6000184

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud Field Notebooks
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	2 field notebooks as one; geology NOTES: Scan covers – 2 books combined; do not scan blank pages 74 p.

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 66001841 4010
BOOK 5

Keuffel & Esser Company

P. MITCHELL
SEPTEMBER 1998

82 0020

Weatherproof Field Book

"Rite in the Rain" All-Weather Paper
32 Leaves
4 5/8" X 7"

CURVE FORMULAS

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

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

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

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

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

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

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

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

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

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

$\text{Tan. def.} = \frac{1}{2} \text{ chord def.}$

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	1/8	3-16	1/4	5-16	3/8	1/2	5/8	3/4	7/8
.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

FRIDAY 11-9-98 EAST END SOUTH RIDGE

(163) (023° to peg ≈ 1050′)

ALS 6 = 350, 30W
6 = 075, 27E (≈ 45° NW) } both = ?
folding ?

NOTE ALS / KMV may be depositional contact & not a fault zone as Randy thinks.

Geophysics
G. Peg = 4516060 N } ⊥
11 362850 E

(164) geochem sample - ALS w/ carbonate
(LS + $CaCO_3$ Vns w/ Qtz = stockworks)
4516260 N } 6
11 362794 E
grab sample NWRA-0068R } grab!
NWRA-0069R

G. peg = 4516400 ON } ALS < (163) ≅ 150′ due South
11 362759 E

(165) = NWRA-70F (grab)

ANDESITE (?) Feldspar porphyry (float)

Strong/intense $CaCO_3$ altn + Hm w/ ~1% disseminated pyrite clots to 0.4mm across

3-5% Amphibole (Hbl?) phenos to 3x6mm

5-7% fsp (plag) phenos 1x2 to 5x8 mm

$\bar{x} \approx$ 2x3 mm

Mx $\xrightarrow{>30}$ $CaCO_3$ + pale green sheet silicate (illite?) + greenish mica = Chlorite (?)

4516605N
11362660E
> Sample location

ALTN = CHLORITE - CALCITE - Hm - PYRITE
(Hm may = ox product of Fe + FeS_2

Texture + color look "metamorphic".

(166) b = 015, 34W = banded Dozer tuff

banding = jasperoid replacement + alon bedding (?) planes ≈ 10% of o/c

F = 320, 60W

F = 330, 50W

(Jasperoid = v. planar!)

NWRA-71 = RX
NWRA-72 = V

	PAM	PR
(166)	4516500N	4516471N
	11 3625165E	3625178E

NOTE: This o/c = distal silicification related to the jasperoid o/c's to the south-southwest on the N flank of Rorebeck Canyon.

* should contour silica % in this "region" on the altn Map.

CT w/ ALS = ??, possibly at base of this slope (EAST).

Rx = Dozer Tuff

(1) No sanidine
(2) No Hbl needles or phenocrysts
(3) No quartz
(4) No plagioclase
(5) No phenocrysts at all = Aphanitic fine (ash) tuff.

NOTE: Dozer probably had significant relief ± 500-1000' so ⇒ numerous "basement" highs when epiclastics + chocolates were deposited! DON'T NEED FAULTS!

1996N
4868E } Td float w/ HT(?) bx + silicification = Jasperoid.

2000N
4868E } Td float = in stream bed.
stream = 255° @ 15°
" = 055 @ 200'

4516900N
11362350E / 335, 75E = bx dike = HT w/ thin stained Mx
≈ fault "trend"
Rv = ?? massive fine (ash) tuff
w/ 1-2% ampl (altered?) Acicular
x/s (microphenos)
Td or Tc ??

2008N
4864E } o/c = planar laminated tuff = Td ??
(LBT??) w/ strong jasperoid veining
+ bx / fractured rock
(167)
bx vns = 320, 62E
b = 350, 40W -> 347, 50W
= strongly broken / fractured
+ brownish red $FeO_x \pm SiO_2$ stain
x̄ = weak - mod silicification as
veins + bx mx. ° = Questionable
maybe chilled margin to Tc dike = trace
sanidine in glassy fraction = possibly
no silicification only veining + glassy phase

Possible fault zone w/ Tc against Td (E)
to E = clay + bx + veined Td
trend o/c = 007°
N end o/c = 030, 56W = planar o/c +
joints @ 8-10/m

(168) 4517228N
11103625 48E } location = Td, bx
topo = 5616 / GPS = 5457
b(?) = 355, 45E = strike + dip of o/c

upper Dozer auto(?) breccia w/ silicification
of mx bx + along bedding (?) planes
similar to o/c @ (166). = v. distal
silicification c/o hematite. (weak).
→ SAMPLE = NWRA - 73

NOTE: The top of the Dozer Tuff is generally
or always a bx, possibly an auto bx

2016N
4860E } 100% chocolate float = Qt

(169) Tc o/c = Amph-pl-son latite
(no qtz seen) w/ onion skin weathering
strong bleaching
5-8% Amph $\xrightarrow{>80}$ green-black silicate (chl?)
+ locally $CaCO_3$
3-5 pl $\xrightarrow{>95}$ $CaCO_3$ + clay (type?) (illite?)
3-5 San $\xrightarrow{<15}$ leached ± weak clay??
Along joints + knots = SiO_2-lined vugs
+ open spaces along fractures.

o/c may be flow or intrusive & apparently
different than Rosebud Quartz Latite, because
no visible (at least here) phenos/microphenos

J = 080, 65W ≃ 10/m
J = 002, 33W ≃ 5/m

(170) b/fb = 077, 33E

2016N 4848E ≈ 150' N = (170) all = Tc = (165) ± intrusion or flow??
rx has relatively large xenoliths of LBT??
= 0.8 to 3.0 cm max dimen. $\bar{x}$ ≈ 1.5cm.
+ v. angular to rounded

UTM (m)

	N	E
163	4516060	11 362850
164	4516260	362794
	4516400	362759
165	4516605	362660
166	4516900	362516
	4516900	362350
167		
168	4517228	362548
169		
170		

State plane (feet)

163	219725N	488339E
(164)	8378	8144
peg	8835	8021
(165)	9502	7684
(166)	9149	7217
✓	220045 1	6649
167	15[illegible]	
(168)	1539	7279

219800N 48700E

peg	4516	362	
	4516045	664	✓
(163)	336	736	✓
(164)	418	811	
peg	447	779	
(165)	427	701	
(166)	611	629	
(167)	4517059	031	
(168)	247	362 415	
(169)	4517 354	361927	
peg –	2197665	487730	✓
163 –	8624	7949	✓
164 –	8898	8190	✓
165 –	8921	7829	✓
166	9520	7582	✓
167	2200954	5593	X
168	1594	6842	X
169	1916	5235	✓

23-9-98 WILD ROSE CANYON w/ P.R.

1 = 171 = biotite "ANDESITE" = trachyte

2 = 172 = microdiorite or andesite (plagioclase)

3 = 173

4 = 174

5 = 175 = LBT? platy-laminated flow-banded Latite(?) = lowest Tc formation.

24-9-98

(176) = rx to 175 = flow-banded (?) platy, contorted on large ($10^{\frac{1}{2}}$m) scale, Sanidine-bearing, fine (ash) tuff w/ intense hm dusting. Sanidine phenos = ≤ 3mm ≈ trace to 4%. = Tbf g Brady.

fb = 303, 80E to 010, 85W

Some auto? bx

tx = "pencil" structure

(177) = Rosebud Qtz Latite, Abundant (3-6%), large (10x4mm, max) euhedral + broken Sanidine phenos + glomerophyric plag phenos (variable <1 to >5%) w/ ± trace quartz, qtz grains + small (≤ 1mm) Sanidine phenos 100k = V. tr smoky quartz = 1 grain seen. Strong argillic altn + silicification (weak) structurally-controlled in o/c. Altn = locally Sanidine destructive.

(178) = to 176, but less platy & flow-banded

(179) bedding / fb = 325, 23E in "planar" laminated lobate tuff = Lt, Intensely strong hm dusting, Sfs

2210,400N 10,400N
47440E 4744E
= bor fb latite(?) tuff float.

