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North Sea, Norwegian Sector,
Ekofisk 2/7-6X, Crude Oil and
Water Characterization.

DAI-55-75

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Geochemical characterization has been completed on fluids recovered from Danian-Cretaceous Limestone during production tests in the Ekofisk 2/7-6X well, Norwegian Sector, North Sea. These include companion petroleum samples collected from DST Nos. 1, 3, and 4, which tested intervals between 2973 and 2987 meters (9755-9800 feet); 2893 and 3054 meters (9820-10,020 feet); and 2914 and 2957 meters (9560-9700 feet), respectively; and water recovered from DST 2, taken at a depth between 3069 and 3078 meters (10,070-10,100 feet).

Conclusions and interpretations resulting from this study are as follows:

1. The crude oil is high in saturates, i.e., paraffins and naphthenes, with a density of about 0.8473 (35.5 API gravity), an asphaltic fraction of less than five wt. per cent; and contains 0.22 wt. per cent sulfur and 0.14 wt. per cent nitrogen.

2. The oil was generated from organic matter which accumulated in an open marine environment and terrestrial material was not transported to the site of deposition in this portion of the Paleocene source rock facies.

3. The oil essentially is identical to other oils produced from Danian-Cretaceous Limestone reservoirs in North Sea fields. These originated in a common source rock facies of Paleocene age where petroleum genesis is well advanced. Despite gross similarities, however, the oil from this well is somewhat less geochemically mature than that recovered in the Ekofisk area.

4. The water recovered from the lower part of DST 2 is representative of the formation fluid. It has a dissolved solids content of 5.58 wt. per cent, a pH of about 8, and a resistivity of 0.12 ohm meters.

Data upon which these conclusions and interpretations are made are presented in the attached Tables I through X and Figures 1 through 12.

DAI-55-75

David A. Morris

DAI:JEP:lf

Attachments: Tables I - X
Figures 1 - 12

TABLE I

DAH-55-75

CHARACTERIZATION OF CRUDE OILS
Physical, Chemical, and Isotopic Properties
Eldfisk 2/7-6X, North Sea, Norwegian Sector (Danian-Cretaceous Limestone Reservoir)

Geochem Branch Code	Depth Interval		Density	API Gravity	Pour Point Deg-C	Viscosity		Heteroelements				Total Crude C-10	Major Petroleum Fractions						Odd-Even Predom- inance OEP
	Meters	Feet				21 Deg-C CS	38 Deg-C CS	Sulfur Wt. %	Nitrogen Wt. %	Vanadium Wt. %	Nickel Wt. %		Saturates Wt. %	Aromatics C-13 Wt. %	Asphaltenes C-13 Wt. %	C-13 Wt. %	C-13 Wt. %	C-13 Wt. %	
MCA ⁽¹⁾	3069 - 3078	10070-10100	--(3)	--	--	--	--	--	--	--	--	-27.6	61.3	-28.3	34.7	-26.6	1.9	-26.3	1.05
MCH ⁽¹⁾	3069 - 3078	10070-10100	--	--	--	--	--	--	--	--	--	-27.4	61.1	-27.9	34.1	-26.9	4.8	-26.3	1.02
MCC ⁽¹⁾	3069 - 3078	10070-10100	--	--	--	--	--	--	--	--	--	-27.6	62.8	-27.9	33.7	-26.8	3.5	-26.2	1.03
MCI ⁽²⁾	2993 - 3054	9820 - 10020	0.8494	35.0	-7.0	2.6	1.9	0.23	0.13	0.69	4.83	-27.7	33.3	-28.0	61.8	-27.4	4.9	-26.8	1.02
MCK ⁽²⁾	2914 - 2956	9560 - 9700	0.8423	36.4	--	9.0	4.6	0.20	0.14	0.78	4.26	-27.6	50.8	-27.8	45.3	-27.5	3.9	-26.6	1.02
MCM ⁽²⁾	2973 - 2987	9755 - 9800	0.8484	35.2	-7.0	10.3	5.6	0.21	0.15	0.51	2.87	-27.5	51.5	-28.0	45.1	-27.1	3.4	-26.8	1.01

(1) Atmospheric crude oil samples recovered from DST 2, Flow 2

(2) Pressurized companion liquid-gas samples. MCI from DST-3, Flow 2; MCK from DST-4, Flow 4; and MCM from DST-1, Flow 3, respectively

(3) Insufficient sample for characterization

TABLE II

Compositional Analysis of Oil, Gas, and Calculated Combined Stream
for Petroleum Companion Samples MCI and MCH from DST 3 in the
2893-3054 meter (9820-10,020 foot) interval, Eldfisk 2/7-6X Well,
Norwegian Sector, North Sea.

COMPONENT	GAS SAMPLE		LIQUID SAMPLE		COMBINED STREAM	
	WT PCT.	MOL PCT	WT PCT.	MOL PCT	WT PCT.	MOL PCT
LIQUID SAMPLE = MCI L						
GAS SAMPLE = MCH G						
HELIUM	0.000	0.000	0.000	0.000	0.000	0.000
HYDROGEN SULFIDE	0.000	0.000	0.000	0.000	0.000	0.000
OXYGEN + ARGON	0.000	0.000	0.000	0.000	0.000	0.000
NITROGEN	0.276	0.197	0.049	0.254	0.120	0.216
CARBON DIOXIDE	8.315	3.791	0.423	1.397	2.653	3.018
METHANE	66.599	83.307	2.113	19.119	20.057	62.595
ETHANE	11.481	7.662	1.345	6.496	4.375	7.285
PROPANE	6.766	3.079	1.815	5.975	3.535	4.013
ISOBUTANE	0.955	0.330	0.445	1.112	0.676	0.582
N-BUTANE	2.429	0.838	1.471	3.674	2.036	1.754
ISOPENTANE	0.641	0.178	0.542	1.091	0.681	0.473
N-PENTANE	0.897	0.249	0.901	1.812	1.086	0.753
NEOHXANE	0.010	0.002	0.011	0.019	0.013	0.007
CYCLOPENTANE	0.084	0.024	0.116	0.240	0.131	0.094
2,3-DIMETHYLBUTANE	0.000	0.000	0.038	0.064	0.035	0.020
2-METHYLPENTANE	0.209	0.048	0.403	0.679	0.434	0.252
3-METHYLPENTANE	0.107	0.024	0.248	0.417	0.261	0.151
N-HEXANE	0.352	0.082	1.004	1.692	1.035	0.601
METHYLCYCLOPENTANE + 2,2-DIMETHYLPENTANE	0.122	0.029	0.487	0.841	0.489	0.291
2,4-DIMETHYLPENTANE	0.012	0.002	0.044	0.063	0.044	0.022
BENZENE + 2,2,3-TRIMETHYLBUTANE	0.038	0.009	0.191	0.355	0.189	0.121
CYCLOHEXANE + 3,3-DIMETHYLPENTANE	0.101	0.024	0.587	1.013	0.577	0.343
2-METHYLHEXANE	0.048	0.009	0.291	0.421	0.285	0.142
2,3-DIMETHYLPENTANE + 1,1-DIMECYCLOPENT.	0.024	0.004	0.149	0.216	0.146	0.073
3-METHYLHEXANE	0.049	0.009	0.330	0.478	0.322	0.161
1-CIS-3-DIMETHYLCYCLOPENTANE	0.015	0.003	0.113	0.168	0.110	0.056
1-TRANS-3-DIMECYPENTANE + 3-ETHYLPENTANE	0.016	0.003	0.131	0.193	0.127	0.064
1-TRANS-2-DIMETHYLCYCLOPENTANE	0.027	0.005	0.216	0.319	0.209	0.106
N-HEPTANE	0.122	0.024	1.093	1.583	1.055	0.527
1-CIS-2-DIMETHYLCYCLOPENTANE	0.003	0.000	0.044	0.066	0.042	0.021
MECYHEX + 2,2-DIMEHEX + 1,1,3-TRIMECYPENT	0.098	0.020	1.190	1.760	1.140	0.581
2,5-DIMETHYLHEXANE	0.003	0.000	0.037	0.047	0.035	0.015
2,4-DIMETHYLHEXANE + ETHYLCYCLOPENTANE	0.011	0.002	0.157	0.199	0.150	0.065
2,2,3-TRIMETHYLPENTANE	0.000	0.000	0.004	0.005	0.004	0.001

2- TABLE II (Continued)

