GEOCHEMICAL EVALUATION OF WELL 6507/6-4A, OFFSHORE NORWAY

Report No. 10115/Ic

Project No. Ic/GN777

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2.2 GEOCHEMICAL ANALYTICAL PROGRAMME

The analytical programme used in this project is detailed below:

Type of Analysis	No. of Samples From Core Material	No. of Ctgs. Samples
Rock sample preparation (washing/description/crushing)	14	221
Solvent clean-up	11	9
Lithological picking	6	21
Total organic carbon (TOC) content	11	34
Rock-Eval pyrolysis	6	-
Vitrinite reflectance (isolated kerogen, slide)	-	33
Vitrinite reflectance (whole rock, block)	-	3
Spore colouration index and kerogen typing	-	26
Solvent extraction	3	-
Extract gas chromatography (GC)	3	-
Alkane gas chromatography-mass spectrometry	1	-
Aromatic gas chromatography-mass spectrometry	1	-

This analytical programme was devised to evaluate the source rock quality of the samples, to characterise any bitumen components identified and to construct a maturity profile for the well.

2.3 SAMPLES ANALYSED

Core samples:

Sample Depth (m)	FRL Reference No.	Components Analysed as Separate Samples
4726.97	2011C222	Dark grey-black shale
		Bitumen
4729.30	2011C223	Dark grey-black shale
		Light-medium grey limestone
4734.10	2011C210	Dark grey-black shale
		Bitumen
4737.30	2011C224	Dark grey-black shale
		Light-medium grey limestone
4744.53	2011C225	Dark grey-black shale
		Light-medium grey limestone
4746.74	2011C211	Medium grey shale
4747.85	2011C212	Dark grey-black shale
		Bitumen
4752.98	2011C226	Dark grey-black shale
4753.40	2011C213	Medium-dark grey shale

Cuttings samples:

The number of samples selected for analysis per interval of interest (specified by E.ON Ruhrgas) is outlined in the following tables.

- Early Triassic interval (4020m to 4040m)

Sample Depth (m)	FRL Reference No.	Dominant Lithology
4020	2011D0358X	Sandstone/siltstone
4030	2011D0359X	Sandstone/siltstone
4040	2011D0360X	Claystone/sandstone

- Early Triassic interval (4190m-4240m)

Sample Depth (m)	FRL Reference No.	Dominant Lithology
4190	2011D0375X	Siltstone/sandstone/claystone
4200	2011D0376X	Siltstone/sandstone
4210	2011D0377X	Siltstone
4220	2011D0378X	Siltstone/sandstone
4230	2011D0379X	Siltstone/sandstone
4240	2011D0380X	Siltstone/sandstone

- Late Permian Ravnefjeld shale interval (4646m to 4714m)

Sample Depth (m)	FRL Reference No.	Dominant Lithology
4610	2011D0443A	Claystone (picked)
4640	2011D0446A	Claystone (picked)
4650	2011D0447A	Claystone (picked)
4660	2011D0448A	Claystone (picked)
4670	2011D0449A	Claystone (picked)
4680	2011D0450A	Claystone (picked)
4685	2011D0451A	Claystone (picked)
4690	2011D0452	Claystone
4695	2011D0453	Claystone
4700	2011D0454	Claystone
4715	2011D0457	Claystone

- Late-?Early Permian interval (4890m to 4957m/TD)

Sample Depth (m)	FRL Reference No.	Dominant Lithology
4894	2011D0528A	Claystone (picked)
4898	2011D0530A	Claystone (picked)
4904	2011D0533A	Claystone (picked)
4906	2011D0535A	Claystone (picked)
4912	2011D0538A	Claystone (picked)
4918	2011D0541A	Claystone (picked)
4924	2011D0544A	Claystone (picked)
4930	2011D0547A	Claystone (picked)
4936	2011D0550A	Claystone (picked)
4950	2011D0557A	Claystone (picked)
4954	2011D0559A	Claystone (picked)
4957	2011D0561A	Claystone (picked)

- Additional samples analysed

Sample Depth (m)	FRL Reference No.	Comments
4450	2011D0422A	Claystone
4758	2011D0472A	Claystone

GENERAL DATA			MATURITY DATA		KEROGEN COMPOSITION DATA		
SAMPLE DEPTH (m)	SPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	VITRINITE REFLECT. Ro%	SPORE COLOUR INDEX (1-10)	% (Visual, from microscopy)		
					INERTINITE	VITRINITE	AMORPHOUS
770	Ctgs(ws)	CLYST, gn-blk	0.51 (3) 1.29 (6) R	4.5	5	5	90
860	Ctgs(ws)	CLYST, gn-blk	0.61 (1)	4.5	Tr	10	90
950	Ctgs(ws)	CLYST, gn-blk	0.60 (4) 0.74 (3) R	4.5	5	5	90
1064	Ctgs(ws)	QTZ, pnk-wht +20% CLYST gn-blk	0.60 (18) 0.98 (2) R	5.0	20	30	50
1160	Ctgs(ws)	CLYST, med-dk gy		5.5	10	5	85
1238	Ctgs(ws)	SST, ol-gy +30% CLYST, gy-blk +mnr COAL		5.0	20	5	75
	Ctgs(ws) (P)	COAL	0.58 (4) 1.66 (11) R 0.30 (5) L				
1247	Ctgs(ws)	SST, dk gy+30% CLYST, gy-blk +tr COAL		5.5		15	85
	Ctgs(ws) (P)	COAL	0.59 (4) 0.59 (1) L				
1320	Ctgs(ws)	CLYST, dk-gy +30% SST, med-dk gy	0.61 (21) 0.78 (3) R	4.5	5	20	75
1440	Ctgs(ws)	CLYST, gn-gy +45% LST, med-dk gy	0.62 (13) 1.02 (6) R	5.5	5	10	85
1560	Ctgs(ws)	CLYST, dk gn-gy	0.58 (10) 1.05 (4) R	5.5	5	10	85
1610	Ctgs(ws)	CLYST, brn	0.69 (2) 1.38 (1) R		Tr	Tr	100
1730	Ctgs(ws)	CLYST, lt gy	0.66 (37) 1.08 (4) R	5.5	1	10	89
1820	Ctgs(ws)	CLYST, med gy	0.65 (12) 0.87 (7) R	5.0	15	25	60
1910	Ctgs(ws)	CLYST, brn	0.67 (10) 1.49 (3) R	5.5	5	10	85
2010	Ctgs(ws)	LST, yel-brn +30% CLYST, med-dk gy	0.61 (13) 0.84 (2) R	5.5	5	20	75
2150	Ctgs(ws)	SST, lt brn	0.68 (9)	*			
2260	Ctgs(ws)	SST, lt brn	0.65 (9)	*			
2420	Ctgs(ws)	SLTST, red-brn +20%SST red-brn	0.64 (39) 1.15 (12) R	6.0 2.0 C	10	30	60
2520	Ctgs(ws)	SLTST, red-brn	0.56 (1) L	*			

TABLE 1 Maturity and kerogen composition data (page 1 of 3)

GENERAL DATA			MATURITY DATA		KEROGEN COMPOSITION DATA		
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	VITRINITE REFLECT. Ro%	SPORE COLOUR INDEX (1-10)	% (Visual, from microscopy)		
					INERTINITE	VITRINITE	AMORPHOUS
2630	Ctgs(ws)	SLTST, med brn +50% SST, brn	0.89 (3) 0.59 (1) L	*			
2770	Ctgs(ws)	SLTST, brn	0.60 (2) 0.81 (1) L	*			
2900	Ctgs(ws)	SLTST, brn		*			
3030	Ctgs(ws)	SLTST, brn	0.91 (2) 1.42 (2) R 0.60 (1) L	*			
3180	Ctgs(ws)	SLTST, brn +40% LST, v lt gy	0.96 (1) R	*			
3300	Ctgs(ws)	CLYST, red-brn	0.83 (2)	*			
3420	Ctgs(ws)	CLYST, med-lt gy	0.87 (1)	*			
3540	Ctgs(ws)	CLYST, brn	0.86 (3) 1.27 (1) R	6.5 8.5 R	5	15	85
3670	Ctgs(ws)	CLYST, dk brn	0.84 (2) 0.59 (1) L	8.0		5	95
3780	Ctgs(ws)	SLTST, yel-brn	0.46 (3) L	7.5 3.5 C	80 inclAm	Tr	20
3890	Ctgs(ws)	SLTST, med-dk gy +20% CLYST, dk brn		*			
4020	Ctgs(ws)	SST, gn-gy +40% SLTST, brn-red +10% CLYST, dk gn-gy	0.82 (4) 1.24 (1) R	*			
4140	Ctgs(ws)	CLYST, med-dk gy +SLTST, yel-brn +30% SST, yel-brn		*			
4270	Ctgs(ws)	CLYST med-lt gy, calc	1.68 (6) R	7.0 2.5-2.6 C	100 Am	Tr	
4405	Ctgs(ws)	CLYST med-lt gy, calc	1.23 (2) 1.72 (10) R	8.0 2.5 C	100 Am	Tr	
4510	Ctgs(ws)	CLYST med-lt gy, calc	1.24 (2) 1.81 (8) R	8.0	95 Am	5	
4610	Ctgs(ws)	CLYST, med-dk gy +mnr CLYST med-lt gy, calc	1.77 (17) R	8.0	100 Am	Tr	
4715	Ctgs(ws)	CLYST, lt gy, calc +30% CLYST dk gy	1.68 (20) R	8.0 1.0 C	100 Am	Tr	
4820	Ctgs(ws)	CLYST med-lt gy, calc	1.67 (25) R	8.5	100 Am	Tr	
4902	Ctgs(ws)	CLYST med-lt gy, calc	0.96 (1) 1.64 (4) R				
4906	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red		8.0	100 Am	Tr	

TABLE 1 Maturity and kerogen composition data (page 2 of 3)

GENERAL DATA			MATURITY DATA		KEROGEN COMPOSITION DATA		
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	VITRINITE REFLECT. Ro%	SPORE COLOUR INDEX (1-10)	% (Visual, from microscopy)		
					INERTINITE	VITRINITE	AMORPHOUS
4950	Ctgs(ws)	CLYST, med-dk gy +20% CLYST, lt gy, calc +10% SLTST, pal red	1.71 (17) R	8.5 4.5 C	100		

TABLE 1 Maturity and kerogen composition data (page 3 of 3)

GENERAL DATA			CHEMICAL ANALYSIS DATA											
				ROCK-EVAL PYROLYSIS					Solvent extraction/Iatroscan fractionation					
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	TOC (% of rock)	Tmax (°C)	HI	OI	PI	POT. YLD. (ppm)	Extr. (ppm)	HC (ppm)	Extr. (wt% TOC)	HC (wt‰ TOC)	HC (% extr.)	Alks. (% HC)
4020	Ctgs(ws)	SST, gn-gy +40% SLTST, brn-red +10% CLYST, dk gn-gy												
	Ctgs(ws)	After extraction	0.42											
4030	Ctgs(ws)	SST, gn-gy +40% SLTST, brn-red +20% CLYST, dk gn-gy												
	Ctgs(ws)	After extraction	0.88											
4040	Ctgs(ws)	CLYST, dk gn-gy +40% SST, brn-gy +20% LS med gy												
	Ctgs(ws)	After extraction	0.67											
4190	Ctgs(ws)	SLTST, gn-gy +30% CLYST, md-dk gy +30% SST, med-dk gn-gy												
	Ctgs(ws)	After extraction	0.43											
4200	Ctgs(ws)	SLTST, med-dk gn-gy +30% SST, med-dk gn-gy +20% CLST, med-dk gn-gy												
	Ctgs(ws)	After extraction	0.44											
4210	Ctgs(ws)	SLTST, med-dk gn-gy +20% CLYST, med-dk gn-gy +20% SST, med-dk gn-gy												
	Ctgs(ws)	After extraction	0.46											
4220	Ctgs(ws)	SLTST, med-dk gn-gy +40% SST, med-dk gn-gy +10% CLYST, med-gy												
	Ctgs(ws)	After extraction	0.45											
4230	Ctgs(ws)	SST, med-dk gn-gy +40% SLTST, med-dk gn-gy +10% CLYST, med-gy												
	Ctgs(ws)	After extraction	0.46											
4240	Ctgs(ws)	SLTST, med-dk gn-gy +30% SST, med-dk gn-gy +30% CLYST, med-gy												
	Ctgs(ws)	After extraction	0.52											
4450	Ctgs(ws)	CLYST, med-gy +40% CLST, med-dk gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.88											
4610	Ctgs(ws)	CLYST, med-dk gy +mnr CLYST med-lt gy, calc												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.52											
4640	Ctgs(ws)	CLYST, med-dk gy +10% LS, v lt gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.36											

TABLE 2 Summary of chemical analysis data (page 1 of 4)

GENERAL DATA			CHEMICAL ANALYSIS DATA											
				ROCK-EVAL PYROLYSIS					Solvent extraction/latroscan fractionation					
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	TOC (% of rock)	Tmax (°C)	HI	OI	PI	POT. YLD. (ppm)	Extr. (ppm)	HC (ppm)	Extr. (wt% TOC)	HC (wt‰ TOC)	HC (% extr.)	Alks. (% HC)
4650	Ctgs(ws)	CLYST, med-dk gy +10% LS, v lt gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.43											
4660	Ctgs(ws)	CLYST, med gy +20% CLYST, med-dk gy +20% LS v lt gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.41											
4670	Ctgs(ws)	CLYST, med gy +20% CLYST, med-dk gy +20% LS v lt gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.38											
4680	Ctgs(ws)	CLYST, med gy +20% CLYST, med-dk gy +20% LS v lt gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.56											
4685	Ctgs(ws)	CLYST, dk-gy +50% LS v lt gy												
	Ctgs(ws) (P)	CLYST, dk-gy	1.00											
4690	Ctgs(ws)	CLYST, gy-blk	0.85											
4695	Ctgs(ws)	CLYST, gy-blk	1.02											
4700	Ctgs(ws)	CLYST, gy-blk	1.19											
4715	Ctgs(ws)	CLYST, lt gy, calc +30% CLYST dk gy	0.44											
4726.97	Core	SH, dk gy-blk + BIT	0.32											
	Core (P)	BIT							3660					
	Core	After extraction		320			0.35	300						
4729.30	Core	SH, dk gy-blk + SH, lt gy												
	Core (P)	SH, lt gy	0.13											
	Core (P)	SH, dk gy-blk	1.16											
	Core (P)	SH, dk gy-blk		340			0.31	200						
4734.10	Core	SH, med gy + BIT	0.16											
	Core (P)	BIT							1000					
4737.30	Core	SH, dk gy-blk + SH, lt gy												
	Core (P)	SH, lt gy	0.03											
	Core (P)	SH, dk gy-blk	1.66											
	Core (P)	SH, dk gy-blk		344			0.30	260						
4744.53	Core	SH, dk gy-blk +mnr SH, lt gy												
	Core (P)	SH, dk gy-blk	1.72											
	Core (P)	After extraction		333			0.24	410						
4746.74	Core	SH, med gy	0.21											
4747.85	Core	SH, med-dk gy + BIT	0.18											
	Core (P)	BIT							300					

TABLE 2 Summary of chemical analysis data (page 2 of 4)

GENERAL DATA			CHEMICAL ANALYSIS DATA											
				ROCK-EVAL PYROLYSIS					Solvent extraction/latroscan fractionation					
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	TOC (% of rock)	Tmax (°C)	HI	OI	PI	POT. YLD. (ppm)	Extr. (ppm)	HC (ppm)	Extr. (wt% TOC)	HC (wt‰ TOC)	HC (% extr.)	Alks. (% HC)
4752.98	Core	SH, dk gy-blk	2.18											
	Core	After extraction		345			0.22	450						
4753.40	Core	SH, med-dk gy	1.78											
	Core	After extraction		349			0.22	390						
4758	Ctgs(ws)	CLYST, med-dk gy +40% CLYST, v lt gy, calc												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.40											
4894	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red												
	Ctgs(ws) (P)	CLYST, med gy	0.42											
4898	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red												
	Ctgs(ws) (P)	CLYST, med gy	0.32											
4904	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red												
	Ctgs(ws) (P)	CLYST, med gy	0.46											
4906	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red												
	Ctgs(ws) (P)	CLYST, med gy	0.45											
4912	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red												
	Ctgs(ws) (P)	CLYST, med gy	0.37											
4918	Ctgs(ws)	SLTST, pal red +10% CLYST, med-dk gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.40											
4924	Ctgs(ws)	SLTST, pal red +10% CLYST, med-dk gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.35											
4930	Ctgs(ws)	QTZ, wht, +10% CLYST, med-gy + 10% SLTST, pal red												
	Ctgs(ws) (P)	CLYST, med-gy	0.55											
4936	Ctgs(ws)	CLYST, lt gy, calc +30% SLTST, pal red +5% CLYST, med-dk gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.46											
4950	Ctgs(ws)	CLYST, med-dk gy +20% CLYST, lt gy, calc +10% SLTST, pal red												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.77											
4954	Ctgs(ws)	CLYST, med-dk gy +30% LS, pnk-gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	0.95											

TABLE 2 Summary of chemical analysis data (page 3 of 4)

GENERAL DATA			CHEMICAL ANALYSIS DATA											
				ROCK-EVAL PYROLYSIS					Solvent extraction/latroscan fractionation					
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	TOC (% of rock)	Tmax (°C)	HI	OI	PI	POT. YLD. (ppm)	Extr. (ppm)	HC (ppm)	Extr. (wt% TOC)	HC (wt‰ TOC)	HC (% extr.)	Alks. (% HC)
4957	Ctgs(ws)	CLYST, med-dk gy +30% LS, pnk-gy												
	Ctgs(ws) (P)	CLYST, med-dk gy	1.54											

TABLE 2 Summary of chemical analysis data (page 4 of 4)

GENERAL DATA			CHEMICAL ANALYSIS DATA							
				ROCK-EVAL PYROLYSIS						
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	TOC (% of rock)	S1 (ppm)	S2 / POT. YLD. (ppm)	S3 (ppm)	Tmax (°C)	HI	OI	PI
4020	Ctgs(ws)	SST, gn-gy +40% SLTST, brn-red +10% CLYST, dk gn-gy								
		After extraction	0.42							
4030	Ctgs(ws)	SST, gn-gy +40% SLTST, brn-red +20% CLYST, dk gn-gy								
	Ctgs(ws)	After extraction	0.88							
4040	Ctgs(ws)	CLYST, dk gn-gy +40% SST, brn-gy +20% LS med gy								
	Ctgs(ws)	After extraction	0.67							
4190	Ctgs(ws)	SLTST, gn-gy +30% CLYST, md-dk gy +30% SST, med-dk gn-gy								
	Ctgs(ws)	After extraction	0.43							
4200	Ctgs(ws)	SLTST, med-dk gn-gy +30% SST, med-dk gn-gy +20% CLST, med-dk gn-gy								
	Ctgs(ws)	After extraction	0.44							
4210	Ctgs(ws)	SLTST, med-dk gn-gy +20% CLYST, med-dk gn-gy +20% SST, med-dk gn-gy								
	Ctgs(ws)	After extraction	0.46							
4220	Ctgs(ws)	SLTST, med-dk gn-gy +40% SST, med-dk gn-gy +10% CLYST, med-gy								
	Ctgs(ws)	After extraction	0.45							
4230	Ctgs(ws)	SST, med-dk gn-gy +40% SLTST, med-dk gn-gy +10% CLYST, med-gy								
	Ctgs(ws)	After extraction	0.46							
4240	Ctgs(ws)	SLTST, med-dk gn-gy +30% SST, med-dk gn-gy +30% CLYST, med-gy								
	Ctgs(ws)	After extraction	0.52							
4450	Ctgs(ws)	CLYST, med-gy +40% CLST, med-dk gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.88							
4610	Ctgs(ws)	CLYST, med-dk gy +mnr CLYST med-lt gy, calc								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.52							
4640	Ctgs(ws)	CLYST, med-dk gy +10% LS, v lt gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.36							

TABLE 3 Summary of TOC and pyrolysis data (page 1 of 4)

GENERAL DATA			CHEMICAL ANALYSIS DATA							
				ROCK-EVAL PYROLYSIS						
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	TOC (% of rock)	S1 (ppm)	S2 / POT. YLD. (ppm)	S3 (ppm)	Tmax (°C)	HI	OI	PI
4650	Ctgs(ws)	CLYST, med-dk gy +10% LS, v lt gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.43							
4660	Ctgs(ws)	CLYST, med gy +20% CLYST, med-dk gy +20% LS v lt gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.41							
4670	Ctgs(ws)	CLYST, med gy +20% CLYST, med-dk gy +20% LS v lt gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.38							
4680	Ctgs(ws)	CLYST, med gy +20% CLYST, med-dk gy +20% LS v lt gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.56							
4685	Ctgs(ws)	CLYST, dk-gy +50% LS v lt gy								
	Ctgs(ws) (P)	CLYST, dk-gy	1.00							
4690	Ctgs(ws)	CLYST, gy-blk	0.85							
4695	Ctgs(ws)	CLYST, gy-blk	1.02							
4700	Ctgs(ws)	CLYST, gy-blk	1.19							
4715	Ctgs(ws)	CLYST, lt gy, calc +30% CLYST dk gy	0.44							
4726.97	Core	SH, dk gy-blk + BIT	0.32							
	Core	After extraction		160	300	620	320			0.35
4727.30	Core	SH, dk gy-blk + SH, lt gy								
	Core (P)	SH, lt gy	0.03							
	Core (P)	SH, dk gy-blk	1.66							
	Core (P)	SH, dk gy-blk		110	260	100	344			0.30
4729.30	Core	SH, dk gy-blk + SH, lt gy								
	Core (P)	SH, lt gy	0.13							
	Core (P)	SH, dk gy-blk	1.16							
	Core (P)	SH, dk gy-blk		90	200	430	340			0.31
4734.10	Core	SH, med gy + BIT	0.16							
4744.53	Core	SH, dk gy-blk +mnr SH, lt gy								
	Core (P)	SH, dk gy-blk	1.72							
	Core (P)	After extraction		130	410	380	333			0.24
4746.74	Core	SH, med gy	0.21							
4747.85	Core	SH, med-dk gy + BIT	0.18							

TABLE 3 Summary of TOC and pyrolysis data (page 2 of 4)

GENERAL DATA			CHEMICAL ANALYSIS DATA							
				ROCK-EVAL PYROLYSIS						
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	TOC (% of rock)	S1 (ppm)	S2 / POT. YLD. (ppm)	S3 (ppm)	Tmax (°C)	HI	OI	PI
4752.98	Core	SH, dk gy-blk	2.18							
	Core	After extraction		130	450	380	345			0.22
4753.40	Core	SH, med-dk gy	1.78							
	Core	After extraction		110	390	390	349			0.22
4758	Ctgs(ws)	CLYST, med-dk gy +40% CLYST, v lt gy, calc								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.40							
4894	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red								
	Ctgs(ws) (P)	CLYST, med gy	0.42							
4898	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red								
	Ctgs(ws) (P)	CLYST, med gy	0.32							
4904	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red								
	Ctgs(ws) (P)	CLYST, med gy	0.46							
4906	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red								
	Ctgs(ws) (P)	CLYST, med gy	0.45							
4912	Ctgs(ws)	CLYST, med gy +50% SLTST, pal red								
	Ctgs(ws) (P)	CLYST, med gy	0.37							
4918	Ctgs(ws)	SLTST, pal red +10% CLYST, med-dk gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.40							
4924	Ctgs(ws)	SLTST, pal red +10% CLYST, med-dk gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.35							
4930	Ctgs(ws)	QTZ, wht, +10% CLYST, med-gy + 10% SLTST, pal red								
	Ctgs(ws) (P)	CLYST, med-gy	0.55							
4936	Ctgs(ws)	CLYST, lt gy, calc +30% SLTST, pal red +5% CLYST, med-dk gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.46							
4950	Ctgs(ws)	CLYST, med-dk gy +20% CLYST, lt gy, calc +10% SLTST, pal red								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.77							
4954	Ctgs(ws)	CLYST, med-dk gy +30% LS, pnk-gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	0.95							

TABLE 3 Summary of TOC and pyrolysis data (page 3 of 4)

GENERAL DATA			CHEMICAL ANALYSIS DATA							
				ROCK-EVAL PYROLYSIS						
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	TOC (% of rock)	S1 (ppm)	S2 / POT. YLD. (ppm)	S3 (ppm)	Tmax (°C)	HI	OI	PI
4957	Ctgs(ws)	CLYST, med-dk gy +30% LS, pnk-gy								
	Ctgs(ws) (P)	CLYST, med-dk gy	1.54							

TABLE 3 Summary of TOC and pyrolysis data (page 4 of 4)

GENERAL DATA			SOLVENT EXTRACTION AND FRACTIONATION DATA							
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	Rock weight (g)	Extract weight (mg)	Extract (wt% rock)	Extract (wt% TOC)	Extract (ppm rock)	Iatroscan fractionation (wt% un-deasphalted extract/topped oil)		
								Alkanes	Aroms.	Polars
4726.97	Core	SH, dk gy-blk + BIT								
	Core (P)	BIT	10.0	36.6	0.37		3660			
4734.10	Core	SH, med gy + BIT								
	Core (P)	BIT	2.5	2.5	0.1		1000			
4747.85	Core	SH, med-dk gy + BIT								
	Core (P)	BIT	10.0	3.0	0.03		300			

TABLE 4 Solvent extraction data

	Compound	Height	Area	Height ppm	Area ppm
m/z 123	ß-C	126	1095	6	9
m/z 177	T	87	519	4	4
	BL				
	dh29	58	320	3	3
m/z 191	t19	49	278	2	2
	P20				
	t20	82	423	4	3
	t21	97	594	5	5
	t22	73	317	4	2
	t23	130	891	7	7
	t24	61	321	3	3
	T24O				
	t25(1)	59	284	3	2
	t25(2)	63	232	3	2
	T24	98	686	5	5
	t26(1)	50	295	3	2
	t26(2)	47	264	2	2
	t28(1)	67	465	3	4
	t28(2)				
	t29(1)				
	t29(2)				
	t30(1)				
	t30(2)	59	250	3	2
	h27s	128	785	7	6
	h27m	125	872	6	7
	B	78	463	4	4
	h29	464	3466	24	27
	h29s	134	1047	7	8
	d30 (X)				
	m29	121	669	6	5
	O				
	h30	462	3538	23	28
	m30	104	694	5	5
	d31S				
	d31R				
	h31S	279	1881	14	15
	h31R	177	1216	9	10
	G	111	703	6	6
	h32S	209	1468	11	11
	h32R	144	809	7	6

	Compound	Height	Area	Height ppm	Area ppm
m/z 191	h33S	138	996	7	8
	h33R	120	652	6	5
	h34S	109	608	6	5
	h34R				
	h35S				
	h35R				
m/z 217	s27b				
	r29c				
	s28b	39	228	2	2
	s29c	64	435	3	3
	s29d	63	461	3	4
	s29e	56	372	3	3
	s29b	60	420	3	3
m/z 218	s27d	71	452	4	4
	s27e	52	398	3	3
	s28d	60	436	3	3
	s28e	49	294	2	2
	s29d	83	512	4	4
	s29e	64	490	3	4
m/z 231	4ms30c	40	209	2	2
m/z 232	3ms28e	29	169	1	1
	3ms28f	30	154	2	1
	4ms28e	35	184	2	1
	4ms28f	24	155	1	1
	3ms29e	22	137	1	1
	3ms29f	26	117	1	1
	4ms29e	28	191	1	1
	4ms29f	20	132	1	1
	3ms30e	34	188	2	1
	3ms30f	24	137	1	1
	4ms30e	33	170	2	1
	4ms30f	28	177	1	1
m/z 259	r27d	35	254	2	2
	r27c	37	207	2	2
	r28d(1)				
	r28d(2)				
	r28c(1)				
	r28c(2)				
	r29d	35	272	2	2
	r29c				

SAMPLE DETAILS
WELL/SAMPLE: 6507/6-4A
DEPTH: 4734.1m
SAMPLE No.: 2012C0210A
SAMPLE TYPE: Core
COMMENTS:

INTERNAL STANDARD
COMPOUND: C24-Cholane (217)
ION: 217
CONC. (ppm): 100
PEAK HEIGHT: 1966
PEAK AREA: 12776

TABLE 5 Alkane GC-MS data

	Compound	Height	Area	Height ppm	Area ppm
m/z142	2MN	644	5424	6	7
	1MN	1070	6838	9	9
m/z 156	26DMN	96	847	1	1
	27DMN	71	336	1	< 1
	13,17DMN	267	1695	2	2
	16DMN	206	1659	2	2
	14,23DMN	80	461	1	1
	15DMN	105	687	1	1
	12DMN	41	219	< 1	< 1
m/z 170	137TMN	69	411	1	1
	136TMN	59	389	1	< 1
	146,135TMN	80	437	1	1
	236TMN	33	187	< 1	< 1
	127TMN	26	100	< 1	< 1
	167TMN	39	173	< 1	< 1
	126TMN	29	149	< 1	< 1
	124TMN	24	116	< 1	< 1
	125TMN	33	163	< 1	< 1
m/z 168	2MBP	13	72	< 1	< 1
	3MBP	38	153	< 1	< 1
	4MBP	75	210	1	< 1
m/z 178	P	616	3444	5	4
m/z 192	3MP	316	2373	3	3
	2MP	387	3100	3	4
	9MP	362	2467	3	3
	1MP	283	2385	2	3
m/z 184	DBT	436	3440	4	4
m/z 198	4MDBT	416	3533	4	4
	2+3MDBT	332	3570	3	4
	1MDBT	3297	20918	29	26
m/z 231	TA20	42	155	< 1	< 1
	TA21	87	657	1	1
	TA26S				
	TA26R+27S				
	TA28S				
	TA27R				
	TA28R				

SAMPLE DETAILS
WELL/SAMPLE: 6507/6-4A
DEPTH: 4734.1m
SAMPLE No.: 2012C0210A
SAMPLE TYPE: Core
COMMENTS:

DEUTERATED STANDARD
COMPOUND: D10-Anthracene (188)
ION: 188
CONC. (ppm): 100
PEAK HEIGHT: 11388
PEAK AREA: 79710

TABLE 6 Aromatic GC-MS data

TERPANE RATIOS (based on peak areas)	
1: h27s/h27m (Ts/Tm) m/z 191	1.02
2: m30/h30 m/z 191	0.23
3: m29/h29 m/z 191	0.26
4: h31S/h31R m/z 191	1.58
5: h32S/h32R m/z 191	1.45
6: (h35S+h35R)/(h31S+h31R) m/z 191	
7: (h35S+h35R)/(h34S+h34R) m/z 191	
8: h29/(h29+h30) m/z 191	0.50
9: B/h30 m/z 191	0.17
10: G/h30 m/z 191	0.24
11: O/h30 m/z 191	
12: BL/h30 m/z 191	
13: dh29/h30 m/z 191	0.13
14: d30/h30 (X/h30) m/z 191	
15: (t28+t29)/h30 m/z 191	0.15
16: t23/h30 m/z 191	0.28
17: T24/t26 m/z 191	1.01
18: T24/h30 m/z 191	0.21
19: T24O/t24 m/z 191	
20: h30/(s29c+s29d+s29e+s29b) m/z 191,217	1.90

STERANE RATIOS (based on peak areas)	
1: s29c/(s29c+s29b) m/z 217	0.52
2: (s29d+s29e)/(s29c+s29d+s29e+s29b) m/z 217	0.49
3: s27b/(s27b+s28b+s29b), % 4: s28b/(s27b+s28b+s29b), % 5: s29b/(s27b+s28b+s29b), % m/z 217	 39.4 60.6
6: (s27d,e)/(s27d,e+s28d,e+s29d,e), % 7: (s28d,e)/(s27d,e+s28d,e+s29d,e), % 8: (s29d,e)/(s27d,e+s28d,e+s29d,e), % m/z 218	32.5 28.8 38.8
9: (r27d,c)/(r27d,c+r28d,c+r29d,c), % 10: (r28d,c)/(r27d,c+r28d,c+r29d,c), % 11: (r29d,c)/(r27d,c+r28d,c+r29d,c), % m/z 259	67.3 32.7
12: (s29c,b)/(s29c,b+s29d,e+r29d,c), % 13: (s29d,e)/(s29c,b+s29d,e+r29d,c), % 14: (r29d,c)/(s29c,b+s29d,e+r29d,c), % m/z 217,218,259	40.5 48.0 11.4
15: 4ms30c/s29b m/z 231,217	0.67
16: (4ms30e+4ms30f)/(s29d+s29e) m/z 232,218	0.42
17: (3ms30e+3ms30f)/(s29d+s29e) m/z 232,218	0.40

RELATIVE COMPOUND ABUNDANCES (ppm)	
s27b (m/z 217)	
s28b (m/z 217)	2
s29b (m/z 217)	3
(s29c,d,e,b) (m/z 217)	14
h29 (m/z 191)	24
h30 (m/z 191)	24
P (m/z 178)	5
DBT (m/z 184)	4
4MDBT (m/z 198)	4

AROMATIC RATIOS (based on peak areas)	
1: 2MN/1MN m/z 142	0.60
2: 26,27DMN/15DMN m/z 156	1.59
3: 236TMN/146,135TMN m/z 170	0.41
4: 125TMN/136TMN m/z 170	0.56
5: 3MBP/2MBP m/z 168	2.92
6: MPI-1: 1.5*(3MP+2MP)/(P+9MP+1MP) m/z 192,178	0.84
7: MPI-2: 3*2MP/(P+9MP+1MP) m/z 192,178	0.92
8: (3MP+2MP)/(3MP+2MP+9MP+1MP) m/z 192	0.52
9: 2MP/(3MP+2MP+9MP+1MP) m/z 192	0.29
10: (TAS20+21)/(TAS20+21+26+27+28) m/z 231	
11: TAS21/(TAS21+TAS28R) m/z 231	
12: TAS26S/TAS28S m/z 231	
13: TAS27R/TAS28R m/z 231	
14: 4MDBT/1MDBT m/z 198	0.13
15: 4MDBT/DBT m/z 198,184	0.95
16: DBT/P m/z 184,178	0.71

SAMPLE DETAILS
WELL/SAMPLE: 6507/6-4A
DEPTH: 4734.1m
SAMPLE No.: 2012C0210A
SAMPLE TYPE: Core

TABLE 7 Calculated GC-MS ratios

GENERAL DATA		BIOMARKERS - MATURITY PARAMETERS																	
		ALKANE BIOMARKERS									AROMATIC BIOMARKERS								
SAMPLE DEPTH (m)	SAMPLE TYPE	Ts / (Ts+Tm)	m30 / (h30+m30)	m29 / (h29+m29)	h31s / (h31r+h31s)	d30 / (h30+d30)	h29s / (h29+h29s)	s29c / (s29c+s29b)	(s29d+s29e) / (s29c+s29d+s29e+s29b)	r29c / (s29b + r29c)	2MN / 1MN	26+27DMN / 15DMN	236TMN / (146+135TMN)	3MBP / 2MBP	MPI-1	TAS21 / (TAS21+TAS28R)	(TAS20+TAS21) / (TAS20+21+26+27+28)	4MDBT / 1MDBT	4MDBT / DBT
4734.10	Core (P)	0.47			0.61														

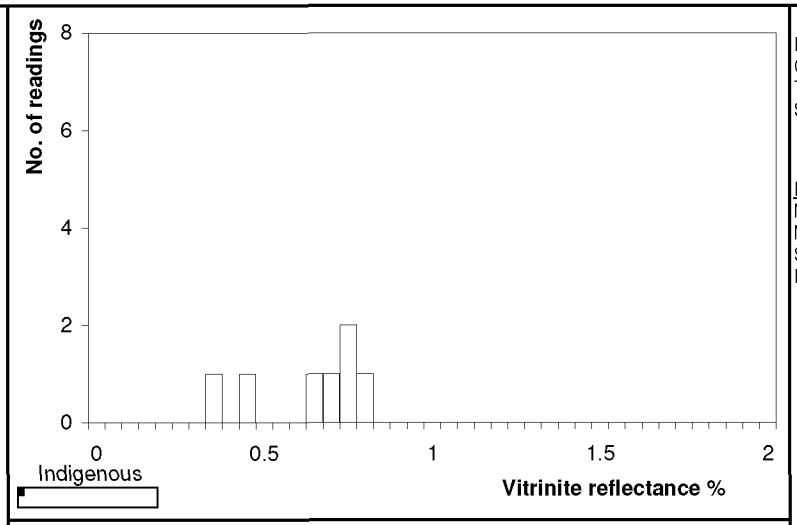
TABLE 8.1 Various saturate and aromatic biomarker ratios indicative of maturity

GENERAL DATA			BIOMARKER RATIOS - SOURCE PARAMETERS													
			ALKANE BIOMARKERS													AROM BIOM
SAMPLE DEPTH (m)	SAMPLE TYPE	ANALYSED LITHOLOGY / DESCRIPTION	h30 / (s29c+s29d+s29e+ s29b + h30)	t23 / (h30+t23)	(t28+t29) / h30	T24 / t26	h29 / (h29+h30)	G / h30	O / h30	B / h30	T24 / h30	4ms30c / s29b	(4ms30e+4ms30f) / (s29d+s29e)	Steranes / (Steranes + Hopanes)	Tricyclics / (Tricyclics+Hopanes)	(t28+t29) / (t29+t29 + Hopanes)	DBT / P
4734.10	Core (P)	BIT					0.50										

TABLE 8.2 Various saturate and aromatic biomarker ratios indicative of source

SAMPLE DATA
DEPTH: 770
CODE: 2012D0001
TYPE: cutting
SAMPLE:

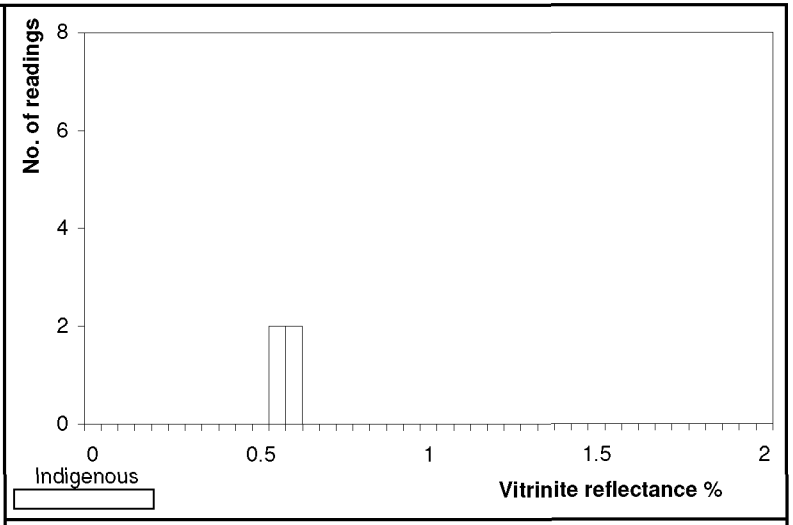
STATISTICS
POPN 1 - Indigenous
Mean value: 0.36
No. of values: 1
Std. deviation: -
Range: 0.36 to 0.36
POPN 2 - Rework./Semifus.
Mean value: 0.71
No. of values: 6
Std. deviation: 0.12
Range: 0.48 to 0.81



0.36 0.77
0.48 0.81
0.70
0.73
0.76

SAMPLE DATA
DEPTH: 950
CODE: 2012D0019
TYPE: cutting
SAMPLE:

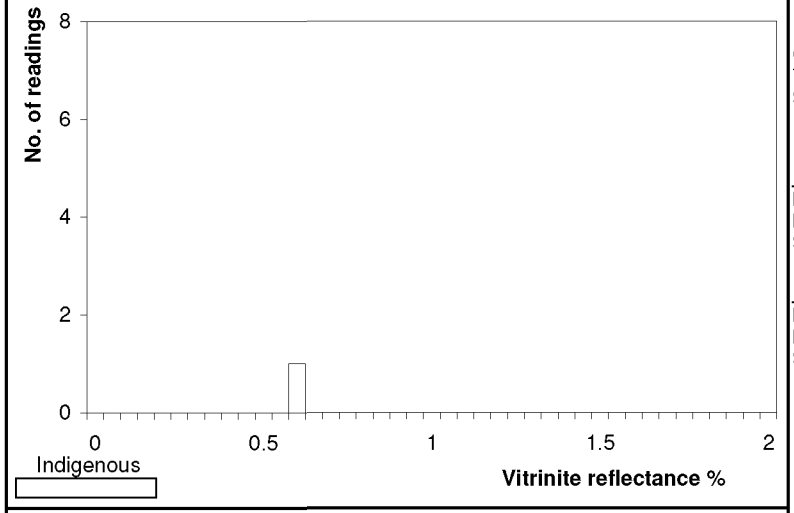
STATISTICS
POPN 1 - Rework./Semifus.
Mean value: 0.60
No. of values: 4
Std. deviation: 0.03
Range: 0.56 to 0.63



0.56
0.60
0.63
0.63

SAMPLE DATA
DEPTH: 860
CODE: 2012D0010
TYPE: cutting
SAMPLE:

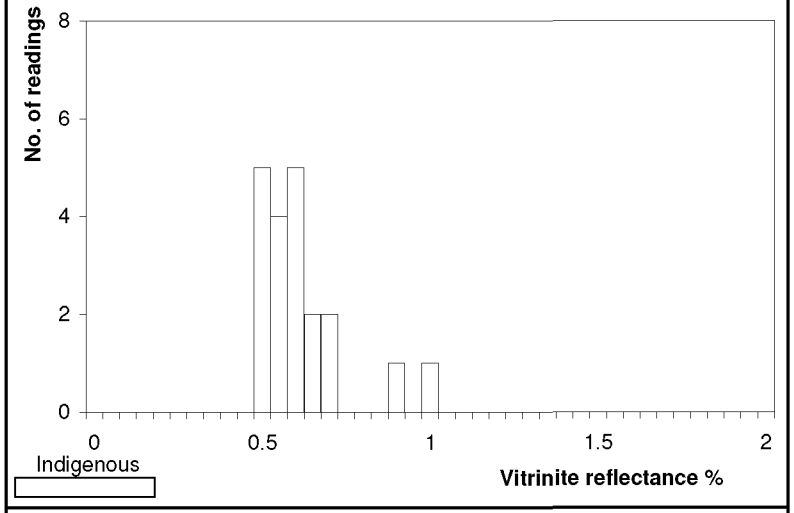
STATISTICS
POPN 1 - Rework./Semifus.
Mean value: 0.61
No. of values: 1
Std. deviation: -
Range: 0.61 to 0.61



0.61

SAMPLE DATA
DEPTH: 1064
CODE: 2012D0031
TYPE: cutting
SAMPLE:

STATISTICS
POPN 1 - Indigenous
Mean value: 0.60
No. of values: 18
Std. deviation: 0.07
Range: 0.52 to 0.74
POPN 2 - Rework./Semifus.
Mean value: 0.98
No. of values: 2
Std. deviation: 0.05
Range: 0.95 to 1.01



0.52 0.55 0.61 0.68
0.53 0.55 0.63 0.74
0.54 0.56 0.63 0.74
0.54 0.58 0.64 0.95
0.55 0.60 0.66 1.01

FIGURE 1 Histograms for vitrinite reflectance data (page 1 of 9)

SAMPLE DATA

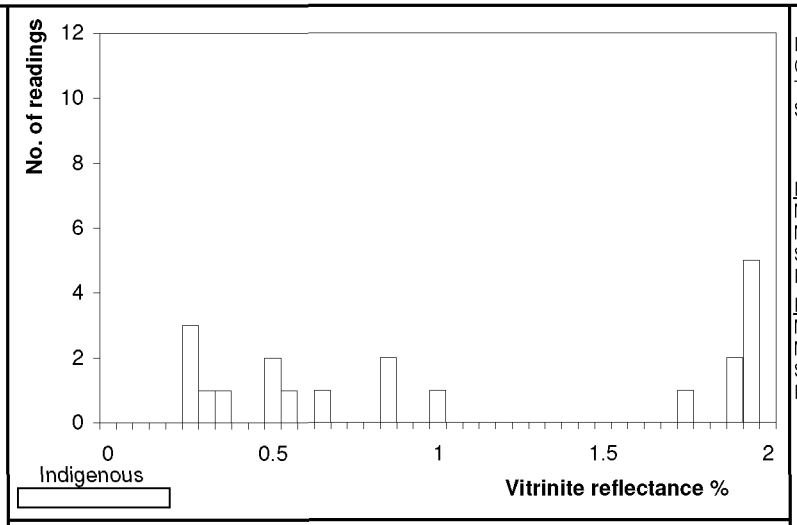
DEPTH: 1238
CODE: 2012D0074
TYPE: cutting
SAMPLE:

STATISTICS

POPN 1 - Indigenous
Mean value: 0.58
No. of values: 4
Std. deviation: 0.08
Range: 0.52 to 0.69

POPN 2 - Low reflect.
Mean value: 0.30
No. of values: 5
Std. deviation: 0.05
Range: 0.26 to 0.38

POPN 3 - Rework./Semifus.
Mean value: 1.66
No. of values: 11
Std. deviation: 0.47
Range: 0.86 to 1.96



0.26	0.52	0.89	1.96
0.27	0.52	1.04	1.96
0.27	0.59	1.78	1.96
0.33	0.69	1.90	1.96
0.38	0.86	1.93	1.96

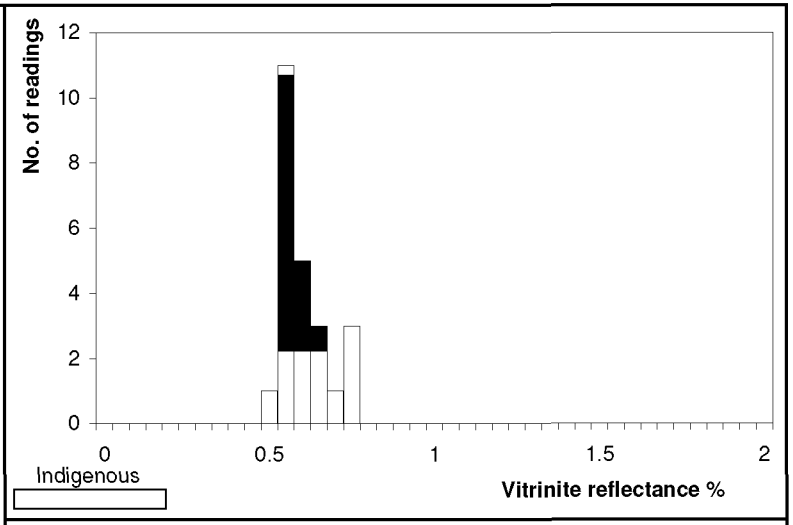
SAMPLE DATA

DEPTH: 1320
CODE: 2012D0091
TYPE: cutting
SAMPLE:

STATISTICS

POPN 1 - Indigenous
Mean value: 0.61
No. of values: 21
Std. deviation: 0.05
Range: 0.55 to 0.74

POPN 2 - Rework./Semifus.
Mean value: 0.78
No. of values: 3
Std. deviation: 0.01
Range: 0.77 to 0.78



0.55	0.56	0.58	0.63	0.74
0.56	0.57	0.59	0.65	0.77
0.56	0.58	0.60	0.66	0.78
0.56	0.58	0.62	0.67	0.78
0.56	0.58	0.63	0.68	

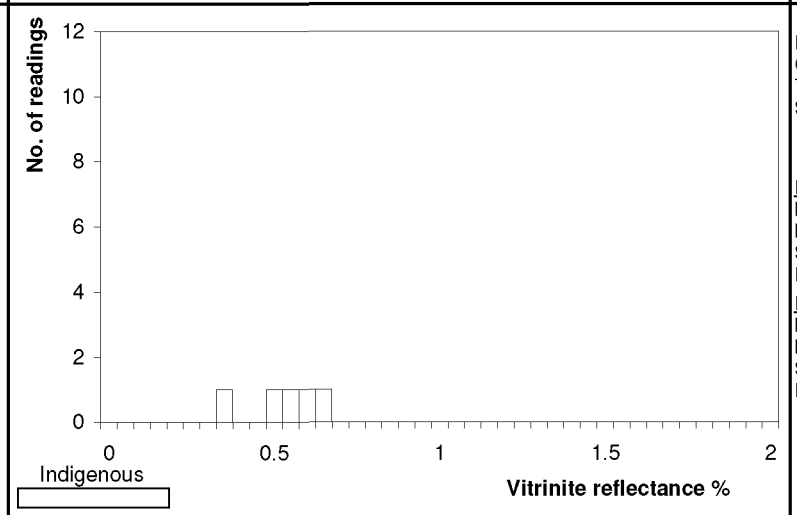
SAMPLE DATA

DEPTH: 1247
CODE: 2012D0077
TYPE: cutting
SAMPLE:

STATISTICS

POPN 1 - Indigenous
Mean value: 0.59
No. of values: 4
Std. deviation: 0.06
Range: 0.52 to 0.66

POPN 2 - Low reflect.
Mean value: 0.36
No. of values: 1
Std. deviation: -
Range: 0.36 to 0.36



0.36
0.52
0.57
0.63
0.66

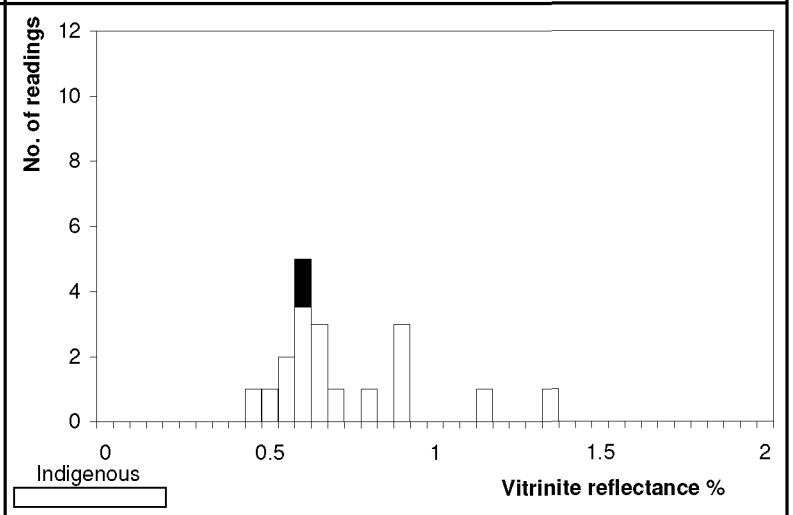
SAMPLE DATA

DEPTH: 1440
CODE: 2012D0103
TYPE: cutting
SAMPLE:

STATISTICS

POPN 1 - Indigenous
Mean value: 0.62
No. of values: 13
Std. deviation: 0.06
Range: 0.50 to 0.70

POPN 2 - Rework./Semifus.
Mean value: 1.02
No. of values: 6
Std. deviation: 0.20
Range: 0.84 to 1.36

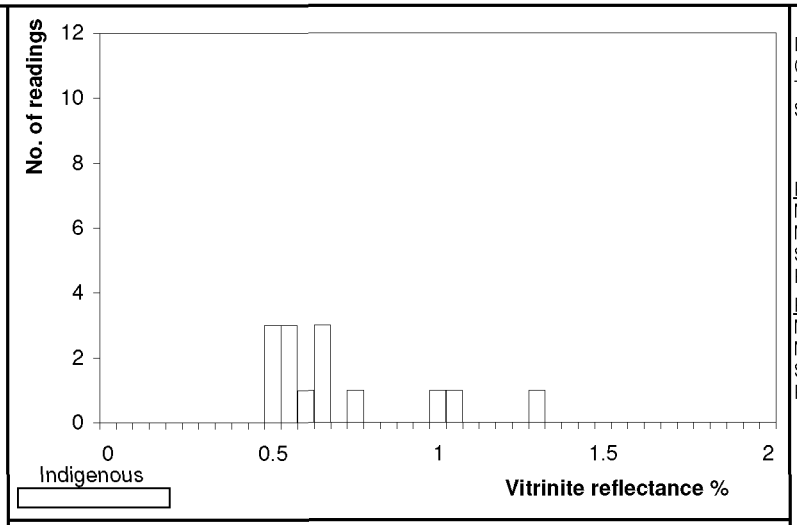


0.50	0.62	0.68	0.93
0.52	0.63	0.69	0.93
0.56	0.63	0.70	1.16
0.58	0.64	0.84	1.36
0.61	0.67	0.91	

FIGURE 1 Histograms for vitrinite reflectance data (page 2 of 9)

SAMPLE DATA
DEPTH: 1560
CODE: 2012D0115
TYPE: cutting
SAMPLE:

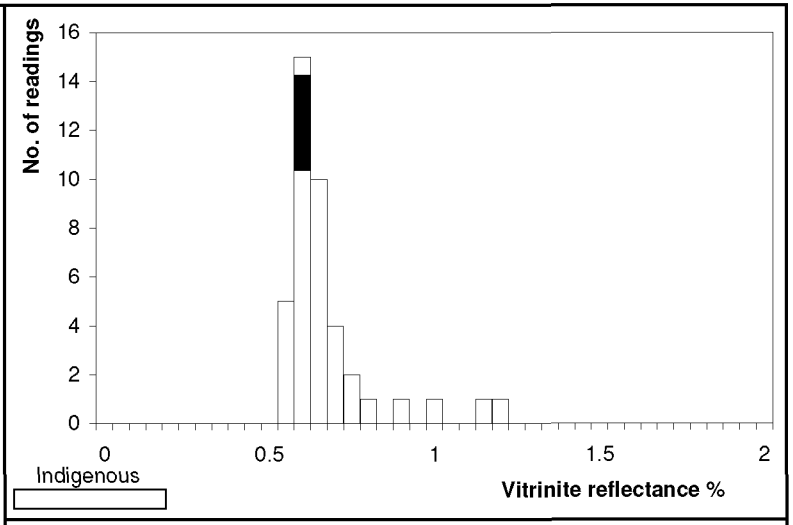
STATISTICS
POPN 1 - Indigenous
Mean value: 0.58
No. of values: 10
Std. deviation: 0.06
Range: 0.50 to 0.66
POPN 2 - Rework./Semifus.
Mean value: 1.05
No. of values: 4
Std. deviation: 0.24
Range: 0.77 to 1.35



0.50	0.56	0.77
0.52	0.61	1.03
0.52	0.65	1.05
0.56	0.65	1.35
0.56	0.66	

SAMPLE DATA
DEPTH: 1730
CODE: 2012D0133
TYPE: cutting
SAMPLE:

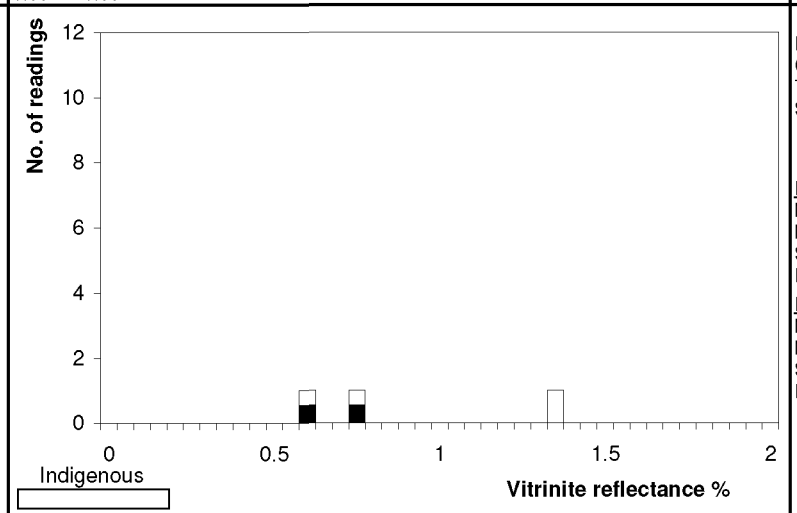
STATISTICS
POPN 1 - Indigenous
Mean value: 0.66
No. of values: 37
Std. deviation: 0.06
Range: 0.58 to 0.83
POPN 2 - Rework./Semifus.
Mean value: 1.08
No. of values: 4
Std. deviation: 0.13
Range: 0.95 to 1.22



0.58	0.60	0.61	0.63	0.65	0.68	0.72	0.78	1.22
0.58	0.61	0.62	0.64	0.66	0.68	0.73	0.83	
0.58	0.61	0.62	0.64	0.66	0.69	0.73	0.95	
0.59	0.61	0.63	0.64	0.67	0.69	0.74	1.00	
0.60	0.61	0.63	0.65	0.68	0.70	0.76	1.15	

SAMPLE DATA
DEPTH: 1610
CODE: 2012D0121
TYPE: cutting
SAMPLE:

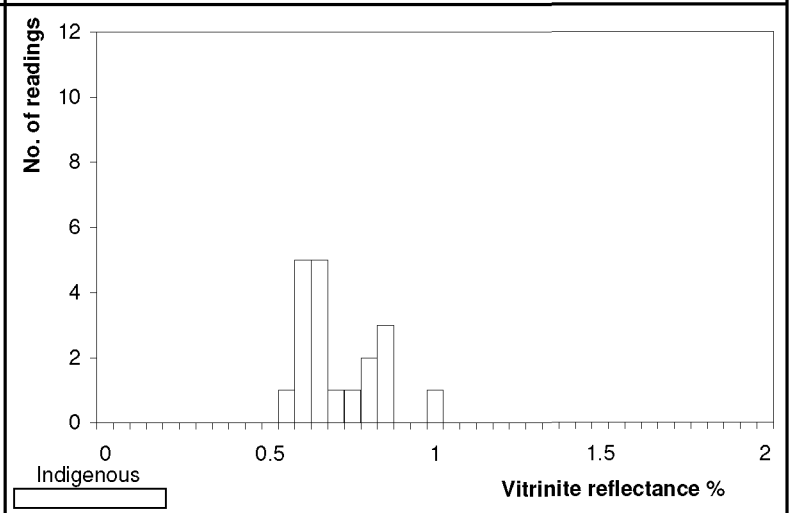
STATISTICS
POPN 1 - Indigenous
Mean value: 0.69
No. of values: 2
Std. deviation: 0.10
Range: 0.62 to 0.76
POPN 2 - Rework./Semifus.
Mean value: 1.38
No. of values: 1
Std. deviation: -
Range: 1.38 to 1.38



0.62
0.76
1.38

SAMPLE DATA
DEPTH: 1820
CODE: 2012D0142
TYPE: cutting
SAMPLE:

STATISTICS
POPN 1 - Indigenous
Mean value: 0.65
No. of values: 12
Std. deviation: 0.05
Range: 0.58 to 0.74
POPN 2 - Rework./Semifus.
Mean value: 0.87
No. of values: 7
Std. deviation: 0.08
Range: 0.76 to 1.02

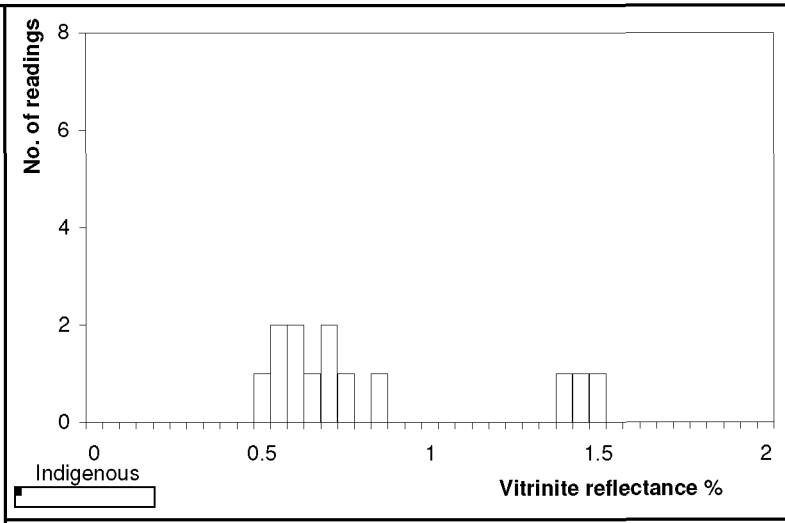


0.58	0.65	0.68	0.87
0.60	0.66	0.74	0.89
0.61	0.67	0.76	0.89
0.61	0.67	0.81	1.02
0.64	0.68	0.85	

FIGURE 1 Histograms for vitrinite reflectance data (page 3 of 9)

SAMPLE DATA
DEPTH: 1910
CODE: 2012D0151
TYPE: cutting
SAMPLE:

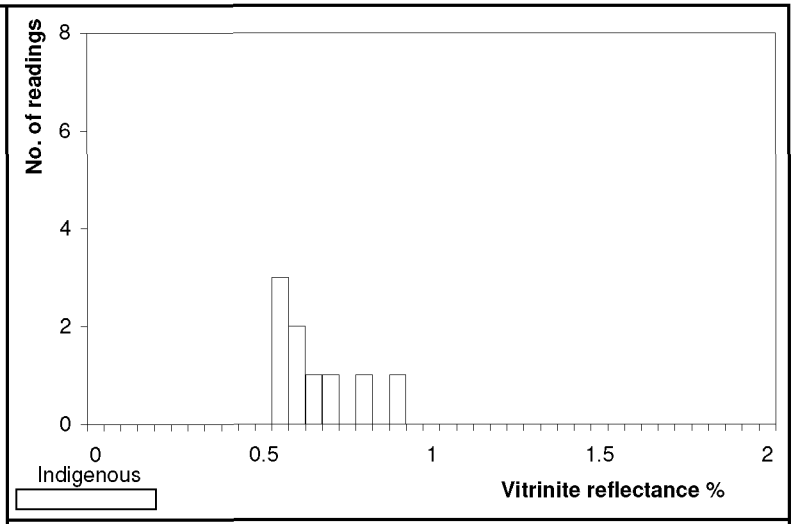
STATISTICS
POPN 1 - Indigenous
Mean value: 0.67
No. of values: 10
Std. deviation: 0.11
Range: 0.52 to 0.88
POPN 2 - Rework./Semifus.
Mean value: 1.49
No. of values: 3
Std. deviation: 0.06
Range: 1.44 to 1.55



0.52	0.68	1.44
0.57	0.74	1.49
0.59	0.74	1.55
0.61	0.79	
0.62	0.88	

SAMPLE DATA
DEPTH: 2150
CODE: 2012D0174
TYPE: cutting
SAMPLE:

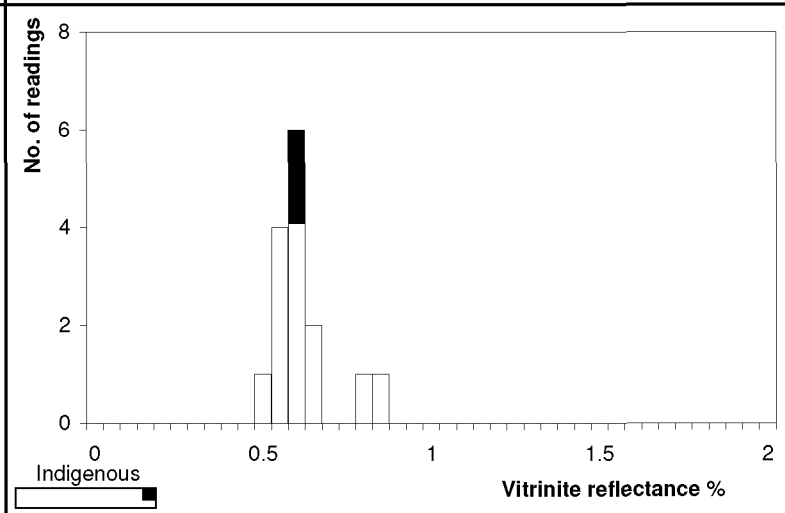
STATISTICS
POPN 1 - Indigenous
Mean value: 0.68
No. of values: 9
Std. deviation: 0.12
Range: 0.58 to 0.91



0.58	0.66	
0.59	0.71	
0.60	0.85	
0.61	0.91	
0.64		

SAMPLE DATA
DEPTH: 2010
CODE: 2012D0160
TYPE: cutting
SAMPLE:

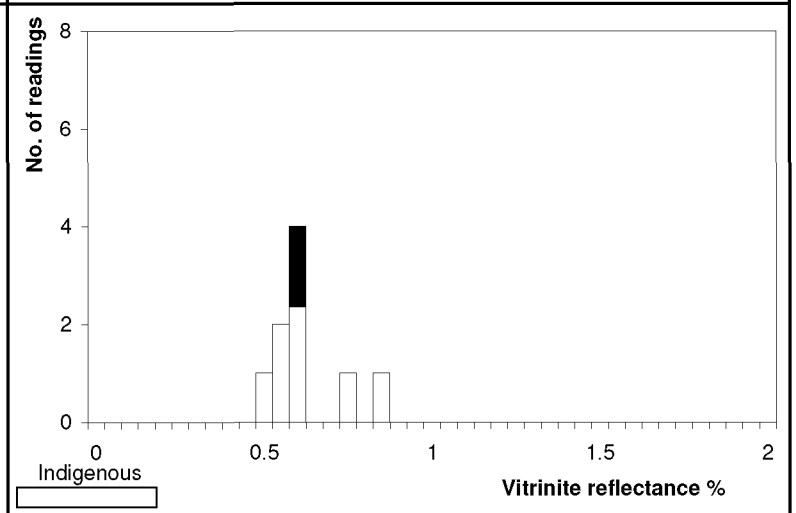
STATISTICS
POPN 1 - Indigenous
Mean value: 0.61
No. of values: 13
Std. deviation: 0.05
Range: 0.51 to 0.70
POPN 2 - Rework./Semifus.
Mean value: 0.84
No. of values: 2
Std. deviation: 0.01
Range: 0.84 to 0.85



0.51	0.60	0.64
0.58	0.60	0.68
0.58	0.61	0.70
0.60	0.61	0.84
0.60	0.62	0.85

SAMPLE DATA
DEPTH: 2260
CODE: 2012D0184
TYPE: cutting
SAMPLE:

STATISTICS
POPN 1 - Indigenous
Mean value: 0.65
No. of values: 9
Std. deviation: 0.11
Range: 0.53 to 0.87

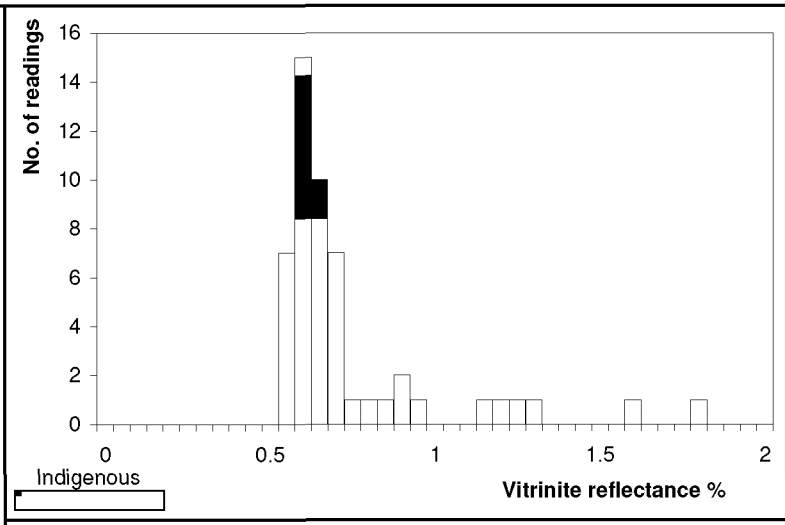


0.53	0.60	
0.59	0.64	
0.59	0.80	
0.60	0.87	
0.60		

FIGURE 1 Histograms for vitrinite reflectance data (page 4 of 9)

SAMPLE DATA
DEPTH: 2420
CODE: 2012D0200
TYPE: cutting
SAMPLE:

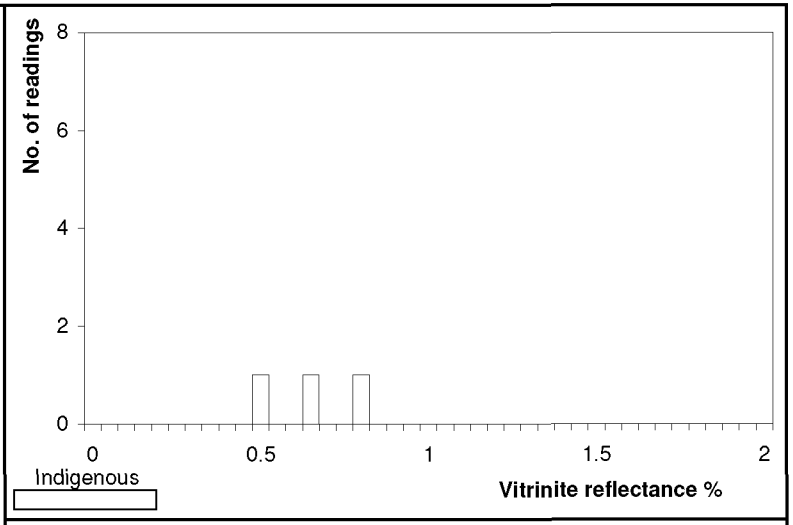
STATISTICS
POPN 1 - Indigenous
Mean value: 0.64
No. of values: 39
Std. deviation: 0.05
Range: 0.57 to 0.73
POPN 2 - Rework./Semifus.
Mean value: 1.15
No. of values: 12
Std. deviation: 0.33
Range: 0.78 to 1.84



0.57	0.60	0.61	0.62	0.64	0.65	0.69	0.72	0.81	1.16	1.84
0.58	0.60	0.61	0.62	0.65	0.66	0.70	0.72	0.89	1.24	
0.58	0.60	0.61	0.62	0.65	0.66	0.70	0.72	0.92	1.29	
0.59	0.60	0.62	0.62	0.65	0.67	0.71	0.73	0.93	1.34	
0.59	0.61	0.62	0.63	0.65	0.67	0.71	0.78	0.98	1.64	

SAMPLE DATA
DEPTH: 2770
CODE: 2012D0235
TYPE: cutting
SAMPLE:

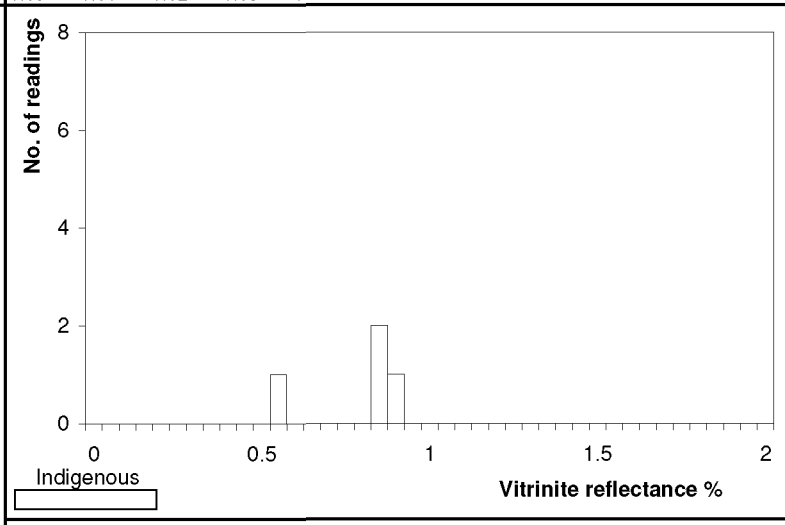
STATISTICS
POPN 1 - Indigenous
Mean value: 0.81
No. of values: 1
Std. deviation: -
Range: 0.81 to 0.81
POPN 2 - Low reflect.
Mean value: 0.60
No. of values: 2
Std. deviation: 0.14
Range: 0.50 to 0.70



0.50
0.70
0.81

SAMPLE DATA
DEPTH: 2630
CODE: 2012D0221
TYPE: cutting
SAMPLE:

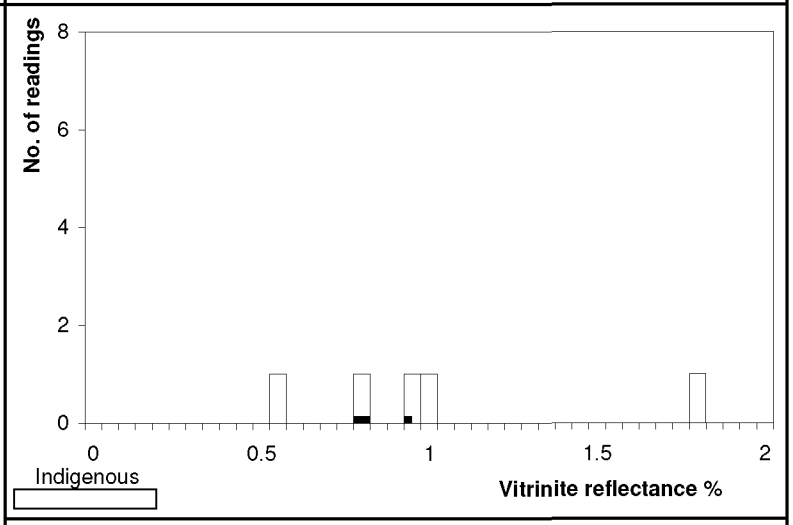
STATISTICS
POPN 1 - Indigenous
Mean value: 0.89
No. of values: 3
Std. deviation: 0.03
Range: 0.85 to 0.91
POPN 2 - Low reflect.
Mean value: 0.59
No. of values: 1
Std. deviation: -
Range: 0.59 to 0.59



0.59
0.85
0.89
0.91

SAMPLE DATA
DEPTH: 3030
CODE: 2012D0260
TYPE: cutting
SAMPLE:

STATISTICS
POPN 1 - Indigenous
Mean value: 0.91
No. of values: 2
Std. deviation: 0.11
Range: 0.83 to 0.99
POPN 2 - Low reflect.
Mean value: 0.60
No. of values: 1
Std. deviation: -
Range: 0.60 to 0.60
POPN 3 - Rework./Semifus.
Mean value: 1.42
No. of values: 2
Std. deviation: 0.56
Range: 1.03 to 1.81

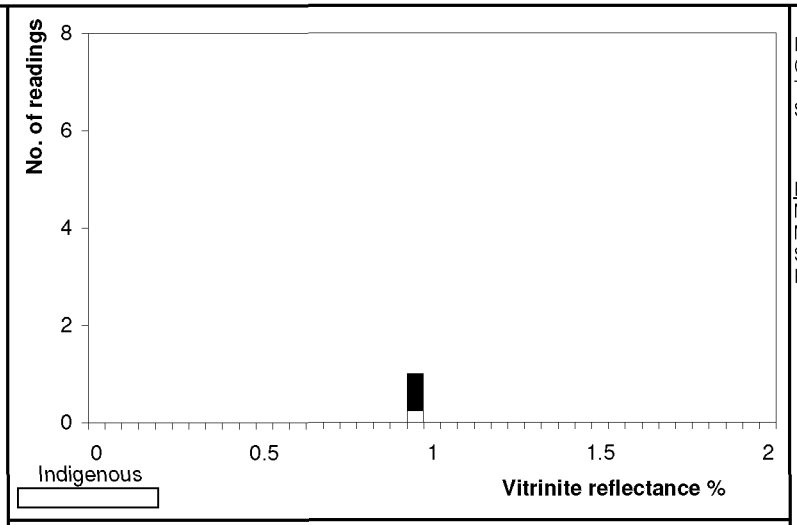


0.60
0.83
0.99
1.03
1.81

FIGURE 1 Histograms for vitrinite reflectance data (page 5 of 9)

SAMPLE DATA
DEPTH: 3180
CODE: 2012D0275
TYPE: cuttings
SAMPLE:

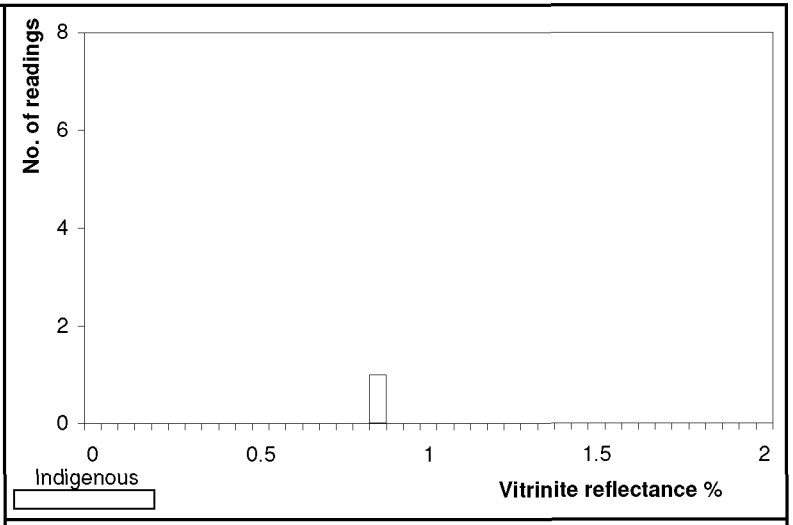
STATISTICS
POPN 1 - Indigenous
Mean value: 0.96
No. of values: 1
Std. deviation: -
Range: 0.96 to 0.96



0.96

SAMPLE DATA
DEPTH: 3420
CODE: 2012D0299
TYPE: cuttings
SAMPLE:

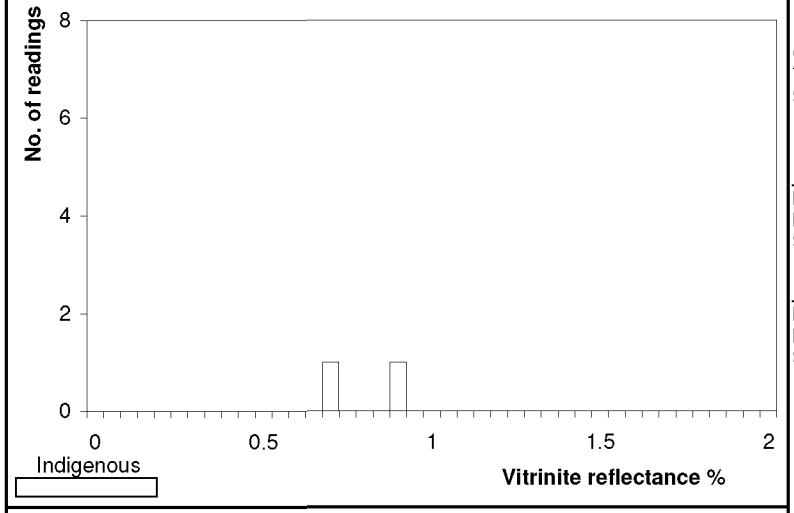
STATISTICS
POPN 1 - Indigenous
Mean value: 0.87
No. of values: 1
Std. deviation: -
Range: 0.87 to 0.87



0.87

SAMPLE DATA
DEPTH: 3300
CODE: 2012D0287
TYPE: cuttings
SAMPLE:

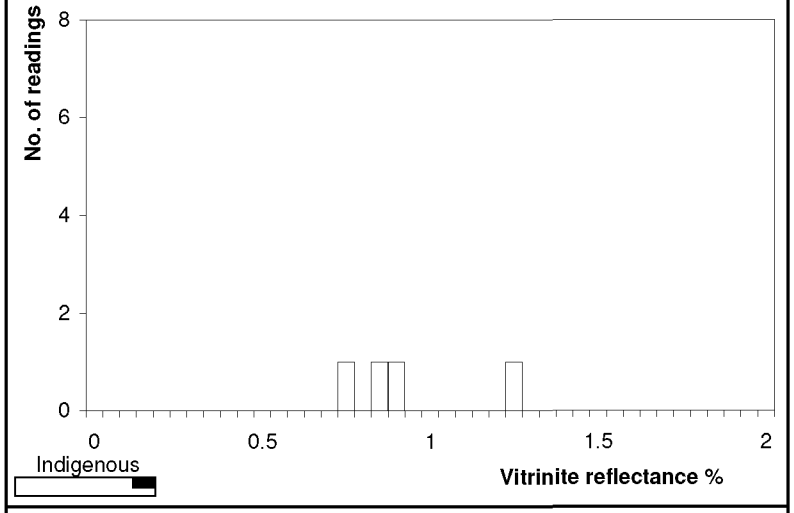
STATISTICS
POPN 1 - Indigenous
Mean value: 0.83
No. of values: 2
Std. deviation: 0.15
Range: 0.73 to 0.94



0.73
0.94

SAMPLE DATA
DEPTH: 3540
CODE: 2012D0311
TYPE: cuttings
SAMPLE:

STATISTICS
POPN 1 - Indigenous
Mean value: 0.86
No. of values: 3
Std. deviation: 0.07
Range: 0.78 to 0.93
POPN 2 - Rework./Semifus.
Mean value: 1.27
No. of values: 1
Std. deviation: -
Range: 1.27 to 1.27

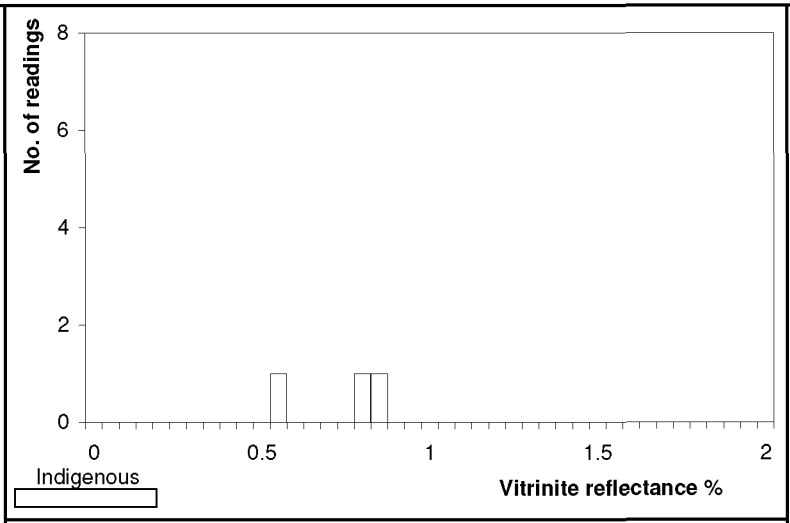


0.78
0.87
0.93
1.27

FIGURE 1 Histograms for vitrinite reflectance data (page 6 of 9)

SAMPLE DATA
DEPTH: 3670
CODE: 2012D0323
TYPE: cuttings
SAMPLE:

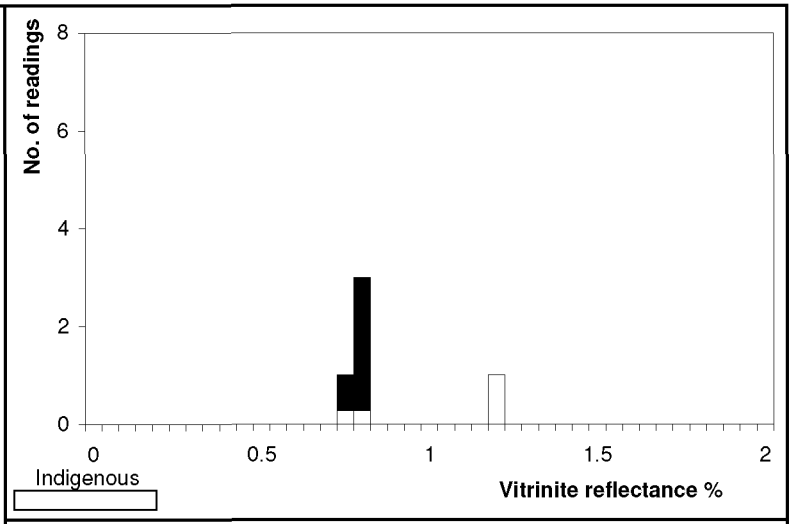
STATISTICS
POPN 1 - Indigenous
Mean value: 0.84
No. of values: 2
Std. deviation: 0.02
Range: 0.83 to 0.86
POPN 2 - Low reflect.
Mean value: 0.59
No. of values: 1
Std. deviation: -
Range: 0.59 to 0.59



0.59
0.83
0.86

SAMPLE DATA
DEPTH: 4020
CODE: 2012D0358
TYPE: cuttings
SAMPLE:

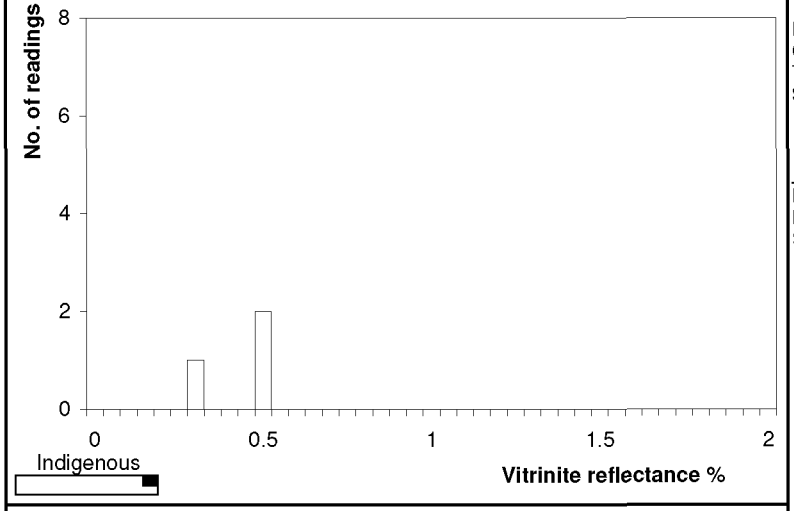
STATISTICS
POPN 1 - Indigenous
Mean value: 0.82
No. of values: 4
Std. deviation: 0.03
Range: 0.78 to 0.84
POPN 2 - Rework./Semifus.
Mean value: 1.24
No. of values: 1
Std. deviation: -
Range: 1.24 to 1.24



0.78
0.82
0.83
0.84
1.24

SAMPLE DATA
DEPTH: 3780
CODE: 2012D0334
TYPE: cuttings
SAMPLE:

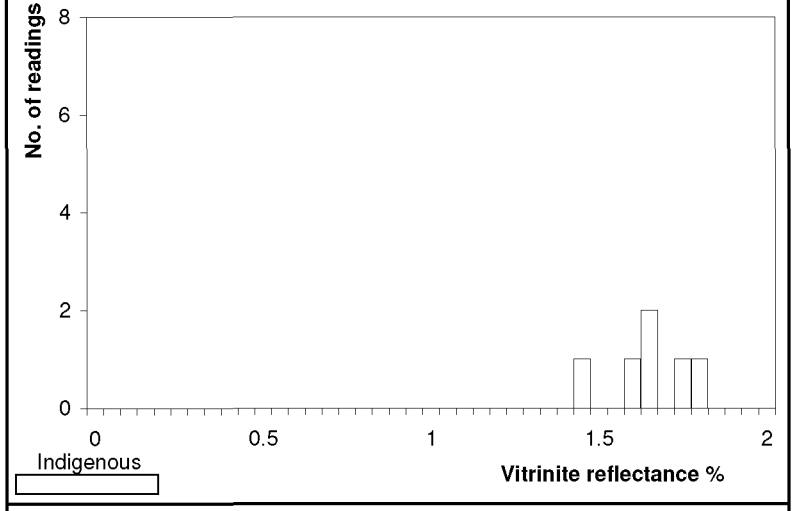
STATISTICS
POPN 1 - Low reflect.
Mean value: 0.46
No. of values: 3
Std. deviation: 0.10
Range: 0.34 to 0.53



0.34
0.51
0.53

SAMPLE DATA
DEPTH: 4270
CODE: 2012D0386
TYPE: cuttings
SAMPLE:

STATISTICS
POPN 1 - Rework./Semifus.
Mean value: 1.68
No. of values: 6
Std. deviation: 0.13
Range: 1.48 to 1.84



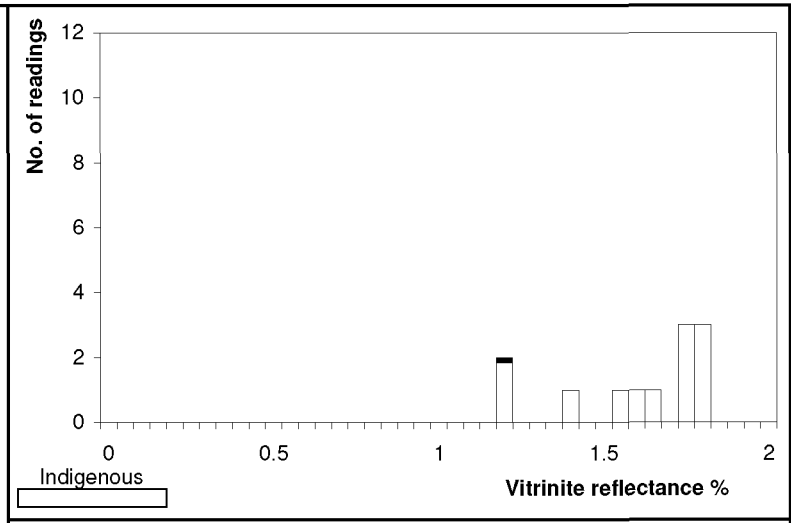
1.48 1.84
1.64
1.65
1.70
1.80

FIGURE 1 Histograms for vitrinite reflectance data (page 7 of 9)

SAMPLE DATA
DEPTH: 4405
CODE: 2012D0413
TYPE: cuttings
SAMPLE:

STATISTICS
POPN 1 - Indigenous
Mean value: 1.23
No. of values: 2
Std. deviation: 0.02
Range: 1.22 to 1.24

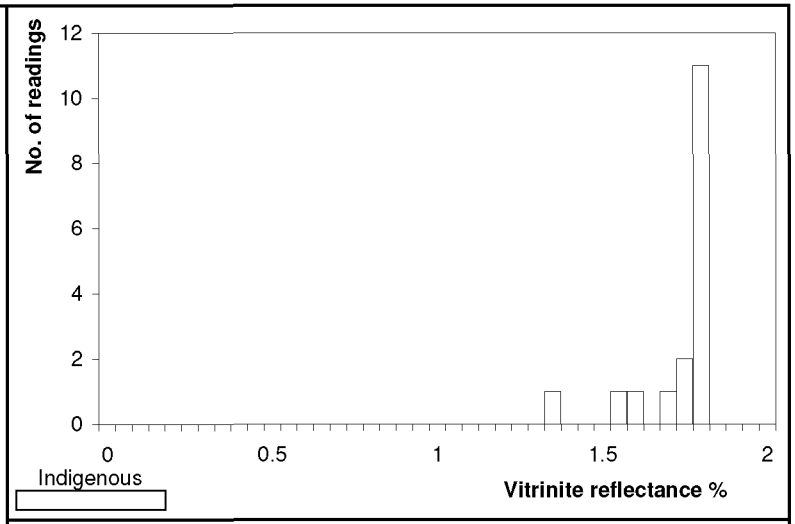
POPN 2 - Rework./Semifus.
Mean value: 1.72
No. of values: 10
Std. deviation: 0.14
Range: 1.42 to 1.84



1.22	1.70	1.84
1.24	1.79	1.84
1.42	1.80	
1.56	1.80	
1.64	1.82	

SAMPLE DATA
DEPTH: 4610
CODE: 2012D0443
TYPE: cuttings
SAMPLE:

STATISTICS
POPN 1 - Rework./Semifus.
Mean value: 1.77
No. of values: 17
Std. deviation: 0.13
Range: 1.40 to 1.84

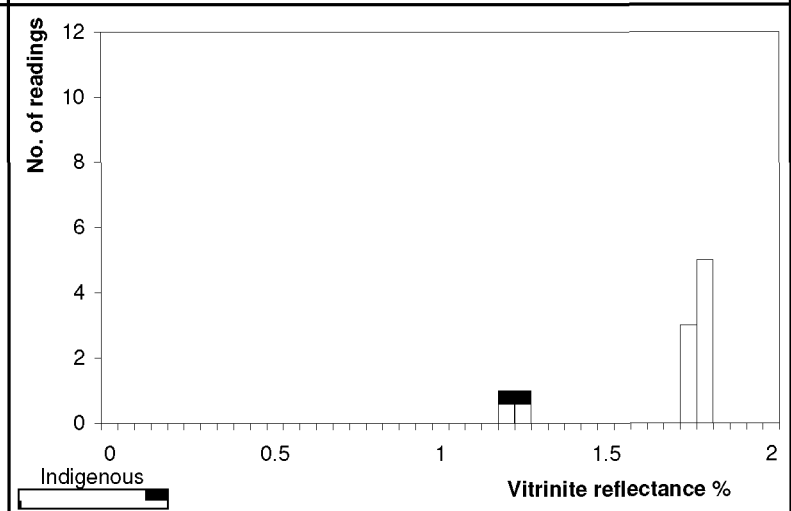


1.40	1.78	1.84	1.84
1.55	1.83	1.84	1.84
1.65	1.84	1.84	
1.71	1.84	1.84	
1.78	1.84	1.84	

SAMPLE DATA
DEPTH: 4510
CODE: 2012D0434
TYPE: cuttings
SAMPLE:

STATISTICS
POPN 1 - Indigenous
Mean value: 1.24
No. of values: 2
Std. deviation: 0.05
Range: 1.21 to 1.28

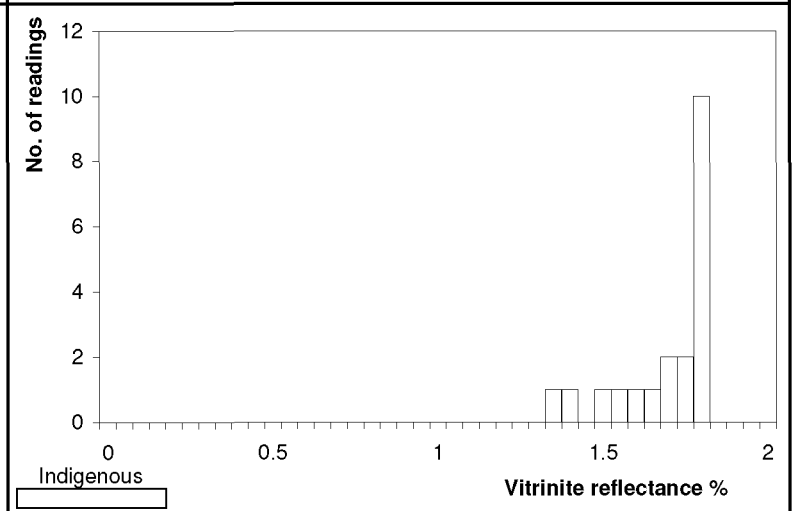
POPN 2 - Rework./Semifus.
Mean value: 1.81
No. of values: 8
Std. deviation: 0.02
Range: 1.78 to 1.84



1.21	1.80		
1.28	1.81		
1.78	1.81		
1.80	1.82		
1.80	1.84		

SAMPLE DATA
DEPTH: 4715
CODE: 2012D0457
TYPE: cuttings
SAMPLE:

STATISTICS
POPN 1 - Rework./Semifus.
Mean value: 1.73
No. of values: 20
Std. deviation: 0.15
Range: 1.38 to 1.84

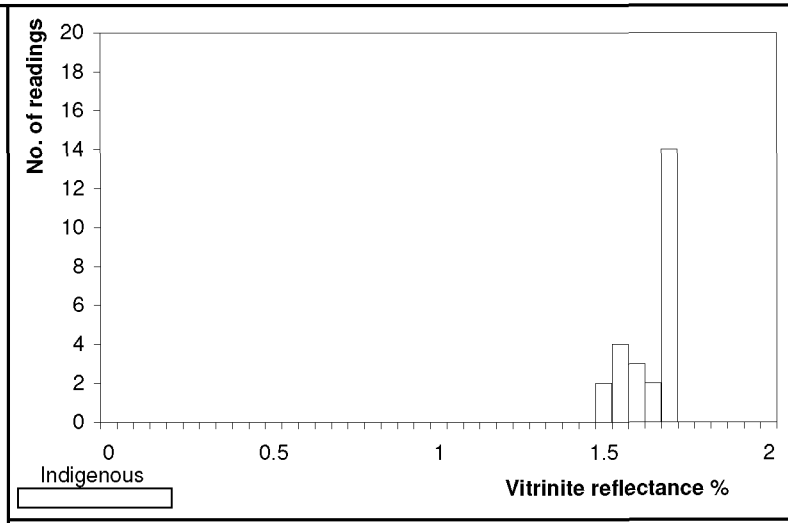


1.38	1.67	1.81	1.84
1.40	1.75	1.82	1.84
1.53	1.75	1.83	1.84
1.60	1.79	1.83	1.84
1.64	1.79	1.84	1.84

FIGURE 1 Histograms for vitrinite reflectance data (page 8 of 9)

SAMPLE DATA
DEPTH: 4820
CODE: 2012D0502
TYPE: cuttings
SAMPLE:

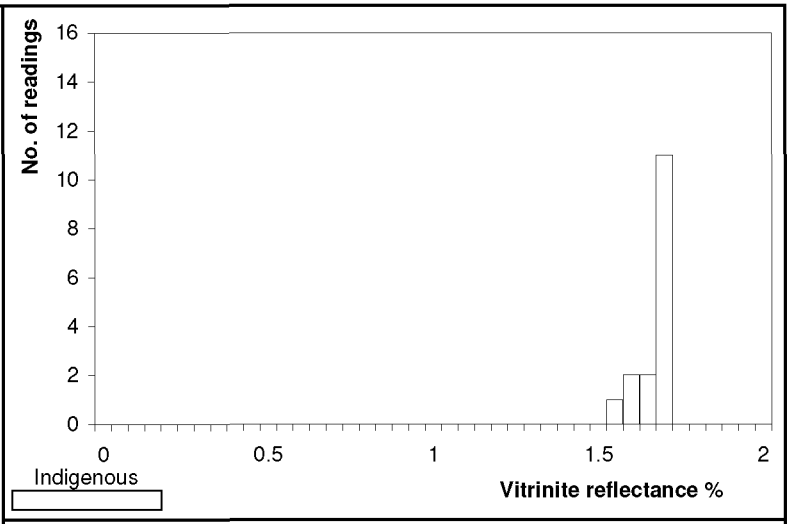
STATISTICS
POPN 1 - Rework./Semifus.
Mean value: 1.67
No. of values: 25
Std. deviation: 0.08
Range: 1.51 to 1.73



1.51	1.60	1.68	1.73	1.73
1.51	1.61	1.70	1.73	1.73
1.55	1.64	1.70	1.73	1.73
1.56	1.64	1.71	1.73	1.73
1.57	1.68	1.73	1.73	1.73

SAMPLE DATA
DEPTH: 4950
CODE: 2012D0557
TYPE: cuttings
SAMPLE:

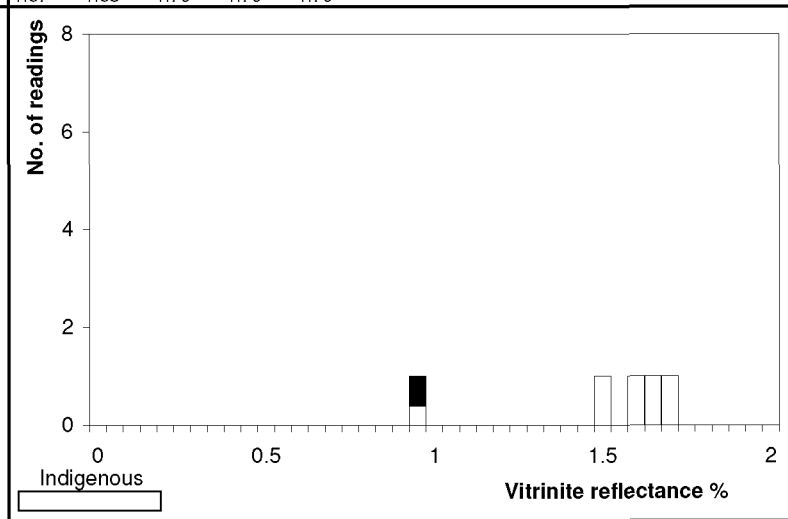
STATISTICS
POPN 1 - Rework./Semifus.
Mean value: 1.70
No. of values: 16
Std. deviation: 0.04
Range: 1.59 to 1.73



1.59	1.70	1.73	1.73
1.64	1.72	1.73	
1.65	1.73	1.73	
1.69	1.73	1.73	
1.70	1.73	1.73	

SAMPLE DATA
DEPTH: 4902
CODE: 2012D0532
TYPE: cuttings
SAMPLE:

STATISTICS
POPN 1 - Indigenous
Mean value: 0.96
No. of values: 1
Std. deviation: -
Range: 0.96 to 0.96
POPN 2 - Rework./Semifus.
Mean value: 1.64
No. of values: 4
Std. deviation: 0.08
Range: 1.55 to 1.73



0.96
1.55
1.63
1.67
1.73

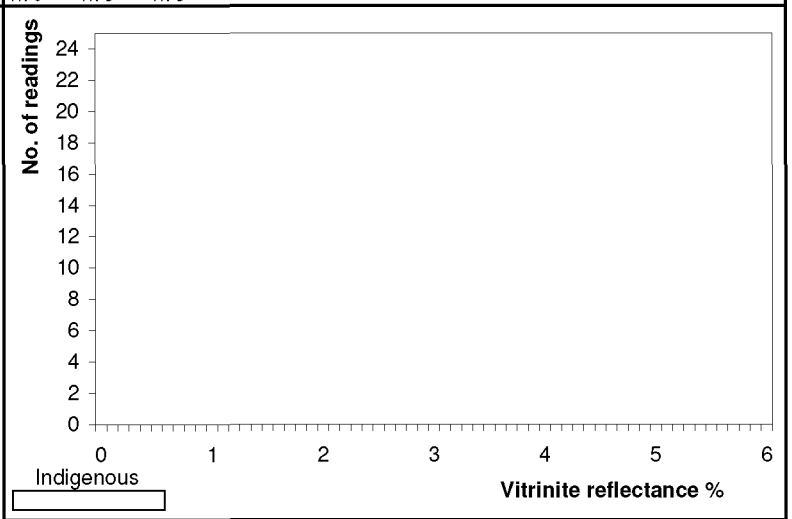


FIGURE 1 Histograms for vitrinite reflectance data (page 9 of 9)

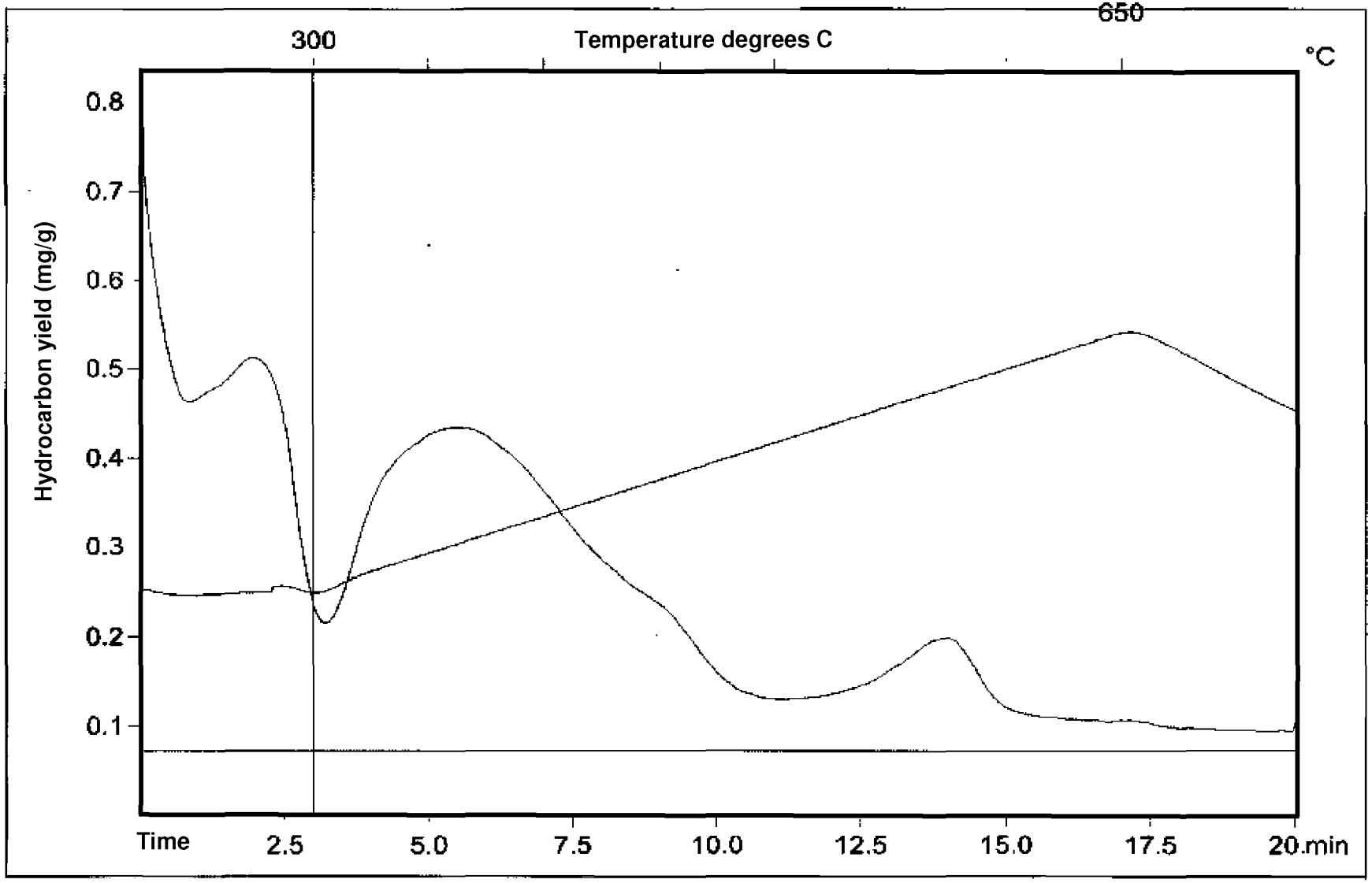


FIGURE 4.1 Rock-Eval pyrolysis pyrogram, core sample 4726.97m

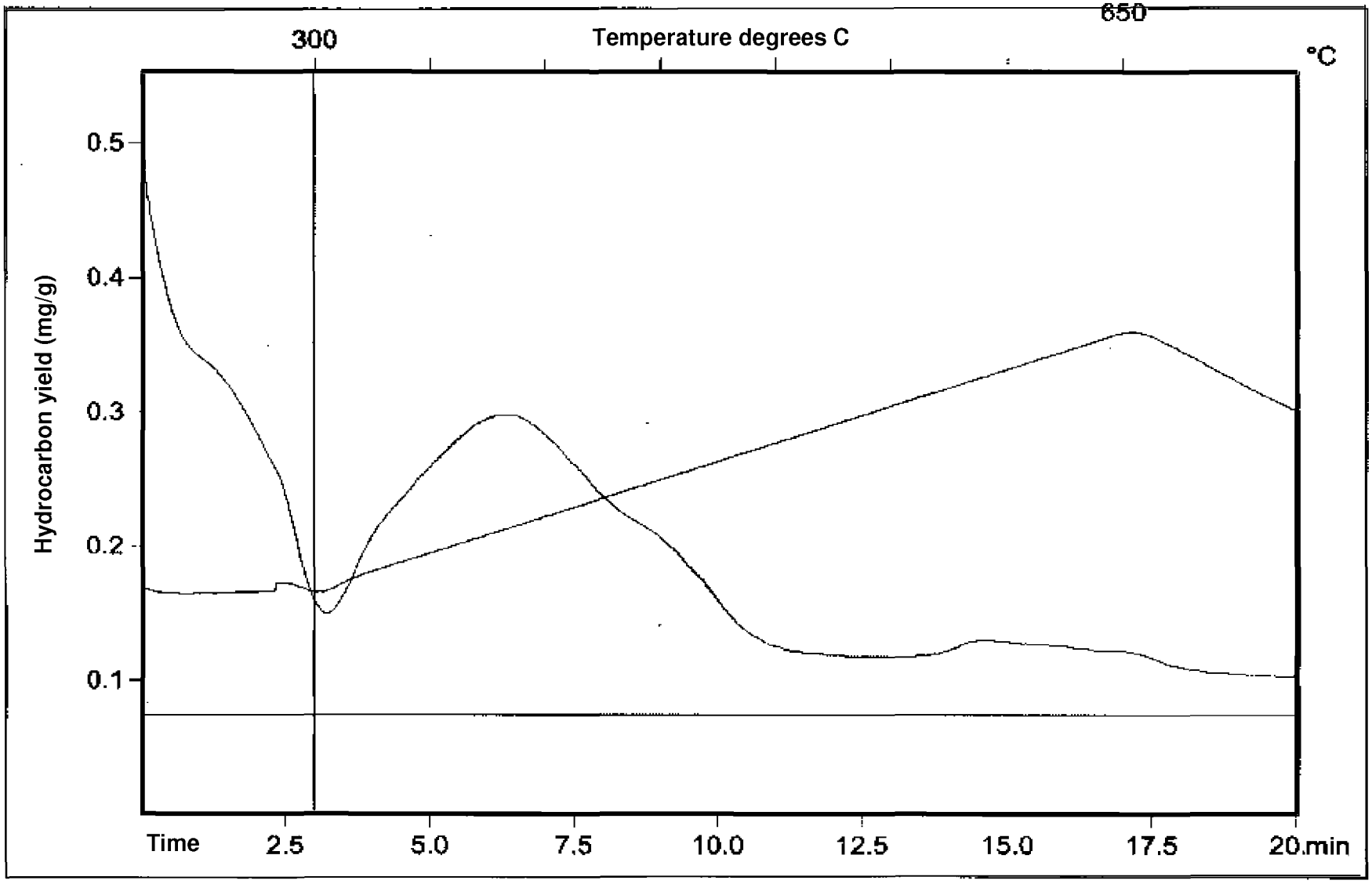


FIGURE 4.2 Rock-Eval pyrolysis pyrogram, core sample 4729.30m

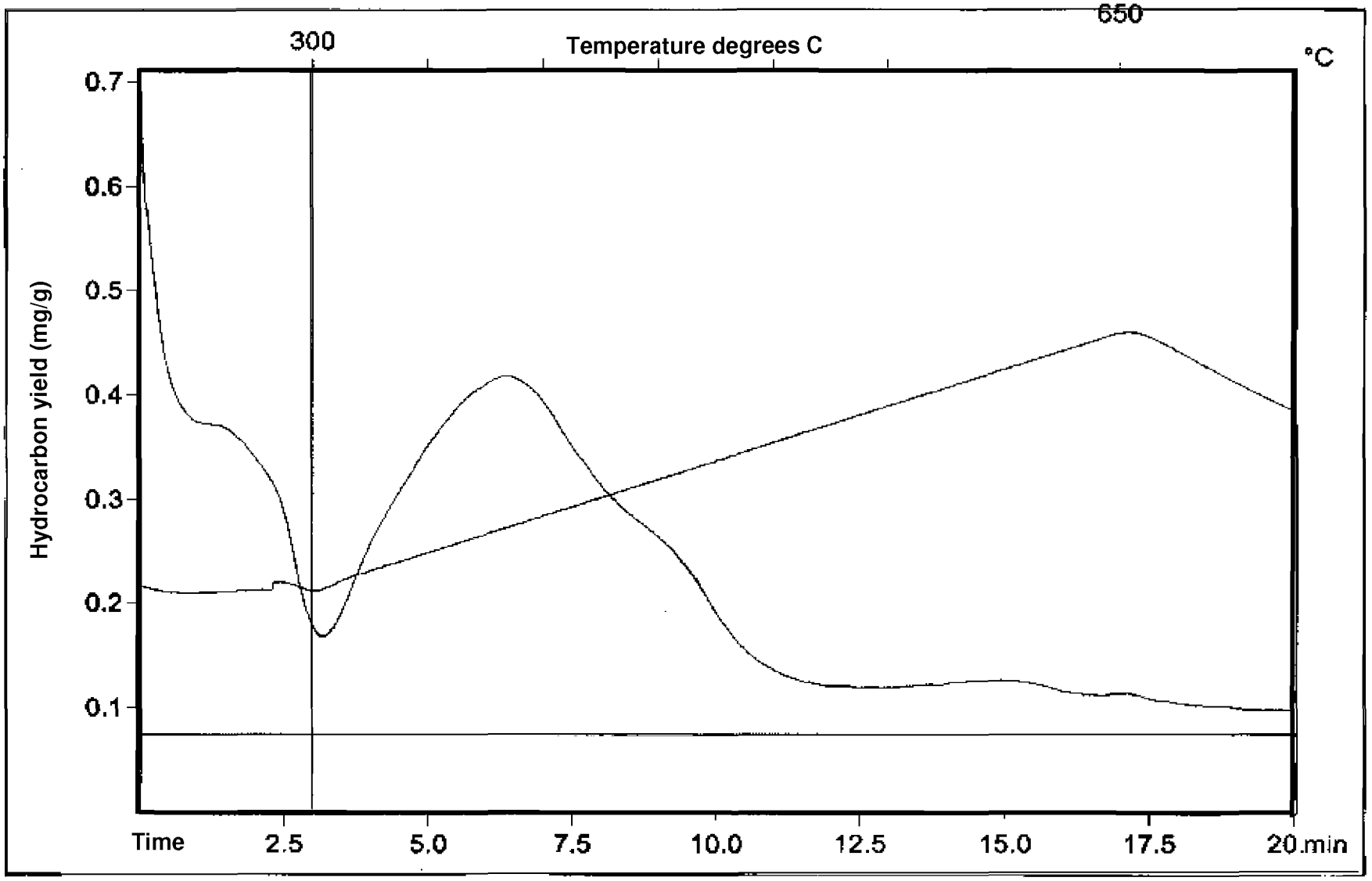


FIGURE 4.3 Rock-Eval pyrolysis pyrogram, core sample 4737.30m

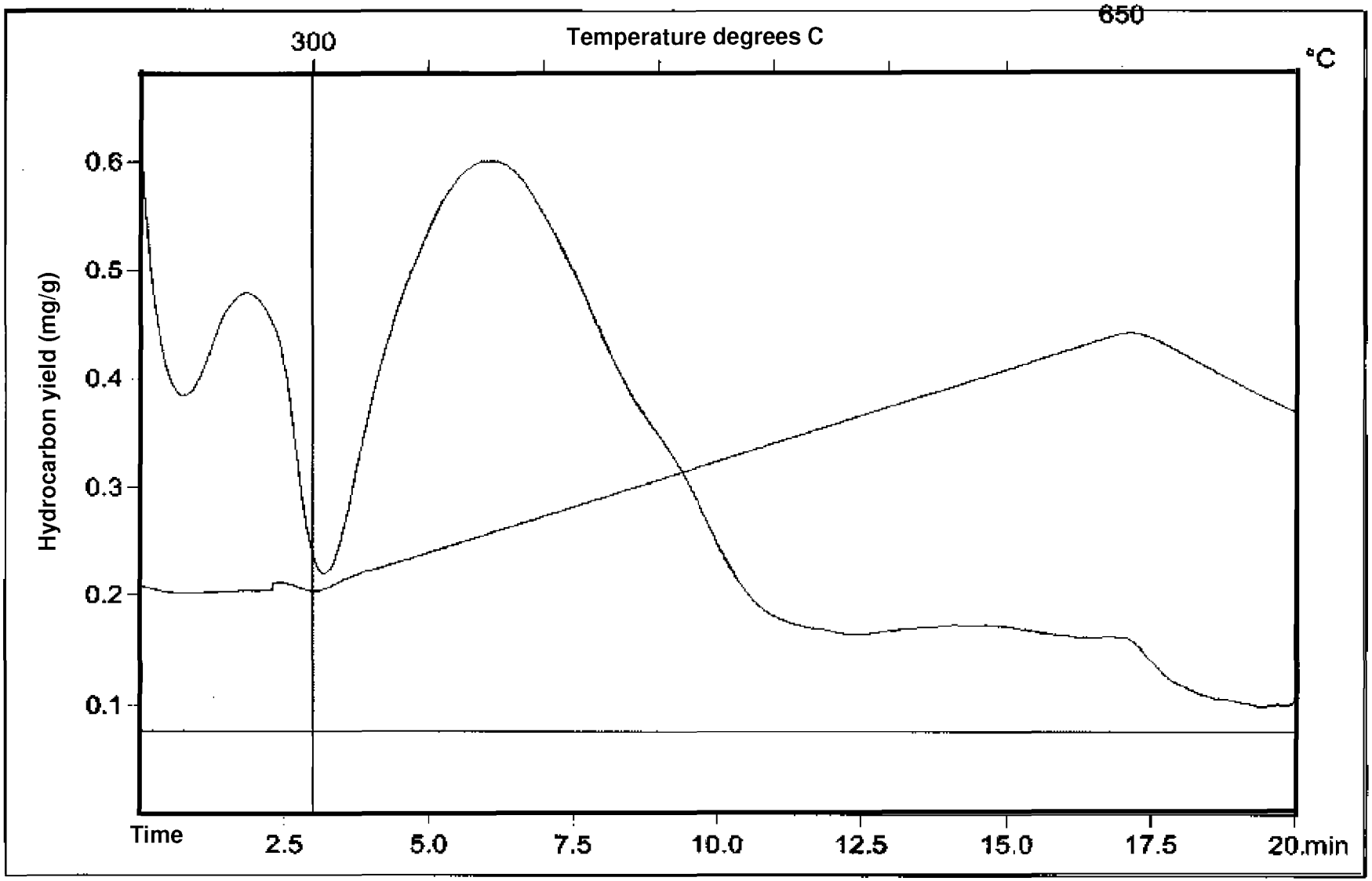


FIGURE 4.4 Rock-Eval pyrolysis pyrogram, core sample 4744.53m

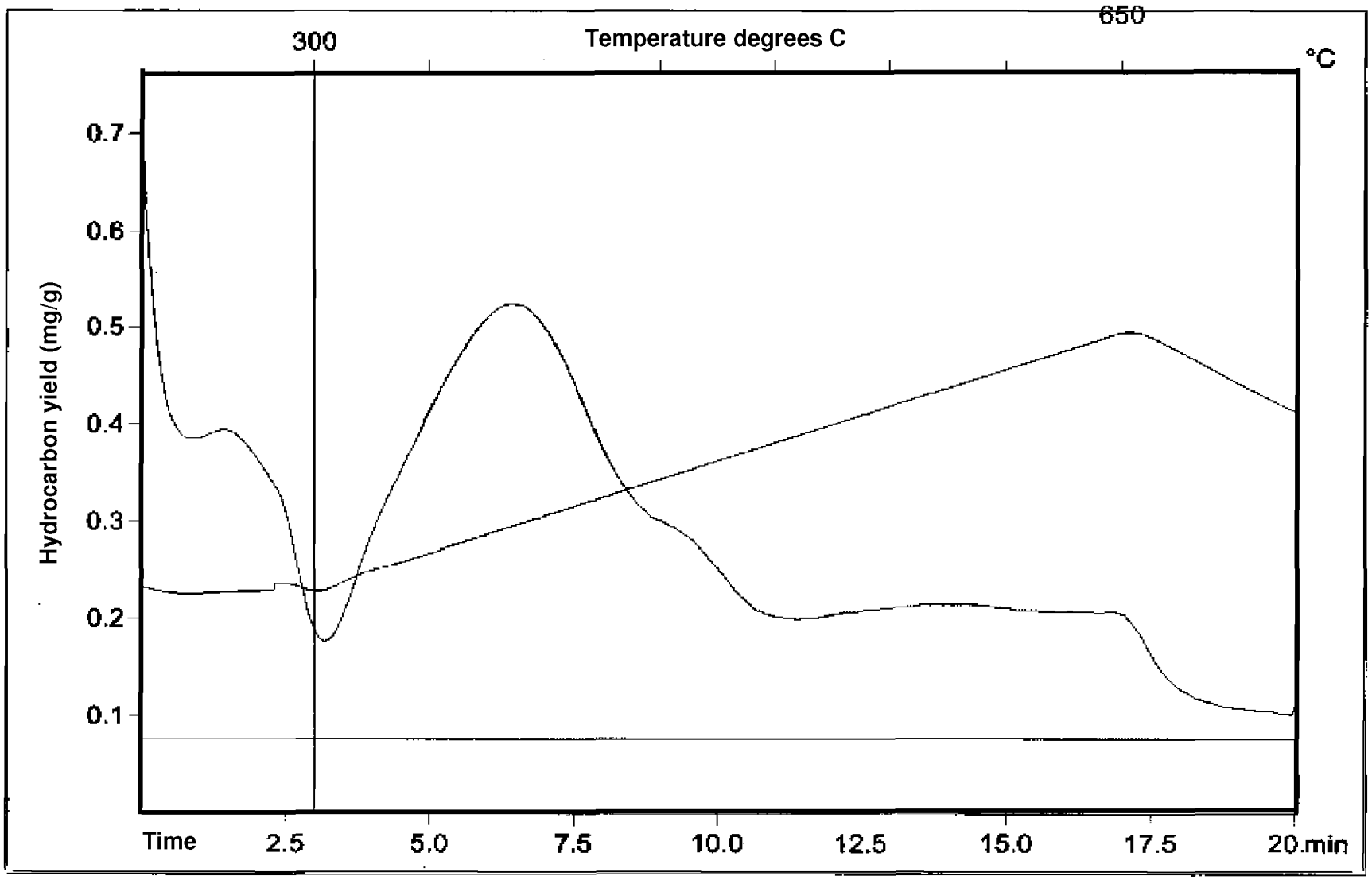


FIGURE 4.5 Rock-Eval pyrolysis pyrogram, core sample 4752.98m

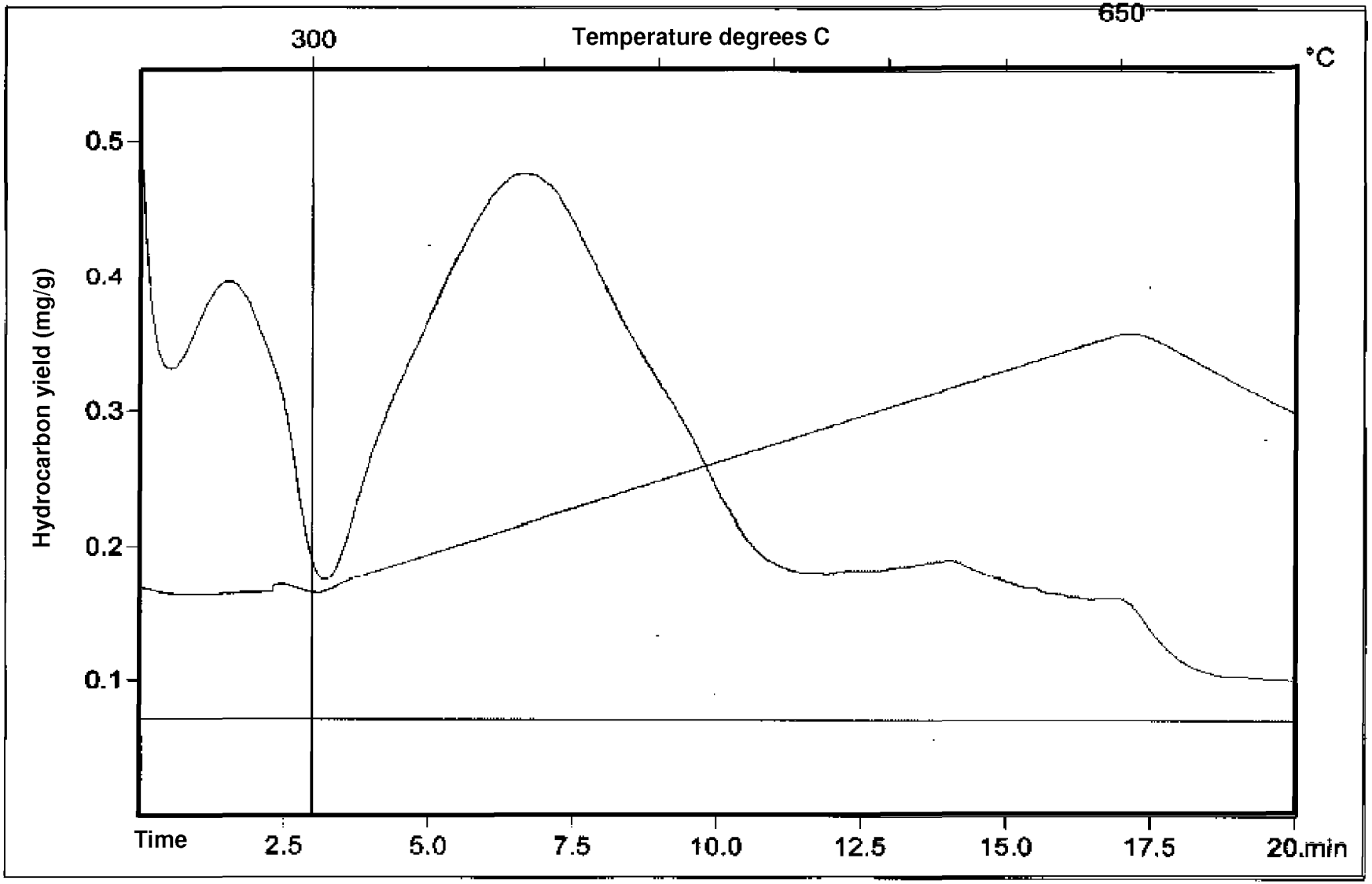


FIGURE 4.6 Rock-Eval pyrolysis pyrogram, core sample 4753.40m

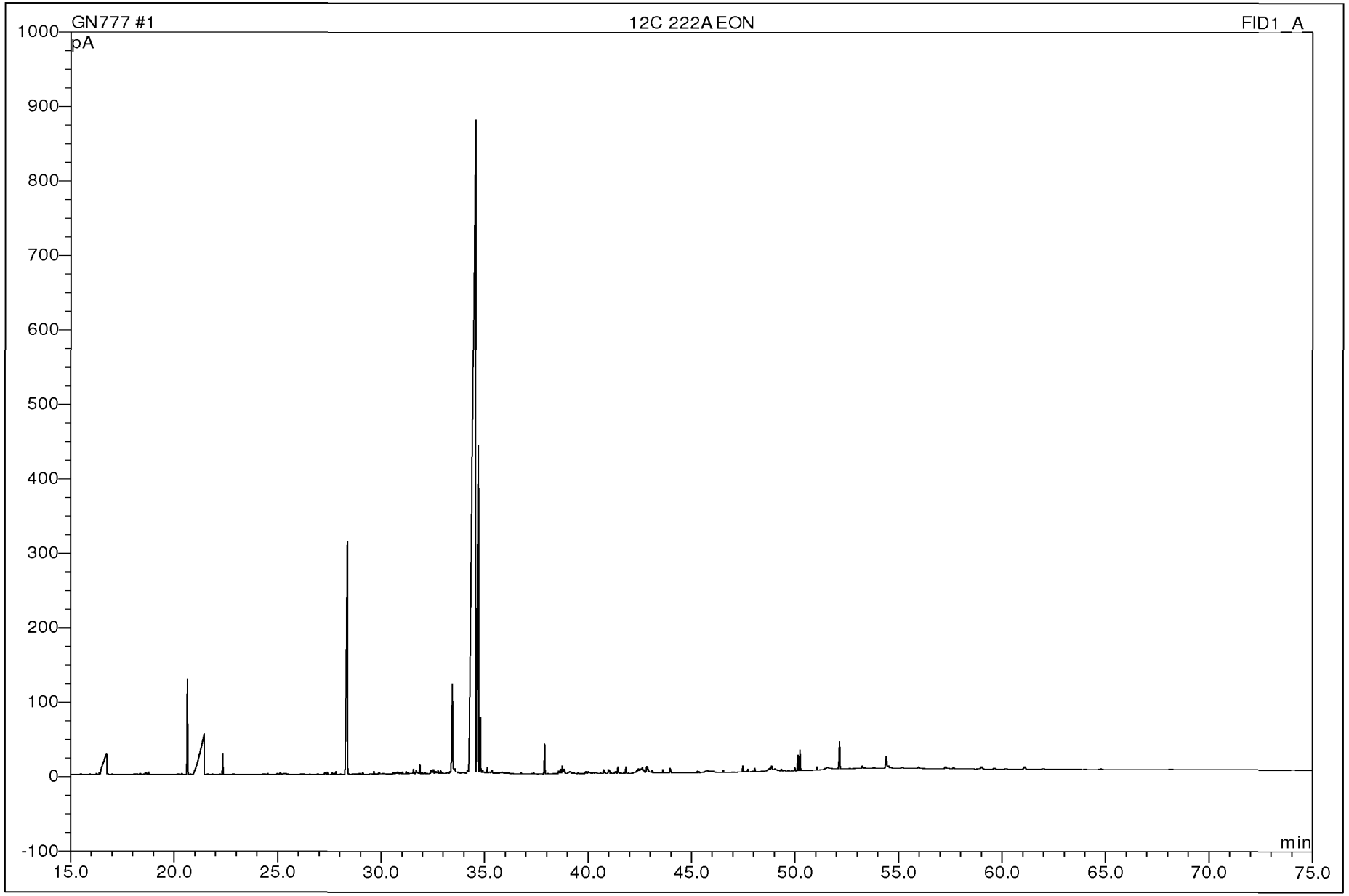


FIGURE 5.1.1 Whole extract gas chromatogram, core sample 4726.97m

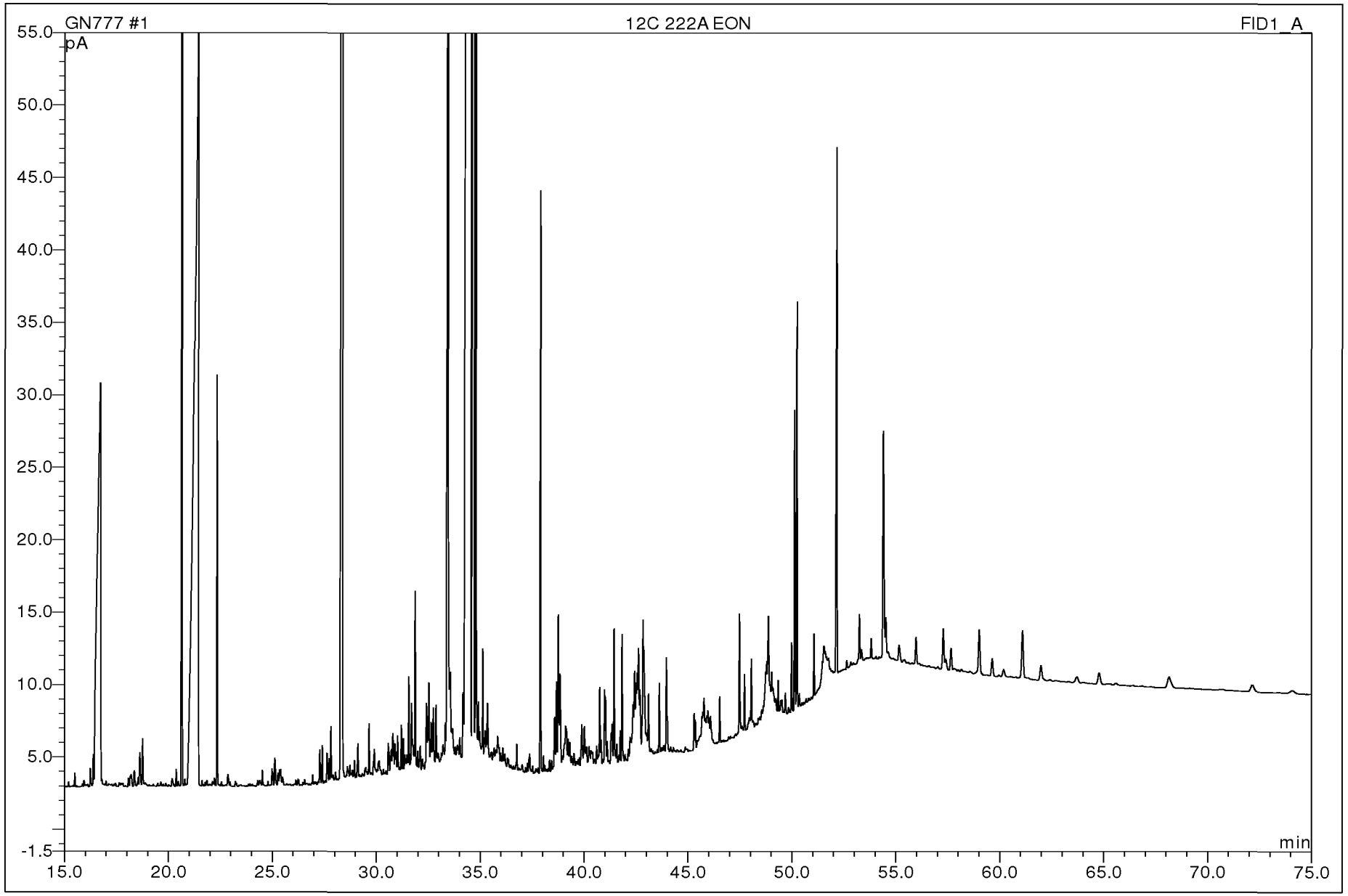


FIGURE 5.1.2 Whole extract gas chromatogram, core sample 4726.97m (expanded)

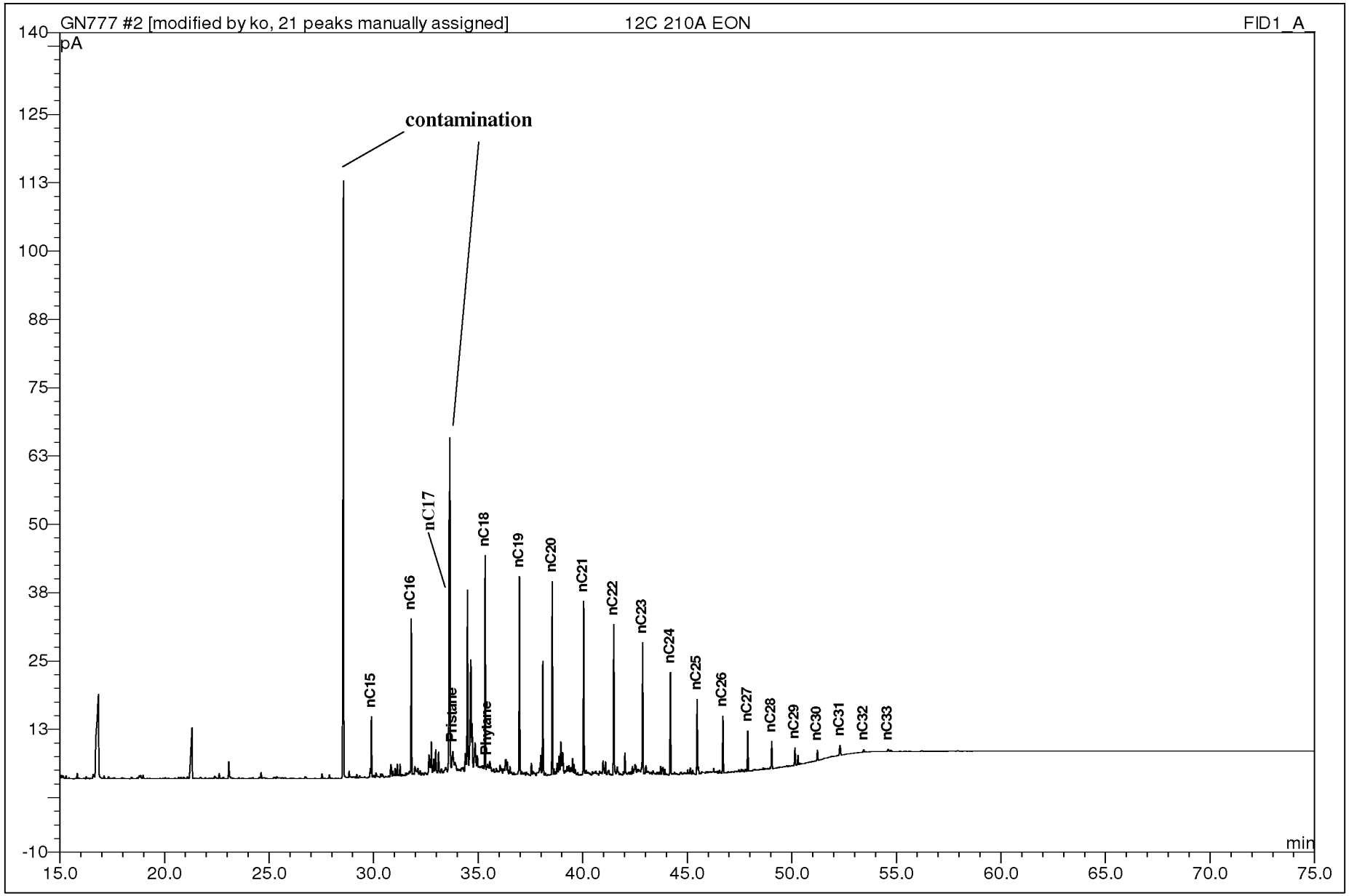


FIGURE 5.2 Whole extract gas chromatogram, core sample 4734.10m

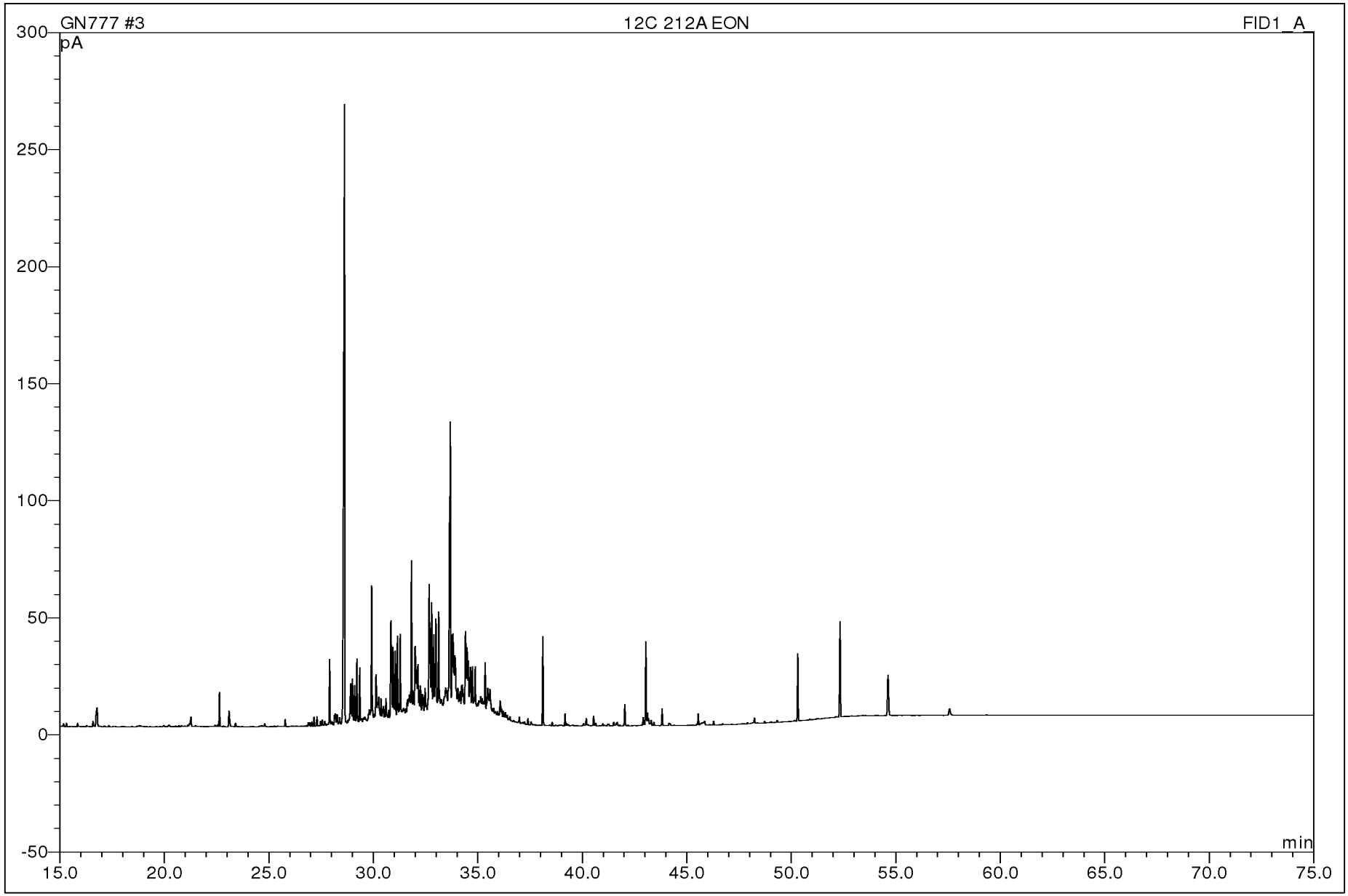


FIGURE 5.3.1 Whole extract gas chromatogram, core sample 4747.85m

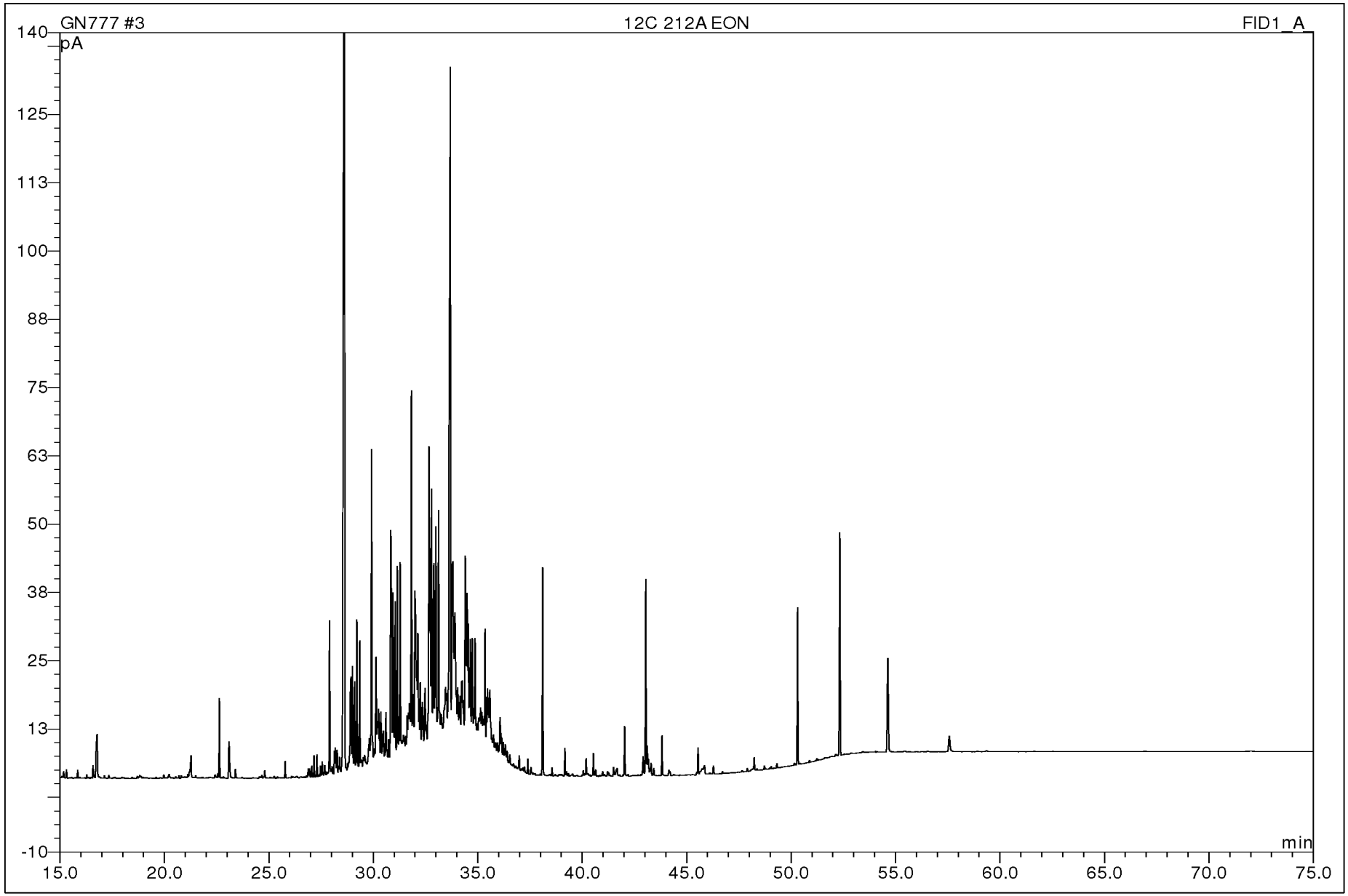


FIGURE 5.2.2 Whole extract gas chromatogram, core sample 4747.85m (expanded)

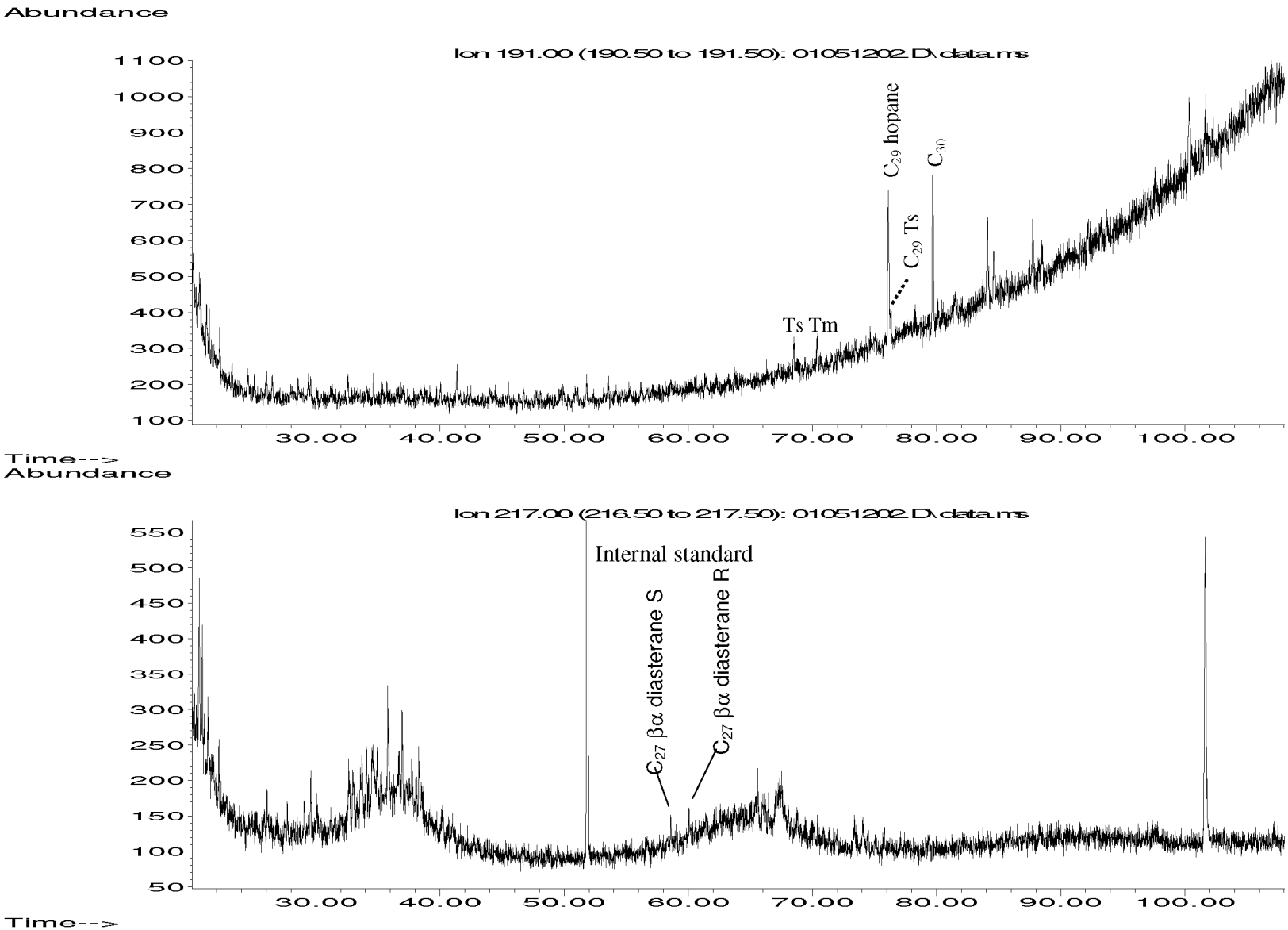


FIGURE 6.1 Alkane GC-MS fragmentograms, m/z 191, 217, core sample 4734.10m

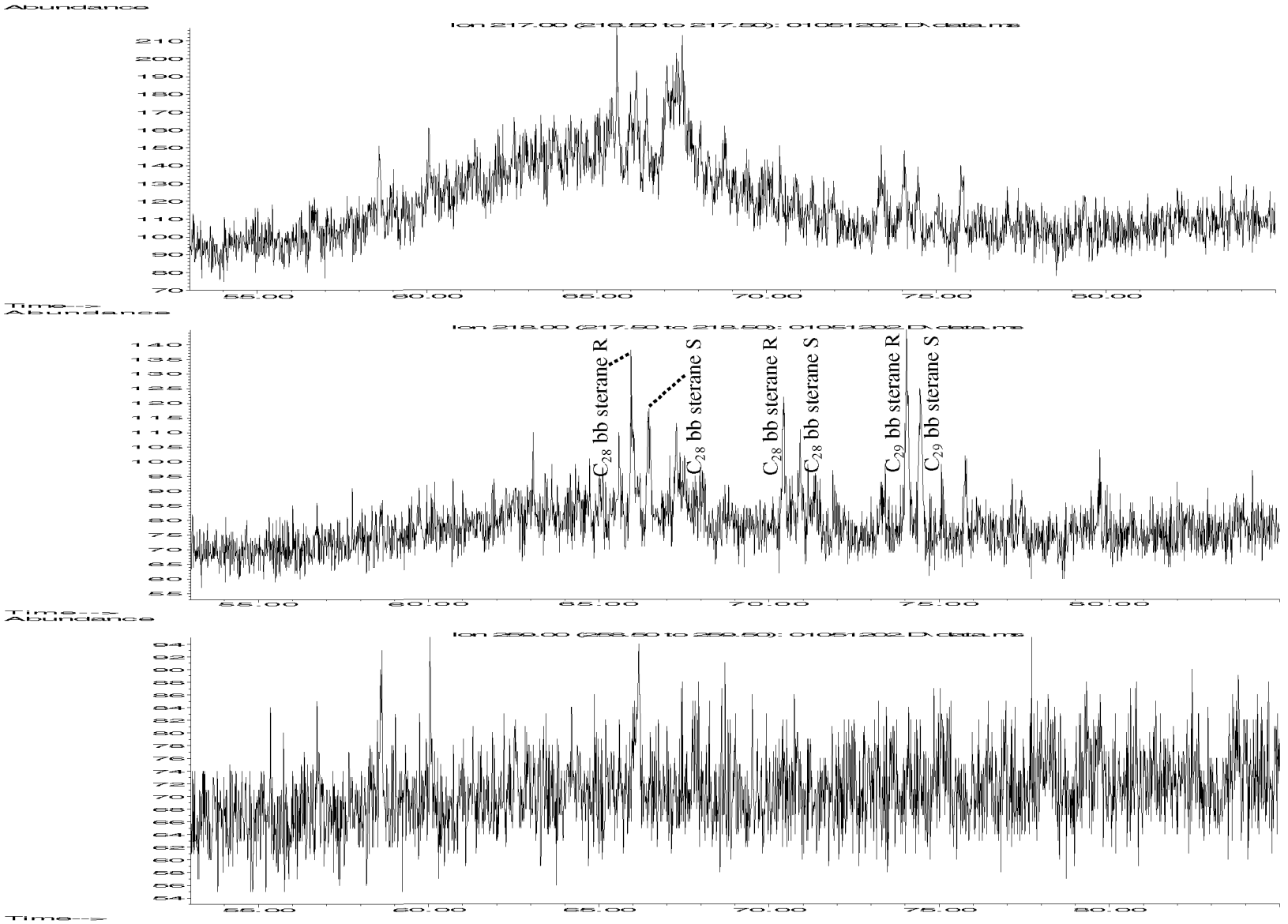


FIGURE 6.2 Alkane GC-MS fragmentograms, m/z 217, 218, 259 core sample 4734.10m

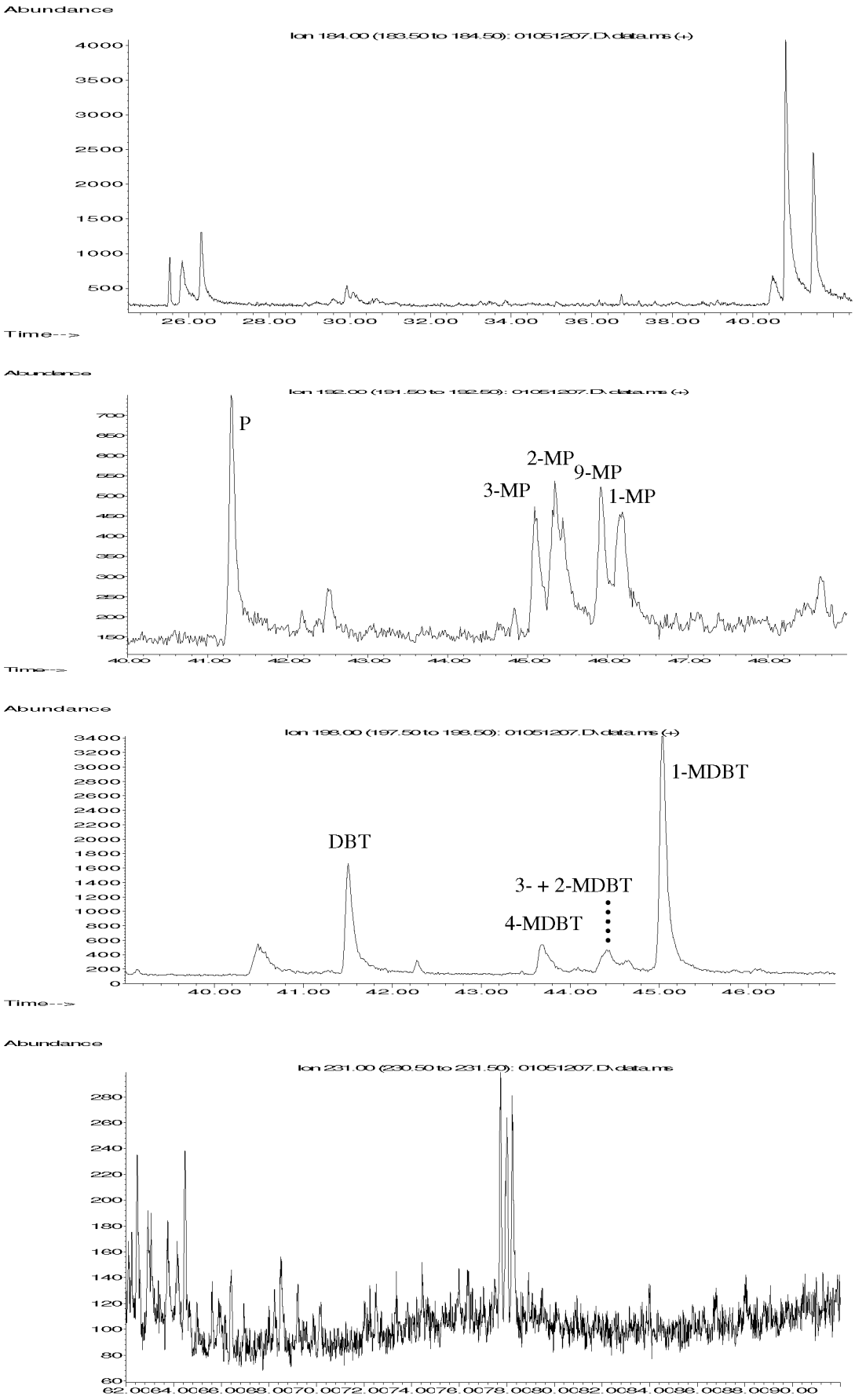


FIGURE 7 Aromatic GC-MS fragmentograms, m/z 184, 192, 198, 231 for core sample 4734.10m

APPENDIX 1

List of Abbreviations

a/a	-	as above	micr	-	micritic
Ac	-	acritarchs	min	-	mineral
ADD	-	mud additive	mnr	-	minor
Al	-	algae	mod	-	moderate
ALKS	-	alkanes	*n*-	-	normal
Am	-	amorphous	NA	-	not available
ANH	-	anhydrite	NS	-	no sample
aren	-	arenaceous	OC	-	organic carbon
arg	-	argillaceous	occ	-	occasional
AROMS	-	aromatics	OI	-	oxygen index
B(IT)	-	bitumen/bituminous	ol	-	olive
bl	-	blue	ool	-	oolitic
bld	-	bleached	orng	-	orange
blk	-	black	OS	-	oil stain
brn	-	brown	P	-	picked lithology, pale (bleached)
calc	-	calcareous	pal	-	pale
CALT	-	calcite	PDB	-	Pee Dee Belemnite
carb	-	carbonaceous	Ph	-	phytane
CGL	-	conglomerate	PI	-	production index
CHK	-	chalk	pnk	-	pink
CHT	-	chert	por	-	porous/porosity
CLYST	-	claystone	pp	-	purple
CMT	-	cement (from casing)	ppt	-	parts per thousand
CPI	-	carbon preference index	ppm	-	parts per million
crs	-	coarse	ppb	-	parts per billion (10^9)
CSG	-	casing point/shoe	Pr	-	pristane
cSt	-	centistokes	pred	-	predominantly
Ctgs	-	ditch cuttings	prt	-	present
Cu	-	cuticle	py	-	pyrolysis
C(vd)	-	caved	PY	-	potential yield
decarb	-	decarbonated	PYR/pyr	-	pyrite/pyritic
Di	-	dinocysts	QTZ(T)	-	quartz(ite)
dk	-	dark	Re	-	resin
DOL/dol	-	dolomite/dolomitic	R(ew)	-	reworked, reworked or high reflecting vitrinite/semifusinite
dsk	-	dusky	Ro	-	reflectance in oil
EPOC	-	extract percent OC	Sap	-	sapropel
E(XTR)	-	extract	SCI	-	spore colour index
Ex	-	exinite	SD	-	standard deviation
f	-	fine	Sf	-	semifusinite
fer	-	ferruginous	sft	-	soft
FID	-	flame ionisation detector	SH	-	shale
flu	-	fluorescence	shly	-	shaly
fm	-	formation	sil	-	siliceous
foss	-	fossils/fossiliferous	sks	-	slickenside surface
FPD	-	flame photometric detector	SLA	-	slate
Fu	-	fusinite	SLT(ST)	-	silt(stone)
GC	-	gas chromatogram (graph)	slty	-	silty
GLC/glc	-	glauconite/glauconitic	SMOW	-	standard mean oceanic water
GC-MS	-	gas chromatography - mass spectrometry	SND	-	sand
gn	-	green	s(t)	-	stained
grd	-	graded/grading to	sndy	-	sandy
grns	-	grains	Sp	-	spores
gy	-	grey	SST	-	sandstone
GYP	-	gypsum	stg	-	strong
HAL	-	halite	str	-	structured
HC	-	hydrocarbons	SWC	-	sidewall core
hd	-	hard	TAI	-	thermal alteration index
HI	-	hydrogen index	TD	-	total depth
i-	-	iso-	TOC	-	total organic carbon
i/b	-	interbedded	tr	-	trace(s)
IGN	-	igneous rocks	v	-	very
indet	-	indeterminate	Vit	-	vitrinite
indig	-	indigenous	vn	-	vein
Inert	-	inertinite	VR	-	vitrinite reflectivity
lam	-	laminae/laminated	wht	-	white
LCM	-	lost circulation material	wk	-	weak
LIG/Lig	-	lignite/lignitic	wxy	-	waxy
L(RV)	-	low reflecting vitrinite	xln	-	crystalline
LST	-	limestone	yel	-	yellow
lt	-	light			
mass	-	massive	-	-	no analysis carried out
MDST	-	mudstone	*	-	analysed but no data obtained
med	-	medium	gy-gn	-	greyish green
MET	-	metamorphic rocks	gy/gn	-	grey-green (gradation)
mic	-	mica/micaceous	gn-gy	-	greenish grey

Note: Maturity tables only. Number in brackets refers to number of reflectivity values averaged to give quoted result. Preferred values for indigenous phytoclasts are listed first.