SGF
WELL

DEL RANCH 11

DR 11

Well Del Ranch-11, Lithology & Mineralogy, Recalc. to 60-ft Intervals DY 08/24/05

Euhedral Hydrothermal Crystals	Slickensides	Vugs	Alternate Interval	Depth Interval	GRIT, GRVL, & PBBL	S & SS	MDS & SLTS	NOD ANH & XLN ANH	GG & µBX	VNLTS	EP	AC	PY	PO	HM	SP	CPY	GYP	AN	TALC	CV	CMT
			55	85 - 140			100															
				140 - 200			100															
				200 - 260			100															
				260 - 320		85.5	14.5															
				320 - 380	0.5	50	49.5						0.15									2.5
				380 - 440		14	80.5	5.5														
				440 - 500		8	89.5	3														1
				500 - 560			98.5	1.5														
				560 - 620		3.5	90.5	4.5					0.35					1.5				
				620 - 680			96.5	3.5					Tr									
				680 - 740			87.5	12.5					1.5									
				740 - 800			93.5	6.5					0.5									
				800 - 860			97	3					0.1									
				860 - 920		7.5	89	3.5					0.15									
				920 - 980			94	6					0.05									
				980 - 1040			95	5					Tr									
				1040 - 1100			96.5	3.5														
				1100 - 1160		61.5	38	0.5											Tr			
				1160 - 1220		35	65															
				1220 - 1280																		
				1280 - 1340		21	79															37.5
				1340 - 1400		9	91															9.5
				1400 - 1460		50	50															
				1460 - 1520		35	65															
				1520 - 1580		26	74															
				1580 - 1640		26	74															
				1640 - 1700		19	81															
				1700 - 1760		21	79														12.5	3
				1760 - 1820		37	63														7.5	
				1820 - 1880		88.5	11.5														1	
				1880 - 1940		88	12														Tr	
				1940 - 2000		80	20															
				2000 - 2060		75.5	24.5															
				2060 - 2120		74	26															
				2120 - 2180		59.5	40.5														1	
				2180 - 2240		16.5	83.5															
				2240 - 2300		41.5	58.5															2.5
				2300 - 2360		74	26														2.5	1.5
				2360 - 2420		40.5	59.5															
				2420 - 2480		37.5	62.5															
				2480 - 2540		77.5	22.5															
				2540 - 2600		4.5	95.5				Tr											
				2600 - 2660		39.5	60.5															
				2660 - 2720		52.5	47.5															
				2720 - 2780		62.5	37.5															
				2780 - 2840		45	55															
				2840 - 2900		52.5	47.5				0.25											
				2900 - 2960		9.5	90.5				Tr											
X				2960 - 3020		5.25	94			0.75	0.5		0.15				0.05					
				3020 - 3080		55.5	44.5				0.75		0.2				0.05					
				3080 - 3140		54.5	45.5				0.05											
				3140 - 3200		61	39				5.5											
				3200 - 3260		89	11				6.5		0.15									
				3260 - 3320		45	55			0.5	4		0.4		Tr		Tr		0.5			
				3320 - 3380		50	49.5			0.25	2.5		0.5									
				3380 - 3440		87	12.8			0.25	7		0.4									

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Euhedral Hydrothermal Crystals	Slickensides	Vugs	Alternate Interval	Depth Interval	GRIT, GRVL, & PBBL	S & SS	MDS & SLTS	NOD ANH & XLN ANH	GG & µBX	VNLTS	EP	AC	PY	PO	HM	SP	CPY	GYP	AN	TALC	CV	CMT
				3440 - 3500		48.5	51			0.5	3.25		0.4									
				3500 - 3560		38.5	61.5			Tr	2.75		0.4									
				3560 - 3620		55	45			Tr	2.5		0.35									
				3620 - 3680		8	91.5			0.5	0.5		0.2						0.5			
				3680 - 3740		1.25	97.8			1	1		0.6						1			
				3740 - 3800		Tr	95			5	0.25		0.75		Tr		Tr		4			
				3800 - 3860		9.25	90.5			0.75	0.35		0.7						0.05			
				3860 - 3920		12.3	87			1.25	1.25		0.5			Tr			0.85			
				3920 - 3980		6.25	92.5			1.25	1.25		0.4						0.4			
				3980 - 4040		42.8	56.8			0.5	2.5		0.4						0.25			
				4040 - 4100		50.5	49.5			Tr	3		0.25				0					
				4100 - 4160		72	28			Tr	4.5		Tr									
				4160 - 4220		43.5	56.3			0.5	3.5		0.4						0.25			
				4220 - 4280		47.5	52			0.5	4.5		0.5				Tr		0.5			
				4280 - 4340		56.5	43.5			Tr	5		0.4		Tr							
				4340 - 4400		58	41.5			0.5	3.5	0.05	0.35									
	X			4400 - 4460		17.3	44.8		33.2	4.67	4.08	4	1.2		0.75	0.02	Tr		0.83			
				4460 - 4520		55.2	35.8		6.67	2.33	6.25	0.42	0.52		0.17				0.75			
				4520 - 4580		45.8	52.2		1.17	0.83	4.25	0.58	0.55			Tr			0.17		11.3	
				4580 - 4640		26.3	73.2			0.5	2.92	0.63	0.43	0.05	0.03		Tr				4	1.83
				4640 - 4720		47.2	50.9			2.08	6.5	0.5	0.77			Tr			0.17		5	
				4720 - 4780		51.7	46			2.33	6.33	0.18	0.8								16.3	
X				4780 - 4840		53	44.3		0.67	2	5.92	0.33	0.25				Tr				10.7	
				4840 - 4900		73.7	25			1.33	8.5	0.08	0.25								25.2	
				4900 - 4960		76.2	21.2		0.33	2.33	7.5	0.92	0.42								39.2	
				4960 - 5020		83.5	14.8			1.67	8.5	0.3	0.48		Tr						11.3	
				5020 - 5080		74	22.8		0.5	2.67	8.5	0.92	1.45		Tr		Tr				30.5	
				5080 - 5140		70.2	28.2			1.6	9.8	0.52	0.78								66	
				5140 - 5200		78.7	20.3			1	7.33	0.77	0.77							Tr	60.7	
	X			5200 - 5260		69.4	28		0.4	2	6.1	0.16	0.5								44.8	
				5260 - 5320		57.6	39.2		0.4	2.8	6	1.4	0.74				Tr				54.8	
				5320 - 5380		67	30.3			2.83	7.83	0.75	0.67				Tr				36.5	
				5380 - 5440		32.5	64.6		0.67	2.25	4.83	0.88	0.55								34.3	
	X			5440 - 5500		10.3	88.8			0.92	1.92	0.3	0.62		Tr				0.2	Tr	8.33	
				5500 - 5560		5.67	91.2			3.17	3.25	0.3	0.1			0.02	0.02		0.97	Tr	8.33	
				5560 - 5620		3.7	94			2.3	3	0.28	1.4			0.02			0.5		27	
				5620 - 5680		19.7	79.5			0.83	1.48	Tr	2.28				0.03		0.6		3.33	
				5680 - 5740		49.3	43.7	5.83		1.17	3.42		0.37						0.13		16.7	
	X			5740 - 5800		31.1	67.2		0.17	1.17	2.47	0.08	0.32			Tr	Tr				43.3	
				5800 - 5860		3.75	95.2			0.75	0.63	Tr	0.33	Tr			Tr		0.35		44.2	
				5860 - 5920		30.3	69.4		Tr	0.25	2.52	Tr	0.55	Tr					0.05		16.7	
X				5920 - 5980		46.2	50.7		0.17	3.17	7.33	1.83	0.75		Tr	Tr	Tr		Tr	Tr	5.83	
X				5980 - 6040		75	22.7			2.33	13	Tr	1.33									
X		X		6040 - 6100		58	39.3			2.83	9.17		1.33						0.08			
			10	6100 - 6110		29	68			3	8		1									

Is CUD same as CV?

DR-11 10/05/02

85-110': 100 mdst, (MDS) semi- to non-consolidated

— silty, lt. grayish-orange, matte ©
w/ 1% anom. coarse detrital mica
1 gram grit (2 mm.

110-140': 100 muddy sand/ss (MDS)

same color as above f-mg (0.2-0.3 mm)
w 0.5% anom. coarse (< 0.6 mm) mica detrital

140-170: muddy sand, AA, almost all unconsolidated/disaggregated.

one ostracod shell.

170-200': 95 ~~to~~ 2 s/lty mdst. same as 85-110' but orange-gray
5% muddy ss.
some mudst. chunks have dis, < 0.5 mm. carbonate (?) concretions.

200-230' AA

230-260 muddy sltst. AA.

1 1 mm chunk of amber or pitch.

DR-11 10/05/02

260-290': 17% mdst AA 83% ss AA

matte grayish-orange to orange-gray

290-320'

7% slts + 5 mds 88% ss AA sand.

IN SS: ↑ 3% pure white interstitial clay (?) erratically distributed.

↳ 2.5% black woody charcoal-like organic debris < 1 mm

320-350 (SS)

100% unconsol. sand AA

2% org. debris

0.3% py.

pyrite occurs as erratically distributed colloidal/microxln cement

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350-380 ~~AA~~ Tr. 9/355 1%

1 pbls.

5 cement 99% silty mud, lt. grayish-orange, with 3-4% anom. coarse (<0.7 mm) detrital mica

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380-410

2 cmt 6 med. anh. <3mm 1 79 slty mds. 15% sand AA

WHITE 2 same color

Tr OBSIDIAN

DR-11 10/05/02

410-440':	5 nod anh	82 slty mdst.	13ss	Tr OBSIDIAN
440-470'	2 nod anh	87 slty mdst	11ss	
470-500'	3 nod anh	92 slty mds	5ss	

~ 5% of the mdst. is v lt, sl. yellowish-gray
rest is lt. grayish-orange / matte
2% "coarse" mica.

500-530'	2 nod an.	98 slty to sparsely sandy mdst.		MDS

lt. orange-gray matte

530-60'	1 nod anh.	7 mds	92 muddy sand. lt. grsh-orange	MDS

560-90	7 nod & xln ANH.	2 gyp	84 slty mdst.	7 ss	0.5 py

"hopper xls
< 1.5 x 0.5 mm
partially hollow

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DR-11 10/05/02

590-620'	2 mod ¢ xln anh.	1 gyp.	97 mds.	0.2 py

lt., sl. orange-gray matte

620-650'	2 mod ¢ xln anh	—	98 mdst	Tr py

~ 25% of the mds. is lt. matte, sl. yellowish-gray
remainder is lt. matte orange-gray
These are admixed as "breccia" but suspect this is the product of the drilling process

650-680'	5 mod ¢ xln anh.		95 mds. AA	Tr py
680-710'	2 mod ¢ xln anh		98 mds AA	Tr py
710-740'	~ 23% mod ¢ xln anh.		77 mdst AA,	3% py.
740-770'	6 mod. ¢ xln anh.		94 mdst AA	1% py
770-800'	7 mod. ¢ xln. anh.		93 mdst. AA	Tr. py
800-830	1 mod. ¢ xln. anh.		99 mdst	—

mostly lt. yell.-gray

DP-11 - 10/05/02

830-860'	5 nod & x/n anh.	95 mdst. lt. yel. gray mott.		0.2 py
860-890'	7 nod & x/n nds	86 mdst AA	7 ss	0.2 py
890-920'	8 nod & x/n. anh.	92 mdst AA	—	0.1 py
920-50	7 nod & x/n. anh.	93 mds' AA	—	0.1 py
950-80'	5	95		Tr =
980-1010'	5	95		Tr

w 10% of the mudst vs mottle lt.-med. grayish-red

1010-1040	5	95		Tr
1040-1070'	4	96		—
1070-1100'	3	97		—
1100-1130'	1 nod x/n anh	75/75 + 57 mds	355s	

DR-1 10/05/02

1130-1160' TR AN — 5 silt + 7 [illegible] — 88 sand mgr. — sagg

1160 — 65 mdst. — 35 sand/s.

mdst mostly lt. yellowish-gray, but some is lt. grayish-red

sands is same, f-g is argillaceous.

1190-1220': AA (vcl)

1220-1250 — 93 slts CMT — 100% ss A vcl

v. lt. yellowish to barely greenish-gray massive semi-consol

1250-1280'

60 CMT looks like SLTS

93 mdst AA — 7% ss

1280-1310'

75 CMT

93 mdst — 7% ss

1310-1340'

AA

65 mdst — 35 ss

friable, disagg.

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DR-11 10/06/02

1340-70 10 CMT	85 mdst lt. grn-gray & red gray	15 ss ? AA	fri-disagg ©	
1370-1400 9 CMT	5 slts + 92 mdst	3 ss	©	AA
1400-1430	5 slts + 56 mdst	39 ss	©	

ss. bec. buffy-white, app. less argillaceous

1430-1460	7 slts + 32 mdst	61 ss	©	mostly lt. grnsh-gray & arg. again
1460-1490	3 slts + 64 mdst	33 ss	©	ss buffy white to v.v.lt. grnsh-gray fri/disagg.
1490-1520 5 CMT	9 slts + 54 mdst	37 ss	© "ruddy"	AA "soft"
1520-1550	5 slts + 68 mdst	~~27 slts~~ 27 ss	©	AA
1550-1580	3 slts + 72 mdst	25 ss	©	AA
1580-1610	5 slts + 62 mdst	33 ss	©	AA

DR-11 ~~#~~ 10/06/02

1610-1640': 13 slts + 68 mdst 19 sand / SS ©

v.lt. YBr to GR Gr mottle dull
earthy, fria.

1640-1670' 5 slts + 70 mdst 25 sand / SS AA ©

1670-1700' 3 slts + 84 mdst 13 ss © AA

earthy

1700-30'
10 CV / 1 cm
1 R$S

5 slts + 11 mdst 84 ss (sand) disagg © buffy white m gr 0.35 mm

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Heavily contaminated / CAVED

1730-60
5 cmt (?)
15 CV
2 R$S

9 slts + 17 mds 74 (sand) AA

pebble frags common.