				DAM-55-75	
1-TRANS-2-CIS-4-TRIMETHYLCYCLOPENTANE	0.004	0.000	0.064	0.083	0.061 0.027
3,3-DIMETHYLHEXANE	0.000	0.000	0.011	0.014	0.010 0.004
TOLUENE	0.033	0.007	0.649	1.022	0.616 0.334
1-TRANS-2-CIS-3-TRIMETHYLCYCLOPENTANE	0.002	0.000	0.035	0.046	0.034 0.015
2,3,4-TRIMETHYLPENTANE	0.000	0.000	0.000	0.000	0.000 0.000
2,3-DIMEHEX+2,3,3-TRIMEPENT+2-ME3-ETPENT	0.003	0.000	0.061	0.078	0.058 0.025
2-METHYLHEPTANE + 4-METHYLHEPTANE	0.017	0.003	0.395	0.502	0.374 0.164
3,4-DIMEHEX + 1-CIS-2-TRAN-4-TRIMECYPENT	0.005	0.000	0.114	0.145	0.108 0.047
3-ETHYLHEXANE	0.001	0.000	0.020	0.026	0.019 0.008
3-METHYLHEPTANE + 3-ME-3-ETHYLPENTANE	0.011	0.001	0.260	0.330	0.246 0.108
2,2,5-TRIMEHEX+1,1,3-TR-4-TETRAMECYPENT.	0.001	0.000	0.012	0.014	0.012 0.004
1-CIS-2-CIS-4-TRIMETHYLCYCLOPENTANE	0.000	0.000	0.019	0.025	0.018 0.008
1-TRANS-4 + 1-CIS-3 + 1,1-DIMECYHEXANE	0.014	0.002	0.395	0.511	0.373 0.166
1-ME-3-ETHCYPENT + 2,2,4-TRIMETHYLHEXANE	0.002	0.000	0.076	0.098	0.072 0.032
1-ME-TRANS-2 + 1-ME-CIS-3-ETHYLCYPENTANE	0.004	0.000	0.124	0.160	0.117 0.052
CYCLOHEPTANE	0.001	0.000	0.037	0.056	0.035 0.016
N-OCTANE + 1-TRANS-2-DIMETHYLCYCLOHEXANE	0.026	0.004	0.998	1.268	0.940 0.412
1-CIS-4-DIMETHYLCYCLOHEXANE	0.005	0.001	0.184	0.238	0.174 0.077
1-TRANS-3-DIMETHYLCYCLOHEXANE	0.001	0.000	0.076	0.098	0.071 0.032
2,2,4-TRIMEHEXANE + ISOPROPYLCYCLOPENT.	0.000	0.000	0.020	0.022	0.018 0.007
2,3,5-TRIMEHEXANE + 2,2-DIMETHYLHEPTANE	0.000	0.000	0.018	0.020	0.016 0.006
1-METHYL-CIS-2-ETHYLCYCLOPENTANE	0.000	0.000	0.065	0.084	0.061 0.027
2,4-DIMEHEPTANE + 2,2,3-TRIMETHYLHEXANE	0.002	0.000	0.130	0.147	0.122 0.047
2,6-DIMEHEPTANE + 1-CIS-2-DIMECYHEXANE	0.001	0.000	0.098	0.111	0.093 0.036
N-PROPYLCYPENT + 2,5- + 3,5-DIMEHEPTANE	0.000	0.000	0.064	0.083	0.060 0.026
ETHYLCYCLOHEXANE	0.005	0.001	0.355	0.460	0.334 0.149
ETHYLBENZENE	0.001	0.000	0.122	0.167	0.115 0.054
3,3-DIMETHYLHEPTANE + 1,1,3-TRIMECYHEXANE	0.001	0.000	0.167	0.189	0.156 0.061
2,3,3-TRIMETHYLHEXANE	0.000	0.000	0.048	0.054	0.045 0.017
2-METHYL-3-ETHYLHEXANE	0.000	0.000	0.036	0.041	0.034 0.013
P-XYLENE	0.002	0.000	0.102	0.140	0.096 0.045
M-XYLENE + 2,3,4-TRIMETHYLHEXANE	0.004	0.000	0.585	0.799	0.548 0.258
2,3- + 3,4-DIMETHYLHEPTANE	0.000	0.000	0.062	0.071	0.058 0.022
4-METHYLOCTANE	0.002	0.000	0.246	0.278	0.230 0.090
2-METHYLOCTANE	0.001	0.000	0.161	0.182	0.151 0.059
3-ETHYLHEPTANE	0.000	0.000	0.039	0.044	0.036 0.014
3-METHYLOCTANE	0.001	0.000	0.196	0.222	0.183 0.071
O-XYLENE (+ A C-10 ALKANE)	0.001	0.000	0.264	0.361	0.247 0.116
2,2,4-TRIMETHYLHEPTANE	0.000	0.000	0.033	0.034	0.031 0.011
2,2,5-TRIMETHYLHEPTANE	0.000	0.000	0.078	0.079	0.073 0.025
2,2,6-TRIMETHYLHEPTANE	0.000	0.000	0.023	0.023	0.021 0.007
*** UNKNOWN ***	0.000	0.000	0.055	0.056	0.051 0.018
2,5,5-TRIMETHYLHEPTANE	0.000	0.000	0.023	0.023	0.021 0.007

2,4,4-TRIMETHYLHEPTANE	0.000	0.000	0.029	0.030	0.027	0.009
*** A C-9 NAPHTHENE ***	0.000	0.000	0.149	0.171	0.139	0.055
ISOPROPYL BENZENE	0.000	0.000	0.083	0.100	0.077	0.032
N-NONANE	0.003	0.000	0.978	1.107	0.916	0.357
C-9 NAPHTHENES + C-10 ALKANES	0.001	0.000	2.363	2.716	2.210	0.876
N-PROPYL BENZENE	0.000	0.000	0.031	0.037	0.029	0.012
1-METHYL-3-ETHYLBENZENE	0.000	0.000	0.176	0.213	0.165	0.068
1-METHYL-4-ETHYLBENZENE	0.000	0.000	0.100	0.121	0.093	0.039
1-METHYL-2-ETHYLBENZENE	0.000	0.000	0.229	0.276	0.214	0.089
1,3,5-TRIMETHYLBENZENE	0.000	0.000	0.256	0.310	0.240	0.100
1,2,4-TRIMETHYLBENZENE	0.000	0.000	0.314	0.379	0.294	0.122
1,2,3-TRIMETHYLBENZENE	0.000	0.000	0.024	0.029	0.022	0.000
N-DECANE	0.000	0.000	0.937	0.956	0.877	0.300
UNDECANES AND HEAVIER	0.002	0.000	71.781	33.337	46.458	10.757

MOL PERCENT C6'S = 1.884

MOL PERCENT C7+ = 17.422

TABLE III

Compositional Analysis of Oil, Gas, and Calculated Combined Stream for Petroleum Companion Samples MCK and MCJ from DST 4 in the 2914-2957 m (9560-9700 foot) interval, Eldfisk 2/7-6X Well, Norwegian Sector, North Sea.

LIQUID SAMPLE = MCK L
GAS SAMPLE = MCJ G

COMPONENT

COMPONENT	GAS SAMPLE		LIQUID SAMPLE		COMBINED STREAM	
	WT PCT.	MOL PCT	WT PCT.	MOL PCT	WT PCT.	MOL PCT
HELIUM	0.000	0.000	0.000	0.000	0.000	0.000
HYDROGEN SULFIDE	0.000	0.000	0.000	0.000	0.000	0.000
OXYGEN + ARGON	0.000	0.000	0.000	0.000	0.000	0.000
NITROGEN	0.107	0.078	0.025	0.126	0.058	0.091
CARBON DIOXIDE	9.870	4.595	0.489	1.540	3.843	3.790
METHANE	64.352	82.197	2.037	17.582	24.090	65.171
ETHANE	11.171	7.613	1.365	6.286	5.032	7.263
PROPANE	6.927	3.219	2.047	6.428	4.129	4.064
ISOBUTANE	1.027	0.362	0.547	1.304	0.817	0.610
N-BUTANE	2.698	0.951	1.912	4.555	2.546	1.901
ISOPENTANE	0.765	0.217	0.723	1.388	0.874	0.526
N-PENTANE	1.098	0.312	1.240	2.379	1.424	0.856
NEOHXANE	0.012	0.003	0.016	0.026	0.018	0.009
CYCLOPENTANE	0.104	0.030	0.168	0.332	0.177	0.110
2,3-DIMETHYLBUTANE	0.000	0.000	0.052	0.084	0.044	0.022
2-METHYLPENTANE	0.261	0.062	0.537	0.862	0.542	0.273
3-METHYLPENTANE	0.132	0.031	0.319	0.513	0.314	0.158
N-HEXANE	0.440	0.104	1.262	2.027	1.213	0.611
METHYLCYCLOPENTANE + 2,2-DIMETHYLPENTANE	0.148	0.036	0.587	0.965	0.545	0.281
2,4-DIMETHYLPENTANE	0.015	0.003	0.052	0.072	0.049	0.027
BENZENE + 2,2,3-TRIMETHYLBUTANE	0.046	0.012	0.230	0.409	0.210	0.116
CYCLOHEXANE + 3,3-DIMETHYLPENTANE	0.121	0.029	0.678	1.115	0.612	0.315
2-METHYLHEXANE	0.058	0.011	0.339	0.468	0.305	0.132
2,3-DIMETHYLPENTANE + 1,1-DIMECYCLOPENT.	0.029	0.005	0.172	0.238	0.155	0.067
3-METHYLHEXANE	0.059	0.012	0.380	0.525	0.340	0.147
1-CIS-3-DIMETHYLCYCLOPENTANE	0.018	0.003	0.127	0.179	0.113	0.050
1-TRANS-3-DIMECPENTANE + 3-ETHYLPENTANE	0.020	0.004	0.146	0.206	0.130	0.057
1-TRANS-2-DIMETHYLCYCLOPENTANE	0.032	0.006	0.237	0.335	0.211	0.093
N-HEPTANE	0.147	0.030	1.268	1.752	1.117	0.484
1-CIS-2-DIMETHYLCYCLOPENTANE	0.004	0.000	0.048	0.067	0.041	0.018
MECYHEX + 2,2-DIMEHEX + 1,1,3-TRIMECPENT	0.114	0.023	1.315	1.854	1.145	0.506
2,5-DIMETHYLHEXANE	0.003	0.000	0.040	0.049	0.035	0.013
2,4-DIMETHYLHEXANE + ETHYLCYCLOPENTANE	0.013	0.002	0.167	0.203	0.145	0.055
2,2,3-TRIMETHYLPENTANE	0.000	0.000	0.004	0.005	0.003	0.001

