725.3 U-139

SOURCE CHARACTERISTICS OF CANNED CUTTINGS FROM 25/8-2 WELL, OFFSHORE NORWAY

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SUMMARY AND CONCLUSIONS

Canned cuttings from the interval 600-8400 ft were analyzed routinely for hydrocarbon source characteristics. Charges for this work were billed to our Job. No. 7880.

The analytical results are interpreted grossly as follows:

Approximate Interval (ft)	Organic Maturity	Richness or Quality of Source Beds	Indigenous Hydrocarbons Expected if Reservoired
600 - 5400	Immature	Poor to Marginal	Lean
5400 - 6250	Transitional	Poor to Marginal	Minor Gas
6250 - 7000?	Transitional	Fair to Good	Oil, Gas
7000? - 8400	Mature	Fair to Rich	Oil, Gas

A graphical summary of the results is given in Fig. 1 and the analytical data are listed in detail in Tables I thru III.

The delineation of the mature zone is a problem. The gasoline (C_4-C_7) yields and the percent C_2-C_4 in total gas suggest that several zones below about 5400 ft are modest sources of hydrocarbon gases and liquids. However, the low kerogen alteration data suggest that these beds are immature to about 6200 ft, and possibly to below 7000 ft. Perhaps some of the gasoline and gases in samples from above 6000 ft. represent migrated materials.

The shales above about 7500 are not very rich in organic content. This is shown by total organic contents mostly less than 1%, and by relatively low total gas yields. The principal exception is a gray shale interval from roughly 6250 to 6700 ft (we have not seen logs of the well) which appears to average between 1.2% and 1.5% total organic matter. These gray shales also apparently contain notable amounts of amorphous and herbaceous organic materials, which are generally rated as oil-prone.

The shales starting at about 7500 ft include beds rich in organic content, some of which contain oil-prone algal and amorphous kerogens. These beds are rated as rich sources of oil and gas.

PROCEDURES

Compositions and concentrations of hydrocarbon gases in the air spaces above the cuttings in the sample cans were determined by gas chromatography. Similar data were obtained on gases released from a standard mixture of cuttings and tap water after two minutes of agitation in a Waring blender. Combined results on the air space gas plus the cuttings gas were calculated for each sample. The data were plotted graphically to show vertical variations in total gas (C_1-C_4) and wet gas (C_2-C_4), and a graphical plot was also made of the percent wet gas in total gas (Fig. 1). Detailed results of the gas analyses are listed in Table I.

Chips of uniform lithologies were picked by hand from the heterogeneous mixtures of chips in the original samples. These are described in Table II. Our routine analytical procedures were used for determining the light gasoline (C_4-C_7) content and the total organic content of the "picked" chips. These results are given in Table III, and they are plotted graphically in Fig. 1. Visual kerogen characteristics were also determined on 14 of the "picked" samples (Fig. 1 and Table II).

DISCUSSION

The profiles of percent C_2-C_4 in total gas and of gasoline yields both suggest that mature oil source beds are present below about 5500 ft (Fig. 1). High C_2-C_4 percentages and high gasoline yields are common for several intervals below 5400 ft. However, the total gas yields and the concentrations of total organic matter are not really very high. The gray shales starting at roughly 6250 ft are the first to rate as better than "marginal" in source quality (Fig. 1). Scattered shales from below about 7500 ft are the only samples that can be rated as "rich" sources.

Most of the samples that were rich in gasolines did not give particularly high gas yields (Fig. 1). This is consistent with the pattern of modest total organic matter values, but it is also possible that considerable gas has migrated into the sands that are in the section.

The kerogen in samples starting at about 6250 ft includes appreciable percentages of herbaceous, amorphous and algal materials, which are considered to be oil-prone. These kerogen types are accompanied by the high gasoline and C_2-C_4 values cited above. That is, the "oil-prone" kerogen appears to have generated wet gas and gasolines, as expected. The discrepancy in the picture is the kerogen alteration profile (Fig. 1). The alterations listed are mostly less than "2", or "immature". However, some microfossils were regularly noted with alterations up to "2^+" in samples from below 7000 ft. (See Table II.) Conceivably the lower alteration values came mainly from cavings and the "2^+" values are the true indices. Alternatively, the lower alteration values are correct as shown in Fig. 1, and with more maturity we would see much higher gas yields and possibly much greater amounts of reservoired hydrocarbons.

Related Report

EPR.94ES.75 "Hydrocarbon Source Characteristics of Cuttings from Well 25/11-5, Norway" by R.E. Metter, August 1975.

