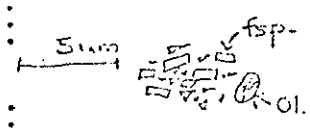


Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretation
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250	250 c	no core			
	252 c	: : : : : :			
	257.5 c	no core			
	259.5 c	o o o o o o o	For 250 and below: Basalt. Medium or dark gray. Microporphyritic, comprising plagioclase as large as c. 1.5 mm and smaller, angular subhedral of plagioclase, forming up to half of rock, and grading into an aphanitic dark gray matrix. Flow orientation of the plagioclase is seen. Rare, roundish, amber, glassy olivine, bearing a thin brown rim (iddingsite?), to 1.5 mm in diameter. Vesicular, to locally scoriaceous at flow tops. Vesicles comprise up to c. 40% of volume. Vesicle diameters reach 5 mm in some zones and several cm in others. Scoriaceous varieties are dark red-brown, dark brown, grayish red-brown.		250-252: flow top? Note red scoria block within darker scoria.
260	c	: : : : : :			
	c	: : : : : :			
	c	o o o o o o o			
	c	o o o o o o o			
	c	o o o o o o o			
	c	o o o o o o o			
270	c	o o o o o o o	263-277: Vesicles are rounded, to flattened along 40% of case. Flattening dips 240°. Feldspars flow dips parallel.		
	273.5 c	o o o o o o o	263-277: occasional fine (cooling?) fractures dip c. 60°.		Finest vesicles
	277 c	: : : : : :			273.5 Coarser vesicles, some scoria
280	c	: : : : : :			
	c	o o o o o o o			
	c	o o o o o o o			
	284 c	o o o o o o o			284: contact may be gradual
	c	o o o o o o o			
	c	o o o o o o o			
	c	o o o o o o o			
	c	o o o o o o o			
290	295 c	o o o o o o o			294: vesicular basalt bears a block of scoria.
	295.5 c	o o o o o o o			
	c	o o o o o o o			
	c	o o o o o o o			
300	301 c	o o o o o o o			
	c	: : : : : :			
	c	o o o o o o o			
	c	o o o o o o o			
	305 c	o o o o o o o			
	c	o o o o o o o			



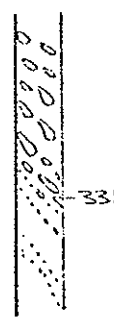
LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 1/2/75

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretation
301.		Scoriaceous zone		Flow break?
		Bears to c. 20% vesicles		
305.		Highly vesicular to and scoriaceous		
310.		To 15-20% vesicles slightly flattened in subhorizontal plane		
314.		Dark gray to brown. Dominantly finely scoriaceous		
320.		c. 15% vesicles. Slight subhorizontal flattening and flow of felt-par.		
		olivine may reach 1% total		
326.		Poorly developed flow of felt-par. and crude flattening of vesicles seems to dip > 30°		
330.		331: Vesicles from c. 10-15% of rock dip to 1-2% across a plane dipping 65-70°. Vesicles above reach 2cm diameter, are flattened parallel to contact. Vesicles below are 1-2mm, dispersed in planes dipping 65-70° and spaced at 5-10 cm intervals. Below c. 238 the plane of the vesicles steepens to c. 83° dip		
340.		c. 2/11: last vesicles		
350.		Note: The gross lithology of the basalt since 250ft has remained unchanged. However, at this level as well as sometimes above, the rocks are essentially aphanitic, rather than microporphyrific, a clear distinction between fine (< 1.5mm) phenocryst plagioclase and the matrix not being discernible. Plagioclase, a fine opaque (magnetite?) and rare to accessory (1%?) olivine microphenocrysts remains the only phases visible with a hand lens.		
360.				



Vesicles may be flattened and dispersed parallel to flow surface. The high dip (65-70°) may be due in part to rotation of the fault block under the site, but principally due to deposition on the irregular, sloping surface of a volcano.

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein / M. J.
Date 1/3/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens Microscopic, 7-30x		Comments and Interpretation
		Occasional cooling(?) fractures dip c. 60°		
360		Fine (2-3mm) vesicles gradually appear moving downwards. Porosity to c. 10%. Flattened(?) in plane with 20-30° dip.		359.5 = scoria block in vesicular basal
361.7				
		Dark gray to red-brown. Scoriaceous to highly vesicular (40% vesicles).		361.7-363.5 may include more than two flows.
370				
		Dark gray. Vesicles to 3cm alternating with finely vesicular to scoriaceous zones.		
		Cooling(?) fractures dip 50-60°		
380				
		Cooling(?) fractures dip c. 90° bear deposits of tan clay.		
		Red sand		clasts: clear plagioclase, magnetite, black glass? or pyroxene, red sandy to dusty unidentifed material,
		Vesicles to c. 3mm. Pore space 10-15%, decreasing downwards.		
390				
		c. 3 to 15% vesicles. Horizontal flattening. Tan clay in vesicles and on occasional cracks.		
397				
		Dark red-brown 15-25% vesicles. Vesicles bear tan clay plus occasional clayey yellow material which appears to coat fine crystals		Scoria could be gradational with rock above.
400				
		Occasional vesicle trains, dipping c. 20°. Cracks at 1cm to 1m intervals, dipping 60-65°.		zeolites?
410				

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 5/11/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
		Aphanitic to feebly micro-porphyrific		
410		Below 412: 5 to 10 cracks/foot of core. Dip c. 65°		
		5-10% vesicles		
414.6		Breccia: c. 50% pebbles aphanitic to microporph. gray basalt in c. 50% yellow-gray sandy matrix, hard to soft and friable. Abundant orange to yellow-brown clay in some cavities. Clasts at bottom and flow top below are notably red. Upper and lower contacts are rough, irregular.	Matrix: predominantly sandy matrix (some bear, some are magnetite) bound by tan clay.	Potential Candelaria member base
c. 418.4				
420		20 to 5% vesicles, decreasing downwards, flattened at a c. 20° dip. Cooling (?) cracks dip c. 60°		
			428.7: Med. gray, aphanitic. Bears fsp microlites to c. 5 mm long in flow orientation.	
430				429-430: scoria may be remnant from flow at 431.3
(429)				
(430)				
431.3		Red-brown, locally grading to dark gray.		
c. 438		c. 10% vesicles. Dark gray.		
c. 439		Red brown, cinder-like fragments		
440		Sand or tuff: Red brown to medium brown. Carries sand to cobble(?) sized clasts of dark gray, vesicular basalt. Fairly friable, particularly so in brown zones. Unbedded.	Matrix: clear, colorless feldspar, lesser or equal red-brown prisms of oxidized pyroxene (?), dusty magnetite, and chry (replacing feldspar)	Scoria below 438 all in fragments may include some cinders (?)
c. 442.5		Basalt: altered brownish gray grading downward to dark gray by c. 444. Bears scant, very fine vesicles		Unable to positively identify contact between "sand" and flow beneath. Sand may be pyroclastic crystal tuff representing an explosive late phase of the underlying flow; alteration of both units from blurring distinctions between them.
		443.5, 451: small cobble xenoliths of vesicular basalt		
450		447: vesicle traces dip c. 50°		
c. 453.5		Red brown to dark gray. Finely vesicular to scoriaceous, includes small amount of sand or tuff at c. 439-442.5.		Cinder fragments at 453.5?
				453.5-458.7: dominantly pebble to cobble-sized fragments.

Symbols used on
LITHOLOGIC LOG

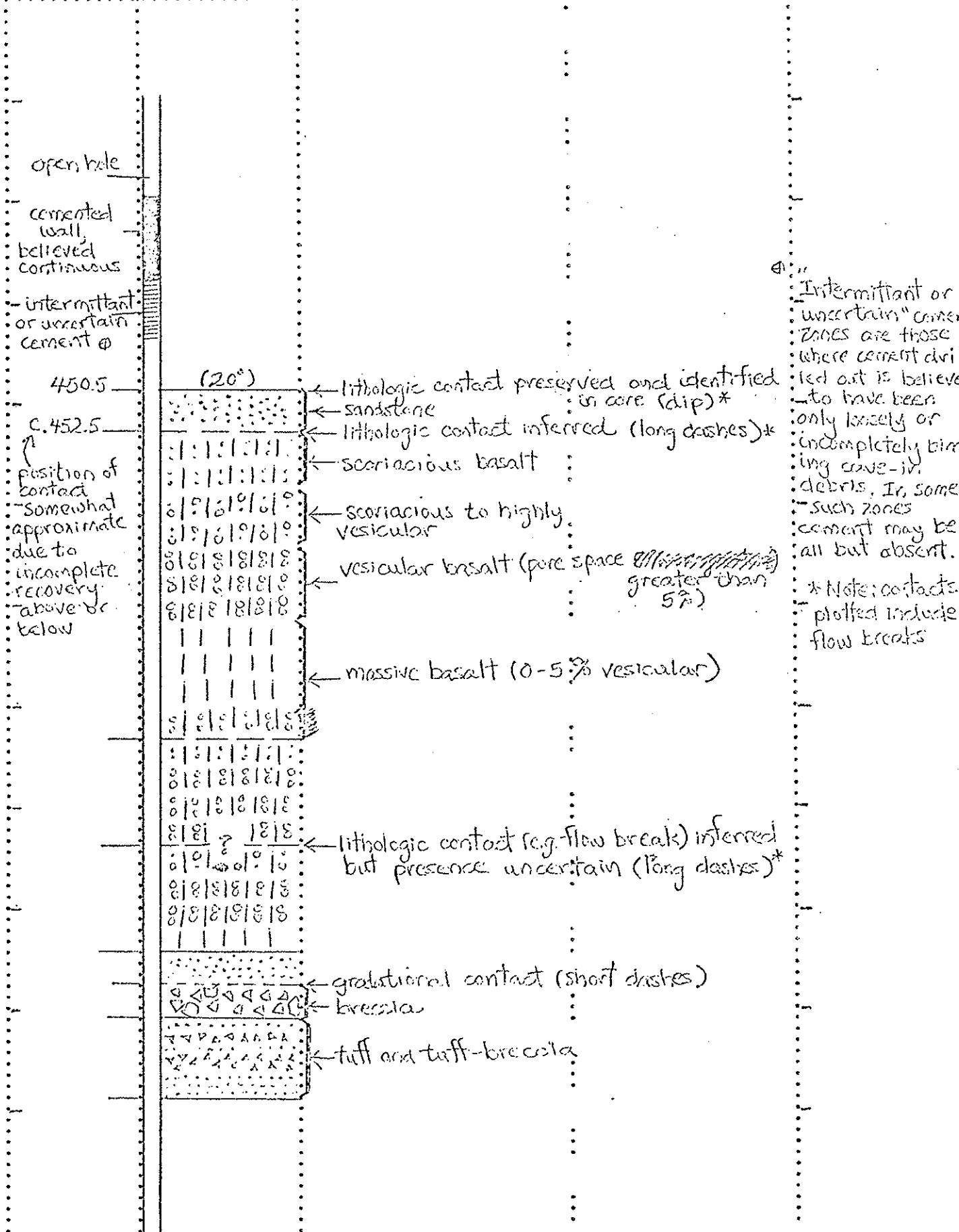
Geothermix, Inc.

