

# FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P4 Core  
 DATE 10/20/74 TITLE Sum. Phillips / S.H. 10 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 START 51.54 COMPLETE 57 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver LOGGED BY B. S. Sims

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
51.54-					Sandstone, 51.54-52.9' Grey, v.f.	
54		P.D. 122		122	grained to silt, non calcareous	
					mod. hard, no distorted	
					laminae at ~30° to horizontal,	
					very round smooth holes (4.0/1) (vugs)	
					(residual vesicles) in upper 1'	
					light colors more calcareous	
					ting (gr. 4.01' but 7.25') thin	
					P.D. 52.9' 53.3' micaceous; gls; quartz	
					Steeper 4.01' hole;	
					P.D. 52.9' 53.3' micaceous	
					52.2 ~35° not 11 2.6. 14.0	
54.57		P.D.		112	Sandstone 54.57-55.4' Grey,	
					fin. grained with silt, rare	
					Feels to, non calcareous	
					conspicuous 20%; 55.4-55.25-	
					color mod. harder mod hard	
					thin 4.01' hole; 4.01' vert;	

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/20/74 TITLE San Phil. H. 25, SOHIO  
 START 57-68' COMPLETE 68'  
 EQUIPMENT USED \_\_\_\_\_

BORING NO. P4 Core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY \_\_\_\_\_

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					... ..	
57-60					Sandstone, as above, laminar	
					local distorted, hydrocarbon	
					... .. to .05' at 80° to	
					horizontal;	
60-61.9					Sandstone, as above, v. graded	
					but coarser above ...?	
					... .. at 60.9' is ...	
					distorted, slightly calcareous	
62.9-65.9					Sandstone, as above with distorted	
					laminae    to each other and	
					at 40° to horizontal (  )	
					FRAC from 65.6 to 65.9;	
					slightly calcareous	
65.9 to 68+?					65.9 to 66.5 as above with    FRAC	
					at 66.5	

## NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-21-74 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START 10-21-74 COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Gardner Denver  
Ligne Western

LOGGED BY J. Craven

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DEPTH	SAMPLES				DESCRIPTION Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
below	6.5 - 71.54				Sandstone 5Y6/1 grey, v. fine to fine grained, even grained lightly calcareous, micaceous, with hydrocarbon streaks. NOTE: Recovery as chunks from 4" to 6", irregular; no bedding noted.	
71.54 - 71.55	2	5Y 7/1	100	200	Sandstone, grey, 10 YR 5/1, grain size to very fine. Subrounded to rounded, non-calcareous, bedding - not distinguishable, few carbon plant fragments. Fractured!	
					Location 31 1. Location 31 1.	
					74.1 Horiz 82.85'	Horiz
					77.9 Horiz 84.4'	Horiz
					80.8 Horiz 85.85'	Horiz
					81.6 Horiz 87.25'	Horiz
					82.2 Horiz 87.50'	80"
					82.44 Horiz 87.85'	Horiz
					83.1 Horiz	Horiz
					89.0 Horiz	Horiz

## NOTES:

10-21-74

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## FIELD LOG OF BORING

PROJECT NO. 77-68

DATE 12-1 TITLE CONFIDENTIAL

START 10-2 COMPLETE           

EQUIPMENT USED 1950-1955

BORING NO. 1-7 Core

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

LOGGED BY S. J. M.

P.L.A. 1

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**NOTES:**

10-21-74 (11:00)

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## FIELD LOG OF BORING

PROJECT NO. 4-368

BORING NO. P-4 core

DATE 10-21-74 TITLE Sum-Hh 145

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START 10-20-74 COMPLETE                     

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Station

LOGGED BY J. Cranor

James Dwyer 2003

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DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:		
111.55 -	4	Core		$\frac{20.0}{19.9}$	Sandstone, gray 7.54R 5%, fine, grain shape not determined, well sorted, cementation - silica? Compaction, calcareous - slight to none, hard. Bedding irregular, subparallel, inclined 20°-30° to core. Lenses throughout run. occasional occurrences of carbonized plant fragments and small spots of hydrocarbons.		
131.55 -					@ 118.4' 2" irregular <sup>irregular</sup> small patch of fine calcite crystals, subhedral, and a phyllosilicate mineral, illite? Subhedral to euhedral. Horizontal fractures caused by drilling or removing core from barrel. No parting planes observed.		

**NOTES:**

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/21/71 TITLE Sun Phillips/50H10  
 START 131.55' COMPLETE 134.4'  
 EQUIPMENT USED Gardner Denver 2000  
Layne Western

BORING NO. 24 Core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems  
 Page 6.

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
131.55-151.55	5	Core		1988	Sandstone 10 YRS 1-6/1, mottled grey; v.f. grained, well sorted, cementation: silica, <sup>slight</sup> clayst;	
		RQD =	3.5" 20'	98%	hard; non calcareous to slightly calcareous; distorted thin laminae to thin beds, at 10° to 40° to horizontal; <sup>intermittent</sup> flecks to small "spots" of hydrocarbons to .4"; some minor pyrite with hydrocarbons;	
			131.55-134.4		FRACTS. or mechanical breaks prior to Removal from barrel at:	
				13385	138	141.54 146.3
				134.4	139.25	141.9 146.8
				135.09	139.67	143.1 148
				136.61	139.140.09	144.95 150.2
				137.87	140.46	146 150.96
						151.55
					All are sub horizontal & at angles to bedding unless noted.	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/21/74 TITLE Sun Phillips / Sottio  
 START 134.4 COMPLETE 140.09  
 EQUIPMENT USED Layne Western  
Gardner Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems  
P. 7

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
134.4-	5			100%	Sandstone same as above to	
137.15			RQD	100%	u/136.5', <del>bed</del> laminae nearly horiz. (<10°)	
					134.75 to 135.3 - moderately calcareous;	
					hydrocarbon spots v. thin (<1/8"), to .5" in	
		Box 31			length;	
					136.5 - 137.15 Sandstone between 7.5' & 8.5'	
					6/1; grey to pinkish grey; v. f. grained &	
					& mod. well sorted; hard; mod. calcareous to non-calcareous; darker conchoidal	
					laminae - finer grained; hydrocarbon flecks	
					(35% horiz.)	
					137 - more even Sandstone v. fine grained	
					as before & nearly horizontal thin	
					bedding	
137.15-	5			100%	Sandstone similar to above:	
140.09			RQD	100	between 2.5' & 6/1 & 6/2; grey & yellowish	
		Box 32			gray; v. fine grained to 138.35, fine grained	
					to 140.09; well sorted; non calcareous &	
					slightly calcareous; thin laminae &	
					thinly bedded, slightly uneven to distinct	
					(below 139.25); hydrocarbon flecks & stringers	
					aligned with bedding; between 138.35	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/21/74 TITLE San Phillips S&H/O  
 START 140.09' COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne Western  
Gardner Denver

BORING NO. P-4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY P. Siems  
P.B.

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						and 139.25-massive unit with hydrocarbons showing no preferred orientation;	
140.09-143.1				100 RQD 100	Box # 38	Sandstone as above; to 141.9 relatively even bedding & laminations at up to 20° to horizontal; below 141.9-very irregular thin beds - to 2"-light discontinuous very calcareous units separated by non calcareous grey units; ~142.8 - last calcareous unit; hydrocarbon flecks & stringers minor & irregularly distributed	
143.1-146				100 RQD 100	Box # 34	Sandstone as above; to ~143.5 has calcareous beds like between 141.9 & 142.8; thin beds and laminae irregular & convoluted, to 60° to horizontal, more frequently 30°-40°; below 145.9 - micaceous & calcite concentrations;	
~145-146						- siltstone 5YR 6/1-6/2; pinkish grey; well sorted; cement-some calcite	

## NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/21/73 TITLE San Phillips  
 START 146' COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne-Western  
Gardner Denver

BORING NO. P-4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems  
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DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						laminar & bedding as above; hydrocarbon flecks absent; mica & calcite concentrations	
146-149.3		RQD	2.8/3.0	2.8/3.0		Siltstone 7.5YR 5/2 brownish grey; well sorted; cementation - silica? & compaction?; hard; non calcareous; massive; mica & calcite concentra- tion at 147.21, 146.2, hydrocarbon flecks (vol%) scattered;	
CORE 6	151.55-171.55					Recovery 11.8/20 RQD 16.85/20	
149.3-152.15		#36				Siltstone 10YR 6/2-7.5YR 6/2 H. brownish grey - pinkish grey; well sorted, slightly calcareous to non calcareous; 150.57 - mica & calcite concentration; to 150.57 - laminae at 60-70° with horizontal; below, laminae sub horizontal; 151.55-152.15 - finer;	

NOTE - BOTTOM OF CORE IS FRAGMENTED - assume missing 1.5' there

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/21/74 TITLE San Phillips  
 START 152.15 COMPLETE 155.1  
 EQUIPMENT USED Gardner Denver-  
Loayne Western

BORING NO. P4.001  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
CORE	6		P.O.P.		151.85, 152.15, 152.45, 153.5, 154, 155.64 156.25 (F?) 156.99 158 (F?), 158.7 (MB?), 159 (F?), 159.4 (F) 159.65 (F), 160.15, 160.97 161.95, 162.3, 162.8 (F) (11 Bed?), 163.35, 164.35, 164.9 (F), 163.5 (F 1 Bed); 166, 166.75 ?, 167.3 (F?), 168.12 (F), 168.75 (F), 169.25 (Sub 11 bed).	
152.15 - 155.1			ROD=100 Rec.=100		Siltstone SVR6/1, pinkish gray; well sorted; non calcareous (90%) to Slightly calcareous (10%), hard, v. finely laminated - variegated with red brown to grey laminations, even beds - slightly undulating, nearly horizontal, hydrocarbon needles Grades into SS at 154.8	
		Box 37				

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/21/74 TITLE San Phillips  
 START 155.1 COMPLETE 160.97  
 EQUIPMENT USED Gardner Denver  
Loyne Western

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Sims

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
155.1 -			Rec	100	Silty Sandstone with siltstone	
158			RQD	100	bed 155.3 - 155.75; 10R5/1	
					reddish gray; cementation -	
					compaction; v. thinly laminated	
					where bedding visible (155.3-155.75,	
		Box	38		156.4, 156.9); sub horizontal (155.3-155.75,	
					156.4, 156.9), 155.75-156.25 ~ 25° to horiz;	
					minor gilsonite stringers, hydrocarbon beds	
					156.4 & 157; below 157 - massive	
158 - 160.97			Rec	100	Sandstone with siltstone beds 158.2 &	
			RQD	32.5 / 355	reddish grey to pinkish grey	
					159.4; 10R6/1 to 10R5/1; v. fine	
		Box	39		grained; hard; non calcareous,	
					massive above 158.75; v. thinly laminated	
					below 158.75; laminations sub horizontal,	
					minor, scattered hydrocarbon plates	
					& stringers    to sub    to bedding;	
					moderately uneven beds; <del>not</del>	
					nod of calcite at 158.2; pyritiferous	
					bed at 159.6	

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/22 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY R. Lins

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
160.97-164				100	Sandstone, 10YR6/1, grey, v.f. grained, well sorted; silt & silica cements; hard, non calcareous to slightly calcareous, v. thinly laminated, sub horizontal to 15° with horiz. undulating; micaceous (biotite) & minor hydrocarbon flecks & plates;	
		Box 40	RQD	100		
164-166.75				100	Sandstone similar to above, ~164.9	
			RQD	100	bedding angle changes to 35°-50°; laminae are irregular, distorted; hydrocarbons present as flecks, to patch ~1" diameter; ~166.6 laminae contain more red grey siltstone	
		Box 41				
166.75-169.6					Sandstone with siltstone, similar to above; <sup>laminar</sup> beds are 25° to horiz; <sup>layer</sup> gilsonite patch at 169.25; non calcareous; siltstone is thin laminae (to ~1") in SS; laminae are discontinuous & deformed;	
		42				

## NOTES:

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## FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. 04000

DATE 10/21/74 TITLE San Phillips

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Loys Western

LOGGED BY B. Siems

Gardner Denver

P.B

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	
169.6-			RQD = 0		Sandstone with siltstone -	
171.55			Rec ?		same as above,	
					but returns are fragmented	
CORE	7		171.55 - 191.55			
				Recovery 20.3/20		
				RQD = <del>100</del> 98		
				Probable that extra core belongs to previous		
				run - will label depths on that assumption		
				FRACTURES	PARTING PL.	
				173.36	176.8	185.3
				174.08	177.85	186.02
				174.75	178.35	186.8
				175.55	179.45	187.7
				176.05	179.85	188.2
				176.45	180.85	188.7
					184.4	190.4
					184.75	
NOTES:						
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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/21/74 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver  
Hayne Western

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

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DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
171.55-						Sandstone as above,	
173.36						distorted laminae, from	
						nearly horizontal to 40°;	
						bedding dips in opposite	
						directions - one ~20°, lower	
						upper ~40°;	
173.36-						Sandstone as above; grey,	
176.3						very fine grained, well sorted,	
						hard, non calcareous, <sup>thinly</sup> laminated	
						to apparent massive; <del>at</del> laminations	
						distorted, sub horizontal to ~20°	
						micaceous (biotite) & hydrocarbon flecks	
176.3-						Sandstone as above; reddish grey	
179.2						bedding more even - parallel	
						to itself, gently undulating to	
						even, ~20° to horiz or less;	
						finer grained; micaceous	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/21/74 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Bardner Denver-  
Layne Western

BORING NO. P4100  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
179.2-				100	Siltstone - Sandy -	
181.75			RQD	100	as above to 179.6;	
					179.6 - Siltstone 5YR 4/1	
					dark grey, reddish caste; hard	
					<del>thin to</del> calcareous; variegated -	
					v. thinly laminated, more even thinner	
					than previously, thinner; <sup>-not distorted</sup>	
					181.5 - becomes redder; less calcareous	
					dark laminae every inch;	
					Parted during description 181.75;	
181.75-					Siltstone as above - dark grey	
184.75					with red caste; <sup>hard, st. to mod. calcareous,</sup> v. thinly laminated -	
					thinner than previous Sandstone;	
					very even beds, <del>trans</del> slightly not deformed	
					shades of reddish grey to grey;	
					micaceous	
184.75-					Siltstone 5YR 4/1 - 5YR 3/2; dk gry to	
187.75					dk reddish brn; calcite; hard	
					mod. calcareous; laminated as above, <sup>rare and</sup>	
					micaceous; rare hydrocarbon flecks;	

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/24/74 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Hayne Western  
Gardner Denver

BORING NO. D4000  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
187.75- 190.25					Siltstone same as above; mod. to v. calcareous, red brown; v. fine laminated; New Partings 190.4; <del>190.25</del>	
190.75- 191.55						
191.55- 200.65			20.0 20.0		Siltstone same as above, bedding not <del>thin</del> visible.	
200.65- 200.85		RQD 93			Sandstone and siltstone bed, 2' thick, dark gray 3.5 YR 4/0, ss medium grain, med. hard, non calcareous, <del>with</del> thickly bedded, siltstone same color and hardness as ss.	

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## FIELD LOG OF BORING

PROJECT NO. 74-088BORING NO. P-4 coreDATE 10-22-74 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Lagne Western  
Gardner Denver.LOGGED BY Cramer

P-17

DEPTH	SAMPLES					DESCRIPTION Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
203.75-						Sandstone, dark gray, 0.1'	
203.85-						thick, hard, mod to strong	
						calcareous, bedding surfaces,	
						parallel.	
204.0-						Siltstone, gray s/y R/S, hard,	
211.65						moderately calcareous, fine grained,	
						thinly laminated <del>to</del> <sup>to</sup> 3 mm to	
						10 mm, parallel but wavy.	
						Some vertical fracturing at	
						at 204.6' and 205.7'	
						206.6 bedding is uneven	
						and pod-like, alge deposits?	
						206.7 and 207.6 horiz. frx.	
						Note: grease from coal	
						barrel on core in several	
						places.	

## NOTES:

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## FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4661

DATE 10-22-74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START 10-20-74 COMPLETE                     

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne western

LOGGED BY J. Cranor

Gardner Denver 2000

P-18

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**NOTES:**

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 Core

DATE 10-22-74 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START 10-20-74 COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western

LOGGED BY J. Cranor

Gardner Denver 2000

P-19

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
231.75 -		C		<u>20.0</u> <u>19.9</u>	Siltstone, gray 10YR 5/1, fine to very fine grained, well sorted, Calcite cementation; hard; slightly to moderately calcareous, bedding is thinly varved. at 234.1' small vertical displacement in beds (local condition). @ 234.5' and 234.9' two beds 0.1" thick composed of what looks to be a mica, illite? Several smaller beds occur in the interval. Small elliptical patches ~ 1-3 mm long of silica? are also present.	
239.9		RQD	100			
239.9 -					Siltstone, very dark <sup>grayish</sup> brown 10YR 3/2 to black 10YR 2/1, fine to very fine, well sorted, non calcareous hard petroli ferous,	
242.4						

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-22-79 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START 10-20-74 COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western  
Gardner Denver.

