

dominantly of carbonate, minor quartz and wallrock fragments.

The Wintrip workings are located 4 kilometres southwest of the Cork Province mine within the sedimentary re-entrant. The first shipment of hand-sorted ore was recorded in 1895 as 13 tonnes averaging 228 grams silver per tonne and 78 per cent lead. Over the life of the mine, a total of 613 tonnes of ore yielded 62 grams gold, 367 kilograms silver, 104 tonnes lead and 57 tonnes zinc. Most production occurred from 1926 to 1928. The workings have since collapsed and are inaccessible.

Six or seven adits were driven to explore two parallel structures, the "A" and "B" lodes. A third unexplored lode "C" is reported 75 metres southeast of the "B" lode (Cairnes, 1935). The "A" and "B" lodes are about 100 metres apart, strike 225 degrees and dip 75 degrees northwest, conformable with the enclosing metasediments. The metasediments comprise abundant recrystallized limestone, biotite schist and, in places, thinly bedded argillite and quartzite. The lodes are sheared and brecciated zones, 0.6 to 1.5 metres wide, comprised of cataclasite and fault gouge. Mineralization is composed of disseminated sphalerite, galena and pyrite associated with siderite and minor quartz.

#### ALPINE MINE (MINFILE 82FNW127), KING SOLOMON (MINFILE 82FNW257)

The Alpine property is located at the head of Sitkum Creek along the divide that marks the southern edge of the park. Initial development of the vein was done in 1896 and 1897. Production commenced with a small shipment of ore in 1915 and continued sporadically until 1948. During this period 15 551 tonnes was mined and yielded 356 162 grams gold, 221 453 grams silver, 49 tonnes lead, and 17 tonnes zinc. Granges Exploration Ltd. drilled the vein in October and November, 1987.

The quartz vein strikes 255 degrees and dips moderately north, is traceable over 400 metres on surface and projects into the park. Contacts with hangingwall and footwall monzonite are sharp and variably sericitized. Vein width averages 1.1 metres. The vein is hosted by fine to medium-grained quartz monzonite (Phase 5; Figure 2). Pre-mineralization aplite and pegmatite dikes are common; post-mineralization lamprophyre dikes are less abundant. Mineralization comprises electrum, silver minerals, pyrite and lesser galena and sphalerite. Rare clots of molybdenum were identified in altered potassium-feldspar granite from the mine dump. The vein is limonitic weathering and highly jointed and fractured. Vein textures are massive crystalline, ribboned, or

banded and vuggy. Quartz is variably milky, white, grey and colourless, suggesting episodic deposition. Analytical results are listed in Table 8. The Alpine and King Solomon contain anomalous gold values with coincident zinc.

TABLE 8  
ALPINE MINE ANALYTICAL RESULTS

Sample	Au (g/t)	Ag (g/t)	Cu (ppm)	Pb (%)	Zn (ppm)	Mo (ppm)
391A	19.2	6	6	0.10	221	<10
394A	50.0	7	<2	0.68	2000	<10
395A	19.8	1	<2	0.01	47	176
397A	1.6	3	<2	0.07	53	78
404B	2.8	8	<2	0.86	60	<10
406B	150.0	55	<2	3.00	11000	<10

Analytical results for grab samples. Locations: A = Alpine and B = King Solomon.

The King Solomon is situated 2 kilometres southwest of the Alpine. Published references to this property are unknown and it was Eric Denny (prospector from Nelson, B.C.) who identified the workings to the authors. The quartz vein occupies a shear zone 0.15 metre wide cutting quartz monzonite. The vein has sharply defined hangingwall and footwall contacts and strikes east with a shallow north dip. Vein mineralogy is similar to the Alpine vein with slightly more galena and sphalerite.

#### ENTERPRISE (MINFILE 82FNW148), WESTMONT (MINFILE 82FNW145)

The Enterprise property is located 4 kilometres west of the park, on the south side of Enterprise Creek; the Westmont/Eastmont property is on the north side of the creek. Enterprise production occurred over 81 years, the first shipments were made in 1896. From 10 687 tonnes of ore mined, 217 grams gold, 32 676 kilograms silver, 1675 tonnes lead and 1057 tonnes zinc were recovered. At the Westmont 3149 tonnes of ore was produced which yielded 2 046 grams gold, 11 084 kilograms silver, 200 tonnes lead and 66 tonnes zinc. Arctex Engineering Ltd. has carried out continuous exploration on the Enterprise property since 1983. Diamond-drilling programs were completed in 1986 and 1987.