1760-90'
3 R$S

mostly caved debris
do not trust sample

make 1

1790-1820'
4 R$S
5 cvd — obvious, could be more

7 slts + 56 mdst 37 sand
? ? ?

much could be caved

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DR-11 10/06/02

1920-50
3 RBS
1 cvd.

2 slts + 13 mds

85 ss (sand) AA

1850-80
1 CV
2 RBS

1 slts + 7 mds lt gray earthy matrix

92 sand (all disagg.!)

1880-1910
2 RBS
Tr CV

6 mds

94 sand AA

snd 0.3-0.35 mm mgr.

1910-40

3 slts + 19-15 mds

82 ss fri. mostly multpl grain frags/chips 2 lith

1940-1970

4 slts + 15 mds

81 ss (mostly sand)

1970-2000

5 slts + 16 mds

79 ss AA

note: sand from 1920-1850 seems well sorted & contains more qtz than most — all matrix winnowed away — could this be aeolian (?) grains mostly subangular to angular

DR-11 10/06/02

HOW MUCH SAND IS CAVED ??

2000-2030'

5 slts + 12 mds — 83 sand AA — CVNG ?

2030-60' — 7 slts + 25 mds — 68 sand AA & ss, fnr-gr — CVNG ?

2060-90' — 4 slts + 16 mds — 80 sand — CVNG ?

2090-2120 — 9 slts + 23 mds — 68 sand & ss. — CVNG?

2125-2150 — 13 slts + 25 mds — 62 sand & ss — CVNG?

4' - 2% cvd. pbl. frags

2150-80' — 7 slts + 36 mds — 57 sand & ss — simp. looks legit ~~OK~~ ~~OK~~ ?

2180-2210 — ~~13~~ 15 slts + ~~60~~ 58 mds — ~~25~~ 27 ss

2210-40' — 18 slts + 76 mds m-dk. matte gray

~~2240-70' 5 slts~~ 91 mds ltc gray

DR #5 ~~22~~ 10/06/02

2240-70':
5 s/lt + 60 mds
11 ↔ lt earthy mette gray mst
15 ss buffy-white ©

2270-2300':
5 CEMENT
5 s/lts + 27 mds
68 ss fr. ©

2300-30'
1 CV pbbls
13 s/lts + 34 mds
53 ss ©

2330-60'
4 cvd. pbls.
3 cement
2 RRs
5 mds
95 sand clean same as 2000'
CV ??
22 ° don't trust

2360-90' (OK)
7 s/lt + 92 mds ©
med-gy
1 ss
OK
no CV

2390-2420'
3 s/lt + 17 mds
80 ss fri, argill. ©

2420-50'
5 s/lts + 25 mds
70 sand & si ©

2450-80'
3 s/lts + 92 mds
5 ss ©

2480-2510'
3 s/lts + 23 mds
74 ss ©

DRS 10/06/02

2510-40' | 2 slts + 17 mds | 8/ss | all ©

ss is fgr, 0.15 mm, friable, earthy buffy white to slightly grnsh-white

2540-70' | 2 slts + 9/ mds | 7 ss AA | Tr. EP

△ med. gray

2570-2600' | 5 slts + 95 mds. | 2 ss AA

2600-30' | 3 slts + 95 mds | 2 ss AA

△ esp fresh-looking, med-dk. gray

2630-60' | 7 slts + 84 mds | 9 ss

2660-2690' | 5 slts + 25 mdst | ~~2355~~ ~~2265~~ 70 ss AA

△

2690-2720' | 7 slts + 58 mds | 35 ss

2720-50' | 5 slts + 40 mst | 55 ss

△

2750-80' | 5 slts. + 25 mds | 70 ss

2780-2810' | 5 slt + ~~35~~ 30 mds | ~~60~~ 65 ss

△

DR-# 10/07/02

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2810-40'	2 slts +	73 mds	25ss	
2840-70'	1 slts +	89 mds ©	10ss	
2870-2900	—	5 mds ©	95 sand © ≠ ss. buffy-white, friable, ©, mgr.	0.5 ep
2900-30'	5 slts +	93 mds AA ©	2 sand	
2930-60'	3 slts +	80 mds AA ©	17ss	Tr. Ep
2960-90'	9 slts +	84 mds © becoming bleached. lt. gray-green	7ss	Tr Ep
2990-3020'	3 slts + ©	92 mds 1'1'1' ep ∠ 0.5x 0.1	~~2ss~~ 3.5ss	1.5 VF 1 EP 0.1 cpy 0.3 py
3020-3050'	2 slts +	63 mds	35s	1 EP 0.1 cpy 0.3 py
3050-80'	11 slt. +	13 mds	76ss	0.5 ep 0.1 py Tr cpy
~~30~~				

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3080–3100'	9 sHz	+ 5 mds	86 ss	0.1 EP
3110–3140'	7 sHz	+ 70 mds	23 ss	Tr. EP
3140–3170'	3 sHz	+ 13 mds	64 ss	8 EP
3170–3200'	17 sHz	+ 45 mds	38 ss	3 EP

DR 11 10/04/02

3200 - 3230':

5 slts + 9 mds. 86 ss 7 EP 0.1 py

most ss is mottled buff - white and yellow-green non-arg. some (in #152) is more argillaceous & chloritic & med. dull grayish-green.

slts & mds are lt-med dull grayish-grn.

3230-60': 3 slts + 5 mds 92 ss, one chrt pebble 6 EP 0.2 py

pp, 2 distinct types of sandstone a little more of the dk grn chlte variety (in 30% of total ss)

3260-90': 5 slts + 12 mds 83 ss for. 1 AN 7 EP 0.5 py Tr HM

a few slst chips are silicified

3290-3320': 8 slts + 86 mdst 7 ss 1 VF 1 EP 0.3 py Tr. cpy

most of the mds is mottle med. gray, msv. & calcareous

3320-50': 13 slts + 54 mdst 33 ss Tr VF 2 EP 0.5 py

3350-60': 15 slts + 17 mdst 67 ss 0.5 VF 3 EP 0.5 py

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DR11 10/04/00

3380–3410	4 slts +	9 mdst	87 SS	Tr VF	6 EP 0.3 py
3410–40	5,5 slts +	7 mdst	87 SS	0,5 VF	8 EP 0.5 py
3440–70	10 slts +	13 mdst	76 SS	1 VF	5 EP 0.5 py
3470–3500	7 slts	72 mdst	21 SS	—	1.5 EP 0.3 py
3500–30	13 slts +	72 mdst	15 SS	—	1.5 EP 0.3 py
3530–60	11 slts +	27 md	62 SS	Tr VF	4 EP 0.5 py
3560–90	25 slts +	~~[illegible]~~ 51 mdst	~~[illegible]~~ 24 SS	Tr VF	2 EP 0.2 py
3590–3620	7 slts +	7 mdst	86 SS		3 EP 0.5 py
3620–50	7 slts +	DK GRAY / LT GRAY–GREEN 82 mdst	11 SS		0.5 EP 0.1 py
3650–80	5 slts +	89 mds	5 SS	1 VF	1 ANH (mod) 0.5 EP 0.3 py
3680–3710	5 slts +	92 mdst	2,5 SS	0.5 VF ep-ani-gtz	1 ANH 1 EP 0.5 py

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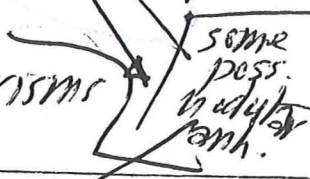
DR-11 10/04/02

3710-40'

16 slts + 93 mdst Tr ss 1 VF 0.7 py
5:3 op-g anh. 1 EP
1 ANH

2 mm plate w 0.5 x 0.2 mm. each. ep. prisms
≡ open space



3740-70'

7 slts + 87 mdst Tr ss 6 VF ≠ med. 5 ANH
same color ↔ blsh. v. lt. grnsh.-gray some aph. modular? 0.3 EP
0.5 py
Tr. cpy

3770-3800'

11 slts + 85 mdst Tr ss 84 VF 3 ANH
1 py
0.2 EP
Tr HM

© is med. matte gray no green

3800-3830'

29 slts + 75 mdst 1.5 ss 0.5 VF 1 py
Tr EP
Tr ANH

3830-60

53 slts + 30 mds 17 ss 1 VF 0.7 EP
0.4 py
0.1 anh.

sl. brnsh med. matte gray

3860-90

AA 61 slts + 28 mds 9.5 ss 1.5 VF 0.7 py
Tr. sp
1 EP
1 ANH

3890-3920'

AA 57 slts + 28 mds 15 ss 1 VF 1.5 EP
0.7 ANH
0.3 py

DR-11 10/04/02

v. fine (1mm) chips

3920-50': 1 steel	15 slts + 79 mdst ©= ©=		5ss ©±	1 VF	1.5 ep 0.3 py 0.3 AN/H
3950-80' 1 steel	27 slts + 64 mdst ©= ©=		7.5ss ⊗	1.5 VF	1 EP 0.5 py 0.5 AN.
3980-4010' 1 steel	~~25~~ ~~30~~ slts + 70 mds. ©± ©±		~~4ss~~ 4.5 ©	0.5 VF	1 EP 0.5 py 0.5 AN/H
4010-40' 2 steel	11 slts + 7.5 mds ⊗ ⊗		8ss ⊗	0.5 VF	4 EP 0.3 py
~~4040-70~~ 2 st. & R 2 LCM	7 slts + 9 mds ⊗ ©±CV?		8ss ©	Tr VF	5 EP 0.3 py
4070-4100'	7 slts + 76 mds ⊗ ©±		17ss ⊗	Tr VF	1 EP 0.2 py Tr. cpy
4100-30'	5 slts + ~~64~~ 11 mds. ⊗ ©±		~~####~~ 8 ss ⊗	Tr VF	5 EP Tr. py
4130-4160'	7 slts + 33 mds ⊗ ©±		60ss ⊗	Tr VF	4 EP Tr py
4160-4190'	7 slts + 31 md ⊗ ©±		62ss ⊗	Tr VF	5 EP 0.3 py
4190-4220	~~8~~ slts + 69 mds 5.5 ⊗ ⊗		25 ss ⊗	1 VF	2 EP 0.5 py 0.5 AN/H

18

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4220-50'		13 slts + 69 mds	17 ss	1 VF	2 EP 1 AN 0.5 py
4250-4280'	crs chips 1.5-2 mm	9 slts + 13 mds	78 ss	Tr VF	7 EP 0.5 py Tr. cpy
4280-4310		17 slts + 42 mds	4 ss	Tr VF	3 EP 0.3 py
steel					
4310-40'		19 lt. gray slts + 9 mds	72 ss	Tr. VF	7 EP Tr HM 0.5 py
4340-4370'		21 slts + 38 mds	4 ss	Tr VF	3 EP 0.3 py

1 chip ss silicified

4370-4400'		11 slts + 13 mds	75 ss	1 VF	0.1 HM 4 EP 0.4 py

several ss & slts chips silicified (~ 5-7% of total)

4400-10' CHANGE		18 slts + 62 mds.	15 ss	2 VF	2 HM 1 EP 0.7 py 1 AN
	2			19	

~ 20% of slts & mds chips are silicified & these contain diss. spic. hematite

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BIG CHANGE

4410-20'

(11)

27 sltst + mdst

355

GOUGE

0.1 SP

Tr cpy

15 AC

2 EP

1.5 HM

3.5 PY

2 AN

much qtz

FAULT ZONE

(10) VVF
(10) GG

20

~ 40% of the chips are brilliant white silky-fibrous TREMOLITE fibrous aggregates (almost certainly altered gouge

~ 5% are porous vbx (crush vbx) w/ ≠ clasts of sltst., mdst., altered (< 1mm) cemented by qtz-anh.

30% are crush vbx — rare sltx

much of the sltst, mdst, gg, ≠ vbx SILICIFIED

w/ pyrite & coarse pyrite

4420-30'

5 sltst + 5 mdst.

35

GOUGE

6 GG
3 VVF

20

3.5 EP
3 ACT
1 HM
1 PY
1 ANH

Tr cpy

DR-11 10/05/02

37

4430-40'

11

20 slt/st + 25 mds | 13 ss | 37 gg | 5 VF

Gouge seeming/y has slts ± ss protolith— commonly foliated v. lt. greenish-gray to buffy white

6 EP
3 AC
tr
0.5 py
0.5 AN
Tr. HM

mackly common epidotized slcfd./act.

mod. sili'eific

4440-50'

8 slt/st + 17 mds | 17 ss | 53 gg | 5 VF

7 EP
2 AC
1 py
0.5 AN

no clix

rx very approx

AA

4450-60'

11 slt/st + 15 mds. | 13 ss ? | 58 gg | 3 VF

5 EP
1 AC
0.5 py

gg mostly derived from ss— commonly sercted, slicfd, epidotized

comm. foliated.

v. lt. yell-grn-gray pearlescent

21

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4460-70

11 sltst + 33 mdst + 28 ss

~~28 ss~~ 23 GG 5 VF

comm fltd

7 EP
1 AC.
0.3 py
0.5 HM

mod. silicification
even "pure" rock types
partly crushed & sheared
(fault zone)

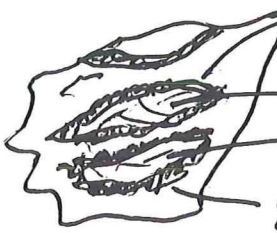
4470-80'

5 sltst + 21 mdst ~~6 ss~~ 5 GG 3 VF

all ~~X~~ ~~X~~

2 HM
1 py
4 EP
1 HM

mdst is msv, med gray to grnish gray, commonly speckled w/ white "snowflakes" (porphyroblasts?) < 0.2 mm.



reminiscent of S= anh. in caprock (inherited here)

DR 11 10/05/02

4480-90': 15 sl/st + 58 mdk | 21 ss | 5 GG 2 | INF | 3.5 ED 0.5 Py Tr. Act

4490-4500': 9 sl/st + 13 mdst | 74 ss | 3 GG | INF | 9 ED 0.5 Py 1 AN Tr. Act

4500-10': 5 sl/st + 11 mdst | 82 ss | 1 GG | INF 0.3 Py | 8 ED 0.5 ACT

4510-20': ~~11 sl/st~~ 11 sl/st + ~~23~~ 23 mdAG | 60 ss | 3 GG | 3 INF | 6 ED 1 ACT 1 ANA 0.5 Py

~~TR~~?


