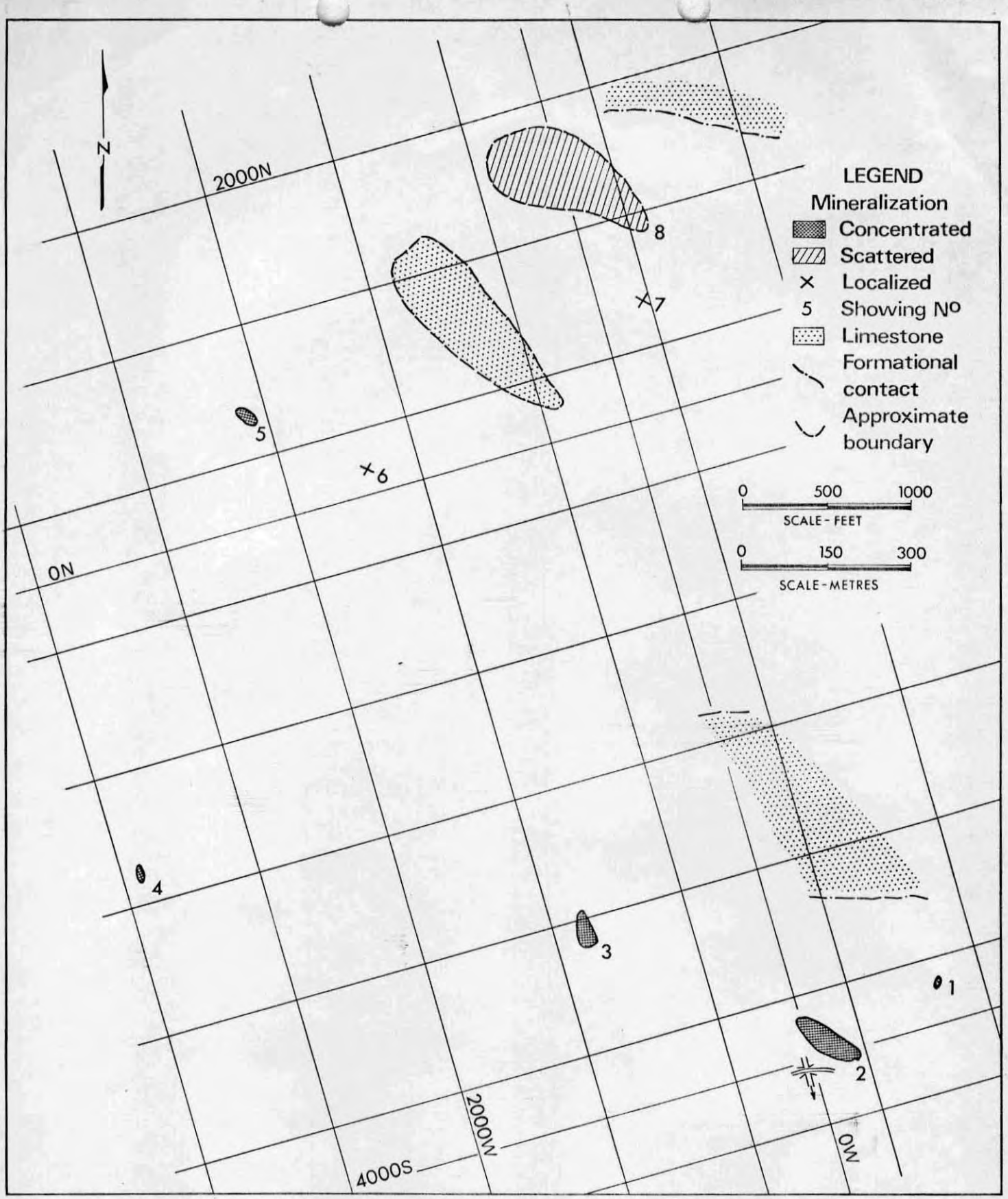
Zone No.	Magnetite	Pyrite & Pyrrhotite	Chalcopyrite	Skarn	Limestone Host	Breccia Host	Diorite Host	Remarks
1	abundant to massive	abundant to massive	minor	locally abundant	✓			Mineralization probably localized adjacent to andesite dykes
2, 3	patchy Locally massive thick. to thin disseminations	abundant to localized	sporadic	abundant to massive		✓		
4	veins, pockets & masses	none	none	minor			✓	
5	locally abundant	locally abundant	moderate	abundant		?		Near limestone
6	common	none	none	abundant		?		" "
7	none	massive	networks	none		✓		
8	pockets	minor	none	common		✓		
9	massive	none	none	none	✓			
10	mostly massive	none	none	minor	✓			Near andesite dykes
11	pockets & narrow bands	none	none	massive				Host not determined

