6000 1837

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud Field Notebook 1
AUTHOR	Mitchell P
DATE OF DOC(S)	1998
MULTI_DIST Y / N? Additional Dist_Nos:	
QUAD_NAME	Sulphur 7½'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine
COMMODITY If not obvious	gold; silver
NOTES	Field notebook: geology NOTE: Scan covers 66p.

Keep docs at about 250 pages if no oversized maps attached
(for every 1 oversized page (>11x17) with text reduce
the amount of pages by ~25)

SS: DP 8/1/08
Initials Date

DB:
Initials Date

SCANNED:
Initials Date

Revised: 1/22/08

ROSEBUD 60001837 YOIC

TBook 1

Keuffel & Esser Company

P. MITCHELL
1998

82 0020

Weatherproof Field Book

"Rite in the Rain" All-Weather Paper

32 Leaves

4 5/8" X 7"

CURVE FORMULAS

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin.} \frac{1}{2} D}$

$\text{Sin.} \frac{1}{2} D = \frac{50}{R}$

$\text{Sin.} \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin.} \frac{1}{2} D}$

$E = R \text{ ex. sec } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{I}{D}$

Tan. def. = ½ chord def.

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve. very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

Right Angle Triangles. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$. $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

Leveling. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574\,d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3}d^2$. The combined correction is negative.

Probable Error. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 the sum of the squares of these differences and n=the number of observations, then the probable error of the mean $= \pm 0.6745\sqrt{\frac{\Sigma d^2}{n(n-1)}}$

MINUTES IN DECIMALS OF A DEGREE

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Rosebud.

Brian Morris

4-30-98

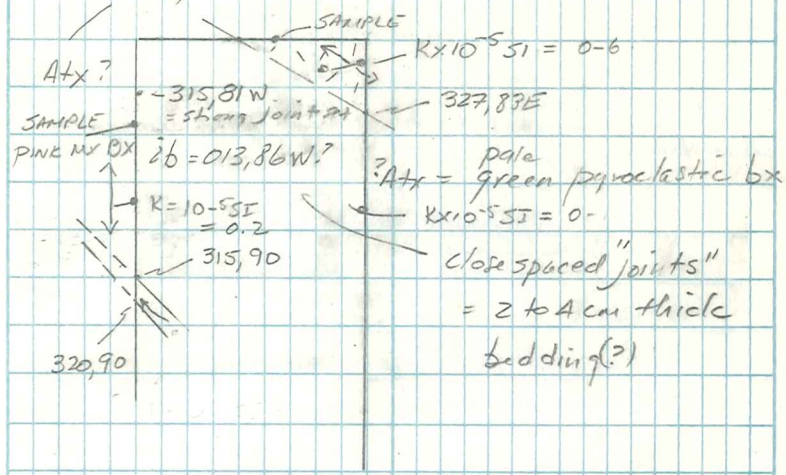
DDH - 97-378 Pts Sample

Small (?) shear = 073,60E 5-50 mm x 15 gouge
to joint w/ movement

basaltic Andesite = dike? N45W, 90 / Atx width 25cm
= dike? 327,83E / Atx ≥1.3m

Separation ≈ 3m

Randy = Bud or Lower Bud??



2 = pts/ts = tuff bx = Ash tuff w/ 5-15% clasts (angular) of vfg porphyritic rock w/ 2-3% Kf & no qtz

no flow-banding in ash tuff unit

3 Hbn - Kf ash tuff (1-2%) (2-5%) = bleached + leached

Some late hydroT? bx w/ silica (embedded x's) coating ~ 1-3mm thick

= mx supported bx = rx to ② but w/o clasts

at adit = 110°

rx w/ silica veining = similar to R.M.

densely welded tuff altn/mineralization

planar law. → = vfg bedded? ash w/ 1% rf.

— mx to clast supported bx

Epiclastic?) facies bx = tuff bx w/ tuff = to

? ?

Hbn-Kf (phenos)

massive Ash tuff

? ? welded? / silicified

Location

2 = N30W ±150'

From 2,204,400N

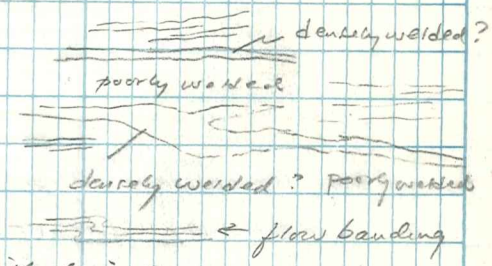
482,000 E

3.5 chocolate

Up Hill = bedded tuff = layered + locally flow banded =

moderately (?) welded tuff

latite?



some lithofacie?

4 = pts/ts Chocolate (maroon color = weak altn)

= rock to 3.5 & 2?

5. b = 012, 43E (flow banding) = planar bedded beds = 2 to 65mm

Joint ± movement (v.v. minor if any) or bx (HT.?) probably latter bx dike

= 078, 64W = Joint set + bx

1 1/5 to 10 cm

planar law.

Truck = 40° 48.26'
118° 38.78"

Office = 0.55 miles @ 226°
@ 5373' → 5447' w/
MOP = 1615' - 1620m

Oscar Andesite (TOS)
K = 540 x 10⁻⁵ SI (470-570) ≈10m from "Dozer Rhyolite" then dimensions to ≈20 near margin/contact DR - AND of some type? or chill margin effect?

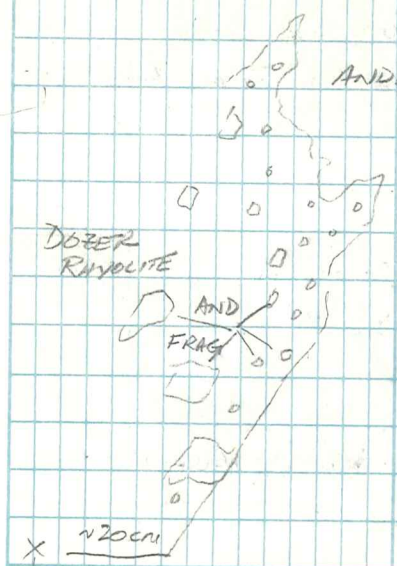
6 @64,54W = "Dozer Rhyo" Dike
10m vertically above = Dozer Rhyolite
b/fb = 358,45E = planar laminated on mm scale

Above = hbn (1-3%) - Sanidine (2-4%)
latite/trachyte ashflow tuff = guess
= CT
@ point 6 + 10m = planar laminated sanidine? bearing ashflow tuff ??
fg tuffaceous rock

@ 6+10m = = pts
40° 47.47 N
118° 40.15 W
028° 0.93 mile
031° for 0.97 mile to office
el = 5447'

A = base of DR
B = float from above

~40m E of last stop = contact DR/AND
+ 5m DOWN HILL = CT
VIEW E



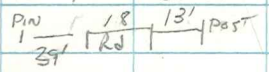
IT LOOKS LIKE DOZE INTRUDES ANDESITE
UNLESS "RHYOLITE" = WELT WITHIN AND EMPLACED

X = planar laminated "Rhyolite" w/ frags of "Rhyolite" in the planar lam. cenit.

5-1-98 Dozer Hill = 070° to post
2204,400N
482,400E } stake = SE Corner MONTEREY 1 + N side MONTEREY 2

090° 6' to Rd + 15' wide

071° to pin at crest



Pk 012,55E = Fb / massive (local "bed")
020,53E = Fb
$K \times 10^{-5} SJ = 0$
033,72E = 1cm Pz+ / m (Hbn + Jar) vein

Flowbanded latite? ash tuff (Hbn?)
planar banded to thick bedded?
hbn ~ 2%, sanidine 1%?, bio tr-1%
rx = bleached, mfe 100 → pale brown - yellow - white mica. fsp 100 → white mica?