24

DR-11 10/07/02

4520-30': (7) + (17) mds! ~~30 mds~~
(5 crush bx)
~~7~~ SLTS
70 ss 1 VF

5 EP
0.3 py
Tr sp.

~1/2 of the ss is apparently soaked with oil, now devolatilized. These chips are ~~med~~ dull grayish-brown

most of the ss is fmg mod-well sorted arkose (?)
speckled yell-green (ep), white (ser.&act)?, & buffy white
Φ & FSP

breaks around grains but not friable

slts. mostly lt. grnsh-gray speckled w/ ep.
fairly hard

mdst — v lt. grayish-green

~~a few of the ss chunks are sheared & partially granulated (proto crush-bx)~~ ≡ FLT edge

the crush breccia is crudely foliated & sheared, w/ few or no surviving clastic grains.
now principally EP-QTZ-SER rock
mottled white & pistachio-green

DR 11 10/07/02

4530-40'
13 CVD

3 SLTS + 17 mds

77 SS

2 crush by

1 VF

7 EP
1 BRN
2 ACT
0.5 py

4540-50'
5 CVD

7 SLTS + 66 mdst ©∓

27 SS

Tr. crush by

Tr act
3 EP
0.5 py

4550-60'
CAVING
35 CV

very coarse chips 6-7mm <16 mm

5 SLTS + 58 mds ©∓ ©±

37 SS

don't trust this one

3.5 EP
Tr ACT

4560-70'
10 CV

7 SLTS + 54 mds ©∓

37 SS

2 VF
v lg chip

1 py
4 EP
0.5 AC

4570-80'
5 CV

23 slts ©± + 49 mds

27 SS

1 VF

1 AC
1 py
3 EP

v. lg chips

4588-90'
7 CV

some v. lg (<12 mm) flattish caved chips

7 slts © + 64 mdst m-dk gray ©

9 SS

26

1 EP
0.5 py
Tr act

DR-11 10/07/02

2 EP
tr. py
tr. bn
0.2 HM
0.3 AC
tr. py

4590-4600' — 7 slts + 77 mds — 16 SS

mdst & slts chips 1-10 mm dia (in 5mm) flattish, matte med. gray, msv some anom. clys. mica

SS as described above

4600-4610' — 15 slts + 51 mds — 33 SS — 1 VF

3 EP
0.5 AC
1 py
1 AC

4610-20 — 13 slts + 60 mds — 27 SS — —

1.5 AC
3.5 EP
0.3 py

4620-30 — 33 slts + 58 mds — 9 SS — — — 0.3 py

1 EP
0.5 AC

chips of slts & mds flakes avg w/ 6X4X 0.5-1 mm (< 11 mm dia.)

LG CHIPS

4630-40' — 7 slts + 27 mds — 64 sand — 2 VF

7 EP
tr. AC
0.5 py

17 CY
1 LCM

slts & mds mostly lt. matte greenish gray & non-C

27

DR-11 10/07/02

4650-60' 7 cv	5 slts +	25 mdst some cv? ©±	68 ss	2 VF	7 EP 0.5 AC 0.5 py
5 cv 4660-70'	7 slts +	6 mds	3 ss	1 VF	3 EP 0.3 AC 0.1 py
4675-80'	23 slts + ©F	59 mds ©F	13 ss	5 VF msthy ep-lor-qtz 1 ext.	7 EP 0.5 AC 0.5 py Tr. sp.

most mdst ± slts lt. grayish-green, matte,

4680-90' 7 cv	slts (17) +	51 mdst 35 mds	32 ss	1 VF	0.7 AC 1 py 4 EP
4690-4700'	slts 5 slts +	27 mds	67 ss	1 VF	0.5 py 7 EP 0.5 ac.

— fria, highly disagg.

4700-10' ss more chloritic	15 slts +	33 mds	58 ss MA	3.5 VF	1.5 py 7 EP

VR-11 10/07/02

4710-20 11 CV VV	2 slits + 15 mds © F	82 ss	1 VF	11 EP 1 AC	1 AU 3 1 py

suspicious bruised chip c/Ac 7mm, 1.5 mm. suspect contamination by caving

4720-30 15 CV Pegs up to 12 X 10 X 1.5 mm	7 slits + 66 mds	25 ss	2 VF	4 EP Tr. AC 1 py	

4730-40 15 CV do AA	5 slits + 60 mds	33 ss	2 VF	5 EP 1.5 py 0.5 AC	

4740-50 17 CV	7 slits + 40 mds	43 ss	2 VF	5 EP 0.7 py 0.1 AC	

4750-60 21 CV	25 slits + 40 mds	? 51 ss	4 VF	6 EP 1 py Tr. AC	

4760-70 17 CV 2 RDs	25 slits + 70 13 mds	~~3 1/2 mds~~ 90 ss AA	2 VF	9 EP 0.5 AC 0.3 py	

4770-80 13 CV	5 slits + 15 mds	70 ss AA	2 VF	9 EP Tr. AC, 0.3 py	

10/~~09~~09/02

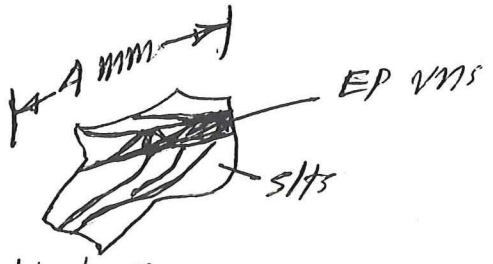
VR-11 ~~4780-90'~~

4780-90' (7 CV) 1 sap sh	9 slts + 62 ~~EB~~ mdst	27 ss	2 VF		4 EP Tr AC 0.1 py

1 1.5 mm euh. qtz x/

4790-4800 (~25 CV)	? 7 slts + ? 25 mds	? 35 ss	? 2 VF		4 EP Tr AC 0.1 Py

4800-10 (7 CV)	21 slts + 27 mds	43 ss	~~3~~ VF EP AC Ø py	4 GG EP SER AC Ø	2 AC 6 EP 0.5 py Tr cpy



a few slt & ss chips silicified.

GG is "messy" mottled-looking aggregate of ep, q, ser & actinolite, in decr. order of abundance

4810-20' (7 CV)	1 slts + 45 mds	94 ss	—	—	9 EP Tr AC 0.3 py

cvd fragments are thick flakes o/ avg 7 x 5 x 1 mm, up to 10 x 7 x 2 mm, slts, chltzd, lt. gray-green

indigenous fragments avg 1 mm, up to 9 mm, almost all sandstone

4820-30 (5 CV)	5 mds +	94 ss	1 VF		9 EP Tr Ac 0.3 Py

DR-11 10/09/02

4830-40 EST 13 CV	5 slts + 6E mdst	25 ss	2 VF	3.5 EP Tr AC 0.2 py
4840-50' est 27 CV	3 slts + 21 mst	76 ss	1 VF	9 EP Tr AC 0.3 py
4850-60' est 27 CV 5 LCM	7 slts + 23 mds	69 ss	1 VF	7 EP Tr AC 0.1 py
4860-70 est 40 CV	3 slts + 9 md	87 ss	1 VF	11 EP 0.5 AC 0.5 py
4870-80' est 17 CV	9 slts + 37 mds	53 ss	1 VF	6 EP Tr AC 0.2 py
4880-90' est 9 CV	8 slts + 17 mds 5	~~79 ss~~ 77 ss	1 VF	9 EP Tr AC 0.1 py
4890-4900' est 31 CV	3 slts + 13 mds	81 ss	3 VF	9 EP Tr AC 0.3 PY
4900-10 est 33 CV	3 slts + 15 mds	79 ss	3 VF	8 EP 0.5 AC 0.7 py

31

DR-11 10/09/02

4910-20' est 55% CV	5 sl/h + 17 mds	75 ss	3 VF		6 EP 1 AC 0.5 py
4920-30' est 55 CV	5 sl/hs + 15 mds	77 ss	3 VF		8 EP 1 AC 0.3 py
4930-40' est 40 CV	3 sl/h + 16 mds	80 ss	1 VF		8 EP 0.5 AC 0.3 py
4940-50' 27 CV	5 sl/h + ~~mds~~ 31	~~ss~~ 59	3 VF	(2 EG)	7 ep 2 AC 0.2 py
4950-60' 25 CV	3 sl/hs + 9 mds	87 ss	1 VF		6 ep 0.5 AC 0.5 py
4960-70' 23 CV	2 sl/hs + 7 mds	90 ss	1 VF		9 ep 0.3 AC. 0.2 py
4970-80 35 CV	~~4~~ 5 sl/hs + 11 mds	83 ss	1 VF		8 ep 0.5 AC 0.3 py
4980-4990'	3 sl/hs + 15 mds	80 ss	2 VF		8 ep 0.5 AC 0.5 py
4990-5000'					

DR-11 10/09/02

5000–5010 3 CV	3 s/Hs + 11 mds	64 ss	2 VF		Tr HM 9 EP 0.1 py Tr. ACT
5010–20 7 CV	AA				Tr HM
5020–30 15 CV	1 st/st + 9 mds	86 ss	3 VF	1 GG	10 ep 1 ACT 0.2 py
5035–40 ~~25 CV~~ 2 LCM	4 s/Hs + 13 mds	79 ss	3 VF	1 GG	9 EP 0.5 ACT Tr HM 0.3 py
5040– ~~5~~ 2 CV 3 LCM	AA				
5050–60 25 CV	8 s/Hs + 9 mds	82 ss	1 VF		8 EP Tr HM 1 py 1 AC
5060–70 50 CV	6 s/Hs + 31 mds	61 ss	2 VF		0.5 py 0.5 AC 8 EP
5070–80 47 CV	4 s/Hs + 35 mds	57 ss	4 VF		2 AC 1 py Tr. cpy 7 EP

VR11 10/09/02

5080–5090 / 60 CV	5 slits	27 mds	65 ss	3 VF	0.15 Act 8 EP 1 py
5090–5100 / 45 CV	1 slits	7 mds	9 ss	1 VF	11 EP 0.5 py 0.5 Act Tr. Talc ?
5100–10 / 65 CV	1 slits	9 mds	89 ss	1 VF	1 Act 0.5 pg 12 EP
5110–20	OMIT >95% CVP — do not trust				
5120–30 / 70 CV	~~4~~ slits ~~2~~ 2	21 mds	76 ss	1 VF	10 EP 0.3 Ac 0.7 pg
5130–40 / 90 CV	? 5 slits	? 25 mds	? 66 ss	? 2 VF	? 8 EP 0.3 ac 1 py
	mostly caved				
5140–50	OMIT >97% CVP — do not trust				
5150–60 / 75 CV	? 3 slits	? 30 mds	66 ss	? 1 VF	7 EP 0.3 act. 0.3 py
5160–70 / 95 CV	5 slits	OMIT 17 mds	77 ss	1 VF	1 py 0.15 Ac 9 EP
		Do not use			

DR-11 10/09/02

5170-80 47 CV	1 s/hs	9 md	89 ss	INF	8 EP 1 py 1 AC Tr. Pdc
5180-90 60 CV	5 s/hs	13 mds	81 ss	INF	7 EP 1 py 1 AC
5190-5200	OMIT > 95% CV — do not trust				
5200-10 37 CV	7 s/hs	15 mds	77 ss	INF	7 EP 0.5 AC 0.7 py
5210-20 37 CV	5 s/hs	17 mds	77 ss	INF	7 EP 0.3 py 0.3 AC
5220-30 40 CV	2 s/hs	9 mds	84 ss	3 INF 266	6 EP 1 py Tr. AC
5230-40 40 CV	6 s/hs	52 mds/t	40 ss	INF	3.5 EP Tr AC 0.2 py
5240-50	OMIT ? 95% CV do not trust				

35

DR-11 10/09/02

5250-60' 70 CV — 6 slts 21 mds 69 ss 4 VF — 7 EP, Tr AC, 0.3 py

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5260-70 OMIT 79% CV — do not trust

5270-80' (68 CV) — 4 slts 61 mds 33 ss 2 VF — Tr AC, 3 EP, 0.5 py

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5280-90' (57 CV) — 6 slts 56 mds 33 ss 4 VF (GG) — 1 AC, 5 EP, 0.7 py

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5290-5300' (55 CV) — 7 slts 12 mds 77 ss 3 VF (1 GG) — 3 AC, 8 EP, 1 py

---

5300-10' (57 CV) — 5 slts 17 mds 75 ss 3 VF — 2 AC, 8 EP, 1 py, Tr. cpy

---

5310-20' (45 CV) — 5 slts 23 mds 70 ss 2 VF — 6 EP, 1 AC, 0.5 py

---

5320-30' (37 CV) — 4 slts + 25 mds 68 ss 3 VF — 1 py, 7 EP, 0.5 AC.