006137



92C/9W GEPE - 1

The Reko claims cover the upper part of Renfrew Creek valley, and the adjoining Kestrel claims extend over the ridge onto the steep slope descending to the west tributary of Hemmingsen Creek. Access is provided by Granite Main Line of B.C. Forest Products and several branch logging roads. The creek is crossed by two bridges: the lower and more useful is at 1,200 feet elevation (365 metres) and is shown on Figure E 75-2.

An outline of exploration from 1970 through 1974 is given in the 1974 report. Prospecting of the Kestrel claims early in 1975 led to the discovery of three significant new showings and several minor ones. The writer spent a week in Vancouver, logging mineralized drill core at its place of storage, and three weeks on the property, surveying part of No. 8 zone and examining the new showings.

Figure E 75-2 is a composite, prepared by enlarging the N.T.S. manuscript map to 1" = 1,000' (1" equals 1,000 feet) and modifying it with details reduced from the company's 1" = 400' map. Geological contacts south of the reverse bend of Renfrew Creek are taken from detailed mapping by R.L. Roscoe, the company's consultant, modified in places by the writer's observations. Mineral zones 1 to 7 are shown as outlined by 1974. The individual showings of zones 8A and 8B were tied in to Roscoe's map by by compass-tape and compass triangulation survey. Zone 8C was not mapped, and the position and outline shown are diagrammatic only. North of the creek the writer made observations along the logging road and along traverses to and around zones 9 to 11.

The north part of the area thus mapped is underlain by grey to white crystalline limestone, and the central and south part is underlain mainly by intrusive breccia. Several bodies of limestone occur in the central and south part, and show differing relations with the breccia. The primary fragments are fine grained and dark greyish green in colour, resembling andesite; some contain amygdules. This andesitic rock was successively intruded by mafic-rich and

mafic-poor diorite. The breccia grades to massive, mesocratic diorite southwest of a line through ~~zones~~ zones 3 and 5, and to massive andesite about the 2,000-foot contour on the west side of the east ridge. A set of long, narrow, fine-grained grey dykes strikes consistently 020 degrees, transects all other rocks, and probably follows late fractures; one dyke is well displayed at the lower bridge. A small body of feldspar porphyry just east of the upper bridge, 200 metres south-southwest of zone 7, is intruded by leucodiorite.

The limestone bodies cannot be shown conclusively to belong to the same formation, but proximity, similar lithology and metamorphic response, and in part similar relations to the intrusions, render this likely. Most of the limestone bodies have been successively intruded by dykes of andesite and leucodiorite, but the dykes are not co-extensive in distribution. The andesite dykes are widespread and form in effect a characteristic part of the limestone lithology. They occur adjacent to zone 10, where diorite dykes are absent, recrystallization of the limestone is mild, and bedding is well preserved. Nearer to the intrusive complex many of the andesite dykes are more or less altered to skarn and some are intruded by dykes of leucodiorite. Southeast of the gravel pit a large diorite dyke, which dips a little more steeply than the hillslope, may intrude the limestone directly. Two of the limestone bodies west of Renfrew Creek contain no diorite dykes and their external contacts are not exposed. The body containing zones 5 and 6, however, appears to be extensively cut up by diorite. The larger body to the southeast appears, in part at least, to rest on the intrusive breccia without being disrupted by it. The southwest contact is well exposed at Granite Main Line, where fingers and tongues of leucodiorite penetrating the andesitic rock terminate abruptly at a 20-cm rind of massive garnetite lying against the limestone. On a branch road above, a small dragfold in the limestone near the southwest contact indicates that the limestone

overlies the breccia. Farther north on Granite Main Line, andesite dykes in the limestone are in part altered to skarn and intruded by dykes of leucodiorite. Drilling through and around zone 1 found a small body of limestone which is not exposed at surface; its origins are speculative.

It is likely that, prior to diorite intrusion, andesite underlay the limestone as well as intruding it:-

(1) The andesite in the breccia is too abundant to be accounted for by small, scattered dykes, even should efficient mechanisms be postulated for removal of the limestone.

(2) Near the 2,000-foot contour andesite is exposed for 250 metres along a road south from the main body of limestone. This expanse is far larger than that of any demonstrable dyke.

