

DEPTH	±	FRX	PF	AL/100	CORE REC.	LITH.	DESCRIPTION
0							Overburden
35							SILTSTONE, light gray, slightly calcareous
50							SANDSTONE, light gray, fine to medium grained with some pebbles & some siltite; moderately sorted; calcareous cement
60							
70							SHALE, medium brown, thinly bedded, fissile
75							SANDSTONE, light gray, fine to medium grained
80							SHALE, light gray-medium brown, thin-bedded, fissile
100							SILTSTONE becoming SANDSTONE, light gray, very fine gr
110							SANDSTONE as above
120							
130							<del>SANDSTONE</del>
140							SANDSTONE as above (some light brown)
150							
160							
170							SANDSTONE as above - becoming coarse grained
180							
190							SANDSTONE as above - fine grained
200							
210							
220							SHALE, light to medium brown; fissile, soft
230							SHALE, light to medium brown; fissile, calcareous
240							SHALE, with some SAND light brown; fissile, calcareous
250							SHALE, with some SAND light brown; fissile, calcareous
260							SANDSTONE, red brown-light brown, calcareous; SAND
270							SHALE, green, calcareous, fissile
280							SHALE, green, calcareous, becoming SANDY
290							SHALE, light green-light brown, calcareous; fissile
300							SANDSTONE, light green-brown; BITUMEN flakes
310							SANDSTONE, light gray-brown
320							SANDSTONE, light gray-brown
330							SANDSTONE, light gray-brown with BITUMEN lenses
340							SANDSTONE, light gray-brown
350							SANDSTONE, light gray-brown
360							SANDSTONE, light gray-brown
370							SANDSTONE, light gray
380							SANDSTONE, light gray, with BITUMEN chips or lenses
390							SANDSTONE, light gray
400							SANDSTONE, light gray
410							SANDSTONE, light gray; some black flakes
420							SANDSTONE, light gray
430							SANDSTONE, light gray
440							SANDSTONE, light gray with visible dark grains
450							No Sample
460							SANDSTONE, light gray-grading into a brown SHALE
470							SHALE, brown; hard & fissile
480							SHALE, brown; hard & fissile
490							SHALE, medium to dark brown, fissile at first but less so with depth; variable organic content
500							SHALE, " " " " "
510							SHALE, " " " " "

COMMENTS:

DEPTH	+	FEET	PP	VAL/TUS	CORE REC.	LITH.	DESCRIPTION
520							SHALE, as above
530							
540							
550							
560							
570							
580							
590							SHALE, as above with minor amount of SANDSTONE, light
600							line-grained, (probably thin lenses)
601							Probable NAHCOLITE zone
602							SHALE, medium to dark brown; somewhat fissile
608							occasional chips of MARLSTONE, light brown
610							SHALE, medium to dark brown; calcareous
620							SHALE, medium to dark brown; calcareous
630							SHALE, light brown, hard
640							SHALE, light brown grading into dark brown
650							SHALE, dark brown
660							SHALE, dark brown
670							SHALE, dark brown; calcareous
680							SHALE, dark brown with light brown lenses; fissile
690							697-698 Kelly bar dropped approximately 1-2 ft. void
700							SHALE, as above
710							SHALE, as above
720							SHALE, medium-dark brown, fissile
730							
740							
750							
760							SHALE, dark to very dark brown, fissile
770							
780							
790							
800							
810							
820							
830							
840							
850							
860							

COMMENTS:

DEPTH	+ FT	GR	PP	GR/TON	CORE REC.	LITH.	DESCRIPTION
870	+132		.45				SILTSTONE, medium brown, finely laminated with occasi
871							blebs of BITUMEN; some very thin layers of PYRITE
872	+130			13.7			HEMATITE; some thin altered, tuffaceous SANDSTONE
873			.01	7.8			generally with distorted upper & lower contacts;
874			.48.58	8.4			occasional very thin layer of SANCOLITE
875			.40	10.5			
876			.00.41	14.1			
877			.48	10.3			877.08-877.18 SANDSTONE, tuffaceous; distorted lower
878			.48.58	13.7			SILTSTONE, as above saturated with dead oil
879			.72	7.6			
880			.4035	7.0			
881				6.2			
882	+120		.53	7.1			
883				10.7			SANDSTONE, thin layer, oil saturated
884				13.8			SILTSTONE as above
885			.96	13.5			885.56-885.74 SANDSTONE, tuffaceous; very fine grained
886				9.9			oil saturated; distorted lower contact; upper contact
887				10.8			SILTSTONE as above
888			.67	12.0			
889				10.1			
890				11.7			890.48-890.57 SANDSTONE, tuffaceous, oil soaked
891				9.5			SILTSTONE as above
892	+110			8.7			
893				2.9			
894				4.8			
895			.55	11.4			
896				15.9			
897			.67	10.4			
898				1.8			898.75-898.96 SANDSTONE, tuffaceous; irregular contact
899				10.1			899.50-899.57 same as above; oil saturated
900			.80	14.7			OIL SHALE, medium-dark brown; finely laminated with s
901			.34	10.8			sandy lenses
902	+100			12.9			
903				9.0			
904				8.5			904.05-904.20 sandy layer, oil saturated
905				7.9			OIL SHALE as above
906				8.0			
907				8.9			
908				1.4			908.53-908.95 sandy layer, oil saturated
909				16.4			OIL SHALE as above
910				1.4			
911				9.6			
912	+100			9.6			
913				9.0			
914				1.5			
915				1.9			
916			.01	11.6			916.14-916.34 sandy layer, oil saturated
917				13.0			917.50-917.86 sandy layer, oil saturated
918				9.5			OIL SHALE as above
919				12.1			

Drilled 30.18 Ft.  
Recovered 30.11 Ft.  
4:30 AM, 11/27/74 (0.07' assumed lost on bottom)

Drilled 30.26 Ft.  
Recovered 30.33 Ft.  
9:00 AM, 11/28/74

COMMENTS: \*Fracture is coated with dead oil.

DEPTH	± FE	FEET	FT	TIME	CORE REC.	LITH.	DESCRIPTION
920			.85	11.3			920.85-921.05 sandy layer, oil saturated
921				9.4			OIL SHALE as above
922	-80		.85	8.5			
923				16.5			923.70-923.76 Sandy layer; oil saturated
924				12.0			OIL SHALE as above
925				9.2			925.56-925.71 sandy layer; oil saturated
926				7.4			OIL SHALE as above
927				5.2			
928				9.4			
929			.00	8.7			
930				6.9			
931			.76	7.3	930.44		931.96-932.19 lost 0.23' of core
932	+70		.19	10.1			
933				9.1			OIL SHALE, medium to dark brown; finely laminated with
934			.43	13.8			interbedded sand lens
935			.44	14.3			935.44-937.06 UPPER WAVY BED, contorted sand layer
936				10.7			
937			.06	9.9			
938				7.9			
939			.40	11.0			
940			.71	14.8			
941				13.6			
942	+60			13.9			
943				11.3			
944				11.3			
945				10.4			
946			.50	7.5			
947				8.3			
948			.38	11.3			
949				14.0			
950			.90	22.7			OIL SHALE, dark brown to black, finely laminated with
951			.74	6.7			interbedded sand lenses
952	-50			8.8			
953			.58	6.6			
954			.67	9.3			
955			.88	15.6			
956				11.2			
957				10.5			
958			.00	13.3			
959			.78	37.4			
960			.44	15.7	960.44		
961				12.7			SHALE - SILTSTONE, medium-dark brown, very hard & oil
962	+40			11.5			moderately calcareous &/or dolomitic; finely laminated
963				14.1			with very thin FRUIT-HEMPLE layers; occasional
964				16.4			very thin beds of oil sand & (oil), tortuous sandstone
965				16.2			beds (frequently with dead oil)
966				15.2			965.10-965.75 low grade (oil) zone with a thin, tuffaceous
967				15.8			SANDSTONE (965.24-965.27), highly contorted lower core
968			.61.78	23.5			oil saturated
969				26.0			low grade zone (968.55-969.35)
							SHALE, as above but light medium brown; contains thin
							laminae of light buff DOLOMITE

## COMMENTS:

lost core from 957.11 to 957.30 (0.19') - left on bottom & pickup up on next run.

