

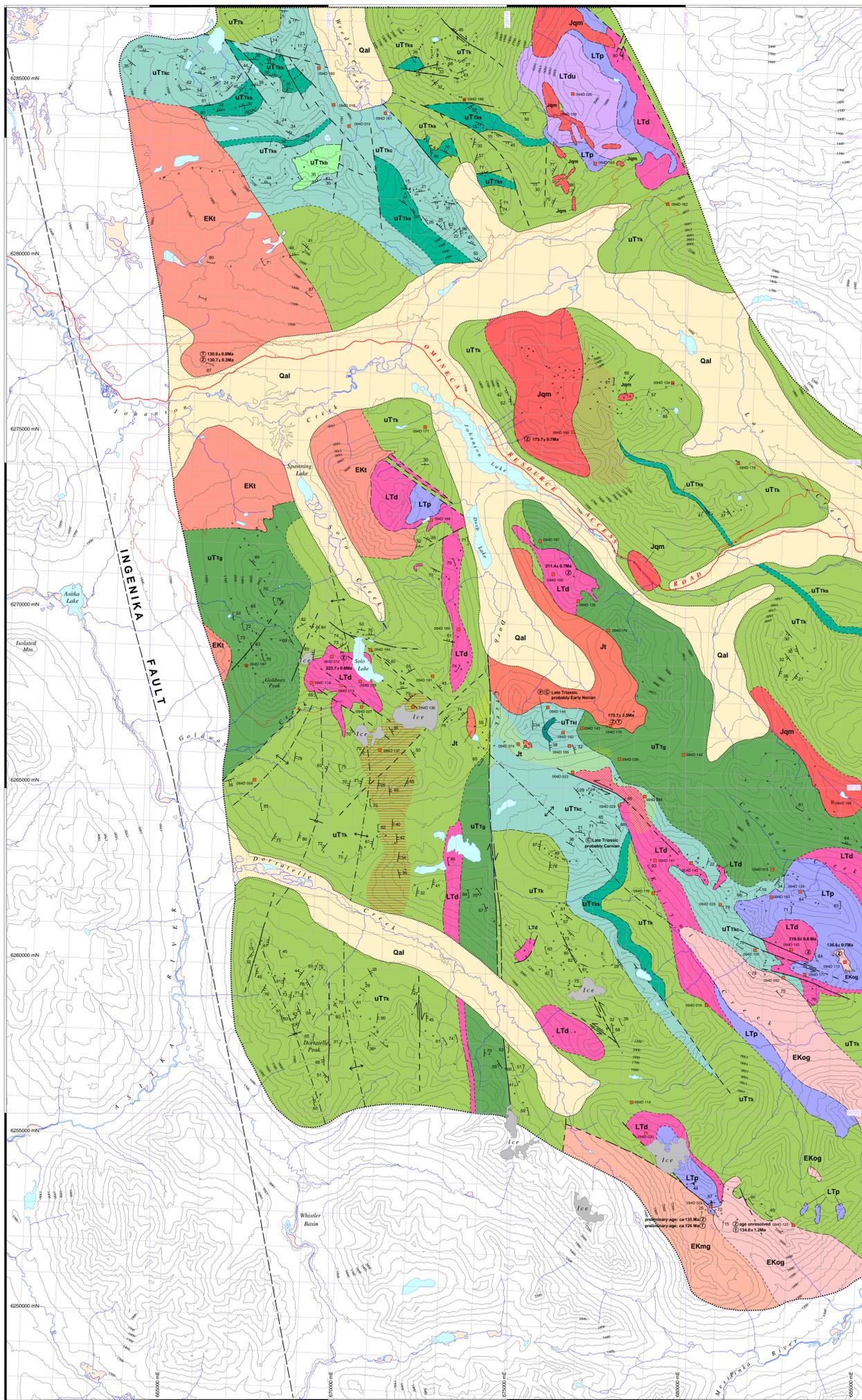
GEOLOGY OF THE JOHANSON LAKE AREA
 PARTS OF NTS 94D/8 and 9

Contribution to the Toodogone Targeted Geoscience Initiative II - Mining Company Partnership