Site: Antist C. Klein

Date: 1/4/76

Weyerhaeuser-Pacific Power & Light # 1

Lithologic Schematic of Lithologic Description Comments and
Contacts Stratigraphy In hand, with 10x lens Microscopic, 7-30x Interpretation



Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens Microscopic, 7-30x	Comments and Interpretation
460		Dark gray, weathered to brownish gray above c. 463. Aphanitic. Bears occasional pebbly xenoliths of finely vesicular dark gray basalt.	Amount of cement in 455-463 believed Very small.
		Cracks with tan clay at 1cm - 20 cm intervals.	463-465: thickness very approximate, may be thinner.
470		Dark gray, 5% vesicles.	
		Dark gray, red-brown on cracks, 15% vesicles.	Amount of cement in 465-482 believed Very small.
		Locally grades to scoria.	
		Coarser vesicular rock overlies finer on sharp contact (subhorizontal). Red sand (?) associated with finer penetrates upward into crack in the coarser rock.	477.6-c.480.9: alternating zones of vesicular and scoriaeous rock. Two or three flows may be present. Extensive fracture of rock.
480		Dark gray. Very fine vesicles to c.10% of rock, decreasing downwards.	
		Cracks at 5 to 20 cm intervals, dipping c.50°. Tan clay on surfaces.	
490		v. fine vesicles to c.10-20%	Rock immediately above and below
		c. 20% vesicles, decreasing downwards; some to several cm diameter; some slightly to strongly flattened in subhorizontal plane.	
500		Trains of v. fine vesicles dip c. 20°	Perched (?) water in hole at c. 500 ft. Lost with penetration of flow bottom at 506.
		502: core fragments include small amount of red sandy material	c. 502-c. 505: core all fragmented into pebble-sized pieces.
		Dark gray, faintly microcrystalline. c. 25% vesicles, most thin to 1mm in diameter, unflattened.	
510			

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretation
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Order of lithologic description: fund lithology
 color
 texture
 mineralogy
 crossphys features

a) larger smaller scale ~~vesicles~~ ^{vesicles}
 vesicles
 flow banding
 b) larger ^{and} more discontinuous
 ceiling cracks
 trends with depth
 other: - vesicle fillings (amygdalae)

Def: Scoria here refers to basalt which is permeated by coarse to very fine vesicles in great abundance, giving the rock a notably higher total pore volume than in merely vesicular basalt, and often ~~flattened~~ making it crumbly and friable when ~~is~~ cored. Such material is often altered to a dark brown to red-brown color, as contrasted to a merely vesicular dark gray basalt (tracks in and vesicle walls of the latter are sometimes ~~even~~ altered to a dark brown). Gradational with vesicular basalt.

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
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510	no core				506' - top of wedge
520	c-523		Gray, aphanitic. Occasional vesicles to c. 1cm dia.		
530	c-		Dark gray to dark brown; fragmented, rubbly, finely scoriaceous to vesicular.		Low % core recovery prevents subdivision of 523-534. See log of first passage through this zone.
540	c-534-536		To 537.5 - fragments red-brown to dark gray sand and fine scoria. Cinders?		In 523-524 fragments are bound by Portland cement.
550	c-		Below 537.5 - bright red-brown to dark gray fine scoria and/or cinder deposit grades downward to (by 539) dark gray aphanitic basalt which bears c. 5% very fine vesicles		From 534 (536) to 539 the rock is of apparent fragmentary origin, composed of sandy-pebbly cinder(?) and scoria. Its gradation downwards into massive basalt is intriguing. Perhaps the red sand in the upper zone is not cindery, but represents a weathering profile.
560	c-		537.5-565 - Core broken only by occasional steeply dipping cooling(?) fractures, bearing occasional tan clay. 547. - 1 ft. long gap in core apparently represents giant gas cavity →		The uncommon fractures here may be of structural origin (e.g. due to regional stress) rather than due to cooling.
560	c-		c. 554 on - no vesicles		

Wedge bypass to 578.7

LITHOLOGIC New rock below

Site Scientist C. Klein

Weyerhaeuser-Pacific Power & Light # 1

Date 1/23/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
560	c			
c.565	c	Basalt carries red sand-pebble grains		
		Dark gray to dark brown, red-brown scoria, rubbly; some red sand		
570	c			
c.571	c	Dark brown highly vesicular (to 20%). Vesicles become finer with depth. c.569- vesicles are flattened in plane dipping c.25°		569-571- nearly complete core
		571-574: heavily fractured ("spidery") some scoria, appears to carry or have associated red sand.		570.5-573.5: Portland cement from adjacent abandoned hole - binding rubble and in cracks.
		c.573.7: Dark brown grades to gray. Many vesicles are tubular, to several cm long, dipping c.15°.		
580	c			
584	c	Basalt is identical to that since 250': med. or dark gray, faintly microporphyritic to aphanitic w/ feldspar microphenocrysts to c. 1.5 mm (rarely >1mm). Amber to r. pale yellow olivine microphenocrysts (to 1.5 mm) (≤2%).		
c.586.3	c	Red-brown grading in central zone to gray. 20-25% vesicles in upper and lower zones; <10% in gray central zone. Bears some brown sand near top and bottom. Abundant cracks at 1-5 cm spacing throughout, at moderate to high angles. Tan clay deposits.		
590	c			
		c.586.3-591: Med. or dark gray, w/c. 20% fine (1-5mm) vesicles, decreasing downwards.		
		591-592: flattening of vesicles (some to 1cm) and vesicle trains lie in subhorizontal plane.		
600	c			
		Core broken only by occasional cracks at 10-60° dip. Tan clay deposits on some. (586.3 and below)		
608.5	c			
610		Vesicles flattened in plane dipping c. 10°		

Sand here could be cuttings, not clearly included in the basalt.

LITHOLOGIC LOG

Site Scientist C. K. K...

Weyerhaeuser-Pacific Power & Light # 1

Date 1/24/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretation
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610		<p>608.5</p>	<p>Bright red-brown to dark gray heavily cracked to fragmented hackly and rbbly in .5 to 1.5cm pieces. Some cracks bear a yellow fine-grained sand.</p>		
620		<p>613 →</p> <p>614-617.5</p>	<p>Dk gray, w/ c. 20% vesicles to 1cm, crude subhorizontal flattening. Vesicles disappear below c. 614. Recovery 100%.</p> <p>abundant low to high angle cracks. Below 617.5 cracks at .5m to 1m intervals.</p>		<p>622.5-627.5: top of water table.</p>
630		<p>630.9</p>	<p>To 639.8: Scoria to highly vesicular basalt, almost all as 1-10 cm rounded to angular fragments. Near top much is bright red-brown; some red sand in cracks. Below c. 633.5 dark gray is dominant.</p>		<p>c. 634 - rough cavity or crack surface in semi scoria bears deposits of a colorless crystalline material. Habit not apparent. No reaction w/ HCl. Is associated with lesser tan clay, but does not appear to be altered or otherwise parented to the clay.</p>
640		<p>644-653</p>	<p>Dark gray, vesicular to c. 20-25% abundance of vesicles varies in zones 10-30 cm thick, with contacts between zones dipping c. 15-20°. Vesicles are flattened at similar d.p. Most are 1-5mm, occasional reach 5cm maximum dimension. Bears cracks at ±.5m intervals; tan clay deposits.</p> <p>locally common 'spidery' high angle cracks, some bearing slickensides on surface (high angle motion)</p>		<p>cement in 633.5-635 washed out - hard cement abc & below</p>
650		<p>656.9-664.3</p>	<p>recovery 14%, prob from top of zone. Driller estimates entered rbbly fl. top at c. 658.</p>		<p>cement in 649-650 uncertain</p>
660		<p>no core</p>			

