THE NAGY GOLD OCCURRENCES, DOCTORS POINT, HARRISON LAKE (92H/12W)

By G. E. Ray

INTRODUCTION

During the summers of 1981 and 1982, the author briefly examined gold occurrences situated near Doctors Point, which is on the west side of Harrison Lake approximately 45 kilometres north-northeast of Harrison Hot Springs. The property is reached via an unpaved road passing north from Weaver Creek Provincial Park. The occurrences were discovered by a prospector, George Nagy, and have been tested by trenching and some recent drilling. The No. I occurrence lies close to the lakeshore at the north end of Doctors Bay approximately 150 metres north of George Nagy's cabin (Fig. 20). The No. II occurrence is seen in a quarried exposure alongside the road, about 300 metres southwest of the cabin. This write-up briefly describes the geologic setting and mineralization observed in the trenches and reports some gold-silver assays and trace element analyses of mineralized grab samples collected by the author.

GENERAL GEOLOGY

The regional geology, adapted after compilations by Roddick (1965) and Monger (1970), is shown on Figure 19. Major, southeasterly trending fractures passing along Harrison Lake are associated with regional hot spring activity and separate the highly contrasting geological regimes exposed on the northeastern and southwestern shores of the lake. The Nagy gold occurrences lie close to this fracture system and also close to the intrusive contact between a younger quartz diorite body and hornfelsed country rocks that are of uncertain age and origin. Further west, Roddick (1965) assigns rocks correlative with the country rocks to the Jurassic or Cretaceous Fire Lake Group (Fig. 19); Monger's (1970) compilation assigns the country rocks of the occurrences to the Middle Jurassic Mysterious Creek Formation.

GEOLOGY OF NO. I OCCURRENCE

A 7-metre by 7-metre excavated trench exposes a very fine-grained, massive textured, dark to medium grey hornfels. This rock is cut by prominent jointing or fracture cleavage. Fractures are 2.5 to 7.5 centimetres apart; they strike 170 degrees and dip 45 degrees west. In thin section the hornfels has a marked decussate texture. Untwinned plagioclase and quartz crystals generally range between 0.05 to 0.1 millimetre in diameter but some remnant plagioclase crystals are up to 0.25 millimetres. These larger feldspars have recrystallized into a fine, polygonal mosaic of small crystals. Biotite forms minute (less than 0.1-millimetre), randomly orientated, subhedral laths and comprise

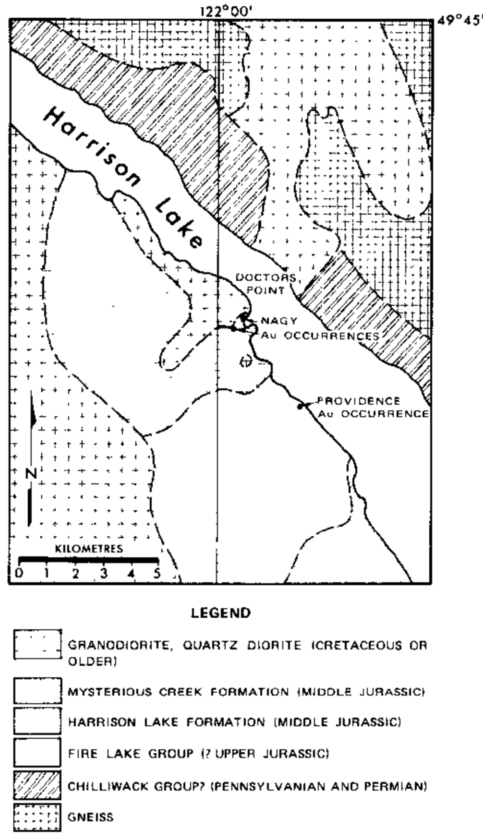

Figure 19. Regional geology of the Doctors Point area, Harrison Lake. (Geology adapted after Monger, 1970).

