GL04738

PRUETT INDUSTRIES, INC.
8905 ROSEDALE HWY. BAKERSFIELD, CA. 93312
(805) 589-2768 TELEX 4992440 PRUETT INT.

SUB-SURFACE PRESSURE SURVEY

CO. CAITHNESS POWER		RUN 2A FIELD STEAMBOAT HILLS WELL 13-5 STRAT			
EFF DEPTH		WELL STAT	STATIC	TOOL HUNG	
CASING	-	CASING PRESS		ON BOTTOM	9:45
LINER	-	TUBING PRESS		OFF BOTTOM	9:55AM
DATE	060889	ELEMENT RANGE	0 - 1004	ZERO POINT	MAT
ELEVATION		ZONE		SHUT-IN	
MAX TEMP		PICK-UP	2402'	ON-PROD	
PERF	-	CAL SER NO.	25146	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	STATIC PRESSURE GRADIENT		

SURVEY DATA

CO. CAITHNESS POWER — RUN 2A FIELD STEAMBOAT HILLS WELL 13-5 STRAT

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
1:00	20	0.0	0.000	1:00	1500	293.3	.403
1:00	500	0.0	0.000	1:00	2000	486.6	.387
1:00	780	3.5	.013	1:00	2402	641.4	.385
1:00	1000	91.8	.401	0:00	0	0.0	0.000

RUN BY T DRIVER / J HANEY

PRUETT INDUSTRIES, INC.
8905 ROSEDALE HWY. BAKERSFIELD, CA. 93312
(805) 589-2768 TELEX 4992440 PRUETT INT.

SUB-SURFACE TEMPERATURE SURVEY

CO. CAITHNESS POWER		RUN 02 FIELD STEAMBOAT HILLS WELL 13-5 STRAT	
EFF DEPTH		WELL STAT	STATIC
CASING	-	CASING PRESS	
LINER	-	TUBING PRESS	
DATE	060889	ELEMENT RANGE	29 - 440
ELEVATION		ZONE	
MAX TEMP		PICK-UP	2402'
PERF	-	CAL SER NO.	31
TUBING	-		
UNITS	ENGLISH	PURPOSE	STATIC TEMPERATURE TRAVERSE

TOOL HUNG	
ON BOTTOM	9:45
OFF BOTTOM	9:55AM
ZERO POINT	MAT
SHUT-IN	
ON-PROD	
MPP	

SURVEY DATA

CO. CAITHNESS POWER — RUN 02 FIELD STEAMBOAT HILLS WELL 13-5 STRAT

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
1:00	20	57.0	0.000	1:00	620	130.4	0.000
1:00	40	57.0	0.000	1:00	640	133.6	0.000
1:00	60	57.2	0.000	1:00	660	136.9	0.000
1:00	80	57.6	0.000	1:00	680	139.8	0.000
1:00	100	58.2	0.000	1:00	700	142.7	0.000
1:00	120	58.7	0.000	1:00	720	146.3	0.000
1:00	140	59.7	0.000	1:00	740	149.8	0.000
1:00	160	60.5	0.000	1:00	760	153.2	0.000
1:00	180	61.4	0.000	1:00	780	156.5	0.000
1:00	200	62.9	0.000	1:00	800	159.7	0.000
1:00	220	64.6	0.000	1:00	820	162.6	0.000
1:00	240	65.4	0.000	1:00	840	165.6	0.000
1:00	260	67.5	0.000	1:00	860	168.0	0.000
1:00	280	69.4	0.000	1:00	880	170.2	0.000
1:00	300	71.7	0.000	1:00	900	172.8	0.000
1:00	320	74.9	0.000	1:00	920	176.0	0.000
1:00	340	78.3	0.000	1:00	940	179.4	0.000
1:00	360	81.2	0.000	1:00	960	182.4	0.000
1:00	380	84.4	0.000	1:00	980	184.8	0.000
1:00	400	89.3	0.000	1:00	1000	187.2	0.000
1:00	420	92.7	0.000	1:00	1020	189.8	0.000
1:00	440	97.1	0.000	1:00	1040	193.0	0.000
1:00	460	101.1	0.000	1:00	1060	195.0	0.000
1:00	480	105.7	0.000	1:00	1080	197.0	0.000
1:00	500	110.2	0.000	1:00	1100	199.6	0.000
1:00	520	113.2	0.000	1:00	1120	202.8	0.000
1:00	540	116.9	0.000	1:00	1140	205.8	0.000
1:00	560	120.2	0.000	1:00	1160	209.0	0.000
1:00	580	123.7	0.000	1:00	1180	211.6	0.000
1:00	600	127.3	0.000	1:00	1200	213.9	0.000