TABLE IA

C_1-C_4 HYDROCARBON ANALYSES - AIR SPACE AT TOP OF CANS

SAMPLE NUMBER	R	DEPTH	GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)							GAS COMPOSITION (PERCENT)									
										TOTAL GAS						WET GAS			
			METHANE (C_1)	ETHANE (C_2)	PROPANE (C_3)	ISO-BUTANE (iC_4)	NORMAL BUTANE (nC_4)	WET (C_2-C_4)	TOTAL (C_1-C_4)	C_2-C_4	C_1	C_2	C_3	iC_4	nC_4	C_2	C_3	iC_4	nC_4
66362A	4	700	3.32	0.20	0.09	0.04	0.07	0.40	3.72	10.7527	90.	5.	2.	1.	2.	49.	23.	10.	18.
66362E	4	1100	14.59	0.84	0.36	0.22	0.43	1.85	16.44	11.2530	89.	5.	2.	1.	3.	46.	19.	12.	23.
66362I	4	1500	4.52	0.16	0.09	0.04	0.05	0.34	4.86	6.9959	93.	3.	2.	1.	1.	47.	26.	12.	15.
66362M	4	1900	34.29	1.32	1.71	0.58	4.92	8.53	42.82	19.9205	81.	3.	4.	1.	11.	15.	20.	7.	58.
66362O	4	2400	4.12	0.16	0.09	0.05	0.06	0.36	4.48	8.0357	92.	4.	2.	1.	1.	44.	25.	14.	17.
66362S	4	2800	6.03	0.29	0.12	0.05	0.11	0.57	6.60	8.6363	91.	4.	2.	1.	2.	51.	21.	9.	19.
66363A	4	3000	6.18	0.43	0.12	0.08	0.12	0.75	6.93	10.8225	89.	6.	2.	1.	2.	57.	16.	11.	16.
66363D	4	3300	19.27	1.50	1.94	0.19	0.92	4.55	19.82	22.9565	76.	8.	10.	1.	5.	33.	43.	4.	20.
66363G	4	3600	920.25	4.94	0.87	0.07	0.25	6.13	926.38	0.6617	99.	1.	0.	0.	0.	81.	14.	1.	4.
66363I	4	3800	701.60	3.57	1.76	0.12	1.14	6.59	708.19	0.9305	99.	1.	0.	0.	0.	54.	27.	2.	17.
66363K	4	4100	1.75	0.05	0.02	0.01	0.02	0.10	1.85	5.4053	94.	3.	1.	1.	1.	50.	20.	10.	20.
66363M	4	4300	5.05	0.43	0.21	0.11	0.18	0.93	5.98	15.5518	84.	7.	4.	2.	3.	46.	23.	12.	19.
66363O	4	4500	1498.03	15.04	5.68	5.24	2.45	28.41	1526.44	1.8612	99.	1.	0.	0.	0.	53.	20.	18.	9.
663630	4	4700	5.42	0.26	0.10	0.09	0.14	0.59	6.01	9.8169	91.	4.	2.	1.	2.	44.	17.	15.	24.
663635	4	4900	68.65	17.45	47.74	35.09	43.02	143.30	211.95	67.6103	32.	8.	23.	17.	20.	12.	34.	24.	30.
66364A	4	5100	2.92	0.17	0.06	0.05	0.10	0.38	3.30	11.5151	88.	5.	2.	2.	3.	45.	16.	13.	26.
66364B	4	5200	5.81	0.31	0.45	0.35	0.58	1.69	7.50	22.5333	77.	4.	6.	5.	8.	18.	27.	21.	34.
66364C	4	5300	2.54	0.21	0.55	0.40	0.59	1.75	4.29	40.7925	59.	5.	13.	9.	14.	12.	31.	23.	34.
66364D	4	5400	20.16	82.26	98.93	102.67	142.14	426.00	446.16	95.4814	5.	18.	22.	23.	32.	19.	23.	24.	34.
66364E	4	5500	7.50	2.93	3.40	2.60	4.14	13.07	20.57	63.5391	36.	14.	17.	13.	20.	22.	26.	20.	32.
66364F	4	5600	26.36	4.16	10.00	8.37	13.43	35.96	62.32	57.7022	42.	7.	16.	13.	22.	12.	28.	23.	37.
66364G	4	5700	10.55	0.66	0.83	0.55	1.63	3.67	14.22	25.8087	74.	5.	6.	4.	11.	18.	23.	15.	44.
66364H	4	5800	7816.34	1644.22	2096.31	834.07	1482.94	6057.53	13873.87	43.6614	56.	12.	15.	6.	11.	27.	35.	14.	24.
66364I	4	5900	10.51	13.27	52.26	27.72	54.87	148.12	158.63	93.3745	7.	8.	33.	17.	35.	9.	35.	19.	37.
66364J	4	6000	313.96	59.14	86.64	35.47	69.10	250.35	564.31	44.3639	57.	10.	15.	6.	12.	24.	34.	14.	28.
66364K	4	6100	7339.28	1340.51	1467.64	471.29	818.71	4098.14	11437.42	35.8310	64.	12.	13.	4.	7.	33.	35.	12.	20.
66364L	4	6200	25.22	1.09	0.77	0.61	0.96	3.43	28.65	11.9720	88.	4.	3.	2.	3.	32.	22.	18.	28.
66364M	4	6300	10.85	0.68	3.26	2.00	4.46	10.40	21.25	48.9411	52.	3.	15.	9.	21.	7.	31.	19.	43.
66364N	4	6400	10.44	5.20	38.52	17.00	42.19	102.91	113.35	90.7896	9.	5.	34.	15.	37.	5.	37.	17.	41.
66364O	4	6500	22.86	7.13	38.75	11.78	28.18	85.84	108.70	78.9696	21.	7.	35.	11.	26.	8.	45.	14.	33.
66364P	4	6600	6.87	1.98	7.44	0.70	3.47	13.59	20.46	66.4222	34.	10.	36.	3.	17.	15.	54.	5.	26.
66364Q	4	6700	3.96	5.82	15.34	2.94	6.99	31.09	35.05	88.7018	11.	17.	44.	8.	20.	19.	50.	9.	22.
66364R	4	6800	3.92	1.22	5.95	1.38	3.74	12.29	16.21	75.8174	24.	8.	36.	9.	23.	10.	49.	11.	30.
66364S	4	6900	4.93	4.81	17.66	4.70	10.76	37.93	42.86	88.4974	12.	11.	41.	11.	25.	13.	47.	12.	28.
66364T	4	7000	7.48	0.38	0.20	0.27	0.60	1.45	8.93	16.2374	84.	4.	2.	3.	7.	26.	14.	19.	41.
66365A	4	7100	7.49	2.07	14.41	8.65	17.62	42.75	50.24	85.0915	15.	4.	29.	17.	35.	5.	34.	20.	41.
66365B	4	7200	8.19	0.37	0.87	0.54	1.26	3.04	11.23	27.0703	73.	3.	8.	5.	11.	12.	29.	18.	41.
66365C	4	7300	14.10	0.83	2.61	1.10	2.52	7.06	21.16	33.3647	67.	4.	12.	5.	12.	12.	36.	16.	36.
66365D	4	7400	4.75	0.25	0.73	0.34	0.65	1.97	6.72	29.3154	70.	4.	11.	5.	10.	13.	37.	17.	33.
66365E	4	7500	9.00	4.50	19.65	5.23	8.98	38.36	47.36	80.9966	19.	10.	41.	11.	19.	12.	51.	14.	23.
66365F	4	7600	204.63	90.88	54.32	8.53	10.74	164.47	369.10	44.5596	55.	25.	15.	2.	3.	55.	33.	5.	7.
66365G	4	7700	6.21	11.46	34.57	7.22	9.32	62.57	68.78	90.9712	9.	17.	50.	10.	14.	18.	55.	12.	15.
66365H	4	7800	7.58	0.55	1.63	0.92	1.24	4.34	11.92	36.4094	63.	5.	14.	8.	10.	13.	37.	21.	29.
66365I	4	7900	6.54	1.10	2.56	0.82	1.26	5.74	12.28	46.7426	53.	9.	21.	7.	10.	19.	45.	14.	22.
66365J	4	8000	11.04	6.38	9.91	2.75	2.93	21.97	33.01	66.5555	34.	19.	30.	8.	9.	29.	45.	13.	13.
66365K	4	8100	6.49	0.48	0.12	0.05	0.19	0.84	7.33	11.4597	87.	7.	2.	1.	3.	57.	14.	6.	23.
66365L	4	8200	6.66	2.75	5.10	1.90	2.25	12.00	18.66	64.3087	36.	15.	27.	10.	12.	23.	42.	16.	19.
66365M	4	8300	8.33	3.16	4.89	1.57	2.36	11.98	20.31	58.9856	40.	16.	24.	8.	12.	26.	41.	13.	20.
66365N	4	8400	8.43	0.60	1.02	0.62	0.86	3.10	11.53	26.8864	74.	5.	9.	5.	7.	19.	33.	20.	28.