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Scale 1:50 000



Quaternary

Qal Unconsolidated glacial, fluvial and alluvial deposits

Early Cretaceous

EKog Oslinka stocks: light grey, locally pink, biotite monzogranite and granodiorite; minor amounts of biotite-muscovite granite, apelite and pegmatite

Ekgm Meslika pluton: lineated and foliated, commonly feldspar megacrystic, light grey to pink biotite monzogranite, quartz monzonite and granodiorite

Ekt Light grey biotite-hornblende tonalite and quartz diorite; minor amounts of hornblende diorite

Jt Light grey hornblende-biotite tonalite and quartz diorite

Jqm Grey to pinkish-grey hornblende quartz monzonite, quartz monzodiorite, quartz diorite, monzonite, diorite and monzodiorite

Zone of abundant monzodiorite and diorite dikes

Late Jurassic

Ltd Light to dark grey and greenish-grey diorite, monzodiorite and gabbro; locally includes monzonite, quartz diorite, microdiorite, hornblende-feldspar gabbro, intrusion breccia, pyroxenite and hornblende

Ltp Dark grey to grey-green pyroxenite, hornblende, whiteite and mafic gabbro; includes lesser amounts of dunite, diorite and monzodiorite

Ltdu Dark grey to black, buff-orange weathering dunite; minor amounts of whiteite

Upper Triassic

TAKLA GROUP

Goldway Peak unit

UTg Dark green to grey-green, brown-weathering mafic volcanic breccias; clasts dominated by pyroxene-phyric basalt; locally includes hornblende-feldspar gabbro, intrusion breccia, pyroxenite and hornblende

Kiyul Creek unit

UTk Grey to green, fine to coarse grained volcanic sandstone, siltstone, pebble conglomerate, lapilli tuff and volcanic breccia; commonly massive, locally thin to thick bedded; typically feldspar-rich; locally also rich in pyroxene and pyroxenite; thin fragments; includes rusty-weathered, thin-bedded siltstone and argillite, dark grey limestone, and green pyroxene-feldspar-phyric basalt

UTsb Grey to green pyroxene-feldspar-phyric basalt

UTsc Sandstone-carbonate subunit: Grey to green volcanic sandstone, siltstone, conglomerate and breccia; commonly associated with dark grey limestone which occurs as beds, lenses, slump blocks, clasts in conglomerate/breccia, and chaotically-deformed breccia matrix

UTsd Light to dark grey, massive to well-bedded limestone; minor amounts of sandy limestone and siltstone

UTst Siltstone-limestone subunit: dark grey, reddish weathering, thin bedded siltstone, limestone and calcareous siltstone; lesser amounts of volcanic sandstone, calcareous sandstone, breccia and conglomerate

Symbols

Limit of mapping

Geological contact (defined, approximate, inferred)

Fault (defined, inferred; arrows indicate relative sense of movement)

Axial trace of fold (anticline/syncline)

Bedding, tops known (inclined/overturned)

Bedding, tops unknown (inclined/vertical)

Igneous Layering

Cleavage, schistosity (inclined, vertical)

Stretching lineation

Axial of mesoscopic fold

Field station location

MINFILE occurrence

Quartz-carbonate alteration zone

Quartz-phyllite-sericite alteration zone

Fossil locality (macrofauna, microfossils, conodonts)

U-Pb age determination site (zircon, titanite)

Road (all weather, seasonal)

