LITHOGEOCHEMICAL REPORT ON THE WAN CLAIM

NORTHERN VANCOUVER ISLAND, B.C.

NANAIMO MINING DIVISION

NTS 92L/12E

85-451
13739

# LITHOGEOCHEMICAL REPORT ON THE WAN CLAIM, NORTHERN VANCOUVER ISLAND, B.C.

NANAIMO MINING DIVISION

NTS 92L/12

BETWEEN 50°36' and 50°38' NORTH LATITUDE
127°43' and 127°45' WEST LONGITUDE

OWNER : PETER A. RONNING
OPERATOR : HOMESTAKE MINERAL DEVELOPMENT COMPANY

REPORT
by
G.J. PRIOR

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## MAPS AND TABLES

## STATEMENT OF QUALIFICATIONS

I, Glen J. Prior, hereby certify that:

1. I graduated from Laurentian University in Sudbury, Ontario, during 1984 having obtained an Honours Bachelor of Science degree in geology.

2. I have been engaged in geological exploration during field seasons since 1981.

3. I am employed as a geologist by Homestake Mineral Development Company, 201 - 856 Homer Street, Vancouver, B.C.

Glen Prior

GLEN PRIOR

# 1. INTRODUCTION

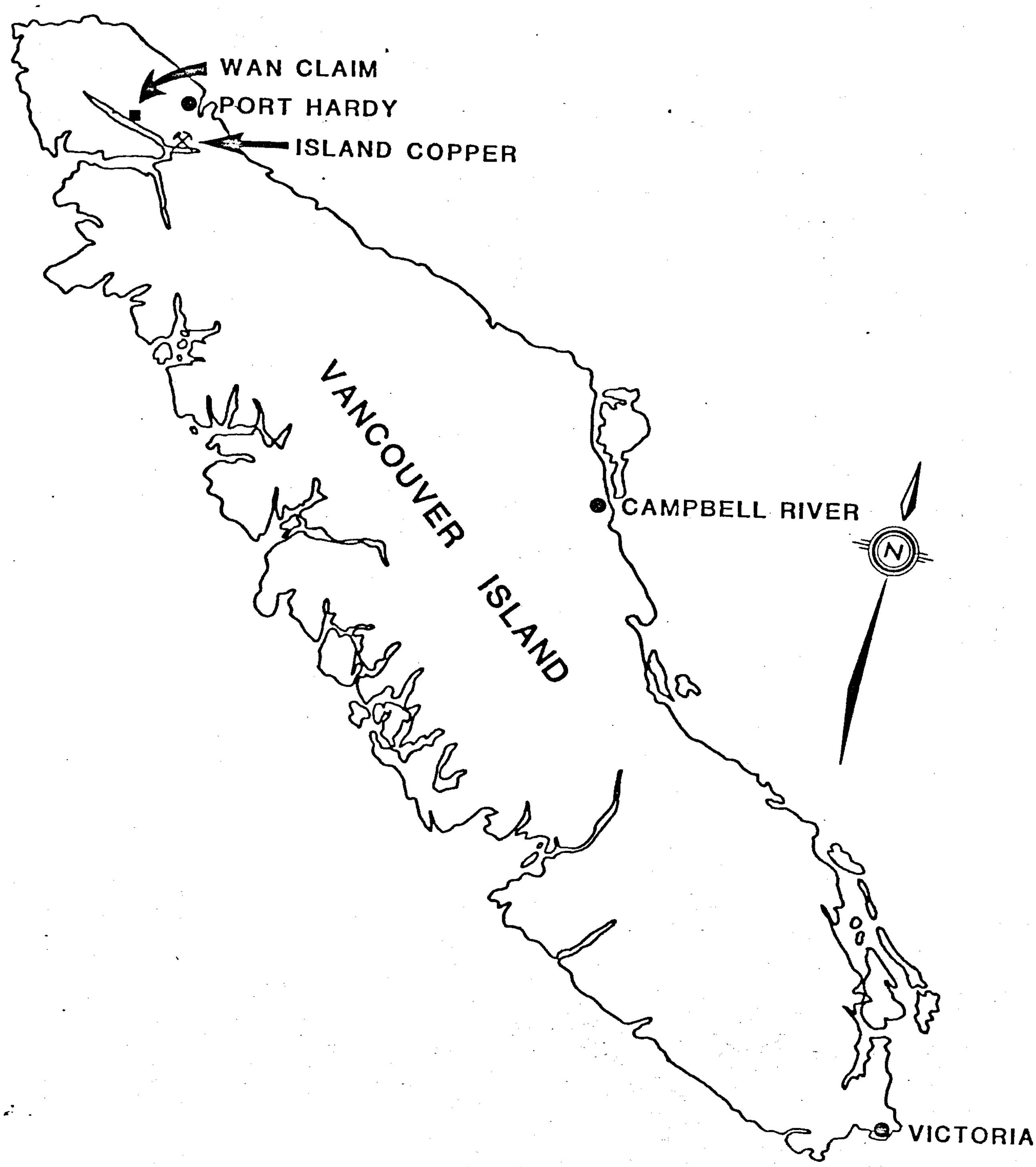
## 1.1. Location and Access

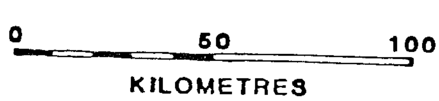
The WAN mineral claim, consisting of 6 units, is located just north of Holberg Inlet on Northern Vancouver Island, 20 km southwest of the town of Port Hardy and 11 km west of the village of Coal Harbour (figures 1 and 2). Road access from Port Hardy is as follows: 4 km south along the North Island Highway; 13 km south-southwest on the paved road to Coal Harbour; and 13 km west along Wanokana Main, a gravel logging road passing through the southern portion of the property. Pemberton Main, an off-shoot of Wanokana Main, provides access to the northeast corner of the WAN claim.

## 1.2. Physiography

The WAN claim lies within the boundaries of Tree Farm Licence No. 6 of which the timber rights are controlled by Western Forest Products. Active logging, on-going during field work, has resulted in 25-35% of the property being clear cut, primarily in the northern portion. The remainder is heavily forested.

Elevations on the claim range from sea level on the shore of Holberg Inlet along the southern boundary to 215 m (700 ft.) in the north-central portion of the property. Annual precipitation at Port Hardy, 20 km to the northeast, is normally about 190 cm (Cargill et al, 1976). The Wan claim straddles two drainage systems, Youghpan Creek to the west and Wanokana Creek to the east, both of which flow southward into Holberg Inlet.



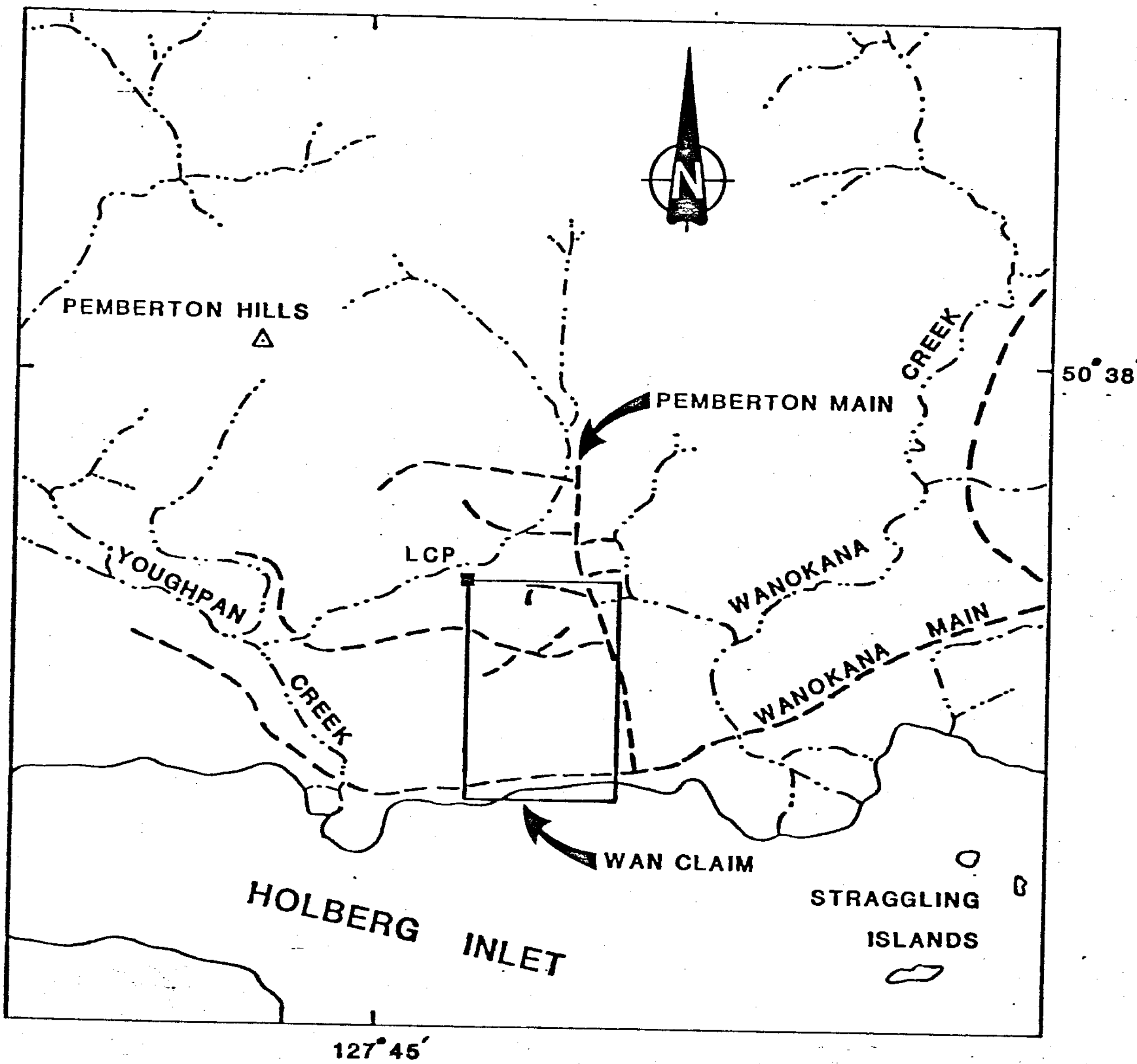




HOMESTAKE
MINERAL DEVELOPMENT COMPANY

WAN CLAIM

KEY MAP

| DRAWN | DATE | FILE CODE | |
|---|---|---|---|
| GJP | OCT, 1984 | NTS | FIG. 1 |
| Revised | | 92L/12 | |




SCALE

0 1000 2000 METERS

LEGEND

- STREAM
- ROAD
- CLAIM BOUNDARY
- LEGAL CORNER POST

HOMESTAKE
MINERAL DEVELOPMENT COMPANY

WAN CLAIM
LOCATION MAP

| DRAWN | DATE | FILE CODE | |
|---|---|---|---|
| GJP | OCT. 1984 | NTS 92L/12 | FIG. 2 |
| Revised | | | |

### 1.3. Property Definition

The WAN mineral claim consists of 6 units, 2 east by 3 south, in the Nanaimo Mining Division. The claim was staked on August 8 and 9, 1984, by Peter A. Ronning using claim tag number 91176 and was recorded in Nanaimo, B.C., on August 21, 1984, with record number 1865. Mr. Ronning, of R.R. #1, Sechelt, B.C., is the present owner of record. Operator for the work included in this report is Homestake Mineral Development Company, 201 - 856 Homer Street, Vancouver, B.C.

