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ANALYSES OF NATURAL GASES FROM GULF OF MEXICO OUTER CONTINENTAL SHELF

By

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INTRODUCTION

This report contains analyses and related source data for natural gas samples from 32 fields in the Gulf of Mexico OCS (Outer Continental Shelf). The interpretation of this data, along with analyses from other fields in Texas, is still in progress.

Duplicate gas samples were taken in 12-oz. glass bottles having a spring, clamp-type stopper using the following method: A bottle was filled with water and inverted in a bucket of water. A rubber hose was attached to the gas well, and gas was allowed to flow through it for 2 or 3 minutes to purge the air. The free end of the hose was then inserted into the bottle and the water was displaced with gas. The bottle was then sealed before removing it from the bucket.

About 30 ml of gas was withdrawn from the bottles and used to fill a 20-ml sample loop, by which the gas was valved into a gas chromatograph. The gas was separated on a 0.64-cm x 3.0-m column (packed with chromosorb 102) into the components of air, CO_2, and C_1-C_5 alkanes, and measured by a thermal-conductivity detector. The methane peaks were collected in a gas-tight syringe as they exited from the detector, and injected into a high-vacuum combustion system in which the hydrocarbons were quantitatively converted to CO_2. The stable carbon isotope ratio (C_{13}/C_{12}) was measured and calculated as δC_{13} permil relative to the PDB standard. The possibility of fractionation during gas-chromatographic separation was checked and eliminated by repeat analyses of 99+ percent pure tank methane, with and without preparative gas chromatography.

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Table 1.--Analyses and related source data of natural gas samples from Gulf of Mexico OCS

[TR indicates trace; --indicates not given; TD, TVD, and perforations are given in feet. 1 ft = 0.348 m]