1-TRANS-2-CIS-4-TRIMETHYLCYCLOPENTANE	0.004	0.000	0.069	0.085	0.059	0.023
3,3-DIMETHYLHEXANE	0.000	0.000	0.012	0.015	0.010	0.004
TOLUENE	0.038	0.008	0.715	1.075	0.615	0.289
1-TRANS-2-CIS-3-TRIMETHYLCYCLOPENTANE	0.002	0.000	0.044	0.054	0.038	0.014
2,3,4-TRIMETHYLPENTANE	0.000	0.000	0.000	0.000	0.000	0.000
2,3-DIMEHEX+2,3,3-TRIMEPENT+2-ME3-ETPENT	0.004	0.000	0.072	0.087	0.062	0.023
2-METHYLHEPTANE + 4-METHYLHEPTANE	0.019	0.003	0.450	0.545	0.385	0.146
3,4-DIMEHEX + 1-CIS-2-TRAN-4-TRIMECYPENT	0.006	0.001	0.128	0.155	0.110	0.041
3-ETHYLHEXANE	0.001	0.000	0.023	0.028	0.019	0.007
3-METHYLHEPTANE + 3-ME-3-ETHYLPENTANE	0.012	0.002	0.288	0.349	0.246	0.093
2,2,5-TRIMEHEX+1,1,3-TR-4-TETRAMECYPENT.	0.000	0.000	0.013	0.014	0.011	0.003
1-CIS-2-CIS-4-TRIMETHYLCYCLOPENTANE	0.000	0.000	0.020	0.025	0.017	0.006
1-TRANS-4 + 1-CIS-3 + 1,1-DIMECYHEXANE	0.016	0.002	0.426	0.526	0.364	0.140
1-ME-3-ETHCYPENT + 2,2,4-TRIMETHYLHEXANE	0.003	0.000	0.080	0.098	0.068	0.026
1-ME-TRANS-2 + 1-ME-CIS-3-ETHYLCYPENTANE	0.004	0.000	0.127	0.157	0.108	0.047
CYCLOHEPTANE	0.001	0.000	0.038	0.054	0.033	0.011
N-OCTANE + 1-TRANS-2-DIMETHYLCYCLOHEXANE	0.030	0.005	1.126	1.364	0.957	0.363
1-CIS-4-DIMETHYLCYCLOHEXANE	0.006	0.001	0.195	0.241	0.166	0.064
1-TRANS-3-DIMETHYLCYCLOHEXANE	0.002	0.000	0.081	0.101	0.069	0.026
2,2,4-TRIMEHEXANE + ISOPROPYLCYCLOPENT.	0.000	0.000	0.020	0.021	0.017	0.005
2,3,5-TRIMEHEXANE + 2,2-DIMETHYLHEPTANE	0.000	0.000	0.019	0.021	0.016	0.005
1-METHYL-CIS-2-ETHYLCYCLOPENTANE	0.001	0.000	0.071	0.087	0.060	0.023
2,4-DIMEHEPTANE + 2,2,3-TRIMETHYLHEXANE	0.002	0.000	0.146	0.157	0.123	0.041
2,6-DIMEHEPTANE + 1-CIS-2-DIMECYHEXANE	0.001	0.000	0.101	0.109	0.085	0.029
N-PROPYLCYPENT + 2,5- + 3,5-DIMEHEPTANE	0.000	0.000	0.072	0.089	0.061	0.023
ETHYLCYCLOHEXANE	0.006	0.001	0.379	0.468	0.321	0.124
ETHYLBENZENE	0.001	0.000	0.134	0.175	0.113	0.046
3,3-DIMETHYLHEPTANE + 1,1,3-TRIMECYHEXANE	0.001	0.000	0.181	0.195	0.153	0.051
2,3,3-TRIMETHYLHEXANE	0.000	0.000	0.053	0.057	0.044	0.015
2-METHYL-3-ETHYLHEXANE	0.000	0.000	0.039	0.042	0.033	0.011
P-XYLENE	0.002	0.000	0.111	0.145	0.095	0.038
M-XYLENE + 2,3,4-TRIMETHYLHEXANE	0.004	0.000	0.627	0.818	0.529	0.217
2,3- + 3,4-DIMETHYLHEPTANE	0.000	0.000	0.067	0.072	0.056	0.019
4-METHYLOCTANE	0.002	0.000	0.266	0.287	0.224	0.075
2-METHYLOCTANE	0.001	0.000	0.180	0.194	0.151	0.051
3-ETHYLHEPTANE	0.000	0.000	0.044	0.047	0.037	0.012
3-METHYLOCTANE	0.001	0.000	0.227	0.245	0.191	0.064
O-XYLENE (+ A C-10 ALKANE)	0.001	0.000	0.276	0.360	0.233	0.095
2,2,4-TRIMETHYLHEPTANE	0.000	0.000	0.041	0.040	0.034	0.010
2,2,5-TRIMETHYLHEPTANE	0.000	0.000	0.084	0.082	0.071	0.021
2,2,6-TRIMETHYLHEPTANE	0.000	0.000	0.025	0.024	0.021	0.006
*** UNKNOWN ***	0.000	0.000	0.060	0.059	0.050	0.015
2,5,5-TRIMETHYLHEPTANE	0.000	0.000	0.025	0.024	0.021	0.006

2,4,4-TRIMETHYLHEPTANE	0.000	0.000	0.031	0.030	0.026	0.008
*** A C-9 NAPHTHENE ***	0.000	0.000	0.159	0.174	0.134	0.046
ISOPROPYLBENZENE	0.000	0.000	0.088	0.102	0.074	0.026
N-NONANE	0.004	0.000	1.089	1.175	0.916	0.310
C-9 NAPHTHENES + C-10 ALKANES	0.001	0.000	2.479	2.719	2.084	0.716
N-PROPYLBENZENE	0.000	0.000	0.034	0.039	0.029	0.010
1-METHYL-3-ETHYLBENZENE	0.000	0.000	0.185	0.213	0.155	0.056
1-METHYL-4-ETHYLBENZENE	0.000	0.000	0.105	0.121	0.088	0.032
1-METHYL-2-ETHYLBENZENE	0.000	0.000	0.243	0.280	0.204	0.073
1,3,5-TRIMETHYLBENZENE	0.000	0.000	0.274	0.315	0.230	0.083
1,2,4-TRIMETHYLBENZENE	0.000	0.000	0.325	0.374	0.273	0.098
1,2,3-TRIMETHYLBENZENE	0.000	0.000	0.021	0.025	0.018	0.00
N-DECANE	0.000	0.000	1.026	0.999	0.863	0.263
UNDECANES AND HEAVIER	0.000	0.000	68.213	30.721	38.509	8.095

MOL PERCENT C6'S = 1.898

MOL PERCENT C7+ = 13.825

TABLE IV

Compositional Analysis of Oil, Gas, and Calculated Combined Stream
for Petroleum Companion Samples MCM and MCL, from DST 1 in the 2973-2987
m (9755-9800 foot) interval, Eldfisk 2/7-6X Well, Norwegian Sector,
North Sea.

COMPONENT	GAS SAMPLE		LIQUID SAMPLE		COMBINED STREAM	
	WT PCT.	MOL PCT	WT PCT.	MOL PCT	WT PCT.	MOL PCT
HELIUM	0.000	0.000	0.000	0.000	0.000	0.000
HYDROGEN SULFIDE	0.000	0.000	0.000	0.000	0.000	0.000
OXYGEN + ARGON	0.000	0.000	0.000	0.000	0.000	0.000
NITROGEN	0.189	0.136	0.049	0.304	0.102	0.181
CARBON DIOXIDE	8.473	3.894	0.162	0.630	2.658	3.010
METHANE	65.116	82.100	0.581	6.197	19.810	61.542
ETHANE	12.479	8.394	0.668	3.798	4.313	7.149
PROPANE	7.896	3.622	1.409	5.460	3.645	4.120
ISOBUTANE	1.069	0.372	0.461	1.355	0.744	0.638
N-BUTANE	2.645	0.920	1.713	5.037	2.374	2.035
ISOPENTANE	0.590	0.165	0.795	1.884	0.913	0.631
N-PENTANE	0.753	0.211	1.376	3.259	1.501	1.036
MEDHEXANE	0.008	0.002	0.017	0.035	0.019	0.010
CYCLOPENTANE	0.060	0.017	0.182	0.444	0.187	0.133
2,3-DIMETHYLBUTANE	0.000	0.000	0.053	0.105	0.049	0.028
2-METHYLPENTANE	0.130	0.030	0.550	1.091	0.550	0.318
3-METHYLPENTANE	0.063	0.014	0.325	0.644	0.320	0.185
N-HEXANE	0.193	0.045	1.273	2.526	1.240	0.717
METHYLCYCLOPENTANE + 2,2-DIMETHYLPENTANE	0.066	0.015	0.593	1.205	0.570	0.338
2,4-DIMETHYLPENTANE	0.005	0.001	0.050	0.086	0.048	0.02
BENZENE + 2,2,3-TRIMETHYLBUTANE	0.018	0.004	0.234	0.513	0.223	0.142
CYCLOHEXANE + 3,3-DIMETHYLPENTANE	0.049	0.011	0.675	1.371	0.642	0.380
2-METHYLHEXANE	0.019	0.003	0.324	0.554	0.307	0.152
2,3-DIMETHYLPENTANE + 1,1-DIMECYCLOPENT.	0.009	0.001	0.165	0.282	0.156	0.078
3-METHYLHEXANE	0.018	0.003	0.365	0.622	0.344	0.171
1-CIS-3-DIMETHYLCYCLOPENTANE	0.006	0.001	0.124	0.217	0.117	0.059
1-TRANS-3-DIMECYPENTANE + 3-ETHYLPENTANE	0.006	0.001	0.143	0.249	0.134	0.068
1-TRANS-2-DIMETHYLCYCLOPENTANE	0.010	0.002	0.233	0.406	0.219	0.111
N-HEPTANE	0.041	0.008	1.208	2.061	1.134	0.564
1-CIS-2-DIMETHYLCYCLOPENTANE	0.001	0.000	0.046	0.080	0.043	0.022
HECYHEX + 2,2-DIMEHEX + 1,1,3-TRIMECYPENT	0.035	0.007	1.274	2.217	1.193	0.605
2,5-DIMETHYLHEXANE	0.001	0.000	0.038	0.057	0.035	0.015
2,4-DIMETHYLHEXANE + ETHYLCYCLOPENTANE	0.003	0.000	0.162	0.242	0.151	0.066
2,2,3-TRIMETHYLPENTANE	0.000	0.000	0.004	0.006	0.003	0.001

2- TABLE IV (Continued)