Staking followed recognition of argillic and silica alteration assemblages considered to be favourable indicators of epithermal gold mineralization systems. A second potential target is an auriferous Cu-Mo deposit similar to Utah's Island Copper Mine on Rupert Inlet, 17 km east of the WAN claim.

### 1.4. Summary of Work Performed

During the period of September 22 to September 24, 1984, 29 rock samples were collected from outcrop on the WAN claim for geochemical analyses. Sampling was conducted along compass traverses with distances being measured by hip-chain. Sample locations and analytical results have been plotted on a 1:5,000 map, produced from field notes, along with logging road locations and outcrop distribution (fig. 3). Combined with the sampling program, the two geologists involved noted rock types and alteration assemblages in all outcrops encountered.

## 2. REGIONAL GEOLOGY

The WAN claim lies near the southern margin of the Nahwitti Fault Block which is bordered to the north by the WNW-trending Goletas Fault in the Goletas Channel along the north coast of Vancouver Island and on the south by the east-west Holberg Fault running through Holberg and Rupert Inlets (Muller et al, 1974). The Nahwitti Block forms a southward inclined panel within which there is a fairly complete package of generally southwest dipping Upper Triassic to Lower Cretaceous rocks. Lithologies from north to south, as mapped by Muller, Northcote, and Carlisle (1974), are: (1) a thick sequence of basaltic volcanic rocks of the Upper Triassic Karmutsen Formation overlain by; (2) Upper Triassic Quatsino limestones which grade into; (3) calcarous siltstones and shales of the Parson Bay Formation which, along with Karmutsen and Quatsino rocks, comprises the Vancouver Group; (4) Lower Jurassic andesitic to rhyodacitic tuffs, lavas, and breccias of the Bonanza Group; (5) Longarm Formation graywackes, conglomerates, and siltstones of the Lower Cretaceous Kyuquot Group; and (6) Lower to (?) Upper Cretaceous Queen Charlotte Group conglomerates, graywackes, siltstones, and shales. This sequence has been considerably complicated by faulting within the Nahwitti Block and the emplacement of Jurassic Island Intrusions of quartz diorite, granodiorite, quartz monzonite, and quartz-feldspar porphyry. Island Copper, a porphyry Cu-Mo orebody located 17 km east of the WAN claim, occurs within Bonanza volcanics adjacent to a quartz-feldspar porphyry dyke believed to be related to the Island Intrusions (Muller et al, 1974; Cargill, 1975).

## 3. GEOLOGY AND ALTERATION OF THE WAN CLAIM

Geological mapping and sampling was confined to the northern half of the claim where access and outcrop distribution are favourable and previous reconnaissance work had located favourable alteration assemblages. All outcrops in which megascopic primary textures have not been totally obscured by alteration were identified as belonging to the Lower Jurassic Bonanza Group with common lithologies being lithic lapilli tuffs, lithic-crystal tuffs, and crystal-ash tuffs (Appendix 2). Regional mapping by Muller, Northcote, and Carisle (1974) indicates a narrow strip of Lower Cretaceous Longarm Formation greywackes, conglomerates, and siltstones along the northern shore of Holberg Inlet within the southern portion of the WAN claim.

Two main types of hydrothermal alteration can be recognized within the mapped area based upon hand specimen examination (fig. 3). Rocks underlying the northeastern area of the property have undergone intermediate argillization as defined by Barnes (1979) with the dominant phases thought to be kaolinite and/or montmorillonite accompanied by some of the clay minerals. As well, pyrophyllite, common in advanced argillic assemblages (Barnes, 1979), is suspected to occur in rocks near the quartz shown in figure 3. Pyrite is locally common within the argillized rocks and may occur as very fine grained, pervasive replacement zones up to 1 meter wide. Post-pyrite hydrothermal alteration and/or weathering along intersecting fractures may leave pods or lenses of pervasive pyrite separated by varying widths of argillically altered rock from which the pyrite has been leached. Pyrite is also reasonably common along hair-line fractures.

Argillization grades fairly abruptly westward into moderate to strong silicification across a NNW-trending boundary passing approximately 175 m east of the Legal Corner Post (fig. 3). Outcrop in the area of sample 4311, near the boundary, was noted to have variable alteration with both moderate silicification and weak to moderate argillization. Pyrite is less common in the silicified area as compared to the area of argillic alteration but can still be observed locally along hairline fractures.

# 4. LITHOGEOCHEMISTRY OF THE WAN CLAIM

## 4.1. Purpose and Sampling Method

Grab samples collected during reconnaissance evaluation of the area in mid-summer of 1984 failed to return any precious or base metal anomalies but, despite the discouraging analytical results, the WAN claim was staked based upon the recognition of favourable alteration assemblages. The field work described in this report was undertaken to more accurately define the distribution and types of alteration and to collect both representative rock samples and selected samples of pyritic zones and fractures in an attempt to discover leakage anomalies. Leakage anomalies, as discussed by Rose, Hawkes, and Webb (1979), are those created by the transport and deposition of ore-stage material via fluid flow within fractures as opposed to diffusion aureoles created by the movement of ions through stationary pore fluid along a concentration gradient. By selectively sampling pyrite-rich material along fractures and in replacement zones leakage anomalies, if present, are enhanced while random chip samples provide average rock values for comparison.

Samples were collected along compass traverses with distances measured by hip-chain. Most outcrops were sampled by collecting random rock chips over areas of approximately one meter by one meter. Wherever possible, a second sample of pyritic material was selectively collected. In a few instances, iron-oxide rich fractures were selectively sampled in the absence of pyrite.

### 4.2. Analytical Procedure

Geochemical analyses were performed by ACME Analytical Laboratories Ltd., 852 East Hastings Street, Vancouver, B.C. Rock samples were crushed to -100 mesh and a 0.5 gram sample of the crushed material was separated. This was digested in a 3 ml solution of $HCl$-$HNO_3$-$H_2O$ in a 3:1:3 proportion at 95°C for one hour followed by dilution to 10 ml with demineralized water. This leach by dilute aqua regia is partial for Mn, Fe, Ca, P, Cr, Mg, Ba, Ti, B, Al, Na, K, and W. Extracted metals were then analysed by inductively coupled argon plasma (lCP) for 30 elements (given in appendix 1). For gold analyses, 10.0 - 30.0 grams of crushed sample was subjected to fire assay preconcentration techniques to produce a silver bead. The bead was then dissolved and the Au content was determined in the solution by graphite furnace atomic absorption. For Hg, 0.5 grams of crushed sample was digested with aqua regia and diluted with 20% HCl. An aliquot of the extract was added to a stannous chloride/hydrochloric acid solution. The reduced Hg was then swept out of the solution and passed into the Hg cell where it was measured by atomic absorption.

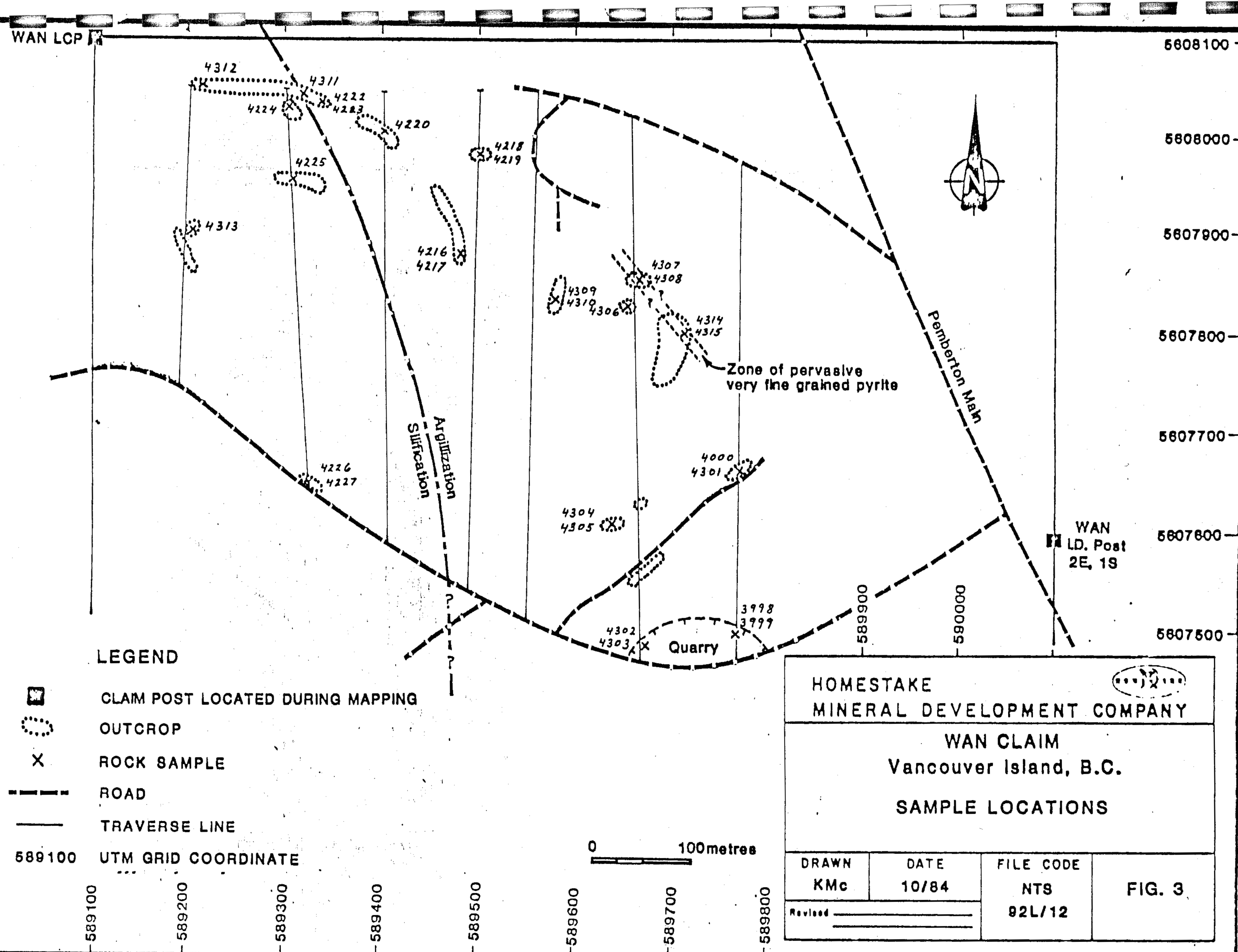
### 4.3. Geochemical Results And Discussion

