



STATE OF ILLINOIS

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DEPARTMENT OF REGISTRATION AND EDUCATION

# PHYSICAL PROPERTIES OF ILLINOIS CRUDE OIL. PART I

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ILLINOIS PETROLEUM 78

ILLINOIS STATE GEOLOGICAL SURVEY

1964

URBANA, ILLINOIS



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ILLINOIS CRUDE OILS

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PART I

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ABSTRACT

Basic data on physical properties of Illinois crude oils, including API gravity at 60° F, viscosity at 50°, 77°, and 100° F, and interfacial tension at 77° F, are presented in tabular form. Approximately 350 samples of oil were analyzed. The samples were taken from producing wells located north of the base line to the third principal meridian. The base line extends roughly from south of Belleville through Mt. Carmel, Illinois.

Samples were collected from pay zones in Pennsylvanian, Chesterian, Valmeyeran, Devonian, Silurian, and Ordovician strata.

INTRODUCTION

The need for fundamental data on the physical properties of reservoir fluids and on the role these properties play in oil recovery becomes more urgent as research in petroleum technology expands. The lack of such data is particularly felt in areas such as the Illinois Basin where primary recovery is diminishing and secondary and tertiary operations are increasing.

An Illinois State Geological Survey project has produced such information about the physical properties of Illinois crude oils. The data collected and presented in this report have many applications.

They could be used in studying flow of fluids through reservoirs, in correlating the physical properties of the crude oils with their geologic occurrence, in determining relationships between physical properties and effectiveness of waterflooding, in predicting physical characteristics of a crude oil from its geologic occurrence, and in predicting how reservoirs would react to specific recovery methods. A comprehensive compilation of the fundamental facts gathered here also could be of great value in reservoir engineering calculations concerned with primary, secondary, and tertiary recovery of Illinois crude oil.

The project was begun by Paul A. Witherspoon, who made the preliminary studies. A. W. Schmidt helped to collect samples, and C. R. Hinson assisted in analyzing the crude oils.

#### PRELIMINARY STUDY

As the samples were to be collected over a long period of time and in all kinds of weather, the first consideration was to determine how consistent results would be for crude oil obtained from a given well at various time intervals. Data (not included in this report) suggest that, within experimental error, the physical properties of oil from a given producing well remained constant throughout the sampling period.

The second preliminary step was to determine whether variations occurred in the physical properties of crude oils that were obtained from the same formation but from wells that produce from different structural positions in a reservoir. The results of the tests

made indicate that there are no definite changes in crude oil physical properties with structural variations in a formation.

To determine the number of samples needed for a comprehensive report, the oil fields and producing formations in the Illinois Basin were studied. Samples were selected according to the following criteria:

1. Samples, with few exceptions, were taken from wells that had not been subjected to waterflooding.
2. Only wells producing from single formations were sampled.

Well records in the technical files of the Illinois Geological Survey were consulted to find single pay and non-waterflood wells for sampling. (Some of the wells chosen have since been subjected to waterflooding.) After samples were collected, the operator of the sampled wells was asked to verify the well location, producing formation, and depth of producing zone. If an operator was unable to furnish data, the information was taken from well records in the Survey files.

#### SAMPLING PROCEDURE

Approximately 700 samples were collected, which represents the majority of the significant oil-producing formations in the state. This report, the first of two parts, includes approximately 350 samples. The samples are from the area north of the base line to the third principal meridian. The base line nearly bisects the Illinois Basin and runs approximately from Belleville to Mt. Carmel. Part II will present data on crude oils from the area south of the base line.

The samples from the north half of the Illinois Basin were collected from the following pay zones:

1. Pennsylvanian--Trivoli, 1st, 2nd, 3rd, 4th Siggins, Bellair 500, Bridgeport, Upper Dudley, Lower Dudley,



Isabel, Petro, Biehl, Pottsville, Bellair 800, Casey, Upper Partlow, "Gas Sand" . . . . .	51 samples
2. Chesterian—Waltersburg, Tar Springs, Golconda, Cypress, Bethel, Benoist, Bellair 900, Sample . . .	104 samples
3. Valmeyeran—Aux Vases, Ste. Genevieve, Ohara, Spar Mountain, McGlosky, St. Louis, Westfield, Salem, Osage, Carper . . . . .	137 samples
4. Devonian—Hardin, Lingle, Cedar Valley, Hibbard, Hoing, Geneva . . . . .	25 samples
5. Silurian . . . . .	18 samples
6. Ordovician—Trenton . . . . .	9 samples

Samples for analysis were collected in glass gallon jugs from bleeder valves or, in exceptional cases, from stock tanks at the well sites. At wells where production was a mixture of oil and water, a glass water-oil separator was used in which oil and water, as pumped from the well, were allowed to stand until separation was complete. The water was drained from the bottom of the separator, additional oil and water were added, water was again drained, and the process was repeated until a sufficient oil sample was collected. Agitation and exposure of samples to air were kept to a minimum.

Samples were sealed (air-tight) and delivered to the analytical laboratory for analysis.

#### ANALYTICAL PROCEDURE

The three physical characteristics determined for the crude oil were: (1) specific gravity, (2) viscosity, and (3) interfacial tension between crude oil and distilled water.

Specific gravity was determined at 50°, 77°, and 100° F (temperature controlled within  $\pm 0.1^\circ$  F) by the glass hydrometer method. Determined specific gravity was converted to specific gravity at 60° F



and then to API gravity at 60° F using ASTM-IP Petroleum Measurement Tables (ASTM-1298).

Viscosities were determined as kinematic viscosities at 50°, 77°, and 100° F ( $\pm 0.1^\circ$  F) using the Ostwald-Fenske type of viscometer, in which the time required for a standard volume of oil to flow through a capillary is measured in seconds and converted to viscosity in centistokes by use of appropriate calibration factors. The centistoke reading was converted to centipoise by multiplying the centistoke reading by the oil density at the temperature under consideration. Viscosity calibrations were made using National Bureau of Standards liquid viscosity standards (ASTM D-445).

Interfacial tension values of crude oil against distilled water were made at 77° F ( $\pm 0.1^\circ$  F) using the DuNouy tensiometer equipped with a platinum-iridium ring. The procedure involved measurements under nonequilibrium conditions. Interfacial tension values of crude oil against water may indicate the presence of compounds having a strong affinity for water (ASTM D-971).

#### PRESENTATION OF DATA

On the following pages, the analytical data derived from the study is arranged in tabular form, by pool and pay. No attempt has been made to correlate the data with the applications noted in the Introduction. The Survey staff decided that the analyses would be more useful if published immediately.

#### REFERENCES

ASTM Committee D-2, 1953, Standards on Petroleum Products and Lubricants: Am. Soc. Testing Materials, Philadelphia, p. 153-155, 191-197, 432-434.

Pool and pay	Location			Producing zone (ft)
	County	S.,T.,R.	Spot	
Allendale Biehl	Wabash	1-1N-12W	600'NL, 600'WL, NW NE	1366-1490
Allendale Waltersburg	Wabash	23-1N-12W	200'NL, 500'WL, NE	1559-1565
Allendale Tar Springs	Lawrence	24-2N-12W	SW NE NE	1533-1544
Allendale Cypress	Wabash	23-1N-12W	NW NW NW	1984-1995
Allendale Bethel	Wabash	1-1N-11W	50'SL, 569'W, SW NE	2011-2032
Allendale McClosky	Wabash	9-1N-12W	SE NE NE	2280-2297
Alma Spar Mountain	Marion	36-4N-2E	264'SL, 610'WL, NW	2070-2101
Amity McClosky	Richland	10-4N-14W	NE SE NE	2962-2967
Ashmore S Pennsylvanian	Coles	19-12N-11E	NE SE NE	424-470
Assumption Benoist	Christian	9-13N-1E	NE SE NE	1037-1076
Assumption C Spar Mountain	Christian	9-13N-1E	380'NL, 330'EL, SE NE	1158-1170
Assumption Cedar Valley	Christian	16-13N-1E	NE SW SE	2312-2328
Assumption S Cedar Valley	Christian	14-12N-1E	SE NW SW	2614-2679
Bartelso Cypress	Clinton	8-1N-3W	NE NW NE	1006-1015
Bartelso Silurian	Clinton	5-1N-3W	SE SW SE	2426-2431

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
33.0	27.3	6.73	10.68	17.47	9-1-60	S.T.*	0-920	1
31.3	36.4	9.20	14.22	36.89	4-4-62	B.V.*	0-1183	2
29.9	33.2	15.17	25.54	67.16	9-1-60	B.V.	0-919	1
34.2	36.9	4.64	7.59	12.91	4-4-62	B.V.	0-1182	2
35.0	28.5	3.95	5.52	11.08	9-1-60	S.T.	0-921	1
36.4	29.3	4.60	8.33	16.47	9-9-60	B.V.	0-942	1
36.2	--	4.6	--	--	3-12-42	B.V.	0-311	3
36.4	31.0	4.67	6.65	11.14	7-28-60	S.T.	0-889	1
24.2	33.7	50.99	101.25	274.60	6-24-60	B.V.	0-817	1
36.4	33.5	4.34	6.11	11.25	6-22-60	B.V.	0-805	1
40.0	30.1	2.95	3.90	5.85	6-22-60	B.V.	0-806	1
38.2	27.4	3.48	4.85	8.09	6-22-60	B.V.	0-804	1
38.6	27.5	3.66	5.26	9.87	6-22-60	S.T.	0-807	1
36.2	--	5.64	--	--	10-12-39	B.V.	0-175	2
40.2	35.0	2.55	3.32	5.14	4-18-62	B.V.	0-1192	2