005 - 19x3 = 57' = PP than 005 - 20x3 = 60 band

Dozer Pk = 40° 48.26' N
118° 38.98' W } 1660m

$K \times 10^{-5} SJ = 5$ = 5 saf. 1657 - 1667
$\bar{x}$ = 1662

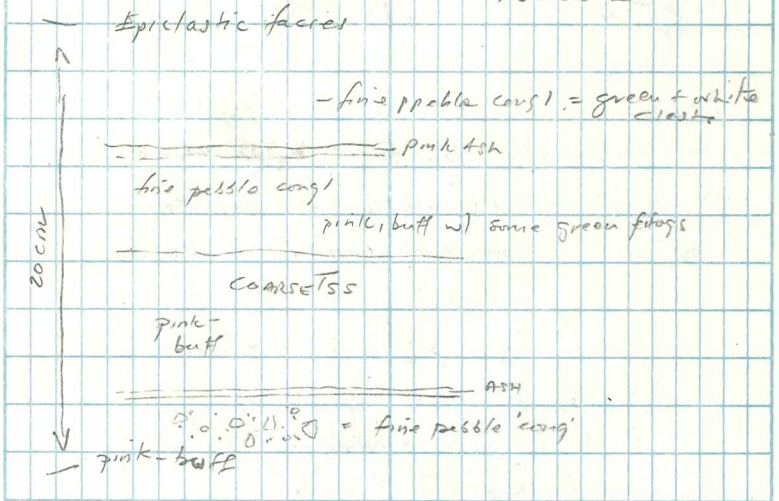
ACTUAL = 1661 + 1.5 = 16625

FINAL = 1667 actual = 1663

154° 20'
272,44E = bx vn ~ 10-30cm wide
b = 020,52E
J = strong >1/20cm = 056,50E (one)
to 054,82W = dominant

$K \times 10^{-5} SJ$ = 12

from EPICLASTIC O/C to GP = 200°
GP = 2200400N
482000E



b = ?? 001,60E EPICLASTIC TBX
b = ? = 022,57E welded latite? tuff (ash)
bio? ± hbn??

Dozer Hole

Latite tuff (Chocolate)

? ——— ?

planar laminated
thin bedded
b = 2-5mm to 10mm

1 Eruption probably tephra fall

Thin to med. bedded
± planar bedded w/ weld, b = 5-30 cm thick

± Ash flow at base over epiclastics

Ash = weakly ll lam. + welded

? ——— ?

At adit to W = hbn-bio-sanidine xl-ash tuff

w/ ≥ 50% (50-65) fsp (sanidine?)

MASSIVE xls < 1mm long dimen + ash Mx.

water-laid? = mod to poor sort =

"big" sanidines. 3mm long dimen.

≃ 5% sanidine

≃ 2-3% hbn needles to 3mm long

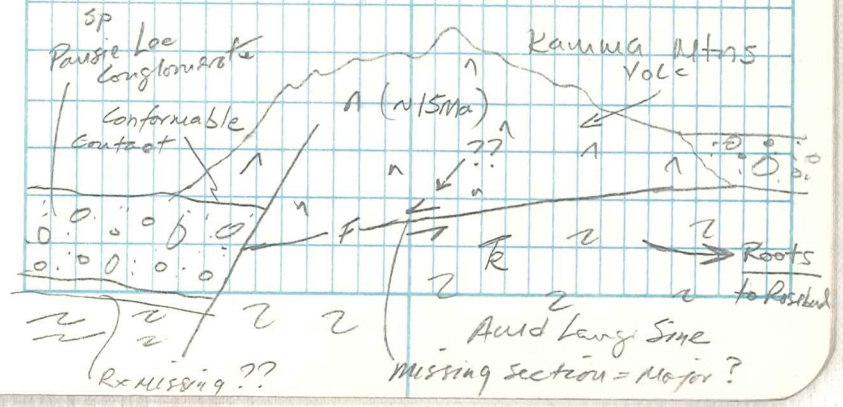
tr biotite

7-5-98

G. Massingill
M. McCulla
R. Vance

Rosebud Review

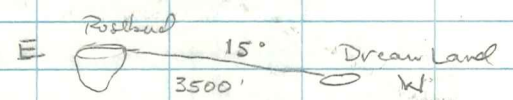
- Simple Shear may be important G.M.
- Negotiations on Rosebud = Bruce Hanson G.M.
- 'Blue Sky' potential - Kind of orebodies
  1. more of the same - high grade, free-milling sulfide.
  2. What is Rosebud and what are the structural controls?
  3. How does Hycroft fit in to the model
  4. Scotia = a lot of 0.01 opt Au
     ¿C Age ?? Volc. ≃ 15ma
     Old ← → Now
     Scotia Rosebud Hycroft
  5. Pansie-Lee gravels?

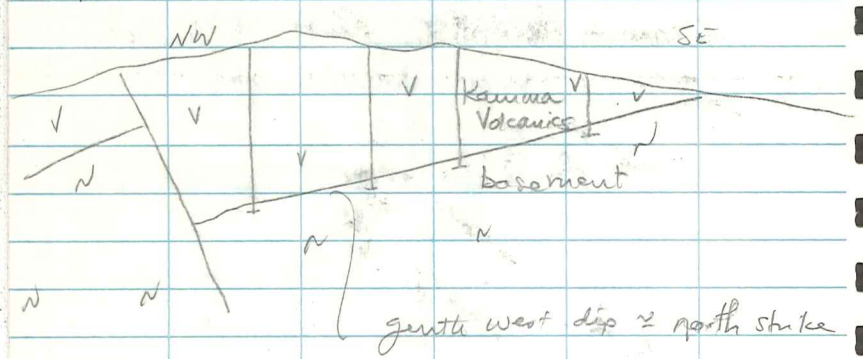


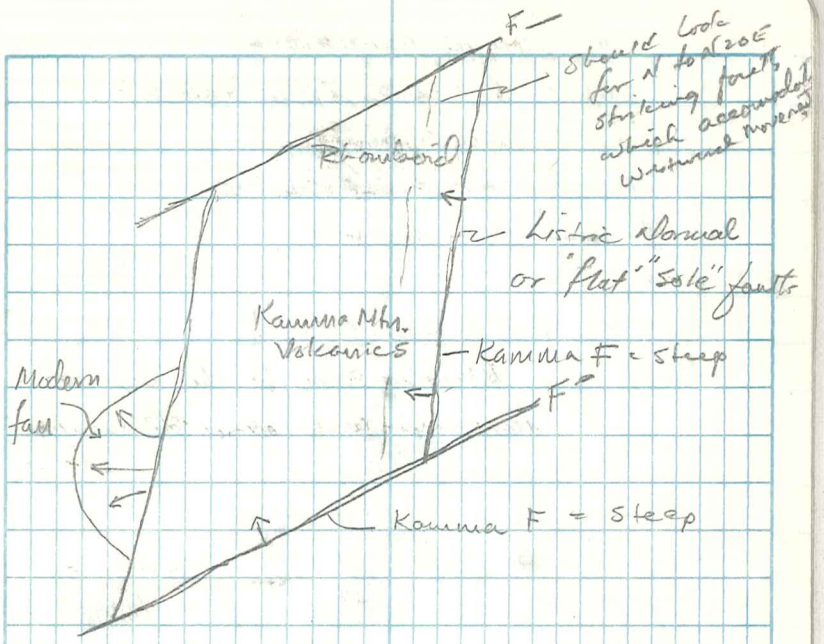
- Geophysics = major hope
- 1. Alteration in a broad sense
  2. Stratigraphy
  3. Structural control

Randy -

1. all good intercepts = in 'elevation' which is ≈ to Rosebud
"There may be an elevation control"

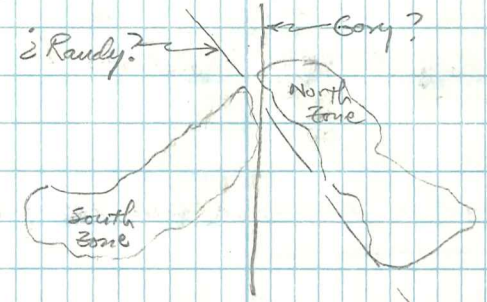






Oscar = hosted by Pause Lee gravels

Ore zone



why is the orebody beat 90°??

Ore = steep fractures in hanging wall above the South Ridge Fault.

Veins in orebody don't cut the South Ridge fault.

Gary - Rheology may be the best or most important control on localization of mineralization.

South zone = clay + sericite (bladed more.)

East zone = siliceous + sericite (bladed more)

Host rock control or ore fluid control??

South Ridge Fault = epiclastic horizon? P.R.

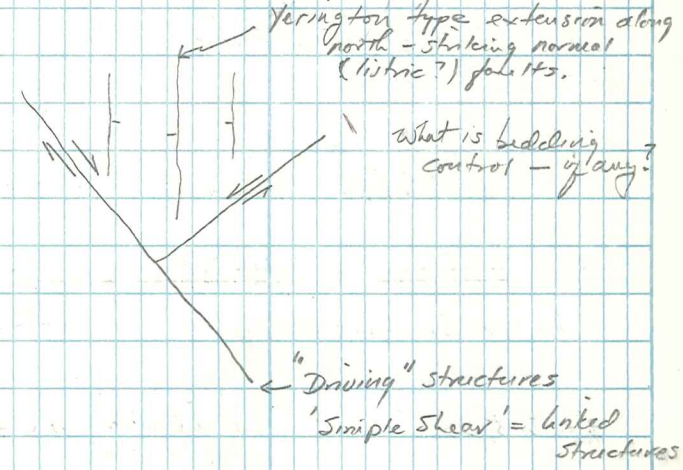
Wildrose = extensive silicification

Pete Rogowski = sick / Flu = probably not.

