

Hole No. 88-12

Coordinates _____

Sheet No. 1A

PHILLIPS PETROLEUM CO.

Date Started 7/12

Collar Elevation _____

Date Completed _____

Total Footage _____

Type Drill _____

Overall Core Recovery _____

Bit Size NQ

Logged By _____

GEOLOGIC LOG

FROM	TO	FT. OF CORE	TYPE	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION			SECTION DEPTH	
1083	1093		1A	ANDESITE - M-H. Gray; Porphyritic w/15% lg phenos; sl. vesicular; massive					
1093	1139.5		2A-10A	ANDESITE - AA					
1139.5	1183		2A-10A						
1183	1202		10-12	Andesite - Lt gray to reddish gray; occ. stringers of red ash 1182-84					
1202	1200		12	LAHAR - red matrix w/lt gray andesite frag					
1200	1209		13	LAHAR - red to gray matrix. Occasional gray 1202					
1209	1237		14-16	LAHAR/BRECCIA - AA size and angularity of frags vary, could be altered flow breccia doesn't look like tuff					
1237	1264		17-19	LAHAR/BRECCIA - AA					
1264	1283		20-22	LAHAR/BRECCIA - AA					
1283	1290.5		22	ANDESITE - M Gray - porphyritic w/10% felds observable; med broken; hard; no vesicles					
1290.5	1316		23-25	ANDESITE - AA					
1316	1352		26-29	ANDESITE - AA					
1352	1363		30	ANDESITE - AA					
1363	1364		30	ANDESITE TUFF? - Red; Porphyritic, m. hard occ soft, massive, looks like Andesite but red.					
1364	1402		31-35						
1402	1409		35	ANDESITE - AA					
1409	1439.7		36-39	ANDESITE - AA					
1439.7	1456		40-41	ANDESITE - AA					
1456	1466.5		41	LAHAR - Red matrix w/ angular frags, matrix supported					

LAHAR or BRECCIA

ANDESITE

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GEOLOGIC LOG

FROM	TO	FT. OF CORE	TYPE	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION		SECTION DEPTH
1456.5	1466		42	LAHAR - AA			
1466	1475.5		43	LAHAR - AA			
1475.5	1504.5		44-47	LAHAR - AA			
1504.5	1510		47	BASALT - M-dk gray; v fn. x 1/16; white w/vee pitting; hard M. hard; massive			
1510	1519		48	BASALT - AA			
1519	1526		49	BASALT - AA			
1526	1527		49	Basalt Breccia - AA but broken w/matrix			
				of low basalt			
1527	1537		50	BASALT flow Breccia / Lahar			
1537	1546		51	BASALT flow Breccia / LAHAR			
1546	1566		52	Flow Breccia / or Lahar			
1566	1565		53	LAHAR - varied mineralogy usually			
1565	1574.5		54	matrix unspashed			
1574.5	1601.5		55-57	LAHAR / Agglomerate - red matrix @ 1578			
1601.5	1628.5		58-60	LAHAR / Agglomerate - AA			
1628.5	1647.5		61-62	ANDESITE - Reddish brown; (looks like above w/no a frag.; porph. m. hard, massive			
1647.5	1679		63-65	ANDESITE - AA occ frag. like flow breccia			
1679	1706		66-68	ANDESITE - AA			
1706	1717		69-70	ANDESITE - AA			
1717	1724.5		70	LAHAR / AGGLOMERATE - red matrix; blocks of			
1724.5	1733.5		71	andesite; soft to hard matrix.			
1733.5	1761		72-74	LAHAR / AGGLOMERATE - AA			

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Sheet No. 3A

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PHILLIPS PETROLEUM CO.

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GEOLOGIC LOG

FROM	TO	FT. OF CORE	TYPE	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION			SECTION	DEPTH
1761	1786		75-77	LAHAR / AGGLOMERATE - AA					
1786	1797.5		78-91	ANDESITE - M-dk gray - porph; hard, massive					
1797.5	1806		79-80	CLAY - soft to mod hard					
1806	1813		80	ANDESITE - AA ex: softer					
1813	1822		81	M. ANDESITE - AA becoming harder at 1818					
1822	1851.5		82-87	ALL ANDESITE - AA soft to hard sections, broken at bottom; bottom looks like sl. metamorphosed material (G. struc)					
1851.5	1853.5		84	LAHAR - brown w/ gray frag; m. hard matrix, andes. frag in matrix supported					
1853.5	1869		85-86	LAHAR - AA					
1869	1872		86	Altered Andesite breccia - H. green; much chlor. altn; porph; brecciated					
1872	1882		87	Altered Andesite - B - AA					
1882	1909.5		88-90	Altered Andesite - B - AA					
1909.5	1921		91-92	Altered Andesite - B - AA					
1921	1936		92-93	Welded TUFF - H. greenish gray to black - soft to mod. hard; massive occ. broken					
1936	1949.5		94-95	Welded TUFF - AA					
1949.5	1962.5		95-96	Altered Andesite - H. greenish gray; porph; soft to hard chl. altn. present					
1962.5	1991		97-99	Altered Andesite - AA occ. brecciated					
1991	2017		100-102	ALL ANDESITE - AA becoming red stained at 2004					
2017	2037		103-104	ANDESITE - AA - red to gray					

ACT. ANDES

LAHAR

ACT. ANDESITE BRECCIA

Hole No. 88-12

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Sheet No. 4A

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PHILLIPS PETROLEUM CO.