Pool and pay	Location			Producing zone (ft)
	County	S.,T.,R.	Spot	
Bartelso Silurian	Clinton	8-1N-3W	NE NW SE	2482-2502
Bartelso S Devonian	Clinton	5-1N-3W	SE SW SE	2417-2431
Bartelso S Devonian	Clinton	20-1N-3W	1115'NL, 192'EL, NE NE	2463-2478
Bartelso W Cypress	Clinton	13-1N-4W	SW SE NE	970-990
Beaver Creek Benoist	Bond	31-4N-2W	1650'EL, 990'SL, NW	1116-1120
Beaver Creek N Benoist	Bond	24-4N-3W	330'NL, 435'WL, NE SE	1116
Beaver Creek S Benoist	Clinton	5-3N-2W	SE SW NE	1194-1204
Bellair Bellair 500	Crawford	11-8N-14W	SE NW NE	566-604
Bellair Bellair 800	Crawford	1-8N-14W	1320'SL, 330'WL, NW	781-855
Bellair Bellair 900	Crawford	11-8N-14W	--	880-939
Bellair Aux Vases	Crawford	14-8N-14W	SE SE SE	1200-1212
Beman Spar Mountain	Lawrence	23-3N-11W	SW NW NW	1858-1863
Berryville C Ohara	Edwards	10-1N-14W	NW SE NW	2944-2951
Berryville C McClosky	Wabash	36-2N-14W	NW SW NW	2887-2897
Bible Grove N Cypress	Effingham	10-6N-7E	SW SW SE	2523-2538

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
41.3	34.7	2.54	3.32	6.26	9-20-61	--	0-979	1
41.5	--	2.97	--	--	1-17-40	F.L.*	0-200	2
40.0	--	3.6	--	--	1-13-43	B.V.	0-356	2
35.6	36.1	5.01	9.00	17.48	6-27-61	B.V.	0-961	2
34.2	29.2	6.29	9.98	24.63	7-1-60	S.T.	0-834	1
24.0	27.0	57.77	115.28	--	1-4-62	S.T.	0-1148	1
35.4	34.2	5.04	7.12	12.69	6-26-61	B.V.	0-954	1
29.3	30.2	14.10	23.39	49.74	9-14-55	B.V.	0-659	1
37.2	34.7	4.26	7.40	10.12	8-29-60	B.V.	0-909	1
37.0	35.9	4.55	6.16	10.25	4-5-62	B.V.	0-1188	1
38.2	36.7	3.49	4.78	7.86	4-5-62	B.V.	0-1187	2
35.4	29.8	3.66	4.94	13.28	8-31-60	S.T.	0-914	1
38.8	32.5	4.52	6.00	11.01	8-5-61	B.V.	0-1010	1
37.2	38.0	7.30	10.92	24.73	8-5-61	B.V.	0-1009	1
38.6	30.9	3.36	4.58	7.71	7-22-60	S.T.	0-869	1



Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Bible Grove S Cypress	Clay	20-5N-7E	SW SW NE	2500-2506
Bible Grove S Aux Vases	Clay	20-5N-7E	NW NW SE	2734-2785
Blackland Silurian	Macon	5-15N-1E	SW SW SW	1920-1950
Bogota McClosky	Jasper	28-6N-9E	SE SE SW	3109-3121
Bogota S McClosky	Jasper	3-5N-9E	SW NW NE	3036-3078
Boulder Benoist	Clinton	35-3N-2W	NE SW SE	1195-1224
Boulder Geneva	Clinton	35-3N-2W	622'SL, 664'WL, SE	2631-2658
Boulder Geneva	Clinton	36-3N-2W	SE NW SW	2641-2643
Boulder E Devonian	Clinton	34-3N-1W	NE NW NE	2848-2853
Bourbon C Spar Mountain	Douglas	13-15N-7E	NW NE NW	1648-1656
Bourbon C Spar Mountain	Douglas	12-15N-7E	NE NW NW	1594-1606
Bowyer Spar Mountain	Richland	35-5N-14W	SW NW NE	2883-2886
Brown Cypress	Marion	15-1N-1E	NE NW NW	1652-1662
Calhoun C Ohara	Richland	6-2N-10E	N/2 NE NE	3144-3153
Calhoun C Spar Mountain	Richland	7-2N-10E	NW NW SE	3122-3130

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
36.4	13.8	6.13	7.15	13.92	7-26-60	B.V.	0-874	1
38.4	19.5	4.59	6.47	8.40	7-26-60	B.V.	0-873	1
38.6	25.3	6.96	3.91	5.98	6-20-60	B.V.	0-797	1
39.4	--	3.74	--	--	8-18-43	B.V.	0-404	2
37.4	35.6	4.90	7.49	10.76	7-27-60	S.T.	0-881	2
37.0	35.0	4.24	5.99	11.96	1-4-62	B.V.	0-1151	1
27.3	38.1	14.89	24.29	49.16	6-26-61	B.V.	0-956	1
28.9	20.2	12.70	20.43	41.46	1-4-62	S.T.	0-1152	1
34.4	34.8	6.45	9.49	21.60	12-14-61	S.T.	0-1133	1
34.0	25.1	6.08	8.29	16.93	6-23-60	S.T.	0-816	1
33.8	33.1	6.12	9.00	16.84	6-23-60	B.V.	0-815	1
36.4	25.2	4.74	9.85	32.29	7-28-60	S.T.	0-888	1
35.8	37.7	5.17	7.25	16.82	12-14-61	B.V.	0-1141	2
39.4	33.8	3.30	4.49	6.84	8-9-61	B.V.	0-1041	1
36.8	25.0	4.80	6.81	12.16	9-15-61	S.T.	0-1068	1



Pool and pay	Location			Producing zone (ft)
	County	S.,T.,R.	Spot	
Calhoun C McClosky	Richland	12-2N-9E	W/2 SW SE	3145-3160
Calhoun E McClosky	Richland	7-2N-11E	SW NW SW	3273-3278
Calhoun N McClosky	Richland	28-3N-10E	S/2 NE SE	3160-3165
Carlinsville N Pennsylvanian	Macoupin	20-10N-7W	--	474
Carlinsville N Pennsylvanian	Macoupin	20-10N-7W	NE SE NE	480-493
Carlyle Cypress	Clinton	10-2N-3W	--	--
Carlyle N Benoist	Clinton	23-3N-3W	NE NE SW	118-1128
Casey Casey	Clark	14-10N-14W	SE SE SW	450-463
Casey Carper	Clark	25-10N-14W	1640'NL, 200'WL, NW	1298-1345
Centralia Cypress	Clinton	2-1N-1W	NE SW NE	1204-1216
Centralia Benoist	Clinton	13-1N-1W	NW NE NE	1361-1385
Centralia Devonian	Clinton	13-1N-1W	NW NE NE	2908-2915
Centralia Trenton	Clinton	12-1N-1W	SW NE SE	4047-4068
Centralia W Benoist	Clinton	14-1N-1W	C NW SW	1430-1441
Chesterville Spar Mountain	Douglas	35-15N-7E	NW SW	1759-1795

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
38.8	31.7	3.80	5.16	7.13	8-9-61	B.V.	0-1039	1
39.0	34.7	3.39	4.62	8.92	8-1-61	B.V.	0-980	1
35.8	34.5	6.09	8.75	15.50	8-9-61	B.V.	0-1040	1
20.3	--	107.75	--	--	4-10-42	S.T.	0-293	3
20.8	36.0	126.77	284.42	--	3-15-60	B.V.	0-793	2
35.2	--	4.59	--	--	1-17-40	F.L.	0-199	2
33.6	36.9	6.98	10.58	24.55	1-4-62	B.V.	0-1149	1
34.8	28.6	5.29	7.60	12.90	9-14-55	B.V.	0-656	1
37.8	31.1	4.09	5.46	10.88	4-10-62	B.V.	0-1196	2
36.8	35.9	4.27	5.91	10.52	12-14-61	B.V.	0-1130	1
37.7	--	4.11	--	--	4-28-38	--	0-147	2
37.4	--	4.12	--	--	--	S.T.	0-219	3
43.2	--	3.18	--	--	1-10-41	B.V.	0-239	3
37.8	--	3.8	--	--	3-12-42	S.T.	0-310	3
37.0	32.8	4.25	5.92	10.91	4-12-62	B.V.	0-1205	2