Ice

Mineral Occurrences

| MINFILE No. | Name | Map | Easting | Northing | Commodities | Description | Reference |
|-------------|-----------------------|-----------------|---------|-----------|----------------|---|--------------------------------------|
| 0401 010 | QUYZVHK | 94D 069 | 689 100 | 6 284 010 | Au, Ag, Cu | quartz veins in shear zones; py, cpy | Cruckshank, 1990; Christopher, 1986 |
| 0401 010 | Solomon | 94D 069 | 688 640 | 6 284 600 | Au, Ag, Cu, Pb | quartz veins in shear zones; py, ga, cpy, nAu | Cruckshank, 1990; Christopher, 1986 |
| 0401 012 | Solo | 94D 059 | 688 220 | 6 288 070 | Au, Ag | quartz veins and stockwork; py, ga | Richards, 1991 |
| 0401 013 | Brown | 94D 059 | 685 520 | 6 288 040 | Au, Ag | quartz veins; py, ga, nAu | Richards, 1991 |
| 0401 014 | Ginger B | 94D 060 | 674 670 | 6 266 590 | Au, Ag | quartz veins; py (ga, cpy) | White, 1948 |
| 0401 015 | Croy | 94D 050 | 682 110 | 6 263 320 | Cu, Au, Ag | shear zones; quartz, carb. chl, py, mag, cpy | Noel, 1971a |
| 0401 019 | Ki | 94D 050 | 680 380 | 6 259 370 | Cu, Ag | sham; cpy, py | Noel, 1971b |
| 0401 020 | Repp | 94D 050 | 678 890 | 6 256 690 | Mo | mo in felsic dikes; cpy-cpy in quartz veins | Coxe, 1972 |
| 0401 022 | Meslika River | 94D 040 | 680 750 | 6 253 650 | Cr | chromite disseminated in peridotite | Lord, 1948, p. 29, 64 |
| 0401 023 | Kiyul | 94D 060 | 678 260 | 6 265 650 | Au, Ag, Cu | magnetite-phyllite-chalcopyrite skarn | Smit and Meyers, 1985 |
| 0401 025 | Suez North | 94D 060 | 680 260 | 6 262 250 | Au, Ag, Cu | antiferroal magnetite-phyllite-chalcopyrite replacement | Smit and Meyers, 1984 |
| 0401 026 | Wilde Creek Chromite | 94D 070 | 675 480 | 6 285 190 | Cr, Pt | chromite lenses in dunite | Noel et al., 1997; Chapter 8 |
| 0401 027 | Goldway | 94D 059 | 670 130 | 6 267 470 | Au, Ag | quartz veins; py, ga, cpy, sph | Richards, 1991 |
| 0401 028 | Independence | 94D 060 | 677 590 | 6 265 280 | Au, Ag | quartz veins | Wilson, 1984 |
| 0401 029 | Banz | 94D 060 | 677 640 | 6 264 870 | Au, Ag | quartz veins, silicified shears; py, cpy, mal | Wilson, 1984 |
| 0401 059 | Galena Ridge | 94D 059 | 687 140 | 6 265 270 | Au, Ag | quartz veins; py, ga, cpy | Myers and Smit, 1985 |
| 0401 092 | Lady Diana | 94D 050 | 682 360 | 6 260 250 | Au, Ag, Cu | py, cpy (ga) in stringers, fractures, disseminations | Greton and Roberts, 1991 |
| 0401 100 | Quap South | 94D 050 | 687 170 | 6 261 000 | Au, Ag, Cu | antiferroal magnetite-phyllite-chalcopyrite replacement | Smolich, 1975 |
| 0401 109 | Nik | 94D 070 | 674 980 | 6 284 530 | Au, Ag | py, cpy, rare mo as disseminations in diorite and peridotite, in fracture coatings, and in veins | Bates, 1976 |
| 0401 113 | Davie Creek Moly | 94D 050 | 684 310 | 6 260 770 | Mo | porphyry Mo; py, mo (zpy) in quartz stringers, stockwork, and along fractures | Folk, 1979; Greton and Roberts, 1991 |
| 0401 114 | McConnell Creek Beryl | 94D 050 | 678 350 | 6 256 510 | Beryl | beryl crystals in one of many blocks of pegmatite found in a moraine | Lord, 1948, p. 64 |
| 0401 115 | Brecca | 94D 060 | 675 670 | 6 274 960 | Mo | cpy, py, born, mo as disseminations; blebs and fracture and vein fillings in secondary polyfictic breccia, andesite and quartz diorite | Christopher, 1982 |
| 0401 125 | Kelly | 94D 040 | 683 150 | 6 253 210 | Mo | "MMS2" in pegmatite" along granodiorite/Takla contact | map in Property File |
| 0401 134 | Lay Creek | 94D 070 | 678 860 | 6 277 070 | Cu, Au, Ag | quartz-carbonate lens (vein?) with massive py, cpy | Serack, 1983 |
| 0401 135 | Dain | 94D 060 | 676 250 | 6 270 740 | Au, Ag | py, cpy and mal stock in shear zones, along fractures and locally within quartz veins cutting Takla volcanics along margin of diorite stock | Lenche and Luckman, 1991a |
| 0401 136 | Glasier | 94D 059 | 675 580 | 6 267 440 | Au, Ag | quartz veins and stockwork; py (ga) | von Rosen, 1986; Gil, 1996 |
| 0401 137 | Maposuite | 94D 059 94D 049 | 670 700 | 6 268 280 | Au, Ag | quartz veins and stockwork within quartz-rusty carbonate alteration zone; py, (ga, cpy) | Myers and Smit, 1985; Gil, 1996 |
| 0401 139 | Aupier | 94D 059 | 682 930 | 6 262 720 | Au, Cu, Ag | quartz veins, shears; py, cpy, mal (ga) | Greton and Roberts, 1991 |