Field	OCS No.	Well	TD[1]	TVD[2]	Perforations	N_2 and (or) air	CH_4	CO_2	C_2H_6	C_3H_8	i-C_4H_{10}	n-C_4H_{10}	i-C_5H_{12}	n-C_5H_{12}	δC_{13} of CH_4 (°/₀₀)
Main Pass Block 290	G1666	B10	7,270	6,267	6,064-88 6,092-6,100 6,102-08	0.961	96.88	0.135	1.54	0.241	0.069	0.081	0.023	0.04	-55.47
S. Pass Block 62	G1294	A11A	9,228	8,042	8,810-26	2.27	84.49	0.354	6.58	3.91	0.662	0.884	0.515	0.331	-55.62
S. Pass Block 62	G1294	A20	9,700	9,200	8,060-64	41.97	47.8	0.266	4.6	3.05	0.585	0.872	0.484	0.364	-53.33
W. Delta Block 133	G1107	D4	11,893	11,211	11,451-81	0.977	93.87	0.310	3.38	0.96	0.197	0.154	0.103	0.049	-58.97
Grand Isle Block 41	0129	A1	12,441	--	9,950-68	0.986	94.25	0.196	2.64	1.01	0.286	0.239	0.244	0.153	-55.0
Grand Isle Block 47	0133	H9	4,582	4,151	4,365-71	1.16	98.28	0.075	0.378	Tr	Tr	Tr	0	0	-62.27
Grand Isle Block 76	G2161	A3	6,474	5,526	5,895-5,944	0.855	95.15	0.083	3.01	0.877	0.061	0	0	0	-44.93
Grand Isle Block 76	G2161	A5	8,000	5,826	7,692-7,712	1.23	94.53	0.173	3.01	0.877	0.055	0.084	Tr	Tr	-59.03
S. Timbalier Block 172	G1251	A1D	10,951	9,031	8,132-37	1.34	95.88	0.167	1.7	0.521	0.123	0.107	0.09	0.061	-51.82
S. Timbalier Block 172	G1251	A3D	8,597	7,116	8,018-24	0.99	96.45	0.142	1.72	0.436	0.090	0.093	0.039	0.035	-50.41
Coon Point	G1868	4D	16,597	--	16,038-60	0.893	90.36	1.5	4.18	1.65	0.414	0.366	0.4	0.238	-48.01
Coon Point	G1441	7	14,545	--	14,312-80	0.924	92.28	0.801	3.5	1.29	0.349	0.312	0.276	0.204	-52.63
Ship Shoal Block 169	0817	2	6,741	6,084	6,420-28	1.76	95.01	0.178	2.25	0.552	0.035	0.095	0	0.084	-51.31
Ship Shoal Block 169	0817	3	6.730	6,090	6,470-76	1.26	95.3	0.177	2.48	0.649	0.031	0.084	0	Tr	-50.97
Ship Shoal Block 208	0827	G4D	10,962	10,219	8,826-43	0.962	93.76	0.204	2.69	1.13	0.323	0.328	0.331	0.254	-51.32
Ship Shoal Block 208	0827	J7A	9,435	8,375	8,598-8,610	1.06	94.77	0.468	2.41	0.67	0.178	0.163	0.174	0.099	-39.48
Ship Shoal Block 271	G1038	7	9,931	8,088	7,550-58	0.861	97.37	0.404	0.77	0.285	0.062	0.099	0.009	0.075	-61.91
Ship Shoal Block 271	G1038	8	8,100	6,602	7,302-16	0.849	97.54	0.447	0.707	0.253	0.037	0.064	0.006	0.027	-58.87
Ship Shoal Block 274	G1043	4A	9,960	9,216	8,602-46	1.0	92.49	0.174	2.97	1.68	0.378	0.504	0.415	0.395	-59.48
Ship Shoal Block 274	G1039	13	10,200	8,543	9,854-10,016	1.42	89.56	0.167	3.14	2.21	0.670	0.984	0.885	0.863	-59.96
Eugene Island Block 198	0437	1	14,200	14,200	12,954-96	1.47	93.82	0.835	2.28	0.818	0.223	0.201	0.206	0.140	-47.08
Eugene Island Block 198	0437	A11	14,265	13,394	13,930-35	1.48	93.47	0.869	2.33	0.867	0.262	0.262	0.242	0.192	-46.91
Eugene Island Block 296	G2105	A1	8,350	7,972	7,860-7,920	0.87	93.0	0.165	3.56	1.26	0.274	0.333	0.236	0.26	-44.98
Eugene Island Block 296	G2105	A7	4,750	4,328	4,570-4,606	0.809	98.35	0.097	0.562	0.005	0.035	0.061	0	Tr	-53.69
Eugene Island Block 306	G2109	A10	11,340	11,093	10,452-500	0.891	93.81	0.214	3.39	0.960	0.220	0.214	0.182	0.117	-43.76
Eugene Island Block 306	G2109	A17	4,598	4,228	4,523-98	0.847	98.39	0.317	0.296	0.075	Tr	Tr	0	0	-50.47
S. Marsh Island Block 66	G1196	B2	14,000	13,136	12,209-25	2.21	95.6	0.485	1.17	0.314	0.071	0.063	0.054	0.029	-41.65
S. Marsh Island Block 66	G1196	B4	13,444	12,923	12,093-109	0.739	97.01	0.408	1.24	0.348	0.076	0.074	0.063	0.042	-41.21
S. Marsh Island Block 108	0792	D1	7,029	5,884	3,837-43	2.06	96.89	0.142	0.887	Tr	0	0	0	0	-55.91
S. Marsh Island Block 108	0792	D7	4,586	4,055	3,719-25 4,331-37	0.911	98.3	0.112	0.666	Tr	0	0	0	0	-58.87
Vermilion Block 218	G1141	A2	12,700	12,411	9,350-72	15.86	79.0	0.362	3.11	0.986	0.226	0.174	0.185	0.093	-52.39

Table 1.--Analyses and related source data of natural gas samples from Gulf of Mexico OCS--Continued