Pool and pay	Location			Producing zone (ft)
	County	S.,T.,R.	Spot	
Chesterville E Spar Mountain	Douglas	6-14N-8E	NE NE NW	1720-1740
Clarksburg Aux Vases	Shelby	8-10N-4E	SE SW SW	1772-1776
Clay City C Cypress	Richland	4-3N-9E	NW NW NW	2581-2592
Clay City C Cypress	Jasper	19-5N-10E	E/2 NE NE	2438-2477
Clay City C Bethel	Clay	19-3N-8E	1180'SL, 330'EL, SW	2874-2886
Clay City C Aux Vases	Jasper	19-5N-10E	SE SW SW	2817-2832
Clay City C Spar Mountain	Jasper	19-7N-11E	NW NW NW	2457-2464
Clay City C St. Louis	Wayne	18-1N-7E	E/2 SE NE	3286-3290
Clay City C Salem	Jasper	17-5N-10E	625'SL, 625'EL, NE NW	3340-3348
Clay City W C Aux Vases	Clay	4-2N-7E	SE SE SW	2966-2974
Clay City W C Aux Vases	Clay	15-2N-7E	SW NW NE	2974-2985
Clay City W C McClosky	Clay	10-2N-7E	S/2 SE NW	3070-3078
Clay City W C McClosky	Clay	9-2N-7E	SW SW NE	3148-3155
Coil N Aux Vases	Wayne	31-1N-5E	SE NW SE	2824-2836
Colmar-Plymouth Hoing	McDonough	19-4N-4W (4th prin. mer.)	NW SW	438-450

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
38.6	33.0	3.76	5.25	8.53	6-23-60	B.V.	0-813	2
36.4	32.3	5.08	7.44	13.28	6-22-60	B.V.	0-810	1
34.6	--	5.69	--	--	6-27-40	B.V.	0-213	3
33.8	36.6	6.86	10.24	19.00	7-28-60	B.V.	0-884	1
38.6	36.4	3.39	4.54	9.98	12-12-61	B.V.	0-1103	1
37.2	36.3	4.20	5.78	9.72	7-28-60	B.V.	0-883	1
38.0	30.3	3.73	5.13	14.94	8-30-60	S.T.	0-913	1
39.0	--	3.6	--	--	5-22-42	Bail	0-318	3
38.0	33.0	3.46	4.79	8.40	7-28-60	B.V.	0-885	1
37.6	37.8	4.35	5.46	8.69	12-12-61	B.V.	0-1106	1
37.6	38.3	4.07	5.30	8.71	12-12-61	B.V.	0-1109	2
39.4	--	4.1	--	--	6-10-42	B.V.	0-322	3
38.4	36.4	3.51	4.35	6.64	12-12-61	B.V.	0-1107	1
39.2	36.3	3.21	4.24	7.02	12-12-61	B.V.	0-1117	1
35.2	30.2	7.19	8.23	13.85	4-20-61	B.V.	0-925	1

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Cooks Mills C Aux Vases	Coles	2-13N-7E	E/2 SE SW	1830-1842
Cooks Mills C Spar Mountain	Coles	19-14N-8E	W/2 NW SW	1798-1808
Decatur Silurian	Macon	33-17N-2E	SW SW NE	2020-2050
Dudley Upper Dudley	Edgar	10-13N-13W	NE NW NW	304-322
Dudley Lower Dudley	Edgar	10-13N-13W	NE NE NW	400-440
Dupo Trenton	St. Clair	28-1N-10W	585'NL, 338'EL, L-41	414-446
Eberle Cypress	Effingham	24-6N-6E	SE NE SW	2473-2483
Eberle McClosky	Effingham	24-6N-6E	SE SW SW	2824-2834
Edinburg W Devonian-Silurian	Christian	21-14N-3W	SE NW NW	1675-1694
Elbridge McClosky	Edgar	1-12N-11W	SW SW NW	986-992
Evers Spar Mountain	Effingham	28-8N-7E	SE SE SE	2617-2622
Exchange Ohara & McClosky	Marion	25-1N-3E	SE SW NW	O. 2695-2705 M. 2730-2738
Exchange E Spar Mountain	Marion	33-1N-4E	SE NE SW	2849-2868
Fairman Benoist	Marion	18-3N-1E	NW NW SE	1430-1436
Fairman Trenton	Clinton	13-3N-1W	E/2 NE	3962-3974



API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
36.4	--	4.9	--	--	12-9-41	B.V.	0-295	3
37.0	--	4.3	--	--	5-28-57	B.V.	BM-57062	4
46.9	--	3.9	--	--	2-23-38	--	0-145	2
24.7	20.4	39.00	70.81	108.57	6-24-60	S.T.	0-819	1
24.3	35.7	40.3	77.3	229.6	4-3-62	B.V.	0-1180	2
32.7	--	9.74	--	--	12-8-39	S.T.	0-187	2
36.6	29.1	4.61	6.65	11.88	6-15-60	B.V.	0-861	1
37.8	26.1	3.58	4.88	8.17	6-14-60	B.V.	0-860	1
40.9	29.5	2.76	3.69	5.77	6-21-60	B.V.	0-803	1
35.4	28.4	5.05	7.18	11.10	6-24-60	S.T.	0-821	1
39.4	29.1	2.87	3.89	6.32	7-6-60	B.V.	0-836	1
37.0	36.9	3.80	5.16	8.52	12-13-61	B.V.	0-1127	1
37.0	4.4	4.20	5.76	9.93	12-13-61	B.V.	0-1126	2
35.2	--	3.84	--	--	1-21-41	B.V.	0-211	3
42.3	37.0	2.67	3.46	8.87	12-14-61	B.V.	0-1134	1

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Friendsville Cen Bethel	Wabash	23-1N-13W	290'SL, 330'EL, NE NE	2322-2380
Friendsville N Biehl	Wabash	1-1N-13W	474'SL, 330'WL, SE SE	1612-1640
Frogtown N Silurian	Clinton	6-2N-3W	NE NE NW	2217-2340
Frogtown N Devonian	Clinton	6-2N-3W	330'SL, 430'WL, N/2 NW	2224-2276
Frogtown N St. Louis	Clinton	31-3N-3W	330'NL, 330'WL, S/2 SW	1204-1221
Gards Point C Ohara	Wabash	14-1N-14W	NE SE SE	2827-2829 2838-2842
Gays Aux Vases	Moultrie	22-12N-6E	SE NW SW	1962-1996
Germantown E Silurian	Clinton	1-1N-4W	1290'NL, 330'WL, NW NE	2312-2336 2407-2417
Gila McClosky	Jasper	28-8N-9E	NW NW SW	2820-2825
Gillespie-Wyen Pennsylvanian	Macoupin	8-8N-6W	--	630-650
Grandview Pennsylvanian	Edgar	33-13N-13W	SE SE SW	554-561
Harristown Silurian	Macon	14-16N-1E	NW NW SE	2058-2070
Hayes Trenton	Douglas	4-16N-8E	SW SW NE	930-1040
Hidalgo N Ste. Genevieve	Cumberland	25-9N-9E	SE SW SW	2660-2673
Hill E Cypress	Effingham	12-6N-6E	NW NW SW	2459-2467



API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
35.2	30.3	5.14	7.30	13.87	9-9-60	S.T.	0-940	2
33.8	28.5	6.83	10.12	30.28	9-9-60	S.T.	0-941	2
35.2	38.1	6.49	9.56	24.07	2-4-62	B.V.	0-1150	1
35.0	35.9	6.37	9.27	22.95	6-27-61	B.V.	0-963	1
35.4	27.9	6.10	8.98	19.76	4-11-62	B.V.	0-1199	2
40.0	33.7	4.03	5.65	8.62	8-5-61	B.V.	0-1011	1
35.8	33.7	5.41	7.60	13.95	6-22-60	B.V.	0-811	2
39.4	36.1	3.57	4.87	6.16	6-27-61	B.V.	0-962	1
38.6	32.6	4.92	7.05	7.38	8-30-60	B.V.	0-912	1
28.4	32.5	17.81	30.45	67.28	1-3-62	B.V.	0-1146	1
29.9	32.2	12.44	18.86	45.43	6-24-60	S.T.	0-818	1
38.6	28.0	2.92	3.77	5.85	6-20-60	B.V.	0-796	1
30.6	35.0	17.13	27.84	184.93	9-12-62	B.V.	0-1272	2
37.4	30.1	3.85	5.32	13.33	8-30-60	S.T.	0-911	2
36.8	19.0	4.40	6.46	12.09	6-15-60	S.T.	0-862	1

Pool and pay	Location			Producing zone (ft)
	County	S.,T.,R.	Spot	
Hill E McClosky	Effingham	11-6N-6E	NE NW SW	2717-2726
Hoffman Cypress	Clinton	10-1N-2W	165'NL, 165'EL, SE	1190-1200
Hoffman Benoist	Clinton	2-1N-2W	300'NL, 200'EL, SE SW	1324-1329
Hord Aux Vases	Clay	2-5N-6E	SW SW SW	2700-2706
Hord Ste. Genevieve	Clay	14-5N-6E	SE SE SW	2780-2788
Hord N Cypress	Effingham	34-6N-6E	SW NW NE	2425-2432
Hord N Aux Vases	Effingham	34-6N-6E	SW SW NE	2634-2644
Hord S Ste. Genevieve	Clay	26, 27, 34, 35- 5N-6E	--	2790
Huey S Cypress	Clinton	6-1N-2W	990'WL, 330'SL, SW	1085-1092
Huey S Silurian	Clinton	36-2N-3W	NE NE SE	2573-2591
Inclose Isabel	Edgar	14-12N-14W	440'NL, 330'WL, NE SE	358-368
Ingraham McClosky	Clay	4-4N-8E	C NE SE	3018-3023
Iola C Cypress	Clay	10-5N-5E	SW NE NE	2151-2162
Iola C Bethel	Clay	15-5N-5E	SE NE NE	2292-2306
Iola C Bethel-Aux Vases- Spar Mountain	Effingham	27-6N-5E	SW SE SW	2296-2445