| 0401 139 | Tat | 94D 059 | 682 670 | 6 268 100 | Au, Ag | quartz veins | Wilson, 1984 |
| 0401 140 | KC 2 | 94D 060 | 679 770 | 6 263 410 | Au, Cu, Ag | silicified, carbonized shears and quartz veins; py, cpy, mag, po, mal, az, ga, sph | Wilson, 1984; Cross, 1985 |
| 0401 141 | Mal | 94D 060 | 678 730 | 6 263 440 | Au, Ag | quartz-carbonate veins associated with silicified fractures and shears; py | Wilson, 1984 |
| 0401 142 | Benum | 94D 060 | 679 420 | 6 268 490 | Cu | quartz veins; py, cpy, mal | Wilson, 1984 |
| 0401 143 | Crier | 94D 060 | 678 470 | 6 267 120 | Au, Ag | "roy and magnetite" | map in Property File |
| 0401 144 | Moraine | 94D 060 | 675 470 | 6 267 670 | Cu | "d" | map in Property File |
| 0401 145 | Karen Creek | 94D 050 | 682 750 | 6 261 060 | Au, Ag, Cu | quartz veins, shear zones; py, cpy, mal (ga, sph) | Greton and Roberts, 1991 |
| 0401 150 | Fisher | 94D 059 | 681 180 | 6 265 830 | Au, Ag, Cu, Pb | quartz veins; py, cpy, mal, az | Smit, 1985 |
| 0401 161 | Inga | 94D 069 | 670 130 | 6 284 420 | Au, Ag | quartz veins in shear zone; py, cpy, po, mal | Smit, 1985 |
| 0401 162 | Redgait | 94D 070 | 678 300 | 6 282 160 | Cu, Mo | py, rare traces of cpy and mo, as disseminations and along fractures | Mustard and Wong, 1979 |
| 0401 163 | Jojes | 94D 070 | 676 180 | 6 283 230 | Mo | py, sph, born, mo as disseminations and in fractures | Bates, 1979; Wong et al., 1985 |
| 0401 163 | Jan 4 | 94D 060 | 675 470 | 6 271 470 | Au, Ag | disseminated py, cpy in diorite and stockwork; quartz stringers; mal along fractures | Lenche and Luckman, 1991a |
| 0401 166 | Jan 2 | 94D 060 | 675 870 | 6 275 550 | Au, Ag | py, cpy, mal along dry fractures within monzonite and adjacent Takla volcanics | Lenche and Luckman, 1991a |
| 0401 167 | Jan 1 | 94D 060 | 675 950 | 6 272 400 | Cu, Au | py, lim, mal, cpy in stringers and fractures along margin of diorite pluton and in dikes and shear zones cutting adjacent volcanics | Lenche and Luckman, 1991a |
| 0401 168 | Jan 1 | 94D 059 | 671 910 | 6 272 470 | Cu | quartz vein lim, mal | Lenche and Luckman, 1991a |
| 0401 169 | Jan 3 | 94D 060 | 672 820 | 6 269 790 | Au, Ag | 3-m-wide chloritized, pyritic shear zone in diorite; thick quartz vein with py, cpy | Lenche and Luckman, 1991a |
| 0401 170 | Jan 9 | 94D 060 | 677 290 | 6 267 220 | Au, Ag | quartz vein in shear zone in tonalite; py | Lenche and Luckman, 1991a |
| 0401 171 | Jan 11 | 94D 059 | 671 630 | 6 275 520 | Cu, Ag | hornfelsed volcanic rock | Lenche and Luckman, 1991a |
| 0401 172 | Jan 2 | 94D 060 | 678 720 | 6 262 920 | Au, Cu, Ag | silicified shear zones with quartz stringers; py | Fox, 1991 |
| 0401 177 | DBC | 94D 050 | 683 170 | 6 260 370 | Au, Cu, Ag | quartz veins, shear zones; py, cpy, mal (ga) | Greton and Roberts, 1991 |
| 0401 178 | F ven | 94D 059 | 670 960 | 6 268 180 | Au, Ag | quartz veins; py, ga, cpy, mal, az, lim | Pawlick, 1985 |
| 0401 179 | Jan 7 | 94D 060 | 677 170 | 6 269 940 | Cu | py, cpy in quartz veins and as disseminations in diorite dikes and adjacent volcanics; mal along fractures | Gil, 1994b |
| 0401 180 | KC 1 | 94D 050 | 678 360 | 6 266 250 | Au, Ag | quartz veins and shear zones; py, cpy, ga | Fox, 1991 |
| 0401 181 | KC1024 | 94D 059 | 672 130 | 6 268 420 | Au | quartz veins | Gil, 1996 |
| 0401 182 | Pacific Sugar | 94D 060 | 679 540 | 6 266 970 | Cu, Au, Ag | magnetite-phyllite-chalcopyrite skarn | Gil, 1995 |
| 0401 183 | LPC | 94D 050 | 682 120 | 6 262 330 | Au, Ag, Cu | quartz veins; py, cpy | Greton and Roberts, 1991 |
| 0401 184 | LPC2 | 94D 059 | 679 320 | 6 269 100 | Au, Ag | quartz veins | von Rosen, 1986 |
| 0401 185 | Kip | 94D 060 | 678 140 | 6 266 600 | Au, Ag | sheared quartz-syenite altered rock | Smit and Meyers, 1985 |
| 0401 186 | Q4PSC24 | 94D 070 | 672 371 | 6 264 696 | Au, Ag, Cu | quartz vein; py, cpy, az | Schiarizza and Tan, 2005 |
| 0401 187 | Q4PSC174 | 94D 059 | 682 860 | 6 268 010 | Au, Ag | quartz-phyllite alteration zone | Schiarizza and Tan, 2005 |
| 0401 188 | Q4SEN230 | 94D 050 | 683 756 | 6 265 313 | Pb, Cu, Au, Ag | quartz veins; py, ga, cpy, mal | Schiarizza and Tan, 2005 |