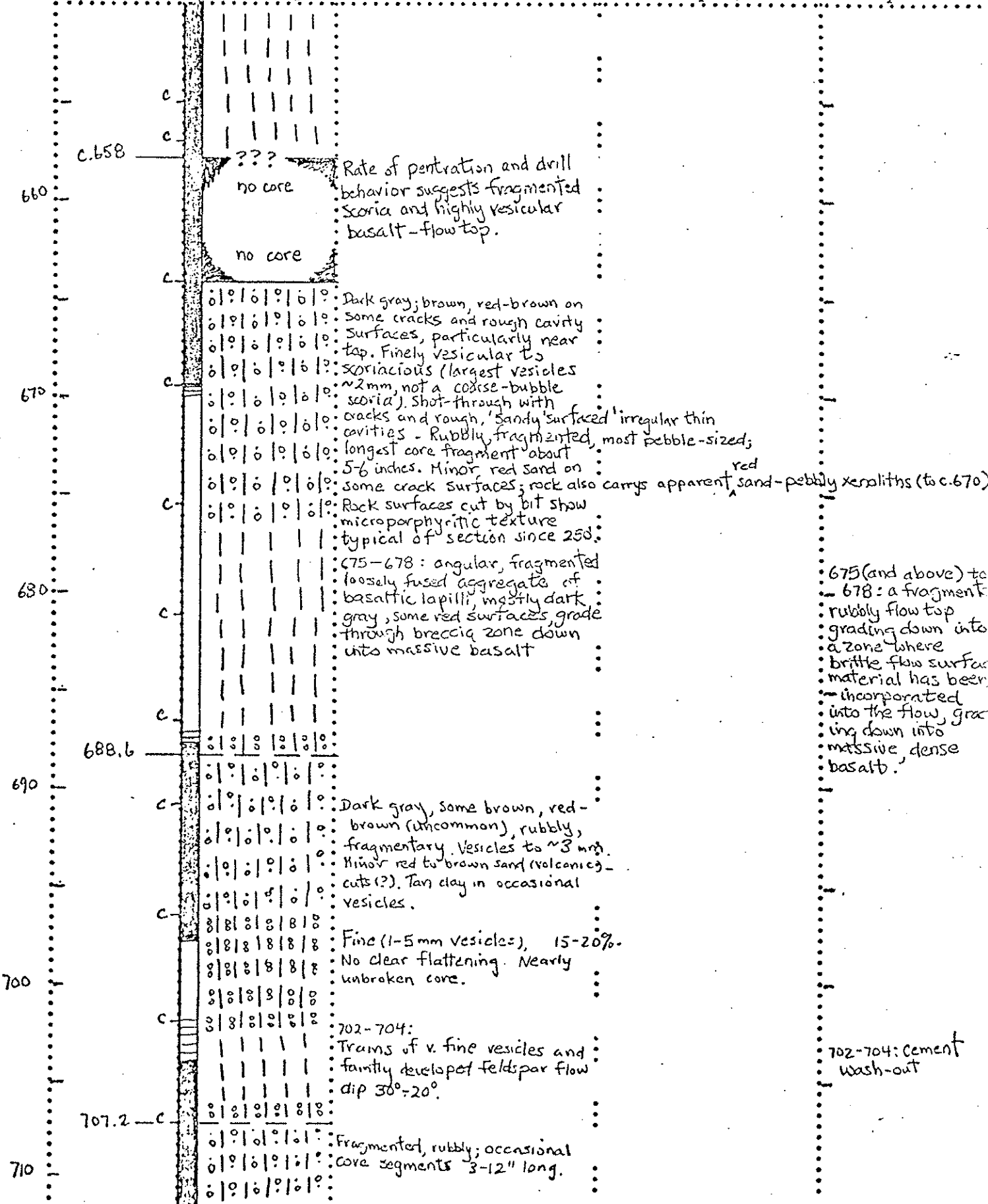
LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 1/26/76 (Mon.)

Lithologic Schematic of Lithologic Description Comments and
 Contacts Stratigraphy In hand, with 10x lens Microscopic, 7-30x Interpretation

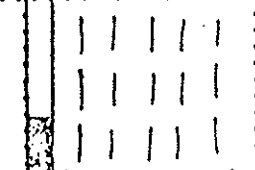

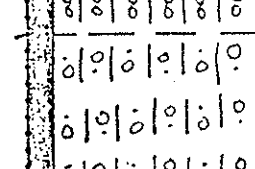

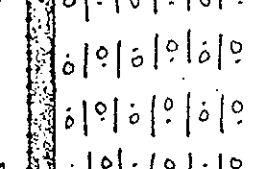
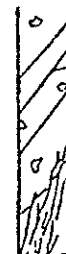
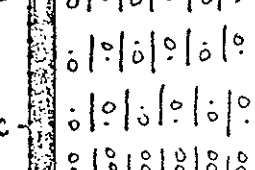

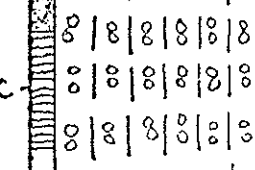
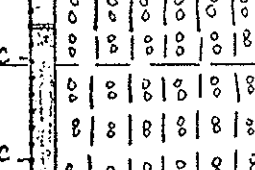


LITHOLOGIC LOG

Site Scientist C. Klein

Weyerhaeuser-Pacific Power & Light # 1

Date 1/28/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
710		To c.724: Dark gray, locally brown, and (uncommon) red-brown where scoriaceous. Vesicles <1mm to 1cm in diameter. Fragmented, rubbly, in pebble to cobble-sized pieces (subangular-subrounded), but also locally giving core sections to 1 ft. in length. Volume of vesicles and cracks varies 10-50%. Poor recovery.		707.2 - c.724: probably a thick section of flow-top rubble, formed during flow movement and break-up of the cooled flow surface. (Alternate: a series of thin flows could be present, with breaks at c.709, 712, 716 and 724; believe this to be unlikely, highly favor first interpretation.)
720		← gradational To 728: Dark gray, c.20-25% 1-5mm vesicles; commonly to abundantly fractured at moderate to high angles, producing chip-like fragments as small as coarse angular sand. (100% recovery).		(schematic) 728
730		728 →: Similar to above, but with ≤20% vesicles to 1.5 mm, and somewhat less abundantly fractured. 732-732.3 - basalt carries scoria, red sand		735-741: Two distinct sets of fractures are present: a) moderate dipping (20°) to vertical but most commonly 60°; clean, straight fractures, some with surfaces altered dark brown. Appears that only (but not all of) those with 60° dip show alteration; b) shear zones of pervasive fractures dipping 60-90°, with slickensides present on many surfaces (mostly dip-slip motion), no brown alteration. It appears that shears (b) offset cracks (a), with normal-type motion. It is not clear whether (as illustrated) they systematically dip in the same direction.
740		732.3 c. 732.3 - c.737.5: Dark brown grading down to dark gray. Vesicular to 20% decreasing downwards. Abundantly fractured, some shearing (see Comments). Many vesicles are elongate (to 1.5 cm long), plunge c.60°. Some bear tan clay.		
750		c.741.5 - 752.6: 15-25% vesicles; flattened to rounded, to 2.5 cm in maximum dimension. Plane of flattening ~ horizontal. c.743.2 - 745: abundant, steeply dipping shearing (see comments, 735-741)		
760		752.6 c. ← Brown to gray, fragmented. c.20% vesicles, decreasing downwards. Size and appearance as in 741.5 - 752.6; occasional high angle fractures, shears.		

LITHOLOGIC LOG

Site Scientist C. Klein

Weyerhaeuser-Pacific Power & Light # 1

Date 1/31/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretation
752.6				
760		Dark gray, c. 20% vesicles Scoria, red-brown vesicular basalt.		760.5-761.7: intense shearing and crushing development of some gouge. High angle motion, small total displacement (≤ several cm?). Recovery good, core nearly unbroken. Undestroyed blocks in zone permit identification of contact 760.7.
768.5		Dark gray, c. 25% vesicles 1-10mm maximum dimension (1.5-2mm below 767), flattened with 20-30° dip, some appear tubular, plunging 20-30°		768: brown-surfaced joint and adjacent undulating shear - wave parallel - Strike directions
770		Dark gray, vesicular basalt overlies brownish gray, with thin, irregular (.5-1.5 cm) layer of fine breccia (dark clasts, yellow matrix) between.		774: vesicle patterns dip 30°
774.4		769.7-773.8: Dark gray, c. 25% vesicles to 5mm, slight sub-horizontal flattening; occasional steep, splintery fractures		775: scoria cavity is lined with unidentifiable cement-gray material. (lichen-like in appearance)
780		Dark gray, some brown; <u>fragmented, rubbly</u> , longest core 4 ft.		775: basalt with finer vesicles overlies coarser vesicular basalt and associated scoria along a contact dipping c. 60°; the basalts above and below are identical in composition, and the exact contact surface is not well-defined.
790		Dark gray, c. 20% vesicles 1-5mm, decreasing to c. 5% by 790. Broken by cracks at .5-1m intervals		
795.2		Dark gray; c. 5% vesicles, 1-3mm diameter, occasionally to 3cm. Patterns of vesicles dip 10-20°		
800		Dark gray to red-brown; <u>fragmented, rubbly</u> .		
802		Dark gray, 30 to 15% vesicles 1-5mm decreasing downwards; fractured to c. 10-20 pieces/meter of core		
808.2		Dark gray, wine brown, red-brown (scarce); bears c. 20% fine (.5-2mm) vesicles; fractured but only slightly (?) rubbly.		c. 806.5: older brown surfaced crack with 60° dip bears younger slickensides (rake 60°)



LITHOLOGIC

Site Sec. Dist C. Klean

Weyerhaeuser-Pacific Power & Light # 1

Date 2/2/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretation
802.				
808.2		Dark gray to uncommon dark brown; pebble-sized fragments		808.2-810: deposits a fine, bright-yellow material are present on some scoriaceous surfaces; form is open, cell-like network
810		Dark gray, 10% vesicles, most 2-5mm; weak flattening dips 60°; core abundantly cracked above 809.8		void 1mm
820		Dark gray; vesicles reach 2 cm diameter; trains dip 30°; fractures not abundant (1 to 4/meter)		This substance does not appear to be clay. The host rock is unaltered.
822.3		← 821.9: xenolith of bright red scoria		
830		Dark gray, brown, red-brown the latter predominant below c. 829; some black glass gradational with the other varieties; micro-porphyrific as typical since 250 ft; all is rubbly fragmented into coarse small to cobble sizes; some is merely highly vesicular, but the abundance of frothy, jagged scoria is notable.		some 'red-brown' is very bright, almost a brick-red.
836.7		→ Brown, 25-30% vesicles, 2mm-1cm diameter; cracked to large pebble and small cobble sizes. Tan clay in some vesicles, on bottom.		836: pure white, 'clay-like' substance occurs deposited on crack surfaces. No reaction with HCl. Distinct from tan clay.
840		836.7-833: dark gray to red-brown; small amount large pebble size fragments only recovered.		Note: could the 'tan clay' here and commonly seen above in section be in reality a Fe-ion gel? (hydroxide of Fe+3?)
845.9		833-842: dark gray; 15%, 1-2mm vesicles; 3 to 10 cracks dipping 20-60° per meter.		
850		← vesicle trains dip 60-70°		
849.4		← Mixture of red to dark gray or black sand, grading to pebbly fragments similarly-colored finely vesicular to scoriaceous basalt.		
851.6		← Dark gray to red-brown; pebbly fragments only.		
856.3		← Dark gray; 10% very fine vesicles.		
860		849-851.6: core is fractured into crs. sand to cobble sized fragments; fracture surfaces are unaltered.		849.4: faintly scoriaceous textures above and below plus small amount red sand on surface of fracture below indicate possible flow break.
		← Red-brown; pebbly rubble; low recovery.		
		Dark gray; slightly diktytaxitic texture; fractured to pebble and cobble sized pieces above 855.		
		Deep red scoria or cinkey sand fused into tough, open aggregates, grading into (xenolithic in?) and alternating with core sections to 10 cm long of dense gray basalt; most scoria in pebble fragments		

