25_a

CHEVRON SHALE OIL COMPANY
DRILL HOLE RECORD

DRILL HOLE No. CC 25
DRILL AREA

COORDINATES		COLLAR ELEV	TD		
N	E	8003.8			

DRILL CO	DRILLER	CORE SIZE	DIA. HOLE	CASING	DATE START	DATE COMPL

RADIOMETRIC LOG	LOGGER	TD LOGGED		

GEOLOGIC LOG BY C. Scott C. Creighton

DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
0			Uinta SS, angular chips of fine gr. $CaCO_3$ cement SS, fresh but oxidized tan in color. (bedrock @ surface?)
10			
			gray to lt brn, sl finer gr. to sltsn
20			(20-25') 50% of sample subang. chips of a yellow-brn clayey rk, (weathered oxidized layers?)
30			incr. of oxidized weathered rk described above
40			sl. less weathered (40-45')
50			

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DRILL HOLE RECORD

DRILL HOLE No. 2C-25

DRILL AREA

DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
60			-60' marked color change. to lt. gray chips angular, fresh. rk is vfg little or no $CaCO_3$ - (Si cement?) dk organic material 3-5%
70			
			- color change to dull brn.
80			
			color varies w/ degree of weathering & alteration. lt gray → tan → white
90			
			95-140 no recovery
100			
110			
120			

REMARKS:

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
130			
			no recovery 95-140
140			
		osh	145 — oil shale, dk brn to blk
150			
			20% sltstn fragments - tan color
160			osh decr. to 30%
		slstn - ss	tr. calcite chips (fracture fill
			rk 20% osh, 25% fgrss, 50% varved sltsn
170			
			(175') incr. ss - 40%, osh decr. to minor amts
180			
		mlstn	(185') hi $CaCO_3$ %. rk mostly mlstn
190		osh	oilshale fresh angular fragments
		sltst/o.sh.	65% sltst lt. brn-gray, o.sh. 20%, 15% gray s.s.

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
		sltst/o.sh.	(200-205)
200		sltstn -ss	40% ss - 60% sltsn, several large, tabular calcite xstls
		osh mlstn	mlst - med yield osh
210			
			approx. 10% ss
220		mlstn	rk nearly 100% thinly laminated mlstn
230			increase sltsn
		ss	rk 70% ss
240			
			90% S.S.
250		S.S/o.sh	50% gray s.s. 50% dk o.sh.
		S.S.	90% S.S., gray
260		o.sh/s.s	50% gray s.s. 50% dk o.sh.
		mlst/s.s.	60% mlst 40% gray s.s.

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
		mrlst / s.s	
270		o.sh	80% dk o.sh. 20% gray s.s. some o.sh. has white, lens shaped mineral (precipitate), nonefferescing
			mostly o.sh, moderate, w̄ mrlst
280		s.s.	gray s.s with o.sh laminations @ 30% of total
		o.sh	70% lean-mod o.sh 20% s.s 10% mrlst
290		s.s	70% gray s.s., 30% mrlst
300			increase in o.sh / mrlst ratio ↓
R-8		o.sh.	lean - mod o.sh.
310		s.s / o.sh	60% gray s.s, 40% lean o.sh
		s.s.	75% gray s.s., 25% mrlst - lean o.sh
320		o.sh / mrlst	40 o.sh, 40 mrlst, 20 s.s.
		o.sh / s.s.	45% lean o.sh / mrlst, 35% s.s., 20% rich o.sh
330		s.s.	70% gray s.s., 30% mrlst / lean o.sh
		mixed zone	33% unconsolidated clay, 33% gray s.s., 33% mrlst/lean o.sh.

