AE 74

(3)

Noranda Exploration (U.K.) Limited.

Project 167A: Kilfinan/~~Glendaruel Stage 1~~. Scotland

Work carried out between 7th Jan and 12th Feb 1972

Introduction

The proposed diamond drilling in this project area was set out in detail in the "Application for financial assistance" accepted by the D.T.I. on 22nd November 1971. All four boreholes were drilled: a total of 1000 feet of drilling.

Summary of Mineralization Found

Small amounts of pyrite and chalcopyite occur in the metamorphosed basic sills intersected in the upper parts of K1 and K4 (possibly the same intrusion). The fault zone intersected in K3 would appear to be devoid of sulphides. A $\frac{1}{8}$ th inch vein of malachite in limestone (at 156' in K1) is the only secondary copper mineralization in the cores.

The following items are attached:-

a. plan showing borehole locations, 6" to 1 mile. } in pocket

b. borehole sections, 1:500 feet.

c. core log sheets for boreholes K1 to K4,

d. sludge sample analyses for K3,

e. core sample analyses for K1 and K4.

R.H. Rastall.

R.H. Rastall

Noranda - Kerr Limited

Diamond Drill Core Log Sheet

D.D.H.No.K1
Prospect 1671A: Kilfinan/~~Glendaruel Stage 1~~. Scotland
Location Line 3 680' E., NR 920 758
Collar elevation about 180' O.D.
Final depth 300'
Completed 21/1/72.

Direction 120° T.
Inclination - 60°

MAIN UNITS FROM	TO	DEPTH	CORE DETAILS ROCK TYPE ETC
0	4		Overburden
4'	119'5"		Epidiorite. Medium to coarse grained hornblende, biotite, plagioclase metamorphosed intrusive with numerous fractures and veins (quartz, calcite, chlorite, hematite, pyrite)
		4' - 12'	Minor chalcopyrite, disseminated and in fine fractures.
		115'- 119'5"	Chilled, fine-grained margin to sill.
		32" - 37' 6"	Shear zone plus veins plus pyrite and chalcopyrite 50° to core axis.
		91'	Irregular vein with grains of silver metallic mineral(?) molybdenite.
		107' - 119'5"	0.1% pyrite and chalcopyrite, disseminated and in fine fractures.
119'5"	147'5"		Loch Tay Limestone. Well-bedded impure granular linestone with 0.1% pyrite disseminated, on micaceous partings and in fine fractures.
		119'5"	Contact concordant 50° to core axis
		133'2" - 134'11"	Calcarcous grit, quartz grains cemented with granular calcite, bedding 60° to c.a.
147'5"	155'9"		Epidiorite. Highly altered, contorted, amphibole, chlorite, epidote etc (?) intrusive with quartz, calcite, hematite veins.

167A : K 1

MAIN UNITS			CORE DETAILS
FROM	TO	DEPTH	ROCK TYPE ETC
155'9"	203'7"		Loch Tay Limestone. Fine -grained impure limestones, well bedded with sericite and chlorite partings, some quartz, increasing with depth.
		155'9"- 165'9"	Veins of coarse calcite(plus minor quartz) in highly contorted zone.
		156'	⅛" vein of malachite.
		178'1"- 178'8"	Pale green tuff band. Bedding 65° to core.
		183'4"-183'6"	Pale green tuff.
		184" -187'11"	Pale Green, banded calc-chlorite tuff.
		188'10"-191'2"	Pale Green tuff.
203'7"	300'5"		Green Beds Fine to medium grained quartz, sericite, chlorite, epidote et schists with minor calcite, hematite, variable mineralogy and strongly foliated. Metamorphosed volcanic tuffs with strong quartz (calcite) veining. No sulphides.

Core Recovery	98.5%
Average footage per run	7.06 feet.

R.H.Rastall

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Diamond Drill Core Log Sheet

D.D.H.No. K2
Prospect 1671A Kilfinan/~~Glendaruel Stage 1~~ Scotland
Location Line 3 825' E., NR 921 758.
Collar elevation about 175' O.D.
Final Depth 200'
Completed 26/1/72

Direction 120° T.
Inclination -60°

MAIN UNITS FROM	TO	DEPTH	CORE DETAILS ROCK TYPE ETC.
0	14'2"		Overburden
14'2"	53'10"		Loch Tay Limestone. Fine-grained, well bedded impure limestone with sericite and chlorite partings, calcite veins with minor pyrite and hematite.
		45'9" - 49'10"	Pale green tuff. Bedding 50° to core axis.
		49'10" - 50' 7"	Fracture zone, calcite veining plus hematite.
53'10"	105'2".		Epidiorite. Fine to medium grained, amphibole, biotite, plagioclase, chlorite rock, probably intrusive, quartz and calcite veins, some hematite no sulphides.
		90'7" - 93' 6"	Fracture zone, quartz, calcite, chlorite
105'2"	111'2"		Loch Tay Limestone. Fine-grained, well-bedded impure limestone, with sericite, chlorite partings. Rare pyrite. Bedding 75° to core.
111'2"	200'4"		Green Beds. Fine to medium grained quartz, sericite chlorite, schists, minor biotite, epidote etc, strongly foliated. Quartz veins.
		158'1" - 162'2"	Fracture zone, massive vein quartz.

Core recovery 97.4%

Average footage per run 7.8 feet.

Noranda - Kerr Limited

Diamond Drill Core Log Sheet.

D.D.H.No.K3
Prospect 167AA Kilfinan/~~Glendaruel Stage 1~~ Scotland
Location Line 3.5S 40'E., NR 921759
Collar elevation about 180' O.D.
Final depth 250'
Completed 2/2/72

Direction 130°T.
Inclination - 60°.

MAIN UNITS			CORE DETAILS
FROM	TO	DEPTH	ROCK TYPE ETC
0	16'6"		Overburden
16'6"	32'1"		Loch Tay Limetstone. Fine-grained well bedded, grey, impure, limestone with sericite partings and chloritic tuffaceous bands.
		25'4" - 27'6"	Breccia zone with calcite ar hematite.
32'1"	45'7"		? Epidiorite. Dark grey, fine-grained basaltic rock bands of calcite and hematite.
45'8"	49'8"		Loch Tay Limestone. As abo
		47'8" ' 48'5"	Chlorite tuff band.
49'8"	58'11"		? Epidiorite. Basaltic rock as above, probably intrusive.
58'11"	78'11"		Loch Tay Limestone. Light grey and pink, fine to coarse grained, well-bedded, impure limestone, micaceous partings, iron staining.
		63'4" - 63'9"	Pale Green, very fine-grained siliceous rock with less than 0.1% pyrite Bedding 80° to core.
		78'	Bedding 60° to core axis

MAIN UNITS FROM	TO	DEPTH	CORE DETAILS ROCK TYPE ETC
78'11"	171'11"		Epidiorite. Fine to coarse-grain pyroxene (hornblende), biotite, plagiodase intrusive sill with some chlorite calcite and minor quartz.
		78'11" - 80'9"	Fine grained chilled margin.
		152' - 171'11"	Fine grained chilled margin.
171'11"	178'6"		Loch Tay Limestone. Grey and pink, medium-grained impure limestone. Bedding 70° to core.
		177' - 178'6"	Fractured and contorted limeston
178'6"	186'2"		Fault Breccia. Fragments of limestone and mica-schist cement with calcite, quartz, minor hemati refractured and cemented more th once. Steep, E-W dextral wrench fault.
186'2"	250'4"		Green Beds. Fine to medium-grain quartz sericite schists with biotite, chlorite, epidote etc. and quartz veins.
		186'2" - 190'5"	Fractured and contorted zone.
		204' - 206'	Fracture zone.
		214'6" - 216'4".	Breccia zone with vein quartz.

Core recovery 99.3%

Average footage per run 6.5 feet

Noranda - Kerr Limited
Diamond Drill Core Log Sheet

D.D.H.No.K.4
Prospect 1671A Kiffinan/~~Glendaruel - Stage 1~~. Scotland
Location Line 8, 1300' E. NR 930770
Collar elevation about 320 O.D.
Final depth 250'
completed 9/2/72

Direction 120°T
Inclination - 60°

MAIN UNITS			CORE DETAILS
FROM	TO	DEPTH	ROCK TYPE ETC
0	1'6"		Overburden
1'6"	47'5"		Epidiorite. Coarse-grained hornblende biotite, plagioclase intrusive sill, grain size decreasing to contact, with rare grains of pyrite and chalcopyrite.
47'5"	102'8"		Loch Tay Limestone. Grey, medium-grained impure limestone and schistose limestone with sericite/chlorite (quartz) rich bands, pyrite towards both contacts (less than 0.5%) Fracture zones with strong calcite and quartz veining.
		47'5"	Chalcopyrite on contact (less than 0.1%)
		71'11"	Bedding 70° to core axis.
102'8"	129'4"		Epidiorite. Fine-grained, green schistose igneous rock, chlorite? amphibole etc.
		112'6" - 115'5"	Fracture zone with vein quartz.
129'4"	142'8"		Loch Tay Limestone. Pale green to grey medium-grained impure limestone with biotite, sericite chlorite rich bands and partings, bedding 80° to core, 0.1% pyrite & some hematite.

167A : K4

MAIN UNITS		CORE DETAILS	
FROM	TO	DEPTH	ROCK TYPE ETC
142'8"	145'7"		? Epidiorite. Dark greenish grey, fine-grained basaltic rock.
145'7"	199'4"		Loch Tay Limestone. Massive medium-grained limestone with occasional mica partings, 0.1% pyrite near upper contact, bedding 85° to core then 20° to core at lower contact.
		154'2" - 157'9"	Fracture zone with massive vein quartz.
199'4"	213'4"		Epidiorite. Medium to coarse grained amphibolite (intrusive), coarser towards base.
213'4"	241'2"		Loch Tay Limestone. Fine medium grained impure limestone with micaceous bands. No Sulphides.
213'2"	250'		Green Beds. Quartz, sericite, biotite chlorite etc. schists with strong foliation 25° to core axis.

Core recovery over 99%
Average footage per run 6.6.feet.

Noranda Exploration (U.K.)Ltd.,

Sludge Samples: D.D.H.No.K3: Kilfinan 1671A.

DEPTH		VALUES IN PARTS PER MILLION.		
FROM	TO	COPPER	LEAD	ZINC
15'	25'	94	23	59
25	35'	69	30	77
35	45'	125	27	83
45'	55'	45	30	50
55'	65'	55	28	40
65'	75'	53	29	45
75'	85'	55	25	56
85'	95'	45	25	42
95'	105'	46	25	41
105'	115"	53	26	57
115'	125'	72	27	60
125'	135'	80	23	45

Water return lost at 135'

Samples ground to - 80 mesh, sample attack with concentrated HNO_3

Analysed by Noranda Exploration Ireland Limited: Sheet No. 52A, 11/5/72

Noranda Exploration (U.K.) Ltd.

Core Samples: Boreholes K1 and K4: Kilfinan 1671A

D.D.H.No.	DEPTH		VALUES IN PERCENTAGES	
SAMPLE NO	FROM	TO	COPPER	LEAD
K1				
71/1/1	4'	8'	0.03	< 0.01
71/1/2	8'	12'	0.03	< 0.01
71/1/3	34.8'	36.8'	0.25	< 0.01
71/1/4	107'	111'	0.04	< 0.01
71/1/5	111'	115'	0.03	< 0.01
71/1/6	115'	119.4	0.02	< 0.01
71/1/7	119.4	123.0	< 0.01	< 0.01
71/1/8	151.75'	155.75	0.02	< 0.01
71/1/9	155.75'	158.75'	0.01	< 0.01
K4				
71/4/1	44.4'	47.4	0.02	< 0.01
71/4/2	47.4'	50.4	0.02	< 0.01

Analysed by Alfred H. Knight Ltd.,

Reference: 501236, 12/5/72.

AE 74

NORANDA EXPLORATION (U.K.) LIMITED

Project 1671B: Glendaruel, Section, Loch Fyne ,

Argyllshire, Scotland.

Work carried out between 6th April and 31st July, 1972.

Introduction

The "Application for financial assistance for mineral exploration" accepted by D.T.I. on 19th June and applying to expenditure incurred after 6th April, was for four diamond drill holes to depths totalling about 1,400 feet Details of land ownership, geology and mining history in the area were set out in the earlier application for work on Project 1671A. In the program now reported, boreholes K5 and K6 were drilled to depths totalling 628 feet, at which point it was decided not to continue. Ten core samples and 33 sludge samples were sent away for analysis

A brief examination was made of outcrops of the serpentinite intrusions, and 11 samples were analysed for copper, nickel, lead and zinc.

Summary of Mineralization Found.

In the core from K5 and K6 pyrite occurs commonly as thin flakes in schists and on partings in the argillaceous bands of limestones. It also occurs in veins with quartz, calcite, chlorite and hematite, and occasionally as fine disseminations. Chalcopyrite occurs with pyrite but is much less common. In the epidiorites chalcopyrite appears as inconspicuous scattered grains and as a minor constituent of some veins. At 312 feet in K6 it occurs disseminated and in vein form in argillaceous limestones near the epidiorite contact. Much of the iron sulphide in K6 is thought to be marcarite.

Finely disseminated iron sulphide is found extensively in outcrops of the main serpentinite mass. Copper minerals occur in very small quantities; chalcopyrite and malachite at one locality and small flakes of native copper in several places.

continued.....

The following items are attached;-

A.		core log sheets for boreholes K5 and K6
B.		sludge sample analyses for K6
C.		core sample analyses for K5 and K6
D.		rock sample analyses from the serpentinite.
E.	Figure 1	plan showing geology, I.P. anomalies and borehole locations at 6 inches to 1 mile.
F	Figure 2	borehole section of K5
G	Figure 3	borehole section of K6
H	Figure 4	plan of serpentinite intrusions showing prospecting traverses and sample points at 6 inches to 1 mile.

NORANDA EXPLORATION (U.K.) LTD.

Diamond Bill Core Log Sheet -

D.D.H. No. K5.

Prospect 1671B: Glendaruel, Scotland.

Location: Line LF 13, 1950 feet W. NR984873

Collar elevation: ± 500 feet O.D.

Final Depth: 150 feet Direction: Grid E 130° mag.

Started 2/6/72 Inclination: -45°
Completed 7/6/72

MAIN UNITS		DEPTH	CORE DETAILS.
From	To		ROCK TYPES, ORE MINERALS ETC.
0	10.3'		Overburden, largely Boulder Clay.
10.3'	27.1'		Quartz biotite-schist: Light grey schist with thin calcite veins and <0.1% pyrite.
		27.2'-27.4'.	Fault gouge 90° to core axis.
27.4'	40.8'		Loch Tay Limestone. Light grey marble with argillaceous bands (biotite), serpentine.
		30.6'-31.8'	calcareous biotite schist.
		39.8'-40.8'	quartz grains in marble & <0.5% pyrite.
40.8'	106.3		Epidiorite. Fine to coarse grained, dark green, plagioclase, hornblende, biotite, chlorite rock, minor pyrite, massive.
		40.8'-43.0'	Fine-grained chilled margin with <0.1% pyrite and <0.1% chalco-pyrite. Fracturing, quartz calcite chlorite veins with pyrite and rare chalcopyrite disseminated throughout.
		10.0'-106.3'.	Fine-grained chilled margin.
106.3'	150.3'		Loch Tay Limestone. as above, more or less argillaceous with pyrite, generally <0.5%.