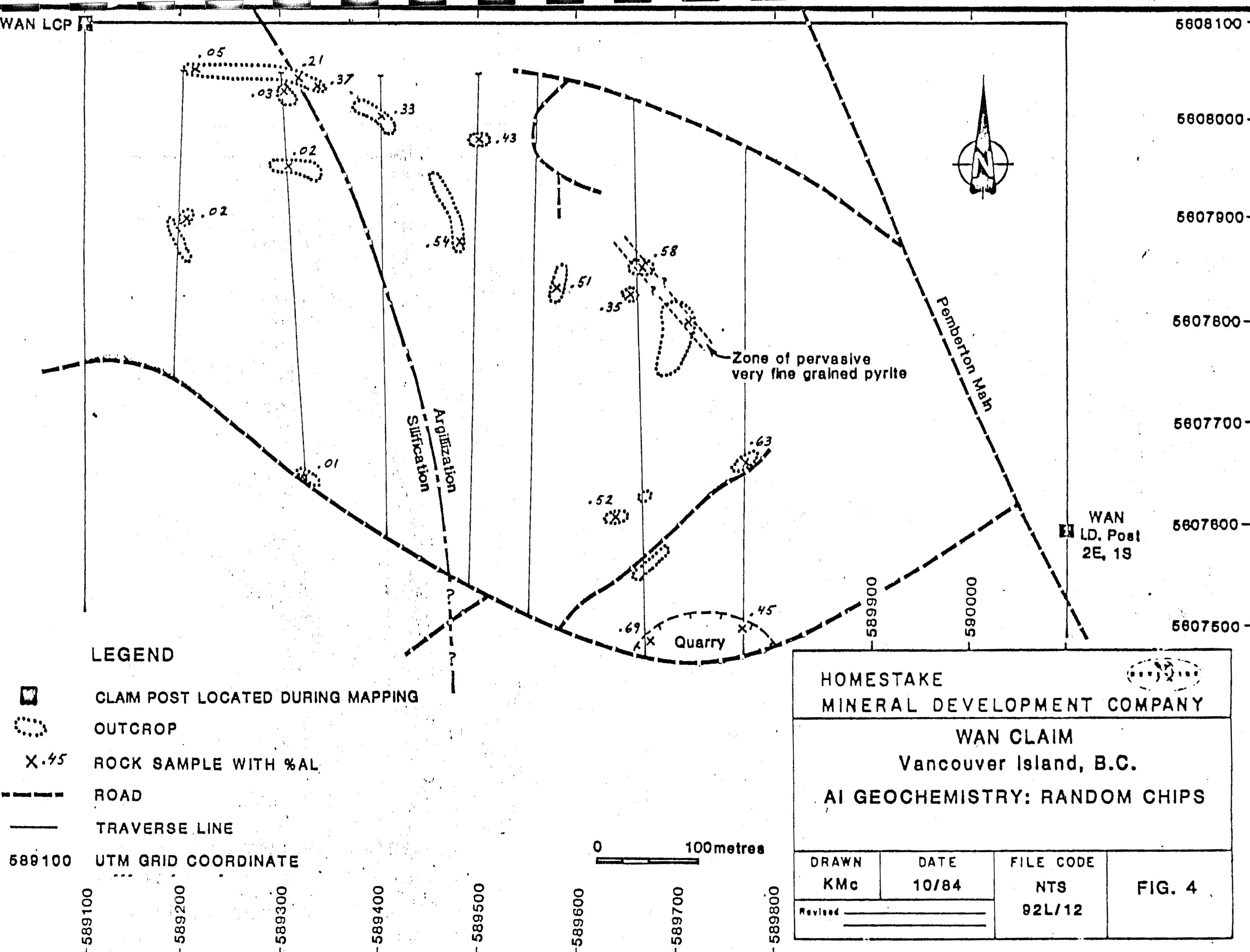
The geochemical results are presented in Appendix 1 and average values for 11 elements are given in table 1 for the entire data set and subsets based upon alteration assemblages. Figure 3 gives the sample locations and figures 4 to 13 are plan views showing the analytical values of Al, Fe, Cu, An, and As for both random chip and Fe-rich samples. Several elements, including Au, Ag, Ni, Co, U, Th, Cd, Bi, V, Ca, P, La, Cr, Mg, Ti, B, Na, K, and W, returned values at or near their detection limits for all samples.

The geochemical distinction between the silicified and the argillized areas of the property, initially determined by field mapping, is excellent. Argillic alteration is characterized by peraluminous phases such as kaolinite, montmorillonite, amorphous clays, pyrophyllite, and alunite which yield an Al-rich geochemical signature (Barnes, 1979). The average Al value in the argillic zone of the WAN claim is 0.48% (23 samples) as compared to 0.02% in the silicified zone (6 samples). This contrast, apparent in figures 4 and 5, is too great and too consistent to be a reflection of primary differences between units of the Bonanza Group or variable effectiveness of acid leach on silicified versus non-silicified rocks, and is therefore attributed to hypogene alteration. It should be noted that although the acid leach is only partial for Al, Fe, and Ba, relative differences remain valid.

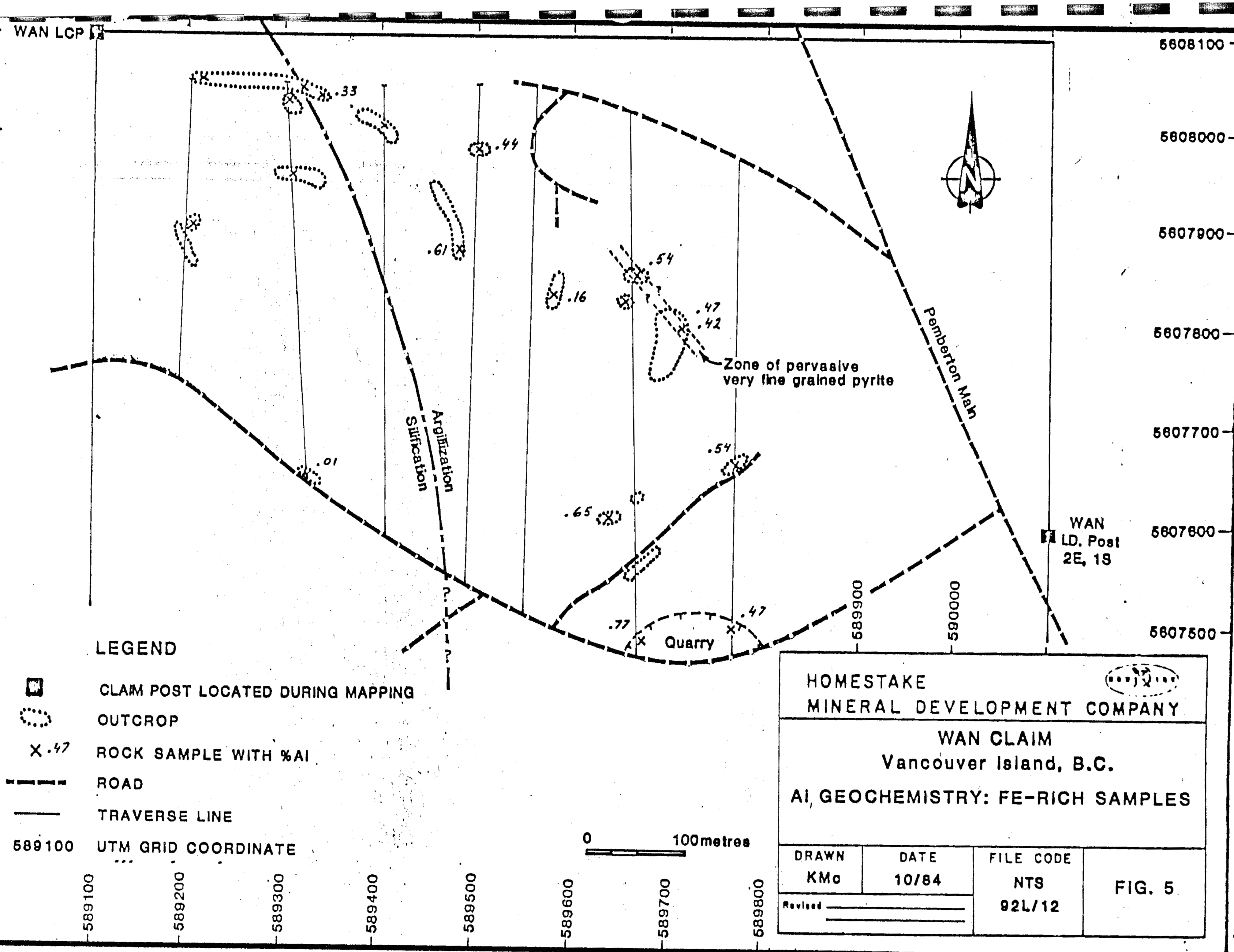
The effectiveness of the sampling program to collect Fe-rich material is conveyed by the elevated average Fe content of the 12 Fe-rich samples, 4.01%, versus that of the 17 random chip samples, 1.37 (table 1; figures 6 and 7). As the Fe-rich rock was collected along fractures and narrow replacement zones where leakage flow should be concentrated, a subsurface orebody could be indicated by increased ore-stage element values in the Fe-rich (leakage) samples versus random chip samples.

Elements with average enrichments of greater than 100% in the leakage samples over values for the random chip samples are Fe, Cu, Zn, and As (figures 8 to 13) while increases of 50 to 100% occur for Mo and Pb. Sb shows a strong enrichment in only one sample (19 ppm in sample 4227). Hg and Sr values vary considerably between samples but average values for the two groups are comparable; the variability of Hg may be partly or totally a function of its high mobility in the surface environment. Ba displays a marked decrease from Fe-rich to random chip samples


WAN LCP
4312
4311
4222
4223
4224
4220
4218
4219
4225
4313
4216
4217
4307
4308
4309
4310
4306
4314
4315
Zone of pervasive
very fine grained pyrite
Pemberton Main
Argillization
Silicification
4226
4227
4000
4301
4304
4305
WAN
I.D. Post
2E, 1S
3998
3999
4302
4303
Quarry
5608100
5608000
5607900
5607800
5607700
5607600
5607500
589100
589200
589300
589400
589500
589600
589700
589800
589900
590000
0
100metres
LEGEND
CLAIM POST LOCATED DURING MAPPING
OUTCROP
ROCK SAMPLE
ROAD
TRAVERSE LINE
589100 UTM GRID COORDINATE
HOMESTAKE
MINERAL DEVELOPMENT COMPANY
WAN CLAIM
Vancouver Island, B.C.
SAMPLE LOCATIONS
DRAWN
KMc
DATE
10/84
FILE CODE
NTS
92L/12
FIG. 3
Revised



WAN LCP
5608100
5608000
5607900
5607800
5607700
5607600
5607500
.05
.21
.37
.03
.33
.43
.02
.02
.54
.51
.58
.35
Zone of pervasive very fine grained pyrite
Pemberton Main
Argillization
Silification
.63
.01
.52
WAN I.D. Post 2E, 1S
.69
.45
Quarry
589100
589200
589300
589400
589500
589600
589700
589800
589900
590000
LEGEND
CLAIM POST LOCATED DURING MAPPING
OUTCROP
X.45 ROCK SAMPLE WITH %AL
ROAD
TRAVERSE LINE
589100 UTM GRID COORDINATE
0 100metres
HOMESTAKE
MINERAL DEVELOPMENT COMPANY
WAN CLAIM
Vancouver Island, B.C.
AI GEOCHEMISTRY: RANDOM CHIPS
DRAWN KMc
DATE 10/84
FILE CODE NTS 92L/12
FIG. 4
Revised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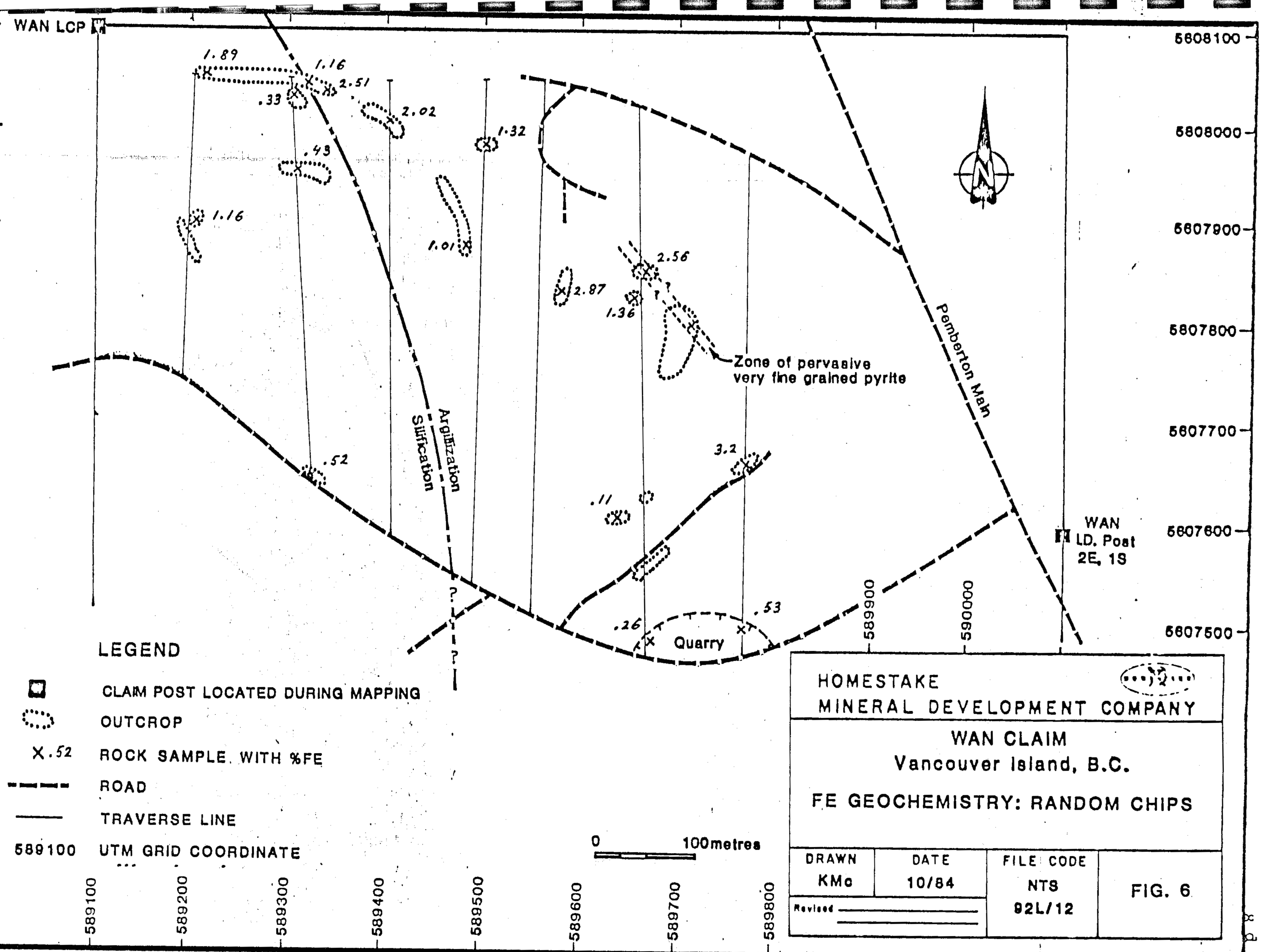
5607900
5607800
5607700
5607600
5607500
.33
.44
.61
.54
.16
.47
.42
Zone of pervasive very fine grained pyrite
Pemberton Main
Argillization
Silification
.01
.54
.65
.77
.47
Quarry
WAN LD. Post 2E, 1S
589900
590000
LEGEND
CLAIM POST LOCATED DURING MAPPING
OUTCROP
X .47 ROCK SAMPLE WITH %Al
ROAD
TRAVERSE LINE
589100 UTM GRID COORDINATE
0 100metres
589100
589200
589300
589400
589500
589600
589700
589800
HOMESTAKE
MINERAL DEVELOPMENT COMPANY
WAN CLAIM
Vancouver Island, B.C.
Al GEOCHEMISTRY: FE-RICH SAMPLES
DRAWN KMc
DATE 10/84
FILE CODE NTS 92L/12
Revised
FIG. 5




LEGEND

CLAIM POST LOCATED DURING MAPPING

OUTCROP

X .52 ROCK SAMPLE WITH %FE

ROAD

TRAVERSE LINE

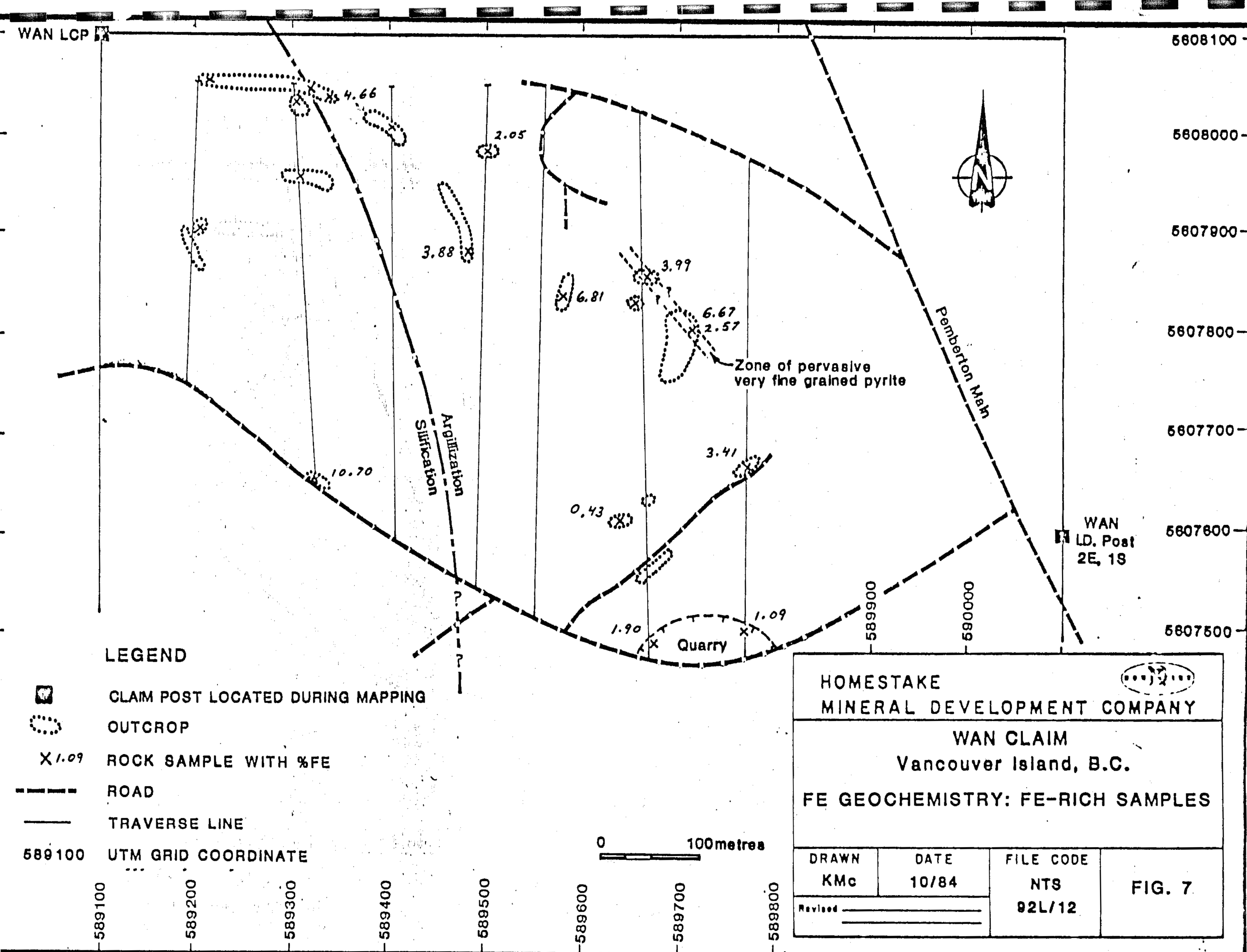
589100 UTM GRID COORDINATE

HOMESTAKE
MINERAL DEVELOPMENT COMPANY

WAN CLAIM
Vancouver Island, B.C.

FE GEOCHEMISTRY: RANDOM CHIPS

| DRAWN | DATE | FILE CODE | |
|---|---|---|---|
| KMc | 10/84 | NTS 92L/12 | FIG. 6 |
| Revised | | | |

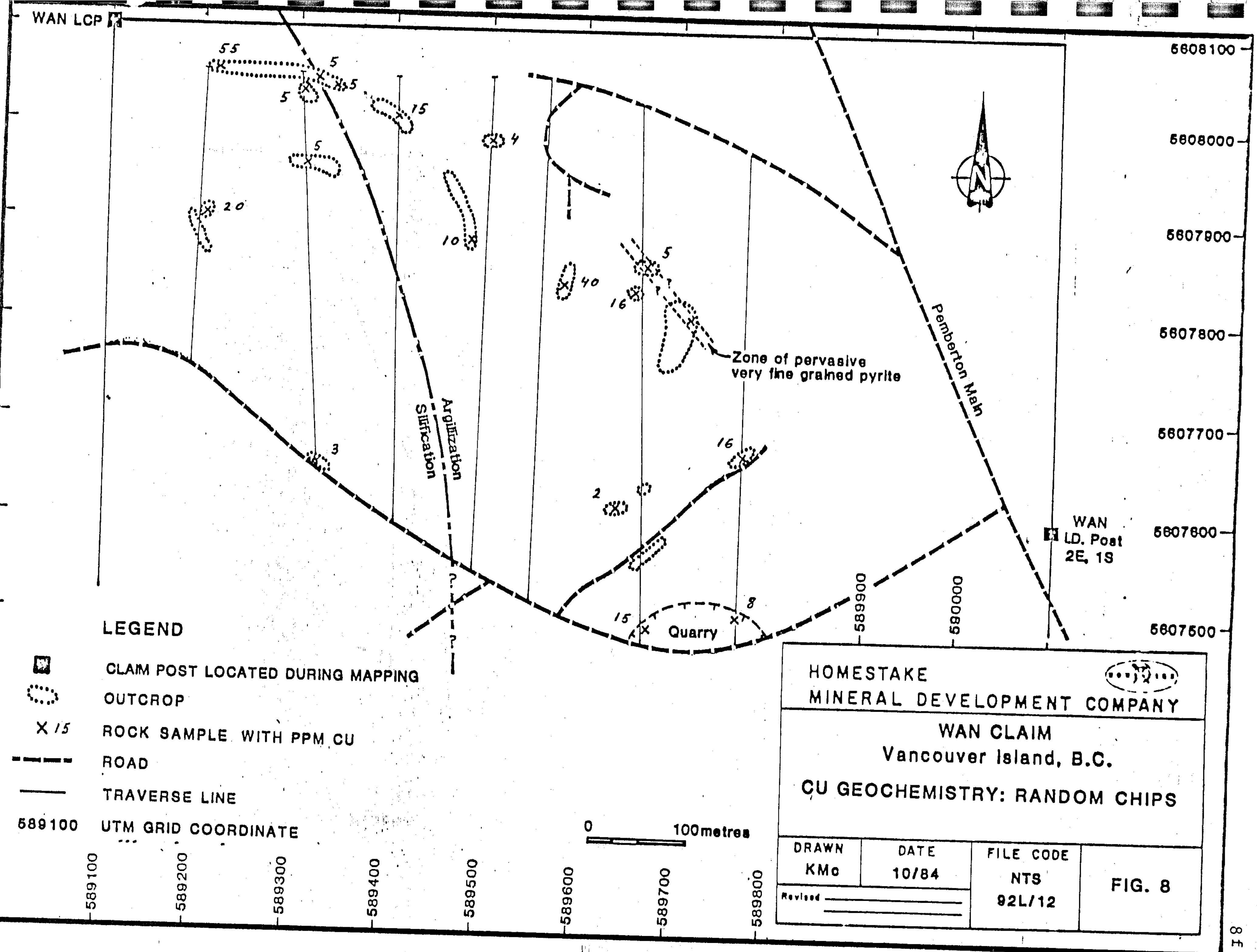



HOMESTAKE
MINERAL DEVELOPMENT COMPANY

WAN CLAIM
Vancouver Island, B.C.

