TRANQUIL CREEK - WARN BAY AREA

006719

925/465E 925-39,49(4)

(49°125°SW)

The Tranquil Creek-Warn Bay Area is on the western coast of Vancouver Island, about 15 miles northeasterly by water from Tofino, the nearest base for supplies and transportation.

A launch or small boat may be taken from Tofino to the head of Tranquil Inlet or Warn Bay. A boat, capable of passing the bars at the mouth of Tranquil Creek, where the depth of water at high tide is about 4 feet, may continue half a mile upstream to the beach camp. From the camp a tractor road extends up the western side of Tranquil Creek to a point two miles from the mouth. Rough trails extend from the end of the tractor road to the Fandora and Gold Flake properties, and about five miles up the valley towards the headwaters of the two main forks of Tranquil Creek.

One mile of truck road leads from the beach at the head of Warn Bay to the Moscena campsite. Rough trails branch from the road bridge to various other discoveries near Bulson Creek. Other rough trails extend from Warn Bay to the Free Gold and Gold Flake properties.

The Tranquil Creek-Warn Bay area is rugged, mountainous, and heavily wooded on the steep bluffy slopes from the valleybottoms to most of the ridge-tops. The highest peak in the area is just over 4,400 feet above sea level.

Report by W.J. Lynott. PROPERTY FILE

Tranquil creek is fed by tarn lakes at its headwaters and has a steep gradient down canyons to the junction of its two main forks about $4\frac{1}{2}$ miles from the head of Thanquil Inlet. The average gradient of the valley bottom from the forks to the mouth is less than 100 feet per mile. Downstream from a 50 foot waterfall about 2 miles from tidewater, the width of the valley floor increases gradually from a few hundreds of feet to half a mile.

Bulson Creek, within the area, flows through a narrow canyon and has an average gradient of 200 feet per mile to its mouth at the head of Warn Bay.

Of numerous mineral claims, staked in the late '90's, nineteen, on the eastern side of Tranquil Creek Valley about 3 miles north of the head of Tranquil Inlet, were crown-granted between forty and fifty years ago and were in good standing in 1946. On these claims lenticular bodies of low-grade copper ore have been explored by surface and underground workings. Most of this work was done before 1904, but some further work has been undertaken from time to time.

In the late '30's several auriferous quartz veins were discovered, claims staked, trails put in, and development work undertaken. Development work continued for several years. Surface stripping and some underground development by the Maple Leaf Syndicate in 1941 disclosed interesting possibilities on a property, now owned by Moscena Mines Ltd., N.P.L., near Bulson Creek 1 mile north of Warn Bay. Surface stripping and underground development on the Fandora property by E.G. Brown and P. Donahue exposed narrow but fairly rich and continuous vein matter in a strongly sheared andesite dyke. Little was done during the later war years but work was resumed in 1946 on the Moscena by Moscena Mines Limited Which any also applied the Gold Flake and on the Fandora by Privateer Gold Mines Limited. Goldbearing veins have been discovered on the Free Gold, Eldorado, 3 J's and Yankee Boy claims but they were not being prospected p in 1946.

In 1905 production of 214 tons containing - gold, 2 oz.; silver, 168 oz.; copper, 29,379 lb.; was recorded from the Hetty Green property on Tofino Creek just east of the present area.

In 1940 production of approximately 35 ounces of gold and some silver was recorded from three properties, the Gold Flake, Maple Leaf and the Yankee Boy.

Altered volcanic rocks, and granitic rocks, principally quartz-diorite, are the chief rock types found in the area. Their distribution is shown in Fig. , a map on the scale of one mile to one inch, based on field work done in the summer of 1946.

The volcanics found in much of the northern two-thirds of the area, extend north from a body of quartz-diorite, of which the northern contact runs easterly from Warn Bay just south of Virge Creek. Another incompletely mapped body of quartz-diorite is found in the vicinity of Bulson Creek and its principal tributary Free Gold Creek, which empty into the head of Warn Bay. The area east of Eulson Creek has not been traversed and this body of quartzdiorite may be found to extend east to the divide between Free Gold Creek and the west fork of Tranquil Creek, where a tongue of quartzdiorite about two-thirds of a mile wide has been mapped for a length of a mile and a quarter. A third considerable body of quartzdiorite is found in the north-eastern part of the area. The volcanic rock is now altered to greenstone and is composed largely of secondary minerals. Probably the rock was originally andesitic in character. Lenses of crystaline limestone with a maximum length of a few hundred feet, lenses of other sedimentary rocks and of garnet-diopside rock are found in the altered volcanics. Dykes and small masses of feldspar porphyry and some small masses of quartz-diorite are found in the areas of greenstone, which are also cut by later andesitic and basaltic dykes.

Most of the quartz-diorite is massive but it is often gneissic along the quartz-diorite side of contacts with older rocks. The most extensive area of gneissic quartz-diorite is along the border zones of the large area lying south of Virge and Gold Flake creeks. Along the contact, breccia zones of varying width are found, in which the bordering volcanics have been brecciated and the fragments sealed by quartz-diorite.

