N08-14	Au quartz vein	Au
Golden Horn, Minnie Gulch, Malemute, Iditarod (Flat District)	P04-07	Polymetallic vein or Sb-Au vein	Au, Ag, Sb, Hg, W
Golden Zone	P06-08	Polymetallic vein and Au-Ag breccia pipe or Cu-Au porphyry	Au, Cu, Zn, As, Sb, Ag, Pb
Goldstream	N09-34	Au quartz vein	Au, Cu, Pb, Zn

Deposit Name	Deposit Number	Deposit Type	Major Metals
Goldstream (Pat)	M11-05	Besshi massive sulfice	Cu, Zn, Ag
Goletsov (Golets)	P56-17	Au quartz vein	Au
Golovninskoe	K55-01	Sulfur-sulfide.	S, FeS
Gora Krassnaya	Q60-04	Porphyry Cu-Mo	Mo, Cu, Au
Gora Sypuchaya	R59-07	Au quartz vein and Au-sulfide disseminated	Au
Gornoe	Q56-02	Southeast Missouri Pb-Zn	Pb, Zn
Gornoe Ozero	O53-01	Carbonatite-related REE	REE, Ta, Nb
Gornostai	Q59-04	Au-Ag epithermal vein	Au, Ag
Goz Creek Area (Barrier Reef)	Q08-05	Southeast Missouri Pb-Zn	Zn, Pb
Granetnoe	Q01-06	Porphyry Mo	Mo
Granduc (South Leduc)	O09-25	Besshi massive sulfide	Cu
Granisle	N09-15	Porphyry Cu-Au (Mo)	Cu, Au, Ag
Granite	P06-36	Au quartz vein	Au
Granite Mountain	P08-06	Porphyry Cu-Mo	Cu, Mo
Gravity (BA)	P09-02	Sedimentary exhalative Ba	Ba
Greens Creek	O08-15	Kuroko Zn-Pb-Cu massive sulfide	Ag, Zn, Au, Pb
Grisha	P57-01	Au-Ag epithermal vein	Au, Ag
Groundhog Basin	O08-31	Polymetallic vein(?), Sn granite, Porphyry Mo	Ag, Pb, Zn
Guan-Ti (Arkhimed)	P54-20	Porphyry Mo	Mo, W
H.B. (Zincton)	M11-36	Sedimentary exhalative Pb-Zn	Zn, Pb, Ag
Haines	O08-06	Zoned mafic-ultramafic Fe-Ti	Fe, Ti
Halibut Bay	O05-09	Podiform Cr	Cr
Hannum Creek	Q03-08	Metamorphosed sedimentary exhalative Zn-Pb?	Pb, Zn, Ag
Harper Creek	M11-03	Cyprus massive sulfide	Cu, Ag, Au
Hart River	Q08-02	Sedimentary exhalative Zn-Cu-Pb	Zn, Cu, Ag
Hedley Camp (Nickel Plate, Mascot, and others)	M10-32	Au skarn	Au, Ag
Hi-Mars (Lewis Lake)	M10-35	Porphyry Cu-Mo	Cu, Mo
Highland Bell (Beaverdell)	M11-28	Ag polymetallic vein	Ag, Pb, Zn
Highmont (Gnawed Mountain)	M10-11	Porphyry Cu-Mo	Cu, Mo
Homestake (Squaam Bay)	M11-07	Kuroko Zn-Pb-Cu massive sulfide	Ag, Pb, Zn, Au, Cu, Ba
Hopkins (Giltana)	P08-12	Cu skarn	Cu
Hot Springs Dome	Q05-11	Polymetallic vein	Pb, Ag, Zn, Au
Howards Pass (XY)	P09-12	Sedimentary exhalative Pb-Zn	Zn, Pb
Huckleberry	N09-27	Porphyry Cu-Mo	Cu, Mo
Hudson Cinnabar	Q06-08	Hg quartz vein	Hg
Ichatkin	R58-01	Sn silicate-sulfide vein	Sn
Igumen	P55-37	Au quartz vein	Au
Ikrimun	O55-01	Porphyry Cu-Mo	Cu, Mo
Ilin-Tas	Q53-14	Sn silicate-sulfide vein	Sn
Illinois Creek	Q04-12	Manto-replacement deposit (polymetallic Pn-Zn, Au)	Cu, Ag, Au, Pb, Zn
Imnekan	Q53-19	Sb vein	Sb
Imtachan	P54-08	Sn polymetallic vein	Pb, Zn, Sn
Imtachan	Q54-11	Au quartz vein	Au
Imtandzha	Q52-09	Sn polymetallic vein	Sn
In' River	M54-02	Volcanic-hosted Hg	W, Hg, Cu
Independence	P04-05	Porphyry Au	Au
Independence	Q03-09	Polymetallic vein	Pb, Ag
Indian Mountain and Purcell Mountain	Q05-14	Porphyry Cu-Au	Cu, Au
Ingagli	N53-18	Au quartz vein	Au
Innakh	Q57-02	Polymetallic vein and Porphyry Cu-Mo	Cu, Mo, Au
Inskoe	M54-07	Volcanic-hosted Hg	Hg
Ippatinskoe	M53-01	Sn quartz vein	Sn
Ir-Nimiiskoe-1	N53-08	Volcanogenic Mn	Mn
Ir-Nimiiskoe-2	N53-07	Sedimentary phosphorite	P

Deposit Name	Deposit Number	Deposit Type	Major Metals
Irbychan	P57-12	Au-Ag epithermal vein	Au, Ag
Ircha	P56-36	Porphyry Sn	Sn, Ag
Irgunei	Q58-10	Au-Ag epithermal vein	Au, Ag
Iron Mask Area (Afton, Ajax)	M10-12	Porphyry Cu-Au	Cu
Iserdek	Q52-03	Clastic sediment-hosted Hg	Hg
Island Copper (Rupert Inlet)	M09-02	Porphyry Cu-Mo	Cu, Mo, Au
It-Yuryak	P54-12	W vein, Sn (W)-quartz vein	W
Itchayvayam	P59-12	Volcanogenic Mn	Mn
Itmatinskoe	N53-14	Volcanogenic Fe	Fe
Iultin	Q01-02	Sn-W polymetallic vein and greisen	Sn, W
Ivolga	P58-08	Epithermal vein	Ag, Sn
Iyikrok Mountain	Q03-01	Podiform Cr	Cr
JC (Viola)	P09-21	Sn skarn	Sn
Jedway (Magnet, Jessie)	N09-31	Fe skarn	Fe
Jeff (Naomi, Baroid)	P09-01	Sedimentary exhalative Ba	Ba
Jersey	M11-39	Sedimentary exhalative Pb-Zn	Zn, Pb, Ag
Jim-Montana	Q06-01	Cu-Zn skarn	Cu, Zn, Ag, Pb
Johnson Prospect	P05-25	Kuroko massive sulfide	Au, Zn, Cu, Pb
Jordan River (Sunro)	M10-34	Gabbroic Cu	Cu, Ag, Au
Jualin	O08-08	Au quartz vein	Au
Julietta	P56-56	Au-Ag epithermal vein	Au, Ag
Jumbo district	N08-09	Cu-Au skarn	Fe, Ag, Au, Cu, Mo
June Creek (Baldwin, Shell)	P09-03	Sediment-hosted Cu	Cu, Ag
Kafen	L53-02	Porphyry Cu-Mo	Cu, Mo
Kagati Lake	O04-01	Sb-Hg vein	Sb, Hg
Kaiyuh Hills (Yuki River)	Q04-13	Podiform Cr	Cr
Kamenistoe	P56-29	Au quartz vein	Au
Kamenushinskoe	N52-05	Cu massive sulfide	Cu, FeS
Kandidatskoe	R55-03	Au skarn	Au, Co, As
Kandychan	P56-51	Sn polymetallic vein	Sn, Ag
Kanelyveen	R58-02	Granitoid-related Au	Au
Kapral	M53-05	Porphyry Mo	Mo
Karagin group	O58-01	Gabbroic Cu	Cu, Zn, Au, Pt, Ni, Co
Karalveem	R58-05	Au quartz vein	Au
Karamken	P56-55	Au-Ag epithermal vein	Au, Ag
Kasaan Peninsula (Mount Andrew)	N08-02	Cu-Fe skarn	Cu, Fe
Kasna Creek (Kontrashibuna)	P05-23	Cu-Fe skarn	Cu
Katenskoe	L53-03	Zoned mafic-ultramafic Ti	Ti
Kathleen-Margaret	P06-17	Cu-Ag quartz vein	Cu, Ag, Au
Kawisgag (Ivanof)	N04-01	Porphyry Cu and (or) polymetallic vein	Cu, Mo, Au
Kegali	P57-08	Au-Ag epithermal vein	Au, Ag
Kekur	R59-01	Sn silicate-sulfide vein	Sn
Kemess (Kemess N., Kemess S.)	O09-16	Porphyry Cu-Au	Cu, Au
Kemuk Mountain	O04-02	Zoned mafic-ultramafic	Fe, Ti, PGE
Kennecott District	P07-13	Kennecott Cu	Cu, Ag
Kennedy Lake (Brynnor)	M10-25	Fe skarn	Fe
Keno Hill (Galena Hill)	P08-01	Ag polymetallic vein	Ag, Pb, Zn, Cd
Kensington	O08-08	Au quartz vein	Au
Kere-Yuryak	Q53-12	Sn-W greisen	Sn, W
Kerr (Main Zone)	O09-21	Porphyry Cu-Au	Cu, Au, Ag
Kester	Q53-05	Sn greisen	Sn, Ta, Nb, Li
Ketchem Dome	Q06-14	Sn greisen	Sn
Khaardak	P54-16	Sn polymetallic vein	Sn
Khakandya	P56-47	Porphyry Mo	Mo
Khakandzhinskoe (Khakandzha)	P54-24	Au-Ag epithermal vein	Au, Ag
Khamna	O53-05	Carbonatite-related REE	REE, Nb
Khangalass	Q55-06	Au quartz vein	Au
Khaptagai-Khaya	Q54-13	Au quartz vein	Au

Deposit Name	Deposit Number	Deposit Type	Major Metals
Kharan	P55-29	Sn polymetallic vein	Sn
Kharga	N53-20	Au quartz vein	Au
Khataren-Industrial	P56-20	Sn silicate-sulfide vein	Sn
Khatynnakh-Sala	R54-13	Au quartz vein	Au
Khayyam	N08-08	Kuroko massive sulfide	Cu, Au
Khenikandja	P55-30	Sn silicate-sulfide and Sn polymetallic vein	Sn
Kheta	P56-43	Sn polymetallic vein	Sn, Zn, Pb, Cu, Bi, Ag
Khetagchan	P57-07	Granitoid-related Au	Au, W, Bi
Khingan	M52-01	Sn greisen	Sn
Kholbolok	Q52-07	Clastic sediment-hosted Hg	Hg
Khomustak	R56-01	Sn greisen	Sn
Khoron	P54-13	Sn polymetallic vein	Sn
Khotoidokh	Q54-04	Kuroko Pb-Zn massive sulfide	Pb, Zn, Ag
Khoton-Khaya	Q53-04	Sn-polymetallic vein, Sn silicate-sulfide vein	Sn
Khrustal (Khrustalnoe)	P58-09	Sn polymetallic vein	Sn
Khrustalnoe	L53-32	Sn silicate-sulfide vein	Sn
Khunkhada	Q53-21	W-Sn skarn	W, Sn
Khuren	P55-41	Sn polymetallic vein	Sn
Khvoshchovoe	L53-01	Porphyry Cu-Mo	Cu, Mo
Kijik River	P05-22	Polymetallic vein and porphyry Cu	Cu, Mo
Kilokak Creek	O04-04	Polymetallic vein(?)	Pb, Zn
Kinzhal	P56-28	Sn silicate-sulfide vein	Sn
Kirganik	N57-05	Porphyry Cu-Mo	Cu, Au
Kirovskoe	N51-03	Granitoid-related Au	Au
Kitkhoi	N57-15	Au-Ag epithermal vein	Au, Ag, Zn, Pb
Kitsault (BC Moly)	N09-09	Porphyry Mo	Mo
Klen	Q57-03	Au-Ag epithermal vein	Au, Ag
Klukwan	O08-05	Zoned mafic-ultramafic Fe-Ti	Fe, PGE, Ti, V
Knight Island, Pandora	P06-41	Cyprus massive sulfide	Cu
Koksharovskoe	L53-30	Zoned mafic-ultramafic Ti	Ti
Kolkhida	P56-52	Au-Ag epithermal vein	Ag, Au, Sn
Komissarovskoe (Vorob'eva plad)	L52-01	Au-Ag epithermal vein	Au, Ag
Kondakovskoe	R55-05	Southeast Missouri Pb-Zn	Pb, Zn
Kondyor	O53-11	Zoned mafic-ultramafic Cr-PGE	Pt
Kontrandya	P55-09	Au quartz vein	Au
Kootenay River Gypsum	M11-19	Strataform gypsum	Gypsum
Kopach	Q56-04	Au quartz vein	Au
Koshkina	M57-01	Polymetallic vein	Cu, Zn, Pb
Kougarok	Q03-06	Sn greisen with Ta and Nb	Sn, Ta, Nb
Krasivoe	O54-05	Au-Ag epithermal vein	Au, Ag
Krasnogorskoe	L53-33	Polymetallic vein	Pb, Zn
Krasnogorskoe	N57-12	Porphyry Cu-Mo	Mo
Krassnaya Gora	P60-04	Podiform Cr	Cr, PGE
Krassnaya Gorka	P59-08	Clastic sediment-hosted Hg or hot-spring Hg?	Hg
Krinichnoe	K53-07	Granitoid-related Au	Au
Krishtofovich Volcano	L55-01	Sulfur-sulfide	S, FeS2
Krokhalin	P56-25	Sb-Au vein (simple Sb)	Sb, Au
Kubaka	P57-03	Au-Ag epithermal vein	Au, Ag
Kuekvun	R60-06	Granitoid-related Au	Au, Bi, Te, Sn, W
Kuibiveen	P59-06	Porphyry Cu-Mo	Mo, Cu, Au
Kukenei	R60-03	Sn polymetallic vein	Sn, Ag
Kulpolney	Q58-04	Volcanic-hosted Hg	Hg
Kumroch	N57-02	Au-Ag epithermal vein	Au, Ag, Cu, Pb, Zn
Kunarev	P56-04	Pb-Zn-Cu-Ag skarn	Pb, Zn, Cu, Ag
Kuolanda	Q52-02	Ag polymetallic vein	Pb, Zn, Ag
Kuranakh-Sala	P55-10	Sn silicate-sulfide vein	Sn

Deposit Name	Deposit Number	Deposit Type	Major Metals
Kurpandja	P53-02	Sediment-hosted Cu	Cu
Kurumskoe	N53-13	Volcanogenic Fe	Fe
Kutcho Creek (Sumac, Esso)	O09-11	Kuroko Zn-Pb-Cu massive sulfide	Cu, Zn, Pb
Kuvalorog	N57-14	Hornblendite peridotite Cu-Ni	Ni, Cu, Co, Pt
Kuy	O05-03	Au-Ag epithermal vein	Au, Ag, Cu
Kuzmichan	P56-27	Clastic sediment-hosted Hg or hot-spring Hg?	Hg
Kvinum	N57-13	Gabbroic Cu-Ni	Ni, Cu, Co, Au, Pt
Kyongdei	R52-02	Sediment-hosted U	U
Kysylga	Q53-02	Au-Ag epithermal vein	Au, Ag
Kyttamlai	R59-08	Clastic sediment-hosted Hg or hot-spring Hg?	Hg, Sb
Kyuchyuss	R53-06	Sb-Au-Hg vein	Au, Hg, Sb
Kyurbelykh	P55-15	Sn silicate-sulfide vein and Sn polymetallic vein	Sn
Lagapskoe	N53-10	Sedimentary phosphorite	P
Lalankytap	P59-07	Porphyry Cu-Mo	Mo, Cu
Lamut	Q59-11	Volcanic-hosted Hg	Hg
Langeriiskoe	M54-03	Au quartz vein	Au
Laryukov	P56-31	Au quartz vein	Au
Lassie Lake Area (Blizzard)	M11-26	Paleoplacer U	U
Lastochka	Q58-11	Mo greisen and vein	Mo
Latouche, Beatson	P06-13	Besshi massive sulfide(?)	Cu, Ag, Zn
Lazo	P56-07	Sn silicate-sulfide vein	Sn
Lazo	Q53-08	Au quartz vein	Au
Lazurnoe	L53-39	Porphyry Cu-Mo	Cu, Mo
Leguil Creek (Letain)	O09-02	Bedded barite	Ba
Lened (Rudi, Godfrey)	P09-13	W skarn	W, Cu
Lenotap	Q01-03	Au quartz vein	Au
Lermontovsky	L53-05	W skarn and greisen	W
Letain (Kutcho Creek)	O09-10	Serpentine-hosted asbestos	Asbestos
Levo-Dybin	P54-10	Granitoid-related Au	Au, W, Bi
Liberty Bell	Q06-22	Kuroko massive sulfide(?) or polymetallic gold vein	Au, Ag, Cu, Bi
Lidovskoe	L53-34	Pb-Zn polymetallic vein	Pb, Zn
Lik	R03-01	Sedimentary exhalative Zn-Pb-barite	Zn, Pb, Ag, Barite
Lime Peak	Q06-09	Sn greisen and Sn vein	Sn, Ag, Zn, U, W
Lime Point	N08-11	Bedded barite	Ba
Lodestone Mountain Area	M10-30	Zoned mafic-ultramafic Fe-V	Fe, V
Logan	P09-17	Zn-Ag polymetallic vein	Zn, Ag
Logtung (Logjam Creek)	P09-22	Porphyry W-Mo	W, Mo
London and Cape	P07-11	Porphyry Cu-Mo	Cu, Mo, Ag
Lornex	M10-10	Porphyry Cu-Mo	Cu, Mo
Lorraine (Duckling Creek)	N10-01	Porphyry Cu-Mo	Cu
Loshadinayagriva (Main)	M53-03	Sn quartz vein	Sn
Lost River	Q03-05	Sn-W skarn, Sn greisen, Carbonate-replacement Sn(?)	Sn, W, F, Be
Lower Liard (Gem, Tee, Tam)	O09-03	Southeast Missouri Ba-F	F, Ba
Lucky Hill, Timberline Creek	P06-23	Au quartz vein	Au, Ag
Lucky Ship	N09-19	Porphyry Mo	Mo
Lucky Strike (Palmer Creek)	P06-37	Au quartz vein	Au
Lugun	O53-06	Southeast Missouri Pb-Zn	Pb, Zn
Lunnoe	R60-05	Sn silicate-sulfide vein	Sn, W
Lussier River (United Gypsum)	M11-25	Strataform gypsum	Gypsum
Lyapganai	P59-11	Clastic sediment-hosted Hg or hot-spring Hg?	Hg, Sb
Lyglykhtakh	P56-12	Sedimentary Mn	Mn
Lynn Creek	M10-26	Zn-Pb skarn	Zn, Pb
Lyukamskoe	M54-05	Volcanogenic Mn	Mn
MacKenzie Basin	Q10-01	Stratform salt	Salt
MacMillan Pass (Tom, Jason	P09-06	Sedimentary exhalative Pb-Zn	Pb, Zn, Ag, Ba

Deposit Name	Deposit Number	Deposit Type	Major Metals
East, Jason Main)			
MacTung (MacMillan Tungsten)	P09-05	W skarn	W, Cu
Maggie (Bonaparte River)	M10-06	Porphyry Cu-Mo	Cu, Mo
Magnetite Island (Tuxedni Bay)	P05-24	Fe skarn	Fe, Ti
Maimakanskoe	N53-03	Anorthosite apatite Ti-P	Ti, P
Maiskoe	R59-06	Disseminated Au-sulfide	Au, As, Sb, Ag
Malakhitovoe	L53-04	Porphyry Cu-Mo	Cu, Mo
Malakhitovoe	N57-09	Porphyry Cu-Mo	Cu, Mo
Maldyak	P55-13	Au quartz vein	Au
Maletoivayam	P58-13	Sulfur-sulfide	S
Malinovskoe	L53-21	Porphyry Cu	Cu
Mallard Duck Bay	O04-07	Porphyry Cu-Mo and(or) polymetallic vein(?)	Cu, Mo
Malomyr	N52-04	Au quartz vein	Au
Maltan	Q54-29	Sb-Au vein	Au, Sb
Maltan Stock	P56-41	Granitoid-related Au	Au, Bi, Te
Maly Ken	P56-16	Sn polymetallic vein	Sn, Ag
Maly Komui	O53-14	Cu skarn	Cu
Maly Peledon	Q59-03	Au-Ag epithermal vein	Au, Ag
Malyutka	O53-09	Au quartz vein	Au
Manganiler	R52-01	Southeast Missouri Pb-Zn	Pb, Zn
Mississippi Pb, Zn			
Mangazeika	Q52-12	Ag polymetallic vein	Pb, Ag
Marg	P08-02	Kuroko Zn-Pb-Cu massive sulfide	Zn, Pb, Cu, Ag, Au
Margerie Glacier	O08-21	Porphyry Cu and lesser polymetallic vein	Cu, Ag, Au
Marysville	M11-30	Strataform magnesite	Magnesite
Mastadon (J&L)	M11-10	Sedimentary exhalative Pb-Zn (?)	Zn, Pb, Au, Ag
Matachingai	Q01-07	Silica-carbonate Hg	Hg
Matt Berry	P09-15	Sedimentary exhalative Pb-Zn	Pb, Zn, Ag, Cu, Sb
McGinnis Glacier	P06-05	Kuroko massive sulfide	Zn, Cu, Pb, Ag
McLean Arm district	N08-13	Porphyry Co-Mo	Co, Mo
McLeod	P04-01	Porphyry Mo	Mo
McMillan (Quartz Lake)	P09-19	Pb-Zn skarn and manto	Pb, Zn, Ag
Mechta	P56-15	Ag-Pb-Zn vein , Polymetallic vein(?)	Ag, Pb, Zn
Medfra	P05-02	Fe skarn	Fe, Cu, Zn, Au
Medgora	Q57-06	Mo-Cu skarn	Mo, Cu
Mel (Otter Creek)	P09-20	Sedimentary exhalative Pb-Zn	Pb, Zn, Ba
Melyul	Q02-03	Pb-Zn-(Cu)-Ag skarn	Pb, Zn, Ag, (Cu)
Michigan Creek	Q05-03	Kuroko massive sulfide	As, Au, Ag, Cu, Zn, Pb
Midas	P06-30	Besshi massive sulfide(?)	Cu, Ag, Au, Zn
Midas (Berg Creek)	P07-12	Cu-Au skarn	Au, Cu, Ag
Midway (Silver Tip)	O09-01	Pb-Zn-Ag skarn and manto	Ag, Pb, Zn
Mike	O04-05	Porphyry Mo	Mo
Milkanskoe	N53-09	Volcanogenic Fe	Fe
Miller House	Q06-13	Au-As polymetallic vein	Au
Millie Mack	M11-20	Au-Ag polymetallic vein	Au, Ag
Mineral King	M11-24	Zn-Pb skarn and manto	Zn, Pb, Ag
Mineral King (Herman and Eaton)	P06-35	Au quartz vein	Au
Minto Copper (Def)	P08-04	Porphyry Cu-Au	Cu
Mirror Harbor	O08-26	Gabbroic Ni-Cu	Ni, Cu
Misheguk Mountain	R04-02	Podiform Cr	Cr, PGE
Miss Molly (Hayes Glacier)	P05-21	Porphyry Mo	Mo
Mission Creek, Headwall, Louise, and Owhat Prospect	P04-11	Polymetallic vein	Au, Ag, Cu, As
Mitrei	Q55-02	Au quartz vein	Au
Miyaoka, Hayes Glacier	P06-04	Kuroko massive sulfide	Cu, Pb, Zn, Au, Ag

Deposit Name	Deposit Number	Deposit Type	Major Metals
Mnogovershinnoe	N54-02	Au-Ag epithermal vein	Au, Ag
Moinskoe	M54-11	Porphyry Mo	Mo
Molybdenitovy	P54-19	Porphyry Mo	Mo
Molybdenum Mountain	P04-20	Porphyry Mo	Mo
Monarch, Cub Bear, American	Q03-18	Stratabound Fe-Mn	Fe, Mn, F
Monarch, Jewel	P06-34	Au quartz vein	Au
Monarch (Kicking Horse)	M11-11	Southeast Missouri Pb-Zn	Zn, Pb, Ag
Moonshine	N08-10	Carbonate-hosted massive sulfide	Ag, Pb
Moose (Spartan, Racicot)	P09-08	Sedimentary exhalative Ba	Ba
Mopau	M54-08	Porphyry Sn	Sn
Morrison	N09-13	Porphyry Cu-Au (Mo)	Cu, Ag, Au
Mosquito	P07-01	Porphyry Cu-Mo	Cu, Mo
Moth Bay	N09-35	Kuroko massive sulfide	Cu, Zn
Mount Brussilof (Baymag)	M11-16	Stratabound Mg	Magnesite
Mount Copeland	M11-08	Porphyry Mo	Mo
Mount Hurst	P04-02	Podiform Cr	Cr, PGE
Mount Igikpak and Arrigetch Peaks	Q05-01	Polymetallic vein, Au quartz vein, Sn skarn, Cu-Pb-Zn skarn	Cu, Pb, Zn, Ag, Au, Sn, W, As
Mount Milligan	N10-02	Porphyry Cu-Au	Cu, Au
Mount Ogden (Nan, Moly-Taku)	O08-12	Porphyry Mo	Mo
Mount Thomlinson	N09-10	Porphyry Mo	Mo
Moyie (St. Eugene)	M11-41	Ag polymetallic vein	Pb, Ag
Mramornoe	R60-09	Sn polymetallic vein	Sn, Ag
Mt. Haskin West (Joem, Rain, Moly Zone)	O09-06	Porphyry Mo-W, Mo skarn	Mo, W
Mt. Polley (Cariboo-Bell)	N10-08	Porphyry Cu-Au	Cu, Au
Mt.Sicker Area (Lenora-Tyee, Twin J, Lara, Copper Canyon)	M10-33	Kuroko Zn-Pb-Cu massive sulfide	Cu, Zn, Ag
Muddy Lake (Golden Bear, Totem)	O08-19	Au quartz vein	Au
Muromets	O53-08	Cu-Mo skarn	Cu, Mo, W
Mutnovskoe	N57-17	Au-Ag epithermal vein	Au, Ag, Cu, Zn, Pb
Mymlerennet	Q60-03	Sn silicate-sulfide vein	Sn
Nabesna Glacier and adjacent areas.	P07-08	Polymetallic vein(?)	Cu, Zn, Au
Nabesna, Rambler	P07-06	Fe-Au skarn	Au
Nadezhda	P56-22	Au quartz vein	Au
Nadina (Silver Queen)	N09-21	Ag polymetallic vein	Zn, Pb, Ag, Au, Cu
Nakhtandjin, Lora	O56-03	Porphyry Cu	Cu
Nanika (DW, New Nanik)	N09-24	Porphyry Cu-Mo	Cu
Natalka	P55-32	Au quartz vein	Au
Nelkanskoe	N53-06	Sedimentary phosphorite	P
Nelson (Glacier Creek)	P07-16	Kennecott Cu	Cu, Ag
Neptun	P59-09	Clastic sediment-hosted Hg or hot-spring Hg?	Hg, Sb, As
Nesterovskoe	L53-13	Porphyry Cu	Cu
Netchen-Khaya	P56-37	Granitoid-related Au	Au, Mo, Bi
Nevenrekan	P57-17	Au-Ag epithermal vein	Au, Ag
Nevskoe	P56-24	Porphyry Sn	Sn, W, Se
Nezhdaninka	P54-14	Au quartz vein	Au, Ag
Niblack	N08-12	Kuroko massive sulfide	Cu, Au, Ag
Nick	Q08-03	Sedimentary exhalative Ni-Zn	Ni, Zn, PGE
Nikolaevskoe	L53-28	Pb-Zn Skarn	Pb, Zn
Nikolaevskoe, Otkrytoe	R52-03	Au quartz vein	Au
Nikolai	P07-14	Cu-Ag quartz vein	Cu, Ag
Nim, Nimbus, Silver King	P06-09	Polymetallic vein and Porphyry Cu(?)	Au, Ag, Cu
Nimiuktuk	R04-03	Bedded barite	Barite
Nivandzha	P54-21	Polymetallic vein	Pb, Zn, Ag
Nixon Fork-Medfra	P05-04	Cu-Au skarn	Au, Cu, Ag, Bi, Sn, W,

Deposit Name	Deposit Number	Deposit Type	Major Metals
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Nizhnee	K53-02	Sn polymetallic vein	Sn, Pb, Zn
Nochnoe	M54-09	Porphyry Cu	Cu
Nome district, Mt. Distin	Q03-13	Au quartz vein	Au
North Bradfield Canal	O09-27	Fe skarn	Fe, Cu
North-Shantarskoe	N53-05	Sedimentary phosphorite	P
Novikovskoe	L54-06	Cyprus massive sulfide(?)	Cu, Zn, Pb
Novinka	P54-18	Au quartz vein	Au
Novoe	L55-07	Sulfur-sulfide	S, FeS2
Novoe	R53-10	Granitoid-related Au	Au
Novy Djagyn	P56-14	Porphyry Sn	Sn
Nugget Creek	P07-10	Cu-Ag quartz vein	Cu, Ag
Nuka Bay District (Nualaska, Lost Creek, Alaska Hills)	O05-05	Au quartz vein	Au
Nunatak (Muir Inlet)	O08-01	Porphyry Mo-Cu	Mo
Nutekin	P60-03	Au quartz vein	Au, Hg
Nyavlenga	P56-49	Au-Ag epithermal vein	Au, Ag
O.K.	M10-13	Porphyry Cu-Mo	Cu, Mo
O'Connor River	O08-03	Stratabound gypsum	Gypsum, Anhydrite
Obyknovennoe	Q57-08	Au-Ag epithermal vein	Au, Ag
Odinokoe	R54-06	Sn greisen	Sn
Oganchinskoe	N57-07	Au-Ag epithermal vein	Au, Ag
Ohio Creek	P06-06	Sn greisen and Sn vein	Sn
Oira	P55-45	Au-Ag epithermal vein	Au, Ag
Okhotnichie	P56-33	Sn silicate-sulfide vein	Sn
Olcha	Q57-07	Au-Ag epithermal vein	Au, Ag
Olgakanskoe	N53-24	Sn greisen	Sn
Olyndja	P57-15	Au-Ag epithermal vein	Ag, Au
Olyutor	P58-12	Clastic sediment-hosted Hg or hot-spring Hg?	Hg, Sb, As
Omar	Q04-01	Kipushi Cu-Pb-Zn	Cu, Pb, Zn, Ag, Co
Omilak area	Q03-12	Polymetallic vein	Pb, Ag, Sb
Omrelkai	Q59-01	Volcanic-hosted Hg	Hg, Sb
Omulev	Q55-05	Stratabound W	W
Onello (Lider)	P53-04	Au quartz vein	Au
Opyt	P56-01	Cu-Ag quartz vein?	Cu, Au, Pb, Zn, Ag, Au
Orange Hill, Bond Creek	P07-07	Porphyry Cu-Mo and Cu-Au skarn	Cu, Mo, Au
Orange Point	O08-07	Kuroko Zn-Pb-Cu massive sulfide	Zn, Cu
Orlinoe	P57-13	Porphyry Mo	Mo
Orlovka	P59-01	Epithermal vein	Au, Zn, Cu, Hg
Oro (Buc, Mar, Dar, Tang)	P09-09	Sedimentary exhalative Ba	Ba
Oroek	Q56-06	Sediment-hosted Cu	Cu
Osennee, Oksa, Usinskoe	O56-01	Porphyry Cu-Mo	Mo, Cu
Ossolonyn	P56-38	Sn greisen	Sn
Ostrinskoe	M54-06	Silica-carbonate Hg	Hg
Owl Creek district	M10-07	Porphyry Cu-Mo	Cu, Mo
Ox Lake	N09-28	Porphyry Cu-Mo	Cu, Mo
Ozernoe	R58-04	Au quartz vein	Au
Ozernovskoe	O57-02	Au-Ag epithermal vein	Au, Ag, Te
Palyan	R59-05	Clastic sediment-hosted Hg or hot-spring Hg?	Hg
Parkhonai	Q59-10	Sn polymetallic vein and Sn silicate-sulfide vein	Sn
Parson	M11-12	Ba vein	Ba
Partin Creek	P06-11	Polymetallic vein or Cu-Ag quartz vein	Cu, Au, Ag
Partizanskoe (Soviet 2, Svetliy Otvod)	L53-26	Pb-Zn skarn	Pb, Zn
Pavel-Chokhchurskoe	R54-02	Sn polymetallic vein and greisen	Sn
Pavlik	P55-34	Au quartz vein	Au
Pebble Copper	O05-01	Porphyry Au-Cu	Au, Cu, Mo
Pelvuntykoinen	R59-12	Granitoid-related Au	Au, Bi, Te

