

New Mexico Bureau of Mines and Mineral Resources
Open File Report No. OF-272

HYDROCARBON SOURCE-ROCK ANALYSES,
TRUE OIL COMPANY NO. 21 MEDINA WELL,
COLFAX COUNTY, NEW MEXICO

By Core Laboratories, Inc.
and Cehvron U.S.A., Inc.

1987

Biostudy 1176
CORE LABORATORIES, INC.



May 17, 1983

Geochemical
 Services

Mr. S. R. Jacobson
 Chevron USA
 Central Region
 P. O. Box 599
 Denver, CO 80201

Subject: Total Organic Carbon and
 Rock-Eval Pyrolysis
 Well: True Oil Company
 No. 21 Medina
 Chevron Job Nos.: P-4079-1
 CMEN-1120
 Our Job No.: 83075

Dear Mr. Jacobson:

The following report contains the analytical results of 30 samples in the interval 3620 to 9000 feet from the True Oil Company No. 21 Medina, Colfax County, N.M. All organic carbon and Rock-Eval Pyrolysis data is presented in Table 2.

The original pyrolysis pyrograms have been returned as requested.

Thank you for the opportunity to be of service to Chevron USA. If you have any questions or if we may be of further assistance, please do not hesitate to call us.

Sincerely,

CORE LABORATORIES, INC.

Robert Blake

Robert Blake
 Supervisor
 Geochemical Services

Paul J. Swetland

Paul J. Swetland
 Manager
 Geochemical Services

RB, PJS:kn

FILE INDEXING INFO.	
DISPLAYS	TB
SAMPL TYPE	P
FOSSIL TYPE	P
TYPE OF STUDY	OK

True Oil Company
No. 21 Medina
ROCK-EVAL PYROLYSIS

Depth (FT)	TOC (wt%)	Mg/Gm Rock			Hydrogen Index	Oxygen Index	Oil or Gas		Trans Ratio	TMAX (Deg C)
		S1	S2	S3			Shows	Potential		
3620- 3880	0.53	0.06	-	0.47	-	88.7	0.06	0.06	-	-
4120- 4130	0.57	0.02	-	0.56	-	98.2	0.02	0.02	-	-
4290- 4310	0.98	0.15	0.73	0.53	74.5	54.1	0.15	0.88	0.17	442
4870- 4920	1.01	0.16	0.41	0.35	40.6	34.7	0.16	0.57	0.28	449
5130- 5170	0.72	0.08	0.06	0.35	8.3	48.6	0.08	0.14	0.57	449
5200- 5210	0.75	0.05	0.09	0.40	12.0	53.3	0.05	0.14	0.36	455
5400- 5430	0.83	0.04	0.08	0.46	9.6	55.4	0.04	0.12	0.33	444
5560- 5640	1.07	0.04	0.20	0.47	18.7	43.9	0.04	0.24	0.17	432
5820- 5850	1.61	0.32	0.68	0.32	42.2	19.9	0.32	1.00	0.32	452
6130- 6270	1.76	0.13	0.24	0.29	13.6	16.5	0.13	0.37	0.35	449
6350- 6400	1.13	0.09	0.07	0.26	6.2	23.0	0.09	0.16	0.56	454
6480- 6500	0.77	0.05	-	0.30	-	39.0	0.05	0.05	-	-
6600- 6650	0.89	0.08	-	0.29	-	32.6	0.08	0.08	-	-
6800- 6850	0.87	0.03	-	0.27	-	31.0	0.03	0.03	-	-
7020- 7100	0.84	0.04	-	0.35	-	41.7	0.04	0.04	-	-
7130- 7200	0.97	0.04	-	0.35	-	36.1	0.04	0.04	-	-
7230- 7260	1.00	0.03	-	0.42	-	42.0	0.03	0.03	-	-
7420- 7490	0.92	0.03	-	0.36	-	39.1	0.03	0.03	-	-
7650- 7680	1.07	0.06	-	0.42	-	39.3	0.06	0.06	-	-
7840- 7860	1.62	0.04	0.09	0.27	5.6	16.7	0.04	0.13	0.31	482
7950- 7980	9.55	0.43	6.51	0.56	68.2	5.9	0.43	6.94	0.06	488
8010- 8080	2.01	0.04	0.16	0.51	8.0	25.4	0.04	0.20	0.20	510
8160- 8180	3.41	0.06	0.52	0.44	15.2	12.9	0.06	0.58	0.10	481
8230- 8250	1.44	0.01	-	0.46	-	31.9	0.01	0.01	-	-
8310- 8350	4.89	0.08	1.20	0.41	24.5	8.4	0.08	1.28	0.06	492
8410- 8450	5.62	0.08	1.09	0.38	19.4	6.8	0.08	1.17	0.07	490
8500- 8560	4.71	0.07	1.19	0.33	25.3	7.0	0.07	1.26	0.06	488
8770- 8800	2.12	0.04	-	0.34	-	16.0	0.04	0.04	-	-
8880- 8940	1.88	0.03	-	0.31	-	16.5	0.03	0.03	-	-
8960- 9000	2.59	0.03	-	0.34	-	13.1	0.03	0.03	-	-

