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Preliminary Interpretation and Evaluation of Geology and Structure of Getty North (Krain) Copper Project Highland Valley, British Columbia

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Introduction

The writer was retained by Getty Copper Corp. (GCC) to review and provide a synthesis of the geology and structure of the Getty North Zone. Drill Logs, summary drillholes and assay results for the central 300 metres of the deposit from 1330 SE to 1600 SE inclusive were carefully examined during the period of March 12 to April 6, 1997.. The resulting geological and structural synthesis was compiled in 10 working cross sections which were reviewed and thoroughly discussed on April 5, 1997, with D. McCombe of Watts, Griffis and McOuat Ltd. (WGM) during her visit to the Logan Lake office before shipping to Toronto for digitizing and printing. Ms. McCombe indicated that prints of these sections should be available within one week to ten days.

Geological Setting

The Getty North (Krain) Zone is the largest of three known deposits within GCC's Highland Valley project area. Drilling to date has outlined a resource of 35 million tonnes grading 0.47% Cu (GCC previous release, March 10, 1997). The other two zones are Getty South (Trojan, South Seas) and Getty West/Transvaal. All are situated in the north central part of the Guichon Creek batholith within the Highland Valley porphyry copper-molybdenum district, the most important copper producing area of British Columbia.

Like the Bethlehem deposits, the Getty deposits are hosted by the Guichon variety of the Highland Valley phase of the batholith (McMillan, 1985) and lie within a belt of post-Bethlehem phase dykes and breccias which stretches for at least 8 kilometres northward from the Bethlehem deposits (Fig. 1). An interpretive geological cross section of the Guichon Creek batholith and the various porphyry copper-molybdenum deposits of the Highland Valley District (Fig. 2) shows that the Getty North (Krain) and the other Getty Copper deposits are at the same or slightly higher structural level as the Bethlehem deposit. Though smaller than current producers, the Lornex and Valley deposits, the four Bethlehem deposits were the first producers of the Highland Valley District and together account for 93.1 million tonnes mined grading 0.50% copper and 0.012 g/t of gold and in excess of 43.5 million tonnes of unmined reserves grading 0.40% copper and 0.013 g/t gold (Table 1). Figure 2 and Table 1 clearly show that a progressively higher structural level corresponds to gradually smaller size but increasing copper and gold grades. As in other porphyry copper systems studied by this writer (Preto, 1972) a higher structural level of emplacement also implies greater structural complexity.

Given the great similarity in structural setting, host intrusive phase, abundance of dykes and breccias and the appreciable size of the unmined resource already indicated at the Krain, the potential clearly exists for Getty deposits to account for an aggregate mineable resource that would favourably compare in size and grade with that of Bethlehem.