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1-TRANS-2-CIS-4-TRIMETHYLCYCLOPENTANE	0.001	0.000	0.066	0.100	0.061	0.027
3,3-DIMETHYLHEXANE	0.000	0.000	0.011	0.017	0.010	0.004
TOLUENE	0.008	0.001	0.697	1.294	0.650	0.351
1-TRANS-2-CIS-3-TRIMETHYLCYCLOPENTANE	0.000	0.000	0.035	0.053	0.032	0.014
2,3,4-TRIMETHYLPENTANE	0.000	0.000	0.000	0.000	0.000	0.000
2,3-DIMEHEX+2,3,3-TRIMEPENT+2-ME3-ETPENT	0.000	0.000	0.062	0.094	0.058	0.025
2-METHYLHEPTANE + 4-METHYLHEPTANE	0.004	0.000	0.412	0.616	0.384	0.167
3,4-DIMEHEX + 1-CIS-2-TRAN-4-TRIMECPENT	0.001	0.000	0.117	0.176	0.109	0.047
3-ETHYLHEXANE	0.000	0.000	0.021	0.031	0.019	0.008
3-METHYLHEPTANE + 3-ME-3-ETHYLPENTANE	0.002	0.000	0.267	0.399	0.248	0.108
2,2,5-TRIMEHEX+1,1,3-TR-4-TETRAMECYPENT.	0.000	0.000	0.013	0.017	0.012	0.004
1-CIS-2-CIS-4-TRIMETHYLCYCLOPENTANE	0.000	0.000	0.020	0.030	0.018	0.008
1-TRANS-4 + 1-CIS-3 + 1,1-DIMECYHEXANE	0.003	0.000	0.403	0.614	0.375	0.166
1-ME-3-ETHCYPENT + 2,2,4-TRIMETHYLHEXANE	0.000	0.000	0.075	0.115	0.070	0.031
1-ME-TRANS-2 + 1-ME-CIS-3-ETHYLCYPENTANE	0.000	0.000	0.121	0.185	0.113	0.050
CYCLOHEPTANE	0.000	0.000	0.037	0.065	0.034	0.017
N-OCTANE + 1-TRANS-2-DIMETHYLCYCLOHEXANE	0.005	0.001	1.039	1.555	0.967	0.421
1-CIS-4-DIMETHYLCYCLOHEXANE	0.001	0.000	0.187	0.285	0.174	0.077
1-TRANS-3-DIMETHYLCYCLOHEXANE	0.000	0.000	0.078	0.119	0.072	0.032
2,2,4-TRIMEHEXANE + ISOPROPYLCYCLOPENT.	0.000	0.000	0.020	0.027	0.018	0.007
2,3,5-TRIMEHEXANE + 2,2-DIMETHYLHEPTANE	0.000	0.000	0.017	0.023	0.016	0.006
1-METHYL-CIS-2-ETHYLCYCLOPENTANE	0.000	0.000	0.064	0.098	0.060	0.026
2,4-DIMEHEPTANE + 2,2,3-TRIMETHYLHEXANE	0.000	0.000	0.132	0.176	0.122	0.047
2,6-DIMEHEPTANE + 1-CIS-2-DIMECYHEXANE	0.000	0.000	0.099	0.132	0.092	0.035
N-PROPYLCYPENT + 2,5- + 3,5-DIMEHEPTANE	0.000	0.000	0.063	0.097	0.059	0.026
ETHYLCYCLOHEXANE	0.001	0.000	0.356	0.542	0.331	0.147
ETHYLBENZENE	0.000	0.000	0.128	0.206	0.118	0.055
3,3-DIMETHYLHEPTANE +1,1,3-TRIMECYHEXANE	0.000	0.000	0.167	0.223	0.155	0.060
2,3,3-TRIMETHYLHEXANE	0.000	0.000	0.050	0.067	0.046	0.016
2-METHYL-3-ETHYLHEXANE	0.000	0.000	0.037	0.050	0.035	0.013
P-XYLENE	0.000	0.000	0.108	0.174	0.100	0.047
M-XYLENE + 2,3,4-TRIMETHYLHEXANE	0.000	0.000	0.590	0.951	0.548	0.25
2,3- + 3,4-DIMETHYLHEPTANE	0.000	0.000	0.063	0.084	0.059	0.022
4-METHYLOCTANE	0.000	0.000	0.243	0.324	0.226	0.088
2-METHYLOCTANE	0.000	0.000	0.165	0.220	0.153	0.059
3-ETHYLHEPTANE	0.000	0.000	0.042	0.056	0.039	0.015
3-METHYLOCTANE	0.000	0.000	0.201	0.267	0.186	0.072
O-XYLENE (+ A C-10 ALKANE)	0.000	0.000	0.271	0.436	0.252	0.118
2,2,4-TRIMETHYLHEPTANE	0.000	0.000	0.037	0.045	0.035	0.012
2,2,5-TRIMETHYLHEPTANE	0.000	0.000	0.079	0.095	0.074	0.025
2,2,6-TRIMETHYLHEPTANE	0.000	0.000	0.023	0.028	0.022	0.007
*** UNKNOWN ***	0.000	0.000	0.057	0.069	0.053	0.018
2,5,5-TRIMETHYLHEPTANE	0.000	0.000	0.024	0.029	0.023	0.008

3- TABLE IV (Concluded)

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2,4,4-TRIMETHYLHEPTANE	0.000	0.000	0.030	0.036	0.028	0.009
*** A C-9 NAPHTHENE ***	0.000	0.000	0.149	0.202	0.139	0.054
ISOPROPYL BENZENE	0.000	0.000	0.083	0.118	0.077	0.032
N-NONANE	0.000	0.000	0.992	1.322	0.921	0.358
C-9 NAPHTHENES + C-10 ALKANES	0.000	0.000	2.319	3.140	2.154	0.850
N-PROPYLBENZENE	0.000	0.000	0.000	0.000	0.000	0.000
1-METHYL-3-ETHYLBENZENE	0.000	0.000	0.175	0.249	0.162	0.067
1-METHYL-4-ETHYLBENZENE	0.000	0.000	0.099	0.142	0.092	0.038
1-METHYL-2-ETHYLBENZENE	0.000	0.000	0.220	0.313	0.204	0.084
1,3,5-TRIMETHYLBENZENE	0.000	0.000	0.249	0.354	0.231	0.096
1,2,4-TRIMETHYLBENZENE	0.000	0.000	0.302	0.430	0.281	0.111
1,2,3-TRIMETHYLBENZENE	0.000	0.000	0.021	0.030	0.020	0.008
N-DECANE	0.000	0.000	0.916	1.100	0.850	0.298
UNDECANES AND HEAVIER	0.000	0.000	72.452	39.399	44.821	10.671

MOL PERCENT C6'S = 2.254

MOL PERCENT C7+ = 17.398

TABLE V

FORMATION WATER CHARACTERIZATION
ELDFISK 2/7-6X N.SEA NORWAY
O&W FLOWING DST #2

GEOCHEMISTRY BRANCH CODE, MCA
TOTAL DISSOLVED CHROMIUM = < 0.31 PPM
RESISTIVITY, 25 DEG. C. 0.139 OHM METERS
PH = 8.10

TOTAL DISSOLVED SOLIDS = 5.33

INORGANIC CONSTITUENTS

CATIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS	ANIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS
SODIUM	1.9900	0.0866	CHLORIDE	2.9900	0.0843
POTASSIUM	0.0200	0.0005	BROMIDE	0.0125	0.0002
CALCIUM	0.0634	0.0032	IODIDE	0.0082	0.0001
MAGNESIUM	0.0086	0.0007	SULFATE	0.1320	0.0027
AMMONIUM	0.0049	0.0002	PHOSPHATE	0.0007	0.0000
AMMONIA	0.0003	0.0000	BICARBONATE	0.0970	0.0016
BARIUM	< 0.00025	0.0000	CARBONATE	0.0000	0.0000
STRONTIUM	0.0125	0.0003			
TOTAL	= 2.0950	TOTAL = 0.0912	TOTAL	= 3.2403	TOTAL = 0.0889

DISSOLVED AROMATIC HYDROCARBONS

COMPOUND	CONCENTRATION PPM
BENZENE	0.00 oil present
TOLUENE	0.00

TABLE VI

FORMATION WATER CHARACTERIZATION
 ELOFISK 2/7-6X N. SEA NORWAY
 O&W FLOWING DST #2

GEOCHEMISTRY BRANCH CODE, MCC
 TOTAL DISSOLVED CHROMIUM = <0.31 PPM
 RESISTIVITY, 25 DEG. C. 0.140 OHM METERS
 PH = 8.20

TOTAL DISSOLVED SOLIDS = 5.28

INORGANIC CONSTITUENTS

CATIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS	ANIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS
SODIUM	1.9900	0.0866	CHLORIDE	2.9600	0.0835
POTASSIUM	0.0200	0.0005	BROMIDE	0.0125	0.0002
CALCIUM	0.0618	0.0031	IODIDE	0.0079	0.0001
MAGNESIUM	0.0085	0.0007	SULFATE	0.1190	0.0025
AMMONIUM	0.0047	0.0002	PHOSPHATE	0.0006	0.0000
AMMONIA	0.0004	0.0000	BICARBONATE	0.0910	0.0015
BARIUM	<0.00015	0.0000	CARBONATE	0.0000	0.0000
STRONTIUM	0.0135	0.0003			
TOTAL	= 2.0943	TOTAL = 0.0911	TOTAL	= 3.1909	TOTAL = 0.0876

DISSOLVED AROMATIC HYDROCARBONS

COMPOUND	CONCENTRATION PPM
BENZENE	0.00
TOLUENE	0.00

oil present

TABLE VII

FORMATION WATER CHARACTERIZATION
MUD ELDFISK 2/7-6X N. SEA NORWAY DST 2 FLOW 2
(WAT) FROM SEA INTERVAL 10070-10100' FLOWING 5/29/73

GEOCHEMISTRY BRANCH CODE, MCD
TOTAL DISSOLVED CHROMIUM = < 0.39 PPM
RESISTIVITY, 25 DEG. C, 0.256 OHM METERS
PH = 4.80

TOTAL DISSOLVED SOLIDS = 0.29

INORGANIC CONSTITUENTS

CATIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS	ANIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS
SODIUM	0.0914	0.0040	CHLORIDE	0.1600	0.0045
POTASSIUM	0.0030	0.0001	BROMIDE	0.0018	0.0000
CALCIUM	0.0036	0.0002	IODIDE	< 0.0005	0.0000
MAGNESIUM	0.0106	0.0009	SULFATE	0.0223	0.0005
AMMONIUM	0.0000	0.0000	PHOSPHATE	< 0.0005	0.0000
AMMONIA	0.0000	0.0000	BICARBONATE	< 0.0010	0.0000
BARIUM	< 0.00025	0.0000	CARBONATE	0.0000	0.0000
STRONTIUM	< 0.0005	0.0000			
TOTAL	= 0.1093	TOTAL = 0.0051	TOTAL	= 0.1860	TOTAL = 0.0050

DISSOLVED AROMATIC HYDROCARBONS

COMPOUND	CONCENTRATION PPM
BENZENE	0.00
TOLUENE	0.00

TABLE VIII

FORMATION WATER CHARACTERIZATION
 TOP ELDFISK 2/7-6X N.SEA NORWAY DST 2 FLOW 2
 (WAT)FROM SEPERATOR FLOWING 5/29/73

GEOCHEMISTRY BRANCH CODE, MCE
 TOTAL DISSOLVED CHROMIUM = 0.49 PPM
 RESISTIVITY, 25 DEG. C, 0.240 OHM METERS
 PH = 7.80

TOTAL DISSOLVED SOLIDS = 5.51

INORGANIC CONSTITUENTS

CATIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS	ANIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS
SODIUM	1.9600	0.0853	CHLORIDE	3.3000	0.0931
POTASSIUM	0.0169	0.0004	BROMIDE	0.0159	0.0002
CALCIUM	0.0861	0.0043	IODIDE	0.0089	0.0001
MAGNESIUM	0.0119	0.0010	SULFATE	0.0249	0.0005
AMMONIUM	0.0061	0.0003	PHOSPHATE	< 0.0005	0.0000
AMMONIA	0.0002	0.0000	BICARBONATE	0.0650	0.0011
BARIUM	0.00055	0.0000	CARBONATE	0.0000	0.0000
STRONTIUM	0.0229	0.0005			
TOTAL	= 2.0985	TOTAL = 0.0915	TOTAL	= 3.4151	TOTAL = 0.0949