The quartz-diorite bodies contain pendants and small masses of andesite and sediments. These included rocks are particularly abundant in an area about three-quarters of a mile in diameter on the east side of the East Fork of Tranquil Creek, about one mile upstream from its junction with Tranquil Creek. The abundance of included rock here and brecciation of much of it, suggest that this area is close to the original roof of the batholith.

The typical quartz-diorite of the area is greyish white in colour and medium-grained in texture. The principal minerals are quartz, 10 to 35 per cent.; feldspar, up to 70 per cent., Or the felds for the finite for the finite for the finite of the finite for the formula of the

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secondary minerals include sericite, epidote, clinozooisite, and chorite. The feldspars are sericitized, the orthoclase usually more than the plagioclase and the hornblende and biotite are partly altered to chlorite. The moderate amount of quartz and an orthoclase-feldspar to plagioclase-feldspar ratio of less than 1 to 3, serve to classify the rock mineralogically as a quartz-diorite.

Dykes of several types and ages are found in both the andesite and the quartz diorite. They include basalt, andesite and feldspar porphyry and quartz feldspar porphyry. Most of the dykes cut both the quartz-diorite and andesite, but none were seen cutting the altered sediments and only one dyke, on altered finegrained andesite or basalt, was seen cutting limestone.

Isolated outcrops of feldspar porphyry were seen within the area mapped as underlain by quartz-diorite, but nowhere was the rock seen in contact with the quartz-diorite. The feldspar porphyry consists of plagioclase feldspar (oligoclase-andesine) and some quartz phenocrysts in a fine-grained ground-mass. It also contains some patches of hornblende, magnetite, ilmenite, sphene, hematite and pyrite. Secondary minerals include chlorite, epidote, clinozoisite and leucoxene. The rock has a fresh appearance and 'S thought to be a quickly cooled or low pressure phase of the quartzdiorite. Similar rock has been seen in dykes cutting the andesite.

Three different strike and dip groups of fractures constitute the main structural features of the area. One group strikes N 65° E and is approximately vertical in dip, a second group strikes NW and is also approximately vertical in dip, and a third group is nearly flat-lying. The north-easterly striking group of fractures is reflected in the topography by deep, narrow chimneys and gorges, approximately transverse to the northerly transing ridges and steep valley sides. The flat-lying fractures are marked by benches and small caves on the precipitous bluffs of the hillsides.

Gold-bearing quartz veins following well-defined shearzones and sheeted zones constitute the main type of ore-deposit in the area. Such veins are found in the altered volcanics in the quartz-diorite and in later andesite dykes.

The time of mineralization was later than the intrusion of the quartz-diorite and of the andesite dykes that cut the quartz diorite. An early period of mineralization, characterized by the development, in shear-zones, of narrow veins or lenses of quartz with sparse sulphides was followed after further movement along the shear-zone, by later mineralization characterized by the introduction of sulphides and gold along sheeted zones within the earlier quartz vein. Gold may also have been introduced in the early period of mineralization.

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This property, held under option by Privateer Gold Mines Ltd., consists of three groups of unsurveyed claims as follows:

the Fandora, owned by Fandora Gold Mining Co. Ltd., N.P.L. and consisting of the Edmar, Edmar No. 1, Fraction No. 1, Edmar No. 2 to 7 incl.

the Gold Flake, owned by Gold Flake Mines Ltd., N.P.L. and consisting of Gold Flake, Gold Flake No. 2 to 5 incl., Tranquil Gold No. 3 and 4.

the Tofino, owned by Mary Mining Co., Ltd., N.P.L. and consisting of Mary, Mary No. 1, Mary No. 2, Mary No. 4, and Mary No. 5.

The main showings $\frac{2}{12}$ on the Mary and Mary No. 1 claims, and on the Edmar and Edmar Fractional No. 1 claims, on the western side of Tranquil Creek between about 1,400 and 2,100 feet above sea level, some $2\frac{1}{2}$ miles north of the head of Tranquil Inlet.

From the end of the tractor road, 2 miles from the mouth of Tranquil Creek a rough trail 2 miles long leads to the present Fandora campsite and the near-by showings. The last half mile of trail climbs steeply up a series of bluffs from an elevation of 500 feet to the campsite at an elevation of about 1,500 feet.

The area of the claims is steep and rugged but nothwithstanding the steep and bluffy nature of the mountain slopes, a heavy mantle of overburden obscures much of the bed-rock. The slopes are heavily wooded affording ample timber for mining. In Tranquil Creek an abundant supply of water is assured all year round for power, mill and camp purposes. At an elevation of 500 feet,

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about $\frac{1}{2}$ mile east of the mine, and easterly towards Tranquil Creek much gently sloping ground is available for a campsite and mill site.

The discovery of gold quartz veins was made in the late '30's when several claims were recorded, and development was undertaken including driving the Craig adits. For several years in the early '40's work was on a very modest scale. Some of this work however disclosed a shear-zone usually containing two narrow out fairly rich veins separated by three or four feet of andesite dyke rock. An adit 400 feet long at about 1900 feet elevation, and another 100 feet long at about 2100 feet elevation were driven along shearzone. Continuity, width, and values proved much more promising than in earlier workings driven on in gold-quartz veins cutting altered volcanic rocks near the andesite dyke.

