III. X-RAY MINERALOGY STUDIES—LEG 43

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INTRODUCTION

Semiquantitative X-ray diffraction analysis of a total of 298 samples randomly taken from cores at Sites 382, 384, 385, 386, and 387 was carried out at the Laboratorium für Sedimentforschung of Heidelberg University (now Institut für Sedimentforschung). The samples were dried at a maximum temperature of 50°C. Determination of the mineral composition was conducted on powdered bulk samples, as well as on a carbonate-free basis for the <2 μm fraction. Hydrochloric acid at a concentration of 10 per cent was used to decalcify the samples. Equipment used was a Phillips PW 1310 diffractometer. Nickel-filtered Cu Kα radiation was used, and the generator was run at 36 kV and 24 mA. Scanning speed, except for some special samples, was 1° 2θ/min. Random orientation of the sample was obtained by filling the powder into a carved aluminum plate. During this procedure a glass plate is mounted over the carved part and the powder settled into the resulting slit. The grains may then still have a certain orientation, but after removing the glass the resulting surface is exposed to the X-ray beam. This surface is perpendicular to the settling direction and a good random orientation is attained.

For clay-mineral analyses, the carbonate-free <2 μm fraction was settled on glass plates from a suspension. By this procedure, a good preferred textural orientation of the clay particles is obtained. For comparison, a slurry of the centrifuge-separated < 2μm fraction was "smeared" between glass plates to avoid preferred settling of clay minerals. All samples were dried at room temperature. About 30 samples were run by both the pipette and the smear methods and the results compared. Good agreement was found. The montmorillonite does not seem enriched in the uppermost layer of the pipette-settling mount. Thus the pipette method was used for routine procedure. Differentiation between kaolinite and chlorite was obtained by slow scanning over the 002 peak of kaolinite and the 004 peak of chlorite, respectively. Samples were glycolated to determine expandable clay minerals.

Weighted peak-area percentages were calculated for the <2 μm fraction according to the method of Biscaye (1964), assuming that kaolinite, illite, chlorite, and montmorillonite account for 100 per cent of that fraction. The clay mineral results are given as the percentage within the <2 μm fraction, and also as total amount of clay minerals present (Tables 1-5).

The total carbonate content was determined by the "carbonate-bomb" method (Müller and Gastner, 1971) on splits of all samples. The percentages of constituent minerals in the bulk sample are summed up to 100 per cent and are normalized to the per cent carbonate determined by the "bomb" technique.

The amounts of minerals present were estimated as follows: Samples with high total carbonate content were taken as standards. In the case of samples containing carbonate and clay minerals only, the "total clay peak" at 18°-20°2θ consisting of the sum of the peaks of montmorillonite (19.95°, I=90), chlorite (18.6°, I=90), kaolinite (19.73°, I=50, and 20.44°, I=60), and illite/mica (19.81°, I=90) was measured. Samples containing only calcite and clay minerals were selected. Calcite content was measured by the "carbonate bomb" method and thus the difference gives the total clay content.

Standards were then prepared with different amounts of quartz, feldspar, calcite, and clay minerals. The carbonate/non-carbonate distribution within the samples was measured by the "bomb" method and the amounts of the non-carbonate minerals estimated by comparison of the analyzed samples with the standards.

Similar standards were also run for the other minerals, in particular for the zeolites. All results were also compared with diagrams and related data from a computer method developed by J. C. Hathaway, and good agreement was observed.

Nevertheless, the results must be regarded as semiquantitative considering the uncertainties in X-ray mineralogical analysis. The X-ray mineralogy results are discussed within the site chapters by the shipboard scientists in the order of lithologic units established.

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REFERENCES

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Müller, G. and Gastner, M., 1971. The "Karbonat-Bombe", a simple device for the determination of the carbonate content in sediments, soils, and other materials: *N. Jb. Mineral., Mh.*, v. 10, p. 466-469.

TABLE 1
X-Ray Mineralogical Determinations

Sample (Interval in cm)	Composition (%) Total carbonate	Calcite	Dolomite	Siderite	Rhodochrosite	Quartz	Feldspar	Clay minerals	Palygorskite	Clinoptilolite	Phillipsite	Analcime	Pyrite	Disordered cristobalite	Other	Distribution in < 2 µm Fraction Kaolinite	Mica	Chlorite	Montmorillonite	
Site 382																				
1-4, 8-10	8	8				30	10(p)	52								8	77	15		
1-4, 49-51	16	16				25	13(p)	44							Hornblende 2%		76	24		Unit 1: Quartzose silty clay, silt and sand Quaternary to upper Pliocene
2-2, 95-97	4	4				60	25	12								10	77	13		
2-2, 109-111	7	7				30	10	53								10	68	14	8	
2-3, 84-86	4	4				50	25	21								10	71	15	4	
3-2, 83-85	11	11				25	15	49								9	81	10		
4-1, 41-43	7	7				25	10(p)	58								9	80	11		
5-3, 51-53						30	10(p)	60								9	33	9	49	
5-4, 59-61						25	8(p)	67								5	37	3	55	
6-3, 67-69						30	8(p)	62								8	22	5	65	
6-6, 79-81						35	8(p)	57								9	46	9	36	
7-3, 64-66						35	10(p)	55								4	19	3	74	
7-6, 79-81						25	8	67								5	17	4	74	
8-3, 71-73						15	5	80								6	23	5	66	Unit 2: Greenish gray clay and silty clay Upper Pliocene to Lower Miocene
9-2, 72-74						22	5	73								9	24	5	62	
9-6, 108-110						15	5	80								4	12	2	82	
11-3, 78-80						14	2	84								7	22	4	67	
12-2, 75-77						20	4	76								4	12	2	82	
12-6, 66-68						15	2	83								3	16	3	78	
13-3, 64-66						17	3	80								4	11	1	84	
13-6, 126-128						23	4	73			trace					5	11	2	82	
14-3, 78-80						20	5	75		1	trace									
14-5, 68-70						22	5	73		?	?					5	17	4	74	
15-2, 98-100						22	7	71								5	21	3	71	
15-4, 125-127						20	4	75		1										
15-5, 128-130						10	5	82		3						1	22	1	76	
15-6, 119-121						11	5	81		3						7	28	3	62	
16-1, 2-3						9	8	83								15	40	10	35	
16-1, 85-87	52	52						48											100	Unit 3A: Variegated clay, silty clay, and marly nanno ooze Upper Campanian to Lower Campanian
16-1, 95-97	14	14				10	8	66		2	trace					10	23	7	60	
16-2, 2-3	14	14				14	15(o)	70			1									
16-2, 48-50							18(p)	78		2									100	
16-3, 28-30	40	40					10(p)	50											100	
16-3, 83-84	6	6					25	60		2	2				Pyroxene? Hornblende 5%				100	
16-4, 107-109	4	4					6	88			2									
16-5, 138-146	4	4					25(p)	70		1									100	
16-6, 45-48	4	4					22(o)	70		3	1								100	
17-1, 109-111	13	13					2	85									11		89	
17-4, 116-118							30	70							Pyroxene?					

17-6, 117-119	9	9		10(o)	79	2							100	Unit 3A: Variegated clay, silty clay, and marly nanno ooze Upper Campanian to Lower Campanian
18-1, 68	41	41	3	10(o)	40				Hornblende 6%	50		50		
18-1, 124-129	7	7		15	75		3			40		60		
18-1, 137	100								Calcite x					
18-2, 32-33	50	50		40(p/o)	10									
18-2, 67-68	6	6		22	70		2		Pyroxene?					
18-3, 68-70	25	25		20	43	trace	7	trace	Hornblende 5%	10	28	9	53?	
18-3, 128-130	25	25		20(o)	50		4				46		54	
18-4, 29-30	28	28	5	15	47				Hornblende 5%	22	57	21		
20-2, 123-125	5	5		15	75		2	3		10		23	67	Unit 3B: Volcaniclastic breccia, sandstone and marly limestone Lower Campanian
20-3, 65-66	6	6		10	78	2	4			6		16	78	Unit 3C: Variegated silty clay Lower Campanian
20-5, 11-12	1	1		16	83	?				9		12	79	
20-5, 107-109	2	2		4	94									
21-1, 88-91	1	1		5	90	1		3					100	Unit 3D: Feldspathic silty clay (stone) and clayey siltstone Lower Campanian
21-2, 84-87	3	3		15	75	1		3	Pyroxene 3%				100	
21-3, 23-25	1	1		10	88	2							100	
21-3, 28-29	1	1	5	15	77	2					10		90	
22-3, 127-129	3	3			97								100	
23-1, 79-81	1	1		10	87			2					100	Unit 3E: Variegated feldspathic silty claystone and clayey siltstone Lower Campanian
23-2, 48-50	2	2		4	94		?							
Site 384														
1-1, 120-122	66	66	3	2	29					17	37	11	35	Unit 1A: Marly nanno ooze Eocene
2-5, 80-81	53	53	7		40					8	35	6	51	
4-3, 78-80	56	56	7	2	33	2				7	17	5	71	
5-3, 72-74	90	90	1		9	?				12	19	3	66	
6-2, 54-56	66	66	2		30	2				7	5	5	83	Unit 1B: Nanno chalk and ooze Paleocene
7-4, 22-24	80	80	2		18					6	7	5	82	
8-2, 70-72	70	70	2	2	26	?				6	13	5	76	
9-3, 128-130	73	73	2		25					8	8	3	81	
9-5, 102-104	73	73	1		26					6	9	4	81	
10-3, 110-112	73	73	2		25					12	6	5	77	
10-6, 126-128	70	70	2		26	2				2	8	2	88	
11-2, 137-139	66	66	3		27	4					14		86	
11-4, 30-32	70	70	3		21	6					17		83	
12-2, 45-47	76	76	2		16	6							100	
12-5, 68-70	90	90	1		7	2				1	15	2	82	
13-2, 30-32	80	80	3		15	2					28	3	69	