Field	OCS No.	Well	TD[1]	TVD[2]	Perforations	N_2 and (or) air	CH_4	CO_2	C_2H_6	C_3H_8	i-C_4H_{10}	n-C_4H_{10}	i-C_5H_{12}	n-C_5H_{12}	δC_{13} of CH_4 (°/₀₀)
Vermilion Block 218	G1141	A2D	12,700	12,411	7,850-64	0.942	93.38	0.221	3.1	1.29	0.351	0.270	0.259	0.156	-52.44
Vermilion Block 320	G2087	A1Z	7,237	7,237	5,796-5,816	0.807	95.42	0.266	2.03	0.737	0.231	0.199	0.151	0.1	-47.62
Vermilion Block 320	G2087	A2	7,334	6,993	6,684-6,710	0.859	87.63	0.266	1.86	0.74	0.253	0.202	0.172	0.104	-47.34
E. Cameron Block 222	G2037	A4	9,969	9,693	9,368-76	4.27	92.41	0.262	1.35	0.418	0.458	0.247	0.087	0.145	-44.33
E. Cameron Block 222	G2037	A6	12,600	11,400	10,495-503	30.57	67.64	0.244	1.00	0.31	0.092	0.072	0.041	0.023	-43.89
E. Cameron Block 224	G0966	A11	6,694	5,367	6,694-758	5.13	92.75	0.15	1.33	0.42	0.106	0.074	0.036	0.009	-47.73
E. Cameron Block 245	G0970	A3D	4,419	3,999	1,651-60	0.707	99.17	0.115	0.011	0	0	0	0	0	-71.38
E. Cameron Block 245	G0970	A6D	4,476	4,059	3,544-56	1.31	98.46	0.117	0.108	0	0	0	0	0	-67.94
W. Cameron Block 40	0224	5	10,940	10,940	10,597-684	1.04	93.78	0.9	3.33	0.668	0.125	0.071	0.056	0.025	-43.98
W. Cameron Block 71	0244	D4	11,717	11,350	11,128-36	1.07	91.74	1.05	3.76	1.34	0.44	0.214	0.247	0.13	-46.58
W. Cameron Block 71	0245	D10D	12,526	11,400	11,894-900	1.17	91.56	1.03	3.8	1.32	0.457	0.209	0.242	0.156	-46.58
W. Cameron Block 229	G0902	A2	16,186	--	6,813-18	3.71	94.49	0.29	0.98	0.29	0.111	0.59	0.051	0.025	-53.02
W. Cameron Block 280	G0911	7	8,812	8,606	8,037-47	0.85	97.6	0.209	0.842	0.18	0.075	0.044	0.059	0.111	-53.32
W. Cameron Block 280	G0911	7D	8,812	8,606	7,780-90	0.843	97.7	0.199	0.848	0.181	0.063	0.051	0.054	0.060	-52.85
W. Cameron Block 513	G2007	B1	10,963	9,948	8,340-60	0.958	96.18	0.124	1.08	0.823	0.297	0.185	0.242	0.106	-58.89
W. Cameron Block 513	G2007	B2	11,434	9,643	8,648-52	1.0	98.56	0.119	0.255	0.010	Tr	0	0	0	-59.21
W. Cameron Block 533	G2226	A1D	7,959	--	3,000-3,008	5.67	94.18	0.10	0.04	0.01	0	0	0	0	-67.79
W. Cameron Block 543	G2010	A8	9,610	9,500	8,156-90 8,493-8,540	1.49	96.36	0.14	1.19	0.408	0.116	0.096	0.11	0.084	-58.95
W. Cameron Block 543	G2011	A10	9,583	8,361	9,309-93	0.97	97.03	0.153	1.21	0.436	0.141	0.116	0.14	0.104	-58.72
W. Cameron Block 587	G2021	A2D	11,880	10,709	4,840-4,932	0.944	97.05	0.102	1.33	0.486	0.014	0.036	0	Tr	-60.67
W. Cameron Block 587	G2021	A8	9,705	8,181	6,012-79	0.927	97.05	0.131	1.37	0.499	0.005	0.019	0	0	-60.14
W. Cameron Block 639	G2027	A5	7,438	5,316	6,872-6,938	0.813	98.38	0.042	0.348	Tr	0	0	0	0	-65.19
W. Cameron Block 639	G2027	A16	9,385	7,449	5,826-46	0.978	97.49	0.097	1.17	0.258	0.006	0.007	0	0	-59.87
W. Cameron Block 643	G2241	A2	7,780	5,691	6,176-6,240	0.847	96.46	0.151	1.88	0.577	0.043	0.037	0	0	-57.39
W. Cameron Block 643	G2240	A8	9,875	5,764	7,834-64	0.744	96.60	0.1	1.92	0.565	0.033	0.028	0	0	-52.27

[1]TD - total depth
[2]TVD - true vertical depth