

HARDY

821955

HZ.241...

NF 101-27

*"Rite in the Rain"*

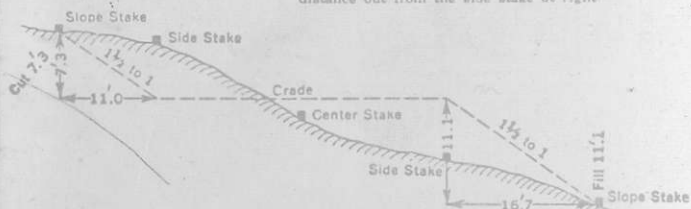
WEATHERPROOF  
FIELD BOOK

No. 350

## DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes  $1\frac{1}{2}$  to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

092H/15

*"Rite in the Rain"*<sup>®</sup>  
WEATHERPROOF

a product of

**J. L. DARLING CORPORATION**

TACOMA, WASHINGTON 98421 U.S.A.

Poso Lake Main Road

July 5/83

130.0

at road Maselfa

n

O/C →

+200m

+560m

Bi granite, slightly gneissic  
but equigranular with sparse  
fine crystalline quartz  
xenoliths  
- fresh, relatively homogeneous

\*

+150m

→ finer crystalline quartz-rich  
intrusive to ? hornfelsed  
sediment

- gritty-textured "sandstone"  
to gneissic metapelite in  
in shades from yellow-brown  
limonite to red-brown  
hematitic in crude, irregular  
to well defined bands

- bands defined by D colour  
X size  
- ? Fe carbonate alteration

H2241 +150m

mafic metavolcanic → could be

NE Creek

N/S

350m from basepoint Creek downstream

Talus only o/c far  
above

→ "orthoquartzite" → very pure,  
metamorphic

Talus w/o/c above  
boulders

- very dark green to maroon,  
finely crystalline with joints  
of about close-spaced Fp xls.

- areas of bleached lighter  
<sup>often more</sup> siliceous green extending out from  
fractures + Q veins, also  
irregular paler green + red  
patches ("mottles")

- coarser xlns chlort. in  
water veins + irregular mottles

- some rusty pieces have  
2-3% finely dis po, as  
well as po in irregular  
rectangular  $\chi$  outlines

- trace py with finely dis  
po + with chlort. in veins

- ? maybe minor galena very  
finely disseminated with po

- gypsum w po along open  
fractures

HZ242 + 900m 575me

mafic metavolcanic, likely ash

- sparse Ct-filled amygdulites
- ? varve-like implosions
  - alteration: chlorite
  - may be patchy silicification

→ IDP  
may or may not be related to  
spilitization

Rare muddy float mineral epx with  
5-10% po but hard to tell  
as may be along fractures

→ BCS0425: more about green  
metavc

- saw epx along chlorite-filled  
fractures

Takes w o/c above

to

clapnet tuff, green ground  
mass with slightly greyer  
- fragments  
- schistose

Plus grey, textureless, relatively  
hard and schistose, could  
be metasol / metabasite

- about very irregular,  
discontinuous veins, some  
parallel to foliation / schistosity,  
some folded

HZ 243 +150m

- mafic metabasite, slightly  
schistose, more chloritic than  
previous, <sup>often</sup> clasts well defined  
fragments but elsewhere well-  
- in places appears more like  
sediment with well-defined cherty  
bands



→ dark maroon + green as at  
previous  
- chloritic in patches

Tapes d/c above

defined extremely flattened lapilli,  
(likely tectonic) to several cm

HZ244 +175m

mafic metavolcanic, lapilli  
to ash tuff, variable green w.  
varying chlorite patches,  
very finely crystalline B<sub>2</sub> in  
places

- irregular Fp with mottles to  
veins sometimes w. coarser kine  
actinolite centres

+ interbedd. argillites + cherts

HZ245 +150m

as above with ↑ argillite +  
cherty argillite

- foliation parallel Q veins  
more abundant

- some banded metapelite →  
possibility of same baking

HZ 246 +150m

- mafic metavolcanic as  
previously tho. with schistosity  
better developed and ↑ irregular

Talus, o/c above not easily  
visible

talus o/c above not easily  
visible

Talus w o/c above

1975m

areas of ? bleaching

- some such areas, related to  
|| to schistosity contain<sup>g</sup>  
chert or Ct + ? lighter  
green muscovite
- fr. py w Ct along fractures
- + finely dis. ungrd. mass
- sparse talus of finely kline  
O dent