TABLE 1 – *Continued*

Sample (Interval in cm)	Composition (%)															Distribution in < 2 μm Fraction				
	Total carbonate	Calcite	Dolomite	Siderite	Rhodochrosite	Quartz	Feldspar	Clay minerals	Palygorskite	Clinoptilolite	Phillipsite	Analcime	Pyrite	Disordered cristobalite	Other	Kaolinite	Mica	Chlorite	Montmorillonite	
13-5, 8-10	90	90				2		8												
14-2, 68-70	90	90						10		?							38	2	60	Unit 1C: Nanno chalk
15-3, 90-92	96	96						4												Maestrichtian
15-6, 54-56	93	93				2		4								9	37	3	51	
21, CC, 13-14								100											100	
Site 385																				
1-2, 109-111						24	6	70								9	24	4	63	
1-4, 40-42						30	7	63								6	12	2	80	Unit 1: Hemipelagic
2-2, 100-102						20	7	73								6	12	2	80	clay
2-5, 50-52						15	6	77			2					9	9	2	80	Pleistocene to
3-2, 40-42						18	4	76		1	1									U. Oligocene
3-5, 40-42						17	5	75		1	2					3	5	2	90	
4-2, 118-120						8	4	87		?	1									Unit 2A: Radiolarian clay and ooze
5-2, 50-52						5	6	86		3										Lower
5-4, 90-92						7	4	86		3	?					7	16		77	Eocene
8-1, 110-112						11	2	64		16	2					1	25	1	73	Unit 2B: Zeolitic silty
9-1, 86-88						10	5	69		16	?						31		69	clay ≥ lower Eocene (?) to
10-1, 137-140						9	3	64		7			17				36		64	lower
11-2, 20-22						13	4	76		7						1	13		86	Paleocene
																				Unit 2C: Marly ooze, clay, marly
12-2, 90-92	23	23				16	3	58		?						22	44	6	28	nanno ooze,
13-2, 40-42	30	30				16	3	51		?						23	36	12	29	calcareous
13-4, 9-11	36	36				10	3	50		1						30	38	11	21	silty clay Lower Paleocene to M. Maestrichtian
																				Unit 3A: Vitric silty
14-2, 11-13						20	6	74								10	15	2	73	clay to clay
15-1, 122-125						13	5	80		2						29	33	9	29	≥ Maestrichtian (?) to
16-2, 92-94								97		3									94	≥ Coniacian (??)

Site 386

1-2, 110-112	12	12	20	6	62							6	67	12	15	Unit 1: Marly nanno ooze and brown clay Quaternary and older
1-5, 60-62	43	43	8	5	44							10	45	11	34	
1-6, 50-52			15	4	81							10	31	6	53	
2-1, 133-135	3	3	15	3	79							14	31	7	48	Unit 2: Quartzose green-gray clay Upper to middle Miocene
2-5, 130-132			14	6	80				?			12	26	6	56	
3-1, 146-148			14	4	82							10	33	7	50	
4-2, 3-5					50						Apatite 50%		72		28	Unit 3A: Calcareous turbidites Lower Miocene
4-2, 40-42			15	5	77	1	2					14	28	8	50	
4-2, 107-109	0		15	5	80		?					11	24	11	54	
4-5, 30-32	63	63	3		34							13	27	11	49	
5-1, 118-120	30	30	3	4	62	1	?					8	18	8	66	
5-2, 78-80	13	13	5	5	72						5 Glass?	8	38	30	24	
5-4, 100-102	13	13	2	4	79		2				Muscovite ?	6	37	7	50	
6-2, 71-73					90		4	3			Pyroxene 3%	10	13	10	67	
6-3, 92-94	16	16			72		5	3			Pyroxene 4%	11	35	11	43	
7-1, 51-53	10	10		5	76		4	3			Pyroxene 2%	9	50	12	29	Unit 3B: Volcaniclastic turbidites Upper Oligocene to middle Eocene
8-1, 136-138	13	13			78		4	2			Pyroxene 3%	7	36	7	50	
8-2, 96-98					95		2	?			Pyroxene 3% ?	13	34	12	41	
9-3, 39-41	14	14		2	78		4	2							100	
11-1, 103-105	13	13			76		4	2			(Pyroxene ?) 5%				100	
12-1, 96-98					95		3	2								
12-3, 46-49	15	15	2	2	81								34		66	
13-3, 28-30	0		3	10	78		?	4			5 Glass?	6	31	25	38	
13-3, 39-41	3'	3	5	10	65		?				20 Glass?	11	27	17	45	
13-3, 99-101	26	26	2	5	65		2						22		78	
14-2, 10-12	15	15	5		80								12		88	
14-6, 33-35	17	17	3		80								22		78	
15-2, 70-72	17	17	4		79								15		85	
15-5, 22-24	20	20	5	2	73								13		87	Unit 4A: Siliceous turbidites Middle Eocene
15-6, 101-104	13	13	5		82							5	31	6	58	
16-3, 69-71	20	20	4		76								22		78	
16-5, 60-65	23	23	4	2	71								14		86	
17-2, 39-41	28	28	3		69								18		82	
17-4, 136-138	13	13	9		78							12	34	2	52	
18-1, 104-106	31	31	3		63					3			17		83	
19-2, 77-79	26	26	4		65					5			17		83	
20-2, 74-76	26	26	3		62					9			26		74	
20-3, 54-56			8	4	85					3			21		79	
21-2, 132-134	13	13	7	2	72					6			18		82	
22-1, 100-102	12	12	9	5	74		?			trace			17		83	Unit 4B: Calcareous turbidites Middle to lower Eocene
22-4, 43-47	66	66	1		30					3			17		83	
23-2, 25-28	13	13	8	5	72					2	Gypsum		23		77	
23-4, 4-6	21	21	5	2	56					16			36		64	
24-2, 6-10	33	33	3	2	52					10			30		70	
24-4, 63-65	25	25	8		56		?			11			18		82	
25-1, 135-137			10	6	84					?			21		79	
25-5, 6-11	9	9	7	2	63					19			22		78	
26-2, 44-46	18	18	6	2	61					13			40		60	
26-5, 4-6	22	22	7	3	63					5			16		84	

TABLE 1 – *Continued*

Sample (Interval in cm)	Composition (%)															Distribution in < 2 μm Fraction				
	Total carbonate	Calcite	Dolomite	Siderite	Rhodochrosite	Quartz	Feldspar	Clay minerals	Palygorskite	Clinoptilolite	Phillipsite	Analcime	Pyrite	Disordered cristobalite	Other	Kaolinite	Mica	Chlorite	Montmorillonite	
27-2, 30-32						8	4	76						12			30		70	
27-4, 33-36						3	2	73		2				20			46		54	Unit 4C: Cherty clay-
28-2, 79-81						14	5	77		1	?			3		5	22	4	69	stones
29-2, 90-92	30	30				3		59						8			33		67	Lower
30-2, 89-91						20		56						24			28		72	Eocene
30-3, 108-110						3		75		3				19						
31-1, 27-30						7		80		6				6			37		63	
31-6, 13-16	15	15				14	2	60						9			17		83	Unit 4D: Radiolarian
32-2, 105-107						6		81		?				13			19		81	mudstones
32-5, 0-3	16	16				6	2	64						12			19		81	Lower Eo-
33-2, 55-57	26	26				7	2	62						3			21		79	cene through
34-2, 50-52	12	12				10	3	72		3							19		81	upper
34-6, 81-84	9	9				15	3	70		3							35		65	Paleocene
35-4, 10-12						14	3	83		?						12	50	10	28	
35-5, 0-3	11	6	5			15	3	71								15	56	10	19	
36-3, 1-3						14	5	81								10	50	5	35	Unit 5: Red claystones
36-3, 41-44						14	5	81								10	57	4	29	Upper Maes-
38-3, 6-9						12	3	73		6				6			53		47	trichtian –
38-4, 120-123						14	2	60		18	2			4			33		67	upper
39-1, 8-10						13	2	70		9	1			5		7	43	7	43	Cenomanian
39-1, 75-77	0					15	3	66		10				6	Glass?	7	31	4	58	
39-1, 131-133						12	2	69		11	1			5			61		39	
39-5, 118-120						11	3	60		16	?			10			17		83	
40-2, 4-5						11	3	78		6				2		4	38	4	54	
41-1, 146-147						28	2	70								5	19	3	73	
41-5, 108-111						38	4	58									20		80	
42-2, 102-104	0					50	?	50							Glass?		42		58	
42-3, 44-45						70		30									47		53	
42-4, 140-143						50	2	48									27		73	
43-1, 87-88						60		40									23		77	Unit 6: Dark greenish
43-2, 139-140						5	2	33 ?					60 ?							gray and black
44-2, 65-67						80		20												claystones with
44-4, 49-50						50	3	47									22		78	radiolarian
45-2, 52-54						60	2	38									37		63	sand layers
45-4, 78-80	65	65				12		21					2				24		76	Upper
45-5, 100-102						40	3	57									24		76	Cenomanian –
46-2, 105-107						40	3	57									22		78	lower Albian
46-5, 53-57						40	3	57									30		70	
47-2, 78-82						45	2	53									33		67	
47-5, 101-104	41	41				12		47									21		79	
48-3, 58-59	5	5				40	3	52									36		64	
49-3, 148-150	63	63	?			9	2	26									35		65	