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
39.6	24.9	2.98	3.96	6.71	6-15-60	S.T.	0-863	1
35.7	34.3	6.50	9.61	28.76	6-26-61	B.V.	0-960	2
33.2	--	5.91	--	--	7-19-40	Sep.	0-233	3
37.2	34.6	4.13	6.56	8.99	7-26-60	B.V.	0-872	1
37.4	27.3	4.46	6.22	10.84	6-15-60	B.V.	0-858	1
33.0	29.2	8.98	14.50	41.53	8-30-60	B.V.	0-859	1
37.8	37.3	4.13	8.03	9.38	8-30-60	B.V.	0-910	1
37.0	29.7	4.10	5.84	10.14	7-27-60	--	0-877	2
34.4	32.3	5.76	8.89	15.33	6-26-61	B.V.	0-958	1
39.6	29.2	3.86	6.41	8.26	6-26-61	B.V.	0-957	1
34.8	24.6	6.44	9.42	18.60	12-5-61	B.V.	0-1269	2
36.8	--	4.30	--	--	8-4-43	S.T.	0-402	2
35.0	33.9	5.16	7.30	13.91	7-13-60	B.V.	0-843	1
36.0	--	5.4	--	--	12-11-42	S.T.	0-347	2
37.4	30.7	4.19	5.93	10.13	9-4-62	B.V.	0-1316	2

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Iola C Aux Vases	Clay	17-5N-5E	SE NW SE	2356-2373
Iola C McClosky	Effingham	22-6N-5E	NE SE NW	2491-2500
Iola C Ste. Genevieve	Effingham	2-5N-5E	SW NW NW	2424-2454
Iola S Benoist	Clay	11-4N-5E	NE SW NW	2431-2442
Iola S Ste. Genevieve	Clay	11-4N-5E	NE NW NE	2565-2575
Irvington N Benoist	Washington	34-1N-1W	SE SW NE	1474-1477
Iuka St. Louis	Marion	3-2N-4E	SE SW SE	2774-2778
Iuka McClosky	Marion	10-2N-4E	NW NE SW	2681-2696
Iuka W McClosky	Marion	18-2N-4E	NW NW SW	2706-2710
Johnson N Casey	Clark	11-9N-14W	SE SE NW	360-406
Johnson N Carper	Clark	23-10N-14W	NE NW SE	1413-1450
Johnson S Casey	Clark	27-9N-14W	NE NE NE	513-549
Johnson S Upper Partlow	Clark	27-9N-14W	NE NE SE	454-520
Johnsonville C McClosky	Wayne	33-1N-6E	N/2 NE NW	3074-3083
Johnsonville N Ste. Genevieve	Wayne	9-1N-6E	NE NE NE	3192-3254

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
35.4	--	5.08	--	--	3-13-40	B.V.	0-190	2
38.4	--	4.50	--	--	8-28-41	B.V.	0-262	3
36.8	27.8	4.25	5.91	10.11	7-13-60	B.V.	0-844	1
36.8	28.8	6.70	10.19	20.67	7-14-60	B.V.	0-856	1
36.8	27.6	4.57	6.24	11.92	7-14-60	B.V.	0-857	1
38.6	35.2	3.20	4.20	6.41	12-14-61	B.V.	0-1128	2
37.0	36.4	4.30	5.82	11.36	12-13-61	B.V.	0-1123	2
39.0	31.6	3.44	4.55	7.79	4-11-62	B.V.	0-1198	2
37.0	34.3	4.07	5.44	10.68	12-13-61	B.V.	0-1125	1
32.3	35.4	7.79	11.83	21.20	4-5-62	B.V.	0-1190	1
37.2	35.8	4.80	10.50	12.42	8-16-60	B.V.	0-895	1
29.7	32.7	13.61	22.41	49.93	4-5-62	B.V.	0-1189	2
31.0	31.9	11.10	17.03	32.81	9-14-55	B.V.	0-657	2
38.0	--	4.10	--	--	10-23-41	B.V.	0-289	3
37.6	--	4.11	--	--	11-23-43	B.V.	0-411	2



Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Johnsonville W McClosky	Wayne	35-1N-5E	SE SE SE	3074-3091
Junction City C Pennsylvanian	Marion	32-2N-1E	640'NL, 620'EL, SW NW	647-694
Kellerville Silurian	Adams	2-2S-5W (4th prin. mer.)	SE NE NE	620-625 (est.)
Kenner Benoist	Clay	30-3N-6E	N/2 NW SE	2665-2672
Kenner Renault	Clay	1-2N-5E	NW NW NW	2766-2781
Kenner Aux Vases	Clay	25-3N-5E	355'SL, 278'EL, SW SE	2756-2773
Kenner N Benoist	Clay	17-3N-6E	SW NE SW	2750-2756
Kenner W Cypress	Clay	23-3N-5E	NE SW NE	2546-2569
Keyesport Benoist	Clinton	17-3N-2W	NW NE NE	1184-1190
Kincaid C Hibbard	Christian	9-13N-3W	SW SE SE	1805-1814
Kinmundy Benoist	Marion	19-4N-3E	NE SE SE	1920-1924
Kinmundy Carper	Marion	13-4N-2E	SE SE SE	3387-3396 3402-3410
LaCledé Benoist	Fayette	22-5N-4E	C NE SW	2336-2348
Lakewood Benoist	Shelby	7-10N-3E	SE SE NW	1694-1698
Lakewood Aux Vases	Shelby	12-10N-2E	SE SE NE	1723-1732

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
40.2	33.8	3.24	4.32	5.94	12-13-61	B.V.	0-1115	1
31.5	26.2	12.25	19.68	99.13	4-11-62	S.T.	0-1200	2
36.8	32.4	4.52	6.42	12.60	2-16-60	--	0-777	2
36.8	--	5.04	--	--	6-10-42	S.T.	0-320	2
36.4	36.6	4.79	6.71	12.61	12-12-61	B.V.	0-1113	2
37.6	37.0	4.17	5.61	9.48	12-12-61	B.V.	0-1111	1
37.8	35.6	4.53	5.97	13.97	12-12-61	B.V.	0-1112	1
37.0	38.1	4.63	6.11	10.95	12-13-61	B.V.	0-1121	2
35.2	34.6	5.99	7.90	15.61	6-26-61	B.V.	0-955	2
38.6	--	3.6	--	--	5-28-57	B.V.	BM 57067	4
29.3	27.1	16.85	27.55	--	7-14-60	S.T.	0-853	2,5
37.4	32.9	5.10	7.32	21.03	5-22-62	B.V.	0-1219	2,6
35.6	--	5.7	--	--	11-19-43	B.V.	0-410	2
30.2	38.1	15.30	29.01	112.12	6-22-60	B.V.	0-809	2
31.7	--	10.05	--	--	9-5-41	B.V.	0-282	2



Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Lancaster Bethel	Wabash	33-2N-13W	SW SW SE	2535-2565
Lancaster McClosky	Wabash	4-1N-13W	NE NE NE	2688-2708
Lancaster Cen Spar Mountain	Wabash	6-1N-13W	SW SW SE	2811-2824
Lancaster E Biehl	Wabash	36-2N-13W	NE SE NW	1745-1767
Lancaster S Bethel	Wabash	21-1N-13W	NW SE NW	2515-2529
Langewisch- Kuester Cypress	Marion	4-1N-1E	SW SW SE	1650-1655
Lawrence Trivoli	Lawrence	1-2N-12W	SW SE SW	200-320
Lawrence Bridgeport	Lawrence	32-4N-12W	330'SL, 360'EL, SW SW	873-888 906-938
Lawrence Tar Springs	Lawrence	17-3N-12W	--	1272-1291
Lawrence Cypress	Lawrence	17-3N-12W	--	1611-1620 1637-1644
Lawrence Benoist	Lawrence	7-4N-12W	SW NW SE	1590-1610
Lawrence Aux Vases	Lawrence	8-2N-11W	330'NL, 787'EL, NE NE	1692-1728
Lawrence McClosky	Lawrence	11-3N-12W	NE SW SW	1754-1764 1789-1796
Lawrence McClosky	Lawrence	20-3N-12W	NW NE NE	1902-1908
Lawrence Osage	Lawrence	8-3N-12W	200'SL, 200'WL, SE SW	2760-2765