FE GEOCHEMISTRY: FE-RICH SAMPLES

| DRAWN | DATE | FILE CODE | |
|---|---|---|---|
| KMc | 10/84 | NTS 92L/12 | FIG. 7 |
| Revised | | | |




LEGEND

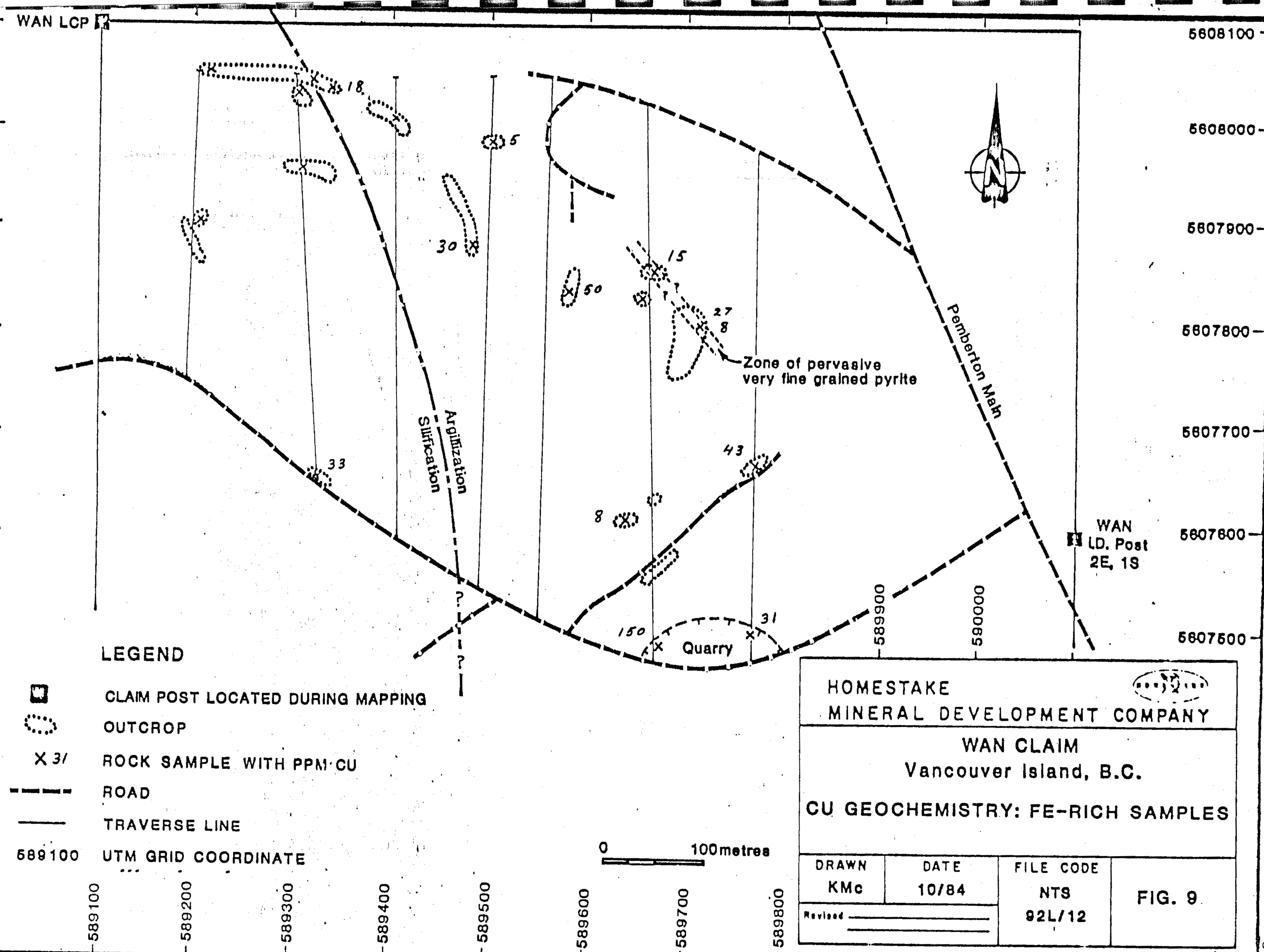
CLAIM POST LOCATED DURING MAPPING
OUTCROP
X 15 ROCK SAMPLE WITH PPM CU
ROAD
TRAVERSE LINE
589100 UTM GRID COORDINATE

HOMESTAKE
MINERAL DEVELOPMENT COMPANY

WAN CLAIM
Vancouver Island, B.C.

CU GEOCHEMISTRY: RANDOM CHIPS

| DRAWN | DATE | FILE CODE | |
|---|---|---|---|
| KMc | 10/84 | NTS 92L/12 | FIG. 8 |
| Revised | | | |




## LEGEND

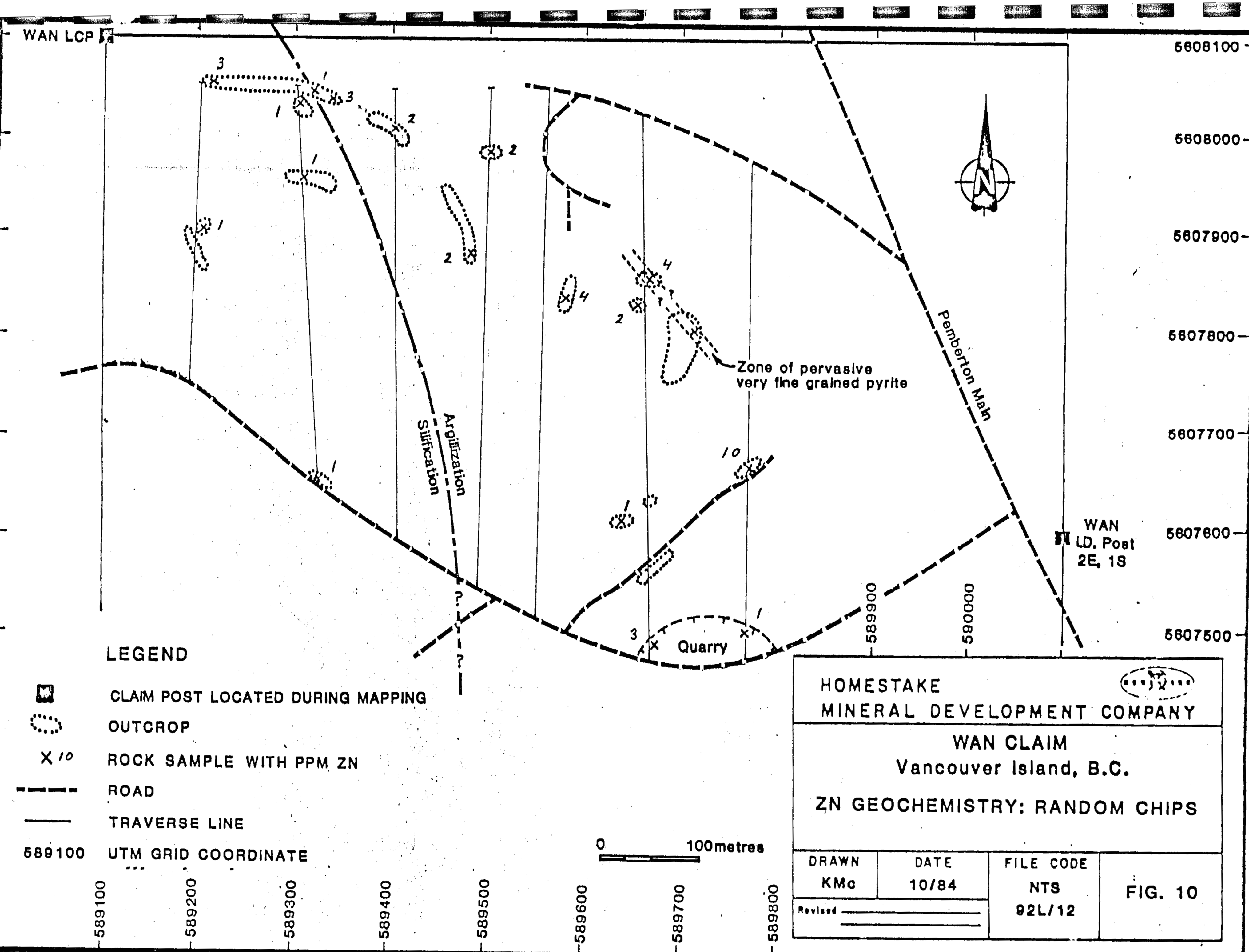
- CLAIM POST LOCATED DURING MAPPING
- OUTCROP
- X 31 ROCK SAMPLE WITH PPM CU
- ROAD
- TRAVERSE LINE
- 589100 UTM GRID COORDINATE