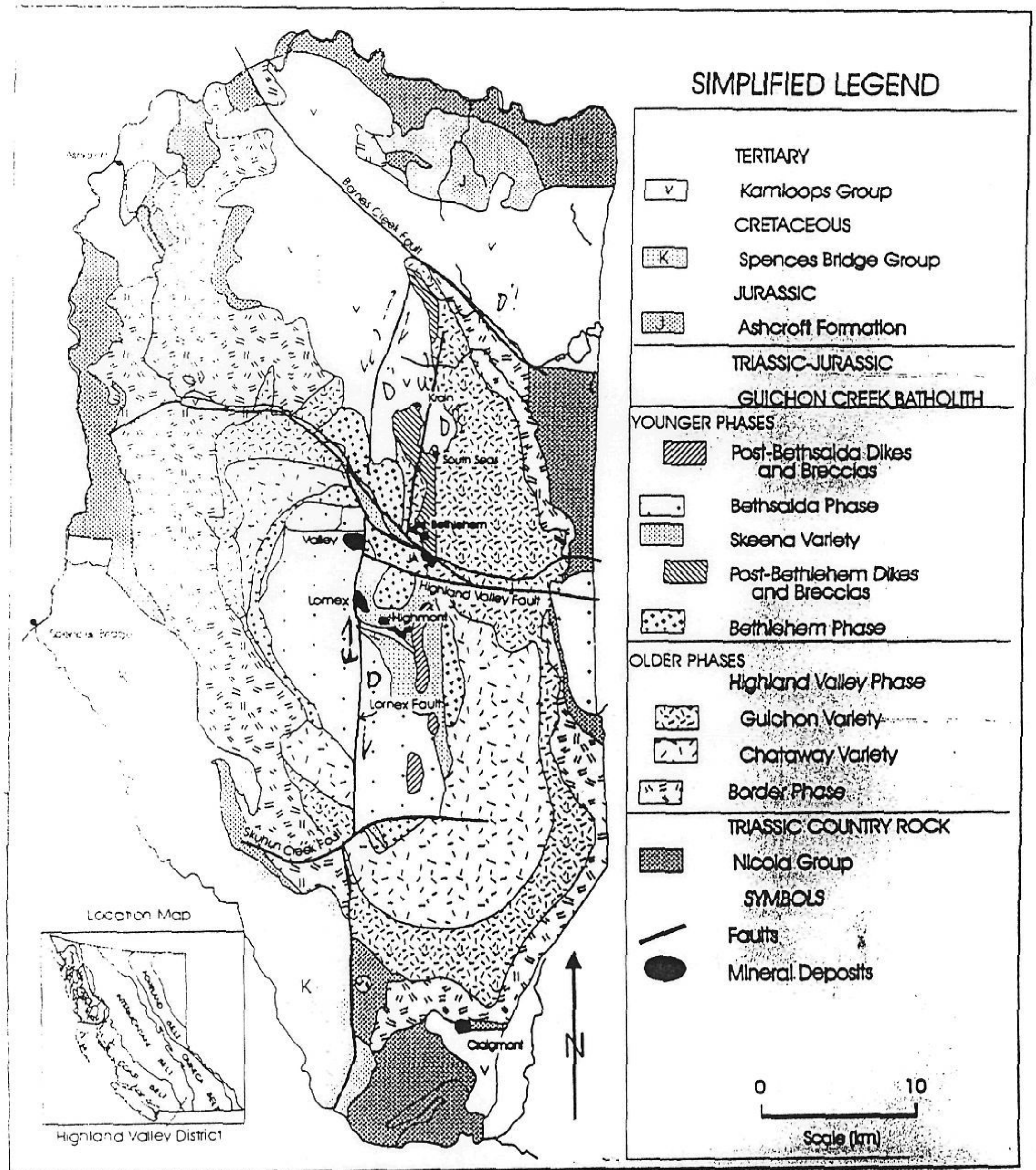

Figure 1 Location and general geology of the Guichon Creek batholith showing major Highland Valley porphyry Cu-Mo deposits (modified after McMillan, 1985).