Core recovery 90.8%

Average footage per run 4.8'.

R.H. Rastall

R.G. Smith.

NORANDA EXPLORATION (U.K.) LTD.

Diamond Drill Core Log Sheet.

D.D.H. No. K6

Prospect 1671B: Glendaruel, Scotland

Location: Line LF25, 900 feet W. N5019986.

Collar elevation: $\pm$350 feet

Final Depth: 478 feet. Direction: Grid E, 130° mag.

Inclination: -55°

Started 14/6/72
Completed 25/6/72

MAIN UNITS		DEPTH	CORE DETAILS.
From	To		ROCK TYPES, ORE MINERALS ETC
0	10.0'		Overburden : Boulder Clay
10.0	19.0'		Overburden : Weathered bedrock
19.0	186.9		Quartz-mica schist: quartz, chlorite, sericite (?) schist with numerous fractures and veins. Sulphide minerals in veins (quartz /calcite) and disseminated throughout, marcasite(?) up to 1%, pyrite less than 1% and rare chalcopyrite.
186.9'	244.6'		Dolerite. Fine to medium-grained dark grey Tertiary dolerite, chilled margins 0.1 feet thick, thin calcite veins with pyrite $<$0.5%.
244.6'	277.6		Quartz mica schist, as above, with calcite veins & $<$0.1% pyrite & $<$0.1% marcasite.
277.6'	281.0'		Dolerite, as above.
281.0'	288.2'	287.5'	Quartz mica schist, as above. Calcite veinlets with pyrite & rare chalcopyrite.
288.2'	289.4'		Dolerite vein, as above
289.4'	310.8'	310.3'-310.8'	Quartz mica schist, as above, 0.1% pyrite. Fault gouge.

D.D.H. No. K6 (continued)

MAIN UNITS		DEPTH	CORE DETAILS.
From	To		ROCK TYPES, ORE MINERALS ETC
310.8'	316.3'	311.9'-312.7'	Loch Tay Limestone. Grey, granular, medium-grained marble with schist bands. 5% disseminated pyrite and chalcopyrite with 0.05' disordant vein chalcopyrite.
316.3'	320.5'		Epidiorite: plagioclase, hornblend, chlorite rock with distinct foliation and <0.1% pyrite plus chalcopyrite disseminated.
320.5'	360.0'		Loch Tay Limestone, as above with quartz/calcite veins and argillaceous bands containing films of pyrite (up to 1%).
360.0'	391.9'		Epidiorite, as above plus biotite, fine to coarse grained, massive. Felspars largely sericitized (?) quartz/calcite veins with pyrite, rare crystals of chalcopyrite, chloritic shear zone with pyrite.
391.9'	424.4'	391.9'-400.6'	Loch Tay Limestone, as above with pyrite, chalcopyrite (?) and marcasite (?) on shaley partings. Frequent shear planes & calcite/quartz veining. Both contacts faulted. Fracture zone, brecciated, contorted bedding.
424.4'	457.4'		Epidiorite, as above, chilled margins, <0.5% pyrite plus chalcopyrite mainly in shears and veins.
457.4'	478.0'		Loch Tay Limestone, as above with pyrite only on shaley partings.

Core recovery about 95%
Average footage per run: 5 feet.

R.G. Smith
R.H. Rastall.

NORANDA EXPLORATION (U.K.) LTD.

Sludge Samples: D.D.H No. K6: Glendaruel 1671B

DEPTH		COPPER p.p.m.		LEAD p.p.m.		ZINC p.p.m.		NICKEL p.p.m.	
From	To		Repeat.		Repeat		Repeat.		Repeat
0'	10'	26		20		74		45	
10'	20'	106		31		118		68	
20'	30'	118		111		295		105	
30'	40'	88		75		120		96	
40'	50'	57		36		84		65	
50'	60'	21		10		17		24	
60'	70'	73		47		55		120	
70'	80'	52		52		57		106	
80'	90'	84		740		1,870		108	
90'	100'	52		235		500		42	
100'	110'	133		1,020		1,130		127	
110'	120	26		63		76		32	
120'	130'	68		600		253		73	
130'	145'	25		83		56		20	
140'	150'	80	72	100	71	91	130	98	81
160'	170'	420		1,150		1,400		142	
170'	180'	94		76		147		95	
180'	190'	117		82		241		76	
190'	200'	76		53		140		60	
200'	210'	200		31		20		13	
210'	220'	21	18	24	17	22	18	18	15
220'	250'	17		21		16		11	
250'	270'	14		37		35		8	
270'	290'	23		43		74		8	
290'	310'	32		28		61		15	
310'	330'	520		125		360		64	
330'	350'	145		103		189		48	
350'	370'	700		209		329		82	

continued.....

Sludge Samples continued.

DEPTH		COPPER		LEAD		ZINC		NICKEL	
From	To		Repeat		Repeat		Repeat		Repeat.
370'	390'	230		64		100		69	
390'	410'	340		176		418		81	
410'	430'	210		111		217		72	
430'	450'	250		78		119		81	
450'	478'	128	160	63	63	106	93	54	58

Samples ground to -80 mesh.

Analysed by Noranda Exploration Ireland Ltd: sheet nos. 70A and 71A, 17/7/71.

NORANDA EXPLORATION (U.K.) LTD.

Core Samples: D.D.H. Nos. K5 & K6: Glendaruel 1671B.

SAMPLE No.	FROM	TO	COPPER IN %.
K5 A	35.8'	40.8'	0.01
B	73.0'	78.0'	0.04
C	78.0'	83.0'	0.05
D	83.0'	88.0'	0.05
E	128.6'	133.6'	$<$0.01
K6 F	308.0'	310.8'	0.06
G	310.8'	313.3'	0.81
H	313.3'	316.3'	0.02
I	316.3'	319.3'	0.03
J.	339.0'	344.0'	0.03

Analysed by Alfred H. Knight Ltd., reference 1514, 1/8/72.

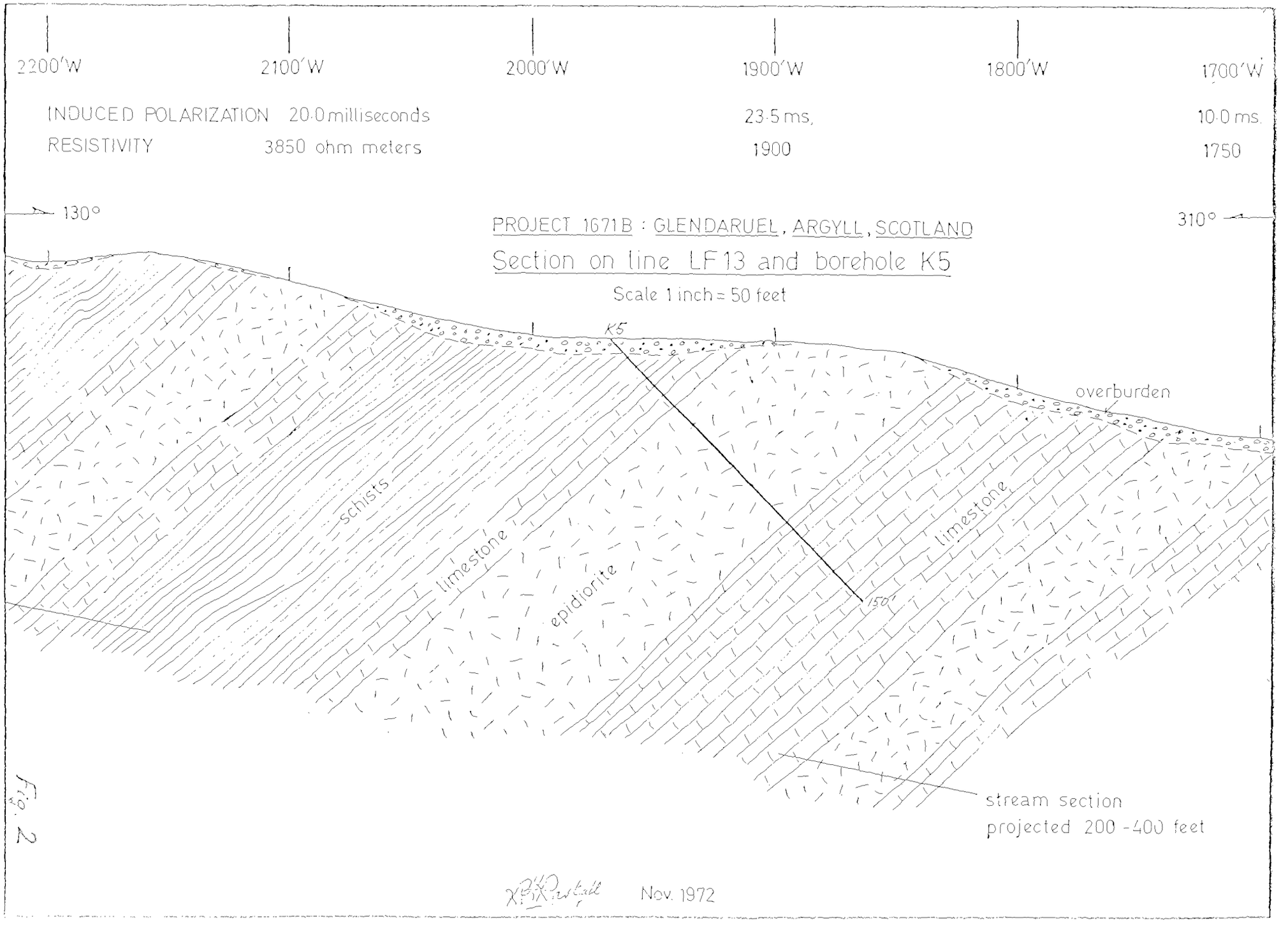
NORANDA EXPLORATION (U.K.) LIMITED.

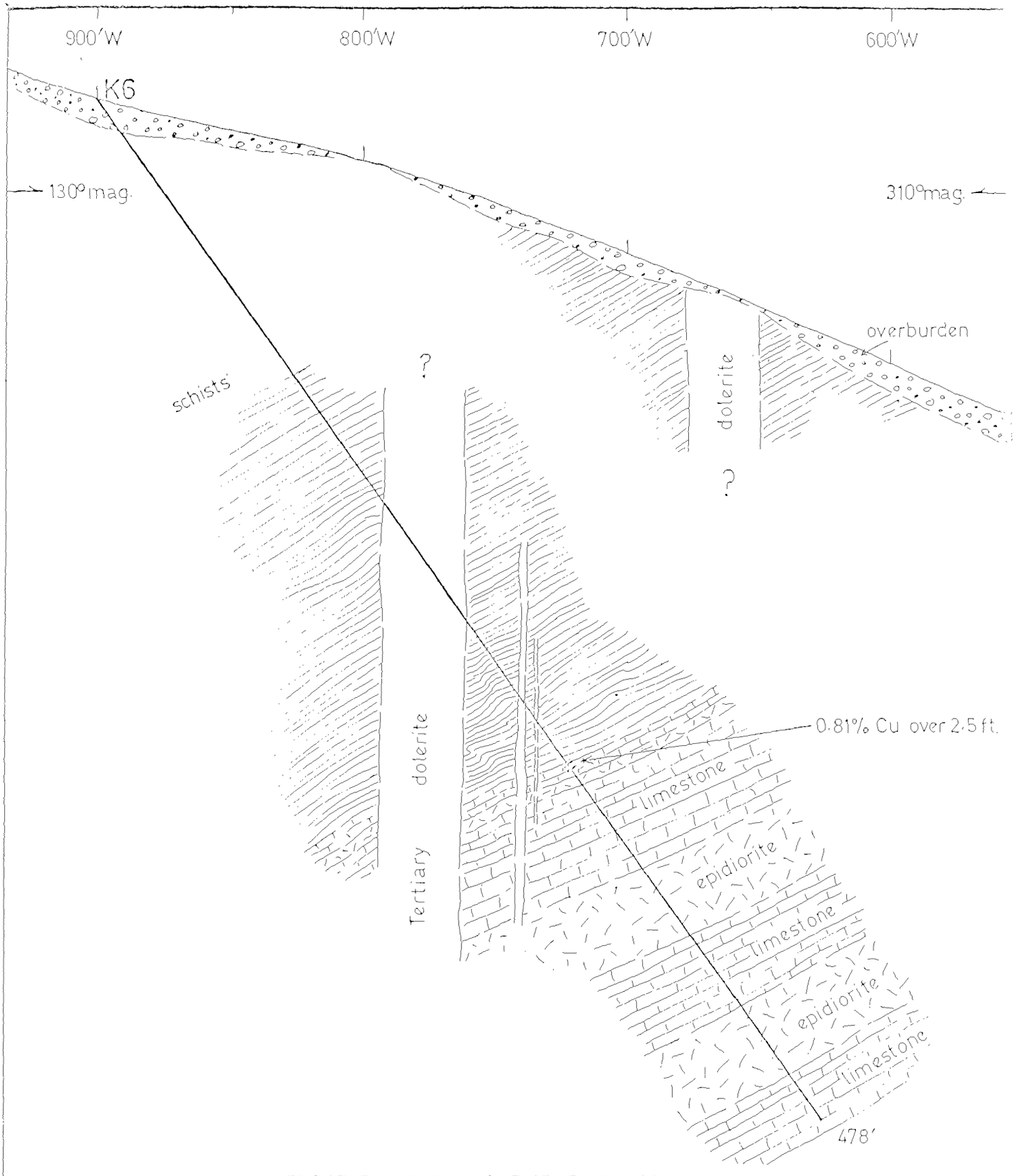
Rock Samples from Ultrabasic Intrusions: Glendaruel
1671B.

SAMPLE NO.	ANALYSES IN P.P.M.				REMARKS
	Nickel	Copper	Lead	Zinc.	Mostly Serpentinite
GD 2	500	250	23	35	Minor dissem. Fe sulphide
GD 3	700	1,250	10	40	Fe sulphide (rare flakes of native copper)
GD 4	500	1,120	10	20	as GD 3, no visible copper.
GD 5	100	180	6	14	Tremolite rock, minor Fe sulphide
GD 6	800	36	16	60	minor dissem. Fe sulphide
GD 8	1,200	30	14	23	limonite coated cavities.
GD 10	800	150	13	35	rare native copper flakes.
GD 11	1,500	20	29	50	grey & brown serpentinite.
GD 13	1,200	10	26	40	finely dissem. Fe sulphide
GD 14	1,400	28	27	55	2-3% dissem. Fe sulphide.
GD 16	150	800	16	21	massive tremolite, some calcite, Fe sulphide, malachite stain.