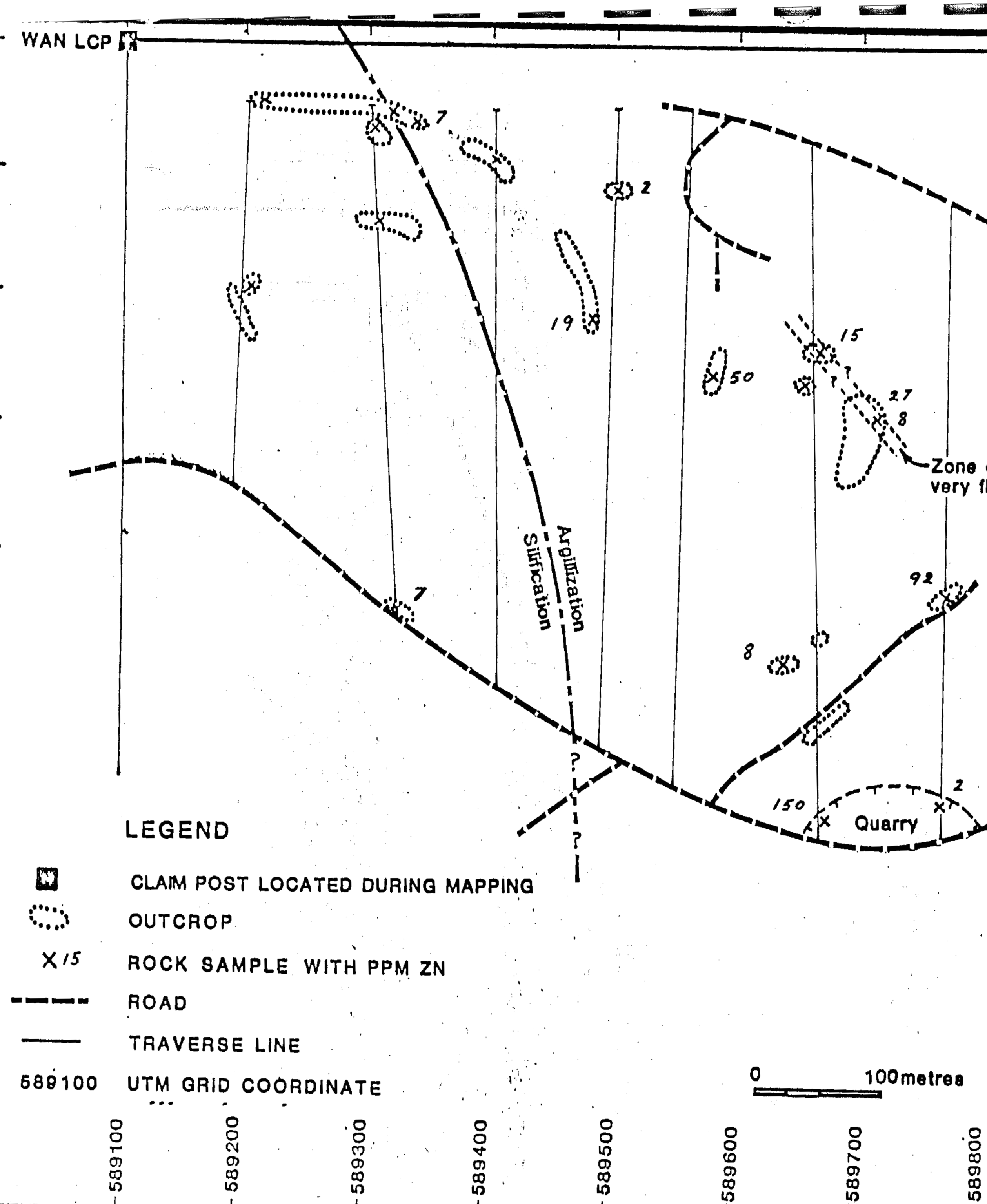
HOMESTAKE MINERAL DEVELOPMENT COMPANY

**WAN CLAIM**
Vancouver Island, B.C.

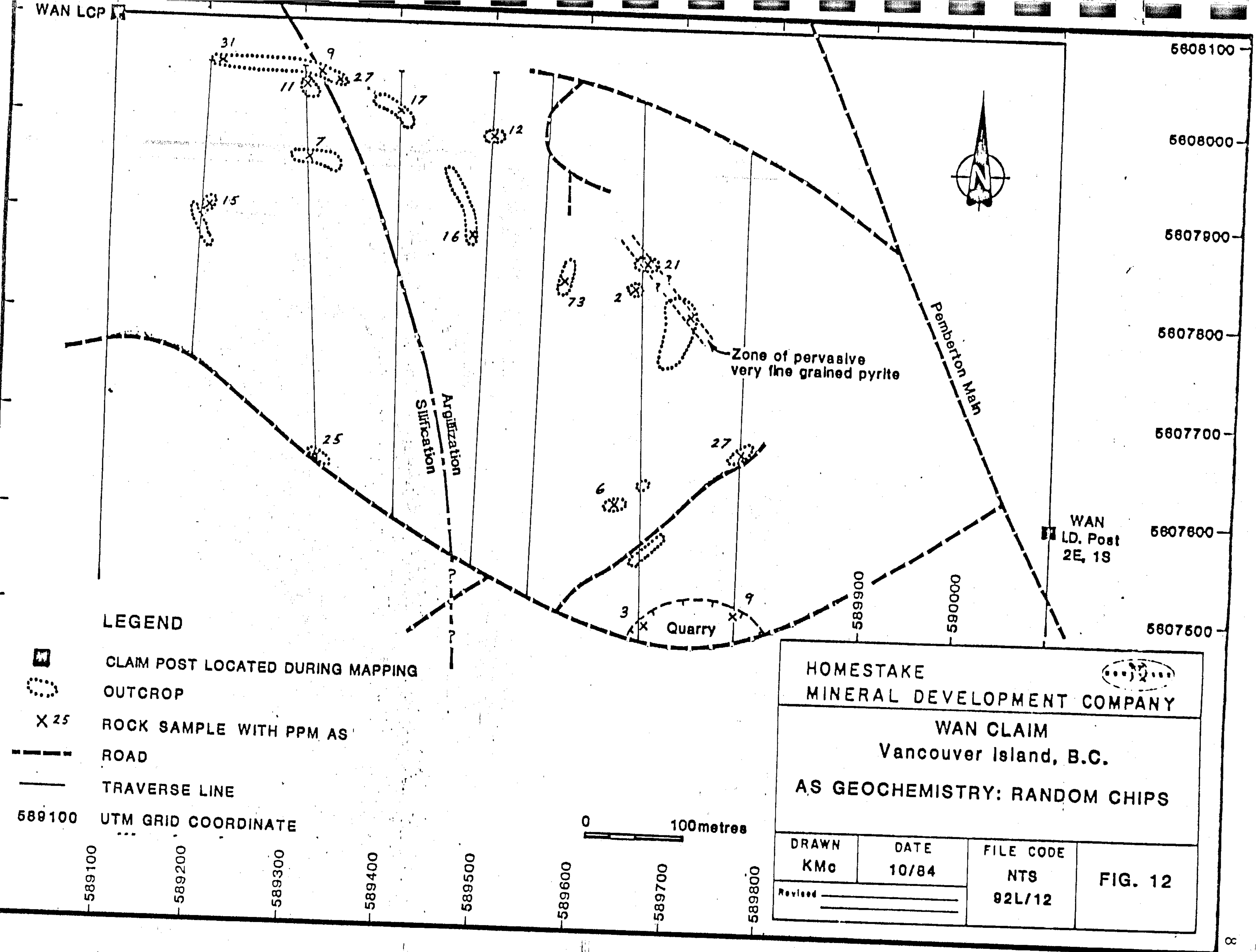
**CU GEOCHEMISTRY: FE-RICH SAMPLES**

| DRAWN | DATE | FILE CODE | |
|---|---|---|---|
| KMc | 10/84 | NTS 92L/12 | FIG. 9 |
| Revised | | | |


WAN LCP
5608100
5608000
5607900
5607800
5607700
5607600
5607500
Zone of pervasive very fine grained pyrite
Argillization
Silification
Pemberton Main
Quarry
WAN LD. Post 2E, 1S
589900
590000
589100
589200
589300
589400
589500
589600
589700
589800
0
100metres
LEGEND
CLAIM POST LOCATED DURING MAPPING
OUTCROP
ROCK SAMPLE WITH PPM ZN
ROAD
TRAVERSE LINE
589100 UTM GRID COORDINATE
HOMESTAKE MINERAL DEVELOPMENT COMPANY
WAN CLAIM
Vancouver Island, B.C.
ZN GEOCHEMISTRY: RANDOM CHIPS
DRAWN KMc
DATE 10/84
FILE CODE NTS 92L/12
Revised
FIG. 10




| HOMESTAKE MINERAL DEVELOPMENT COMPANY | | | |
|---|---|---|---|
| WAN CLAIM<br>Vancouver Island, B.C.<br>ZN GEOCHEMISTRY: FE-RICH SAMPLES | | | |
| DRAWN<br>KMc | DATE<br>10/84 | FILE CODE<br>NTS<br>92L/12 | FIG. 11 |
| Revised | | | |


WAN LCP
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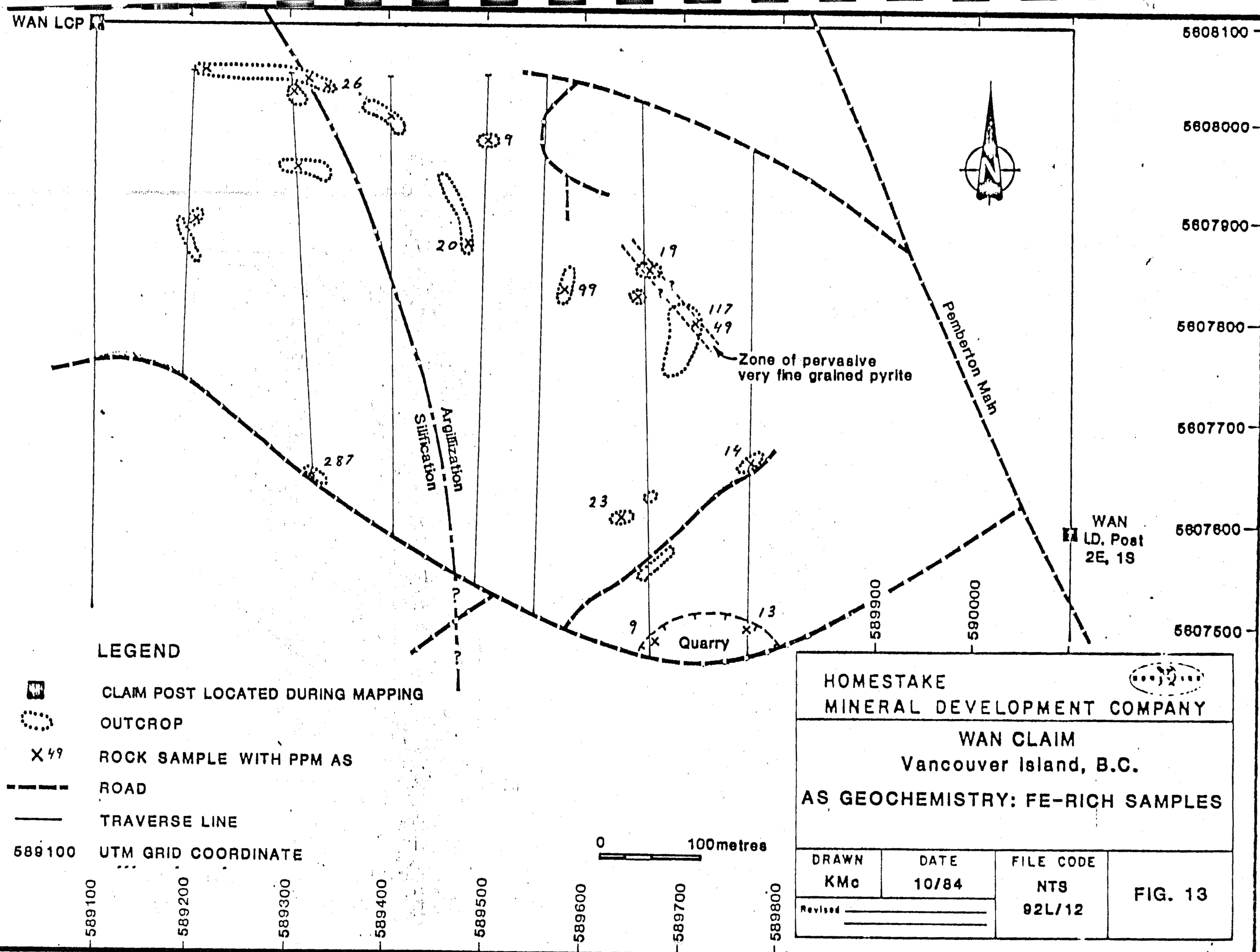
5608000
5607900
5607800
5607700
5607600
5607500
31
9
27
11
17
12
7
15
16
73
21
2
Zone of pervasive very fine grained pyrite
Pemberton Main
Argillization
Silification
25
27
6
3
9
Quarry
WAN L.D. Post 2E, 1S
589900
590000
LEGEND
CLAIM POST LOCATED DURING MAPPING
OUTCROP
X 25 ROCK SAMPLE WITH PPM AS
ROAD
TRAVERSE LINE
589100 UTM GRID COORDINATE
0 100metres
HOMESTAKE MINERAL DEVELOPMENT COMPANY
WAN CLAIM
Vancouver Island, B.C.
AS GEOCHEMISTRY: RANDOM CHIPS
DRAWN KMo
DATE 10/84
Revised
FILE CODE NTS 92L/12
FIG. 12
589100
589200
589300
589400
589500
589600
589700
589800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5607800
5607700
5607600
5607500
26
9
20
99
19
117
49
Zone of pervasive very fine grained pyrite
Pemberton Main
Argillization
Silicification
287
14
23
9
13
Quarry
WAN LD. Post 2E, 1S
589100
589200
589300
589400
589500
589600
589700
589800
589900
590000
LEGEND
CLAIM POST LOCATED DURING MAPPING
OUTCROP
X 49 ROCK SAMPLE WITH PPM AS
ROAD
TRAVERSE LINE
589100 UTM GRID COORDINATE
0 100metres
HOMESTAKE MINERAL DEVELOPMENT COMPANY
WAN CLAIM
Vancouver Island, B.C.
AS GEOCHEMISTRY: FE-RICH SAMPLES
DRAWN KMc
DATE 10/84
FILE CODE NTS 92L/12
Revised
FIG. 13