Deposit Name	Deposit Number	Deposit Type	Major Metals
Pepenveem	Q01-10	Au-Ag epithermal vein	Au, Ag
Perseverance	Q04-11	Polymetallic vein(?)	Pb, Ag, Sb
Pervenets	P59-05	Silica-carbonate Hg	Hg, As, Sb
Peschanka	Q58-05	Porphyry Cu-Mo	Cu, Mo, Au
Phoenix-Greenwood District	M11-31	Cu-Au skarn	Cu, Au, Ag, Fe
Pil	P54-01	Au quartz vein	Au
Pinchi Lake	N10-03	Silica-carbonate Hg	Hg
Pioneer	N52-02	Granitoid-related Au	Au
Plamennoe	R60-08	Volcanic-hosted Hg	Hg, Sb
Plastun	L53-29	Porphyry Cu	Cu
Pobeda	Q56-03	Ironstone	Fe
Podgornoe	P56-19	Au-Co-As vein	Au, Co, Bi, Te, (As)
Poiskovoe	N53-15	Granitoid-related Au	Au
Poison Mountain (Copper Giant)	M10-04	Porphyry Cu-Mo	Cu, Mo
Pokrovskoe	N52-03	Au-Ag epithermal vein	Au, Ag
Polaris-Taku (Whitewater)	O08-18	Au quartz vein	Au, Ag, Cu, As, Sb
Polevaya	R55-06	Au-Ag polymetallic vein	Au, Ag
Polyarnoe	R54-07	Sn greisen and vein	Sn, W
Poplar	N09-20	Porphyry Cu-Mo	Cu, Mo, Ag
Porcupine Lake	R06-02	Polymetallic vein(?)	Cu, Zn, Ag, F
Porozhistoe	K53-11	Granitoid-related Au	Au
Porozhistoe	P55-33	Sn polymetallic vein	Sn
Potato Mountain	Q03-04	Sn quartz vein	Sn
Prairie Creek (Cadillac)	P10-02	Pb-Zn skarn and manto	Pb, Zn, Ag
Prasolovskoe	L55-09	Au-Ag epithermal vein.	Au, Ag
Pravourmiiskoe	M53-02	Sn greisen	Sn
Primer (North Zone)	M10-22	Porphyry Cu	Cu, Fe
Primorskoe	R56-02	Sn polymetallic vein	Sn
Prizovoe	P55-05	Bedded barite	Ba
Prognoz	Q53-17	Ag polymetallic vein	Ag, Pb
Progress	K53-10	Granitoid-related Au	Au
Prolivnoe	P55-06	Southeast Missouri Pb-Zn	Pb, Zn
Promezhutochnoe	R59-09	Au-Ag epithermal vein	Au, Ag
Prosperity-Porter Idaho	N09-01	Ag-Pb-Zn polymetallic vein	Ag, Pb, Zn
Purdy	Q07-08	Au quartz vein	Au
Pyramid	N04-03	Porphyry Cu	Cu, Au
Pyrkakai	R59-03	Porphyry Sn	Sn, W
Quartz Creek	Q04-10	Polymetallic vein	Pb, Zn, As, Ag
Quartz Hill	N09-04	Porphyry Mo	Mo
Quigley Ridge	P05-09	Polymetallic vein	Ag, Au, Pb, Zn
Rainbow Mountain	P06-19	Porphyry Cu	Cu, Ag
Rainy Creek District	P06-18	Cu-Ag skarn	Cu, Ag, Au
Ramsay-Rutherford	P06-29	Au quartz vein	Au
Rat Fork, Sheep Creek	P05-16	Cu-Pb-Zn skarn	Cu, Zn, Pb
Ray Gulch (Potato Hills, Mar)	Q08-06	W skarn	W
Rea Gold (Hilton)	M11-06	Kuroko Zn-Pb-Cu massive sulfide	Ag, Pb, Zn, Au, Cu
Ready Cash	P06-07	Polymetallic vein(?)	Au, Cu, Pb, Ag, Sn, Zn
Red Chris (Money)	O09-12	Porphyry Cu-Au	Cu, Au, (Zn, Pb, Mo)
Red Devil	P04-12	Clastic sediment-hosted Hg	Hg, Sb
Red Dog	R03-02	Sedimentary exhalative Zn-Pb-barite	Zn, Pb, Ag, Ba
Red Dog	M09-01	Porphyry Cu	Cu
Red Mountain	O05-06	Podiform Cr	Cr
Red Mountain	N09-02	Au-Ag polymetallic vein	Au, Ag
Red Mountain (Bug, Fox, Boswell R.)	P08-13	Porphyry Mo	Mo
Red Mountain Moly (Coxey, Novelty, Nevada)	M11-33	Mo skarn	Mo
Red River	N09-36	Kuroko massive sulfide	Cu, Mo
Red Rose	N09-11	W polymetallic vein	W, Au, Cu, Ag
Redbird	N09-29	Porphyry Mo	Mo

Deposit Name	Deposit Number	Deposit Type	Major Metals
Redfern L. (Egg, Foo, Be)	O10-04	Southeast Missouri Pb-Zn	Zn, Pb
Reechen	Q02-05	Fe-Pb-Zn-Sn skarn	Fe, Pb, Zn, Sn
Reef Ridge	P05-03	Southeast Missouri Pb-Zn	Zn, Pb
Reeves-MacDonald (Reemac)	M11-40	Southeast Missouri Pb-Zn	Zn, Pb, Ag
Reid Inlet	O08-22	Au quartz vein	Au, Pb
Reidovskoe	L55-04	Porphyry Mo	Mo
Rex	O04-03	Porphyry Cu	Cu, Au
Rexspar (Birch Island)	M11-02	Felsic plutonic U-REE	U, F, Sr, REE, Th
Reznikov	P58-10	Sn polymetallic vein	Sn, Ag, Au
Rifovoe	M57-04	Au-Pb-Zn epithermal vein	Au, Zn, Pb
Riondel (Blue Bell)	M11-23	Zn-Pb-Ag skarn and manto	Zn, Pb, Ag
Risby (Cab)	P08-11	W skarn	W
River Jordan (King Fissure)	M11-09	Sedimentary exhalative Zn-Pb	Pb, Zn, Ag
Riverside	O09-28	Au quartz vein or polymetallic vein	Ag, Au, Cu, Pb, W, Zn
Robb Lake	O10-05	Southeast Missouri Pb-Zn	Zn, Pb
Rock Creek	Q03-14	Au quartz vein	Au, Ag, W
Rodionov	P55-39	Au quartz vein	Au
Rodnikovoe	N57-16	Au-Ag epithermal vein	Au, Ag
Rogovik	Q56-07	Au-Ag epithermal vein	Ag, Au
Romanzof Mountains	R07-01	Polymetallic vein, Pb-Zn and possibly Sn skarn	Pb, Cu, Zn, Mo, Sn, Ag, F
Roosevelt Creek	Q05-06	Kuroko massive sulfide	Cu, Zn, Pb, Ag, Au
Rossland (Le Roi, War Eagle)	M11-34	Au-Ag polymetallic vein	Au, Ag
Roundy Creek	N09-08	Porphyry Mo	Mo
Roy Creek (former Mount Prindle)	Q06-10	Felsic plutonic U	U, Th
Ruby Creek, (Bornite)	Q04-05	Kipushi Cu-Pb-Zn	Cu, Co, Zn, Ag
Ruddock Creek	M11-01	Sedimentary exhalative Zn-Pb	Zn, Pb, Ag
Rudnikovskoe	L55-08	Sn silicate-sulfide vein	Sn, Pb, Zn
Russkoe	M55-01	Podiform Cr	Cr
Rusty Mountain (Vera, Val, Cavey)	Q08-04	Ag-Pb-Zn polymetallic vein	Ag, Pb
Rusty Springs (Termuende)	Q07-02	Southeast Missouri Zn-Pb-Ag	Ag, Zn, Cu
Rys'e	M55-02	Cyprus massive sulfide	Cu, Pb, Zn
Ryveem	R60-02	Au quartz vein	Au
Rzhavy	Q58-09	Porphyry Cu-Mo	Cu, Mo, Au
S.Q.E. (Storie, Casmo)	O09-07	Porphyry Mo	Mo
Sa Dena Hes (Mt. Hundere)	P09-18	Pb-Zn skarn and manto	Pb, Zn, Ag
Sagurskoe	N53-19	Au quartz vein	Au
Sakyryr	P54-11	Southeast Missouri Pb-Zn	Zn, CaF2
Salcha River	Q06-16	W skarn	W
Salt Chuck	N08-06	Zoned mafic-ultramaficCu-Au-PGE	Cu, Pd, Pt, Au
Salyut	L53-11	Au-Ag epithermal vein	Au, Ag
San Diego Bay	N04-04	Au-Ag epithermal vein(?)	Ag, Au, Cu, Pb, Zn
Sana	Q54-27	Au quartz vein	Au
Sardana	P53-07	Southeast Missouri Pb-Zn	Pb, Zn
Sarylakh	Q54-23	Sb-Au vein	Au, Sb
Sawtooth Mountain	Q06-06	Sb-Au vein	Sb
Schaft Creek (Liard Copper)	O09-13	Porphyry Cu-Mo	Cu, Mo
Scrafford	Q06-20	Sb-Au vein	Sb, Au
Sea Level	N09-33	Au quartz vein	Au, Ag
Sedanka (Biorka)	N03-01	Polymetallic vein	Zn, Pb, Cu
Sedoi	P57-02	Ag-Co arsenide vein and Fe-Pb-Cu-Ag-Au skarn	Ag, Co
Segenyakh	P53-03	Southeast Missouri Pb-Zn	Pb, Zn, CaF2
Mississippi Pb, Zn			
Seikimyan	Q54-26	Clastic sediment-hosted Hg	Hg
Selerikan	Q54-25	Sb vein	Sb
Senduchen	P54-05	Sb-As vein	As, Sb
Seneca (Harrison)	M10-27	Kuroko Zn-Cu-Pb massive sulfide	Zn, Cu, Pb, Ag
Senon, Utro, Serebryanoe	P55-42	Epithermal vein and volcanic-hosted	Ag, Au, Sb

Deposit Name	Deposit Number	Deposit Type	Major Metals
		Sb vein	
Sentachan	Q53-09	Sb-Au vein or clastic sediment-hosted Sb-Au	Sb
Sentyabr	P55-44	Au-Ag epithermal vein	Ag, Au
Serb Creek	N09-18	Porphyry Mo	Mo
Serdtse-Kamen	Q02-01	Pb-Zn skarn	Pb, Zn, Cu, Sn, Ag
Sergeev	P58-01	Au-Ag epithermal vein	Au, Ag
Sernaya River	L55-05	Au epithermal vein	Au, Zn, Cu
Serovskoe	Q59-08	Au-Ag epithermal vein	Au, Ag
Serpentine Hot Springs	Q03-07	Polymetallic vein	Pb, Zn, As, Ag, Au, Sn
Severny Uy	O53-12	Sediment-hosted Cu	Cu
Shakh, Zhilny	Q60-06	Au-Ag epithermal vein	Au, Ag
Shanuch	N57-04	Hornblendite peridotite Cu-Ni	Ni, Cu, Co, Au, Pt
Shcherbakovskoe	K53-03	Polymetallic vein	Pb, Zn
Sheep Creek	P06-01	Kuroko massive sulfide?	Zn, Pb, Ag, Sn
Sheep Creek Area (Kootenay Belle, and others)	M11-37	Au-Ag polymetallic vein	Au, Ag, Pb, Zn
Shell Creek	Q07-06	Ironstone	Fe
Shellabarger Pass	P05-12	Besshi massive sulfide	Cu, Ag, Fe, Zn
Shirokoe	Q55-01	Au-Ag epithermal vein	Au, Ag
Shkolnoe	P55-35	Granitoid-related Au	Au
Shturm	P55-16	Au quartz vein	Au
Shumagin	N04-07	Au-Ag epithermal vein	Au, Ag
Shurykan	R60-07	Porphyry Cu-Mo	Mo, Cu
Sigilyakh	R53-08	Sn silicate-sulfide vein	Sn
Silbak-Premier (Premier Gold)	O09-26	Au-Ag epithermal vein	Au, Ag, Pb, Zn
Silverton District (Sandon, Silver Ridge)	M11-21	Ag polymetallic vein	Ag, Pb, Zn
Singyami	Q53-20	Clastic sediment-hosted Hg	Hg
Siniktanneyak Mountain	R04-05	Podiform Cr	Cr, Ni, PGE
Sischu Creek	P05-01	Felsic plutonic U	U, Th
Skalistaya	Q60-07	Basaltic Cu	Cu
Skalistoe	K53-01	Porphyry Mo	Mo
Skarn	P57-06	Fe (ñAu, Cu, W, Sn) skarn	Fe
Skarnovoe	P56-50	Pb-Zn-Ag skarn	Zn, Pb, Ag
Skrytoe	L53-20	W skarn	W
Slate Creek	P06-21	Porphyry Cu(?)	Cu, Ag, Au
Slate Creek, Eagles Den, Caribou Creek	P05-10	Sb-Au vein	Sb
Slate Creek (Fortymile)	Q07-05	Serpentine-hosted asbestos	Asbestos
Slavyanovskoe	K52-01	As quartz vein	As
Sleitat	P04-18	Tin Greisen and Skarn	Sn, Ag, W, As
Slezovka	Q56-01	Southeast Missouri Pb-Zn	Pb, Zn
Smirnovskoe	L53-24	Polymetallic vein	Pb, Zn, Sn
Smucker	Q04-03	Kuroko massive sulfide	Cu, Zn, Pb, Ag
Snake River (Crest Iron)	Q08-01	Ironstone	Fe
Snezhnoe	P59-10	Zoned mafic-ultramafic Cr-PGE	Cr, PGE
Snip (Shan)	O09-17	Au-Pb-Zn polymetallic vein	Au
Snippaker Creek (E & L)	O09-18	Gabbroic Ni-Cu	Ni, Cu
Snow Gulch-Donlin	P04-10	Sb-Au vein	Sb, Au, As, Hg
Snowfields (Sulphurets)	O09-22	Au-Ag polymetallic vein	Au, Ag
Sof'ya	L55-03	Au epithermal vein	Au
Sokh	Q54-18	Au quartz vein	Au
Solkuchan (Khatys)	Q54-14	Sn polymetallic vein	Ag, Sn
Solnechnoe	M53-04	Sn quartz vein	Sn
Solur	R53-05	Granitoid-related Au	Au
Sopka Rudnaya	R60-04	Au-Ag epithermal vein	Au, Ag
Soyuz	K53-05	Au-Ag epithermal vein	Ag, Au
Spiridonovskoe	L55-11	Sn polymetallic vein	Sn, Pb, Zn
Spiridonych, Teply	P57-19	Au-Ag epithermal vein	Au, Ag
Spirit Mountain	P06-26	Gabbroic Ni-Cu	Ni, Cu, Co, Ag

Deposit Name	Deposit Number	Deposit Type	Major Metals
Spruce Creek	P05-07	Polymetallic vein	Au, Ag, Pb, Zn, Sb
Sprut	P58-06	Au-Ag epithermal vein	Ag, Au
Sredne-Ichuveem	R59-04	Au quartz vein	Au
Srednekan	P56-26	Au quartz vein	Au
Stakhanov	P55-12	Au quartz vein	Au
Stampede	P05-06	Sb-Au vein	Sb
Stepovich Lode	Q06-19	W skarn	W, Au
Stibnitovoe	P54-06	Sb vein	Sb
Story Creek	R04-06	Pb-Zn-Au-Ag vein	Pb, Zn, Ag, Au
Sukakpak Mountain	Q06-02	Sb-Au vein	Au, Sb, Mo
Sukharikovskie Grebni	N57-01	Au-Ag epithermal vein	Au, Ag
Sukhoe	L54-03	Au-Ag epithermal vein	Au, Ag
Sukhoi Creek	M54-10	Porphyry Cu-Mo	Cu, Mo
Sullivan (Kimberley)	M11-29	Sedimentary exhalative Pb-Zn	Pb, Zn, Ag
Sulphurets (Gold Zone)	O09-20	Porphyry Cu-Au	Au, Cu
Sumdum	O08-29	Kuroko massive sulfide(?)	Ag, Cu, Zn
Sumdum Chief	O08-30	Au quartz vein	Au, Ag, Cu, Pb, Zn
Sun, (Picnic Creek)	Q05-05	Kuroko massive sulfide	Cu, Zn, Pb, Ag, Au
Sustut Copper	O09-24	Basaltic Cu	Cu
Sutlahine River Area (Thorn, Kay)	O08-11	Porphyry Cu-Mo	Cu, Mo, Ag
Suvorov	P56-44	Rhyolite-hosted Sn	Sn
Svetlin	Q58-01	Au quartz vein	Au
Svetloe	P56-48	Sn polymetallic vein	Sn
Svetloe	R01-02	Sn quartz vein	Sn, W
Svetloe, Kholodnoe	P55-18	Au quartz vein	Au
Svetloe, Medvezhje	Q54-08	Sn quartz vein and greisen	Sn, W
Svetlovskoe	M54-04	Silica-carbonate Hg	Hg
Svetly	P53-05	Au quartz vein	Au
Sweetheart Ridge	O08-28	Kuroko massive sulfide	Ag, Au, Cu, Pb, Zn
Swim (Sea, SB)	P08-10	Sedimentary exhalative Pb-Zn	Zn, Pb, Ag
Syncha-I & II	Q52-01	Au quartz vein	Au
Syugyunyakh-Kende	R52-06	Au quartz vein	Au
Table Mountain	Q06-12	Sn polymetallic vein	Au
Taboga	P55-11	Au quartz vein	Au
Takalkan	R54-10	Sn greisen	Sn
Talalak	Q54-21	Au quartz vein	Au
Talaminskoe	N53-22	Sb-Au vein	Sb, Au
Talov	P58-03	Podiform Cr	Cr
Tamvatney	P60-02	Silica-carbonate Hg	Hg, W, As
Tankist	P55-36	Porphyry Mo	Mo
Tasu Sound (Wesfrob, Tasu, Garnet)	N08-05	Fe skarn	Fe, Cu
Taurus	P07-02	Porphyry Cu-Mo	Cu, Mo
Taylor Mountains	P04-16	Hg-Ag epithermal vein(?)	Hg, Au
Tayozhnoe	L53-17	Ag epithermal vein	Ag
Tea (Brock)	P09-07	Sedimentary exhalative Ba	Ba
Tektonicheskoe	P55-23	Pb-Zn-Ag vein	Pb, Zn, Ag, Sn
Telekai	Q60-01	Sn silicate-sulfide vein and Sn greisen	Sn
Teleneut	Q58-08	Podiform Cr	Cr, Ni
Tenkergin	R01-01	Sn quartz vein	W, Sn
Terrassnoe	P55-04	Pb-Zn skarn	Pb, Zn
Tet'yaevskoe	L55-02	Cu-Pb-Zn polymetallic vein	Cu, Zn, Pb
Texada Iron	M10-17	Fe skarn	Fe
Texada (Vananda, Marble Bay, and others)	M10-16	Cu-Au skarn	Cu, Au, Ag
Three Castle Mountain	Q07-03	Sedimentary exhalative Pb-Zn	Pb, Zn
Threeman, Standard Copper	P06-32	Cyprus massive sulfide	Cu, Au, Ag
Tidit	P56-13	Ag-Pb-Zn vein, Polymetallic vein(?)	Ag, Pb, Zn
Tigrets-Industriya	P55-26	Sn polymetallic vein	Sn, Ag, Pb, Zn
Tigrinoe	L53-08	Sn-W greisen	Sn, W, Ta, Nb, In

Deposit Name	Deposit Number	Deposit Type	Major Metals
Tikas	P57-18	Porphyry Mo	Mo
Tikhon	Q54-06	Au-Ag epithermal vein	Ag, Au
Tikhorechen	P58-04	Podiform Cr	Cr
Tin Creek	P05-13	Cu-Pb-Zn skarn	Pb, Zn, Cu
Tirekhtyak district (Nagornoe, Podgornoe, Poputnoe)	R53-03	Sn quartz vein	Sn, W
Titovskoe	Q54-01	Sn (B) magnesian skarn	B
Tokichan	P55-27	Au quartz vein	Au
Tokur	N53-17	Au quartz vein	Au
Tommot	R54-12	Carbonatite-related REE (Ta, Nb)	REE, Ta, Nb
Toodoggone District (Lawyers)	O09-14	Au-Ag epithermal vein	Au, Ag
Travka	Q59-09	Porphyry Mo	Mo
Treadwell	O08-27	Au quartz vein	Au, Ag, Pb
Treasure Creek	P06-12	Porphyry Cu-Mo	Mo, Cu
Trood	P56-34	Sn polymetallic vein	Sn, Pb Zn, Ag
Trout Lake	M11-13	Porphyry Mo	Mo
Tsirkovy	P58-02	Granitoid-related Au	Au, Ag, Cu, W, Bi
Tuguchak-1	R55-01 Mo	Mo quartz vein	
Tuguchak-2	R55-01	Granitoid-related Au	Au, W, Bi, Te
Tulsequah Chief (Big Bull)	O08-09	Kuroko Zn-Cu-Pb massive sulfide	Zn, Cu, Au, Ag, Pb
Tumannaya	Q57-10	Au-Ag epithermal vein	Au, Ag
Tumannoe	N57-10	Au quartz vein	Au
Tumannoe	Q01-04	Disseminated Au-sulfide	Au, As, Sb
Tumannoe	Q54-07	Au quartz vein	Au
Tungsten Queen (Silverquick, Manitou)	M10-03	Silica-carbonate Hg	Hg
Tunguss	Q55-07	Au quartz and Sb vein	Au, Sb
Tuora-Tas	Q54-17	Au quartz vein	Au
Tutkhlivayam	O57-01	Au-Ag epithermal vein	Au, Ag, Cu, Pb, Zn, Te, Cd
Tyrskoe	N54-05	Porphyry Cu	Cu
Uchui	Q54-05	Au quartz vein	Au
Ugryumoe	P60-05	Kuroko Cu-Zn-Ag massive sulfide(?)	Cu, Zn, Pb, Au
Ukachilkan	R54-03	Sn polymetallic vein	Sn
Ulakhan-Egelyakh	Q53-06	Sn silicate-sulfide vein	Sn
Ulakhan-Sala	R53-09	Sn silicate-sulfide vein	Sn
Ulkanskoe	O53-15	Felsic plutonic REE	REE, Be, Zr
Union Bay (Cleveland Peninsula)	N08-01	Zoned mafic-ultramafic Cr-PGE	Fe, V, Ti, Cr, PGE
Unnei	P58-07	Sn polymetallic vein	Sn, Ag, Au
Uochat	P55-01	Carbonate-hosted Hg	Hg
Upper Kanuti River	Q05-09	Polymetallic or epithermal vein	Pb, Zn, Ag
Uralskoe	Q58-07	Volcanic-hosted Hg	Hg, Sb, Au, Ag
Urui	O53-03	Southeast Missouri Pb-Zn	Pb, Zn
Urultun	P55-02	Southeast Missouri Pb-Zn	Pb, Zn
Ussuri deposits	L53-18	Ironstone	Fe
Ust-Belaya	Q59-07	Podiform Cr	Cr, PGE
Utessnoe	P56-54	Au-Ag epithermal vein	Ag, Au, Hg
Utinka	P56-21	Au quartz vein	Au
Uzlovoe	Q53-13	Sb-Au vein or clastic sediment-hosted Sb-Au	Au, Sb
Vaegi	P59-04	Au quartz vein	Au
Valentinovskoe	L55-10	Kuroko Cu-Pb-Zn massive sulfide	Cu, Pb, Zn
Valkumei	R59-02	Sn silicate-sulfide vein	Sn
Valley Copper	M10-09	Porphyry Cu-Mo	Cu, Mo
Valunistoe	Q60-05	Au-Ag epithermal vein	Au, Ag
Vangorda Creek (Grum, Firth, DY)	P08-09	Sedimentary exhalative Pb-Zn	Zn, Pb, Ag
Vechernee	P57-05	Porphyry Mo-Cu	Mo, Cu
Verkhne-Khakchan	P55-08	Au quartz vein	Au

Deposit Name	Deposit Number	Deposit Type	Major Metals
Verkhne-Khatynnakh	P55-21	Sn quartz vein	Sn
Verkhne-Naanchan	R56-05	Polymetallic vein	Pb, Zn
Verkhne-Seimchan	P56-08	Co-As vein	Co, Bi
Verkhne-Seimkan	P56-53	Co-Bi-As vein	Co, Bi
Verkhnebidzhanskoe	M52-03	Sn quartz vein	Sn
Verkhnee Menkeche	P54-09	Ag polymetallic vein	Pb, Zn, Ag
Verkhnenyotskoe	O54-07	Au-Ag epithermal vein	Au, Ag
Verkhnezolotoe	L53-06	Porphyry Cu	Cu, Sn
Verkhny-Koargychan	P57-10	Au-Ag Polymetallic vein	Au, Ag, Pb, Zn
Verkhny-Omolon	P57-09	Ironstone	Fe
Vesennee	Q58-06	Au-Ag epithermal vein	Au, Ag
Vesnovka	Q55-04	Kipushi Cu-Pb-Zn	Cu, Pb, Zn, Ge
Vetrenskoe	P55-31	Au quartz vein	Au
Vetvisty	P56-32	Au-Ag epithermal vein	Ag, Au
Victor, Venus, Evelyn Lee, and Ebo	Q06-03	Porphyry Cu and Cu skarn	Cu, Ag, Mo
Viking	O56-04	Porphyry Cu-Mo	Cu, Mo
Vine	M11-42	Ag-Au polymetallic vein	Pb, Zn, Ag, Au
Vinesale Mountain	P04-23	Porphyry Au	Au
Vodorazdelnoye	Q60-02	Sn silicate-sulfide vein	Sn
Von Frank Mountain	P05-26	Porphyry Cu-Ag	Cu, Ag
Voskhod	P54-22	Au quartz vein	Au
Vostok-2	L53-07	W skarn	W
Voznesenka-I	L53-35	Korean Zn massive sulfide	Zn
Voznesenka-II	L53-36	Fluorite greisen	Fluorite
Vysokoe	L55-06	Sulfur-sulfide	S, FeS2
Vysokogorskoe	L53-25	Sn silicate-sulfide vein	Sn
Warner Bay (Prospect Bay)	O04-09	Porphyry Cu, Polymetallic vein	Cu, Mo, Pb, Zn
Wasi Lake Area (Suzie, Beveley, Regent)	O10-07	Southeast Missouri Pb-Zn	Pb, Zn, Ag, Ba
Wellgreen	P07-18	Gabbroic Ni-Cu	Ni, Cu, PGE
Westmin (Buttle Lake- Myra, Lynx, H-W, Battle)	M10-15	Kuroko Zn-Cu massive sulfide	Zn, Cu, Ag, Au
Westover	P07-15	Kennecott Cu	Cu, Ag
Wheeler Creek	Q04-07	Felsic plutonic U	U
Whit (Whiting Creek)	N09-26	Porphyry Mo-Cu	Mo, Cu
White Mountain	P05-14	Carbonate-hosted Hg(?)	Hg
Whitehorse Copper Belt (Little Chief, War Eagle, and others)	P08-14	Cu skarn	Cu, Au, Ag
Whoopee Creek	R04-07	Zn-Ag-Au vein	Zn, Ag, Au
Williams Creek	P08-07	Porphyry Cu-Au	Cu
Willow Creek District (Gold Cord, Independence, Thope, and others)	P06-24	Au quartz vein	Au
Win-Won or Cloudy Mountain	P04-03	Sn polymetallic vein	Sn, Ag, Cu
Windermere Creek (Western Gypsum)	M11-18	Strataform gypsum	Gypsum
Windy (Balsam, Star, Kuhn, Dead Goat)	O09-04	W skarn	W, Mo
Windy Craggy (Alsek River Area)	O08-02	Cyprus massive sulfide	Cu, Co
Windy Creek	Q03-10	Porphyry Mo	Mo
Wolf Mountain	P04-13	Felsic plutonic U	U, Th, As, Nb, Mo, REE
Wrigley (Fry Group)	P10-01	Southeast Missouri Pb-Zn	Zn, Pb, Ag
WTF, Red Mountain	P06-03	Kuroko massive sulfide	Cu, Pb, Zn, Ag, Au
Yagodnoe	L54-01	Au-Ag epithermal vein	Au, Ag
Yantarnoe	L53-09	Porphyry Sn	Sn
Yapon	O56-02	Porphyry Cu	Cu
Yaroslavskoe	L53-37	Sn greisen	Sn
Yasnoe	M54-01	Silica-carbonate Hg	Hg

Deposit Name	Deposit Number	Deposit Type	Major Metals
Yassnoe	R58-03	Clastic sediment-hosted Hg or hot-spring Hg?	Hg
Ymir-Erie Creek (Yankee Girl)	M11-35	Au-Ag polymetallic vein	Au, Ag
Yolochka	P57-04	Au-Ag epithermal vein	Au, Ag
Yugler	P56-30	Au quartz vein	Au
Yukhondja	Q54-12	Au quartz vein	Au
Yur	O53-02	Au quartz vein	Au
Yurievka	O54-04	Au-Ag epithermal vein	Au, Ag
Yuzhno-Khingan	M52-04	Ironstone	Fe
Yuzhno-Tominskoe	N54-01	Podiform Cr	Cr
Yuzhnoe	L53-22	Polymetallic vein	Pb, Zn, Ag
Yuzhnoe	R56-06	Polymetallic vein	Pb, Zn
Zabytoe	L53-14	W-Sn greisen	W, Sn, Bi
Zackly	P06-16	Cu-Au skarn	Au, Cu, Ag
Zaderzhnoe	P54-23	Au quartz vein	Au
Zagadka	Q52-05	Clastic sediment-hosted Hg	Hg, Sb
Zane Hill	Q05-13	Porphyry Cu-Au	Cu, Au
Zane Hills	Q04-09	Felsic plutonic U	U, Th
Zaozernoe	M57-03	Sulfur-sulfide	S, FeS2
Zarechnoe	L53-23	Porphyry Cu	Cu
Zarnitsa, Kutinskoe	P54-15	Polymetallic vein	Pb, Zn, Ag
Zatessnoe	P56-35	Au quartz vein	Au
Zazubrinskoe	N53-16	Au quartz vein	Au
Zeballos Iron (Ford)	M09-04	Fe skarn	Fe
Zerkalnoe	P56-45	Au-Ag epithermal vein	Au, Ag, Bi, Te
Zet	Q57-05	Au-Ag epithermal vein	Au, Ag
Zhar	O54-03	Au quartz vein	Au
Zhdannoe	Q54-15	Au quartz vein	Au
Zimnee	L53-15	Sn polymetallic vein	Sn, Pb, Zn
Zolotaya Gora	N52-01	Au quartz vein	Au
Zolotoi	N57-08	Au-Ag epithermal vein	Au, Ag
Zolotoi Stream (Sofie-Alekseevskoe)	L52-03	Au quartz vein	Au
Zvezdnoe	L53-10	Porphyry Sn	Sn
Zvezdochka	Q52-06	Clastic sediment-hosted Hg	Hg

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ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS
GEOLOGICAL SURVEY OF CANADA

TABLE 2. SIGNIFICANT METALLIFEROUS PLACER DISTRICTS OF THE RUSSIAN FAR EAST, ALASKA, AND THE CANADIAN CORDILLERA

By

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District No. / Latitude / Longitude / Summary Description / References	District Name / Deposit Type	Major Commodities / Minor Commodities	Grade and Tonnage
L54-01 47°58'N 142°16'E	Il'inka River Placer Au	Au	Size: Small.

Gold is fine, 0.2 to 0.3 mm. Heavy-mineral concentrate consists of chromite, epidote, and garnet. Small gold-cinnabar occurrences are presumably sources for the placer. Deposit occurs along the Il'inka River near where it discharges into Tatar Strait. Alluvium of the first (lowest) floodplain terrace is gold-bearing.

V.D. Sidorenko , 1977.

M10-01 50°50'N 122°50'W	Bridge River Camp Placer Au	Au	Production of 171 kg fine Au. Years of Production: 1902-1990. Fineness: 812-864

Gold is in Bridge River camp occurs in gravels of ancient river channels, and reworked gravels in modern river bed and banks. The bedrock to the gravels is Shulaps serpentinite and Bridge River slate. The source of the gold may be quartz-pyrite-gold veins that are hosted in Permo-Triassic diorite, gabbro and greenstone within the Caldwallader Break, including Bralorne and Pioneer mines. Primary mineralization is associated with Late Cretaceous porphyry dikes. Bridge River area was worked for placer gold as early as 1860, but production figures were included with Fraser River figures until 1902.

B.C. Minfile, 1991.