Abbreviations: az-azurite; born-bornite; carb-carbonate; chl-chlorite; cpy-chalcopyrite; ga-galena; lim-ilmenite; mag-magnetite; mal-malchite; mo-molybdenite; nAu-native gold; po-pyrrhotite; py-phyllite; sph-sphalerite

References

Bates, C.D.S. (1976). Drilling report on the Ingelika Range property, Nk mineral claims, numbers 1 and 2, Omica Mining Division (NTS 94D/9). B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 6015, 4 pages.

Bates, C.D.S. (1978). Drilling report on the Ingelika Range property, Nk mineral claims, numbers 2, 3, and 4, Omica Mining Division (NTS 94D/9). B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 7451, 8 pages.

Christopher, P. (1982). Geological, geophysical and diamond drilling report on the Brecca, Brecca 2, Brecca 3 and Brecca 4 claims, Jp Creek, Omica Mining Division (94D/9). B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 15 586, 17 pages.

Christophor, P. (1986). Geological, geophysical and geophysical report on the Inge property (Inge 1 through Inge 4 claims), Omica Mining Division, British Columbia (94D/9). B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 15 586, 17 pages.

Coxe, D.B. (1972). Geological and geophysical report on the Inge property (Inge 1 through Inge 4 claims), Omica Mining Division, British Columbia (94D/9). B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 2038, 19 pages.

Cross, D.B. (1985). Geological, geophysical and geophysical report, KC 1 and 2 claims, Omica Mining Division, British Columbia, N.T.S. 94D/8, 9E. B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 14 416, 18 pages.

Cruckshank, R.D. (1990). Geological and trenching report on the Inge 1 to 4 mineral claims, Omica Mining Division, British Columbia, N.T.S. 94D/8, 9C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 21 521, 22 pages.