| Alteration Assemblage | N.S. | * Al % | * Fe % | Mo PPM | Cu PPM | Pb PPM | Zn PPM | As PPM | Sb PPM | Sr PPM | * Ba PPM | Hg PPB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All Samples | 29 | 0.38 | 2.46 | 6.9 | 22.3 | 19.1 | 7.4 | 34.3 | 3.1 | 16.2 | 127. | 56.0 |
| Any Sample-Fe | 17 | 0.34 | 1.37 | 5.2 | 13.5 | 14.6 | 2.5 | 18.3 | 2.6 | 15.9 | 199. | 49.7 |
| Any Sample+Fe | 12 | 0.45 | 4.01 | 9.3 | 34.8 | 25.5 | 14.4 | 57.1 | 3.8 | 16.7 | 27. | 65.0 |
| Argillic±Fe | 23 | 0.48 | 2.45 | 7.2 | 22.9 | 22.0 | 8.7 | 27.0 | 2.4 | 18.8 | 85. | 45.9 |
| Argillic-Fe | 12 | 0.47 | 1.58 | 5.8 | 11.8 | 17.8 | 2.9 | 18.5 | 2.3 | 19.4 | 137. | 42.9 |
| Argillic+Fe | 11 | 0.49 | 3.41 | 8.7 | 35.0 | 26.6 | 15.1 | 36.2 | 2.5 | 18.1 | 28. | 49.1 |
| Silica±Fe | 6 | 0.02 | 2.51 | 5.7 | 20.2 | 8.2 | 2.3 | 62.7 | 6.0 | 6.5 | 291. | 95.0 |
| Silica-Fe | 5 | 0.03 | 0.87 | 3.8 | 17.6 | 7.2 | 1.4 | 17.8 | 3.4 | 7.6 | 347. | 66.0 |
| Silica+Fe | 1 | 0.01 | 10.70 | 15.0 | 33.0 | 13.0 | 7.0 | 287.0 | 19.0 | 1.0 | 7. | 240.0 |

Table 1. Average geochemical values for total data set and subsets based on argillic, silica, and iron alteration.

(N.S. : number of samples; *: partial digestion only)

## 5. SUMMARY AND CONCLUSIONS

The WAN mineral claim, consisting of 6 units in the Nanaimo Mining Division, is located on the north shore of Holberg Inlet on northern Vancouver Island, approximately 20 km southwest of Port Hardy. The claim is owned by Peter A. Ronning of R.R. #1, Sechelt, B.C., and was recorded in Nanaimo, B.C., on August 21, 1984, using record number 1865.

The northern half of the WAN claim is underlain by pyroclastic volcanic rocks of the Lower Jurassic Bonanza Group. Two distinct alteration assemblages occur at a property scale separated by a NNW-trending boundary. The eastern area has undergone intermediate argillic alteration characterized by peraluminous phases such as kaolinite, montmorillonite, and clay minerals with local zones approaching intense argillic alteration with the addition of pyrophyllite. Rocks in the western area of the property are moderately silicified. Lithogeochemical results from the two areas contrast sharply in Al values.

Leakage anomalies obtained by comparing average analyses for selective Fe-rich samples from along fractures and in narrow replacement zones to average values for random chip samples suggest that the fluids flowing through these permeable zones were moderately enriched in Fe, Cu Zn, and As, weakly enriched in Mo and Pb, and depleted in Ba. Several elements, including Au and Ag, return low values at or near their detection limits for all samples.

## 6. ITEMIZED COST STATEMENT

| | | |
|---|---|---|
| **Salaries** | | |
| 3 man days field work, Sept. 22-Sept. 24 @ $94.00/day by G. Prior | $282.00 | |
| 3 man days field work, Sept. 22-Sept. 24 @ $80.00/day by P. Fagerlund | 240.00 | |
| 5 man days report writing and drafting @ $94.00/day by G. Prior | 470.00 | $ 992.00 |
| **Analytical Costs** | | |
| 30 element 1CP @ 6.00/sample x 29 samples | 174.00 | |
| Geochemical Hg analyses @ 3.00/sample x 29 samples | 87.00 | |
| Geochemical Au analyses @ 5.50/sample x 29 samples | 159.50 | |
| Rock sample preparation @ 2.75/sample x 29 samples | 79.75 | 500.25 |
| **Accommodation** | | |
| Sept. 22-Sept. 24, Port Hardy Inn, Port Hardy @ 42.80/night | 128.40 | 128.40 |
| **Meals** | | |
| September 22 | 64.14 | |
| September 23 | 62.38 | |
| September 24 | 22.45 | 148.97 |
| **Gasoline** | | |
| September 25, Port Hardy | 26.00 | 26.00 |
| **Sample Shipment** | | |
| September 28 | 14.46 | 14.46 |
| TOTAL COST: | | $1,810.08 |

## 7. REFERENCES

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# APPENDIX 1

# ANALYTICAL RESULTS

ACME ANALYTICAL LABORATORIES LTD. 852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6 PHONE 253-3158 DATA LINE 251-1011

# GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-3 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: P1-ROCKS P2-ROCKS & SILTS AU** ANALYSIS BY FA+AA FROM 10 GRAM SAMPLE. HG ANALYSIS BY FLAMELESS AA.