DISSOLVED AROMATIC HYDROCARBONS

COMPOUND	CONCENTRATION PPM
BENZENE	1.40
TOLUENE	0.60

TABLE IX

FORMATION WATER CHARACTERIZATION
 MIDDLE ELDFISK 2/7-6X N. SEA NORWAY DST 2 FLOW 2
 (WAT) FROM SEPERATOR WELL FLOWING 5/29/73

GEOCHEMISTRY BRANCH CODE, MCF
 TOTAL DISSOLVED CHROMIUM = <0.38 PPM
 RESISTIVITY, 25 DEG. C. = 0.238 OHM METERS
 PH = 7.82

TOTAL DISSOLVED SOLIDS = 5.69

INORGANIC CONSTITUENTS

CATIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS	ANIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS
SODIUM	1.9400	0.0844	CHLORIDE	3.5100	0.0990
POTASSIUM	0.0174	0.0004	BROMIDE	0.0156	0.0002
CALCIUM	0.0800	0.0040	IODIDE	0.0088	0.0001
MAGNESIUM	0.0116	0.0010	SULFATE	0.0224	0.0005
AMMONIUM	0.0061	0.0003	PHOSPHATE	<0.0005	0.0000
AMMONIA	0.0002	0.0000	BICARBONATE	0.0690	0.0011
BARIUM	0.00055	0.0000	CARBONATE	0.0000	0.0000
STRONTIUM	0.0219	0.0005			
TOTAL =	2.0716	TOTAL = 0.0902	TOTAL =	3.6262	TOTAL = 0.1008

DISSOLVED AROMATIC HYDROCARBONS

COMPOUND	CONCENTRATION PPM
BENZENE	0.70
TOLUENE	0.40

TABLE X

FORMATION WATER CHARACTERIZATION
 BOTTOM ELDFISK 2/7-6X NORTH SEA NORWAY DST-2
 OIL AND WATER TAKEN FROM SEPARATOR 5/29/73

GEOCHEMISTRY BRANCH CODE, MCG
 TOTAL DISSOLVED CHROMIUM = <0.40 PPM
 RESISTIVITY, 25 DEG. C, 0.124 OHM METERS
 PH = 7.76

TOTAL DISSOLVED SOLIDS = 5.58

INORGANIC CONSTITUENTS

CATIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS	ANIONS	CONCENTRATION WT/WT PER CENT	EQUIVALENTS PER 100 GRAMS
SODIUM	2.1400	0.0931	CHLORIDE	3.2400	0.0914
POTASSIUM	0.0140	0.0004	BROMIDE	0.0115	0.0001
CALCIUM	0.1000	0.0050	IODIDE	0.0080	0.0001
MAGNESIUM	0.0124	0.0010	SULFATE	0.0180	0.0004
AMMONIUM	0.0058	0.0003	PHOSPHATE	<0.0005	0.0000
AMMONIA	0.0002	0.0000	BICARBONATE	0.0210	0.0003
BARIUM	<0.00145	0.0000	CARBONATE	0.0000	0.0000
STRONTIUM	0.0170	0.0004			
TOTAL =	2.2850	0.0998	TOTAL =	3.2989	0.0923

DISSOLVED AROMATIC HYDROCARBONS

COMPOUND	CONCENTRATION PPM
BENZENE	0.00 oil present
TOLUENE	0.00

FIGURE 2. Odd-Even Predominance (OEP) curves as a function of carbon number for crude oil samples recovered from Danian-Cretaceous carbonate reservoir in the Eldfisk 2/7-6 Well. Individual curves represent samples from DST Nos. 1, 3, and 4. These curves fall within the narrow envelop of similar plots for oils produced from Danian-Cretaceous carbonate reservoirs in the North Sea Tertiary Basin.

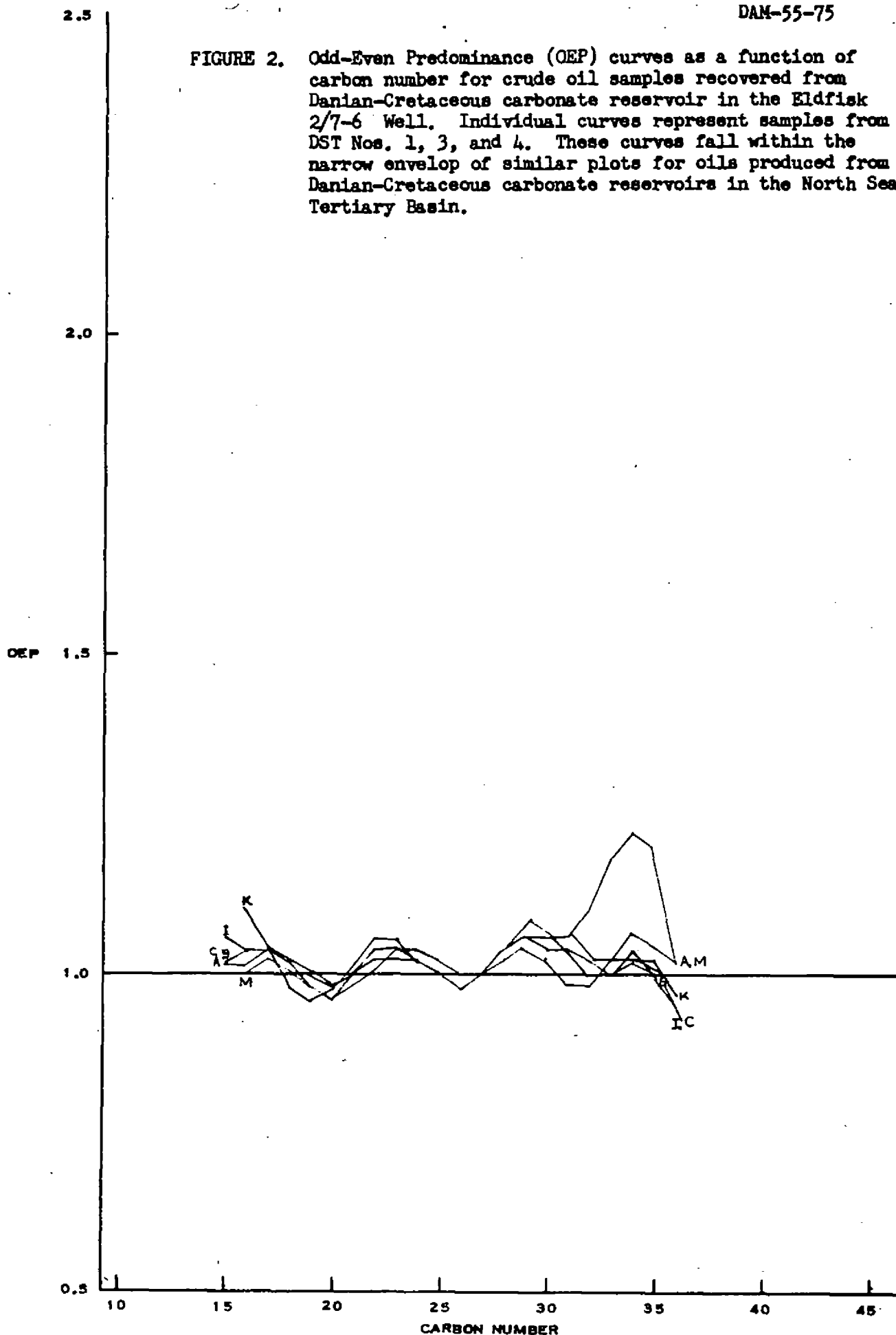


FIGURE 3. Concentration of n-alkanes by carbon number for crude oil samples recovered from Danian-Cretaceous carbonate - DST Nos. 1, 3, and 4 - Eldfisk 2/7-6X well. These curves are similar to like plots for oils produced from Danian-Cretaceous Limestone reservoirs in the North Sea Tertiary Basin.