TOC = Total Organic Carbon

Oil or Gas Shows = S_1 Hydrogen Index = S_1/TOC Oil or Gas Potential = $S_1 + S_2$ Oxygen Index = S_3/TOC Trans Ratio = $\frac{S_1}{S_1+S_2}$

TRUE OIL CO. #21 MEDINA
SEC. 25 - 24N - 16E

COLFAX CO., NEW MEXICO

HYDROCARBON GENERATION ZONES

BIOSTUDY NO. 1176

% KEROGEN TYPES

LOG TOPS	SAMPLE NUMBER	INTERVAL	VITRINITIC REFLECTANCE AND TAI DETERMINATIONS	TAI				% KEROGEN TYPES				WEIGHT % TOC	ORG YIELD/DG	Tmax
				%R0	MATURE ZONE	OIL ZONE	CONDENSATE AND GAS ZONE	DRY GAS ZONE	I	II	III			
	PH-1	3400-3400	TAI, 2.9					0	10	50	30	.23	.8	
	PH-2	3400-3400						0	80	80	0	.57	.8	
	PH-3	3400-3400						0	20	58	20	.39	1.0	447.5
	PH-4	3400-3400	TAI, 2.9-3.1; T _g , 50-1.1; T _g , 4.3; T _g , 2.4-2.4					0	30	0	30	.4		
	PH-5	3400-3400	T _g , 1.2; TAI, 2.2					0	20	30	30	1.0	.8	449
	PH-6	3400-3400						0	20	90	10	.12	.8	142
	PH-7	3400-3400						0	20	50	30	.15	1.0	165
	PH-8	3400-3400						0	20	10	20	.23	.5	144
	PH-9	3400-3400	TAI, 1.9-2.0; T _g , 50-1.0					0	30	40	30	1.07	1.0	432
	PH-10	3400-3400						0	10	60	30	1.51	.5	452
	PH-11	3400-3400						0	10	80	10	1.16	.8	447
	PH-12	3400-3400	T _g , 1.1; TAI, 2.3-2.4					0	10	10	30	3.13	.8	434
	PH-13	3400-3400	TAI, 2.3-2.5; T _g , 2.3-2.5					0	20	18	30	.11	1.0	
	PH-14	3400-3400						0	15	80	20	.81	.8	
	PH-15	3400-3400						0	10	50	40	.81	1.0	
	PH-16	3400-3400						0	10	80	10	.81	.8	
	PH-17	3400-3400	T _g , 1.1; TAI, 2.4-2.5					0	30	60	10	.91	.5	
	PH-18	3400-3400						0	10	10	20	1.50	1.0	
	PH-19	3400-3400	TAI, 2.3-2.5; T _g , 1.5-1.7					0	10	50	40	1.07	1.0	
	PH-20	3400-3400	T _g , 2.2-2.4; T _g , 1.2-1.4; T _g , 2.2-2.4					0	10	40	50	.72	1.0	
	PH-21	3400-3400	T _g , 1.2; TAI, 2.4-2.4					0	10	60	30	3.6		
	PH-22	3400-3400						0	10	18	20	1.42	.1	431
	PH-23	3400-3400						0	10	40	30	2.55	2.7	418
	PH-24	3400-3400	TAI, 2.7-2.8; T _g , 2.0-2.7					0	10	60	30	2.05	1.0	310
	PH-25	3400-3400						0	10	50	30	2.41	2.0	481
	PH-26	3400-3400						0	20	50	30	1.44	2.0	
	PH-27	3400-3400	T _g , 1.2; TAI, 2.3-2.4					0	20	10	30	4.81	2.0	492
	PH-28	3400-3400	T _g , 1.2; TAI, 2.3-2.4					0	20	30	30	2.42	1.0	490
	PH-29	3400-3400						0	20	50	30	1.5		
	PH-30	3400-3400						0	20	50	30	4.21	.7	488
	PH-31	3400-3400	T _g , 1.2; TAI, 2.3-2.4					0	20	50	30	2.12	.07	
	PH-32	3400-3400	TAI, 2.5-2.7; T _g , 1.3-2.0					0	20	30	30	1.81	.2	
	PH-33	3400-3400	TAI, 2.4-2.7; T _g , 1.7-2.0					0	20	50	30	2.83	.7	