DATE RECEIVED: OCT 1 1984 DATE REPORT MAILED: Oct 4/84 ASSAYER. [signature] .DEAN TOYE. CERTIFIED B.C. ASSAYER

HOMESTAKE MINERALS PROJECT # 5710 FILE # 84-2841

PAGE 1

| SAMPLE# | MO PPM | CU PPM | PB PPM | ZN PPM | AG PPM | NI PPM | CO PPM | MN PPM | FE % | AS PPM | U PPM | AU PPM | TH PPM | SR PPM | CD PPM | SB PPM | BI PPM | V PPM | CA % | P % | LA PPM | CR PPM | MG % | BA PPM | TI % | B PPM | AL % | NA % | K % | W PPM | AU** PPB | HG PPB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VW-01-4-4216 | 10 | 10 | 17 | 2 | .1 | 2 | 2 | 16 | 1.01 | 16 | 5 | ND | 2 | 9 | 1 | 2 | 2 | 2 | .04 | .01 | 3 | 1 | .01 | 21 | .01 | 4 | .54 | .01 | .01 | 2 | 1 | 60 |
| VW-01-4-4217 | 18 | 30 | 21 | 19 | .1 | 8 | 14 | 47 | 3.88 | 20 | 5 | ND | 2 | 6 | 1 | 2 | 2 | 2 | .03 | .01 | 3 | 1 | .01 | 11 | .01 | 2 | .61 | .01 | .01 | 2 | 1 | 20 |
| VW-01-4-4218 | 3 | 4 | 14 | 2 | .1 | 1 | 1 | 8 | 1.32 | 12 | 5 | ND | 2 | 8 | 1 | 2 | 2 | 2 | .01 | .01 | 3 | 1 | .01 | 8 | .01 | 4 | .43 | .01 | .01 | 2 | 1 | 30 |
| VW-01-4-4219 | 2 | 5 | 14 | 2 | .1 | 1 | 1 | 9 | 2.05 | 9 | 5 | ND | 2 | 4 | 1 | 2 | 3 | 2 | .01 | .01 | 3 | 1 | .01 | 10 | .01 | 4 | .44 | .01 | .01 | 2 | 1 | 10 |
| VW-01-4-4220 | 5 | 15 | 14 | 2 | .1 | 1 | 1 | 9 | 2.02 | 17 | 5 | ND | 2 | 12 | 1 | 2 | 12 | 2 | .01 | .01 | 3 | 1 | .01 | 560 | .01 | 2 | .33 | .01 | .01 | 2 | 1 | 90 |
| VW-01-4-4222 | 5 | 5 | 25 | 3 | .1 | 1 | 1 | 3 | 2.51 | 27 | 5 | ND | 2 | 27 | 1 | 2 | 13 | 3 | .01 | .01 | 4 | 1 | .01 | 17 | .01 | 4 | .37 | .01 | .01 | 2 | 3 | 160 |
| VW-01-4-4223 | 3 | 18 | 29 | 7 | .1 | 2 | 2 | 5 | 4.66 | 26 | 5 | ND | 2 | 18 | 1 | 2 | 14 | 2 | .01 | .01 | 2 | 1 | .01 | 8 | .01 | 2 | .33 | .01 | .01 | 2 | 2 | 170 |
| VW-01-4-4224 | 3 | 5 | 5 | 1 | .1 | 1 | 1 | 32 | .33 | 11 | 5 | ND | 2 | 5 | 1 | 5 | 11 | 2 | .01 | .01 | 3 | 1 | .01 | 99 | .01 | 3 | .03 | .01 | .01 | 2 | 2 | 20 |
| VW-01-4-4225 | 3 | 5 | 4 | 1 | .1 | 1 | 1 | 19 | .43 | 7 | 5 | ND | 2 | 2 | 1 | 2 | 3 | 2 | .01 | .01 | 3 | 1 | .01 | 29 | .01 | 2 | .02 | .01 | .01 | 2 | 1 | 40 |
| VW-01-4-4226 | 2 | 3 | 3 | 1 | .1 | 1 | 1 | 17 | .52 | 25 | 5 | ND | 2 | 15 | 1 | 4 | 4 | 2 | .01 | .01 | 3 | 1 | .01 | 974 | .01 | 4 | .01 | .01 | .01 | 2 | 1 | 10 |
| VW-01-4-4227 | 15 | 33 | 13 | 7 | .3 | 3 | 1 | 19 | 10.70 | 287 | 5 | ND | 2 | 1 | 1 | 19 | 2 | 2 | .01 | .01 | 2 | 2 | .01 | 7 | .01 | 2 | .01 | .01 | .01 | 2 | 2 | 240 |
| VW-01-4-3998 | 4 | 8 | 8 | 1 | .1 | 4 | 1 | 11 | .53 | 9 | 5 | ND | 2 | 32 | 1 | 2 | 3 | 7 | .01 | .01 | 4 | 2 | .01 | 65 | .01 | 2 | .45 | .01 | .01 | 2 | 1 | 5 |
| VW-01-4-3999 | 15 | 31 | 13 | 2 | .3 | 5 | 1 | 12 | 1.09 | 13 | 5 | ND | 2 | 30 | 1 | 3 | 2 | 7 | .01 | .01 | 4 | 1 | .01 | 104 | .01 | 4 | .47 | .01 | .01 | 2 | 1 | 5 |
| VW-01-4-4000 | 5 | 16 | 15 | 10 | .1 | 1 | 1 | 7 | 3.20 | 27 | 5 | ND | 2 | 14 | 1 | 2 | 2 | 6 | .01 | .02 | 4 | 1 | .01 | 175 | .01 | 4 | .63 | .01 | .01 | 2 | 1 | 5 |
| VW-01-4-4301 | 4 | 43 | 22 | 92 | .1 | 2 | 4 | 74 | 3.41 | 14 | 5 | ND | 2 | 16 | 1 | 2 | 2 | 2 | .01 | .01 | 4 | 2 | .01 | 25 | .01 | 3 | .54 | .01 | .01 | 2 | 1 | 5 |
| VW-01-4-4302 | 2 | 15 | 5 | 3 | .2 | 1 | 1 | 25 | .26 | 3 | 5 | ND | 2 | 28 | 1 | 2 | 2 | 4 | .03 | .01 | 3 | 1 | .01 | 127 | .01 | 2 | .69 | .01 | .01 | 2 | 1 | 50 |
| VW-01-4-4303 | 1 | 150 | 8 | 4 | .2 | 1 | 1 | 5 | 1.90 | 9 | 5 | ND | 2 | 10 | 1 | 2 | 2 | 3 | .02 | .01 | 3 | 1 | .01 | 37 | .01 | 5 | .77 | .01 | .01 | 2 | 1 | 160 |
| VW-01-4-4304 | 4 | 2 | 6 | 1 | .2 | 1 | 1 | 7 | .11 | 6 | 5 | ND | 2 | 20 | 1 | 2 | 2 | 2 | .01 | .01 | 3 | 2 | .01 | 37 | .01 | 3 | .52 | .01 | .01 | 2 | 1 | 20 |
| VW-01-4-4305 | 17 | 8 | 9 | 1 | .1 | 1 | 1 | 6 | .43 | 23 | 5 | ND | 2 | 29 | 1 | 2 | 2 | 4 | .01 | .01 | 3 | 2 | .01 | 54 | .01 | 5 | .65 | .01 | .01 | 2 | 2 | 40 |
| VW-01-4-4306 | 2 | 16 | 6 | 2 | .1 | 1 | 1 | 65 | 1.36 | 2 | 5 | ND | 2 | 7 | 1 | 2 | 2 | 6 | .01 | .03 | 3 | 1 | .01 | 64 | .01 | 4 | .35 | .01 | .01 | 2 | 1 | 30 |
| VW-01-4-4307 | 10 | 5 | 21 | 4 | .1 | 1 | 1 | 18 | 2.56 | 21 | 5 | ND | 2 | 23 | 1 | 2 | 2 | 3 | .01 | .01 | 3 | 1 | .01 | 131 | .01 | 5 | .58 | .01 | .01 | 2 | 1 | 5 |
| VW-01-4-4308 | 9 | 15 | 22 | 9 | .1 | 1 | 1 | 49 | 3.99 | 19 | 5 | ND | 2 | 16 | 1 | 2 | 2 | 2 | .01 | .01 | 3 | 1 | .01 | 25 | .01 | 5 | .54 | .01 | .01 | 2 | 1 | 5 |
| VW-01-4-4309 | 5 | 40 | 40 | 4 | .2 | 1 | 1 | 27 | 2.87 | 73 | 5 | ND | 2 | 35 | 1 | 5 | 3 | 5 | .01 | .02 | 4 | 2 | .06 | 186 | .01 | 4 | .51 | .01 | .01 | 2 | 1 | 20 |
| VW-01-4-4310 | 9 | 50 | 54 | 12 | .2 | 1 | 2 | 17 | 6.81 | 99 | 5 | ND | 2 | 19 | 1 | 3 | 3 | 5 | .01 | .01 | 4 | 4 | .01 | 10 | .01 | 4 | .16 | .01 | .01 | 2 | 1 | 70 |
| VW-01-4-4311 | 15 | 5 | 42 | 1 | .1 | 1 | 1 | 13 | 1.16 | 9 | 5 | ND | 2 | 18 | 1 | 3 | 2 | 2 | .01 | .01 | 3 | 1 | .01 | 249 | .01 | 2 | .21 | .01 | .01 | 2 | 2 | 40 |
| VW-01-4-4312 | 9 | 55 | 19 | 3 | .1 | 2 | 1 | 53 | 1.89 | 31 | 5 | ND | 2 | 14 | 1 | 4 | 4 | 2 | .01 | .01 | 3 | 1 | .01 | 581 | .01 | 5 | .05 | .01 | .01 | 2 | 1 | 60 |
| VW-01-4-4313 | 2 | 20 | 5 | 1 | .1 | 2 | 1 | 48 | 1.16 | 15 | 5 | ND | 2 | 2 | 1 | 2 | 3 | 2 | .01 | .01 | 3 | 1 | .01 | 54 | .01 | 3 | .02 | .01 | .01 | 2 | 1 | 200 |
| VW-01-4-4314 | 13 | 27 | 66 | 13 | .2 | 2 | 3 | 29 | 6.67 | 117 | 5 | ND | 2 | 22 | 1 | 5 | 6 | 2 | .01 | .01 | 3 | 3 | .01 | 11 | .01 | 4 | .47 | .01 | .01 | 2 | 1 | 50 |
| VW-01-4-4315 | 5 | 8 | 35 | 5 | .3 | 1 | 1 | 21 | 2.57 | 49 | 5 | ND | 2 | 29 | 1 | 2 | 2 | 2 | .01 | .01 | 3 | 1 | .01 | 17 | .01 | 3 | .42 | .01 | .02 | 2 | 1 | 5 |

APPENDIX 2

# APPENDIX 2

## Rock Sample Descriptions

| | |
|---|---|
| 3998 | Random chips; white to light grey, lithic (± crystal) tuff. Moderate to strong argillic alteration with pyrophyllite. Trace very fine grained pyrite occurs disseminated and along hairline fractures. |
| 3999 | Selective chips; pyrite-rich fractures in rock described for 3998. |
| 4000 | Random chips; white, fine grained rock which is probably tuffaceous but texture is obscured by strong to intense argillic alteration with pyrophyllite. Minor quantity of white and pink zeolite (laumontite?) along irregular fractures. Irregular, grey pods rich in very fine grained pyrite are generally on the order of 1 - 2 cm long by a few millimeters wide and account for 1-2% of the rock. |
| 4216 | Random chips; bleached, fragmented volcanic has undergone strong argillic alteration. Minor pyrite occurs disseminated and in pods. |
| 4217 | Selective chips; pods of very fine grained pyrite in rock described for 4216. |
| 4218 | Random chips; bleached, fragmental volcanic has undergone strong argillic alteration. Minor pyrite occurs along fractures. |
| 4219 | Selective chips; pyritic fractures in rock described for 4218. |
| 4220 | Random chips; grey-brown volcanic rock is strongly altered to argillic assemblage. Minor, disseminated pyrite. |
| 4222 | Random chips; medium grey, fine grained volcanic (?) rock has original texture masked by strong argillic alteration. Pyrite reaches concentrations of 15% in local bands and also occurs disseminated in minor amounts. |
| 4223 | Selective chips; pyritic bands in rock described for 4222. |
| 4224 | Random chips; strongly silicified rock of unknown original texture, possibly with minor argillic alteration as well. Trace disseminated pyrite. |
| 4225 | Random chips; strongly silicified rock of unknown original texture. Trace disseminated pyrite. |
| 4226 | Random chips; strongly silicified lapilli tuff is light grey to white in colour. Possibly minor argillic alteration. Fine to coarse grained pyrite occurs concentrated in pods scattered throughout rock. |

| | |
|---|---|
| 4227 | Selective chips; pyritic pods in rock described for 4226. |
| 4301 | Selective chips; pyritic pods in rock described for 4000 |
| 4302 | Random chips; light grey to white, ash and crystal tuff with weak to strong argillic alteration, possibly with pyrophyllite. Sericite with minor chlorite is fairly common along irregular fractures devoid of pyrite. Trace pyrite occurs in irregular veinlets up to 1 mm wide. |
| 4303 | Selective chips; pyritic veinlets in rock described for 4302. |
| 4304 | Random chips; white, fine grained tuff (?) displays strong argillic alteration, possibly including pyrophyllite. Trace Fe as Fe-oxide fracture coatings. |
| 4305 | Selective chips; Fe-oxide fracture coatings in rock described for 4304. |
| 4306 | Random chips; bleached, white to light grey tuff displays weak argillic alteration. |
| 4307 | Random chips; bleached, white, fine grained tuff (?) has undergone moderate to strong argillic alteration. Fe-oxides, possibly limonite or jarosite, occur along fractures. 30-40% of the rock consists of pyritic pods, each containing 5-15% very fine grained pyrite, which may be up to 3 cm wide and 10 cm long. |
| 4308 | Selective chips; pyritic pods in rock described for 4307. |
| 4309 | Random chips; bleached, white, ash and crystal-ash tuff. Feldspar phenocrysts up to 2 cm long have been completely weathered leaving empty casts. Feldspars had probably undergone argillization. Minor, very fine grained pyrite occurs in pods. |
| 4310 | Selective chips; pyritic pods in rock described for 4309. |
| 4311 | Random chips; bleached, white, crystal and lithic lapilli tuffs have undergone variable alteration. Some areas are moderately silicified while others have undergone weak to moderate argillic alteration. Feldspar crystals are completely leached in most areas leaving casts. |

4312 Random chips; white, lithic-crystal lapilli tuff with grey fragments up to 3 mm long. The rock appears to have undergone an initial fracture-controlled phyllic (sericite-quartz-pyrite) alteration followed by moderate to strong silicification, also fracture controlled. The initial phyllic (pyritic) assemblage survives only in central areas between fractures in the form of pods. Also, the majority of feldspar crystals have been leached.

4313 Random chips; medium grey, strongly silicified tuff (?).

4314 Selective chips; 1 m wide, verticle zone of pervassive very fine grained pyrite trending 325$^{o}$ within lapilli tuff. Lenses and veinlets up to 2 mm wide of argillically altered material occur within the pyritic zone.

4315 Selective chips; wallrock of 4314 consisting of highly altered tuff. Rock grades from pervassive pyrite to a rock which has undergone strong argillic alteration. The rock is highly fractured (approximately 30 fractures per meter) with light brown, iron-oxide staining, possibly limonite or jarosite.