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GEOLOGIC LOG

FROM	TO	FT. OF CORE	TYPE	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION			SECTION DEPTH	
2037	2054		105-100	ANDESITE - reddish gray, fine grain, hornblende, 20% w/ 30% by hornblende phenos.					
2054	2082.5		107-109	Andesite - AA occ red clay zones					
2082.5	2165		110-118	Andesite - AA					
2165	2170		119	Porphyritic Andesite, Med grey groundmass w/ 30% small plag phenos (white) and 5% small black hornblende phenos, chlorite on sheared surfaces					
2170	2179		120	Porphyritic Andesite, AA					
2179	2188		121	" " "					
2188	2197		122	" " "					
2197	2206		123	" " " Fe Oxide + chlor on Shear surfaces					
2206	2214		124	" " " " "					
2214	2223		125	" " " "					
2223	2232		126	" " " "					
2232	2242		127	" " " same cobble size lithic inclusions					
2242	2250		128	" " " "					
2250	2259		129	" " " "					
2259	2267		130	" " " somewhat darker, especially when fresh surf					
2267	2275		131	" " " / basalt?					
2275	2283		132	And basalt, black, fine grad					
2283	2293.5		133	Andesite, porphyritic w/ small white plag phenos (40%) & small grn/blk hornblende phenos (5-10%)					
2293.5	2302		134	Andesite, AA					
2302	2310		135	" " "					

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Sheet No. 5A

PHILLIPS PETROLEUM CO.

Collar Elevation _____

Date Started _____

Total Footage _____

Date Completed 7/24

Overall Core Recovery _____

Type Drill _____

Bit Size _____ Box

GEOLOGIC LOG

Logged By Beall

FROM	TO	FT. OF CORE	TYPE	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION			SECTION DEPTH	
2313	2322		136	Andesite, AA					
2322	2331.5		137	" "					
2331.5	2338		138	" "					
2338	2341.5		138	dk red vol ash/clay					
2341.5	2348		139	dk red to brown clay / Ash ± cinders, poorly consolidated					
2348	2356		140	AA, grading to soft, brown, clay, (weathered ash?)					
2356	2357.5		140	Andesite, porphyritic, dk grey					
2357.5	2367		141	" "					
2367	2376		142	" " (V. high % of plag phenos)					
2376	2384		143	" " some thin clay / Ash seams					
2384	2393		144	" " (V. fresh)					
2393	2401		145	" " "					
2401	2410.75		146	" " "					
2410.75	2420.5		147	" " "					
2420.5	2430		148	" " "					
2430	2439		149	" " "					
2439	2448		150	Andesite, highly weathered Altered to chlorite / Fe oxide, thin clay / ash zones					
2448	2456		151	Andesite, highly chloritized, porphyritic					
2456	2464		152	" " "					
2464	2474		153	" " " w / thin clay / ash zones					
2474	2484		154	" " "					
2484	2493		155	" " " V. highly chloritized					
2493	2500		156	" " "					
2500	2510		157	" " "					

Hole No. _____

Coordinates _____

Type Drill _____

Bit Size _____

Sheet No. 60A

Date Started _____

Date Completed _____

PHILLIPS PETROLEUM CO.

Collar Elevation _____

Total Footage _____

Overall Core Recovery _____

Logged By _____

GEOLOGIC LOG

FROM	TO	FT. OF CORE	Box #	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION				SECTION DEPTH	
2510	2519	159		Andesite, porphyritic, v. highly chloritized						
2519	2527	159		" " "						
2527	2537	160		" " "						
2537	2546	161		" " "						
2546	2552	162		" " "						
2552	2556	162		Andesitic flow breccia, with large calcite vein filling fracture						
2556	2564.5	163		A.A. more calcite fract filling						
2564.5	2574	164		Andesite, A.A. w/ med clay fract filling (poss either of calcite)						
2574	2584	165		ANDESITE - AA						
2584	2592.5	166		ANDESITE - AA						
2592.5	2600.75	167		Andesite AA v. small plagiophenos						
2600.75	2609.5	168		" " "						
2609.5	2618.5	169		" " "						
2618.5	2627.5	170		Basalt, blk, fine grad w/ mafic phenos						
2627.5	2636.5	171		Basalt/Andesite fresh, hard except for highly chloritized fract surf's.						
2636.5	2645	172		" " " " "						
2645	2653	173		" " " " "						
2653	2663	174		" " " " "						
2663	2673	175		" " " " "						
2673	2681.5	176		" " " " "						
2681.5	2693	177		A.A. but grading to more altered, chloritized appearance						
2693	2700	178		Andesite, highly chloritized						
2700	2709.5	179		Andesite, highly chloritized						
2709.5	2719	180		" " "						

Hole No. 88-12

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Sheet No. 7A

PHILLIPS PETROLEUM CO.