Fern, F. (2000). Preliminary geology between Lay and Wrods ranges, north-central British Columbia (NTS 94D/2, 94D/9, 16). B.C. Ministry of Energy and Mines, Canada 2000, 1, 120 pages.

Folk, P. (1979). Diamond drill report, Kiyul claim, #1581 (12), 20 units, Omica Mining Division, Map 94D/8E, 94D/9W, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 7743, Part 1, 3 pages.

Fox, M. (1986). Geological and geophysical report, KC 1 and 2 mineral claims, N.T.S. 94D/8 and 9E, Omica Mining Division, British Columbia, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 21 521, 22 pages.

Gil, D.G. (1994a). Geological, geophysical and physical assessment report on the Juh, Dark, Croydon, Maposuite and Kiyul properties, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 23 379, 38 pages.

Gil, D.G. (1994b). Geological and geophysical assessment report on the Juh property, N.T.S. mapsheet 94D/9, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 23 543, 15 pages.

Gil, D.G. (1994c). Geological, geophysical assessment report on the Darb property, N.T.S. mapsheet 94D/8, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 23 543, 15 pages.

Gil, D.G. (1995). Geological assessment report on the Juh 3 group of claims, N.T.S. mapsheet 94D/9, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 23 942, 16 pages.

Gil, D.G. (1996). Drilling report on the Mariposa property, N.T.S. 94D/8, 9C. B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 24 778, 23 pages.

Greton, L. and Roberts, P. (1991). Porphyry Creek Property, 1990 prospecting, mapping and sampling, N.T.S. 94D/8, 9C. Omica Mining Division, British Columbia, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 21 521, Part 1, 68 pages.

Irwin, T.A. (1978). Studies of cordierite-gabbro and ultramylonites, British Columbia: Report of Activities, Part A, Geological Survey of Canada, Paper 79-A, pages 75-81.

Lenche, P. D. and Luckman, N. (1991a). Geological and geophysical report on the Juh property, Johanson Lake area, Omica Mining Division, British Columbia, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 21 782, 23 pages.

Lenche, P. D. and Luckman, N. (1991b). Geological and geophysical report on the Darb property, Johanson Lake area, Omica Mining Division, British Columbia, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 21 782, 23 pages.

Lord, C.C. (1948). McConnell Creek map-area, Cassiar District, British Columbia, Geological Survey of Canada, Memoir 251, 72 pages.

Mustard, D.K. and Wong, R.H. (1979). Geological and geophysical assessment report on the 819-1-68 mineral claims, Kiyul Creek area, B.C. Department of Mines and Petroleum Resources, unpublished M.S. thesis, McGill University, 102 pages.

Monger, J.W.H. (1977). The Triassic Takla Group in the Omica Mining Division, north-central British Columbia; Geological Survey of Canada, Paper 79-A, pages 75-81.

Nixon, G.T., Hennock, J.L., Ash, C.H., Cabri, L.J., Cain, G., Connelly, J.N., Heaman, L.M., Laflamme, J.H., G., G., (1978). Petrochemical setting of Takla Group volcano-sedimentary rocks, Queenella, north-central British Columbia, unpublished M.S. thesis, McGill University, 102 pages.

Noel, G.A. (1971a). Geological - geophysical report on the Croy mineral claims, Alkan Lake area, B.C. Department of Mines and Petroleum Resources, Assessment Report 2082, 10 pages.

Noel, G.A. (1971b). Geological - geophysical report on the Kiyul mineral claims, Kiyul Creek area, B.C. Department of Mines and Petroleum Resources, Assessment Report 2084, 30 pages.

Noel, G.A. (1972). Geological - geophysical report on the 819-1-68 mineral claims, Kiyul Creek area, B.C. Department of Mines and Petroleum Resources, Assessment Report 3977, 17 pages.

Pawlick, D.J. (1985). Report on assessment work on the Goldway Peak property, Omica Mining Division, Johanson Lake, British Columbia, B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 14 105, 17 pages.

Richards, T.A. (1976). Geology, McConnell Creek map-area (94D/8E). Geological Survey of Canada, Open File 342, 1,200,000 scale.

Richards, T.A. (1991). Geologic setting and sampling of vein systems,