DRH 10/09/02

5330-40
5 LCM
45 CV
5 Hits + 27 mds
66 SS
2 VF
7 EP
0.5 AC
1 py

5340-50
37 CV
7 Hits + 29 mds
66 SS
4 VF
EP 77 AC 77 py
2 AC
8 EP
0.5 py

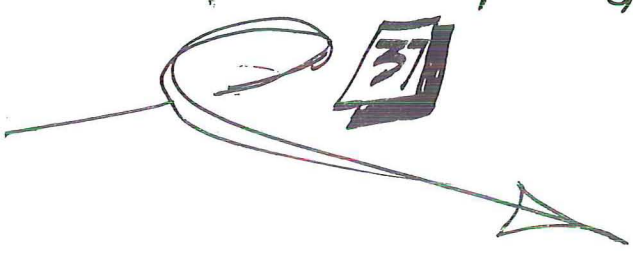
5350-60
40 CV
3 Hits + 25 mds
70 SS
3 VF
9 EP
~~0.5 AC~~
1 AC
0.5 py

5360-70
2 LCM
35 CV
2 Hits + 19 mds
76 SS
3 VF
0.5 py
Tr. cpy
9 EP
0.5 AC

5370-80
25 CV
3 Hits + 33 mds
62 SS
2 VF
7 EP
Tr. AC
0.5 py

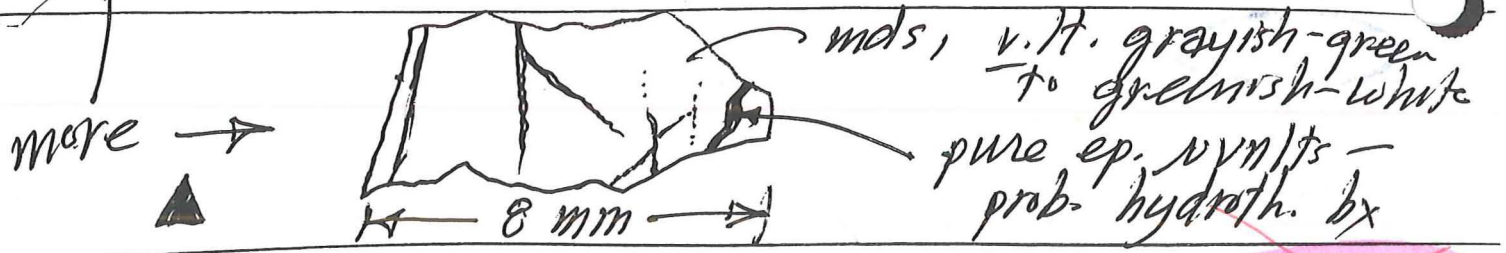
5380-90
21 CV
AA
7 EP
1.5 AC
0.5 py

5390-5400
2 Hits
58 mds
35 SS
3 VF
2 GG
1.5 AC
5 EP
0.5 py

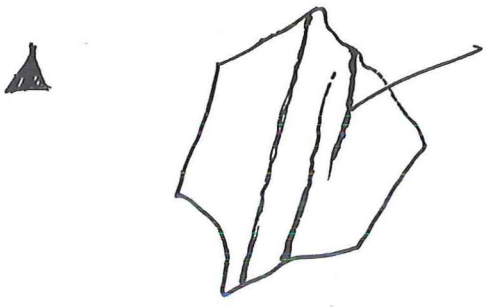


10/10/02 DR 11 ~~5400-5410~~

5400-10' (55 CV)	3 SLTS + 59 mds	35 ss	2 VF	1 GG	0.3 py 0.5 BC 4.5 EP
5410-20' (68 CV)	5 slts + 49 mds	41 ss	4 VF	1 GG	1 py 6 EP 0.5 BC
5420-30 (60 CV)	11 slts + 64 mds 7.5	27 ss	1.5 VF	Tr GG	0.7 py 1 BC 3.5 EP
5430-40' (<10 CV)	5 slts + 73 mds	21 ss	1 VF	Tr GG	0.3 py 0.3 BC 3 EP
5440-50' (<10 CV)	7 slts + 75 mds (C+)	17 ss	~~Tr~~ VF 1	—	0.5 BC 2.5 EP 0.3 py



5450-60'	6 slts + 76 mds	17 ss	1 VF		~~Tr. TALC~~ Tr HM 0.7 py 0.5 BC 2.5 EP



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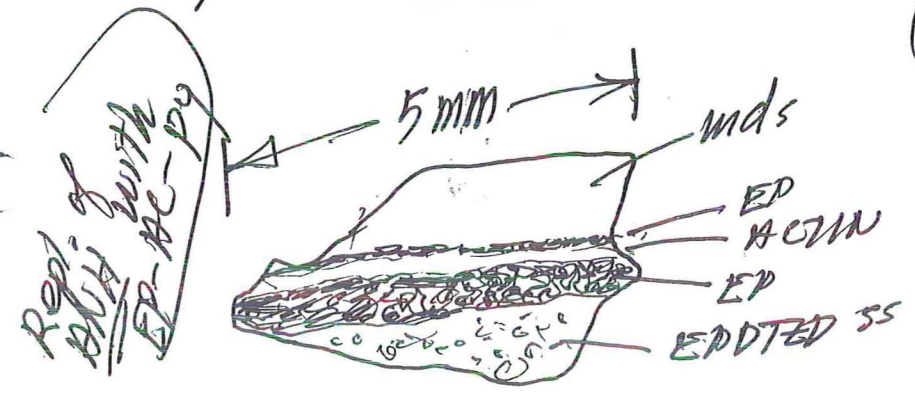
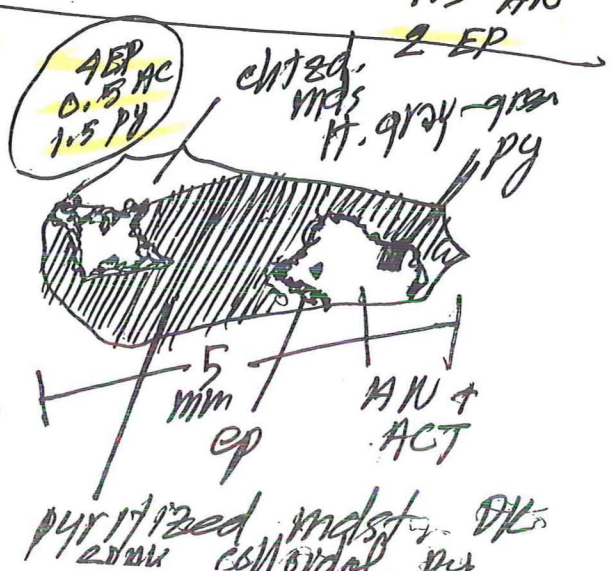
5460-70 (<10 CV) //	3 slits + 89 mds	7.5 s	0.5 VF		Tr AN 1.5 EP 0.2 AC 0.3 py
5470-80 (<10) //	5 slits + 85 mds	9 ss	1 VF	Tr AN	1 py 1.5 EP 0.2 AC
5480-90 (<10) //	7 slits + 87 mds	5 ss	1 VF		AN 0.5 0.7 py 0.2 AC 1.5 EP Tr TALC
5490-5500 (<10) //	8 slits + 85 mds	6 ss	1 VF		0.2 AC 0.7 py 0.7 AN 2 EP
5500-10 (<10) //	5 slits + 83 mds	9 ss	3 VF		1 py Tr TALC 1.5 AN 0.3 AC 2.5 EP
5510-20 (<10 //	8 slits + 85 mds.	5 ss	2 VF		Tr TALC 0.2 AC 1.5 EP (P) 1.5 AN 2 EP
5520-30 //	9 slits + 83 mdst	3 ss	4 VF		4 EP 0.5 AC 1.5 py

39





DR11 10/10/02

5530-40 (<10)	13 slt/st +	78 mdst	7ss	2VF	0.3 AN 0.3 py 0.1 cpy 0.1 sp 2 EP 0.2 AC
5540-50 (<10)	9 slts +	~~87~~ mds 83	5ss	3VF	1 AN 4 EP 0.1 AC 0.7 py
5550-60 (<10)	14 slts +	76 mds	5ss	5VF	5 EP 1.5 AN 0.5 AC 1 py
OMIT 5560-70	> 90% cv do not trust				
5570-80 (<10)	17 slts +	72 mds.	7ss	4VF	5 EP 0.5 AC 1.5 py Tr AN
5580-90 (<10)	13 slts +	78 mdst	7ss	2VF	3 EP 0.3 AC 0.5 AN 1 py
5590-5600 (<15)	5 slts + (60 mds + 33 AR)		Tr ss	2VF	1.5 EP Tr AC 0.5 AN 1 py

Actinolite vn/lt. cutting msv epidote

(AR-argillite is med. matte gray, msv, flinty-appearing

MDS is lt-med grnish-gray, msv, matte, "earthier"-texture than the argillite)

DR-11 ~~10/02~~ 10/10/02

5600–10 (<10) — AA

5sl ts + 52 mds / 37 AR — AA — 4.5 ss — 1.5 VF — 2.5 py, 0.1 sp, 1 EP, Tr. AC, 1 AN

py is mostly discs, colloidal, in argillite

5610–20 (<10)

5625–30 (<10)

3 slts + 11 mds / 83 AR — AA — 2 ss — 1 VF — 0.7 EP, ~~0.1~~ py 2.5, ~~0.1~~, 1 AN, Tr. AC

5630–40 (<10)

5 slts + 7 mds / 86 AR — AA — 1 ss — 1 VF — 4 py, 0.2 cpy, 0.5 EP, 1 AN, Tr AC

5640–50

9 slts + ~~7~~ 5 mds / 44 AR — AA — 4 ss — 1 VF — 1.5 py, 3 EP, Tr AC, 0.5 AN

ss is speckled yel.-grn (EP) & buff-white, very servitic, very friable, ~~medium~~-grained. fine

5650–60

5 slts + 5 mds / 29 AR — 6 ss — 1 VF — 4 EP, Tr. cpy, 0.7 py, 0.3 AN, Tr AC.

41

DR-11 10/10/02

5660-70'	2 slts	7 mds / 77 AR AA	13 ss	1 VF	4 py 0.5 EP 0.5 AN

Arg mdst is slightly translucent py colloidal/disc. AA.

5670-80'	2 slts	2 mds / 95 AR	1 ss	Tr VF	1 py 0.2 EP 0.3 AN

↳ dark gray

5680-90'	5 slts	10 mds / 59 AR	25 ss	~~Tr VF~~ 1 VF	0.5 py 0.3 AN 1.5 EP
5690-5700'	5 slts	13 mds / 46 AR AA	35 ss AA	1 VF	2 EP 0.5 AN 0.3 py
5700-10'	2 slts	~~AA~~ 2 mds / 11 AR	84 ss	1 VF	5 EP 0.3 py

ss vf-f-mgr, poorly-sorted, abund. ~~calc~~ calcd. arg/ll. matrix w/ very little (rel.) op.

ss speckled buff-white transl. lt. gray, lt. grnsh-gray, & yellow-green (op.

EXTREMELY ~~FRIABLE~~ FRIABLE
Breaks around grains

42

DB-11 10/[illegible]/10

5710-20 (40+) CV	3 slts	5 mds / 13 AR	78 ss AA	VF	6 EP 0.5 py
5720-30 (50+)	5 slts	3 mds / 9 AR	82 ss AA	VF	7 EP 0.3 py
5730-40' Tr scale (sdp) (<40 CV) <10	9 slts	55 mds / 7 AR	27 ss	2 VF	3.5 EP 0.3 py

mdst is v. lt. matte grayish-green (chloritized)

5740-50' (40+ CV) V/A	27 slts	32 mds / 3 AR	32 ss	3 VF 1 GG	5 EP 0.3 py 0.5 AC

much of the ss looks pasty crushed/sheared, but not enough to call it gouge — These chips are essentially ED-STR SED rock w/ apparently no FSP remaining.

5750-60' (40+)	17 slts ©+	45 mds / 2-5 AR	35 ss	0.5 VF	3.5 EP 0.5 py
5760-70' (40+)	9 slts	5.5 mds / 12 AR	72 ss	1.5 VF	4 EP 0.3 py
5770-80 (40+)	19 slts ©+	5 mds / 71 AR	5 ss	Tr. VF	0.3 EP Tr py
5780-90 (60+)	17 slts ©+	3 mds / 49 AR	31 ss	1 VF	1 EP 0.3 py
5790-5800' (40+)	7 slts	3 mds / 76 AR	13 ss 43	1 VF	1 EP 0.5 py Tr Cpy Tr sp

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5800-10': 3s/Hs 3mds/87 AR 2.5 SS 1.5 VF Tr Po 0.3 EP 0.5 AN 0.3 py Tr Gy

(50+ CN)

ARGILLITE is dk matte gray msv, slightly translucent — apart from "metamorphism" rock is very fresh-looking ≡ heat, no fluid

5810-20': 5s/Hs 3mds/90 AR 2 SS Tr VF 0.7 py Tr AC 0.2 EP

(60+) NOTE: w/ few veinlets, massive, & unaltd. this argillite is a great candidate for a permeability barrier

5820-30' (60+): 3s/Hs /mdst/91 AR 5 SS Tr VF 0.3 EP 0.2 py 0.1 AN

5s/Hs 3 mds/87 AR 5 SS Tr VF

5830-40' (25): ~~53~~ ~~3s/Hs~~ @± 3 ~~mds~~ /39 ~~87~~ AR 5.5 SS 0.5 ~~Tr~~ VF 1.5 EP 0.3 AN

5840-50' (30+): 23 s/Hs @± 58 mds/13 AR 5 SS 1 VF 0.7 AN 0.5 py 1 EP

~~5850~~ 60' (40+): 25 s/Hst 56 mds/15 AR 2.5 SS 1.5 VF 0.5 EP 0.3 py 0.5 AN

5860-70' (25): 5 s/Hst 16 mds/82 AR (aa) 3 SS Tr VF 0.3 EP 0.5 py 0.3 AN

~~5870-80'~~ (35): 3 s/Hs 17 mds/13 AR 6.7 SS Tr VF 44 4 EP 0.7 py Tr AN

5880-90': SS is (for) speckled buff-white to pinkish-white (pure white and gr.-yellow (EP)