The property was optioned by Privateer Gold Mines, Ltd., in 1946. In the period May to July 29, 1946 the 2100 level was extended from 100 feet to 370 feet, the 1900 level was extended from 400 feet to 660 feet and a new level was started in the dyke at an elevation of 1700 feet. A crew of 8 men continued driving the 1900 and 1700 foot levels by hand-mining after July 29th. The rock breaks easily and proved particularly amenable to hand-mining, ..., much timbering was required.

The claims are underlain by altered volcanics, tuffs and breccias. These rocks are cut by dykes and small bodies of feldspar porphyry and by dykes of andesite and basalt. Quartz-diorite is exposed half a mile to the northwest, and about half a mile to the southwest and south.

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Steeply dipping fractures, striking north of east to south of east, cut the volcanic rocks and are often reflected in the topography as narrow canyons. In the area of the showings an andesite porphyry dyke 10 to 20 feet wide, strike north 70 to 80 degrees east and dip 60 to 75 degrees north-westward, follows such a fracture. The dyke is exposed in the workings, and in a few places along the gully-bottom marking its outcrop, from an elevation of 2,100 feet down to an elevation of about 1,450 feet, a horizontal distance of about 1,200 feet. Extensions of the dyke beyond 2100and 1450 foot elevations are covered by overburden on top of a ridge at an elevation of about 2,700 feet, 1,300 feet southwesterly projected from the Fandora workings along a similar dyke outcrops but apparently dips about 45 degrees southeast. Along the extended trace, about half a mile southwesterly from the Fandora workings, the Gold Flake working at about 2,500 feet elevation exposes a narrow auriferous quartz vein in altered volcanics near an andesite dyke. This working is close to a small mass of quartz-diorite intruding the altered volcanics.

In the three levels, at 2100, 1900 and 1700 foot elevations, and in an open cut at 1,450 feet, two narrow but continuous veins about 4 to 5 feet apart occur along parallel shears in a zone that, in part follows the dyke. Values in the veins are spotty but are high in parts of their lengths (see Fig.___). In places the veins narrow and, as a result of post-vein movement along the walls or pass into gouge, crushed rock and quartz-fragments that contain moderate amounts of gold.

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The vein matter is sheeted, thin partings of rusty material or fine sulphides separate plates of unsheared vein filling. Varying widths of rusty gouge are found along the walls. Oxidation is noted in most parts of the veins so far exposed.

The vein matter consists of quartz; some carbonate; altered wall rock; finely crystalline pyrite where free from oxidation, and, rarely, finely crystalline chalcopyrite, galena and sphalerite. Small specks of gold are rarely visible in hand specimens although fine colours may often be seen in panning vein matter.

The effect of oxidation and circulating ground water within the vein shears may have some effect on the concentration of gold values by leaching the other vein matter.

The sampling and measurement of veins was handicapped by roof lagging. Where possible channel samples were taken 20 feet apart across maximum accessible vein widths on both the hanging wall and footwall veins. The width sampled **x** is not necessarily the full width of the vein. The details of sampling and assayresults are shown in Fig. _____.

Gold quartz veins cutting altered volcanics in the hanging and footwall rock of the dyke are exposed in the nearby Craig adits (Fig.____). These veins are apparently weaker and less regular than those in the more competent dyke rock.

Other veins in greenstone have been discovered about 1400 feet north-westerly and northerly from the Fandora workings.

A working on the Gold Flake property shows a 4-inch vein cutting altered volcanics near a contact with quartz diorite and

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fresh andesitic rock. The details of sampling this vein and the assay results are shown in Fig.

This property, consisting of eight unsurveyed mineral MOSCENA claims, Maple Leaf No. 1 to 7 inclusive, Kim, and Kim Fractional, unsurveyed mineral claims, is owned by Moscena Mines Ltd., N.P.L..

The main showings lie on the Maple Leaf No. 1 to 4 inclusive on the eastern side of Bulson Creek at elevations between 240 and 500 feet above sea level.

One mile of 8-foot tractor road leads from the head of Warn Bay up the western side of Bulson Creek, acress a bridge over Bulson Creek to the Moscena campsite. Short trails extend from the campsite to the various workings.

The claims extend over a relatively low, glaciated, rugged rocky knob. Overburden obscures much of the geology in the vicinity of the showings but the vein shears are marked by straight narrow, rock-walled, parallel gulleys remarkably persistent in length.

The area is covered by heavy growth and mine timber is plentiful. An abundant year around supply of water is available from Bulson Creek for power, mill and camp purposes. Much flat ground is available for a campsite.

The discovery and early development in this area were practically contemporaneous with that of the Tranquil Creek area. The property was acquired in 1941-42 by staking and purchase by the Maple Leaf Syndicate who did most of the surface and underground development and in 1942 suspended operations because of wartime conditions. Moscena Mines Ltd., later qcquired the property and resumed activity in 1946, completed the tractor road and bridge to the camp and with machinedrills commenced a crosscut at 225 feet elevation to intersect several

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veins on the property at varying distances below the surface.

The claims are underlain by quartz-diorite and by pendants of volcanics and sedimentary rocks which are cut by dykes of andesite and andesite porphyry. The altered volcanics are cut by small bodies of fresh feldspar porphyry.