50-3, 112-115						35	3	62				33		67	
50-5, 134-136	60	47				8		32		Mangano – calcite 13%		40		60	
51-1, 30-33	43	43				18	2	40				33		67	
51-4, 60-65	46	46				12		42				21		79	
52-2, 70-71	76	76				7		17				62		38	
52-6, 50-52	47	47				25	2	26				35		65	
53-4, 29-33	11	11				50	2	37				40		60	
53-4, 63-65	40	38	2			25		35				53		47	
54-1, 123-124	50	47	3			13		37				59		41	
54-4, 70-74	64	62				13		23		Mangano – calcite 2%		55		45	
54-6, 42-44	80		80			2		18							
55-2, 68-71	10	10				40	3	47				62		38	
55-4, 118-119	30		30			10		60				71		29	
56-2, 101-103	7	7				25	3	65				80		20	
56-2, 113-116	40		28	12											
56-4, 132-135	66	66				25		9				67		33	
56-5, 121-125	43	25	18[a]									59		41	
57-4, 13-15	22	22				17		61				73		27	
57-5, 5-6	20	9	11									80		20	Unit 6: Dark greenish gray and black claystones with radiolarian sand layers Upper Cenomanian – lower Albian
58-1, 148-150						50	3	37	10			100			
58-3, 52-53	66	9	20			6		28		High – Magnesian-calcite 37% = = 9–10 Mole% Mg CO_3					
59-3, 65-67	33	24	9			9		58				86		14	
59-4, 116-117						70		30				100			
59-5, 118-120	6	6				35	2	57				100			
60-2, 47-49						50		50				100			
60-3, 119-121	60				60	5		35							
60-5, 93-95						40		60				89		11	
61-2, 28-31						45		55				95		5	
61-4, 25-27						50		50			3	84	3	10	
62-3, 24-25						50		50				91		9	
62-3, 120-122						70		30				100			
62-4, 46-47	66					10		20		Barite 4% Mangano – calcite					
62-6, 146-150						60		40							
63-3, 146-147						55		43		Apatite 3%		100			
63-4, 77-78	40			40		8		52				100			
64-5, 113-115	46			24	22			24		Barite 30%		100			
64-6, 61-63	66			60	6	5		29				100			
65-1, 109-111	20	5				2		38	40	High – Magnesian-calcite 15% = = about 8 Mole% $MgCO_3$					
65-2, 62-64						60		40				100			
Site 387															
1-2, 75-77						15	4	81			12	42	7	39	Unit 1: Clay and zeolitic clay Quaternary

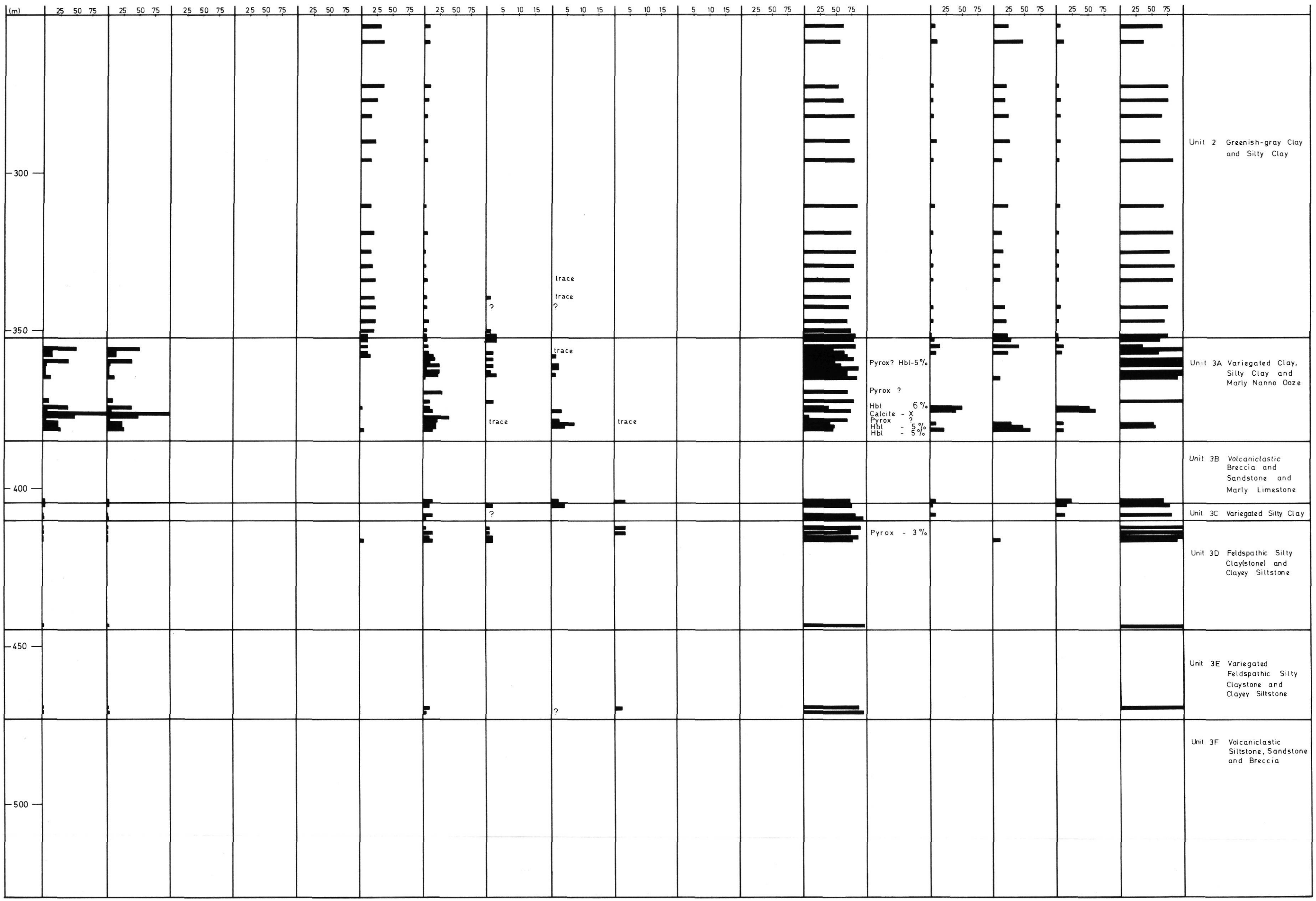
TABLE 1 – *Continued*

	Composition (%)															Distribution in $<$ 2 μm Fraction				
Sample (Interval in cm)	Total carbonate	Calcite	Dolomite	Siderite	Rhodochrosite	Quartz	Feldspar	Clay minerals	Palygorskite	Clinoptilolite	Phillipsite	Analcime	Pyrite	Disordered cristobalite	Other	Kaolinite	Mica	Chlorite	Montmorillonite	
2-2, 34-36						15	4	81								12	25		63	
2-5, 90-92						12	4	84								10	16	3	71	Unit 2: Radiolarian
3-1, 80-82						9	2	88		1						9	17	3	71	mud
4-1, 48-50						10	3	85		2						11	20	3	66	M. Eocene-
5-4, 20-22						7	2	89	?	2						18	27	5	50	Oligocene
6-3, 31-34						4	3	91		2						3	8		89	
7-1, 70-73						11	2	87								4	25	2	69	
7-2, 90-93						5	2	91								5	27	2	66	
8-2, 15-18	17	17				15		68									18		82	
8-2, 44-46						7	3	90									24		76	Unit 3A: Siliceous
9-1, 80-83						7	3	90								1	34	1	64	turbidites
9-6, 50-53	15	15				11	3	71									16		84	Middle
10-1, 50-52	16	16				4	2	78									35		65	Eocene
10-6, 80-82						12	2	86									20		80	
11-1, 138-140						5	2	93								5	22	2	70	
12-1, 102-104						9	2	89								5	15	2	78	
13-1, 64-66	8	8				7	3	82								5	22	3	70	
14-2, 53-55						5		85						10						
16-1, 106-108	16	16				7	3	71						3			9		91	
17-1, 96-98	5	5				9	4	73						9			25		75	
18-1, 30-33						9	5	68	trace	trace				18			40		60	
19-2, 63-65	13	13				35		40						12						
19-3, 100-103						10	3	75						12			32		68	Unit 3B: Silicified
20-2, 93-96	7	7				24	2	63						4			11		89	claystone
20-3, 101-103	30	30				3		55		trace				12			40		60	radiolarian
21-1, 40-43	40	40				4	2	43		2				9			21		79	mudstone
21-2, 90-93	10	10				15		73						2		12	29	3	56	and chert
22-1, 143-146						3	2	67	4	6				18						L. Paleocene-
22-2, 78-81	20	20				14	2	50		4				10			26		74	middle Eocene
23-1, 84-86	26					8		62						4			25		75	
23-5, 29-31						12	2	84		2						6	28	3	63	
24-1, 82-84	8	8				9	5	65		trace				13			24		76	
25-3, 74-76	4	4				7	3	68		2				16			39		61	
26-1, 48-50						35	5	50					5	trace	Gypsum 5%		36	3	61	
27-1, 84-86						22	4	71		3							25	2	73	
27-3, 97-99	43	43				9	2	46									19	1	80	Unit 4: Marly chalk
27-6, 59-61	50	50				6		44								1	17	2	80	U. Maestrichtian
28-1, 114-116	40	40				7		53								17	48	11	24	
29-2, 64-66	30	15				15	4	51							High-Magnesian-calcite 15% = 8–9 Mole%	14	41	10	35	Unit 5: Red claystone
29-2, 105-108						15	2	83								27	56	17		U. Campanian- L. Maestrichtian