LITHOLOGIC LOG

Site Scientist *C. Klein*

Weyerhaeuser-Pacific Power & Light # 1

Date *2/9/76*

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens; Microscopic, 7-30x	Comments and Interpretation
851.6			
856.3			
860.8		Dark gray to brown, coarse-bubbly, sponge-like scoria. Traces of red sand. Fragments only. Dark gray, c. 5% fine vesicles, abundantly cracked	860-866.8 - yellow vesicle walls Note poor recovery from 860.8 - 866.8
866.8		Red-brown, some gray. Cinders and/or fragmented scoria; all recovery is rough; sub-rounded to angular pebbles.	
c. 869		Volcanic sand and gravel (or rubble). Fine sand to cobble sized clasts. Dominantly red-brown. Cobble interiors are scoriaceous to finely vesicular, dark gray. Abundance of larger clasts may increase with depth; dominantly sand and pebbles from c. 869 - 872. Loose and unconsolidated except below c. 873.5, where the assemblage is lithified to a moderately strong rock.	Cinder zones 866.8 - 869 and could be portions of sand-gravel 869.
874.3			874.3 from which finer clasts have washed out.
875.9		874.3 - 875.9: red-brown to gray, pebbly fragments (rubble)	875.9: dense basalt grades upwards into breccia-like rock of gray rubble in red-brown matrix similar to that below 881.5
c. 881.5		875.9 - 881.5: Medium gray, c. 5% fine vesicles; bears occasional flow banding dipping 30°; commonly fractured at low to high angles. Lower portion bears inclusions of essentially identical but slightly more vesicular basalt, plus some red scoria and/or sand. Pebble-cobble-sized fragments of gray basalt (c. 10%, 2 mm vesicles) in equal amount red-brown, sandy-scoriaceous matrix. Hard, but fragmented and somewhat <u>rubbly</u>	
890			
900			
910			

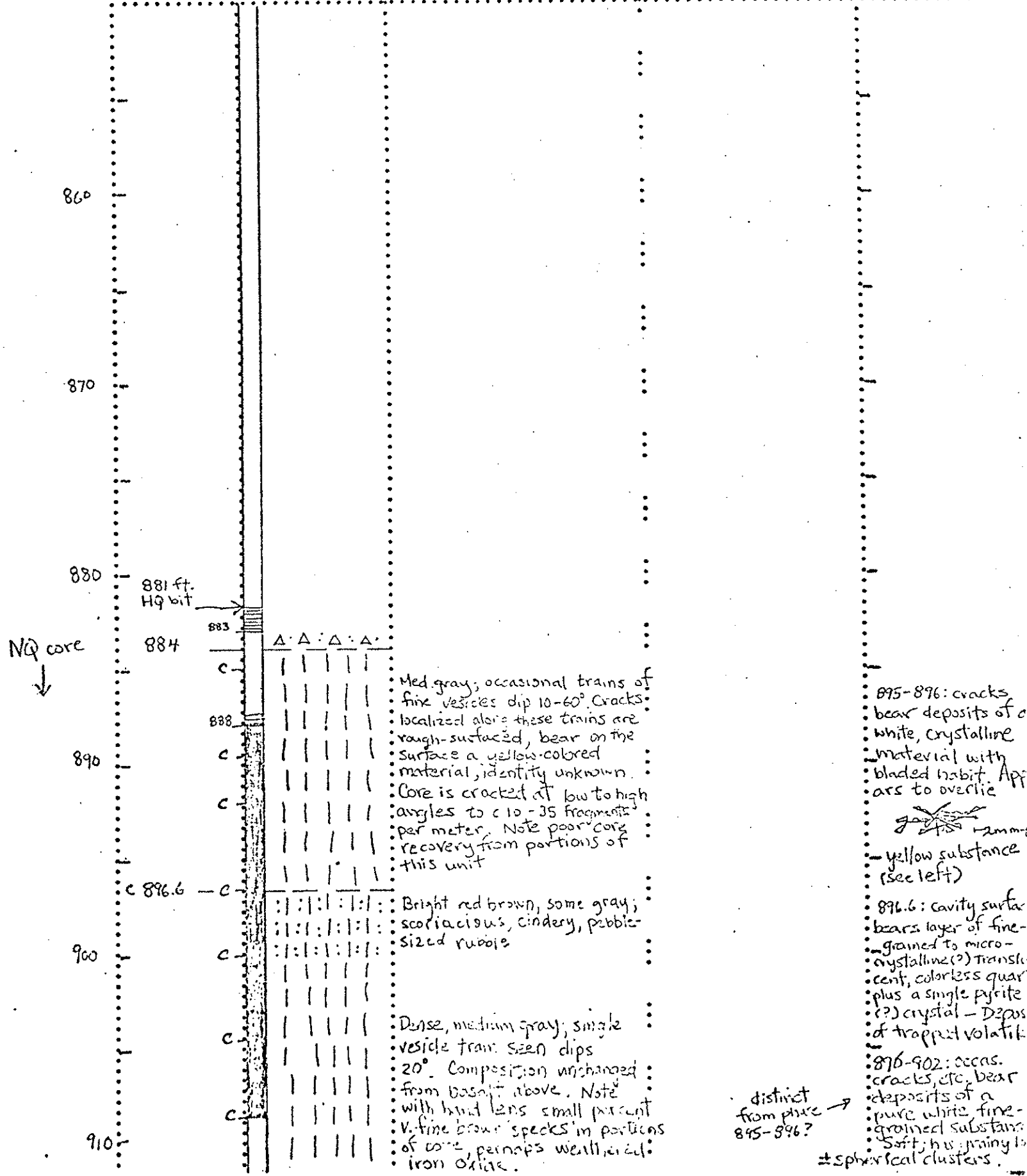
LITHOLOGIC LOG

Site Scientist C. Klein

Weyerhaeuser-Pacific Power & Light # 1

Date 2/22/76

Lithologic Contacts Schematic of Stratigraphy Lithologic Description In hand, with 10x lens Microscopic, 7-30x Comments and Interpretation



Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
910	c			
914.8	c		Red-brown, brown, pebble to cobble sized rubble	
920	c		Gray, to 20% vesicles 1-5 mm diameter, some scoria along cracks; in angular to rounded small pebble to cobble-sized fragments	914.8-922 and c. 922-935 may be heavily fractured rock rather than loose rubble - no problems with caving during drilling.
930	c		To c. 946 : dense basalt; to 942.5 fractured into pebble- to cobble sizes along common, irregular, brownish, scoria-like zones and by high-angle straight fractures. Carries common, pebble-sized xenoliths of equivalent but more vesicular basalt, doubtlessly derived from the same flow. Xenoliths are gray but dense matrix is gray mottled locally by dark brown. Locally, the dense matrix bears to c. 10% fine vesicles	
940	c			
950	c		943-950: trains of fine vesicles dip 50-60°.	
960	c		Below c. 942.5 core is in pieces from pebble-sized chips to 2+ ft. in length, broken by mostly high-angle fractures; some fracture surfaces bear a thin deposit of brownish-gray clayey material.	

LITHOLOGIC

Site Scientist C. Klein

Weyerhaeuser-Pacific Power & Light # 1

Date 2/29/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
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960	c				
	c				
	c				
	c				
	c				
970	c				
	c				
	c				
	c				
	c				
980					
982.2					
983.2	c				
985.7	c				
	c				
	c				
990					
996.0	c				
c.997					
	c				
1000					
c.1002.5					
	c				
1010					

Rarely to commonly fractured at high to low angles. High angle fractures (c. 60° dip) commonly bear thin film of grayish, clayey material.

c. 5% vesicles

To 983.2: fragmented gray vesicular basalt carrying pockets of red sand plus xenoliths red scoria

983.2-985.7: Breccia. Small pebbles - small cobbles red to occas. gray scoria and highly vesicular basalt in matrix of red sand, medium to coarse. Sand is mostly cemented or fused to fairly competent, hard rock, though a small amount is loose

985.7-c.990: reddish gray, rounded to angular pebbly rubble, scoriaceous.

c.990-991.7: gray, dominantly finely vesicular, but extensively fragmented to angular sand-cobble sized pieces, especially along brown to gray scoriaceous zones.

991.7-996: To 10% 1 to 7mm vesicles, flattened in sub-horizontal to slightly dipping plane

996-c.997: angular fragments gray to brown scoria plus coarse gray sand, rare grains red sand

c.997-1002.5: gray; to 20% vesicles to 1 cm diameter flattened in subhorizontal plane. Extensive high angle (to vertical) jagged fractures. Fracture surfaces unaltered, but some bear a v. small amount brownish gray clayey material. Local brown scoria at 997.

Below c.1002.5: brownish gray vesicular basalt, grading to gray vesicular within .5 ft; all as fragments; small pockets brown scoria above and below contact.