LOGGED BY J. Cranor

P-20'

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
239.9 - 242.4	(Cont)				bedding is varved and somewhat undulatory with several small inclusions of medium grained sandstone which are lense shape & about 0.1" thick. Has strong <i>Retrokifusus</i> odor.	
242.4 - 251.75					Siltstone, very dark gray, 5-6R 3/4, grading to dark gray 10YR 8/1 very fine grain, well sorted, calcite cementation hard, <del>streaked</del> thinly laminated.	
251.75 - 271.75				$\frac{20.0}{20.0}$	RQD = 95%	
				Parting	Planes	
					253.1      259.5      265.55	269.2
					257.3      261.4      267.7	269.5
					257.82      262.67      268.2	270
					258.62      263.55      268.6	270.3
					259.08      264.5      268.85	270.7

Below 267.7 Planes undulate, but still appear to parallel bedding;

NOTES:

fuano

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/21/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western

LOGGED BY B. Siems

Gardner Denver

Page 2/

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
250.95-254			RQD=100	Rec=100	<sup>-shale</sup> Siltstone 7.5YR 4/2-3/2 dark brown with black cast; calcite cement; hard; v. calcareous to slightly calcareous; v. finely laminated (<.1") - shades of red brown to black; most beds very even & continuous; mechanical breaks occur on bedding planes	
254-257			RQD=100	Rec=100	<sup>-shale</sup> Siltstone - Same as above; <del>at 256.5-</del> beds pinch & are slightly irregular; hydrocarbon fleck;	
257-260			RQD=100	Rec=100	Siltstone with sandstone - highly variable 257.3 - same as above At 257.3 - Sandstone, .2' thick; 7.5YR 7/4, v. fine grained; v. biotitic; non calcareous 257.3 - 260 - siltstone as above interbedded with sandstone; sandstone is less regularly laminated, sometimes deformed into pods; siltstone laminae	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/22 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Shaker Drives

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Sierra

Page 22

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	
					within SS are discontinuous; unevenly calcareous; below 259.4 - bedding laminae become very even, regular siltstone again to 260.5	
260-263					- shaley Siltstone 25' above to 260.5	
754					below 260.5 to 261.4 siltstone interbedded with Sandstone; light grey to white ss; v. fine grained; well sorted; some white cement; hard; deformed undulating beds .02' to .15' thick; unevenly calcareous; 25% pyrite; quartz;	
263.01- 264.5					261.4-263 - siltstone - red grey as above Siltstone <sup>shaley</sup> as above - red grey, v. fine, v. evenly & thinly laminated, essentially undeformed horizontal bedding,	
75					rare gilsonite plates to 1"; unevenly calcareous; rare thin (.01'-.05') sandstone laminae; also rare thin (<.01') black petroliferous laminae	

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/32 TITLE San Phillips

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Gardner Denver

LOGGED BY B. Sims

Page 22

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					264.3- gilsonite layer	
					264.3-264.4- oil shale - <sup>siltstone</sup> <del>petroliferous</del>	
					smell, red brown to 10R3/1 dark	
					reddish grey; hard; slightly calcareous,	
					v. thinly & evenly laminated;	
					petroliferous laminae occur in decreas	
					amounts to 264.8; sand stone interbeds	
					to .1'; deformed bedding near SS &	
					siltstone stringers have been raised	
					& incorporated into SS;	
					264.8-265 high angle deformed siltstone	
					laminae (~40°)	
					265-265.55- siltstone - brownish grey,	
					micaceous, with some gilsonite & hydro-	
					carbons; similar to previous (264-264.3),	
					v. thinly & evenly laminated.	
265.53-					Sandstone 10YR 7/1 light grey (very); very	
266.7					fine grained; well sorted; some calcite;	
					hard; slightly calcareous; massive, but	
266-269 #76					with sub horizontal discontinuous thin	

NOTES:

fuano

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/52 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Mudlog Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Sims

Page 24

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						red, brown Siltstone laminae; hydrocarbon patches;	
					266.7-267.7		
						-shale Siltstone - 5/8 3/1 - dark grey with	
					100% Rec	red cast; v. slightly calcareous;	
Bot 76		RQD	100			v. finely laminated, infrequent SS to	
						1.5'; as before - SS is deformed &	
						deforms nearby siltstone laminae;	
						otherwise siltstone is very even &	
						undeformed;	
					267.7-269.7		
269-271.75						Sandstone between 2.5 1/8 1/2 & 3/2 with black	
						flecks gen <.01'; v. fine grained; well	
						sorted; poorly cemented - porous relative	
						to previous core; hard; non calcareous	
						except n 268.5; massive, except n 268.5;	
						268.5 - thinly laminated, distorted	
						laminae, of petrolierous siltstone,	
						zone .02'; also sim. at 269.2';	
						becomes indistinctly thinly bedded	
						below 270;	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/22 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver

BORING NO. 04000  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Liens

Page 25

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						tuffaceous; micaceous; hydro-carbonaceous flecks or plates aligned with bedding concentrated in some laminae	
271.55 - 291.55				Recovery 19.7/20		RQD = 100	
				Parting Planes		FRACTURES	
			272.8		278.65	274.35	
			272.8		282.88	275.6	
			273.1		283.23	277.6	
			275.1		283.75 (after removal)	279.66	
			275.95		284.5	280.45	
			276.25?		286.2		
			276.8		288.1		
			277.1		289.1		
			277.2		289.5		
			281.74		290.8		

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/22 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Landner Denver

BORING NO. P4 100  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Sano

Page 26

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
271.75-				100	Sandstone - 7.5 YR 6/2-5/2 with	
274.75			RQD	100	7.5 YR 8/6 <del>irregular layers</del> discontinuous layers	
#78					Very fine grained, well sorted, hard, v. slightly calcareous, bedded; micaceous & contains carbon plates;	thinly massive minor hydro-
					Dark red brown petroliferous shale beds at 273.15 (.1' thick) and 273.75 (.03' thick); thinly laminated, undulating, ~10° to horizontal	
274.75-					Sandstone as above to 275.1	
277.6					Interbedded Sandstone & Siltstone approx. half & half;	
#79					275.2 begins <del>petroliferous</del> siltstone grading into sandstone at 275.9; Siltstone is dark grey to reddish yellow variegated; hard, non-calcareous to slightly calcareous; v. thinly laminated; laminae are irregular, wavy, discontinuous	

NOTES:

turno

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/22 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Cardner Saver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Sims

P. 27

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					petroliferous mat'l concentrated in upper .1'-diffuse below that;	
					Below 275.45 - Sandstone with <sup>laminar</sup> <del>laminar</del> where hydrocarbon beds are more concentrated	
					rare thin discontinuous siltstone laminae; micaceous	
277.6 -					Sandstone as above (below 275.45)	
279.7						
279.7 - 280.45					Siltstone & Sandstone very finely interlaminated; siltstone is red brown, sandstone light pinkish grey; sandstone is carbonaceous, siltstone less so; very fine grained;	
					contact at 279.7 shows flow distortion at time of deposition or soon after;	
280.45 -					Siltstone-shaly; 7.5 x R 5/2 brown (with reddish cast) mud cement probably v. slightly calcareous to non	
286.2						
Bores 81-82						

NOTES:

fuano

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/22 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Cordier Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY R. Sims

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	
					calcareous; very thinly laminated, even laminations, not distorted, some beds pinch, most are continuous; between 283.4' & 283.8' - <del>some</del> calcite dike - snake like form;	
286.2 -				100	<sup>shaly</sup> Siltstone 7.5YR 3/2 dark brown;	
289.1			RQD	100	cementation: clay, some calcite; hard; v. slightly calcareous to mod calcareous, v. thinly & evenly laminated; <sup>some beds to 290.7'</sup> some interbedded sand laminae; beds distorted near sand, otherwise not; some gilsonite stringers;	
Box #83						
289.1 -			Rec	~95	<sup>shaly, w. th sandstone</sup> Siltstone Same as above, but black	
292.3			RQD	100	v. thin petroliferous laminae becoming more frequent; <sup>to 290.7'</sup> 290.6-.7 quite dark; NAHCOLITE CAVITIES - 289.5 & 290.8 with calcite; ~.3' diameter; also 292.3	
Box #84						
					v. irreg. calcite stringers <sup>pods</sup> 291.8 & 292	

291.3# FRACTURES <sup>horiz</sup> 206.1 PARTING PLANES

NOTES:	295.7	300.2	303.5	307.5	299.5
	297	300.5	304.45	308.2	295.3
	298.25	301.5	305	308.8	297
	298.2	302.5	305.4	309.1	

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/22 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

Page 29

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
292.3- 294.15					Siltstone <sup>shaly</sup> same as 286.2, only 1 sandstone layer, at 292.8	
294.15- 295.3					Sandstone - 7.5 VRS/2; brown; v. fine grained & silty; silt-some clay?; hard; non calcareous; thinly bedded to laminated- highly deformed, to nearly horizontal, not distinct	
85					NAHCOLITE & CALCITE CAVITY @ 295.3 - 295.5, 295.6 - 296	
295.3- 298.25					Sandstone - as above to 296 296 - 297.6 - sim to above with plastically deformed blebs & stringers of shale-red brown - surrounded by halos of pyrite-v.f. grained; v. tiny to v. 1"; also <sup>minor</sup> hydrocarbon stringers & flecks	
86					297.6 - 297.8 SS with small (v. 0.1") calcite & naheolite crystal groups - <del>to</del> <sup>bottom of</sup> bed inclined w/ 15-20°; hydrocarbons;	

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-23-79 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western

LOGGED BY \_\_\_\_\_

Page 30

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						to 298.15 - siltstone	
						then sandstone to 298.25, v. fine	
						grained, micaceous, hydrocarbon	
						flecks;	
298.2 -						Sandstone as above; clayey; H.	
301.3 - 309.5						pinkish grey, v.f. grained; non calcareous,	
#87						hard, very indistinct bedding - may have	
#88						rotation stains - oval - v. 2';	
#89	307					still inclusions of shale with halos;	
#90 307.309.9						infrequent plates & flecks of hydro-	
						carbons - horizontal on 45° to vert.; mica-	
						eous	
						305-305.4 - very contorted silt interbedded	
						with ss - vertical beds continuous	
						with horizontal;	
						309.7 - contorted white clayey zone	
						with pyrite, magnetite & unknown black	
						needlelike min; banded as though white	
						leached as metallics deposited;	

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10-23 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Laguna Western

BORING NO. P-4 Core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY J. Cranor

P-31

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
311.6' - <del>311.6'</del>				19.8 20.0		Sandstone, Tuffaceous light gray; fine grained; moderately to well sorted; Silica cement?; hard to very hard, non-calcareous; <del>bedding distinct</del> <sup>Horizontal</sup> fracture at 312.8' <sup>at 313.1</sup> Small, ~ 1 mm or less, dark colored needle shape minerals, amphibole or pyroxene?; deformed bedding from 312.8 to 313.85' < 1" thick. material possibly reworked lacustrine deposited?.	
313.85' - 315.25'						Siltstone, dark gray; very fine grained; well sorted; <sup>and calc.</sup> Silica cementation(?); very hard; moderately to slightly calcareous; thinly laminated ~ graded ss bed 0.2" thick @ 314.6' Frx. at 314.4' <del>Frx.</del> <del>314</del>	

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-23 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western

LOGGED BY J. Cranor

P-32

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
315.25-						Sandstone, brown, fine grained, well sorted, hard, $\text{CaCO}_3$ cement? Slightly calcareous, <sup>one</sup> small arcuate shaped fracture, grains possibly quartz.	
315.55-							
315.55-						Siltstone same as from 313.35' to 315.25'. A 0.4" brown sandstone bed with wavy surfaces occur at 315.7'	
315.8'							
315.8						Siltstone & reddish gray, very fine, well sorted, calcite cement, hard, slightly calcareous, highly porous w/ <del>fracturing</del> oil bleeding from interstitial voids.	
316.0							

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-23 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY Cranon, J.

P-33

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
316.0 -						Siltstone, very dusky red, v.f.	
321.3						grains; well sorted, calcite	
						cement? hard, slightly calcareous,	
						frx at 318.95' and 321.3', Horiz.	
						thinly laminated, Two 'thin	
						ss beds, ~.2" thick at 316.15'	
						and 317.0 like those described	
						at 315.8	
321.3 -						Siltstone very dusky red, like	
321.5						that above but. contains	
						many eu hedral and sub hedral	
						crystals of calcite some appear	
						translucent mineral, Horiz.	
						frxs, on both sides of	
						zone.	
321.5 -						Siltstone like at 316.0, frx	
<del>321.5</del>						at 322.65' with calcite xls, frx at	
331.6						323.5, 325.15, 326.15, 327.5	

NOTES:

fuero

## FIELD LOG OF BORING

PROJECT NO. 74-068

DATE 10-23 TITLE \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

BORING NO. P-4 Core

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

LOGGED BY C. Rawon, J.

P-34

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
321.5 - 331.6		Cont.			Frk. at 328.7 has more calcite xls, also 328.9, Frk 329.1, 329.6, 329.8, 330.0. All Frks above are horiz. Siltstone is thinly varved.	
331.6 - 336.1		RQD = $\frac{4.4}{19.0}$ ↓ 1232		$\frac{19.0}{20.0}$	Siltstone, dark reddish gray, grains; fine to V.F., well sorted cement-silica + calcite?, very hard, slightly calcareous, very thinly laminated to with a very thin bed of siltstone @ 334.15' horiz. Frk. @ 331.6, 331.85, 332.15, 332.6, 332.85, 332.95, 333.45, 334.35 to 334.55' is a bed of calcite xls and marcasite and pyrite. The bed is quite porous + vuggy. FINE XL are small < 1 mm., CaCO <sub>3</sub> XL are ≤ 2 mm.	

**NOTES:**

— 10 —

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE \_\_\_\_\_ TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY Cranor

P-35'

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
336.1 -					Tuffaceous siltstone, Lt. gray to	
336.45 -					gray; fine to v.f. well sorted	
					cement - calcite, hard, mildly	
					calcareous, thin bedded,	
					contains some small <del>crystals</del>	
					crystals of pyrite and	
					needles of amphibole or pyroxene?	
					FeS <sub>2</sub> shows a small alteration halo	
336.95 -						
339.1					Siltstone, dark gray, fine	
					grained, well sorted, calcite	
					cement, hard to very hard,	
					moderately calcareous, thin	
					laminated, very thin lenses of beds of	
					hydrocarbon, @ 337.75' a 2, 3"	
					bed of dark gray ss containing	
					some hydrocarbons. at 338.75'	
					an other ss bed 0.4" thick.	
					@ about 338.6' to 338.8' a gradual	
					increase in hydrocarbon content	

occurs.

## NOTES:

funco

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core.

DATE \_\_\_\_\_ TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Borden Denver

LOGGED BY Crane

P-36

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
339.1-						Siltstone and <del>quartz</del> coarse	
339.35-						quartz sand grains, dark gray to black (wet). Siltstone is	
						fine to very fine grained, <sup>uniform</sup> poorly sorted, quartz	
						is coarse and makes up about 15-20 %	
						<del>20-40</del> % of the rock about 30 % is	
						composed of flat, elongate shaped grains and crystals of calcite	
						This zone is laminated and	
						contains many interstitial voids	
339.35-						Siltstone, dark dusky red	
346.75-						grading to brown and pinkish gray laminations, grains are	
						very fine and well sorted	
						calcite cement, very hard to	
						hard, very slightly calcareous	
						laminated becoming thinly	
						laminated with depth.	

## NOTES:

*Crane*

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P9 Core

DATE \_\_\_\_\_ TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY Cramer

P-37

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
339.35		Cont.			At 345.60' to 345.80' small	
346.75					calcite crystals jacketed by	
					marco silt occurs in the siltstone,	
					when removed they leave small	
					rounded cavities behind.	
					The siltstone is as above	
					frxs. both horiz and inclined	
					are found. the former is	
					dominant. 340.9', 341.0'	
					341.6', 341.95', 342.2', 342.8,	
					343.3, 343.5, 343.6, 343.65,	
					343.9, both horiz and inclined at 70'	
					to horiz, 344.2, 344.35,	
					344.45 horiz and inclined 75°	
					up for 4", 345.0, 345.95'	
					345.8, 346.0, 346.5 and	
					346.6. From 343.3 to	
					343.6 much of the core is	
					broken into small fragments.	

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-9 Corn

DATE \_\_\_\_\_ TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY Cramer

P-38

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
346.75					Siltstone, Very dark brown,	
<del>347.5</del>					Fine grained - v.f. grained,	
350.5					sorted, well sorted, calcite	
					crust, hard - Very hard,	
					slightly calcareous. The	
					entire section is composed	
					of small bands of interconnecting	
					voids, some filled with calcite	
					and occasionally pyrite or marcasite.	
					This appears to be the water	
					producing horizon. Areas	
					around voids are cut after	
					1 <sup>st</sup> 15' - 16' after coming from hole.	
					Fr. 94.4 $\approx 35^\circ$ to horizontal,	
					348.2 horiz., 348.5, horiz.,	
					348.65 Horiz. 349.85-	
					Note: Core loss, 1 ft. possibly	
					from bottom of rungs. 350.1	
					-351.5	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 77 068  
 DATE 10-23 TITLE \_\_\_\_\_  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED \_\_\_\_\_

BORING NO. P-4 - Corn  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY Cranor

P-39

DEPTH	SAMPLES				DESCRIPTION			REMARKS	
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:				
					351.55 - 371.55				
					$\frac{9.93 + 9.42}{20} = \frac{19.35}{20}$ Recovery				
					RQD $\approx$ 50%				
					Parting Planes				
					352.4	354.3	357.35	360.78	368.95
					352.6	354.45	357.5	361.45	369.23
					352.65	355.03	357.72	361.9	369.8
					352.7	355.45	357.86	361.93	370
					352.8	355.53	357.95	362.45	370.1
					352.9	355.75	358.1	362.5	370.31
					352.98	356	358.35	362.8	370.8
					353.05	356.05	358.37	363	371.15
					353.2	356.15	358.44	363.35	371.5
					353.35	356.4	358.58	Cavity 364	371.55
					353.4	356.5	359	364.85	
					353.63	356.6	359.35	365.25	
					353.64	356.73	359.65	Cavity 364	
					353.78	356.93	360.07	366.5	
					353.96	357.25	360.18	367.1	
					354.04	357.3	360.57	368	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 24-068  
 DATE 10/23 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY P. Siems

P-40

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	
351.55 - 371.55					Siltstone 54R 4/2 dark reddish grey n.f. grained; calcite & clay; hard; structures detailed by depth - generally very thin laminations, horizontal, frequent partings, pyrite, hydrocarbon zones (detailed below), calcite, nahcolite, major variations are in form of CO <sub>2</sub> concentra & attitude of laminae:	
					351.55 - 352.4 - Carbonates are in very tiny oval pods aligned with bedding (.01'-.03' long); some beds are <sup>(.01")</sup> neatly entirely made up of pods	
					352.4 - 354.1 pods become larger & more numerous, beds of carbonates & pyrite are thicker (.03'); 20-25% of total rock; CAVITY AT ~353.8	
					354.1 - 356 Carbonates form crystals & groups of crystals; most freq. size ~.04'; preferred orientation is with bedding, but <del>are</del> frequently cross bedding also; may be seen as smaller	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 54-068  
 DATE 10/23 TITLE \_\_\_\_\_  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver

BORING NO. P4 Core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

Page 4/1

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
				35.5	crystals concentrated in tubes	
				340% CO <sub>2</sub>	resembling worm burrows - .01' diam;	
				356-358.5	Carbonates with pyrite form beds	
					of crystals from .01-.2' apart &	
					<.01'-.03' thick; zone at 357 (356.8-	
					357.3) has dikelets & burrow form	
					again; from <10% to 20% CO <sub>2</sub> 's;	
				358.5-359.6	CO <sub>2</sub> 's rarer & form straight "dike"	
					like forms shooting of beds; also	
					occur as v. tiny pods along bedding;	
				359.6-361	Like 351.55+ section 30-50%	
				361-361.6	Like 359.6 - tiny pods - some <sup>tiny</sup> bed laminar	
				361.6-363.5	Siltstone - shaly -	
					bituminous material begins at 362;	
					concentrations of <sup>needles</sup> carbonate pods occur but are rarer;	
					bedding to 25° with core; petroliferous	
					material is most concentrated around	
					363 & below; near 363 bed occurs	
					with CO <sub>2</sub> needles	

## NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 24-068  
 DATE 10/23 TITLE \_\_\_\_\_  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver

BORING NO. P4 Core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

Page 42

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					363.5 - 364 siltstone as before with tiny CO <sub>2</sub> pods	
					364 Calcite & nahcolite cavity	
					364 - 364.5 - layered <sup>(.07' thick)</sup> CO <sub>2</sub> , one tube v 100% to horiz; .3' long	
					364.5 - 365.2 tiny pods & concentrations as 351.55	
					365.2 - 367 beds, burrow shapes & cavities filled with carbonates, pyrite; 20% - 25% of total rock; cavities .15' to width of core	
					367 - 368.5 - siltstone with tiny pods as 364.5 - but smaller than 351.55	
					368.5 - beds & dike forms, largest dike .8'	
					368.5 - 369.8 - as 367 0-20% CO <sub>2</sub>	
					369.8 - 370.4 - <del>beds</del> small laminae & larger irregular patches to .1'; ~20% CO <sub>2</sub>	
					370.4 - 371.55 - pods - tiny - as 367	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 94-068  
 DATE 10/23 TITLE \_\_\_\_\_  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner-Denver

BORING NO. D4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

P43

DEPTH	SAMPLES				DESCRIPTION		REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:		
						</	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. D4 core

DATE 10/23/74 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Wayne Western  
Gardner Denver

LOGGED BY B. Siems

44

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows of Force	Recovery, Condition		
373.4 - <del>375.2</del> 380.45					Siltstone - same as above without the tiny carbonate pods; slightly-moderately calcareous; hard; rather evenly laminated; bitumen lenses as above	
					375.3 - 377.4 - thin calcite beds .03' & <.01';	
					377.4 - thin carbonate bed (.01') with minor magn.	
					377.4, 378.45 - 379, NAHCOLITE CAVITIES	
380.3 - 384					Siltstone similar to above, has tiny carbonate pods; similar to 370.4 zone;	
Missing core probably was in this interval				382.6		
384 - 385					Siltstone 5YR 3/1, dark grey; fine-grained; mod. calcareous - calcite & clay cement; hard; v. finely & evenly laminated; bituminous - not highly;	
385 - 391.55					Siltstone - same as before - 373.4 - 380.5 NAHCOLITE & Calcite 385.25	

## NOTES:

389.85 - 9 - med. grey sandstone, f. grains soft; undulating contacts - sharp; well sorted, non laminated, fine grained, ped. of this rare in m. 2' - 2.5' - 3' - 3.5'

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10-24 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY Cranor

P-45'

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
391.5-	ROD = $\frac{31}{22.62} = 0.137$				Siltstone, weak red - reddish gray to dark reddish gray fine to very fine, well sorted. CaCO <sub>3</sub> cement, hard, moderate to strong, calcareous, thinly laminated, small lenses, < .2" thick, of FeSe between 394.5' and 400.5'. Through out the run are small elongate spots < .1" thick & .1-1.5" long of hydrocarbon. @ 406.3' a small calcite lined cavity, 405.4' a 1." band of Siltstone with about 10-15% FeSe sphares, < .1" across, 408.0 - 408.4' core is crumbled and broken, 409.8' tan porous zone, mod calcareous, 410.2, Nocolite cavity	
411.5-						
					399.5-399.7, DK gray to black porous zone, cavities filled in part, with calcite,	

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-29 TITLE \_\_\_\_\_

ELEVATION 5640 DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Lagne Whetstone

LOGGED BY Cramer

(Cont.)

P-46

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
391.5-					Fr. 395.95, 398.9, 399.2, 399.5	
411.5					399.7, 400.6, 404.45, 404.9, (405.7) 50° incline	
				30° incline	(406.7) 406.6, 406.9, 407.1, 407.4,	
					407.65, 407.8, 408.0, 408.4,	
					409.8, 410.3, 410.85	
411.5-					0.75' of core missing, probably from 408.0' area, surface is irregular.	
411.5-	ROD = 100			19.75 20.00	Siltstone, Very dusky red, very fine grained, well sorted, hard, non calcareous, thinly laminated, surface of core is much smoother than what has been seen before. <del>at</del> 412.5' end is <del>partially</del> coated with Calcite and may be place of some core loss. (0.25'),	
412.5						

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE \_\_\_\_\_ TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY Cramer

P-47

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
412.5-					Siltstone, Varies in color	
431.5-					dark reddish gray to 421.36'	
					becoming a reddish brown to	
					423.5' where it is a dark gray.	
					becoming reddish brown again	
					@ about 426', and remains so	
					to 431.5'.	
					Grains are fine to very fine	
					except at the following locations	
					where small, (< 2 mm) pits	
					or CaCO <sub>3</sub> XL occur. These	
					zones are 0.1' to 0.05' thick,	
					413.6, <del>413.85</del> 413.85, 414.3	
					414.8, 415.4.	
					Moderate to slight calcareous, small	
					lenses and thin horizontal	
					of hydro carbons are through	
					out the the core.	
					finely disseminated FeS <sub>2</sub> grains	
					also present.	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-24 TITLE \_\_\_\_\_

ELEVATION 5640 DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Gardner Denver

LOGGED BY B. Sims

P-49

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
451.5		RGD=100		$\frac{20.00}{20.0}$	Problem with depth labels; measured stickup of next core should then begin at 450.4; Labeled current core from bottom using those depths - i. 430.23-450.4	
430.23-450.4					Siltstone - <sup>shaly</sup> 54R 4 1/2 - slightly greyer; dark reddish grey; v. fine grained; calcite cement; v. thinly laminated - even bedding - undeformed except rare small sandstone beds to be noted later; mica - v. minor; hydrocarbon flecks; partial laminae locally - zones to be noted later;	
Parting Planes				432.38	439.7	448.83
				433.55	440.72	449.36
				434.95	441.45	450.3
				436.74	442.7	450.4
				437.8	445.75	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/23/74 TITLE San Phillips

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western -  
Gardner Denver

LOGGED BY B. Siems

Page 50

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					431.8 to 434.2 - laminar with discontinuous partial bituminous laminar in specific beds - i.e. 3/4 partial laminar bed, then none until next concentration concentrations v. 0.2' - .4' separation, most frequent is .1'; become more widely spaced lower in core;	
					432.2-432.4 contains two thin <sup>gray beds with</sup> carbonate concentrations; v. small xls - probably some nahcolite;	
					432.55- deformed .03' thick grey ss. bed; "cauliflower" like shape to contacts	
					top to 435.3 is slightly darker - contains more very thin petroliferous laminar than core below; laminar are very fine, grade in both directions into nonpetroliferous material	
					437.8 - 438.8 - contains many tiny oval pods of carbonate (cc. 0.1') concentrated along bedding & in certain	
					438.6 - 440.8 - higher bitumen content; 439.1 - 440.8 pick up discontinuous bitumen laminar - as 431.8 - 434.2;	

NOTES:	

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/23/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western-

LOGGED BY B. Liems

Gardner Denver

51

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					439.9 - med dk grey discontinuous sandstone - "augen" - 0.01' thick	
					442.45 - grey nodulating, non calcareous, carbonaceous spots on siltst. parting	
					444.05 - discontinuous, <del>deformed</del> augen shaped	
					448.24 - grey sandstone	
					449.7 "	
					446-448 scattered partial laminae of ss - 1-2' apart	
					450.4 - 450.5 RGC = 100% $\frac{30.3}{30.1}$ RQD = 100	
					Shaly siltstone - reddish grey, v.f. grained, calcite, very hard, v. finely laminated - undrained, contains sandstone beds as detailed below; petroliferous in zones as detailed below	
					451.5 - contains tiny CO <sub>2</sub> blebs; (<0.01')	
					457.9 - tiny med. dk grey carbonaceous ss pinching bed <0.01' thick;	
					452.6 - 453.5 - contains a number of laminae richer in hydrocarbons	

Fract  
Partings:  
450.4  
450.5  
450.6  
450.7  
450.8  
450.9

NOTES:

fuero

BORING NO. P4 core  
ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
LOGGED BY B. Siems

82

NOTES:		

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4

DATE 10/24/73 TITLE Sus Phillips

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED (Medner) Driller

LOGGED BY B. Lewis

Layne Western

83

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
470.14 to 487.14					From strapped rods Rec - 16.89/17 ROD = 100 Partings: 478.17; 482.8 Siltstone: 15R 4/2 dark reddish grey; v. fine grained; calcite frequently; & clay; v. hard; slightly calcareous to mod. calcareous, some very; v. thinly laminated (< .01'), even unde- formed. Variations will be noted below: 470.95 - 23' diam blebs of grey ss; 470.05 - 471.25 - tiny blebs of carbonate ss before (oval, aligned w. bedding, (< .01')); 472.8 - begin getting v. thin petrolierous laminar - one at 471.8 - < .01'; more after 472, increasing in frequency to 475.05; 475.05 - v. 1' thick petrolierous dark grey bed, non calcareous; hydrocarbon cement? 472.25 - med dk grey ss - irregular contacts & pinching bed; carbonaceous or other bk 473.7 - 474.25 - deformed, irreg. ss as 472.25 474.9 - red brown flakes - thin bed, non calcareous, ss soc. with carboniferous mat	
NOTES:						
						fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/24 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne Western  
Hardner Denver

BORING NO. P4  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Sims  
54

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	
					475.15-476.6 - non petroliferous reddish grey siltstone;	
					476.6 again begin picking up fine petroliferous laminae; very minor - make no dark grey beds, only occasional laminae; to 478.6;	
					478.6 - discontinuous .01' bituminous <sup>as above</sup> <del>lamin.</del>	
					to 482.5 - siltstone with minor amount of bituminous laminae;	
					482.5-482.7 - tuffaceous Sandstone, 2.5 VR7, micaceous; clayey & silty; v. fine grained, calcite cement;	
					482.7 to 487.14 - siltstone - decreasing petroliferous material to 484, almost nonexistent below 484;	
					485.5 med dk grey sandstone - pods - v. 0.3' diam;	

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-25 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne western  
Gardner Denver 2000

LOGGED BY J. Cranor

P-55

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
487.15 - 507.16		RQD = 100		20.00 20.00	Siltstone, dark reddish gray siltstone, v.f. grains, well sorted, CaCO <sub>3</sub> cement, hard - Very hard, strong reaction to HCl. Thinly laminated < 0.1". @ 493.2' a 0.5" thick, med grained ss bed ss also at 494.2' < .5" thick both. 497.1 + 497.3' ss occurrences, < 0.2" thick, 487.2 - 488.2' siltstone is black with higher % of hydrocarbons being present, 499.1 irregular shaped bed, < .01' thick, of fine grain ss, dk gray to black, 506.05', ss bed, 1" thick, dk grayish brown, medium grained, Horiz. fr. at: 489.2, 491.2, 493.25, 495.45, 498.6, 501.65, 505.2, 506.1	

NOTES:





## FIELD LOG OF BORING

PROJECT NO. 74-068

DATE 10/25 TITLE San Phill Lps

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

EQUIPMENT USED Layne Western-

BORING NO. P4

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

LOGGED BY P. Sims

57

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	
527.15-547.15					Depths defined from tool string & Kelly	
Rec 90/20		RQD=100			down - 547.15' tools in hole, Kelly all	
P. Planes	541.74	536-1, 543.68			Way down @ end of run	
527.15-529.8		Siltstone			5YR 3/1 Very dark grey (with brownish casts, some sand size material, poorly sorted; slightly to moderately calcareous, v. thinly laminated w/ very even beds; v. micaceous - fine sand size to .005"; - 1% or less of rock; moderately petroliferous - Details noted below;	
					527.15-529.8 less petroliferous - slightly, few black laminae; Clay flecks ~ 1% to 528.1 - much less bl. sand stone laminae - <.01' thick - do 528 very min with siltst, but minor amt; bed lamination @ 529	
					529-529.8 - higher grade oil rock - mod. petroliferous	
					529.8-537.1 - even grade - but less than 529; still mod. petroliferous;	
					Sandstone pods & laminae - at 530.5, 531.5, 532.7 (pod ~.05 by .2'), 532, 532.2, 532.7, 533.2, 533.7, 534.6, 535.1, 535.6, 536.1, 536.6, 537.1, 537.6, 538.1, 538.6, 539.1, 539.6, 540.1, 540.6, 541.1, 541.6, 542.1, 542.6, 543.1, 543.6, 544.1, 544.6, 545.1, 545.6, 546.1, 546.6, 547.1, 547.6, 548.1, 548.6, 549.1, 549.6, 550.1, 550.6, 551.1, 551.6, 552.1, 552.6, 553.1, 553.6, 554.1, 554.6, 555.1, 555.6, 556.1, 556.6, 557.1, 557.6, 558.1, 558.6, 559.1, 559.6, 560.1, 560.6, 561.1, 561.6, 562.1, 562.6, 563.1, 563.6, 564.1, 564.6, 565.1, 565.6, 566.1, 566.6, 567.1, 567.6, 568.1, 568.6, 569.1, 569.6, 570.1, 570.6, 571.1, 571.6, 572.1, 572.6, 573.1, 573.6, 574.1, 574.6, 575.1, 575.6, 576.1, 576.6, 577.1, 577.6, 578.1, 578.6, 579.1, 579.6, 580.1, 580.6, 581.1, 581.6, 582.1, 582.6, 583.1, 583.6, 584.1, 584.6, 585.1, 585.6, 586.1, 586.6, 587.1, 587.6, 588.1, 588.6, 589.1, 589.6, 590.1, 590.6, 591.1, 591.6, 592.1, 592.6, 593.1, 593.6, 594.1, 594.6, 595.1, 595.6, 596.1, 596.6, 597.1, 597.6, 598.1, 598.6, 599.1, 599.6, 600.1, 600.6, 601.1, 601.6, 602.1, 602.6, 603.1, 603.6, 604.1, 604.6, 605.1, 605.6, 606.1, 606.6, 607.1, 607.6, 608.1, 608.6, 609.1, 609.6, 610.1, 610.6, 611.1, 611.6, 612.1, 612.6, 613.1, 613.6, 614.1, 614.6, 615.1, 615.6, 616.1, 616.6, 617.1, 617.6, 618.1, 618.6, 619.1, 619.6, 620.1, 620.6, 621.1, 621.6, 622.1, 622.6, 623.1, 623.6, 624.1, 624.6, 625.1, 625.6, 626.1, 626.6, 627.1, 627.6, 628.1, 628.6, 629.1, 629.6, 630.1, 630.6, 631.1, 631.6, 632.1, 632.6, 633.1, 633.6, 634.1, 634.6, 635.1, 635.6, 636.1, 636.6, 637.1, 637.6, 638.1, 638.6, 639.1, 639.6, 640.1, 640.6, 641.1, 641.6, 642.1, 642.6, 643.1, 643.6, 644.1, 644.6, 645.1, 645.6, 646.1, 646.6, 647.1, 647.6, 648.1, 648.6, 649.1, 649.6, 650.1, 650.6, 651.1, 651.6, 652.1, 652.6, 653.1, 653.6, 654.1, 654.6, 655.1, 655.6, 656.1, 656.6, 657.1, 657.6, 658.1, 658.6, 659.1, 659.6, 660.1, 660.6, 661.1, 661.6, 662.1, 662.6, 663.1, 663.6, 664.1, 664.6, 665.1, 665.6, 666.1, 666.6, 667.1, 667.6, 668.1, 668.6, 669.1, 669.6, 670.1, 670.6, 671.1, 671.6, 672.1, 672.6, 673.1, 673.6, 674.1, 674.6, 675.1, 675.6, 676.1, 676.6, 677.1, 677.6, 678.1, 678.6, 679.1, 679.6, 680.1, 680.6, 681.1, 681.6, 682.1, 682.6, 683.1, 683.6, 684.1, 684.6, 685.1, 685.6, 686.1, 686.6, 687.1, 687.6, 688.1, 688.6, 689.1, 689.6, 690.1, 690.6, 691.1, 691.6, 692.1, 692.6, 693.1, 693.6, 694.1, 694.6, 695.1, 695.6, 696.1, 696.6, 697.1, 697.6, 698.1, 698.6, 699.1, 699.6, 700.1, 700.6, 701.1, 701.6, 702.1, 702.6, 703.1, 703.6, 704.1, 704.6, 705.1, 705.6, 706.1, 706.6, 707.1, 707.6, 708.1, 708.6, 709.1, 709.6, 710.1, 710.6, 711.1, 711.6, 712.1, 712.6, 713.1, 713.6, 714.1, 714.6, 715.1, 715.6, 716.1, 716.6, 717.1, 717.6, 718.1, 718.6, 719.1, 719.6, 720.1, 720.6, 721.1, 721.6, 722.1, 722.6, 723.1, 723.6, 724.1, 724.6, 725.1, 725.6, 726.1, 726.6, 727.1, 727.6, 728.1, 728.6, 729.1, 729.6, 730.1, 730.6, 731.1, 731.6, 732.1, 732.6, 733.1, 733.6, 734.1, 734.6, 735.1, 735.6, 736.1, 736.6, 737.1, 737.6, 738.1, 738.6, 739.1, 739.6, 740.1, 740.6, 741.1, 741.6, 742.1, 742.6, 743.1, 743.6, 744.1, 744.6, 745.1, 745.6, 746.1, 746.6, 747.1, 747.6, 748.1, 748.6, 749.1, 749.6, 750.1, 750.6, 751.1, 751.6, 752.1, 752.6, 753.1, 753.6, 754.1, 754.6, 755.1, 755.6, 756.1, 756.6, 757.1, 757.6, 758.1, 758.6, 759.1, 759.6, 760.1, 760.6, 761.1, 761.6, 762.1, 762.6, 763.1, 763.6, 764.1, 764.6, 765.1, 765.6, 766.1, 766.6, 767.1, 767.6, 768.1, 768.6, 769.1, 769.6, 770.1, 770.6, 771.1, 771.6, 772.1, 772.6, 773.1, 773.6, 774.1, 774.6, 775.1, 775.6, 776.1, 776.6, 777.1, 777.6, 778.1, 778.6, 779.1, 779.6, 780.1, 780.6, 781.1, 781.6, 782.1, 782.6, 783.1, 783.6, 784.1, 784.6, 785.1, 785.6, 786.1, 786.6, 787.1, 787.6, 788.1, 788.6, 789.1, 789.6, 790.1, 790.6, 791.1, 791.6, 792.1, 792.6, 793.1, 793.6, 794.1, 794.6, 795.1, 795.6, 796.1, 796.6, 797.1, 797.6, 798.1, 798.6, 799.1, 799.6, 800.1, 800.6, 801.1, 801.6, 802.1, 802.6, 803.1, 803.6, 804.1, 804.6, 805.1, 805.6, 806.1, 806.6, 807.1, 807.6, 808.1, 808.6, 809.1, 809.6, 810.1, 810.6, 811.1, 811.6, 812.1, 812.6, 813.1, 813.6, 814.1, 814.6, 815.1, 815.6, 816.1, 816.6, 817.1, 817.6, 818.1, 818.6, 819.1, 819.6, 820.1, 820.6, 821.1, 821.6, 822.1, 822.6, 823.1, 823.6, 824.1, 824.6, 825.1, 825.6, 826.1, 826.6, 827.1, 827.6, 828.1, 828.6, 829.1, 829.6, 830.1, 830.6, 831.1, 831.6, 832.1, 832.6, 833.1, 833.6, 834.1, 834.6, 835.1, 835.6, 836.1, 836.6, 837.1, 837.6, 838.1, 838.6, 839.1, 839.6, 840.1, 840.6, 841.1, 841.6, 842.1, 842.6, 843.1, 843.6, 844.1, 844.6, 845.1, 845.6, 846.1, 846.6, 847.1, 847.6, 848.1, 848.6, 849.1, 849.6, 850.1, 850.6, 851.1, 851.6, 852.1, 852.6, 853.1, 853.6, 854.1, 854.6, 855.1, 855.6, 856.1, 856.6, 857.1, 857.6, 858.1, 858.6, 859.1, 859.6, 860.1, 860.6, 861.1, 861.6, 862.1, 862.6, 863.1, 863.6, 864.1, 864.6, 865.1, 865.6, 866.1, 866.6, 867.1, 867.6, 868.1, 868.6, 869.1, 869.6, 870.1, 870.6, 871.1, 871.6, 872.1, 872.6, 873.1, 873.6, 874.1, 874.6, 875.1, 875.6, 876.1, 876.6, 877.1, 877.6, 878.1, 878.6, 879.1, 879.6, 880.1, 880.6, 881.1, 881.6, 882.1, 882.6, 883.1, 883.6, 884.1, 884.6, 885.1, 885.6, 886.1, 886.6, 887.1, 887.6, 888.1, 888.6, 889.1, 889.6, 890.1, 890.6, 891.1, 891.6, 892.1, 892.6, 893.1, 893.6, 894.1, 894.6, 895.1, 895.6, 896.1, 896.6, 897.1, 897.6, 898.1, 898.6, 899.1, 899.6, 900.1, 900.6, 901.1, 901.6, 902.1, 902.6, 903.1, 903.6, 904.1, 904.6, 905.1, 905.6, 906.1, 906.6, 907.1, 907.6, 908.1, 908.6, 909.1, 909.6, 910.1, 910.6, 911.1, 911.6, 912.1, 912.6, 913.1, 913.6, 914.1, 914.6, 915.1, 915.6, 916.1, 916.6, 917.1, 917.6, 918.1, 918.6, 919.1, 919.6, 920.1, 920.6, 921.1, 921.6, 922.1, 922.6, 923.1, 923.6, 924.1, 924.6, 925.1, 925.6, 926.1, 926.6, 927.1, 927.6, 928.1, 928.6, 929.1, 929.6, 930.1, 930.6, 931.1, 931.6, 932.1, 932.6, 933.1, 933.6, 934.1, 934.6, 935.1, 935.6, 936.1, 936.6, 937.1, 937.6, 938.1, 938.6, 939.1, 939.6, 940.1, 940.6, 941.1, 941.6, 942.1, 942.6, 943.1, 943.6, 944.1, 944.6, 945.1, 945.6, 946.1, 946.6, 947.1, 947.6, 948.1, 948.6, 949.1, 949.6, 950.1, 950.6, 951.1, 951.6, 952.1, 952.6, 953.1, 953.6, 954.1, 954.6, 955.1, 955.6, 956.1, 956.6, 957.1, 957.6, 958.1, 958.6, 959.1, 959.6, 960.1, 960.6, 961.1, 961.6, 962.1, 962.6, 963.1, 963.6, 964.1, 964.6, 965.1, 965.6, 966.1, 966.6, 967.1, 967.6, 968.1, 968.6, 969.1, 969.6, 970.1, 970.6, 971.1, 971.6, 972.1, 972.6, 973.1, 973.6, 974.1, 974.6, 975.1, 975.6, 976.1, 976.6, 977.1, 977.6, 978.1, 978.6, 979.1, 979.6, 980.1, 980.6, 981.1, 981.6, 982.1, 982.6, 983.1, 983.6, 984.1, 984.6, 985.1, 985.6, 986.1, 986.6, 987.1, 987.6, 988.1, 988.6, 989.1, 989.6, 990.1, 990.6, 991.1, 991.6, 992.1, 992.6, 993.1, 993.6, 994.1, 994.6, 995.1, 995.6, 996.1, 996.6, 997.1, 997.6, 998.1, 998.6, 999.1, 999.6, 1000.1, 1000.6, 1001.1, 1001.6, 1002.1, 1002.6, 1003.1, 1003.6, 1004.1, 1004.6, 1005.1, 1005.6, 1006.1, 1006.6, 1007.1, 1007.6, 1008.1, 1008.6, 1009.1, 1009.6, 1010.1, 1010.6, 1011.1, 1011.6, 1012.1, 1012.6, 1013.1, 1013.6, 1014.1, 1014.6, 1015.1, 1015.6, 1016.1, 1016.6, 1017.1, 1017.6, 1018.1, 1018.6, 1019.1, 1019.6, 1020.1, 1020.6, 1021.1, 1021.6, 1022.1, 1022.6, 1023.1, 1023.6, 1024.1, 1024.6, 1025.1, 1025.6, 1026.1, 1026.6, 1027.1, 1027.6, 1028.1, 1028.6, 1029.1, 1029.6, 1030.1, 1030.6, 1031.1, 1031.6, 1032.1, 1032.6, 1033.1, 1033.6, 1034.1, 1034.6, 1035.1, 1035.6, 1036.1, 1036.6, 1037.1, 1037.6, 1038.1, 1038.6, 1039.1, 1039.6, 1040.1, 1040.6, 1041.1, 1041.6, 1042.1, 1042.6, 1043.1, 1043.6, 1044.1, 1044.6, 1045.1, 1045.6, 1046.1, 1046.6, 1047.1, 1047.6, 1048.1, 1048.6, 1049.1, 1049.6, 1050.1, 1050.6, 1051.1, 1051.6, 1052.1, 1052.6, 1053.1, 1053.6, 1054.1, 1054.6, 1055.1, 1055.6, 1056.1, 1056.6, 1057.1, 1057.6, 1058.1, 1058.6, 1059.1, 1059.6, 1060.1, 1060.6, 1061.1, 1061.6, 1062.1, 1062.6, 1063.1, 1063.6, 1064.1, 1064.6, 1065.1, 1065.6, 1066.1, 1066.6, 1067.1, 1067.6, 1068.1, 1068.6, 1069.1, 1069.6, 1070.1, 1070.6, 1071.1, 1071.6, 1072.1, 1072.6, 1073.1, 1073.6, 1074.1, 1074.6, 1075.1, 1075.6, 1076.1, 1076.6, 1077.1, 1077.6, 1078.1, 1078.6, 1079.1, 1079.6, 1080.1, 1080.6, 1081.1, 1081.6, 1082.1, 1082.6, 1083.1, 1083.6, 1084.1, 1084.6, 1085.1, 1085.6, 1086.1, 1086.6, 1087.1, 1087.6, 1088.1, 1088.6, 1089.1, 1089.6, 1090.1, 1090.6, 1091.1, 1091.6, 1092.1, 1092.6, 1093.1, 1093.6, 1094.1, 1094.6, 1095.1, 1095.6, 1096.1, 1096.6, 1097.1, 1097.6, 1098.1, 1098.6, 1099.1, 1099.6, 1100.1, 1100.6, 1101.1, 1101.6, 1102.1, 1102.6, 1103.1, 1103.6, 1104.1, 1104.6, 1105.1, 1105.6, 1106.1, 1106.6, 1107.1, 1107.6, 1108.1, 1108.6, 1109.1, 1109.6, 1110.1, 1110.6, 1111.1, 1111.6, 1112.1, 1112.6, 1113.1, 1113.6, 1114.1, 1114.6, 1115.1, 1115.6, 1116.1, 1116.6, 1117.1, 1117.6, 1118.1, 1118.6, 1119.1, 1119.6, 1120.1, 1120.6, 1121.1, 1121.6, 1122.1, 1122.6, 1123.1, 1123.6, 1124.1, 1124.6, 1125.1, 1125.6, 1126.1, 1126.6, 1127.1, 1127.6, 1128.1, 1128.6, 1129.1, 1129.6, 1130.1, 1130.6, 1131.1, 1131.6, 1132.1, 1132.6, 1133.1, 1133.6, 1134.1, 1134.6, 1135.1, 1135.6, 1136.1, 1136.6, 1137.1, 1137.6, 1138.1, 1138.6, 1139.1, 1139.6, 1140.1, 1140.6, 1141.1, 1141.6, 1142.1, 1142.6, 1143.1, 1143.6, 1144.1, 1144.6, 1145.1, 1145.6, 1146.1, 1146.6, 1147.1, 1147.6, 1148.1, 1148.6, 1149.1, 1149.6, 1150.1, 1150.6, 1151.1, 1151.6, 1152.1, 1152.6, 1153.1, 1153.6, 1154.1, 1154.6, 1155.1, 1155.6, 1156.1, 1156.6, 1157.1, 1157.6, 1158.1, 1158.6, 1159.1, 1159.6, 1160.1, 1160.6, 1161.1, 1161.6, 1162.1, 1162.6, 1163.1, 1163.6, 1164.1, 1164.6, 1165.1, 1165.6, 1166.1, 1166.6, 1167.1, 1167.6, 1168.1, 1168.6, 1169.1, 1169.6, 1170.1, 1170.6, 1171.1, 1171.6, 1172.1, 1172.6, 1173.1, 1173.6, 1174.1, 1174.6, 1175.1, 1175.6, 1176.1, 1176.6, 1177.1, 1177.6, 1178.1, 1178.6, 1179.1, 1179.6, 1180.1, 1180.6, 1181.1, 1181.6, 1182.1, 1182.6, 1183.1, 1183.6, 1184.1, 1184.6, 1185.1, 1185.6, 1186.1, 1186.6, 1187.1, 1187.6, 1188.1, 1188.6, 1189.1, 1189.6, 1190.1, 1190.6, 1191.1, 1191.6, 1192.1, 1192.6, 1193.1, 1193.6, 1194.1, 1194.6, 1195.1, 1195.6, 1196.1, 1196.6, 1197.1, 1197.6, 1198.1, 1198.6, 1199.1, 1199.6, 1200.1, 1200.6, 1201.1, 1201.6, 1202.1, 1202.6, 1203.1, 1203.6, 1204.1, 1204.6, 1205.1, 1205.6, 1206.1, 1206.6, 1207.1, 1207.6, 1208.1, 1208.6, 1209.1, 1209.6, 1210.1, 1210.6, 1211.1, 1211.6, 1212.1, 1212.6, 1213.1, 1213.6, 1214.1, 1214.6, 1215.1, 1215.6, 1216.1, 1216.6, 1217.1, 1217.6, 1218.1, 1218.6, 1219.1, 1219.6, 1220.1, 1220.6, 1221.1, 1221.6, 1222.1, 1222.6, 1223.1, 1223.6, 1224.1, 1224.6, 1225.1, 1225.6, 1226.1, 1226.6, 1227.1, 1227.6, 1228.1, 1228.6, 1229.1, 1229.6, 1230.1, 1230.6, 1231.1, 1231.6, 1232.1, 1232.6, 1233.1, 1233.6, 1234.1, 1234.6, 1235.1, 1235.6, 1236.1, 1236.6, 1237.1, 1237.6, 1238.1, 1238.6, 1239.1, 1239.6, 1240.1, 1240.6, 1241.1, 1241.6, 1242.1, 1242.6, 1243.1, 1243.6, 1244.1, 1244.6, 1245.1, 1245.6, 1246.1, 1246.6, 1247.1, 1247.6, 1248.1, 1248.6, 1249.1, 1249.6, 1250.1, 1250.6, 1251.1, 1251.6, 1252.1, 1252.6, 1253.1, 1253.6, 1254.1, 1254.6, 1255.1, 1255.6, 1256.1, 1256.6, 1257.1, 1257.6, 1258.1, 1258.6, 1259.1, 1259.6, 1260.1, 1260.6, 1261.1, 1261.6, 1262.1, 1262.6, 1263.1, 1263.6, 1264.1, 1264.6, 1265.1, 1265.6, 1266.1, 1266.6, 1267.1, 1267.6, 1268.1, 1268.6, 1269.1, 1269.6, 1270.1, 1270.6, 1271.1, 1271.6, 1272.1, 1272.6, 1273.1, 1273.6, 1274.1, 1274.6, 1275.1, 1275.6, 1276.1, 1276.6, 1277.1, 1277.6, 1278.1, 1278.6, 1279.1, 1279.6, 1280.1, 1280.6, 1281.1, 1281.6, 1282.1, 1282.6, 1283.1, 1283.6, 1284.1, 1284.6, 1285.1, 1285.6, 1286.1, 1286.6, 1287.1, 1287.6, 1288.1, 1288.6, 1289.1, 1289.6, 1290.1, 1290.6, 1291.1, 1291.6, 1292.1, 1292.6, 1293.1, 1293.6, 1294.1, 1294.6, 1295.1, 1295.6, 1296.1, 1296.6, 1297.1, 1297.6, 1298.1, 1298.6, 1299.1, 1299.6, 1300.1, 1300.6, 1301.1, 1301.6, 1302.1, 1302.6, 1303.1, 1303.6, 1304.1, 1304.6, 1305.1, 1305.6, 1306.1, 1306.6, 1307.1, 1307.6, 1308.1, 1308.6, 1309.1, 1309.6, 1310.1, 1310.6, 1311.1, 1311.6, 1312.1, 1312.6, 1313.1, 1313.6, 1314.1, 1314.6, 1315.1, 1315.6, 1316.1, 1316.6, 1317.1, 1317.6, 1318.1, 1318.6, 1319.1, 1319.6, 1320.1, 1320	

**NOTES:**

**Forward**

## FIELD LOG OF BORING

PROJECT NO. 74-068

DATE 10/25 TITLE Sun Phillips

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

EQUIPMENT USED Gardner Denver

Layne Western

BORING NO. PA

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

LOGGED BY B. Linn

58

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
			5		Sandstone laminae - 537.8 - 538.3; 538.3 - 540.15	
					537.8 - 538.3 - higher grade, clay flecks	
					538.3 - 540.15 - Siltstone - dark grey, less red casts; sandy & sand laminae; poor sorting; med - highly calcareous; v. thin laminae, even layered, sandstone in discontinuous laminae, as well as v. thin continuous ones; v. sl. petroliferous to med. high content of bituminous mat'l; clay pods - scattered & rounded; micaceous; sand less & concentrated in laminae below 541.	
					540.2 - 542.9 richer in petroliferous mat'l - moderately high grade; clay pods; 1/55 at 542.5	
					542.9 - 542.15 as before; significant but minor amt of sand - variously included in the shale or concentrated in laminae;	

**NOTES:**

**Funerary**

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/25 TITLE San Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver  
Layne Weston

BORING NO. P 4  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siano  
P. 59

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
547.15 - 567.1					Rec. = 19.83 / 19.95 RQD = 100% / 100% 19.73 19.93	
		Siltstone			547.15 - 548.5 dark grey w. reddish	
					caste; fine grained, calcite & hydrocarbons	
					clay?; hard; med. calcareous; v. thinly	
					laminated - undeformed; slightly micaceous	
					less than above; slightly petroliferous	
					rare coarser laminae containing	
					reddish brown vitreous flakey material	
					* also, rare grey ss beds - non calcareous	
					547.54 - 548.5 - mixed black & red brown	
					bed of sand size mat'l	
					550.95 - grey sand size pods; black min	
					(magnetite);	
					551 - 555.2 - Siltstone as described	
					uniform, decreasing from sl. petroliferous	
					to almost non petroliferous.	
					555.2 - 556.95 - much higher grade	
					of oil shale - med. high	
					decreasing grade to 556.5 - still	
					mod; then below - v. light,	

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/25 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gardner Denver -  
Layne Western

BORING NO. P4  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Seem  
60

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					556.5 - 560.7 siltstone as described above - relatively uniform, only v. slightly petrolicerous	
					560.7 - 561.3 - mod. highly petrolicerous;	
					561.3 - 562 decreasing hydrocarbon content - mod low	
					562 - 563.2 - v. slight hydrocarbon content	
					563.2 - 566 - slight - mod hydrocarbon content	
					563.2 - magnetite <sup>ss</sup> lamination - N.02'	
					567.10 - 567.05 - from strapped rod measurements;	
					Recovery: $\frac{9.78 + 10.46}{19.95} = \frac{20.24}{19.95}$	
					RQD: 100	
					Siltstone, <del>uniform</del> color dark reddish gray, 569' approaching black due to hydrocarbon content.	
					575.2' to 576' more hydrocarbon causing darker color. Very fine, well sorted.	
					Few small ss beds, black well rounded, hard with some mica flakes.	