SURVEY DATA

CO. CAITHNESS POWER RUN 02 FIELD STEAMBOAT HILLS WELL 13-5 STRAT

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
1:00	1220	216.3	0.000	1:00	1820	310.5	0.000
1:00	1240	218.9	0.000	1:00	1840	313.9	0.000
1:00	1260	221.7	0.000	1:00	1860	317.6	0.000
1:00	1280	224.5	0.000	1:00	1880	320.8	0.000
1:00	1300	227.3	0.000	1:00	1900	323.9	0.000
1:00	1320	230.3	0.000	1:00	1920	326.5	0.000
1:00	1340	232.7	0.000	1:00	1940	330.2	0.000
1:00	1360	235.8	0.000	1:00	1960	334.0	0.000
1:00	1380	238.8	0.000	1:00	1980	338.3	0.000
1:00	1400	241.8	0.000	1:00	2000	342.4	0.000
1:00	1420	244.6	0.000	1:00	2020	346.2	0.000
1:00	1440	247.8	0.000	1:00	2040	349.9	0.000
1:00	1460	251.0	0.000	1:00	2060	353.2	0.000
1:00	1480	253.2	0.000	1:00	2080	356.7	0.000
1:00	1500	256.4	0.000	1:00	2100	359.3	0.000
1:00	1520	258.2	0.000	1:00	2120	362.4	0.000
1:00	1540	261.4	0.000	1:00	2140	365.3	0.000
1:00	1560	264.2	0.000	1:00	2160	368.3	0.000
1:00	1580	267.6	0.000	1:00	2180	370.8	0.000
1:00	1600	271.8	0.000	1:00	2200	373.3	0.000
1:00	1620	275.0	0.000	1:00	2220	376.8	0.000
1:00	1640	278.6	0.000	1:00	2240	380.5	0.000
1:00	1660	282.0	0.000	1:00	2260	384.2	0.000
1:00	1680	285.7	0.000	1:00	2280	386.9	0.000
1:00	1700	289.3	0.000	1:00	2300	389.8	0.000
1:00	1720	292.9	0.000	1:00	2320	393.2	0.000
1:00	1740	296.8	0.000	1:00	2340	396.1	0.000
1:00	1760	300.4	0.000	1:00	2360	399.2	0.000
1:00	1780	304.0	0.000	1:00	2380	401.5	0.000
1:00	1800	307.3	0.000	1:00	2402	405.6	0.000

RUN BY T DRIVER / J HANEY

CAITHNESS POWER

STEAMBOAT HILLS STATIC TEMPERATURE TRAVERSE

13-5 STRAT

6/8/89

2402'

file 02ST13-5

STATIC PRESSURE GRADIENT

file 2AST13-5

TEMPERATURE (F)

400.0
320.0
240.0
160.0
80.0
0.0

PRESSURE (PSI)

800.0
400.0
0.0

DEPTH (FT)