(3) The south body of limestone is not ~~non-conformable~~ unconformable on the breccia, but it appears to rest on it, indicating that it must have rested on the andesite before it was intruded and broken up.

The contact of the main body of limestone with the expansive andesite was excavated, but with inconclusive results. A narrow cave separates the limestone from 20 cm of skarned andesite and a further 15 cm of sheared, rusty andesite. Not only are the contact relationships indeterminate, but it seems likely that the contact has been faulted to some extent.

The geological structure is unclear, though there are indications of folding and faulting. Metamorphic recrystallization has obliterated most of the bedding in the limestone over most of the area, leaving only sporadic thin sandy beds and rare layers of andesite chips. Sandy beds were used to outline a small northwest-plunging dragfold near the southwest contact of the south body of limestone, indicating that the limestone occupies a northwest-plunging syncline. The lobe to the northeast may indicate a second, distorted syncline. This limestone terminates at the creek, and the patches to the northwest may be fragments

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of the synclines disrupted and carried up by the force of intrusion. The northwest trend is discordant to the westerly trend of the main body of limestone. Discordant attitudes in the main body near its south contact suggest at least local intense deformation. Near zone 10 the limestone is well bedded, with an easterly strike and gentle south dip. The overall structure of this main body appears to be a highly assymetric syncline.

The strongest indication of faulting is provided by the gravel pit in the saddle north of Renfrew Creek (size exaggerated in Fig.). The gravel is flanked on the west and underlain by rubbly intrusive breccia which has been closely fractured and healed with thin white veinlets. Limestone is exposed in the southeast corner of the pit and on the ridge to the east. The lowest part of the pit (that is, deepest gravel) lines up with a deep draw trending 215° toward Renfrew Creek. The relation of the intrusive breccia to the limestone farther west has not been determined, and the amount and direction of movement on the fault are unknown. Indications of movement along the south contact of the main body of limestone have been noted already. Numerous gouge and shear zones appear in drill core, but they probably do not represent significant amounts of movement.

The age of the rocks is unknown. Lithologically the limestone closely resembles Quatsino limestone, which also has ubiquitous andesite dykes, and the andesite resembles rocks characteristic of the Karmutsen Formation. The intrusive breccia is probably the gently-dipping roof zone of a batholith or large stock. It appears to resemble the Westcoast Diorites, which have been assigned a Jurassic age (Muller and Carson, 1969; Northcote, 1972).

Eleven mineral zones have been identified for descriptive purposes. Two additional magnetite occurrences were briefly examined and judged too small to be significant. Some further occurrences are reported to be small, and were not seen. The main characteristics of the eleven zones are summarized in the following table:

(insert table)

Where substantial sulphides are present, pyrrhotite generally predominates over pyrite, except in zone 2.

Sub-zones A, B, and C of zone 8 correspond to the company's designation A, B, and C of the North Pit Zone. Sub-zone A comprises massive to thickly disseminated magnetite in skarn, as exposed in a road cut and small quarry. Sub-zone B comprises small magnetite showings on a bedrock knoll and a low ridge to the northeast of it. The three showings on the knoll comprise veins and pockets of massive magnetite in patches of skarn in intrusive breccia; the largest is 4.5 X 6 metres. Considerable local magnetic attraction was found in the saddle between this knoll and the ridge. A fire in 1975 exposed a jumble of small and large angular float and rounded boulders around the rim and sides of the ridge and a slightly dished central area floored by fine overburden. Blocks of limestone, andesite, intrusive breccia, and the two blocks of magnetite indicated on Figure E 75-2 , are juxtaposed. Two large exposures of diorite and intrusive breccia may be projections of bedrock, but most of the ridge appears to have been transported by some form of mass movement. A glacial end moraine cannot be ruled out, but a large concavity in the hillside to the northeast suggests a landslide. The occurrence shown on the north nose of this ridge consists of pyrite and bornite disseminated in a transported block of limestone. Sub-zone C consists of several poorly-exposed magnetite showings in the logged-off hillside.

Zone 9 is a body of almost pure magnetite emplaced directly in the limestone. It is exposed over an area of about 8 by 15 metres, but high positive and negative magnetic anomalies over adjacent overburden indicate that it may be more extensive. Magnetite pebbles and float continue uphill almost to the crest of the ridge. About 60 metres northeast of zone 9 a vein of massive magnetite 50 centimetres wide dips 70° southwest in the limestone; the exposed length is a few metres. Southwest of zone 9 a 120-centimetre lens of massive magnetite dips 70° east-northeast.