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10-26 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western

LOGGED BY J. Cranor

Gardner-Denver

P - 61

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
567.10 -					Siltstone thinly laminated, $\text{CaCO}_3 + \text{SiO}_2(?)$ cement, hard, moderate reaction to HCl, Horiz. frx. 568.75, 570.75, 573.05, 574.25 (horiz and vertical length 8 in), 577.20, 583.7, 584.05, 585.25, 585.35 (both Horiz and Vertical, fine-grained long).	
587.05						
587.05 -					Siltstone Same physical properties as above. Several ss beds between 0.04' and 0.3' thick occur in this run, all contain hydrocarbon, one at 591.8' is tacky to the touch, black in color and look to contain free oil, the others are only dark brown to black and not tacky. Grain size is medium and rounded.	
607.00'						

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4

DATE 10-26 TITLE \_\_\_\_\_

ELEVATION 5640 DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western  
Gardner Denver, 200

LOGGED BY Cranor

P-62

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
587.05'-					For all horiz - 590.8', 593.9'	
607.00					574.84, 605.05', 606.5, 599.15	
					Parting Plains 598.7, 599.5, 602.8	
					Parting Plains all occur in a Ss	
					unit or at the contact of Ss and	
					Siltstone	
607.00-				19.85	Siltstone, brown to dark brown,	
626.85				19.93		
					general lithology & description	
					same as above. Sandstone beds, laminations	
					and <del>lenses</del> lenses are from 1/8" to	
					6" thick with a large % being nearer	
					the smaller limit. Surfaces vary	
					from smooth to undulating, colors	
					from red brown to light gray	
					to black, depending on amount	
					of hydrocarbons present. A 608.2'	
					is a 0.5' Ss bed with much	
					oil is tacky to the touch.	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/27 TITLE San Phillips / S0410  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gayre - Western  
Gardner Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

p. 73

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					730.5-730.6 <sup>dark grey;</sup> Sandstone buffaceous?; v. f. grained, non calcareous, v. hard, uneven con- tacts, ss included within shale below,	
					730.6-731.25 - shale - mod. petroliferous	
					731.25-732.1 - oil shale - mod. to highly petroliferous irregular grey sandstone lamination at 731.3	
					732.1-734.1 - shale - 5VR6/2-5VR4/1 pinkish grey to dark grey; carbonate hydrocarbon cement; v. finely laminated, undeformed, discontinuous laminae; mod. to slightly petroliferous,	
					732.2-733 <sup>thin</sup> grey ss stringers every .1';	
					734.1-734.2 - slightly more petroliferous than above	
					734.2-734.35 - Sandstone dark grey, <del>slate</del> v. f. grained, mod. to highly petroliferous convoluted bedding, shale stringers included;	

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/27 TITLE Sun Phillips / SOHIO  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Lucy Western  
Quadrant Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

74

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					734.25-735.05 oil shale - mod. to highly petroliferous	
					735.05-736 - oil shale - slight to mod. petro-liferous; ss lense at ~735.55-irregular contacts,	
					736-737 - shale - red brown, sl. petroliferous more calcite - effervesces readily;	
					Partings 716.9, 717.2, 720.2, 720.3, 720.4, 721.03, 721.15, 736.3	
738.00		RQD=100	19.74	19.97	Siltstone - brown 7.5 YR 5/4, to reddish brown 5 YR 5/4, very fine grained, well sorted, CaCO <sub>3</sub> cement, very hard, moderate reaction to HCl, + laminated bedding in siltstone with small irregular shaped, discontinuous lenses and beds of <del>limestone</del> medium to fine grained, gray 7.5 YR 5/6, max thickness about 1"	very thin bed.
744.38						

## NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 Coring

DATE 10-28 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western  
Gardner Denver 2000

LOGGED BY Cramer

P-75

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
744.38 - 756.85						Siltstone reddish brown 5YR 5/2 to dusky red, 2.5YR 3/2, Very fine grained, well sorted, calc. cement, hard to very hard, mod to strong reaction to HCl. Thinly laminated, with very <del>fine</del> few ss laminations.	
<del>756.85</del>						Panting Plains: 738.15', 739.14', 739.75', 740.85', 741.5', 742.93', 743.95', 746.13', 746.96', 748.3', 749.65', 751.9' (uneven <del>brk</del> breaks), 753.42', 753.93', 755.20'	
756.85 - 776.82	RED: 100-99		20.28 19.97			Silty Shale - clayey siltstone <del>4</del> few interbedded <sup>lenses of</sup> ss beds 0.01' to 0.34' thick. <del>some thin interbed</del> Color of shale varies from Lt. brownish gray 10YR 4/2, brown 7.5YR 5/2, 10YR 5/3, gray 5Y 4/6, Very dark gray 10YR 3/1, Very dark grayish brown 10YR 3/2	

NOTES: Greas on core from Core barrel.

FUORO

# FIELD LOG OF BORING

PROJECT NO. 54-068  
 DATE 10/28 TITLE \_\_\_\_\_  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne Western  
Gardner Denver 2000

BORING NO. P-9 Core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY \_\_\_\_\_

P-76

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
<u>756.85</u> <u>776.82</u>					grain size (silty shale) from very fine to clay size, well to very well sorted, CaCO <sub>3</sub> cement, moderate to very hard, moderate to strong reaction to HCl. bedding is from thinly laminated to very thinly bedded.	
					Sandstone beds one at 764.55' to 764.93' is black, porous with some hydrocarbons present.	
					765.70' a 0.06' beds of ss exhibits some out gassing of air or gas a brown stain indicates the presence of oil. other, smaller, ss beds and lenses vary in color from <del>light</del> little or no evidence of hydrocarbons.	
					parting <del>surfaces</del> parting planes, 759.2, 761.1, 761.8, 764.3, 765.9, 766.9, 766.95, 680, 778.5, 773.5, 774.65, 775.05, 776.2.	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 77-068

BORING NO. P4 core

DATE 10/28 TITLE Sun Phillips / SOHIO

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne (Western)

LOGGED BY B. Siems

Gardner Denver P-77

DEPTH	SAMPLES				DESCRIPTION		REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:		
			776.82-	796.79	Rec = $\frac{19.85}{79.97}$ RQD = $\frac{17.85}{79.85}$		
			Partings		Fractures		
			777.4	789.55	777.78	779.9	
			778.6	794.58	778.09	780.15	
			781.7	795.65	778.84	780.5	
			782.31	796.6	779.2	780.8	
			783.81		779.5	781.15	
			786.86				
			776.82 - 777.05	Same as above:			
			Shale	54R 2.5/2 dark reddish brown; silty; poorly sorted; calcite & organic cement; v. hard to hard; silty calcareous; v. thinly laminated; moderately petroliferous; some areas highly petroliferous			
			777.05 - 777.4	Sandstone - silty & clayey, med-f. grained; poorly sorted; hard clay & silica?; hard; non calcareous; v. thinly laminated - highly distorted; laminae lensing & contorted; mica; bituminous - slightly; quartz			
			777.4 - 777.5	oil shale - moderately highly petroliferous			

NOTES:

FUBRO

# FIELD LOG OF BORING

PROJECT NO. 24-068

BORING NO. P4 core

DATE 10/28 TITLE Sun Phillips/GH 10

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Hayne Western  
Lardner Denver

LOGGED BY B. Sims

p. 78

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
	777.5-777.6				Shale, claystone & sand - mixed in contorted bed	
	777.6-777.78				Sandstone fine grained, light brownish grey; mixed with minor claystone & shale; med. sorted;	
	778-778.8				oil shale - sim. to above, 2.5Y 4/2 - dark grayish brown with olive caste - with red brown & v. dark grey to black laminae; slight to very calcareous, calcite & hydrocarbon cement; <sup>hard</sup> v. thinly laminated, rare sand lenses; laminae undeformed; <del>hard</del> olive caste <sup>seems</sup> caused by an olive green waxy hydrocarbon; this color was over core from 776.8	
	778.8-781.67				Sandstone - 0YR 6/4 - 10YR 4/1 - light yellowish brown to dark grey; some v. dark reddish brown; coarse; rounded; poorly sorted; clay & hydrocarbon cement, v. hard; non calcareous; breccia - contains claystone fragments & highly contorted bands of varying composition; contains green waxy caste; mica; gilsonite; quartz;	781.7

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. p-4(care)

DATE 10/28 TITLE Sun Phillips / S4H10

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western -

LOGGED BY B. Siems

(S.A.) 10/28/74 Gardner Denver

page 79

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					781.67-783.75 - siltstone-claystone & oil shale laminar - 10YR 6/3 (pale brown) - to dark grey, calc. clay; <sup>mod. to hard</sup> <del>mod. to hard</del> calcareousness; thinly laminated to thinly bedded; bedding offsets cut core at 25° one way & 35° opposite; sealed - by lithification? - offsets are clean; non petroliferous to mod. petroliferous - decrease in freq. of dark laminae with depth;	
					783.75-788.31 - v. dark grey sandstone, v.f. grained; magnetite;	
					788.31-790.5 - Claystone with siltstone & silty shale 10YR 6/5 dominantly, to 10YR 6/1 & 10YR 2/1 - pale brown to grey to black, 90% shades of brown; calcite & clay cement, rare hydrocarbons; mod. hard to hard; <sup>mod. to hard</sup> <del>mod. to hard</del> calcareous; thinly laminated to thinly bedded - max. v. 3';	
					789.1-789.3 - mod. petroliferous; other dark laminae & zones exist; 788.5-788.7 - st. petrolif.	
					790.5-794.7 - siltstone with claystone & - color change to v. 50% gray & 50% light brown; <sup>mod. to hard</sup> <del>mod. to hard</del> calcite & clay cement of calcite; <sup>mod. to hard</sup> <del>mod. to hard</del> v. thinly laminated to thinly bedded (to 7')	

NOTES:

FUGRO

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/28 TITLE SUN / PHILLIPS / SONID  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED LAYNE WESTERN -  
GARDNER-DENVER

BORING NO. P-4 CORE  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY BARBARA SIENS  
pg. 80

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
794.05 - 794.02' - 794.03'						OF SANDSTONE - med grey, v.f. grained, offset & bottom contact has feather intrusions into material below along tiny offsets - <del>2.01'</del> - 2.01';	
794.7 - 795.63						oil shale - 10YR3/2 v. dk greyish brown; hydrocarbon & clay cement; also carbonate; v. thinly laminated to thinly bedded (.2' max.) contacts gradational-indistinct; slight to med. petroliferous;	
795.63 - 795.8						Oil Shale highly petroliferous - dark brownish grey;	
795.8 - 796.79						Claystone as before (790.5') but darker - 10YR5/2 & slightly petroliferous. (MAY HAVE HAD DOLONITE EARLIER - calcareousness is really effervescent on fresh surface.	
796.79 - 816.79'						Recovery $\frac{9.9 + 10.4}{20} = \frac{19.94}{20}$ RQD = 100 Partings 796.45	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/28 TITLE SUN/PHILLIPS/SCALO  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED LAYNE WESTERN -  
GARDNER DENVER

BORING NO. PH - CORE  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. SIEMS  
pg. 81.

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
796-79' - 802.7'					SILTSTONE, clayey; 7.5 YR 6/2-5/2; dolomite cement-clay; (effervesces slowly until powdered); v. hard dolomitic, v.f. laminated - blk to brown, gen. flat - rarely undulating; hydrocarbons - waxy feel & oily surface when wet, odor; magnetite sandstone - 800.1-800.15; 800.5; black petroliferous beds - 800.75-800.8; 800.9-801.1; siltstone as above - bed from 800.1-800.75.	
802.7-804.2					Partings - 801.05 Siltstone & minor sandstone - brown & grey; v.f. grained; calcite & clay; v. hard, calcareous; v. thinly laminated, v. even, undeformed, sharp color contrasts at contacts; much of sand is dark magnetitic;	
804.2-806.5					siltstone & sandstone dominantly shades	

## NOTES:

**FURRO**

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/29 TITLE Son/shulps/sobio  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne Western -  
Gardner Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems  
pg 82

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						of brown, well sorted within laminae, or beds; carbonate cement & brown hydrocarbons; (to 804.8 is siltstone)	
						(804.8-805.3-SS with minor siltstone) v. hard; v. thinly laminated to thinly bedded (.2'); most is v. thinly laminated; undeformed; odor of hydrocarbons; 805.35-805.4 - v. bituminous sticky calcareous siltstone.	
						Partings - 804.67; 805.35	
806.5-807.7						Sandy siltstone & claystone 4.5 YR 7/1 & 6/4; light grey/light brown; v. thin dark grey laminae with magnetite sand odor;	
						Partings - 806.85	
807.7-813.3						Sandy siltstone - dominantly light grey with thin black laminae & brown laminae, varying in frequency, v. fine grained, carbonate and clay cement;	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/29/74 TITLE Sun/Phillips/Solbio  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Kayne-Western -  
Gardner-Senior

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems  
pg. 83.

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						v. thinly laminated - dominantly undisturbed (810.5, 810.7, 810.8 - thin laminae of disturbed material); magnetite sand in pods & <sup>at</sup> disturbed bands; minor pyritic laminae; petroliferous odor;	
813.3-816.2						Darker zone - med dark grey & brown; minor bedding offsets; still petroliferous odor; v. thinly laminated;	
						Partings 814.55; <del>814.55</del>	
816.2-816.79						v. light brownish grey; similar to previous (806.5-807.7) - slightly sandy;	
						Partings 816.69	
816.79-836.79'						Recovery $\frac{20.18}{20}$ RQD = $\frac{15.59}{20.18}$	Descriptions very difficult and contacts hard to pick
816.79-820.7						siltstone - same as much of previous core; light brown - med. brown; clay & carbonate cement; v. hard;	due to block greasy surface

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/29/74 TITLE Sun/Phillips/Schiro

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Wayne Western Gardner Denver

LOGGED BY B. SIEMIS

pg. 84

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	
					v. thinly bedded; slightly sandy; petro liferous odor, slight effervescence - likely calcinitic.	
					Partings - 818.28, 819.4, 819.75	FEATURES; 820.32; 820.82
820.7 - 823.8					Oil shale - 5 yr 3/2 - 3/3 - dark reddish brown; hydrocarbon & carbonate cement; v. hard; slight effervescence; thinly laminated; laminae, distorted-undulating, discontinuous, pinching, v. irregular; zone varies in hydrocarbon content - rich to mod, rich to slight;	
					Partings - 821.60	
823.8 - 824.2					Oil shale - thinly & evenly laminated, mod. petro liferous to highly petro liferous.	
824.2 ~ 827					Siltstone - shaly - red brown, hard; v. thinly & evenly laminated; petro liferous - slight to moderate	
					Partings - 824.75, 825.75, 826.87, 827.85	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-008

BORING NO. P4 CORE

DATE 10/29/74 TITLE Sun/Phillips/Sollid

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western - Gardner Denver

LOGGED BY B. Stems

pg 85.

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
827-828.2					Oil shale - highly petrolierous to mod. petrolierous; poor zone 827.7-827.85; core surface is very <del>rich</del> only and dark <del>grey</del> <sup>grey</sup> .	
828.2-829.5					Siltstone - lens of sand .01' thick; surfaces of core - light brown to dark grey;	
					Parting - 829.6.	
829.5-829.6					Sandstone, highly bituminous - dark grey	
					Parting - 829.6	
829.6-830.3					Siltstone - probably like 828.2	
830.3-830.4					Sandstone - bleeding v. liquid dark reddish brown hydrocarbon;	
830.4-833.3					siltstone and claystone - (1' sandstone at 832.4 - med grey) light brown dominantly; laminated with shades of brown, minor grey/black;	
					slight to mod. effervescent; carbonate	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 24-068

BORING NO. P4 CORE

DATE 10/29/74 TITLE Son/Phillips/schic

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western - Gardner Denver

LOGGED BY B. Siems

pg. 85a

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						and clay cement, some hydrocarbons - slight; v. hard, v. thinly laminated. to thinly bedded; frequency of dark black laminae increases from 0% at top to ~5% at bottom, sandy-minor.	
						Partings - 830.69, 831.8	
833.3 - 834.5						Siltstone - red brown, interbedded with thin laminae of grey sandstone, ~1' separation	
						Partings - 832.53, 833.66, 834, 834.3	
834.5 - 836.2						claystone light brown, sandy, highly effervescent; minor grey sandstone laminae; magnetite;	
836.4 - 836.78						Partings - 834.6, 835.4, 835.83, 836.17, 836.78.	
836.2 - 836.4						Oil sand - black very petroliferous, well sorted, v. grained.	

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 (core)

DATE 10-29 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western  
Gardner Denver.

LOGGED BY Cramer

P-86

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
834.79-	RQD.99			<u>19.88</u> <u>20.00</u>	Siltstone w/ several interbedded	dark colored
856.79					Ss beds. Color of siltstone	
					varied and laminations of light	
					colored shale, C	
					Color of the siltstone is	
					varied and changes vertically	
					from one lamination to another	
					with no one area being more	
					distinctive than another.	
					Colors observed in the siltstone	
					are: 2.5YR 4/2, 2.5YR 4 1/2, 5YR 5 1/2 4/3	
					10YR 7.5YR 4/3, 7/2, 10YR 4/2, 7/3, 4/3	
					10R 4/1, 7/2, 10R 4/1, 7/2.	
					of the sandstone colors are	
					black to very dark gray.	
					Grain size of the siltstone	
					is very fine, ss is fine, sorting	
					in each is to a high degree.	
					Cementation CaCO <sub>3</sub> , very hard	
					reaction to HCl is slight to moderate.	

NOTES:

FLUORO

# FIELD LOG OF BORING

PROJECT NO. 74 068

BORING NO. P-4 Core

DATE 10/29 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western  
Gardner Denver 2000

LOGGED BY Cranor

P-87

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
836.79 -						Bedding is mainly in the form of thin laminations with local gross changes in color ie from gray to browns. Sand stons are in beds from 0.5' to 0.1' thick with uneven surfaces. Three major distinct ss beds occur at: 845.2 (thinnest) 845.3 (contorted, 0.2' thick) <del>845.4</del> 849.75 (0.5' thick). Laminations are most distinct between 847 & 853	
846.79							
						Parting Plains: 838.8, 841.60, 841.70, 845.15, 846.80, 849.30, 849.80, 850.55, 851.15, 851.65, 851.90, 854.30, 854.9.	