Four veins now exposed in the workings follow fractures, strike north 40 to 45 degrees west, dip almost vertical, that are marked by long, narrow draws. The wall rock of the veins is either quartzdiorite, fresh andesite, or a breccia composed of altered sediments and volcanics with quartz-diorite matrix.

The straight gulleys extend from the quartz-diorite and breccia into the garnet rock and coarsely crystalline limestone without apparent deflection. No quartz veins are exposed in unbrecciated zones of the altered older rocks.

Of the four veins and stringers mentioned above most of the development has been done on the Shaft and the "E" veins. A vein known as the "H" vein is exposed in surface cuts.

The Shaft vein (Fig. ___) is exposed in a gulley about 500 feet long. The vein has been exposed intermittently for a length of about 400 feet in a 15-foot adit, a 25-foot vertical shaft and several open cuts, some of which are now filled. Elevations on the vein-outcrop range between 260 and 350 feet above sea level. The gulley is terminated to the north-west by a bluff. The vein has not been traced to the south-east beyond a contact between andesite and limestone about 40 feet south-east of the shaft.

The details of the sampling and the assay results are shown in Fig. _____ are for channel samples which where possible were taken across the width of the vein.

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The "E" vein (Fig. ____) is exposed in a gulley about 900 feet long, by open cuts distributed along a length of 800 feet. Some 70 feet below the vein-outcrop a crosscut and drift have been driven where the vein is exposed over a length of 200 feet. Elevations on exposed vein range between 430 feet in the drift to 530 feet at the surface.

Channel samples were taken in surface workings and in the drift; details of the sampling and assay results are shown in Fig. ____.

The "H" vein (Fig. ___) is exposed intermittently in open cuts extending along the base of a 10 to 20-foot bluff over a distance of some 170 feet.

Channel samples were taken in the open cuts; the details of sampling and assay results are shown in Fig. ____.

A small vein is exposed in an open cut about 30 feet north of the crosscut at 240 feet elevation and again in the crosscut about 23 feet in from the portal. A channel sample taken across the vein in the open cut assayed 0.01 oz. gold per ton across $5\frac{1}{4}$.

Small stringers are exposed along the trail between the Shaft Vein and the 430 level portal at points about 180 feet, 230 feet and 254 feet northerly from the shaft. No samples were taken.

A straight narrow gulley about 500 feet long and parallel to the "E" vein, occurs between the "E" and "H" veins about 50 feet southwest of the "H" vein. It has been reported that single cuts in such gullies have exposed vein material, and possibly a vein was discovered here, referred to as the "F" vein.

Immediately northeast of the "E" vein is a deep narrow gulley trending northwesterly.

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The veins on the Moscena property, where mineralized, are sheeted, but massive, and contain varying amounts of sulphide in bands parallel to the walls. The walls are separated from the vein by a thin parting of gouge and iron oxide.

The vein-matter consists of quartz, carbonates and sulphides, including pyrite, chalcopyrite, arsenopyrite, sphalerite and galena. One speck of free gold associated with finely disseminated galena in quartz was seen in a specimen from the shaft dump. The sulphides are coarser in texture than those seen in vein-matter of the Fandora property.

Mineralization in the form of sulphides is sparse in the quartz-diorite wall rock although alteration close to the veins is evident. 92F1445E 92F-39,40,41,205

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the Tofino owned by Mary Mining Co., Ltd., N.P.L. and consisting of Mary, Mary No. 1, Mary No. 2, Mary No. 4, and Mary No. 5.

PROPERTY FILE

The main showings lie on the Mary and Mary No. 1 claims, and on the Edmar and Edmar Fractional No. 1 claims, on the western side of Tranquil Creek between about 1,400 and 2,100 feet above sea level, some $2\frac{1}{2}$ miles north of the head of Tranquil Inlet.

An 8 foot tractor road extends up the west side of Tranquil Creek from the beach camp, half a miles upstream from the mouth to a Franche end of the tractor road, 2 nules for point 2 miles from the mouth. A-rough trail 2 miles long leads from the end of the tractor road to the present Fandora campsite and the near-by showings. The last half mile of trail climbs steeply up a series of bluffs from an elevation of 500 feet to the campsite at an elevation of about 1,500 feet.

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The area of the claims is steep and rugged but notwithstanding the steep and bluffy nature of the mountain slopes, a heavy mantle of overburden obscures much of the bed-rock. The slopes are heavily wooded affording ample timber for mining. In Tranquil Creek an abundant supply of water is assured all year round for power, mill and camp purposes. At an elevation of 500 feet, about $\frac{1}{2}$ mile east of the mine, and easterly towards Tranquil Creek much gently sloping ground is available for a campsite and mill site. A gravity type aerial tranway could be built to transport ore from the mine.

The discovery of gold quartz veins was made in the late '30's when several claims were recorded, and development was undertaken including driving the Craig Adits. For several years in the early '40's work was on a very modest scale. Some of this work however disclosed a shear-zone usually containing two narrow but fairly rich veins separated by three or four feet of andesite dyke rock. An adit . 400 feet long at about 1900 feet elevation, and another 100 feet long at about 2100 feet elevation were driven along shear-zone. Continuity, width, and values proved much more promising than these encountered in earlier workings driven on in gold-quartz veins cutting altered volcanic rocks near the andesite dyke.