SCALE 2 INCHES TO 100 FEET PRESENTATION PURPOSES

MAGALLEN (CND)

Prelim.

BIOSTRATIGRAPHIC STUDY NO. 1176
PALYNOLOGY REPORT
P4079

Location

True Oil Co. #21 Medina
Sec. 25-24N-16E
Colfax County, New Mexico

Problem

Cuttings samples submitted by Steve Phillips for determination of maturity (TAI-V_o) and microscopic organic analysis (MOA) indices.

Note: For discussion in this report, the samples are grouped mainly by Tmax values, the interval 3620-6400 has Tmax values in the oil generating range, the interval 6480-7770 had insufficient S₂ values during pyrolysis to measure Tmax and the third interval from 7840-8800 has Tmax values in the gas-cond. generative range.

Specimens of Lycospora sp. were used or considered in making TAI determinations. The restricted range of this palynomorph is Devonian, Miss. and Penn., thus corroborating to some extent the stratigraphy as given. They were first noted in sample 8, (5560-5640) and were generally evident to TD.

Sample 33 (8310-8320) was very good for determination of vitrinite reflectance. The vitrinite plug for sample 28 (8770-8800) seemed noticeably clean of caving material. Also the TAI slide for this sample had a small TAI spread indicating a homogeneous sample. The TAI slide for sample 30 (8960-9000) contained two groups of TAI indices, the 3.8-3.9 (dry gas) group was interpreted as reworked, the less mature group 3.6-3.7 was interpreted as probably being in place and corroborated by vitrinite reflectance.

Results

Sample		<u>Data</u>				TOC	Organic Yield (ml./10 grams.)
		Kerogen Types (MOA)					
		I	II	III	IV		
P4079-1	(3620-3880)	0	10	60	30	.53	.6
2	(4120-4130)	0	10	60	30	.57	.5
3	(4290-4310)	0	20	50	30	.98	1.0
31	(4610-4670)	0	30	40	30		.6
P4079-4	(4870-4920)	0	20	50	30	1.01	.6
5	(5130-5170)	0	20	50	30	.72	.5
6	(5200-5210)	0	20	50	30	.75	1.0
7	(5400-5430)	0	20	50	30	.83	.5
8	(5560-5640)	0	10	60	30	1.07	1.0
9	(5820-5850)	0	10	60	30	1.61	.5
10	(6130-6270)	0	10	60	30	1.76	.6
11	(6350-6400)	0	10	60	30	1.13	.8

Maturity

Tmax sample 3, 442°C oil generative zone.
 samples 4-7, 9-11, 444°C-455°C oil gen. zone.
 sample 8, 432°C immature. Note: Tmax value is not substantiated by TAI and therefore should not be used.

V_o sample 31, .83 (=TAI 2.8-2.9) oil gen. zone.
 sample 4, 1.2 (=TAI 3.2) early gas-cond. gen. zone.
 Note: sample 4 has a higher V_o reading than might be expected from adjacent interval, could be measuring reworked vitrinite.
 sample 11, 1.31 (-TAI 3.3-3.4) gas-cond. gen. zone.

TAI sample 1, 2.9 (=V_o .90) oil gen. zone.
 sample 31, 2.9-3.1 (=V_o .90-1.1) oil gen. zone.
 sample 8, 2.9-3.0 (=V_o .90-1.0) oil gen. zone.