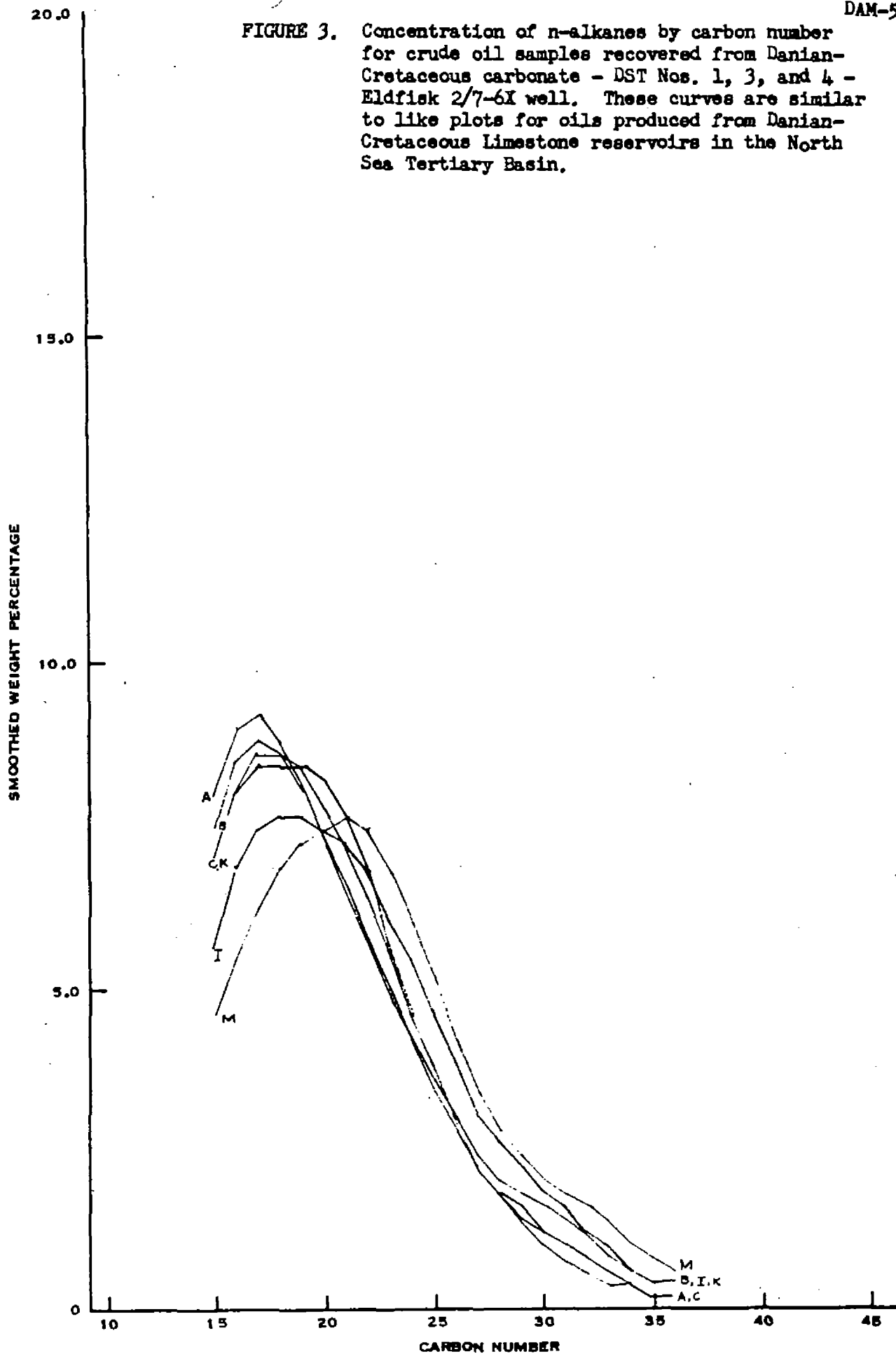


FIGURE 4. Carbon Isotopic Composition of Individual Hydrocarbons, Methane through n-Butane - for gas samples from the Eldfisk 2/7-6X well, compared with average curves for representative gases from the Greater Ekofisk Complex. Isotopic distribution patterns are similar, indicating that the petroleum is of a common origin. However, the average curves show that the Eldfisk 2/7-6X hydrocarbons are isotopically lighter or less mature.

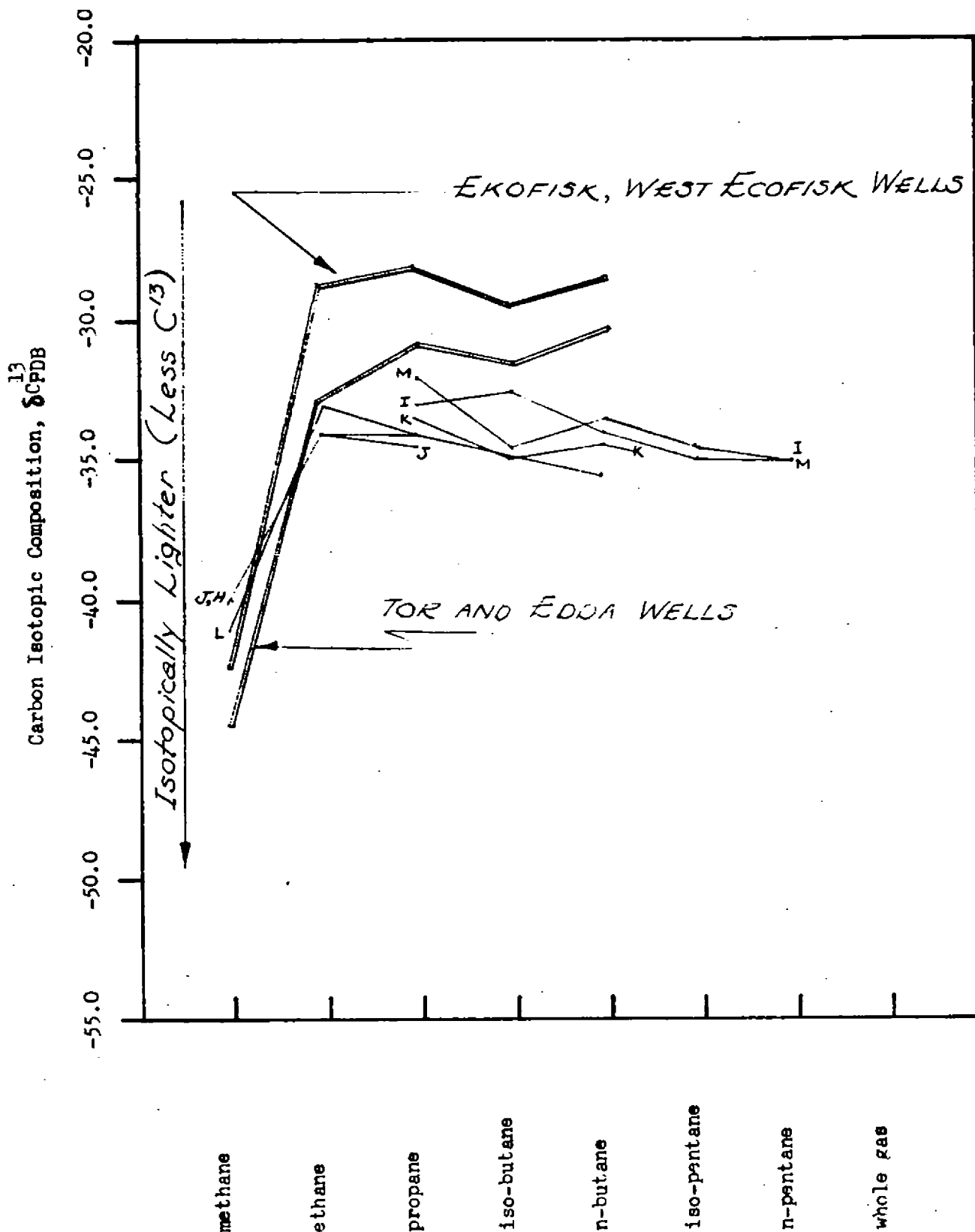


FIGURE 5. RATIOS OF COMPONENTS

for pairs not easily fractionated in the earth for oil samples from the Eldfiek 2/7-6X Well. These plots are similar to those for oils recovered from Danian-Cretaceous carbonate reservoirs in the North Sea Tertiary Basin, indicating a common origin.

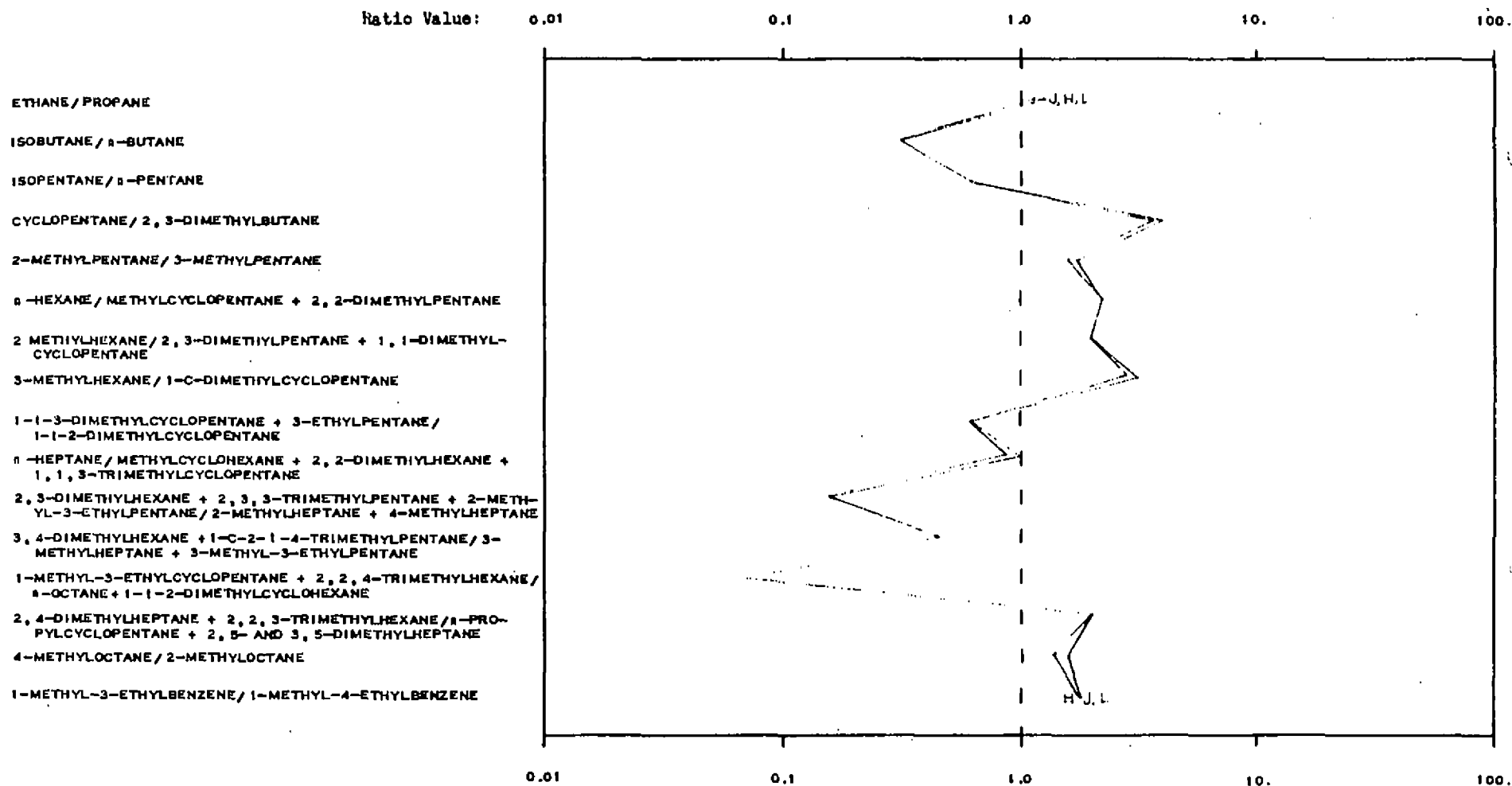
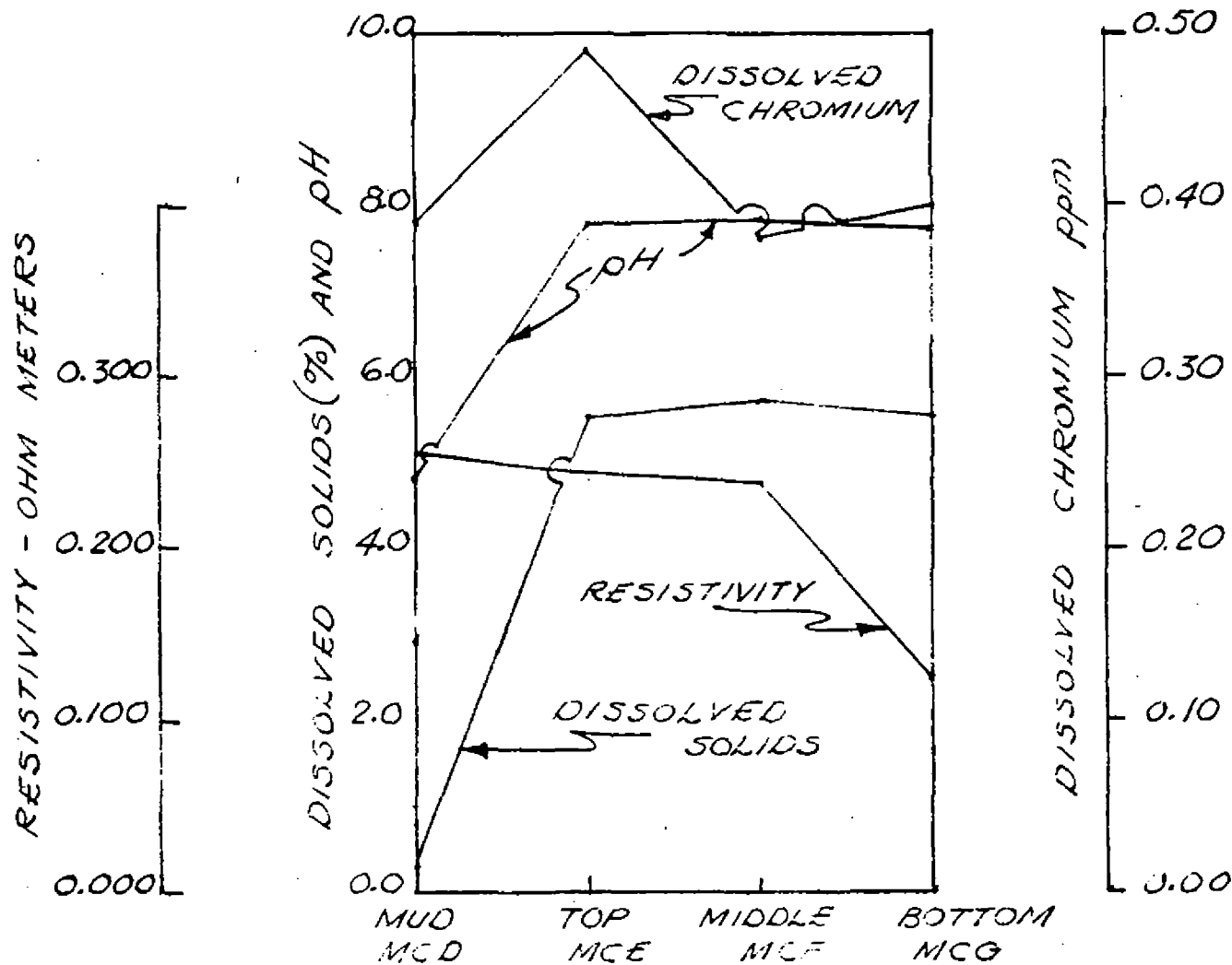