H2247 o/c immediately above +150m

- mafic metavolcanics as before but
- ↑ schistose + chloritic  
plus ? metavolcanic or  
intrusive light grey with  
diffuse green areas, very  
fresh turned plagioclase,  
very easily cleaves into  
large fresh surfaces
- looks like very well  
defined ash tuff
- trace py

→ ? folded veins  
but also spread outward from  
fractures

→ IDP finely crystalline intrusive

H2248 +150m d/c immediately ab

mafic metabas schistose with  
some evidence of tectonic fabric  
on small scale → shears, slips

- dent white mottles to beds  
often with yellowish ? muscovite  
lines which unplaces feel grey  
? talcose

- muscovite, cherty  
- dent talcose of white,  
fine-grained intrusive which  
appears Px-bearing - ? granodiorite

H2249 +150m small walk through

- mafic metabas, schistose,  
likely stuff tho too weathered  
to be sure

H2250 +1600m 615me

mafic metaultramafic, schistose  
with beautiful flattened lapilli  
- trace py ← very minor limonite  
but elsewhere return to more  
banded material ± cherts

one

+ 2275

→ lapilli tuff texture visible in  
places

or Ep

+ 2425

woods (visible from road) o/c <sup>well</sup> above

H: with lenses of Bi and/or  
chlorite and Q-rich material  
- plus interbedded cherts to  
cherty argillites

HZ 251 +200m o/c close above  
well banded ? metavolcanic  
to cherty metasediment  
- bands on  $< 0.5$  cm scale,  
well defined by  $\Delta$  comp, grain size  
- but high chlorite content  
→ at least some VC component,  
as does hardness + breakage  
across grains  
→ schistose, biotitic  
+ interbedded distinctive fusible  
cherts + argillites → contorted  
subcherts

HZ 252 +150m o/c  
cherty tuff / chert with phyllite  
argillite interbeds; variable amt  
- well banded, wiggly  
undulatory O/70°NE



← +1200 road to S  
Talus

ute to  
ts

H - in places ?  $\Phi$  veins or bands, very sharply folded

HZ253 +150m <sup>Talus</sup> no o/c unmod.  
- predominantly cherts,  
cherty argillites; variable  
amts silica  
- well banded, in places  
contorted  
< phyllitic than previously

AZ254 +150m o/c  
? mafic metab  $\rightarrow$  chlorite-Bi  
schist; finely  $\times$  line flakes,  
- hard  
= no remnant texture visible

HZ255 +200m o/c above, talus  
chert, block with some variable  
sedimentary and/or tuffaceous  
component  
- schistosity planes well  
developed  $\rightarrow$  <sup>cherty</sup> Bi schist  
- no effervescence

visible but very angular blocks  
in area of open talus

450m  
post 100-d

15  
→ mazy

+100m road to NE at  
29 km sign

+300m widely talus  
widely glacial debris

+ 10,200 m road to right →  
intrusive d/c + 200m in

+1100m 435me  
→ d/c of argillites w. very  
numerous chert bands 1-5mm  
→ too thin to sample  
no effervescence

+1200m Hicks Creek  
Recreation Centre Road to E

H3257

H3256 +300m d/c with  
well defined X cutting dyke,  
just off road  
cherty <sup>to argillites</sup> ~~teuff~~ well laminated,  
chloritic w. py ± po in  
places po > py

H2256: chiefly argillite to chert,  
with white quartzose bands  
very strongly folded

- coarse xline Bi, chl ± Q  
lenses to bands

- trace Op in coarser band  
+ folds w shears

- minor carbonate bands

very intensely folded

interbedded with laminar  
black argillites, light  
grey totally recrystallized  
limestone

- mafic metabasite  $\rightarrow$   
chl-Bi schist, light green  
- laminar impure w py  
cubes  
 $\rightarrow$  phyllitic schist in  
places 345°/vertical

$\rightarrow$  boudins + flame structures  
in interbedded schist/argillites

+ mafic metabasite, v. fr.  
gained schist w. areas of  
coarse chl + Bi

- gyp. along open fractures  
I  $\otimes$

- variable Po  $\equiv$  py in such  
areas

DYKE: felsic, granular,  
med. fr. x-line  $\rightarrow$  granodiorite

H2257 ? + SP argillite or  
tuffaceous metaV (J2H)  
- well banded - fr. gr. block  
with elongate lenses to  
bands of chlorite and/or  
biotite

- minor py very finely  
dis. along specific bands  
? metamorphic segregation

→ **BCS 0454**

- also at H2257 definite green  
with wavy fibrous amphibole  
texture ← is definite VC but  
passes laterally to + interbanded  
w. definite argillites

→ granitic -  $\Phi$  - 10%  
- Bi < 5%

- no rose aureoles tho may be due to schistosity
- finer xline near edges
- + may have large clots of anhedral Bi + may be well foliated near edges

- 1000? talus in bridge  
 12258 + 400m O/C

- intrusive with seds + vc

- mafic metabc. sampled as before

- argillites show some microfolding but only very thin interbed. cherts

not yet  
~~checked~~  
 on geology  
 or plotted  
 238  
 259  
 only at 1:50,000



- mass of bright granular  
pink  $\text{Q}$ -rich w.  $\text{Fp}$  + large  $\text{Q}$   
clots of foliated MS

→ laminated  $\text{Q}$ -rich mottled  
metased.

- discontinuous py stringers  
±  $\text{Q}$

- minor pinkish fibrous  
mineral along thin laminae  
? anthophyllite / actinolite or  
just sheared quartz

also at #2258



+ 500m Silver Lake Rec Rd to  
SW

A2259 + 5400m talus off gravel  
pit w. o/c far above 355m

→ O diorite intrusion

fresh O diorite w v  
hard contact zone  
of O-rich material  
w. chlorite, Bi

→ Bi gneiss w K-spar

at edges

- O diorite foliated to massive,  
locally porphyritic O Bi  
O f.p. phenocrysts

+ 1500m to DMZ to gneiss

O diorite, fresh xenoliths

10-20% mafics, O + 5%

CI 10-20% f.p. comp

+ 150m intrusive

+ 150m intrusive

+ 600m O diorite intrusive

- likely no geochem.

sub parallel to schistosity

# SHAWATUM

## GIANT CREEK

starts 835me

July 6/83

→ at 800m tree block path  
970me

HZ 260 top of road 1105me  
o/c and at least 2 dull  
sites

- silicification and bleaching  
highly variable in o/c and  
grab samples

- possibility that some of  
bleaching due to modern sulphide  
oxidation

- many samples fragmental  
to amygdaloidal but as often  
massive apharitic

### GRAB samples

(a) Sulphides <sup>①</sup> massive coarsely  
x-line pyrite - variably tarnished  
+ limonitic; occasional whetted  
cubes to 1cm

- possible cpy, rare? sph

3400 ft

② granular po with  
sparse irregular dark  
brown sphalerite veins  
+ discrete py cubes

- in places actinolite / anthophyllite  
isettes w coarsest py

- coarsely crystalline masses  
cross-cut any fabric of host  
py also very finely disseminate  
to blebby within host and  
along discrete discontinuous  
whingers

- Ep frequently patchily w py  
+ gyp. may exist bet  $X_1$  planes, along  
- also rosettes to elongate  
acicular masses? amphiblyllite  
actinolite

### (b) Host

mafic metavolcanic: blebby  
BASALT, from very dark green,  
finely crystalline to light  
green labilli - rich to light  
white, slightly banded

- hardness extremely  
variable, and does not  
necessarily correlate with  
colour

- irregular chlorite blebs to  
fine fill (rather) may be present in  
all colours

NNE-N / dips SE ~~\*~~  
dip slope: thin sulphide skin

open fractures

→ tectonic Bx + bleached fragments  
plus capilli tuft v. abundant  
seraceous fragments  
→ chloritic - 2° in fractures and  
silicified patches grd  
mass

△ A.D → u. mafic, very hard

locally hyalokistite + spherulitic

- fragmentals: ash to lapilli to  
bomb size; frag homog to  
heterog.

- in talus - some samples  
contain about rounded  
clasts, very poorly sorted w.  
wide variations frag +  
matrix comp → debris flow

HZ 260 sample

Basalt: very dark green,  
finely crystalline, patchily  
silicified

- slight differences in clasts  
xl. size

- py finely dis. +  
clumped along crude fractures  
+ 2-3%

→ Semi-continuous o/c



→ A.D. ? unafec

#2261 + 65m

1100mo

o/c massive sulfides with  
ferricrete above

py massive with beautiful etched cubes  
to 1.5cm, agt. granular coarsely  
crystalline material.

→ **BCS 0426** chip panel (1x1m)  
massive limonitic py >>> ? sp,  
over about 6m x 1m, no estimate of  
strike of py-rich portion relative to  
"non-magnetic" likely with

→ **BCS 0427** massive granular  $po \pm$   
? sph. (blk anhedral) with fr.  
whingeis epy 1m x 1m o/c chip

- short fragmental capelli to <sup>very</sup> sm  
bomb size in variable green  
to black <sup>slightly</sup> silicified ground  
mass <<< massive wa obsais fr.  
- frag. homog. to heterogeneous

-? very angular hyaloclastite in places

3350ft

→ rusty over 6m x 3m  
area but hard

host: very bleached + silicified X cutting  
Ep veins, w. py or granular intergrowths

→ appears to be vein X cutting Po-  
rich sulphides w. py ↑ near vein  
- immediate host grey, ± Ep ± chl?  
or actinolite

and granular py ∴ not markedly magnetic.

plus ± minor Cp rims on cm-sized  
striated py cubes

± granular Q, minor Ep

± irreg. discontinuous veins  
of sp (blk)

all

→ not Lepidolite size

s. → black green, no obvious fragments

HE 262

+150m

1065me

series of close-spaced fractures  
in lapilli mafic K, holding to  
homog fragments - ? could be  
tectonic Bx but frag too rounded

- variable bleaching +

silicification (rout from fractures)

- var abnt py to 5%  $\gg$  in  
stringers than disseminations

- 20 chl. along fractures +  
pos as irreg patches  
± Ep locally

DW: 3 directions of py fractures  
may influence type of  
weathering → po balls

3250'

+ limonite + Ct

~40m to MAIN SHOWING w.  
possible Kill zone - areas of  
limonite + ? former spring w.  
goethite

Host mafic VC, variable silicification  
+ bleaching - some may be  
hydrothermal extending out from  
fractures but some is recent  
- some lapilli

→ MgS prod. pt w. very  
discontinuous veins py, coarsely  
crystalline + granular quartz,  
abnt Ep + acicular ? actinolite, amib

→ abnt shears + fractures  
indicate fault proximity  
despite bleaching

AZ 263 +165m 1040m

- ?  $\odot$  about intrusive w.

Ep, muscovite alteration, but  
-2-3% py

→ BCS036 dark green,  
? mafic volcanic very hard,  
finely x-line conchoidal  
fracture

- locally spherulitic

ophyllite

A zone of "mafic VC" which is sparse  
zoned KLS which only occur in  
thick flows or intrusions where  
there is time to cool  
3170'

on brittle fractures + as fine  
disseminations

? - trace very fine po ~~ss~~<sup>02</sup>  
hit as distinctly magnetic

+ 65m road w possible pit  
atop, not looked at

+ 45 m switch back, 1225me

HZ 264 +40m 1015me

Qdiorite in contact with  
basaltic vc with apophyses  
off from intrusions into  
dyke

- contact clearly very irregular  
as degree of hornfels development  
varies

- basalts ? pillared with  
different weathering, more



fragile, gritty between  
subrounded competent?

pillows

- elsewhere possible flow bands  
+ definite lapilli-sized  
fragments

- variable bleaching, silicification  
some Ep;  $\pm$  chl - ? 2°

- py as fine dis. + veins 1-4%  
elements

+45m switchback +80m

H2 265 +100m 975me

- as before py 1-3%, had  
to get sulphide poor sample

- basalt tho without any  
? pillows → BAKED BASALTIC

+36m

**Bas 0928**

massive py w.

? sphalerite microcrystalline,  
dark black + Mt

- more coarsely crystalline

→ sample as far away from main  
intrusive mass as possible

MANLY LINES

surface block 995me  
3000ft.