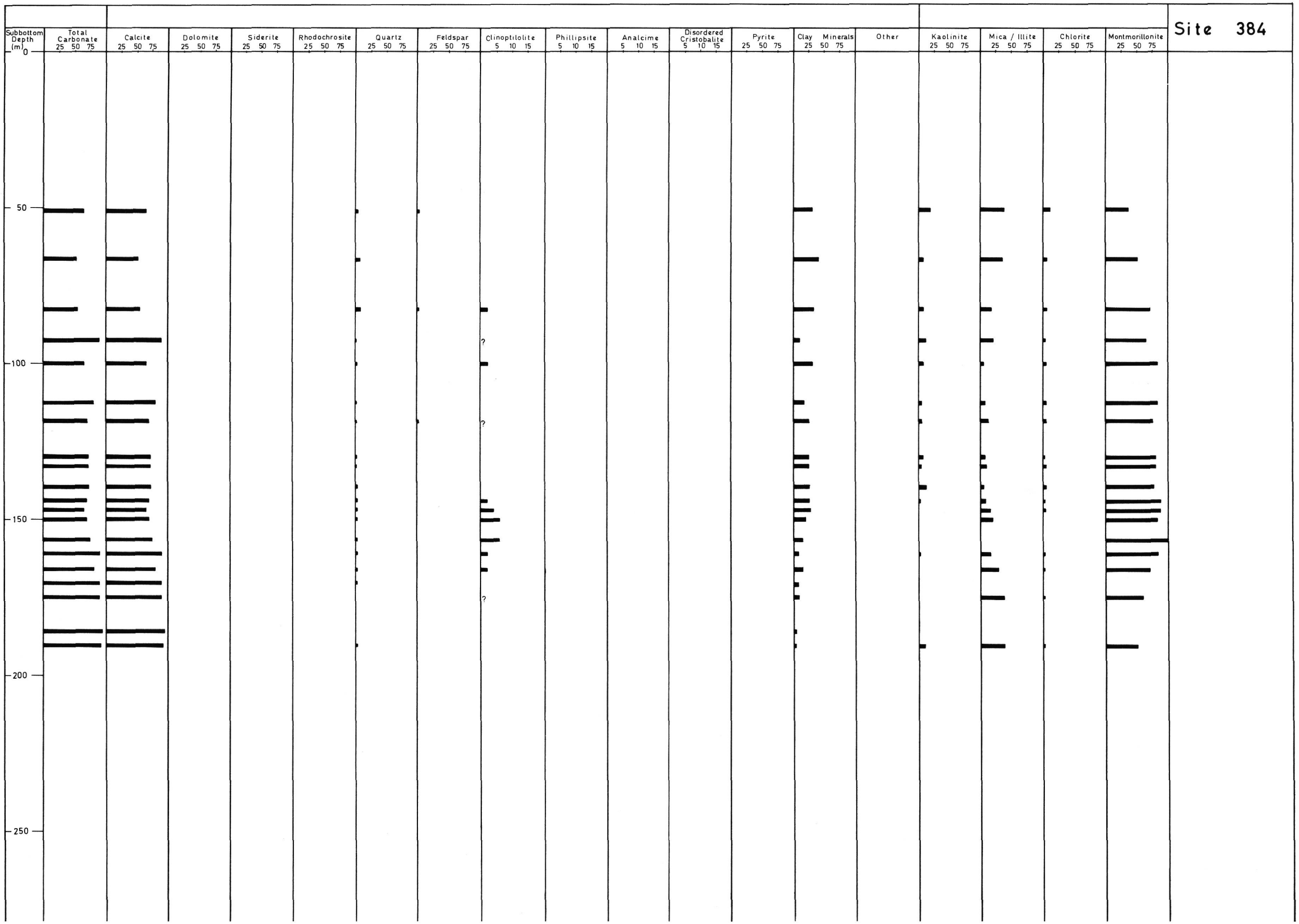
30-1, 135-136				23	2	64	5	3	Gypsum 3%		47		53		
31-1, 136-139				18	2	80	trace				31		69		
32-1, 10-13				25	4	71					26		74		
32-4, 84-87				35	4	61					36		64		
33-2, 91-93				35	4	61					33		67	Unit 6:	Green-gray
34-2, 136-138				35	2	63				2	37	2	59		and black
34-4, 92-94				50	3	47	trace				31		69		claystone
35-2, 132-134				50	3	47	trace				47		53		Barremian –
35-4, 88-90				50	3	47					47		53		Cenomanian
36-1, 47-49				50	2	48					41		59		
36-3, 43-45				50		50					49		51		
37-2, 87-89				45	2	53					46		54		
37-3, 113-115				45	3	52				1	54	1	44		
38-1, 140-142	91	91		2		7					100				
39-2, 63-65	70	70		8		22					100				
39-2, 146-148	93	93		1		6									
40-1, 88-90	60	60		6		34					100				
41-1, 92-94	56	54	2	9		35									
41-1, 108-111	93	93		1		4					85		15		
42-1, 139-141	98	98		1		1					92		8	Unit 7:	Limestone
44-1, 64-70	95	95		1		4	trace?				100				U. Berriasian/
44-1, 125-129	80			2			trace?				98	2			L. Valanginian-
45-1, 120-122	94	93	1	2		4					100				Barremian
46-1, 119-121	73	19	54	5		22	trace?				98	2			
47-1, 140-142	83	83		3		14					100				
48-1, 101-102	55	35	20	6		39					98	2			
49-2, 54-56	93	83	10	1		6					98	2			
49-5, 111-113	56	24	32	10		34				4	91	2	3		

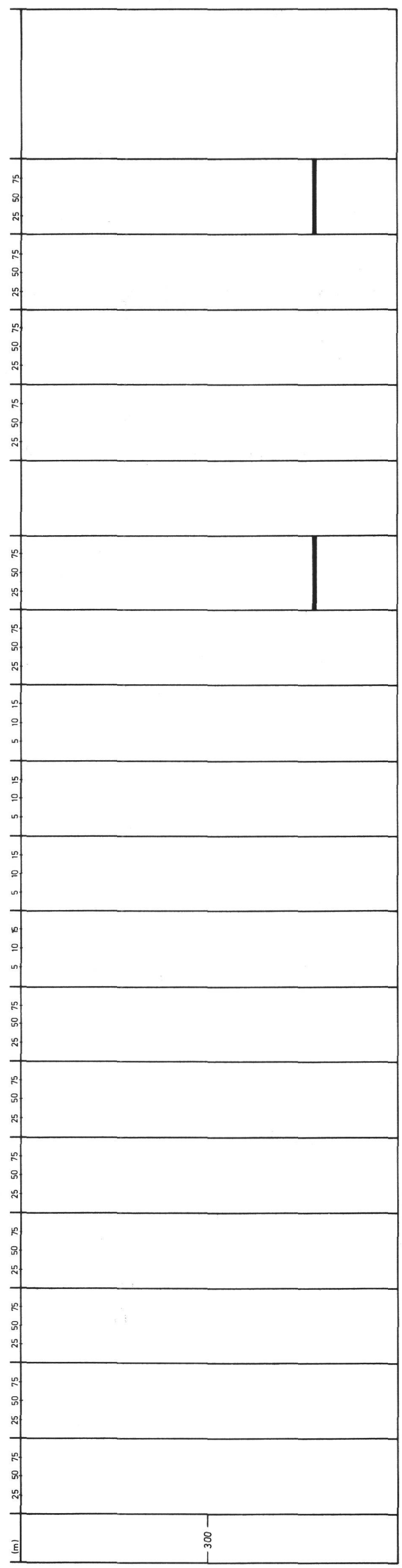
Note: p = mostly plagioclase; o = mostly K-feldspar.
[a]Ca – dolomite.