(180) = contact latite tuff - Rosebud quartz latite
RI = dike strike = 290°, dip ± Vertical
chilled margin.
Much stronger altn in the dike than the tuff.
27 × 2.5 ≈ 50' wide
25
135
54
67.5

(181) ≈ 50' East of gravity station (113°) = RI, but much less altd = propylitic / sericite >> illite to Kaolinite / dickite.

(182) crystal-poor (≤1%) fine (ash) tuff = "glassy" xls (phenos) may be sanidine + plagioclase - not sure = argillic altn, rx "looks" relatively unaltd locally, but wl fsp -> clay
tx = massive to platy, variable attitudes as "bedding." some = ± flat = 10-15° E dip
Intense Hm "dusting."

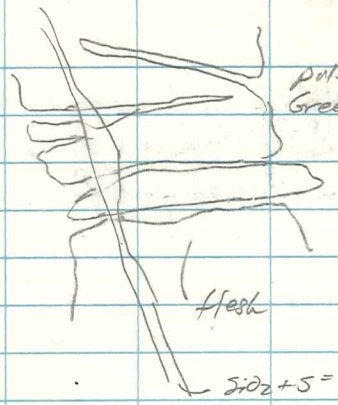
(183) f = 305, 46W w/ SiO_2 along slickensides + mullions. = ± 100% dip slip movement
f = 315, 47W w/ Altn (arg) + SiO_2 along fault plane; mullions = ± 100% ds movement

Rx + altn ≈ (182) massive >> platy

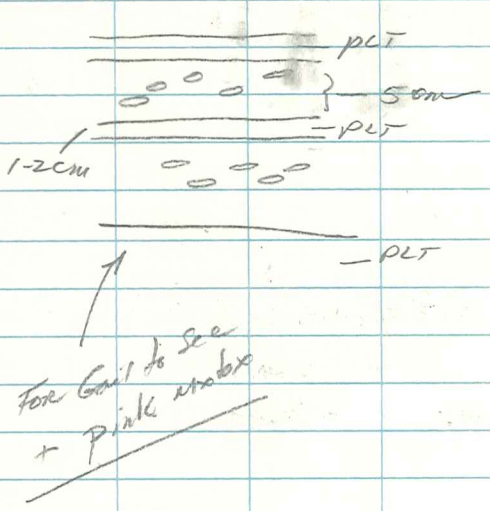
#1015 2210410N 473600E = float of tuff - RI + RI D/C w/ strong / Intense argillic altn

29-9-98 UG Tour

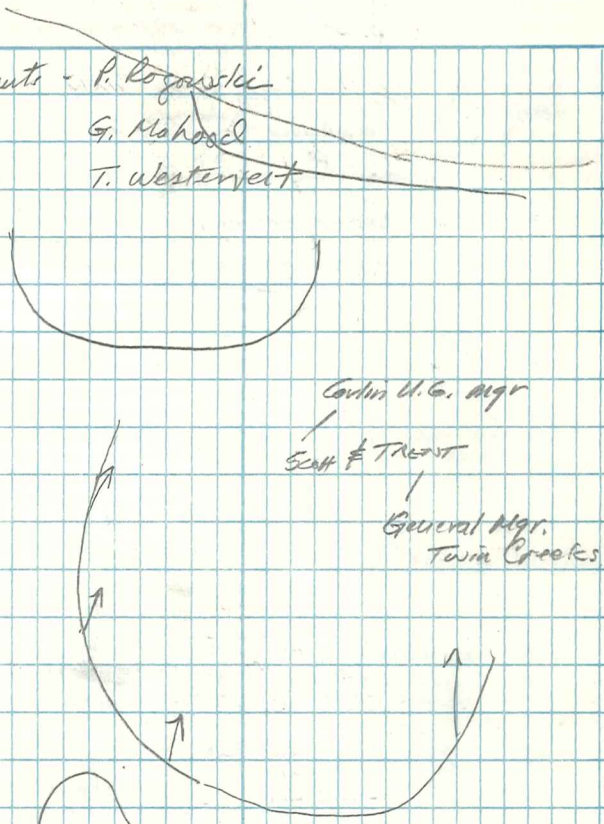
Alex - planar laminated & LST = 2 phases of the same unit!
LST = Vernicular top to PLANAR laminated flow - irregular CT between these units ± = LST would be.



2300 Drift ~ 1/2 way down =



Consultants - P. Rogowski
G. Mahood
T. Westervelt



Joint Dow
Jeff Hupperti, Dave Grimes, Rick Lisle
Roy Owen, Dave Matheson
Randy Vance, Dick Reid

FIELD VISIT ~13

1-10-98

North side South Ridge above aggregate plant

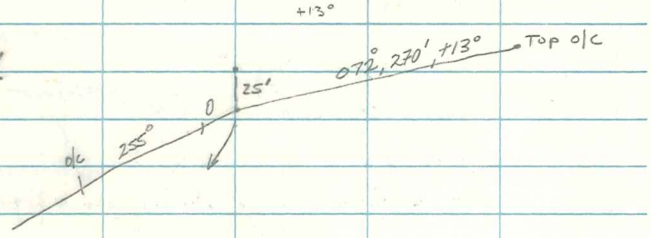
2016N / 4804E } o/c road cut ~ 20' WNW = ^ bedded (This) aphyric tuff bleached white

bedding 4cm to ~10cm. possibly Dozer or planar law. Chocolate ??

trace sanidine(?) phenos — prob. TC

<1% bleached Mercasite → wx + LM

2008N 4792E



@45' = platy tuff

58' = cobble congl w/ fb + vesicular frags to 20x20 cm
b = 017, 31E b ≈ 50cm, resting on ash tuff (maroon)

66' = granule to fine pebble congl. = olive green
↳ to 87' b = 013, 40E (100% volc.) = med bedded 5 to 20cm

87-137 = tan to yellowish green granule to fine pebble congl = 100% volc, thin to med bed.
reddish br. @ top ; x̄ bedding = 10cm
but 65 to > 25cm b = 014, 42E

@137 = erosional surface

b = 008, 63E, rx — pebble to cobble congl

w/ cobbles to 25cm, x̄ ≈ 4cm

Exposed beds (15) / unit ≈ 1.25M, beds sep. by silt or ash w/ or w/o granule size frags.

159-165 = b = 010, 53E, ~45cm Thick of tuffaceous sltst + ss w/ horizons of pebble to granual congl ≤ 1 cm thick = blue-green

Frag at eol traverse = 172'

New rx = similar to 157-165 but poor o/c

rx = pale yellowish green (coarse)

77' = "large" cobble (≤30cm) congl = possibly to 92', but v. poor o/c = ± float

b = 020, 44E

"From 92" = thin to med bedded sequence

b = @ 92 - maroon beds

0-92 = +0° From 92' to 270' = +18° VA

92=0 → 134 VA = 11° 0-56 = beds ≤ 15cm = olive green

56 b = 017, 44E

0-56' = pebble congl = volc bx

95 b = 025, 47E = boulder/cobble horizon in pebble congl

134 b = 012, 46E

56-134 = beds = 0.25 to 1M thick = volc. bx or pebble congl w/ minor ss - granual beds

134 →

↳ = pebbly ss — tan to buff = yellowish gray

ss = L/M ss (≥80%), coarse to v.c. upper tuffaceous lower

sand (5-15%), granual + pebble 5 to 10%

below 134 unit = greyish green to pale green

w/ frags = blackish red to dark reddish brown

→ CT = 012, 46E @ 134

"Top" = 119° to frag

= ft

Unit starting at 134 = ~19m thick & had

Thin <10cm interbeds of volc pebble congl.