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
36.0	30.7	4.71	6.58	11.60	9-9-60	S.T.	0-937	1
39.8	--	3.57	--	--	6-27-40	S.T.	0-214	2
37.4	30.2	3.67	5.13	12.58	9-9-60	S.T.	0-938	2
30.6	18.2	13.14	21.03	64.13	9-9-60	S.T.	0-936	1
36.0	34.1	4.80	6.80	11.58	9-9-60	S.T.	0-939	1
33.0	38.6	7.77	11.64	33.07	1-5-62	B.V.	0-1154	1
28.2	--	127.9	--	--	5-25-39	--	0-160	2
35.6	--	5.1	--	--	6-4-57	B.V.	BM 57069	4
33.8	32.0	6.01	8.74	15.08	8-18-60	B.V.	0-899	1
40.0	32.2	4.49	6.27	6.81	8-17-60	B.V.	0-897	1
38.2	33.8	3.72	5.09	10.60	8-18-60	B.V.	0-900	1
38.2	33.0	4.18	5.84	8.59	9-2-60	B.V.	0-926	1
41.3	--	4.18	--	--	6-14-38	--	0-148	2
38.4	33.9	3.49	4.79	7.84	8-17-60	B.V.	0-898	1
38.8	--	4.2	--	--	1-22-43	Swab	0-358	2

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Lawrence W Bethel	Lawrence	14-3N-13W	SE SE SE	1996-2022
Lawrence W McClosky	Lawrence	13-3N-13W	NW SW SW	2224-2234
Lillyville McClosky	Effingham	6-8N-7E	1120'NL, 300'WL, fr/sec.	2405-2415
Litchfield Pennsylvanian	Montgomery	3-8N-5W	NW NE SW	663-680
Livingston Pennsylvanian	Madison	30-6N-6W	500'NL, 990'WL, NW NE	540-560
Livingston S Pennsylvanian	Madison	21-6N-6W	330'SL, 150'EL, NE SE	520
Locust Grove Aux Vases	Wayne	31-1N-9E	SE NW NE	3180-3189
Louden Cypress	Fayette	31-7N-3E	NE SE SW	1528-1544
Louden Bethel	Fayette	9-7N-3E	NW NE NW	1573-1584
Louden Benoist	Fayette	28-8N-3E	NE SE NE	1508-1535
Louden Aux Vases	Fayette	28-8N-3E	SE NE NW	1502-1514
Louden Carper	Fayette	3-8N-3E	SW SE SE	2824-2831 2838-2852
Louden Devonian	Fayette	21-8N-3E	C NW SE	3014-3128
Main C Robinson 2nd	Crawford	18-13W-7N	840'SL, 845'WL	948-980
Main C Robinson 3rd	Crawford	10-7N-13W	NW NW SE	982-1008

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
33.0	35.4	7.97	9.39	18.03	9-7-60	B.V.	0-928	1
40.0	33.8	2.64	3.36	5.36	9-7-60	B.V.	0-927	1
35.6	27.3	4.45	6.40	16.43	7-6-60	S.T.	0-835	1
23.0	--	83.20	--	--	12-20-39	B.V.	0-202	2
35.4	34.5	5.71	8.23	13.71	6-30-60	B.V.	0-824	2
35.2	30.0	6.09	8.80	14.81	6-30-60	S.T.	0-825	2
41.7	31.9	2.29	2.93	4.43	8-9-61	B.V.	0-1036	1
36.0	--	5.1	--	--	9-21-42	B.V.	0-339	1
37.8	--	3.78	--	--	6-26-40	B.V.	0-209	2
38.4	15.3	3.82	5.19	12.49	7-6-60	B.V.	0-837	2
36.6	33.0	4.37	6.05	10.13	7-6-60	B.V.	0-838	1
35.6	28.6	5.37	8.06	14.68	7-6-60	B.V.	0-839	1
28.2	--	15.24	--	--	6-30-42	B.V.	0-324	2
36.8	26.1	4.08	5.60	9.89	12-28-55	B.V.	0-675	1
35.4	27.5	4.81	6.69	11.61	12-28-55	B.V.	0-674	1

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Main C Pennsylvanian	Crawford	5-6N-12W	SW SW SW	960-980
Main C Cypress	Crawford	19-5N-12W	SE NE NE	1468-1494
Main C Bethel	Crawford	19-5N-12W	NE NW NE	1574-1588
Main C Aux Vases	Crawford	8-6N-12W	NW NW SE	1538-1543
Main C Salem	Crawford	29-7N-13W	--	1786-1789
Main C Devonian	Crawford	9-6N-13W	E/2 NE NW	2937-2965
Maple Grove C Aux Vases	Wayne	23-1N-9E	SW NE SE	3152-3166
Maple Grove C Ohara	Edwards	29-1N-10E	NE NE SW	3273-3282
Maple Grove C McClosky	Edwards	9-1N-10E	E/2 NE NE	3268-3277
Maple Grove C McClosky	Edwards	4-1N-10E	E/2 NE SW	3267-3272
Marine Devonian	Madison	15-4N-6W	SE NW SW	1727-1796
Martinsville Carper	Clark	30-10N-13W	NE NW SE	1336-1415
Martinsville Devonian	Clark	30-10N-13W	209'SL, 203'WL, SE NE	1557-1583
Mason N Benoist	Effingham	9-6N-5E	NE SE NE	2286-2291
Mattoon Cypress	Coles	2-11N-7E	NW NE NW	1847-1861



API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
35.4	37.7	5.85	8.42	15.36	4-4-62	B.V.	0-1184	2
33.0	31.5	7.55	11.40	28.36	8-19-60	S.T.	0-903	1
36.2	27.3	4.57	6.39	13.96	8-19-60	S.T.	0-904	1
34.8	30.8	5.31	7.56	12.60	4-4-62	S.T.	0-1185	2
36.8	33.4	3.97	5.38	12.73	8-18-60	S.T.	0-901	1
37.0	--	4.5	--	--	11-13-41	S.T.	0-291	2
38.0	37.1	3.51	4.77	7.48	8-9-61	B.V.	0-1034	1
26.6	36.1	34.81	86.62	259.12	8-9-61	B.V.	0-1035	1
40.6	35.4	2.61	3.34	4.95	8-8-61	B.V.	0-1031	2
40.6	--	2.99	--	--	6-23-43	S.T.	0-395	2
35.2	--	6.25	--	--	7-15-43	B.V.	0-399	2
37.2	35.6	4.49	6.23	14.65	8-16-60	B.V.	0-896	1
36.2	30.3	4.94	6.83	12.56	4-10-62	S.T.	0-1197	2
37.8	34.9	4.09	5.58	9.33	7-13-60	B.V.	0-842	1
38.6	36.4	3.37	4.52	7.33	12-21-54	B.V.	0-516	1

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Mattoon Aux Vases	Coles	2-11N-7E	SE NW SW	1936-1948
Mattoon McClosky	Coles	35-12N-7E	NW NE SW	2026-2029
Mattoon Devonian	Coles	11-12N-7E	SE NW NE	3158-3164
Mattoon N Spar Mountain	Coles	27-13N-7E	NE NW NE	1902-1920
Melrose Isabel	Clark	13-9N-13W	SE SE SW	841-851
Miletus Benoist	Marion	21-4N-4E	NW NW NE	2130-2134
Miletus Aux Vases	Marion	21-4N-4E	NE NW NE	2200-2205
Mills Prairie N Ste. Genevieve	Edwards	11-1N-14W	NE NW NW	2857-2873
Mt. Auburn C Silurian	Christian	27-15N-2W	S/2 NE NE	1895-1905
Mt. Carmel Tar Springs	Wabash	33-1N-12W	NW NW SW	1693-1697
Mt. Carmel Sample	Wabash	33-1N-12W	NE NW SW	2094-2108
Mt. Carmel Bethel	Wabash	33-1N-12W	SW NW SW	2104-2118
Mt. Erie N Aux Vases	Wayne	3-1N-9E	E/2 NE NW	3120-3138
Mt. Erie N Spar Mountain	Wayne	3-1N-9E	W/2 NE NW	3222-3228
Mt. Olive Pennsylvanian	Montgomery	29-8N-5W	NW SE SW	600-602



API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
32.4	36.9	4.06	5.72	9.40	4-12-62	B.V.	0-1204	2
36.6	--	3.8	--	--	7-19-40	Swab	0-234	3
33.4	--	6.7	--	--	2-13-46	Bail	0-428	2
39.8	33.7	3.32	4.49	7.22	6-23-60	B.V.	0-812	1
35.2	36.6	6.20	8.35	17.05	4-5-62	B.V.	0-1191	1
35.0	33.1	5.85	8.59	20.36	7-14-36	B.V.	0-852	1
36.0	29.3	5.93	9.12	21.45	1-14-60	B.V.	0-854	1
40.9	--	3.22	--	--	7-21-43	S.T.	0-400	2
36.6	--	4.1	--	--	4-5-43	B.V.	0-373	2
33.2	35.7	5.29	7.75	14.23	8-2-61	B.V.	0-990	1
36.8	34.7	5.39	8.64	14.90	8-2-61	B.V.	0-992	1
35.2	30.6	5.65	6.43	10.62	8-2-61	B.V.	0-991	1
40.2	38.0	2.99	3.83	5.84	9-26-62	B.V.	0-1094	2
38.8	36.6	3.29	4.39	7.82	9-26-62	B.V.	0-1095	2
33.2	--	8.9	--	--	12-21-42	B.V.	0-354	2