X-ray Mineralogy, Site 382

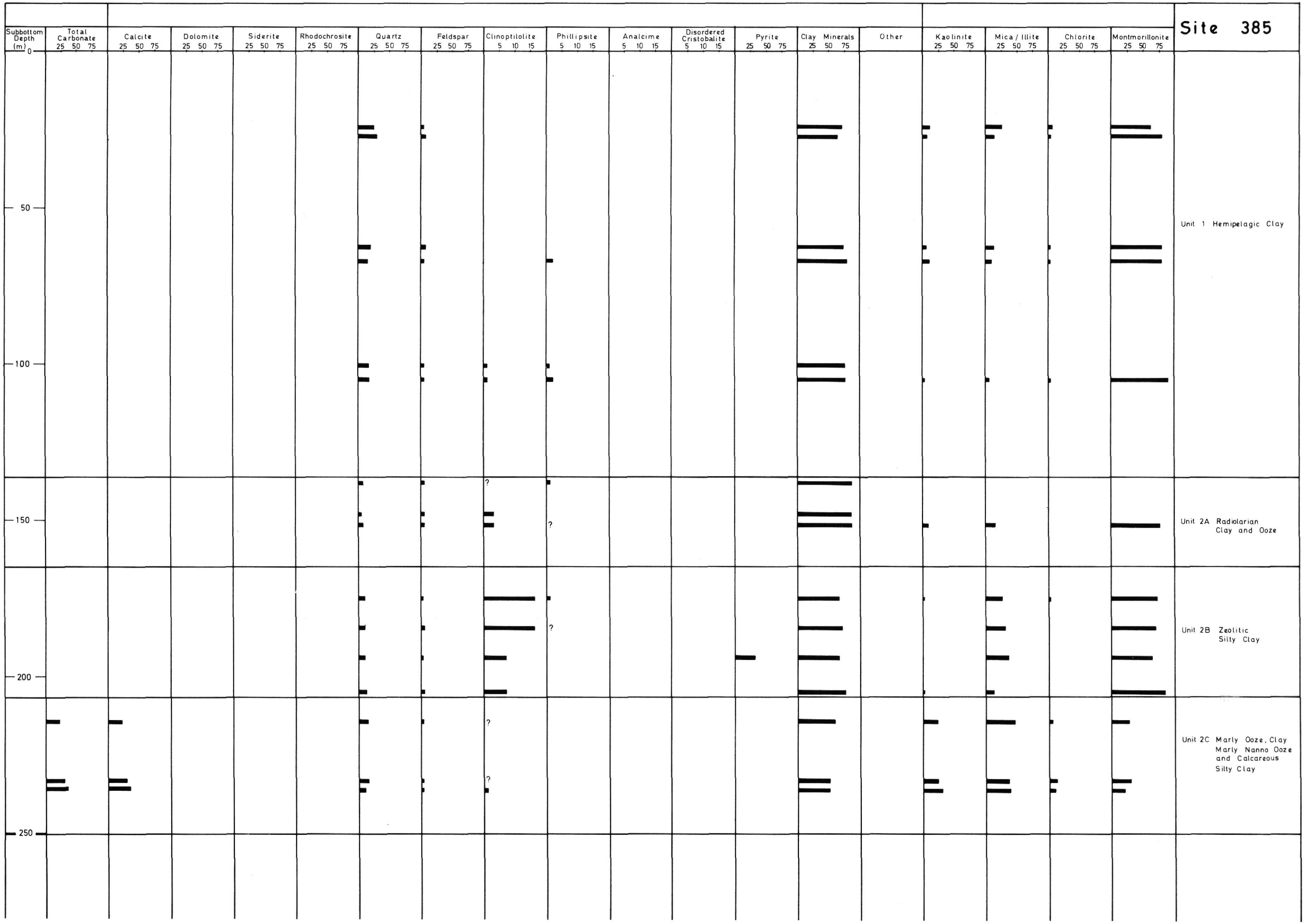

(m)
25 50 75
5 10 15
300
350
400
450
500
trace
?
Pyrox? Hbl-5%
Pyrox ?
Hbl 6%
Calcite - X
Pyrox ?
Hbl - 5%
Hbl - 5%
Pyrox - 3%
Unit 2 Greenish-gray Clay and Silty Clay
Unit 3A Variegated Clay, Silty Clay and Marly Nanno Ooze
Unit 3B Volcaniclastic Breccia and Sandstone and Marly Limestone
Unit 3C Variegated Silty Clay
Unit 3D Feldspathic Silty Clay(stone) and Clayey Siltstone
Unit 3E Variegated Feldspathic Silty Claystone and Clayey Siltstone
Unit 3F Volcaniclastic Siltstone, Sandstone and Breccia

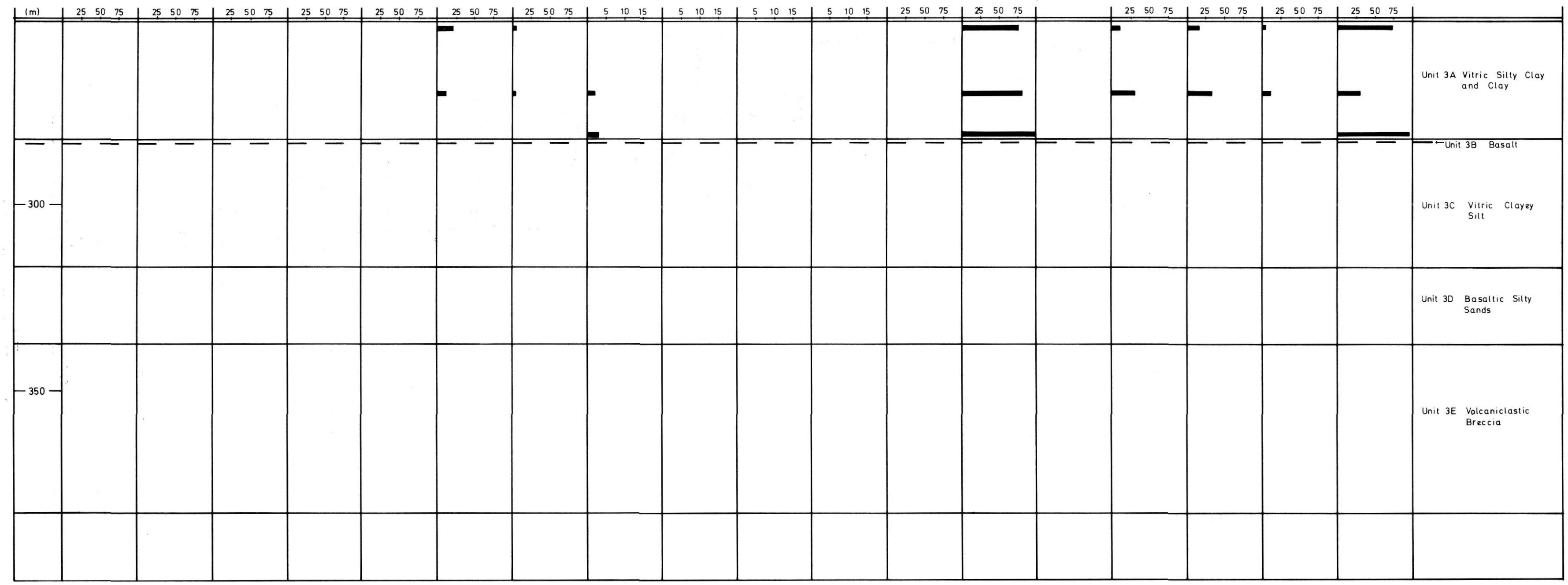
X-ray Mineralogy, Site 384



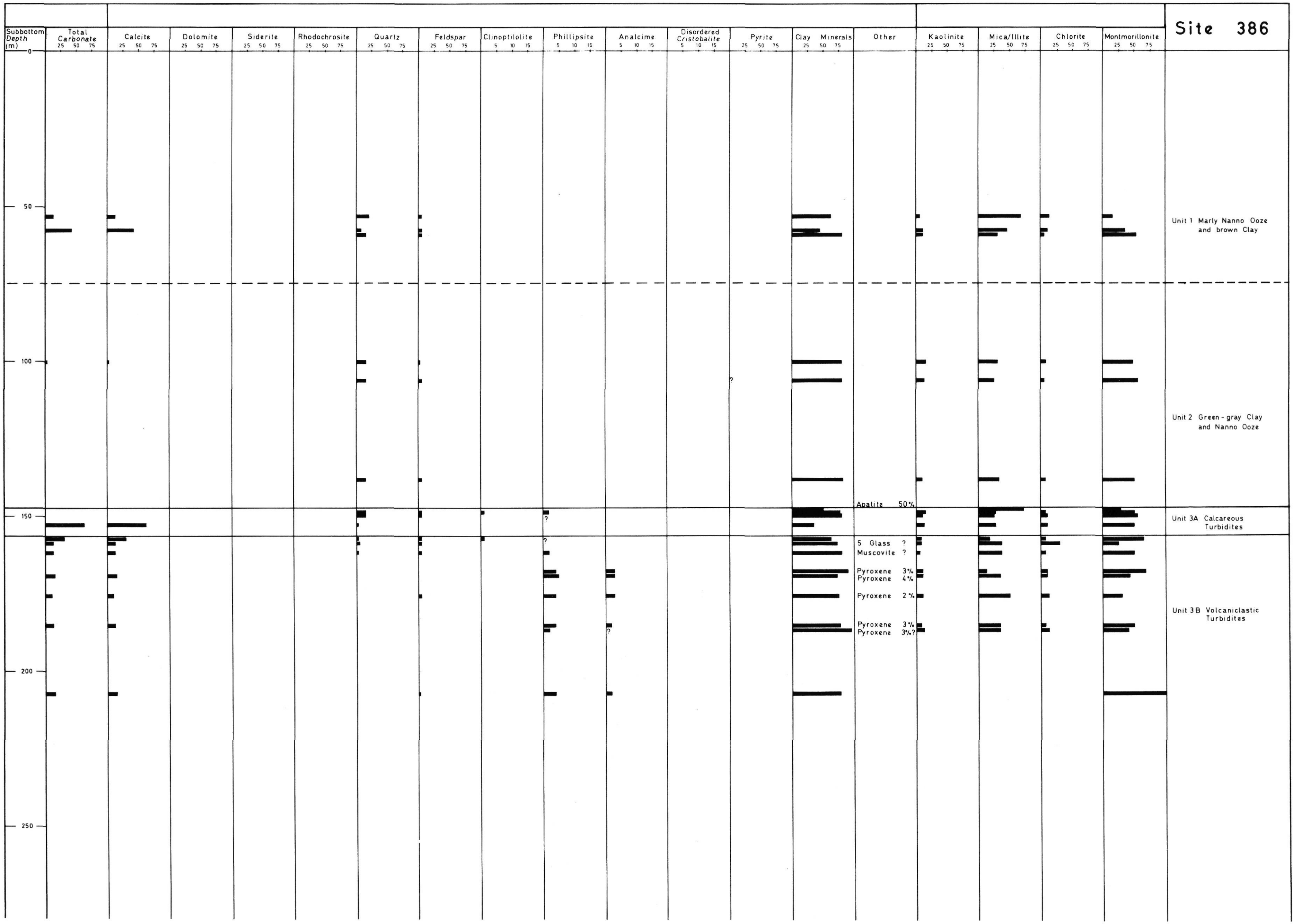

(m)
300
25 50 75
5 10 15

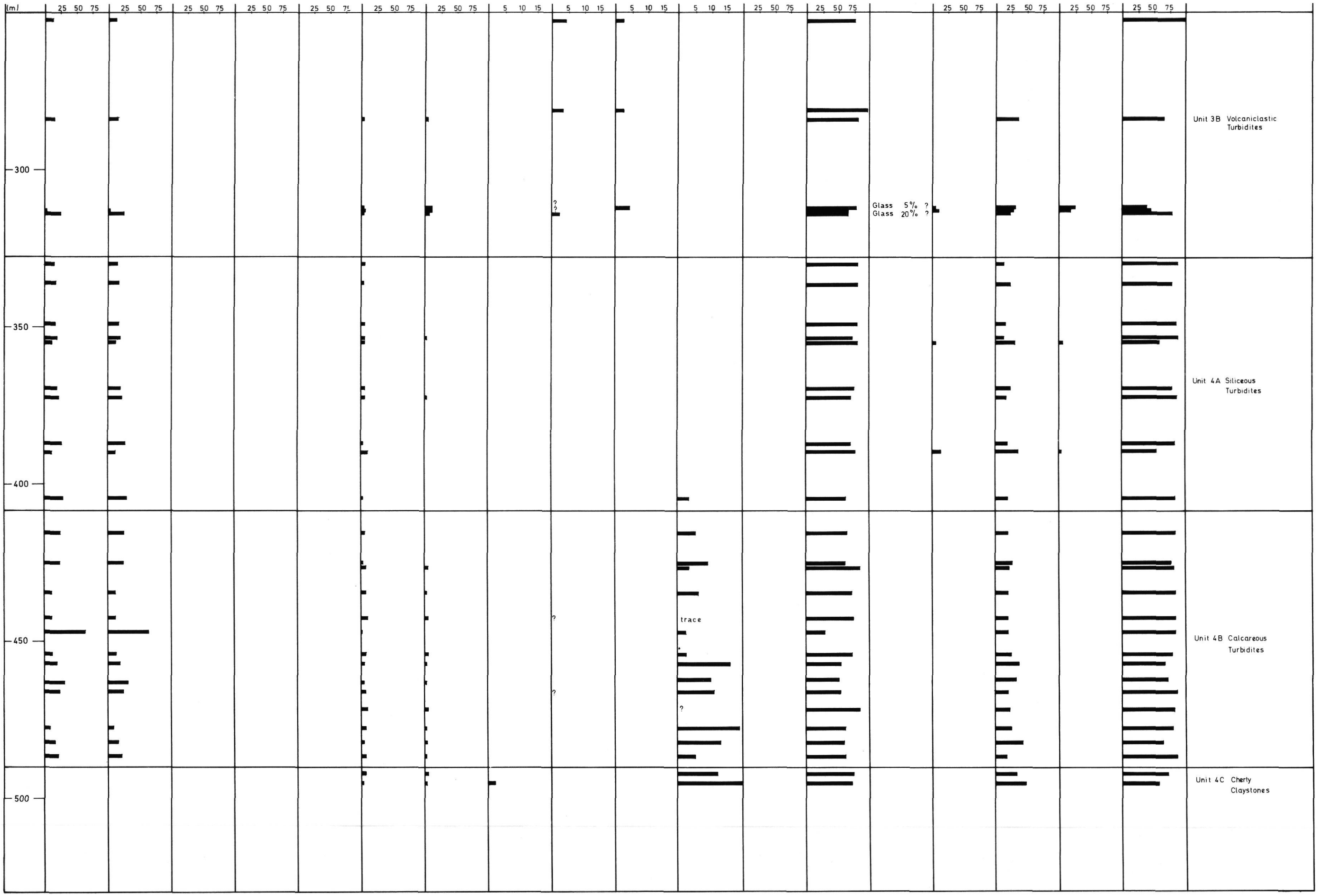
X-ray Mineralogy, Site 385



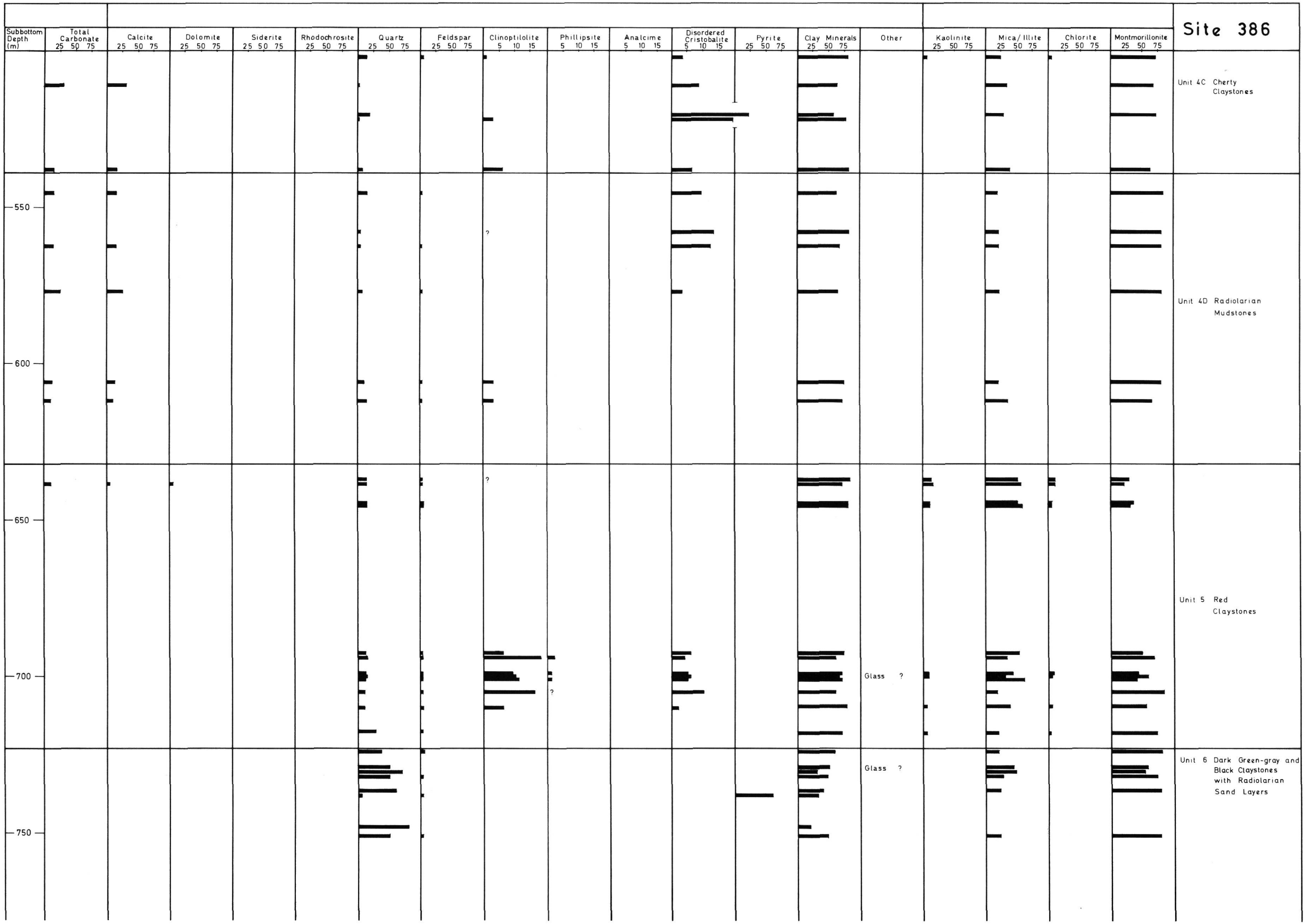

(m)
25 50 75
5 10 15
300
350
Unit 3A Vitric Silty Clay and Clay
Unit 3B Basalt
Unit 3C Vitric Clayey Silt
Unit 3D Basaltic Silty Sands
Unit 3E Volcaniclastic Breccia