CT + ~35' @ 225° = 6 = 015, 42E

End of traverse = CT w/ overlying unit

@ flag.

on ridge line

to 2008N 4792E = 253½°

to 2012N 4800E = 098½° } = CT + flag

to 2012N 4792E = 315°

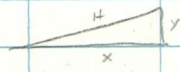
6 in overlying unit + CT = 007, 42E

actual CT = ~15' @ 085° from flag = ridge center

= Cobble (rounded) congl w/ exotics

up to 1.5m across

Az	Dist	VA	T. Dist.	Elev
072	270'	+13	263	61
	178'	+18	169	55
	92-134	+11	41	8



$\cos = \frac{x}{H}$

$\sin = \frac{y}{H}$

778-2863 – DAVE GROVES (5TH STREET)

10-2-98

0937A = George Langstaff
5-5627

1506 = Randy Sunday 8 Am
625-5613

= GAIL MAHOOD =

3-10-98 – Gail Barrel Syrings

Stop 1 (184)

Strong dips (>2 to 3°) = structural outliers in pyroclastic tuff

Rhyolitic tuff

↳ drainage exposure – began to flow

andesite(?) inclusions + MEGS + lithophysae

Holes = lithophysae (drugs) + spherulites

Hot = recrystallization? (if add air = no welding)

to weld must have magmatic gas – exotic

deposited from base of column.

just has to be hot, not necessarily proximal or big! biotite + px = high T gas °C

Densely welded + Rheomorphic

Hot Mega or proximal!

Caldera + intracaldera tuffs / environments

gas = welded at top
tuff at base

rx = sanidine + qtz + biotite

Vent + pickaxe cup

Coal + wire = Bishop tuff! paper

Everything above was in tuff = from the vent

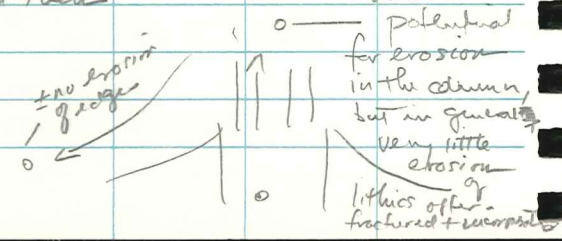
Mafic magma - look for flattening - not as flattened as the xln rx, crenulated margins

Andesite = lithic, etc

Here = xenoliths (lithics) not mafic melt blobs because not flattened enough + too angular Look for evidence of flattening (ie. foamy-like edges) & edges

Andesite when fractured can give any shape - some lithics here have very odd shapes, but are probably lithics

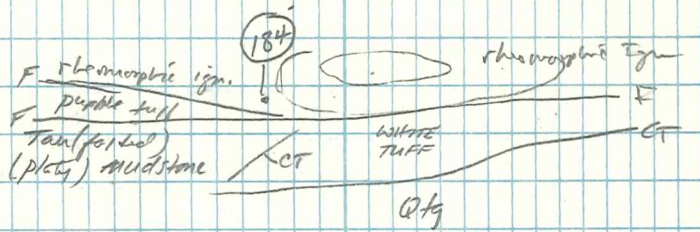
Here xenoliths/lithics = alt rinds around them

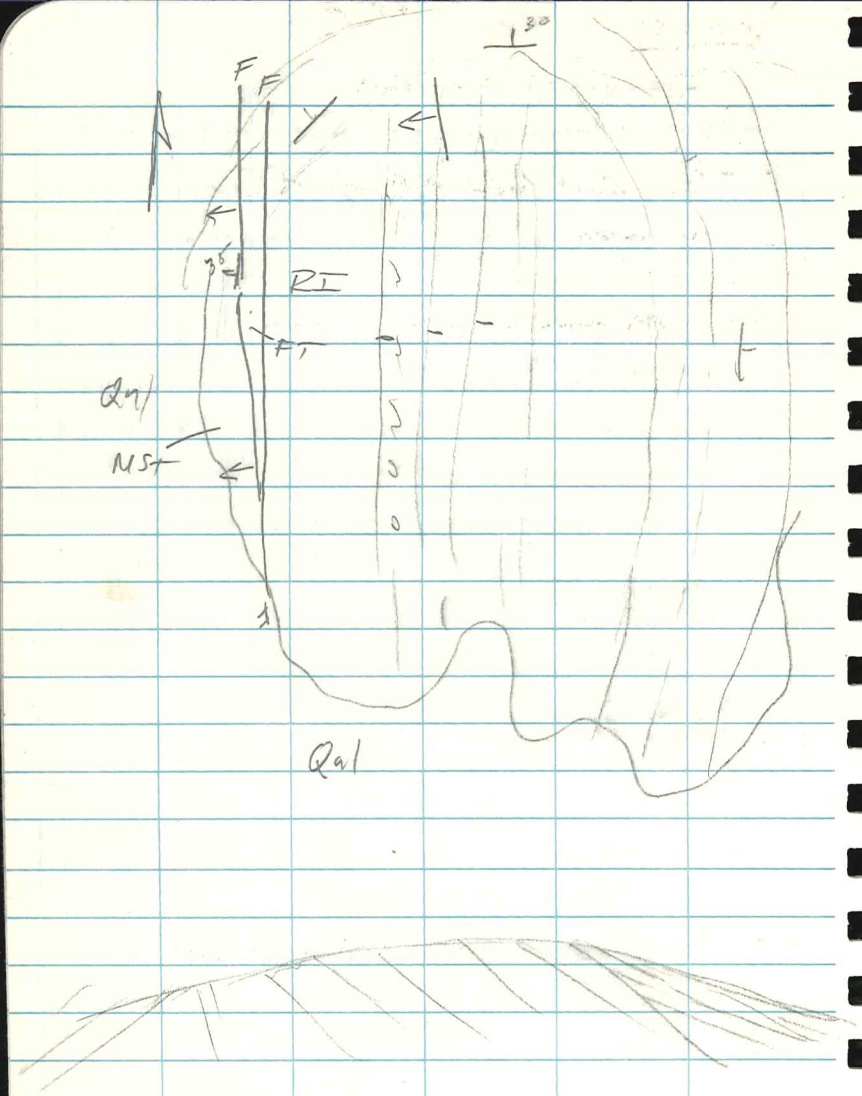


Stop 2 = rhyolite/dacite dike = back side & ridge near Qt, dr to <1%
Qtz phens to 2mm across.

Rheomorphic fea = ign's ½ melt - mix + mtl & welding - not preserved in geologic record - this is a ignimbrite!

= Rheomorphic Ignimbrite





SAMPLES

(184) = Rheomorphic Ignimbrite
NWRA-3615

(185) = (A) Fallout tuff → silicified } trachyte
(B) LAVA
NWRA-3616

(186) = tuffaceous (?) mudstone / siltstone
NWRA-3617

* R_2 look like trachyte = not enough quartz

(sed rx bedding ankeckd 1x5), pumiceous (lapilli-size) — (3) (186) NWRA-3617

NWRA-3618 1.5m (187) (4)

fvsl = vitric crystal tuff (20%-25% x15)

reverse graded = lake turbidite sandstone? to granule size grains

sediment

1m thick

pumiceous (floats) resedimented so can get reverse grading.

lacustrine ± tuffaceous MST/SLT/SS + porcellanite

conformable

Beach lag? → ALS pebble congl.

because of planar conformable CT for long distance + imbrication + lack of rounding of pebbles

fed by fan/lowerelt somewhere

± Lacustrine tuffaceous SLTST/MST

(2) – (185) – NWRA-3616

unconformity

Rheomorphic Tgn.

(1) (184) NWRA-3615

F – less blobs + less rheomorphic F

BASE NOT EXPOSED

lava flows have broken xls

pepperite zeophyllite alteration

(Tuffaceous) SLST/MST

Tfg younger tgn + v. young

K_{2S} = Sulfur group

Lower Al_2O_3 higher Fe = $2.72\%(Fe_2O_3)$

"Alkali Rhyolite" plagioclase Trachyte

Comendite = 72 to 73% SiO_2 Trachyte

Pantellerite = 68% SiO_2 Trachyte

Big Fresno Trachyte

Dozer = flow-banded trachyte (comendite)

= along road on N side South Ridge

↳ + some local autobx zones = small + irregular

strongly parallel banding (>5m) = lava

discontinuous + pinch & swell = rheomorphic tuff

↳ 10's of cm.