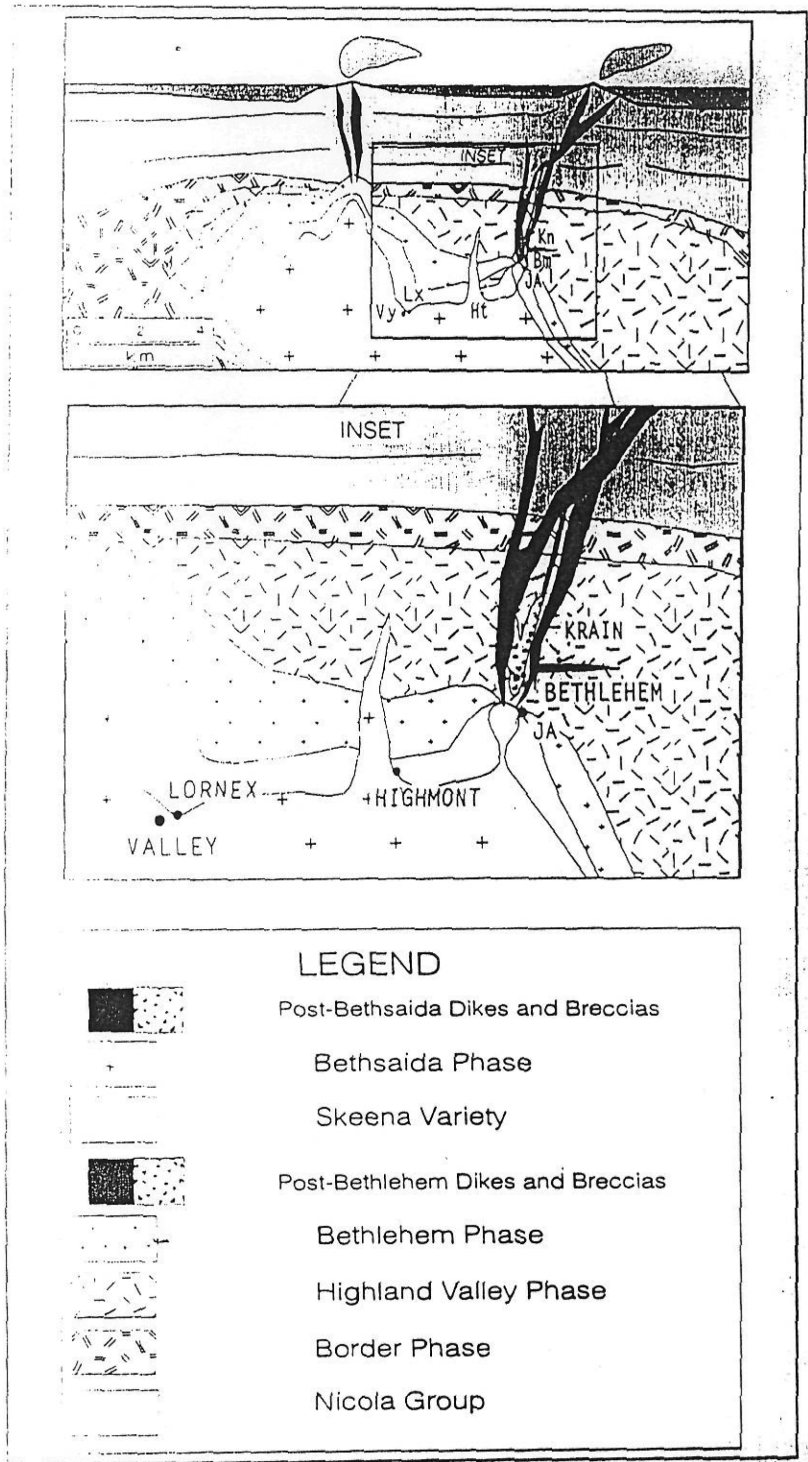

Figure 2 *Interpretive geological cross-section of the Guichon Creek batholith based on geology, gravity and mineral deposit studies. The diagram depicts the inferred original setting of various Highland Valley porphyry copper-molybdenum deposits (partly after Ager et al., 1973; McMillan, 1976).*

Deposit	Status	Mined to Jan. 1, 1994	Mined Cu(%)	Mined Mo(%)	Mined Gold (g/t): Recovered	Strip Ratio	Daily Rate (tonnes)	Reserves (includes inferred)	Copper (%)	Molybdenum (%)	Gold (g/t): Contained	Contained Gold (tonnes)
Bethlehem												
Total	N(1982)	93.1	0.50	-	0.012	1.93:1	-	43.5 + 6 oxide	0.40	minor	0.013	1.8
East Jersey	N	9.0	0.60	-		?	-	20.6	0.40			
Jersey	N	53.2	0.50	-		?	-	22.9	0.40			
Iona	N	29.5	0.52	-		?	-	6(oxide)				
Huestis	N	1.4	0.40	-		?	-	-	0.40			
Lornex	O	341.1	0.42	0.01	0.0005	1.81:1	12,500	119.2	0.36	0.013	0.006	2.8
Valley Mine	O	283.3	0.44	0.01	0.0005	1.07:1	112,000	507.8	0.44	0.006	0.006	4.7
Highmont												
Total	N(1984)	34.7	0.22	0.03	-	1.53:1	-	88.4	0.26	0.021	0.004	0.5
West Pit	N	14.2	0.15	0.05	-	2:1	-	0.8	0.15	0.048		
East Pit	N	20.5	0.26	0.02	-	1.2:1	-	87.6	0.26	0.021	-	
JA	P	-	-	-	-	-	-	286(1983	0.43	0.017	?	?
Krain	P	-	-	-	-	-	-	9.1	0.53	0.010	?	?
					-		-	4.9 oxide	0.64	?		

Table 1: Status and reserves information for major Highland Valley deposits. Symbols under status are: O - operating mine; N(1984) - past producer and date production stopped; and P - developed prospect (after Casselman et al, in press).

Geology, Getty North

The geology of the Getty North deposit can be synthesized and better understood as consisting of the following four pre-Tertiary units:

1. **Guichon Granodiorite to Quartz Diorite (Unit G)**

Generally medium grey, with 10-20% mafics evenly distributed as small clusters. Hydrothermal alteration may range from nil, to weak or intense chlorite-sericite, sometimes resulting in the obliteration of the original texture and composition. Good host for mineralization.