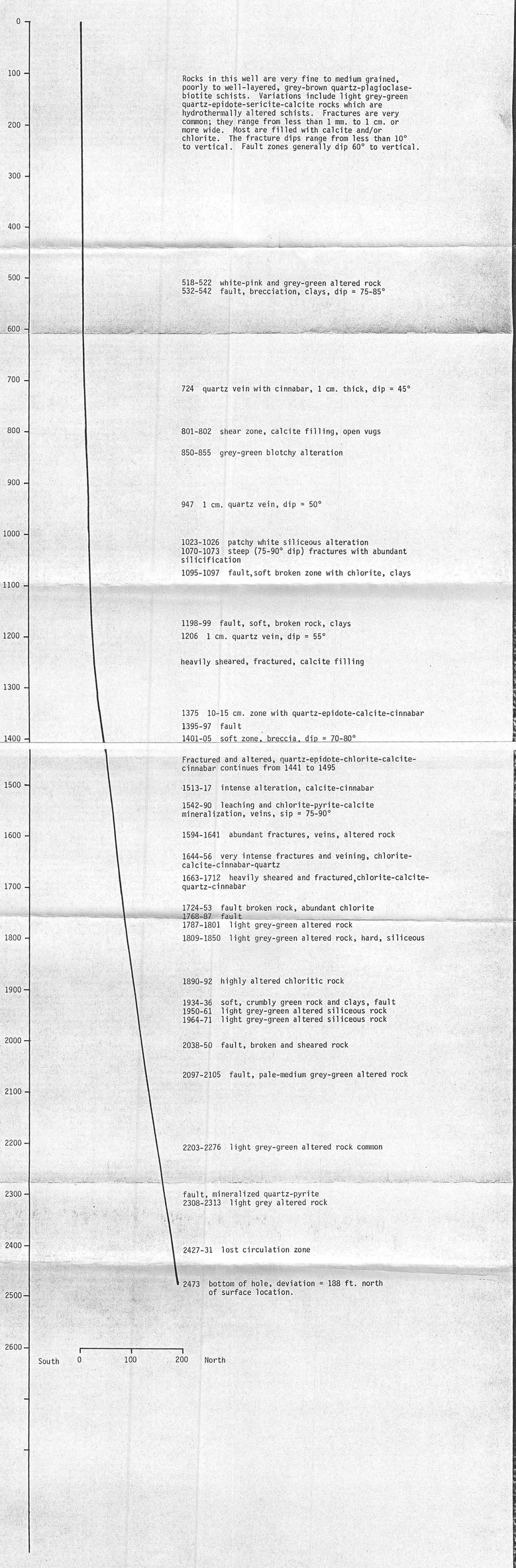
0.0 200.0 400.0 600.0 800.0 1000.0 1200.0 1400.0 1600.0 1800.0 2000.0 2200.0 2400.0

STRATIGRAPHIC TEST # 13 - 5

STEAMBOAT HILLS, NEVADA

Sec. 5, T17N, R20E

Elevation 5660'



Rocks in this well are very fine to medium grained, poorly to well-layered, grey-brown quartz-plagioclase-biotite schists. Variations include light grey-green quartz-epidote-sericite-calcite rocks which are hydrothermally altered schists. Fractures are very common; they range from less than 1 mm. to 1 cm. or more wide. Most are filled with calcite and/or chlorite. The fracture dips range from less than 10° to vertical. Fault zones generally dip 60° to vertical.

518-522 white-pink and grey-green altered rock
532-542 fault, brecciation, clays, dip = 75-85°

724 quartz vein with cinnabar, 1 cm. thick, dip = 45°

801-802 shear zone, calcite filling, open vugs

850-855 grey-green blotchy alteration

947 1 cm. quartz vein, dip = 50°

1023-1026 patchy white siliceous alteration
1070-1073 steep (75-90° dip) fractures with abundant silicification
1095-1097 fault, soft broken zone with chlorite, clays

1198-99 fault, soft, broken rock, clays
1206 1 cm. quartz vein, dip = 55°

heavily sheared, fractured, calcite filling

1375 10-15 cm. zone with quartz-epidote-calcite-cinnabar
1395-97 fault
1401-05 soft zone, breccia, dip = 70-80°

Fractured and altered, quartz-epidote-chlorite-calcite-cinnabar continues from 1441 to 1495

1513-17 intense alteration, calcite-cinnabar

1542-90 leaching and chlorite-pyrite-calcite mineralization, veins, sip = 75-90°

1594-1641 abundant fractures, veins, altered rock

1644-56 very intense fractures and veining, chlorite-calcite-cinnabar-quartz

1663-1712 heavily sheared and fractured, chlorite-calcite-quartz-cinnabar

1724-53 fault broken rock, abundant chlorite
1768-87 fault
1787-1801 light grey-green altered rock

1809-1850 light grey-green altered rock, hard, siliceous

1890-92 highly altered chloritic rock

1934-36 soft, crumbly green rock and clays, fault
1950-61 light grey-green altered siliceous rock
1964-71 light grey-green altered siliceous rock

2038-50 fault, broken and sheared rock

2097-2105 fault, pale-medium grey-green altered rock

2203-2276 light grey-green altered rock common

fault, mineralized quartz-pyrite
2308-2313 light grey altered rock

2427-31 lost circulation zone

2473 bottom of hole, deviation = 188 ft. north of surface location.

ST-13-5

Nov. 28, 1988.

Cores 304-314' Grey-brown mmphic rock - appears altered - commonly soft w/ fe-staining - due to weathering?
fractures common, dips = 50°, 2-85°,

323-325' Dark brown-grey metamorphic rock heavily sheared / fractured. 40°, 50°,
Calcite common in these fractures, a few small vugs (1-2 mm oval openings (eyes)). Most filled fractures are < 0.1 - 2 or 3 mm. wide.