* lava flow vesicular + vapor phase xln = flow laminations

Dozer trachyte / (m) Comendite

autobx (1) lava dome ?

(2) slide blocks?

↳ tectonic transport

↳ lava domes - brecciated along external margins

no sfx + no variation in fragment size

Definitely not hydroT or pyroclastic

Here Dozer = lava flow or lava dome

trachyte can go 3 to 5 km easily

flowage = Temp effect more than SiO2 content

Very Hot lava flows can flow easily -

↳ Rhyodacite, not quite 76% SiO2

Vitrophyre in ignimbrite = 10m or less

in lava flows vitrophyre can go for a long way.

* generally in ignimbrite of this composition should have lithic inclusions.

Ash flows + lavas can have from 0 to 40% crystals

Gail M. = ± 11 Km³ ignimbrite flow is aphyric.

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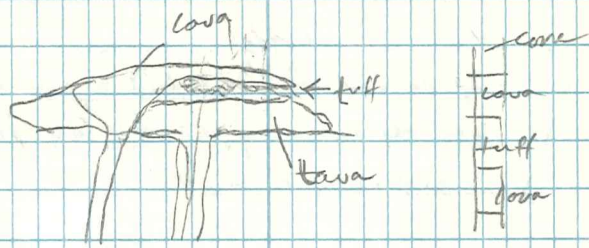
rhyolite domes have fall out units w/in them



SUNDAY 4-10-98

1. Notes on how to identify volcanic units, ie., lava flows, ash flows, tuffs, in the field.

2. Rock type.

═══ = Parallel to from E.

Vertical flow foliation generally simply vent area; other places = on flow fronts = regional (can have local vertical flow foliation) Some recirculation = evidence for lava flow or lava dome

NOTE: If flow-foliation is rotated to pre-tilt it is still vertical.

If vertical flow-foliation = continuous over the length of the o/c (all primitive) = probably a vent.

Yesterday — flow layer = rel. shallow = flowing "away"; — flow down + base flow.

Hot flow margins can recycle so clasts w/o real boundaries

Highly recirculated flow tops = Not preserved in geological record

This bx @ the top of Td could be HT!

This is a talus pile = crude bedding Poorly sorted. !!
from different Dozer tows

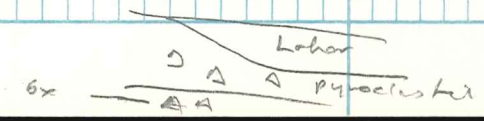
- less HT, but dom Td

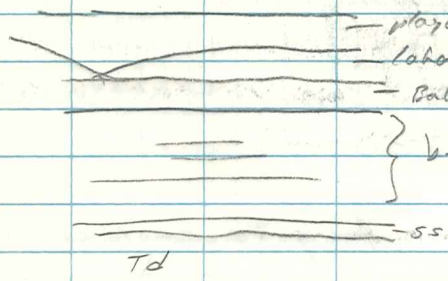
more HT = HT probably = Hyd eruptive

Evidence for lava dome complex = non-continuous units

* "TOS" above the bx maybe a pyroclastic deposit

Lahar = unsorted mix, wide range of recirculation some angular, wide clast size range Some = v. large, massive

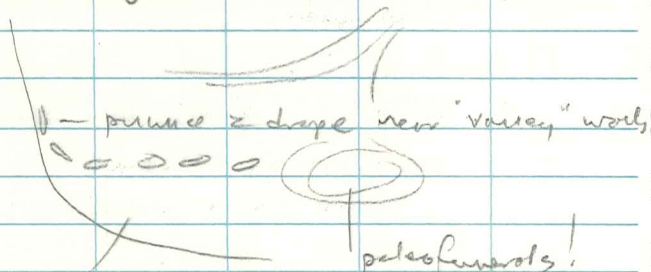




Lahars = preserved = in valleys

Later activity = possibly HT.

Weakly welded Ignimbrite = Valley of lapse surface



filling paleo canyon 100,000's to millions

Ages →

* few 10's of thousands to a few million

Erosion surface - lava dome - eroded

Note vert. lam (flow) in Td on W side of ravine

1. Sequence = going in and out of lacustrine deposits + ignimbrites or reworked material + lahars
equivalents = "map the environment (facies) not the units"

Lahars = doubly graded.

* platy jointing = classic intermediate compositions
Lava flows = probably latite to trachyte lava! two joint sets => penecontemporaneous

if biotite = not an andesite = a mafic trachyte.

Spots => alkalic intermediate compositions
Hawaiites and up - these may be (Icelandites)

also have flow bx!
=> near south side canyon have a feeder dike - orange flow!

Dozer II = plagioclase phyric (≤2%, $\bar{x}$ ~ fr to 4%)
↳ Name plagioclase phyric Dozer (?)

* to E = "Chocolate" greenish dike = Sanidine + hbn

⇒ * Vitrophyre = possibly associated w/ a densely welded tuff - they occur ~ 1 to 2m above the base - the bottom 1-two m's = cooled too quickly to form vitrophyre - this rock could be dated!!

Lunch

Badger (1) at prospect may be lahar
(2) playa environments w/ flash flood deposits

Intermediate composition dikes can become bx near the surface where they breach and flow or form lahars

1. The gorilla = Sanidine, plagioclase ± biotite
brecciated, locally vesicular
If is not! the Rosebud Quartz latite

The earlier platy tuff = lava flow = different than the gorilla rx.

The gorilla = intrusive plug of trachyte
i.e. = Dozer + Chocolate ⇒ debris flow/fan
bx (1) if heterolithic = less likely syn eruptive
(2) if monolithic = syn-eruptive = hot and "spalling" off a lava dome = ± welded together i.e., all Chocolate
debris fans = relative isolated individual lobes

= lava dome

Creek ⇒ Exposure = bx spalling off!

Gail - This does not look like a lava dome bx — proximal Debris flow coming off Chocolate lavas, but not hot

* White Alps Porphyry = feldspar trachyte

(porphyritic (volcanic name) =

porphyry = fine-grained (aphanitic) gmx > 2mm

Nomenclature

Monday 5-10-98 (Washout South Ridge)

Oscar Andesite - no plag, Amp (?) = v fresh (?) (same px?)
relative felsic - possibly trachyte, but
not normal andesite.

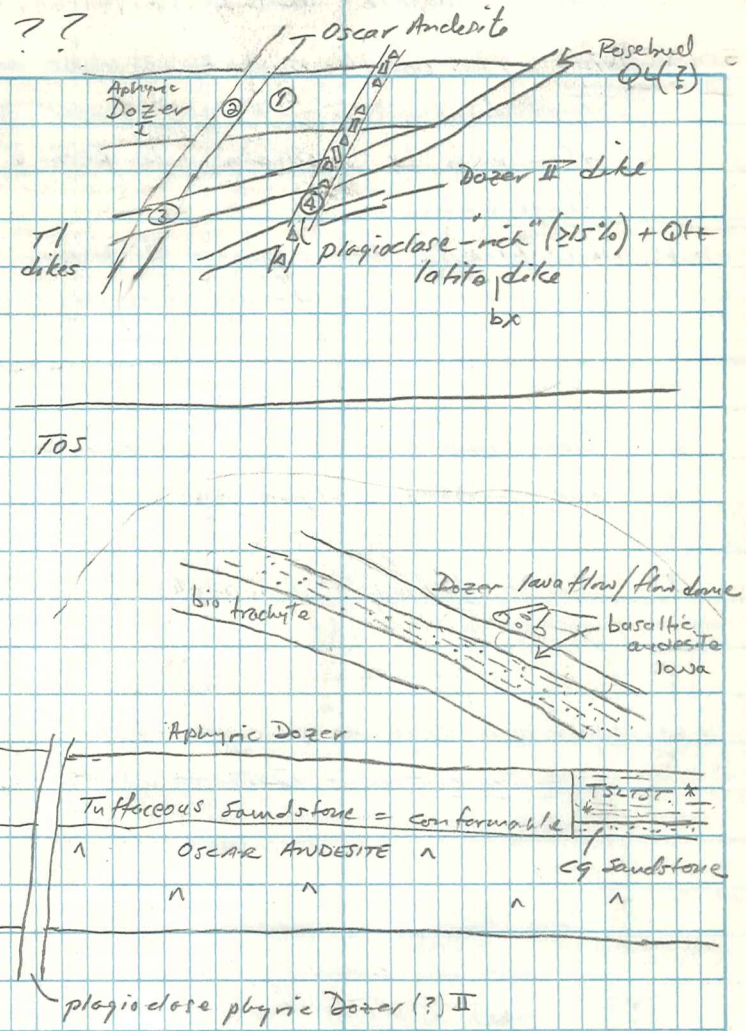
By Road

Dozer = closer to plag phyric Dozer (?)
oops → plag ± sanidine (?) + Qtz phenos =
Rosebud Quartz latite dike (?) = flow banded