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5870-80 (out of sequence)	6 slts	52 mds / 35 AR	7ss Tr VF		0.3 py Tr py 0.3 EP
~~5880-90~~ 5890-5900	7.5 slts 2.5	44 mds / 11 AR	37ss	0.5 VF	3.5 EP Tr AC 0.3 py
	ss matrix may contain anhydrite				
5900-10' (25)	5 slts	30 mds / 12 AR	53ss	Tr VF	~~4~~ 5 EP Tr AC 0.5 py
5910-20' (20)	5 slts	29 mds / 50 AR	15ss	1 VF Tr GG	2 EP Tr AC 1 py
	AR & MDST are flinty-appearing mdst. is med greenish-grdy & transl.				
5920-30' (15)	29 slts	25 mds / 15 AR	27ss	4 VF 1 GG	4 EP 1 py Tr AC Tr AN
5930-40' (20)	5 slts	19 mds / 3 AR	70ss	3 VF Tr sp.	15 EP! 1 py Tr cpy 4 AC
	ss is med. gr, grnsh-yellow, unusually rich in epidote & actinolite				
5940-50'	9 slts	11 mds / 5 AR	73ss EP ↓ CH & SER ↑	2 VF	7 EP 2 AC 0.5 py
5950-60'	OVER				

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5950-60':	2 slts	75 mdst	17 ss	6 VF	4 vn ch 7 EP 1 py

rock is much different: mostly mdst, lt–med grayish-green, heavily veined w/ fxln chl; vnlts ≤ 1 mm (mostly ≤ 0.1 mm) also vern qtz & ep. — both commonly exch. Tr HM

5960-70'	23 slts (sndy)	mds 21	ss 54 ss	2 VF	6 EP Tr AC 0.5 py

ss vs chloritic/argillaceous

5970-80'	51 sndy slts	11 mds	36 ss Fri	2 VF	5 EP 0.5 py Tr Ap

5980-90	all AA				

5990-6000'	7 slts AA	5 mds	86 ss Fri	2 VF	13 EP 1 Py Tr Ap

6000-6010'	7 slts	15 mdst	76 ss	2 VF	4 py 1.5 15 EP record Tr AC

sandstone vs hard, siliceous, breaks across grains

6010-20'	5 slts	2 mds	93 ss AA	2 VF	1.5 py 17 EP Tr Ap

but some friable

DR-11 10/12/02

6025-30'	8 slts	19 mds	7/ ss	2 VF	2.5 py 11 EP Tr BC

slts & muds are lt. grayish-green, earthy/ mottle

6030-40'	4 slts	4 mds	88 ss	4 VF	17 EP ! 2 py

EP

a few VF EP-chl-qtz up to 3 mm dia, very porous

6040-50'	17 slts	7 mds	75 ss	1 VF	14 EP ! 2 py

ss finer-grained & mostly friable, breaking around grains

6050-60'	9 slts	5 mds	84 ss	2 VF	1 py 15 EP

much of the VF is CHL

6060-70	4 slts	2 mds	7/ ss mostly breaks across grains	4 VF EP > CHL > QTZ >> PY	10 EP 1.5 py

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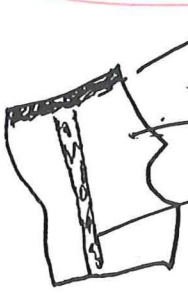
6070-80':	7 slts	18 mds	7 ss brks across grains	1 VF	1.5 py 7 EP

mdst mostly med-dk gray-green, mottled, sl. translucent, hard

6080-90'	9 slts	70 mds	17 ss	4 VF	1 py 3 EP 0.5 AN



6090-6100'	16 slt	53 mds	27 ss	2 VF 4	6 EP 1 py
6100-10'	17 slts	51 mds	29 ss	3 VF	8 EP 1 Py

TD

WELL DEL RANCH - 11

J. Hulen 12/26/04

• Miscellaneous Notes, Observations, & Features of Particular Interest

① The principal obvious fault zone cut by this well spans the *depth range 4410 - 4470'. This zone is notable for abundant gouge≠ & crush microbreccia≠ (up to 58%) along with veinlets & veinlet fragments (up to 10%). The zone has slickensides as well, & incorporates abundant actinolite (actually tremolite). Specular hematite is present (up to 2%), but not in the spectacular concentrations seen in, say, M-68. Also, for the SSGF, a high concentration of pyrite. No dilational microbreccia or euhedral crystals: suspect fluid production moderate at best, but.....

≠ Readily distinguished from artificial "bit gouge"

* Measured

① cont'd.

... Possible fluid entries, based on mineralogy and texture, at:

3720-3760'

4800-4810'

5220-5230'

5440-5460'

~~6020~~ 6030-6070'

② There is an enormous amount of hydrothermal <u>epidote</u> between 3140' and 6110' (TD). Epidote below ~ 4500' & TD commonly accounts for <u>6-7%</u> of the cuttings volume, and locally reaches <u>15%</u>. The bulk of the epidote, however, occurs as sandstone-matrix cement. By itself, the epidote is not a good permeability indicator. Rather, the epidote signals potentially good reservoir within which highly productive fluid conduits might reasonably be expected.

③ Traces of <u>talc</u> in veinlets with actinolite below ~~5000~~ 5080' indicate mineralization temperatures in excess of 320°C (608°F)

WELL DEL RANCH-11 J. Hulen 12/26/04

• Miscellaneous Notes, Observations, & Features of particular interest, cont'd.

④ There is far less diagenetic anhydrite in the ductile mudstone cap (to ~1100' depth) than in the same unit penetrated in wells to the northwest and southeast. Whereas in the wells indicated (NW and SE) anhydrite commonly accounts for 20% of the cap, in DR-11 the sulfate averages only ~5-6%. The discrepancy permissibly could be due to partial dissolution of the sulfate by relatively cool groundwater percolating downward along an intermittently reactivated major fault zone that penetrates all the way through the cap. The ductile mudstone of the cap would tend to heal the breach ~~xx xx~~ relatively rapidly (thereby preserving seal integrity) but not before a portion of the anhydrite dissolved.

⑤ There is a "redbed" interval-a likely marker horizon- just below the cap (itself a good marker) spanning the depth range 1160-1520'. The redbeds (mostly mudstone) likely reflect deposition in a stream-laced terrestrial mudflat environment that prevailed prior to inception of the alkaline lake from which the caprock mud & evaporite were deposited.

⑥ The interval 1700-2080' yielded principally <u>unconsolidated sand</u>. The sand apparently was formed by hydrothermal dissolution of diagenetic calcite cement in a precursor sandstone. There was a good deal of sloughing through this zone, and it must have been nasty to drill. Something to watch out for in nearby new wells.

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85-110': 100 mdst, semi- to non-consolidated

silty, lt. grayish-orange, matte ©
w/ 1% anom. coarse detrital mica
1 gram grit (2 mm.

110-140': 100 muddy sand/ss
same color as above f-mg (0.2-0.3 mm)
w/ 0.5% anom. coarse (< 0.6 mm) mica detrital

140-170: muddy sand, AA, almost all unconsolidated/disaggregated.

170-200': 95 ~~100~~ 2 silty mdst. same as 85-110' but orange-gray
5% muddy ss.
some mudst. chunks have dis, < 0.5 mm. carbonate (?) concretions.

200-230' AA

230-260 muddy sltst. AA.

1 1mm chunk of amber or pitch.

DR-11 10/05/02

260-290': 17% mdst AA 83% ss AA
matte grayish-orange to orange-gray

290-320'
7% slts 5 mdst 88% ss AA
sand.
IN ss: ~ 3% pure white interstitial clay (?) erratically distributed.
~~1.5%~~ 2.5% black woody charcoal-like organic debris < 1 mm

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320-350
100% unconsol. sand AA (S)
2% org. debris
0.3% py.
pyrite occurs as erratically distributed colloidal/microxln cement

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350-380
~~AA~~ Tr. glass 1% pbls.
5 cement
99% silty mud, lt. grayish-orange, with 3-4% anom. coarse (<0.7 mm) detrital mica

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380-410
2 cmt
6 mod. anh. <3 mm
1 79 slty mds. 15% sand AA
same color
WHITE
Tr OBSIDIAN

DR-11 10/05/02

410-440': 5 mod anh; 82 slty mdst.; 13 ss — Tr OBSIDIAN

440-470': 2 mod anh; 87 slty mdst; 11 ss

470-500': 3 mod anh; 92 slty mds; 5 ss

~ 5% of the mdst is v lt, sl. yellowish-gray
rest is lt. grayish-orange / matte
2% "coarse" mica.

500-530': 2 mod an.; 98 slty to sparsely sandy mdst.
lt. orange-gray matte

530-60': 1 mod anh.; 7 mds; 92 muddy sand.
lt. grsh-orange

560-90: 7 mod & Xln ANH.; 2 gyp; 84 slty mdst.; 7 ss; 0.5 py

"hopper xls
< 1.5 x 0.5 mm
partially hollow

mod anh.
py platelets
2mm

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590-620'	2 mod ¢ xln anh.	1 grp.	97 mds.	0.2 py

lt., sl. orange-gray matte

620-650'	2 mod ¢ xln anh	—	98 mdst	Tr py

~ 25% of the mds. vs lt. matte, sl. yellowish-gray
remainder is lt. matte orange-gray
These are admixed as "breccia" but suspect
this is the product of the drilling process

650-680'	5 mod ¢ xln anh.		95 mds. AA	Tr py
680-710'	2 mod ¢ xln anh		98 mds AA	Tr py
710-740'	~ 2% mod ¢ xln anh.		77 mdst AA,	3% py.
740-770'	6 mod. ¢ xln anh.		94 mdst AA	1% py
770-800'	7 mod. ¢ xln. anh.		93 mdst. AA	Tr. py
800-830	1 mod. ¢ xln. anh.		99 mdst (mostly lt. yell.-gray	—

DP-11 - 10/05/82

820-860'	5 mod # x/n anh.	95 mdst lt. yel. gray matte		0.2 py
860-890'	7 mod # x/n anh	86 mdst AA	7 [illegible]	0.2 py
890-920'	8 mod # x/n. anh.	92 mdst AA	—	0.1 py
920-50	7 mod # x/n. anh.	93 mds' AA	—	0.1 py
950-80'	5	95		Tr =
980-1010'	5	95		Tr

in 10% of the mudst vs matte lt.-med. grayish-red

1010-1040	5	95		Tr
1040-1070'	4	96		—
1070-1100'	3	97		—
1100-1130'	1 mod x/n anh	75/15	57 mds.	35ss

DR-1 10/05/02

1130-1160' TW AN 5slt Tn 88 sand mgr. sagg

1160 — 65 mdst. 35 sand/ss

mdst mostly lt. yellowish-gray, but some is lt. grayish-red

sands is same, is argillaceous.

1190-1220': AA (col)

1220-1250 93 CMT 100% ss A all ©

? lt. yellowish to barely greenish-gray marlye semi-consol

1250-1280'

60 CMT looks like SLTS ?

93 mdst AA 7% ss

75 CMT ?

93 mdst 7% ss

1280-1310'

65 mdst 35 ss

AA friable, disagg

6

DR-11 10/06/02

1340-70 10 CMT		85 mdst lt. grn-gray & red gray	1553 ?	frj- disagg AA	©
1370-1400 9 CMT	5 slts	92 mdst	3 ss	©	AA
1400- 1430-	5 slts	56 mdst	39 ss	©	
ss. bec. buffy-white, app. less argillaceous					
1430- 1460-	7 slts	32 mdst	61 ss	©	mostly lt. grnish- gray & arg.
1460- 1490-	3 slts	64 mdst	33 ss	©	ss, buffy white to vvlt. grnish-gry frr/disagg.
1496- 1520 5 CMT	9 slts	54 mdst.	37 ss	©	AA "ruddy" "soft"
1520- 1550	5 slts	68 mdst.	27 ~~slts~~ ss	©	AA
1550- 1580-	3 slts	72 mdst	25 ss	©	AA
1580- 1610-	5 slts	62 mdst	33 ss	©	AA

DR-11 ~~FG~~ 10/06/02

1610-~~1640~~':	13 slts	68 mdst	19 sand / ss	©
	v.lt. YGr to GR Gr mottle, dull earthy, fria.			
1640-1670'	5 slts	70 mdst	25 sand / ss	AA ©
1670-1700'	3 slts	84 mdst	13 ss	© AA
			earthy	
1700-30' / 10 CV / 1 cmt / 1 R$s	5 slts	11 mdst	84 ss (sand) disagg	© buffy white m gr 0.35 mm
	Heavily contaminated / CAVED			
1730-60 / 5 cmt (?) / 15 CV / 2 R$s	9 slts	17 mds	74 (sand)	AA
	pebble frags common.			
1760-90' / 3 R$s	mostly caved debris do not trust sample			
1790-1820' / 4 R$s / 5 cvd - obvious, could be more	7 slts ?	56 mdst ?	37 sand ?	8
	much could be caved			

DR-11 10/06/02

1820-50 3 R$s 1 cvd.	2 slts	~~0~~ 13 mds	~~13 mds~~ 85 ss (sand) AA
1850-80 1 CV 2 R$s	1 slts	7 mds lt gray earthy matrix	92 sand (all disagg.!)
1880-1910 2 R$s TR-CV		6 mds	94 sand AA
1910-40'	3 slts	14-15 mds	82 ss mostly multgr grain frags/chips < 1 mm
1940-1970	4 slts	15 mds	81 ss (mostly sand)
1970-2000'	5 slts	16 mds	79 ss AA

snd 0.3-0.35 mm mdgr.

note: sand from 1820-1830' seems well sorted & contains more qtz than most — all matrix winnowed away — could this be aeolian (?) grains mostly subangular to angular

DR-11 10/06/02 HOW MUCH SAND IS CAVED ??