40-50° dips may follow compositional layering (foliation).

ST 13-5

NOV. 28, 1988

CORE 518 - 542'

518 - 22 Hard, lt. grey-green, white + pink siliceous rock - likely was sheared and permeated with silica-rich fluid

522 - 542' Hard, dark grey-brown, v. f. grained metamorphic schist -

Depths are approximate

518-519' - firm, tight rock. — low angle and v. steep fractures

518-520' Core broken into angular pieces — calcite on fractures (<1 - 3 mm thick ct. filling in fracs.) - One core piece - mostly calcite, min thickness = 5 cm.

520 - 521' - firm, tight rock. 520.3', low angle (15-15°) fracture w/ ct + brown cinnabar(?), also vertical frac. w/ ct.

521' - 521.5' — Broken rock, major fracture w/ 40-60° dip, chlorite in fracture

521.5 - 532' - Generally, tight, firm rock - broken along flat fracture planes, fracture dips = 40, 50°, 45°, 20° 50°, 70°, 60°, 85°, 87°, at least 2 sets which intersect (joints/fractures) 87° w/ chlorite, slickensides, 60°, 35°, 83°, 55° w/ Red-brown clays

All fractures (joints) appear to be <1 mm wide - little void space. Near-vertical fractures follow core for 20' ±

ST 13-5

Nov. 28, 1988

532 – 542 ±

Steep fractures w/ calcite filling dominate this interval. Entire system of fractures has been cemented with calcite.

Steep fractures dip 75 – 85°, 88°

2nd set dips 35°, 7–8°

Fracture widths <0.1 – 5 mm, most 1–2 mm or less.

Rusty Fe-stain common in fractures, minor cinnabar-dk brown-red.

Part of this interval is badly broken due to intense fracturing and clay alt'n – (fault zone?). Much of rock appears mylonitic

ST-13-5

12/28/88

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
646–712	Brownish-grey f-med.gr. metamorphic rock.	chl, ct	<1mm –2mm	35, 35, 20, 80, 10,
	Earlier episode of steep-moderate angle fracturing with qtz-ct-ep.			25, 30, 5 30, 45, 85
	filling cut by later 45-90° fracs. w/ calcite filling. Clay in some cracks			90, 10, 5, 35
712–719	Rocks as above but broken extensively. Clay in fractures	fault zone?		
* 724	Quartz vein	qtz, ct cinn	1cm.	45°
719–752'	Grey-Brown mmphics as above 1-4' competent, then 1-3' broken rock.	chl, ct	<1–3mm	10, 30, 25, 80
				55, 55, 90, 25,
751'–775	Brownish-grey, vf-figr. mmphic rock – abt. alteration along fractures (now tight) and in matrix. Minor Fe stain = pyrite?	qtz, chl ct ± py?		55, 10, 25, 50,
				5, 85, 90 80, 75,
	Later veining with calcite + chl along high angle shears, fracs.	chl, ct.	+/–5mm	55, 20
775–801'	Brownish-grey f-med gr. mmphic rock. Rare cavity silicones alt'n.	ct, chl	<1mm – 1cm	5, 15, 85 35, 65,
	Most fractures have ct-chl. fillings. 1-3' zones heavily broken,			0, 10, 90, 40,
	2-4' sections competent w/ fractures spaced 2-20 cmm.			50,
	801-802 = shear zone dip = 65-70°. open vugs.	ct.		

P.S. 674.5

ST 13-5

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
800 - 877	Grey-medium, to grey brown of vf gr. mmphic rock - less altered (weathered?) than rocks above	ct, chl	<1-5mm	60, 60 15, 60, 45, 85 45, 5, 10
vert.	fractures 3-10 mm apart.			70, 40,
848 - 860	Vertical veins in fractures bleaching, alt'n adjacent,	qtz - chl ct.	<1 - 2cm	

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
823-877'	Grey-brown vf-f. gr., meta-volc/meta-sed. Vert. fracs common in 823-855	ct, minor chl. int	1-6 mm.	80-90, 15, 35°
	850-855 - abt. [illegible] altn w/ patches of white qtz, ep, ct.			
	855-877 - "Normal" - little altn., low fractures	ct/chl	<1-3 mm	45, 15, 20-90