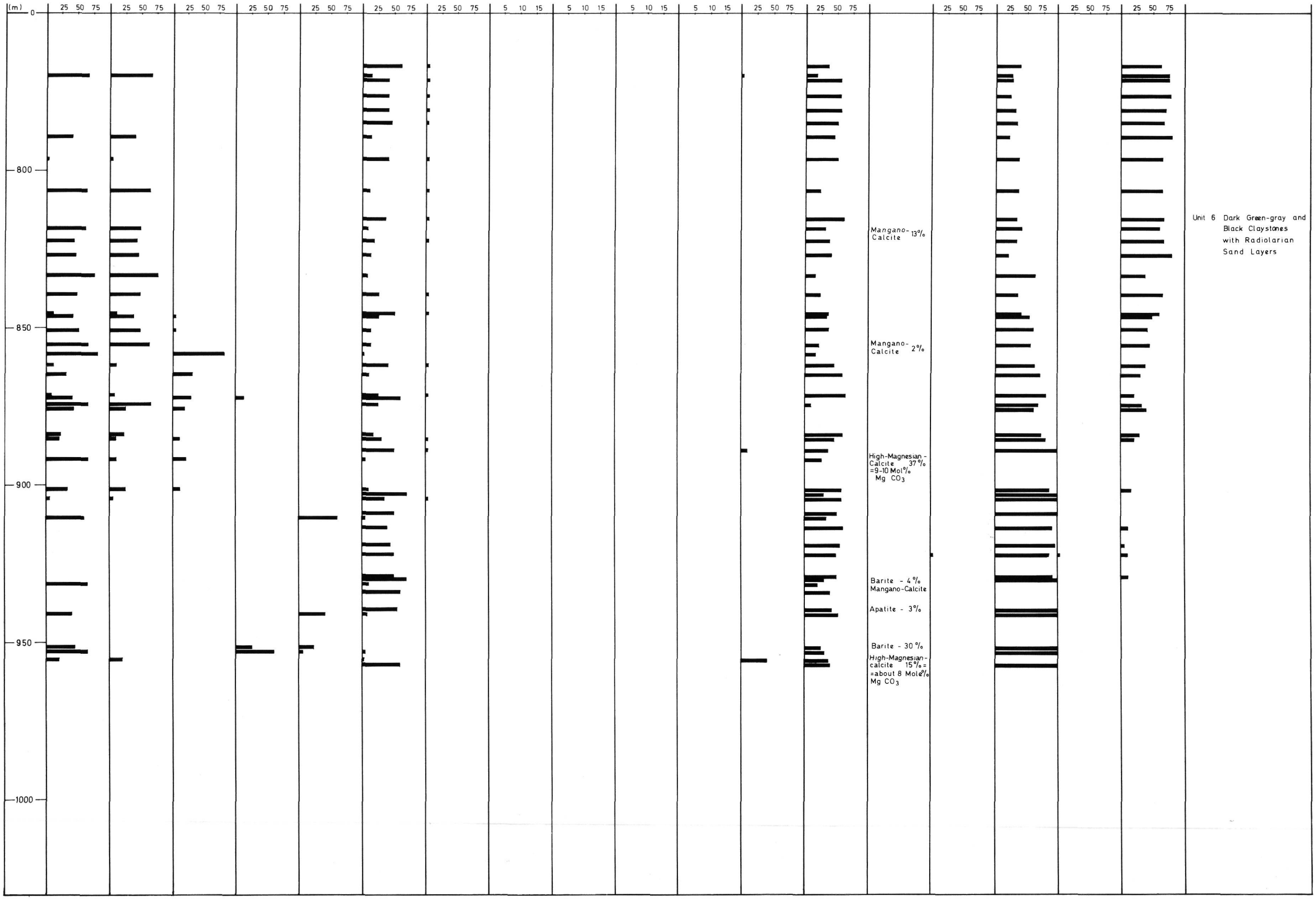
X-ray Mineralogy, Site 386



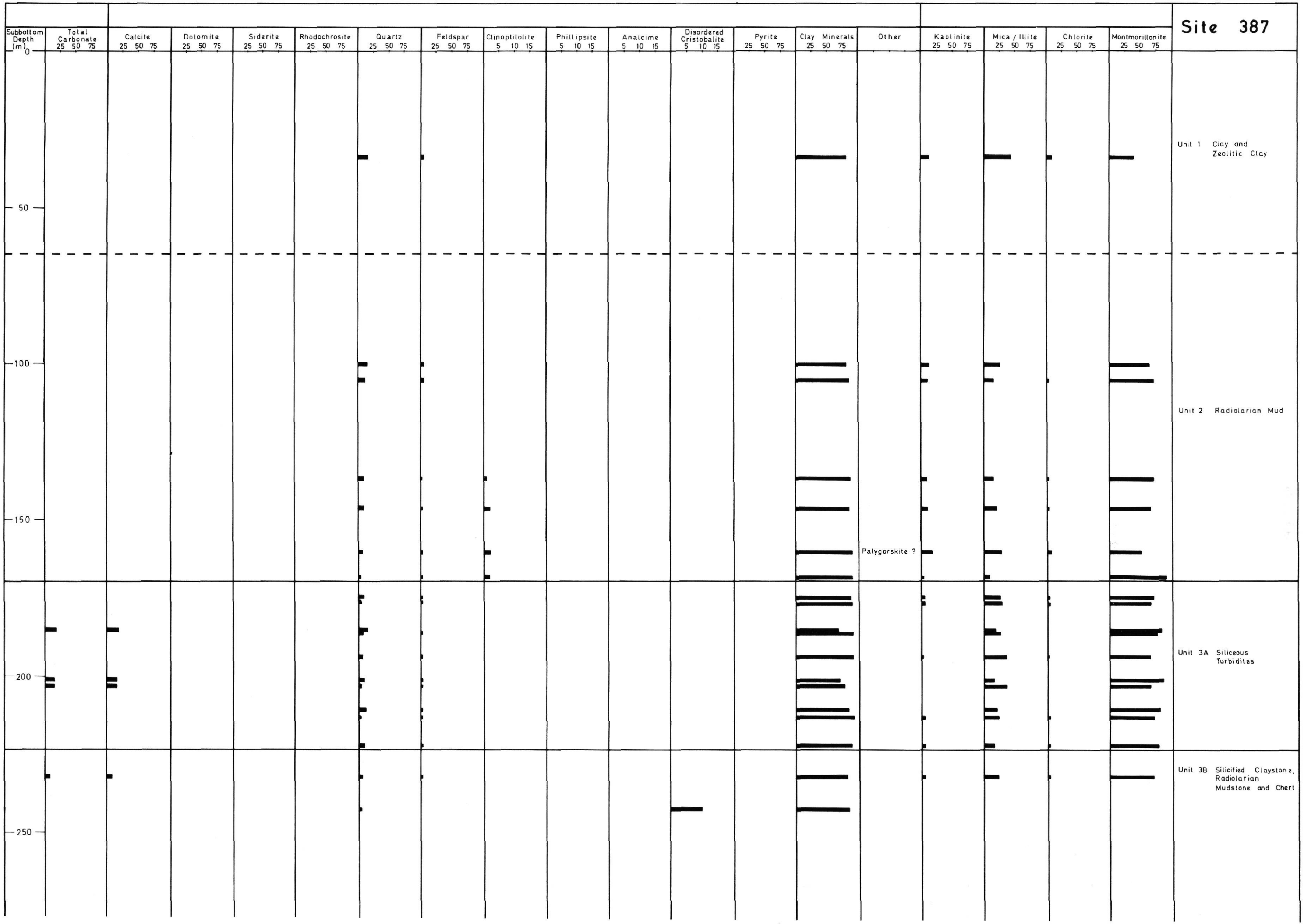

(m)
25 50 75
5 10 15
300
350
400
450
500
Glass 5% ?
Glass 20% ?
trace
?
Unit 3B Volcaniclastic Turbidites
Unit 4A Siliceous Turbidites
Unit 4B Calcareous Turbidites
Unit 4C Cherty Claystones