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
New Baden E Silurian	Clinton	9-1N-5W	NW NW SE	1949-1988
New City Silurian	Sangamon	10-14N-4W	NW NW SE	1731
New Memphis N Devonian	Clinton	21-1N-5W	SW NE SW	2050-2068
Newton Spar Mountain	Jasper	13-6N-9E	NW NW NW	2938-2948
Newton W McClosky	Jasper	35-7N-9E	NW NE SE	2944-2952
Oakley Cedar Valley	Macon	2-16N-3E	SE SE SE	2272-2290
Oak Point Aux Vases	Clark	31-9N-14W	SE NE	1182-1208
Oak Point W Aux Vases	Clark	30-9N-14W	NW NW	1194-1219
Odin Cypress	Marion	7-2N-2E	880'SL, 545'W SW	1753-1765
Old Ripley Pennsylvanian	Bond	22-5N-4W	NE NE NW	576-584
Olney C Aux Vases	Richland	32-4N-10E	330'SL, 360'EL, SE NE	2918-2928
Olney C McClosky	Richland	27-4N-10E	SE SE NE	3067-3072
Olney S Spar Mountain	Richland	16-3N-10E	SE NE NW	3095-3102
Olney S McClosky	Richland	28-3N-10E	SE NW NE	3158-3164
Orchardville Aux Vases	Wayne	32-1N-5E	NW SW NE	2830-2833

API Gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
39.4	34.6	4.32	6.17	12.28	6-27-61	B.V.	0-965	1
39.4	25.4	2.97	3.95	6.02	6-21-60	B.V.	0-800	2
40.0	34.7	3.86	5.37	14.09	6-27-61	B.V.	0-966	1
37.2	32.0	3.80	5.21	8.81	7-27-60	S.T.	0-882	1
38.4	33.6	3.29	4.41	7.77	9-4-62	B.V.	0-1315	2
36.8	27.0	4.10	5.66	9.91	6-20-60	B.V.	0-814	1
36.6	30.2	4.83	6.79	15.93	8-29-60	S.T.	0-908	2
35.2	27.1	5.82	8.05	16.78	8-29-60	S.T.	0-907	2
37.0	36.1	4.03	5.50	9.30	12-15-61	B.V.	0-1142	1
34.0	26.3	7.80	11.72	21.33	6-30-60	S.T.	0-826	1
36.8	32.0	4.52	6.43	11.50	4-11-62	B.V.	0-1202	2
37.2	--	4.12	--	--	7-15-40	B.V.	0-227	3
36.4	34.2	5.00	7.01	11.77	9-15-61	B.V.	0-1066	1
37.4	12.9	6.47	9.46	16.77	8-9-61	B.V.	0-993	2
38.0	35.8	3.84	5.16	8.89	12-13-61	B.V.	0-1116	1

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Orchardville Ohara	Wayne	29-1N-5E	SW SE NW	2904-2912
Oskaloosa Benoist	Clay	3-3N-5E	NE NW NW	2632-2644
Oskaloosa Aux Vases	Clay	34-4N-5E	NE NE NE	2647-2668 2680-2691
Oskaloosa S McClosky	Clay	8-3N-5E	SW SE SW	2769-2773
Pana Benoist	Christian	35-12N-1E	SW SW SW	1477-1483
Panama Golconda	Montgomery	19-7N-3W	SW SW SE	708-716
Panama Benoist	Montgomery	23-7N-4W	SE NW SW	796-802
Parkersburg C Waltersburg	Richland	32-3N-14W	SE SW NE	2352-2358
Parkersburg C Cypress	Edwards	31-2N-14W	W/2 NE SE	2748-2768 2828-2847
Parkersburg C Bethel	Edwards	6-1N-14W	296'NL, 330'EL, NW NW	2994-3006
Parkersburg C Spar Mountain & McClosky	Edwards	20-2N-14W	SW SW NE	3158-3169 3179-3194
Parkersburg S Pennsylvanian	Edwards	8-1N-14W	NE SW NE	1388-1396
Parkersburg S Bethel	Edwards	8-1N-14W	NE NE SW	2813-2828
Parkersburg W McClosky	Richland	23-2N-10E	SW SE SE	3274-3281
Parnell Sonora	DeWitt	34-21N-4E	NE NE SE	670-700

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
36.6	35.9	4.40	6.14	12.86	1-5-62	B.V.	0-1155	2
37.4	34.6	4.27	5.73	15.39	4-11-62	B.V.	0-1201	2
36.6	29.2	4.90	7.08	13.12	7-14-60	B.V.	0-855	1
33.4	33.7	6.44	9.48	28.95	12-13-61	B.V.	0-1122	1
36.8	33.7	4.60	6.45	11.60	6-22-60	B.V.	0-808	1
31.3	27.8	11.44	18.24	40.18	6-30-60	S.T.	0-828	1
28.4	28.6	21.46	37.34	--	6-30-60	S.T.	0-829	1
39.2	34.9	5.53	7.98	17.81	8-5-61	B.V.	0-1007	2
35.8	35.8	5.75	7.06	12.17	8-8-61	B.V.	0-1029	1
29.8	34.3	4.25	5.75	7.74	8-8-61	B.V.	0-1028	2
35.8	34.9	6.88	8.58	15.36	8-1-61	B.V.	0-988	1
35.0	35.2	6.71	9.94	22.89	8-8-61	B.V.	0-1027	1
35.0	35.9	5.76	8.05	14.10	8-8-61	B.V.	0-1026	2
37.6	34.5	2.90	5.15	7.76	8-8-61	B.V.	0-1030	1
31.9	28.0	8.46	12.83	23.36	10-2-63	F.L.	0-1347	2



Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Passport Spar Mountain	Clay	2-4N-8E	SW NW NE	3004-3007
Passport N Aux Vases	Richland	30-5N-9E	NW NW SE	2942-2952
Passport S Cypress	Richland	18-4N-9E	SE SW NE	2686-2697
Passport S Ste. Genevieve	Clay	13-4N-8E	SE SE SE	3028-3038
Passport W Ste. Genevieve	Clay	22-4N-8E	SW NE NW	3030-3040
Patoka Benoist	Marion	19-4N-1E	SE NW SE	1441-1445
Patoka Spar Mountain	Marion	29-4N-1E	NW NW SE	1554-1587
Patoka Geneva	Marion	29-4N-1E	C NW SE	2892-2908
Patoka Trenton	Marion	32-4N-1E	NE NW NW	3926-3960
Patoka E Cypress	Marion	34-4N-1E	220'NL, 1094'EL, NE	1362-1370
Patoka E Benoist	Marion	34-4N-1E	SW SE NE	1466-1481
Patoka E McClosky	Marion	34-4N-1E	615'SL, 990'EL, SE NE	1624-1643
Patoka E Geneva	Marion	34-4N-1E	662'SL, 990'EL, SE NE	2942-2952
Patoka S Cypress	Marion	9-3N-1E	330'NL, 287'EL, NW NW	1352-1358
Patoka S Benoist	Marion	5-3N-1E	NE NW SE	1465-1476



API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
37.8	27.9	3.90	5.50	10.09	7-22-60	B.V.	0-865	1
36.2	19.1	6.56	9.98	30.99	7-27-60	S.T.	0-880	1
38.4	36.9	5.78	6.26	10.24	7-27-60	B.V.	0-879	1
37.6	30.5	4.94	6.58	10.34	7-22-60	B.V.	0-866	1
37.2	30.8	5.43	6.54	9.56	7-22-60	S.T.	0-867	1
37.0	14.6	4.15	5.69	10.75	7-14-60	S.T.	0-849	1
40.9	--	4.2	--	--	5-25-39	B.V.	0-158	2
40.0	--	3.7	--	--	2-11-43	B.V.	0-365	2
41.7	26.4	2.82	3.83	14.97	7-14-60	B.V.	0-848	1
36.0	--	5.06	--	--	9-4-41	B.V.	0-270	2
35.8	31.9	5.06	7.16	22.02	7-14-60	B.V.	0-850	1
34.4	37.9	7.13	10.43	30.34	1-4-62	B.V.	0-1153	1
35.0	18.6	6.19	9.31	18.43	7-14-60	S.T.	0-851	1
36.4	34.2	5.47	6.03	11.83	12-14-61	B.V.	0-1136	2
38.4	35.3	3.43	4.50	7.45	12-14-61	B.V.	0-1135	1

Pool and pay	Location			Producing zone (ft)
	County	S.,T.,R.	Spot	
Patoka W Benoist	Fayette	10-4N-1W	--	1384-1390
Pinkstaff E McClosky	Lawrence	10-4N-11W	NE NE NE	1638-1644
Plainview S Pennsylvanian	Macoupin	22-8N-8W	NW NW NE	428-444
Posey Cypress	Clinton	16-1N-2W	315'NL, 160'WL, NW NW	1105-1110
Posey E Devonian	Clinton	16-1N-2W	NE NE SE	2725-2750
Raccoon Lake Cypress	Marion	3-1N-1E	NE SE SW	1657-1664
Raccoon Lake Spar Mountain & McClosky	Marion	3-1N-1E	SE NW SE	1855-1886 1902-1927
Raymond Pottsville	Montgomery	12-10N-5W	C N/2 SE SE	580-598
Raymond E Pennsylvanian	Montgomery	15-10N-4W	SW SW SE	592-599
Riffle Spar Mountain	Clay	5-4N-6E	SW NE SW	2737-2744
Rinard N McClosky	Wayne	29-2N-7E	N/2 SE SE	3142-3149
Ritter N Spar Mountain	Richland	7-3N-11E	SW SW SE	3212-3217
Roby Silurian	Sangamon	3-15N-3W	NE SE NW	1724-1780
Ruark Pennsylvanian	Lawrence	7-2N-12W	SW SW NW	1630-1648
Ruark Pennsylvanian	Lawrence	12-2N-13W	SE SE NE	1654-1660