Samples crushed, pulverised and screened to -80 mesh.

Analysed by Alfred H. Knight Ltd., reference W1072, 27/7/72.


2200'W
2100'W
2000'W
1900'W
1800'W
1700'W
INDUCED POLARIZATION 20.0 milliseconds
23.5 ms.
10.0 ms.
RESISTIVITY 3850 ohm meters
1900
1750
130°
310°
PROJECT 1671B : GLENDARUEL, ARGYLL, SCOTLAND
Section on line LF13 and borehole K5
Scale 1 inch = 50 feet
K5
overburden
schists
limestone
epidiorite
limestone
150'
stream section
projected 200 -400 feet
Fig. 2
Nov. 1972



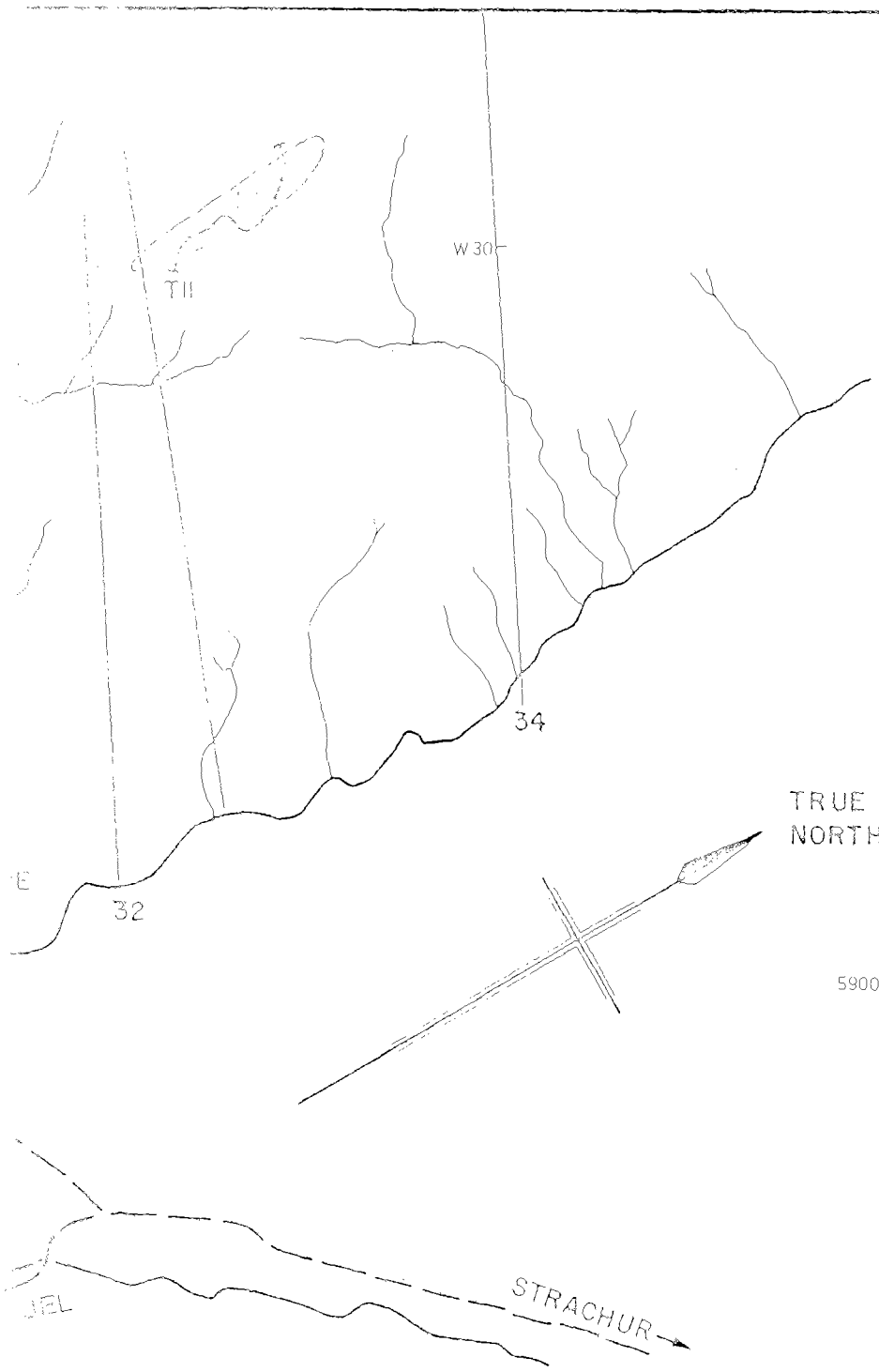
PROJECT 1671B GLENDARUEL, ARGYLL.

SECTION ON LINE LF 25 and BOREHOLE K6.

Scale 1 inch = 50 feet.

Fig. 3

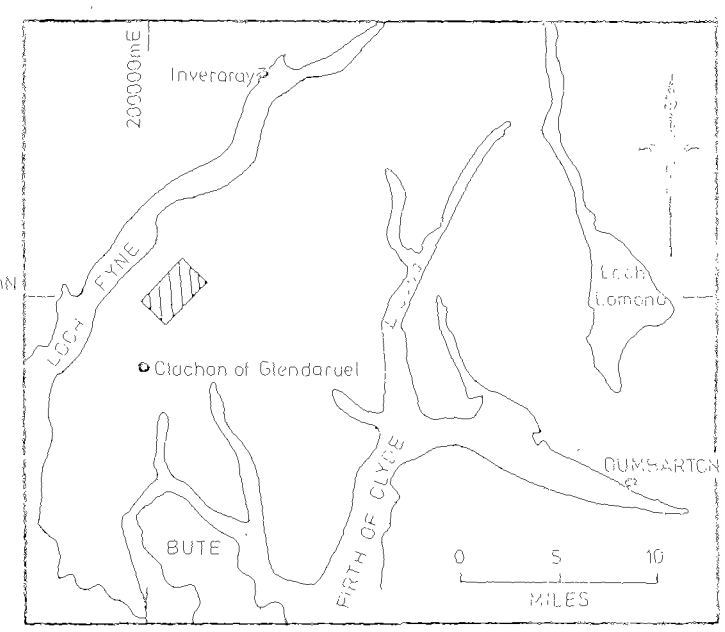
R.H. Rastall Nov. 1972



ANALYSED ROCK SAMPLES

SAMPLE	Ni	Cu	Pb	Zn	ppm
GD 2	500	250	23	30	
GD 3	700	1250	10	40	
GD 4	500	1220	10	20	
GD 5	100	180	3	1	
GD 6	800	36	16	30	
GD 8	1200	30	14	28	
GD 10	800	150	13	35	
GD 11	1500	20	29	30	
GD 13	1200	10	26	40	
GD 14	1400	28	27	53	
GD 16	150	800	16	21	

LOCALITY



KEY

- Serpentinite, ultramafics
- Minor disseminated sulphide
- Trace native copper
- EP peak value
- GD3 Prospecting traverse and sample
- 100ppm Cu contour, soil
- 2000ppm Ni contour, soil
- Diorite dyke

NORANDA EXPLORATION (UK) LIMITED

PROJECT 1671B, GLENDARUEL

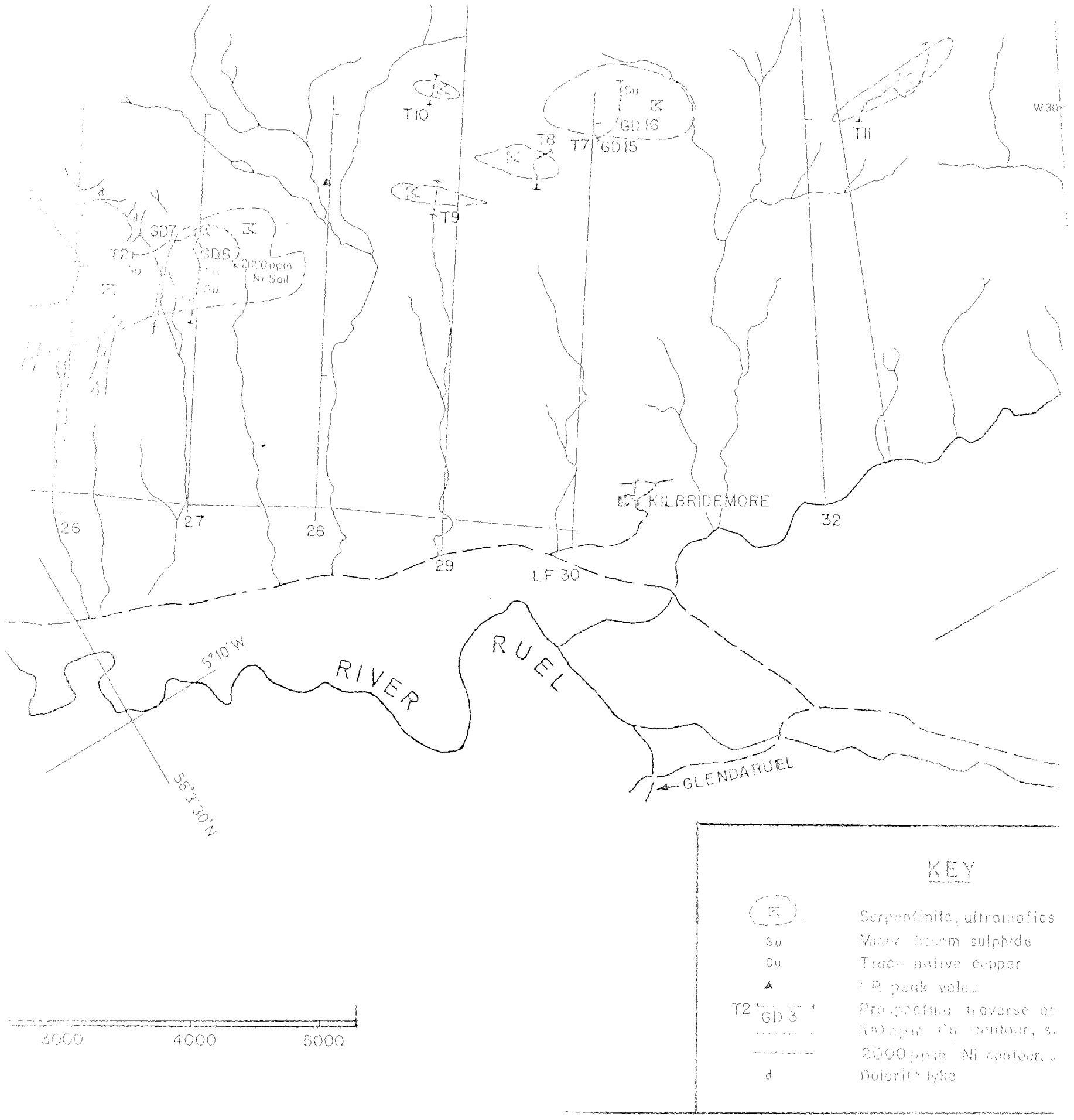
ARGYLL, SCOTLAND

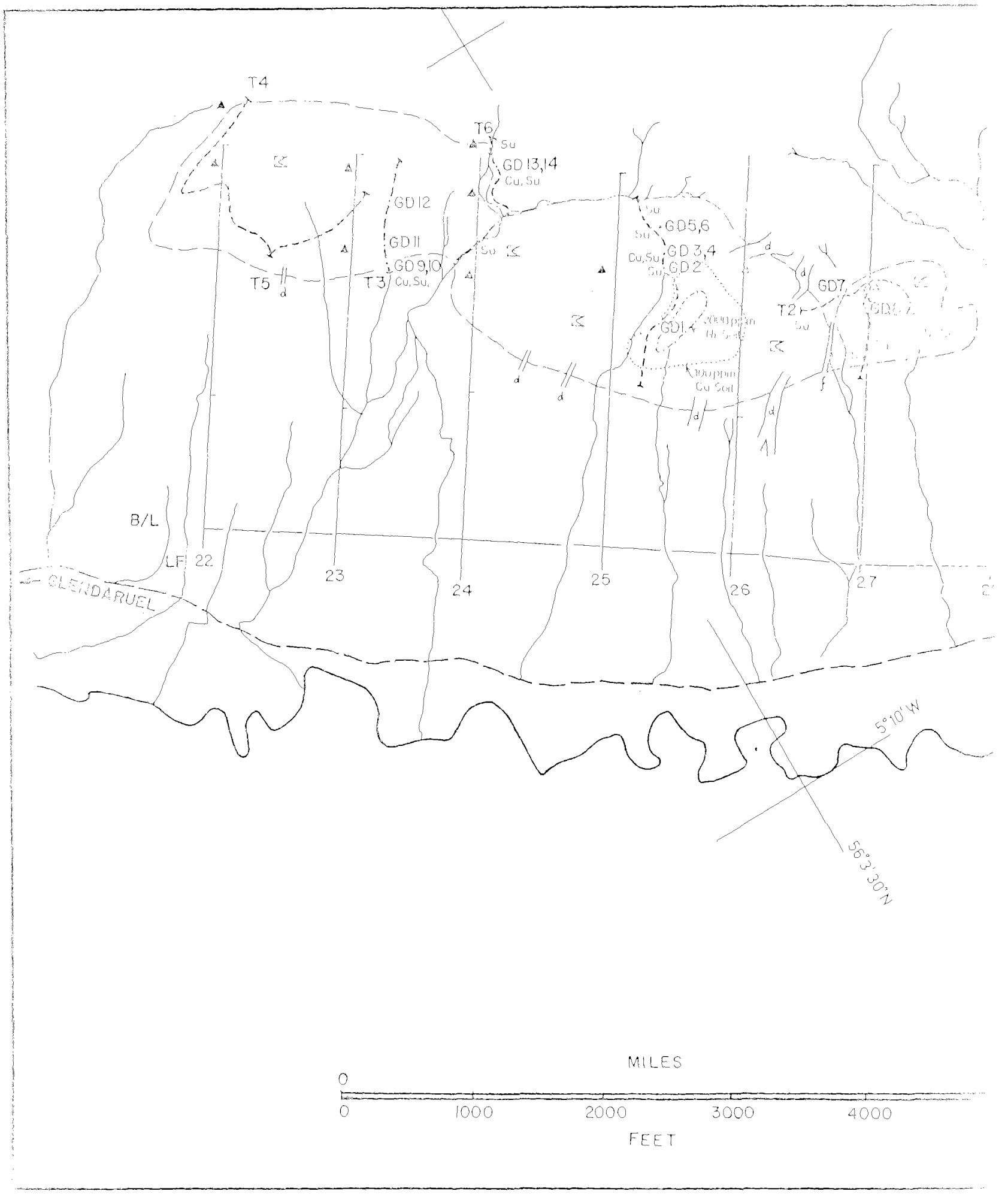
GLENDARUEL ULTRAMAFICS

PROSPECTING TRAVERSES, SAMPLE LOCALITIES AND ROCK GEOCHEMISTRY, Pb, Zn

Author: John G Langlands | Fieldwork: [illegible]

Drawn: N. Flower Date: Oct. 1972


T10
T9
T8
T7
GD15
GD16
Su
T11
W30
GD7
T2
GD6
Cu
Ni Soil
26
27
28
29
LF 30
32
KILBRIDEMORE
5°10'W
RIVER
RUEL
GLENDARUEL
56°30'N
KEY
Serpentinite, ultramafics
Minor stream sulphide
Trace native copper
I.P. peak value
Prospecting traverse or
Copper (%) contour, s
2000 ppm Ni contour,
Dolerite dyke
3000
4000
5000


T4
T6
Su
GD13,14
Cu, Su
GD12
GD11
GD9,10
Cu, Su,
T5
T3
GD5,6
GD 3,4
Cu,Su
Su
GD2
GD7
T2
GD1
B/L
LF 22
23
24
25
26
27
GLENDARUEL
5°10' W
56°3' 30" N
MILES
0
0
1000
2000
3000
4000
FEET

(3)

Noranda Exploration (U.K.) Limited.