3000ft.

no intrusive in d/c

fragmental chl, Ep, variable silica  
+ baking  
- less baked than HZ 264

← GARNET SKARN

than previous examples  
- elongate parallel to  
py stringers visible to one  
side

that mafic matrix, probably  
fragmental as before  
- massive py discontinuous  
over 3m exposed length  
across  $< 0.5m$

Volant Creek

July 8/83

## MAIN SHOWING

Sulphides occur across about  
5m width + tend upward  
along gully to SE of dk  
(see PHOTO)

- exposed across width of  
about 30m but discontinuous  
- erratic towards edges

HZ 266 geschen above  
sulphides

with granular  $\text{Q}$ , minor  $\text{Ep}$

HZ 267 geochem below  
sulphides

IDP - ? frag mental: in place  
serraceous + below here maybe  
tectonic fragments / foliac

fresh samples → limonite ± malakite  
rapidly

BCS 0429  
0430 } gabs of Mes below OK

- massive granular po, intergrown  
with coarse Q and anhedral

Sph; minor chlorite; tr. cpy

- some specimens show well defined

HZ  
265 → HZ  
268

BCS 0431 → massive py in o/c  
major VC as above

- both mafic ~~ve~~<sup>vc</sup> - ? basalt:  
variably silicified, chloritic?
- hard to tell originally  
new mafic + how altered
- replaces chloritic material →  
? actinolite / anthrophyllite
- py very variable 1-3%  
as disseminations + stringers  
(hard to sample w/o sulphides)

0429

- massive po intergranular with  
granular  $\text{Q}$  + masses of dark ? chlorite  
or actinolite (? deformed veins)
- often with minor anhedral Cpx  
→ max 1%
  - minor later (?) coarse py veins, blebs

→ fine mafic vc to scoriaceous frags.  
but elsewhere just irregular masses  
discrete from similar irregular  
masses of quartz

H2268 from **Bc 5012** +150m 990me

mafic volcanic: various shades of white + green, ductile lamination +? Escalated ductile Bx  
- variable silica chlorite  
- po 1-3% very finely diss. + in irregular clots

**Bc 5013**

? massive red sph  
locally glassy with intermixed Q + Ep  
Gt but brown streak + ↓ hardness  
Di - w. intergrow py  
+ - X cut by denser py veins  
Ep locally  
+ out - sharp but irreg. contact w.  
w/ram VC host  
- ? replacement not markedly  
linear + appears to end  
agst capilli tufts (mafic)  
end to base (albite) laterally  
+ up wards  
- occurs near O/C base  
- sph. intergrow w. Ep +

3000 ft

- patchy areas of flattened shards  
which appear to be more siliceous

→ Sawed samples, weakly  
lapilli tuff, variably bleached  
- frag. tectonically elongate, w sharp  
borders agst chlE<sub>p</sub> ± D<sub>p</sub> ± Gt (?)  
- in places 1-2% black, widely  
but other samples nearby  
non-magnetic

→ ? sph to 1.5m width ± 70% sph

→ sphalerite may show thin bleached  
rim agst host

SAWED SAMPLES suggest granular  
matrix Q - ? remobilized, refolded,  
tectonized vein → ? skarn  
may be mixed w altered vc

NB: Yodes euhedral → possibility of garnet  
→ Q + limonite coat



→ sph mass. over 8m  
length

- folers out randomly  
irregularly into scuffed  
vc with abnt Ep veins

+100m - ? pit below. 970me

H2269 +60m 950me

mafic metabc, dark green  
to pale green, patchy

- hard to tell if originally  
very mafic or chlorite  
alteration

? chlorite, silica

- sparse Ep veins

- marked light green to white  
weathering, and, rare samples  
show complete bleaching +  
suggestion of vein like intrusive

- somewhat fragmental but seen  
texture

- py to 3% along stringers,  
<1% disseminated

(cont'd) Sawed samples show lenses  
of very silicified chloritic lapilli  
tuff (elongate, shredded)  
+ w/ps in granular  
material

? resin (?) intergrow intimately  
w/ anhedral py + anhedral Mt  
%py + %Mt very variable

2900 ft

↪ appears to be sharp contact  
between silicified chloritic  
host lapilli tuff + massive  
granular stain

+50m switchback 940me

subsidary road off main  
HZ270 } w of <sup>main</sup> py + 140m  
HZ271 } E of main py

- mafic ~~meta~~ volcano, various shades of green, local blebbing

+ probable silicification

- markedly chloritic / actinolitic in places

- massive to fragmental this in places this is tectonic

- abnt py veins 1 → 5%

- sulphides trend about NNE / dip SW

→ BEWARE Magnetite

BSS  
0432  
BSS  
0434

} grab of sulphides

945 no

2900 ft

SKARN

re lapilli tuff

**BCS 0435**: massive Mt, rarely  
Octahedral XLS, Cu stained, ≠ Ep;  
may be very black to dark red sph  
intergrown <sup>? Qtz</sup>  
- sparse? pent crystals - harder than  
carb, infus