Amount (of organics)

Wt % TOC samples 1-3, .53-.98 fair (.5-1.0).
 samples 5-7, .72-.83 fair (.5-1.0).
 samples 4, 8-11, 1.01-1.76 good (1.0-2.0)

Organic yield, see above.

Sample		Kerogen Types (MOA)				TOC	Organic Yield (ml./10 grams.)
		I	II	III	IV		
P4079-12	(6480-6500)	0	20	50	30	.77	1.0
13	(6600-6650)	0	10	60	30	.89	.6
14	(6800-6850)	0	10	60	30	.87	1.0
15	(7020-7100)	0	10	60	30	.84	.8
16	(7130-7200)	0	10	60	30	.97	.5
17	(7230-7260)	0	10	60	30	1.00	.5
34	(7240-7250)	0	20	50	30		1.0
18	(7420-7490)	0	10	60	30	.92	1.0
19	(7650-7680)	0	10	60	30	1.97	1.0
32	(7740-7770)	0	10	60	30		1.6

Maturity

Tmax insufficient S-2

V_o sample 16, 1.41 (=TAI 3.4-3.5) gas-cond. gen. zone.
sample 19, 1.56 (=TAI 3.5-3.6) gas-cond. gen. zone.
sample 32, 1.41 (=TAI 3.4-3.5) gas-cond. gen. zone.

TAI sample 13, 3.3-3.5 (=V_o 1.3-1.5) gas-cond. gen. zone.
sample 18, 3.5-3.6 (=V_o 1.5-1.7) gas-cond. gen. zone.
sample 19, 3.3-3.6 (=V_o 1.3-1.7) gas-cond. gen. zone.

Amount (of organics)

wt% TOC samples 12-16, 18, .77-.97 fair (.5-1.0).
samples 17, 19, 1.0-1.7 good (1.0-2.0).

Organic yield, see above.

Sample		Kerogen Types (MOA)				TOC	Organic Yield (ml./10 grams.)
		I	II	III	IV		
P4079-20	(7840-7860)	0	10	60	30	1.62	.1
21	(7950-7980)	0	10	60	30	9.55	2.2
22	(8010-8080)	0	10	60	30	2.01	1.6
23	(8160-8180)	0	20	50	30	3.41	2.0
24	(8230-8250)	0	20	50	30	1.44	2.0
25	(8310-8350)	0	30	40	30	4.89	2.0
33	(8310-8320)						1.2
26	(8410-8450)	0	20	50	30	5.62	1.5
35	(8430-8450)	0	30	50	30		1.5
27	(8500-8560)	0	20	50	30	4.71	.2
28	(8770-8800)	0	20	50	30	2.12	.07
29	(8880-8940)	0	20	50	30	1.88	.3
30	(8960-9000)	0	20	50	30	2.59	.2

Maturity

Tmax samples 20, 21, 23, 25, 26 and 27, 481⁰~~510~~⁴⁹²°C Gas cond. gen. zone. sample 22, 510°C. Post mature. Note: This value is out of context with adjacent values. This sample also has a higher maturity index (TAI 3.7-3.8= V_o 2.0-2.7) which is actually not inconsistent with the Tmax of 510°C but the thermal gradient as indicated by adjacent samples doesn't accommodate these maturity values. The most likely reason for higher indices in this sample is that a perhaps larger amount of redeposited material was present in this interval.

V_o sample 33, 1.39 (=TAI 3.3-3.4) gas-cond. gen. zone.
 sample 35, 1.61 (=TAI 3.5-3.6) gas-cond. gen. zone.
 sample 28, 1.53 (=TAI 3.5-3.6) gas-cond. gen. zone.
 sample 29, 1.67 (=TAI 3.5-3.6) gas-cond. gen. zone.
 sample 30, 1.75 (=TAI 3.6-3.7) gas-cond. gen. zone.

TAI sample 28, 3.5-3.6 (= V_o 1.5-2.0) gas-cond. gen. zone.
 sample 30, 3.6-3.7 (= V_o 1.7-2.0) gas-cond. gen. zone.

Amount (of organics)

samples 20, 24, and 29, 1.44-1.88 good (1.0-2.0).
 samples 21, 22, 23, 25, 26, 27, 28, and 30, 2.01-9.55 very good (2.0-10.0).

Organic yield, see above.

J. D. SAXTON
6/9/83

JDS:mm

Attachments: Computer drafted chart
Fig. 1
Core Lab Report 83075