M10-02 53°40'N 122°43'W	Fraser River Placer Au, Pt, Ir	Au	Production of 5689 kg fine Au. Years of Production: 1857-1990. Fineness: 855-892

Gold in Fraser River district was first found on a tributary of the Fraser River in 1857. Large amounts of gold were found shallowly buried in bars on the lower river in 1858. Gold occurs along several hundred miles of the Fraser. Fine gold was found as far as 25 miles below Hope. Coarse gold occurs further up river, as far as Lillooet. Coarse gold was considered of local origin, eroded from belts of argillite and micaceous schists along the river. Mesothermal gold-quartz veins of the Carolin camp, hosted in Permo-Jurassic sediments of Hozameen and Ladner groups, are one possible source of placer gold. The Fraser River fault zone follows a major inter-terrane suture that includes the Coquihalla serpentinite belt plus numerous granitoid plutons all of which may have been controlling factors on the emplacement of original lode-gold veins. Fine gold was probably reworked from glacial gravels and transported considerable distances from the source. Some platinum and iridium have also been found near Lytton.

British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1989.

M10-03 51°27'N 120°13'W	North Thompson-Tranquille Placer Au	Au	Production of 424 kg fine Au. Years of Production: 1852-1990. Fineness: 827-916

Placer gold-bearing creeks in North Thompson-Tranquille district are underlain by volcanic rocks of the Nicola Assemblage and metasedimentary rocks of underlying Harper Ranch Group, both intruded by Early Jurassic plutons of the Guichon and Copper Mountain Suites. Polymetallic Au-Ag veins, as at Vidette, associated with the plutons are a probable source of placer gold.

B.C. Minfile, 1989.

District No. / Latitude / Longitude / Summary Description / References	District Name / Deposit Type	Major Commodities / Minor Commodities	Grade and Tonnage
M10-04 49°26'N 120°31'W	Tulameen-Similkameen Camp Placer Au-Pt-Ag	Au	Production of 1171 kg fine Au. Years of Production: 1853-1990. Fineness: 869-889

Gold discovered in Tulameen-Similkameen Camp district on Similkameen River in 1853. Platinum and gold are recovered from the Tulameen River and its tributaries, in some places more platinum than gold was recovered. Estimated up to 20,000 oz of platinum were recovered between 1885-1963. The origin of the platinum is the Upper Triassic Tulameen mafic-ultramafic complex, cut by the Tulameen River. It occurs with gold in black sands. Gold is generally rough and angular, sometimes with quartz adhering to it. The source of the gold is believed to be the auriferous veins of Grasshopper Mountain. Since the area is blanketed in glacial material, erosion of gold and platinum from the host rock must have occurred in pre-glacial times. Post-glacial streams have reworked some of the older placers.

Rice, 1960; British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; Boyle, 1976; B.C. Minfile, 1992.

M10-05 49°24'N 121°13'W	Coquihalla River Camp Placer Au, Pt	Au	Production of 3.9 kg fine Au. Years of Production: 1874-1990. Fineness: 850-901

District is underlain by the Coquihalla Serpentine Belt, comprised chiefly of serpentinite intersected by large and small dioritic dikes and a few quartz-porphyry dikes.

B.C. Minfile, 1988.

M10-06 48°30'N 123°44'W	Leech River Camp Placer Au	Au	Production of 277 kg fine Au. Years of Production: 1864-1940. Fineness: 864-890

Placer gold in Leech River Camp district occurs in gravels of streams that drain slaty schists of the Jurassic to Cretaceous Leech River Formation. The drainages occupy in part the Leech River fault that separated Leech River Formation of Pacific Rim Terrane to the north from Tertiary Metchosin volcanics of the Crescent Terrane to the south. Gold in Recent gravels is probably derived from small auriferous quartz veins and stringers in the schists. Veins are too small to be mined. Placer gold also occurs in coastal areas in what appears to be remains of a glacial delta that drained the Leech River valley. Gold was found on the Leech River in 1864.

British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1990.

M11-01 51°39'N 118°37'W	Big Bend Camp Placer Au	Au	Productionof 2678 kg fine Au. Years of Production: 1864-1990. Fineness: 901-910

Coarse grains and nuggets of gold in Big Bend Camp distrcit occur along bedrock in McCulloch Creek and French Creek, and fine colors in gravel probably have their source in quartz-gold veins in the headwaters of McCulloch and Graham Creeks. Area is underlain by Paleozoic metasedimentary rocks of the Shuswap region of Kootenay terrane, on the northeastern flank of the Monashee terrane.

Holland, 1950; Wheeler, 1965; British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1988.

District No. / Latitude / Longitude / Summary Description / References	District Name / Deposit Type	Major Commodities / Minor Commodities	Grade and Tonnage
M11-02 50°22'N 116°57'W	Lardeau-Duncan and Lake-Bugaboo Placer Au, U Th, Nb	Au U Th, Nb	Production of 15.9 kg fine Au. Years of Production: 1850-1990. Fineness: 792-845

Lardeau-Duncan and Lake-Bugaboo district contains several creeks that drain the Cretaceous Bugaboo Batholith. Placers contain concentrations of uranium, thorium, and niobium. Reserves for Vowell Creek are 15,292,000 m^3 at 18.1 g/t U and 196.28 g/ m^3 Nb_2O_5. Malloy Creek reserves are 9,330,000 m^3, 19.6 g/m^3 U, 97.85 g/ m^3 Nb_2O_5 and 68.8 g/m^3 thorium oxide. Upper Bugaboo Creek reserves are reported as 1,000,000 m^3 with 0.18% U. Auriferous quartz-filled shears occur in schists of Lardeau and Hamill groups.There is a gradation from quartz-pyrite-gold veins to quartz-galena-sphalerite-pyrite-gold veins.

Galloway, 1932; Reesor, 1973; Northern Miner, October 25, 1979; B.C. Minfile, 1987.

M11-03 50°18'N 119°28'W	Okanagan Valley Placer Au	Au	Production of 115 kg fine Au. Years of Production: 1861-1990. Fineness: 842-920

Placer gold deposits in Okanagan Valley district, Falkland area, are underlain by volcanic rocks of Nicola Group and underlying sedimentary rocks of Late Paleozoic Harper Ranch Group. Minor Cu-Ag veins occur in volcanic rocks and occur along intrusive contacts.

British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1985.

M11-04 50°13'N 118°32'W	Monashee-Cherry Creek Camp Placer Au	Au	Production of 181 kg fine Au. Fineness: 700-845

Placer gold in Monashee-Cherry Creek Camp occurs in the gravels of a pre-glacial Cherry Creek. The existing river closely follows the old river course. Quartz veins occur in shales of the Shuswap region of Kootenay Terrane.

Galloway, 1930; B.C. Minfile, 1985.

M11-05 49°05'N 119°07'W	Boundary-Kettle River Placer Au	Au	Production of 388 kg fine Au. Fineness: 831-866

Placer gold deposits in Monashee-Cherry Creek Camp district are underlain by oceanic sedimentary and volcanic rocks of the Ordovician to Triassic Old Tom and Shoemaker formations of the Okanagan subterrane of Quesnellia. Numerous lode gold-silver vein deposits are known in the region, as at Camp McKinney, that probably served as a source of placer gold.

Holland, 1950; British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963.

M11-06 49°26'N 120°31'W	Ymir-Nelson-Slocan Camp Placer Au-W	Au	Production of 19 kg fine Au. Fineness: 861-894

Placer gold in Ymir-Nelson-Slocan Camp interpreted as derived from potentially economic polymetallic Au-Ag- quartz vein deposits that occur in shear zones in the area. W skarns are associated with plutons of the mid-Cretaceous Bayonne suite. Ymir area is underlain by schists of Triassic Ymir and lower Jurassic Rossland Groups that are intruded by apophyses of Jurassic Nelson batholith.

Galloway, 1932; B.C. Minfile, 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
M11-07 49°08'N 117°15'W	Pend D'Oreille-Sheep Creek Placer Au	Au	Production of 228 kg fine Au. Years of Production: 1855-1874. Fineness: 815-861

Placer gold in the Pend D'Oreille-Sheep Creek district is interpreted as derived from polymetallic Au-Ag veins at Sheep Creek, Ymir, and Rossland, and from Au-Zn-Pb deposits in Kootenay terrane. At Sheep Creek sheared gold veins and lead-zinc replacements in limestone occur in anticlines formed in quartzite and argillite of the Nevada and Nugget members of the Quartzite Range formation.

Galloway, 1932; B.C. Minfile, 1991.

M11-08 49°23'N 116°00'W	Moyie-Goat River Camp Placer Au	Au	Production of 2727 kg fine Au. Years of Production: 1867-1990. Fineness: 861-905

Placer gold in the Moyie-Goat River Camp district occurs in Tertiary channels in Moyie River gravels. Bedrock geology consists of oxidized and fractured argillite and massive quartzite of Middle Proterozoic Aldridge Formation in contact with Moyie diorite sills. Higher gold grades occur at the bedrock/Tertiary channel interface. Base metal sulfide deposits with minor gold contents that occur in turbidites of the Aldridge Formation are a probable source of placer gold.

B.C. Minfile, 1986; B.C. Minfile, 1989.

M11-09 55°33'N 123°23'W	Wildhorse Creek Camp Placer Au-Pt	Au	Production of 10,751 kg fine Au. Years of Production: 1863-1990. Fineness: 878-938

Placer gold in Wildhorse Creek Camp district was first found on the Wild Horse River in 1863. The Wild Horse and Bull Rivers are among the few rivers that drain westward from the Rocky Mountains that contain coarse placer gold. Fine gold and platinum occur in the Peace, Findlay, McLeod and Parsnip Rivers. The rivers drain the Mississippian Slide Mountain Group. Placer deposits occur in Recent gravels.

British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1991.

M52-01 51°55'N 131°55'E	Turansky district Placer Au	Au	Production of 0.3 tonne Au. Proven reserves of 6.0 tonnes Au; inferred reserves 29.0 tonnes Au; total of 35.0 tonnes Au. Fineness: 937

Turansky district occurs in the Turansky subterrane (BUT) of the Bureya terrane. District is subdivided into the Byssinsky, Ulmiisky, and Aleunsky subdistricts. Only the Byssinsky subdistrict is of economic importance. The only lode source is the unexplored Buyanovsky occurrence. In this subdistrict, Precambrian metamorphic rocks are overlain by Early Cretaceous volcanic rocks. A large placer was discovered on the Sinnikan River and its tributaries. Length is 9 km, average width is 80 m, thickness of economic bed is 0.54 m, and gold grade in economic bed is 1059 mg/m^3. Proven reserves of the placer are 980 kg. Much placer gold is concentrated in tributaries of the Sinnikan River.

V.D. Melnikov and others, written commun., 1989.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
M52-02 50°50'N 127°25'E	Blagoveshchensk-Svobodnensky district Placer Au	Au	Production of 1.0 tonnes Au. Proven reserves of 0.0 tonnes Au; inferred reserves of 10.0 tonnes Au, total 11.0 tonnes Au..

Blagoveshchensk-Svobodnensky district occurs in an area adjacent to the Amur River from the city of Blagoveshchensk to the village of Chenyaevo, and along the Zeiya River from the mouth to the Selemdzha River. This area is overlain mostly by unconsolidated deposits of the Amur-Zeiya valley. Bedrock outcrops occur near the Amur River are part of the Norsk-Sukhotinsky terrane. Gold deposits in the district have been known since the beginning of the century when prospectors started operations on bars and islands of the Amur and Zeiya Rivers. The Surazhevka bar placer, in the Zeiya River near the town of Svobodny, has been mined. The most promising area for placer deposits is the northern bank of the Amur River from the city of Blagoveshchensk to the village of Ushakovka. This area continues into China, on the opposite bank of the Amur River, where it is known as the Fabelakhe subdistrict.

Dzu Sung, 1991; V.D. Melnikov and others, written commun., 1989.

M52-03 49°10'N 130°55'E	Malokhingansky (Malokhingan) district Placer Au	Au	Production of 4.0 tonnes Au. Proven reserves of 1.0 tonne Au, inferred reserves of18.0 tonnes Au; total of 23.0 tonnes Au.

Malokhingansky district is subdivided into the Nizhnebureisky and Arkharinsky gold-bearing subdistricts. The largest lode deposit in the area is the Prognoznoe deposit, located within the Nizhnebureisky subdistrict. This deposit was discovered in 1972 during geologic mapping. Small placers (in the Simichi River and Gniloi Spring) were discovered in 1972 near the Prognoznoe lode deposit. Placer gold is derived from nearby lode deposits.

Arkharinsky subdistrict occurs in the southeastern part of the Malokhingansky district. Bedrock is mainly Early Paleozoic and Early Mesozoic granitic rocks. Neogene-Quaternary basalt locally locally overlies unconsolidated Cenozoic deposits in the headwaters of the Maly Bira and Uril Rivers. Estimated placer gold potential was already considered high at the beginning of this century. The location near a railroad and character of the deposits (mineable by dredging) make this a very promising area. Richest placers were mined in the area of the Maly Bira River. Undiscovered placer deposits may occur beneath the basalt. Deposits as at Paskhalny Spring were completely mined out by underground mining in the 1950s. Mesozoic and Cenozoic sedimentary units may also contain old placer deposits.

V.D. Melnikov and others, written commun., 1985.

M54-01 50°49'N 139°37'E	Oemku Placer Au	Au	Size: Small. Fineness: 800-850

Placer gold in Oemku district occurs in stream deposits of the Oemku River and other northern tributaries of the Muli River, which in turn flows into the Tumnin River. Gold-bearing beds contain fine and medium gold. Gold is derived from the Oemku lode deposit which contains gold-rich quartz veins. Local bedrock is Early Cretaceous siltstone and sandstone.

A.M. Peshkov, written commun., 1972.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
M54-02 50°10'N 142°57'E	Langeriiskoe Placer Au	Au	Size: Medium. Fineness: 879-932

Langeriiskoe district occurs in several river valley placers that range from 1000 to 7200 m long and 20 to 30 m wide. A zone of alluvium, from 1.8 to 2.0 m thick adjacent to bedrock, is most enriched in gold. Grains of gold range in size: from less than 0.5 mm (30%), 0.5 to 1.0 mm (33%), 1.0 to 2.0 mm (26%), to more than 2.0 mm (11%). Chromite, pyrite, zircon, rarely cinnabar, scheelite, arsenopyrite, galena, and hematite also occur in heavy concentrates. Placer gold is derived from Au quartz vein deposits in quartz-micaceous schist.

V.D. Sidorenko, 1977.

M57-01 51°33'N 156°33'E	Ozyornaya River Placer magnetite	Ti, Fe	Reserves: Estimated 261,000 tons titanomagnetite concentrate.

Ozyornaya River district is 8.6 km long, 20 to 85 m wide, and 8 m thick, and is associated with recent beach sand deposits. Sand is sorted, coarse- and fine-grained, and polymictic. Minerals are magnetite (up to 31%), titanomagnetite, quartz, feldspar, pyroxene, amphibole, olivine, epidote, ilmenite, and hematite; minor garnet, leucoxene, apatite, zircon, andalusite, and rutile; and rare gold, cinnabar, sphalerite, and scheelite. Deposit is estimated to contain equivalent of 261,000 tons of titanomagnetite concentrate. Chemical analyses of placer sediments show 8.07 to 14.17% Fe_2O_3, 0.92 to 2.09% TiO_2, trace to 1 g/t Au, and 1.1 to 4.4 g/t Ag.

M.F. Kobylkin, written commun., 1966.

N09-01 54°53'N 128°24'W	Skeena River Placer Au	Au	Production of 129 kg fine Au. Fineness: 827-861

Skeena River district occurs in drainages that erode flat-lying conglomerate, argillite, and sandstone of Jurassic to Cretaceous Bowser Lake Group. Coarse placer gold occurs in drift-filled pre-glacial channels. Placer gold interpreted as derived from Au quartz vein deposits that occur in the area and related to post-accretionary intrusions of Skeena and Bulkley plutonic suites.

B.C. Minfile, 1989.

N10-01 55°45'N 124°40'W	Manson Camp (Omineca) Placer Au	Au	Production of 1829 kg fine Au. Years of Production: 1870-1990. Fineness: 847-895

Gold in Manson Camp district was initially found on Germansen Creek in 1870. Much of the gold is coarse. Gold occurs in modern stream gravels, reworked from glacial deposits. Area is underlain by schistose phyllite, argillite and felsic tuff of the Mississippian(?) to Lower Permian Cooper Ridge Group of Slide Mountain Terrane, and Middle Triassic to Lower Jurassic Takla Group of Quesnellia terrane. Bedrock units are intruded by numerous small bodies of granite. Polymetallic Au-Ag quartz veins are common in the schist and are interpreted as the source of gold.

Galloway, 1930; Galloway, 1932; British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1992.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N10-02 55°42'N 125°28'W	Vital-Silver Creek Camp (Omineca) Placer Au, Cu, Ag, nephrite	Au	Production of 500 kg fine Au. Years of Production: 1869-1949. Fineness: 846-888

Gold in Vital-Silver Creek Camp district was initially found on Vital Creek in 1869. Much of the gold is coarse. Native copper and arquerite (silver amalgam) also occur but not economic. Area is underlain by metasedimentary and metavolcanic rocks of the Carboniferous to Jurassic Cache Creek Complex. Phyllite, limestone and tuff, the most common bedrock, and contain numerous rusty quartz veins up to one meter wide, that may be the source of gold. Nephrite jade boulders occur on Vital Creek.

Galloway, 1930; British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1992.

N10-03 52°34'N 121°30'W	Cariboo-Hixon Camp Placer Au	Au	Production of 4449 kg fine Au. Years of Production: 1874-1990. Fineness: 787-872

Placer gold deposits in Cariboo-Hixon Camp district have been worked on Hixon Creek since 1874. Placer gold occurs in Tertiary basal conglomerate, and in remnants of pre-glacial channels and in post-glacial deposits. Area is underlain by Takla Group metasedimentary rocks. Placer gold interpreted as derived from Au quartz veins that are associated with granitoid intrusive bodies.

Galloway, 1932; B.C. Minfile, 1989.

N10-04 53°06'N 121°35'W	Cariboo-Barkerville-Wells Placer Au	Au	Production of 64,859 kg fine Au. Years of Production: 1850-1990. Fineness: 755-920

Cariboo-Barkerville-Wells district is underlain by greenschist facies metasedimentary rocks of the Upper Proterozoic to Lower Paleozoic Snowshoe Group in the Kootenay terrane, and in Mesozoic sedimentary and volcanic rocks of Quesnellia terrane. Placer deposits interpreted as derived from the Downey Creek Formation of the Snowshoe Group that contains Au quartz veins. In the Pleistocene, a stagnant ice sheet overlaid the region, and eroded weathered material at higher elevations, but not affecting the placer deposits in the valleys.
Cariboo-Barkerville-Wells district has produced 65% of placer gold in British Columbia. District is divided into three belts, the Barkerville, the Horsefly and the Hixon. The Barkerville belt occurs in the mountainous Quesnel Highland region. Present-day streams follow the same drainages as those that formed the placer deposits.

Galloway, 1930; Galloway, 1932; British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1989: BCGSB Bulletin 89, 1993.

N10-05 52°34'N 121°30'W	Cariboo-Quesnel-Horsefly Placer Au, Pt	Au	Production of 21,565 kg fine Au. Years of Production: 1859-1990. Fineness: 801-902

Gold in the Cariboo-Quesnel-Horsefly district was first found on the Horsefly River in 1859, followed by other important discoveries in the Cariboo area in the 1860's. The Quesnel area of the Cariboo District is comprised of large valleys and plateaus that pre-date glaciation. Underlying bedrock is sedimentary and volcanic rocks of the Upper Triassic to Lower Jurassic Nicola and Takla Groups. Metamorphic lode gold deposits, as at Frasergold, occur in a black phyllite unit. Extensive gravel and gold accumulated in the valleys during Tertiary uplift. The stagnant Pleistocene ice sheet largely protected these deposits, but some reworking occurred during interglacial periods. Post-glacial streams eroded the drift and reworked some of the gold into recent deposits. Ancient stream beds resting on bedrock are the richest and most continuous. The interglacial stream deposits are lower grade but fairly extensive. Modern stream gravels contain small deposits of fine grained gold. Fine platinum is irregularly distributed in black sands along the Quesnel River.

Galloway, 1930; Galloway, 1932; British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; Boyle, 1976; B.C. Minfile, 1989.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N51-01 55°40'N 125°00'E	Verkhnegilyui Placer Au	Au	Production of 5 tonnes Au. Proven reserves of 6 tonnes Au; inferred reserves of 55 tonnes Au; total reserves of 66 tonnes Au.

Verkhnegilyui district is divided into the Apsakan, Laprin, Malogilyui, and Bryantin subdistricts. The district occurs in the axial part of the Stanovoi anticline. Gold-bearing areas within the district occur close to the Mesozoic Tynda, Dyupkoisky, Unakhinsky, and Mulmugin plutons.

The Apsakan subdistrict lies in basins at the headwaters of the Verkhny Larba, Nizhny Larba, and Sredny Larba Rivers, and is confined to the northwestern margin of the Tynda pluton, that intrudes Proterozoic granite and Archean metamorphic rocks. The ratio between the number of lode deposits and placer deposits in the Apsakan subdistrict is 3:2. This is the only subdistrict in the Verkhnegilyui district, where the number of lode deposits is greater than the number of placers. More than 25 lode deposits are known, all are associated with the zones of hydrothermally altered metamorphic rocks. Every placer or low-grade placer deposit overlies a lode deposit. The Larba River placer is the largest in the subdistrict. It was discovered in 1929, and was prospected in the 30's and 40's. It includes several small creek placers, with a total length of 21 km. The deposit starts in the middle of Yanvarsky Creek, continues along the valleys of the Khorogochikan Creek (from the mouth of the Yanvarsky Creek to the confluence with the Sredny Larba Creek) and terminates 4 km downstream from the mouth of Gromkachi Spring. Au content is extremely uneven. Native gold occurs in the lowest bed of pebble deposits and in the upper part of underlying eluvium. Terraces have not been studied. Estimated reserves are 2003 kg.

The Laprin subdistrict is located in predominantly Late Archean metamorphic rocks between the Mesozoic Tynda and Dyupkoisky plutons. Cretaceous rocks of the Tiptursky volcanic field occur in the northeastern part of the subdistrict. Only a small portion of the subdistrict has been mined. At the beginning of the century, only placers of the Khitrusha, Maksimovka (the basin of the Lapri River) and Bugorikty (the basin of the Mogota River) Rivers were mined. Placer mines are being planned for the Malinovy, Lysovsky, Tsyganka, and Medvezhi Creeks. The largest placer in this subdistrict, the Khitrusha valley-type deposit, occurs in the Khitrushka Creek that is a tributary of the Lapri River. The deposit has been mined from 1928 to 1950, and there is evidence of earlier operations (presumably 1880-1900). About 4 km of the placer deposit has been mined. The placer averages 60 m wide and 3.4 m thick. Gold grade is 297 mg/m^3 and fineness of native gold is 900. Inferred reserves are 1200 kg (V.D.Melnikov, written comm., 1990).

The Malogilyui subdistrict is related to Cambrian metamorphic rocks between the Dyupkoisky granodiorite pluton and the Mesozoic Unakhinsaky granite-granodiorite pluton. Placers of the Malogilyui subdistrict were previously mined in valleys of the Des (Kamenisty), Olongo (Somnitelny, Marmontovsky), and Maly Gilui (Karlovsky, Kruglovsky, and Kurnosovsky) Rivers. The total potential of the area is 19 tonnes gold.

The Bryantin subdistrict occurs between the Unakhinsky and Mulmugin plutons. Au-Cu-Mo porphyry deposits were identified along with numerous other gold lode deposits. Additional lode gold deposits are associated with zones of hydrothermally altered metamorphic rocks. All known lode deposits have related placers deposits. Total placer potential of the subdistrict is 12 tonnes gold.

V.D. Melnikov, written commun., 1990.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N51-02 54°53'N 124°15'E	Srednenuykzhinsk Placer Au	Au	Production of 23 tonnes Au. Proven reserves of 25 tonnes Au; inferred reserves of 76 tonnes Au; total reserves of 124 tonnes Au.

The Srednenyukzhinsky district consists of three gold-bearing subdistricts - Elgakan, Urkimin, and Dzheltulak.

Elgakan - The Elgakan subdistrict is located on the western side of the Nyuksha River. Several small hydrothermal lode gold occurrences are known in this area; including Balykhtakh which is confined to a EW-trending fault bounding the southern edge of the Mesozoic Chilchinsky granitic pluton. Only low-grade gold placer deposits are known.

Urkimin - The Urkimin subdistrict is located on the eastern side the Nyuksha River. The Dzheltula and Sredny Larba placer deposits are confined to the Dzheltulak (Burpalin) fault zone which separates PR terrane metamorphic rocks to the north from the Anosov pluton to the south. Placers of the Urkimin subdistrict are extremely high-grade. They include large prospected placers along the Urkima, Onon, Odolgo, and Agin Rivers, presently being mined by dredges, and smaller placers on the Glubokaya, Razdolnaya, Sivagli, and other Rivers, some of which has been mined recently. The largest placer is on the Urkima River. There are over 20 lode gold deposits in the area, related to the zones of hydrothermal alteration of metamorphic rocks. The largest lode deposit is Odolgo. High-grade lode gold deposits occur near the placer of Berikan Creek. The lode deposits were mined in the early century. The Urkimin valley-type placer was discovered in 1913 on the Urkima River, the eastern tributary of the Nyuksha River. The deposit was mined by hand methods from discovery until 1947 when a low-capacity dredge (250 liter) began operation. The total production from 1913 through 1980 is estimated as 810 kg. The placer is 18 km long, average width is 236 m, average thickness is 7.2 m, total volume of gold-bearing gravel is 32 million m3, average gold grade is 225 mg/m3, fineness of native gold is 881, and proven reserves are 7 tonnes. At present, the placer is being mined with dredges.

Dzheltulak - The Dzheltulak subdistrict includes the valleys at the headwaters of the Bolshoi Dzheltulak River and the middle part of the Tynda River; both western tributaries of the Gilyui River. This district has been known for a long time but only placers have been mined, even though the district also contains many lode occurrences. A major fault in the subdistrict, the Dzheltulak shear zone, separates the Getkansky and Kurbatovsky Proterozoic plutons to the north from the Anosov pluton in the south. Intermittant mining has occurred on placers of the Ilichi, Baldyglia, headwaters of the Bolshoi Dzheltulak, and Burpaly Rivers (these have proven reserves); and on numerous placers of the Tynda River, tributaries of the Burpaly River, and headwaters of the Bolshoi Dzheltulak River. All placers are spatially associated with the Dzheltulak shear zone, a major fault which separates the Getkansky and Kurbatovsky Proterozoic plutons to the north from the Anosov pluton in the south. The largest placer in the Dzheltulak subdistrict is on the Bolshoi Dzheltulak River, which is a southern tributary of the Gilyui River and contains an alluvial valley-type placer which was discovered in the period 1893-96. Approximately 1.3 tonnes gold had been mined by 1959. In 1954-58 the placer reserves were recalculated based on use of a 250-liter capacity dredge, and that dredge started operating in 1980. At the beginning of dredge operations, the placer was 22 km long, 114 m wide, and the gravel deposit 4 m thick. Average content of native gold is 228 mg/m3, proven reserves are 2474 kg, and the fineness of gold is 887. The deposit is now 70% mined out.

V.D. Melnikov and V.V. Ratkin, written commun., 1994.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N51-03 53°55'N 122°30'E	Verkhneamursk Placer Au	Au	Production of 169 tonnes Au. Proven reserves of 3.5 tonnes Au; inferred reserves of 50 tonnes Au; total of 284 tonnes Au. Grade: Average gold grade is 133 mg/m3, ranging from 58 to 237 mg/m3 in different

The Verkhneamursk gold-bearing district consists of the Solov'ev and Urusha-Oldoi subdistricts. The largest placer in the Urusha-Oldoi subdistrict is the Khaiktinsky placer, and the largest placer in the Solov'ev subdistrict is the Dzhalinda placer.

The Khaiktin placer deposit occurs in the valley of the Bolshoi Oldoi River, a large tributary on the north side of the Amur River. Placers in the valley of the Khaikty River have been known since the early century. The Konstantinovka and Orogzhan placers were intensely mined. Based on questionable data, over 2000 kg Au was produced from the Khaikta River valley through 1925. The Khaiktin deposit is a valley type and is 28.8 km long. It is located within the flood plain of the Bolshoi Oldoi and Khaikta Rivers. The width of the flood plain ranges from 500 to 1000 m; alluvium thickness is less than 6.4 m. Gold-bearing sediments contain pebbles with sand, gravel, ooze, clay, and boulders. Bedrock consists of gneiss, granite, amphibolite, and diorite with a well-develpoed weathering crust. Bedrock has a smooth upper surface, with relief of 0.5 to 1.2 m. Gold fineness is very fine (0.25 mm) 6.47%, fine (0.25 - 1.0 mm) - 41.6%, medium (1.0-3.0 mm) - 38.81%, and large (more than 3 mm) - 13.12%. Average fineness is 876. The gold-bearing bed is 0.6 to 3.6 m thick. Nuggets have not been found. Thirty-four percent of the area of the deposit has permafrost. The deposit has been explored by prospect pits and drill holes across an area 400 x 20m. Only a small portion (3.5%) of the placer deposit has been mined.

The Dzhalinda placer deposit is the largest in the Amur Region. Total production exceeds 120 tonnes gold. The deposit has numerous lode sources, including the Kirovka gold-quartz deposit associated with granodiorite intrusions and metamorphic gold occurrences hosted in greenschist. The deposit is over 45 km long, averages 250-300 m wide, and alluvial deposits are 5 m thick. The placer was discovered in 1867 by N.P.Anosov, and was the first economic placer to be mined in the Verkhnee Priamur'e. Deposit was mined by hand methods until 1929 (with production of 39 tonnes Au). Dredges have been used since from then through the present. Gold is occurs throughout the section; maximum grades have been found near the bedrock. The fineness is high, averaging 940.

Placer deposits of the Yankan River are derived from the Kirovka lode deposits. Placer deposits have been known since 1867 and have been mined since 1871. The placers are over 15 km long, average 350 m wide, and have alluvium about 6 m thick. Gold fineness is 930.

The Nagim placer deposit is located in the western part of the Solov'evsky subdistrict, and is a very thick gold-bearing deposit (up to 50 m thick).

E.I. Belousov and V.D. Melnikov, written commun., 1979; B.Y. Grezin and V.S. Borodin, written commun., 1982.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N51-04 53°30'N 125°30'E	Gonzhinsky (Gonzha) Placer Au	Au	Production of 48.0 tonnes Au. Proven reserves of 8.0 tonnes; inferred resources 66.0 tonnes; total of 122.0 tonnes.

The Gonzhinsky district occurs in the western part of the Burea superterrane. The area is underlain mainly by Precambrian metamorphic rocks. The largest gold-bearing deposits of the district (Pokrovskoe, Pioneer, Borgulikan, Burinda, and Kulikan) are interpreted as being derived from Early Cretaceous volcanic overlap assemblages.

The Osezhinsky subdistrict is underlain by Upper Jurassic-Lower Cretaceous clastic trough. The largest placer is in the Bolshoi Burgali River (the Alma-Burgali subdistrict) that has been mined intermittently since 1890, with a total of production of 1.7 tonnes gold. The placer is 9 km long, averages 250 m wide, and the alluvium is 4-5 m thick. Gold-bearing bed occur in the lower part of alluvium and are 1.6 m thick. Gold is fine (0.3-0.4 mm) and poorly rounded. The placer is being mined again after additional exploration.

The Tygda-Ulundy gold-bearing subdistrict occurs in a hilly area in the northwestern part of the Cenozoic Amur-Zeiya depression. The area contains wide river valleys with gentle slopes grade into drainage divides. Topographic releif is commonly 20 to 50 m, rarely 100 m, with the highest releif being 340 to 360 m. The Ulunginsky placer is largest in the subdistrict.

The Ulunginsky placer deposit occurs in the valley of the middle part of Bolshoi Ulunga Creek. The first prospect (Pioneer) was discovered in 1911. Mining operations began in 1915 and are occurring. The Aprelsky prospect, containing both just-subsurface and also deep-seated placer material, was discovered in 1937. The stratigraphic section (from top to bottom) consists of: 0-3 m yellow viscous clay and ooze; 3-7 m dark-brown compact ooze; the first gold-bearing bed (5-7 m below the surface); 7-12 m of false bedrock consisting of angular pebbles derived from granodiorite, decomposed to varied-color clay; the second gold-bearing bed (5 to 7 m), consisting of coarse grained gray sand with poorly-rounded quartz pebbles. Granite boulders up to 40 cm occur locally. About 75% of gold is irregular in shape and less that 0.25 mm makes up about 75%. Gold from 0.5 to 2 mm diameter is of tabular shape and very light in color. Proven reserves of the deep-seated placer are 186 kg; inferred reserves are 500 kg. The placer is 10 km long, average thickness of the gold-bearing bed is 1.3 m, and average thickness of the pit layer is up to 20 m. Gold content varies from 641 to 1419 mg/m3. Gold is 0.25 to 2.0 mm in size, with fineness of 800.

V.D. Melnikov and V.V. Ratkin, written commun., 1994.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N52-01 54°55'N 131°05'E	Verkhnezeisk Placer Au	Au	Production of 24 tonnes Au. Proven reserves of 6 tonnes Au; inferred reserves 76 tonnes Au; total reserves of 106 tonnes Au.