The property was optioned by Privateer Gold Mines, Ltd., in 1946. In the period May to July 29, 1946 the 2100 level was extended from 100 feet to 370 feet, the 1900 level was extended from 400 feet to 660 feet and a new level was started in the dyke at an elevation of 1700 feet. A crew of 8 men continued driving the 1900 and 1700 foot levels by hand-mining after July 29th. The rock breaks easily and proved particularly amenable to hand-mining; much timbering was required.

The claims are underlain by altered volcanics, tuffs and breccias. These rocks are cut by dykes and small bodies of felspar porphyry and by dykes of andesite and basalt. Quartz diorite is exposed half a mile to the northwest, and about half a mile to the southwest and south.

Approximately vertical fractures, strike east-northeasterly to east-southeasterly cut the volcanic rocks and are often reflected in the topograph as narrow, canyons. In the area of the showings an andesite porphyry dyke 10 to 20 feet wide, north 70 to 80 degrees east and dip 60 to 75 degrees north-westward? follows such a fracture. The dyke is exposed in the workings, and in a few places along the gully-bottom marking its outcrop, from an elevation of 2,100 feet down to an elevation of about 1,450 feet, a horizontal distance of about 1,200 feet. Extensions of the dyke beyond 2100 and 1450 foot elevations are covered by overburden. Southwesterly 1,300 feet along the projected trace of the dyke, on top of a ridge at an elevation of about 2,700 feet, a similar dyke outcrops but apparently dips about

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45 degrees southeast. Along the extended trace, about half a mile southwesterly from the Fandora workings, the Gold Flake working at about 2,500 feet elevation exposes a narrow auriferous quartz vein in altered volcanics near an andesite dyke. This working in close to a small mass of quartz-diorite intruding the altered volcanics.

In the three levels, at 2100, 1900 and 1700 foot elevations, and in an open cut at 1,450 feet, two narrow but continuous veins about 4 to 5 feet apart occur along parallel shears that, in part follow the dyke. Values in the veins are spotty but are high in parts of their lengths (see Fig.__). In places the veins, piece ant narrow and as a result of post-vein movement along the walls, pass into gouge, crushed rock and quartz-fragments that contain moderate amounts of gold.

The vein matter is sheeted, thin partings of rusty material or fine sulphides separate plates of unsheared vein filling and varying widths of rusty gouge are found along the walls. Oxidation is noted in most parts of the veins so far exposed.

The vein matter consists of quartz, some carbonate, altered wall rock, and, where free from oxidation;) finely crystalline pyrite and, rarely, finely crystalline chalcopyrite, galena and sphalerite. Small specks of gold are rarely visible in hand specimens although fine colours may often be seen in panning vein matter.

In an early stage of mineralization quartz and sparse sulphides were deposited in the veins later after slight movement parallel to the walls, sulphides were introduced into the sheeted quartz. Gold values may have been introduced in either stage or both. The effect of oxidation and circulating ground water within the vein shears may have some effect on the concentration of gold values by leaching the other vein-matter. The sampling and measurement of veins was handicapped by roof lagging. Where possible channel samples were taken 20 feet apart across maximum accessible vein widths on both the hanging wall and footwall veins. Widths sampled are not necessarily full width of vein. The details of sampling and assay-results are shown in Fig. ____

Gold quartz veins cutting altered volcanics in the hanging and footwall rock of the dyke are exposed in the nearby Craig adits (Fig. ___). These veins are apparently weaker and more irregular than those optimized in the more competent dyke rock.

Other veins in greenstone have been discovered about 1400 feet north-westerly and northerly from the Fandora workings.

A working on the Gold Flake property shows a 4-inch vein cutting altered volcanics near a contact with quartz diorite and fresh andesitic rock. The details A sampling the fein and the assay results are hown in Fig -.

This property, consisting of eight unsurveyed mineral Moscena claims, Maple Leaf No. 1 to 7 inclusive, Kim, and Kim morreyed mineral claims, Fractional, is owned by Moscena Mines Ltd., N.P.L.

The main showings lie on the Maple Leaf No. 1 to 4 inclusive on the eastern side of Bulson Creek at elevations between 240 and 500 feet above sea level.

One mile of 8-foot tractor road leads from the head of Warn Bay up the western side of Bulson Creek, across a bridge over Bulson Creek to the Moscena campsite. Short trails extend from the campsite to the various workings. The area of the claims extends over a relatively low, glaciated, rugged rocky knob. Overburden obscures much of the geology in the vicinity of the showings but the vein shears are marked by straight narrow, rock-walled, parallel gulleys remarkably persistent in length.

The area is covered by heavy growth and mine timber is plentiful. An abundant year around supply of water is available from Bulson Creek for power, mill and camp purposes. Much flat ground is available for a campsite.

The discovery and early development in this area were practically contemporaneous with that of the Tranquil Creek area. The property was acquired in 1941-42 by staking and purchase by the Maple Leaf Syndicate who did most of the surface and underground development and in 1942 suspended operations because of wartime conditions. Moscena Mines Ltd., later acquired the property and resumed activity in 1946, completed the tractor road and bridge to the camp and with machine-drills commenced a crosscut at 225 feet elevation to intersect several veins on the property at varying distances below the surface.