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
877–955'	gray–brownish gray ms/mv. 880–882 – lt. gray zone – prob. altered (leached)	ct, chl. (generally v. little or no chl.)	<1–5mm	vert. ± 5, 20, 80, 70, 55°, 45, 85°, 55° 75° 30, 35° 70, 75°,
*	Quartz vein @ 947'		1cm	50°
955–960	As above, moderate fracturing	ct	<1–3mm	5, 15, 85–90° 15, 65
960±–990'	Rock similar to above, but common vertical fracturing. Also low angle fractures v. difficult to find compositional layering in these rocks.	ct	1–5mm	85–90° dominant 10, 8°, 25, 12°
990–1023	Normal dk grey to grey-brown metamorphic rock, variably fractured – generally v. hard and tight.	ct	<1–2mm	80°, 35, 40°, 45 85–90° 05° 35, 40, 60, 70
1023–1026	patchy white silicified rock, calcite in vein/fractures	ct	1–8mm	
TS 1052 1026–1058'	similar to 990–1023', tight fractures c. gr. biotite-rich rock 1045–1053' = mylonitic (or steep comp. layering w/ dip = 60–75°)	ct	<1–3mm	82°, 25° 20, 10 15, 55
1058–1070'	As above			85, 50, 15
1070–1073'	Steep fractures w/ abt silicification (tight)	c/, silica cp, chl, cp.	5–20mm	75–90°
1073–1111'	c. gr. metavolc. med grey, fractured. frags 2–20cm apart in vertical dimension 1095–97 soft, broken zone, chl, clays	ct, chl	<1–5mm	70–90° 10, 20, 50, 35°, 20, 30°, 85°

Dec, 14, 1988

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1111–1165	med - c.gr gray to dk grey-brown meta-tuff (?)	ct, chl.	<1–4mm	85–90°, 50, 10, 35, 25
1165–1249	med - dark grey-brown metamorphic rock f-m.gr.	ct, chl	<–5mm.	50°, 40°, 20, 20, 80°,
	1205–11, lighter zone = 40–50° dip layers,			30°, 65, 10,
	1206 – 1cm qtz. vein	qtz	1cm.	55°
	1198–99 – brecciated zone, soft, ct, clays			
1249–1285	metamorphics as above but more sheared, fractured, & filled with ct, qtz, ep, cinn.	ct,	<1–5mm	60°, 90°, 5°, 35°, 25°, 45, 75, 55
	1274–75 – extensive chl + ct in close spaced fractures		20–30cm zone	75°
1285–95'	Less fractured than above, med-dk grey-brown metamorphic rocks.			44, 55, 75, 80–90°, 10° 70°

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1296–1348	"Normal" grey-brown metavolc-metased. Fractures at 2-40 cm. intervals.	ct/chl.	4-3mm	25, 15, 75 35, 75, 50° 35, 70, 40, 45°, 20, 75°
1348.5–1372	"Normal" grey-brown metased-mv. with common fractures - These are 1-2	to 30 cm apart		
		ct/chl	<1-7mm	50, 70, 25, 30, 70, 70, 85-90
1372-74	Tan c.gr. biotite bearing rock may be a felsic tuff (meta) or felsic dike	ct/chl.	1-5mm	75, 45
1374–1393	grey-brown mv. w/ few fractures	ct./chl	<1-4mm	
* 1375'	10-15 cm zone w/ sil+ep-ct-cinn. host rock bleached on either side.			

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1392.5 - 1395	grey-brown mvt. f-m. gr.	ct/chl	1-2mm	40°
1395-97'	Fault - sheared, brecciated zone soft. - slickensides @ 40° from horiz	ct/chl		75°
1397 - 1401	normal mvt - few ct. - filled fractures			
1401-05	mix of hard + soft, granulated rocks, fractures			70-80°
1405 - 1441'	grey-brown mvt. - minor-mod. fracturing.			
1441 - 1454'	fractured + altered mvt. variable qtz-ept-chl-ct alt'n w/ cinnabar	ct, chl.	<1-8mm	25, 30°, 75°; also 80-90°
near-	vertical fractures run as far	5-6' in core.		