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
32.3	28.2	8.28	12.61	24.95	7-7-60	S.T.	0-840	2
34.8	36.0	4.94	6.65	11.37	8-19-60	B.V.	0-902	1
22.6	--	--	--	--	8-9-39	--	0-165	2
35.8	--	5.07	--	--	9-4-41	S.T.	0-273	2
37.6	32.2	5.32	10.96	17.31	6-26-61	B.V.	0-959	2
34.0	9.6	7.20	11.01	--	12-14-61	B.V.	0-1138	1
35.6	37.2	4.96	6.78	16.24	12-14-61	B.V.	0-1140	2
34.8	--	7.52	--	--	8-27-41	B.V.	0-260	3
34.2	33.1	7.58	11.27	20.15	6-29-60	B.V.	0-822	1
35.8	31.8	5.09	7.17	12.61	7-27-60	S.T.	0-878	1
39.4	36.0	3.58	4.79	9.14	12-13-61	B.V.	0-1114	1
39.0	35.3	4.66	6.11	10.87	8-5-61	B.V.	0-1006	1
38.0	28.2	3.68	5.02	8.58	6-20-60	B.V.	0-798	1
33.0	30.3	7.77	11.61	24.42	9-9-60	B.V.	0-935	1
32.7	31.0	8.08	12.13	27.45	9-9-60	S.T.	0-934	1

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Ruark Bethel	Lawrence	8-2N-12W	SW NE NE	2065-2071
Ruark Aux Vases	Lawrence	9-2N-12W	NW NE SW	2212-2223
Ruark W Bethel	Lawrence	12-2N-13W	NE SE SW	2222-2238 2243-2258
Ruark W McClosky	Lawrence	12-2N-13W	NW NE NW	2380-2385
St. Francisville Bethel	Lawrence	20-2N-11W	NW NE SW	1855-1857
St. Francisville Pennsylvanian	E Lawrence	16-2N-11W	NE NW NE	1303-1307
St. Francisville Pennsylvanian	E Lawrence	16-2N-11W	SE NW NE	1300-1308
St. Francisville Cypress	E Lawrence	10-2N-11W	C E/2 NW SW	1607-1623
St. Francisville Bethel	E Lawrence	22-2N-11W	500'NL, 330'WL, SW NE	1742-1772
St. Jacob Trenton	Madison	16-3N-6W	SW NE SE	2319-2370
St. Jacob E Hardin	Madison	12-3N-6W	SE SW SW	1843-1854
St. James Cypress	Fayette	30-6N-3E	NW SW NE	1595-1613
St. James Ste. Genevieve	Fayette	36-6N-2E	SE SE NE	1898-1906
St. James Carper	Fayette	25-6N-2E	E/2 NE SE	3082-3087
St. Paul Benoist	Fayette	31-5N-3E	NE NE NW	1884-1891

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
36.2	35.3	4.51	6.36	12.90	9-7-60	B.V.	0-933	1
36.8	38.3	4.62	6.49	14.58	9-7-60	B.V.	0-932	2
37.0	33.7	4.23	5.84	9.85	9-7-60	B.V.	0-931	1
37.6	33.8	4.05	6.46	9.25	9-7-60	B.V.	0-930	1
31.7	29.6	7.78	11.99	36.94	8-31-60	S.T.	0-918	1
30.0	34.0	12.28	19.68	59.67	8-31-60	B.V.	0-915	1
30.0	35.8	12.70	21.78	55.46	8-31-60	B.V.	0-916	1
36.2	26.9	5.11	7.33	8.94	8-31-60	B.V.	0-917	2
39.8	--	3.6	--	--	5-5-43	B.V.	0-380	2
40.0	--	4.05	--	--	8-5-42	B.V.	0-335	2
23.1	20.8	73.89	159.69	487.86	6-15-55	B.V.	0-648	2
34.4	--	6.70	--	--	1-11-40	B.V.	0-192	2
37.8	31.7	4.69	6.60	13.32	7-13-60	B.V.	0-845	1
37.4	19.2	4.77	6.45	14.18	7-18-62	B.V.	0-1232	2
33.4	16.9	7.06	10.46	29.58	7-13-60	S.T.	0-847	1



Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Ste. Marie McClosky	Jasper	5-5N-14W	SE NE SW	2815-2823
Ste. Marie W McClosky	Jasper	1-5N-10E	W/2 NW NW	2810-2816
Sailor Springs Cen Clay Ste. Genevieve		30-4N-8E	SE NE SE	3008-3013
Sailor Springs C Clay Tar Springs		26-4N-7E	NW SW NE	2309-2326
Sailor Springs C Cypress	Effingham	27-6N-7E	NW SW SW	2526-2536
Sailor Springs C Clay Bethel		8-5N-7E	NE NE NE	2640-2647
Sailor Springs C Clay Aux Vases		1-5N-6E	SW SE NE	2704-2714
Sailor Springs C Clay McClosky		5-5N-7E	SE SE	2813-2819
Salem C Benoist	Marion	31-2N-2E	NW NW NE	1726-1765
Salem C Aux Vases	Marion	8-1N-2E	NW SW SW	1877-1910
Salem C McClosky	Marion	16-2N-2E	C N/2 NE SW	2010-2150
Salem C Devonian	Marion	32-2N-2E	NW NW SW	3288-3529
Salem C Trenton	Marion	6-1N-2E	940'NL, 355'WL, NE NE	4502-4560
Samsville N Bethel	Edwards	30-1N-14W	NW SW NE	2905-2912
Samsville W Ohara	Edwards	34-1N-10E	NE NW	3244-3250



API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
36.6	30.3	5.07	7.22	17.89	3-1-61	B.V.	0-953	1
40.0	29.2	2.96	4.10	7.27	7-28-60	S.T.	0-887	1
35.8	28.5	4.62	6.82	13.83	7-21-61	S.T.	0-864	1
37.0	--	4.3	--	--	12-9-41	B.V.	0-297	3
39.4	31.0	3.21	4.56	6.04	7-26-60	B.V.	0-868	1
36.8	31.8	4.54	7.38	11.71	7-26-60	B.V.	0-870	1
35.2	35.5	5.42	8.36	13.57	7-26-60	B.V.	0-871	1
40.0	--	3.0	--	--	4-27-42	S.T.	BM 42060	4
37.0	32.1	3.27	4.49	7.95	1-6-55	B.V.	0-524	2
37.0	34.6	3.48	4.87	8.05	9-17-54	B.V.	0-503	1
35.0	22.0	4.37	6.25	14.43	1-6-55	B.V.	0-522	2
35.2	33.9	5.96	8.64	19.98	1-6-55	B.V.	0-526	2
37.0	--	4.9	--	--	6-7-57	B.V.	BM 57075	4
38.2	36.5	4.67	6.57	7.97	8-1-61	B.V.	0-989	2
40.2	35.6	2.31	3.00	4.30	8-9-61	B.V.	0-1033	1

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Samsville W McClosky	Edwards	27-1N-10E	E/2 NW SW	3273-3278
Sandoval Geneva	Marion	8-2N-1E	NW NW NE	2920-2926
Schnell McClosky	Richland	7-2N-9E	S/2 NW NW	2989-2994
Seminary McClosky	Richland	17-2N-10E	NW NE SW	3191-3197
Shattuc Cypress	Clinton	28-2N-1W	NW SW NE	1281-1288
Shattuc Trenton	Clinton	28-2N-1W	N/2 SW	4010-4042
Shelbyville C Aux Vases	Shelby	21-11N-4E	NE NE SE	1830-1840
Sicily Silurian	Christian	13-13N-4W	NW SE SE	1857-1865
Siggins 1st Siggins	Cumberland	13-10N-10E	C W/2 NE NW	342-370
Siggins 2nd Siggins	Cumberland	7-10N-11E	--	479
Siggins 3rd & 4th Siggins	Clark	7-10N-14W	--	530
Sorento C Devonian	Bond	29-6N-4W	SE NW SW	1852-1858
Sorento C Lingle	Bond	21-6N-4W	SE SE SE	1821-1849
Springfield E Silurian	Sangamon	21-15N-4W	S/2 N/2 SW	1588-1606
Staunton W Pennsylvanian	Macoupin	17-7N-7W	SW SE NE	480-486