The area of the claims is underlain by quartz diorite roots and by pendants of volcanics and sedimentary rocks which are cut by dykes of andesite and andesite porphyry. The altered volcanics are cut by small bodies of fresh feldspar porphyry.

Four veins now exposed in the workings follow fractures, strike north 40 to 45 degrees west, almost vertical, that are marked by long, narrow draws. The wall rock of the veins is either quartz diorite, fresh andesite, or a breccia composed of altered sediments and wolcanics in quartz diorite.

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The straight gulleys extend from the quartz diorite and breccia into the garnet rock and coarsely crystalline limestone without apparent deflection. No quartz veins are exposed in unbrecciated zones of the altered older rocks.

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Of the four veins and stringers mentioned above most of the development has been done on the Shaft and the "E" veins. A vein known as the "H" Vein is exposed in surface cuts.

The Shaft Vein (Fig. ___) is exposed in a gulley about 500 feet long. The vein has been intermittently for a length of about 400 feet in a 15-foot adit, a 25-foot vertical shaft and several open cuts, some of which are now filled. Elevations on the vein-outcrop range between 260 and 350 feet above sea level. The gulley is terminated to the north-west by a bluff. The vein has not been traced to the southeast beyond a contact between andesite and limestone about 40 feet southeast of the shaft.

The details of the sampling and the assay results are shown in Fig. _____ are for channel samples which where possible were taken across the width of the vein.

The "E" Vein (Fig. ___) is exposed in a gulley about 900 feet long, by open cuts distributed along a length of 800 feet. Some 70 feet below the vein-outcrop a crosscut and drift have been driven where the vein is exposed over a length of 200 feet. Elevations on exposed vein range between 430 feet in the drift to 530 feet at the surface.

Channel samples were taken in surface workings and in the drift; details of the sampling and assay results are shown in Fig. The "H" Vein (Fig.___] is exposed intermittently in open cuts extending along the base of a 10 to 20-foot bluff over a distance of some 170 feet.

Channel samples were taken in the open cuts; the details of sampling and assay results are shown in Fig.

A small vein is exposed in an open cut about 30 feet north of the cross-cut at 240 feet elevation and again in the cross-cut about 23 feet in from the portal. A channel sample taken across the vein in the open cut assayed 0.01 oz. gold per ton across $5\frac{1}{4}$.

Small stringers are exposed along the trail between the Shaft Vein and the 430 level portal at points about 180 feet, 230 feet and 254 feet northerly from the shaft. No samples were taken. A straight narrow where y about 500 feet long and parallel to the "E" vein, occurs between the "E" and "H" veins about 50 feet southwest of the "H" vein. It has been reported that single cuts in such gullies have exposed vein material, and possibly a vein was discovered here, referred to as the "F" Vein.

Immediately northeast of the "E" vein is a deep narrow gulley trending northwesterly.

The veins on the Moscena property, where mineralized, a're sheeted, but massive, and contain varying amounts of sulphide in bands parallel to the walls. The walls are separated from the vein by a thin parting of gouge and iron oxide.

The vein-matter consists of quartz, carbonates and sulphides, including pyrite, chalcopyrite, arsenopyrite, sphalerite and galena.

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One speck of free gold associated with finely disseminated galena in quartz was seen in a specimen from the shaft dump. The sulphides are coarser in texture than those seen in vein-matter of the Fandora property.

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Mineralization in the form of sulphides is sparse in the quartz diorite wall rock although alteration close to the veins is evident.

The veins are younger than any of the rock-types on the property. Mineralization post-dates the altered volcanics and sediments, the quartz diorite rocks, and the fresh andesite dykes. Mineralization apparently occurred in two stages, one characterized by the introduction of quartz with sparse sulphides into marrow continuous fissures and after small movement parallel to the walls, a second, characterized by the introduction of sulphides into sheeted zones within the quartz.

Other properties in the area include the Yankee Boy on Tranquil Creek, the Free Gold, near Warn Bay. No work was being done on these properties in 1946.

The Mankee Boy working in an inclined shaft on top of a low bluff of quartz diorite on the west side of Tranquil Creek 200 feet south-easterly from a point on the Tranquil Creek road 1,000 feet from the beach-camp.

The incline, 10 feet by 3 feet and filled with water, has been driven on a slope of 56 degrees north-westerly down the dip of a quartz vein, strike N $50^{\circ} - 70^{\circ}$ E and dip $50^{\circ} - 70^{\circ}$ N.W. that follows the schistosity of amphibolite. Granitic material intrudes the amphibolite along its schistosity. The quartz vein 0 to 2 inches wide, may be traced for 96 feet south-westerly from the shaft before it becomes covered by overburden. North-easterly from the shaft, overburden extends for about 100 feet along the strike of the vein, and a rock-bluff on strike at this point does not expose any quartz vein-matter. The quartz contains ferruginous carbonate and small amounts of fine sulphide, largely altered to limonite and malachite. A sample of vein-matter from the dump assayed: Gold, 0.38 oz. per ton; Silver, trace.

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It is reported that several tons of high grade ore were taken from the shaft.

The Free Gold property, on a creek by that name, is reached by $l\frac{1}{2}$ miles of foot-trail that leads up Free Gold Creek from near its junction with Bulson Creek.