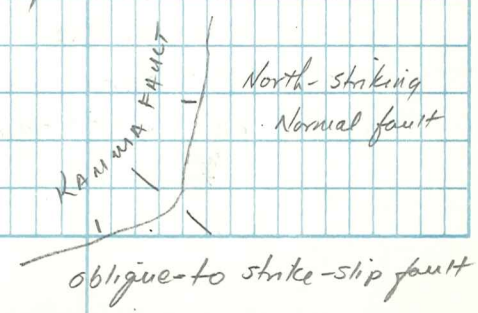
(Ruth Analogy)

1. Fault dissection of ore zones
   1. structural reconstruction
   2. alteration + mineralization
   3. rock type

We need to try this as soon as possible



Kanuma Fault may be a 'linked' structure



Paleo topography ?

Drainage valley = NE-SW G.M.

Regional Map Ts = sandstone = Pansie Lee Conglomerate

Conglomerates = quartzite-rich = out of E to NE (no local source) = Eocene age valley

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* RATIOS TO DO

1. K/Mg
2. K/Th

FIELD TRIP

Barrel Springs ± = Pansie Lee

Possibly 100's ' 200-500' → 48.30 43.00 5

B = 345,38E 40° 48.34 N, 118° 42.95 W 3

→ 1507 m el 6/7

El = 1664 m el 3

b = 350,32E gravels + silt/sand

Sample 1 = Fe cemented congl

" 2 = arg'd? rhyolite

"loc 2"

b = 341,30E = pebble congl w/ Fe ox ± SO4 cement

b = 335,41E = hm + v. weak FeSO4 cement

67

40° 48.44'N 118° 42.95E el = 1526-1541 = 1534 m

"Lag" = fc + fine upper sandstone = quartzite if not fsp leached out = 20%

GPS Northing = 1° off Easting = ± ok, el. = ± ok

Top of Hill 40° 46. 83 N (pg ← reset) 118° 44. 70 W, 62 W (5 sat reset)

el. 1530 - 1455 m

Reset to 1481 m

El = 1481 m = Rhyolite ash = minor black lithics = possible sediments = bedded + platy

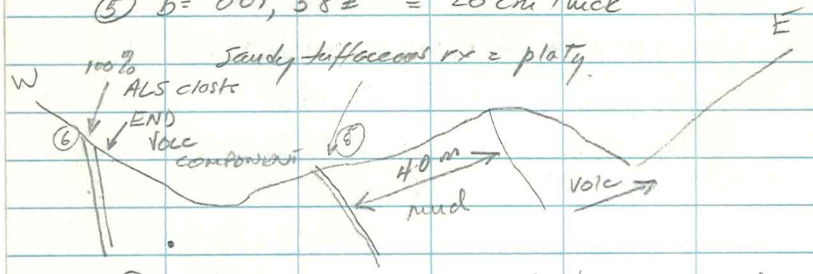
(4) — Map Location

b = 008, 59E = tuff bed in tuffaceous SS
(010, 53E) Randy
w/ Abundant pumice

bedding = cm to decimeter, max = 1-2m
= coarse to v. coarse-grained volcaniclastic
intercalated w/ ash + pumice-rich tuff
beds = unwelded

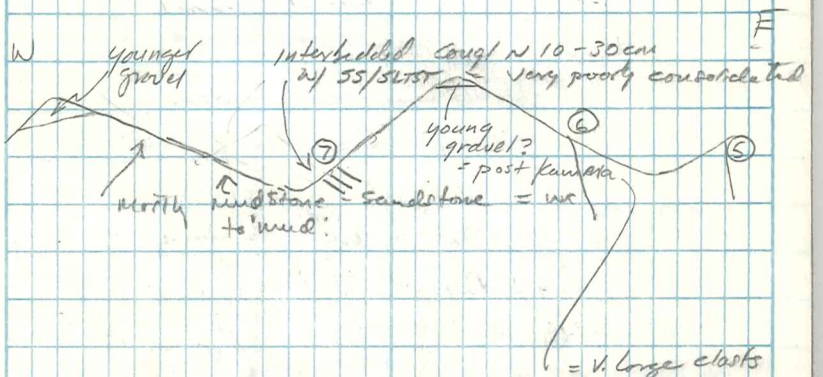
(4b) starting to pick up beds (10-25 cm thick)
w/ ≥ 40% ALS clasts above here
= Volcanic only! = END of Tc
detritus = transitional base to
KAMMA Volcanic. + earlish eruption
= pumiceous
= down drainage ("S") ~ 30m vert to 50
at top of S bend

(5) b = 001, 58E = 20 cm thick
Sandy tuffaceous rx = platy.



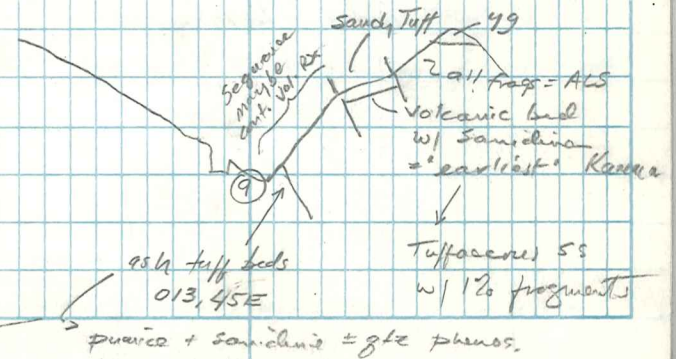
(6) b = 001, 58E = earliest 'volcanic' unit
= time line below here = Auld Lang Syne
fragments in congl. + SS.
b = 005, 62E in elongate pebble congl.
~ 5m (horiz) w of contact!

over the hill



= v. large clasts to rounded to subrounded boulders to 1.5m across.

* This stuff looks like Beger
so some Barrel Springs may be mismapped
in the mine area.
Barrel Springs has no volcanic clasts



* Pumiceous ash beds (tuffs) w/in tuffaceous SS unit.

(9) b = 337,43E = welded pyroclastic unit w/ ALS frags + MAfic/Int. VOCC + Felsic volc. frags = V. Near vent tephra-fall tuff

welded (bx-dom)

welded ash downwarp

welded pyroclastic (bx-dom.)

(10) b = 315,47E = unit to above

315,43E = "

(11) = W Volc Seq — pebble ALS, Cough (±only) — E

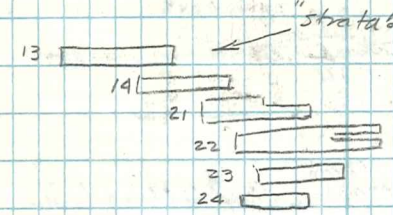
CT = 340,48E

(12) b = 335,37E = bedded ash "mud" + SS

beds = 1 to 10cm

5-8-98

MINE TOUR - Chris Raspa



(1) Cave fault ≟ Rosebud Shear

chocolate (porphyritic latite?)

Dozer (leopard Tuff)

gone { Rud > lowest upper / LBT / TOS

'Faulted out'

Cave Fault = Removed

(2) Dozer ≈ 500' thick (strat) = ash tuff

xl-poor (chlor > fsp ?) Σ phenos = <1% mafic

≈ 2-3mm x 1 mm (chlor)

probably poorly to moderately welded (ash flow or tephra-fall) tuff

→ my guess = Thick ash flow tuff probably proximal (≤ 5km) to the vent. Lithophysae zones locally = ?? welding, — look up.

Thickness

500' Dozer tuff

? Barrel Springs) epiclastic + pyroclastic

AULD LANG SYNE

③ South Ridge Fault

Lithic-rich Epiclastic w/ Dozer frags | BUD / DOZER TUFF

Strong calcite + pale green clay alteration w/in the fault zone

→ poorly sorted locally w/ smaller <5cm angular fragments w/ large rounded cobbles as = Dozer.