Stop 2 possibly Rosebud Qtz Latite = Pete's TI (= latite)
+ g/gm. pl
2 dikes, 1 w/ Qtz-San-bio and
1 w/ Qtz ± ?

Stop 3 = xenolithic ? feldspar-rich (bx) dike
fragments = in Dozer II pl + coarser grained
cuts TI dikes + Oscar andesite

??



Age of "andesite" dikes

NOTE: The basaltic andesite (?) dikes are much fresher (±unaltd) and denser so these may be v. young = to Basin & Range Extension

Weakly alkaline Volcanic dikes = age to the volcanic center w/ v. late basin + range calc-alkaline dikes

---

6 = Rosebud Quartz Latite (?), but cryptocrystalline grm and possibly more plagioclase phenos

7 = Sanidine-bearing latite w/ amphibole

Upper Bed Epiclastic beds = clastic w/ pumice eruptions occurring at the same time, possibly primary pyroclastic deposits

Lacustrine volcaniclastic sedimentary rx mudstones + siltstones, breccias, ash, flows + dikes, pepperite maybe 80 to 100' thick.

pale green color = smectite (?) = typical of lacustrine deposits deserveir.

5 = (188) = NWRA-3619

* Sills usually have diabasic textures - @ least cryptolithic or coarser. This is v. fg to glassy & probably a flow

Big Chocolate PK

NWRA-3620 (189) 6 Rosebud Qtz Latite

NWRA-3621 (190) 7 Lacustrine Volcaniclastic Sedimentary + pyroclastic(?)

NWRA-3622 (191) 8 (Vitrophyre) lava flow

1 flow

9 (192) LBT = platy (+ some flows = vitrophyre) w/ sanidine (?) rare large (>5mm) bio ± micro xls interior = devitrified

NWRA-3623 ? not exposed — usually thinner bottom layer

* Don't bore calls on pheno contents < 1%

≠ Not = to platy unit just above dozer from Ans of day 2 - missing mafic magma blebs + biotite

NOTE: Need to be sure mmb's are ≈ in abundance

NWRA-3624 (193) 10 Lacustrine Epiclastic volcaniclastic Sedimentary

10 = Spherulitic flow? (major proximal flow above)

↯ unconformity 025, 48E 015, 52E

1m — med/thick bedded talus bx — lahar (multiple units)

Erosional surface → Dozer lava dome — Autobx dome margin

(194) 11

NWRA-3625 Saddle

NWRA-3626

(195) 12 LBT = 9

Saddle

only[?] difference = no mmbs ± less saudine, both have bio

Volcaniclastic lacustrine sediments mass flow deposits ± pumice

Note: should measure sections here at silicified pebble conglom. + Eastern and western locations = 3 sections

NWRA-3627

LBT?

probably trachytic? welding w/o much pumice = trachyte = >900°C HOT! Lithic rich

13 (196) lithic-rich xl- ± pumice-poor trachytic ignimbrite (?), columnar jointed (both hills / dikes

Caldera wall collapse bx (possibly entrained in the ignimbrite)

tuffaceous mx ± ign

one unit

Stopped mapping

(?) Baby ignimbrite from below

(197) 14

NWRA-3628

Fault ?? Epiclastic / volcaniclastic section

Welded Ignimbrite ≈ (14), maybe repeated section?? - Some big blocks = exotic blocks = Spalling off topographic high - less welding around blocks

~~Epiclastic / VOLCANICLASTIC SEDIMENTS~~

~~Spherulitic unit w/ zones of flow lineation~~

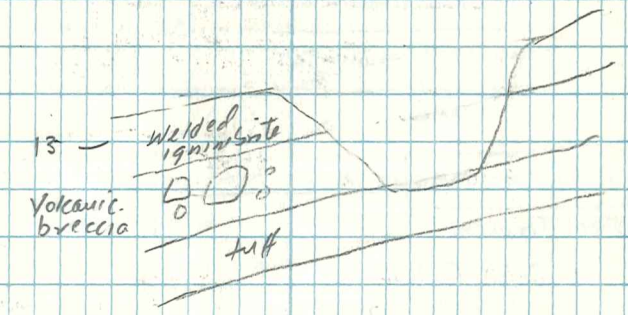
LBT (thick)

TOS(?) few feet to few m

Dozer I

DOZER DIKES

LAHAR



(1) ignimbrites give paleo-horizontal

(2) ignimbrites = planar surface = mappable unit

(3) Caldera w/ multiple flow dome fields + Ash

Spherulites = near edge of lava flow or dome = cool quickly — if cools slowly xtls do not radiate outward from points = but more equal xtls

Vapor phase altn mostly near the top of the flow / dome

% phenos does not vary much in a

— General Eruptive Sequence — South Ridge

LBT = Lava Flow

~~Lacustrine volcaniclastic rx~~

Lahars + ignimbrites

~~~~~~~~~~ Erosional Surface

Domes

Tuesday 6-10-98 $317+

Field Traverse

1. Basal Badger
2. DDH-446 - Rosebud Quartz Latite
3. Shortshot + Wild Rose + RQL dike
4. Wild Rose Canyon + Juniper Canyon — Wild Rose

Gail - Comments

1. Use Alkali Rhyolite for the Dozer rock name to denote alkalinity.

2. Rosebud Quartz Latite may be the causative intrusion

3. Vitrophyre = glass + >5% phenocrysts,
   <5% phenocrysts = obsidian

4. Dikes don't usually have well developed flow lineation

5. LBT should be renamed = Wild Rose Trachyte 68% + 8% Alkalis

Pete's Stop = LBT

---

* At short shot the Brown Flow / Wild Rose = LBT and to the south along the road to the west

(198) NWRA-3629

George's o/c = (15) on map

possibly trace sanidine

SiO_2 ~ 68% } trachyte

$Na_2O + K_2O$ > 8.0

NWRA-3630

(199) (16) = possible, densely welded ignimbrite, lithic-rich + crystal- & pumice-poor, possibly = to yesterdays (13)!, but w/ biotite

(200) NWRA-3631

(17) = "South Ridge" LBT = identical!

(201) NWRA-3632

(18) = sanidine-bearing (1-2%) obsidian

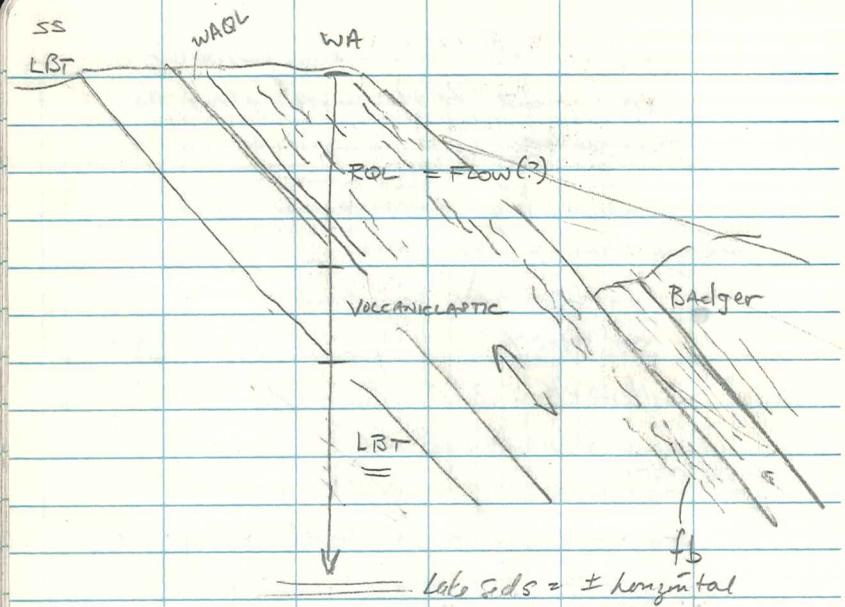
possibly trachyte

---

6 Mass flows (debris flows) off domes = Lacustrine + Subaerial

7 RQL = Sills, may breached surface, upflow =

DON ALAN
~~~~~~~~~~

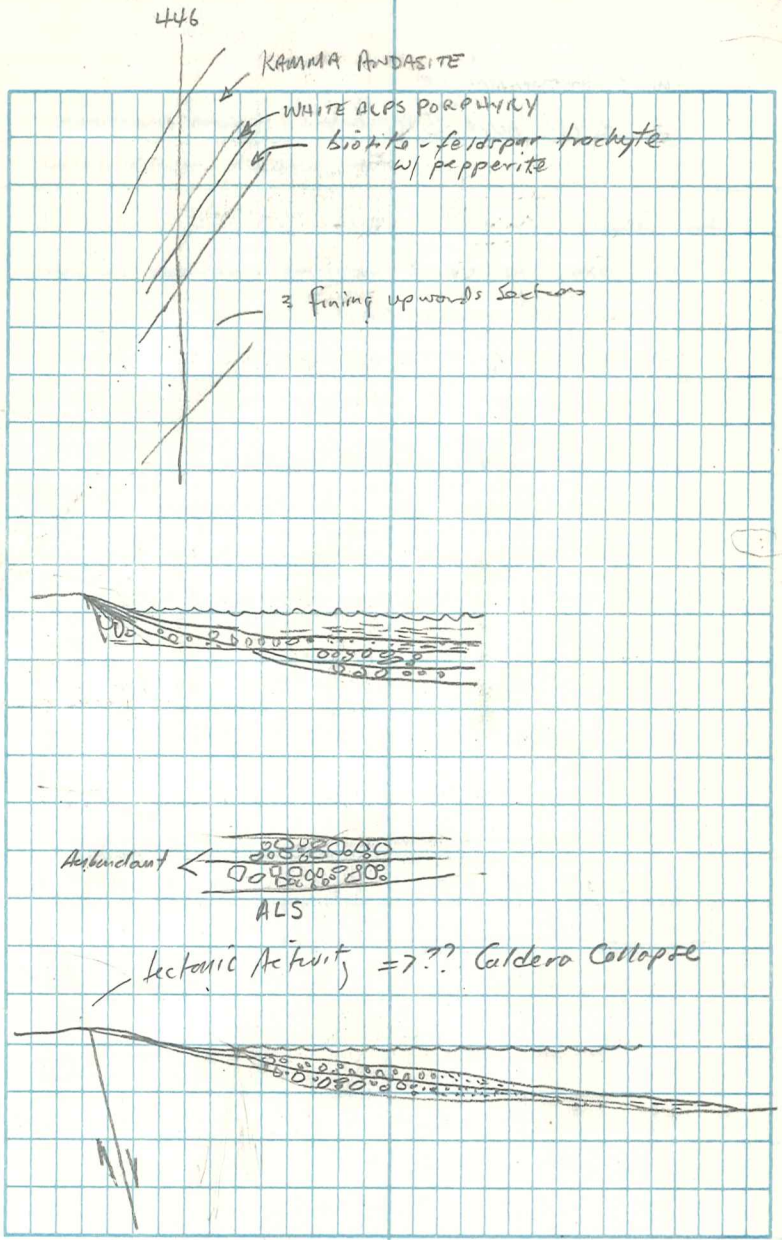


Dozer

Gail – only use feldspar-bearing or feldspar absent for the dozer – Don't worry about plagioclase or sanidine which we probably can't tell.

(1) Megascopic Identification of volcanic rx

(2) Rock nomenclature



Tu = groundmass
West end SR LBT + correlation

Ask Randy
(1) what he wants Gail to address in her report — see Gail
(2) 50¢/mile? — see Gail

END FIELD TRIP

Deep water lake — look up turbidites

Silt/ss bedding ⊥? potential = structural problem!

COMMENTS —

RHEOMORPHIC IGNIMBRITE (FLOW)
WILD ROSE TRACHYTE = LBT A, B, C etc. (DOME OR FLOW)
DOZER ALKALI RHYOLITE = DOZER TUFF (DOMES)
WILD ROSE OBSIDIAN (DIKE + FLOW

"Comendite" Dome field with inter dome volcaniclastic deposits intercalated w/ ignimbrite flows and lava flows. No caldera = ALS basement beneath Kamma Mtns

Domes (1) DOZER, (2) LBT,

Add Turbidite section in 446 + OTHER DIKES

Rosebud Quartz Latite = flow, sill, dike? + cryptodome

Randy Barron

	18.00	Basic Wittace Rock	18.00
	SiO_2	Extended Add on	16.00
	Al_2O_3		
	TiO_2		
9.00	FeO		
	Fe_2O_3		
	MnO		
	MgO		
	CaO		
	K_2O		
	Na_2O		
	P_2O_5		
	LOI		
		8.00	
6.50	S	Ba	La
16.00	Cl	Nb	Ni
18.00	F	Rb	Th
		Sr	
	Se	Y	
		Zr	

Report
Mudge

303

6A = NWRA-3620A

Phenos

Rosebud Quartz Latite (?) II

3% mafic magma blobs

~ 8% Feldspar

3% Sanidine

5% Plagioclase

≤ 1% Quartz

1% Smoky

0 Clear

4% Amphibole microphenocrysts

≤ 1% Magnetite

Rosebud Quartz Latite II

558

6B = NWRA-3620B

Phenos

Chocolate / Alkali Rhyolite

1% mafic magma blobs

~ 4% Feldspar

1% Sanidine

3% Plagioclase

10% Quartz

Smoky

10% Clear

7% Amphibole

≤ 1% Magnetite

CHOCOLATE PEAK

ALKALI RHYOLITE

fine- medium grained grs of feldspar - quartz - Amphibol

7 = 190 = NWRA-3621
Rosebud Quartz Latite (?) – III

6A = 189A = NWRA-3620A
Rosebud Quartz Latito (?) – II

6B = 189B = NWRA-3620B
Chocolate Peak Alkali Rhyolite

8 = 191 = NWRA-3622
Wild Rose alkali rhyolite – I (?)

9 = 192 = NWRA-3623
Wild Rose alkali rhyolite – I (?)

	6A	6B	7	8	9
mafic magma blobs	3	1	0	0	1
Feldspar	8	4	6	3	2
Sanidine	3	1	1		≤1
Plagioclase	5	3	5		≥0
Quartz	≤1	10	2	?	≤1
Smoky	0	0	0		0
Clear	≤1	10	2		≤1
Amphibole	4	7	5	?	≤1
Pyroxene	0	0	0	?	0
Magnetite	≤1	≤1	4	?	≤1

PHENOS

groundmass

6A plagioclase, sanidine, Quartz, amphibole; fine-medium

6B "

7 feldspar, Quartz, Amphibole; cryptocrystalline v. fine-grained

8 cryptocrystalline to glassy

9 feldspar, Quartz, Amphibole; fine- to medium-grained
Spotted – maybe plagioclase => pl ≈ 40%

FRIDAY 9-10-98

NOTE: IN DDH D-293 (9.9-11.5) = contact between TOS (mine) and LBT. Here the contact occurs over 1.5' to ≥2.0 feet and looks like a flow bottom to LBT where it is picking up fragments of TOS.

LBT - planar laminated grades into fine-grained massive and vitrophyre phases. The can between fine-grained massive and vitrophyre is a visual coat. Usually the vitrophyre is highly fractured, but the fracturing is hydrothermal.

LBT in D-293 has mafic magma blobs, but no sanidine/plag phenos were obvious - possibly they are missing from the fg base and "vitrophyre" portions of the flow.

2096N / 4756E } SCREE — Rosebud Qtz bitite (30%)
Volcaniclastic (10%)
LBT (60%)

2096N / 4752E } SCREE — RQL (≥50) / LBT (≤50) } some slickensides in the gloom

mud mx ± = precursor to Badger-like rocks

2096N / 4748E } scree — RQL = (≤20) / LBT = (≥80) } o/c ~ 25' S = LBT in road cut + Recrimmed.

2096N / 4744E } s/oc to scree >95% LBT — ≥ 18" wide
ENE ~ 60' = HT(?) Breccia Dike w/ At least one visible margin = 065, 53E
Near 2096N/4748E (≈ 75' ESE = Slickenlidos =

NOTE: to WSW in valley = Fault w/ associated bx + silicification = 085, 74E, possible slickS = 265, 22 rake. Bx = LBT/wild Rose

NOTE: on SW side of the main hill the LBT has columnar jointing over 15-20' o/c ~⊥ to flow-foliation
Here the LBT has tr feldspar - possibly Sanidine, <1% Amphibole and possibly trace Qtz microphenocrysts, None longer than 3mm. no mafics

NOTE: ON TOP OF THE HIGHEST HILL LBT = <1% fsp (probably plag) → Bo white clay w/o visible Qtz or Amph. Near flow??

2096N / 4760E > scree = Volcaniclastic (≤20%, exclusive of fines)
Rosebud Quartz Latite (≤10%)
LBT (≤45%)
feldspar porphyry (≤10%)
breccia (≥15)

2096N / 4764E > scree ± s/oc = ~~Rosebud Qtz latite~~ - some silicified, fsp porphyritic lava

NOTE = TS = ~ 200' N of 2096N, 4764E ~ 100' from ridge = Vesicular Rosebud Quartz Latite (202)

2104N / 4760E > scree 795% LBT w/ Amph (≤2%), feldspar (plag and possibly Sanidine, ≤3%), and possibly Quartz (tr)
* Possibly mafic magma blobs??

≥18 ≤ 201

NWRA-3632 = Obsidian w/ <1% feldspar microphenocrysts

≥19 ≤ 20?

NWRA-3633 = pumiceous quartz latite (lapilli tuff) ≤2% fsp phenocrysts pl:san ~1:1, trace clear quartz, ±20% lapilli-size pumice fragments.

10 = 193 = NWRA-3624 = Sandy, tuffaceous granule to pebble conglomerate (medium to coarse-grained sand, to to 3% pumice

11 = 194 = NWRA-3625 A = massive, aphyric, pumiceous (?) lava
3625 B = flow-banded, quartz-bearing (1-2%), ± fsp-bearing lava

12 = 195 = NWRA-3626 = Relatively aphyric, weakly banded lava w/ rare Aphibole and <1% feldspar phenocrysts.

13 = 196 = NWRA-3627 = Densely welded lithic-rich (<1 to ~8mm; $\bar{x}$ = 5mm) crystal (sanidine?)-poor, pumice-poor ignimbrite.

granule = 2-4mm
pebble = 4-64mm

14 = 197 = NWRA-3628 = poorly welded, crystal-bearing (fsp = sanidine? ≈ 12%; biotite <1%), lithic-rich, pumiceous ignimbrite

15 = 198 = George's location

16 = 199 = NWRA-3630 =

17 = 200 = NWRA-3631 = Strongly flow-banded, crystal-poor (tr Amph, tr-1% sanidine?, trace ≤1% qtz) alkali rhyolite(?) lava

Badger	900-1000	Qal 0 to > 300'
chocolate flow	+300'	Conglomerate 40 to ≥250
chocolate tuff	+300'	Ts lake beds 2000
Upper Bud Seg	+300	
Bradley Seg	90+26+185	
Lower Bud	+1000'	
Dozer	250-1800'	
TOS	0-50'?	
TCS	0-100'	

42½ = 1700' = 168.5

250' = 37.7

10.09

33.8

osceola seg

Rheomorphic Ignimbrite > 700' 213m

white tuff — 90 (27m)

Tuffaceous silt & mst — 140 (43m) } ≈ 230' 70m

ALS pebble Congl — ≈250' (76m)

Tuffaceous silt/mst/ss + tuff — > 2000' (610m)

1" = 500'

1" = 400' = 1:4800

1" = 200' = 1:2400

≥ 2000' (610m) Tuffaceous silt, mst, ss w/ intercalated pumiceous bx

≈ 250' (76m) ALS pebble Conglomerate

≈ 140' (43m) tuffaceous silt & mst } ≈ 230' (70m)

≈ 90' (27m) white tuff

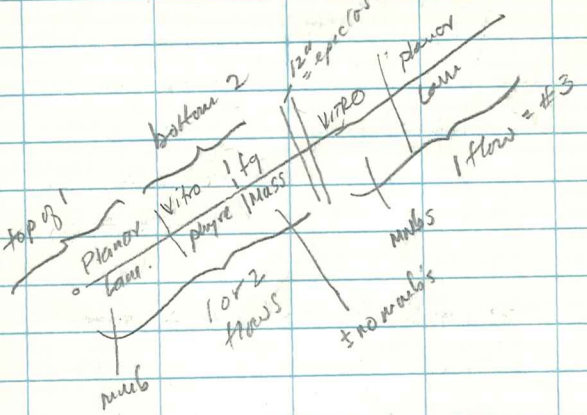
> 700' (213m) Rheomorphic Ignimbrite

≥ 2180' (969m)

Fault — Fault

12-10-98

IN HOLE DDH-0273, 5°



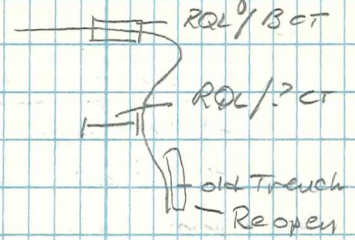
tx + comp ∨ in all "3" lava flows!

6000-7000' ± keeping up, not much slacking w/ 2 people.

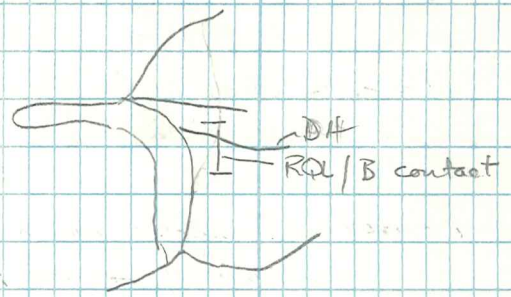
1 month to tie up w/o new drilling

Excavator Trenches

1, 2 & 3 = along drill road west of the Gorilla



4 below last RC hole in Breakaway



5 on George Drill road
= RQL/B CT

6 @ CT between RQL + B on White Alps Road = Turbidite section

153°, 085°, 124° 312, 114 / 325

294°, 050°, 155° 031, 159, 291 020/18 200/15

(203) A Erosional surface or chilled margin on chilled margin + pepperite along contact

Contact ≈ 025, 25E (V. approximate). CT = Latite + volcaniclastic sequence ABOVE the WILD ROSE TRACHYTE.

DOESN'T FIT GEOL

Latite here does not have qtz, possibly because it is a chilled margin (=RDL), but it may be a different unit.

fb ≈ contact

J = 020, 64W ≈ 40/m

084, 84E ≈ 2/m

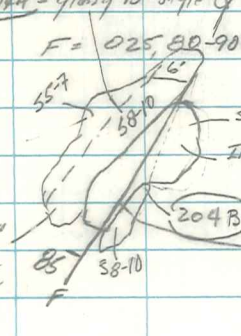
F = 296, 51W, slicks = 296, 60° rake

(w/ strong bleaching (ARG ALTN) = 203B

(204A) = glassy 'B'-style Qv!