NOTES:

fuano

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 Core

DATE 10-29 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Lagne Western  
Gardner Denver 2000

LOGGED BY Cranon

P-88

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
856.79	RQD	95		20.73 20.03	Siltstone, with thin beds of	
856.82					Shale and Sandstone of varied	
					colors which are the same as described	
					above. Within the three' rock	
					types found, they all are	
					well sorted, all are hard to	
					Very hard. Reaction to HCl	
					varies from none to moderate	
					the most reactive being in the	
					non-petroli-form siltstones.	
					bedding is from thinly laminated	
					to very thinly bedded. Several	
					areas through out the run is	
					found thin lensed, pods (algae),	
					and undulating beds. Between	
					870' and 871' occurs a thin ss	
					bed that is moderately porous and	
					out gased while logging. The core	
					from 859' to 864' and 870' to 873'	
					is somewhat petroli-form.	

## NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10-29 TITLE Sun Phillips / 50410  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Lagne western  
Gardner Denver 2000

BORING NO. P-4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY Cranon - Sims  
P-89

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
856.79					Plant fossil noted on	
876.82					<del>Plant</del> panting plain at 864.2'	
					Panting Plains: 857.4'	
					858.5, 859.3, 864.2, 864.45,	
					864.85, 866.15, 866.20,	
					867.7, 870.65, 870.80, 870.85,	
					873.7, 875.3' surface of	
					PP are un coated	
876.82-896.82					Recovery = $\frac{19.62}{20}$ RQD = $\frac{17.87}{19.62}$	
					Pantings:	
					880.9 888.66 891.76 895.27	
					884.17 888.82 892.08	
					884.5 889.13 892.49	
					886.53 889.75 892.82	
					887.87 890.89 893.21	
					888.35 891.26 893.52	
					Upper portion of core greasy again: probably	
					from grease in core barrel	

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 cor

DATE 10/22 TITLE Sum Phillips / SAH10

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western -  
Gardner Denver

LOGGED BY B. Lewis

90

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
876.82 - <del>876.82</del> 877.9		Oil shale & sandstone			7.5 VR 3/1 - 3/2; mostly shale; sandstone v. 1' at top; v. dark; v. f. grained ss; well sorted; hydrocarbon & carbonate cement; v. hard; v. finely laminated; undeformed; carbonate probably dolomitic;	
877.9 - 883.4		Sandy siltstone			- many shades of gray & pinkish gray & brown; sand - v. f. grained; clay & carbonate cement; v. hard - hard magnetite grains in ss sand - some concentrations; v. finely laminated thinly bedded; laminations contacts may be abrupt or gradational; slight to med. petroliferous at 879.35 - .65, .8; 880.05 - .4; 881.9 - .95;	
883.4 - 887.4		Petroliferous siltstone			- 5VR 4/1 - 5VR 5/2 dark grey to reddish gray; carbonate, hydrocarbon & clay cement; v. hard; carbonaceous - dolomite?; v. finely laminated to thinly bedded, undeformed; some lensing laminae; slightly petroliferous to highly petroliferous - ave. less than moderate;	

## NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. D4 (core)

DATE 10/29 TITLE San Phillips, SAHVO

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Lucine Winkler  
Gardner Denver

LOGGED BY B. Sims

91

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
887.4 - 888.4					oil shale <sup>sandy</sup> - dark reddish grey to black; v. thinly laminated; carbonate, clay & hydrocarbon cement; v. hard; dolomitic?; v. thinly laminated some terminated; generally undeformed; magnetite sand; highly petroliferous; magnetite present also as xls - disoriented needles	
888.4 - 890.6					siltstone 10YR 5/2 - 6/1; grey to grayish brown; carbonate cement; v. hard; <del>calc</del> calcareous - may be dolomitic also; v. tiny pod-pellet shaped calcite concentrations (< 0.1); v. thinly laminated to thinly bedded; magnetite - concentrated in beds & disseminated;	
890.6 - 898.82					siltstone <sup>claystone</sup> as above; <del>magnetite</del> generally lighter colored 10YR 6/1 - 6/2; hard; calcite & dolomite cement, clay, calcareous & dolomitic?; v. thinly laminated to thinly bedded - contents gradational to abrupt; magnetite beds & fillings in joints? or fractures? - irregular trace on core surface, but regular trends - 1 to 2 directions cutting bedding planes;	

NOTES:

THIRD

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/29 TITLE Sun Phillips / 50410

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Wacker

LOGGED BY B. Sims

Gardner Denver

92

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					also concentrated in pods v. 0.2' x 0.5'; lineations may be formed at time of deposition or later; pyrite; may have formed & then been offset by bedding plane movement; 3' ← sim. to that; one set measured at 60° to horiz.; mag. is v. f. grained;	
896.82' - 916.78'				Recovery = $\frac{20.16}{19.96}$	RQD = $\frac{19.74}{20.16}$	
896.82' - 900.53'					same as above, bedded thinly - contacts freq. indistinct	
899.15 - 899.85'					laminar highly irregular, probably originally deposited irregular more than deformed; 899.6 - clay stone with siltstone - very irregular deformed contact;	
<del>899.85</del>					all of above has much magnetite - as beds, splashes, & disseminated;	
<del>900.3</del>						
900.3 - 905.7					siltstone - shaly at times; between 5/8 & 1/2 - dark grey to dark reddish grey; lighter shades to 7/8 & 1/2; overall is more light brown than gray; carbonate & Fe oxide cement, probably some hydrocarbons; mod. to slight effervescence even scratched; <del>mag.</del> v. thinly laminated to	

NOTES:

tuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 case

DATE 10/29 TITLE Ann/Phillips/50410

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Hydrocarbon Analyzer

LOGGED BY B. ABIE SIENIS

93

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					v. thinly bedded - contacts gen. more distinct than above; magnetite & pyrite - less abundant than above but still common;	
					905.15 - becoming darker - some bleeding hydrocarbons	
					905.7 - 908 oil shale dark reddish brown; mod. petroliferous slightly calcareous; calcite & hydrocarbon cement; v. hard; v. thinly laminated; pyrite	
					908 - 909.4 - siltstone reddish gray; with magnetite & pyrite laminae; v. hard; non calcareous;	
					909.4 - 911.3 - <del>siltstone</del> <sup>claystone</sup> - 5/16" - 1/2" gray to pinkish gray; v. thinly laminated to v. thinly bedded - beds actually v. thin less distinct laminary hard; carbonate & clay cement; rare pinching hydrocarbon stringers; still minor magnetite - v. f. sand size grains	
					911.3 - 915.6 - oil shale & siltstone - 5/16" 3/2; carbonate & hydrocarbon cement; v. hard w. waxy feel; dolomitic?	
					912.82 - 914.15 - v. thinly laminated; 913.75 - 914.15 - zones where laminae irregular; (11.3' respectively)	
					914.82 - 915.1 - oil sand - bleeding; pressure caused sand to bulge & crack; also 915.2 ~ .01"	

NOTES:

915.4 - 1' oil sand

FURRO

# FIELD LOG OF BORING

PROJECT NO. 74-065

BORING NO. P4

DATE 10/29 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western  
Gardner Denver 2000

LOGGED BY Cramer

94

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
915.6 - 916.78					claystone - marlstone? - 5YR 7/2-6/2; calcite & clay cement; v. thin, laminated to laminar m hard; minor magnetite beds;	
916.78 - 919.4	RQR=99.9		19.96 19.97		Very fine Siltstone, Lt. gray 5YR 7/1 pinkish gray 5YR 7/2, Lt. reddish brown 5YR 6/4 little to no reaction to HCl, hard to very hard, bedding is very thin thinly laminated to laminated generally thinner near 919'.	
919.4 - 922.6					Very fine grained Siltstone 7/1 through so thin, deformed beds of ss containing moderate to little petroleum. Siltstone is black <del>bedding</del> beds is well sorted, non calcareous, very hard. Between 919.4' and 921' the bedding is well defined, based on slight color changes and undulation -	

NOTES:

fuaro

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 Core

DATE 10-30 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Lagne Western  
Gardner Denver 2000

LOGGED BY Cranor

95

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
919.4 - 922.6						920.6, Near bottom of undulated portion of this section is a 0.1' thick ss bed containing moderate amount of petroleum. at 922.3' free oil along a parting plane. Minor amounts of FeS <sub>2</sub> in the form of very small flakes occurs in the siltstone.	
922.6 - 928.4						Inturbidated Siltstone and <sup>calcareous</sup> shale. Very pale brown 10YR 7/3, brown 7.5YR 5/2, light gray 10YR 7/1, gray 10YR 4/1. very fine grain to clay size grains, well sorted, cement - CaCO <sub>3</sub> , reaction to HCl moderate. Bedding - thinly laminated to very thinly bedded.	

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 24-068

BORING NO. P-4 Corn

DATE 10/30 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne western  
Gardner Denver 2000

LOGGED BY Cramer

P-96

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
928.4-					Very fine siltstone gray 10IR 4/1	
936.74					dark gray 10IR 3/1, well sorted,	
					Cement - CaCO <sub>3</sub> , Very hard,	
					reaction to HCl - moderate to	
					weak., bedding - thin laminations	
					rare biotite blocks < 1/2 mm.	
<del>936.74'</del>					Panting Plains: 914.8, 916.9,	
					918.5, 920, 921.9, 922.3	
					923.3, 923.5, 924.35	
					926.9, 927.3, 927.6, 928.85	
					930, 931.6, 933.1, 934,	
					935.8,	
936.74'				20.20 19.97	Fine siltstone with thin laminations	
941.80					of shale, Lt. gray 2.5Y 7/2, Lt. gray	
					10YR 7/1, very pale brown 10YR 7/3,	
					well sorted, calcite cement, hard	
					moderate reaction to HCl.	
					Bedding mostly thinly laminated.	

## NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 Core

DATE 10-30 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western  
Gardner Denver 2000

LOGGED BY Cramer

P-92

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
934.74					From 934.74 - 937.5' many small,	
941.80					horiz. oriented, gray spots, SiO <sub>2</sub> gel (?)	
					Same material fill; small vortical	
					sub parallel frx. 0.1' long.	
941.80					Very fine siltstone as above.	
952.35					<del>gray</del> gray 10% R <sup>5/1</sup> , to dusky red	
					laminations 2.5% R <sup>3/2</sup> , well sorted	
					very hard to hard, very slight	
					reaction to HCl. Thinly laminated	
					irregularly shaped blibs, <del>of</del>	
					mostly vertical, of marcosite	
					occur in this section about	
					5-8% of core (?) last <del>1.4</del> 1.4'	
					of section FeS <sub>2</sub> is less abundant	
					and laminations more pronounced.	

## NOTES:

fuoro

# FIELD LOG OF BORING....

PROJECT NO. 74-068

BORING NO. P4 102

DATE 10-30 TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY Cranor

P-98

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
952.35 -					Inter bedded laminations of shale, very pale brown 10/R 3/4 and very dark grayish brown 10/R 1/2. CaCO <sub>3</sub> cementation, moderately hard. Slight reaction to HCl. easily cleaved along contacts of shale lamination, which are slightly uneven.	
952.55						
952.55					Sandstone - 54 L/1 gray; v.f. grained; med. grained well sorted, calcite cement; mod. hard to hard; <sup>mod.</sup> calcareous; v. fine laminated to v. thinly bedded; ripple beds in places; others flat, thin laminations; micaceous - mica throughout as well as concentrated along beds; magnetic; v.f. grained - present throughout.	

NOTES:

fuero

7-23-73 1-01

# FIELD LOG OF BORING

PROJECT NO. \_\_\_\_\_

BORING NO. P4 600

DATE \_\_\_\_\_ TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY \_\_\_\_\_

P. 99

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
956.71 - 956.85					Silty Claystone - 10YR 6/1 - 10YR 6/2; light brownish gray to gray; carbonate & clay cement; mod. hard to hard; calcite & dolomite?; thinly laminated; undeformed; magnetite sand-minor;	
956.85 - 958.4					Petroliciferous siltstone 5YR 3/1 v. dark gray with reddish casts; v. fine grained; v. minor carbonate cement & hydrocarbons; hard-v. hard; v. finely laminated - irregular uneven discontinuous w. horiz. laminae, mod. <del>petro</del> petroliciferous;	
958.4 - 961.65					Siltstone - 7.5YR 5/2 brown; hydrocarbon & minor carbonate cement; hard-v. hard; sl. dolomite?; v. thinly laminated - uneven color; non deformed; red brown crystalline hydrocarbon & magnetite bed; 959.61; also 960.17; both v. 02-03' thick; only slight effervescence even scratched;	
961.65 - 969.5					marlstone? with minor claystone; Siltstone varicolored: 7.5YR 8/2 (pinkish white) 7.5YR 7/2 (pinkish gray) 4.0YR 6/1 (gray) 10YR 5/1; v. thinly laminated to thinly bedded; carbonate & clay, minor hydrocarbons in selected beds; calcite; v. effervescent;	

NOTES:

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# FIELD LOG OF BORING

PROJECT NO. \_\_\_\_\_

BORING NO. D400

DATE \_\_\_\_\_ TITLE \_\_\_\_\_

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED \_\_\_\_\_

LOGGED BY \_\_\_\_\_

100

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					pyrite? or marcasite disoriented sand-size plates & needles; hydrocarbons - minor; & decreasing dark laminar toward bottom;	
969.5 - 972.95					<sup>Sandy</sup> siltstone-shaly; 10/RS/2 grayish brown; brownish gray; calcite cement; v. hard; v. effervescent; dominantly thinly bedded with indistinct interval v.f. laminations; very magnetitic; also pyrite; magnetite-disseminated as beds & in "veins";	
972.95 - 976.71					Siltstone sim. to above; laminations more distinct - v. thin; laminated browns to grays; dominantly brownish gray; magnetite laminae, also pyrite; marcasite? pod-grown in place from both sides to center - along bedding, v. 0.1' thick; also magnetite "veins" - v. fine grained concentrations crossing the bedding.	
					Partings: 958.5, 959.6, 960.9, 962.16, 963.85, 965.58; 966.52; 967.98; 45; 968.55; 969.67; 970.52; 971; 972.83;	
976.71 - 996.69					Rec 19.9 / 19.98 19.56 / 19.98 = RQD	
					Partings 977.25, 979.9, 982.4, 983.3, 983.55, 984.2, 986.5, 988.86, 990.25, 992.21, 994.5, 994.9, 996.32, 996.65	

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/30 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western

LOGGED BY B. J. Novak

101

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
976.6 -						Siltstone 3/2 5YR dark reddish br.	
980.4						w/bands 5/2 7.5R brown, hard, non-	
						v. slightly calcareous, laminated, w/ <1% pyrite, gradational lower contact	
977.53						Siltstone, 5/2 7.5R 0.02' thick as above but w/ 4% pyrite, fracture due to differential compaction	
980.40 -						Siltstone 3/2 5YR dark reddish br	
988.74						hard, non calcareous, v. thinly laminated w/ pyrite increasing downward, maximum 5%, very homogeneous. some magnetite gradational lower contact	
984.20						Pyrite healed fracture	
985.48						Blebs of Marchisite .01' x .02' in linear horizontal string	

## NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10/30/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Cayne Western, Gardner Denver  
2000

LOGGED BY NOVAK

Page 102

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
988.74-					Siltstone, 4/4 7.5 R, brown, hard	
991.05					v. slightly calcareous, laminated w/	
					many lenses up to .03' thick. lenses	
					are sandy siltstone w/ fgr sand 5-	
					8% pyrite, 2% magnetite. Gradational	lower contact
988.86					Laminae, black, of magnetite,	
					magnetite increasing downward 3-4%	
					maximum	
991.05 -					Siltstone 4/2 7.5 R brown, hard,	
995.09					v. slightly calcareous, thinly laminated	
					w/ 1% pyrite, 4-5% magnetite, magnetite	
					healed fractures, occasional laminae	
					of sandy siltstone, fgr sand w/ 8-10%	
					magnetite, and thin laminae of magnetite	

NOTES:

TUWA

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 10/30/74 TITLE Sun Phillips

ELEVATION D DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western Gardner Denver

LOGGED BY NOVAK

2000

Page 103

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
991.05-					Siltstone (cont)	
995.09 (cont)						
994.90					Silty Sandstone block, 0.04' thick v.f. f grain, subangular, poorly sorted, noncalcareous w/ 1-2% pyrite, 10-15% magnetite, parting plane along upper contact. Depositional contacts, top and bottom	
995.9-					Siltstone, 5/2 9.5R brown, hard	
996.69					slightly calcareous, thinly laminated w/ 1% pyrite and some laminae of sandy siltstone w/ 3% magnetite	End of core
					v.f. grain sand	run
					gradational upper contact	996.69

NOTES:

1000

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/31/74 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne Western, Gardner Denver  
2000

BORING NO. P-4 core  
 ELEVATION \_\_\_\_\_ DATUM MSL  
 WATER LEVEL dry AFTER \_\_\_\_\_  
 LOGGED BY NOVAK

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
996.69-				→	Missing 0.12' recovery here	
996.81						
996.81-					Parting planes horizontal, 997.89	
1016.63					999.44, 1000.12, 1000.77, 1001.65	
					1003.52, 1004.88, 1006, 1006.58,	
					1006.67, 1008.80, 1008.96, 1009.48	
					1010.52,	
					Fractures "V" shape 1000.93	
					1000.48	
996.81-					Inter <sup>laminated</sup> <del>bedded</del> Sandy Siltstone 5/2 7.5YR	
998.7					brown, hard, slightly calcareous w/1% pyrite, laminated and Silty Sandstone	
					7/2 2.5Y H. gray, fine grain, subangular	
					poorly sorted, calcite cement w/1% magnetite and Claystone, 6/4 7.5YR	
					mod hard, slightly calcareous thin bedded	
					Silty ss and silty siltstone laminae contacts	
					gradational. Claystone contacts depositional	
					Bottom contact, convoluted depositional	

NOTES:

frame

# FIELD LOG OF BORING

PROJECT NO. 74-068  
DATE 10/31/74 TITLE Sun Phillips  
START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
EQUIPMENT USED Layne Western Gardner Denver  
2000

BORING NO. P-4 core  
ELEVATION \_\_\_\_\_ DATUM MSL  
WATER LEVEL Dry AFTER \_\_\_\_\_  
LOGGED BY NOVAK

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
998.7-					Interbedded <sup>laminated</sup> Siltstone, 5/2 7.5YR brown	
1001.2					mod hard slightly calcareous, laminated and Claystone 6/4 7.5YR lt. brown	
					mod hard, slightly calcareous, laminated w/ < 1% pyrite, magnetite	
					gradational lower contact	
1001.2 -					Siltstone 4/2, 2.5Y, dk grayish brown	
1006.15					hard, slightly - mod calcareous, laminated w/ 5-8% magnetite, < 1% pyrite	
					depositional lower contact	
1004.79					clayey Sandstone 0.13' thick, black-greenish	
					black uf-f grain, subangular, poorly sorted, clay cement? w/ 30% magnetite	
					1% pyrite, Depositional upper and lower contacts	