LBT = looks like thinly-bedded dozer
(possibly = flow-banded tuff
(ash-flow)

Carbon w/ ore zone ± hydrocarbon??
= fluids coming from ACS deposit

MINE SEQUENCE

L Bud Tuff

(9 units)

→ LBT 0 - ±600'

TOS Oscar Sediments 0 - ±200'

DT Dozer Tuff 0 - ±600'

TCS Basal Tertiary Sediments 0 - 100'

Erosional Unconformity

KJa Auld Lang Syne Group +1000'

Qal 0 - ±100

Chocolate 0 - ±600

U BUD 0-100'

BMB 0-100'

L Bud 0-100'

1. Monolithic, autobx, fg tuff
2. Massive-bedded, fg tuff
3. Planar-laminated, fg tuff (local flow banding)
4. Med-grained, wavy-laminated, tepee-fold tuff
5. Vesicular, flow-banded tuff (lepoxed slow text LST)
6. Massive, vfg vitrophyre
7. mx-support, chaotic-bedded, tuff bx
8. clast-support, " "
9. Flow-banded, mx-support lithic tuff bx

PINK MATRIX Bx =
pyroclastic fall deposit
= angular, Mx supported bx

South Ridge fault looks = like pyroclastic (lapilli tuff)

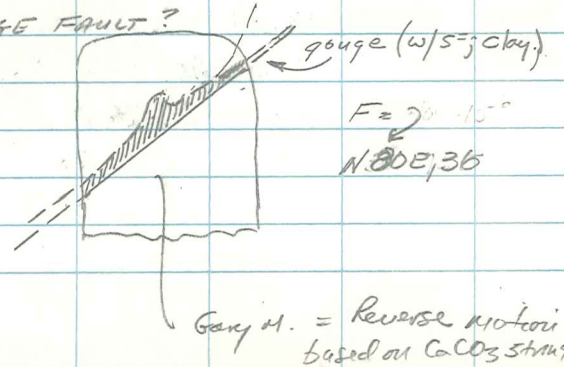
By def. TOS must have ALS frags/clasts.

Red rock = unaltd ash tuff
= Fg massive (planar lam.)

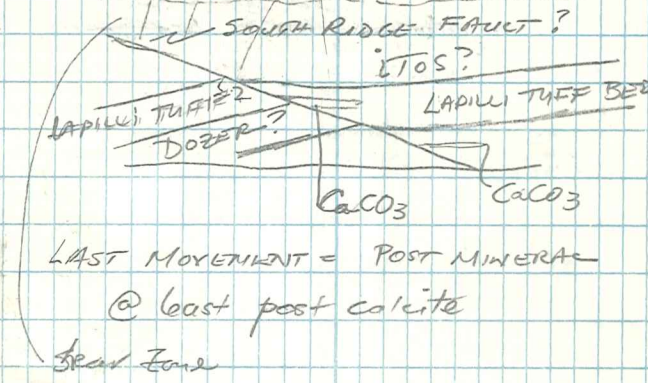
Bx #4 = "solution bx" Chris = looks like
rx in DOZER = breccia (clasts = Mx)
= in TOS? = Fine grained massive

END OF TOUR STOPE 25

¿SOUTH RIDGE FAULT?

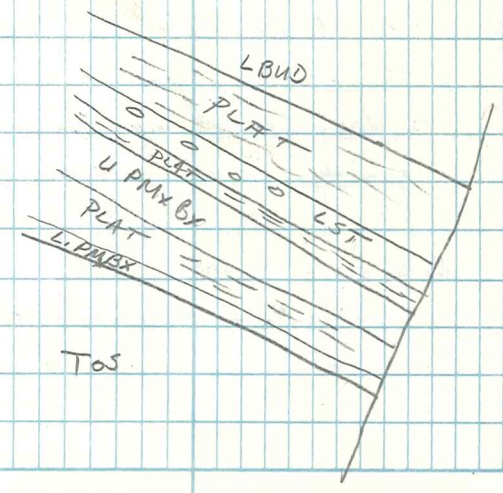


RIGHT RIB looking toward HEADING/FACE



LAST MOVEMENT = POST MINERAL
@ least post calcite

"MINE" SEQUENCE



(12) 005, 54E poorly to mod. welded pumiceous rhyolite c.g. xl-lithic tuff Qz ≈ 3-5%, pumice to 1cm (5-8%)
Ashflow? tuff - local sorting
RHYOLITE possible epiclastic but I doubt it

Sample = (12)
over lain by vfg ash = platy + thin bedded

(13) 011, 74E? = Thin bedded to flaggy SLTST
fossil, platy wx
possible fossils / ⊙
pole = accretionary lapilli

@ (6) = 1 angular frag wole. in pebble congl.
= the only one seen. (2 seen)
= qtz-rich - xl tuff - rhyolite to alkali granite clast = 5cm x 8cm x 6cm

Contact
quartzite + calcareous slst frags Ordovician/Silurian Elder Creek
Valmy

(7) = lacustrine mudstone (montmorillonite) w/ v. small < 0.3cm pebbles + gypsum = maroon color

(14) = Hbn-rhyolite (bio ≥ 1%, Hbn ≥ 1%) mod-strong welded qtz ≈ ≈1%?
fragments of rhyolite tuff?
This unit underlies the welded unit below
= Ashflow tuff?? (contains frothered? pumice?)
J = 020, 45W = Joint (?) set
Sample = (14)

(15) Hydrothermal bx w/ SiO2 mx + bleaching
= welded (spherulitic) tuff w/ pumice + > 3% Hbn laths to 8mm long + 1-2%? bio
Some andesite xenoliths / clasts
Rhyolite (ashflow?) tuff HT bx = 075° strike?

* Should sample this hill

(16) Strike = 347° (fracture? 020, 46E)
welded pyroclastic = green altd frags
best guess 347, 46E?

below P.R. 010, 75E
Sample = 16

(17) = Spherulitic Rhyolite tuff = densely welded lithic tuff (lapilli)

[Sample 16 + Geochem.]

Strange elongate spherulites = worms

hbn -> epidote ≤1-2%

biotite ≈ 1-2%

J/Fract. 065, 86W = set ≈ 0.6m apart.

(18) b = 347, 60E = Ash flow (?) tuff ≈ (17)

Randy's 7 =

8 =

5-11-98

(19) = tuffaceous siltst/ms, v. thin bedded, planar

dom. volc. ≈ lacustrine?

b = 007, 62E.

END = RBS LM103 Cumor 090° ~ 15N

(20) = 005, 56E b in pebble cough w/ 100% ALS fragments

(21) = b = 334, 18E AZ = 165° to trend

Cold Rain + hail!

(22) = ALS bx ± bed = 332, 42E

bx = ? all ALS clasts + large to 25 x 25 x 3 cm, all = platy

looks like metamorphic - shear

plastic / brittle deformation / shale vs ss (all Low-grade to unbrd grnd qs

prob. < dough.

some late qtz in O.S. between fragments.

This point = side of fold? / down end pebble cough & ALS (core?)

(23) = b ?? 072, 37W = 185° to "Meta rx bx"

5-16-98

RECON JUNGO Hills (west of)

1 41° 04.53' } basalt/bouo
118 24.83'

vesicular "basalt" ~ 320 x 10^-5 SI
massive "basalt" ~ 1500 "

4322
·3048
34576
17288
129660
1417.3456

locally = pl phenos in glassy, vesicular mx

possible strike = 048°

2. fd porphyry basalt vesicular 300 x 10^-5 SI

possible dike

mx = more coarse xln { "above" = porphyritic basalt? 1200 x 10^-5 SI
1-2% pl phenos to 5mm

3 two prospect pits at top of ridge on qtz from ALS = surficial log/Qal deposit

frags of fgp ppy basalt on top = ?? How did they get here??

Northern Assessment pit = 4547185 N (185)
1357m 11 380356 E (360)

4 small o/c of fd ppy basalt (no preferred orient to pl phenos here or above)
4546980 N 380240 E

K = 500 x 10^-5 SI

5 = plag ppy basalt = 284 but w/o large plags

tertiary (Qal)
vesicular basalt (red-brown)
plag. ppy basalt
Qal

4544323 N
11 378970

6 basalt to and bx = scoria (spatter?)
± no mx x̄ K = 700

7 = top of hill = scoraceous basalt to basaltic-and generally aphyric w/ ≤1-2% plag phenos (tablets) to 3mm long
olt + px phenos ± pl but real. aphyric

8 = top of Hill = vesicular basalt
K ≈ 400 x 10^-5 SI

possibly autobx = flow No Ol or px or pl phenos seen

8a Color anomaly to "5m" = px andesite(?) x̄ ≈ 2mm
mod coarse gm w/ 2-4% px? phenos ±~3%
plag. phenos to 4mm x̄ ~ 2mm
= mod yellowish brown soil (moist)

K = 300 x 10^-5 SI

(9b) mod. Reddish brown = spatter(?) volc. bx = basalt
at prospect = assessment work pit
chalcedony float some w/ x-cutting QV

(10) J? = 020,87E
4544528 N 1501M
11 376628 E
prospect pit = 335° trend
possible shear/crush zone in basalt(?) -> silicified?
w/ clay (Mont?) gouge. Rounded fragments in zone

Sample = NWRA-0035 = 3.6m chip-channel across (?) zone/structure.
Original bx = ?