FIGURE 6. Characterization of water samples recovered from DST-2, which tested the 3069-3078 meter (10,070-10,100 foot) interval in the Eldfisk 2/7-6X Well.



Water DST 2 - Eldfisk 2/7-6X
 3069.33 m - 3078.48 m

FIGURE 7. STIFF DIAGRAM FOR WATER SAMPLE MCA

ELDFISK 2/7-6X N. SEA NORWAY
O&W FLOWING DST #2

MILLIEQUIVALENTS / LITER

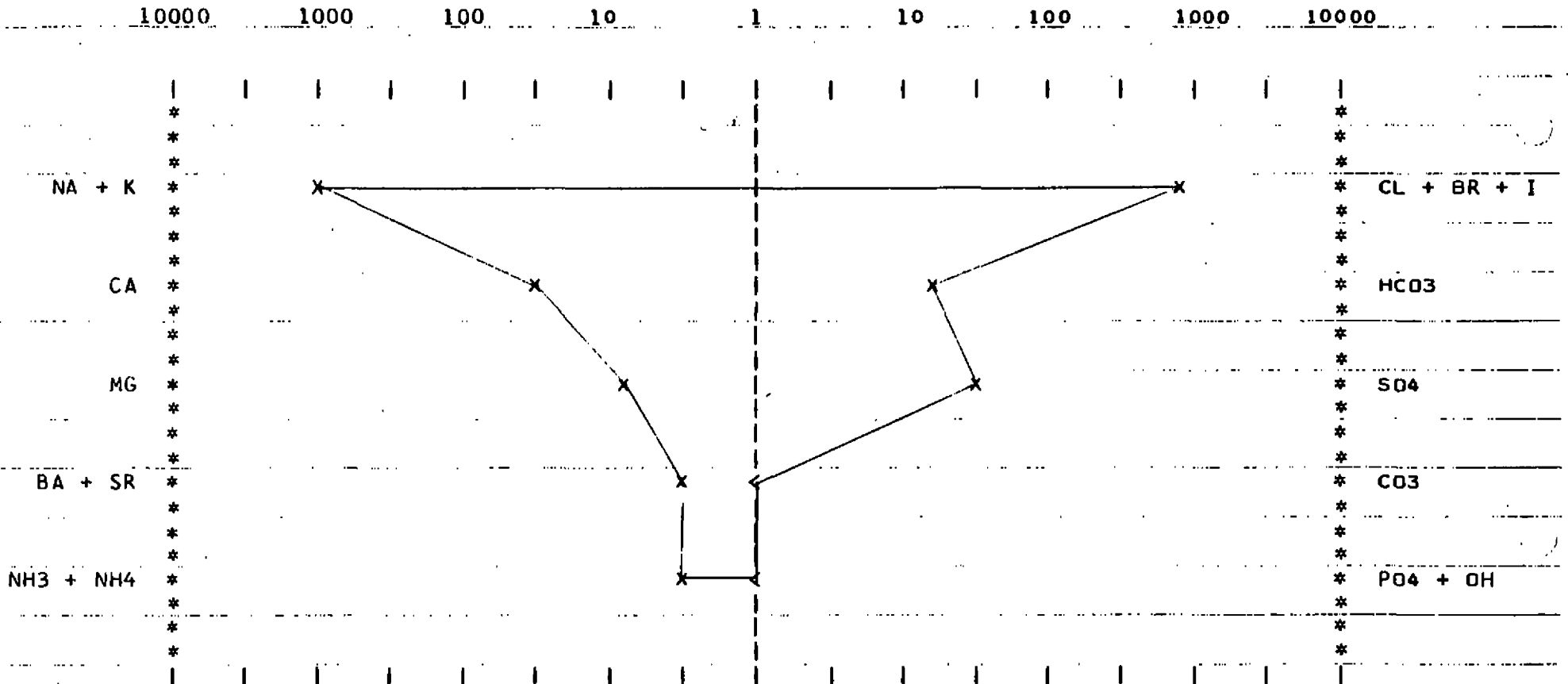


FIGURE 8. STIFF DIAGRAM FOR WATER SAMPLE MCC

ELDFISK 2/7-6X N. SEA NORWAY
 D&W FLOWING DST #2

MILLIEQUIVALENTS / LITER

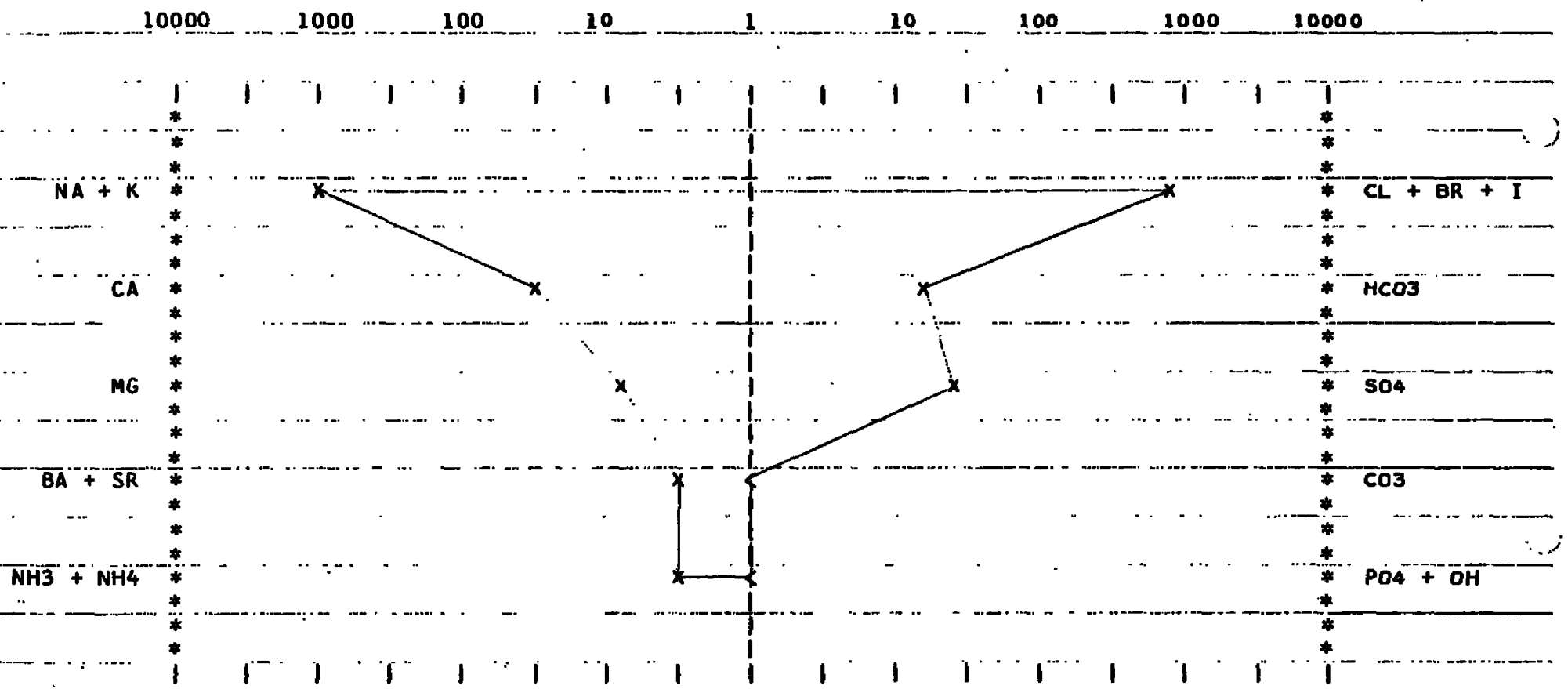


FIGURE 9. STIFF DIAGRAM FOR WATER SAMPLE MCD

MUD ELDFISK 2/7-6X N.SEA NORWAY DST 2 FLOW 2
 (WAT)FROM SEA INTERVAL 10070-10100' FLOWING 5/29/73

MILLIEQUIVALENTS / LITER

10000 1000 100 10 1 10 100 1000 10000