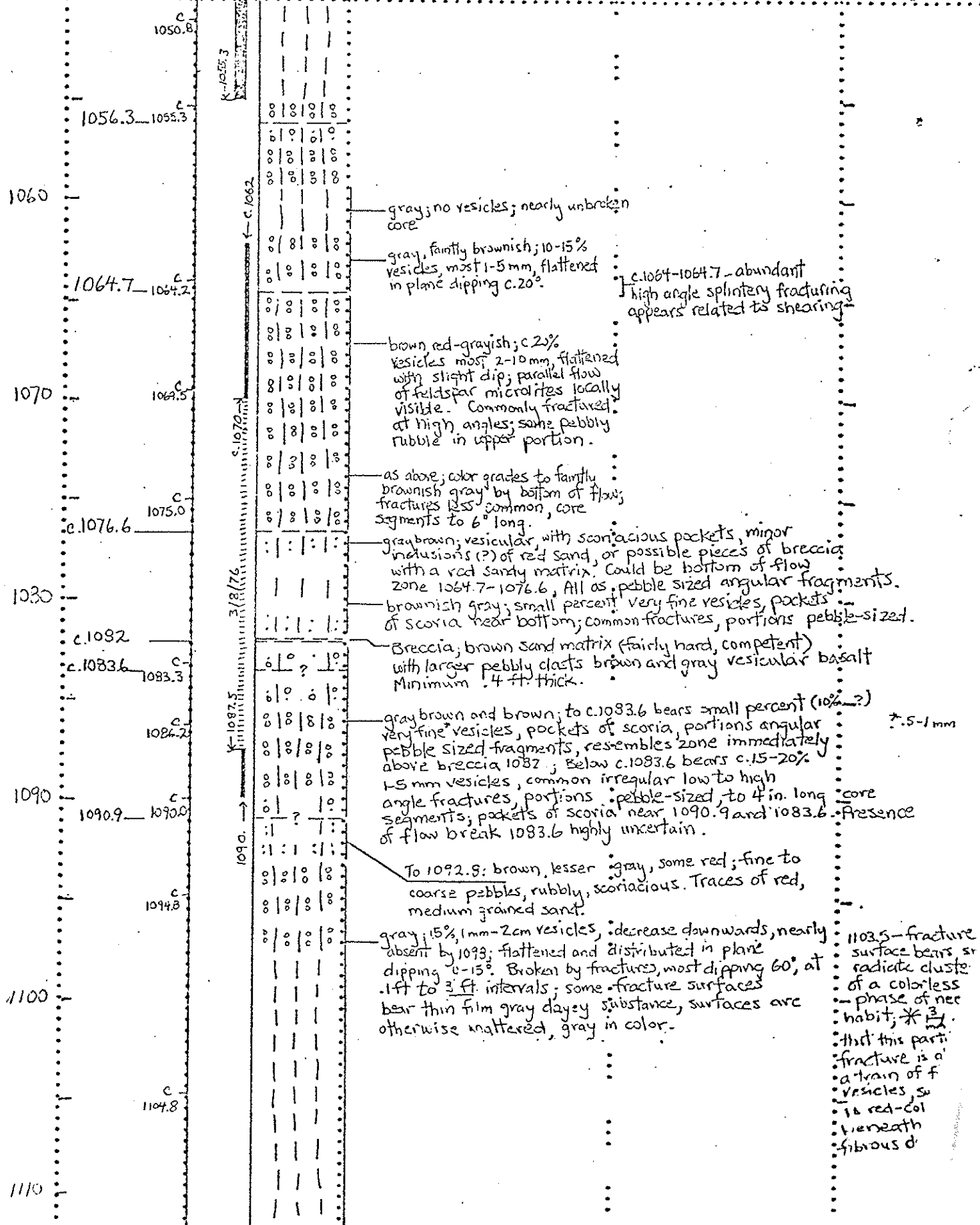
0 to >10 cracks/ft. of core.

982.2-983.2: fragmented, brecciated. Flow bottom carrying material from sand and scoria deposit below.

loose sand may be result of drilling

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens; Microscopic, 7-30x	Comments and Interpretation
c.1002	To c.999		
1001.8	3/18/76		Note poor recovery below 1004.8
1010	K-1012	1006.4-1023.1: gray; variable 0-10% vesicles .5-3mm diameter; pockets of red cinderly scoria (xenoliths) in 1006.4-1007.4; brownish alteration of cracks and vesicle surfaces in various intervals; extensively cracked and fragmented, as solid core to 6 in. long to locally abundant rounded to angular pebble-sized fragments.	
1012.0	3/14/76		
1020	1016		
1023.1	K-1026	gray; to 20% vesicles 1-5mm diameter; as angular fragments, mostly pebble and small cobble sizes. Minor brown, rough, frothy scoria pockets; red-brown alteration of vesicle walls and cracks.	Flow break at 1023.1 doubtful, indicated only by rubbly, fragmented rock and minor scoria-like pockets
1026	c.1027.5		
1030	K-1029	gray; 15% vesicles 2mm-2cm in maximum dimension, many tube-like (horizontal); nearly unbroken core.	
1033.1	c.1040		
1035.0	K-1046	1033.1-c.1037.4: brownish gray grading down to gray; 25+% vesicles to 5mm diameter; fractured throughout to angular pebble-sized fragments; fracture surfaces and vesicle walls: altered red-brown.	1033.1-1037.4: various vesicles bear: a) tan-colored clayey or gel-like substance; b) yellow powdery substance; c) pure white powdery substance. Zeolites?
1038.8	3/6/76		
1040	K-1049	1038.8-c.1049: brown, grading down to gray; 15-20%, 2mm-2cm vesicles, size and abundance decreasing slightly downwards; scant scoria (brown) at top; to c. 1045 locally grades into black, glassy-looking basalt along cracks. Much fractured above c.1046, nearly unbroken core below. Below c.1048 vesicles decrease to <1% by 1050.	1033.9-c.1049: some fracture surfaces bear white powdery material; some vesicles bear tan clayey substance.
1045.4	c.1053		
1050	K-1053	c.1049-1056.3: gradational with zone above c.1049; gray with tawny brownish; acutely bedded look above c.1052. Locally broken by common high angle fractures.	c.1040-1070-t appear (w/ha. petrographic equivalent) those high abundance
1053.3			
1056.3		15% vesicles	Section, 1
1055.3			
1050.8			
1054.3			
1055.3			
1056.3			
1055.3			
1055.3			
1055.3			
1055.3			
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Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
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LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 2/13/76

[Handwritten signature]

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens; Microscopic, 7-30x	Comments and Interpretation
1107.9			
1110			
1115.8 - 1115.0		gray; to 15%, 1-3 mm vesicles	
1120			
1121.7		brownish red; coarse bubbly, spongy; rubbly; fractured, coarse to fine pebbly angular to rounded fragments.	
		brown; to c. 15% vesicles, most 2-10mm, crude flattening in plane with slight dip; near 1121.5 vesicles fewer, discontinuous gray bands dip c. 30°.	
		1121.7-1128: red, gray below 1126.3; fine to coarse pebbly rubicite occasionally larger fractured core fragments (to .3 ft)	
1130			
1133.5		fused fragmental finely vesicular grades down into dense flow.	
1137.7		faintly pinkish gray; pinkish-grayish med. brown when wet; occasional high angle fractures.	May contain accessory pyroxene as well as olivine; total mafics visible only c. 3%. Matrix feldspar microlites with interstitial microcrystalline pink-red material, possibly plitaxitic, subplitic, sulfide might be present, possibly coating olivine grains (giving bronzy sheen, which also could be caused by incipient weathering or other alteration)
1140			Thin section advisable? Note possible pyroxene. Mafics may be less abundant than in basalt above.
1146.5		brown, reddish brown, some gray; pinkish gray below 1146.5. Traces of red sand. Crumbly, rubbly, also angular fracture fragments, particularly below 1146.5	1138-vesicular rock contains accessory Pyrite cubes, rare
1150			
1156.3 - 1156.3		pinkish gray pinkish brown when wet; c. 1% round vesicles to 1cm diameter; occasional to locally common high angle fractures; vesicular with sporadic pockets, much fractured at bottom of flow	Flows 1121.7-1137.7 and 1137.7-1156.3 may be andesitic in composition relative to basalt above.
			Matrix: feldspar microlites, interstitial micro or crypto-crystalline pink-red material, possibly plitaxitic or hyaloplitic? (very fine grained); bears c. 1-2% fine microphenocrysts green pyx? and ol? Some olivine (?) has bronzy surface; sulfides present?
1160			

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site: Scientist C.R.M. M

Date 3/17/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens Microscopic, 7-30x	Comments and Interpretation
1160 c. 1156.2 1156.3 c. 1160.1 1160.2 c. 1166.4 1166.2		<p>pinkish gray, vesicular with scoria pockets</p> <p>gray, pinkish gray, fine vesicles; rounded large pebble fragments</p> <p>pinkish gray; open, porous, of very fine vesicles; in upper part, appears composed of fused sand to pebble-sized cinder fragments; nearly unbroken core; grades into dense flow rock below.</p> <p>pinkish gray, grades to gray at c. 1165; bottom few inches oxidized red, contain scoria pockets. Trains of vesicles dip 20-30°. Broken by several near vertical fractures of curved, irregular surface</p>	<p>Pinkish gray colors typically appear pinkish brown when wet</p>
1170 1173.5 1176 1177 1178		<p>c. 1166.4 - 1177.8: red, some pinkish gray, scarce gray. Most is medium to coarse spongy scoria; fragmented, broken, angular pieces small to large pebble sizes, occasionally rounded. Locally finely vesicular, giving core segments to 6 in. long (pinkish gray); these might be center or basal portions of very thin flows.</p> <p>pinkish gray, with common small swirls and patches of gray, and partially resorbed xenolithic, angular fine to coarse pebble-sized fragments of gray vesicular basalt. Permeated by extremely fine vesicles or pores less than .5 mm in diameter; total porosity might exceed 10%. Very much fractured, broken up below c. 1181.3, to angular fragments as small as coarse sand.</p>	<p>1166.4 - 1177.8 could contain two thin flows plus the top of the flow of dense rock</p> <p>1177.8 - 1193.3. Very speculative.</p>
1180 1183.3 1186.3		<p>no core recovered</p> <p>drilled with rock bit (3/17)</p> <p>to 1192: behavior of drill suggests presence of rubble and possibly much sand; caves-in repeatedly</p>	
1190 1196.2		<p>below 1192: very hard rock; probably dense flow; periodic high drill vibration suggests fractures are locally common.</p> <p>brownish gray; grayish brown, especially when wet; less pinkish than above, though still faintly so in some portions. Scarce to locally common irregular high angle (to vertical) fractures.</p>	<p>measurement of 1196 may be in error - possibly is 1196.6</p>
1200 1206.2 1208.4		<p>to 1210.6 or below: no recovery, drill behavior suggests rubble flow top.</p>	