(204) F = 025, 80-90W

Rx = Latite w/ ≈ fresh sou in silicified areas w/o Qz = 203 rx



SAM = "fresh"

N 100 ⇒ white clay

rake on slicks = guess = 45° @ 205°

(205)

J w/ ALTN = INTENSE ARGILLIC

J = 038, 61W = ± dip slip movement 2/m

J = 294, 83W ≈ 1/m

J = 042, 80W ≈ 2/m — Looks like a fault

possible slick = 290@12° rake ↓ rare??

Rx = 203 & 204 = Extremely rare qtz, but micro trace qtz plagues to D.Smith here = (205) SAMPLE

ALTN 1) SiO2 on hanging wall
2) Arg on foot wall
> = consistent

NOTE:

203-205 ok contain abundant xenoliths / not mafics - I think that the mafics are resorbed xenoliths!

53 x 3 = 159

064° 110° 19m = 57'

(206) F = 010, 30W — No definite slicks, SiO2 along footwall of the fault.

b = 344, 66E = flow-lineation in wild rose trachyte (RDT)

J = 325, 60W ≈ 1/m possible fault

J = 052, 76E ≈ 1/m "

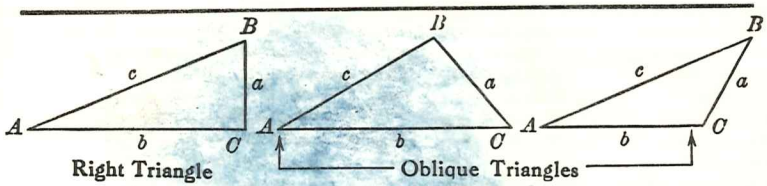
(207) F= 005, 53 W slicks = 185 @ 40° LASER
Rx = WRT / LBT 112°, 26m = 78' / 85' HC
b/fb = 015, 46E
weak to strong silicification along fault plane
to Jasp (5-9+

(208) F = 080, 76W; slicks = 260 @ 35° 5-10 + bx Hanging wall
5-10 Footwall
Strong Si O2 ± 8" other side fault plane
peg = 067°, VA ≈ 18°
• 100 = end o/c 195
• 56 = measured / 53
• 48/46
• 33/31
bx dike
325, 576
b = 325, 536
b/fb =
76
35
= 075, 54W

(209)
AZ = 095° VA = 30°
AZ = 091° VA = +25°
AZ = 109° VA = +20°
105° to (208)
63'
D = 69'
D = 63'
59
D = 121'
AZ = 100°
105'
1° o/c
61'
F = 080, 69W
slicks = 260 @ 32°
b/fb = 332, 62E
325°
~ wind ~ = 50's

078½° / 073° / 067½°
182
3
546 / VA = -13° → 532'
097° / 23'

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

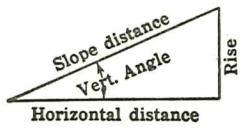
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

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	$s = \frac{a+b+c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{b\,c}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{a\,c}}$, $C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{b\,c \sin A}{2}$
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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Book 5

ALL-WEATHER

FIELD

Spiral Notebook

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32 Sheets
4 5/8" x 7"

ROSEBUD SOUTH RIDGE 11/9/98

MAPPING CODES:

(1) STATION # WITH NOTES

[2845R] SAMPLE #

V VEIN SAMPLE

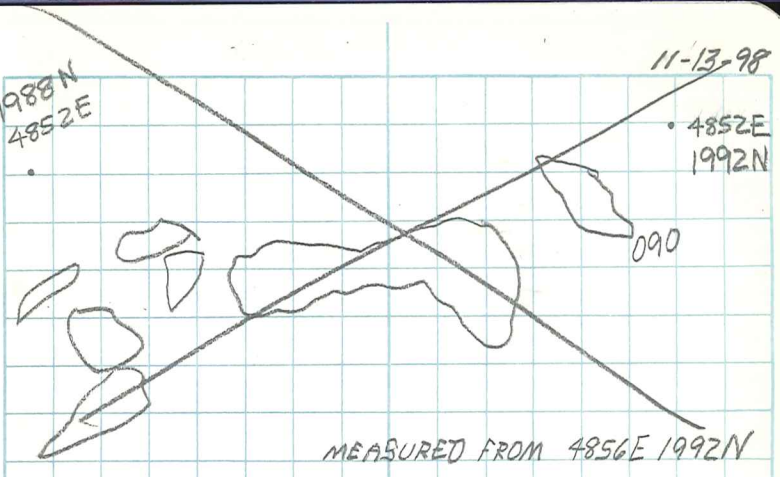
R ROCK SAMPLE

G GRAB SAMPLE (NON-REPRESENTATIVE)

F FLOAT "

GET COLIN TO BRING: FROM HOME
BACKPACK
COMPTON'S

11-13-98

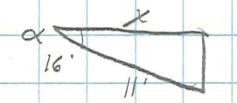


MEASURED FROM 4856E 1992N

1 = MAROON CHOCOLATE BRECCIA OUTCROP N35°W GLOMEROPORPHYRITIC PLAG-BEARING, ~~ANGUL~~ SUB-ANGULAR FRAGMTS IN MORE STRLY HEMATIZED MATRIX.

4856E, 1988N = 40', 088° } +180°
103', 020° }
72', 082 }

HEIGHT- SLOPE CORRECTN 11-15-98



$\frac{x}{h} = \cos\alpha = \frac{x}{179} =$

$\frac{x}{11} = \cos 16$

$x = 10.57'$

$\frac{x}{179} = \cos 13$

$x = 174.4'$

NOTES FOR MAPPING 11-17-98

4848E 1980N: SAMPLE TAKEN RIGHT AT GRID PT. 2 OUTCRORS NEED TO BE MAPPED. ATTITUDES ON JNTS NEED TO BE TAKEN, H4 SAMPLE NEEDS TO BE TAKEN. 4477R

4848E 1984N: SAMPLE TAKEN 25' N46W OF GRID PT IN TYPE DOZER AUTOBRECCIA TEXTURED FLAT OUTCROP IN DRAINAGE. MOD TO STR HmOx. 4478R

4848E 1988N: Qt, TRY FOR LO RELIEF DOZER DOWNSLOPE.

4852E 1976N: 448OR @ 95', N05°W OF GRID.
VOLCANICLASTIC BRECCIA: PURPLE TO MAROON W/ HmOx STAINING. BLOCKY, PHENOCRYST-RICH (FSPS) FRAGMTS IN A BRICKY RED, EARTHY HmOx-RICH MATRIX. LOOKS LIKE A CHOCOLATE UNIT.

1980N 4884 : 65' @ S54W
BED 025°, 78°W

: 85' @ S75°W
BED 326°, 14°W

11-21-98

~~050 005°W~~ 355°, 55°E,
BLUE-GRN-GRY W/ PHYLLITIC SHEEN & LINEATION
90', N65E TO GRID PT

11-22-98

40', N29°E, OUTCROP BOWS IN TO W. THRU DRAINAGE
120', N60°W OUTCROP BOWS IN TO DRAINAGE ~~NE~~E OF LINE
42', S35°E
66', N63°W
~50', N41°E
45', N60°W

154' 20°

COS 20° = a/154' = 145'

11-23-98

N72°E, 72'
N70°W, 43'

11-24-98

4647R = VOLCANIC BRECCIA FROM LARGE OUTCROP @ 260' N11°W FROM 1968N, 4656E.

START: 27', N40°W OF 4848E
45', N71°E,
50', N23°E, COMPASS STUCK
47', [illegible]°E
41', N36E N65E
71', N12E N15E
N80W DUE W

180°E, 70°NW = STNTING
0' DUE EAST OF GRID PT = 3506R

4647R 4656E