2. **Porphyritic Phases of Guichon Granodiorite to Quartz Diorite (Porphyritic G)**

Mafic content and distribution, grain size and alteration are same as for G above, but texture may range from porphyritic (5-10% tabular plagioclase phenocrysts) to rarely a crowded porphyry (25-35% phenocrysts). Some phases may have a pink quartz-potash feldspar groundmass imparting a granophyric texture to the rock – variously referred to as Bethlehem phase and granophyric crowded porphyry (GPP).

The key point is that this unit is a gradational phase of unit G above and not intrusive into it. Clearly gradational contacts can be observed over distances of a few centimetres to two metres without a structural break or intrusive contact. Good host for mineralization.

3. **Crowded Feldspar Porphyry (CFP)**

Light to medium or pinkish grey with 5-15% evenly distributed mafics and 30-45% tabular plagioclase phenocrysts. Some phases may have a granophyric texture. Where not obliterated by a fault, contact with unit G is clearly intrusive. Usually occurs as larger dyke-like bodies along zones of strong fracturing or faulting. This is the main mineralizing phase. Depending on structures, alteration may range from nil to weak to intense sericite-chlorite ± carbonate, and generally begins as narrow envelopes spreading outward from fractures. Excellent host for mineralization. When in doubt, distinguish from porphyritic G on basis of contact which must be either intrusive or clearly a fault, but not gradational.

4. **Dykes**

Pink, grey, greenish-grey or tan porphyry dykes with less than 20% phenocrysts and a fine grained crystalline to aphanitic matrix. Dacitic in composition with quartz or quartz/feldspar phenocrysts and usually less than 5%, rarely 5-10% mafics. May range in width from several centimetres to many tens to metres. Alteration and mineralization usually nil to weak sericite-pyrite. May rarely contain up to 0.20% copper. Contacts with units G and CFP always intrusive.

Commonly follows zones of intense fracturing, faulting or central parts of larger bodies of unit CFP. Barren to very poor host for mineralization. Late to post-mineral in age.

All of these four units are part of the Guichon Creek batholith and of late Upper Triassic age. As previously described for other units of the batholith (Casselman et al, 1995, page 170) textural and contact relationships observed between units G, porphyritic G and CFP support that CFP was injected into G along zones of structural weakness before the older phase was completely solidified. Accordingly, as displayed in sections 1450 SE, 1510 SE and 1540 SE, wide zones of unit "porphyritic G" flank bodies of unit CFP in similar fashion as diagramatically shown in Figure 3.

Tertiary Units

Tertiary volcanic and intrusive rocks belonging to the Eocene-age Kamloops Group were observed in the northeastern parts of Sections 1330 SE to 1480 SE.

1. Tertiary Dykes (Unit Td)

Intrusive rocks occur as dykes of dark grey andesite which follow northeast trending extensional faults (Section 1350 SE).

2. Tertiary Volcanics (Unit Tv)

Tertiary Volcanics rocks occur as a thin veneer over the oxide zone in Sections 1330 and 1360 SE, but primarily as a northerly to northeasterly facing down faulted block in the northern and northeastern part of the deposit from section 1480 SE northward. The thickness of this volcanic package exceeds 100 metres east and southeast of the Krain impoundment and represents a considerable obstacle to the tracing of valuable oxide mineralization in this area.