TABLE I8

C_1-C_4 HYDROCARBON ANALYSES - CUTTINGS ONLY

SAMPLE NUMBER	R	DEPTH	GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)							GAS COMPOSITION (PERCENT)									
										TOTAL GAS						WET GAS			
			METHANE (C_1)	ETHANE (C_2)	PROPANE (C_3)	ISO-BUTANE (iC_4)	NORMAL BUTANE (nC_4)	WET (C_2-C_4)	TOTAL (C_1-C_4)	C_2-C_4	C_1	C_2	C_3	iC_4	nC_4	C_2	C_3	iC_4	nC_4
66362A	4	700	704.30	4.95	0.58	0.19	0.64	6.36	710.66	0.8949	99.	1.	0.	0.	0.	78.	9.	3.	10.
66362E	4	1100	721.12	4.57	0.54	0.29	0.64	6.04	727.16	0.8305	99.	1.	0.	0.	0.	75.	9.	5.	11.
66362I	4	1500	738.99	5.25	1.07	0.29	0.59	7.20	746.19	0.9648	99.	1.	0.	0.	0.	73.	15.	4.	8.
66362M	4	1900	725.33	6.60	2.21	1.21	9.03	19.05	744.38	2.5591	98.	1.	0.	0.	1.	35.	12.	6.	47.
66362Q	4	2400	693.79	5.92	1.68	0.68	1.14	9.42	703.21	1.3395	99.	1.	0.	0.	0.	63.	18.	7.	12.
66362S	4	2800	490.91	5.04	1.16	0.19	1.74	8.13	499.04	1.6291	99.	1.	0.	0.	0.	63.	14.	2.	21.
66363A	4	3000	11.69	0.62	0.21	0.10	0.37	1.30	12.99	10.0077	89.	5.	2.	1.	3.	48.	16.	8.	28.
66363D	4	3300	659.10	4.35	1.07	0.29	1.11	6.82	665.92	1.0240	99.	1.	0.	0.	0.	64.	16.	4.	16.
66363G	4	3600	524.55	3.47	0.68	0.30	0.69	5.14	529.69	0.9703	99.	1.	0.	0.	0.	68.	13.	6.	13.
66363I	4	3800	425.74	4.20	0.73	0.15	0.88	5.96	431.70	1.3805	99.	1.	0.	0.	0.	70.	12.	3.	15.
66363K	4	4100	579.21	5.10	0.37	0.15	0.52	6.14	585.35	1.0488	99.	1.	0.	0.	0.	84.	6.	2.	8.
66363M	4	4300	557.14	4.65	0.44	0.17	0.42	5.68	562.82	1.0091	99.	1.	0.	0.	0.	82.	8.	3.	7.
66363O	4	4500	570.80	3.52	0.89	2.30	1.55	8.26	579.06	1.4263	99.	1.	0.	0.	0.	42.	11.	28.	19.
66363Q	4	4700	544.52	4.50	28.69	19.81	23.01	76.01	620.53	12.2491	87.	1.	5.	3.	4.	6.	38.	26.	30.
66363S	4	4900	522.45	7.48	39.25	58.74	93.81	199.28	721.73	27.6114	73.	1.	5.	8.	13.	4.	20.	29.	47.
66364A	4	5100	582.36	8.35	26.08	39.47	64.34	138.24	720.60	19.1839	81.	1.	4.	5.	9.	6.	19.	29.	46.
66364B	4	5200	494.06	4.30	6.99	18.49	35.93	65.71	559.77	11.7387	89.	1.	1.	3.	6.	7.	11.	28.	54.
66364C	4	5300	612.85	25.20	108.80	95.57	157.18	386.75	999.60	38.6904	60.	3.	11.	10.	16.	7.	28.	25.	40.
66364D	4	5400	490.38	106.08	315.47	454.39	723.58	1599.52	2089.90	76.5357	23.	5.	15.	22.	35.	7.	20.	28.	45.
66364E	4	5500	546.62	95.28	337.82	413.36	802.87	1649.33	2195.95	75.1078	25.	4.	15.	19.	37.	6.	20.	25.	49.
66364F	4	5600	464.63	21.54	148.54	220.98	476.48	867.54	1332.17	65.1223	35.	2.	11.	17.	35.	2.	17.	25.	56.
66364G	4	5700	853.57	9.75	67.07	121.68	290.28	488.78	1342.35	36.4122	63.	1.	5.	9.	22.	2.	14.	25.	59.
66364H	4	5800	904.03	158.88	294.17	221.29	523.92	1188.26	2092.29	56.7923	42.	8.	14.	11.	25.	13.	24.	19.	44.
66364I	4	5900	853.57	12.39	150.78	164.10	420.55	747.82	1601.39	46.6982	54.	1.	9.	10.	26.	2.	20.	22.	56.