Project 1671A: Kilfinan/~~Glendaruel Grage 1~~. Scotland

Work carried out between 7th Jan and 12th Feb 1972

Introduction

The proposed diamond drilling in this project area was set out in detail in the "Application for financial assistance" accepted by the D.T.I. on 22nd November 1971. All four boreholes were drilled: a total of 1000 feet of drilling.

Summary of Mineralization Found

Small amounts of pyrite and chalcopyite occur in the metamorphosed basic sills intersected in the upper parts of K1 and K4 (possibly the same intrusion). The fault zone intersected in K3 would appear to be devoid of sulphides. A $\frac{1}{8}$ th inch vein of malachite in limestone (at 156' in K1) is the only secondary copper mineralization in the cores.

The following items are attached:-

1 ~~a.~~ plan showing borehole locations, 6" to 1 mile. } in pocket

2 ~~b.~~ borehole sections, 1:500 feet.

3 ~~c.~~ core log sheets for boreholes K1 to K4,

4 ~~d.~~ sludge sample analyses for K3,

5 ~~e.~~ core sample analyses for K1 and K4.

R.H. Rastall.

Noranda - Kerr Limited

Diamond Drill Core Log Sheet

D.D.H.No.K1
Prospect 1671A: Kilfinan/~~Glendaruel Stage 1~~. Scotland
Location Line 3 680' E., NR 920 758
Collar elevation about 180' O.D.
Final depth 300'
Completed 21/1/72.

Direction 120° T.
Inclination - 60°

MAIN UNITS FROM	TO	DEPTH	CORE DETAILS ROCK TYPE ETC
0	4		Overburden
4'	119'5"		Epidiorite. Medium to coarse grained hornblende, biotite, plagioclase metamorphosed intrusive with numerous fractures and veins (quartz, calcite, chlorite, hematite, pyrite)
		4' - 12'	Minor chalcopyrite, disseminated and in fine fractures.
		115'- 119'5"	Chilled, fine-grained margin to sill.
		32" - 37' 6"	Shear zone plus veins plus pyrite and chalcopyrite 50° to core axis.
		91'	Irregular vein with grains of silver metallic mineral(?) molybdenite.
		107' - 119'5"	0.1% pyrite and chalcopyrite, disseminated and in fine fractures.
119'5"	147'5"		Loch Tay Limestone. Well-bedded impure granular linestone with 0.1% pyrite disseminated, on micaceous partings and in fine fractures.
		119'5"	Contact concordant 50° to core axis
		133'2" - 134'11"	Calcareous grit, quartz grains cemented with granular calcite, bedding 60° to c.a.
147'5"	155'9"		Epidiorite. Highly altered, contorted, amphibole, chlorite, epidote etc (?) intrusive with quartz, calcite, hematite veins.

1672A : K1

MAIN UNITS FROM	TO	DEPTH	CORE DETAILS ROCK TYPE ETC
155'9"	203'7"		Loch Tay Limestone. Fine -grained impure limestones, well bedded with sericite and chlorite partings, some quartz, increasing with depth.
		155'9"- 165'9"	Veins of coarse calcite(plus minor quartz) in highly contorted zone.
		156'	⅛" vein of malachite.
		178'1"- 178'8"	Pale green tuff band. Bedding 65° to core.
		183'4"-183'6"	Pale green tuff.
		184" -187'11"	Pale Green, banded calc-chlorite tuff.
		188'10"-191'2"	Pale Green tuff.
203'7"	300'5"		Green Beds Fine to medium grained quartz, sericite, chlorite, epidote et schists with minor calcite, hematite, variable mineralogy and strongly foliated. Metamorphosed volcanic tuffs with strong quartz (calcite) veining. No sulphides.

Core Recovery 98.5%

Average footage per run 7.06 feet.

R.H.Rastall

Noranda-Kerr Limited
Diamond Drill Core Log Sheet

D.D.H.No. K2
Prospect 1671A Kilfinan/~~Glendaruel Stage 1~~ Scotland
Location Line 3 825' E., NR 921 758.
Collar elevation about 175' O.D.
Final Depth 200'
Completed 26/1/72

Direction 120° T.
Inclination -60°

MAIN UNITS FROM	TO	DEPTH	CORE DETAILS ROCK TYPE ETC.
0	14'2"		Overburden
14'2"	53'10"		Loch Tay Limestone. Fine-grained, well bedded impure limestone with sericite and chlorite partings, calcite veins with minor pyrite and hematite.
		45'9" - 49'10"	Pale green tuff. Bedding 50° to core axis.
		49'10" - 50' 7"	Fracture zone, calcite veining plus hematite.
53'10"	105'2".		Epidiorite. Fine to medium grained, amphibole, biotite, plagioclase, chlorite rock, probably intrusive, quartz and calcite veins, some hemati no sulphides.
		90'7" - 93' 6"	Fracture zone, quartz, calcite, chlorite
105'2"	111'2"		Loch Tay Limestone. Fine-grained, well-bedded impure limestone, with sericite, chlorite partings. Rare pyrite. Bedding 75° to core.
111'2"	200'4"		Green Beds. Fine to medium grained quartz, sericite chlorite, schists, minor biotite, epidote etc, strongly foliated. Quartz veins.
		158'1" - 162'2"	Fracture zone, massive vein quartz.

Core recovery	97.4%
Average footage per run	7.8 feet.

Noranda - Kerr Limited

Diamond Drill Core Log Sheet.

D.D.H.No.K3
Prospect 167AA Kilfinan/~~Glendaruel Stage 1~~ Scotland
Location Line 3.5,840'E., NR 921759
Collar elevation about 180' O.D.
Final depth 250'
Completed 2/2/72

Direction 130°T.
Inclination - 60°.

MAIN UNITS FROM	TO	DEPTH	CORE DETAILS ROCK TYPE ETC
0	16'6"		Overburden
16'6"	32'1"		Loch Tay Limetstone. Fine-grained well bedded, grey, impure, limestone with sericite partings and chloritic tuffaceous bands.
		25'4" - 27'6"	Breccia zone with calcite a hematite.
32'1"	45'7"		? Epidiorite. Dark grey, fine-grained basaltic rock bands of calcite and hematite.
45'8"	49'8"		Loch Tay Limestone. As abo
		47'8" ' 48'5"	Chlorite tuff band
49'8"	58'11"		? Epidiorite. Basaltic rock as above, probably intrusive.
58'11"	78'11"		Loch Tay Limestone. Light grey and pink, fine to coarse grained, well-bedded, impure limestone, micaceous partings, iron staining.
		63'4" - 63'9"	Pale Green, very fine-grained siliceous rock with less than 0.1% pyrite
			Bedding 80° to core.
		78'	Bedding 60° to core axis

MAIN UNITS			CORE DETAILS
FROM	TO	DEPTH	ROCK TYPE ETC
78'11"	171'11"		Epidiorite. Fine to coarse-grain pyroxene (hornblende), biotite, plagiodase intrusive sill with some chlorite calcite and minor quartz.
		78'11" - 80'9"	Fine grained chilled margin.
		152' - 171'11"	Fine grained chilled margin.
171'11"	178'6"		Loch Tay Limestone. Grey and pink, medium-grained impure limestone. Bedding 70° to core.
		177' - 178'6"	Fractured and contorted limeston
178'6"	186'2"		Fault Breccia. Fragments of limestone and mica-schist cement with calcite, quartz, minor hemat refractured and cemented more th once. Steep, E-W dextral wrench fault.
186'2"	250'4"		Green Beds Fine to medium-grain quartz sericite schists with biotite, chlorite, epidote etc. and quartz veins.
		186'2" - 190'5"	Fractured and contorted zone.
		204' - 206'	Fracture zone
		214'6" - 216'4".	Breccia zone with vein quartz.

Core recovery 99.3%

Average footage per run 6.5 feet

Noranda - Kerr Limited
Diamond Drill Core Log Sheet

D.D.H.No.K.4
Prospect 1671A Kiffinan/~~Glendaruel - Stage 1~~. Scotland
Location Line 8, 1300' E. NR 930770
Collar elevation about 320' O.D.
Final depth 250
completed 9/2/7?

Direction 120°T
Inclination - 60°

MAIN UNITS			CORE DETAILS
FROM	TO	DEPTH	ROCK TYPE ETC
0	1'6"		Overburden
1'6"	47'5"		Epidiorite. Coarse-grained hornblende biotite, plagioclase intrusive sill, grain size decreasing to contact, with rare grains of pyrite and chalcopyrite.
47'5"	102'8"		Loch Tay Limestone. Grey, medium-grained impure limestone and schistose limestone with sericite/chlorite (quartz) rich bands, pyrite towards both contacts: (less than 0.5%) Fracture zones with strong calcite and quartz veining.
		47'5"	Chalcopyrite on contact (less than 0.1%)
		71'11"	Bedding 70° to core axis.
102'8"	129'4"		Epidiorite. Fine-grained, green schistose igneous rock, chlorite? amphibole etc.
		112'6" - 115'5"	Fracture zone with vein quartz.
129'4"	142'8"		Loch Tay Limestone. Pale green to grey medium-grained impure limestone with biotite, sericite chlorite rich bands and partings, bedding 80° to core, 0.1% pyrite & some hematite.

MAIN UNITS			CORE DETAILS
FROM	TO	DEPTH	ROCK TYPE ETC
142'8"	145'7"		? Epidiorite. Dark greenish grey, fine-grained basaltic rock.
145'7"	199'4"		Loch Tay Limestone. Massive medium-grained limestone with occasional mica partings, 0.1% pyrite near upper contact, bedding 85° to core then 20° to core at lower contact.
		154'2" - 157'9"	Fracture zone with massive vein quartz.
199'4"	213'4"		Epidiorite. Medium to coarse grained amphibolite (intrusive), coarser towards base.
213'4"	241'2"		Loch Tay Limestone. Fine medium - grained impure limestone with micaceous bands. No Sulphides.
213'2"	250'		Green Beds. Quartz, sericite, biotite chlorite etc. schists with strong foliation 25° to core axis.

Core recovery over 99%
Average footage per run 6.6.feet.

Noranda Exploration (U.K.)Ltd.,

Sludge Samples: D.D.H.No.K3: Kilfinan 1671A.

DEPTH		VALUES IN PARTS PER MILLION		
FROM	TO	COPPER	LEAD	ZINC
15	25'	94	23	59
25	35'	69	30	77
35	45'	125	27	83
45'	55'	45	30	50
55'	65'	55	28	40
65'	75'	53	29	45
75'	85'	55	25	56
85'	95'	45	25	42
95'	105'	46	25	41
105	115"	53	26	57
115	125'	72	27	60
125	135'	80	23	45

Water return lost at 135'

Samples ground to - 80 mesh, sample attack with concentrated HNO_3

Analysed by Noranda Exploration Ireland Limited: Sheet No. 52A, 11/5/72.

Noranda Exploration (U.K.) Ltd.

Core Samples: Boreholes K1 and K4: Kilfinan 167/A

D.D.H.No.	DEPTH		VALUES IN PERCENTAGES	
SAMPLE NO	FROM	TO	COPPER	LEAD
K1				
71/1/1	4'	8'	0.03	< 0.01
71/1/2	8'	12'	0.03	< 0.01
71/1/3	34.8	36.8	0.25	< 0.01
71/1/4	107	111'	0.04	< 0.01
71/1/5	111	115'	0.03	< 0.01
71/1/6	115	119.4'	0.02	< 0.01
71/1/7	119.4	123.0'	< 0.01	< 0.01
71/1/8	151.75	155.75'	0.02	< 0.01
71/1/9	155.75	158.75'	0.01	< 0.01
K4				
71/4/1	44.4'	47.4'	0.02	< 0.01
71/4/2	47.4'	50.4'	0.02	< 0.01

Analysed by Alfred H. Knight Ltd.,

Reference: 501236, 12/5/72.

FINANCIAL ASSISTANCE FOR MINERAL EXPLORATION (M.E.I.G.A.)

COMPANY: NORANDA KERR LTD

REF: AE 74
MRD 84/17/2/1 and 2
MRD 144/17/2

PROJECT: KILFINAN/GLENDARUEL

The following Open File material is held by B.G.S. in London, Keyworth and Edinburgh. Available for public inspection from 24.2.79.

- PROJECT NO: 1671 (Appendix 1 of Application Nov '71 Stage 1) with the following plans:

  * 1671/71/1 - Loch Fyne area properties. 1" : 1 mile

    1671/71/1A - Properties and IP lines. 1" : 1 mile

  * 1671/71/2 - Geology and earlier DDHS. 6" : 1 mile

  * 1671/71/3 - Otter section showing IP lines and Geochemical soil values for Cu. 6" : 1 mile

- PROJECT NO: 1671A. Work carried out between 7.1.72 and 12.2.72. Includes the following:

  a) Map No: 1671A/71/3 Borehole locations, IP Lines and soil geochemistry. 6" : 1 mile

  b) Borehole sections K1 to K4. 1 : 500

  c) Diamond Drill core log sheets for boreholes K1 to K4

  d) Sludge sample analyses for K3

  e) Core sample analyses for K1 and K4

- Parts 4 and 7 of Application March '72. Stage 2 with the following maps:

  * 1671/71/1 - Geology IP and Borehole locations. 1" : 1 mile

  * 1671/71/4 - Glendaruel, Geology and IP Grid. 6" : 1 mile (coloured)

    1671/71/5 - Glendaruel, showing Cu distribution in soil. 6" : 1 mile

- PROJECT NO: 1671B. Work carried out between 6.4.72 and 31.7.72, with the following enclosures:

  A. Core log sheets for boreholes K5 and K6

  B. Sludge sample analyses for K6

  C. Core sample analyses for K5 and K6

(continued)

D. Rock samples from Ultrabasic Intrusions

E. Figure 1 (from 1671A) 1671/71/3 showing geology, IP grid and borehole sites. 6" : 1 mile

F. Figure 2, borehole section of K5

G. Figure 3, borehole section of K6

H. Figure 4. Glendaruel ultrabasics, prospecting traverses, sample locations and rock geochemistry Ni, Cu, Pb, Zn. 6" : 1 mile

*§ letter 17.5.72, enclosing amended version of 1671/71/3 dated 17 May 1971 (sheet and negative). Both letter and plan describe the proposed four drill holes

* letter 9.11.72 - reply to queries regarding project

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§ Not in Edinburgh * Not in Keyworth

NORANDA-KERR LIMITED

APPLICATION FOR FINANCIAL ASSISTANCE

FOR MINERAL EXPLORATION

SECTION III : DETAILS OF THE EXPLORATION PROJECT

4a. Name: PROJECT 1671 - KILFINAN/GLENDARUEL - STAGE II

4b. Location: Near the village of Kilfinan, Argyllshire, Scotland.

National Grid Ref: NR 9479 to NR 1505

Details of geology, mineral rights, etc.are as given in the earlier Application for work on this project. Attached are maps on a scale of 6": 1 mile, showing the geology (1671/71/4) and copper in soils (1671/71/5) of the area of proposed work.

6. Planning Permission: The opinion of the County Planning Officer has been obtained, in the form of a letter dated 8th February (a copy of which was sent to the Department of Trade and Industry on 22nd February), in which assurance is given that planning permission is not required for the work proposed.

SECTION IV : DETAILS OF WORK PROGRAMME - STAGE II

7a. Diamond drilling in four holes, each of approximately 350 ft. depth for a total of 1400 feet. The holes are to be sited to test IP anomalies and fault structure in an area of high copper in soils.

7b. Proposed Starting Date: May, 1972.
Duration: 12 weeks.

7c. Estimated Cost: See Appendix 1.

74/5

NORANDA EXPLORATION (U.K.) LIMITED

Project 1671B: Glendaruel, Section, Loch Fyne

Argyllshire, Scotland.

Work carried out between 6th April and 31st July, 1972.

Introduction

The "Application for financial assistance for mineral exploration" accepted by D.T.I. on 19th June and applying to expenditure incurred after 6th April, was for four diamond drill holes to depths totalling about 1,400 feet. Details of land ownership, geology and mining history in the area were set out in the earlier application for work on Project 1671A. In the program now reported, boreholes K5 and K6 were drilled to depths totalling 628 feet, at which point it was decided not to continue. Ten core samples and 33 sludge samples were sent away for analysis.

A brief examination was made of outcrops of the serpentinite intrusions, and 11 samples were analysed for copper, nickel, lead and zinc.

Summary of Mineralization Found.

In the core from K5 and K6 pyrite occurs commonly as thin flakes in schists and on partings in the argillaceous bands of limestones. It also occurs in veins with quartz, calcite, chlorite and hematite, and occasionally as fine disseminations. Chalcopyrite occurs with pyrite but is much less common. In the epidiorites chalcopyrite appears as inconspicuous scattered grains and as a minor constituent of some veins. At 312 feet in K6 it occurs disseminated and in vein form in argillaceous limestones near the epidiorite contact. Much of the iron sulphide in K6 is thought to be marcasite.

Finely disseminated iron sulphide is found extensively in outcrops of the main serpentinite mass. Copper minerals occur in very small quantities; chalcopyrite and malachite at one locality and small flakes of native copper in several places.

continued.....

The following items are attached;-

A.		core log sheets for boreholes K5 and K6.	✓
B.		sludge sample analyses for K6	✓ 2 pp.
C.		core sample analyses for K5 and K6	✓ 1 p
D.		rock sample analyses from the serpentinite	✓ 1 p
E.	Figure 1	plan showing geology, I.P. anomalies and borehole locations at 6 inches to 1 mile.	✓
F.	Figure 2	borehole section of K5.	✓
G.	Figure 3	borehole section of K6.	✓
H.	Figure 4	plan of serpentinite intrusions showing prospecting traverses and sample points at 6 inches to 1 mile.	✓

NORANDA EXPLORATION (U.K.) LTD.

Diamond Bill Core Log Sheet -

K5.

Prospect 1671B: Glendaruel, Scotland.

Location: Line LF 13, 1950 feet W. NR984873

Collar elevation: ± 500 feet O.D

Final Depth: 150 feet Direction: Grid E 130° mag.

Started 2/6/72 Inclination: -45°
Completed 7/6/72

MAIN UNITS		DEPTH	CORE DETAILS.
From	To		ROCK TYPES, ORE MINERALS ETC.
O	10.3'		Overburden, largely Boulder Clay.
10.3'	27.1		Quartz biotite-schist: Light grey schist with thin calcite veins and <0.1% pyrite.
		27.2'-27.4'.	Fault gouge 90° to core axis.
27.4'	40.8		Loch Tay Limestone. Light grey marble with argillaceous bands (biotite), serpentine.
		30.6'-31.8'	calcareous biotite schist.
		39.8'-40.8'	quartz grains in marble & <0.5% pyrite.
40.8'	106.3'		Epidiorite. Fine to coarse grained, dark green, plagioclase, hornblende, biotite, chlorite rock, minor pyrite, massive.
		40.8'-43.0'	Fine-grained chilled margin with <0.1% pyrite and <0.1% chalco-pyrite. Fracturing, quartz calcite chlorite veins with pyrite and rare chalcopyrite disseminated throughout.
		10.0'-106.3'.	Fine-grained chilled margin.
106.3'	150.3'		Loch Tay Limestone, as above, more or less argillaceous with pyrite, generally <0.5%.

Core recovery 90.8%

Average footage per run 4.8'.

R.H. Rastall

R.G. Smith.

NORANDA EXPLORATION (U.K.) LTD.

Diamond Drill Core Log Sheet.

D.D.H. No. K6

Prospect 1671B: Glendaruel, Scotland 896

Location: Line LF25, 900 feet W. N5019986.

Collar elevation: ±350 feet.

Final Depth: 478 feet. Direction: Grid E, 130° mag.

Inclination: -55°

Started 14/6/72
Completed 25/6/72

MAIN UNITS		DEPTH.	CORE DETAILS.
From	To		ROCK TYPES, ORE MINERALS ETC
0	10.0'		Overburden : Boulder Clay
10.0'	19.0'		Overburden : Weathered bedrock.
19.0'	186.9'		Quartz-mica schist: quartz, chlorite, sericite (?) schist with numerous fractures and veins. Sulphide minerals in veins (quartz/calcite) and disseminated throughout, marcasite(?) up to 1%, pyrite less than 1% and rare chalcopyrite.
186.9'	244.6'		Dolerite. Fine to medium-grained dark grey Tertiary dolerite, chilled margins 0.1 feet thick, thin calcite veins with pyrite $<0.5\%$.
244.6'	277.6'		Quartz mica schist, as above, with calcite veins & $<0.1\%$ pyrite & $<0.1\%$ marcasite.
277.6'	281.0'		Dolerite, as above.
281.0'	288.2'	287.5'	Quartz mica schist, as above. Calcite veinlets with pyrite & rare chalcopyrite.
288.2'	289.4'		Dolerite vein, as above.
289.4'	310.8'	310.3'-310.8'	Quartz mica schist, as above, 0.1% pyrite. Fault gouge.

D.D.H. No K6 (continued)

MAIN UNITS		DEPTH	CORE DETAILS.
From	To		ROCK TYPES, ORE MINERALS ETC
310.8'	316.3'	311.9'-312.7'	Loch Tay Limestone. Grey, granular, medium-grained marble with schist bands. 5% disseminated pyrite and chalcopyrite with 0.05' discordant vein chalcopyrite.
316.3'	320.5'		Epidiorite: plagioclase, hornblend, chlorite rock with distinct foliation and <0.1% pyrite plus chalcopyrite disseminated.
320.5'	360.0'		Loch Tay Limestone, as above with quartz/calcite veins and argillaceous bands containing films of pyrite (up to 1%).
360.0'	391.9'		Epidiorite, as above plus biotite, fine to coarse grained, massive. Felspars largely sericitized (?) quartz/calcite veins with pyrite, rare crystals of chalcopyrite, chloritic shear zone with pyrite.
391.9'	424.4'	391.9'-400.6'	Loch Tay Limestone, as above with pyrite, chalcopyrite (?) and marcasite (?) on shaley partings. Frequent shear planes & calcite/quartz veining. Both contacts faulted. Fracture zone, brecciated, contorted bedding.
424.4'	457.4'		Epidiorite, as above, chilled margins, <0.5% pyrite plus chalcopyrite mainly in shears and veins.
457.4'	478.0'		Loch Tay Limestone, as above with pyrite only on shaley partings

Core recovery about 95%
Average footage per run: 5 feet.

R.G. Smith
R.H. Rastall.

NORANDA EXPLORATION (U.K.) LTD.

Sludge Samples: D.D.H. No. K6: Glendaruel 1671B

DEPTH		COPPER p.p.m.		LEAD p.p.m.		ZINC p.p.m.		NICKEL p.p.m.	
From	To		Repeat.		Repeat		Repeat.		Repeat
0'	10'	26		20		74		45	
10'	20'	106		31		118		68	
20'	30'	118		111		295		105	
30'	40'	88		75		120		96	
40'	50'	57		36		84		65	
50'	60'	21		10		17		24	
60'	70'	73		47		55		120	
70'	80'	52		52		57		106	
80'	90'	84		740		1,870		108	
90'	100'	52		235		500		42	
100'	110'	133		1,020		1,130		127	
110'	120	26		63		76		32	
120'	130'	68		600		253		73	
130'	145'	25		83		56		20	
140'	150'	80	72	100	71	91	130	98	81
160'	170'	420		1,150		1,400		142	
170'	180'	94		76		147		95	
180'	190'	117		82		241		76	
190'	200'	76		53		140		60	
200'	210'	200		31		20		13	
210'	220'	21	18	24	17	22	18	18	15
220'	250'	17		21		16		11	
250'	270'	14		37		35		8	
270'	290'	23		43		74		8	
290'	310'	32		28		61		15	
310'	330'	520		125		360		64	
330'	350'	145		103		189		48	
350'	370'	700		209		329		82	

continued.....

Sludge Samples continued.

DEPTH		COPPER		LEAD		ZINC		NICKEL	
From	To		Repeat		Repeat		Repeat		Repeat.
370'	390'	230		64		100		69	
390'	410'	340		176		418		81	
410'	430'	210		111		217		72	
430'	450'	250		78		119		81	
450'	478'	128	160	63	63	106	93	54	58

Samples ground to -80 mesh.

Analysed by Noranda Exploration Ireland Ltd: sheet nos 70A and 71A, 17/7/71.

NORANDA EXPLORATION (U.K.) LTD.

Core Samples: D.D.H. Nos. K5 & K6: Glendaruel 1671B.

AMPLE No.	FROM	TO	COPPER IN %.
K5 A	35.8'	40.8'	0.01
B	73.0'	78.0'	0.04
C	78.0'	83.0'	0.05
D	83.0'	88.0'	0.05
E	128.6'	133.6'	< 0.01
K6 F	308.0'	310.8'	0.06
G	310.8'	313.3'	0.81
H	313.3'	316.3'	0.02
I	316.3'	319.3'	0.03
J.	339.0'	344.0'	0.03

Analysed by Alfred H. Knight Ltd., reference 1514, 1/8/72.

NORANDA EXPLORATION (U.K.) LIMITED.

Rock Samples from Ultrabasic Intrusions: Glendaruel
1671B.

SAMPLE NO.	ANALYSES IN P.P.M.				REMARKS.
	Nickel	Copper	Lead	Zinc.	Mostly Serpentinite
GD 2	500	250	23	35	Minor dissem. Fe sulphide
GD 3	700	1,250	10	40	Fe sulphide (rare flakes of native copper)
GD 4	500	1,120	10	20	as GD 3, no visible copper.
GD 5	100	180	6	14	Tremolite rock, minor Fe sulphide
GD 6	800	36	16	60	minor dissem. Fe sulphide
GD 8	1,200	30	14	23	limonite coated cavities.
GD 10	800	150	13	35	rare native copper flakes.
GD 11	1,500	20	29	50	grey & brown serpentinite.
GD 13	1,200	10	26	40	finely dissem. Fe sulphide.
GD 14	1,400	28	27	55	2-3% dissem. Fe sulphide.
GD 16	150	800	16	21	massive tremolite, some calcite, Fe sulphide, malachite stain.

Samples crushed, pulverised and screened to -80 mesh.

Analysed by Alfred H. Knight Ltd., reference W1072, 27/7/72.