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
1208.4		<p>1208.4 - c.1216: to c.1213 = red-brown vesicular and scoria rubble, very low recovery.</p> <p>c.1213-1216: brown, with c. 20% small vesicles (1-3 mm), grading to a glassy black along common irregular high angle cracks and in small scoria pockets; abundantly fractured, but one core segment 10" long is recovered.</p>		No recovery 1208.4-1210.6
1210				
1220		<p>c.1216-1222.8: brown, faintly pinkish, grayish; bears variable 5-15% vesicles, 1mm-1cm, some in trains dipping 40°. Locally abundantly cracked to small angular fragments; elsewhere gives core segments to 1.5 ft. long.</p>		
1220				
1230		<p>red, locally dark gray, black (glassy); rubble, pebble to cobble sized rounded to angular fragments.</p>		
1230		<p>drilled with rock bit (3/19)</p> <p>no core or cuttings obtained: drill behavior suggests presence of rubble fractured rock, possibly substantial sand. Repeated cave-ins.</p>		
1240		<p>soft rock, drills quickly, but does not cave or bind.</p> <p>rock very hard, resistive; probably dense f.w.</p>		1243: red-gray 'basalt' contains bronzy-surfaced altered olivine (?; 5%) plus common, disseminated very fine sulfide specks (<1%)
1240		<p>drilled with rock bit (3/20)</p>		
1250		<p>1241.3 - c.1244: reddish to brownish dark gray; c. 5% fine vesicles</p> <p>reddish dark gray (finely mottled red and very dark gray), resembles zone immediately above, but contains pockets of brown scoria; extensively fractured to pebble-cobble sized fragments.</p>		c.1244: flow break possible
1250		<p>red sand, moderately well cemented to fairly competent sandstone.</p>		c.1244-1247.6 bears traces of red sand. True thickness of sand 1247.6-1247.8 may be much greater (to over 1 ft.)
1260		<p>1247.8 - 1255.3: pinkish brown; to 35%, 2mm-1cm vesicles, decreasing downwards; extensively fractured at high angles above 1257. One sub-vertical crack bears fault gouge, subvertical slickensides. Occasional vesicles bear tan 'clay' deposits in basin.</p>		

Lithologic Schematic of Lithologic Description Comments and
 Contacts Stratigraphy In hand, with 10x lens Microscopic, 7-30x Interpretation

1260	1255.5	Continuous to 1201	1259-1272.5: pinkish gray; local vesicle trains, occasional gray-colored bands (several cm thick) dip 20-50°; upper portion is locally much fractured at high angles; below c. 1265 fractures are spaced at 2+ ft intervals.	Very fine texture. Matrix of approximately equal proportions aphanitic red material (oxidized glass?) and colorless material which may be clustered feldspar microlites (?). In the red portion of the matrix very fine feldspar microlites are sharply outlined. Scarce fine lath-shaped green matc-pyroxene.
1270	1265.0	3/21	breccia of flow matrix with inclusions of sand and scoria from below. Fractured along scoria zones and common subvertical cracks.	
	1273.3	3/24	fractured, rubbly red scoria + some red sand grades down to red vesicular to reddish dark gray vesicular to red-vesicular again at bottom; 20-10% vesicles decreasing downward; common fractures throughout.	Microphyritic: c. 40% feldspar microlites to 1mm long; red to mottled red and gray aphanitic matrix.
1280	c. 1274.5	← c. 1280.4	no core	
	(1281.6)	1281.6	drilled with rock bit 3/22	
	(1282.6)	1282.6	pinkish or maroonish gray, the red component increasing downwards; 25% to 5% 1-4mm vesicles, decreasing downwards; vesicle trains dip 40°; fractures uncommon.	
	1285.6		red scoria rubble grading down to dark gray basalt with disseminated traces brown alteration; 5% round vesicles; common irregular high angle fractures.	1288: vesicles bear fine zeolite (?) of acicular habit
1290	c. 1288.0		red brown; 18-20% 2-8mm vesicles; scarce to abundant irregular high angle fractures (many angular small pebble sized fragments, also core to 1 ft. long)	Driller reports very soft rock at c. 1293 - missing flow break?
	1289.3		red scoria (v. low recovery); brown grading down to red-brown flow, with 20+ % grading down to 5+ % vesicles 1-5mm, size decreasing with depth; common fractures.	1293: vesicle walls are coated by a thin (.5mm?) film of opal-blue (pale sky blue) aphanitic material. Occasional others bear white material in fine cauliflower bundles
	c. 1291.5		red, pebbly rubble, rounded to more commonly angular fragments.	and rare vesicles bear tan clayey material
1300	1294.2		1303.5-1303: pinkish brown (wet) to strongly pinkish gray (dry); to 5% vesicles; common high angle fractures.	
	c. 1298.2			
	1299.6			
	c. 1301.8			
	c. 1308		to 1310.5: red, rubbly, coarse sand to large pebbles, subrounded to angular.	
1310				

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein M.S.

Date 3/23/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
c 1301.8 1308				
1310 c 1313.5 1320 c 1323.8		<p>pinkish gray or weakly reddish gray; to 12.5.5 pores maximum 20% vesicles, decreasing downwards, 1-4 mm; fractured at .5 to 2+ foot intervals above c.1321, abundant fractures below, mostly at high angles.</p>	<p>The red component of the color here, as in flows above, is due to alteration of cryptocrystalline (? or glassy?) matrix, which surrounds feldspar microclites, to a bright red-orange color.</p>	<p>1313: high angle (80°) fracture surface in bears orange and white clayey materials; occasional vesicles bear deposits of a white phase grown in fine clusters of cauliflower-like habit (see also 1293)</p>
1330				
1340				
1350				
1360				
1370				
1380				
1390				

LITHOLOGICAL LOG

Weyerhaeuser-Pacific Power & Light # 1

Geophysical, Inc.

Site Scientist C. Klein

Date 4/19/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens; Microscopic, 7-30x	Comments and Interpretation
1309.8			
c.1308			
1310			
c.1313.5		<p>Pinkish gray or weakly reddish gray; to c. 1315.5 bears maximum 20% vesicles, decreasing downwards, 1-4 mm; fractured 5.5 to 2+ foot intervals above c. 1321, abundant fractures below, mostly at high angles.</p>	<p>Reddish color is due to alteration of cryptocrystalline (or glassy?) matrix which surrounds feldspar microlites, to a bright red-orange color.</p>
1320			
c.1323.8			
1323.8		<p>Red oxidation developed only as fine mottling. Most of matrix is dark gray; typical of basalts throughout the section.</p>	<p>Crude subhorizontal flow orientation of feldspar microlites</p>
1329.4			
c.1332.8			
1330		<p>To c. 1338: red, grayish red. Variable vesicular porosity 15 to 40%. Much splintery high angle fracture.</p>	
1340			
c.1345			
1345		<p>Medium gray, faintly brownish; locally faintly reddish. To 15% roundish, 1-3mm vesicles, abundance decreasing downwards. Subhorizontal trains. Locally common high angle fractures.</p>	<p>1338: possible flow break suggested by abrupt color change</p>
1350			
c.1353.7			
1353.7		<p>c. 20%, 2-5mm vesicles, faint horizontal flattening.</p>	
1350			
c.1352.2			
1352.2		<p>Red-gray or maroon Pebbly rubble.</p>	

1323.8 - 1313.5 this pair continuous cement to 1209
 3/4

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Geological, Inc.

Site Scientist

Date

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens : Microscopic, 7-30x	Comments and Interpretation
1353.7 — 1353.1			
1359.2		1358.2-1359.2: Med. gray, slightly mottled by brown oxidation. 15%, 3mm vesicles.	
1364.8		Medium gray. Finely mottled by brown. High angle fractures at 1 ft. intervals.	1360-1361: void. Upper surface bears white powdery phase deposits in clumps and as a thin film.
1368.3		Red-brown. Much fractured, cobble to sand-sized fragments. Low recovery	c.1371-1372: abundant angular sand to silt-sized material. Sediment layer, clastic dike or shear-crush zone in scoria?
1376.3		c.1373-1391: Dark gray mottled finely by red-brown oxidation. Intensity of redness decreases with depth. Bears 25% to <5% vesicles, abundance decreasing with depth; roundish, 1mm to 1cm diameter; horizontal trains in lower portion. Aphanitic texture. Scarce to locally common high angle fractures.	
1386.3			
1393.6		Color grades from brownish medium gray to faintly brownish light gray, mixing downwards. No vesicles. Occasional subvertical fractures with irregular surfaces. Aphanitic.	
1403.6			Very fine-grained. Feldspar, lath shaped (?) red-brown (oxidized?) mafic phase, dusty opaque. Occasional yellow-greenish material (as roundish) bodies (?; olivine?; rare if present).