66364J	4	6000	763.17	20.40	79.86	76.46	201.78	378.50	1141.67	33.1532	66.	2.	7.	7.	18.	5.	21.	20.	54.
66364K	4	6100	604.44	32.52	105.32	76.61	190.10	404.55	1008.99	40.0945	60.	3.	10.	8.	19.	8.	26.	19.	47.
66364L	4	6200	480.40	11.46	55.02	71.17	161.95	299.60	780.00	38.4102	62.	1.	7.	9.	21.	4.	18.	24.	54.
66364M	4	6300	620.21	28.74	722.35	820.51	2276.93	3848.53	4468.74	86.1211	14.	1.	16.	18.	51.	1.	19.	21.	59.
66364N	4	6400	503.00	33.72	919.08	420.20	1331.04	2704.04	3207.04	84.3158	16.	1.	29.	13.	41.	1.	34.	16.	49.
66364O	4	6500	675.92	142.32	2138.23	914.99	2854.66	6050.20	6726.12	89.9508	10.	2.	32.	14.	42.	2.	35.	15.	48.
66364P	4	6600	649.64	69.48	1269.82	798.13	2319.41	4456.84	5106.48	87.2781	13.	1.	25.	16.	45.	2.	28.	18.	52.
66364Q	4	6700	658.05	523.20	2702.59	542.66	1622.73	5391.17	6049.22	89.1217	11.	9.	44.	9.	27.	10.	50.	10.	30.
66364R	4	6800	717.97	98.04	925.04	312.66	978.46	2314.20	3032.17	76.3216	24.	3.	31.	10.	32.	4.	40.	14.	42.
66364S	4	6900	662.26	76.08	797.86	292.77	1026.60	2193.31	2855.57	76.8081	23.	3.	28.	10.	36.	3.	36.	13.	48.
66364T	4	7000	620.72	6.12	47.82	86.09	297.36	437.39	1068.11	40.9499	59.	1.	4.	8.	28.	1.	11.	20.	68.
66365A	4	7100	444.66	17.82	308.02	169.39	502.68	997.91	1442.57	69.1758	31.	1.	21.	12.	35.	2.	31.	17.	50.
66365B	4	7200	525.60	6.70	83.21	80.81	263.73	434.45	960.05	45.2528	55.	1.	9.	8.	27.	2.	19.	19.	60.
66365C	4	7300	509.83	11.55	256.68	198.29	604.63	1065.35	1575.18	67.6335	32.	1.	16.	13.	38.	1.	24.	19.	56.
66365D	4	7400	441.50	6.04	71.04	58.27	189.39	324.74	766.24	42.3809	57.	1.	9.	8.	25.	2.	22.	18.	58.
66365E	4	7500	463.05	92.40	1102.90	389.12	1212.09	2796.51	3259.56	85.7941	14.	3.	34.	12.	37.	3.	39.	14.	44.
66365F	4	7600	7198.61	12633.59	12578.96	1690.75	3497.52	30400.82	37599.43	80.8545	19.	35.	33.	4.	9.	41.	41.	6.	12.
66365G	4	7700	541.37	141.60	1436.74	634.03	1560.43	3772.80	4314.17	87.4513	13.	3.	33.	15.	36.	4.	38.	17.	41.
66365H	4	7800	466.73	15.54	248.40	173.43	417.72	855.09	1321.82	64.6903	35.	1.	19.	13.	32.	2.	29.	20.	49.
66365I	4	7900	418.90	27.54	318.95	293.40	733.49	1373.38	1792.28	76.6275	23.	2.	18.	16.	41.	2.	23.	21.	54.
66365J	4	8000	443.61	167.04	914.11	272.88	502.68	1856.71	2300.32	80.7153	19.	7.	40.	12.	22.	9.	49.	15.	27.
66365K	4	8100	511.93	704.64	1428.80	372.96	676.85	3183.25	3695.18	86.1460	14.	19.	39.	10.	18.	22.	45.	12.	21.
66365L	4	8200	252.29	405.12	1387.06	462.47	862.34	3116.99	3369.28	92.5120	7.	12.	41.	14.	26.	13.	44.	15.	28.
66365M	4	8300	605.49	117.36	371.11	146.70	298.07	933.24	1538.73	60.6500	39.	8.	24.	10.	19.	13.	39.	16.	32.
66365N	4	8400	417.65	4.95	72.66	44.68	105.67	227.96	645.81	35.2983	65.	1.	11.	7.	16.	2.	32.	20.	46.

TABLE IC

C_1-C_4 HYDROCARBON ANALYSES - CUTTINGS AND AIR SPACE

SAMPLE NUMBER	R	DEPTH	GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)							GAS COMPOSITION (PERCENT)									
										TOTAL GAS						WET GAS			
			METHANE (C_1)	ETHANE (C_2)	PROPANE (C_3)	ISO-BUTANE (iC_4)	NORMAL BUTANE (nC_4)	WET (C_2-C_4)	TOTAL (C_1-C_4)	C_2-C_4	C_1	C_2	C_3	iC_4	nC_4	C_2	C_3	iC_4	nC_4
66362A	4	700	707.62	5.15	0.67	0.23	0.71	6.76	714.38	0.9462	99.	1.	0.	0.	0.	76.	10.	3.	11.
66362E	4	1100	735.71	5.41	0.90	0.51	1.07	7.89	743.60	1.0610	99.	1.	0.	0.	0.	69.	11.	6.	14.
66362I	4	1500	743.51	5.41	1.16	0.33	0.64	7.54	751.05	1.0039	99.	1.	0.	0.	0.	73.	15.	4.	8.
66362M	4	1900	759.62	7.92	3.92	1.79	13.95	27.58	787.20	3.5035	97.	1.	0.	0.	2.	29.	14.	6.	51.
66362O	4	2400	697.91	6.08	1.77	0.73	1.20	9.78	707.69	1.3819	99.	1.	0.	0.	0.	63.	18.	7.	12.
66362S	4	2800	496.94	5.33	1.28	0.24	1.85	8.70	505.64	1.7205	99.	1.	0.	0.	0.	61.	15.	3.	21.
66363A	4	3000	17.87	1.05	0.33	0.18	0.49	2.05	19.92	10.2912	90.	5.	2.	1.	2.	51.	16.	9.	24.
66363D	4	3300	674.37	5.85	3.01	0.48	2.03	11.37	685.74	1.6580	99.	1.	0.	0.	0.	52.	26.	4.	18.
66363G	4	3600	1444.80	8.41	1.55	0.37	0.94	11.27	1456.07	0.7740	99.	1.	0.	0.	0.	75.	14.	3.	8.
66363I	4	3800	1127.34	7.77	2.49	0.27	2.02	12.55	1139.89	1.1009	99.	1.	0.	0.	0.	62.	20.	2.	16.
66363K	4	4100	580.96	5.15	0.39	0.16	0.54	6.24	587.20	1.0626	99.	1.	0.	0.	0.	82.	6.	3.	9.
66363M	4	4300	562.19	5.08	0.65	0.28	0.60	6.61	568.80	1.1620	99.	1.	0.	0.	0.	77.	10.	4.	9.
66363O	4	4500	2068.83	18.56	6.57	7.54	4.00	36.67	2105.50	1.7416	99.	1.	0.	0.	0.	50.	18.	21.	11.
66363Q	4	4700	549.94	4.76	28.79	19.90	23.15	76.60	626.54	12.2258	87.	1.	5.	3.	4.	6.	38.	26.	30.
66363S	4	4900	591.10	24.93	86.99	93.83	136.83	342.58	933.68	36.6913	63.	3.	9.	10.	15.	7.	25.	27.	41.
66364A	4	5100	585.28	8.52	26.14	39.52	64.44	138.62	723.90	19.1490	81.	1.	4.	5.	9.	6.	19.	29.	46.
66364B	4	5200	499.87	4.61	7.44	18.84	36.51	67.40	567.27	11.8814	89.	1.	1.	3.	6.	7.	11.	28.	54.
66364C	4	5300	615.39	25.41	109.35	95.97	157.77	388.50	1003.89	38.6994	60.	3.	11.	10.	16.	7.	28.	25.	40.
66364D	4	5400	511.54	188.34	414.40	557.06	865.72	2025.52	2536.06	79.8688	20.	7.	16.	22.	34.	9.	20.	28.	43.
66364E	4	5500	555.12	98.21	341.22	415.96	807.01	1662.40	2216.52	75.0004	25.	4.	15.	19.	36.	6.	21.	25.	48.
66364F	4	5600	491.99	25.70	158.54	229.35	489.91	903.50	1394.49	64.7907	35.	2.	11.	16.	35.	3.	18.	25.	54.
66364G	4	5700	864.12	10.41	67.90	122.23	291.91	492.45	1356.57	36.3011	63.	1.	5.	9.	22.	2.	14.	25.	59.
66364H	4	5800	8720.37	1803.10	2380.48	1055.36	2006.86	7245.79	15966.16	45.3822	54.	11.	15.	7.	13.	25.	32.	15.	28.
66364I	4	5900	864.08	25.66	203.04	191.82	475.42	895.94	1760.02	50.9051	49.	1.	12.	11.	27.	3.	23.	21.	53.
66364J	4	6000	1077.13	79.54	166.50	111.93	270.88	628.85	1705.98	36.8615	62.	5.	10.	7.	16.	13.	26.	18.	43.
66364K	4	6100	7943.71	1373.03	1572.96	547.90	1008.81	4502.69	12446.41	36.1766	64.	11.	13.	4.	8.	30.	36.	12.	22.
66364L	4	6200	505.62	12.55	55.79	71.78	162.91	303.03	808.65	37.4735	62.	2.	7.	9.	20.	4.	18.	24.	54.
66364M	4	6300	631.06	29.42	725.61	822.51	2281.39	3858.93	4489.98	85.9452	14.	1.	16.	18.	51.	1.	19.	21.	59.
66364N	4	6400	514.44	38.92	957.60	437.20	1373.23	2806.95	3320.39	84.5367	15.	1.	29.	13.	41.	1.	34.	16.	49.
66364O	4	6500	698.78	149.45	2176.98	926.77	2882.84	6136.04	6834.82	89.7761	10.	2.	32.	14.	42.	2.	35.	15.	48.
66364P	4	6600	656.51	71.46	1277.26	798.83	2322.88	4470.43	5126.93	87.1949	13.	1.	25.	16.	45.	2.	29.	18.	51.
66364Q	4	6700	661.01	529.02	2717.93	545.60	1629.72	5422.26	6084.27	89.1193	11.	9.	45.	9.	27.	10.	50.	10.	30.
66364R	4	6800	721.89	99.26	930.99	314.04	982.20	2326.49	3048.38	76.3189	24.	3.	31.	10.	32.	4.	40.	13.	43.
66364S	4	6900	667.19	80.89	815.52	297.47	1037.36	2231.24	2898.43	76.9810	23.	3.	28.	10.	36.	4.	37.	13.	46.
66364T	4	7000	638.20	6.50	48.02	86.36	297.96	438.84	1077.04	40.7450	59.	1.	4.	8.	28.	1.	11.	20.	68.
66365A	4	7100	452.15	19.89	322.43	178.04	520.30	1040.66	1492.81	69.7115	30.	1.	22.	12.	35.	2.	31.	17.	50.
66365B	4	7200	533.79	7.07	84.08	81.35	264.99	437.49	971.28	45.0426	55.	1.	9.	8.	27.	2.	19.	19.	60.
66365C	4	7300	523.93	12.38	253.49	199.39	607.15	1072.41	1596.34	67.1793	33.	1.	16.	12.	38.	1.	24.	19.	56.
66365D	4	7400	446.25	6.29	71.77	58.61	190.04	326.71	772.96	42.2673	57.	1.	9.	8.	25.	2.	22.	18.	58.
66365E	4	7500	472.05	96.90	1122.55	394.35	1221.07	2834.87	3306.92	85.7254	14.	3.	34.	12.	37.	3.	40.	14.	43.
66365F	4	7600	7404.24	12724.47	12633.27	1699.28	3508.26	30565.29	37968.52	80.5016	19.	34.	33.	4.	9.	42.	41.	6.	11.
66365G	4	7700	547.58	153.06	1471.31	641.25	1569.75	3835.37	4382.95	87.5066	12.	3.	34.	15.	36.	4.	38.	17.	41.
66365H	4	7800	474.31	16.09	250.03	174.35	418.96	859.43	1333.74	64.4376	36.	1.	19.	13.	31.	2.	29.	20.	49.
66365I	4	7900	424.44	28.64	321.51	294.22	734.75	1379.12	1804.56	76.4242	24.	2.	18.	16.	41.	2.	23.	21.	54.
66365J	4	8000	454.65	173.42	924.02	275.63	505.61	1878.68	2333.33	80.5150	19.	7.	40.	12.	22.	9.	49.	15.	27.
66365K	4	8100	518.42	705.12	1428.92	373.01	677.04	3184.09	3702.51	85.9981	14.	19.	39.	10.	18.	22.	45.	12.	21.
66365L	4	8200	257.95	407.87	1392.16	464.37	864.59	3128.99	3387.94	92.3567	8.	12.	41.	14.	26.	13.	44.	15.	28.
66365M	4	8300	613.82	120.52	376.00	148.27	300.43	945.22	1559.04	60.6283	39.	8.	24.	10.	19.	13.	39.	16.	32.
66365N	4	8400	426.28	5.55	73.68	45.30	106.53	231.06	657.34	35.1507	65.	1.	11.	7.	16.	2.	32.	20.	46.

Table II Descriptions of Selected Samples and of Visual Kerogen Characteristics, 25/8-2 Cuttings

(Kerogen by J.L. Morgan)

Depth (ft)	EPR No.	Gross Lithology of "Picked" Chips	GSA Color Code (dry)	Total Organic Matter (%)	Kerogen* Alteration	Types of Kerogen (% of Total on Slide)							Remarks
						Herbaceous	Woody	Coaly	Algal?	Algal	Amorphous	Microplankton	
3000	66363-A	Sandstone, v. lt. gray, argillaceous, poorly sorted, calc. (cement?)	N7	.26	-								
4000	-K	Claystone, med. olive gray, finely micaceous	5Y5/1	1.38	-								
4500	-O	Claystone, med. olive gray	5Y5/1	.62	1+	30	30	30	-	-	-	trace	
4900	-S	As above; tr. pyrite	5Y5/1	.63	-								
5100	66364-A	Shale, med. olive gray, tr. pyrite	5Y5/1	.72	1+	20	50	20	trace	-	-	-	
5300	-C	As above	5Y5/1	.57	-								
5500	-E	Shale, med. olive gray to med. gray	5Y5/1-N5	.82	1+	20	50	20	trace	-	-	-	
5700	-G	As above	N5-5Y5/1	.63	-								
5900	-I	Shale, med. gray	N5	.62	2-	20	60	10	-	-	-	trace	Range "1+" to "2"
6200	-L	Claystone, med. gray	N5	.26	2	20	50	20	-	-	-	10	Range "1+" to "2+"
6300	-M	Shale, med. gray	N5	1.35	1+	40	30	20	-	-	10	-	
6500	-O	As above	N5	1.23	1+	40	20	20	-	-	20	-	
6700	-Q	As above	N5	1.49	2-	30	30	20	-	-	20	-	" " "
6900	-S	As above, plus quartz grains, tr. pyrite, tr. red-brown and green shales	N5	.51	2-	10	30	30	-	30	-	-	Range "1+" to "2"
7100	66365-A	Shale, med. gray, tr. chalk, tr. rose quartz and clear qtz. grains	N5	.81	2	10	40	20	20	-	-	10	Range "1+" to "2+"
7300	-C	Shale, med. dk. gray to med. gray	N4-N5	.94	-								
7500	-E	Shale, dk. gray, some finely micaceous	N3	2.94	2-	trace	20	30	-	20	30	-	" "
7600	-F	Claystone, grayish black, looks coaly	N2	8.34	2-	trace	30	30	-	30	-	-	" "
7700	-G	Claystone, med. gray to med. olive gray, plus quartz granules and congl.	N5-5Y5/1	1.51	-								
7900	-I	Claystone, as above, plus quartz grains	5Y5/1-N5	.66	2-	20	40	30	trace	-	-	trace	" "
8100	-K	Mixture of shale, lt. gray siltstone and sandstone, coal, pyrite, quartz	N4;N7	6.56	-								
8300	-M	Mixture of shale, coal, sandstone, coarse quartz grains (gravel)	5Y5/1;5YR7/1	3.72	2	10	40	30	20	-	-	-	

*See "Remarks" Column

Table III Light Gasolines (C_4-C_7) and Total Organic Matter in "Picked" Cuttings

Analyses by R.R. Dudley; H.M. Fry

Depth (feet)	EPR No.	Total Organic Matter (%)	Total C4-C7 (ppm)	Correlation Ratios			
				C_1/C_2	A/D_2	C_1/D_2	CH/MCP
3000	66363-A	.26	0.	-	-	-	-
4000	-K	1.38	0.	-	-	-	-
4500	-O	.62	0.	-	-	-	-
4900	-S	.63	2.0	.58	18.3	3.82	.24
5100	66364-A	.72	1.7	.52	21.2	4.44	.25
5300	-C	.57	5.7	.76	19.8	5.89	.57
5500	-E	.82	40.8	1.86	14.7	10.3	.71
5700	-G	.63	59.8	1.30	6.91	7.75	.92
5900	-I	.62	17.6	2.07	6.95	4.53	1.28
6200	-L	.26	9.4	2.50	5.91	4.81	1.61
6300	-M	1.35	260.	2.37	9.42	12.3	1.64
6500	-O	1.23	78.9	1.07	6.49	12.3	1.06
6700	-Q	1.49	64.7	.86	5.42	14.2	.87
6900	-S	.51	50.4	.83	6.13	11.7	.80
7100	66365-A	.81	32.3	1.21	7.77	10.8	1.00
7300	-C	.94	57.8	1.43	6.98	9.95	1.36
7500	-E	2.94	288.	1.63	11.8	34.7	1.20
7600	-F	8.34	1034.	1.07	8.32	33.4	.49
7700	-G	1.51	62.7	1.27	6.86	12.8	1.04
7900	-I	.66	37.0	.59	2.12	6.09	.52
8100	-K	6.56	90.5	1.05	7.80	12.1	.67
8300	-M	3.72	25.8	1.76	15.2	15.8	1.19

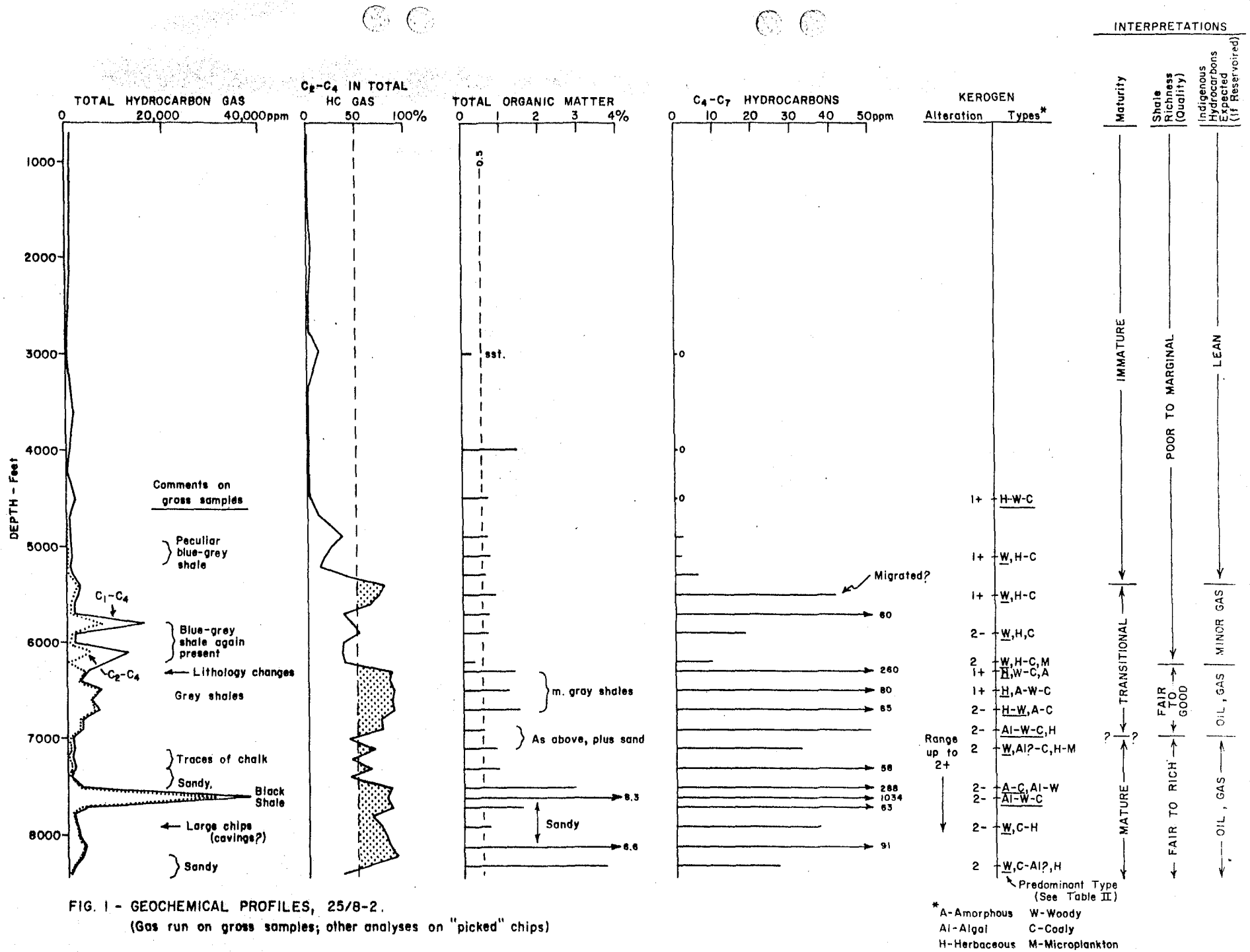

FIG. 1 - GEOCHEMICAL PROFILES, 25/8-2.
(Gas run on gross samples; other analyses on "picked" chips)