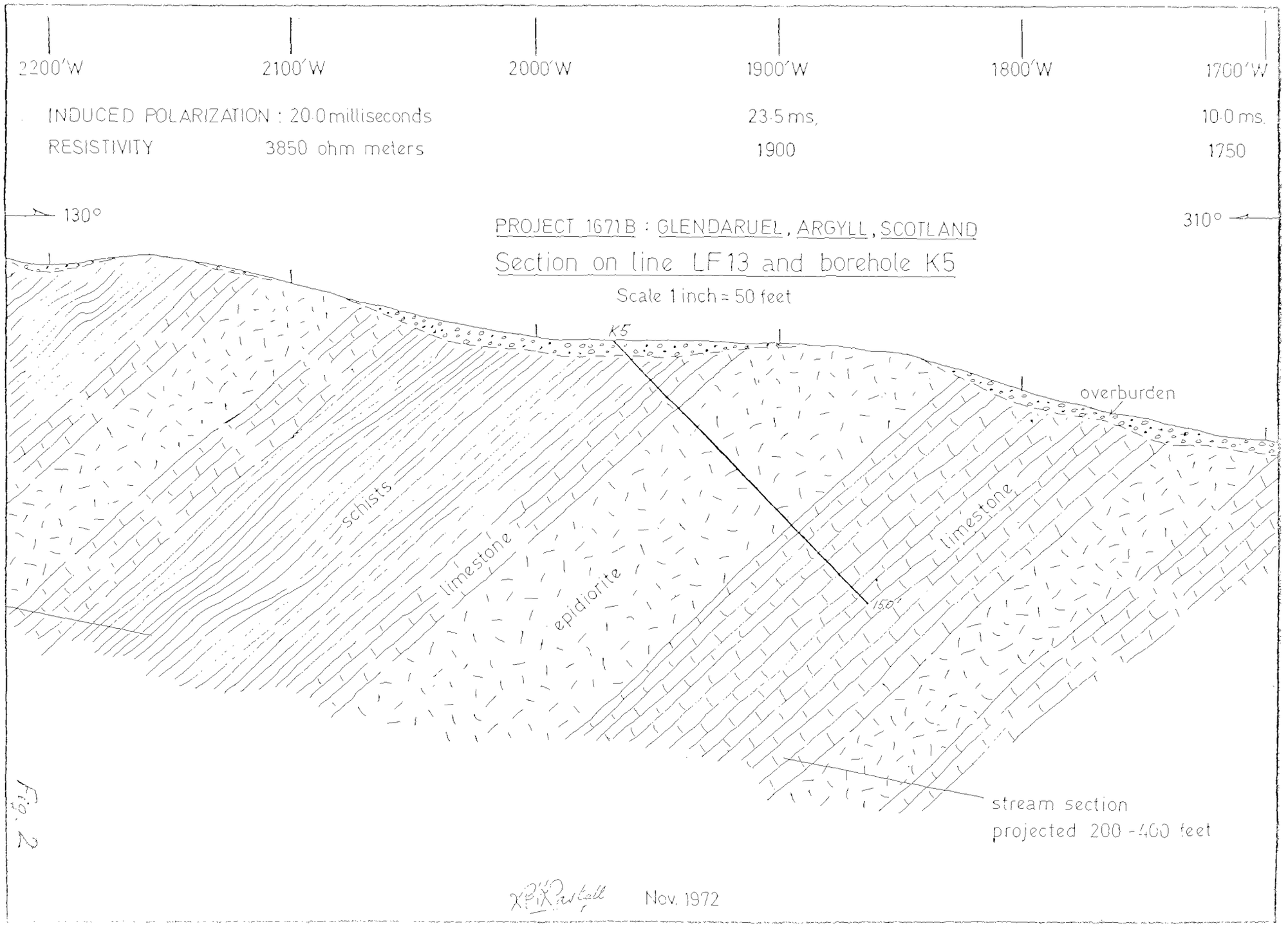
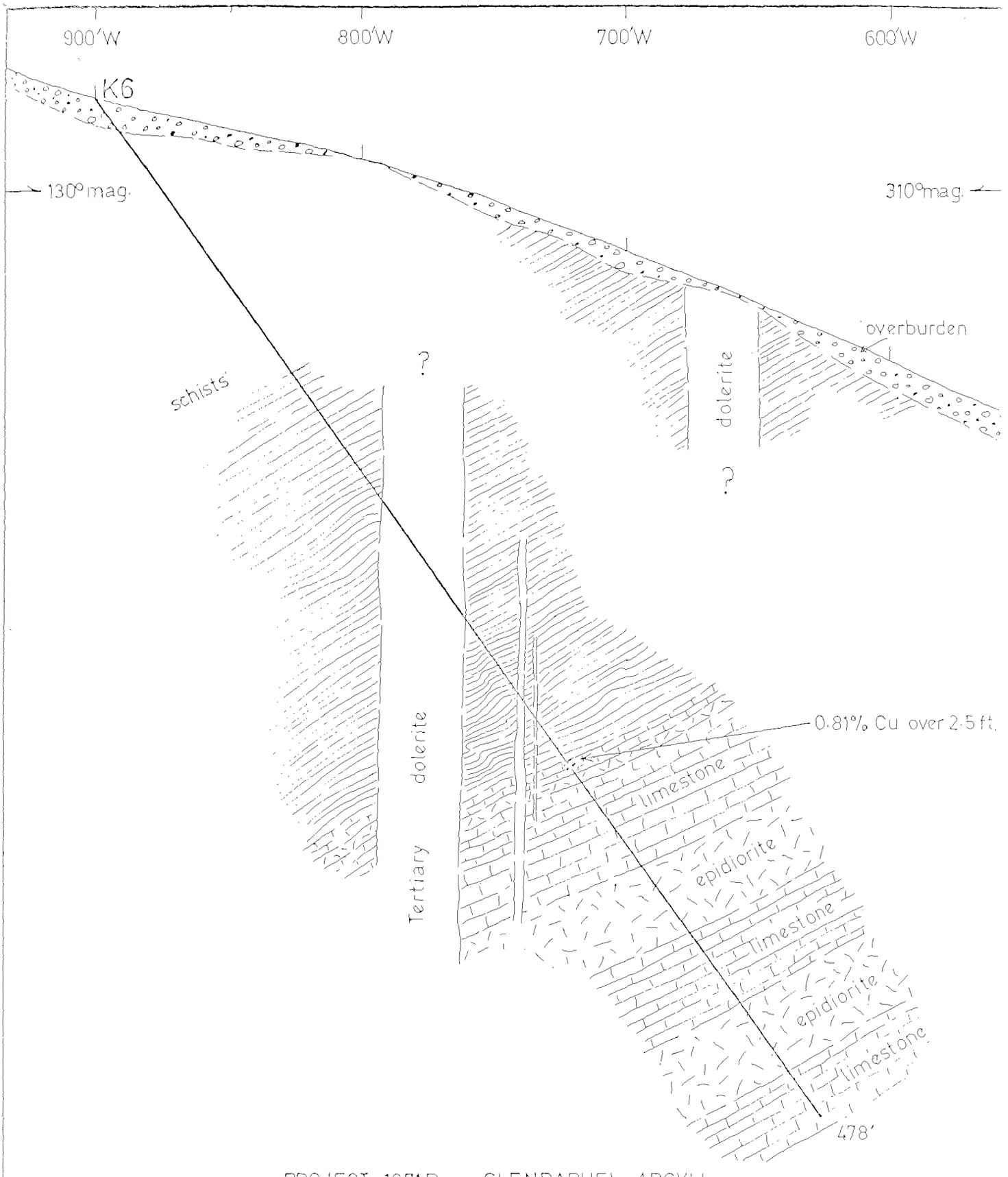

2200'W
2100'W
2000'W
1900'W
1800'W
1700'W
INDUCED POLARIZATION : 20.0 milliseconds
23.5 ms,
10.0 ms.
RESISTIVITY
3850 ohm meters
1900
1750
130°
310°
PROJECT 1671B : GLENDARUEL, ARGYLL, SCOTLAND
Section on line LF13 and borehole K5
Scale 1 inch = 50 feet
K5
overburden
schists
limestone
epidiorite
limestone
150'
stream section
projected 200 - 400 feet
Nov. 1972

Fig. 2



PROJECT 1671B : GLENDARUEL, ARGYLL.

SECTION ON LINE LF 25 and BOREHOLE K6.

Scale 1 inch = 50 feet.

Fig. 3

R.H. Rastall Nov. 1972

AE 74

NORANDA-KERR LIMITED

PROJECT NO. 1671 - LOCH FYNE/KILFINAN

Application for Financial Assistance : ... November, 1971

APPENDIX 1 : GEOLOGY OF THE AREA

GEOLOGY (map 1671/71/2)

The Dalradian succession in this part of the Highlands is considered to be inverted; being the lower limb of the Loch Tay Nappe. The beds dip 30 - 45°W.N.W. and the succession from west to east is as follows:-

a. Mica schists (from the shore of Loch Fyne eastwards) including a number of schistose limestone horizons of which the major one is

b. Loch Tay limestone with associated hornblendic sills: thickness roughly 110 feet with a similar or greater thickness of sills.

c. Within 100 feet of the lower contact of the limestone are the "Green Beds" - chlorite epidote schists of possible volcanic origin.

The aerial photographs show conjugate sets of wrench faults trending due west and north-northwest. Faults of both sets show displacements of several hundred feet and the former set is frequently occupied by basic dykes. Rapid variations in apparent thickness of the limestone (from 40' to 170') may result from strike faulting and rapid facies variation.

GEOCHEMICAL ANOMALIES (map 1671/71/3)

A series of 16 soil sample lines spread 1000 feet apart was completed in early 1970. The lines were oriented across the strike. Samples collected on them at 100 ft intervals were analysed for Cu, Pb, Zn and Ni. Copper appears to be present in anomalous amounts, and its distribution shows a relationship to the Loch Tay limestone outcrop or suboutcrop areas, or to other minor calcareous beds.

GEOPHYSICAL ANOMALIES (map 1671/71/3)

The soil sample lines were used for an I.P. survey, carried out by Frank A. Buckley Limited during April 1971 using the Wenner electrode array with spacing of 200 feet. Despite high

background chargeabilities well defined anomalies occur. The anomalies centred on lines LF3 and LF8 coincide with the limestone outcrop and its down dip position at shallow depths, but the anomalies between lines LF16 and LF18 do not correlate either with calcareous horizons or geochemical anomalies.

FORMER WORKINGS

Trials for copper were made near Inveryne Farm (922759), and near Drum Farm (930776). At Murder Lode (938789) near Kilfinan village a replacement body was mined during the First World War. Disseminated ore is also reported and the minerals recorded are malachite azurite, chalcocite and bornite.

PREVIOUS EXPLORATION

In 1964 a survey was carried out by A.B. Baldwin for M.J. Boylen Engineering of Toronto, Canada. He concentrated on surface geological mapping and field geochemical techniques and had ten diamond drill holes put down beneath the old trials and workings (map 1671/71/2). At Drum Farm work was concentrated on a minor calcareous horizon to the exclusion of the main horizon further east. None of these boreholes intersected payable mineralisation. No geophysical work was done at this time.

TARGETS OF PRESENT WORK

Four DDHs are planned on the Otter Farm property (58/16) at the present time, of which three are sited to test I.P. anomalies and the fourth a geological contact, all in an area of high copper in soils. Sites are as follows (map 1671/71/3) with reference to the Kilfinan section I.P. grid:

Site 1 : Line 3 at 700 ft. east, at a dip of -60 to grid east (120° azimuth), to a depth of 350 ft.; to test anomaly

Site 2 : Line 3 at 1000 ft. east, dip -60° to grid west (300° azimuth), depth 350 ft.; to test I.P. anomaly.

Site 3 : Line 3.5 at 640 ft. east, dip -60° to grid east (120° azimuth), depth 300 ft.; to test faulted contact.

Site 4 : Line 8 at 1300 ft. east, dip -60° to grid east (120° azimuth), depth 400 ft.; to test I.P. anomaly.

COUNTY COUNCIL OF ARGYLL

G. V. TURNER, B.A., A.M.T.P.I.
COUNTY PLANNING AND
DEVELOPMENT OFFICER

PLANNING DEPARTMENT
POLTALLOCH STREET
LOCHGILPHEAD
ARGYLL

Telephone No.
Lochgilphead 268

Your Ref.
Our Ref. G.6/Mineral Resources

8th February, 1972

HMM
11/2/72

Hans R. Morris, Esq.,
Noranda-Kerr Ltd.,
6 Curzon Place,
LONDON, W.1.

Dear Mr. Morris,

Prospecting for Minerals

I refer to your letter of 1st February. I understand from Mr. Rastall's description of your proposed activities that, in addition to preliminary sample testing and instrument survey, they would include the use of a small drilling rig with some associated temporary shelter and store for the crew. I also understood that such an installation would be changing its location at frequent intervals.

Accordingly I take the view that these operations, including exploratory rock drilling, are permitted development in terms of "Class IV (2) Temporary buildings and uses" of the First Schedule of the Town and Country Planning (General Development) (Scotland) Order, 1950.

I am glad that you will keep us informed of your activities since as I pointed out to Mr. Rastall there are certain areas of the County where the planning authority has to be especially sensitive on questions of amenity.

Yours sincerely,

G. V. Turner

County Planning and
Development Officer.

GVT/JMF.

1st February, 1972

G.V. Turner, Esq.,
County Planning & Development Officer,
Planning Department,
Poltalloch Street,
Lochgilphead,
ARGYLL.

Dear Mr. Turner,

I am writing with regard to our work in the Kilfinan area, which was described to you by our geologist, Mr. Roger Rastall, at a meeting on the 14th January. Mr. Rastall has sent to me a copy of the letter which you wrote, following this meeting, and has also sent me his own notes on the points discussed. As he may have indicated to you, we have been asked by the Department of Trade and Industry to show them some evidence that Planning Permission is not required for our exploration activities in the Kilfinan area, in relation to possible financial assistance from the Government for this work.

Your letter of the 14th January to Mr. Rastall is, I believe, almost exactly the kind of thing which would meet this requirement, but I would be grateful if you would confirm that the exploration activity referred to in the letter is, in fact, that described by Mr. Rastall in his memo to me and does therefore include drilling at the Kilfinan site.

Please be assured that we will keep you in touch with the progress of our activities in the area.

Yours sincerely,

Hans R. Morris.

M E M O

To: H.R. Morris 24th January, 1972

From: R.H. Rastall

Planning Permission for Drilling - Scotland, Argyll

On Friday, 14th January, I saw Mr. G.V. Turner, the Planning Officer for Argyll, in Lochgilphend. I described our surveys in some detail and, later said that we would be drilling at Kilfinan. The problem was new to him and he had not heard, apparently, of previous drilling at Kilfinan and elsewhere or, indeed, of any of the recent exploration work.

Mr. Turner and his assistants came to the conclusion that drilling could not be described as a "mining operation" or as "development" at all. They did not seem to think that the 28 days rule would apply therefore but I had the impression they were not entirely satisfied with this interpretation.

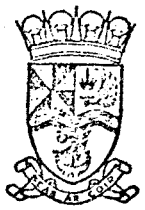
Mr. Turner promised to look up correspondence with the Highlands and Islands Development Board concerning mineral exploration and write to me. I enclose his letter, received yesterday. The special points he refers to mainly concern work near roads and buildings near roads, the restrictions being listed, I think, in the General Development Order of 1963. Also, he said that parts of the County, including Glencoe and Ben Nevis, in the north, were designated as a future National Park and special restrictions might apply.

RHR

.....

COUNTY COUNCIL OF ARGYLL

/URNER, B.A., A.M.T.P.I.
JNTY ( )NNING AND
/EVELOPMENT OFFICER



PLANNING DEPARTMENT
POLTALLOCH STREET
LOCHGILPHEAD
ARGYLL

Your Ref.
Our Ref. G.6/Mineral Resources

Telephone No.
Lochgilphead 268

14th January, 1972

R.H. Rastall, Esq.,
c/o Creggans Inn,
STRACHUR,
Argyll.

Dear Mr. Rastall,

Prospecting for Minerals
Noranda-Kerr Ltd.

I refer to your visit to my office this morning and have now had the opportunity to look up our correspondence with the Highlands and Islands Development Board. As a result of this extra information there is no change in the view I expressed at our meeting.

Without going into detail I confirm that the kind of exploratory activity which you described would not normally require planning permission.

Please bear in mind the special points which we made. If you can keep me informed of your proposed activities I think it will be beneficial to both sides.

Yours sincerely,

G.V. Turner.