2000-2030'	5 slts	12 mds	83 sand AA	CVNG ?
2030-60'	7 slts	25 mds	68 sand BB & ss, fnr-gr	CVNG ?
2060-90'	4 slts	16 mds	80 sand	CVNG ?
2090-2120	9 slts	23 mds	68 sand & ss.	CVNG ?
2125-2150 tr. 2% cvd. pbl. frags	13 slts	25 mds	62 sand & ss	CVNG ?
2150-80'	7 slts	36 mds	57 sand & ss	smpl. looks legit ~~OK~~ ~~OK~~ ?
2180-2210	~~10~~ 15 slts	~~12 mds~~ 58 mds	~~23~~ 27 ss	©
2210-40'	18 slts	76 mds m-dk. matte gray	6 ss	©
~~2240-70~~	~~5 slts~~	~~91 mds dk gray~~	~~4 ss~~	~~©~~

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DR 5 ~~22~~ 11 10/06/02

2240-70':	5 slt	80 mds lt earthy mdbe gray msl	16 ss	buffy-white ◎
	11 ↔			
2270-2300': 5 CEMENT	5 slts	27 mds	68 ss fr. ◎	
2300-30' 1 CV pbbls	13 slts	34 mds	53 ss ◎	
2330-60' 4 cvd. pbls. 3 cement 2 Rds	11	5 mds	95 sand clean same as 2000'	CV ?? 22 don't trust
2360-90' (OK)	7 slt	92 mds ◎ med-gy	1 ss	OK no CV
2390-2420'	3 slts	17 mds	80 ss frr, argill. ◎	
2420-50'	5 slts	25 mds	70 sand ◎	
2450-80'	3 slts	92 mds	5 ss ◎	
2480-2510'	3 slts	23 mds	74 ss	◎

DRS 10/06/02

2510-40'

2 slts 17 mds 8 ss all ©

ss is fgr, 0.15 mm, friable, earthy buffy white to slightly grnsh-white

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2540-70' 2 slts 9 mds 7 ss AA Tr. EP

med. gray

2570-2600' 5 slts 95 mds. 2 ss AA

2600-30' 3 slts 95 mds 2 ss AA

esp. fresh-looking, med-dk. gray

2630-60' 7 slts 84 mds 9 ss

2660-2690' 5 slts 25 mdst ~~25 ss~~ ~~23 ss~~ 70 ss AA

2690-2720' 7 slts 58 mds 35 ss

2720-50' 5 slts 40 mst 55 ss

2750-80' 5 slts. 25 mds 70 ss

2780-2810' 5 slts ~~35~~ 30 mds ~~60~~ 65 ss

DR-11 10/07/02

2810-40	2 sltHs	73 mds	25 ss	
2840-70	1 sltHs	89 mds ©	10 ss	
2870-2900	—	5 mds ©	95 sand © ≠ ss. buffy-white, friable, ©, mgr.	0.5 ep
2900-30	5 sltHs	93 mds AA ©	2 sand	
2930-60	3 sltHs	80 mds AA ©	17 ss	Tr Ep
2960-90	9 sltHs	84 mdst © becoming bleached. lt. gray-green	7 ss	Tr Ep
2990-3020	3 sltHs	© 92 mds ep < 0.5 x 0.1	~~3 ss~~ 3.5 ss	1.5 VF / 1 Ep 0.1 cpy 0.3 py
3020-3050	2 sltHs	63 mds	35 ss	1 Ep 0.1 cpy 0.3 py
3050-80	11 sltHs	13 mds	76 ss	0.5 ep 0.1 py Tr cpy
~~30~~				

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DR-11 10/07/02

3080–3100'	9 slts	5 mds	86 ss	0.1 EP
3110–3140'	7 slts	70 mds	23 ss	Tr. EP
3140–3170'	3 slts	13 mds	84 ss	8 EP
3170–3200'	17 slts	45 mds	38 ss	3 EP

DR 11 10/04/02

3200-3230':

5 slts @ | 9 mds. @ | 86 ss @ | 7 EP 0.1 py

mostly ss is mottled buff-white and yellow-green, some (~ 15%) is more argillaceous & chloritic & med. dull grayish-green. non-arg.

slts & mds are lt-med dull grayish-grn.

3230-60':

3 slts @ | 5 mds @ | 92 ss @ | 6 EP 0.2 py

one chip silicified

pp, 2 distinct types of sandstone a little more of the argill chlte variety (~ 30% of total ss)

3260-90'

5 slts @ | 12 mds @ | 83 ss @ for. | 1 AN 7 EP 0.5 py Tr HM

a few slst chips are silicified

3290-3320'

slst 1 @± | 86 mdst 80 @ 20 | 7 ss @± | 1 VF | 1 EP 0.3 py Tr. cpy

most of the mds is mottle med. gray, msv. & calcareous

3320-50'

13 slts @± | 54 mdst @± | 33 ss @± | Tr VF | 2 EP 0.5 py

3350-80'

15 slts @± | 17 mdst @± | 67 ss 15 | 0.5 VF | 3 EP 0.5 py

DP 11 10/04/02

3380–3410	4 slts	9 mds ©±	87 ss	Tr VF	6 EP 0.3 py
3410–40	5.5 slts	7 mds ©±	87 ss	0.5 VF	8 EP 0.5 py
3440–70	10 slts	12 mdst	76 ss	1 VF	5 EP 0.5 py
3470–3500	7 slts ©±	72 mdst ©±	21 ss	—	1.5 EP 0.3 py
3500–30	13 slts ©±	72 mdst ©±	15 ss	—	1.5 EP 0.3 py
3530–60	11 slts ©∓	27 md ©±	62 ss	Tr VF	4 EP 0.5 py
3560–90	25 slts ©±	51 mds ©///	24 ss	Tr VF	2 EP 0.2 py
3590–3620	7 slts	7 mdst	86 ss		3 EP 0.5 py
3620–50	7 slts	DK GRAY / LT GRAY-GREEN 82 mdst ©±	11 ss		0.5 EP 0.1 py
3650–80	5 slts ©±	89 mds ©	5 ss	1 VF	1 ANH (mod) 0.5 EP 0.3 py
3680–3710	5 slts	92 mdst ©∓ 16	2.5 ss	0.5 VF ep-anc gr2	1 ANH 1 EP 0.5 py

DR-11 10/04/02

3710-40'

16 slts 5.5 ©

93 mdst ©

Tr SS ©

1.5 # VF ep-q anh.

0.7 py
1 EP
1 ANH

some poss. hollow anh.

2 mm plate w 0.5 x 0.2 mm. each. ep. prisms ≡ open space

3740-70'

7 slts ©
same color ↔ grnsh.-gray ©

87 mdst bkrd v. lt. ©

Tr SS ©

6 VF ≠ med. some anh. modular?

5 ANH
0.3 EP
0.5 py
Tr. opy

3770-3800'

11 slts ©≡

85 mdst ©≡
© is med. matte gray no green

Tr SS ©

84 VF

3 ANH
1 py
0.2 EP
TR HM

3800-3830'

29 slts ©≡

75 mdst ©≡
med. gray matte

1.5 SS

0.5 VF

1 py
Tr EP
Tr ANH

3830-60

53 slts ©≡
sl. brnsh med. matte gray

30 mds ©≡

AA

17 SS ©≡

1 VF

0.7 EP
0.4 py
0.1 anh.

3860-90

AA

61 slts ©≡

28 mds ©≡

9.5 SS ©±

1.5 VF

0.7 py
Tr. SP
1 EP
1 ANH

3890-3920'

AA 57 slts ©≡

~~45~~ 28 mds ©≡

15 SS ©±

1 VF

1.5 EP
0.7 ANH
0.3 py

DR-11 10/04/02

v. fine (1mm) chips

3920-50': 1 steel	15 slts ©=	79 mdst ©=	5ss ©±	1 VF	1.5 ep 0.3 py 0.3 ANH
3950-80' 1 steel	27 slts ©=	64 mdst ©=	7.5ss ✗	1.5 VF	1 EP 0.5 py 0.5 AN.
3980-4010' 1 steel	25 slts ©±	70 mds. ©±	4ss 4.5 ©	0.5 VF	1 EP 0.5 py 0.5 ANH
4010-40' 2 steel	11 slts ✗	7.5 mds ✗	8 ss ✗	0.5 VF	4 EP 0.3 py
4040-70 2 st. & R 2 LCM	7 slts ✗	9 mds ©± CV ?	84ss ©	Tr VF	5 EP 0.3 py
4070-4100'	7 slts ✗	76 mds ©±	17ss ✗	Tr VF	1 EP 0.2 py Tr. cpy
4100-30'	5 slts ✗	11 mds. ©±	89ss ✗	Tr VF	5 EP Tr. py
4130-4160'	7 slts ✗	33 mds ©±	60 ss ✗	Tr VF	4 EP Tr py
4160-4190'	7 slts ✗	31 md ©±	62ss ✗	Tr VF	5 EP 0.3 py
4190-4220	5 slts ✗	69 mds ✗	25 ss ✗	1 VF	2 EP 0.5 py 0.5 ANH

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DR-11 10/05/02

4220-50-		13 slts	69 mds	17 ss	1 VF	2 EP 1 AN 0.5 py
4250-4280-	crs chips 1.5-2 mm	9 slts	13 mds	78 ss	Tr VF	7 EP 0.15 py Tr. cpy
4280-4310 1 steel		17 slts	42 mds	4 ss	Tr VF	3 EP 0.3 py
4310-40-		19 lt. gray slts	9 mds	72 ss	Tr. VF	7 EP Tr HM 0.5 py
4340-4370		21 slts	38 mds	4 ss	Tr VF	3 EP 0.3 py
	1 chip ss silicified					
4370-4400		11 slts	13 mds	75 ss	1 VF	0.1 ACT 4 EP 0.4 py
	several ss & slt chips silicified (~ 5-7% total					
4400-10- CHANGE		18 slts	ED mds.	15 ss	2 VF	2 HM 1 EP 0.7 py 1 AN
		21			19	

~ 20% slts & mds chips are silicified & these contain diss. spec. hematite

DR-11 10/05/02

BIG CHANGE

4410-20'

11

27 sltst

mdst

355

GOUGE

2EP

3.5PJ

FAULT ZONE

10 VVF
10 GG

20

~ 40% of the chips are brilliant white silky-fibrous TREMOLITE fibrous aggregates (almost certainly altered gouge

~ 5% are porous vbx (crush vbx) w/ ± clasts of sltst., mdst., altered (< 1mm) cemented by qtz-anh.

30% are crush vbx — rare sltx

much of the sltst, mdst, gg, ± vbx SILICIFIED

± pyritized & bordered pyrite

4420-30'

5 slts

5 mds.

35

GOUGE

6 GG
3 VVF

20

3.5 EP
3 ACT
1 HM
1 PY
1 ANH
Tr cpy

DR-11 10/05/02

37

4420-40'

11

20 sltst | 25 mds | 13 ss | 37 gg | 5VF

Gouge seemingly has slts ± ss protolith— commonly foliated v. lt. greenish-gray to buffy white

mackly comm epidotized slcfd./act.

mod. silicific.

6 EP
3 AC
tr
0.5 py
0.5 AN
Tr. HM

4440-50'

8 sltst | 17 mds | 17 ss | 53 gg | 5VF

mod/ix

rx very approx

AA

7 EP
2 AC
1 py
0.5 AN

4450-60'

11 sltst | 15 mds. | 13 ss | 58 gg | 3VF

5 EP
1 AC
0.5 py

gg mostly derived from ss— commonly sericized, silicified, epidotized comm. foliated.

v. lt. yell-grn-gray pearlescent

21

DD-11 10/05/02

4460-70

11 slts 33 mds 28 ss 23 GG 5 VF

comm folded

7 EP
1 AC.
0.3 py
0.5 AN

mod. silicification
even "pure" rock types partly crushed & sheared
(fault zone)

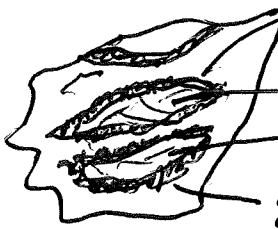
4470-80'

5 slt 21 mds 6 ss 5 GG 3 VF

all

2 AN
1 py
4 EP
1 HM

mdst is msv med gray to grnish gray, commonly speckled w/ white "snowflakes" (porphroblasts?) < 0.2 mm.



reminiscent of S= anh. in caprock (inherited here)

DR 11 10/05/02

4480-90':	15 sl/st	58 md	2 SS	5 GG 2	1 VF	3.5 ED 0.5 Py Tr. Act
4490-4500':	9 sl/st	13 md st	74 SS	3 GG	1 VF	9 ED 0.5 Py 1 AN Tr. Act
4500-10'	5 sl/st	11 md st	82 SS	1 GG	1 VF 0.3 Py	8 ED 0.5 ACT
4510-20'	~~11 sl/st~~ 11 sl/st	~~23~~ 23 md AC	60 SS	3 GG	3 VF	6 ED 1 ACT 1 ANT 0.5 Py

~~TD~~ ?