Two parallel veins outcrop on the Enterprise property. The western vein has received recent drilling exploration, the main vein 115 metres to the east is historically more important having produced the bulk of past production. It is continuous over 680 metres horizontal distance and developed over a vertical distance of 300 metres. Country rock is potassium-

feldspar megacrystic granite commonly with xenoliths of diorite, in places comprising up to 40 per cent. The vein strikes about 055 degrees, dips 70 degrees southeast and varies in width up to 0.6 metre, averaging 0.3 metre.

The distribution of sulphide and gangue minerals indicates a vertical zoning pattern within the vein system. Quartz decreases downward into a more carbonate-rich siderite and calcite mineralogy. Sulphide assemblages also change from galena and tetrahedrite-rich upper sections to more sphalerite-rich at depth.

At the Westmont property the main lode strikes 060 degrees, dips 75 degrees southeast, averages 1.2 metres in width and comprises a zone of brecciated and silicified country rock. Sulphide mineralogy includes galena, sphalerite, pyrite, tetrahedrite and silver sulphosalts.

## PROSPECTS AND SHOWINGS IN KOKANEE GLACIER PARK

Mineral occurrences in the park are described below and plotted on Map 4. Of the 14 mineral occurrences, Al and Silver Ranch contain elevated gold values in grab sample assays.

The Al (82FNW253) showing is located approximately 1 kilometre south of Wheeler Lake in potassium-feldspar porphyritic granite. This is a relatively recent discovery which has received only cursory trenching and soil sampling. Elevated gold values have been obtained from grab sampling in sloughed trenches. The quartz veins are less than 5 centimetres thick, base metal-rich and occupy a northerly trending argillic-altered zone 15 centimeters wide. Vein mineralogy comprises galena, sphalerite and pyrite. Grab sample analyses are listed in Table 5.

The Silver Ranch vein (82FNW215) occupies a sheared and faulted northwest-trending joint set located on the east flank of Boomerang Mountain. Mineralization is covered by crown grants, over which a hand trenching and sampling program was completed in 1987. The quartz vein is up to 1 metre thick and occupies a 5-metre-wide clay and limonite-altered zone in potassium feldspar porphyritic granite. Mineralization comprises coarse-grained pyrite, intergrown galena and sphalerite and silver minerals, grab sample analyses are listed in Table 5.

Four additional mineral occurrences are distributed along regional structures parallel to the Silver Ranch vein system. These include the Hudson Bay (82FNW123), Silver Crest (82FNW124), Soldier Boy (82FNW125) and Gold Galena (82FNW177). Mineralization comprises galena, sphalerite, pyrite and various silver minerals, in quartz veins (generally <15

centimeters wide) and flanked by limonitic and argillic-altered wallrocks.

The Joker (82FNW115) is located on the east side of Joker Lake at the head of Keen Creek. The crown grants cover workings begun before 1900 and include four or more adits (now caved) which tested quartz veins containing base and precious metals. A lower vein at the southeast end of the lowest Joker Lake strikes 055 degrees, dips 85 degrees southeast and carries traces of disseminated galena and tetrahedrite. At the uppermost lake another vein striking 015 degrees, dips 60 degrees southeast contains disseminated pyrite, galena, sphalerite and chalcopyrite. The veins are narrow (less than 10 centimetres wide) hosted by potassium-feldspar porphyritic granite.

The Barnett (82FNW126) crown grant is situated 1 kilometre north of McGuire Creek on the east side of Mount Ruppel. The vein has been tested by three short exploratory adits and over 450 metres of surface stripping. The quartz vein follows a flat sheared and altered joint plane in potassium-feldspar porphyritic granite. Vein mineralogy comprises pyrite, galena and tetrahedrite in massive, banded and drusy varieties of quartz. A 75-centimetre argillic and sericitic alteration envelope contains sparse disseminated sulphides that reportedly carry gold values (Minister of Mines Annual Report, 1922).

The Black Eagle (82FNW239) and King Solomon (a second occurrence of the same name; 082FNW242) prospects are situated at the head of Woodbury Creek. Neither could be located during 1987 fieldwork. The King Solomon is reported to have produced 32 tonnes of ore which yielded 1698 kilograms lead and 514 kilograms zinc (Minister of Mines Annual Report, 1947).

## GALENA LEAD ISOTOPE CHARACTERISTICS OF MINERALIZATION

The following discussion of new galena lead isotope data from 22 mineral deposits located in and around Kokanee Glacier Provincial Park is condensed from Logan *et al.* (1988). The study was undertaken to determine lead isotope characteristics of a variety of mineral occurrences. Deposits were selected on the basis of past production, mineralogy and vein orientation, to ensure all types were represented. Lead isotope ratios cluster in three separate groups. The groupings suggest three separate lead sources; two show mixing with Nelson batholith leads. The majority of the deposits have lead signatures close to Nelson batholith potassium-feldspar leads and a few have old nonradiogenic leads. Lead isotope ratios, when