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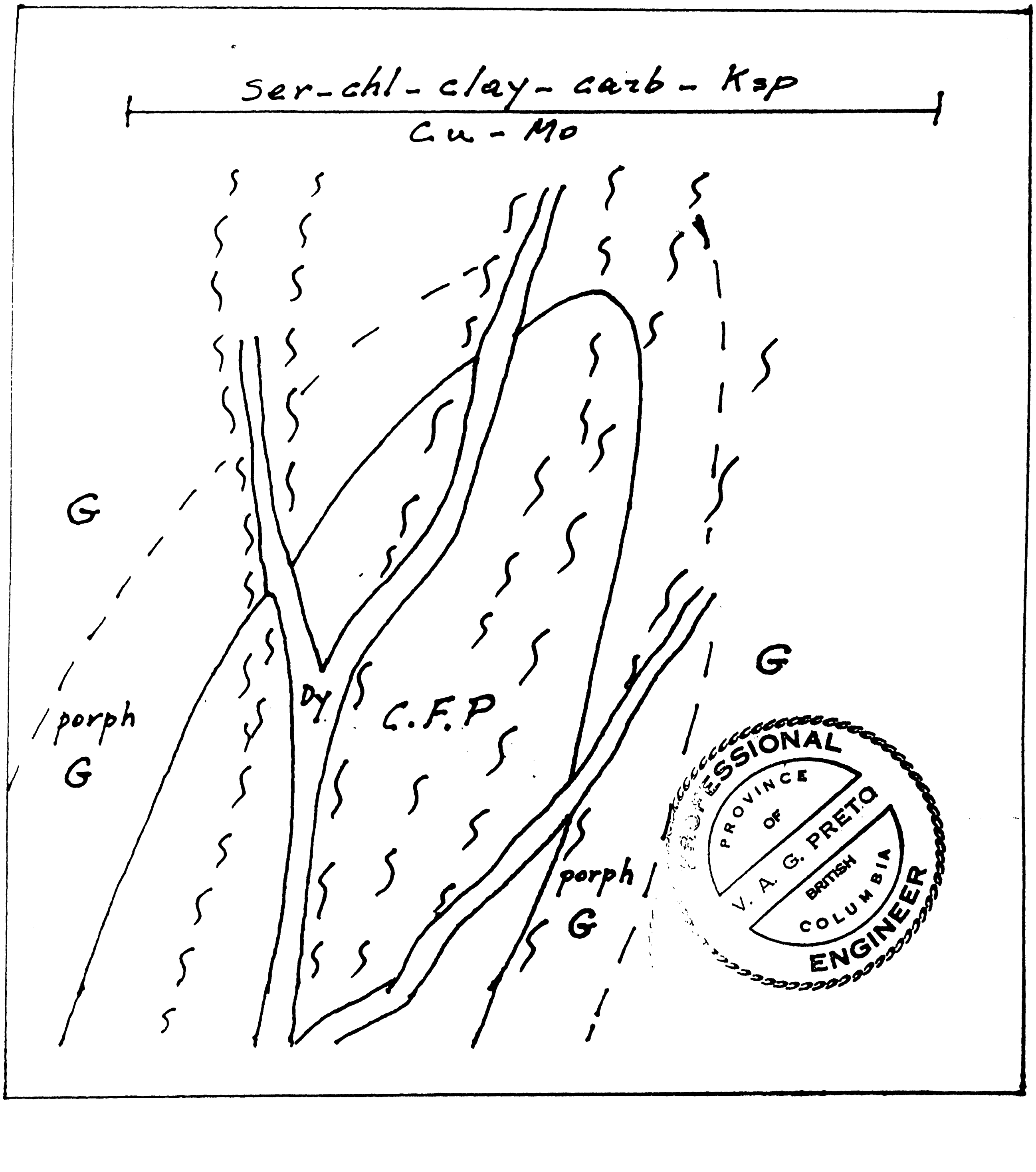

Figure 3. Schematic Diagram Showing Relationships of Pre-Tertiary Units

Structure, Getty North

Work by the Getty Copper team, particularly K. M. Newman, P.Geo, has shown the Getty North area to be one of intense faulting. (Fig. 4).

Major through-going faults trend northerly to northeasterly and follow prominent lineaments. The Krain fault dips steeply west and follows a prominent ravine which continues southward from the Krain impoundment along the western part of the mineralized zone. The Central fault follows a northerly to northeasterly trending depression through the southern part of the deposit, and the East fault parallels the eastern edge of the deposit. The North Fault and the South Fault follow northwesterly trending lineaments along the north part of the deposit and south of it.

Within the mineralized zone, at least five northeasterly trending faults, dipping vertically to steeply north, have been identified by K. M. Newman at 1330 to 1350 SE, 1390 SE, 1450 SE, 1480 to 1510 SE and 1550 SE. One of these structures at 1450 SE is followed by a prominent Tertiary dyke. Another at 1480 to 1510 SE marks the abrupt southern terminus of the oxide zone and of Tertiary volcanic rocks. Movement along these structures appears to be extensional in nature with relative downward movement of the northwestern block.