The workings, elevation about 1,200 feet, consist of two adits driven into a bluff on the north side of the creek. A cabin, blacksmith shop and a jig 3 feet by 6 feet have been built near the workings.

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TRANQUIL CREEK - WARN BAY AREA

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Location and Access.--The Tranquil Creek-Warn Bay area is on the western coast of the island, about 80 miles down the coast from Zeballos, about 120 miles due west of the City of Vancouver, and about 15 miles northe sterly by water from Tofino, the nearest base for supplies and transportation.

Tofino is served three times a month by C. P. S. S. "Maquinna", intermittently by Frank Waterhouse ships, and semiweekly by C.P. Airlines. The M.V. "Uchuck" sails three times weekly from Port Alberni to Ucluelet and is met by motor vehicle carrying light freight and passangers to Tofino over some 26 miles of good gravel road. Motor boats may be chartered to run between Port Alberni and Ucluelet.

A launch or small boat may be taken from Tofino to the head of Tranquil Inlet or Warn Bay. At high tide only some 4 feet of water is available to put a small boat over the bars at the mouth of Tranquil Creek and upstream $\frac{1}{2}$ mile to the beach camp at the lower end of 2 miles of tractor road extending up the westerly side of Tranquil Creek. Rough trails extend from the end of the tractor road about $1\frac{1}{2}$ miles further up the valley to the Fandora and Goldflake properties, and about 5 miles up the valley towards the headwaters of the two main forks of Tranquil Creek.

One mile of truck road leads from the beach at the head of Warn Boy to the Moscena campsite. Rough trails branch

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from the road bridge to various other discoveries near Bulson Creek. Other rough trails extend from Warn Bay to the Freegold and Goldflake properties.

Topography.--The Tranquil Creek-Warn Bay area is rugged, mountainous and heavily wooded on the steep bluffy slopes from the valley bottoms to most of the ridge tops. The highest peak in the map-area is just over 4,400 feet above sealevel. Maximum relief is about 3,700 feet. Tranquil Greek is fed by tarn lakes at its headwaters and has a steep gradient down canyons to the junction of its two main forks about 4.5 miles up the valley from the head of Tranquil Inlet. The average gradientof the valley bottom from the forks to the mouth is less than 100 feet per mile. The creek flows over a 50-foot waterfall about 2 miles up the valley from tidewater. Downstream from the falls the valley floor gradually widens from a few hundreds of feet to half a mile.

Bulson Creek, within the map-area, flows through a narrow canyon and has an average gradient of 200 feet per mile down to its mouth at the head of Warn Bay.

<u>History</u>.--Several mineral claims were staked under Crown grant in the late 90's. They comprise nineteen claims on the easterly valleyside of Tranquil Creek about 3 miles north of the head of Tranquil Inlet. Here, surface and underground development of isolated lenticular bodies of low-grade copper ore on the B.C. Wonder group continued until 1903.

Activity in the area waned until the late 30's when

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several auriferous quartz veins were discovered, claims staked, trails put in, and development work undertaken. Development work continued for several years. The results were disappointing until the early 40's. Surface stripping and some underground development by the Maple Leaf Syndicate in 1941 disclosed interesting possibilities on a property, now owned by Moscena Mines Ltd., N.P.L., near Bulson Creek, 1 mile north of Warn Bay. Surface stripping and underground development on the Fandora property by E.G. Brown and P. Donahue exposed two narrow but fairly rich continuous veins in a strong sheared andesite dike. Activity slowed down during the later war years but was resumed in 1946 on the Moscena and Fandora properties.

<u>Production</u>.--(Check production, if any, of the early Crown-granted mineral claims, Yankee Boy, Goldflake, Freegold, Maple Leaf.)

Geology.--Granitic rocks, cut by a few large andesitic dikes, underlie most of the area examined north of Warn Bay. Pendants and numerous small inclusions of older altered volcanics and/or sediments occur in scattered zones and patches. Altered andesitic volcanics, cut by fresh andesitic dikes and small bodies of feldspar porphyry, are found in the area northwesterly and easterly of Warn Bay.

A large area underlain mostly by granitic rocks, gneissic near the contact zone, lies immediately south of Virge Creek. The approximate greenstone-"granite" contact runs

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easterly from the mouth of Virge Creek, over the divide, down Goldflake Creek, and across Tranquil Creek at a point approximately 2 miles up from the head of Tranquil Inlet.

Altered volcanics with small scattered lenses of altered sediments, crysta line limestone and garnetiferous rocks for the most part, underlie the entire westerly valley side of T_r anquil Creek north of Goldflake Creek. The older rocks are cut by numerous andesitic to basaltic dikes, by numerous small bodies of fresh feldspar porphyry, and, along the ridge tops, by a few isolated apophyses of granitic material. Northeasterly to southeasterly of the junction of Tranquil Creek forks, granitic rocks predominate. Numerous pendants and breccia zones of altered volcanics and/or sediments in granitic material give evidence that much of the above area is near the roof contact of the underlying batholith. Bodies of fresh feldspar porphyry, believed to be a fine grained phase of the granitic rocks, occur throughout the area. This rock was not seen in contact with granitic rocks.

The Volcanic rocks are cut by numerous steeply dipping to vertical fractures trending north 65 degrees east to due east reflected topographically by deep narrow gashes and gorges cutting transversely the northerly tending ridges and steep valley sides. Fairly flat lying fractures are numerous, often marked by cave-like openings under precipitous bluffs climbing step-like up the steep valley sides. Many fractures striking north 35 degrees west and dipping 45 degrees to 85 degrees

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northeasterly are found in the trea.

Gold quartz mineralization post-dates the granitic rocks and fresh andesite dikes. It apparently occurred in two stages, first with the introduction of quartz with sparse sulfides into narrow continuous fissures and secondly, after small movement parallel to the walls, with the introduction of sulfides and gold into sheeted zones within the quartz.

Gold Deposits

Two properties were being developed in the summer of 1946, namely, the Fandora, Goldflake and Tofino Groups held under option by Privateer Gold Mines Ltd., and the Moscena Mine, owned by Moscena Mines Ltd. (N.P.L.). Other discoveries examined in the area lie within the following mineral claims: Freegold, Eldorado, 3J's, and King.

<u>Strike Groups</u>.--The gold quartz veins of the Moscena property in granitic rocks north of Warn Bay strke north 40 to 45 degrees west and dip 85 to 90 degrees northeasterly.

The gold quartz veins on the Fandora property strike north 72 degrees east and dip 60 to 70 degrees northwesterly.

<u>Structural Types</u>.--The veins all occur in narrow continuous fissures in granitic rock, andesite dike, or altered volcanics. The veins are usually sheeted with free walls and often grade longitudinally into zones of gouge and small fragments of quartz and altered country rock.

A barren sheeted zone some 200 feet wide, of quartz

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within altered volcanics is exposed on the Leviathan No. 1 mineral claim. The quartz bodies, apparently up to 15 feet wide, appear to strike north 35 degrees west and to dip steeply northeasterly. The exposure outcrops on a steep bluff. Longitudinal extensions, if they exist, are covered by overburden.

<u>Vein Texture.</u>--The veins of the Fandora property consist of thin plates of quartz separated by thin partings of rust-coloured fine material. Finely disseminated sparse sulfides are visible in zones free of oxidation. Movement along the vein shear produces wide zones of gouge containing angular oxidized fragments of mineralized quartz and country rock.

The veins of the Moscena property are ribboned but massive and contain varying amount of sulfide often distributed in bands parallel to the walls, often separated from the vein by thin partings of gouge and iron oxide.

<u>Vein Matter</u>.--The vein matter consists of quartz, carbonates, occasional chloritic material, and sulfides. The sulfides include pyrite, chalcopyrite, arsenopyrite, sphalerite and galena.

The uncrushed ore material of the Fandora veins contains less than 1 per cent of finely crystalline pyrite with occasional chalcopyrite, galena, and sphalerite, Small specks of free gold rarely visible in hand specimens although a panning of crushed material will show many small colours.

Sulfides are coarser and more abundant in the ore material of the Moscena property, and consist of pyrite, chalco-

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pyrite, sphalerite, galena, and occasionally, small amounts of arsenopyrite. Small specks of free gold were seen in one specimen from the shaft dump associated with fine disseminated galena.

Mineralization in the form of sulfides is sparse in granitic wallrock although alteration close to the veins is evident. The andesite dike wallrock of the main Fandora veins is unaltered except between the two closely-spaced parallel veins where it is crushed and considerably softer than fresh material of the exterior walls.

Rocks associated with Gold Veins.--The gold-quartz veins are associated with granitic rocks, either massive or gneissic, fresh andesite, altered volcanics, or in breccia composed of granite and altered volcanics and/or sediments.

Veins in which the wallrock is granitic are found on the Moscena group, where the vein shears also cut altered sediments and fresh andesite, on the Yankee Boy, and on showings in the following mineral claims: Eldorado No. 5, 3J's, and King. Gold values in grab samples from the last three claims were trace to .02 ounce per ton.

Veins in which the wallrock is fresh andesite are found on the Fandora property where two parallel feins, about 5.5 feet apart, are found in certain zones within a strong dike.

Veins in which the wall rock is altered volcanic are found on the Goldflake group and on the Fandora group and environs.

The vein shears in the area examined appear to have

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marked continuity longitudinally in spite of their narrow width, particularly when they fill fissures in competent fresh unaltered rock, either andesitic or granitic material, rather than in altered volcanics or sediments.

Suggestions for Prospecting.--The Tranquil Creek-Warn Bay area has already produced two prospects of economic interest, each in a different geological setting, although both are near the contact zone of a large mass of granitic rock.

Further field and laboratory work must be carried out before specific recommendations for prospecting in the area, can possibly be made.

It would appear that the near-contact zone of the granitic rocks, both in the greenstone and in the granite, would be the most likely area for new discoveries in view of the known facts. The well-developed tributary drainage above the main valley bottoms affords excellent opportunity for sampling the country by float and pannings.

The northwesterly vein-bearing fractures in the Moscena showings are reflected topographically by long narrow parallel guts probably scoured out by glacial or fluvioglacial erosion.

The east-north-easterly shear on the Fandora property is similarly marked by a straight, narrow, stream-worn, steepwalled gut.

Similar topographic features within the area of the

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near-contact zone might well mark the sites of new discoveries.