County Planning and
Development Officer.

GVT/JMF.

Noranda Exploration Company Limited
Stratton House, Stratton Street
London, W1X 6AS, England

AE 74

50TH ANNIVERSARY 11

noranda

01-499 7124

For the attention of Mr. R.A. Ellis,
Institute of Geological Sciences,
Geochemical Division,
67-78 Gray's Inn Road,
London WC1 8NG.

9th November, 1972.

Dear Mr. Ellis,

In your letter of the 26th October you made a number of queries with regard to our projects 1671 (Kilfinan) and 1672A (Coulin). I will answer your questions as they occur in your letter.

Kilfinan

1. The cores were split for assay on sections selected after careful examination by the geologist concerned. Samples were taken in sections where copper minerals (chalcopyrite and malachite) were seen and in sections rich in pyrite. Also, some samples were taken where a black mineral was noted which could not be identified in hand specimens.

   The results obtained from the assays were very low and generally agreed with visual estimates. The obvious lack of economic mineralisation indicated no further sampling was justified.

2. We did not plan any further work at Kilfinan since none of the drill holes indicated mineralisation in any way approaching economic interest. The designation for this drilling programme as "Stage 1" was perhaps premature. The designation of the Glendaruel work as "Stage 2" is confusing and should be ignored. The work at Glendaruel although on similar geological ground is in no way an extension of the Kilfinan drilling.

Coulin

1. Control samples were not sent to both laboratories. Four rock samples in the area of LC2 taken on the surface from fault breccias with limonitic staining showed rather high copper and zinc values, i.e. 72-185 ppm copper, and 127-210 ppm zinc, equivalent to five to ten times back-

ground. The sludge samples from LC2 showed similar ranges with occasional higher values up to 520 ppm copper and 369 ppm zinc. The reference to contamination was made with the thought that the copper in the sludge could have been obtained by the collection of high copper and zinc values from the jointing intersected near the top of the hole, without there being very much in the way of copper or zinc sulphides in the core itself. Perhaps contamination was not a good word to use. It seems likely that fault or shear zones in the neighbourhood of the drilling carry unusual quantities of base metals but it is clear from the drilling results that nothing in the way of economic interest occurs in the rocks as a whole.

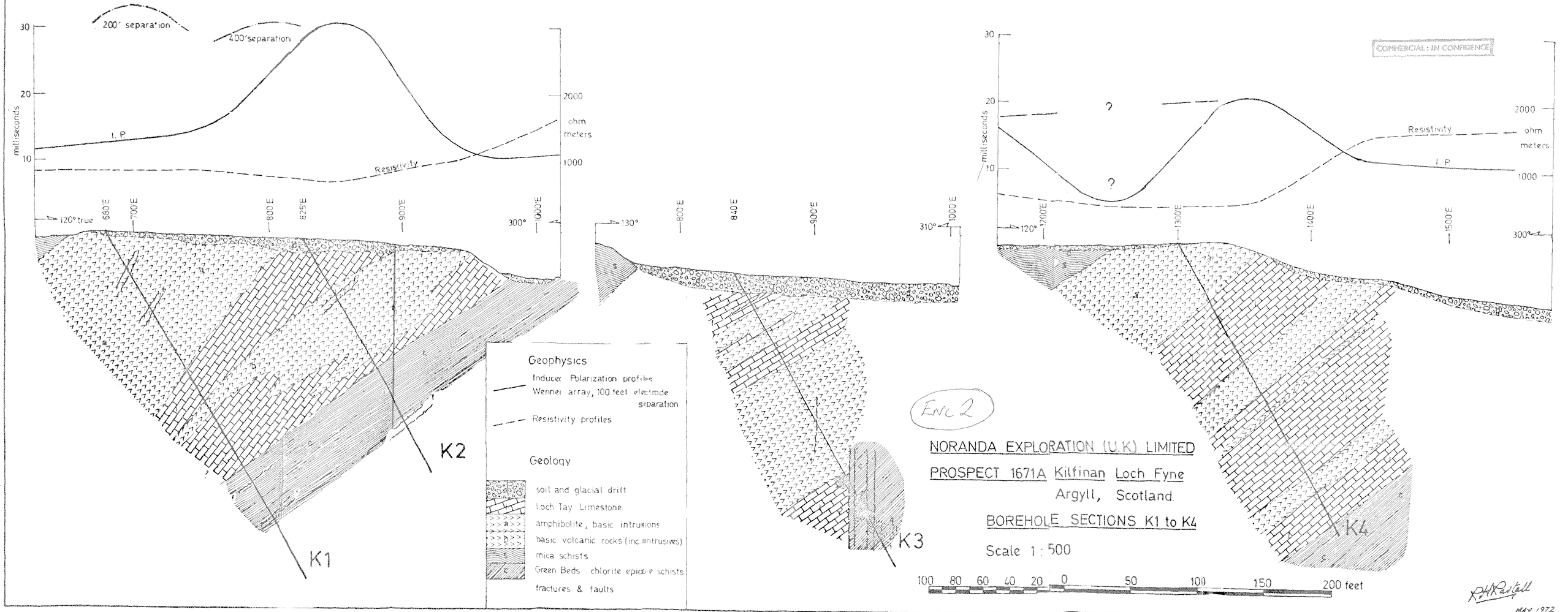
2. The drilling was suspended in May because the cost was found to be running far above the planned budget for the project. This was due, as I believe I noted in the report, to an unexpected thickness of quartzites above the basement, as well as to the difficulties, involving extra costs, of drilling through the rocks encountered.

We then had second thoughts about the project and decided that more surface geological examination was required. In view of the complete lack of mineralisation in the drill core and the lack of any encouragement from additional geological prospecting we have no economic reason for continuing working in this area.

The possibility of lead mineralisation either in the basal quartzites or the fucoid beds may well exist but we do not have a target sufficiently well defined to justify further drilling.

Yours sincerely,

Hans R. Morris.


200' separation
400' separation
I.P
Resistivity
milliseconds
ohm meters
120° true
680'E
700'E
800'E
825'E
900'E
1000'E
300°
130°
840'E
310°
1200'E
1300'E
1400'E
1500'E
120°
K1
K2
K3
K4
Geophysics
Induced Polarization profiles
Wenner array, 100 feet electrode separation
Resistivity profiles
Geology
soil and glacial drift
Loch Tay Limestone
amphibolite, basic intrusions
basic volcanic rocks (inc. intrusives)
mica schists
Green Beds chlorite epidote schists
fractures & faults
COMMERCIAL : IN CONFIDENCE
ENC 2
NORANDA EXPLORATION (U.K) LIMITED
PROSPECT 1671A Kilfinan Loch Fyne
Argyll, Scotland.
BOREHOLE SECTIONS K1 to K4
Scale 1 : 500
100 80 60 40 20 0 50 100 150 200 feet
MAY 1972

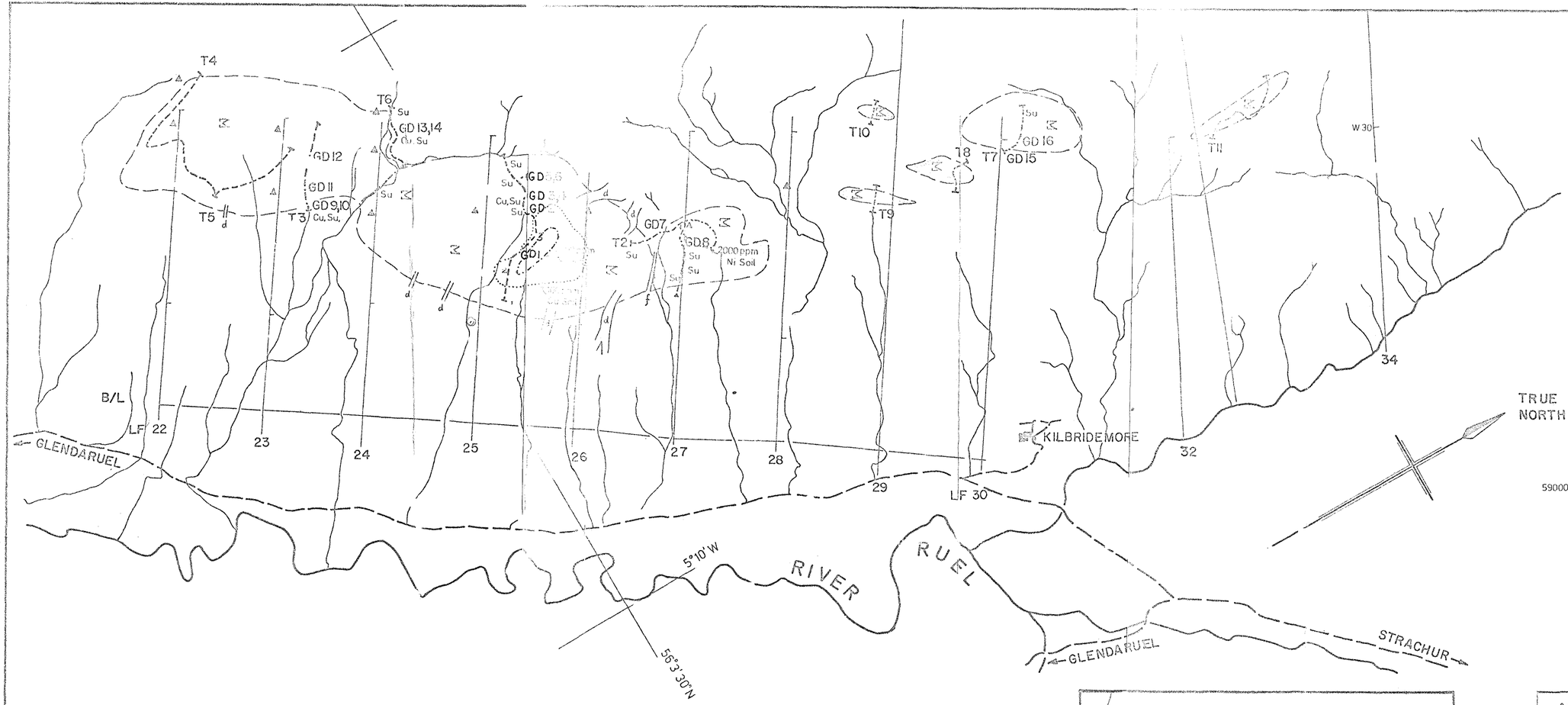
KEY

- CHLORITE EPIDOTE SCHIST
- CHLORITE LIMESTONE
- MICA SCHIST & GNEISS SCHISTS
- SERPENTINE
- EPIDIORITE
- DOLERITE BASALT
- TRACHYTE
- FAULTS

KEY TO I.P. ANOMALIES

- I.P. MAJOR ANOMALIES
- ▲ > 20 MILLISECONDS
- ● 15-20 MILLISECONDS
- × PEAK VALUES > 15 MILLISECONDS

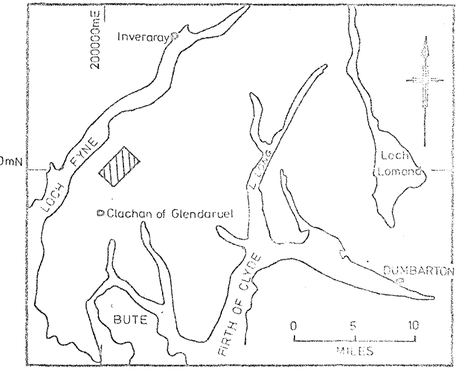
NORANDA-KERR LTD
LOCH FYNE PROJECT
1671A **GLENDARUEL**
GEOLOGY & I.P. GRID
SCALE 6"=1 MILE
MAP No. 1671/71/3
SHOWING BOREHOLE SITES



ANALYSED ROCK SAMPLES

SAMPLE	Ni	Cu	Pb	Zn	ppm
GD 2	500	250	23	35	
GD 3	700	1250	10	40	
GD 4	500	1220	10	20	
GD 5	100	180	6	14	
GD 6	800	36	16	60	
GD 8	1200	30	14	25	
GD 10	800	150	13	35	
GD 11	1500	20	29	50	
GD 13	1200	10	26	40	
GD 14	1400	28	27	55	
GD 16	150	800	16	21	

LOCALITY



KEY

- Serpentinite, ultramafics
- Su — Minor dissem sulphide
- Cu — Trace native copper
- △ — I.P. peak value
- T2 / GD 3 — Prospecting traverse and sample
- ..... — 100 ppm. Cu contour, soil
- ---- — 2000 ppm Ni contour, soil
- d — Dolerite dyke

NORANDA EXPLORATION (UK) LIMITED

PROJECT 1671 B, GLENDARUEL
ARGYLL, SCOTLAND

GLENDARUEL ULTRABASICS

PROSPECTING TRAVERSES, SAMPLE LOCALITIES AND ROCK GEOCHEMISTRY, Ni, Cu, Pb, Zn.

Author: John G Langlands	Fieldwork: July 1972
Drawn: H. Flower Date: Oct. 1972	FIG. 2


K6
K5
KEY
Pp PHYLLITE (ARDOT SCHIST
λ CARBONIFEROUS LIMESTONE
ρ MICA SCHIST & QUARTZ SCHIST
Σ SERPENTINE
Bg PORPHYRITE
D DOLERITE BASALT
Tr TRACHYTE
FAULTS
KEY TO I.P. ANOMALIES
I.P. MAJOR ANOMALIES
> 20 MILLISECONDS
15-20 MILLISECONDS
PLUS FACTOR 5 MILLISECONDS
DRILL HOLE
NORANDA - KERR LTD
LOCH FYNE PROJECT
1671A GLENDARUEL
GEOLOGY & I.P. SURVEY
SCALE 6" = 1 MILE
MAP No. 1671/GL/3
SHOWING BOREHOLE SITES

KEY

- CHLORITE EADOTE SCHIST
- SCHISTOSE LIMESTONE
- MICA SCHIST & UNDIFF SCHISTS
- SERPENTINE
- EPIDIORITE
- DOLERITE BASALT
- TRACHYTE
- FAULTS

KEY TO I.P. ANOMALIES

- I.P. MAJOR ANOMALIES
- > 20 MILLISECONDS
- 15-20 MILLISECONDS
- PEAK VALUES > 15 MILLISECONDS
- DRILL-HOLE

NORANDA-KERR LTD
LOCH FYNE PROJECT
1671A GLENDARUEL
GEOLOGY & I.P. GRID
SCALE 6"=1 MILE
MAP No. 1671/71/3
SHOWING BOREHOLE SITES

Licence Areas. { 52/24, 52/25 } Retained by N.K. (20.1.77).

VM

Fig. 1

NS 03 E

NS 04 E

NS 05 E

NS 94 N

NS 93 N

NS 92 E.

NS 91 N

NS 89 N

NS 03 E

NS 98 N

NS 01 E

NS 02 E

NS 96 N.