(11) 4542570 N J? = 315,72E
11 375930 E v. strong set 30-50/M

RC Sample NWRA-36 Tr S = ?
10x4M
K = 400 x10⁻⁵ SI AltT
K = 800 " less Alt'd above ef

V.F.G.

(12) J/b = 328,48E = 4 to 5/m = cx to (11)
J = 344,85E
K = 2205 x10⁻⁵ SI

4543775 N (91/79) 11 376784 E (70) > 4 1547m

~ rx to intermediate

RC Sample NWRA-0037 = porphyritic rhyolite??
10x4m

(13) Sample = NWRA-0038 = RC

275,65E = Ø (silica) vn #silicified fair #/bleaching
Rc = ?? glassy?
totally sheared volc.

4544172 N (780) 11 377140 E (50) > 7 Drill hole seq o/c ~ 50m

o/c ~ 10m x 5m Not continuous

(14) b = 315, 35E = epiclastic ash tuff interbedded w/ pebble congl. rounded to ↲

~~Some platy frags to 25cm x 3cm x?~~

dom volc. (>90%) pebbles w/ minor from ALS or other sed

pebbles to cg sand.

ash = glassy?

K = 0

J = 335, 57W ≅ 10-15/m

graded beds = top up

b = ≤5mm to 25cm to ~1/m

K = $\bar{x}$ = 50-70 x 10^{-5} cgs

4544275 N

" 378547 E

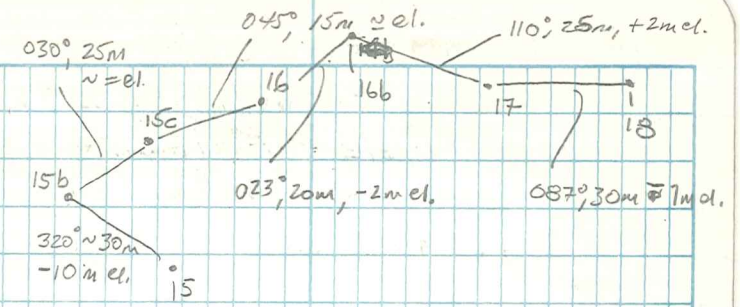
(15) For hydrotbx in vitric tuff several o/c along this side of the gulley

Sample = RC = NW-RA-0039

o/c ~ 5m/3m

45 44 069 N ~ 050E

" 378 499 E ~ 494



(15) = a+b+c = vitric tuff (px+bio?)

(16) = flow banding(?) = 310, 66E

prph vitric tuff (fsp+px+bio?)

J = 8-10/m = 315, 67W

16b = rx to 16

= some bx = hydrotT = silica around clasts?

17 + 18 = rock to 16 & 15 = vitric tuff

bx = K = 50 x 10^{-5} SI

Tuff = K = 0 x 10^{-5} SI

(19) b = 010, 77E = ALS

INTRUSIVE CONTACT = 005-355° dip ≈ bedding

005, 87E = CT (wavy)

sample 19 = Intrusive = grd? to MZ

(20) 4543068 → 3100 → 106

|| 3807 2015 705 →

14-22

695

1382m = el. 690

MZ

MZ

4543100

|| 380690

MZ

MZ

MZ

MZ

MZ

ALS

MZ

MZ/Grd = still w/in ALS

JUNE 9TH 1998 WHITE ALPS JASPEROID

KNOW	DON'T KNOW
1. Rx = plagioclase phyric glassy tuff (Abundant broken pl phenos). +Hbn needles ± Qz (trace)	1. Origin(s) of breccias
2. Breccias are common to dominant.	2. origin of primary lithology
A. jig-saw-type mx-supported	
B. matrix-supported fluidized(?) w/ rotated Angular to rounded clasts	
C. Clast-supported w/ open space (rare)	
3. O/c trends 037° which is ≈ bedding strike	
* 4. away from the silicified zones the bx texture is lost! Maybe bx = HT?	
4a. NOT ALWAYS!	

41°

J = 050, 51 W

Northwest margin of jasperoid 030, 54E
040, 57E
048, 57E
(10) → o/c trace ~ 027°
023, 50E

J = 085, 83 W to 285, 70 W = V. STRONG "SET"

Rock DESCRIPTION

% primarily a devitrified glass containing
±tr quartz microphenocrysts (≈ 0.2 to 0.5 mm)
5-8 plagioclase phenocrysts 1x1 to 2x8
$\bar{x}$ ~ 1x5 mm, locally flow aligned, v. commonly broken
tr-2 hornblende needles 0.1 to 0.3 x 5.0 to 10.0 mm

Rock texture commonly = breccia (characteristic)
Apparently = Hyloclastite overprinted locally by HT bx probably associated w/ jasperoid formation

Guess = Neue Ardant deposited in a shallow lake

(11) trend of o/c = 043° = "Silicified" (jasperoid)
plag phyric glassy Hyaloclastite (?) latite (?)
(SW end) J = 047, 83E ± = 0.5 cm wide silica + py → 100 Hm vn
070, 84E; 067, 90; 080, 78E (NE end)

outside jasperoid = pl phyric glassy latite (?)
bx / hyaloclastite

* silicification = bedding plane controlled, introduced along "E-W" joints = ?

10.1 o/c + silicification = 044, 51 W
10.2 J ± b = 041, 45E
J = 068, 72 W o/c ~ 055°

(12) J = 085, 83 W (weak set 340, 88E); 085, 76 W
ÀRx? = 9 & 10 = jasperoid
Clasts locally contain "rare" sanidine.
ALTN = looks AA, v. locally resembles "vuggy silica."
smaller + fewer plagioclase phenos!

(13) This rx = rx @ 10 & 11 ± 12
It has a strongly developed bx texture that looks primary. The main difference is that here the mx is vf x/n & not glassy.
The bx = matrix-supported, poorly sorted w/ dominantly subrounded clasts; rounded clasts are common, or at least some rounded corners, but angular clasts are uncommon.
frags appear to be equal to mx?
Clasts = ≤1mm to > 20 cm.

J = 067, 83W 6/m, some dip E at 65-75°

This is a distinct, larger clast bx zone = should be noted on the map.

(14) j = 270-275°, 83-90 W dominant, but some W
weak set = 055, 82 W
Rc + Acin = (13) EXACTLY! = mx-supported bx!
= Section line ±
8' 'W" j = 073, 60-80 W = dominant

@ yesterdays (9) = New rx type = sanidine + pl rock = to (8)!
this rock may be a dike?

(14-1) Flow-banded, aphyric latite (?) = spherulitic!
Fb ≟ b = 350, 35E possible slump block?

(15) Zone ~ 3-4m wide = "pee-gravel" like material looks crushed but not cemented (only v.v. weakly)
trend ≈ 080° = connects to zone on upper road = ?? possible fault zone!
then more, whole zone ~ 20m ending at small ravine trending 285°.

on "upper" road

(16) trend of small valley + juniper ≅ 065° (060-075°)
~15-20m of "pee-gravel" again = very distinctive.
possible fault/crush zone different rocks either side
most float = bx w/ plagioclase phenos + a glassy gm = rx to E

(17) two zones w/o bx surrounded by bx
± unbx rx + joints = 089, 88W; 285, 67E;
+ 074, 84W. = rx pl w/o sanidine

(18) = rx to 17-16 J = 275, 85W

10 June 1998

10N 2211215N, 467800E → 2205600N, 490800E

1N 2204910N, 467800E → 2196775N, 490800E

START = 2076N, 4816E

(19)

Jat = b.? = possible slump? 355, 67W, 345, 75W, 350, 63W, 355, 81W
005, 67W = 30/m 013, 64W = good

J = 303, 85E-90 ≈ 3/m ; 289, 79E = 10/m

Rx = porphyritic Hbn-Andesite (?) (trachyte ?)

pl = 5-6 Euhedral to anhedral, "radial" clusters

Sanidine ? = possible, need pts

Hbn/Amph ~ 5% ≤ 1 x 4mm

Bio = ?

pl size = 1x3mm to 2x4mm, rare to 5x6mm

gm = fsp + hbn = fg crystaline

hbn ~ 2% 100 → green mica + hm

plagioclase = 96%

mt 100 → hm ≤ 2%

2076N 4812E

2076N 4816

AND o/c

* minor Alti along J = ± w/ s = 100 → Hm

Alti = Ep ± Ab?? + Chlorite?

From 2076N 4812E 100' @ 290° = o/c ?