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
38.0	33.0	2.62	3.51	5.38	8-9-61	B.V.	0-1032	1
37.4	37.1	4.81	6.54	12.89	12-14-61	B.V.	0-1137	1
38.6	31.4	4.44	6.24	11.82	8-9-61	S.T.	0-1038	1
38.6	35.2	5.19	7.50	12.89	9-15-61	B.V.	0-1067	1
35.8	36.4	5.05	7.10	13.24	12-14-61	B.V.	0-1131	1
<hr/>								
42.1	35.5	2.80	3.76	6.97	12-14-61	B.V.	0-1132	1
34.0	--	--	--	--	9-15-46	--	0-429	2
38.8	29.4	3.42	4.70	7.47	6-21-60	S.T.	0-802	2
35.6	33.7	5.08	7.38	12.33	9-14-55	B.V.	0-662	2
35.6	32.5	5.14	7.17	12.60	4-10-62	B.V.	0-1195	2
<hr/>								
36.8	32.6	4.56	6.35	10.35	4-10-62	B.V.	0-1194	2
36.8	21.7	4.66	6.52	11.64	6-30-60	B.V.	0-827	1
35.4	--	6.25	--	--	12-10-36	B.V.	0-138	2
38.8	28.6	3.34	4.48	6.97	6-21-60	B.V.	0-799	1
35.4	31.4	5.39	7.71	12.87	6-29-60	B.V.	0-823	2

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Stewardson Aux Vases	Shelby	27-10N-5E	C N/2 N/2	1942-1951
Stewardson Spar Mountain	Shelby	27-10N-5E	SE SE NW	1848-1856
Stringtown McClosky	Richland	6-4N-14W	SW NE NW	3024-3033
Toliver E Ste. Genevieve	Clay	30-5N-7E	SW NW SE	2838-2854
Toliver S McClosky	Clay	1-4N-6E	SE SE NE	2879-2899
Tonti Benoist	Marion	34-3N-2E	867'SL, 217'WL, SW SW	1928-1955
Tonti Aux Vases	Marion	34-3N-2E	544'SL, 147'WL, SW SW	1989-2054
Tonti McClosky	Marion	33-3N-2E	150'SL, 150'WL, SW SE	2137-2149
Tonti Devonian	Marion	34-3N-2E	524'SL, 220'WL, SW SW	3509-3547
Tovey Silurian	Christian	6-13N-3W	353'NL, 260'WL, NW SE	1851-1881
Waggoner Pottsville	Montgomery	31-11N-5W	SW SW NE	610-624
Wamac Petro	Washington	25-1N-1W	385'NL, 130'EL, NW NE	751-761
Wamac E Isabel	Marion	29-1N-1E	NE SW SW	872-890
Wapella E Silurian	DeWitt	28-21N-3E	NE NW NW	1110-1112
Warrenton Borton Edgar Pennsylvanian		13-14N-14W	SE SW SE	248-256 300-316

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
37.8	--	4.11	--	--	10-24-39	B.V.	0-178	2
37.2	37.5	4.26	5.88	10.07	4-12-62	B.V.	0-1203	2
39.8	--	3.6	--	--	12-10-41	S.T.	0-294	2
35.6	31.3	4.77	6.76	25.99	7-26-60	S.T.	0-875	1
34.0	32.2	6.73	8.78	16.39	7-27-60	B.V.	0-876	2
36.2	38.8	4.60	5.83	11.72	12-15-61	B.V.	0-1143	1
36.0	35.4	5.07	6.98	17.66	12-15-61	B.V.	0-1144	1
38.4	--	3.27	--	--	3-23-40	--	0-208	2
36.8	36.3	4.57	6.41	17.28	12-15-61	B.V.	0-1145	1
38.4	27.0	3.53	4.85	7.86	6-21-60	B.V.	0-801	1
28.0	--	17.9	--	--	3-13-42	S.T.	0-309	2
36.0	33.4	4.96	7.01	11.77	12-14-61	B.V.	0-1129	1
30.2	30.8	13.99	24.58	70.69	6-28-61	S.T.	0-987	1
30.6	32.8	8.51	13.00	29.00	12-14-62	B.V.	0-1310	2
30.6	22.8	12.86	20.44	46.45	6-24-60	S.T.	0-820	1



Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Watson McClosky	Effingham	18-7N-6E	SW SW SW	2434-2445
Weaver Devonian	Clark	30-11N-10W	NE NW SE	2072-2076
West Seminary Aux Vases	Clay	5-2N-7E	SW SE NW	2972-2978
West Seminary McClosky	Clay	5-2N-7E	SW SW NE	3085-3089
Westfield "Gas Sand"	Clark	30-11N-14W	NW SE	279-307
Westfield Westfield	Clark	33-12N-14W	SE SW SW	318-386
Westfield Carper & Westfield	Clark	18-11N-14W	NE NE NE	611 907-933
Westfield Westfield	Clark	19-11N-14W	SW SW SE	Top 338
Westfield Trenton	Clark	17-11N-14W	SE NE NW	2390-2462
Westfield E Lower Dudley	Clark	2-11N-14W	300'SL, 150'EL, NW SE	397-437
Wilberton Lingle	Fayette	18-5N-3E	NW SW NW	3472-3474
Willow Hill E McClosky	Jasper	6-6N-11E	NW SE NE	2653-2655
Woburn C Cypress	Bond	16-6N-2W	330'NL, 380'WL, NE SE	854-916
Woburn C Benoist	Bond	10-6N-2W	820'NL, 1160'WL, NW NW	1002-1014
Woburn C Renault	Bond	10-6N-2W	NW NE NW	1047-1052



API gravity	tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
38.4	27.8	3.30	4.51	8.07	7-13-60	S.T.	0-841	1
36.6	33.0	5.15	7.26	10.27	8-29-60	S.T.	0-905	1
37.2	34.4	3.85	5.25	6.94	12-12-61	B.V.	0-1105	1
37.6	32.7	3.92	5.32	9.48	12-12-61	B.V.	0-1104	1
28.6	30.8	19.16	32.77	74.40	9-14-55	B.V.	0-660	2
35.8	30.3	4.50	6.72	11.55	4-10-62	B.V.	0-1193	1
38.6	29.5	5.15	6.13	14.13	8-16-60	B.V.	0-893	2
34.8	33.2	5.47	7.71	13.27	12-20-63	B.V.	0-1348	2
38.2	--	4.10	--	--	10-9-39	--	0-183	2
32.7	30.0	7.86	11.92	21.87	4-3-62	S.T.	0-1181	2
28.0	16.2	33.81	75.75	>1000	7-13-60	Pit	0-846	1
40.9	34.6	2.56	3.34	5.12	4-4-62	B.V.	0-1186	2
35.2	24.3	5.48	7.94	16.50	7-1-60	S.T.	0-832	2
36.4	--	4.55	--	--	1-16-41	B.V.	0-259	3
36.0	27.3	5.23	7.46	12.85	7-1-60	B.V.	0-830	1

Pool and pay	Location			Producing zone (ft)
	County	S., T., R.	Spot	
Woburn C Aux Vases	Bond	10-6N-2W	SE SW NW	1059-1062
Woburn C Lingle	Bond	3-6N-2W	NE SW SW	2295-2310
Woburn C Trenton	Bond	21-6N-2W	650'SL, 660'WL, SW SE	3175-3179
Xenia Aux Vases	Clay	4-2N-5E	W/2 SW SW	2786-2790
Xenia Carper	Clay	5-2N-5E	C SW SE	4230-4242
Xenia E Cypress	Clay	11-2N-5E	SE SW NE	2492-2500 2514-2520
Xenia E Benoist	Clay	11-2N-5E	330'SL, 370'EL, SW NE	2696-2707
York Isabel	Cumberland	6-9N-11E	NW NW SE	594-614
Zenith N Spar Mountain	Wayne	21-2N-6N	NE SW NE	3078-3100
Zenith S McClosky	Wayne	16-1N-5E	SE SW NW	2980-2986

<sup>1</sup> Verified by producer.

<sup>2</sup> Illinois State Geological Survey data.

<sup>3</sup> Illinois State Geological Survey data; part of data previously published.

<sup>4</sup> Data from USBM analysis.

\* S.T.—Stock tank; B.V.—bleeder valve; F.L.—flowing line.

API gravity	Interfacial tension (dynes/cm)	Viscosity (Cp)			Date sampled	Sample from	Lab no.	Remarks
		100°F	77°F	50°F				
36.4	30.3	5.78	8.04	17.98	2-4-62	B.V.	0-1147	2
35.0	31.4	5.51	8.45	18.06	7-1-60	B.V.	0-831	1
38.6	26.9	5.42	7.87	20.30	7-1-60	S.T.	0-833	1
35.2	--	5.8	--	--	11-14-41	S.T.	0-292	3
37.8	37.6	3.53	5.00	7.74	8-15-62	B.V.	0-1258	2
37.2	35.6	4.44	6.10	12.88	12-13-61	B.V.	0-1120	1
35.0	37.6	5.41	7.71	16.33	12-13-61	B.V.	0-1119	1
31.0	28.4	11.09	17.64	45.36	8-29-60	S.T.	0-906	1
38.2	32.5	3.31	4.42	8.67	12-12-61	B.V.	0-1110	2
37.0	35.7	4.42	6.03	11.44	12-13-61	B.V.	0-1118	1

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