- again "granular"  $\text{Q}$  may be  
subhedral  $\Rightarrow$  euhedral in  
places  $\rightarrow$   $\approx$  (of or per sph  
(cf. Magma R))

2 distinct shades of green +  
granular to acicular textures

epy sparse as thin elongate  
blebs

mt interxtine bet. granular  
red

py within mt as amorphous,  
anhedral to subhedral / euhedral  
masses seen by anhedral  
py within mt

not - mt very finely crystalline,  
rare octahedral  $\chi$ LS  $\pm$  ilms  
Ep and in places intergrown w.  
acicular chlorite  
Ep variably abundant,  $\uparrow$   
with sulphides

typ ± mt ← ? end products  
of acid leech

H2272

+150m

900m

- mungy white o/c + <sup>met</sup> gossan  
w. mafic VC underneath  
+ white / grey powdery weathering  
magmatite ← total weathered/  
? altered

+ mafic VC, red to dark  
green, chloritic, ? amygdules  
in places.

- typ for dis + stunges  
- locally laminated - at least  
3 prominent ft directions

---

Reers Creek area

July 8/83

- fogged out  
up to 1100m.

SF - no samples

July 9/83

Reers Creek in fog

1060m

→ top of road 1200m

1120m

no o/c + now visible

→ <sup>some</sup> samples Mt +  $\Phi$  only  
- rare samples w. acicular specular  
Ht

2700 ft

→ fishes very abundant ( $\Phi$ ) or  
rosette of actinoliths

unconnected. 3400 ft

ble above through thick fog



→ fog clears → boulder field /  
w/o obvious d/c above → N/S  
+ 310m above truck road

Look UP 92H/6 43 mm Dep  
273 (float no Mo only R<sub>y</sub> to 5% for  
po to 1-2%

H2273 +990m 885me 945mo.

BASALT: various shades of  
darker green; rare fresh size  
fragments

- patchy silicification +  
chloritization

- about 10 veins, irregularly distributed

massive

885me

H2274 +350m 825me

highly silicified BASALT/AND:;  
various shades of green with vague  
bands variably visible

elsewhere chloritic patches re

softer

→ ? flowbands

ends

very diss along shingerclets)  
locally vesicular or mafic VC

2900 ft

1000

2700 ft

SITE

855me  
HZ275 + 150m 795me  
Basalt, dark green, chloritic  
h. po, no silicification, <sup>ch.</sup> amygdules

850me  
HZ276 <sup>lower</sup> end of road 790me  
rusty weathering etc of sheared  
graphitic argillites w/ bd  
→ ribbon chert w. thin w/ps  
to interbeds of argillites,  
dark grey

835mo  
HZ277 + 775me  
argillites, non-graphitic, relatively  
sheared  
→ cherts w. cover between, light  
grey, massive; py as discrete cubes  
along stringers + very finely  
disseminated, plus po in m. blbs  
to 1%

905  
HZ278 Sleepwood 845me at top  
sandstone / basalt, med green

2600 ft.

2600 ft

2550 ft

2800 ft

chloritic

surface texture of o/c may suggest sheared pillows + pillowbx but all fresh samples - homogeneous

Th py

900m.

H2279: +150

840m

Magfic vc ? flow or intrusion, very coarsely crystalline, almost trachytic, more rarely aphanitic - o/c to 4m height w/ obvious flowtop

- 1-2% po, very finely diss. in coarser crystalline varieties

855m

H2280 +310m

795m

BASALT/ANDESITE: mod green with sparse lapilli visible - likely saussureite - 25p and chloritic along slickensided surfaces; patchy differences - massive

2750 ft

2600 ft

hardness and shades of green  
→ patchy silicification

810 me.

HZ 281 +200m 750me

- And / Basalt, amygdaloidal in places,  
 - chlorite + saussurite  
 - Quartz; tr. py  
 - more weathered than previous

775me

HZ 282 +150m 715me

Andesite / basalt well shattered,  
 limonitic in places

- chlorite + saussurite → 2 sch
- po fndiss + blebs to 1%
- lapilli to ash buff texture easily visible in places
- sparse amygdules (chl)

750me.