The Verkhnezeisk district occurs in the eastern part of the Nora-Sukhotin terrane. The Mulmugin, Toksky, and Okonon plutons of Mesozoic age underlie over half of the district; rest of district is underlain by nearly equal amounts of Early Archean metamorphic rock and Precambrian igneous rock. The district consists of the Sugdzhar, Verkhnetok, Kupuri-Maisky, and Arginsky subdistricts.

The Sugdzhar subdistrict occurs near the giant Malmugin and Okonon granitoid plutons. Most lode and placer deposits of the Sugdzhar subdistrict occur within the Sivakan-Toksky block of metamorphic rocks. About 20 lode occurrences are known, related to a long, wide (up to 7 km) shear zone cutting zones of schistose rocks and zones of retrograde metamorphic rock containing disseminated sulfides. Gold occurs in small quartz, quartz-pyrite, quartz-epidote and quartz-feldspar veins and veinlets, in altered gabbro-amphibolite, and in gneisses containing quartz-filled fractures. Most commonly, gold has a fineness 720 to 830. Gold grains are angular, intergrown with quartz (up to 2.5 wt. %), and are small (normally less than 1 mm). Lode sources for gold are interpreted as forming during Late Jurassic accretion; lode deposits are confined to the areas of intense schistosity and retrograde metamorphism.

The Verkhnetok subdistrict occurs between the Toksky and Okonon granitic plutons. Late Archean metamorphic rocks and mafic granitic rocks predominate. Estimated placer potential of the Verkhnetok subdistrict is 6 tonnes gold.

The Kupuri-Maisky placer subdistrict occurs in the eastern the Okonon pluton in the valley of the headwaters of the Kupuri and Maai Udsky Rivers. Archean metamorphic rocks and gabbro-amphibolite predominate, granodiorite and diorite are subordinate.

Neronsky and Dobraya, 1976, V.D. Melnikov, written commun., 1979.

N52-02a 54°40'N 126°40'E	Dambuki - Part A Placer Au	Au	Production of 185 tonnes Au. Proven reserves of 56 tonnes Au; inferred reserves of 88 tonnes Au; total 329 tonnes Au.

The Dambuki district is well defined. Internal division is difficult because it is highly gold-bearing throughout. Seven tentative subdistricts are distinguished: Mogoktak-Talginsky, Ilikan-Unakhinsky, Kokhaniisky, Zolotogorsko-Uspensky, Dzhalta-Uldegitsky, Ugan-Mogotsky, and Zhurbansky. The shallow Khugdersky placer and the deep Petrovsky and Yasnopolyansky placers are described as examples.

The lode sources for the Khugdersky placer deposit are the Zolotaya Gora deposit and retrograde metamorphism Au lode deposits. The deposit is 15.6 km long, averages 189 m wide and 4.0 m thick, and has an average gold grade of 285 mg/m^3. Fineness of gold is 940. The bedrock consists of metamorphic rocks (amphibolite, gneiss, gneissic granite, and diapthorite). Loose sediment consists of 41 % pebbles (more than 5 mm), 31 % gravel (1-5 mm), 21 % sand (less than 1.0 mm), and 3 % ooze and clay. Gold is fine and medium in size: 1.2 % is up to 0.2mm, 50.6 % is 0.21-0.63 mm, 7.2 % is 0.64-2.5mm, and 1 % is greater than 2.5 mm. Gold grains are tabular and bright yellow, locally with a reddish tint. More than 8 tonnes of gold has been mined. Nuggets up to 18 kg were recovered. Heavy-mineral concentrates contain scheelite, zircon, rutile, sphene, anatase, ilmenite, monazite, andalusite, kyanite, molybdenite, apatite, epidote, garnet, pyrite, amphibole, and pyroxene.

Anert, 1928; V.D. Melnikov and others, written commun., 1989.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N52-02b 54°40'N 126°40'E	Dambuki - Part B Placer Au	Au	Production of 185 tonnes Au. Proven reserves of 56 tonnes Au; inferred reserves of 88 tonnes Au; total 329 tonnes Au.

The Petrovsky placer deposit occurs in a saddle on the Tukuringra Ridge. The placer was discovered in 1897 and has been mined since 1898. It does not coincide with a modern river system. Major accumulations of unconsolidated Cenozoic sediments occur in a small elongated NS-trending basin. The slopes of the basin are mostly gentle, with well-preserved piedmonts and wide erosional terraces, corresponding to ancient piedmonts with elevations of 700 to 750 m. The floor and slopes of the basin consist mostly of gneiss and amphibolite with Early Archean marble lenses. The basin floor is rather wide (about 500 m, indulated, with local depressions ranging from 5-10 m and 60-100 m wide). Unconsolidated sediments are 60 m thick. Bedrock exhibits a thick weathering crust consisting of a layer 1-3 m thick of angular pebble-sized fragments that occurs almost everywhere at the base of the sequence of gold-bearing gravel. Unconsolidated material is mainly sandy pebble gravel to pebble sand, with beds and lenses of gravelly mud and peat, muddy sand, and compact clay. The largest and most poorly-rounded clasts are concentrated in the deepest part of the basin, its center. There are several gold-bearing beds in the section, although the richest gold deposits are in the lowermost gravel beds and in the bedrock weathering crust. Grains less than 1.0 mm form 82-90 % of the gold of this ancient placer. Some nuggets occur, mostly 2 to 12 kg and rarely up to 100 kg. Fineness of gold is 950-962. An alluvial origin is interpreted for the sediments of the Petrovsky placer. Anert (1928) proposed initially an origin as an eluvium placer that was redeposited virtually in situ. The placer is presently being mined as a small-scale operation, producing 30 to 60 tonnes gold per year. A total of 4-5 tonnes gold have been produced. Proven reserves are 1 tonne Au; inferred reserves are 2-3 tonnes Au.

The Yasnaya Polyana placer deposit occurs within the Yasnaya Polyana basin. The upper level of ancient alluvium was mined in the 1920s. The Yasnaya Polyana basin is 14 km long and 0.6-2 km wide. The basin occurs in a fault zone between Early Archean Dambuki and Late Archean Ilikansky blocks. The basin is filled with sand, pebble gravel, and clay. Clasts are well-rounded and consist of granite, gneiss, and quartzite, with less common amphibolite and volcanic rocks (rhyolite, andesite, and dacite). The placer occurs at the thalweg of a northwest-trending paleovalley. Absolute heights (elevations over the sea level) range from 462.7 m at the western part of the deposit to 403.5 m at its eastern part. The gold-bearing beds are predominantly gravel and pebble with larger clasts. Coarse sand makes up 20%, and clay 15%. The thickness of the gold-bearing bed ranges from 1 to 17.6 m, gold grade varies from colors to 17,966 mg/m^3. Gold grains are found 0.4-0.8 m into the bedrock. Gold grains are either small (less than 0.1 mm) of irregular dendritic shape, or are larger, tabular, poorly-rounded grains. Scarce intergrowths of gold with other minerals (quartz, pyrite commonly with galena) generally occur as small grains (less than 0.16 mm). Gold is bright yellow, about 15% of grains are light yellow (straw-like color). These grains are rounded, spindle-shaped. The fineness of native gold is 967. The bedrock consists of granite, Early Proterozoic granodiorite and gneiss, and Archean amphibolite.

Anert, 1928; V.D. Melnikov and others, written commun., 1989.

District No. / Latitude / Longitude / Summary Description / References	District Name / Deposit Type	Major Commodities / Minor Commodities	Grade and Tonnage
N52-03 53°50'N 130°00'E	Dzhagdy Placer Au	Au	Production of 20 tonnes Au. Proven reserve of 2 tonnes Au; inferred reserve 51 tonnes Au; total reserves of 73 tonnes.

The Dzhagdy district is confined to the Tukurigra-Dzhagdi terrane and is subdiviided into the elongate, east-west-trending Un'ya-Bomsky subdistrict which contains most of the placer gold deposits, and a group of subdistricts to the south (Verkhnedepsky, Tuksinsky, and Egorsky). Placer and lode deposits clearly restricted to the east-west-trending Un'insky thrust. Streams are rapid and steep, valleys are canyons. Un'ya Creek has the widest flood plain (300-450 m), the valley of the Bom Creek is steep. Valleys of tributaries (rapids) of the Bom Creek are even steeper.

The Born Creek placers are largely concentrated in the first flood plain terrace which is 40-45 m high and 400-450 m wide. The deposits are about 5 m thick and gold-bearing throughout the whole length of the creek. Gold distribution is extremely irregular. Gold occurs locally on the floor of the creek and in tiny fractures in the greenschist bedrock. Gold grains are coarse and nuggets up to 400 kg g are found.

The Un'ya Creek deposit contains both terrace- and valley-type placers. The valley placer part is 20 to 120 m wide. Valley alluvium is 2.5 to 6.0 m thick. The gold-bearing bed consisting of gravel and pebble near the bedrock is 0.2 to 0.6 m thick. Terrace placers of Un'ya Creek are also mainly related to the first flood plain terrace, which is 15-20 m high. Terrace alluvium ranges from 6 to 25 m thick. Gold distribution is irregular. Gold is coarse and poorly rounded. Quartz fragments in some places contain visible gold and scheelite.

V.D. Melnikov and others, written commun., 1985.

N52-04a 52°50'N 128°50'E	Zeiya-Selemdzha - Part A Placer Au	Au	Production of 111 tonnes Au. Proven reserves of 29 tonnes Au; inferred resources 101 tonnes Au; total 241 of tonnes Au.

The Zeiya-Selemdzha district is underlain by Early Cretaceous volcanic rocks which mostly overlie the Nora-Sukhotin terrane. The district is subdivided into the Umlekan, Yasnensky, Oktyabrsky, Sokhatiny, Chagoyan, and Nizhneselemdzha subdistricts. The Zeiya-Selemdzha placer gold district has the largest gold reserves in the the Amur region.

The Umlekan subdistrict covers an area of about 3,000 km^2 in the valley of the Umlekan and Nemogin Rivers, and in the valley of the Zeiya River from the mouth of the Chalbachi Creek to the mouth of the Bugo Creek. The first discovery was a rich placer on a bar in the Zeiya River near the mouth of the Bugo Creek. The subdistrict occurs in an Early Cretaceous caldera. Numerous lode occurrences are in the subdistrict and consist of quartz veins in hydrothermally altered volcanic rocks and in granodiorite that intrudes Jurassic sandstone. About 20 small placers occur in the subdistrict. Some are exhausted; others were only explored (Umlekan and Algachan Rivers). Gold in placers is of variable size and shape, often in intergrowths with quartz. Fineness is 750-850. The sources for shallow-seated placers of small creeks are gold-bearing, hydrothermally-altered volcanic rocks.

The Yasnensky subdistrict occurs in the basin of the Yasny Creek, the adjacent valley of the the Dep River, and the headwaters of the Gar 1 and Gar 2 Rivers. Most placers are occur in Lower Quaternary deposits. More than 25 placers occur in the subdistrict, most are exhausted. Extremely interesting data were obtained from a prospecting trench crossing the valley of the Gar 2 River at the mouth of the Karakatitsa Creek. This trench contains a displaced weathering crust of greenstone rocks, and the 665 nuggets recovered from this trench differ sharply from gold of the placer by having higher fineness values. The lode source is unknown.

V. Lozhnikov and others, written commun., 1984; V.D. Melnikov and others, written commun., 1985.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N52-04b 52°50'N 128°50'E	Zeiya-Selemdzha - Part B Placer Au	Au	Production of 111 tonnes Au. Proven reserves of 29 tonnes Au; inferred resources 101 tonnes Au; total 241 of tonnes Au.

The largest placer of the Yasnensky subdistrict is the Yasny Creek placer, discovered in 1934. It was actively mined from 1935 to 1937. More recently the deposit was mined using a dredge and exhausted. The bedrock consists of crushed extrusive rocks, with less common sandstone and siltstone. Gold-bearing gravel directly overlies bedrock. Gold distribution is uneven. Gold content decreases sharply to colors as distance above bedrock increases. Gold grain shapes are irregular and rounded. Intergrowths with quartz or quartz and tourmaline are common. Gold fineness is 900, gold grains are coarse (2-4 mm), and nuggets of 30-60 g are common. Nuggets locally locally reach 100 g. The gold-bearing bed is overlain by gold-bearing ooze and clay (0.5-4.0 m), and less common sandy-clay deposits 0.3-1.7 m thick. The section is covered by a bed of soil 0.3-0.5 m thick.

The Oktyabrsky subdistrict covers the valley of the Dzheltulak River and the headwaters of Inkan, Elna, and Bolshoy Kalakhta Creeks. Gold was discovered in 1937 in the Dzheltulak 1 and Dzheltulak 2 Rivers, and in a very rich placer in Sandunovsky Creek, a tributary of the Dzheltulak 1 River. Numerous placers were later discovered and prospected within the subdistrict, which are still being mined using dredges. The subdistrict is underlain mainly by Early Paleozoic granite with fragments of Late Proterozoic to Early Cambrian schist and marble, Silurian conglomerate, sandstone, siltstone, and Devonian clastic carbonate rocks. Numerous lode gold occurrences are in quartz-cambonate and calcedony veins. Small gold-bearing skarn bodies in limestone are less common. Most gold placers are related to Late to Middle Quaternary sediments. Almost all placers are alluvial, either valley or terrace, locally mixed. Eluvium and talus placers such as Nagornaya and Morennaya are uncommon. Modern and ancient placers are located separately: modern ones occur below the talweg of the valley (or close to it) at a depth of 3-6 m. Old placers are not related to the modern valley floor and much deeper (5 to 15 m). Locally old and modern placers occur one above the other and are separated by a layer of barren sediment. In some valleys, old placers are eroded either completely or partly, forming modern placers. The bedrock is generally heavily weathered granite, now angular pebbles and clay. The gold-bearing bed of old placers consists of heavily eroded pebbles with clay patches of different shades and pebbly sandy-clay deposits. Gold generally occurs in the middle part of beds. Native gold fineness is commonly high, up to 950. Large nuggets up to 500 grams were found locally (eg: headwaters of the Kalakhta River). Gold in placers is associated with scheelite, cinnabar, and less common galena. Modern placers have lower gold grade. They are confined to the flood valley alluvium and consist of clay, ooze, and sand with pebbles. Native gold fineness in modern alluvium placers (up to 885) is locally significantly lower than in older placers. The lower fineness results is because these placers were derived directly from lode sources, rather than from erosion and reconcentration of old placers.

V. Lozhnikov and others, written commun., 1984; V.D. Melnikov and others, written commun., 1985.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N52-04c 52°50'N 128°50'E	Zeiya-Selemdzha - Part C Placer Au	Au	Production of 111 tonnes Au. Proven reserves of 29 tonnes Au; inferred resources 101 tonnes Au; total 241 of tonnes Au.

Sokhatiny - The Sokhatiny gold-bearing subdistrict covers the valley of the Sokhatiny River and headwaters of the Mamyn River (Orlovka, Levy and Pravy Mamyn Creeks). The placers of the Sokhatiny River were discovered in 1942, and have been mined from 1948 through the present time. Bedrock consists of Early Paleozoic granitic rocks cutting Proterozoic to Cambrian deposits, as well as small Early Cretaceous intrusions and numerous dikes. Only three lode occurrences are known in the subdistrict, consisting of quartz-tourmaline breccia zones with sulfides and altered quartz-sericite rocks. About 30 placers have been discovered; many of them are mined out. The valley of the Adamikha River is being explored.

Chagoyan - The Chagoyan gold-bearing subdistrict is located in the southern part of the NS terrane and covers the valley of the Zeyia River from the mouth of the Tygad River to the mouth of the Gramatukha River, including all tributaries. Placers here have been mined since 1893. Lode gold occurrences (seen in talus) in the valley of the Malyutka River contain fragments of veined quartz with visible gold. A prospecting drill hole on the Chagoyan polymetallic deposit revealed high gold grades at depths of 29-32 m. Gold placers within the Chagoyan subdistrict occur either in bars or the river bottom. Gold is coarse and of different shapes. In the headwaters of Maly Chukan and Chagoyan Creeks, nuggets up to 140 g occur as intergrowths with quartz. Native gold fineness is 675-911.

Nizhneselemdzha (Maisky) - The Nizhneselemdzha (Maisky) gold-bearing subdistrict covers the areas near the mouths of the Orlovka, Selemdzha, and Aldikon Rivers. Most placers occur in the valley of the Neklya River. Placer mining began here in 1895 and continues today. Bedrock consists of crystalline metamorphic rocks, including Silurian schist cut by large Early Paleozoic granitoid intrusions. The largest placer in the subdistrict is on the Neklya River, consisting of shallow and deep-seated gold-bearing beds. This placer has been mined since 1902, producing a total of 9.5 tonnes gold. This placer occurs between two granitic stocks (the Tatarkinsky in the north and Ust-Orlovsky in the south) but is confined to the area of Early Paleozoic schist between them. An economic placer 15 km long and averaging 140 m wide occurs in the headwaters and middle part of the Neklya River valley. In the upper part of this deposit the first gold-bearing layer is 1.5 m thick and 6-8 m below the surface; splitting into two beds downstream with a bed of gold-free alluvium 10-12 m thick between them. The beds coincide in plan view. A paleoplacer plunges to the south, and has been explored to a depth of 24 m. Gold-bearing deposits consist of quartz pebble and cobble gravel with a compact clay matrix. Average gold grade in deposits being mined at present is 115 mg/m^3; fineness of native gold is 900. Gold is fine, average size is 0.64 mm. Most gold in placers is dense, but several dendritic grains were observed. Unlike the lower bed, the upper one has smaller gold grains and they are poorly rounded. Poorly-rounded nuggets intergrown with quartz also occur. Fragments of veined quartz found in headwaters of the Neklya River, contain up to 2.4 g/tonne gold. The placer is presently being mined by a dredge.

V. Lozhnikov and others, written commun., 1984; V.D. Melnikov and others, written commun., 1985.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N53-01 53°00'N 132°45'E	Verkhneselemdzha Placer Au	Au	Production of 137.0 tonnes Au. Proven reserves of 29.0 tonnes Au; inferred reserves of 60.0 tonnes Au; total reserves of 226.0 tonnes Au.

The Verkhneselemdzha district is the best known placer district in the Amur region and includes the Kharga, Malomyrsky, Verkhnestoibinsky, and Tokur-sagursky subdistricts. Total inferred reserves for the district are 226 tonnes gold; which is 13.7% of the total reserves of the Amur region. The majority of mined lode gold deposits are also concentrated in this district (Zazubrinsky, Poiskovoe, Sagur, Afanas'evsky, Kharga, Unglichikan, and Yasnoe). The only lode deposit in Amur which is currently being mined. The Tokur deposit also occurs here. Most lode gold deposits in the Verkhneselemdzha district occur in metamorphic rocks. The district includes large placers that can be mined by dredge (Selemdzha River, Verkhny and Nizhny Stoiba, Kharga, Maly Naergen, Elga, Semertak, Ugokhan, and Bolshoi and Maly Karaurak deposits). Placer mining began here in 1972 and continues.

The Malomyrsky subdistrict is small, but gold grades are high. It also includes the medium-sized Malomyr lode deposit. The largest placer occurs on the Nizhny Stoiba River.

The Verkhne-Stoibinsky placer subdistrict includes two small lode gold deposits (Pokrovka and Voroshilovka) and large placers in the valley of the Verkhny Stoiba River. Gold is mainly concentrated near granitoid intrusions and lode sources.

The Tokur-Sagursky subdistrict includes deposits. The Tokur lode deposit and several rich placers in the headwaters of the Bolshoi Karaurak and Tarnakh Rivers occur in the northern part of the subdistrict. Numerous small lode occurrences in greenschist facies metamorphic rocks and small placer deposits occur in the middle part of the Bolshoi and Maly Karaurak Rivers. Some placer deposits occur within the Sagur dome-like structure. The largest placer at Koboldinsky occurs in the Koboldinsky part of the Selemdzha River between the Ogodzha and Maly Karaurak Rivers. The Sagursky lode deposit occurs to the east; bedrock near this deposit contains numerous metamorphic gold occurrences. To the west of the placer are very promising lode gold deposits (Pridorozhnoe, Mostovoe, and others).

The Kharga subdistrict contains six small Au and Au-W lode deposits and one Au-Sb lode deposit. Three placer gold-bearing areas are distinguished and are confined to metamorphic domes and outcrops of small intrusions. The Kharga placer is the largest in the subdistrict and produced over 20 tonnes Au was produced from valley part of the deposit. This deposit has several lode sources. The richest part of the placer occurs close to the Kharga lode deposit. Numerous metamorphic gold occurrences with high gold grades occur the placer. The upper part of the Kharga Creek valley was recently explored. The richest part of the placer occurs immediately adjacent to the Talyminsky Au-Sb lode deposit.

V.D. Melnikov and others, written commun., 1985 ; V.D. Melnikov & V.D. Polevanov, written commun., 1990.

N53-02 52°14'N 133°53'E	Sofiiskoe Placer Au	Au	Size: Medium. Deposits are exhausted. Fineness: 750-800

The Sofiiskoe distrist occurs in stream deposits in the upper reaches of the Niman River (a tributary of the Burea River). Total length of placers is approximately 30 km. Fine- and medium-grained gold is distributed irregularly. Gold fineness is 750-800. Gold is derived from greenschist facies rocks of the Sofiisky metamorphic dome that contain streaks, veins, and lenses of ore-bearing quartz. Gold-bearing tributaries drain small veinlet deposits. Placer deposits are exhausted.

N.V. Ognyanov, this study.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N53-03 52°24'N 135°44'E	Kerbi Placer Au	Au	Size: Small. Fineness: 800-850

Kerbi district occurs in the valley of the Kerbi River and its numerous tributaries. Total length of gold-bearing beds is approximately 35 km. Gold is fine- and medium-sized with fineness of 800-850. Bedrock is Jurassic black shale that is metamorphosed to greenschist facies and that contains thin scattered streaks of gold-bearing quartz.

N.V. Ognyanov, this study.

N54-01 53°52'N 139°49'E	Ulskoe Placer Au	Au	Size: Small. Fineness: 850-900

Ulskoe district contains stream and bench placers of the Ul Orelsky River and tributaries. Total length of placers along the Ul Orelsky River and its tributaries is approximately 15 km. Gold is associated with vein quartz. Fineness of 850-900. Local bedrock consists of Early Cretaceous siltstone, sandstone, and late Cretaceous volcanic rocks. Deposit derived from the Mnogovershinnoe lode gold deposit.

N.V. Ognyanov, this study.

N54-02 53°35'N 140°21'E	Kolchanskoe Placer Au	Au	Size: Small. Deposits are exhausted. Fineness: 500-600

Kolchanskoe district contains low-grade stream placers that occur along the Kolchan River and its tributaries with a total length of approximately 10 km. Gold is fine-grained; fineness of 500 to 600. A few nuggets occur, ranging up to 10-20 g. Gold is associated with quartz and adularia. Local bedrock consists of volcanic rocks and hydrothermally altered siliceous rock. Placer deposits are derived mainly from the Belogorsk lode deposit that consists of late Paleogene gold-bearing altered siliceous rocks with quartz-adularia alteration.

N.V. Ognyanov, this study.

N54-03 53°02'N 138°46'E	Kherpuchinskoe Placer Au	Au	Size: Medium. Fineness: 700-850

Kherpuchinskoe district contains stream deposits along the Kherpuchi River and tributaries of the Somni spring (a tributary of the Amgun River). Placer deposits occur both in main and branch valleys along a distance of over 25 km. Gold is fine- or medium-sized, and high-grade. Vein quartz occurs in the gold-bearing sand. Gold is derived from small quartz veins and veinlets that contain gold and arsenic sulfides. Local bedrock consists of Early Cretaceous sandstone and siltstone.

N.V. Ognyanov, this study.

N54-04 52°37'N 139°29'E	Oktyabrskoe Placer Au	Au	Size: Small. Fineness: 800-850

Oktyabrskoe distict contains alluvial-colluvial placers that occur in the valley and on slopes of the Pochel River (a tributary of the Amgun' River). Gold is concentrated largely in a weathering crust developed in a gold-bearing, mid-Cretaceous tonalite that contains quartz streaks with As and Pb sulfides. Rock-forming minerals from the tonalite and veined quartz are abundant in gold-bearing sands. Gold is fine and medium size.

N.V. Ognyanov, this study.

District No. / Latitude / Longitude / Summary Description / References	District Name / Deposit Type	Major Commodities / Minor Commodities	Grade and Tonnage

N54-05 54°06'N 142°55'E	Schmidtovskoe Placer Au	Au	Size: Small. Fineness: 800-900

Schmidtovskoe district contains small placers, 30 to 10 m wide and up to 1000 m long. Gold occurs throughout the 3 to 4 m thick section of modern alluvium, although a 1.2 to 1.4 m thick zone near bedrock is the richest. Alluvium consists of ultramafic and mafic rocks that are altered to chlorite, zeolite, and albite. Heavy-mineral concentrates contain chromite, magnetite, pyrite, and siderite. Gold grains are normally larger than 0.5 mm. Some gold forms intergrowths with albite and magnetite. The bedrock source of the placer deposits is gold-bearing zeolite-epidote-prehnite-chlorite and albite-pyrite-chlorite rocks that occur at the contact with serpentinized ultramafic rocks and propylitic altered gabbro. Source rocks contain up to 2 g/t Au.

V.D. Sidorenko, 1977.

N57-01 54°57'N 159°42'E	Temny Creek Placer Au	Au	Estimated original 59 kg Au. Probably exhausted. Grade: Estimated 0.8 g/t.

District consists of a shallow alluvial placer, up to 1200 m long and 20 m wide. Gold is coarse-grained; 40% is 3-5 mm in diameter, 30% is 1-3 mm. Heavy-mineral fraction contains magnetite, cinnabar, scheelite, chromite, ilmenite, and gold. Bedrock consists of hydrothermally altered tuff and tuff breccia, with veinlets and masses of quartz containing 0.4 g/t gold and up to 7.4 g/t silver.

A.V. Sytov, written commun., 1980.

N57-02 53°49'N 159°48'E	Kronotsky Bay Placer magnetite	Ti, Fe	Estimated reserves of 18.8 million tonnes of titanomagnetite concentrate. Grade: No data.

Consists of a modern beach placer, about 17 km long and 30 to 80 m wide. Heavy mineral fraction, including magnetite, in the placer sand ranges from 0.5 to 1.5%.

A.V. Kurkin, written commun., 1964.

N57-03 53°43'N 158°34'E	Udachny Creek Placer Au	Au	Size: Small. Estimated production of 162 kg gold. Probably exhausted. Grade: Estimated average of 0.7 g/cu m Au.

Consists ofshallow placer deposits that occur in a flood plain and flood plain terrace in an area about 3000 m long and 20 m wide. Forty percent of gold grains range 0.1 to 0.5 mm. Heavy minerals are magnetite and pyrite. Bedrock consists of pyritized, kaolinized, silicified Miocene tuff with up to 0.5 g/t Au and 10-70 g/t Ag.

S.S. Koval, written commun., 1966.

N57-04 53°26'N 157°44'E	Iudumich Creek Placer Au	Au	Size: Small. Resources of 543 kg Au. Proven reserve of 61 kg Au.. Grade: Ranges from 3 to 22 g/cu m Au.

Consists of a buried alluvial placer about 2700 m long and up to 50 m wide. Gold grains range from 3 to 5 mm (45%) and 0.5 to 1 mm (48%). Heavy minerals are magnetite, scheelite, and platinum (few grains). Non-rounded gold grains occur in alluvium. Bedrock consists of pyritized and silicified tuffs containing 0.3-0.5 g/t gold and up to 70 g/t silver. Bedrock is brecciated and fractured along contacts with lamprophyre dikes.

S.S. Koval, written commun., 1973.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
N57-05 53°21'N 158°17'E	Kamenisty Creek Placer Au	Au	Production of 8 kg Au. Deposit exhausted. Grade: Up to 2.26 g/m3 .

Consists of a buried alluvial placer. Fifty percent of gold grains are larger than 5 mm, 30% range from 3 to 5 mm. Heavy minerals are magnetite, zircon, garnet, rutile, sphene, ilmenite, apatite, leucoxene, chromite; with rare platinum. Gold derived from thin quartz veins and fracture zones in Miocene quartz diorite that exhibits a gold content up to 5 g/t, and quartz-rich zones in metamorphosed Proterozoic shale.

A.P. Sharga, written commun., 1965.

N57-06 53°12'N 159°15'E	Khalaktyrskoe Placer magnetite	Ti, Fe	Estimated tonnage of concentrate is 5,998,100 tonnes; estimated resource of 2,310,000 tonnes Fe and 390,000 tonnes TiO2 in 6,000,000 tonnes concentrate.

Consists of titanomagnetite sand that occur in a typical beach placer 500 to 5000 m wide with an economic ore-bearing zone 2 to 10 m thick. Ore minerals are magnetite, titanomagnetite, martite, and ilmenite. Sand contains 11.8 to 14.5% total Fe, 1.42 to 1.77% TiO_2, and 0.06 to 0.11% V_2O_5. Concentrate produced by hydraulic and magnetic separation contains 58.1% Fe, 9.72% Ti, 0.46% V_2O_5, 0.01% sulfur, and 0.032% phosphorus. Iron ore is low-grade.

M.F. Kobylkin, written commun., 1964.

N57-07 53°03'N 157°07'E	Kameshkovoi-Polovinchik Riv er Placer Au	Au	Production of 25 kg Au. Grade: Average Au 0.5 g/m3 .

Consists of shallow, valley placers that occur in a flood plain and on terraces. Placers occur as discontinuous layers up to 8 km long and 60-360 m wide. Gold is fine-grained; 60% ranges from 0.1 to 0.5 mm. Gold is derived from thick (up to 400 m) veinlet zones that contain up to 65.4 g/t gold. Heavy minerals are ilmenite, magnetite, zircon, epidote, and scheelite. Placers are partly mined.

V.I. Shaposhnikov, written commun., 1969.

N57-08 52°50'N 156°59'E	Goltsovka Placer Au	Au	Production of 86 kg Au. Grade: 0.4 to 0.5 g/m3.

Consists of a group of shallow alluvial placers that are over 8 km long and up to 80 m wide. Placers occur both in flood plains and on terraces. Heavy minerals are magnetite and ilmenite. Gold is fine- and medium-grained. Interpreted source of gold are fracture and mylonite zones in Late Cretaceous sandstone and siltstone that contains up to 0.1 g/t Au and up to 2 g/t Ag.

M.M. Zadornov, written commun., 1968.

District No. / Latitude / Longitude	District Name / Deposit Type	Major Commodities / Minor Commodities	Grade and Tonnage

Summary Description
References

O04-01 59°00'N 161°10'W	Goodnews Bay, Bethel Placer PGE-Au	Pt, Au Cr	Production of over 20,200 kg PGE and 2,259 kg Au. Years of Production: 1900-1995. Fineness: 854-893

Most extensive platinum placer deposits are in the Salmon River drainage; smaller productive placers also occur in Wattamuse, Fox, Butte, and Kowkow Creeks and in Snow Gulch; all northwest of Goodnews Bay. This latter area is sometimes referred to as the Bethel district. Platinum and gold mined mainly by bucketline dredges. Production mainly from 1934 to 1982, a major portion of the primary U.S. platinum production. Average percentages in placer concentrates are 73.6% Pt, 9.9% Ir, 1.9% Os, 0.15% Rh, 1.2% Ru, 0.34% Pd, 2.1% Au, and 10.9% impurities. In Salmon River drainage, Pt, Cr, and some Au, are apparently derived from the nearby informally named Middle Jurassic Goodnews Bay ultramafic complex of Southworth and Foley (1986), composed of dunite, pyroxenite, and hornblendite, with anomalous PGE concentrations associated with sparse chromite segregations. In both areas preglacial ancestral channels and reworked till forms main placer deposits. Gold in Wattamuse, Fox, Butte, and Kowkow Creeks (Bethel district) probably derived from monzonite plutons. Magnetic surveys indicate possible 5-km offshore extension of the Goodnews Bay complex. Fineness values range from 854 to 893 for Wattamuse, Butte, Fox, and Kowkow Creeks.

Mertie, 1940, 1969; 1976; Berryhill, 1963; Cobb, 1973; Southworth and Foley, 1986; Barker and Lamal, 1989; Zelenka, 1988; Bundtzen and others, 1996.

O05-01 57°45'N 153°30'W	Kodiak Placer Au	Au, Ag, Cr, Pt	Production of 149 kg Au. Years of Production: 1895-1920, intermittently. Fineness: average 837

Gold is concentrated in beach deposits and in sand dunes that are derived from glacial outwash and tills. Pre-glacial placers removed during Pleistocene glaciation. Heavy minerals include magnetite, pyrite, chromite, and platinum. Gold fineness averages 837 from eight analyses of strandline deposits. Gold probably derived from Au-bearing quartz vein deposits in graywacke and argillite of the Upper Cretaceous Kodiak Formation. Platinum probably derived from the Jurassic or older, informally named, Border Ranges ultramafic and mafic complex of Burns (1985). Local bedrock is Late Cretaceous graywacke, granitic plutons, and Tertiary sandstone.

Capps, 1937; Cobb, 1973

O07-01 59°00'N 138°00'W	Yakutat (Lituya Bay) Placer Au-Ti	Au Ag, Pt, Fe, Ti, garnet	Production of 135 kg Au.. Years of Production: 1894-1989. Grade: Estimated 4.6 million m3 grading 10.0% ilmenite.

Consists of discontinuous strandline deposits of placer gold, ilmenite, and other heavy minerals are found along 450 km of coastal plain from Cape Spencer northwest to Point Manby on Yakutat Bay. Ilmenite rich strandline deposits are concentrated between Dixon Harbor to Cape Fairweather, where beach sands contain from 5 to 40% heavy minerals including garnet, pyroxene, ilmenite, magnetite, rutile, sphene, and zircon. Titanium content in ilmenite ranges from 48 to 53% TiO_2. Trace platinum group metals have been recovered during placer mine activities. Much of the heavy mineral component on strandlines is believed to be derived from Laparouse layered gabbro-ultramafic intrusion in the Fairweather Range. Glaciers and rivers brought heavy minerals to the coast, where they were concentrated along the beachline by longshore drift and other coastal erosional processes. Estimated indicated reserves at Yakatat are 57 million tonnes averaging 3.23% ilmenite, 0.11% rutile, 0.05% zircon, and unknown but significant gold content. Indicated reserves from Situk River to Boussole Bay are 192 million tonnes of 2.40% ilmenite and rutile combined. Fine platinum and ilmenite occur in low concentrations.

Tarr and Butler, 1909; Mertie, 1933; Rossman, 1957; Thomas and Berryhill, 1962; Thomas and Berryhill, 1962; Brew and others, 1978; Foley and others, 1995.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
O08-01 59°20'N 136°08'W	Porcupine-Haines Placer Au	Au Ag, V, Ti, Magnetite	Production of 2,525 kg Au. Years of Production: 1898-1994. Fineness: 669-902; averages 837

Deposits occur in modern streams incised into bedrock, as ancestral channels elevated above modern floodplains, in alluvial fans, and in glacial till. Distribution (dispersal) of heavy mineral placer deposits greatly influenced by Late Pleistocene to recent glaciation. Heavy minerals include magnetite, ilmenite, pyrite, sphalerite, scheelite, zircon, and trace cassiterite. Gold fineness ranges from 669- 902 and averages 837. Principal producing streams include Porcupine, Glacier, McKinley, Nugget, Summit, Cahoon, Christmas, and Cottonwood Creeks; over 90% of total production was derived from Porcupine Creek and its tributaries. Large, low grade placer gold resources exist in Nugget and Porcupine Creek alluvial fans; smaller, high grade, modern stream placers have been largely mined out. Gold interpreted as being derived from quartz-carbonate-sulphide-gold veins and vein swarms that intrude Paleozoic slate near the head of auriferous stream drainages. Erosion of Klukwan mafic-ultramafic intrusions has produced an alluvial fan deposit containing 980 million tonnes averaging about 10.8% $Fe2O3$, 1.7% $TiO2$, and 0.3% vanadium.

Eakin, 1919; Beatty, 1937; Wright, 1940; Berg, 1984; Bundtzen, 1986; Bundzten and Clautice, 1986; Hoekzema and others, 1989; Still and others, 1991.

O08-02 59°35'N 133°32'W	Atlin Camp Placer Au	Au	Production of 15,448 kg fine Au. Years of Production: 1898-1990. Fineness: 774-842

District consists of placers in weathered Tertiary and pre-Wisconsian interglacial deposits, and post-glacial gravels. Gold occurs in alluvial valley fill and terraces. Some placers are capped by Tertiary and Pleistocene basalts. Gold is generally coarse-grained. Mesothermal gold-quartz-sulphide veins occur in the vicinity of placers, but are generally sub-economic. The high grade portions may have been eroded off to form the placers. Veins are hosted by greenstone, argillite, and serpentinite of the Cache Creek Group. Gold was discovered in the Atlin Camp in 1898. District underlain by sedimentary, volcanic, and intrusive rocks of Paleozoic to Pleistocene age. The oldest rocks are the serpentinized ultramafic rocks of the Upper Paleozoic Cache Creek Group.

Galloway, 1930; Aitken, 1959; Boyle, 1976; B.C. Minfile, 1988; Morison, 1989.

O08-03 58°18'N 134°22'W	Juneau-Admiralty Placer Au	Au Ag	Production of 2,188 kg Au. Years of Production: 1880-1993. Fineness: 772-827

NOTE: REVISE
Placer deposits occur in modern streams, semi-residual ancestral benches, and strandline deposits on Douglas and Admiralty Islands and on the mainland of Juneau Gold Belt. Principal deposits occur mainly in Gold Creek and in Silver Bow Basin near Juneau; others include Middle Basin, Little Basin, Mist Creek, Montana Creek, McGinnis Creek, Nugget Creek, Last Chance Basin, and Boulder Creek. Much of the production or about 1,060 kg gold (48% of the total) was derived from Gold Creek and Silver Bow Basin. Gold in Silver Bow Basin is found directly over the auriferous Alaska-Juneau sheeted vein system, and some production consisted of high grade gold in quartz boulders that was later crushed in local hardrock mills. Gold was also recovered from tailings disposed from Alaska-Juneau and Treadwell mine complexes. Gold has been located in submarine placer strandlines near the mouth of Gold Creek, but the deposit has never been mined. Placer paystreaks are found discontinuously in steep stream gradients; large glacial boulders have posed a significant recovery problem throughout the Juneau-Admiralty districts. Gold fineness ranges from 772 to 827, similar to fineness in nearby mesothermal, low sulfide, gold-quartz deposits. Principal heavy minerals are arsenopyrite, galena, and sphalerite.

Smith, 1941; Spencer, 1906; Cobb, 1973; Redman and others, 1989; Bundzten and others, 1994.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
O09-01 58°40'N 130°10'W	Cassiar Camp Placer Au	Au	Production of 6989 kg fine Au. Years of Production: 1874-1990. Fineness: 759-894

Main placer gold production from pre-glacial sediments in drainages transverse to the northwest glacial direction. Gold derived from Au quartz veins that occur in greenstones and metasedimentary rocks of Mississippian to Permian Sylvester allochthon of Slide Mountain terrane. Early Cretaceous granitoids of the Cassiar Batholith are associated with gold veins. Stringers occur mainly in the sedimentary rocks, some occur in intrusives. Erosion and concentration of gold in river channels occurred during the Tertiary. Gold was reworked but not dispersed during two later glacial events. Color and fineness of the gold varies widely from creek to creek indicating different sources. Gold from Boulder Creek is coarse and in the form of nuggets, with quartz adhering to it, suggesting that the source is proximal.

Holland, 1940; Gabrielse, 1963; B.C. Minfile, 1988.

O09-02 57°44'N 131°46'W	Stikine River-Telegraph Creek Placer Au	Au	Production of 171 kg fine Au. Years of Production: 1861-1990. Fineness: 849-855

Gold was initiall found in Stikine River-Telegraph Creek district on the Stikine River 1861. River drains volcanic and sedimentary rocks of the Stuhini Group that is intruded by Jura-Cretaceous granitoid rocks. Gold interpreted as derived from post-Pleistocene erosion of Coast Mountains. Most placer gold has been recovered from near bedrock surface; some flour gold is recovered from Stikine River bars.

British Columbia Department of Energy, Mines, and Petroleum Resources Bulletin 21, 1963; B.C. Minfile, 1988.

O51-01 56°28'N 122°01'E	Nizhnenyukzinsky district Placer Au	Au	Inferred reserves 35 tonnes Au.

The Nizhneyukzhinsky district is the largest in the Far East Russia and occurs to the north of the Mesozoic Chilchinsky granitic pluton that intrudes Early and Late Archean metamorphic rocks. Granitic rocks are anorthosite (Kalar pluton), syenite (Tassky pluton), and granite (Sedolchinsky and Cheremkhalaksky plutons). In the northern part of the district, zones of retrograde metamorphism occur along the Stanovoi and Yuzhnoaldan regional faults that occur between the Aldan shield (the Siberian Craton) and Nora-Sukhotin terrane. Only a few placers occur in this area. The total potential (mined + proven reserves + inferred reserves) comprises 2% of the total potential of the Amur Region.

The Darynmakitsky placer, the best studied deposit in the Nizhneyukzhinsky district, was discovered in 1929 and was mined during the 1930s. Gold occurs for a distance of 10 km. The placer averages 60 m wide, alluvium ranges from 4 to 6 m thick, and gold-bearing gravel occurs in the lower 2 m of the alluvium. Average grade is 450 mg/m^3 Au. The richest part of the placer occurs near bedrock and consists of eluvium, with gold-bearing sand filling the fractures. :ode sources for the placer are presumably quartz veins and zones of cataclastic and weakly altered to sulfide-bearing rocks, both closely related to the Stanovoi fault zone.

V.D. Melnikov, written commun., 1979.

O53-01 58°37'N 137°11'E	Kurun-Uryakh Placer Au	Au	Production of about 12 t Au. Grade: 3.2-4.5 g/cu m Au.

Consists of a buried placer that is 5 km long and 0.2-0.4 km wide. Depth of overburden ranges from 5-30 m. Gold-bearing bed is 0.2 m thick, grade is 3.2-4.5 g/m^3. Interpreted as derives from the Malyutka gold-quartz deposit. The placer district includes several small deposits.

P.P. Smirnov, written commun., 1961; N.L. Kobtseva, written commun., 1988.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
O53-02 57°36'N 134°38'E	Kondeur Placer PGE	PGE Au	Size: Major. Production of 3 metric tonnes PGE in 1993. Second largest placer PGE producer in Russia . Years of Production: Mining since about 1988.

Consists of an alluvial placer that occurs in the north-flowing Kondeur River valley. Richest placer occurs in a 10 km-long paystreak that averages 100 m wide. Placer platinum occurs in 6-8 m thick fluvial gravels on or just above bedrock. Typical platinum grains range from 0.5 mm to 1 cm in diameter. A 4.3 kg iso-ferro-platinum nugget was recovered recently. Iso-ferro-platinum is commonly combined with chromite. Small inclusions of iridium-osmium minerals occur in larger platinum nuggets. Gold comprises 10% of total production (by weight) and occurs in cubic crystalline form with individual cubes up to 1 cm across. Gold contains up to 40% copper and up to 10% palladium. The deposit was discovered in the 1970's. Minor production occurred in early years from small, high-grade placer pockets. All present production is from placers near the head of the drainage. Kondeur placer deposits are derived from lode deposits in the Kondeur zoned mafic-ultramafic complex.

V. Molchanov and V. Sapin, written commun., 1993.

O54-01 59°44'N 143°27'E	Okhotsk Placer Au	Au	Production of about 15 tons Au before 1930. Most deposits exhausted. Grade: 3-47 g/m3. Fineness: 720-850

Okhotsk placer district was discovered in 1829 covers an area of about 140 sq. km. Aabout ten placer deposits occur in the district; nearly all are exhausted; a few are mined at the present. Placer deposits occur in valleys; some are buried. Gold-bearing beds range from 0.12 to 14 m thick and up to 2,000 m long. Gold nuggets to 1 kg were found. Bedrock sources for placer deposits are unknown. Example deposits occur at Zolotoi Creek and Raasvet Creek/Gusinka Creek.

Zolotoi Creek placer deposit is buried placer that is 2.9 km long and averages 54 m wide. Depth of overburden is 17 m. Two placer beds occur. The lower bed is 1.8 m thick and directly overlies a weathered crust developed from Cretaceous rhyolite. The upper placer bed is 2.4-5.4 m thick and overlies a clay false bedrock. Gold grade ranges from 2.9-9 g/m^3. Gold is mostly fine-grained, with an average size of 0.4 mm. Gold fineness is 717-770. Gold nuggets are scarce but nuggets up to 129 g have been recovered. Bedrock sources are unknown. Gold production was about 2 tons.

Raasvet Creek and Gusinka Creek placer deposits are 600 m long and range from 30-100 m wide. The gold-bearing bed is 0.2-1.8 m thick, with about 4 to 10 m of overburden. Gold grade is 1.5-42.7 g/m^3. Gold is coarse-grained. One gold nugget with minor quartz, weighing nearly 1 kg, was found. Gold fineness is 820-850. Bedrock sources are unknown. Production of 233 kg gold.

P.P. Smirnov, written commun., 1962; N.L. Kobtseva, written commun., 1988.

O58-01 59°16'N 163°08'E	Ossora Bay Placer magnetite	Ti, Fe	No Data.

Ossora Bay district occurs in an elongate Ossorsky Bar about 0.5 to 1 km wide extending 15-16 km along the shore of Ossora Bay. Several beds of almost pure magnetite (90% by visual estimate) occur in the tidal zone within marine deposits. The magnetite beds range from 0.03 to 0.3 m thick and pinch out laterally. A beach sand layer about 1.4 m thick has a magnetite content of 27.1%.

V.N., Popov, written commun., 1981.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P04-01 63°30'N 156°30'W	Innoko Placer Au	Au, Ag, Hg, Pt, Sn, W	Production of 21,965 kg Au. Years of Production: 1906-1995. Fineness: 825-910; average of about 870

Bulk of gold from Innoko district placers occurs on bedrock benches on easterly or northerly hill slopes. Minor platinum and about 1% of gold content recovered from Boob Creek. Some dredging. Major heavy minerals are chromite, scheelite, and arsenopyrite. Most of district not glaciated. Gold derived from mineralized rhyolite and basalt dike swarms and small monzonite plutons intruding the Kuskokwim Group in the Yankee Creek, Ophir Creek, and Spruce Creek areas. Largest dike swarm located along Ganes-Yankee Creek fault zone which parallels Iditarod Nixon Fault. Placer gold in Colorado, Cripple, and Bear Creeks derived from both granite porphyry and monzonite. Local bedrock also includes Cretaceous metasedimentary and metavolcanic rocks, chert, basalt, and felsic dikes.

Harrington, 1919; Mertie, 1936; Cobb, 1973; Bundtzen and Laird, 1980; Bundtzen and others, 1985, 1987, 1996.

P04-02 61°55'N 161°30'W	Marshall Placer Au	Au, Ag, Pt Ag, W, Hg	Production of 3,863 kg Au. Years of Production: 1913-1995. Fineness: average 802

Marshall district contains productive placers on Willow, Montezuma, Elephant, and Wilson Creeks near Marshall, and Kako Creeks and Flat Creek near Russian Mission. Area not glaciated. Heavy minerals are gold, platinum, magnetite, hematite, ilmenite, scheelite, and cinnabar. District characterized by relatively low gold fineness, averaging 802. Gold probably derived from vein lode deposits associated with Cretaceous hypabyssal alaskite intruding Mesozoic greenstone belt, or alternatively mother lode veins within the greenstone belt.

Harrington, 1918; Hoare and Cobb, 1972, T.K.Bundtzen, written commun., 1991; Bundtzen and others, 1996.

P04-03 62°30'N 158°30'W	Iditarod Placer Au	Au, Hg, Sb, Sn, W, Cr, REE, Ag	Production of 48,563 kg Au. Years of Production: 1910-1995. Fineness: 830-905, average 870

Iditarod district contains gold placer deposits that occur in modern stream gravels, residual concentrations, and benches. All mining occurs within 14 km of Flat. Heavy minerals are chromite, scheelite, cassiterite, arsenopyrite, ilmenorutile, and heavy concentrations of cinnabar. Gold fineness ranges from 830 to 905 and averages 870. Extensive dredging. Nonglaciated highlands are mantled by residual material, colluvium, and silt; lowlands are covered by thick alluvium. Placer deposits on Flat, Chicken, Prince, Happy, Slate, and Willow Creeks are radially distributed around Chicken Mountain. Gold derived from polymetallic vein lode deposits in Late Cretaceous monzonitic stocks such as the Golden Horn and Chicken Mountain deposits, and from other mineralized contact zones in sedimentary and volcanic rocks of the Cretaceous Kuskokwim Group. Local bedrock of Early Proterozoic schist and metagranite, Mesozoic clastic and volcanic rocks, and Cretaceous granitic plutons.

Cobb, 1973; Bundtzen and others, 1985, 1988, 1992a; Miller and Bundtzen, 1993; Bundtzen and others, 1996.

P04-04 61°00'N 158°00'W	Aniak Placer Au-Hg	Au, Ag, W, Cr, Hg, Pt	Production of 17,683 kg Au. Years of Production: 1908-1995. Fineness: Average 925 at Tuluksak River and 880 at Aniak River

Placer gold in Aniak district mined from modern streams and benches; Nyac area and Crooked Creek basin most productive. Placer deposits in Nyac area distributed in glacio-fluvial outwash below terminus of Early Wisconsin and pre-Wisconsin glacial deposits. Older bench levels in Donlin area are probably Late Tertiary in age. Heavy minerals are gold, magnetite, garnet, scheelite, cassiterite, pyrite, cinnabar, stibnite, and monazite. Placer cinnabar mined from Cinnabar Creek. Gold probably derived from polymetallic vein lode deposits in contact zones in graywacke of the Cretaceous Kuskokwim Group intruded by Cretaceous hypabyssal granitic plutons. Local bedrock is Cretaceous sedimentary and volcanic rocks, and granitic plutons.

Cady and others, 1955; Cobb, 1973; T.K.Bundtzen, written commun., 1992; Bundtzen and others, 1996.

District No. / Latitude / Longitude / Summary Description / References	District Name / Deposit Type	Major Commodities / Minor Commodities	Grade and Tonnage
P05-01 63°40'N 150°50'W	Kantishna Placer Au	Au, Ag, Sb, Pb, W, Mn	Production of 3,088 kg Au; also minor Sb, Ag, W. Years of Production: 1905-1986. Fineness: Large range of 550-900, average of 725

Placer deposits in Kantishna distict occur in modern streams and benches. Highlands glaciated. Lowlands covered by glaciofluvial and eolian deposits. Most mining on streams near Kantishna. Scheelite and nuggets of native silver recovered. Heavy minerals are very numerous, including: magnetite, scheelite, galena, sphalerite, stibnite, arsenopyrite, and minor cassiterite. District contains widest fineness range of all Alaskan placer districts. Gold in district probably derived from polymetallic or Au-bearing quartz vein lode deposits that formed during Cretaceous regional metamorphism and(or) plutonism in Yukon-Tanana terrane. Local bedrock is mainly middle Paleozoic or older metasedimentary and metavolcanic rocks, and Cretaceous granitic plutons.

Capps, 1919; Cobb, 1973; Bundtzen, 1981, 1983a.

P05-02 62°45'N 155°00'W	McGrath Placer Au, Hg	Au, Sn, W, Bi, REE, Hg, Cu, Pb	Production of 4,074 kg Au, accessory Hg and Ag. Years of Production: 1910-1995. Fineness: 860 in Nixon Fork area, 910 in Candle Creek

McGrath district contains stream and bench placers that are mined by hydraulic methods and one dredge. Productive areas are Hidden Creek and tributaries of Nixon Fork, Carl and Candle Creeks in the Candle Hills, and Alder Gulch on Vinasale Mountain. Candle Creek area most productive and contained gold nuggets up to 62 g. Heavy minerals are gold, cinnabar, bismuthinite, chromite, zircon, magnetite, pyrite, and scheelite; with trace ferro-platinum. Gold fineness in Candle Creek averages about 910; in the Nixon Fork area about 860. Gold in district probably derived from polymetallic vein, and related lode deposits in Late Cretaceous hypabyssal monzonite plutons. Placers from Hidden Creek and Nixon Fork area probably derived from Nixon Fork gold skarn deposits. Local bedrock is Paleozoic limestone, Cretaceous sandstone, shale, and granitic rocks.

Mertie, 1936; Cobb, 1973; Bundtzen, 1986; Bundtzen and Laird, 1983b; Bundtzen and others, 1987; Bundtzen and others, 1996.

P05-03 62°20'N 151°00'W	Yentna Placer Au	Au, Cu, Ag, Pt	Production of 6,133 kg Au. Years of Production: 1905-1995. Fineness: 835-870, average 850

Placers in Yentna district consist of stream and bench deposits, Pleistocene glaciofluvial deposits, and Tertiary conglomerates. Glacial and alluvial deposits blanket much of area. Most production in Cache Creek area from dredging operations. Heavy minerals are gold, platinum, cassiterite, scheelite, native copper, sulfides, and uranium and thorium minerals. Gold fineness ranges from 835 to 870, averaging 850. Gold in district probably derived from Au-bearing quartz and polymetallic vein lode deposits associated with granitic plutons and dikes, and Upper Jurassic and Lower Cretaceous clastic rocks. Local bedrock is Late Jurassic and Early Cretaceous flysch, Cretaceous granitic plutons, and Tertiary conglomerate.

Capps, 1913; Mertie, 1919; Cobb, 1973; Bundtzen and others, 1996.

P06-01 64°00'N 148°30'W	Bonnifield Placer Au	Au, Ag, Hg, Pt, Sn, W	Production of 2,325 kg Au. Years of Production: 1903-1995. Fineness: 825-900, average of 855

Bonnifield district placer gold occurs in sreams and a few benches. Thick glaciofluvial deposits and loess cover much of district. Heavy minerals include various sulfides, scheelite, cassiterite, and cinnabar; PGE are found in Daniels Creek. Gold in district probably derived from Cretaceous or early Tertiary Au-bearing quartz or polymetallic vein lodes and middle or older kuroko massive sulfide deposits in Yukon-Tanana terrane, with probable recycling through Tertiary gravels. Local bedrock is Paleozoic or older metasedimentary and metavolcanic rocks of the Yukon-Tanana terrane, and Cretaceous granitic plutons.

Capps, 1912; Cobb, 1973; Gilbert and Bundtzen, 1979; Bundtzen and others, 1996.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P06-02 63°00'N 143°30'W	Valdez Creek Placer Au	Au, Cu, Pb	Production of 15,763 kg Au. Years of Production: 1905-1995. Fineness: Narrow value of 852

Valdez Creek placers exhibit a complex Pleistocene history. Gold produced from modern stream gravels and from channels is ancestral to Valdez Creek and is buried by up to 60 m of till and glacio-fluial deposits. Main pay channels considered to be Sangamon (mid Pleistocene) in age. District mined by open pit and sluice methods. Heavy minerals are gold, magnetite, pyrite, zircon, sphene, sillimanite, kyanite, galena, realgar, orpiment, hessite (a silver telluride). Gold in district probably derived from polymetallic vein deposits associated with Cretaceous granitic rocks. Extensive recent mining; currently the largest placer mine in Alaska. Other smaller placer mines in district include White, Black, and Timberline Creeks, and Lucky Gulch. Local bedrock is Late Jurassic or older metasedimentary rocks, Mesozoic graywacke, and Cretaceous and early Tertiary granitic plutons.

Chapin, 1918; Capps, 1919; Tuck, 1938; Smith, 1970; Cobb, 1973; Bressler and others (1985); Fechner and Herzog, 1990; Reger and Bundtzen, 1990; Bundtzen and others, 1996.

P06-03 63°20'N 146°00'W	Delta River Placer Au	Au	Production of 204 kg Au. Years of Production: 1903-1995. Fineness: average 825

Gold in Delta River district probably derived from numerous occurrences and prospects of polymetallic vein and porphyry Cu deposits associated with late Paleozoic porphyries and Mesozoic granitic plutons intruding upper Paleozoic sedimentary and submarine volcanic rocks of the Slana Spur and Eagle Creek Formations and from mineralization in the Yukon-Tanana terrane. Glacial and glaciofluvial deposits cover most of district. Local bedrock is late Paleozoic sedimentary and volcanic rocks, mafic to ultramafic sills, and Cretaceous granitic plutons on the southern portion; and Yukon-Tanana terrane in the northern portion.

Rose, 1965a; Cobb, 1973; I.M. Lange and W.J. Nokleberg, written commun., 1984; Bundtzen and others, 1996.

P06-04 63°00'N 144°30'W	Chistochina Placer Au	Au, Pt, W, Cr, Zn, Hg, Pb	Production of 5,637 kg Au. Years of Production: 1898-1995. Grade: 0.51 g/m3 at Round Wash; 1.12 g/m3 Ag at Quartz Creek. Fineness: 862-887

Most placer mining in Chistochina district occurs in the extreme headwaters of Chistochina River on Miller Gulch and Slate Creek. Gold occurs in Tertiary conglomerate named "Round Wash". Source not known for either lode gold or rock clasts in Tertiary conglomerate; source presumably offset along nearby Denali fault. Placer gold also produced from glacial drift in valleys in area. Heavy minerals are gold, platinum, magnetite, pyrite, chromite, native copper, native silver, galena, cinnabar, garnet, and scheelite. Gold fineness has a narrow range of 862 to 887, indicating a single lode source. Local bedrock is late Paleozoic sedimentary, volcanic, and granitic plutonic rocks.

Rose, 1967; Cobb, 1973; Yeend, 1981a, b; Foley and Summers, 1990; Bundtzen and others, 1996.

P06-05 61°40'N 149°00'W	Willow Creek Placer Au	Au, Cu, W, Pt	Production of 1,737 kg Au. Years of Production: 1900-1995.

Bulk of placer gold in Willow Creek district produced from Grubstake Gulch and Willow Creek. Heavy minerals include gold, chalcopyrite, and platinum. Placers derived from polymetallic vein or Au-bearing quartz vein deposits in the Jurassic Talkeetna Mountains batholith, adjacent schist, or recycled in Tertiary conglomerate. Local bedrock is Jurassic granitic rocks, and Tertiary conglomerate.

Capps, 1915; Jasper, 1967b; Cobb, 1973; Bundtzen and others, 1996.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P06-06 61°40'N 145°00'W	Nelchina Placer Au	Au, Pt, W	Production of 439 kg Au. Years of Production: 1912-1995. Fineness: 812-819

Gold occurs in stream gravels and low benches in Busch, Yako, and Alfred Creeks. Fine gold occurs in glacial and glaciofluvial deposits of Wisconsin age. Much of gold occurs within 1 m of bedrock and on bedrock surface. Scheelite and platinum occur in some samples. Gold probably derived from auriferous deposits in the Talkeetna Formation; however, most gold interpreted as recycled from Tertiary continental deposits.

Moffit and Capps, 1911; Chapin, 1918; Jasper, 1967b; Cobb and Matson, 1972; T.K.Bundtzen, written commun., 1991; Bundtzen and others, 1996.

P06-07 61°10'N 149°30'W	Hope Placer Au	Au, Cu, Sb, Hg, Pb	Production of 2,090 kg Au. Years of Production: 1888-1995. Fineness: 812-856

Gold occurs in streams and bench gravels; recycled in part from glacial and glaciofluvial deposits. Mills and Canyon Creeks are most productive streams. Mining with small dredges and hydraulic systems. Heavy minerals are gold, native silver, native copper, sulfides, scheelite, and cinnabar. Largest deposit at Crow Creek placer: estimated 1,200,000 m^3 grading 1.1 g/m^3; gold occurs in blue or yellow clays near false bedrock; most production from bench gravels. Gold in district mostly derived from Au-bearing quartz vein deposits in metagraywacke and phyllite of the Upper Cretaceous Valdez Group. Local bedrock is Upper Cretaceous graywacke and phyllite.

Moffit, 1906; Martin and others, 1915; Cobb and Richter, 1972; Jansons and others, 1984; Winkler and others, 1984; Bundtzen and others, 1996.

P07-01 64°01'N 140°43'W	Sixtymile Placer Au	Au	Production of 10,634 kg fine Au. Years of Production: 1870-1994. Fineness: 775-855

Sixtymile placer district is underlain by metamorphosed Proterozoic to Paleozoic rocks of the Yukon-Tanana terrane that is intruded by Devonian and Mississippian plutons (Simpson Range suite), Middle Jurassic pegmatitic and aplitic dikes (Klotassin suite), and Upper Cretaceous porphyritic dikes and related volcanics, (Carmacks Group andesites and dacites), which are in turn overlain by Quaternary alkali-olivine basalts (Selkirk Group). Area was not glaciated. Two potential lode sources exisit for placer gold; structurally controlled polymetallic Au-Ag veins in the metamorphic rocks, e.g. Mosquito Creek, Connaught, and Tertiary epithermal mineralization. Epithermal veins are subdivided into a quartz-pyrite-arsenopyrite-gold-bearing assemblage and a quartz-galena-sphalerite-silver-bearing assemblage.

Hughes and others 1986; Glasmacher and Friedrich, 1992; Thompson, and Van Kalsbeek, 1993; Fuller, 1995; Bundtzen and others, 1996.

P07-02 63°42'N 138°36'W	Klondike Placer Au	Au	Production of 217,089 kg fine Au. Years of Production: 1870-1994. Fineness: 685-860

Klondike district is underlain mainly by Klondike Schist that consists of folded, and faulted quartz-mica, chlorite, sericite and pyritic-graphitic schists, quartzites, phyllites, and highly sheared quartz porphyry sills. Area contains two suites of intrusives, a Cretaceous granodiorite suite and an Eocene bimodal quartz-feldpar porphyry/plag-phyric-mafic porphyry suite. Auriferous quartz veins and boudins occur in the schists and represent two different periods of vein formation. Generally barren quartz veins also occur in the Eocene rocks. Epithermal style veins with anomalous precious metals occur in Quaternary rocks. The Klondike placers were formed during late Tertiary uplift. The area has not been glaciated. Most important placer deposits occur in gravels in the bottom of valleys, resting on bedrock. Gravel is locally derived from the schists. The White Channel gravels are comprised dominantly of quartz. They are ancient deposits as well, probably dating back to the Pliocene. A later period of uplift, Late Pleistocene or Recent, has resulted in modern streams channelling deeply into the old gravel deposits, further concentrating the gold.

Boyle, 1979; Thompson, and Van Kalsbeek, 1993.

District No. / **Latitude** / **Longitude** — **District Name** / **Deposit Type** — **Major Commodities** / **Minor Commodities** — **Grade and Tonnage**

Summary Description

References

District No. / Latitude / Longitude	District Name / Deposit Type	Major Commodities	Grade and Tonnage
P07-03 63°00'N 138°35'W	Stewart River Placer Au	Au	Production of 23,777 kg fine Au. Years of Production: 1870-1994. Fineness: 728-903

Stewart River district occurs on the unglaciated Klondike Plateau and is underlain by metamorphosed Proterozoic to Paleozoic rocks, intruded by Devonian and Mississippian plutons of the Simpson Range suite, mid-Cretaceous intrusions of the Whitehorse suite, and partially overlain by Tertiary Carmacks Group volcanics. Fluvial gravel deposits, the principal placer gold producer are found both in modern streams and on bedrock terraces up to 100m above present stream levels. Gravels consist of predominantly metamorphic clasts with lesser volcanic clasts. Soil development on the gravels suggest they predate the oldest Pleistocene glaciation. They may be the same age as the White Channel gravels in the Klondike area. The Moosehorn Range granodioritic pluton, part of the Triassic Klotassin Batholith, contains auriferous polymetallic-quartz veins that contain native gold occurs in arsenopyrite, galena, boulangerite and sphalerite.

Yukon Minfile, 1990; Thompson, and Van Kalsbeek, 1993; Fuller and Anderson, 1993; Murphy and others, 1993.

District No. / Latitude / Longitude	District Name / Deposit Type	Major Commodities	Grade and Tonnage
P07-04 62°15'N 142°00'W	Chisana Placer Au	Au, Ag	Production of 2,425 kg Au. Years of Production: 1910-1995. Fineness: 797-866, average 830

Placer deposits in Chisana district occur generally within a few kilometers of Bonanza Creek area. Most gold derived from Tertiary gravel. Heavy minerals are native copper, native silver, galena, cinnabar, and molybdenite. Most placer deposits are in Tertiary conglomerate that occur near or are deposited on volcanic and sedimentary rocks of the Lower Cretaceous Chisana Formation. Unconsolidated glacial and fluvial deposits cover most lowlands. Local bedrock is Early Cretaceous volcanic rocks and flysch.

Capps, 1916; Richter and Matson, 1972; Bundtzen and others, 1996.

District No. / Latitude / Longitude	District Name / Deposit Type	Major Commodities	Grade and Tonnage
P07-05 61°18'N 138°32'W	Kluane Placer Au	Au	Production of 2069 kg fine Au. Years of Production: 1870-1994. Fineness: 798-874

Kluane district straddles the Denali Fault, and is underlain mainly by volcanic rocks of the Wrangellia terrane to the south, and metamorphic rocks of the Windy and adjacent metamorphic terranes to the north, as well as by plutons of the early Tertiary Bennett suite. The stocks are highly fractured and contain porphyry Cu-Mo occurrences and pyritic quartz veins, which are likely sources of gold.

Yukon Minfile, 1990; Thompson and Van Kalsbeek, 1993.