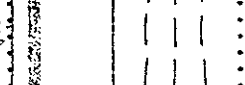
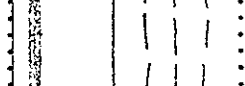
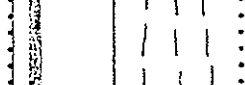


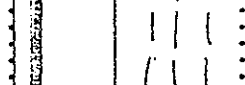
LITHOLOGICAL LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 4/19/74

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens : Microscopic, 7-30x	Comments and Interpretation
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1410			
1420			
1430		<p>Below 1428 fractures very rare.</p>	
1440			
1450		<p>Color grades to red-brown. Pockets of scoria</p>	
1460		<p>Deep reddish gray. Rubbly, in pebble sized fragments, some larger.</p>	
		<p>Medium gray finely mottled by red-brown. Bears 15 to 45% vesicles, decreasing downwards. Faintly microporphyrific texture.</p>	

1403.6

1414.0

1424.2

1433.4

1443.8

1450.5

1455.5

1/2

LITHOLOGICAL LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 4/19/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens; Microscopic, 7-30x	Comments and Interpretation
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1450.5			
1455.5			
1460		<p>Medium to light pink-brownish gray.* Aphanitic, faintly microporphyritic. Uncommon high angle fractures. No vesicles.</p>	<p>*Darker color than flow above (1388-1445.5)</p>
1465.5			
1470		<p>To c.20% round, 1-5mm vesicles. Occasional pockets of scoria.</p>	
1471.5		<p>To c.1476.2: Red-brown, reddish gray. Rubby, very low recovery.</p>	
1476.2		<p>To c.1484.2: Finely mottled red-brown (oxidized) and medium gray. Aphanitic. Bears 5 to 10% 1mm-1cm vesicles, subhorizontal flattening. Abundant to intensely fractured at irregular high angles. From 1483-1484 in angular pebble down to silt-sized fragments, with signs of shearing (slickensides)</p>	
1487.2		<p>As above. Abundant high angle fractures (60° to vert), decreasing in frequency downwards.</p>	
1486			
1490			
1494.5		<p>To c.1500: Brown, mottled ash gray and red-brown. To 20%, 4mm-2cm vesicles, round. Upper 2 ft. much fractured. Less broken below</p>	<p>Thin clay in some vesicles. At top some vesicle walls are yellow.</p>
1500		<p>Light, pink-brownish gray. Aphanitic (feldspar microlites, oxidized to fresh black mafic grains, fine laths). Occasional steep (70-90°) fractures; portions unfractured for up to 10 ft.</p>	<p>Some of the flow material at very top (1494.5) may be glassy.</p>
1502.5			

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 4/19/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens; Microscopic, 7-30x	Comments and Interpretation
1502.5	[Schematic symbols]		
1510	[Schematic symbols]		
1513.3	[Schematic symbols]		
1516	[Schematic symbols]		
1520	[Schematic symbols]		
1523.7	[Schematic symbols]		
1530	[Schematic symbols]	Below 1529: fractures fairly abundant	
1533.4	[Schematic symbols]	Grayish-pinkish red. Alternating zones spongy scoria and denser flow rock with abundant extremely fine vesicles (<1mm), carrying pebbly xenoliths coarser vesicular flow (auto-breccia?). Fractured to angular fragments throughout.	1533.4-1539.4: more than one flow could be present
1539.4	[Schematic symbols]	Bright red to grayish red, red-brown. Spongy scoria, angular fragments. To 1544.	Change of character at 1544 is very abrupt.
1545	[Schematic symbols]	Pinkish gray, extremely fine-grained. No vesicles.	
1549	[Schematic symbols]	To c. 1551.7: Spongy scoria. Bright red, grayish red. Angular fragments.	1545 v. approx. 1552 v. approx. 1539.4-1556: note equivalent patterns of three zones.
1552	[Schematic symbols]	c. 1551.7-1552: Pinkish gray, extremely fine grained. No vesicles.	
1556	[Schematic symbols]	To 1555.7. Equivalent to 1545-1551.7.	
1557.5	[Schematic symbols]	To 1556. Equivalent to 1551.7-1552.	
1560	[Schematic symbols]		

LITHOLOGIC LOG

Site Scientist C. Klein

Weyerhaeuser-Pacific Power & Light # 1

Date 7/21/75

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens : Microscopic, 7-30x	Comments and Interpretation
c.1552			
1556			
1557.5			
1560			
1562			
1564			
1570			
1574			
1580			
1584			
1590			
1594			
1600			
1604			
1610			

Bright orange red-orange orange-brown. Subrounded to angular small pebble-sized fragments of red to gray finely vesicular scoriaceous rock grading into fine orange matrix, which includes an abundant silt-sized fraction. General coarseness of silt clasts increases somewhat with depth. Top is a sandy siltstone, bottom coarse sandstone. Well cemented (lithified) and competent, hard.

Variable red, red-brown, gray-brown, maroon, dark gray, medium gray. Becomes mostly gray with depth. Fine to coarse spongy scoria. Vesicle walls blackish, glassy.

Below 1569: medium gray* Aphanitic, but with $\leq 1\%$ olivine. Has a low porosity (perhaps 5-10% to c.1571, $\leq 5\%$ below) v. fine (<1mm) vesicles. These produce a faintly diktytaitic-like texture where most clustered (not a proper term to describe the rock). Below c 1575 the porosity is $\leq 1\%$. Broken by 1-2 high angle fractures every 2-4 ft.

1585: olivine may locally reach several percent. Appears to be clustered, with feldspar (glomeroporphyritic). Overall olivine is probably 1-2%.

1590: Local faintly pinkish color of rock absent here and below; all is medium gray, uniform.

1556-1562: Possibly an explosion breccia or tuff. Matrix may be mostly limonite-goesite. At c.1558 is a small cobble-sized scoria clast

* locally faintly pinkish olivine: roundish grains, <1mm diameter. Green glassy, with iridescent tarnish.

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Sit Scientist C. Klein

Date 4/21/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens : Microscopic, 7-30x	Comments and Interpretation
1607			
1610			
1614.3		1615-1617: in zones several cm thick to each side of high angle cracks which is oxidized to rusty red-brown staining the rock yellowish. The oxidized zones are sharply to gradationally bounded against the fresh rock.	
1620			
1630			
1640			

LITHOLOGICAL LOG

Weyerhaeuser-Pacific Power & Light # 1

Geothermal, Inc.

Site Scientist C. Klein

Date 4/21/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretation
1659.7				
1660				
1664.5				
1670				
1674				
1674.0	o o o o			
1677.5	o o o o			
1680	o o o o			
c.1683.5	o o o o			
1686.2	o o o o			
1690	o o o o			
1694				
1700	o o o o			
1705	o o o o			
1710	o o o o			

Lower few feet color is faintly pinkish gray.

Red-brown grading down to brown. Feldspar microclites, to 2(?)% fine olivine in oxidized, aphanitic matrix. 5-10% roundish 3mm-3cm vesicles. To c.1675 much fracture to small (pebble- to sand) sized fragments by high angle shearing.

Brownish gray, grading to medium or dark gray by 1691. Bears 5-30% roundish 3mm-3cm vesicles (<5% in 1692-1696) Aphanitic, bears to 2% fine (<1mm) somewhat clustered olivine; microclitic feldspar. The rock bears small, slightly scoriaceous, brown pockets at c.1702, 6, 7, 8 and 1710. Above 1691 and below 1702 much broken to angular fragments at irregular low to high angles (pebble to large cobble sized fragments).

Tan 'clay' or gel in vesicles.

Note that zone c.1701-1702.5 was redrilled several times, extensive caving.

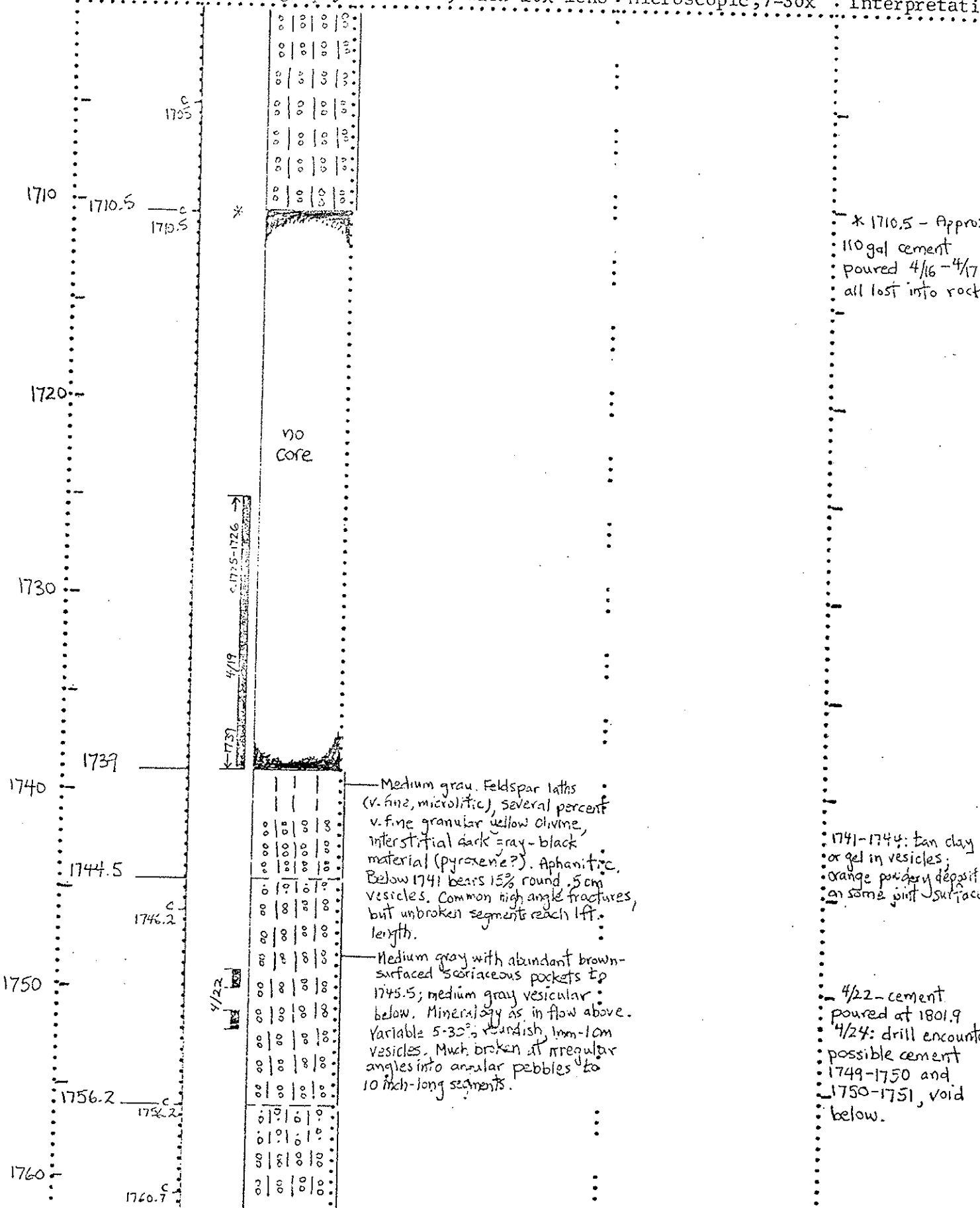
LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 4/21/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretati
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Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Microscopic, 7-30x	Comments and Interpretation
1756.2		<p>Medium gray, with brown scoria pockets from 1756.2-1758 and 1761.5-1762.5. Bears 15-25% 2mm-2cm vesicles, generally roundish; largest sizes are in a central zone, smaller near top and bottom. Occasional to abundant mostly high angle fractures - core segments to 1ft long, down to many pebble-chip sized fragments.</p>		
1760.7				
1766.2				
1777		<p>Medium gray, with brown scoria zones to c. 1782. Bears variable 3-10%, 1mm-2cm vesicles 1782-1792. Upper scoria zone abundantly fractured, below 1792 fractures less common but locally abundant (1 to 5 per foot), most are at 60-90° dip-</p>		
1783.7				
1792		<p>Medium gray, faintly reddish; near top and bottom, due principally to red-brown oxidation of vesicle walls. Nearly aphanitic, but feldspar 'microclites' and fine specks of yellow-green olivine are visible to unaided eye. Bears 5-20% vesicles, most roundish, 2-5mm. Common irregular 60° to sub-vertical fractures; unbroken core to 1ft. long.</p>		
1806.3				