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Overall Core Recovery _____

Type Drill _____

Logged By Beall

Bit Size _____

BOX

GEOLOGIC LOG

FROM	TO	FT. OF CORE	CORRECTION	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION			SECTION DEPTH	
2619	2628	191		Andesite, highly chloritized					
2728	2737	196		" " "					
2737	2747	193		" " "					
2747	2756	184		" " "					
2756	2766	185		Andesite highly chloritized, vugs w/ quartz lining					
2766	2775	196		Andesite, porphyritic w/ small white plagioclase, chloritized fract surf's					
2775	2784	197		" " "					"
2784	2793	188		" " "					"
2793	2801	189		" " "					"
2801	2810	190		AA					
2810	2819	191		AA					
2819	2828	192		AA calcite ± qtz in fract's					
2828	2838	193		AA					
2838	2847	194		AA					
2847	2857	195		AA					
2857	2866	196		AA					
2866	2876	197		AA					
2876	2885	198		AA					
2885	2894	199		AA					
2894	2904	200		AA					
2904	3331	200-246		ANDESITE-AA, occ. clay stringers along fracture; occ. slickensides					
3322	3331	246		Andesite, porphyritic w/ white plagioclase, med grey groundmass					
3331	3338	247		AA but somewhat more bleached / altered					

100% of apparent contact at base. Andesite crystals are rounded. Also some quartz, pyrophyllite. Andesite crystals are rounded. Also some quartz, pyrophyllite.

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Sheet No. 8A

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GEOLOGIC LOG

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FROM	TO	FT. OF CORE	CORRECTION	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION			SECTION DEPTH	
3338	3347	248		AA - Still more bleached/altere					
3347	3358	249		AA					
3358	3367	250		AA - Andesite w/ qtz, plag, biot phenos, lt. grey groundmass v. hard, brittle rx.					
3367	3376	251		See note for box 246 (3325'). Probably a dike. Rock is light colored, porphyritic, and contains more quartz than the andesite. The quartz occurs as rounded crystals and as "eyes". The biotite has been bleached. Rhyolite (?). Contact at an angle of about 45°. Lower contact at a depth of 3397'. Core thickness of dike - 72'. True thickness - 50'.					
3376	3386	252		Rhyolite as above.					
3386	3397.5	253		Rhyolite as above to 3397'. Dark purplish-colored andesite - below 3397.					
3397.5	3405	254		Dark purplish-colored andesite					
3405	3415.75	255		AA					
3415.75	3424	256		AA					
3424	3432.5	257		AA					
3432.5	3442	258		AA					
3442	3451	259		AA					
3451	3460	260		AA					
3460	3469.5	261		AA					
3469.5	3478	262		AA					
3478	3489	263		AA to 3487. 3487 to 3489 is a light-colored porphyritic dike rock similar to that in the interval from 3325' to 3397'.					

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Sheet No. 9A

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GEOLOGIC LOG

FROM	TO	FT. OF CORE	TYPE Box	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION				SECTION DEPTH	
3487	3498		264	Light-colored porphyritic dike to 3496.5. Contact irregular. Dark purplish-colored andesite from 3496.5 to 3498.						
3498	3507		265	Dark purplish-colored andesite.						
3507	3517		266	AA						
3517	3526		267	AA						
3526	3535.5		268	AA						
3535.5	3544.5		269	AA. Some narrow veinlets calcite below 3540'.						
3544.5	3553.75		270	AA with some veinlets calcite						
3553.75	3563		271	AA						
3563	3572		272	AA						
3572	3582		273	AA						
3582	3590		274	AA						
3590	3599		275	AA						
3599	3609		276	AA						
3609	3616		277	AA						
3616	3625		278	AA						
3625	3634		279	AA						
3634	3643		280	AA						
3643	3652.5		281	AA						
3652.5	3662		282	AA						
3662	3670		283	AA						
3670	3679.5		284	AA						
3679.5	3688		285	AA						
3688	3698.5		286	AA						

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Sheet No. 10A

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PHILLIPS PETROLEUM CO.

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GEOLOGIC LOG

FROM	TO	FT. OF CORE	TYPE	ROCK DESCRIPTION, ALTERATION AND REMARKS	METALLIZATION				SECTION DEPTH	
3699.5	3708		287	AA						
3708	3715		288	AA						
3715	3724		289	AA						
3724	3733		290	AA						
3733	3744		291	AA						
3744	3752		292	AA						
3752	3762		293	AA						
3762	3771.5		294	AA						
3771.5	3780.5		295	AA						
3780.5	3790		296	AA						
3790	3799		297	AA						
3799	3808.5		298	AA						
3808.5	3817		299	AA						
3817	3826		300	AA						
3826	3833		301	AA						
3833	3843		302	AA						
3843	3854		303	AA						
3854	3864		304	AA						
3864	3873		305	AA						
3873	3883		306	AA						
3883	3892		307	AA						
3892	3901		308	AA						
3901	3911		309	AA						
3911	3921		310	AA						