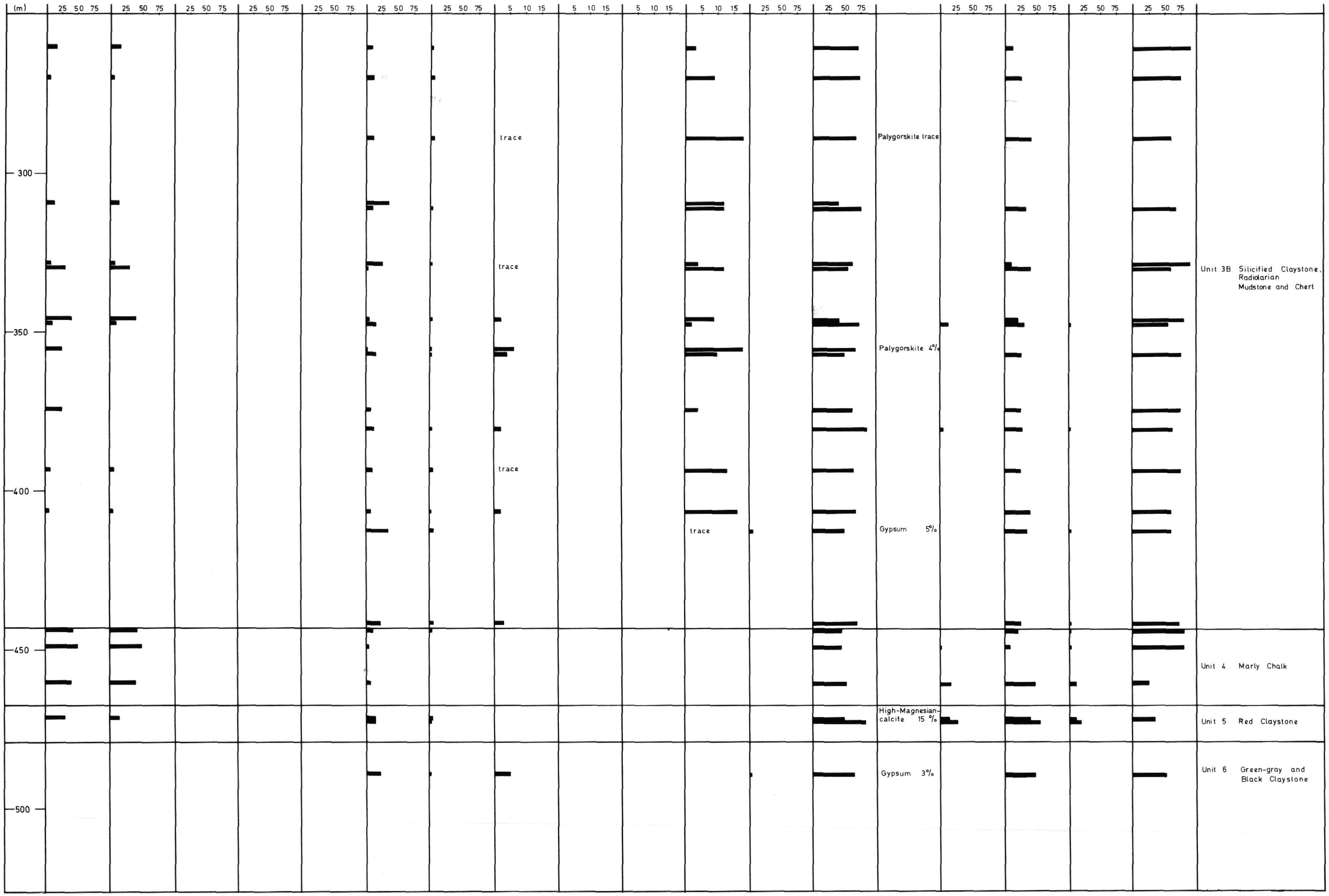
X-ray Mineralogy, Site 386 – *Continued*



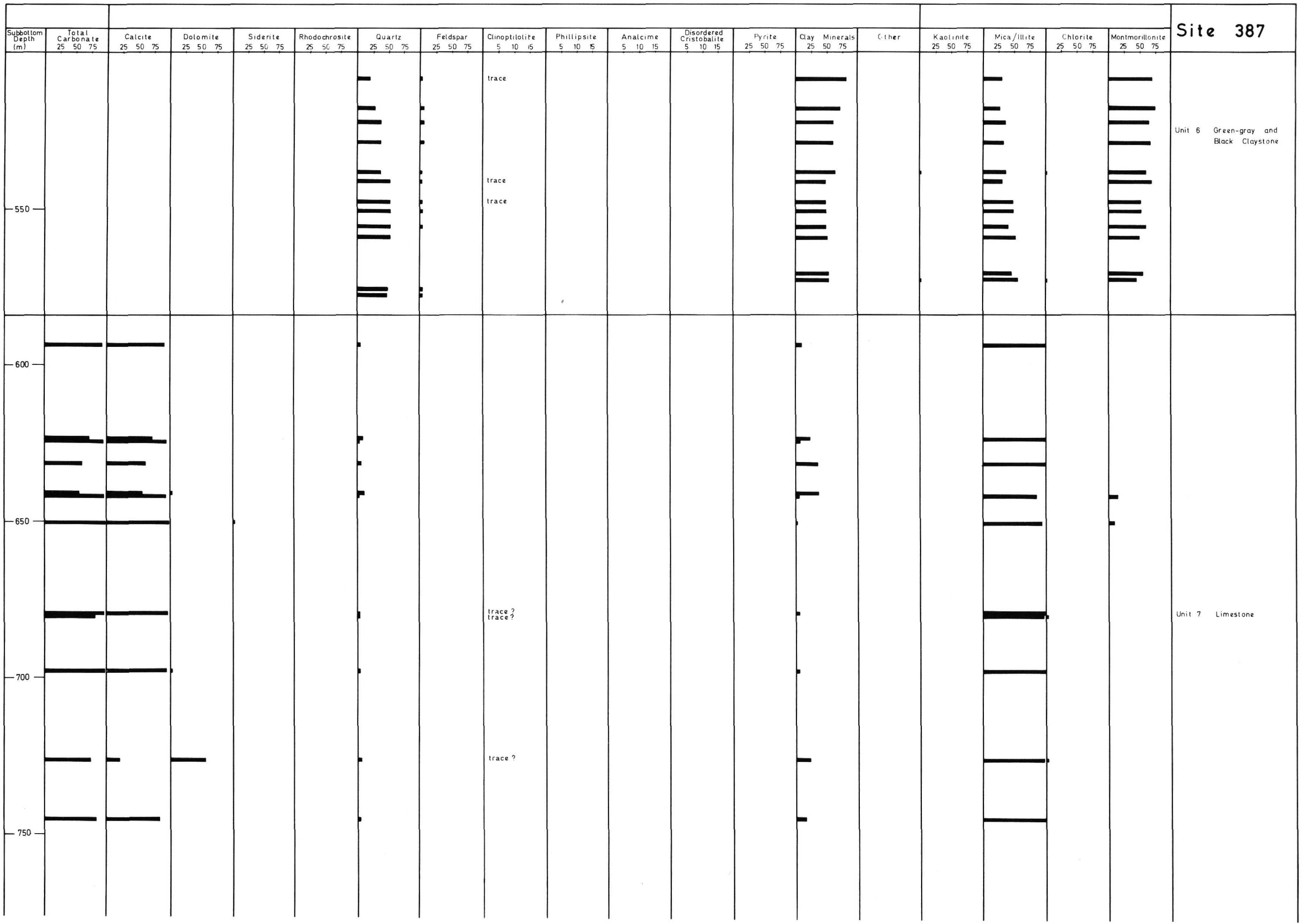

(m)
0
800
850
900
950
1000
25 50 75
5 10 15
Mangano-Calcite 13%
Mangano-Calcite 2%
High-Magnesian-Calcite 37% =9-10 Mol% Mg CO3
Barite - 4% Mangano-Calcite
Apatite - 3%
Barite - 30%
High-Magnesian-calcite 15% = =about 8 Mole% Mg CO3
Unit 6 Dark Green-gray and Black Claystones with Radiolarian Sand Layers

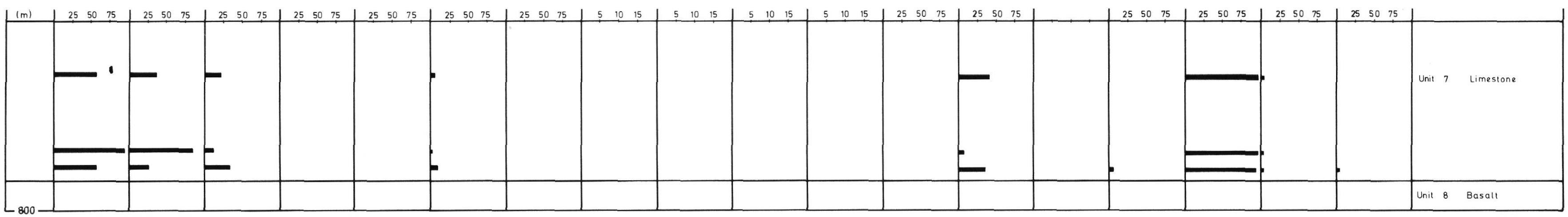
X-ray Mineralogy, Site 387




(m)
25 50 75
5 10 15
300
350
400
450
500
trace
Palygorskite trace
Palygorskite 4%
Gypsum 5%
High-Magnesian-calcite 15 %
Gypsum 3%
Unit 3B Silicified Claystone, Radiolarian Mudstone and Chert
Unit 4 Marly Chalk
Unit 5 Red Claystone
Unit 6 Green-gray and Black Claystone

X-ray Mineralogy, Site 387 – *Continued*




(m)
25 50 75
5 10 15
Unit 7 Limestone
Unit 8 Basalt
800