Zone 10 is a narrow zone of outcrops of mostly massive magnetite trending at a small angle to a creek gully tributary to West Hemmingsen Creek. Downslope it appears to finger out among andesite dykes, but mostly the walls appear to be limestone. The width appears to range from 3 to 15 metres, over a length of inferred continuity of 75 metres. Upslope the ground is mostly covered, but a small magnetite showing occurs 200 metres above.

Zone 11 occupies a long wedge-shaped ridge between a creek canyon on the west and a shallow creek gully on the east. It consists largely of garnetite, which contains pockets and narrow bands of magnetite. The upper part has an estimated width of 45 metres, and the wedge was reported to have a slope length of 120 metres.

Province of
British Columbia

Ministry of
Energy, Mines and
Petroleum Resources

Parliament Buildings
Victoria
British Columbia
V8V 1X4

14 August 1980

The Manager
North West Trust
1113 Blanshard St.
Victoria, B.C.
V8W 2H7

Dear Sir:

Please deposit the attached cheque in accordance with the details given below.

Yours very truly,

A. Sutherland Brown, Ph.D., P.Eng.
Chief Geologist, Geological Division
Mineral Resources Branch

ASB:nhc

NAME:	G.E.P. Eastwood	
CHEQUE NO.	8569399	8569142
DATE:	11 Aug.	11 Aug.
AMOUNT:	$555.45	$206.25
ACCOUNT NO:	3739	

c.c. to: P. Eastwood

5'	× 1.12 =	5.60	
5'	× 1.67 =	8.35	
5'	× 1.24 =	6.20	
5'	× 1.28 =	6.40	
7'	× 0.88 =	6.16	
27'		32.71	

5'	× 48.39 =	242
5'	× 51.0 =	254
5'	× 42.77 =	214
5'	× 52.41 =	262
7'	× 32.33 =	226
27'		1198

Av. Cu = 1.21%

Av Fe = 44.4%

Area of 7-6 sec'n = 27 × 50' = 1350 □'

Vol. of W block of lower lens = 50 × 1350 cu ft.

At 44.4% Fe T. F. is 8.1

$\frac{50 \times 1350}{8.1}$ = 6750 short tons

5'	× 1.00 =	5.00	
5'	× 1.20 =	6.00	
5'	× 1.12 =	5.60	
5'	× .23 =	1.15	
5'	× .76 =	3.80	
5'	× .56 =	2.80	
7'	× .84 =	5.88	
37'		30.23	

5'	× 23.44 =	117.4
5'	× 14.39 =	72.0
5'	× 19.67 =	98.3
5'	× 0 =	00.0
5'	× 0 =	00.0
5'	× 0 =	00.0
7'	× 34.92 =	174.6
37'		462.3

Av. Cu = 0.82%

Av Fe = 12.5%

5'	× 1.72 =	8.60
42'		38.83

Av. Cu = 0.925%

Area of 2-1 sec'n = 37 × 50' = 1850 □'

Vol of middle block of lower lens = 20 × 1850 cu ft.

At 12.5% Fe T. F. is 10.9

$\frac{20 \times 1850}{10.9}$ = 3400 short tons

Area of 2-1 sec'n = 1850 □'

" " DDH 8 " = 25 □'

Vol. of pyramidal block = 1/3 × 1850 × 33 = 1850 × 11 cu. ft.

Take T. F. at 11.0

$\frac{1850 \times 11}{11}$ = 1850 short tons.

8'	× .33 =	2.64	
7'	× .36 =	2.52	
5'	× .34 =	1.70	
5'	× .46 =	2.30	
6'	× .30 =	1.80	
5'	× .24 =	1.20	
36'		12.16	

8'	× 49.85 =	395
7'	× 46.78 =	327
5'	× 38.35 =	192
5'	× 44.10 =	220
6'	× 38.25 =	230
5'	× 40.47 =	202
36'		1566

Av. Cu = 0.34%

Av. Fe = 43.5%

Area of 7-6 sec'n = ½ bh = $\frac{28 \times 64}{2}$ = 896 □'

Vol. of w block of middle lens = 50 × 895 cu ft.