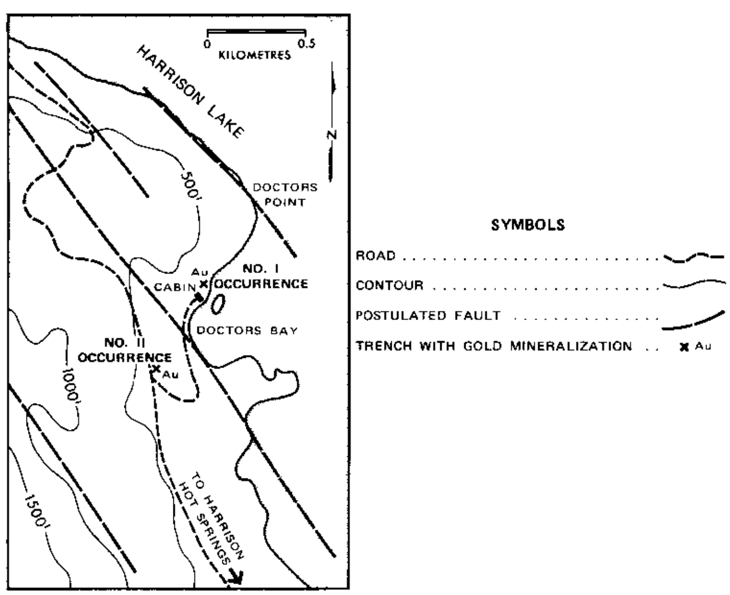

Figure 20. Location of the Nagy gold occurrences, Doctors Point, Harrison Lake.

up to 10 per cent of the total rock. Accessory minerals include epidote, zoisite, clinozoisite, sericite, chlorite, muscovite, and opaques. The muscovite occurs as late, ragged, poikiloblastic crystals with many inclusions; it may be intergrown with biotite. The opaques form less than 1 per cent of the total rock. They are largely minute magnetite granules but there are minor amounts of pyrite. In outcrop numerous randomly orientated sulphide-rich veins cross the hornfels. Most are less than 2 centimetres wide but some are up to 12.5 centimetres in width. These veins contain massive pyrite and arsenopyrite with lesser amounts of limonite, jarosite, scorodite ($FeAsO_4 \cdot 2H_2O$), sericite, quartz, and chlorite. Less commonly, thinner (generally less than 1 centimetre wide) quartz veins cut the hornfels. Some quartz veins contain central vugs lined with small euhedral quartz crystals.

Gold and silver assays and trace element analyses from grab samples of sulphide vein material from the No. I occurrence are shown in Table 1. The gold-silver mineralization is associated with anomalous amounts of bismuth, cobalt, copper, mercury, molybdenum, tungsten, lead, and arsenic.

TABLE 1. TRACE ELEMENT ANALYTICAL RESULTS FROM MINERALIZED GRAB SAMPLES FROM THE NO. I NAGY OCCURRENCE

	GR 40	GR 210	GR 211
Au*	0.7 ppm	5.4 ppm	5.8 ppm
Ag*	8 ppm	6.2 ppm	40.9 ppm
As*	0.35%		
Bi*	56 ppm		
Co*	11 ppm		
Cu*	0.15%		
F**	178 ppm		
Hg***	280 ppb		
Mo*	10 ppm		
Sb*	<5 ppm		
W****	26 ppm		
Pb*	56 ppm		
Ni*	6 ppm		
Zn*	165 ppm		

*Atomic absorption
**Ion specific electrode
***Cold vapour AA
****Colourimetric

GR 40 - Hornfels with sulphide veins up to 5 centimetres wide, collected from south end of trench.

GR 210 - Hornfels with thin sulphide veins and vuggy quartz veins, collected from north end of trench.

GR 211 - Massive pyrite-arsenopyrite from 12-centimetre-wide sulphide vein, collected from south end of trench.

GEOLOGY OF NO. II OCCURRENCE

The No. II occurrence is seen in a quarried exposure on the east side of the main access road, approximately 50 metres north of the turnoff to Doctors Bay (Fig. 20). Mineralization is localized along the faulted contact between a quartz diorite to the north and structurally underlying fine-grained, massive grey hornfelsic rocks to the south.