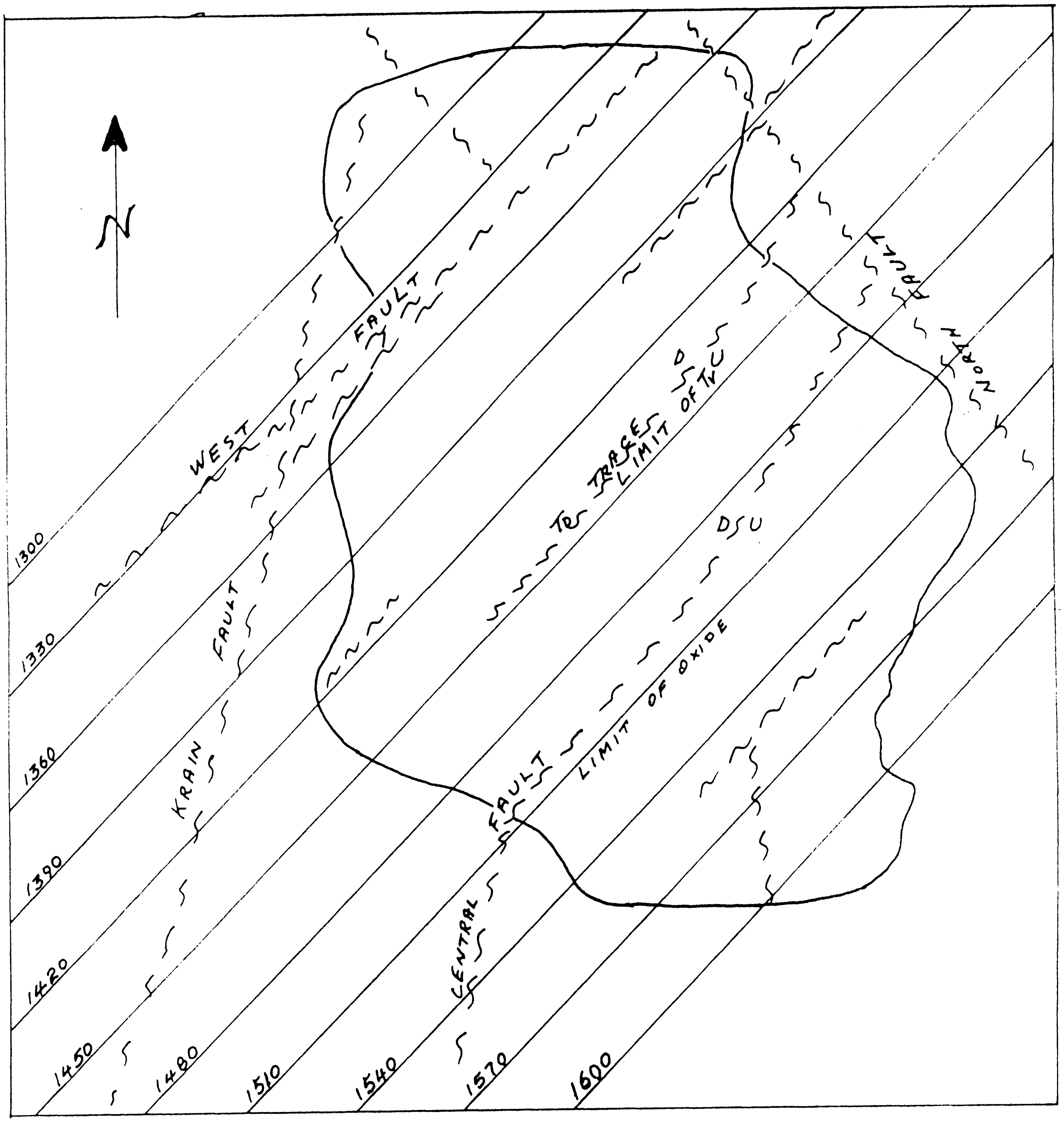

Figure 4. Main Faults, Getty North Zone (after K. M. Newman)

Mineralization and Synthesis of Cross Sections

Sulphide/oxide mineralization at the Getty North Copper Deposit is currently estimated at 35 million tonnes grading 0.47% copper (GCC Press Release, March 10, 1997). This resource occurs in a northerly trending zone with a moderate westerly dip which from 1450 to 1600 SE is centered on one or more complexly faulted lenses of Crowded Feldspar Porphyry (CFP) that intrudes unit G granodiorite. North of section 1510 SE, the sulphide zone is overlain by an oxide zone now calculated to contain 7 million tones of 0.60% copper which is included in the 35 million total.