DEPTH	FEET	FRS	FE	ALY LOS	CORE RIG.	LITH.	DESCRIPTION
970				7.3			
971				5.6			
972	+30	1.35	.38	5.2			
973		1.47	(1.47)	2.8			973.47 thin layer (0.01') chalky white material along
974				7.2			irregular parting plane & as blebs & discontinuous
975			.07	6.5			
976		1.75		4.7			OIL SHALE, low grade, medium brown to gray with much
977		1.82	.10	3.2			MARCASITE along fine laminae in upper portion; fine-
978		1.84	.21	2.1			grained, finely laminated
979				2.0			
980			.62	3.6			
981				13.0			
982	+20			12.9			
983			.32	20.3			983.76-983.84 SANDSTONE, tuffaceous; oil saturated;
984				27.4			irregular contacts
985				15.7			985.37-985.56 chalky material, white-buff; distorted
986				13.2			much PYRITE & MICAITE, some CALCITE
987				13.9			
988			.68	23.0			988.75-989.15 SANDSTONE, tuffaceous; irregular, oil
989				29.6			saturated additional thin layers of tuffaceous SAND
990			.28	26.5	990.00		below with thin layers of chalky material at top
991				27.0			OIL SHALE, light brown to black, hard with fine bed
992	+10		.00	7.4			interbedded zones of SANDSTONE, oil saturated
993			.84	40.0			
994				24.9			994-1000 OIL SHALE light brown, low grade with some
995				18.9			interbedded thin zones of tuffaceous SANDSTONE
996				14.6			layers throughout section are oozing oil
997				10.9			
998				12.2			
999				17.0			OIL SHALE, light brown, homogeneous; thinly laminated
1000			.74	10.2			
1001				12.5			
1002	0		.39	13.2			1002.45-1002.77 MAROGANY MARKER; competent SANDSTONE,
1003		.07		9.9			tuffaceous; oozing oil; rich oil zones below
1004		.90		8.7			OIL SHALE as above
1005		.65		12.3			
1006		.59		19.5			1006.69, Irregular fracture in small sand lens
1007		.00		48.1			1007-1012 Dark black oil zone
1008		.12		22.9			
1009				21.6			
1010				16.2			
1011				30.8			1011.8 SANDSTONE, tuffaceous (thin) 1011.3-1013 SAND
1012	-10			22.7			small irregular layer) intermittent
1013		.66		37.1			zones of oil
1014		.18	.33	50.9			1014-1016 OIL SHALE, high grade
1015		.48		36.7			around the lens
1016		1.80	.57	24.1			
1017		.80	.89	64.4			
1018				48.3			1018.67-1018.70, sand lens
1019				52.6			

1020.00

## COMMENTS:

Parting planes exist mostly on contacts between sand lenses &amp; oil shale.

DEPTH	+ME	FRX	FP	AI/100	CORE REC.	LITH.	DESCRIPTION
1020				20.8			
1021				39.5			
1022	-20	1.85	.60	23.9			OIL SHALE, dark brown-black mostly high grade; irregular thin bedding with some contorted sandy lenses
1023				20.7			
1024		50		23.1			
1025		42	.33	26.5			
1026				32.8			1026.60-1026.78 SANDSTONE, tuffaceous
1027			.23	41.0			OIL SHALE, very black
1028			.41	35.1			OIL SHALE, very black
1029				21.5			OIL SHALE, very black
1030				30.8			
1031				28.8			
1032	-30			18.1			1032.28-1033.13 SANDSTONE lens
1033			.11	15.9			
1034				21.5			
1035				31.2			OIL SHALE, banding seen between zones of black-brown, light brown oil shale
1036				12.0			
1037				11.2			
1038				12.8			OIL SHALE, light brown with dark brown bands
1039				16.5			
1040				32.2			
1041				35.2			
1042	-40			31.0			
1043			.44	23.6			OIL SHALE, light brown
1044			.97	23.9			
1045			.38	36.3			
1046				27.7			
1047			.70	20.1			1047.09-1047.41 CALCITE lens 3
1048				14.9			
1049				11.6			
1050				17.7	1050.31		OIL SHALE, light-medium brown, low grade; hard, very calcareous
1051				14.1			
1052	-50			23.9			OIL SHALE, moderate grade zone
1053			.12	10.4			
1054			.45	8.2			
1055			.67	5.9			
1056				4.9			
1057			.50	7.5			
1058			.90	19.4			1059.2-1062.3 only slightly calcareous
1059			.87	7.2			1059.95-1060.30 SANDSTONE, tuffaceous; oil saturated
1060			.62	8.2			
1061			(.83)	21.1			OIL SHALE, moderate grade zone with some layers (0.02 thick) of high grade; tuffaceous SANDSTONE layer, L.
1062	-60			14.5			bleeding oil
1063				8.6			
1064				6.7			
1065				17.2			
1066			.10	38.5			OIL SHALE, moderate-high grade zone with numerous thin laminae of tuff
1067				5.3			
1068			.36	5.0			
1069				2.6			

Drilled 30.31 Ft.  
Recovered 30.34 Ft.