4/22: cement poured at 1801.9
 4/24 - possible severe short bridges of cement in 1780-1795.5; void above and below. Bridges are only c. 6" thick.
 presence of flow break at 1792 very uncertain
 1800: abrupt change in vesicle size and density could be a flow break
 Occasional vesicles bear tan 'clay' or 'gel'.

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 4/25/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description	Comments and Interpretation
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1806	○ ○ ○ ○		
1506.5	○ ○ ○ ○		
1810	○ ○ ○ ○	Brown, grading to medium gray by 1809. Aphanitic. Bears 15-20% vesicles, most 2-4 mm, abundance decreasing to <1% from 1824 to 1826. Much broken above 1809.5. Below 1809.5 fractures are uncommon to rare, almost exclusively confined to breaks along occasional vesicle trains dipping 20-45°.	1809.5-1840.2 - note scarcity of fractures; numerous unbroken core segments 2-4+ ft. long.
1815	○ ○ ○ ○		
1820	○ ○ ○ ○		
1824	○ ○ ○ ○		
1830	○ ○ ○ ○		
1834.0	○ ○ ○ ○		
1840	○ ○ ○ ○		
1844.5	○ ○ ○ ○	Medium gray, grading down to mottled brown and gray, then brown. Bears to 40% 1-5 mm vesicles. Much broken at all angles to angular pebble-cobble sized fragments.	A flow break may lie at 1840.2 instead of c. 1844.5. The break has been placed at 1844.5 because of a qualitative change in appearance crossing that level (slight color change, size of vesicles + their distribution + density. Also, the change at 1840.2 appears gradual.
1845	○ ○ ○ ○		
1850	○ ○ ○ ○	Brown, grading to medium gray by 1850. Bears 20%-0% vesicles; abundance decreasing downwards; in occasional subhorizontal trains below 1850. Fractured along vesicle trains and irregular subvertical cracks, which show slight + no alteration; fractures are common above c. 1862; uncommon below.	
1856.2	○ ○ ○ ○		
1860	○ ○ ○ ○		

LITHOLOGICAL LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 4/27/76, 5/12/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens	Lithologic Description Microscopic, 7-30x	Comments and Interpretation
c 1856.2				
1860				
c 1866.2				
1870				
c 1876				
1880				
c 1886.1				
1890				
c.1890.8				
	no recovery			
c 1896.1				
1900				
1900.8				
c 1906.1				
1910				
c 1907.3				

To c.1897: brownish gray pebbly scoria rubble, plus dark gray to brown coarse to fine sand (volcanic?)

Dark gray, nearly aphanitic, c. 20-25% roundish 2-10 mm vesicles; Unbroken core

To c.1910: brown to gray brown, nearly aphanitic; abundant fine to coarse vesicles, pockets of scoria; extensively fractured, rubbly. No clear flow breaks.

Flow break at 1900.8 uncertain

LITHOLOGIC LOG

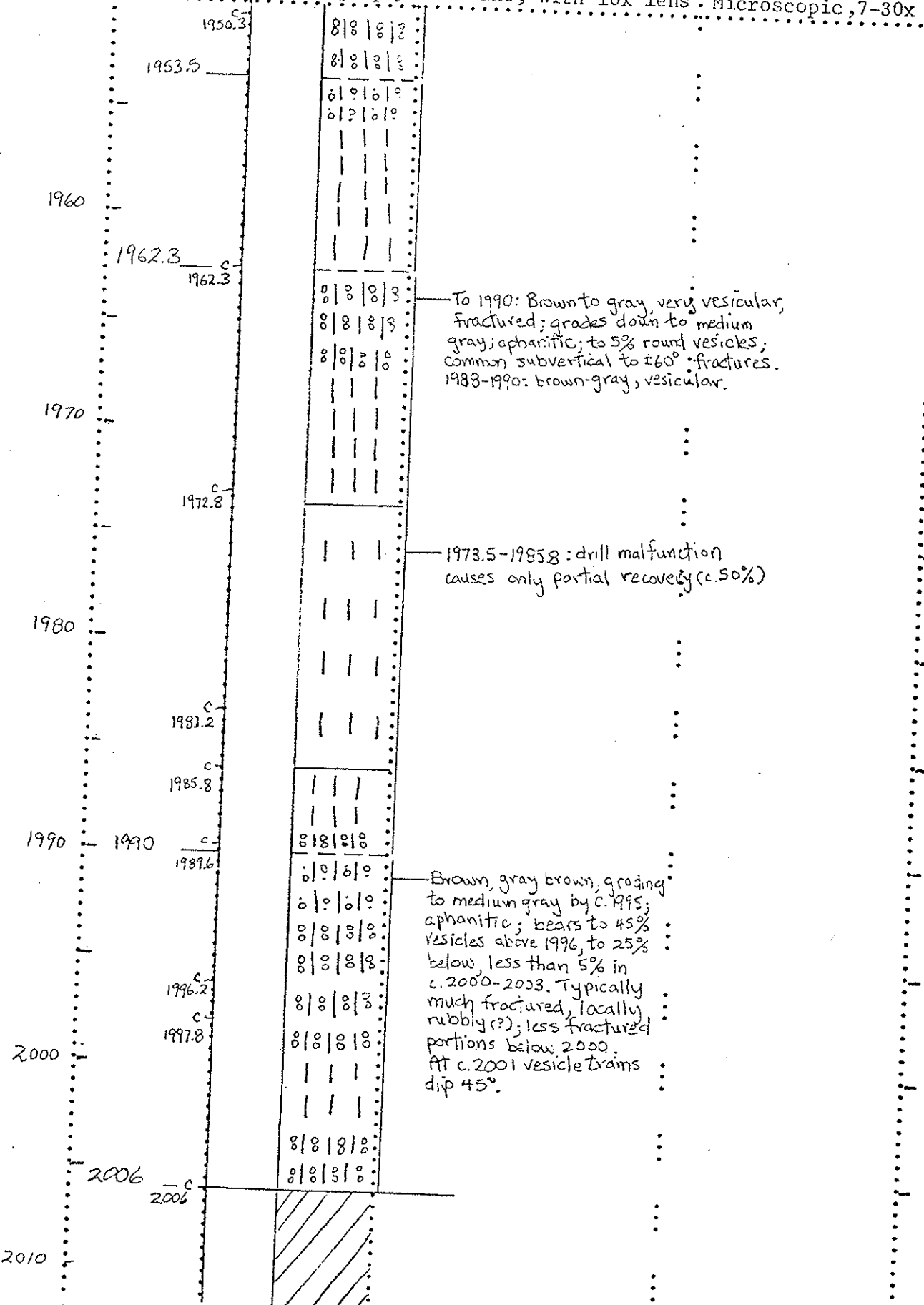
Weyerhaeuser-Pacific Power & Light # 1

Geothermal, Inc.

Scientist C. Klein

Date 5/10/76

Lithologic Contacts Schematic of Stratigraphy In hand, with 10x lens Lithologic Description Microscopic, 7-30x Comments and Interpretation



2010

LITHOLOGIC LOG

Weyerhaeuser-Pacific Power & Light # 1

Site Scientist C. Klein

Date 5/30/76

Lithologic Contacts	Schematic of Stratigraphy	Lithologic Description In hand, with 10x lens; Microscopic, 7-30x	Comments and Interpretation
1905.8			
1906.1			
1910			
1909.3			
1916.0			
1920			
c.1922			
1921.3			
1930			
c.1932.7			
c.1935			
1940			
1941.3			
1950			
1950.3			
1953.5			
1960			

To 1918: dark gray to brown; nearly aphanitic; 10 to 25% vesicles; occasional small pockets scoria; much is unbroken core segments .5 to 1.2 ft long, but locally more fractured. Traces of brown to gray sand at c. 1911.

Possible flow break at 1911.

To c. 1922: dark gray; abundant fine vesicles. Zone 1918-1920.7 rubbly, v. poor recovery; 1920.7-1921.3 single segment; no recovery below 1921.3

Flow break 1922 very approximate

To 1925: brown, red-brown, grading down to gray; fractured, rubbly; very fine vesicles.

1925 - c. 1935: Medium gray; nearly aphanitic; bears 5-15% vesicles in 1925-1926 and below c. 1932; vesicle trains dip 20-30°; occasional fractures above 1932.7, much fractured below. Pockets of scoria 1933-1935

To c. 1940.8: brown; scoriaceous, highly vesicular; much fractured, rubbly.

Dark gray; 5-20% vesicles, <5% in flow center, roundish, 1-10 mm; occasional 60° to subvertical fractures.

To c. 1957: dark gray, gray-brown; scoriaceous to vesicular; much broken, somewhat rubbly at top.

Med. gray, aphanitic; common to abundant subvertical fractures