The CFP unit is interpreted as an intramineral porphyry and the main mineralizing unit, closely related in origin and age to the Guichon phase. It was emplaced slightly before, during and slightly after the main mineralization event. Numerous porphyry dykes of late- to post-mineral age cut units G and CFP. These are interpreted to be late differentiates or offshoots of the main CFP unit. Most mineralization is fracture controlled and occurs in units G and CFP, moderately to strongly altered to sericite-chlorite and clay-carbonate, though some has been observed in weakly altered to fresh CFP and rarely in porphyry dykes.

<u>Section 1600 SE</u>

Based only on holes GN96-11, 12 and GN97-10 at this time, the section is dominated by unit G intruded by two highly segmented southwesterly dipping lenses of CFP and a few small porphyry dykes. Faulting is strong and widespread and interpreted to have a reverse sense of movement. The sulphide zone and ends abruptly down dip between holes GN96-12 and GN97-10.

<u>Section 1570 SE</u>

Similar to 1600 SE but with more CFP and dykes intruding unit G. Faulting remains strong and widespread with a reverse sense of movement again indicated. The sulphide zone is approximately double the size of the preceding section but again appears to end abruptly down dip between 95-28 and GN96-16.

<u>Section 1540 SE</u>

Based on holes 95-19, 12 and GN96-9 only at this time. Very similar to 1600 SE with unit G predominant over CFP and only one feldspar porphyry dyke at the bottom of hole 95-19. Faulting still strong, widespread and showing reverse movement. The sulphide zone is similar in size to 1570 SE and apparently open down dip.

Section 1510

Based on holes 65-8, 95-18 and GN96-10, 17. Section is dominated by a large, relatively unfaulted central lens of CFP flanked by unit G in the shallower holes and by broad sections of porphyritic unit G at deeper levels. Porphyry dykes are limited to one at the bottom of hole GN96-10. A weakly mineralized and altered central portion of the CFP unit could also be a dyke. Faulting is still strong and widespread, but largely confined to the eastern part of the section. An oxide zone now occurs over the sulphide zone which is centered on the CFP unit, is much larger than in 1540 SE, is open down dip and has now assumed a definite arcuate shape with an upper and lower limb and a weakly mineralized, but not barren (0.21 to 0.24% copper) central part.

Section 1480 SE

This section is very similar to 1510 SE, again dominated by a central, coherent body of CFP now flanked to the east by a smaller, deeper lens and to the west, near the Krain fault by a shallower lens strongly segmented by intense faulting. Porphyry dykes are limited to a weakly altered, nearly barren central portion of the main CFP unit. Tertiary volcanic rocks are in fault contact with unit G at the extreme east end of the section. The oxide zone is broader and thicker. The sulphide zone is similar in size to 1510 SE, open down dip, and maintains a definitely arcuate shape with a weakly mineralized to barren central portion.

Section 1450 SE

Based on holes GN97-2, 6 and 13. Similar to 1480 SE. Central CFP unit is now bisected by a larger more continuous barren porphyry dyke. Lower CFP lens is larger but weakly altered and poorly mineralized. Unit G granodiorite between the two CFP lenses is almost ubiquitously porphyritic and well mineralized. Two barren Tertiary dykes follow an eastern fault zone and the central porphyry dyke at shallower levels. Faulting is still widespread but not as intense as in previous sections, except for an eastern zone between the two CFP lenses. The oxide zone continues strong. The sulphide zone is of similar size and shape to 1480 SE and open at depth.

Section 1420 SE

Based on holes 95-4, 5, 11, 15 and GN96-2 and 11. Central CFP unit has been almost completely replaced by a large, barren porphyry dyke. Drilling has not tested at sufficient depth below this dyke for the presence of the lower CFP lens or for the intervening porphyritic unit G which was well mineralized in the previous section. Three Tertiary dykes and a thick section of

Tertiary dykes and a thick section of Tertiary volcanics dominate the central and eastern part of this section. Faulting is widespread, locally strong and dips less steeply to the west. The oxide zone is thicker and broader than in 1450 SE but partly buried under Tertiary volcanics. The sulphide zone has now lost its "crown" and is split into an upper and lower limb. The upper limb is continuous at depth, but drill information is required between the bottom of holes 95-11 and GN96-11 to test the down dip extent of the lower limb.