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DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1454-60	brown-grey mv. w/ alt'n. patchy alt'n. oriented along steep fractures	ct-chl.	<1-2cm	80°/65°
	which are narrow tight zones @ 65-80° dip fractures which have m-c biotite — apparently recrystallized in shear zone.			
1460-81	— brown-grey mv. w/ alt'n similar to above - variable intensity -		1478-81'	
	Alt'n minerals in 1454-81 interval occurring in patches are qtz, ep, chl, ct.		<1-3mm	50°/65°/80°

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DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1481-96	grey-brown mv w/ chl. alt'n along fractures - 75-90° dips - fractures are 0.5-10 cm apart, some brecciation all tight	chl-ct	0.1-3 mm	75-90°
1491-95	Heavy fracturing, brecciation, white - lt. gray silica w/ red cmn.			
1496-1507	dk gray-brown to gray mv-ms. - minor patches w/ chl. alt'n, few fracs.	ct-chl.	1-3 mm.	60-70

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1507	grey-brown mv 1-2 mm bio on frac. surf.	ct, chl	2-3 mm	67°
1507 1/2	— " —	ct, chl	2-4 mm	45°
1508	grey-brown mv.	ct, chl.	2 mm	50°
1509	— " —	ct, chl.	2-3 mm	55°
1510'	— " — 0.5-1 cm. wide zone of fractures	ct, chl.	1-3 mm	73°
1510-11'	— " —	ct.	1-2 mm	85°
1512-13'	— " — slicks @ 22° above horiz steep fracture w/ red cmn.	ct, chl	3-10 mm	85-0
1513-17'	zone of intense alt'n - lt. grey silicified(?) rock w/ ct-cmn. no sulfides noted			
1519'-20	grey-brown mv. fractures common	ct, chl	1-3 mm	80°/55°/68
1521-22	"	"	1-3 mm	80°/45° 75°/
1517-18	mv — " — 65° offset by 40°, which is offset by 80°	"	1-2 mm	
1523'-25'	mv - grey-brown vf-gr. qtz, c. musc @ 1524 ±	ct, chl	1-2 mm	72°/60/85° 50°
1526 ±	mv w/ c. qtz. vein or lens. @ 1526			
1528-29	grey-brown mv. (1529' T.S.)	ct-chl	1-5 mm	85/35 55

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DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1533–1542	vf- f.gr. metamorphic rock as above hard, tight. few fractures	ct, chl	<1–2mm	
1542–1590	Rocks as above with leaching - patchy and chl - py - ct altn (mineralization) in patches along shears, some rusty Fe staining [1566' slickensides @ 60-70° from horizontal	ct, chl, py(si?)	<1–4.5mm	45, 35, 60, 55, 75, 85, 10, 20, 75, 60, 5
1583-4	large ct vein w/ open vugs - druse lining. Dips 75-0 Other fractures also mineralized	ct, chl.	2–15mm	75, 5, 60, 85-90°, 45, 10, 25,
1590–94	Lightly fractured metamorphic rock, No alteration patches	ct, chl.	<1–3mm	
1594–1641	Similar to 1542-90 interval w/ steep fractures + joints w/ leached, mineralized patches + veins. 1625- slickensides of cinnabar	ct, chl cinn.	<1–2cm	80°, 80°, 5°, 40, 85, 40, 25, 85
1641–1656	as above but more intense mineralization (more mafic host rock?)	chl, ct, cinn, py	<1–2cm	85, 20, 30, 75,
1656–1663	less altered and mineralized than above, similar to 1610-41 interval with fractures and patchy altn	ct, chl si, cinn	<1–0.5cm	— 11 —
1663–1712'	Heavily sheared + fractured rock, very chloritic, Intense mineralization.	ct, cinn, si, chl,	<1–2 cm	75-90, 10, 15, 20, 80, 35°, 90°
1712–1718±	Much less altered rock than above interval, still fractured and common chloritic alteration	ct, chl. si, minor cinn.	<1–5mm	5, 60°, 40, 87°, 20, 35°, 25°

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DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1718-1724'	lt-med grey altered felsic (?) metased with tight healed fractures, abt. mineralization. V. chloritic intervals with horiz. + steep slickensides.	ct, chl, cinn.	<1-10 mm	75, 40, 90° 60°
1724-1753'	more mafic meta-rock - v. chloritic heavily sheared, some badly broken 6-12" intervals. - fractures as above	ct, chl,	<1-3 mm	— " —
1753-1768+	slightly less mafic dk grey-brown vf-f.gr. meta volc/meta sed. - chlorite on fractures + shears common. 75° slip Altered zone 1754-55, bleached. slightly mag, mineralized. minor lg. min. on a few fractures	ct, chl (cinn.) ct, chl. qtz.	<1-5mm	30°, 50°, 70° 60, 85, 90 30° 70°
1768-1787	similar to 1753-68', fairly mafic rock w/ abt chlorite + serp (?) alt'n on fractures. slickensides = horizontal to steep dips sparse v.f. py. in matrix	chl, serp, ct.	<1-8mm	45°, 75° 20°, 80°, 40° 20°, 55°, 30° 85°, 75°
1787-1801	light grey-green - med-dk grey rock - altered, tight veined fractures mostly mafic felsic rock locally some brown-red cinnabar	ct, chl, cinn, qtz.	<1-5mm	80°, 30°
1801-1809	dark grey-brown v.f.gr. metam. rock - Vein of coarse qtz-feld-ep-py about 1-1.5 cm. thick.			80-90
1809-1850	light grey-green felsic, qtz-rich rock as above (1787-1801) with intervals up to 2-3' of darker grey-brown quartzose mafic rock. - some of this has patchy pale green-grey alt'n.	ct, chl		65°, 25°, 30° 50°, 60°, 70° 90° 25°