24

DR-11 10/07/02

4520-30': 7 slts ~~30 mds~~ 17 mdst 5 crush-bx 70 ss 2 VF 1 ss

5 Ep
0.3 py
Tr. sp.

~1/2 of the ss is apparently soaked with oil now devolatilized. These chips are med dull grayish-brown

most of the ss is f-mg mod-well sorted arkose (3) speckled yelf-green, white (ser. & act) & buff-white Φ & FSP

breaks around grains but not friable (ep)

slts. mostly lt. grnsh-gray speckled w/ ep. fairly hard

mdst — v lt. grayish-green

~~a few of the ss chunks are sheared & partially granulated~~

(proto crush-bx) = FLT edge

crushed

the crush breccia is foliated & sheared, w/ few or no surviving clastic grains. now principally EP-QTZ-SER rock mottled white & pistachio-green

DR 11 10/07/02

4530-40'
13 CVP

3 SLTS 17 mds 77 SS 2 crush by 1 VF

7 EP
1 BRW
2 ACT
0.5 py

4540-50'
5 CVP

7 SLTS 66 mdst © F 27 SS

Tr crush by

Tr act
3 EP
0.5 py

4550-60'
10 CV
35 CV

very coarse chips 6-7 mm
<1/2 mm

5 SLTS © F 58 mds © ± 37 SS

3.5 EP
Tr ACT

CAVING

don't trust this one

4560-70'
10 CV

7 SLTS 54 mds © F 37 SS 2 VF v lg chip

1 py
4 EP
0.5 AC

4570-80'
5 CV

23 slts © ± 49 mds 27 SS 1 VF

v. lg chips

1 AC
1 py
3 EP

4580-90'
7 CV

some v. lg (<12 mm) flattish caved chips

7 slts © 69 mdst m-dk gray © 9 SS 26

1 EP
0.5 py
Tr act

DR-11 10/07/02

2 EP
0.3 py
Tr. bn
0.2 HM
0.3 AC
Tr. gy

4590-4600' 7 slts 77 mds 16 ss

mdst & slts chips 1-10 mm dia (< 5mm) flattish, matte med. gray, msv some anom. cbs. mica

ss as described above

4600-4610' slts 15 51 mds 33 ss 1 VF

3 EP
0.5 AC
1 py
1 AC

4610-20 13 slts 60 mds 27 ss

1.5 AC
3.5 EP
0.3 py

4620-30 33 slts 58 mds 9 ss 0.3 py

1 EP
0.5 AC

chips of slts & mds flakes avg 6x4x0.5-1 mm (< 11 mm dia.)

LG CHIPS

4630-40' 17 CX 1 LCM

7 slts 27 mds 64 sand 2 VF

7 EP
Tr. AC
0.5 py

mds - mostly lt. matte greenish gray & slts & non

27

DR-11 10/07/02

4650-60' 7 cv	5 slts ©±	25 mdst some cv? ©±	68 ss	2 VF	7 EP 0.5 Ac 0.5 py
5 cv 4660- 70	7 slt/f	6 mds	3 ss	1 VF	3 EP 0.3 Ac 0.1 py
4675-80'	23 slts ©F	59 mds ©F	13 ss	5 VF mstly ep-sar-grz ± ext.	7 EP 0.5 Ac 0.5 py Tr. sp.

most mdst ± slts lt. grayish-green, matte,

4680-90' 7 cv	5 slts (17)	51 mdst	32 ss	1 VF	0.7 Ac 1 py 4 EP
4690-4700'	± slts 5 slts	27 mds	67 ss	1 VF	0.5 py 7 EP 0.5 ac.

— fra, highly disagg.

4700-10' ss more chloritic	15 slt/st	33 mds	58 ss AA	VF 3.5 VF	1.5 py 7 EP

VR-11 10/07/02

LAU 3
1 py
11 EP
1 AC

4710-20 11 CV 3 VV	2 slits © F	15 mds © F	02 ss ~~©~~	1 VF	

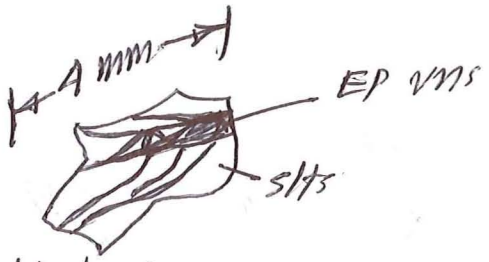
suspicious bimodal chip < 1/2 c 7mm, 1.5 m.
suspect contamination by caving

4720-30 15 CV Frags up to 12 X 10 X 1.5 mm	7 slits ~~©~~	~~66~~ mds ~~©~~	25 ss ~~©~~	2 VF	4 EP Tr. ~~1 py~~ AC 1 py
4730-40 15 CV do AA	5 slits	60 mds	33 ss	2 VF	5 EP 1.5 py 0.5 AC
~~4740-50~~ 17 CV	7 slits	40 mds	43 ss	2 VF	5 EP 0.7 py 0.1 AC
4750-60 21 CV	? 25 slits	? 40 mds	? 51 ss	4 VF	6 EP 1 py Tr. AC
4760-70 17 CV 2 RDs	? 5 slits	? 13 mds	~~? 12 mds~~ 80 ss AA	2 VF	9 EP 0.5 AC 0.3 py
4770-80 13 CV	5 slits	15 mds	70 ss AA	2 VF	9 EP Tr. AC, 0.3 py

10/~~09~~09/02

DR-11 ~~4780-90'~~

4780-90'; (7 CV)	9 slts	62 ~~&~~ mdst	2 ss	2 VF	4 EP, Tr Ac, 0.1 py
4790-4800 (~25 CV)	? 7 slts	? 5 mds	? 3 ss	? 2 VF	4 EP, Tr Ac, 0.1 py
4800-10 (7 CV)	21 slts	27 mds	4 ss	3 VF (EP, Ac, Py)	4 GG (EP, Ser, Ac, Py) — 2 Ac, 6 EP, 0.5 py, Tr. cpy
4810-20' (7 CV)	1 slt	5 mds	9 ss	—	— — 9 EP, Tr Ac, 0.3 py
4820-30 (5 CV)		5 mds	9 ss	1 VF	9 EP, Tr Ac, 0.3 py



a few slt & ss chips silicified.

GG vs "messy" mottled-looking aggregate of ep, q, ser & actinolite, in decr. order of abundance

cvd fragments are thick flakes o. avg 7 x 5 x 1 mm, up to 10 x 7 x 2 mm, slts, chltzd, lt. gray-green

indigenous fragments avg 1 mm, up to 9 mm, almost all sandstone

DR-11 10/09/02

4830-40 EST 13 CV	5 slts	68 mdst	25ss	2 VF	3.5 EP Tr AC 0.2 py
4840-50' est 27 CV	3 slts	21 mst	76 SS	1 VF	9 EP Tr AC 0.3 py
4850-60' est 27 CV 5 LCM	7 slts	23 mds	69 ss	1 VF	7 EP Tr AC 6.1 py
4860-70 est 40 CV	3 slts	9 md	87 ss	1 VF	11 EP 0.5 AC 0.5 py
4870-80' est 17 CV	9 slts	37 mds	53 ss	1 VF	6 EP Tr AC 0.2 py
4880-90' est 9 CV	8 slts 5	17 mds	~~79 ss~~ 77 ss	1 VF	9 EP Tr AC 6.1 py
4890-4900' est 31 CV	3 slts	13 mds	81 ss	3 VF	9 EP Tr AC 0.3 py
4900-10 est 33 CV	3 slts	15 mds	79 ss	3 VF	8 EP 0.5 AC 0.7 py

DP-11 10/09/02

4910-20'; est 55% CV	5 slits	17 mds	75 ss	3 VF	6 EP 1 AC 0.5 py
4920-30' est 55 CV	5 slits	15 mds	77 ss	3 VF	8 EP 1 AC 0.3 py
4935-40' est 40 CV	3 slits	16 mds	80 ss	1 VF	8 EP 0.5 AC 0.3 py
4940-50' 27 CV	5 slits	31 mds	59 ss	3 VF (2 EG)	7 ep 2 AC 0.2 py
4950-60' 25 CV	3 slits	9 mds	87 ss	1 VF	6 ep 0.5 AC 0.5 py
4960-70' 23 CV	2 slits	7 mds	90 ss	1 VF	9 ep 0.3 AC 0.2 py
4970-80' 35 CV	4 slits 5	11 mds	83 ss	1 VF	8 ep 0.5 AC 0.3 py
4980-4990'	3 slits	15 mds	80 ss	2 VF	8 ep 0.5 AC 0.5 py
4990-5000'					

DR-11 10/09/02

5000–5010						Tr HM
3 CV	3 s/Hs	11 mds	84 ss	2 VF		9 EP
						0.1 py
						~~0.5~~
						Tr. ACT
5010–20		AA				Tr HM
7 CV						
5020–30	1 st/st	9 mds	86 ss	3 VF	16 G	10 ep
15 CV						1 ACT
						0.2 py
5035–40	?		79			
25 CV	4 s/Hs	13 mds	~~86~~ ss	3 VF	16 G	9 EP
2 LCM						0.5 ACT
						Tr HM
						0.3 py
5040–50		AA				
21 CV						
3 LCM						
5050–60	8 s/Hs	9 mds	82 ss	1 VF		8 EP Tr HM
25 CV						1 py 1 AC
5060–70	6 s/Hs	31 mds	61 ss	2 VF		0.5 py
50 CV						0.5 AC
						8 EP
5070–80	4 s/Hs	35 mds	57 ss	(4) VF		2 AC
47 CV						1 py
						Tr. cpy
						7 EP

DR11 10/09/02

5080–5090 / 60 CV	5 slts	27 mds	65 ss	3 VF	0.5 ACT 8 EP 1 py
5090–5100 / 45 CV	1 slts	7 mds	91 ss	1 VF	11 EP 0.5 py 0.5 ACT Tr. Tale ?
5100–10 / 65 CV	1 slts	9 mds	89 ss	1 VF	1 ACT 0.5 py 12 EP
5110–20	>95% CVP – do not trust				
5120–30 / 70 CV	~~2~~ slts ~~2~~ 2	21 mds	76 ss	~~2~~ 1 VF	10 EP 0.3 AC 0.7 py
5130–40 / 90 CV	? 5 slts	? 25 mds	? 68 ss	? 2 VF	2, 8 EP 0.3 ac 1 py
	mostly caved				
5140–50	>97% CVP – do not trust				
5150–60 / 75 CV	? 3 slts	? 30 mds	66 ss	? 1 VF	7 EP 0.3 act. 0.3 py
5160–70 / ~~95~~ CV	5 slts	17 mds	77 ss	1 VF	1 py 0.5 AC 9 EP

Do not use

34

DR-11 10/09/02

5170-80- 47 CV	2 slts	9 mds	89 ss	IVF	8 EP 1 Py 1 Ac Tr Ac
5180-90- 60 CV	5 slts	13 mds	81 ss	IVF	7 EP 1 Py 1 Ac
5190-5200	> 95% CVD — do not thrust				
5200-10- 37 CV	7 slts	15 mds	77 ss	IVF	7 EP 0.5 EP Ac 0.7 Py
5210-20 37 CV	5 slts	17 mds	77 ss	IVF	7 EP 0.3 Py 0.3 Ac
5220-30 40 CV	2 slts	9 mds	84 ss	3VF 266	6 EP 1 Py Tr. Ac
5230-40- 40 CV	6 slts	52 mds st	40 ss	IVF	3.5 EP Tr Ac 0.2 Py
5240-50	> 95% CVD do not thrust				

35

DR-11 10/09/02

5250-60 70 CV — 6 slts 21 mds 69 ss 4 VF — 7 EP, Tr AC, 0.3 py

5260-70 — 79% CV — do not trust

5270-80 (68 CV) — 4 slts 61 mds. 33 ss 2 VF — Tr AC, 3 EP, 0.5 py

5280-90 (57 CV) — 6 slts 56 mds 33 ss 4 VF (1 GG) — 1 AC, 5 EP, 0.7 py

5290-5300 (55 CV) — 7 slts 12 mds 77 ss 3 VF (1 GG) — 3 AC, 8 EP, 1 py

5300-10 (57 CV) — 5 slts 17 mds 75 ss 3 VF — 2 AC, 8 EP, 1 py, Tr. cpy

5310-20 (45 CV) — 5 slts 23 mds 70 ss 2 VF — 6 EP, 1 AC, 0.5 py

5320-30 (57 CV) — 4 slts 25 mds 68 ss 3 VF — 1 py, 7 EP, 0.4 AC.

DR II 10/09/02

5330-40 5LCM 45CV	5 slts	27 mds	66 SS	2VF	7 EP 0.5 AC 1 py
5340-50 37CV	7 slts	29 mds	60 SS ✓	4VF ↓ EP ?? AC ?? py	2 AC 8 EP 0.5 py
5350-60 40CV	3 slts	25 mds	70 SS	3VF	9 EP ~~1.5 AC~~ 1 AC 0.5 py
5360-70 3 LCM 35 CV	2 slts	19 mds	76 SS	3VF	0.5 py Tr. cpm 9 EP 0.5 AC
5370-80 25CV	3 slts	33 mds	62 SS	2VF	7 EP Tr. AC 0.5 py
5380-90 21 CV	——	AA	——	——	7 EP 1.5 AC 0.5 py
5390-5400	2 slts	58 mds	35 SS	3 ~~4~~ VF	2 GG 1.5 AC 5 EP 0.5 py

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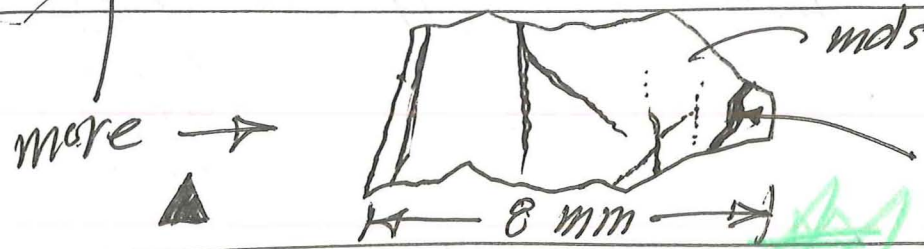
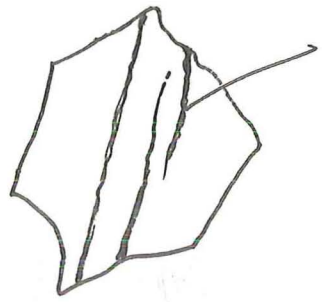
10/10/02 DR II ~~5400-5410~~

5400-10' (55 CV)	3 SLTS	59 mds	35 ss	2 VF	1 GG	0.3 py 0.5 AC 4.5 EP
5410-20' (60 CV)	5 slts	49 mds	41 ss	4 VF	1 GG	1 py 6 EP 0.5 AC
5420-30 (60 CV)	11 slts 7.8	64 mds	27 ss	1.5 VF	Tr GG	0.7 py 1 AC 3.5 EP
5430-40' (<10 CV)	5 slts	73 mds	21 ss	1 VF	Tr GG	0.3 py 0.3 AC 3 EP
5440-50' (<10 CV)	7 slts	75 mds (C±)	17 ss	~~Tr~~ VF 1	—	0.5 AC 2.5 EP 0.3 py