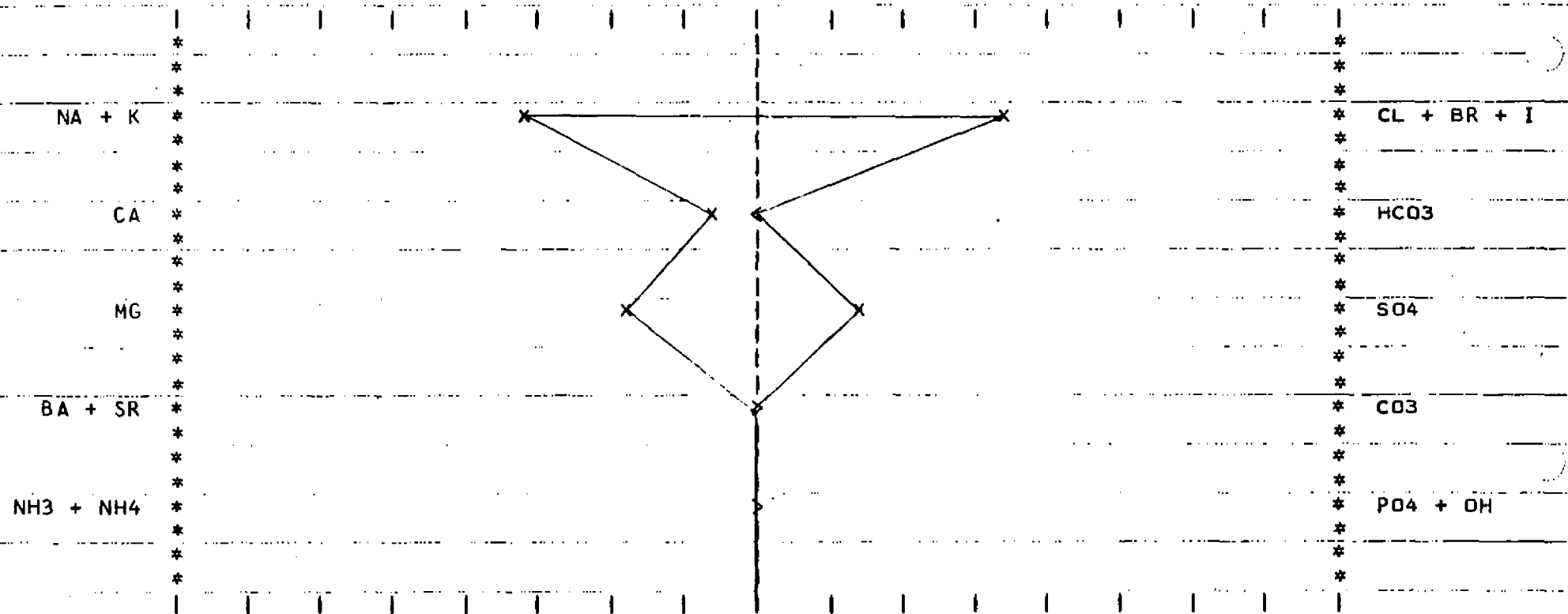


FIGURE 10. STIFF DIAGRAM FOR WATER SAMPLE MCE

TOP ELDFISK 2/7-6X N. SEA NORWAY DST 2 FLOW 2
 (WAT) FROM SEPERATOR FLOWING 5/29/73

MILLIEQUIVALENTS / LITER

10000 1000 100 10 1 10 100 1000 10000

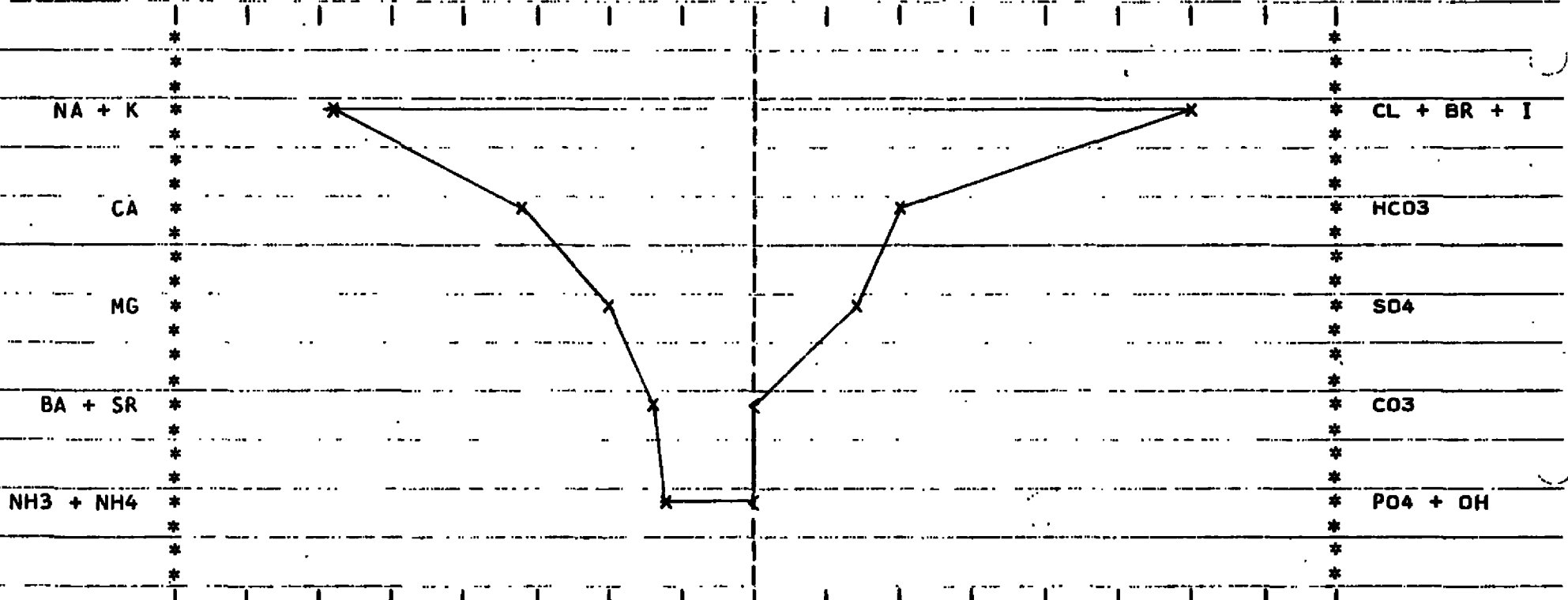


FIGURE 11, STIFF DIAGRAM FOR WATER SAMPLE MCF

MIDDLE ELDFISK 2/7-6X N.SEA NORWAY DST 2 FLOW 2
 (WAT)FROM SEPERATOR WELL FLOWING 5/29/73

MILLIEQUIVALENTS / LITER

10000 1000 100 10 1 10 100 1000 10000

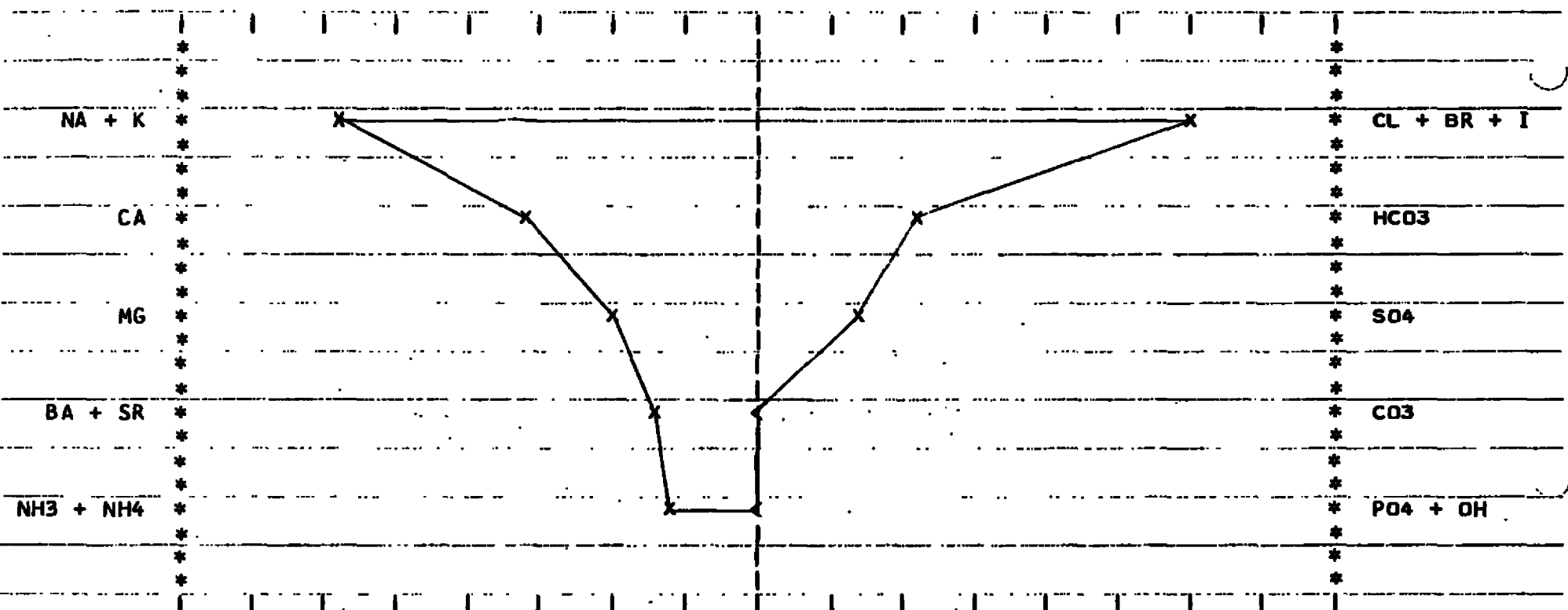


FIGURE 12. STIFF DIAGRAM FOR WATER SAMPLE MCG

BOTTOM ELDFISK 2/7-6X NORTH SEA NORWAY DST-2
 OIL AND WATER TAKEN FROM SEPARATOR 5/29/73

MILLIEQUIVALENTS / LITER

10000 1000 100 10 1 10 100 1000 10000