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DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1844'	Compositional layering - pale grey-green meta-pyroclastics (?) underlain by dark grey-brown mmphic rock			55°
1850 - 1881	Dark grey-brown metavole/metased. v. hard, v.f.-f.gr., competent. little alteration akin to above, fractures 1cm. —— 20 cm apart. Rare matrix pyrite, Some microporphyritic rock	ct, chl.	<1-5mm	65°, 50, 65°, 25°, 50, 50, 75
1881 - 1890'	Rocks similar to above but with steep dipping fractures - spaced <1-10cm apart. Tight, ct sealed fractures ~~1890~~ - some of this rock is c.gr. (1882')	ct, chl. some cinn.	<1-4mm	60°, 75°, 70°, 45°
1882-84 - shearing yields pseudo-comp. layering 1890-92'	highly altered rock w/ chl, cinn. fractures tight.	chl, ct, cinn.		75°
1897'	10-15 cm. zone similar to 1890-92'	"		45° 85°
1892 - 1916'	Dark grey-brown metavole. w/common chl. green (+ seys) on fractures and shear faces.	ct, chl.	<1mm - 1.5cm.	45, 90, 35° 55° 85° 50°
1916 - 1928	Rocks as above but more intensely sheared w/ fracs <1-10cm. apart	ct, chl.	<1-8mm	
1928 - 1934	Dark grey-brown mmphic rock as above less fractured - 10-20cm spacing of fractures. 1922-23	cinn. ct, chl. ct-chl cinn.	<1-5mm	30, 75, 10 20, 65 85°, 35°
1934 - 1936	Soft crumbly green rocks - chl, calcite			
~~1936~~	"			

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DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1936 – 1950'	Med - dk gray - brown meta - volc/meta - sed. vf - f. gr. fractures 10-20 cm apart, few with vein filling - ~~some~~ some are barren joints.	ct chl	</- 2mm.	10°, 65° 45°, 70° 45°, 45°
	1949 1/2 - 1cm zone of altn - c. gr. chl - feld - qtz. - cinn.			

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DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
1950 – 1958	lt.-med grey vf-fgr. metam. fractures w/ alt'n. tight adjacent fractures 10-30 cm apart	chl chl+ct cinn	<1-2mm	50, 20 30, 75
1958 – 1961	Pale grey-green silicified (?) rock sheared at steep angles (60-70°)	chl-ct-cinn	<1-2mm	55, 50 70, 60 50,
1961 – 1964	Med-dk grey-brown metamorphics vf-f. gr.	chl-ct	<1-3mm	50, 60 45,
1964 – 1971	Med-pale grey-green monphic w/ abt bleaching alt'n.	chl, qtz, ct, ep	<1mm-2cm.	65, 10
1971 – 1997	med-dk grey-brown monphic dk-grey to black also. Fractures common, spaced about 1-10cm apart	chl, ct	<1-2mm	35, 45, 70, 50, 45, 55, 75, 60, 10,
	Thickest veins are steep dipping generally.			70, 60, 75, 20, 45
1997 – 2005	Rocks similar to above but more broken w/ abt. chl + ct.	chl, ct.	<1-4mm	50, 25, 45
2005 – 2032	Grey-dk grey-brown monphic - f-vf. gr., little visible structure or layering.	chl, ct	<1-2mm	85, 45 50, 60, 80
2016	Steep vein in monphic. rock chl. at margin, white-buff qtz-calcite filling no cinnabar.	ct, qtz,	1-3cm	60, 50, 5
2032 – 2050	Med-dk grey + grey-brown metamorphic rock with intense fracturing (<1-5cm spacing) and alteration. Common chl-ct-qtz vein filling as above. 2038 – 2050 – Badly broken + sheared common slickensides	qtz-ct-chl.		70, 15

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Steep fractures have the thickest veins.