At 43.5% Fe T. F. is 8.27

$\frac{50 \times 895}{8.27}$ = 5420 short tons

5'	× .52 =	2.60	
5'	× .23 =	1.15	
8'	× .48 =	3.84	
5'	× 1.32 =	6.60	
5'	× .52 =	2.60	
5'	× .50 =	2.50	
5'	× 1.12 =	5.60	
38'		24.89	

5'	× 12.48 =	62
5'	× 19.62 =	98
8'	× 28.37 =	142
5'	× 28.48 =	142
5'	× 18.92 =	95
5'	× 15.19 =	76
5'	× 0 =	0
38'		615

Av Cu = 0.655%

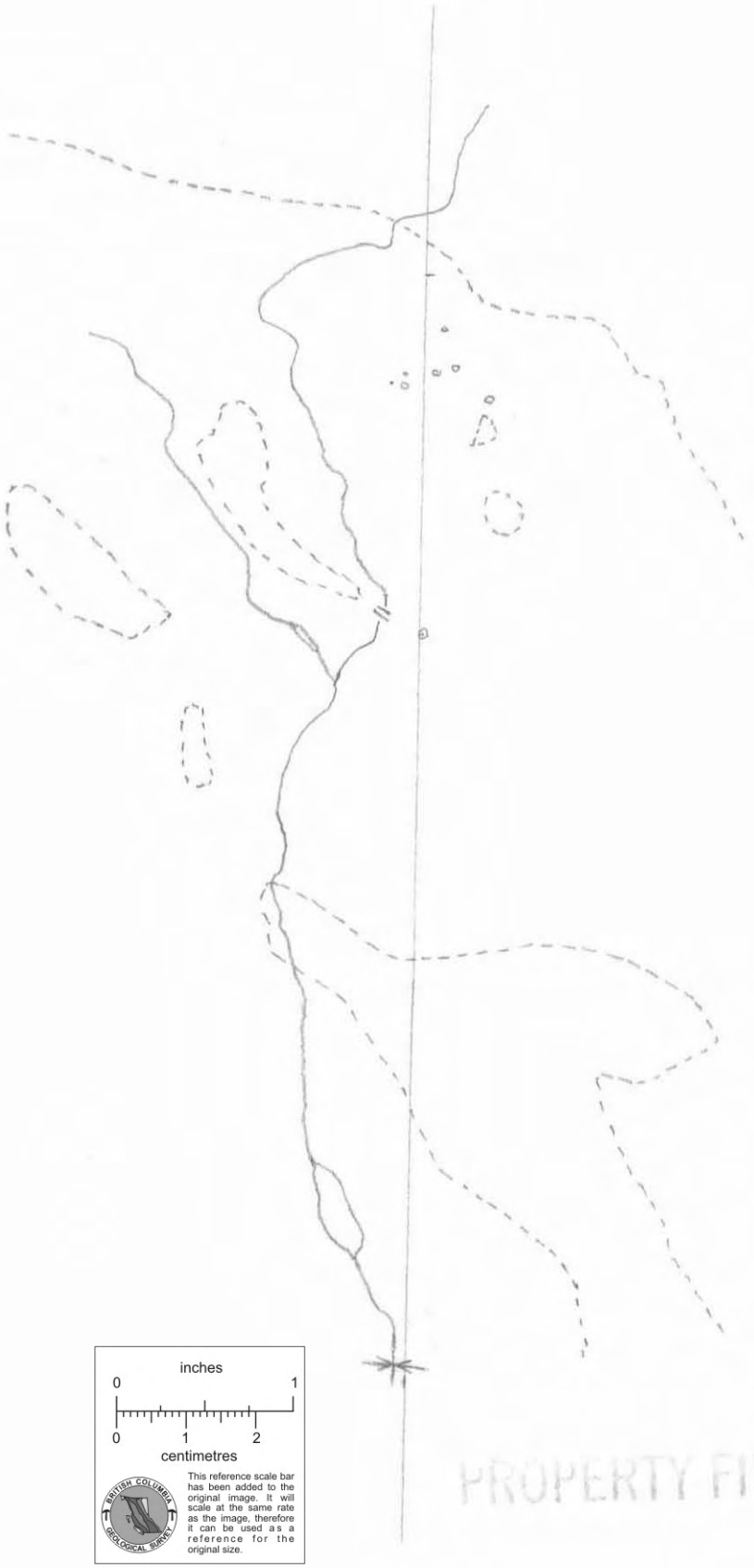
Av. Fe = 16.2%

Area of 2-1 sec'n = $\frac{35 \times 38}{2} + \frac{35 \times 38}{2}$ = 35 × 38 = 1330 □'

Vol. of middle block = 1330 (20 + 17.5)

At 16.2% Fe T. F. is 10.13

$\frac{37.5 \times 1330}{10.13}$ = 4920 short tons



inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

1" = 1,000'
Apr. '76