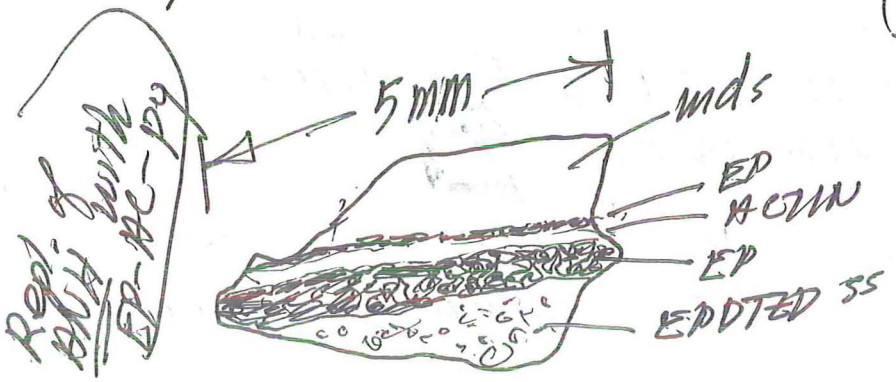
5450-60'	6 slts	76 mds	17 ss	1 VF	no shearing	Tr. TALC Tr HM 0.7 py 0.5 AC 2.5 EP

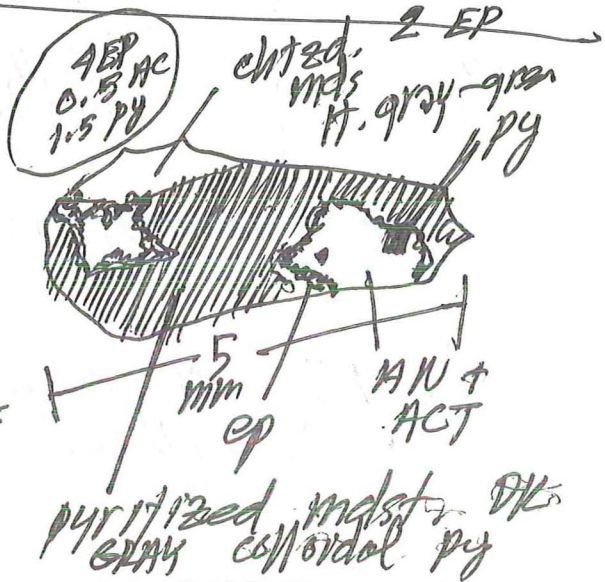


PR II 10/10/02

5460–70 (<10 cm)	//	3 slits	89 mds	7.5 ss	0.5 VF	Tr AN 1.5 EP 0.2 AC 0.3 py
5470–80 (<10)	//	5 slits	85 mds	9 ss	1 VF	Tr AN 1 py 1.5 EP 0.2 AC
5480–90 (<10)	//	7 slits	87 mds	5 ss	1 VF	Tr AN 0.5 0.7 py 0.2 AC 1.5 EP Tr TALC
5490–5500 (<10)	//	8 slits	85 mds	6 ss	1 VF	0.2 AC 0.7 py 0.7 AN 2 EP
5500–10 (<10)	//	5 slits	83 mds	9 ss	3 VF	1 py Tr TALC 1.5 AN 0.3 AC 2.5 EP
5510–20 (<10	//	8 slits	85 mds.	5 ss	2 VF	Tr TALC 0.2 AC 1.5 EP (PI) 1.5 AN 2 EP
5520–30	//	9 slits	84 mdst	3 ss	4 VF	4 EP 0.5 AC 1.5 py

39





DR11 10/10/02

5530-40 (<10)	13 slts	78 mdst	7ss	2VF	0.3 AN 0.3 py 0.1 cpy 0.1 sp 2 EP 0.2 AC
5540-50 (<10)	9 slts	~~87~~ mds 83	5ss	3VF	1 AN 4 EP 0.1 AC 0.7 py
5550-60 (<10)	14 slts	76 mds	5ss	5VF	5 EP 1.5 AN 0.5 AC 1 py
5560-70	~ 90% cv do not trust				
5570-80 (<10)	17 slts	72 mds.	7ss	4VF	5 EP 0.5 AC 1.5 py Tr AN
5580-90 (<10)	13 slts	78 mdst	7ss	2VF	3 EP 0.3 AC 0.5 AN 1 py
5590-5600 (<15)	5 slts	60 mds 33 AR	Tr ss	2VF	1.5 EP Tr AC 0.5 AN 1 py

actinolite vnlt. cutting msv epidote

(AR argillite is med. matte gray, msv, flinty-appearing 40

MDS is lt-med grnish-gray, msv, matte, "earthier" - texture than the argillite)

DR-11 ~~10/02~~ 10/10/02

5600-10 (<10) AA

5610-20 (<10) 5 slts 52 mds / 37 AR AA 4.5 ss 1.5 VF py vs mostly diss, colloidal, in argillite 2.5 py 0.1 sp 1 EP Tr. AC 1 AN

5620-30 (<10) 3 slts 11 mds / 83 AR AA 2 ss 1 VF 0.7 EP ~~1~~ py 2.5 ~~0.1~~ 1 AN Tr. AC

5630-40 (<10) 5 slts 7 mds / 86 AR AA 1 ss 1 VF 4 py 0.2 cpy 0.5 EP 1 AN Tr AC

5640-50 9 slts 5 mds / 44 AR AA 4 ss 1 VF 1.5 py 3 EP Tr AC 0.5 AN

ss vs speckled yel.-grn (EP) & buff-white, very sericitic, very friable, ~~medium~~-grained. fine

5650-60 5 slts 5 mds / 29 AR 6 ss 1 VF 4 EP Tr. cpy 0.7 py 0.3 AN Tr AC.

41

1

DR-11 10/10/02

5660-70' 2slts 7mds/77 AR AA 13ss 1VF 4py 0.5 EP 0.5 AN !

Arg Mdst is slightly translucent py colloidal/diss. AA.

5670-80' 2slts 2mds/95 AR 1.5s Tr VF 1 py 0.2 EP 0.3 AN

↳ dark gray

5680-90' 5slts 10 mds/59 AR 25ss ~~AA~~ 1VF 0.5 py 0.3 AN 1.5 EP

5690-5700' 5slts 13mds/46 AR AA 35ss AA 1VF 2 EP 0.5 AN 0.3 py

---

5700-10' 2slts ~~AA~~ 2mds/11 AR 8As 1VF 5 EP 0.3 py

ss lf & mgr, poorly sorted, abund. ~~calc.~~ altd. arg/lt. matrix w/ very little (rel.) ep.

ss speckled buff-white transl. lt. gray, lt. grnsh-gray, & yellow-green (ep.

42

EXTREMELY FRIABLE
Breaks around grains

DR-11 10/[illegible]/12

5710-20 (40+) CV	3 slts	5 mds / 13 AR	78 ss AA	1 VF	6 EP 0.5 py
5720-30 (50+)	5 slts	3 mds / 9 AR	82 ss AA	1 VF	7 EP 0.3 py
5730-40' Tr scale (sap) (<10 CV) <10	9 slts	55 mds / 7 AR	27 ss	2 VF	3.5 EP 0.3 py

mdst is v.fi. matte grayish-green (chloritized)

5740-50' (40+ CV) VF	~~23~~ 27 slts	~~8~~ 32 mds / 3 AR	~~[illegible] ss~~ 32 ss	3 VF	5 EP 0.3 py (1 EG) (0.5 AC)

much of the ss looks partly crushed/sheared, but not enough to call it gouge — These chips are essentially EP-SEP rock w/ apparently no FSP remaining.

5750-60' (40+)	17 slts	45 mds ©± / 2-5 AR	35 ss	0.5 VF	3.5 EP 0.5 py
5760-70' (40+)	9 slts	5.5 mds / 12 AR	72 ss	1.5 VF	4 EP 0.3 py
5770-80 (40+)	19 slts ©±	5 mds / 11 AR	5 ss	Tr. VF	0.3 EP Tr py
5780-90 (60+)	17 slts ©±	3 mds / ~~44~~ 49 AR	~~[illegible] ss~~ 31	1 VF	1 EP 0.3 py
5790-5800' (40+)	7 slts	3 mds / 76 AR	13 ss 43	1 VF	1 EP 0.5 py Tr cpy Tr sp

DR/11 10/11/02

5800-10':

(30+CN)

5800-10' (30+CN)	3 slts	3 mds / 87 AR	2.5 ss	1.5 VF	Tr po	0.3 EP, 0.5 AN, 0.3 py, Tr gy

ARGILLITE is dk matte gray msv, slightly translucent — apart from "metamorphism" rock is very fresh-looking ≡ heat, no fluid

5810-20' (60+)	5 slts	3 mds / 90 AR	2 ss	Tr VF	0.7 py, Tr AC, 0.2 EP

NOTE: w/ few veinlets, massive, & unaltd. this argillite is a great candidate for a permeability barrier

5820-30' (60+)	3 slts	1 mdst / 91 AR	5 ss	Tr VF	0.3 EP, 0.2 py, 0.1 AN
	5 slts	3 mds / 87 AR	5 ss	Tr VF	
5830-40' (25)	53 slts Ⓒ±	3 mds / 39 AR	5.5 ss	0.5 VF	1.5 EP, 0.3 AN
5840-50' (30+)	23 slts Ⓒ≠	58 mds / 13 AR	5 ss	1 VF	0.7 AN, 0.5 py, 1 EP
5850-60' (40+)	25 sltst	56 mds / 15 AR	2.5 SS	1.5 VF	0.5 EP, 0.3 py, 0.5 AN
5860-70' (25)	5 sltst	10 mds / 82 AR (aa)	3 ss	Tr VF	0.3 EP, 0.5 py, 0.3 AN
~~5870-80'~~ 5880-90' (35)	3 slts	17 mds / 13 AR	67 ss	Tr VF **44**	4 EP, 0.7 py, Tr AN

ss is (fgr) speckled buff-white to pinkish-white, pure white and gr-yellow (EP) — very friable

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5870-80 (out of sequence) 6 slts 52 mds/35 AR 7ss Tr VF 0.3 py Tr. p. 0.3 EP

~~5880-90~~

5890-5900 7.5 slts 7.5 44 mds/11 AR 37ss 0.5 VF 3.5 EP Tr AC 0.3 py

ss matrix may contain anhydrite

5900-10' (10') 5 slts 30 mds/12 AR 53ss Tr VF ~~0~~ 5 EP Tr AC 0.5 py

5910-20' (20) 5 slts 29 mds/50 AR 15ss 1 VF Tr GG 2 EP Tr AC 1 py

AR & MDST are flinty-appearing mdst. vs med greenish-grdy & transl.

5920-30' (15) 29 slts 25 mds/15 AR 27ss 4 VF 1 GG 4 EP 1 py Tr AC Tr AN

5930-40' (20) 5 slts 19 mds/3 AR 70ss 3 VF 15 EP! Tr Sp. 1 py Tr. cpy 4 AC

ss is med. gr., grnsh-yellow, unusually rich in epidote & actinolite

5940-50' 9 slts 11 mds/5 AR 73ss 2 VF 7 EP 2 AC 0.5 py

EP ↓ CH & SER ↑

5950-60' OVER

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5950-60': 2 slts 75 mdst 17 ss (6 VF) 4 vn ch. 7 EP 1 py

rock is much different: mostly mdst, lt-med grayish-green, heavily veined w/ fxln chl; vnlts ≤ 1 mm (mostly < 0.1 mm) also vein qtz & ep. — both commonly ech. Tr HM

5960-70': 23 slts (sndy) 21 mds 54 ss 2 VF 6 EP Tr AC 0.5 py

ss is chloritic/argillaceous

5970-80': 51 sndy slts 11 mds 36 ss Prr 2 VF 5 EP 0.5 py Tr Ac

5980-90: all AA

5990-6000': 7 slts AA 5 mds 86 ss (Prr) 2 VF 13 EP 1 Py Tr Ac

6000-6010': 7 slts 15 mdst 76 ss 2 VF 4 py 1.5 15 EP record Tr. AC

sandstone is hard, siliceous, breaks across grains

6010-20': 5 slts 2 mds 93 ss AA 2 VF 1.5 py 17 EP Tr Ac

but some friable

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6025-30' 8 slts 19 mds 71 ss 2 VF 2.5 py
11 EP
Tr BC

slts & muds are lt. grayish-green, earthy/matte

6030-40' 4 slts 4 mds 88 ss 4 VF 17 EP !
2 py

EP

a few VF EP-chl-qtz up to 3 mm dia, very porous

6040-50' 17 slts 7 mds 75 ss 1 VF 14 EP !
2 py

ss finer-grained & mostly friable, breaking around grains

6050-60' 9 slts 5 mds 84 ss 3 VF 1 py
15 EP

much of the VF is CHL

6060-70 4 slts 21 mds 7 ss 4 VF 10 EP
1.5 py

mostly breaks across grains

EP > CHL > QTZ

>> PY

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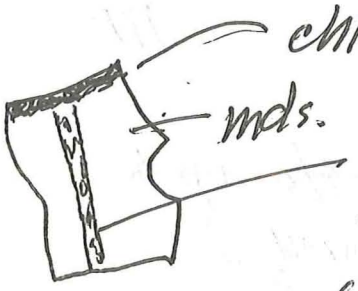
6070-80':	7 slts	18 mds	24 ss birks across grains	IVF	45 py 7 EP

mdst mostly med-dk gray-green, matrix sl. translucent, hard

6080-90'	9 slts	70 mds	17 ss	4 VF	1 py 3 EP 0.5 AN



6090-6100'	16 slt	53 mds	27 ss	2 VF 4	6 EP 1 py
6100-10'	17 slts	51 mds	29 ss	3 VF	8 EP 1 Py

TD