District No. / Latitude / Longitude	District Name / Deposit Type	Major Commodities	Grade and Tonnage
P07-06 61°20'N 142°45'W	Nizina Placer Au	Au, Ag, Sb, Cu, Pb, Mo	Production of 4,618 kg Au. Years of Production: 1900-1991. Fineness: 894-903, average 900

Placer deposits in Nizina district occur in Quaternary sediments in valley fills and on benches. Native copper produced from some placers. One 3-tonne native copper nugget recovered. Heavy minerals are gold, native copper, native silver, and galena. Gold probably derived from vein deposits in Cretaceous or early Tertiary granitic plutons. Some gold possibly derived from Cu-Ag vein deposits in the Nikolai Greenstone. Local bedrock is Late Jurassic and Early Cretaceous flysch, and Cretaceous and early Tertiary granitic plutons.

Moffit, 1914; Cobb and Matson, 1972; Cobb and MacKevett, 1980; T.K.Bundtzen, written commun., 1991; Bundtzen and others, 1996.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P07-07 60°05'N 142°00'W	Yakataga Placer Au	Au, Ag, Cr, Cu	Production of 561 kg Au. Years of Production: 1898-1992. Fineness: 892-896

Gold in Yakatage disctrict occurs in beach deposits along coastal plain extending east-southeast from mouth of Copper River. Gold also occurs in bench and streams of White River. Heavy minerals are gold, magnetite, zircon, chromite, rutile, and native copper. Narrow fineness range suggests a single lode source for the placer. Probably derived from variety of bedrock sources drained by Copper River, including: (1) graywacke and argillite of lower Tertiary Orca Group and associated mafic extrusive rocks and mafic and granitic plutons, and (2) metagraywacke and phyllite of the Upper Cretaceous Valdez Group, and associated mafic extrusive rocks and granitic plutons. Possible recycling of glacial deposits in region.

Maddren, 1914; Cobb, 1973; Bundtzen and others, 1996.

P08-01 64°03'N 135°51'W	Mayo-McQuesten Placer Au	Au	Production of 8252 kg fine Au. Years of Production: 1895-1994. Fineness: 695-938

Mayo-McQuesten district lies within the Selwyn Basin and is underlain by Late Proterozoic to Mississippian clastic sedimentary rocks of Hyland, Road River and Earn Groups are imbricated along three Jurassic and Cretaceous thrust faults. Area intruded by mid-Cretaceous felsic plutons of Tombstone and Selwyn suites. Associated with plutons are quartz-Au-arsenopyrite, quartz-Au-Sb-Ag and Sn-W veins, and W-Cu-Au skarns and breccias. Placer gold was discovered on Haggart Creek in 1895 and on Dublin Gulch in 1898. Galena, sphalerite, scheelite and jamesonite occur in placer gravels.

Yukon Minfile, 1990; Emond and Lynch, 1992; Thompson and Van Kalsbeek, 1993; Murphy and Heon, 1995.

P08-02 62°06'N 137°13'W	Klotassin-Dawson Range Placer Au	Au	Production of 625 kg fine Au. Years of Production: 1870-1994. Fineness: 800-860

Klotassin-Dawson Range district underlain by Paleozoic and upper Proterozoic basement metamorphic rocks of the Yukon-Tanana terrane that are intruded by Upper Triassic to Jurassic granodiorite (Klotassin Batholith), porphyritic syenite, and quartz monzonite of the Jurassic Big Creek Plutonic suite. Bedrock also intruded by Early Cretaceous Dawson Range granite and granodiorite, and by Late Cretaceous Carmacks volcanic suite quartz-feldspar porphyries and related massive flows and lapilli tuffs. Metamorphosed Cu-Au-Ag porphyry style deposits, as at Minto Copper and Williams Creek are associated with porphyry intrusions of the Klotassin suite, and Cu-Au porphyry deposits with Late Cretaceous Carmacks suite as at Casino and Cash. Au skarns and veins occur peripheral to several plutonic suites. Several placer deposits occur in Recent valley alluvium and Pleistocene terraces occur near or on lode deposits; other placers are more distal. Deep tropical weathering of the bedrock occurred during the Tertiary Period. Two Pre-Reid glaciation events later covered the area. Reid glaciation did not reach the area but extensive aggradation occurred. Glacial material is not generally gold-bearing, only where glaciers cut mineralized bedrock. Gold is concentrated at interfaces between bedrock, gravel and diamicton.

Yukon Minfile, 1992; Jackson, 1993; Thompson and Van Kalsbeek, 1993; Kreft, 1994; LeBarge, 1995.

P08-03 61°24'N 134°23'W	Big Salmon-Teslin Placer Au	Au	Production of 2400 kg fine Au. Years of Production: 1905-1994. Fineness: 700-895

Big Salmon-Teslin district underalin by Paleozoic schist and quartzite of the Yukon Cataclastic Complex of the Yukon-Tanana terrane along the Teslin Suture Zone, and by fault slices of Slide Mountain and Cache Creek oceanic terranes. Feldspar porphyry dikes, probably equivalent to Late Cretaceous Carmacks Group volcanics, are associated with auriferous quartz-sulphide veins. Chemistry, mineralogy and fluid inclusion studies indicate the placer gold is derived from veins.

Stroink and Friedrich, 1992; Yukon Minfile, 1992; Thompson and Van Kalsbeek, 1993.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P09-01 60°45'N 130°30'W	Laird River Placer Au	Au	Production of 1.5 kg fine Au. Fineness: 800

Laird River district underlain by tightly folded and metamorphosed Proterozoic and Lower Cambrian carbonate and siliciclastic rocks of Cassiar terrane that contains Pb-Zn-Ag deposits. Structural emplacement of the Slide Mountain and Kootenay terranes in Late Jurassic to Early Cretaceous was accompanied by the intrusion of widespread granitic and granodioritic plutons. Major dextral strike-slip faulting occurred during late Cretaceous and early Tertiary times. Tertiary and Quaternary volcanic rocks also occur in district.

Yukon Minfile, 1978.

P54-01 61°01'N 138°09'E	Allakh-Yun Placer Au	Au	Production of about 23 t between 1940 to 1964. Grade: 1 to 10 g/m3, . Fineness: 813-844

Allakh-Yun district contains about 150 placer deposits, mostly in the Allak-Yun and Yudoma River basins. Small channel-fill placers occur in the northern part of this area. Medium-size and some large valley placers and sparce bench placers occur in the middle of district. Flood-plain placer deposits and some channel-fill deposits occur in southern part of district. Gold placers occur in interglacial deposits. Gold-bearing beds range from 0.5 to 3 m thick. Depth of overburden ranges up to 100 m. The highest-grade gold placers occur in the southern part of the district. Placers range from 1 to 10 km long and up to 200 m wide. Gold nuggets to 1 kg weight are found. Bedrock sources are Au quartz vein deposits. Individual placer deposits are Zhar Creek, Yur-Duet, and Brindakit.

Zhar Creek placer deposit is 7 km long. Average thickness of the gold-bearing bed is 1.4 m and the overburden is 3.5 m thick. Fine gold (particles less than 1 mm in size) comprise 87% of all gold. Five percent of gold occurs as nuggets weighing 10 to 200 g. Bedrock source of this placer is Au quartz veins. 2.7 tonnes gold produced between 1940 to 1964.

Yur-Duet and Brindakit placer consist of several auriferous placer zones. Largest is 10 km long and from 10-300 m wide. Gold grade is 1-7.3 g/m^3. The gold-bearing bed is 0.2-3.2 m thick, with 20-30 m overburden. The average size gold particles is 1-2 mm, fineness 813-844. Gold nuggets to 1,050 g weight were common at the Yur placer deposit. About 20 tonnes of gold produced between 1940-1964.

P.P. Smirnov, written commun., 1961; V.I. Korostelev, written commun., 1963; Trushkov, 1971; N.L. Kobtseva, written commun., 1988.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P55-01 62°50'N 147°52'E	Susuman-Chai-Yuryuyen Placer Au	Au	Grade: District average of 1-20 g/m3 Au, Berelekh: 1-15 g/m3 Au, Chai-Yuruyue: 1-20 g/m3 Au. Fineness: 800-900; average of 867

Susuman-Chai-Yuryuyen district contains the largest concentration of placer gold deposits in the central Kolyma region. More than 400 individual placer deposits have been exploited. Deposits are Lower to Upper Pleistocene and most are buried to shallow depths (up to 15 m). Terrace and buried or ancestral placers occur in neotectonic hollows at depths of up to 300 m. Placers of ancestral streams occur in interstream areas. Major portions of the placer deposits are now worked out. Lode sources of the placer mineralization are quartz veins, mineralized dikes, and zones of low-sulfide gold-quartz veinlets. Major deposits are at Berelekh and Chai-Yuruyue.

Berelekh placer deposit occurs in a seventh-order stream drainage system. Gold-bearing stratum are 4-5 m thick. Some coarse gold is recovered. Gold distribution is extremely irregular, with deposits concentrated in pods. Terrace deposits occur within eighth-order stream drainages and placers ancestral to and diagonal to the trend of modern stream courses also occur.

Chai-Yuruyue pacer deposit occurs in a fifth-order stream drainage system. Gold-bearing stratum are 1.2 m thick. Coarse gold is common; more than 60% of the gold being 4 mm or larger. Largest nuggets exceed 1 kg in weight. Gold is intergrown with quartz. Gold fineness averages 869. Gold derived from quartz-vein zones and dikes of intermediate composition which contain 1.6 to 12 g/m^3 gold.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

P55-02 61°53'N 149°39'E	Sanga-Talon Placer Au	Au	Grade: Elgenya deposit: 3 to 12 g/m3 Au. Fineness: 750-900

Placer deposits of the Sanga-Talon District occur in a northwest-trending zone that crosses the Kolyma River valley. More than 96 placer deposits are delineated in first-to-ninth order stream drainages. Main gold concentrations occur in third-to-sixth order stream systems, with gold about equally divided between terrace and modern valley deposits. Most placers occur in higher order stream valleys that occur in terrace alluvium. Placer deposits range in age from Lower Pleistocene to Holocene, but Upper Pleistocene deposits are predominate. Gold-bearing stratum range in thickness from 1.2 to 1.4 m; most are buried by 3 to 70 m of overburden. Gold is mostly coarse and intergrown in low-sulfide quartz-arsenopyrite veins with gold content of 12 to 15 g/t. The connection of placer deposits to original lode sources is strongly expressed in Vetren Region, where placer deposits occur near and are derived from lode sources in the valley. The Elgenya deposit is a major example in the district.

Elgenya placer deposit occur in terrace alluvium along a sixth-order steam drainage system. Auriferous alluvium occurs in four distinct levels within the terrace deposits, at depths of 5, 25, 50, and 80 m. The two youngest terrace deposits are of middle Pleistocene age. Placer deposits locally range up to widths exceeding 200 m, and gold-bearing pay zones range from 0.8 to 1 m thick. Auriferous deposits are commonly concentrated in small pod-like zones. Coarse gold is common and gold fineness ranges from 837 to 863. Buried placers up to 40 m thick occur under slope and glacial deposits.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P55-03 61°24'N 148°41'E	Tenka Placer Au	Au	Grade: District average of 1-10 g/m3 Au. Fineness: 510-900

Tenka District contains than 100 placer deposits that occur in a northwest-trending zone that is confined to the central part of Ayan-Yuryakh anticlinorium. The most concentrated areas of placer development occur in Upper Pleistocene to Holocene age deposits of third- to fifth-order streams. Most placer deposits occur in relatively shallow in valley alluvium. Auriferous terrace alluvium is only poorly preserved, and contains subordinate gold values. Alluvial placers also occur. Gold fineness exhibits a wide range from 510 to 900, but averages 800 to 850. Most placer deposits are exhausted. Lode sources are quartz-carbonate low-sulfide veins, zones, and dikes, and contain up to 20 g/t gold. An major deposit occurs at Omchak.

Omchak placer deposits occurs in a fifth-order stream drainage and reach maximum widths of 510 m and thicknesses of 2 to 3.3 m. Gold is generally fine-grained (0.6-0.9 mm); fineness ranges from 740 to 811. Lode sources of gold are sheeted low-sulfide quartz vein systems in the Natalka and Pavlin deposits, and from other lode gold deposits that contain 3 to 7 g/t gold.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

P56-01 62°23'N 150°50'E	Debin-Orotukan-Srednikan Placer Au	Au	Grade: At-Yuryakh deposit: 5 g/m3 Au. Fineness: 710-980

Debin-Orgtukar-Srednikan District contains more than 270 individual placer deposits. Most deposits occur in Upper Pleistocene placers up to 8 m thick, and less commonly in Middle and Lower Pleistocene deposits. Buried placers occur in Seimchan-Buyundin and Taskan hollows. Gold is variable in size; several nuggets of more than 4 kg have been recovered. The bulk of the gold consists of small flakes and grains with fineness of 710 to 975. Original lode sources are quartz veins that contain up to 300 g/t gold, and shear zones and dikes that contain up to 14 g/t gold. Major deposits occur at At-Yuryakh and Orotukan.

At-Yuryakh placer deposit occurs in terrace alluvium in a fifth-order drainage system. Pay channels increase in width and gold grade increases in the mouths of tributary streams, where placer deposits are up to 900 m wide. Thickness of gold-bearing stratum ranges from 0.4 to 3.8 m. Gold consists mainly of well-rounded, laminated, fine grains; fineness ranges from 916 to 980. Major impurities are admixtures of silver and zinc. Cassiterite, scheelite, and ilmenite occur in placer concentrates.

Orotukan placer district occurs in terrace alluvium in a sixth-order drainage system. More persistent placers occur in 10-m thick terrace alluvium where gold-bearing stratum range up to 1.4 m thick. Cassiterite and scheelite occur in noneconomic concentrations.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

P57-01 62°07'N 161°14'E	Taigonoss Placer Au	Au	Grade: 1-6 g/m3 Au.

Gold placer deposits Taigonoss district occur in second-to-fourth order valleys in the northern and central parts of Tiagonoss Peninsula. At least 12 placer deposits are known; largest are at Avekov, Pylgin, and Kolymak Rivers. Placer deposit types include alluvial, and flood plain. Rare terrace alluvial and spit placers, with a width up to 100 m, occur in the Avekov River valley. Most of the placer deposits are Holocene, and rarely Pleistocene. The Prima placer deposit which occurs at depths of 45 m, is interpreted as Early Quaternary. Most placers are shallow (0.4-2.6 m depth), and gold is complexly distributed throughout the alluvium. Several placer deposits forming. Gold grains are small (0.5-0.8 mm), laminated, and mainly well-rounded. Gold-bearing quartz veins and zones in metamorphosed rocks of the Avekov block, and Mesozoic sedimentary and volcanic rocks are the principal lode sources. Lode deposits range up to 8 g/t gold.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P58-01 63°53'N 164°35'E	Vidny Creek Placer Au	Au	Estimated production of 560 kg. Probably exhausted. Grade: Estimated up to 0.6 g/m3 . Fineness: 625

Vidny Creek district contains shallow alluvial placer up to 4000 m long and 100 m wide. Heavy minerals are hematite, ilmenite, zircon, and rutile. Gold is derived from areas in bedrock with adularia-quartz-metasomatic, propylitic, and argillic alteration; which occur on the floors and slopes of valleys.

V.N. Pavlov, written commun., 1988.

P58-02 63°33'N 163°40'E	Kedrovy Creek Placer Au	Au	Estimated production of 300 kg. Probably exhausted. Grade: Estimated 0.7 to 1.44 g/m3 . Fineness: 630 to 650

Kedrovy Creek district contains flood plain and buried alluvial placers. Deposit length varies from 1000 to 3000 m, and ranges up to 70 m wide. Major heavy minerals are magnetite (up to 60%), epidote, hematite, pyrite, and zircon. Gold is fine-grained about 0.5-0.6 mm. Source of the placers interpreted as gold-silver-adularia-quartz veins.

V.A. Korovkin, written commun., 1991.

P58-03 63°37'N 167°10'E	Pravaya, Kondyreva River Placer Au	Au	Production of more than 300 kg Au. Grade: Up to 0.66 g/m3 . Fineness: 890

Pravaya and Kondyreva River districts contain shallow alluvial placer that are over 8000 m long and range up to 115 m wide. Grains range from 0.25 to 1.0 mm. Magnetite is dominant in heavy-mineral concentrate. Ilmenite, pyrite, limonite, and epidote occur in electromagnetic fraction. Gold was derived from Au quartz veins.

Yu.I Ivintaksov, written commun., 1988.

P58-04 63°20'N 166°37'E	Ushkan'e River Basin Placer Au	Au	Produced more than 1000 kg Au. Grade: 0.8 to 1.2 g/ m3 in shallow deposits, up to 2.5 g/m3 in buried placers. Fineness: 850

Ushkan'e River Basin district contains two types of placers: (1) surface deposits ranging from 0.8 to 1.2 g/m^3 Au; and (2) alluvial placers buried up to several m deep containing up to 2.5 g/m^3 Au. Shallow placers are related to the flood plains and flood plain terraces. Length of placers ranges from 1500 to 8600 m and width ranges from 50 to 200 m. Gold grains are 0.15 to 2.0 mm. Magnetite, hematite, ilmenite (up to 19%), amphibole, pyroxene, and zircon occur in heavy-mineral fraction. Gold is derived from hydrothermally-altered rocks. Linear weathering crusts occur in the bottom of the valleys.

B.V. Dvoretsky, written commun., 1982.

P58-05 62°40'N 167°05'E	Gorelaya River Placer Au	Au	Grade: Ranges from a few g/m3 to 5.3 g/m3. Fineness: 788

Gorelaya River contains numerous shallow and alluvial, and rare proluvial and diluvial placers. Deposits range from a few hundred to 2700 m long. Gold is fine grained, rarely up to 2 mm. Magnetite (up to 66%), ilmenite (up to 77%), hematite, pyroxene, epidote, garnet, zircon, marcasite, galena, sphalerite, and anatase occur in heavy mineral fractions. Gold derived from veinlets and disseminations in carbonate rocks in volcaniclastic rocks.

S.V. Spivak, written commun., 1989.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
P58-06 62°09'N 162°41'E	Perspektivny Creek, Kechichma River Placer Au	Au	Estimated production of 440 kg. Probably exhausted. Grade: Average of 0.95 to 1.40 g/m3. Fineness: 850-860

Perspektivny Creek and Kechichma River districts consists of a group of shallow alluvial placers that vary from 1000 to 6000 m long and 50-60 m wide. Deposits occur in the riverbed and flood plain of Perspektivny Creek. Gold grains range from 0.5 to 2 mm. Probable lode source is Au quartz veins.

P.I. Chehculin, written commun., 1990.

P58-07 62°16'N 164°22'E	Smyaty and Grif Creeks Placer Au	Au Pt	Production pf 25 kg Au. Grade: Up to 1.45 g/m3. Fineness: U to 912

Smyaty and Grif Creeks districts contain shallow alluvial placers that are related to flood plain and terraces, up to 1600 m long and 30-35 m wide. Average size of gold grains is 1 mm. Heavy minerals are magnetite and chrome-spinel, with subordinate pyroxene, hornblende, ilmenite, garnet, platinum group minerals (osmiridium), pyrite, sphalerite, cinnabar, and rare silver. Platinum/gold ratio is 1/300 to 1/400. The lode source has not been determined. Gold is interpreted as partly recycled from Early Cretaceous conglomerates, and from gold-sulfide and Au quartz vein deposits that contain up to 1-5 g/t gold.

G.P. Shipitsin, written commun., 1968; O.T. Kovalishin, written commun., 1989.

P58-08 62°20'N 165°53'E	Kichavayam River Placer Au	Au	Estimated production of 120 kg. Probably exhausted. Grade: Up to 0.64 g/m3.

Kichavayam River district contains shallow placers deposits up to 900 m long and 50 m wide that occur in riverbed and flood plain alluvium. Heavy-minerals are hematite (up to 97%), pyroxene, epidote, leucoxene, garnet, zircon, chrome-spinel, corundum, and cinnabar. Gold derived from gold-sulfide quartz veins. Source lode deposits ranges from 0.4 to 28.7 g/t Au, 4.6 to 40.66 g/t Ag, up to 6.45% Zn, and up to 1% As.

V.A. Volkov, written commun., 1986.

P58-09 61°07'N 166°48'E	Seinav-Galimanan Placer PGE	PGE	Modest production of PGE. Grade: 0.6-2.2 g/m3 PGE .

Seinav-Galimanan district contains several small PGE deposits that occur in influvial gravels along valley floors and in terrace alluvium, with minor deposits in colluvial slope deposits adjacent to streams. District underlain by dunite, pyroxenite, and gabbro that form part of Seinav-Galimanan zoned ultramafic complex. The Latyrenavayam River deposit is 140-340 m wide and covered by 2.8-17.1 m of overburden. PGE-bearing gravels range from 1.2-4.7 m thick. Ledinoye Creek contains terrace alluvial deposits that contain 1-7 g/m^3 PGE. PGE-bearing gravels in Ledinoye Creek terrace alluvium are 1.-2.6 m thick. Platinum fineness is 874 at Ledinoye Creek. Average placer PGE concentrations for district are: 2.77% Ir, 1.25% Pd, and 0.45% Os. PGE in the ultramafic source rocks averages 1 g/tonne combined Pd, Ir, Pt, and Rh.

Y. Frolov, this study.

District No. Latitude Longitude	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage

Summary Description
References

P59-01 62°25'N 171°47'E	Vesyoly Creek Placer PGE	PGE	Grade: Average of 1.05 g/m3 PGE.

Placer deposits in Vesyoly Creek district are associated with alluvium that occurs immediately above bedrock in flood plains and terraces 10 to 12 m high. Deposit is 7 km long and 40 m wide. Distribution of metals is uneven, averaging 1.05 g/m^3. PGE consist of hexagonal solid solutions of osmium, iridium, and ruthenium, and cubic solid solutions of iridium (10%). PGE compounds with iron, arsenic, and sulfur also occur. PGE grains are dominantly in the 0.4 to 0.8 mm size fraction. Heavy-minerals are chromite, ilmenite, zircon, rutile, pyrite, marcasite, apatite, and garnet. Underlying bedrock consists of Upper Jurassic to Lower Cretaceous (Tithonian to Valanginian) serpentinite.

A.V. Razumny, written commun., 1990.

P59-02 61°00'N 171°12'E	Prizhimny Creek, Dobraya River Placer Au	Au PGE	Grade: Over 1 g/m3 Au and 0.18 g/m3 PGE. Fineness: 871-899

Shallow placer deposits in Prizhimny Creek and Dobraya River district display a complex genesis varying from fluvio-glacial to alluvial. Deposits are up to 1000 m long and up to 60 m wide. Seventy-five percent of gold grains range from 0.3 to 0.5 mm. Heavy-minerals consist of 85% magnetite, up to 10% chromite, and subordinate pyroxene, ilmenite, pyrite, anatase, garnet, and sparse sphalerite, galena, cinnabar, PGM, and gold. PGE grains are mostly 0.5 to 1.0 mm. Gold was derived from quartz-carbonate veins containing up to 100 g/t gold. Veins and stockworks occur along contacts within and adjacent to gabbroic, picrite, and diorite intrusions. A network of carbonate-quartz veinlets containing up to 5 g/t gold occurs along the Dobaraya River valley.

M.B. Ivanik, written commun., 1989.

Q01-01 67°28'N 177°20'W	Penyelkhin Placer Au	Au	No data. Fineness: 880-900

Penyelkhin district contains as many as 10 placer deposits that occur in valleys in a mountainous area near the Vankarem lowland. The principal placer deposit is at Penyelkhin that formed during the Miocene to Pleistocene during multiple erosional events. Gold-bearing stratum is confined to a thalweg channel and a 10-m-thick terrace of alluvium that are now buried under up to 30 m of glacial drift. The Penyekhin deposit extends for 4 km and ranges up to 300 m wide. Auriferous gravels range up to 3 m thick; rarely more. The gold is concentrated in pods. Gold grains are small and average 0.5 mm in diameter. Octahedral gold crystals occur. Gold fineness ranges from 880 to 900. Low-sulfide Au quartz veins and silicified shear zones are the lode sources.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

Q03-01 65°40'N 166°30'W	Port Clarence Placer Au-Sn	Sn, Au, REE, W, Cr, Pb, Ag, Hg, Pt	Production of 1,273 kg Au and about 1,300 tonnes of Sn.. Years of Production: 1898-1993. Fineness: 880-902

Port Clarence district placer deposits occur in creeks and benches that occur as much as 60 m above present-day streams. Dredge mining produced bulk of gold. Gold probably derived from low-sulfide Au-bearing quartz veins in metamorphic rocks of the Nome Group. Sn province occurs in western part of the district; about 1300 tonnes of combined placer and lode tin produced. Cape Creek placer deposit in Cape Prince of Wales area produced an average 100,000 kg tin in cassiterite concentrate each year from 1979 to 1990 when creek placer was apparently exhausted. Tin placers on streams draining contact zones around Cretaceous Sn-bearing granitic rocks and associated vein deposits. Heavy minerals in both gold and tin placers are gold, cassiterite, scheelite, cinnabar, monazite, xenotime, zircon, columbite, tantalite, and wolframite. Local bedrock is slate and schist of the Nome Group and Cretaceous granitic plutons.

Brooks, 1901; Collier and others, 1908; Mulligan, 1959; Cobb and Sainsbury, 1972; T.K.Bundtzen, written commun., 1992; Bundtzen and others, 1996.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q03-02 65°45'N 164°50'W	Kougarok Placer Au-Sn	Au, Sn, W	Production of 5,410 kg Au.. Years of Production: 1900-1995. Fineness: 857-931

Kougarok district contains large gold resources that occur in Quaternary(?) glacial outwash gravels of the Tertiary and Quaternary(?) Kougarok Gravels. Buried Tertiary gravels and conglomerates may be gold source. Most mining by dredging. Heavy minerals are gold, pyrite, magnetite, hematite, cassiterite, scheelite, cinnabar, and lead sulfides. Richest areas in Iron and Taylor Creeks and near Coffee Dome. Placer gold derived mainly from low-sulfide Au-bearing quartz veins in metamorphic rocks and from Sn lode deposits associated with Cretaceous granitic plutons. Local bedrock is schist, slate, marble, and granitic rocks.

Collier and others, 1908; Cobb, 1973; Eakins, 1981; Bundtzen and others, 1996.

Q03-03 64°30'N 165°30'W	Nome Placer Au	Au, Ag, W, Sb	Production of 151,595 kg Au.. Years of Production: 1902-1995. Fineness: 845-902

Nome district produced bulk of gold from ancient beach gravels developed in till. Up to five separate elevated beaches and several submerged beaches. Modern stream gravels, and low and high alluvial benches also contain gold. Beach strandlines contain inferred (drilled) reserves of 80 million m^3 grading 0.4 g/tonne Au. Heavy mineral concentrates dominated by arsenopyrite and scheelite. Placers known for exceptionally large gold nuggets, mostly found in elliptical deposits on Anvil Mountain. Gold in district probably derived from Au-bearing quartz vein lode deposits, such as Rock Creek, and at Sophie Gulch north of Nome. Local bedrock is Paleozoic metasedimentary and lesser metavolcanic rocks of Nome Group with Au-bearing quartz veins.

Collier and others, 1908; Moffit, 1913; Cobb, 1973; Eakins, 1981; R.V.Bailey, written commun., 1991; Bundtzen and others, 1996.

Q03-04 64°45'N 163°30'W	Council (Includes Solomon) Placer Au	Au, W, Hg, Cu	Production of 31,706 kg Au. Years of Production: 1989-1995. Grade: Reserves of 0.4 to 0.7 g/m3, known in Spruce Creek. Fineness: 826-870 in Solonom River and 902-960 in Fish River

Council district contains beach, modern stream, and rare bench gold placers. Heavy minerals dominated by arsenopyrite, magnetite, and scheelite. Mined mainly by dredging and sluicing. Gold in district probably derived from Au-bearing quartz vein deposits in metamorphic rocks of the Nome Group, such as the Big Hurrah Gold-Tungsten deposit. Local bedrock is schist, marble, dolomite, and thin quartz veins.

Collier and others, 1908; Smith, 1910; Smith and Eakin, 1911; Cobb, 1973; Bundtzen and others, 1996.

Q04-01 67°10'N 160°15'W	Kiana Placer Au	Au, nephrite	Production of 1,263 kg Au.. Years of Production: 1898-1968. Fineness: 888-913

Gold in Kiana district mined principally from tributaries of Squirrel River. Coarse gold, some nuggets with quartz attached. Magnetite common in concentrates. Gold and magnetite probably derived from Au-bearing quartz vein lode deposits in metamorphic rocks. Local bedrock is marble and schist.

I.M. Reed, written commun., 1931; Cobb, 1973.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q04-02 67°00'N 157°00'W	Shungnak Placer Au	Au, Cu, Ag, Cr, Cd	Production of 465 kg Au.. Years of Production: 1898-1988. Fineness: 772-803

Shungnak district placer deposits occur in streams that drain Cosmos Hills. Gold source is mainly Au quartz veins that occur in metasedimentary and metavolcanic rocks. Most placer production was from Dahl Creek. Heavy minerals include gold, magnetite, chromite, native copper, and silver. Nephrite and serpentinite boulders collected from creek gravels and tailings piles. Large numbers of quartz crystals recovered from placer operations. Local bedrock is metasedimentary and metavolcanic rocks.

Smith, 1913b; Anderson, 1945; Cobb, 1973.

Q04-03 65°45'N 161°41'W	Fairhaven (Includes Candle and Inmachuk) Placer Au	Au, Pb, W, Pt, Ag	Production of 18,865 kg Au.. Years of Production: 1900-1995. Fineness: 847-898

Fairhaven district contains rich placer gold deposits on Candle Creek and Inmachuk River. Major streams extensively dredged; substantial resources remain unmined in buried drainages in northern part of district. Buried gold-rich channel gravel occur in vicinity of Mud Creek. Most production on Candle Creek was from left limit bench (paleo-Candle Creek) about 600 m wide and 6 km long. Placers at Kiwalik Flat occur at mouth of Paleo-Candle Creek and were partially reworked by marine conditions. Auriferous bench deposits occcur 30 m above Inmachuk River and are overlain by a 5.7 Ma basalt flow. Heavy minerals are galena, magnetite, scheelite, sphalerite, and trace platinum metals. Gold probably derived from polymetallic vein lode deposits associated with Cretaceous granitic plutons or alternatively from Au-bearing quartz veins in metamorphic rocks, or alternatively from Au-bearing quartz veins in metamorphic rocks. Local bedrock consists of schist, marble, granitic plutons, and Tertiary basalt.

Henshaw, 1909; Cobb, 1973, T.K.Bundtzen, written commun., 1991; Bundtzen and others, 1996.

Q04-04 65°00'N 161°20'W	Koyuk Placer Au, Pt	Au, Sb, W, Pt, Bi	Production of 2,616 kg Au and about 10 kg byproduct Pt.. Years of Production: 1915-1993. Fineness: 840-920 (950-966 in Dime Creek)

Koyuk district contains creek and bench placers at Bonanza, Dime, and Sweepstakes Creeks. Nuggets with vein quartz attached have been recovered. Mining by sluicing, dredging, and drifting. Heavy minerals are gold, magnetite, ilmenite, scheelite, stibnite, bismuthinite, wolframite, platinum, chromite, rutile, garnet, uranothorianite, hydrothorite, hematite, chrome spinel, iron and copper sulfides, galena, sphalerite, and molybdenite. Gold fineness on Dime Creek is extremely high (950-966); fineness values average 840 and 920 in Sweepstakes and Ungalik Creeks respectively. Gold probably derived from polymetallic vein and other lode deposits associated with Cretaceous granitic plutons. Altered ultramafic rocks found in Dime Creek drainage may be source of platinum. Local bedrock is schist, marble, granitic plutons, and Cretaceous sedimentary rocks.

Smith and Eakin, 1911; Harrington, 1919; Cobb, 1973, T.K.Bundtzen, written commun., 1991; Bundtzen and others, 1996.

Q05-01 68°00'N 156°00'W	Noatak Placer Au	Au	Production of 242 kg Au.. Years of Production: 1898-1989.

Gold mined mainly from Lucky Six Creek and small tributaries. Nearby lode deposit contains sulfides and gold. Gold probably derived from Au quartz or polymetallic vein deposits. Local bedrock consists of marble, metasedimentary, and metavolcanic rocks. District occurs in a National Conservation unit where mining is prohibited.

Smith, 1913b; Cobb, 1973; Bundtzen and others, 1996.

District No. **Latitude** **Longitude** **Summary Description** **References**	**District Name** **Deposit Type**	**Major Commodities** **Minor Commodities**	**Grade and Tonnage**
Q05-02 67°15'N 150°45'W	Wiseman (Koyukuk) Placer Au	Au, Bi, Cu, W, Pb	Production of 10,578 kg Au.. Years of Production: 1893-1995. Fineness: 925-975

Glaciation in parts of Wiseman district has caused disarrangements of drainage, resulting in complex placer deposits. Gold-rich gravels occur in modern streams, bench, and buried stream deposits on bedrock. Large nuggets include 4.29 kg nugget on Hammond River and 1.28 kg on Nolan Creek. Large nuggets more common than elsewhere in Alaska. Heavy minerals are gold, stibnite, native silver, native copper, native bismuth, scheelite, pyrite, chalcopyrite, cinnabar, rutile, cassiterite, monazite, andalusite, and kyanite. Larger deposits at Hammond River and Nolan Creek.