NS 95 N

NW 99 E

NORANDA - KERR LTD.
LOCH FYNE PROJECT
GLENDARUEL
SHOWING Cu. DISTRIBUTION IN SOIL
SCALE 6" = 1 MILE
MAP No. 1671/71/5

5

KEY

1	MORE THAN 180 ppm
2	90 - 180 ppm
3	45 - 90 ppm
4	18 - 45 ppm

PROJECT 1671A - KILFINAN
IP, SOIL GEOCHEMISTRY
& BOREHOLE LOCATIONS

O S. Sheet Nos
Scottish County Sheets
Argyllshire CLXXXI SE & NE

Kilfinan

PROPERTY BOUNDARY 58/16

LOCH FYNE

K1 K2 K3 K4

KEY TO I.P ANOMALIES

- IP major anomalies
- ▲ >20 milliseconds
- O 15-20 milliseconds
- x 10-15 milliseconds

KEY TO GEOCHEMISTRY ANOMALIES

- 0-18 p.p.m copper
- 18-45 p.p.m.
- 45-90 p.p.m.
- 90-180 p.p.m.
- > 180 p.p.m

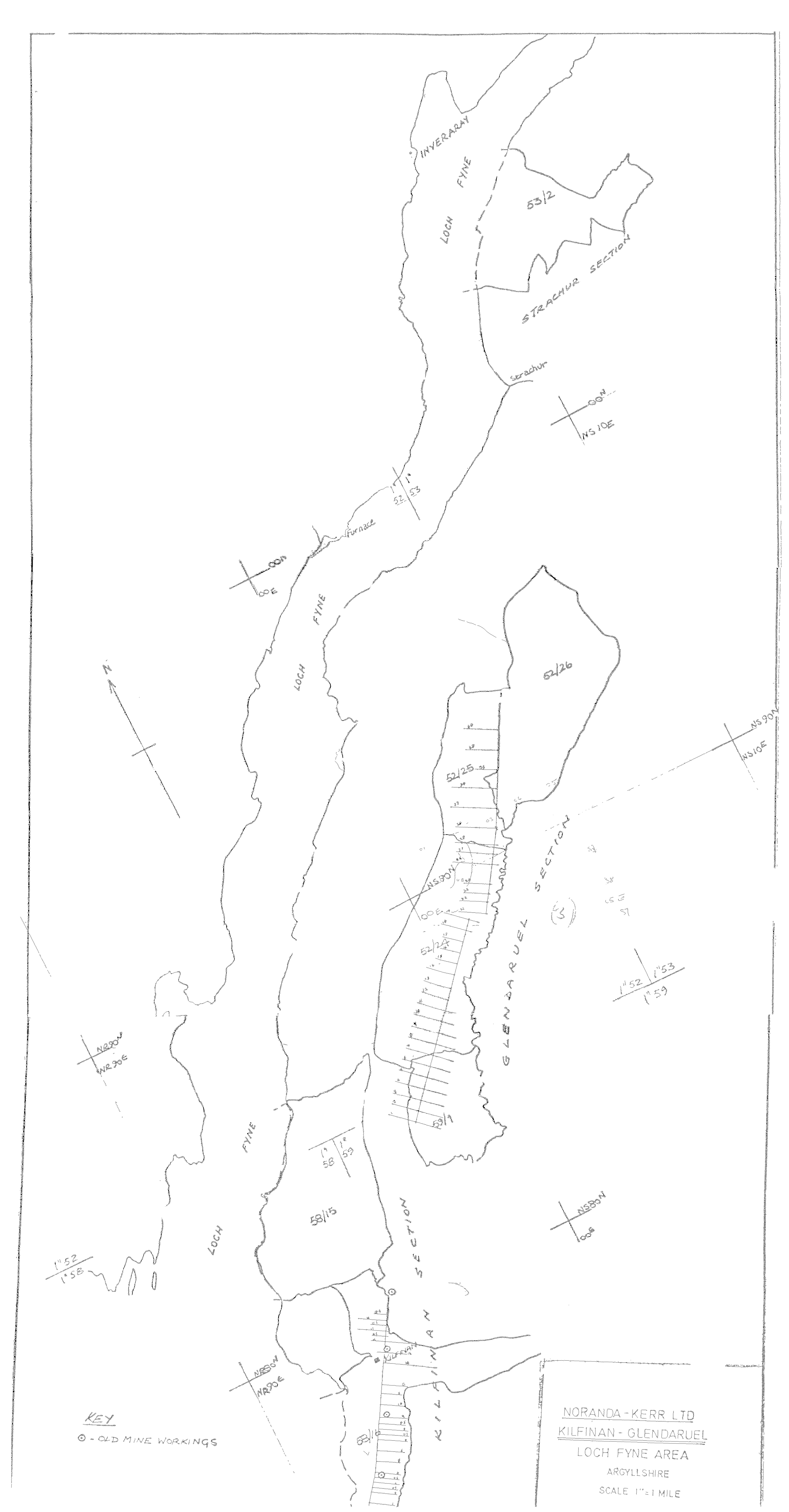
Borehole locations

Map No. 1671A/71/3

NORANDA EXPLORATION (UK) LIMITED

PROJECT 1671A
LOCH FYNE, ARGYLL, SCOTLAND.
BOREHOLE LOCATIONS, I.P. LINES
& SOIL GEOCHEMISTRY - COPPER IN P.P.M.

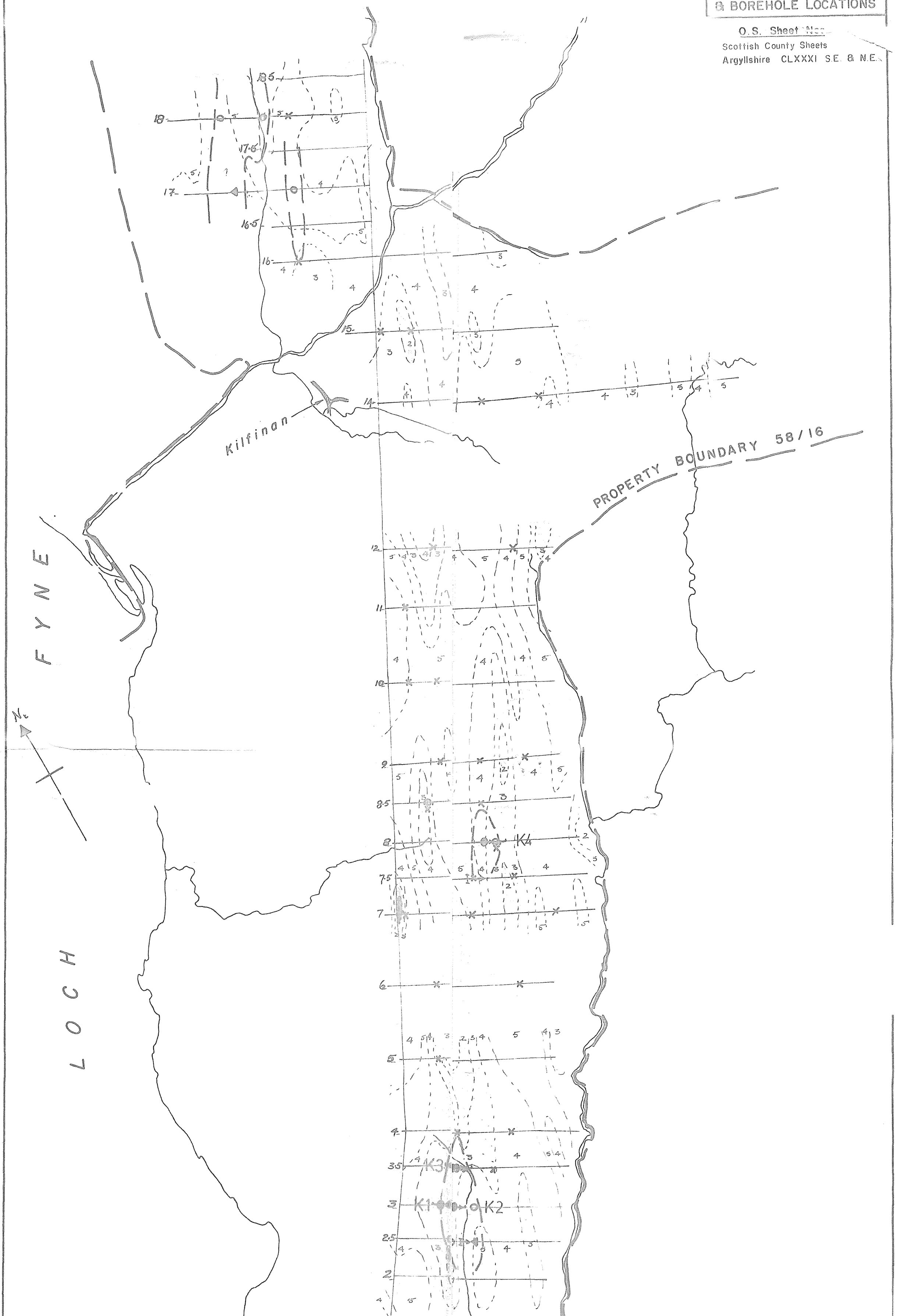
Author: I Rastall	Date of work: 1971	Drawn: R.R. Date
Scale: 6 inches to 1 mile.		Revised:


INVERARAY
LOCH FYNE
53/2
STRACHUR SECTION
Strachur
N90W
NS10E
1"
52, 53
Furnace
N00E
LOCH FYNE
52/26
52/25
NS30W
00E
GLENDARUEL SECTION
NS30W
NS10E
52/24
59/1
1"52
1"53
1"59
N80W
NR90E
LOCH FYNE
1"
58
1"
59
58/15
SECTION
NS30W
00E
1"52
1"58
LOCH
KILFINAN
N80W
NR90E
KILFINAN
KEY
⊙ - OLD MINE WORKINGS
NORANDA - KERR LTD
KILFINAN - GLENDARUEL
LOCH FYNE AREA
ARGYLLSHIRE
SCALE 1"=1 MILE

Map no. 1671A/71/3

PROJECT 1671A - KILFINAN
IP, SOIL GEOCHEMISTRY
& BOREHOLE LOCATIONS

O.S. Sheet Nos.
Scottish County Sheets
Argyllshire CLXXXI S.E. & N.E.



KEY TO I.P ANOMALIES

- IP major anomalies
- △ >20 milliseconds
- ○ 15-20 milliseconds
- × 10-15 milliseconds

KEY TO GEOCHEMISTRY ANOMALIES

5	0-18 p.p.m. copper
4	18-45 p.p.m.
3	45-90 p.p.m.
2	90-180 p.p.m.
1	>180 p.p.m.

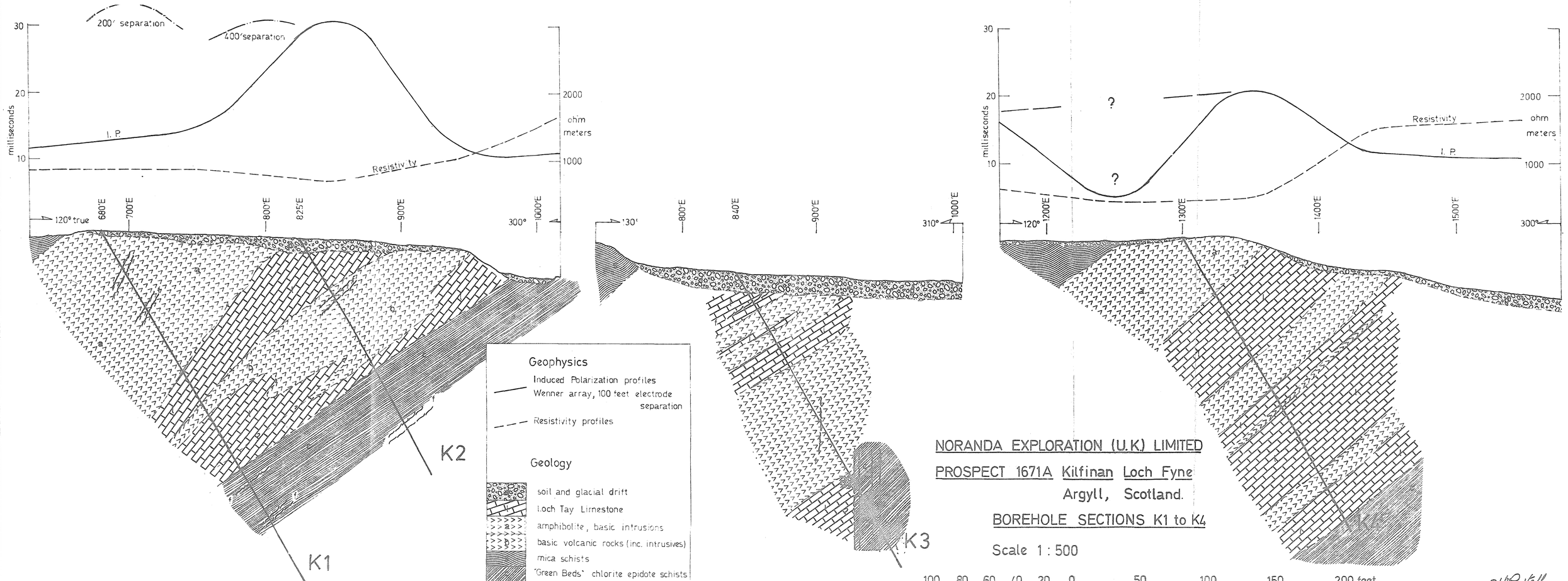
Borehole locations

Map No. 1671A/71/3

NORANDA EXPLORATION (UK) LIMITED

PROJECT 1671A
LOCH FYNE, ARGYLL, SCOTLAND.
BOREHOLE LOCATIONS, I.P. LINES
& SOIL GEOCHEMISTRY - COPPER IN P.P.M.

Author: R. Rastall	Date of work: 1971	Drawn: R.R. Date.
Scale: 6 inches to 1 mile.		Revised:


200' separation
400' separation
I. P.
Resistivity
milliseconds
ohm meters
120° true
680'E
700'E
800'E
825'E
900'E
300°
1000'E
130°
800'E
840'E
900'E
310°
1000'E
120°
1200'E
1300'E
1400'E
1500'E
300°
K1
K2
K3
K4
Geophysics
Induced Polarization profiles
Wenner array, 100 feet electrode separation
Resistivity profiles
Geology
soil and glacial drift
Loch Tay Limestone
amphibolite, basic intrusions
basic volcanic rocks (inc. intrusives)
mica schists
'Green Beds' chlorite epidote schists
fractures & faults
NORANDA EXPLORATION (U.K.) LIMITED
PROSPECT 1671A Kilfinan Loch Fyne
Argyll, Scotland.
BOREHOLE SECTIONS K1 to K4
Scale 1 : 500
100 80 60 40 20 0 50 100 150 200 feet
MAY 1972.