**NOTES:**

**Funktion**

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/31/74 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne Western Gardner Denver  
2000

BORING NO. P-4 core  
 ELEVATION \_\_\_\_\_ DATUM MSL  
 WATER LEVEL Dry AFTER \_\_\_\_\_  
 LOGGED BY NOVAK

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1006.15-					<sup>laminated</sup> <del>Interbedded</del> Silty Sandstone 5/2 2.5Y	
1006.89					grayish brown, fine grain poorly sorted	
					subangular and relatively no <del>trace</del> <sup>accessory</sup>	
					minerals and Sdy Siltstone - Siltstone	
					w/same characteristics, laminated	
					Depositional lower contact	
1006.89-					Interbedded 4/4 7.5YR dk brown	
1011.80					hard slightly calcareous w/ 2% magnetite	
					1% pyrite with Claystone 6/4 7.5YR	
					lt brown mod hard, slightly calcareous	
					w/relative no accessory minerals	
					gradational lower contact	
1010.44					Sandy Siltstone .08' thick black	
					f grain w/3-5% pyrite clayey	
					cement, displays crossbedding	
					Upper contact gradational, lower	
					contact depositional	

## NOTES:

7-23-73 L-013

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/31 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne Western Gardner Denver  
2000

BORING NO. P-4 core  
 ELEVATION \_\_\_\_\_ DATUM MSL  
 WATER LEVEL Dry AFTER \_\_\_\_\_  
 LOGGED BY NOVAK

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DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
1011.80-						Siltstone G/O 7.5YR, lt gray	End of
1016.63						hard, slightly calcareous, laminated	core
						w/ 7-10% magnetite? marchisite	Run
						< 1% pyrite	1016.63
1016.63 - 1036.60						Recovery 20.06/19.97 ROD 18.72/20.06	
						*Note: Last core run measurements off by 0.09'	
						1015 is really 1014.91	
<del>1016.54 - 1017.58</del>							
						Parting Planes:	Fractures:
						1017.85 1025.69	1017.58 - N60° to horiz
						1018.28 1025.9	1018.07 ~ 40°
						1018.43 1026.77	1018.78 ~ 35°
						1020.62 1027.26	1027.26 - 1027.26
						1020.8 1028.4	1033.95 ~ 45°
						1021.21 1031.6	1034.96 ~ 45°
						1023.98 1033.45	
1016.54 - 1020.62						Shale 5/3/2 dark olive gray; clay & minor hydrocarbon	
						& minor carbonate; hard; non calcareous	
						& v. slightly effervescent; v. thin laminated	

NOTES:

7-23-73 1-013

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 line

DATE 10/91 TITLE Sun Phillips 150410

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Hayes (Moberg) - Gardner Denver

LOGGED BY B. Sim

P. 108'

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					undeformed; <sup>stone</sup> sandstone & beds at: 1017.86, 1017.25, 1017.94 (.01'), 1018.28 (.02'), 1018.43 (.03'), 1019.25 (.01'), 1020.12 (.15'); dark gray, magnetitic, probably some hydrocarbons; v.f. grained; clay cement?; mod. hard; tendency for partings to occur at lower contact; contacts v. slightly irregular; tiny pyrite & magnetite needles in both rock types	
1020.62 - 1020.8					sandstone with <sup>shale</sup> claystone inclusions - dark gray to olive brown (inclusions); v.f. grained, hydrocarbon cement; hard; non calcareous; pyrite 1-2%; black streaks & laminae of hydrocarbons; thinly laminated, highly deformed	
1020.8 - 1023	34	Siltstone			5 1/2' gray; 3 1/2' light gray; 2.5 1/2' - dark grayish brown; 5 1/2' dark olive gray; browner near top, grayer near bottom; calcite cement, probably minor hydrocarbons; mod-v. calcareous, magnetitic (v.f. sand size) pyrite, filled fractures occurs in beds, & is disseminated; increases in % toward bottom; to 15%; v. thinly laminated flat-undeformed; rare filled fractures	

## NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 10/30 TITLE San Phillips, SOHIO  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Gayne (Western) -  
Gardner Denver

BORING NO. P 4  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Siems

*p 109*

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1023.34 - 1024.19	1024.19	Siltstone	2.5V 7/2, 6/2 & 5/2		light gray to grayish brown, well sorted; cement-clay & hydrocarbon mod-hard; v. sl. effervescent in places; v. thinly laminated; undeformed; magnetite - % unknown; v. fine grained;	
1024.19 - 1026.5	1026.5	Siltstone			as 1020.8 - 1023.34 - dom. gray; magnetite sand beds at 1025.69, 9, 1026.07, 7.5V R 3/4 - v. calcareous claystone - v. irregular laminated ~ 1026.07 - 1026.123; beds have rounded irreg. tops as algal striae or pods;	
1026.5 - 1029.5	1029.5	Sandstone			light gray to gray; v. f. grained; contains light brown clay laminae - v. minor - near top; mod. sorting; calcite & clay cement; hard; v. thinly laminated & laminated; gradational contacts; laminae wavy - as ripple bedding at times - v. low angle & laminae frequently horizontal; mod to v. calcareous; 1027.6 - claystone piece - claystone frags in ss; to .02"; angular to subrounded;	
1029.5 - 1031.5	1031.5	Siltstone			light gray to gray, v. thinly laminated & even colored; v. minor clay laminae near bottom	

## NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/31 TITLE Sun Phillips SAH10

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Hayne Western - Gardner  
Denver

LOGGED BY B. Siems

p 110

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					sim to SS above but finer grained & laminar horizontal	
<del>1031.5 - 1032.3</del>					<del>thin interbedded laminae of siltstone, oil shale (low grade) &amp; claystone; 5VR 2/1 - 3/1 - 4/2 - 4/1 - 2SVR 3/2; mainly siltstone; calcite &amp; hydrocarbon cement; hard; light to mod. calcareous; v. thinly laminated; magnetite - disseminated &amp; laminae;</del>	
<del>1032.3 - 1033.35</del>					<del>claystone - 7.5VR 3/2; calcite cement; v. thinly laminated - undisturbed except a dk grey sand laminae (u 1032.45) enclose brecciated claystone; magnetite;</del>	
<del>1033.35 - 1033.65</del>					<del>Shaly siltstone gray, with minor pinkish white &amp; pinkish gray claystone laminae near bottom &amp; dark gray v.f. sandstone laminae; ss-magnetite cement - calcite &amp; minor hydrocarbons; clay?; mod to v. calcareous</del>	
<del>1033.65 - 1036.4</del>					<del>SS at 1034.4 - contains angular siltstone frags nearly in place - fragmented bed filled around with black v.f. sand,</del>	
1036.4 -					Sandstone - gray, i.f. grainol, thinly laminated & thinly bedded; sl. calcareous	

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 24-068  
 DATE 10/31 TITLE Sun Phillips / S410  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Sege Water  
Gardner Denver

BORING NO. P4 core  
 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 LOGGED BY B. Sims  
0111

DEPTH	SAMPLES				DESCRIPTION		REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:		
1036.6-1056.6				Recovery	19.82/80	R9D 19.52/19.82	
		Boring		Planes			FRACATURES
	1037.25			1046.5			<del>1045.5</del>
		.82		<del>1048.</del>			1055.35
	1038.48			1050.3			1053.65
	1040.55			1052.55			1056.05
	1042.8			1052.57			
		.85		10.			
	1044.21						
	1044.46						
1036.6-1037.2		Sandstone	2.5	SYR7/1	v.f. grained, slightly calcareous-carbonate cement; v. hard; mod. calcareous; v. thinly laminated to v. thinly bedded; undeformed; micaceous; magnetite;		
1037.2-1042.5		Sandstone-siltstone & <del>interbedded</del> claystone			interbedded; 5/6/1, 1/5/1, 1/2/1, claystone 5/8/2; v.f. grained; calcite & clay cement; most is sandstone & siltstone-claystone is minor; sl. to mod calcareous-mainly slight; 3 highly perforiferous laminae - 1037.3, 1038.05, 1040.1 (v. 0.2' thick); hard to v. hard; v. thinly laminated-thinly		

## NOTES:

cut & small sects of core  
 claystone laminae are uneven-like dol.  
 structures  
 mic & magnetite

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 10/31 TITLE San Phillips S.H. 10

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western  
Gardner Denver

LOGGED BY R. Siems  
p112

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					below 1040.5 - claystone is very minor; - decreases in amount with depth;	
1042.5-	7	Claystone			creamy white, as above, irregular hummocky top as algal structures; dolomitic, with magnetite laminae; offset (.01') within zone;	
1042.7-1043.26	26	Siltstone			sim. to before - <sup>sandy</sup> gray, v.f. grained, sandy, magnetitic; carbonate cement, v. thinly laminated	
1043.16-	26	Claystone			with magnetite laminae as 1042.5	
1043.26-		Sandstone			gray, very even colored; v.f. grained, well sorted; carbonate cement; mod. hard to hard; mod. calcareous; v. thinly laminated to thinly bedded; some of bed laminae are highly distorted; many are even; magnetite occurs throughout in bedding - also minor amounts as fracture fillings; becomes finer grained & more evenly laminated lower in the section;	
1043.8						
1043.8-1044.21-1044.46		Sandstone			dark grey brown; mod. grained, tuffaceous;	

NOTES:

Turner

# FIELD LOG OF BORING

PROJECT NO. 74-060

BORING NO. P4 core

DATE 10/31 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Hayes Western

LOGGED BY B. Siems

Gardner Denver

113

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1048.8-1050.25		Siltstone			5YR 3/1 v. dark gray; gradational contact; carbonate cement, also clay; v. thinly laminated - rare deformed beds; hard; v. slightly micaceous; slightly petroliferous - content increasing to moderate at center of section & decreasing toward bottom;	
1050.25-1052.1		Siltstone			7.5YR 4/1 with minor 7.5YR 4/2 dark gray to dark brown; v. f. grained; carbonate cement; mod. hard to hard; mod. calcareous; v. v. thinly laminated; magnetite, micaceous; grades into bed below - laminae become thicker, more distinct in next bed, carbonate content increases	
1052.1-1056.6		Siltstone			7.5YR 6/1 & 6/2 gray & pinkish gray; sim. to above - grading from above into finer grained more clayey material; beds thicken downward & brown more clayey material increases; sand size magnetite decreases; becomes more calcareous; 1052.55 - marcasite layer, 0.1' thick; toward bottom red brown slightly petroliferous mat'l begins to occur;	

NOTES:

7-23-73 L-013

# FIELD LOG OF BORING

PROJECT NO. 74-068  
 DATE 11/1/74 TITLE Sun Phillips  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
 EQUIPMENT USED Layne Western, Gardner  
Denver  
2000

BORING NO. P-4 core  
 ELEVATION \_\_\_\_\_ DATUM MSL  
 WATER LEVEL Dry AFTER \_\_\_\_\_  
 LOGGED BY NOVAK

114

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1056.6 -					Parting planes horizontal 1059.4	
1076.67					1061.17, 1064.08, 1065.35, 1065.8	
					1068.18, 1069.61, 1070.16, 1070.37	
					1071.3, 1071.37	
					Fracture 30° 1073.23	
1056.6 -					Gradational contact w/ rock described	
1063.13					at 1052.1 @ 1056.6	
					Siltstone 6/2 2.5Y, light brownish	
					gray - 4/2 2.5Y dk brownish gray	
					hard, v slightly calcareous, thinly	
					laminated w/ relatively no accessory	
					minerals and silty Sandstone white,	
					v f grain, subangular, poorly sorted	
					silty cement w/ <1% pyrite, magnetite	
					gradational lower contact	

NOTES:

7-23-73 L-013

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11/1/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver  
2000

LOGGED BY NOVAK  
Page 115

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
1063.13-						Interlaminated Siltstone 3/2 10YR	
1064.58						hard, non calcareous, thinly laminated	
						w/ < 1% pyrite and silty Sandstone	
						8/4 10YR, v f-f grain subangular, poorly	
						sorted, laminated and an lenses w/ < 1% pyrite	
						thin laminae of magnetite	
						non calcareous	
						Last 0.15' is silty sandstone - sandy	
						siltstone 3/2 10YR f grain,	
						Bottom contact depositional	
1064.17						Silty sandstone black 0.06' thick	
						f grain poorly sorted, subangular	
						silty cement w/ 15% magnetite	
						< 1% pyrite. Depositional contacts	
1063.9						Silty sandstone as above	
						but w/ erosional lower contact	
						0.01' thick	

## NOTES:

Fluoro

## FIELD LOG OF BORING

PROJECT NO. 74-068  
DATE 11/1/74 TITLE Sun Phillips  
START \_\_\_\_\_ COMPLETE \_\_\_\_\_  
EQUIPMENT USED Layne Western, Gardner Denver  
2000

BORING NO. P-4 core  
ELEVATION \_\_\_\_\_ DATUM MSL  
WATER LEVEL Dry AFTER \_\_\_\_\_  
LOGGED BY Novak

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	
1064.58-					Siltstone 6/2 2.5Y 1+ brownish gray	
1068					4/2 .25Y dk brownish gray, hard	
					non-calcareous, thinly laminated, w/	
					almost no accessory minerals and	
					Siltstone 8/4 10YR hard, non calcareous	
					laminated. Section highly disturbed	
					laminar is often truncated and/or	
					broken and filled consequently by	
					the same material. Undisturbed laminae	
					Erosional remnants are abundant	
					<del>possibly</del> Undisturbed laminae often	
					separated by erosional surfaces	
					depositional contact	
					Possible worm burrows 1064.9	
					1067.25 0.2 x 0.05'	

**NOTES:**

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11/1/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver  
2000

LOGGED BY NOVAK

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1068.0 -					Inter laminated silty sandstone	
1071.37					6/0 25Y gray f grain, poorly sorted subangular, non calcareous w/ relatively no accessory minerals; laminated and in lenses and stringers and	
					siltstone - sandy siltstone gray, hard non calcareous sometimes displays grading upwards to silty ss depos. tional bot. cont.	
1068.8					0.40' interval w/ worm borrows 0.1x0.2' in siltstone filled w/ sdy siltstone w/ 0.1x0.1 frags of silty sandstone	
1070.30					0.3' interval mostly silty sandstone lenses ss lenses + laminae decreasing downward almost nil	
1071.3					Sandstone gray, 0.05' thick, m grain poorly sorted subangular, siliceous cement w/ 1-2% pyrite, 2% magnetite, depositional contacts	

NOTES:

## FIELD LOG OF BORING

PROJECT NO. 74-068

DATE 11-1-74 TITLE Sun Phillips

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

EQUIPMENT USED Layne Wester Gardner, Denver  
2000

BORING NO. P-4 core

ELEVATION \_\_\_\_\_ DATUM MSL

WATER LEVEL Dry AFTER \_\_\_\_\_

LOGGED BY Novak

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1071.37-1073.0					Siltstone S/L 5x gray, hard, non calcareous, laminated w/ c 10% pyrite, & nacholite stringer gradational bottom contact	
1073.0-1074.68					Siltstone, dk reddish brown, hard, non calcareous, laminated and displays some fines grading upward w/ 1% pyrite w/ <del>1</del> 0.3' vertical filled voids containing erosional remnants silty sandstone frags marchisite blebs, disturbed in much the same way as at 1064.58. Depositional lower contact	End of core run
1074.68-1076.67					Siltstone as above at 1071.37 but without nacholite	1076.67

**NOTES:**

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11/1/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver  
2000

LOGGED BY NOVAK

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
* 1076.67-					Parting planes horizontal, 1087.42	
1096.6					1089.05, 1089.54, 1092.08, 1092.12	
1076.67-					Siltstone 5/15y gray hard, non-	
1077.06					calcareous, laminated w/ < 1% pyrite	
					gradational bottom contact	
1077.06-					Siltstone 3/1 10R, dk reddish gray	
1083.16					hard, non calcareous, thinly laminated	
					highly - v. highly petroliferous w/ 1% pyrite and blebs of Sandstone	
					dk brown, f grain poorly sorted, subangular	
					clayey cement 0.02 x 0.12' Erosional lower contact	
1078.82					Black Tar Sandstone, f gr bleeding	
					tarry oil. Can not see detail	
					Erosional contacts top and bottom	
					0.08' thick	
1081.0					Siltstone as above but with several	

very pale brown claystone laminae for a 1.0' interval

NOTES: Due to 100% plus recovery on this and the last run, the last run, 1056.6 - 1076.67, should move its measurement back 0.35'

# FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P-4 core  
 DATE 11-1-74 TITLE Sun Phillips ELEVATION \_\_\_\_\_ DATUM MSL  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_ WATER LEVEL Dry AFTER \_\_\_\_\_  
 EQUIPMENT USED Layne Western, Gardner Denver LOGGED BY NOVAK  
2000

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1083.16-					Silty Sandstone - Sandy siltstone	
1084.19					5/2 5YR reddish gray - 6/1 5YR	
					pinkish gray, f grain, poorly sorted,	
					subangular w/ <1% gilsonite magnetite	
					lenses, stringers, laminae, 25% of the	
					time, they grade into each other, silty cement	
1083.31					Erosional surface which slopes at 20°	
1084.0					Silty Sandstone 0.19' thick, 6/1 5YR	
					pinkish gray as above but w/	
					secondary solution cracks .001 - .01'	
					wide replaced w/ clay	
					depositional upper and lower contacts	
1084.19 -					Sandstone black, f grain, subangular	
1084.48					poorly sorted, highly petroliferous	
					petroliferous cement w/ 1% gilsonite	
					Depositional lower contact w/ some	
					minor solutioning effects	

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11/1/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver  
2000

LOGGED BY NOVAK

Page 121

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
1084.48						Siltstone 4/3 5YR, reddish brown and	
1087.42						4/1 5G bluish green, hard, non calcareous	
						thinly laminated w/ v minor accessory	
						minerals erosional bottom contact	
1087.42-						Sandstone 4/2 2.5Y, dark grayish	
1087.44						brown, f-m grain, poorly sorted, subangular	
						w/ .03' wide cracks filled w/ <sup>clay</sup> silt, probably	
						secondary. Nacchulite crystals found	
						along cracks. Erosional contacts	
						Top and bottom	
1087.44-						Siltstone, 4/2 5YR, dk reddish brown	
1091.31						hard, non-calcareous laminated, w/clg,	
						pyrite, sandy in some areas and	
						occasional 0.02 laminae stringers	
						of bluish gray Sandstone, f grain	
						Both sandstone and Siltstone are	
						highly petroliferous	
						gradational lower contact	