(20) = "Vn" = silicified fracture w/ s = 4 bleaching from wx

Rx = Hyaloclastite to autoclastic bx overlain by nonbx equivalent. probably a trachyte

3-4% phenos = Hbn? Acicular angular fine to 0.2mm x 1.5mm = flow aligned

tr-1% bio 1x1mm books

No fsp

mx = vfg fsp+??

trachyte flow

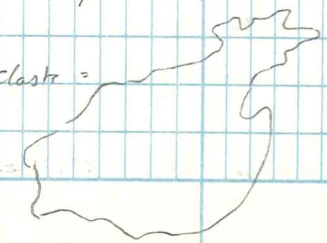
possible bedding

two small prospect pits / one on silicified jasp bx

J = possible bedding = 030, 50W = above bx unit
V. likely

1N creek = large flow-banded clasts to 0.4m x 0.3m
= Auto bx prob. Hyaloclastite

Some clasts =

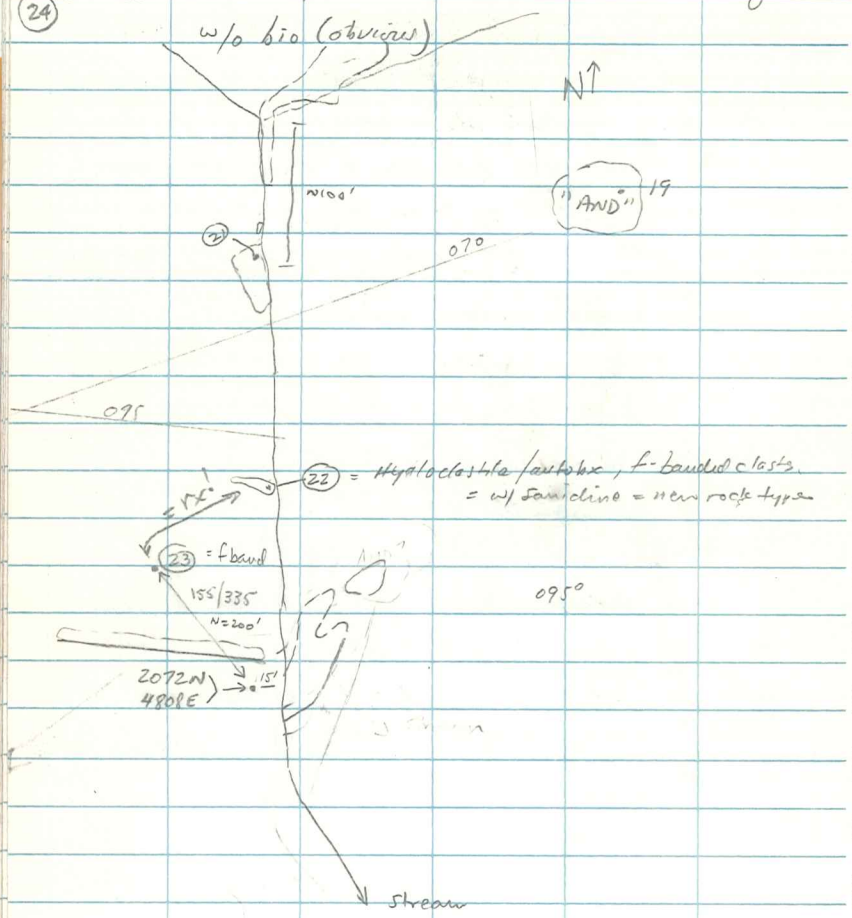


MAGIC OF MERLINSKI
Dennis Dobies

= fg plane = (21)

2076N 4808E (21) (24)

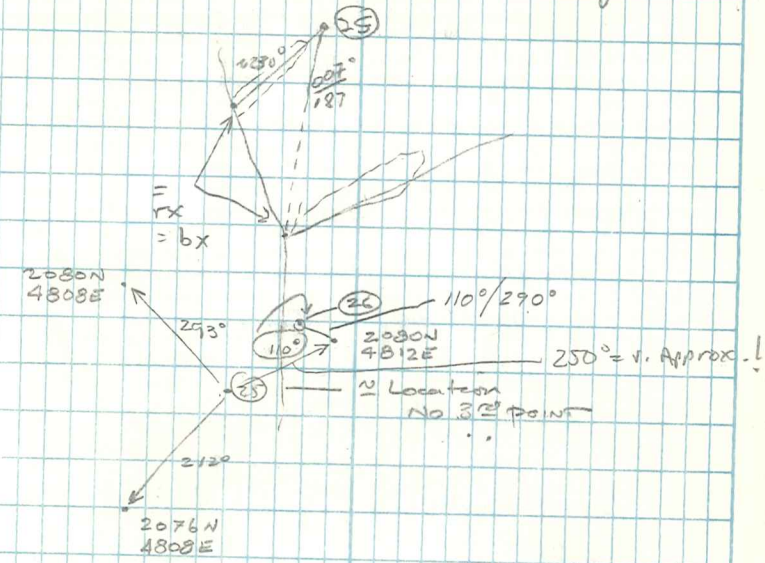
(21) J = 278, 30E = rx to bx ?? but finer grained w/o bio (obvious)



✓ (23) flow-banding 282, 49E in Hyaloclastite/peperite = syncline - bearing unit

(24) = Rx @ 21 w/o bx b(?) = 299, 18E

(25) = 187 to first tib + main stream junct



(26) = 075, 28W; 277, 48E; 272, 40E ≈ flow-banding ± joint?

11-6-98 Hycroft Crowfoot-Lewis

Thickness

>1400' Camel Conglomerate looks like a fan-glomerate mostly angular fragments, poorly sorted, muddy possibly mud flow in part. Shed off Kamma Mtns. + deeper Camel Congl. Contains ALS clasts. Some clast-rich zones = channels?

Silicification + mineralization in part, syndepositional - mineral.

mining cost = $0.60/ton

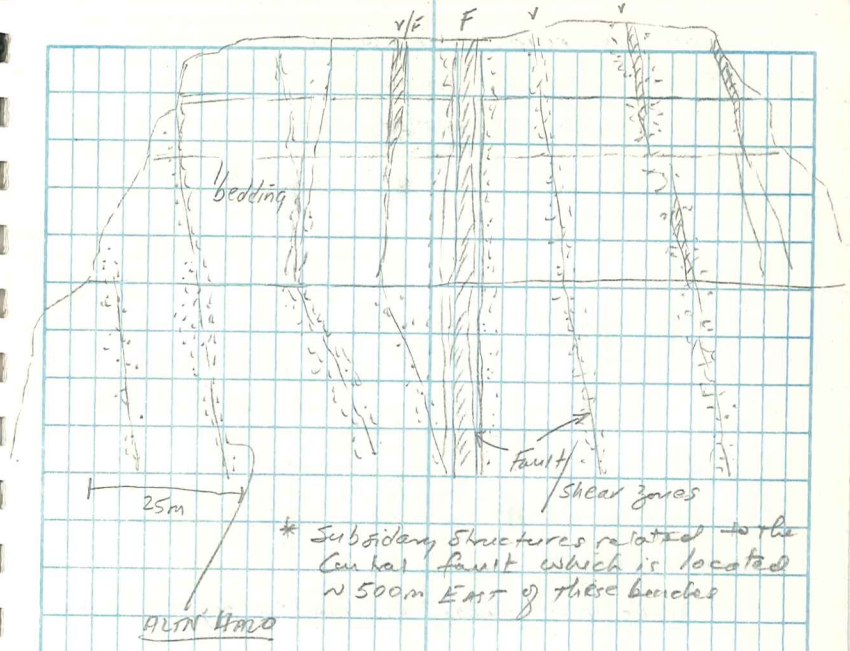
Mined along strike of Central Fault for 2 to 2.5 miles

illite-smectite clay = blue-green.

leachpads = 12" compacted clay.

Everything tilted to E (Albert F, Range Front F)
pre - syn - post mineral movement

S END CENTRAL PIT



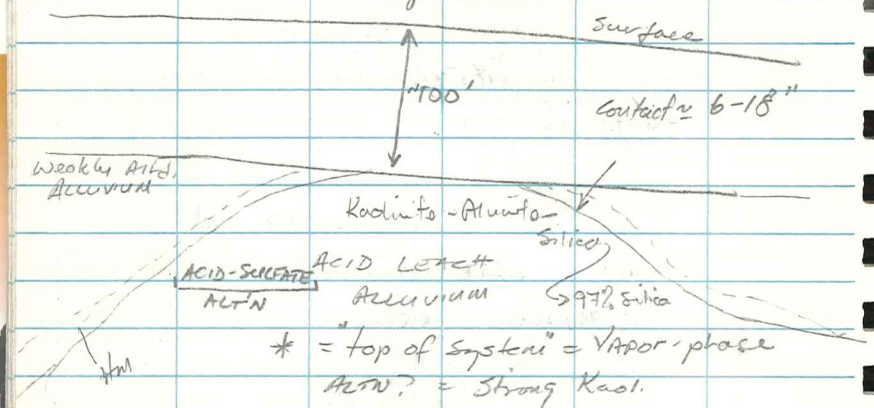
* Subsidiary structures related to the Central fault which is located ~500m EAST of these benches

14 faults/veins in 150m ≈ 1/10m
altn around structure varies from 10m down to ≤1m (total width)
Oxide Altn : Sulphide(?) Compl ≈ 6:3

These are mostly veins. Altn on main F = kaolinite probably supergene.
The vein/fault structures are subparallel over long distances (>300m) even though they are only about 10m apart on average.

took samples of Cal → Qtz vein + S=-rich Qtz vein for Assay = from another pit

250M tons mude of which 75M tons ore



* = "top of system" = VAPOR-phase
ALT'N? = Strong Kaol.

Sb, Hg, As, Tl, Se
Higher Higher

Brimstone pit

widespread ≥3000m horizontal along the East fault and ≥500 m wide

Above H_2O Table!

0.02X Au Reserve

0.6 - 0.8 ppm =

Lake Lahontan fluctuations

0.007 CN-Soluble = cut-off

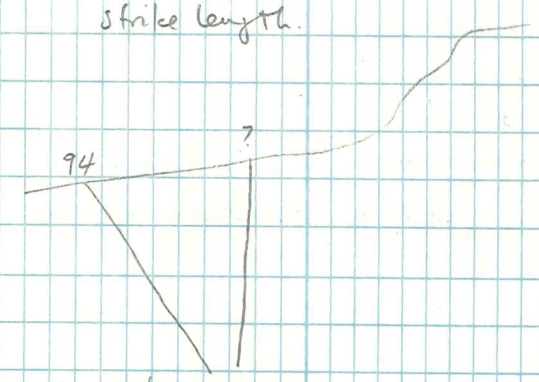
Near west edge of Brimstone pit = ↓

Core hole 94 @ 1820' = Kamma Volc / ALS contact
KV = clay (il-sm?) alt'd w/ disseminated pyr + Marcasite ≈ 1%. = Alt'n in ALS

94 @ 785.3 → 6x rock (volc.) w/ low T(?) Chalcedonic Silica w/ banded epithermal veins = runs 1-2 grams 350-400' = 1 gm/t, with narrow intervals of 0.3 opt. = Refractory + bladed calcite → quartz w/ xls to 8 cm!

the banded vns = higher grade

There are two holes w/in 1 mile strike length.



These holes are away from any known fault

* epithermal - banded Silica + Marcasite ± pyrite

This looks really good!!

The silica vns = open space filling
also bladed calcite

≤ 500 – 800' = 0.038 opt

Host = fsp porphyritic volc ± tuff = broken
xls + other Ashy-looking
rocks = brittle.

Should
(1) look at mineralized holes
(2) Exploration Data
Drilling + Sampling

more Ag to South + my hw.

4 Samples
1=Pir, 2=Chem, 1:?

Wednesday Am early 0700 @ HYCROFT TO
look at the core + field trip.

12-6-98 Bnd = 060, 76W

(27) Vn ≈ 4cm + splits = 045, 70W; silica ± bx vns
main
ADIT = 041°
Rx = massive to finely laminated fg (< 0.1mm)
latite (?) tuff strongly bx = in post HT
also primary ??
bx clasts = angular to rounded, mostly subrounded
to subangular poorly sorted (range =
≤ 0.5 cm to ≥ 20 cm, mx = cu to f / x̄ ≈ m
+ locally graded, grains = x̄ = subrounded
set in vfg (mud) "matrix" cement 70 → chrysotile (?)
Matrix = bedded or layered locally.
?→ possible bedding = 358, 45E in Matrix
Alt associated w/ vn = leaching (hypogene + supergene) fsp + vf → kaolinite + silica ± white mica?
clasts had ~1 to 3% fsp phenos to 2mm x 3mm,
x̄ = 0.5 x 1.0 mm; + they are monolithologic
bx varies from mx to clast supported and
locally forms a crackle (jig-saw) bx
→ it looks (and locally is) hydrothermal (injection) bx!
Mapped as Bagar Fm.

possible pepperite!

ON TOP 1778m possible b = 030, 45?E

5825
.305
27125
17475 0
1776.625

o/c — 10m — portal — 12m edge dump — 4m = toe

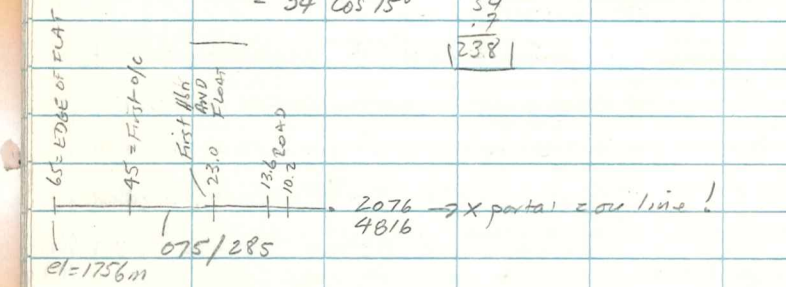
at 030°/210° to peg = 259/81° for 34m @ 15° VA

Dump = ~9m wide top = 5 —

o/c @ portal · strong Hm stain = ayler 5 =

b = c cos A

= 34 cos 15° 34 × .7 = 238



(19) @ 10/6/98

o/c = 40m → 125' to 2076/4812 o/c = 50' across (17m)

1240/17°

andesite (?)

Hm-Feldspar porphyry (≤ 0.5 x 1.0 to 4 x 5 mm) x̄ = 3x2 & 4x4

~ 8% fsp anhedral (60%) + laths (40) commonly "rounded" or broken(?) angular boundaries

~ 1% hbn lath 100 → hm 80 → go ± chl ??

fsp = glomeroporphyritic, weak flow align

fsp 80 → calcite + clay + white mica/muscovite?)

Mt ≈ 5% 100 → hm 80 → go

Vfy gm = jarosite stained

Altn = ?

to prospect pit = 305° VA = 05°

20 = stream
27 = o/c
47 = pit

@ pit 089, 84E = J

minor "HT bx" vms

Shear plane = 271, 70W, sticks plunge 091, 24

intensely silicified "pyroclastic" = (20) @ 10/6/98

± Vn = 6' wide → guess trend = J/F div.

2nd pit = 36' @ 326° = 180 + 146°

35' x Stream = 240° 60'

END FLOAT + 60' = CT No = further up hill

Altn in pit w/ Vn = Kaolinite ± white mica + silica

rock = trachyte bx (Hydrolosilite/autobx or tuff bx)

→ best guess

o/c = @ 10 – 22 = Kaol Actn

22 = 67 Hm

bend @ 28m 87 140 168

o/c to 45 @ 54 = o/c = large clast?

→ trib = 72m VA = 18° 071 214°/005°

(225')

bx = hot "welded" rivers

214° = 15m then 212° 32, 36, 43m (103, 116, 160)

325, 15E two textures prob = rx

both bx

1 = clast supported, angular, curved poorly sorted, monolith. bx (autobx) ± "bedded" or layered

2 = mx supported, ang to subangular, locally curved, no rev. bed/layering poorly sorted

34m = 110' / 003°

'b' = 291, 66E ; 333, 50E (W)

⊥ 005° → o/c 22-27 29 - 56 = OC

at 40 to post = 2072 4808

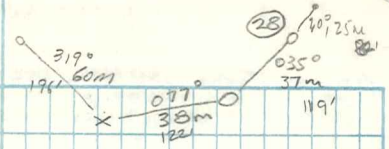
290° VA = 12° M = 12

129'

1710 – RAIN – END

15/6/98

2080N, 4812E



Road N = 006 ⊥ = 113°

(28) Flow "jointing" 069, 88E

303, 76W

Flow banded, Hbn fsp (sanidine + pl) porphyritic latite

		Max =	
sanidine	= 3%	2x8mm, 4x4mm	40/25 → Ab
plag	= 5%	2x8mm, 4	60 → Ep
Amp/Hbn?	= 2%	1x3mm	100 → green mica + clay

Strong Hm stain to cryptoxline qtz.