REMARKS:

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
		mixed zone	
340	7649		
		o.sh.	med grade o.sh w 10% mrlst
350			
		o.sh.	60% hi grade, 40% lean
		s.s./o.sh	60% s.s. (50% white, 50% grey) 40% lean o.sh
360		o.sh/mrlst	60% lean o.sh./mrlst 40% rich o.sh.
			o.sh. more moderate & less bimodal distribution calcite xtals present
370			
380		o.sh/mrlst	60% mod o.sh. 40% mrlst
390		o.sh.	90% rich o.sh. 10% mrlst
		o.sh/mrlst	80% lean-med o.sh. 20% mrlst
400			end of rotary samples

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
		osh	Begin core samples med-lean osh
400			siltstone or tuff, w/ tar in matrix, tar [illegible] to highest % @ top (4" @ 406.5'
			fractures vertical (408-413)
410			[illegible]
		mrlst	[illegible] mrlst 400-401 403-405 408-410
420			.8-1.5" clastic units. lenticular to wavy w/ tarry matrix, bounded by ¼" lean osh (429.0, 431.7, 433.0)
430			[illegible]
440			(443-448) vertical fractures
450			(451.7') fine gr. tuff, irreg. contacts altered w/ white mineral (analcite repl.?)
460			(449-460) minor lenses of barren clay (<1mm)
			466.3 [illegible] thinly laminated highly convolute

REMARKS:

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
			mrlst 474-475
470			intermittent thin ≤1cm bands of gr. to brn tuff. partially replaced (analcite?) total 3-5% of interval 468-479.
		o.sh.	
480			lean o.sh. 482-484
		mrlst	
490		osh	vertical fractures (496.6 - 499.0) (510 - 512.5)
			mrlst 492-493 494-496 505-507
500		mrlst	
		o.sh.	
510			super saturated o.sh. 2 cm thick 510.4 - 512.7 vertical fractures
		mrlst	
520			(519.5 - 519.7, 521.0 - 521.4) fine gr. clastic lenses w/ distorted interbeds of osh. Saturated w/ tar possible alteration and/or precip
			528.3 2" unit as above
530			
			534 - 540.5 thin units of above rk, .3-3cm thick

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
540		o.sh o.sh	clastics (fine grained) o.sh. in lenses (30% entire section) with reworked appearance
			fine grained clastic lenses w̄ distorted beds of o.sh. saturated w̄ tar, possible alteration and/or precip 546.1 - 546.9 550.7 - 551.3 563.1 - 563.7 547.7 - 548.1 556.1 - 556.4 usually assoc. w̄ leaner o.sh
550			558.0 - 558.3 as above w̄ bedding slightly disturbed below & higher oil saturation
560			mrlst 565 - 566 570 - 571 577 - 579
570			bedding dip increases to 15° from horizontal disturbed bedding w̄ tar dip ranges from 10° to near vertical
580			581.3 - 582.4 rich tar layers seeping out from particular layers overall unit has stromatolite appearance, possible analcite alteration
590			
600			603.0 - 605.6 Near vertical fractures, no replacement
		mrlst	1cm pyrite band along bedding plane; white, noneffervescing mineral assoc with pyrite

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
		osh	
610			
			lean o.sh. 627-628
620			622.3-622.7 rich osh w/ thin laminations, [illegible] lenses, and spheres of buff colored med grained rk *
		----	623.4
		mlstn "A"	"A" groove - highly fractured barren mlstn. tr. pyrite.
630			
		----	633.0
		osh	less fractured appears to be a higher yield
640			638-639.2 .5-1.5cm tuffs 10% of rk gray to brn, depending on tar content
			639.5 } 640.0 } 2½" units as above, seem to contain white opaque secondary grains (analcite?) (false MM?)
650			- mahogany marker 5" gray - lt brn tuff analcitized and w̄ tar filled cavities ≤1mm fine - med grain [mrlst 652-653]
			654.5 rich osh same as 622.3-622.7
660			- 648.1 cl sltstn lenses surrounded by a gray reaction ring resembling SiO_2 or Analcite - Total zone 1½ cm thick
			648.7 3" layer of buff - brn, fine grained rock darker areas higher in tar
670			x.s.
			674.6 fracture approximately parallel to bedding plane, some tar bedding also starts to slope at this point with dip increasing downward 675.5 tuff w̄ sltst, tar, 1" thick
			676.6 3½" nahcolite zone (nahcolite 60%, rich o.s. 40%) @677 dip is @ 17° and max. value