Hammond River contains an estimated 210,000 m^3 grading 5.1 g/m^3 Au and 0.32 g/m^3 Ag. Total production of up to 1.84 million g Au. Estimated production of 3.1 million g Ag. Deposit mined by drift and sluice methods. Placer deposit mostly occurs within lower 5 km of mouth of Koyukuk River. Placer mining from 1900 until 1942.

Nolan Creek contains an estimated 146,000 m^3 grading 12 g/m^3 Au. Drift mining employed. Local stibnite veins occur in metamorphic and granitic rocks. Deposits in district probably derived from Au quartz veins and Sb-Au vein deposits. Local bedrock consists of metasedimentary rocks, granitic plutons, and Cretaceous sedimentary rocks.

Maddren, 1913; I.M.Reed, written commun., 1938; Brosge and Reiser, 1960; Cobb, 1973; Dillon, 1982; Bundtzen and others, 1996.

Q05-03 65°50'N 155°00'W	Hughes-Koyukuk Placer Au	Au, Cu, Pb, Ag, Sn, Pt, Zn	Production of 7,212 kg Au.. Years of Production: 1910-1995.

Gold in Hughes district derived from streams draining contact zones around Cretaceous granitic plutons near Indian Mountain and in southern Zane Hills. Recent dredging on Bear Creek where most production has occurred. Most of area not glaciated. Gold probably derived from polymetallic vein and other lode deposits associated with Cretaceous granitic plutons. Local bedrock is Jurassic and Cretaceous clastic and volcanic rocks, and granitic plutons.

Eakin, 1916; Miller and Ferrians, 1968; Cobb, 1973; T.K. Bundtzen, written commun., 1990; Bundtzen and others, 1996.

Q05-04 65°30'N 152°30'W	Melozitna (Gold Hill) Placer Au	Au, Sn, Pb, Ag, Zn, Cu	Production of 355 kg Au.. Years of Production: 1909-1995. Fineness: 895

Gold in Melozitna district occurs in thin bench deposits and shallow-stream gravels in Grant, Illinois, and Mason Creeks that form small tributaries of Yukon River. Heavy minerals are gold, cassiterite, magnetite, ilmenite, hematite, garnet, and tourmaline. Single gold fineness value of 895 recorded. Placers occur within a few kilometers of known or inferred granitic plutons. No known lode deposits. Gold probably derived from polymetallic vein and skarn deposits associated with Cretaceous hypabyssal granitic plutons. Local bedrock is metasedimentary and metavolcanic rocks, and Cretaceous clastic and granitic rocks.

Eakin, 1912; Chapman and others, 1963; Cobb, 1973; Bundtzen and others, 1996.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q05-05 65°10'N 151°00'W	Hot Springs Placer Au-Sn-Nb	Au, Sn, Cr, REE, Cu, Pb, Ag, Ni, Hg, W, Bi, Nb	Production of 17,784 kg Au and about 400,000 kg of Sn.. Years of Production: 1898-1995. Fineness: 740-875

Nearly all placer deposits in Hot Springs district consist of buried bench gravels that occur on old terraces or buried stream deposits derived from older bench gravels. Thick deposits of frozen silt conceal placer deposits and make exploration difficult. Area not glaciated. Principal deposits explored were those on Sullivan Bench. Gold fineness ranges from 740 to 875.

Glen Creek deposit contains an estimated 600,000 m^3 grading 2.5 g/m^3; over 1.50 million g produced by 1931. Gravels derived from local slate and quartzite with quartz veinlets.

American Creek deposit contains an estimated 410,000 m^3 grading 5.3 g/m^3. Total production at least 2.18 million g Au. Gold occurs in lower 1.1 m of gravels and upper 1 m of bedrock. Gold in quartz-carbonate veins associated with east-west-trending shear zone. Gold in district possibly related to granitic plutons in area.

Ni-bearing columbite and aeschynite occurs in tailings of drift placer mines near Tofty. Concentrates of tailings contain between 0.2 and 4.5% Nb. Estimated 45,400 kg recoverable Nb_2O_5 in placer deposits near Tofty. Local bedrock consists of Cretaceous sedimentary rocks and Tertiary granitic plutons.

Mertie, 1934; Wayland, 1961; Heiner and Wolff, 1968; Cobb, 1973; Southworth, 1984; Warner, 1985; Warner and Southworth, 1985; Warner and others, 1986; Bundtzen and others, 1996.

Q05-06 65°30'N 150°00'W	Rampart Placer Au	Au, Ag, Bi, W, Sn	Production of 6,103 kg Au.. Years of Production: 1881-1995. Fineness: 900-955

Bulk of gold production in Rampart district occurred in drainages of Minook, Little Minook, Hunter, Hoosier, andTroublesome Creeks. Area not glaciated. At least four prominent terraces occur in Minook Creek, about 3 to 900 m above sea level. Pliocene(?) gravel in highest terrace is up to 20 m thick and auriferous, but not generally commercial. More than half of gold produced in district from Little Minook Creek. Heavy minerals are gold, garnet, barite, chrome spinel, pyrite, cinnabar, native bismuth, and tetrahedrite. Larger deposits are at Ruby Creek, Hunter-Dawson Creek, Morelock Creek, Hoosier Creek, and Little Minook Creek.

Ruby Creek contains an estimated 290,000 m^3 grading 0.67 g/m^3. Mined mainly by open-cut and drift methods. Hunter-Dawson Creek contains an estimated 250,000 m^3 grading 2.6 g/m^3; hydraulic and drift mining. Gold occurs in lower 1 m of gravel and upper 1.1 m of bedrock. Local bedrock of shear zone with sulfide minerals and quartz-calcite veins.

Morelock Creek contains an estimated 150,000 m^3 grading 3.6 g/m^3. Sluice mining. Gold occurs in lower few centimeters of gravel and upper few centimeters of irregular bedrock surface.

Little Minook Creek contains an estimated 120,000 m^3 grading 13 g/m^3 Au, 1.1 g/m^3 Ag. Estimated total production of 2.02 million g Au; gravels vary from 2 to 4 m thick with gold at base and in upper 0.2 m of bedrock. Although most placer gold derived from Pliocene gravels, original source is probably polymetallic vein lode deposits associated with mid to Late Cretaceous monzonitic stocks. Local bedrock is Paleozoic sedimentary and volcanic rocks, and Tertiary granitic plutons.

Mertie, 1934; Waters, 1934; Chapman and others, 1963; Heiner and Wolff, 1968; Cobb, 1973; Bundtzen and others, 1996.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q05-07 64°25'N 154°20'W	Ruby Placer Au	Au, Sn, Bi, REE, Pb, W, Pt	Production of 14,830 kg Au.. Years of Production: 1907-1995. Fineness: 800-890

Ruby district displays a complex geomorphic history. Vein quartz, chert, and other resistant rocks are common in placers. Several cycles of erosion and deposition are interpreted. Placer deposits are generally buried and are mined with shafts and drifts. Region not glaciated. Heavy minerals are gold, cassiterite, platinum, scheelite, allanite, and native bismuth. Largest deposit on Long Creek produced nearly half of the district gold through 1993. Bedrock consists of quartz veins in schist in or near granite. District also contains minor placer Sn deposits. Gold in district probably derived from polymetallic vein and skarn deposits associated with Cretaceous hypabyssal granitic plutons. Local bedrock consists of limestone, schist, volcanic rocks, and granitic plutons.

Eakin, 1918; Mertie and Harrington, 1924; Cass, 1959; Chapman and others, 1963; Cobb, 1973; Bundtzen and others, 1996.

Q06-01 67°50'N 148°00'W	Chandalar Placer Au	Au, Sb, Ag, W	Production of 1,460 kg Au.. Years of Production: 1905-1995.

Chandalar district contains complicated placer deposits that formed during a complicated glacial history. Two generations of placer deposits occur on Little Squaw Creek, one preglacial, one postglacial. Placers occur in streams draining Au quartz vein deposits. Heavy minerals are gold, monazite, magnetite, hematite, rutile, pyrite, arsenopyrite, chalcopyrite, galena, stibnite, molybdenite, scheelite, and uranothorianite. Largest deposits are at Little Squaw and Tobin Creeks. A small placer deposit occurs on Hodzana River, south of the Chandalar Lake. Deposits are both preglacial and postglacial. Significant production. Local Au quartz veins occur in schist. Placers occur downstream from Au quartz vein deposits that occur near the head of Little Squaw Creek drainage. Local bedrock consists of metasedimentary and metavolcanic rocks.

Mertie, 1925; Cobb, 1973; Dillon, 1982; Bundtzen and others, 1996.

Q06-02 65°30'N 148°10'W	Tolovana Placer Au	Au, Sn, Cu, Pb, Hg, W, Cr, Sb, REE, Bi, PGE	Production of 15,439 kg Au.. Years of Production: 1915-1995. Grade: 1.22 g/m3, Livengood Creek. Fineness: 897-905

Tolovana district contains auriferous stream and bench placers. Mature erosion surface largely buried by later sediments. Steam capture common. Rich, buried bedrock benches are not completely exhumed. District is a recently discovered placer district in Alaska. Heavy minerals are gold, magnetite, PGE, hematite, ilmenite, limonite, chromite, spinel, cinnabar, stibnite, scheelite, cassiterite, monazite, and REE minerals. Gold in Livengood Creek and around Amy Dome has narrow fineness range of 897 to 905. Largest deposit occurs at Livengood in Tertiary bench level and may contain 30 million m^3 grading 1.44 g/m^3 Au. Gold possibly derived from polymetallic vein deposits associated with Cretaceous granitic plutons. Local bedrock is schist, Cretaceous sedimentary rocks, and granitic plutons.

Foster, 1966, 1969; Mertie, 1937b; Cobb, 1973; Eakins, 1981.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q06-03 65°30'N 144°45'W	Circle Placer Au	Au, Ag, Sn, Sb, W, Pb, REE, Mo, Hg	Production of 31,959 kg Au.. Years of Production: 1893-1995. Fineness: 720-920

Gold in Circle district occurs in alluvial and colluvial deposits (2 to 5 m thick), frequently overlain by 1 to 2 m of muck. Non-glaciated, broad upland of nearly accordant ridge crests. Large gold resource may occur in lower reaches of Crooked and Birch Creeks, and in the topographic trough south of Crazy Mountains. Larger deposits are at Mammoth Creek, Deadwood Creek, Eagle Creek, and Coal Creek.

Mammoth Creek contains an estimated 4.0 million m^3 grading 1.9 g/m^3 Au, 0.45 g/m^3 Ag. Estimated production of up to 4.7 million g Au through 1926. Mining by hydraulic and dredge methods. Local quartz veins occur in bedrock. Deadwood Creek contains an estimated 1.44 million m^3 grading 2.3 g/m^3 Au and 0.49 g/m^3 Ag. Estimated total production of over 93.3 million g Au. Mined by dredge and hydraulic methods.

Coal Creek contains an estimated 810,000 m^3 grading 0.38 g/m^3 Au, 0.041 g/m^3 Ag. Estimated 311,000 g Au produced. Dredge mining.

Eagle Creek contains an estimated 760,000 m^3 grading 1.2 g/m^3 Au, 0.16 g/m^3 Ag. About 0.9 million Au g produced through 1906; recent production in 1985.

Gold in district probably derived from Cretaceous or early Tertiary Au-bearing quartz vein, polymetallic vein, skarn, porphyry lode, and volcanogenic massive sulfide deposits in region in mid Paleozoic or older metamorphic rocks of Yukon-Tanana terrane, with recycling through Tertiary conglomerates. Fineness varies widely, depending on drainage system; ranging from 720 to 920. Alluvial diamonds found in placer concentrates during the 1980's. Local bedrock consists of middle Paleozoic or older metasedimentary rocks of Yukon-Tanana terrane, and Cretaceous granitic plutons.

Prindle, 1913; Mertie, 1938; Heiner and Wolff, 1968; Cobb, 1973; Yeend, 1982, 1987, 1991; Menzie and others, 1983; Lasley, 1985; Bundtzen and others, 1996.

Q06-04 64°55'N 146°30'W	Fairbanks Placer Au	Au, Sb, W, Sn, Ag , Bi	Production of 249, 498 kg Au.. Years of Production: 1902-1995. Fineness: 830-900, average 875

Placer deposits in Fairbanks district occur in streams that radially drain three mineralized areas in Fairbanks District, Ester Dome, Cleary-Pedro Dome, and Gilmore Dome. Nearly all placers consist of buried streams that were ancestral to Cleary, Goldstream, Fairbanks, Engineer, Dome, Eldorado, Treasure, Little Eldorado, Ester, Cripple, Gilmore, and Smallwood drainage basins. Largest placer deposits in Cleary, Fairbanks, Goldstream and Cripple Creek drainages. Deposits are buried by thick sections of frozen loess and mud. Recent stratigraphic and radiometric age studies suggest that most bench deposits in district are Pliocene. Over 30 heavy minerals are identified and include stibnite, scheelite, bismuthinite, native bismuth, and galena. Stibnite and scheelite have been commercially recovered from placers. Early drift mining produced about 55% of gold production of 133 million grams. About 40% of production or 96.1 million grams was recovered from nine-bucket line stacker dredges that operated from 1920 to 1964. The remaining 5% of production was from large open cut mines, mainly from 1975 to the present. The Goldstream Creek pay streak is over 1 km wide and 13 km long, and produced 62 million grams from dredge and drift mining methods. On the richest Cleary Creek, drift mining recovered 2.9 million m^3 grading 14 g/m^3 or 35.1 million grams from 1903 to 1920. Placer gold derived from: (1) several hundred mineralized veins in Ester Dome and in the Cleary Hill-Pedro Dome area; (2) Au skarns in the Gilmore Dome area; and (3) polymetallic veins associated with Cretaceous plutons at Melba Creek, and Pedro, Gilmore, and Ester Domes.

Smith, 1913a; Prindle and Katz, 1913; Mertie, 1918; Heiner and Wolff, 1968; Cobb, 1973; Light and others, 1987; Metz, 1987, 1991; Metz and Hamil, 1986; T.K.Bundtzen, written commun., 1991; Bundtzen and others, 1996.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q06-05 64°30'N 145°10'W	Richardson Placer Au-Ag	Au, Ag Hg, Sn	Production of 3,685 kg Au and 2,550 kg Ag.. Years of Production: 1905-1995. Fineness: two types average 900 and 670

Richardson distruct contains modern stream, bench, and classic residual auriferous placers that occur downslope or downstream lode deposits that occur along or near Richardson lineament. Granite porphyries with gold and gold-silver sulfosalts occur at Mitchell Lode and are probably the source of gold placers in Democrat Creek. Gold in Tenderfoot Creek, the district's largest producer, is derived from a similar granite porphyry sill that intruded along Richardson lineament. Deposit of gold-silver alloy mined on Hinkley Bench is residual accumulation above hydrothermally altered schist and granite porphyry sill. Placer gold consists of of two types: (1) high-fineness gold averaging 900 fine; and (2) low-fineness electrum averaging 670 fine and frequently alloyed with native silver. Latter type predominates. Heavy minerals are diverse and include cinnabar, cassiterite, wolframite, silver sulfosalts, and radioactive monazite. Placers are deeply buried by 10 to 45 m of wind-blown and reworked loess. Early placer developments (pre-WWI) were drifts that frequently encountered artesian waters. At least two pay streaks are identified in Tenderfoot Creek, including a false bedrock pay streak located 10 m above bedrock.

Reger and Bundtzen 1977, and T.K.Bundtzen, written commun., 1991; Bundtzen and others, 1996.

Q07-01 65°00'N 142°00'W	Eagle Placer Au	Au, Ag, Cr, Pt	Production: of 1,617 kg Au.. Years of Production: 1895-1991. Fineness: 844-880, average 871

Gold in Eagle district partly recycled through Cretaceous and Tertiary conglomerates. Heavy minerals are gold, platinum, cinnabar, cassiterite, chromite, and native silver. Most of area not glaciated. Gold in district probably derived from combination of Au quartz veins, polymetallic veins, skarns, and porphyry Cu deposits that are associated with Cretaceous or Tertiary plutons that intrude middle Paleozoic or older metamorphic rocks of Yukon-Tanana terrane. Local bedrock consists mainly of metasedimentary and volcanic rocks, and Cretaceous granitic plutons.

Mertie, 1938; Cobb, 1973.

Q07-02 64°20'N 142°00'W	Fortymile Placer Au	Au, REE, Pb, Sn, W, Hg	Production of 16,631 kg Au.. Years of Production: 1886-1995. Fineness: 620-890

Fortymile district generally contains stream and bench placer deposits. Most of area not glaciated. Loess mantles much of area. A 1.71 kg nugget was recovered from Jack Wade Creek deposit. Gold fineness ranges widely between drainages. Highest fineness is in Walker Fork and lowest fineness is in South Fork of Fortymile River. Lode source probably polymetallic quartz-pyrite veins. Mining by hydraulic, drift, dredge, and open cut methods. Gold derived from a combination of Au quartz and polymetallic veins that occur in metamorphic rocks near contacts with Cretaceous or early Tertiary felsic plutons that intrude middle Paleozoic or older metamorphic rocks of Yukon-Tanana terrane. Local bedrock consists of mainly metasedimentary rocks, Cretaceous granitic plutons, ultramafic and mafic plutonic rocks, and Tertiary sedimentary rocks.

Mertie, 1938, Cobb, 1973; Bundtzen and others, 1996.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q52-01 65°54'N 129°45'E	Verkhoyan Placer Au	Au	Grade: Up to 15 g/m3 Au. Fineness: 703-766

Verkhoyan district contains several small valley and ravine placers. Deposits range up to 4 km long and 50 m wide. Bench placers also occur. Placer deposits are buried by 1-3 m of alluvium. Gold-bearing beds are less than 2 m thick. Gold occurs irregularly in radial and ore pocket forms. Erosion-caused truncation is minor and does not indicate a wider occurrence of placer deposits. The Chochimbal Creek placer deposit is typical of deposits in this district.

Chochimbal deposit occurs as a valley placer that is located in the upper reaches of Chochimbal Creek. The deposit is about 4 km long and 10-50 m wide. Average depth of overburden is about 2 m. The gold-bearing bed is 0.6-3.6 m thick, averagely 1.71 m. Gold grade ranges up to 15 g/m^3. Near bedrock, gold particles are very large (up to 10.1 mm) and gold nuggets range up to 150 g and constitute 39% of the gold. Bedrock sources are small Au quartz veins and, probable Au polymetallic veins. The deposit is exhausted.

Trushkov, 1971; Ivensen and others, 1975; Yu.A. Vladimirtseva, written commun., 1985.

Q53-01 67°23'N 134°11'E	Verkhne-Yansky Placer Sn	Sn	Grade: Up to 1,169 g/m3 cassiterite.

Verkhne-Yansky district contains about 60 cassiterite placer occurrences that form groups of three to ten placer deposits; each group is closely related to their bedrock sources. Main types are eluvial-slope and ravine placer deposits that range up to some kilometers long and about 100 meters wide. Thickness of the payable bed ranges up to 15-20 m and sometimes larger. Cassiterite is generally fine- to sometimes coarse-grained. Buried placers also occur. A major deposit occurs at Kerbeng Creek.

Kerbeng Creek deposit consists of three cassiterite-bearing beds from 4-15 m thick. The paystreak is 100-620 m wide and occurs under 1.7-24 m of overburden. Grades are 330-2,000 g/m^3 cassiteriete and 45-81 g/m^3 wolframite. Bedrock sources are Sn quartz veins and stockworks of the Kuturuk mountain.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q53-02 66°42'N 137°29'E	Adychan Placer Au	Au	Grade: 0.2-34.4 g/m3 Au. Fineness: 475-960

Adychan district contains more than 60 placer deposits that are mostly small and non-commercial. Deposits include buried placers in neotectonic depressions (as at Nadezhnoe), and high terrace and valley placers. Deposits in depressions are Miocene to Pliocene. Modem deposits occur on spits. Placer deposits range from 700 to 12,700 m long and 5 to 1,000 m wide. Overburden of glacial drift ranges from 0.4 to 70 m thick and gold-bearing layers are 0.2 to 7 m thick. Gold-bearing gravels in each district occurs as deiscrete paystreaks of two morphologies, highly elongate and sub-equant. Gold sometimes occurs in rich pockets. Gold particles range in size, and nuggets up to 580 g occur. Associated minerals are cassiterite, wolframite, scheelite, and cerolite. Twenty percent of placers are already mined, and some are currently being worked. Lode sources are Au quartz veins and mineralized shear zones and, less commonly, gold-REE deposits related to granitoids. Major deposits are at Adychanskoe, Adycha, Nadezhnoe, and Lazo.

Adychanskoe deposit occurs on the Adycha River terrace 75-100 m above river level. Deposit is 12.4 km long and up to 1 km wide. The gold-bearing bed is 0.3-1.9 m thick. Au grade is 0.72-11.82 g/m^3. Gold particles differ in size and roundness. Gold forms intergrowths with quartz, chlorite, and galena. Gold fineness is 832-844.

Adycha deposit occurs on a large spit in the Adycha River. Deposit is about 2 km long, and the gold-bearing bed is 0.4-2 m thick. Au grade is 0.01-30 g/m^3. Gold particles are well-rounded, 2-5 mm in size; gold fineness is 740-810. Gold distribution is irregular, radial, locally in ore pockets.

Nadezhnoe deposit is about 3 km long and occurs within a graben. The gold-bearing bed is 0.6-3.6 m thick and occurs below 70 m of overburden. Gold grade is 2.62-34.4 g/m^3. Gold particles average 1-6 mm, gold fineness is 640-880. Associated minerals are cassiterite, scheelite, wolframite, magnetite, ilmenite, and arsenopyrite. Bedrock sources are Au quartz and gold-REE veins and zones, including the Delyuvialnoe deposit.

Lazo deposit is a typical valley placer deposit. It is 6 km long and displays a narrow radial distribution of mineralization. The gold-bearing bed is 1.33 m thick and burried 0.2-1.3 m deep. The commercial part of the deposit is 2-6 m wide. Gold particles are 2-12 mm in size, and gold nuggets up to 5.3 g have been found. Bedrock source is the Lazo Au quartz vein deposit.

Rozhkov and others, 1964; Trushkov, 1971; Yu.A. Vladimirtseva, written commun., 1985.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q54-01 64°33'N 142°50'E	Verkhne-Indigirsky Placer Au	Au	Grade: 2.6-650 g/m3 Au. Fineness: 730-969

Verkhne-Indigirsky district contains more than 250 different and non-contemporaneous placer deposits. Most deposits are flood-plain and bench placers that occur in Holocene and interglacial deposits. Three stages of placer formation occurred in the Oligocene-Miocene, Pliocene-Early Pleistocene, and Late Pleistocene-Holocene. Highest-grade deposits are Pliocene-Early Pleistocene as atSana, Bazovy, Dirin-Yuryak, and Elgi. These depositsoccur in intermontane depressions that formed along deep fault zones. Placers occur on terraces 6 to 200 m above river level. Most have 0.2-20 m of overburden, but some have up to 150 m. Gold-bearing beds are 0.2-6.6 m thick and gold grades range up to 1 kg/m^3 (as at Sana). Gold nuggets up to 5 kg weight are found. Commercial placers are mostly confined to Late Pleistocene and modern fluvial deposits. These deposits have 10 m or less overburden, and are 0.5 to 15 km long, with gold-bearing beds that range1-6.8 m thick and gold fineness of 582-907. Major deposits occur at Promezhutochny Creek, Tuora-Tas Creek, Khangalas Creek, and Kurun-Agalyk Creek.

Promezhutochny Creek consists of a buried placer deposit that occurs in Neogene-to-Early Pleistocene gravel. The thickness of overlying alluvial, colluvial, and glacial deposits varies from 50 to 140 m, and averages 63 m. Gold grade is 8.6 g/m^3. The gold-bearing bed is 3.28 km long and averages 62.8 m thick. The majority of the gold (80%) is confined to the bedrock eluvium. Large gold particles comprise less than 10%; fineness is 840-863%, average is 849. Gold is associated with arsenopyrite, pyrite, anatase, and garnet.

Tuora-Tas Creek flood-plain gold placer is 10 km long and occurs in a broad valley with multiple well-formed terraces. The gold-bearing bed is about 1.5 m thick, gold fineness is 798, and gold particles are about 4 mm in size.

Khangalas Creek deposit consists of flood-plain and bench placers that range up to 3 km long and 150 m thick. Some individual paystreaks are 180-1,000 m long, 0.4-3 m thick, and have 0.4 to 6 m of overburden. Gold fineness is 850. Bedrock sources of are gold-quartz veins of the Khangalas deposit.

Kurun-Agalyk valley placer is 5,500 m long and 20-150 m thick. The gold-bearing bed is 0.2-3.6 m thick, with 2-3 m thick overburden. Gold fineness is 856-891 and gold particles are 0.5-8 mm in size.

Pepelyaev and others, 1964, B.V. Pepelyaev, written commun., 1964; Skryabin, 1964; Trushkov, 1971; Yu.A. Vladimirtseva, written commun. 1987; Oleinikov, 1992.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q56-01 65°04'N 152°57'E	Shamanikho-Stolbov Placer Au	Au	Grade: 3-15 g/m3 Au at Glukhariny deposit. Fineness: 820-960

Shamanikho-Stolbov District contains fifteen placer gold deposits that overlie Proterozoic metamorphic complexes. Unlike placers in tectonically active zones, as those near Ucts-Omchug and in the Central Kolyma region, the placer deposits of the Shamanikho-Stolbov district occur in a deeply eroded, mature region with a passive recent tectonic history. Principal placers range from Neogene to Lower Quaternary. These deposits, including the Stolbovaya and Glukhariny deposits, occur in river valleys at depths of 15-70 m and have widths of up to 300 m. Late Pliocene to Holocene placers are less important. Gold grains are moderately rounded and have undergone secondary attenuation in the form of coatings of hydroxides of iron up to 2.2 mm thick. Younger placers occur both in stream valley and terrace alluvium, where average gold grain size is about 1.3 mm. Neotectonic block subsidence occurred in some valleys with formation of auriferous deposits up to 8 m thick. Gold fineness ranges from 820 to 960. Low-sulfide stockwork zones and rare quartz veins with gold contents of up to 20 g/t are interpreted as original lode sources of the placer deposits. A major deposit occurs at Glukhariny.

The Glukhariny deposit formed in a complex alluvial environment and consists of of valley-thalweg deposits of Lower to Upper Pleistocene age, and karst placers of Pre-Quaternary age. Both types are been buried in the Glukhariny alluvial basin. The karst type formed in Proterozoic limestone. Deposit is characterized by extremely irregular, but rich accumulations of gold. Thickness and width of auriferous gravels average 8 m and 220 m respectively. Gold grains are moderate size (3-4 mm), poorly rounded, and contain coatings of hydroxides of iron. Maximum concentrations of gold occurs where shaly deposits fill karst holes and depressions. Younger portions of placer deposits within older thalwegs where unconsolidated river gravel ranges from 20 to 70 m thick and is up to 220 m wide. Gold grains range in size from 0.25 mm to 2.2 mm. Gold fineness from 830 to 960.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

Q57-01 67°39'N 160°39'E	Khetachan Placer Au	Au	Grade: 3-15 g/m3 Au. Fineness: 860

At least 12 placer deposits in the Khetachan District occur discontinuously within a region transitional between the mountainous area of Kuryin Ridge and the Anyui lowland. The most important placer deposits are at Dalniy, Topolevka, and Ruslan. The placers are buried under a thick section (up to 40 m) of Upper Pleistocene rock debris and silty deposits of the Yedom Formation. Placers occur in banded alluvial deposits that are confined to alluvium on or near bedrock. Weathering into the sedimentary and granitoid bedrock ranges up to 3 m thick. Auriferous zones range in thickness from 1 to 3.5 m. Alluvial-talus placers also occur and are associated with weathering crusts; however, gold reserves are not significant. Age of the majority of placers is pre-Upper Pleistocene, probably Lower Pleistocene. Gold grains are small (averaging 0.97-1.53 mm); local gold grains average less than 0.5 mm in diameter. Interpreted source lode deposits are quartz-sulfide zones that arespatially associated with Cretaceous gabbro-syenite intrusions. Most mineralized lode zones contain up to 7 g/t gold, but bonanza contents are also known. These mineralized zones are interpreted as a porphyry Cu deposit.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q57-02 67°16'N 159°35'E	Innakh Placer Au	Au	Grade: 2-8 g/m3 Au at Uzhasny deposit. Fineness: 800-860

Innakh District contains about 20 placer deposits that occur in third-order stream drainages that are radially distributed around a massif composed of Cretaceous syenite and diorite. Placer formation was influenced by high-angle and vertical fault movement. Valley of Springs deposit occurs in tributaries of the Omolon River and is buried by 30 to 50 m of thick slope deposits. Placer deposit age ranges from Upper Pleistocene to Holocene. Gold grains are typically small. The original lode sources of the gold are deformed sulfide zones and sparse quartz-sulfide veins and stockwork zones that are associated with Cretaceous syenite-diorite. A major deposit is at Uzhasny.

Uzhasny placer alluvium deposit occurs in third-order stream valleys about 7 km long formed in banded gravels to depths of 5-20 m. Auriferous pay zones average 1.6 m thick. Gold grains in lower gravels average 0.73 mm in size, upper gravels average 1.3 mm in size.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

Q57-03 65°26'N 157°24'E	Visualnin Placer Au, Ag	Au, Ag	Grade: 1-15 g/m3 Au, and up to 50 g/t Ag. Fineness: 525-924

Visualnin district contains more than 20 placer deposits that occur in the Omolon massif and include the Rassokha, Burgachan, and Bulun deposits. Deposits are confined to second- to third-order stream valleys. Placer deposits range from Upper Pleistocene to Holocene and consist of shallow alluvial gravels that range from 3 to 8 m thick. Auriferous zones are 0.6 to 2.2 m thick and include gold within altered bedrock. Gold grains are small to very small in size, averaging 0.97 mm. Small native silver nuggets occur in some of the placer deposits. The original lode sources are silica-sulfide zones that occur in brecciated rocks, and low-sulfide Au quartz and quartz-carbonate veins. Gold ranges up to a maximum of 15 g/t.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

Q58-01 67°45'N 167°51'E	Aliskerov Placer Au	Au	Grade: District average: 0.5-11 g/m3 Au, Egilkynveem: 0.87 g/m3 Au. Fineness: 812-845

The Aliskerov District is analogous the Keperveem district, but contains a smaller number of placer deposits (about 25) with lower gold concentrations. The largest placers are confined to forth-order stream valleys. Placers are shallow with overburden averaging 8.2 m thick. Gold grains are small and tabular. Nuggets are very rare. Deposit is zoned with regard to gold fineness and grain size. Quartz veins containing up to 3 to 25 g/t gold, and shear zones with 1.5 g/t gold are interpreted as lode sources. A sample deposit is at Egilkynveem.

Egilkynveem deposit is confined to a fourth-order stream valley and can be traced for more than 8 km. The deposit is narrow, with maximum widths of 20 m and depths of 5-6 m. Gold fineness ranges from 812 to 820. Deposits was exhausted by hydraulic mining.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q58-02 66°58'N 166°44'E	Stadukhin Placer Au	Au	Grade: 2-10 g/m3 Au. Fineness: 822-907

Gold-bearing placer deposits of Stadukhin district occupy a large area. Commerical exploitation focussed in the Yarakvaam area where at least 12 placer deposits have been worked. Holocene alluvial placers are dominant. Late Pleistocene alluvial terraces of sediment buried 25-30 m deep also occur. Gold-bearing stream channels that occur in hanging tributaries are exposed in valley walls by erosion by large trunk glaciers. The largest placer deposit occurs in the flood plain of the Karalveem River, and on two sets of alluvial terraces at 10-15 m and 25 m above the valley floor. Placer deposits in the Khrabtovy River drainage occur along an extinct ancestral drainage system and are concentrated on granitoid bedrock. Gold grain size ranges from 0.7 to 2.2 mm. Lode sources are low-sulfide Au quartz veins and silicified zones up to 1 m thick and containing up to 20 g/t Au.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

Q58-03 66°13'N 164°36'E	Bayimka Placer Au	Au, Ag, Cu, Pt	Grade: 1-12 g/m3 Au (district average). Fineness: 673-934, average 824

Bayimka district contains at least 40 placer gold deposits that occur discontinuously in a north-northwest trending belt that is 150 km long. Valley alluvial placers occur in first-to-third order stream drainages. Gold-bearing alluvial terraces and alluvial talus 10-25 m occur above the valley, are Upper Pleistocene in age, and are poorly preserved. Most of the deposits are interpreted as Holocene. Gold grains are generally small. Ferruginous coatings on grains are common. Lode sources are interpreted as zones of Au-Ag sulfides that are associated with a porphyry Cu stockwork. Lode deposits contain between 0.26 and 20 g/t Au. Main placer deposits are exhausted. A sample deposit is at Krivoy.