<u>Section 1390 SE</u>

Based on holes 93-1, 95-6, 95-14, GN97-4 and 7. CFP unit is absent and only suspected at depth in the central part of the section. The central barren porphyry dyke is now much smaller and is found only at the bottom of hole 95-6, but a second, larger dyke has now appeared at depth to the east. Faulting is dominated by a thick central zone which dips moderately to the west. Tertiary volcanics cap the eastern part of the section. The oxide zone is much larger and thicker than in 1420 SE and reaches down to 1600 metres elevation. The sulphide zone is similar in size and extent to 1420 SE, but drilling is required to confirm the down dip continuity of both limbs.

<u>Section 1360 SE</u>

Substantially different from 1390 SE. A new body of CFP has appeared at depth along the lower limb of the mineralized zone, the central barren porphyry dyke has disappeared and the lower dyke continues but only much smaller in size. The western part of the section consists of at least 50% barren porphyry dykes which intrude unit G along and west of the Krain fault. Tertiary volcanics begin to appear at the extreme west end while to the east continue much as in the two previous sections and cap part of the oxide zone which is of similar extent and depth as in 1390 SE. The sulphide zone continues much as in 1390 SE, but the split between upper and lower limb appears to be 50-70 metres deeper while the upper limb appears to be pinching out near the bottom of hole GN97-12. Drilling is required below hole GN97-5 to test for the continuation of the lower limb.

<u>Section 1330 SE</u>

Based on holes 95-12, 13 and GN97-1 and 8. This section is drastically different from 1360 SE. There is no evidence of CFP while barren porphyry dykes dominate the central and western part of the section. Tertiary volcanics occur in two down faulted blocks at the eastern and western extremities of the section while a thin veneer uncomformably caps the central part. The oxide zone is much smaller and underlain by a small, poorly developed sulphide zone. A lower, apparently separate sulphide zone appears to continue in the central part of the section but must be dissected by faulting since it does not appear in hole GN97-8.

Section 1330 SE is poorly understood. In fact, it raises more questions than it answers. It is drastically different than 1360 SE, in virtually every aspect. Hole GN96-4 drilled in a northwesterly direction from 1430 SE pierced the central part of the section at elevation 1600 metres and yielded assays averaging 0.44% copper while hole GN97-8 averages only 0.14% copper over 22 metres in this immediate area and less than 0.1% copper throughout the rest of its length.

Conclusions

The present study provides a synthesis of key mappable units and structures as they relate to copper mineralization at Getty North.

Four pre-Tertiary units have been identified and described. These should allow for simpler and faster logging of drill core and for the confident preparation of a 3-dimensional block model of the zone by WGM. A conceptual idealized diagram of the deposit is also provided in Figure 3.

The ten cross sections that were compiled during this study and have been submitted to WGM for digitizing and printing, provide a geological and structural synthesis across 300 metres of the deposit based on these four units.

Due to other time commitments by the writer this study is only a first step toward solving the complex geology and structure of the Getty Copper Deposit.

Recommendations

1. The geological and structural review of the deposit should be continued from 1600 to 1720 SE and north of 1330 SE. When complete the sections should be used to compile a map of the deposit.

2. All available surface and subsurface geological and geophysical data should be reviewed in an effort to unravel the complex structure of the deposit, particularly in its north and eastern parts. This data should be integrated in the preparation of a map of the Getty North Zone.

3. The four mappable units defined in this report should be adopted for drill core logging and used in the construction of a 3-dimensional model. The work recommended in 1 and 2 above, should from the basis of the this model.

4. Given the geological and structural complexities identified by this study of the Getty North deposit, similar syntheses and reviews should be done for the Getty South and Getty West zones preliminary to any further drilling.

5. A location survey of all available drill holes should be undertaken as soon as the present snow cover allows.

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Certificate of Qualifications

Vittorio A. Preto, Ph. D., P. Eng.

I, Vittorio A. Preto, of 6393 West Saanich Road, Saanichton, British Columbia, do hereby certify that:

1. I am a graduate of the University of British Columbia with a Bachelor of Applied Science in Geological Engineering, 1962; a Masters of Applied Science, 1964 and a Ph. D. from McGill University, 1967.

2. I have been practicing geology since 1962.

3. I am a registered Professional Engineer in the Province of British Columbia and a Fellow of the Geological Association of Canada.

4. I have no direct or indirect interest in the holdings of Getty Copper Corp.

5. I have personally completed the review of all drill holes and other pertinent data described in this report during the period of March 13 to April 7, 1997.

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April 7, 1997

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