(28a) 077, 78E Flow banding / joint

@ 2080N 4816E to road = 270° = 24 (12) 327° ~ 65'

308

114

260

2080 N 4820E 286° to post

270° to o/c + bend in Rd

62m 203' 81m

to post = 317°

365'

(29) Bager o/c

= Conglomerate (rounded pebbles to cobbles w/ 3 comp. (1) hbn trachyte

(2) Sanidine - pl ppy latite/trachyte

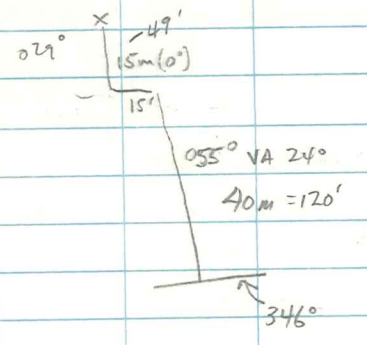
(3) Rhyolite (?) ~ 5% Qtz phenos = irrep.

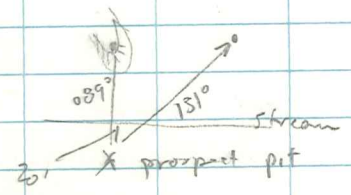
From 2076N 012° to prospect pit VA 21°
48 20E
21 for 25m 77'
10 to 24m 77'
154

311
356

(30) - Non vesicular porphyritic sanidine + pl + Hbn trachyte = (28) but w/o Ep.
fsp $\xrightarrow{60}$ Ab) tr ep.
Hbn $\xrightarrow{100}$ green mica + clay
Strong hm stain to mx
Mt $\xrightarrow{?}$ hm

(31) 279° to Stream = 55° to S side dump.
VA = 24°
o/c → 029° back → dump.
then 150° → 15'





(31) This is a central o/c
(1) clasts of (100%) hbn "trachyte", vfg + platy = o/c (20)
supported by a sandy, hm-red mx,
poorly sorted (well sorted on v. local scale)
w/ angular to subrounded clasts
clast size ≤ 1mm to ≥ 30 cm.

(2) looks like ≈ mx w/ (±100%) clasts of flow-banded trachyte/latite (?) (to >50% hbn trachyte)
mx maybe volcanic, but = silicified

The first bx looks like Badger! It is possible that these o/cs + Bager represent a diatreme! the mud mx looks "just like" the diatreme (?) bx dikes on Gold Hill near the Spotted Horse!

* A diatreme origin would allow for
1. graded + bedded horizons
2. large + locally irregular distribution
3. variable clast content, locally mimicing lithologic contacts
4. rounded to angular clasts
5. mx- to clast-supported textures.

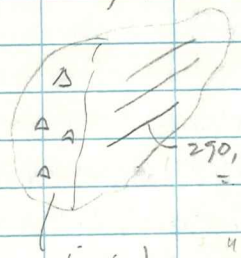
241°
21°
153

134
158
211

(32) = mud mix bx w/ 2 clasts hbx trachyte "lava"

(33) = rx to (20)

(34) = non vesicular porphyritic trachyte



290, 85 W
= flow dipping

intrusion bx or "diatreme" = pts

104 o/c to post	Prospect 109 - post
167	183 pg

(35) 087, 64E = Vn in mud mix bx

slicks = 267, 73

Vn = silicified rx + 5" → 1m ≈ 15 cm wide

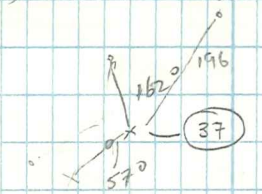
132° to post, 184 to rock

(36) 135 silicification zone "Vn" 085, 88W
174 ~ 0.2m wide Host = mud mix bx

6-18-98

Note: Some of the "Trachyte" intrusion have 3-4% sanidine some closeup

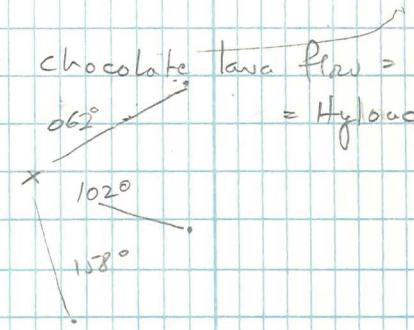
(2) 2nD intrusion in gully



153° 570E, 68W
052°

Tq = N60E, 17 SE ≈ bedding (ESTIMATED)

(39) Tcl = chocolate lava flow = Auto bx
= Hyloclastite



MAGIC OF MERLINSKI
Dennis Dobies

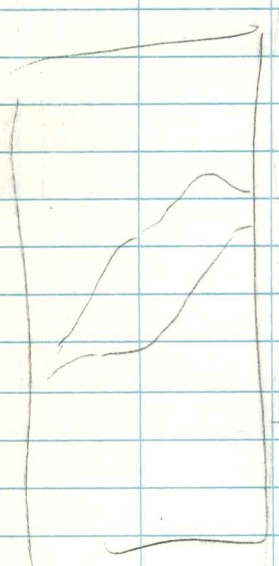
2%? / 2-3% ± No fsp

J = 275, 24E (= b??) hbn-bio "latite" tuff lava

J = 310, 80W = w/ Altn = bleaching greenish white silicification

(38) 051 → 089° →

J = 072, 68E



ADIT W/ DUMP AZ = 032°

(40) 271, 64E

F = 280, 79E

Slicks = 57E

Adit =

357° from gorilla

300° to peg

073°

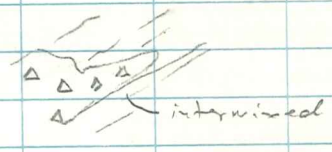
048

30

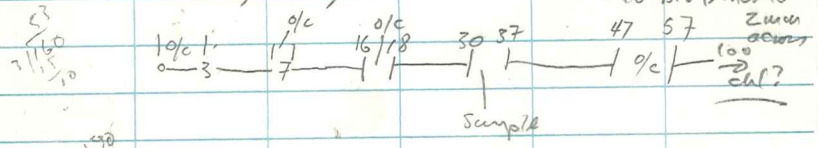
(41) glomeroporphyritic hbn-fsp Andesite
pl 5-8 → ep, pl 50 → Ab(?) + calcite
hbn → green sheet silicate
gnt + mt ⇒ hbn
Incipient + brecciation = autoclastic

@ b = complex flow banding = 335, 75E
+ incipient bx
≈ trend to bx dike ~ 20cm wide
= HT bx or autoclastic? can't tell
but looks HT.

@ c = autoclastic bx + strong flow-banding
fb = 022, 58E = align of planar + color + joints
pts



(42) looks like an ash tuff, but local autoclastic texture ⇒ flow or dike
Dx = vfg, mostly aphyric trachyte? ~3% hbn phenos to 2mm x 0.3
162°, 065.5, 035½ ~1% bio books to 2mm across



"bedding" = planar joints = 321, 20E
Sample

~South 10' from 42 = o/c of glomeroporph. hbn-fsp Andesite + strong bx w/ frags of flow-banded andesite
90
3|270

(43) glomeroporphyritic Hbn-Pl Andesite
possible fb = 038, 80W
autoclastic flow or dike.

037, 062

(44) 288, 43E = Flow-banding pl + sanidine aphanitic
reddish aphyric ~2-3% sanidine trachyte, also
strong auto bx + chl-ce ± silica altn + hm

opaline silica in cracks + vugs = hypogene?

(45) Sanidine-bearing unit - strong fb or bx
± trace cal altn w/ chl + sanidine → ?
Sample = pts

215°

(37) Gorilla = Hbn-Sanidine-trachyte
blocky bx w/ clast-supported (angular) bx
autoclastic?

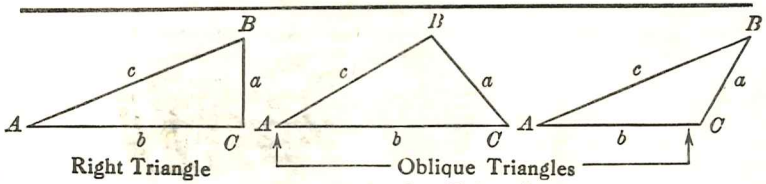
(46) = vesicular hbn-sanidine trachyte
= base of gorilla to southwest.

pts

(47) 060,38E = Dominant flow banding
= sanidine crystal
310, 345

(48), (49), (50) = samples pts
No 49

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

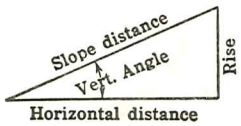
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	
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	$B = 90° - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$.
A, b	B, a, c	$B = 90° - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$.
A, c	B, a, b	$B = 90° - A$, $a = c \sin A$, $b = c \cos A$,

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180° - (A+B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180° - (A+B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A+B = 180° - C$, $\tan \frac{1}{2}(A-B) = \frac{(a-b)\tan\frac{1}{2}(A+B)}{a+b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{bc}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{ac}}$, $C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{bc \sin A}{2}$
A, B, C, a	Area	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° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .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. Cosine 5° 10′ = .9959. 1 — .9959 = .0041. 319.4 × .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.

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