The Krivoy placer deposit occurs in talus and alluvium in a small, steep stream with an asymmetrical profile. The deposit is one of the largest placers in the Bayimski District. Gold-bearing talus deposits occur as far upstream as the river head; but deposits near the river mouth contain the most concentrated resources and are the most extensively developed. Auriferous placers range up to 150 m wide. Greenish-yellow gold with fineness values averaging 720 prevails. Au-Ag quartz-carbonate veins and sulfide zones are the principal lode sources.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

Q59-01 67°58'N 170°06'E	Chaanay Placer Au	Au	Grade: 5-6 g/m3 Au. Fineness: 900-960

Chaanay district occurs in the Chaun lowland in an old, ancestral river drainage system that is not expressed in modern drainage patterns. The main placer deposits are part of the buried Oligocene-Miocene age Chaanay River valley, and are among the oldest placer systems known in the Russian Northeast. Placers are multiply stacked, alluvial, and extend for a length of 11 km. Two buried alluvial terraces at the 15-20 m and 30-40 m levels, relative to the thalweg, are identified. Gold-bearing placers occur below sea level, average 30-40 m in thickness, and are buried under unconsolidated deposits ranging from 50 to 120 m thick. Separate pay channels range from 30-200 m wide, contain localized bonanza zones, and exhibit a variable gravel thickness ranging from 0.6 to 6.4 m. Gold grain size ranges from 0.4 to 1.6 mm. Gold grains are coated with Fe hydroxides. Heavy minerals are cinnabar and cassiterite. Placer deposits are partly exhausted. Lode sources are not identified.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
Q59-02 67°58'N 170°41'E	Omrelkai Placer Sn	Sn	Grade: 600-1700 g/m3 cassiterite.

Omrelkai district contains seven placer Sn deposits that occur in a transitional zone between the Chukotka upland and the Chaun plain in an area of low-mountain relief. The placer deposits occur in first- to fourth-order stream valleys (as at Oleniy, Ptichiy) and sixth-order stream valleys (as at Lenyuveem). Pay zones of Upper Pleistocene to Holocene age range up to 2 km long and are generally simple single-layered deposits. Deeply-buried (40 m and deeper) placers of Lower- to Upper-Pleistocene age are between 2 and 5.5 m thick, contain 600 to 1700 g/m^3 cassiterite, and are deep placers that occur in gravel deposits. Small eluvial-talus placers are associated with stockworks in the Ptichiy deposits. Source lode deposit composed of cassiterite and quartz.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

Q59-03 65°02'N 172°30'E	Otrozhen Placer Au	Au	No data. Fineness: 830-975

Otrozhen district contains more than 18 deposits fof Late Tertiary to Holocene age and are characterized by a complex geomorphology. Gold occurs in crevices up to 1.7 m in bedrock. Main part of associated drainage system was formed in Late Tertiary; Quaternary valleys partly inherited the ancestral Tertiary channels. All deposits are alluvium placers; majority occur near the surface. Thickness of gold-bearing stratum ranges from 0.4 to 5.2 m. Gold is of small grain size (up to 3 mm). Nuggets weighing up to 4 kg have been found. Cinnabar and rare platinum are observed. The majority of the placer deposits are exhausted. Lode sources are Au quartz veins and zones with low gold content. A sample deposit is at Otrozhnaya.

The Otrozhnaya placer deposit is one of the largest in the Otrozhen District. The lower part of the deposit occurs in the Udachnen hollow and was deposited on late Tertiary sediments. Formation occurred mainly in the Middle Pleistocene to Holocene. Deposit ranges up to 300 m wide and from 0.8 to 2.2 m thick. Productive stratum is confined to the lower part of alluvial deposits. Average size of gold particles is 4.3 mm, and roundness is poor. Gold is distributed in elongate streaks. Placer gold content is highly variable from trace amounts to 20 g/m^3.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

Q60-01 64°58'N 178°48'E	Zolotogorsk Placer Au	Au	Grade: 5-7 g/m3 Au. Fineness: 850-860

Placer gold in the Zolotogorsk district has been known at Zolotoy Ridge since 1906. This small district contains 8 placer deposits that formed from the Early Pleistocene to Holocene. Valley-alluvial placers are predominante and occur mainly on an igneous bedrock. Placer paystreaks reach a maximum length of 160 m. Placer deposits are buried to depths of 20 m. Thickness of gold-bearing stratum ranges from 0.6 to 1.5 m; rarely to 2.7 m. Gold particle size ranges from 0.9 to 2.1 mm. Gold fineness is 837. The Pravaya Kolbi placer deposit of Early Pleistocene age is buried to depths of 32 m. Small gold placer deposits occur along the shoreline of Anadyr Bay in modern marine sediments. Lode sources are Au quartz veins and zones, and Au-bearing dikes.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
R01-01 68°02'N 178°55'W	Iultin Placer Sn, W	Sn, W, (Au)	Grade: 200-650 g/m3 cassiterite.

Iultin district contains more than 27 placer deposits that are occur near the Iultin tin-tungsten lode deposit. District is in moderate relief area that has been modified by glaciation. Placers consist of alluvial, valley-fill, deeply-buried, and complex types. Latter occur at Iultinskaya, Granitny, and Lenotan. Wolframite and rare gold are commercial. Placer deposits are concentrated in second- to fourth-order streams and formed from Early Pleistocene to Holocene. Upper Pleistocene to Holocene talus-alluvial placers are poorly developed. Placers exhibit variable thickness. Thickness of pay gravels ranges from 1.5 to 10 m. Associated Sn lode deposits occur at Iultin, Svetloye, Solnechnoye, and Severnoye.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

R53-01 70°20'N 134°17'E	Kular Placer Au	Au	Grade: 0.5-26 g/m3 Au. Fineness: 391-962

Kular district contains several different placer deposit types, including: buried Paleogene-Neogene placers which occur at the base of superimposed depressions, and small ravine placers which are Late Quaternary. District contains about ten known placer deposits of variable length and width. Gold-bearing beds covered by up to 150 m of overburden. Gold particles are small in size (0.1-3.5 mm) and average 0.8-1 mm. Flattened gold particles predominate. Gold-bearing gravels form elongate zones. Valleys are up to 1,200 m wide and contain paystreaks are up to 100 m wide. Equant and elongate weathering crusts up to 30-50 m thick are wide-spread. Most of the placers were formed by water-reworking of weathered crust material during the early Oligocene. The bedrock sources of the placer deposits are Au quartz veins and zones, and Au-REE and Au-Hg deposits. Major deposits are at Kara-Onkuchak and Burguat.

Kara-Onkuchak placer occurs in an ancient buried valley, consists of a gold-bearing bed up to 10-20 m thick, and is formed in an Lower Oligocene alluvial gravel with quartz pebbles (50%) cemented with light-grey sandy clay. Overburden is about 100 m thick. Average size of gold particles is 0.5-1 mm and fineness 795-815.

Burguat bench placer deposit of Early Pleistocene age occurs on an aggradation-denudation terrace that is 15-20 m above river level. Pay gravels consist of quartz pebbles (20%) and clastic rocks of the Vekhoyan Formation. Gravels are cemented with argillaceous sand. Pay gravels are underlain by a weathing crust in the middle section of the river and by Miocene gravel in the lower reaches of the river. Some gold-bearing layers occur in the thalwegs of buried ancient valleys. Gold-bearing gravel beds range up to 10-15 m thick. Average size of gold particles ranges from 0.88 to 1.44 mm. Gold fineness is 680-886, with the maximum in the middle portion of the deposit.

Ivensen and others, 1975; Samusikov and Sergeenko, 1974; Arsky and others, 1963, Yu.M., written commun., 1963; Amuzinsky and others, 1988.

District No. **Latitude** **Longitude** **Summary Description** **References**	**District Name** **Deposit Type**	**Major Commodities** **Minor Commodities**	**Grade and Tonnage**
R54-01 69°42'N 140°22'E	Polousnensky Placer Sn	Sn	Grade: Up to hundreds g/m3 cassiterite .

Polousnensky district contains several tens of cassiterite-bearing zones. The Deputatskaya and Omchikandinskaya placer deposits are most important. Placers in this district are located near granite intrusions and are closely related to bedrock sources. Close bedrock-placer proximity is characteristic of the district. The Sn placers are mostly alluvial; more rarely are eluvial-diluvial. The most important Sn placers are associated with lode stockworks. The amount of cassiterite is variable, and may exist in association with wolframite and sometimes with bismuth nuggets. Cassiterite is coarse, 40-50% is larger than 7 mm. Boulders of cassiterite occur. Example deposits are at Deputatsky Creek and Omchikandya Creek.

Deputatsky Creek placer deposit occurs in a broad valley with multiple well-formed terraces. Overburden ranges from 3-4 m to 8 m thick. Distribution of cassiterite is rather regular. Within the mineralized layer, finer-grained cassiterite occurs in the upper portion, and coaster-grained cassiterite in the lower parts. The bedrock source is the Polousnensky lode deposit.

Omchikandya Creek placer deposit occurs in a broad valley with multiple well-formed terraces. Deposit forms a continuous wide band that completely fills the valley. The deposit is more than 3 km long and is either not overlain, or is overlain by a few meters of overburden. The pay zone is 20-30 m thick. Minerals are cassiterite (larger than 7 mm fraction of 40-50%) and wolframite. Cassiterite to wolframite ratio of 2:1 to 3:1. Bismuth nuggets to 1 kg are common. Lode source is the Polyarny deposit.

Epov and Sonin, 1964; O.G. Epov and G.S. Sonin, written commun., 1964; Trushkov, 1964, 1971.

R54-02 68°17'N 141°39'E	Khatynnak-Sala Placer Au	Au	Grade: Up to 10-15 g/m3.

Khatynnak-Sala disctrict contains several gold placer deposits that occur at several horizons. The placers are not long. Gold is fine and platy. Placer gold occurs in gravel overlying Paleozoic limestone. One example is at Khatynnak-Sala Creek.

Khatynnak-Sala Creek placer deposit occurs in a broad creek valley that contains multiple, well-developed alluvial terraces. The alluvial placer is 7.5 km long and about 90 m wide. The gold-bearing placer is 0.2-1.8 m thick. Gold has also accumulated in fissures and cavitites in the Paleozoic limestone bedrock to depths of 1 m. The placer deposit is overlain by 5 to 8 m of overburden. Gold is fine and platy and is often present in the form of intergrowths with quartz and calcite. Gold occurs in association with zircon, ilmenite, magnetite, pyrite, galena, and chalcopyrite.

O.G. Epov and G.S. Sonin, written commun., 1964; Trushkov, 1971.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
R58-01 68°07'N 165°60'E	Keperveem Placer Au	Au, W, Sb	Grade: 3-15 g/m3 Au (Karalveem deposit). Fineness: 800-950; average of 900

Keperveem district contains at least 50 placer deposits that are largely confined to Upper Pleistocene to Holocene, forth-order stream valleys. Adjacent auriferous terrace alluvium contains subordinate gold. Auriferous zones 0.8 to 3.3 m thick are buried by 14 m of overburden. Placers are commonly contain two gold-bearing layers. Glacio-fluvial placers occur in the Enmyveem River basin that is glaciated. Placers are buried under Upper Pleistocene glacial deposits amd occur at a depth of more than 90 m. Fineness decreases at the flanks of the district. Au quartz veins in Triassic gabbro-diabase and sedimentary rocks, and rare Au quartz zones, that contain 3-40 g/m^3 gold, are interpreted as the lode source. An example deposit is at Karalveem.

The Karalveem deposit comprises a continuous placer that is 10 km long in the Karalveem River valley. The placer extends downstream from the mouth of the Byezymanny River and occurs in a forth-order drainage system. The placer is composed of auriferous sandy-pebble deposits that are Upper Pleistocene to Holocene. Bedrock surface underneath the placer deposits is relatively even, and bedrock is composed of sandstone, shale, and diabase. Multiple pay layers occur, with auriferous zones ranging up to 5 m where layers join. Gold is commonly coarse (averaging 2-6 mm) and nuggets weighing more than 1 kilogram are found. Average gold grains range from 2 to 6 mm. Deposit has a maximum width of 300 m. Gold increases where the valley narrows. Heavy minerals are galena, ilmenite, and scheelite. Lode source is the Cretaceous age Karalveem Au quartz vein lode that contains up to 40 g/t gold.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

R59-01 69°52'N 171°35'E	Northern Placer Sn	Sn	Grade: 200-600 g/m3 cassiterite.

Northern District contains more than 55 placer deposits and occurs in the northern part of the Chaun Mesozoic fold belt in a region of moderate relief. Most placers are near-surface alluvial deposits that occur in first- to third-order stream valleys. The placers form single-stratum concentrations of Upper Pleistocene to Holocene age. Multiple pay layers are rare. Cassiterite placers extend for 11 km, average 0.6 to 1.2 m thick, contain 200-600 g/m^3 cassiterite, and locally contain up to 1500 g/m^3 cassiterite. Eluvial-talus placer deposits occur near the Terrace and Olovyanny Sn lode deposits. Placers are mainly monomineralic, but small admixtures of gold, wolframite, and scheelite occur. Most placer deposits in the Northern District are now exhausted. Cassiterite grains are small (1-2 mm, rarely 5-8 mm). Lode sources are Sn silicate stockworks, zones, dikes, and rare veins. Sn lode deposits contain from 0.5 to 1.0% Sn.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

R59-02 69°29'N 171°58'E	Perkakay Placer Sn (Au, W)	Sn, (Au, W)	Grade: 200-800 g/m3 cassiterite.

Pyrkakay District occurs in the central part of the Chukotka Mesozoic fold belt in an area of moderate relief. More than 23 placer deposits are closely associated with the lode sources, and occur in second- to fifth-order stream drainages. Placers are of Miocene to Holocene age. Pre-Quaternary placers formed in areas with extensive chemically-weathered crusts up to 10 m thick. Late Pleistocene to Holocene placers are alluvial, valley-fill, and eluvial-talus types. Valley placers are 5 km long and contain gravel ranging in thickness from 2 to 3.6 m. Placers contain both single and multiple pay layers. Cassiterite content of placers is 200 to 800 g/m^3; wolframite, gold, topaz, garnet, and sulfides also occur. Gold and tungsten grades are not high, but are recovered as by-products. Lode sources are Au quartz-sulfide veins, stockworks, and shear zones that contain cassiterite and sulfides. Cassiterite in lode deposits is fine-grained (0.1 mm) with a few large crystals ranging up to 1-2 cm.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. / Latitude / Longitude / Summary Description / References	District Name / Deposit Type	Major Commodities / Minor Commodities	Grade and Tonnage
R59-03 / 69°08'N / 172°53'E	Ichuveem / Placer Au, Sn	Au, Sn, W	Grade: 2-15 g/m3 Au (M. Ichuveem deposit). Fineness: 850-900

Ichuveem district contains at least 30 placer deposits that occur in valley bottoms of second- to sixth-order streams. Placers are mainly Holocene age. Upper Pleistocene placers occur in the terrace alluvium at 10-12 m elevations, and are rarely higher. Thickness of pay zones ranges from 1.4 to 2.0 m; width of terrace alluvial placers ranges up to 700 m. Most gold grains average less than 2 mm in size; however, commonly nuggets range up to 2 kg. Placer deposits along Promyezhutochny River differ from others in the district and are characterized by small grain size and low gold fineness. Placer deposits along Mlelyuveem River contain up to 400 g/m^3 Sn and locally more. Low-sulfide Au quartz veins and rare shear zones and dikes of intermediate composition are interpreted as lode sources. An example deposit is M. Ichuveem.

M. Ichuveem placer Au deposit generally occurs in valley bottoms of forth- to sixth-order streams, and less commonly in terrace alluvium at levels of 7-8 m. Thickness of gpay zones ranges from 1.2 to 3.2 m, rarely up to 5 m. Overburden thickness ranges from 25 to 70 m. Gold particles have a broad range of shapes, including scales, tables, and plates. Gold grains ranges from 0.2 to 8 mm. Average fineness of 822. Placers are mainly exhausted; with deep technogenic placers currently being exploited.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

R59-04 / 68°32'N / 168°38'E	Rauchan / Placer Au	Au	Grade: 3-7 g/m3 Au (Gremuchaya deposit). Fineness: 874-896; rarely to 917

Rauchan district contains more than 20 placer gold deposits that occur in second- to fifth-order stream drainages. Deposits are mainly Late Pleistocene. Average thickness of pay zones is 1.4 m. Gold grains are generally very small, but nuggets weighing several hundred grams have been recovered. Gold is poorly to moderately rounded. Au quartz-carbonate veins and sulfide shear zones are interpreted as lode sources that contain up to 5 or 6 g/t Au; rarely more. An example deposit is at Gremuchaya.

Gremuchaya placer deposit is more than 12 km long and occurs in an old thalweg at depths between 8 and 25 m. Pay zones range from 2.7 to 5 m thick. Gold ranges from 0.8 to 1.5 mm, with average fineness of 917. Placer deposit is mostly exhausted. Lode sources are uartz-chlorite and quartz-carbonate veins with sulfides that contain up to 0.5 to 20 g/t Au.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

R60-01 / 68°49'N / 174°60'E	Pegtymel / Placer Sn	Sn	Grade: 270-1000 g/m3 cassiterite.

Pegtymel district contains twelve placer deposits and is located along the boundary between Mesozoic sedimentary rocks of the Chukotka terrane and the Okhotsk-Chukotka volcanic-plutonic belt. Placer deposits occur in first- to forth-order streams as buried alluvial thalwegs, with several pay zones that range up to 7 m thick and occur at depths of 3 to 40 m. Minor amounts of gold occur in the placers. Cassiterite crystals range in size from 1 to 2 mm. The Lunnoye Sn quartz deposit is the source for the placer deposits.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

District No. Latitude Longitude Summary Description References	District Name Deposit Type	Major Commodities Minor Commodities	Grade and Tonnage
R60-02 69°14'N 178°25'E	Ryveem Placer Au	Au, Ti, Agate	Grade: 1-25 g/m3 Au (Lower River and Coastal Plain deposit). Fineness: 700-866

Ryveem district contains more than 15 placer deposits that occur in valleys of first- to fifth-order streams and in the near-shore coastal plain of the Chukotsk Sea. Most deposits are alluvial, but one is of strandline. The age of most placers is lower to middle Pleistocene, with minor deposits of upper Pleistocene to Holocene age. Most placers are covered by overburden ranging in from 8 to 50 m thick. Coastal placers are the thickest and range up to 5 to 8 m thick. Grains averages 2 mm in diameter. Gold grains are commonly coated with greigite (Fe_3S_4) and iron hydroxides. Principal admixtures in gold bullion include silver, copper, and iron. Ilmenite, scheelite, and other minerals also occur. Low-sulfide Au quartz veins and silicified shear zones with up to 15 g/t Au are the lode sources. The lodes occur in Paleozoic clastic deposits. An example is the Lower River and Coastal Plain deposit.

Lower River and Coastal Plain placer deposit are of alluvial and coastal marine origin and occur in the lower part of Ryveem River valley and Valkarai lowlands. Both types of deposit are interpreted as Pliocene to Pleistocene in age. Exceptionally wide valley placers range from 4 to 7 km in width. Rich bonanza-grade placers occur in zones of extensive weathering with increasing thickness of pay zones. Multiple pay zones are common. Pay zones in the lower parts of the river are usually less than 1 m thick. Gold is localized in pods. Gold grains are poorly rounded and average 2 mm in size. Gold fineness ranges from 814 to 866. Strandline placers occur subparallel to the coastal plain and consist of several parallel pay zones. Gold concentrations occur along the contacts of consolidated and unconsolidated deposits. Iron oxide coats gold particles. Exploration in progress.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

R60-03 68°43'N 178°19'E	Kuvet Placer Au	Au	Grade: 4-8 g/m3 Au. Fineness: 865-895

Kuvet district contains more than 12 placer deposits that occur in the Kuvet River basin and at the head of the Kuekvunya River. The more important placers occur along the Kuvet River and tributaries. Placers occur as buried, valley, and alluvial types and are Upper Pleistocene. Sediment overburden ranges from 20 to 100 m thick. Pay zones range from 0.4 to 2.2 m thick, and are up to 200 m wide. Gold occurs in individual, narrow paystreaks. Distribution of gold is irregular, with some pay zones up to one km long. Bonanza concentrations occur locally. Gold is mainly well-rounded, ranging in size from 0.75 to 3.5 mm. Small nuggets have been recovered. Placers are partly exhausted. Low-sulfide Au quartz and quartz-carbonate veins and zones of silicification and brecciation are the lode sources. Lode deposits contain 4 to 12 g/t Au.

P.O. Genkin and E.A. Sinuygina, written commun., 1973; M.E. Gorodinsky, written commun., 1991.

S54-01 72°13'N 140°05'E	Chokurdak Placer Sn	Sn	Production of about 100 tonnes. Grade: 100-2,000 g/m3Sn, locally up to 18.9 kg/m3 cassiterite.

The main Chokurdak district placer deposits occur just offshore in ravines of small creeks. The sea-beach placer is 1,700 m long and 10 to 110 m wide. Offshore extent of the deposit is unknown. The tin-bearing bed is 1-2 m thick. Cassiterite is fine-grained (0.25-2 mm) and forms intergrowths with tourmaline and quartz. Cassiterite is associated with arsenopyrite, pyrite, ilmenite, magnetite, and chalcopyrite. Two ore-bearing horizons are known, an upper one that overlies both sea gravels, and a lower one that overlies false bedrock. Lode source is the Chokurdak deposit.

D.S. Sorokov and D.A. Voitsekhovsky, written commun., 1961; Trushkov, 1964; Prokhorova and Ivanov, 1973.

Alphabetical Index for Significant Placer Districts of the Russian Far East, Alaska, and the Canadian Cordillera

District Name	District Number	Deposit Type	Major Metals
Adychan	Q53-02	Placer Au	Au
Aliskerov	Q58-01	Placer Au	Au
Allakh-Yun	P54-01	Placer Au	Au
Aniak	P04-04	Placer Au-Hg	Au, Ag, W, Cr, Hg, Pt
Atlin Camp	O08-02	Placer Au	Au
Bayimka	Q58-03	Placer Au	Au, Ag, Cu, Pt
Big Bend Camp	M11-01	Placer Au	Au
Big Salmon-Teslin	P08-03	Placer Au	Au
Blagoveshchensk-Svobodnensky district	M52-02	Placer Au	Au
Bonnifield	P06-01	Placer Au	Au, Ag, Hg, Pt, Sn, W
Boundary-Kettle River	M11-05	Placer Au	Au
Bridge River Camp	M10-01	Placer Au	Au
Cariboo-Barkerville-Wells	N10-04	Placer Au	Au
Cariboo-Hixon Camp	N10-03	Placer Au	Au
Cariboo-Quesnel-Horsefly	N10-05	Placer Au, Pt	Au
Cassiar Camp	O09-01	Placer Au	Au
Chaanay	Q59-01	Placer Au	Au
Chandalar	Q06-01	Placer Au	Au, Sb, Ag, W
Chisana	P07-04	Placer Au	Au, Ag
Chistochina	P06-04	Placer Au	Au, Pt, W, Cr, Zn, Hg, Pb
Chokurdak	S54-01	Placer Sn	Sn
Circle	Q06-03	Placer Au	Au, Ag, Sn, Sb, W, Pb, REE, Mo, Hg
Coquihalla River Camp	M10-05	Placer Au, Pt	Au
Council (Includes Solomon)	Q03-04	Placer Au	Au, W, Hg, Cu
Dambuki	N52-02	Placer Au	Au
Debin-Orotukan-Srednikan	P56-01	Placer Au	Au
Delta River	P06-03	Placer Au	Au
Dzhagdy	N52-03	Placer Au	Au
Eagle	Q07-01	Placer Au	Au, Ag, Cr, Pt
Fairbanks	Q06-04	Placer Au	Au, Sb, W, Sn, Ag, Bi
Fairhaven (Includes Candle and Inmachuk)	Q04-03	Placer Au	Au, Pb, W, Pt, Ag
Fortymile	Q07-02	Placer Au	Au, REE, Pb, Sn, W, Hg
Fraser River	M10-02	Placer Au, Pt, Ir	Au
Goltsovka	N57-08	Placer Au	Au
Gonzhinsky (Gonzha)	N51-04	Placer Au	Au
Goodnews Bay, Bethel	O04-01	Placer PGE-Au	Pt, Au
Gorelaya River	P58-05	Placer Au	Au
Hope	P06-07	Placer Au	Au, Cu, Sb, Hg, Pb
Hot Springs	Q05-05	Placer Au-Sn-Nb	Au, Sn, Cr, REE, Cu, Pb, Ag, Ni, Hg, W, Bi, Nb
Hughes-Koyukuk	Q05-03	Placer Au	Au, Cu, Pb, Ag, Sn, Pt, Zn
Ichuveem	R59-03	Placer Au, Sn	Au, Sn, W
Iditarod	P04-03	Placer Au	Au, Hg, Sb, Sn, W, Cr, REE, Ag
Il'inka River	L54-01	Placer Au	Au
Innakh	Q57-02	Placer Au	Au
Innoko	P04-01	Placer Au	Au, Ag, Hg, Pt, Sn, W
Iudumich Creek	N57-04	Placer Au	Au
Iultin	R01-01	Placer Sn, W	Sn, W, (Au)
Juneau-Admiralty	O08-03	Placer Au	Au
Kamenisty Creek	N57-05	Placer Au	Au
Kameshkovoi-	N57-07	Placer Au	Au

District Name	District Number	Deposit Type	Major Metals
Polovinchik River			
Kantishna	P05-01	Placer Au	Au, Ag, Sb, Pb, W, Mn
Kedrovy Creek	P58-02	Placer Au	Au
Keperveem	R58-01	Placer Au	Au, W, Sb
Kerbi	N53-03	Placer Au	Au
Khalaktyrskoe	N57-06	Placer magnetite	Ti, Fe
Khatynnak-Sala	R54-02	Placer Au	Au
Kherpuchinskoe	N54-03	Placer Au	Au
Khetachan	Q57-01	Placer Au	Au
Kiana	Q04-01	Placer Au	Au, nephrite
Kichavayam River	P58-08	Placer Au	Au
Klondike	P07-02	Placer Au	Au
Klotassin-Dawson Range	P08-02	Placer Au	Au
Kluane	P07-05	Placer Au	Au
Kodiak	O05-01	Placer Au	Au, Ag, Cr, Pt
Kolchanskoe	N54-02	Placer Au	Au
Kondeur	O53-02	Placer PGE	PGE
Kougarok	Q03-02	Placer Au-Sn	Au, Sn, W
Koyuk	Q04-04	Placer Au, Pt	Au, Sb, W, Pt, Bi
Kronotsky Bay	N57-02	Placer magnetite	Ti, Fe
Kular	R53-01	Placer Au	Au
Kurun-Uryakh	O53-01	Placer Au	Au
Kuvet	R60-03	Placer Au	Au
Laird River	P09-01	Placer Au	Au
Langeriiskoe	M54-02	Placer Au	Au
Lardeau-Duncan and Lake-Bugaboo	M11-02	Placer Au, U Th, Nb	Au
Leech River Camp	M10-06	Placer Au	Au
Malokhingansky (Malokhingan) district	M52-03	Placer Au	Au
Manson Camp (Omineca)	N10-01	Placer Au	Au
Marshall	P04-02	Placer Au	Au, Ag, Pt
Mayo-McQuesten	P08-01	Placer Au	Au
McGrath	P05-02	Placer Au, Hg	Au, Sn, W, Bi, REE, Hg, Cu, Pb
Melozitna	Q05-04	Placer Au	Au, Sn, Pb, Ag, Zn, Cu
Monashee-Cherry Creek Camp	M11-04	Placer Au	Au
Moyie-Goat River Camp	M11-08	Placer Au	Au
Nelchina	P06-06	Placer Au	Au, Pt, W
Nizhnenyukzinsky district	O51-01	Placer Au	Au
Nizina	P07-06	Placer Au	Au, Ag, Sb, Cu, Pb, Mo
Noatak	Q05-01	Placer Au	Au
Nome	Q03-03	Placer Au	Au, Ag, W, Sb
North Thompson-Tranquille	M10-03	Placer Au	Au
Northern	R59-01	Placer Sn	Sn
Oemku	M54-01	Placer Au	Au
Okanagan Valley	M11-03	Placer Au	Au
Okhotsk	O54-01	Placer Au	Au
Oktyabrskoe	N54-04	Placer Au	Au
Omrelkai	Q59-02	Placer Sn	Sn
Ossora Bay	O58-01	Placer magnetite	Ti, Fe
Otrozhen	Q59-03	Placer Au	Au
Ozyornaya River	M57-01	Placer magnetite	Ti, Fe
Pegtymel	R60-01	Placer Sn	Sn
Pend D'Oreille-Sheep Creek	M11-07	Placer Au	Au
Penyelkhin	Q01-01	Placer Au	Au
Perkakay	R59-02	Placer Sn (Au, W)	Sn, (Au, W)
Perspektivny Creek, Kechichma River	P58-06	Placer Au	Au
Polousnensky	R54-01	Placer Sn	Sn

District Name	District Number	Deposit Type	Major Metals
Porcupine-Haines	O08-01	Placer Au	Au
Port Clarence	Q03-01	Placer Au-Sn	Sn, Au, REE, W, Cr, Pb, Ag, Hg, Pt
Pravaya, Kondyreva River	P58-03	Placer Au	Au
Prizhimny Creek, Dobraya River	P59-02	Placer Au	Au
Rampart	Q05-06	Placer Au	Au, Ag, Bi, W, Sn
Rauchan	R59-04	Placer Au	Au
Richardson	Q06-05	Placer Au-Ag	Au, Ag
Ruby	Q05-07	Placer Au	Au, Sn, Bi, REE, Pb, W, Pt
Ryveem	R60-02	Placer Au	Au, Ti, Agate
Sanga-Talon	P55-02	Placer Au	Au
Schmidtovskoe	N54-05	Placer Au	Au
Seinav-Galimanan	P58-09	Placer PGE	PGE
Shamanikho-Stolbov	Q56-01	Placer Au	Au
Shungnak	Q04-02	Placer Au	Au, Cu, Ag, Cr, Cd
Sixtymile	P07-01	Placer Au	Au
Skeena River	N09-01	Placer Au	Au
Smyaty and Grif Creeks	P58-07	Placer Au	Au
Sofiiskoe	N53-02	Placer Au	Au
Srednenuykzhinsk	N51-02	Placer Au	Au
Stadukhin	Q58-02	Placer Au	Au
Stewart River	P07-03	Placer Au	Au
Stikine River-Telegraph Creek	O09-02	Placer Au	Au
Susuman-Chai-Yuryuyen	P55-01	Placer Au	Au
Taigonoss	P57-01	Placer Au	Au
Temny Creek	N57-01	Placer Au	Au
Tenka	P55-03	Placer Au	Au
Tolovana	Q06-02	Placer Au	Au, Sn, Cu, Pb, Hg, W, Cr, Sb, REE, Bi
Tulameen-Similkameen Camp	M10-04	Placer Au-Pt-Ag	Au
Turansky district	M52-01	Placer Au	Au
Udachny Creek	N57-03	Placer Au	Au
Ulskoe	N54-01	Placer Au	Au
Ushkan'e River Basin	P58-04	Placer Au	Au
Valdez Creek	P06-02	Placer Au	Au, Cu, Pb
Verkhne-Indigirsky	Q54-01	Placer Au	Au
Verkhne-Yansky	Q53-01	Placer Sn	Sn
Verkhneamursk	N51-03	Placer Au	Au
Verkhnegilyui	N51-01	Placer Au	Au
Verkhneselemdzha	N53-01	Placer Au	Au
Verkhnezeisk	N52-01	Placer Au	Au
Verkhoyan	Q52-01	Placer Au	Au
Vesyoly Creek	P59-01 PGE	Placer PGE	
Vidny Creek	P58-01	Placer Au	Au
Visualnin	Q57-03	Placer Au, Ag	Au, Ag
Vital-Silver Creek Camp (Omineca)	N10-02	Placer Au, Cu, Ag, nephrite	Au
Wildhorse Creek Camp	M11-09	Placer Au-Pt	Au
Willow Creek	P06-05	Placer Au	Au, Cu, W, Pt
Wiseman (Koyukuk)	Q05-02	Placer Au	Au, Bi, Cu, W, Pb
Yakataga	P07-07	Placer Au	Au, Ag, Cr, Cu
Yakutat (Lituya Bay)	O07-01	Placer Au-Ti	Au
Yentna	P05-03	Placer Au	Au, Cu, Ag, Pt
Ymir-Nelson-Slocan Camp	M11-06	Placer Au-W	Au
Zeiya-Selemdzha	N52-04	Placer Au	Au
Zolotogorsk	Q60-01	Placer Au	Au

U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

PREPARED IN COLLABORATION WITH:
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ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS
GEOLOGICAL SURVEY OF CANADA

REFERENCES FOR SIGNIFICANT METALLIFEROUS AND SELECTED NON-METALLIFEROUS LODE MINERAL DEPOSITS AND PLACER DISTRICTS, AND FOR METALLOGENESIS OF THE RUSSIAN FAR EAST, ALASKA, AND THE CANADIAN CORDILLERA

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