REMARKS: * previously labeled as sand

This hole appears to contain more tuff

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
		o.sh.	678-679.5 dipping (12°) and pyrite along the bedding plane
680			679.5 dip is nearly horizontal
			683.1 - 683.6 near parallel fractures in o.sh.
			at base of fractures - 1½ cm tuff bed gray, analcitized
			684.5 - 686.2 pyrite along bedding plane
			685.9 - 686.7 & 687.7 - 689.6 o.sh. has different appearance
690			thin black lenses rather than complete laminations
			mrlst 701-702, 704-705, 712-714
			4 <1cm bands of gray-white minerals (tuff?) with pyrite
700			tuff common
			710.2 - 710.6 thin (≤ 1mm) bands & lenses of tan colored clastic material in rich osh
			712.5 - 713.5 barren mlstone, highly fractured
			714.7 - 715.6 vfg ss (reverse graded bedding?)
710			
720		mrlst	thin discontinuous pyrite rich bands
		o.sh.	
			Gradational contact
		"B" mlstn	"Barren" thinly lamin. mlstn, broken & fractured in places
730			729.5 2" unit gray sugary text. rk rich in pyrite along vert. fractures and in lenses, 15-20% porosity
			pyrite along bedding planes, very little along fractures ↳ thin laminations, 1mm
			740 - 740.9 brecciated mrlst 733-735 ung loss
740			R-6
		o.sh.	740.2 - 741.0 brecciated, distorted marlstone muddy appearance
			mdst 748-750

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
		o.sh.	748.2 - 748.4 vfg well sorted rk, clean, (ss?) 1" in center is stained light orange - color may be caused by orange tar
750			
		mrlst	748.8 - 749.0 vfg well sorted rk, clean (ss.?) gray-white
			749.9 1/2 cm band (tuff?) gray - black
760			756.4 2" vfg (sltst) lt. gray — leaner o.sh more broken up
			759.3 gray - black tuff, fine-med grain, small clay lenses mixed in
			gray tuff, 2", fine - med grain
770			mrlst 757-758, 760-761, 763-764, 768-769
			774.4 - 776.9 very lean o.sh. - mrlst, pyrite along bedding planes
			776.9 - 780.0 60% rich o.sh. with spotted look due to small sltst lenses 40% med o.sh. - no lenses
780			mrlst 772-773, 775-777
			785.0 - 786.1 rich o.sh w small clay lenses as above
			786.1 - 786.6 fracture w very minor xtallization, 20° to core axis, in lean o.sh
790		o.sh.	mrlst 804-806
		mrlst.	mrlst lt brn - gray broken up @ 796.0 - 796.5 pyrite in spots & along bedding planes
800			801 - 820
		o.sh.	50% o.sh. - 50% mrlst units cm - 4 ft thick ↳ med-lean
810			tuffs - tar filled, fine grn 1-2" thick 807.8, 808.9
		mrlst	
			814.0 - 817.3 core loss slippage & broken zone above for 3 ft. (in mrlst)
		o.sh.	817.3 - 819.2 spotted o.sh. (sltst lenses)

REMARKS:

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DEPTH	ELEV.	ROCK UNIT	DESCRIPTION
820		o.sh.	820 - 826 lean o.sh.
830		mrlst	gray - buff mrlst pyrite along bedding planes & in lenses seems to be associated more with grayish mrlst than buff colored (organic relationship?) higher yield of kerogen lo yield thin ss/sltst layers begin
840			lean o.sh. 832-833, 835-837
850		o.sh.	highly broken - lo yield mrlst 877.5 lean - mod o.sh. 1st ½ ft broken up
860		o.sh / mrlst	gray - buff mrlst with laminated to poorly lam o.sh. pyrite occurs as above small sand/sltst lenses (1cm thick) intermixed
870		o.sh.	med grade o.sh. poorly laminated core loss 8"
880		mrlst	mrlst 873-874, 875-877 gray - buff pyrite more abundant lenses & along bedding planes wafers of reworked marl 1" tuff analcitized Fe oxide? coating fine - med grn core loss 883.7 - 885.0
		o.sh.	887.3 minor vug w pyrite & yellow (Fe oxide?) & mystery mineral End of hole 893.5 highly wafered & fractured

REMARKS: o.sh. - 891
mrlst 891 - 893.5