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
2050 – 2080	med - dk grey-brown, vf-f.gr. mmphic - much more competent than above. fracture spacing = 5-20 cm.	chl, ct	<1-3mm	45, 55 40, 45, 35, 50, 85, 50, 40, 35, 45, 45 45, 20, 45,
2080 – 2097	Rock as above but highly altered by shearing, leaching, and mineralization. Red-brown cinnabar common on joints/fractures. Slickensides from horiz to vertical. fracture spacing = <1-20 cm.	chl-ct-cinn.	<1mm-1cm.	75, 25, 10 70, 50, 40, 45, 45, 35, vertical 25, 5, 25
2097 – 2105	Pale - med. grey-green chloritic rock highly sheared	chl, ct	<1-5mm	45, 35, 50, 25
2105 – 2128	med - dark grey-green-black rock w/ abt chlorite, fractures spaced <1-10cm apart.	chl-ct	<1-5mm	70, 5, 20, 50, 25, 55, 60, 35,
2128 – 2182	med - dk. grey-brown vf-f.gr. metamorphics, much more competent than rocks above. fractures 1-30/40cm apart.	chl, ct.	<1-2mm	50, 55 55, 80, 15, 75, 90,
2182 – 2203	Dark grey-black-brown vf.-f.gr mmphics. Generally competent rock fracture spacing = 5-40 cm.	chl, ct	<1-5mm	80, 90, 90, 45 45, 30, 45 70, 55, 60, 80, 40, 40
2203 – 2276	Rocks as above but variably altered - bleaching, qtz. veins, siliceous alt'n. Intervals up to 4-5' altered, in between lightly altered to fresh.	chl, ct qtz.	<1-1cm max.	65, 20, 30, 80 15, 15, 30, 30, 65, 35 70, 30, 25,
Pale to 20	grey-green altered areas related -30° dipping fractures (now v. tight)			60, 65, 45 50, 65, 60, 15

TS 2080

TS 2103

TS 2168

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later, hydrothermal solutions brought in calcite and cinnabar — (2224-30"±) along steeper fractures (70, 65, 80)

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
2276–	med-dk gray-brown mmphic rock vf-f.gr., chl. common on joints	ct, chl	</-3mm	85, 15, 50, 45, 85
2301	fractures spaced 5-20cm.			10, 75, 25,
2260-76	qtz, pyrite in some fractures.			

*

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
2301–2330	med. grey-brown to dk-grey-black metamorphics	ct, qtz, py	<1–10mm	70-90
*	2308-2312 - highly altered rock-bleached to lt. grey w/ vug ct-si-py veining, also brown fe stain			
2330–2341	dk-grey-black metavolc. (?) with rel. few fractures, vf py. in matrix	ct	<1-3mm	
* 2341-44	med brown-grey mvor (?)-bleached out w/ near vertical ct-si-py vein	ct-si, py	<1-10mm	80-90
2344–2354	as for 2330-41 v.f pyrite common in matrix	ct	<1-3mm	50, 25 15, 70
* 2354-2369	Heavily fractured metavolc (?) w/ mineralization	ct-si-py		70-90 45, 20
2369-2377	dark grey-black vf gr. metavolc? vf. pyrite in matrix			

TS.
2382'
2378'
2429'
2450'

DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
2377–2416	med-dk grey f. - v.f. gr. metavolc/ or volcanic? v.f. pyrite in matrix. ~~metased.~~ fractures common		<1–20mm most <5mm.	<10 to vertical
	Some v.dk. grey-black v.f. gr. rock may be volc.? (Check T.S.)			80, 5, 25 50, 75
2416–2419	metamorphics as above w/ fractures fractures all appear tight.	qtz + py minor ct.	±1-4mm	65, 5, 45
	Chlorite rare or absent			
2419–2462				80-90, 35 70, 70, 30, 35,
2427–2431'	Lost circulation @ 2429– Rock is fractured + broken but no large obvious openings.	ct, minor chl.	<1-5mm.	17, 65, 35, 45

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DEPTH	ROCK DESCRIPTION	FILLING	WIDTH	DIP
2462-2470'	dk grey-brown to blackish brown siliceous metamorphic rock. Variable alteration along steep fractures (now v. tight) dips = 65° I) This alteration predates fractures with calcite filling. Quartz + pyrite in earlier fractures.	chl, cl., qtz, py.	<1-3mm	60°, 25°, 65°, 50° 35°