+440m 690me

o/c felsic andesite

w <5% mafics (Hb)

- +20% Q, at least 1/3 plag
- tr py other Fp w/ly
- to 3% Fe Carbonate alkali

745me

+290m 685me

argillites, rusty weathering

tr. py N/S

2500 ft

top (ch) in place

2350 ft

3  
7  
slightly pinkish

2300 ft



+ 750m Steve's road up

→ Continue to opposite side of  
Creek + road w. white o/c  
- not drivable

→ go up to logging area → no o/c exc  
→ try upper logging area road w.  
flagging across, only o/c at very top

H2283

(see photo)

1600m

1000m

chert, various shades to grey,  
with minor argillite

- trace py

- showed no obvious bedding

add 60m to all values  
for altitude correction

Coulter Ridge

July 10/83

H2284

1945m

- meta-chert, well showed  
calut very fine PICT veins  
- thin argillite wraps to interbed

pt well also logging area

3475 ft

3200 ft



H2285 +150m ridge before saddle

- mafic vc - ? andesite

faintly well weathered the texture  
suggests epidote

- saussurite, amonite in places  
(no fuzs)  
- chlorite

H2286 +160m 1855m

- cherts → ribbon cherts w

cherty argillite + sparse

- andesite flows <10%  
isogono, light green, <sup>mod</sup> fr. X<sub>1</sub>  
well banded, granular

- sparsely porphyritic to 10%

- saussurite, this is fresh surface

Fr relatively fresh

- chlorite as sparse fr. flakes  
350/70 SW

H2287 +170m 175m <sup>small</sup> ahead

- andesite, mod green, weathered

saussurite + chlorite

- trace py

1920 me

above main saddle

+200m o/c. 1740me  
lst, w. argillites, mod gy  
mod xline, no primary textures  
visible

H2288 +50m at saddle 73  
andesite, mod gm, mod xline,  
saussurite, chlorite

H2289 +230m 800me -upside  
andesite, more chloritic + sheared  
than previous, but elsewhere light green  
- saussurite  
- h. py

H2290 +160m 1855me  
schistose sheared metavolcanic,  
light green ? Andesite  
- no texture preserved, locally porphy  
- saussurite, limy to extremely  
limy - lst  
- sparse dk gm chlorite kbbles  
elongate parallel to schistosity

5me

Zad  
saddle

> of shearing

ritic

- coarser crystalline

- same place under silica

→ scratch hammer

H2291 +150m 1900me  
andesite, green, mod gr w.  
sparse lapilli and Fp phenocrysts  
- 1/2 py + Amantite along fracture  
planes as well as occasionally  
across c/c  
- saussurite, chlorite Ovens

H2292 +150m off W edge 910me  
subsidiary peak almost at saddle  
andesite 'lapilli' tuff, saussurite  
+ chlorite  
- soft  
- 41. py  
- unorg. discart Ovens

→ strongly folded +  
contorted white ribbon chert,  
w. folds showing deformation

H2293 +150m 1930me  
andesite, mottled brown to  
green, saussurite + chlorite  
+ 1/2 py poorly banded in pla

plant 1945 mg

up next 1100

es



→ 270°/70°N

well banded, bdd. And.  
w. numerous shells  
→ clasts (fragments) weathered  
out on exposed surface

+ 43m est, dk grey,  
weathers white, massive, no  
primary texture visible but abnt  
veins

AZ294 +17m 1960me  
B/andesite, dark green, weathers  
= darker brown green than  
previous, amygdulae  
chl > saussureite  
- limonite in places  
- trace pyrite locally

→ ribbon chert, slightly  
folded w boudins 360/70°W

AZ295 +140m 2035me  
A as before, but w chert/shale

+90m

+90m

top Mt Coulter  
6200 ft

H2296 +160m 2015me  
Basalt, inclt chlorite / saussurite  
somewhat weathered; light to  
very dark green but uniformly  
west  
chlorite >>  
- trace pyrite

H2297 +150m 2025me  
sillan chert, white, well bdd  
2-10cm scale highly folded  
but lacks consistent orientation  
- folds on 1m amplitude

H2298 +150m 1925me  
Basalt as before? lapilli on  
some surfaces  
- discontinuous Queenis to ~25m