## NOTES:

funco

# FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P-4 core  
 DATE 11-1-74 TITLE Sun Phillips ELEVATION \_\_\_\_\_ DATUM MSL  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_ WATER LEVEL Dry AFTER \_\_\_\_\_  
 EQUIPMENT USED Layne Western, Gardner Denver LOGGED BY NAVAK  
2000

Page 122

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1091.31-					Interlaminated silty sandstone 4/2	
1092.4					5YR dark <del>reddish</del> brown, f. grain, poorly sorted subangular non calcareous and sandy siltstone 6/3 5YR lt. reddish brown. Depositional contact	
1092.08					Sandstone, bluish gray, f grain 0.04' thick	
1092.4-					Marlstone 7/2 2.5Y, light gray	
1093.94					mod <del>calcareous</del> <sup>hard</sup> , extremely effervescent when powdered and increasing sandstone laminae, lenses and blebs last 0.5' toward bottom	
1093.85					0.09' thick bed of marlstone but 8/4 2.5Y, very pale brown erosional contacts top and bottom	

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11-1-74 TITLE San Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver

LOGGED BY NOVAK

2000

Page 123

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1093.85-					Siltstone dark reddish brown, hard,	
1094.72					non calcareous, petroliferous, laminated	
					w/ 1% pyrite depositional contact	
1094.61					Sandstone black, v f grain, subangular	
					poorly sorted, v. highly petroliferous	
					0.07' thick	
1094.72					Marlstone - Sandy Marlstone, 7/2	
1096.60					2.5Y, light gray, mod hard, highly	
					calcareous when powdered w/ lt gray	
					sandstone blebs and beds. 0.03' thick	
					f grain etc	End of
					effervescence decreases downward	Core Run
					hardness increases downward	1096.60

NOTES:

fuoro

# FIELD LOG OF BORING

PROJECT NO. 44-068

BORING NO. P/Car

DATE 12/1/74 TITLE San/Phillips/so bio

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Hayne Western

LOGGED BY B. Sims

Lardner-Denver

P. 124

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1096.60 - 1116.62					Recovery 20.15/20.02	note: 13'
					200% = 100%	extra ft. of core;
1096.47 - 1097.15					Marlstone - same as above;	put at top of run - labels
					between 54 7/2 & 6 1/2: light grey	begin at 1096.47
					and light olive grey; carbonate	
					cement; hard; very effervescent	
					when powdered; v. thinly laminated	
					to v. thinly bedded, magnesian	
					distributed throughout and in	
					rare deformed laminae - v.f.	
					sand size, v. minor bitumen	
					laminae - discontinuous;	
1097.15 - 1098					Siltstone - sandy & highly	
					variable; upper 3' is gradational	
					change from above to siltstone	
					below; 1097.45 - siltstone	
					between 7.5 & 4 1/2: dark	
					grey & brown; hydrocarbon	
					clay cemented siltstones, likely	
					do some cementing; v. hard;	

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 11/1/74 TITLE Sun/Phillips/Sobio

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western - Gardner Denver

LOGGED BY B. Siems

P. 125

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					non calcareous; v. thinly laminated to thinly laminated; magnetite; sulfide flecks - gold; disoriented - pyrite or marcasite; .65-.85 <u>marly</u> sandstone - light as above; discontinuous wavy lenses of magnetitic sand;	
1098-1103	35				siltstone shaly; bet. 7.5 yr 4 1/2' & 4 1/2' - dark grey & brown; hydrocarbon and clay cemented; v. minor carbonate; v. hard; v. slight effervescence even powdered; v. thinly laminated - laminae less distinct - color variation in gen. is minor; marcasite (?) needles & flecks ~ 1% or less; magnetite sand infrequent laminae; two light claystone beds - 1100.16 (.02') & 1102.1-115;	

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P4 core  
 DATE 11/1/74 TITLE Son/Phillips/schis ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_ WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 EQUIPMENT USED Layne Western Coring Driller Denver LOGGED BY B. Siems  
 P. 126

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1103.35 - 1103.55					Sandstone - Tuffaceous, dark grey, well sorted, subrounded, fi. grained, relatively even colored; med. hard to hard; non calcareous; ~ "massive," mica, quartz, marlstone breccia (v. minor < .01'); sl. magnetite;	
					Parting plane - 1103.55	
1103.55 - 1105.3					Marlstone - 2.5 x 7 1/2 light grey (brownish yellow cast); carbonate cement; med. hard - hard; v. effervescent powdered - dolomite; very thinly laminated, v. thinly bedded; becomes increasingly sandy downward; magnetite sand; increasingly hard;	
					1104.48 - 1' of deformed disconformous laminae - erosional contact below	
1105.3 - 1109.48					shale 10 YR 4/1 dark grey;	

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P4 (C)  
 DATE 11/1/74 TITLE San Phillips / So. Hic ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_ WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 EQUIPMENT USED Layne Western - Gardner Denver LOGGED BY B. Sims

P 127

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					hydrocarbon & clay cement; v. hard; noncalcareous to sl. calcareous when powdered; v. thinly laminated; undisturbed; marcesite flecks;	
					marlstone beds 1108.15 - 2, .59 - .68	
					very pale brown; irregular contact hummocky - v. small mounds - sim. to algal str. much of lower is v. fine magnetite sand;	
					marcesite flecks below 1108.68	
					v. fine magnetite sand present as v. thin laminae elsewhere.	
					Parting Planes - 1106.68, 1109.42	
1109.42 - 1110.3					Marlstone - 2.5 y 3/4 pale yellow; carbonate cement; mod. hard to hard; strong effervescence powdered. has irregular bedding as algal str.; thinly laminated -	

## NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4000

DATE 11/1/54 TITLE San Phillips / Soho

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western - Gardner  
Drum

LOGGED BY B. Sims

P. 129

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					1110.97 - 1111.09 - brecciated claystone(?) with magnetite matrix.	
					Parting planes - 1111.09	
1111.8 - 1112.8					Martstone as before (1109.42)	
					contains .03' thick bed of bituminous shale;	
					Partings - 1112.01	
1112.8 - 1114.53					Oil shale 7.5 yd 3/2 d.k.	
					brown to blk, v. thinly laminated;	
					hydrocarb cement; carbonate,	
					v. hard; slightly calcareous	
					scratched, v. thinly laminated -	
					laminar undulate & pinch; upper	
					section grades into martstone above;	
					mod. to highly petroliferous.	
1114.53 - 1115.6					Sandstone - marly; 2.5 y 7/1 with	
					6/2 mart beds & breccia pieces;	
					v.f. grained; carbonate cement;	
					hard; v. finely laminated to v. thick	
					bedded; laminar in marly portions	

NOTES:

T-100

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 11/1/74 TITLE Sun/Phillips/Sabia

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Lynn Weston Gardner Denver

LOGGED BY B. Sieny

P 130

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					are cut by magnetite sand filled	
					worm(?) burrows; some mud	
					beds have been broken & deposited	
					as breccia; others are broken	
					by fractures - magnetite sand filled;	
					some beds are distorted; one	
					irregular magnetite healed fracture	
					extends from $\approx$ 1114.53-1115.6	
					Partings - 1114.65	
1115.6-1116.61					Shaly siltstone - red brown, v. hard;	
					carbonate & hydrocarbon cement;	
					flocks & crystal concentrations	
					of pyrite(?) or marcasite;	
					petroliferous odor - slight to	
					mod. petroliferous; gradational	
					contact w/ many sandstone above;	
1116.62-1136.62					Recovery = 19.59/20	
					RQD = 16.6/19.6	

NOTES:

7-23-73

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 11/1/74 TITLE Sun Phillips / 50 Geo

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Rayne Western - Gardner Denver

LOGGED BY B. Sims

P 131

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					Partings are concentrated in marlstone.	
					Core labeled 1116.62-1136.32 -	
					part of missing distributed within,	
					most left at end;	
					Core is basically a series of marlstone	
					beds separated by oil shales -	
					ea bed 1-2' thick;	
1116.6-1118.45					Siltstone shaly 7.5 YR 3/2	
					dark brown; carbonate & hydrocarbon	
					cement; hard-v. hard; sl. to	
					mod. effervescent; v. thinly	
					laminated-undeformed; more site(?)	
					blebs - coarse sand size; random	
					orientation; some concentrated	
					with magnetite in snakelike fractures;	
					Partings - 1118.45	
1118.45-1121.85					Marlstone sandy clayey; upper	
					contact abrupt; lower gradational;	
					5 Y 7/2 (light grey) 5 Y 6/1 grey;	
					carbonate cement & mod. hard;	

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 Cnd

DATE 11/1/74 TITLE San Phillips Soho

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Jaeger-Wheeler (Gardner)  
Jaeger

LOGGED BY B. S. Sisk

p. 131a

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					v. effervescent; calcite & dolomite; thinly laminated to v. thinly bedded; beds broken frequently by burrows or fracturing; some beds slightly tilted or offset; burrows usually filled by coarser material than they were formed in; magnetite sand & silt dispersed throughout and concentrated in coarser beds; bed yellower near top - grades into greyer beds - bottom 5' 5/1	
					Parting Planes - 118.5, 118.7, 1119.46, 1119.72, 1120.92	
1121.85 - 1122.95					Oil shale - 7.5 1/2 3/2; v. dark grey to dark brown; carbonate & hydrocarbon cement; v. hard; slight to med. effervescence; v. thinly laminated - undisturbed - except where cut by burrows & burrows filled by non-or less petroliiferous mudstone; slight -	

NOTES:

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P4 core

DATE 11/74 TITLE San Phillips / Soho

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

EQUIPMENT USED Dayce Western - Gardner

LOGGED BY P. Seane

P: 131.8

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						mod. petroliferous; minor flecks of marcasite (?) or pyrite (?) lower contact abrupt;	
						Partings - 1122.12, 1122.45	
1122.95 - 1127.6						Marlstone similar to above (1118.45); rare include shales & v.f. siltstone laminae; beds not deformed by burrows; gen. flat - rare lenses; frequent primary offsets (compaction) cut beds - offsets to .03'; at about 1127.4 becomes brownish & begins grading into underlying petroliferous zones	
						Partings - 1123.13, 1123.75, 1123.89, 1124.25, 1124.55, 1125.3, 1125.78, 1125.97, 1126.35, 1126.44, 1126.7	
						1127.26	
1127.6 - 1128.5						Siltstone - shaly, similar to 1121.85 - laminae undeformed ~ 1127.8 - 9.	

NOTES:

Final

# FIELD LOG OF BORING

PROJECT NO. 74-068

DATE 11/1/74 TITLE San Felipe Bank

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

EQUIPMENT USED same Western Union

BORING NO. P4 200

ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_

WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_

LOGGED BY B. Sims

p. 131 c

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					sandstone - irregular contacts, discontinuous bed, petroliferous too. mod. to highly petroliferous, 1128.5 begins grading into marlstone.	
					Partings - 1127.95, 1128.09	
1128.85 -	1130.7				Marlstone clayey; 7.5' R 7/2'; similar to 1118.45; sand v. minor; more clayey; burrows cut & deformed beds; some lensing; minor beds eroded & brecciated; matrix silty - v.f. sand;	
					Partings - 1129.07, 1129.28, 1129.8, 1130.05	
1130.7 -	1133.6				Oil shale similar to 1121.85; upper half cut by burrows (?) to 2' deep; lower half - undeformed laminae;	

**NOTES:**

# FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P4  
 DATE 11/1 TITLE San Phillips/50410 ELEVATION \_\_\_\_\_ DATUM \_\_\_\_\_  
 START \_\_\_\_\_ COMPLETE \_\_\_\_\_ WATER LEVEL \_\_\_\_\_ AFTER \_\_\_\_\_  
 EQUIPMENT USED Barber Driller LOGGED BY B. Simon

132

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1133.6-1135.6					Mudstone - OS 1128.85, minor offsets; some slump structures; more than 50% undeformed;	
1135.6-1136.32					Oil shale OS 1130.7; undeformed; contact whole gradational	End of run 1136.62
				→	1136.32 - 1136.62 No Recovery	
					However, recovered 0.2' on next run	
1136.42-					Siltstone (oil shale)	
<del>1143.41</del>					Parting planes horizontal 1142.82	
1156.62					1146.61, 1148.84, 1151.70, 1151.86	
					1152.98	
1136.42-					Siltstone (oil shale) 3/2 SYR, dk reddish brown, hard, non calcareous, thinly laminated, highly petroliferous w/ 0.5-1% pyrite. Fairly homogeneous	
1143.41					depositional bottom contact	

## NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11/2/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver  
2000

LOGGED BY NOVAK

• Page 133

DEPTH	SAMPLES				DESCRIPTION Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1136.42 -					Siltstone (oil shale) cont.	
1143.41 cont.						
1136.42					Sandstone, black, f. grain bleeding oil, detail obscured 0.03' thick depositional contacts Top and bottom	
1137.23					Siltstone, $\frac{2}{3}$ SYR 1/3 reddish brown 0.11' thick, hard, non calcareous, massive non petro. ferous, erosional upper contact gradational lower contact	
1141.1					Bleeding oil slightly from 0.03 x 0.07' bleb. No distinguishable lithologic change from Siltstone (oil shale)	
1142.5					Bleeding oil as above	

## NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11-2-74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver  
2000

LOGGED BY NOVAK

Page 134

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
1143.1-						Marly Siltstone, 6/3 5YR 1R reddish brown, hard, slightly mod calcareous when powdered, Thinly laminated w/ slight banding due to siltstone (oil shale) laminae	
1145.01						Gradational lower contact	
1145.01-						Siltstone (oil shale) as described at	
1146.54						1136.42. lower contact gradational	
1146.54-						Siltstone (oil shale) 3/2 5YR dk reddish brown and 5/1 5GB bluish green hard non calcareous, thinly laminated, slightly mod petroliciferous w/ 1% pyrite, rare pieces of carbonized mat'l. At 1148.5, remaining core is bluish green	
1156.62							
1149.93						Siltstone, 6/2 5YR pinkish brown hard, non-calcareous, faintly laminated faintly laminated, gradational contacts top and bottom	

NOTES:

funco

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11-2-74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver

LOGGED BY NOVAK

Page 135

DEPTH	SAMPLES				DESCRIPTION Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1146.54-					Siltstone oil shale 5/5 GB bluish	
1156.6 cont.					green (CONT.)	
1150.35					Pod of Pinkish brown Siltstone as	
					described at 1149.93 0.2 x 0.3'	
1151.27					Bed of Pinkish brown Siltstone as	
					above 0.03' thick	End of
						core run
1153.5					As above 0.1' Thick	1156.6
1156.62-					Parting planes horizontal 1157.7	
1173.00					1159.43, 1160.47, 1161.04, 1166.74	
					1167.39, 1170.28, 1172.91	
					30° Fracture 1157.56	

NOTES:

fuero

# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11/2/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western Gardner Denver  
2000

LOGGED BY NOVAK

• Page 136

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1156.62					Siltstone (oil shale) as described at	
1163.54					1146.54, 5/1 56B, bluish green,	
					hard, non calcareous, thinly laminated,	
					mod petroliferous w/ 1-3% pyrite	
					increasing downward, 1% magnetite	
					decreasing downward. depositional	
					lower contact	
1163.54-					Marly silty Sandstone 4/4 54R	
1164.51					reddish brown and 5/2 2.5Y grayish	
					brown, v fine graine, poorly sorted, subangular	
					mod-highly eff. when powdered, thinly	
					laminated w/ grayish brown occasionally	
					infilling cracks in reddish brown, relatively	
					no accessory minerals. gradational bottom	
					contact	
1163.68					Sandy marlstone gray to black 0.1 thick	
					w/ several worm burrows 0.03 x 0.12'	
					infilled by above SS, depositional upper contact	
					erosional lower contact	

## NOTES:

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# FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-4 core

DATE 11/2/74 TITLE Sun Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western, Gardner Denver  
2000

LOGGED BY NOVAK

~~11/2/74~~ Page 137

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
1164.51 -						Siltstone (oil shale) 3/2 SYR, dk reddish	
1167.12						brown-black, hard, non calcareous, mod-	
						highly petroliferous, <del>top</del> Top 0.73' lenses,	
						truncated laminations with blebs of	
						marly sandstone v. disrupted. Remaining	
						portion is thinly laminated w/ occasional	
						stringer of marly sandstone as above,	
						< 1% pyrite. Depositional bottom contact	
1167.12 -						Marlstone, 7/2 SYR, pinkish gray,	
1168.17						mod hard - hard, thinly laminated, v. highly	
						eff. when powdered w/ occasional marly	
						sandstone filled fractures, f. grain	
						gradational bottom contact	
1168.17 -						Siltstone (oil shale) 3/2 SYR, dk reddish	
1169.98						brown, hard, non calcareous thinly laminated	
						w/ < 1% pyrite, mod-highly petroliferous	
						depositional bottom contact	

## NOTES:

funco

## FIELD LOG OF BORING

PROJECT NO. 74-1168

BORING NO. P-4 core

DATE 11/2/74 TITLE Son Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Layne Western Gardner Denver  
2000

LOGGED BY Novak

Page 13E

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1169.07					Sandstone, black, v.f. grain, poorly sorted subangular, highly petrioliferous. It's a lense 0.03' thick max. Depositional contacts top and bottom	
1169.54					Linear string of marchisite blebs 0.02 x 0.03'	
1169.98 - 1170.70					Marlstone, 6/1 5YR, gray, hard & highly eff when powdered, thinly laminated w/ thin marly claystone parting planes	
1169.98					Sandstone 4/3 5YR reddish brown 0.02' thick, f grain, poorly sorted, subangular clay cemented, thinly laminated, depositional contacts	

**NOTES:**

**fundo**

## FIELD LOG OF BORING

PROJECT NO. 74-069

BORING NO. P-4 cor 2

DATE 11/2/74 TITLE Sen Phillips

ELEVATION \_\_\_\_\_ DATUM MSL

START \_\_\_\_\_ COMPLETE \_\_\_\_\_

WATER LEVEL Dry AFTER \_\_\_\_\_

EQUIPMENT USED Cayman Western Gardner Server  
2000

LOGGED BY NRK  
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[illegible]

**NOTES:**

**fusro**