The mineralized zone, which is up to 0.7 metres wide and exposed for 20 metres along strike, trends 130 degrees and dips gently (20 to 30 degrees) northward parallel to the faulted margin of the overlying quartz diorite. Mineralization consists mainly of coarse pyrite and arsenopyrite with abundant light green scorodite ($FeAsO_4 \cdot 2H_2O$). In addition, the zone carries limonite, quartz, sericite, and feldspar. Locally the mineralization is rhythmically zoned and vuggy while elsewhere the sulphides have been extensively leached, producing a pronounced boxwork texture. Remnant coarse crystals of quartz and altered feldspar in these leached areas resemble those in the hangingwall quartz diorite.

Minor normal faults and numerous small fractures striking 160 degrees and dipping 75 degrees east cut and displace the main mineralized zone. Thin mineralized veins in these younger fractures, suggest some late stage remobilization of the sulphides. Gold and silver assays and trace element analyses of sulphide-rich grab samples from the mineralized zone are shown in Table 2.

TABLE 2. TRACE ELEMENT ANALYTICAL RESULTS FROM MINERALIZED GRAB SAMPLES FROM THE NO. II NAGY OCCURRENCE

	GR 213	GR 215
Au*	19.9 ppm	34.6 ppm
Ag*	10.69 ppm	112.6 ppm
As**	>3%	>3%
Bi**	Tr	Tr
Mo**	Tr	Tr
W**	Tr	Tr
Sb**	0.02%	0.02%

*Atomic absorption
**Semiquantitative emission spectroscopy

GR 213 - Sulphide-rich grab sample from northern exposed portion of mineralized zone.

GR 215 - Sulphide-rich grab sample from southern exposed portion of mineralized zone.

Both in hand specimen and thin section the footwall hornfels closely resembles the hornfels that hosts the No. I occurrence. However, at the No. II occurrence they are coarser grained (up to 0.3 millimetres) and contain appreciably more sericite, magnetite, and other opaque minerals; the coarser texture presumably reflects its closer proximity to the quartz diorite pluton. Recognition of vague, remnant clasts under thin section suggests that the hornfels is either thermally metamorphosed tuff or clastic sedimentary rock.

The hangingwall quartz diorite is a massive, coarse-grained rock with crystals varying from 2 to 10 millimetres in diameter. It consists of 15 to 20 per cent hornblende which forms subeuhedral prisms and commonly encloses remnant, corroded augitic cores. Biotite forms 1 to 3 per cent of the rock; some is intergrown with the hornblende. It is partially altered to chlorite. The plagioclase (An_{30-47}) forms well-twinned, zoned crystals with clouded cores and clear margins; many are partially saussuritized. Quartz makes up 1 to 3 per cent of the rock, and sub-euhedral pyrite crystals are recognizable in hand specimen.

The quartz diorite generally has a fresh, homogeneous appearance but immediately adjacent to its faulted contact with the hornfels it is leached and highly fractured. In a highway exposure on the hairpin bend approximately 1.2 kilometres north-northwest of the No. II occurrence, numerous subhorizontal, 7 to 10-centimetre-wide veins of leucocratic biotite quartz diorite cut the pluton. At this locality a steep westerly dipping, north-south-trending fault zone cuts the body. Intense fracturing and alteration over a 5-metre width marks this fault. Gently plunging slickensides (23 degrees toward 200 degrees) suggest some subhorizontal movement.

DISCUSSION

The two most likely explanations concerning the controls and origin of the Nagy gold occurrences are:

(1) The mineralization was genetically related to the quartz diorite intrusion, which explains its spatial association with the hornfelsed margin. If correct, this suggests that the remaining margin of the quartz diorite body and possibly those of other granitoid plutons in the area, particularly where they intrude the Fire Lake or Harrison Lake Groups (Fig. 21), may represent good exploration targets for similar gold-silver mineralization.

(2) Mineralization was preferentially emplaced along the faulted pluton margin during hydrothermal activity which was not necessarily related to the quartz diorite intrusion. The Nagy occurrences lie close to a regional fracture system that is associated with one former gold producer (Providence, MI 92H/NW-30), numerous other gold occurrences, and regional hot spring activity (Fig. 21). Thus, the

Harrison Lake fault system, particularly its northern section where it intersects both granitic plutons and the Fire Lake Group, could represent an interesting exploration target for both higher temperature vein and epithermal, Cinola-type gold mineralization.

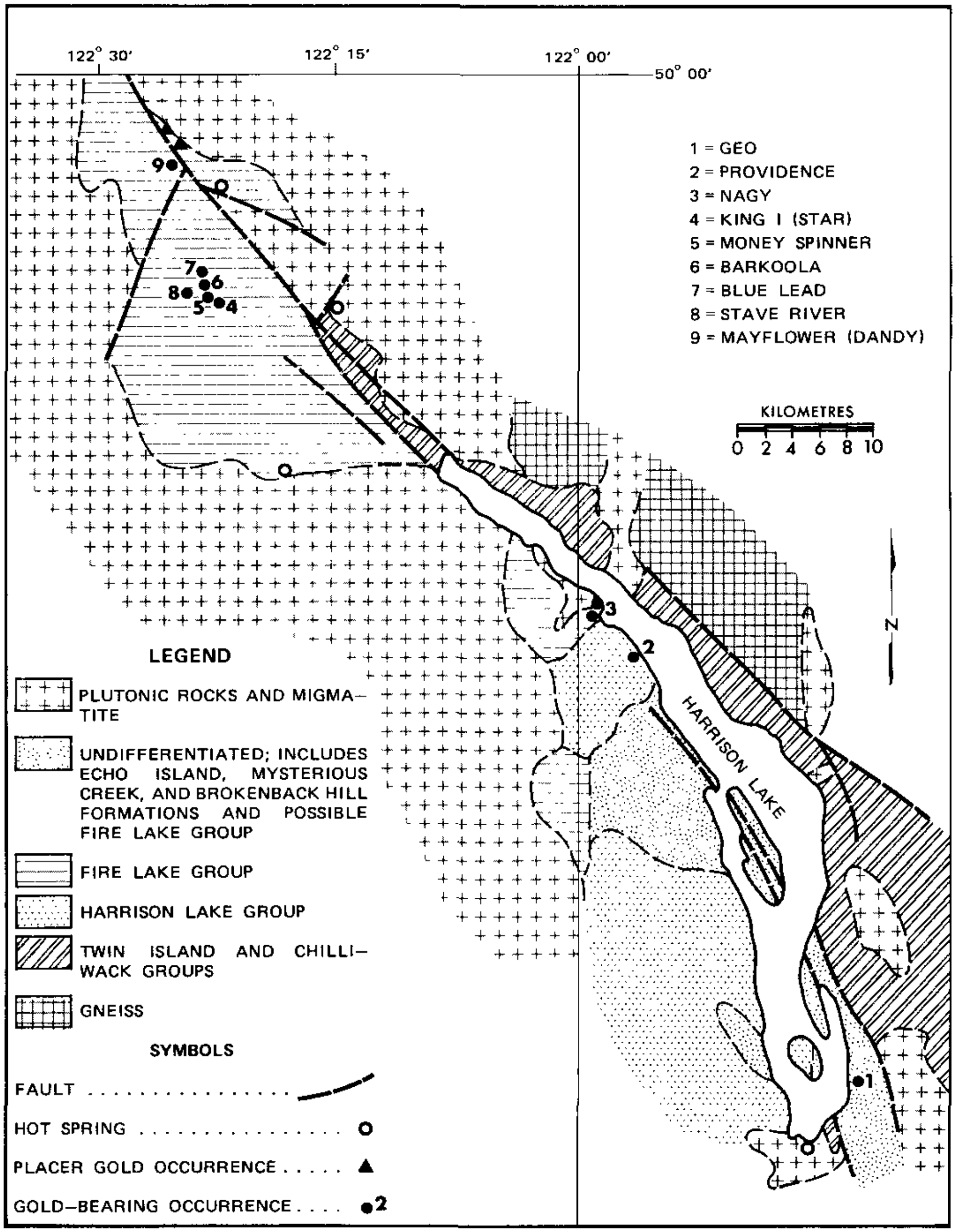

Figure 21. Regional geology of the Harrison Lake fault system showing hot spring and gold occurrences. [Geology adapted after Roddick (1965) and Monger (1970)].

ACKNOWLEDGMENTS

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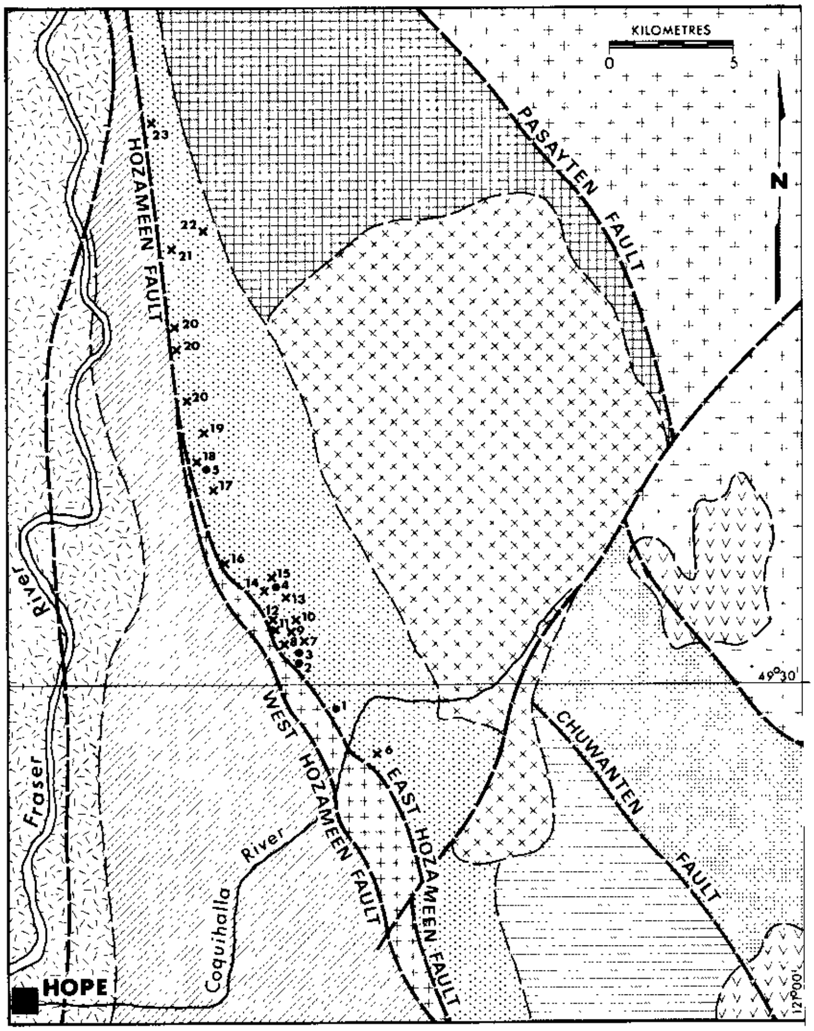

LEGEND

- COQUIHALLA GROUP
- NEEDLE PEAK PLUTON
- PASAYTEN GROUP
- JACKASS MOUNTAIN GROUP
- DEWDNEY CREEK GROUP
- LADNER GROUP
- COQUIHALLA SERPENTINE BELT
- FOLIATED GRANODIORITE
- HOZAMEEN GROUP
- GNEISSES AND GRANITES

● PAST AND PRESENT GOLD PRODUCERS (*SEE* TABLE 2)

1 = EMANCIPATION
2 = AURUM
3 = IDAHO ZONE (CAROLIN MINE)
4 = PIPESTEM
5 = WARD

✖ REPORTED GOLD OCCURRENCES (*SEE* TABLE 3)

6 = BROKEN HILL
7 = SNOWSTORM
8 = MONTANA
9 = RUSH OF THE BULL
10 = GOLDEN CACHE
11 = McMASTER ZONE
12 = MURPHY
13 = GEM
14 = STAR
15 = HOME X
16 = NORM AND GEORGIA 2
17 = EMIGRANT
18 = RODDICK
19 = MARVEL
20 = SPUZ A, B, G AND MONUMENT
21 = MAJESTIC
22 = GOLD COIN
23 = GOLD CORD

Figure 22. Regional setting of the Coquihalla gold belt showing location of gold deposits and occurrences. (Geology adapted after Monger, 1970).