H2299 +150m 1965me  
chert to cherty argillites,  
white to grey, intensely folded

saddle between 2 subsidiary peaks

top of 2nd peak

saddle both peaks

HZ 300 +185m 1955me  
basalt, chloritic → very dark  
green, soft  
- somewhat brecciated, vesicose

HZ 501 +160m 1980me  
as above interbedded w.  
carbon chert the contact under  
cover

HZ 502 +170m 1970me  
andesite, l. green, markedly  
amygdular - chlorite filled  
+ chlorite + saussurite  
→ if amygdular → flow top  
to NE but flow contacts not  
well defined

HZ 503 +150m 1945me  
andesite, lapilli tuff;  
schistose / brecciated  
light green, soft  
→ saussurite / chlorite

f

? saussurite  
→ subbranchites  
argillites

4

+ 45 m LST, dark to light  
grey, medium crystalline, <sup>bonapod</sup> no  
primary textures preserved  
- well jointed → blocky  
appearance but appears  
massive. 0/40°SE

+170m est w 1-2cm folded  
chert bands

HZ 504 +20m 1890me  
sheared + schistose andesite

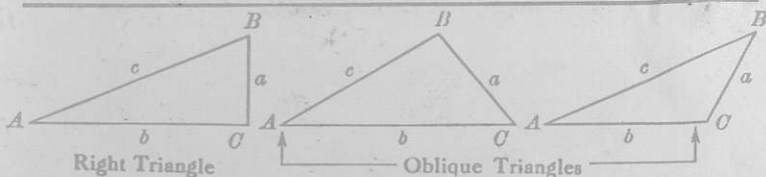
± chlorite + sericite  
light green, weft  
- appears to be interbed in est  
as est o/c continues

→ cherts as before

HZ 505 +150m 1890me  
andesite as before  
+ py

HZ 506 +130m 1875me  
andesite as before, schistose  
+ interbed. cherts 340/very  
steep

# TRIGONOMETRIC FORMULÆ



Right Triangle

Oblique Triangles

## Solution of Right Triangles

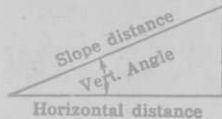
For Angle  $A$ .  $\sin = \frac{a}{c}$ ,  $\cos = \frac{b}{c}$ ,  $\tan = \frac{a}{b}$ ,  $\cot = \frac{b}{a}$ ,  $\sec = \frac{c}{a}$ ,  $\operatorname{cosec} = \frac{c}{a}$

Given	Required	Formulas
$a, b$	$A, B, c$	$\tan A = \frac{a}{b} = \cot B, c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
$a, c$	$A, B, b$	$\sin A = \frac{a}{c} = \cos B, b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
$A, a$	$B, b, c$	$B = 90^\circ - A, b = a \cot A, c = \frac{a}{\sin A}$
$A, b$	$B, a, c$	$B = 90^\circ - A, a = b \tan A, c = \frac{b}{\cos A}$
$A, c$	$B, a, b$	$B = 90^\circ - A, a = c \sin A, b = c \cos A$

## Solution of Oblique Triangles

Given	Required	Formulas
$A, B, a$	$b, c, C$	$b = \frac{a \sin B}{\sin A}, C = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$
$A, a, b$	$B, c, C$	$\sin B = \frac{b \sin A}{a}, C = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$
$a, b, C$	$A, B, c$	$A + B = 180^\circ - C, \tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$ $c = \frac{a \sin C}{\sin A}$
$a, b, c$	$A, B, C$	$s = \frac{a + b + c}{2}, \sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$ $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}, C = 180^\circ - (A + B)$
$a, b, c$	Area	$s = \frac{a + b + c}{2}, \text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
$A, b, c$	Area	$\text{area} = \frac{bc \sin A}{2}$
$A, B, C, a$	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

## REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle =  $5^\circ 10'$ . From Table, Page IX.  $\cos 5^\circ 10' = .9959$ . Horizontal distance =  $319.4 \times .9959 = 318.09$  ft. Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained.  $\cos 5^\circ 10' = .9959$ .  $1 - .9959 = .0041$ .  $319.4 \times .0041 = 1.31$ .  $319.4 - 1.31 = 318.09$  ft.

When the rise is known, the horizontal distance is approximately: — the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance =  $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$  ft.