6:00 AM  
12/4/74

Drilled 29.79 Ft.  
Recovered 29.84 Ft.

(100+2)

COMMENTS: Parting planes exist mostly on contacts between sand lenses & oil shale.

HOLE NO. X-1 SHEET 5 OF 6 DATE: 12/5/74 LOGGED BY: Gentzler &amp; Moulton T.D. 11

DEPTH	FEET	INCHES	FEET	INCHES	CORR. REC.	DEPTH	DESCRIPTION
1070			.22	3.3			1070.22-1070.25 chalky-white material, laminated
1071			.85	3.4			
1072	-70		.73	11.4			OIL SHALE, high grade
1073			(Integ.)	15.2			1073.64-1074.22 SANDSTONE, tuffaceous, buff; calcareous
1074			(Integ.)	24.3			altered contorted; GILSONITE flecks
1075			50.52	12.0			1075.10-1075.15 SANDSTONE, tuffaceous
1076				6.6			
1077				2.9			OIL SHALE, becoming silty
1078			.39	4.1			
1079				4.5			
1080				4.1			OIL SHALE, low to moderate grade, hard; interbedded SA
1081				4.3			& BITUMEN zones - BITUMEN zones are oozing oil; all
1082	-80			5.7			above are thinly bedded
1083				5.8			
1084				5.9			
1085			.36	3.2			
1086				9.4			
1087				5.9			
1088				3.2			
1089			.74	2.6			
1090			22.50	1.0			1090.28-1090.50 SANDY zone with sulfide layer (MARCASITE)
1091			.31	4.2			also BITUMEN
1092	-90			2.6			1092.5-1093.0 BITUMEN zone (lenses or blebs) oozing oil
1093				3.8			
1094				4.3			
1095			.33.76	2.9			1095.82-1096.00 SANDY lens with sulfide zone (generally
1096				4.0			MARCOSITE) oozing zones (BITUMEN)
1097				3.4			oozing zones (BITUMEN)
1098				3.0			oozing zones (BITUMEN)
1099			.45	2.5			oozing zones (BITUMEN)
1100				2.2			OIL SHALE, light brown-gray; low grade with sand lens
1101				2.4			
1102	-100			4.0			1102.35-1103.00 SANDY zone
1103				6.8			
1104				1.3			Some very thin BITUMEN seams & TUFF zones
1105				1.1			
1106				1.0			
1107				0.7			
1108				0.9			
1109				1.6			
1110				1.2			
1111				0.5			
1112	-110			0.4			OIL SHALE, light to dark brown, low to moderate grade;
1113				1.1			very hard, thinly bedded
1114				3.2			
1115				5.5			
1116				5.3			
1117				2.4			
1118				1.3			
1119				5.6			

COMMENTS:

HOLE NO. X-1 SHEET 6 OF 6 DATE: 12/5/74 LOGGED BY: Moulton, T.D.

DEPTH	± AC	FRX	PP	PAV/TON	CORE REC.	LITH.	DESCRIPTION
1120				12.1			OIL SHALE as above
1121				13.6			
1122	-120		.35				
1123			.43				
1124			.11				
1125			.26				
1126							
1127			.46.67				1127.46-1127.67 SANDY lens, buff; scarce MARCASITE
1128			.05.19				1128.05-1128.19 SANDY lens, buff; scarce MARCASITE
1129			.34.80				1129.80-1129.98 SANDY lens, buff; scarce MARCASITE
1130							
1131			.53.90				
1132	-130		.08				
1133		1.98	.38.79				1133.50-1133.69 SAND, black ?
1134			.76				
1135			.12				
1136							
1137							
1138			.34				
1139			.15.53				
1140	-138						OIL SHALE, moderate grade
					1140.05		

Drilled 30.10 Ft.  
Recovered 30.10 Ft.  
10:00 PM. 12/5/74

COMMENTS: