

**OIL-GRAVITY AND DEPTH DATA
FOR OIL FIELDS IN THE FOREST CITY BASIN OF
NORTHEASTERN KANSAS, SOUTHEASTERN NEBRASKA, AND
NORTHWESTERN MISSOURI**

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Summary

The table included in this report represents a compilation of oil-gravity data in the Forest City basin in northeastern Kansas, southeastern Nebraska, and northwestern Missouri. Oil in the Forest City basin is mostly an Ordovician-type oil with a unique geochemical character (Longman and Palmer, 1987; Hatch and others, 1987; Newell and others, 1987; Hatch and Newell, in preparation). The unique geochemical characteristics of Ordovician-type oils are: a strong preference in odd-number normal alkanes from C₁₁ to C₁₉, low relative amounts of heavier normal alkanes, and relatively low amounts of steranes and hopanes including pristane and phytane (Martin and others, 1963; Reed and others, 1986). These oils have been attributed to the organic-walled microfossil *Gloeocapsomorpha prisca* (Reed and others, 1986; Fowler, 1992). Due to incomplete fill-up of structures and their location deep within the basin, the Ordovician-type oils in the Forest City basin were probably generated within the immediate drainage areas of the traps that hold them, and are not the product of long-distance migration (Jenden and others, 1988).

The source documents for subsea and subsurface production depths in the compilation of oil-gravity data (Table 1) are scout cards for producing wells, which are available at the Kansas Geological Survey. Oil gravities were also obtained from these cards and from other sources that are footnoted on the table. Information in the table is summarized in two figures showing the variation of oil gravity with subsea depth (Figure 1) and with the projected subsea depth of the Middle Ordovician Simpson Group at each oil field (Figure 2). In some localities the Ordovician-type oils have apparently leaked vertically upward into shallower reservoirs, such as into the Silurian-Devonian "Hunton" group along the axis of the basin, and even into Mississippian and Pennsylvanian pay zones at the complex of oil fields at Easton and McLouth on the eastern flank of the basin. The plotting of oil gravities according to the depth of the underlying Simpson Group is an attempt to plot the variations in oil-gravity vs. the approximate depth of their most-likely source rocks.

A general increase in oil gravity with increasing depth occurs within the Forest City basin (Figures 1, 2). The increase of oil gravity with depth appears more tightly constrained when plotted according to the depth of the Simpson Group (Figure 2). It is unclear whether the upward decrease in oil gravity is due to temperature of the locality where the oil was generated, effects of migration up through the stratigraphic column, or the physical conditions in the reservoir. Geochemistry may provide answers. Oil fields that are significantly off the oil gravity-depth trends in Figures 1 and 2 (e.g., Bosch, Mill Creek Southwest, and Alta Vista East fields) may contain geochemically separate types of oil.

References

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Table 1. Oil gravities and production depths for oil field in the central part of the Forest City basin and adjacent areas. Depth to Simpson is estimated for each oil field. Data were compiled from scout cards available at the Kansas Geological Survey except where noted. Fields are arranged according to location from north to south in the basin.

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
32-T.65N.-R.39W.	Tarkio (Missouri)	Cherokee (Penn.)	1330 - 1451	-360	~ -2025	26 ¹	
15-T.63N.-R.40W.	Runamuck (Missouri)	Maquoketa	2820	-1909	~ -2160 - -2180	33	oil show
15, 16, 21-T.63N.-R.40W.	Runamuck (Missouri)	Viola	2780 - 2813	-1895 - -1923	~ -2160 - -2180	32 - 33	
21-T.63N.-R.40W.	Corning (Missouri)	Viola	2960 - 2975	-1990 - -2005	~ - 2150	31 - 32	
25, 26, 29, 35, 36-T.3N.-R.16E. 1, 2, 3, 11, 15-T.2N.-R.16E.	Barada (Nebraska)	Hunton	2354 - 2513	-1289 - -1453	~ -2250 - -2420	29 - 32	
31, 32-T.3N.-R.16E.	Shubert (Nebraska)	Hunton	2446 - 2540	-1434 - -1480	~ -2400 - -2440	23 ²	
29-T.2N.-R.14E.	Snethen (Nebraska)	Hunton	2390	-1275	~ -2260 - -2270	29 ²	
29-T.2N.-R.14E.	Snethen (Nebraska)	Viola	3080 - 3106	-2030 - -2042	~ -2260 - -2270	27 ²	
2, 3, 9, 10, 11, 13-T.1N.-R.14E.	Dawson (Nebraska)	Hunton	2130 - 2202	-1188 - -1248	~ -2230 - -2260	22 - 28 ²	
2, 3, 9, 10, 11, 13-T.1N.-R.14E.	Dawson (Nebraska)	Viola	2854 - 2905	-1918 - -1930	~ -2230 - -2260	27 - 29 ²	commingled with Simpson

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
2, 3, 9, 10, 11, 13-T.1N.-R.14E.	Dawson (Nebraska)	Simpson	3182 - 3198	-2232 - -2255	~ -2230 - -2260	27 - 29 ²	commingled with Viola
7, 8, 17, 18, 20, 29-T.1N.-R.16E.	Falls City (Nebraska)	Hunton	2211 - 2353	-1312 - -1401	~ -2300 - -2390	30 ³	
1-T.1S.-R.14E.	Kanaska	Simpson	3510 - 3530	-2393 - -2412	~ -2400 - -2410	26 - 28	
3, 4, 10-T.1S.-R.15E.	Livingood	Hunton	2568 - 2643	-1493 - -1526	~ -2350 - -2370	26 - 27	
3, 4, 10-T.1S.-R.15E.	Livingood	Viola	3280 - 3343	-2185 - -2200	~ -2350 - -2370	30	
10-T.1S.-R.15E.	Livingood South	Viola	3309 - 3314	-2180 - -2185	~ -2340 - -2350	31	
3, 4, 10-T.2S.-R.15E.	Rokey	Viola	3532 - 3555	-2229 - -2243	~ -2400 - -2410	29 - 32	
13, 14-T.2S.-R.15E.	Sabetha	Hunton	2840 - 2862	-1579 - -1618	~ -2410 - -2420	25 - 28	
13, 14-T.2S.-R.15E.	Sabetha	Viola	3461 - 3560	-2224 - -2271	~ -2410 - -2420	28 - 31	
26, 27-T.2S.-R.14E.	Strahm	Hunton	2768 - 2918	-1460 - -1594	~ -2410 - -2420	21 - 26	
26, 27-T.2S.-R.14E.	Strahm	Viola	3566 - 3583	-2246 - -2264	~ -2410 - -2420	27 - 29	
34-T.2S.-R.14E.	Strahm	Viola	3568 - 3617	-2332 - -2356	~ -2550 - -2560	24 - 28	
3-T.3S.-R.14E.	South						
34-T.2S.-R.14E.	Strahm	Simpson	3779 - 3782	-2553 - -2556	~ -2550 - -2560	not available	
3-T.3S.-R.14E.	South						
24-T.4S.-R.13E.	McClain Southwest	Viola	3502 - 3506	-2274 - -2278	~ -2490 - -2500	27	commingled with Simpson
24-T.4S.-R.13E.	McClain Southwest	Simpson	3714 - 3716	-2486 - -2488	~ -2490 - -2500	27	commingled with Viola

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
35-T.4S.-R.13E. 3-T.5S.-R.13E.	Heinen	Viola	3580 - 3682	-2303 - -2321	~ 2430 - -2450	31 - 34	
7, 8, 17, 18-T.4S.-R.14E. 7, 8, 17, 18-T.4S.-R.14E.	McClain McClain	Viola Simpson	3365 - 3494 3593 - 3708	-2185 - -2264 -2402 - -2504	~ -2400 - -2500 ~ -2400 - -2500	30 26	
14, 23-T.5S.-R.12E. 14, 23-T.5S.-R.12E.	Corning Corning	Viola Simpson	2426 - 2516 2649 - 2696	-1113 - -1204 -1336 - -1356	~ -1340 - -1350 ~ -1340 - -1350	30 - 31 30	commingled with Viola
36-T.5S.-R.12E.	Corning South	Simpson	3352 - 3360	-2056 - -2062	~ -2060	not available	
9-T.5S.-R.13E.	Hermesch	Viola	3612 - 3622	-2273 - -2283	~ -2400 - -2410	27 - 28 ⁴	
20-T.5S.-R.14E.	Mosquito Creek	Viola	3590	-2345	~ -2470	not available	
27, 34-T.6S.-R.13E.	Soldier West	Viola	3410 - 3416	-2187 - -2199	~ -2320 - -2330	28	
35-T.6S.-R.13E.	Soldier	Hunton	2856	-1648	~ -2310	not available	
9, 10-T.7S.-R.12E.	Casey	Viola	3294 - 3337	-1905 - -1951	~ -1990 - -2030	23 - 24	
14, 15, 21, 22-T.7S.-R.13E. 14, 15, 21, 22-T.7S.-R.13E.	Leach Leach	Hunton Viola	2659 - 2783 3207 - 3313	-1530 - -1594 -2089 - -2129	~ -2080 - -2220 ~ -2080 - -2220	26 - 28 26 - 32	
19-T.7S.-R.17E.	Worner	Hunton	2375 - 2377	-1352 - -1354	~ -1950	27	
27-T.7S.-R.13E.	---	Misener (Dev. - Mississippian)	2879 - 2890	-1581 - 1592	~ -2280	30	noncommercial oil show

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
23, 24, 25, 26-T.7S.-R.21E.	Oak Mills North	McLouth (Penn.)	1285 - 1460	-363 - -406	~ -1250 - -1280	25	
24, 25-T.8S.-R.20E. 18, 19, 20-T.8S.-R.21E. 3-T.9S.-R.20E.	Easton	McLouth (Penn.)	1271 - 1519	-334 - -497	~ -1160 - -1310	19 - 27	
24, 25-T.8S.-R.20E. 18, 19, 20-T.8S.-R.21E. 3-T.9S.-R.20E.	Easton	Mississippian	1316 - 1500	-430 - -556	~ -1160 - -1310	22	
3-T.8.S.-R.21E.	Lowemont	McLouth (Penn.)	1449 - 1454	-363 - 368	~ -1170	not available	
8, 9, 17-T.8S.-R.21E.	Easton Northeast	McLouth/ Burgess (Penn.)	1350 - 1498	-331 - 465	~ -1130 - -1260	19 - 24	
8, 9, 17-T.8S.-R.21E.	Easton Northeast	Mississippian	1445 - 1487	-395 - -416	~ -1130 - -1260	23	
11, 12, 13-T.8S.-R.21E. 18, 19-T.8.S.-R.22E.	Leavenworth Northeast	McLouth/ Burgess (Penn.)	1166 - 1370	-299 - -477	~ -1100 - -1280	20 - 23	
13, 14-T.8S.-R.21E.	Apple Valley	McLouth/ Burgess (Penn.)	1179 - 1377	-309 - -398	~ -1110 - -1180	19 - 24	
15, 16, 21, 22, 28-T.8S.-R.21E.	Easton East	McLouth (Penn.)	1280 - 1505	-327 - -485	~ -1130 - -1270	20 - 24	
15, 16, 21, 22, 28-T.8S.-R.21E.	Easton East	Mississippian	1424 - 1578	-389 - -482	~ -1130 - -1270	23	
23-T.8S.-R.21E.	Leavenworth West	McLouth (Penn.)	1337 - 1420	-318 - -361	~ -1120 - -1160	23 - 24	

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23-T.8S.-R.21E.	Leavenworth West	Mississippian	1390 - 1412	-350 - -362	~ -1120 - -1160	23	
23-T.8S.-R.21E.	Leavenworth	McLouth (Penn.)	1257 - 1434	-286 - -402	~ -1090 - -1200	17 - 26	
27, 34-T.8S.-R.21E.	Lake Stellamaris	McLouth (Penn.)	1400 - 1467	-323 - -352	~ -1120 - -1150	23 - 27	
19, 20-T.8S.-R.22E.	Slammer Northeast	McLouth/ Burgess (Penn.)	1152 - 1233	-266 - -373	~ -1070 - -1170	not available	
20-T.8S.-R.22E.	Corral Creek	McLouth (Penn.)	1160 - 1257	-310 - -357	~ -1110 - -1160	22	
28, 32-T.8S.-R.22E.	Corral Creek Southeast	McLouth (Penn.)	1305 - 1307	-345 - -347	~ -1150	not available	
28, 32-T.8S.-R.22E.	Corral Creek Southeast	Mississippian	1449 - 1452	-389 - -392	~ -1150	not available	
29, 32-T.8S.-R.22E. 5-T.9S.-R.22E.	Possum Hollow Northeast	McLouth/ Burgess (Penn.)	1280 - 1462	-323 - -397	~ -1120 - -1180	20	
30-T.8S.-R.22E.	Slammer	McLouth/ Burgess (Penn.)	1438 - 1446	-528 - -532	~ -1330	19	
33-T.8S.-R.22E.	Christy	McLouth/ Burgess (Penn.)	1398 - 1440	-330 - -401	~ -1130 - -1190	19 - 20	

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
6-T.9S.-R.22E.	Possum Hollow	McLouth/ Burgess (Penn.)	1312 - 1489	-342 - -384	~ -1140 - -1180	24 - 27	
7-T.9S.-R.20E.	Zachariah West	McLouth (Penn.)	1402 - 1408	-412 - -418	~ -1200	23	
8, 17, 19, 20, 21, 29-T.9S.-R.20E.	McLouth North	McLouth (Penn.)	1408 - 1526	-381 - -504	~ -1180 - -1300	19 - 26	
9-T.9S.-R.20E.	Zachariah	McLouth/ Cherokee (Penn.)	1376 - 1490	-280 - -459	~ -1080 - -1250	17 - 19	
23, 24-T.9S.-R.20E.	Tullis	McLouth/ Burgess (Penn.)	1376 - 1410	-363 - -390	~ -1160 - -1183	23	
28-T.9S.-R.20E. 4, 5, 8-T.10.S.-R.20E.	McLouth	McLouth (Penn.)	1442 - 1472	-371 - -401	~ -1110 - -1350	24 ⁵	
28-T.9S.-R.20E. 4, 5, 8-T.10.S.-R.20E.	McLouth	Mississippian	1513 - 1680	-362 - -600	~ -1110 - -1350	23 - 24	
12, 14-T.9S.-R.21E.	Fred	Burgess (Penn.)	1418 - 1421	-344 - -347	~ -1120 - -1150	not available	
12, 14-T.9S.-R.21E.	Fred	Mississippian	1306 - 1360	-320 - -359	~ -1120 - -1150	not available	
28-T.9S.-R.22E.	Aufdemberge	Burgess (Penn.)	1303 - 1307	-292 - -296	~ -1090 - -1100	18	
17-T.9S.-R.23E.	Thumper	McLouth (Penn.)	948 - 960	-187 - -199	~ -990 - -1000	15	
3, 10-T.10S.-R.20E.	Bankers Life	McLouth (Penn.)	1329 - 1494	-329 - -467	~ -1130 - -1260	21 - 30	

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
7, 17, 18-T.10S.-R.20E.	McLouth South	McLouth (Penn.)	1445 - 1516	-393 - -478	~ -1190 - -1270	22 - 23	
27-T.10S.-R.20E.	State Lake	McLouth (Penn.)	1324 - 1377	-329 - -382	~ -1130 - -1180	18	
6, 7-T.10S.-R.21E.	Ackerland	McLouth (Penn.)	1352 - 1408	-352 - -373	~ -1150 - -1170	not available	
9, 10, 15-T.10S.-R.21E.	Jarbalo East	McLouth (Penn.)	1171 - 1282	-313 - -348	~ -1110 - -1140	21 - 24	
16-T.10S.-R.21E.	Jarbalo	McLouth (Penn.)	1190 - 1244	-308 - -338	~ -1110 - -1130	19	
12-T.10S.-R.22E.	Fairmount	Mississippian	1103 - 1105	-182 - -184	~ -930	22	
21-T.11S.-R.7E.	Ogden	basal Penn. cgl.	1602 - 1686	-492 - -525	~ -1280 - -1300	33	
22-T.11S.-R.8E.	Yaege Northwest	Mississippian	1553 - 1626	-385 - -421	~ -900 - -930	34	
25, 26, 36-T.11S.-R.8E. 30, 31-T.11S.-R.9E.	Yaege	basal Penn. cgl. & Hunton	1504 - 1776	-268 - -374	~ -750 - -850	30 - 33	
26-T.11S.-R.8E.	Ge-See	basal Penn. cgl.	1633 - 1761	-385 - -410	~ -1120	not available	
26-T.11S.-R.8E.	Ge-See	Mississippian	1804 - 1809	-474 - 479	~ -1120	not available	
29-T.11S.-R.8E.	Gerril	basal Penn. ss.	1821 - 1824	-358 - -361	~ -1120	30	
2, 11-T.11S.-R.11E.	Newbury	Viola	2861 - 2904	-1755 - -1777	~ -1860 - -1890	27	

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
22, 23-T.11S.-R.11E.	Paxico	Hunton	2411 - 2460	-1401 --1426	~-1870 --1900	18 - 19	
18, 19-T.12S.-R.11E.	Steuwe	Viola	3173 - 3183	-1901 --1925	~-2000 --2020	21	
2-T.13S.-R.10E.	Mill Creek	Viola	2917 - 2930	-1818 --1834	~-1940 --1950	22	
2-T.13S.-R.10E.	Mill Creek	Simpson	3037 - 3053	-1939 --1953	~-1940 --1950	33 - 34	
11-T.13S.-R.10E.	Mill Creek Southwest	Simpson	3186 - 3218	-1977 --1990	~-1980 --1990	38	
22-T.13S.-R.10E.	Davis Ranch Northeast	Viola	3230 - 3235	-1838 --1842	~-1930	not available	
28, 33, 34-T.13S.-R.10E.	Davis Ranch	Kansas City	1811 - 1884	-388 --464	~-1830 --1900	30 ⁶	
4-T.14S.-R.10E.							
28, 33, 34-T.13S.-R.10E.	Davis Ranch	Hunton	2931 - 2938	-1506 --1513	~-1830 --1900	19	
4-T.14S.-R.10E.							
28, 33, 34-T.13S.-R.10E.	Davis Ranch	Viola	3113 - 3208	-1738 --1800	~-1830 --1900	20 - 30	
4-T.14S.-R.10E.							
10-T.14S.-R.8E.	Alta Vista	Hunton	1928 - 1930	-448 --450	~-730	not available	
11-T.14S.-R.8E.	Alta Vista East	Hunton	1893 - 1898	-413 --426	~-690	29	
20-T.14S.-R.10E.	Ashburn North	Viola	3290 - 3291	-1775 --1776	~-1890 --1900	28	
20-T.14S.-R.10E.	Ashburn North	Simpson	3404 - 3420	-1890 --1898	~-1890 --1900	27 - 28	
28-T.14S.-R.10E.	Ashburn East	Simpson	3380	-1903	~-1900	24	

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
29-T.14S.-R.10E.	Ashburn	Viola	3237 - 3266	-1748 --1769	~ -1840 --1860	22 - 25 ⁷	
32-T.14S.-R.10E.	Ashburn South	Viola	3240 - 3255	-1749 --1764	~ -1840 --1860	not available	
20, 29-T.14S.-R.12E.	Wilmington	Hunton	2860 - 2865	-1456 --1461	~ -1720 --1740	“low gravity”, “tarry”	
20, 29-T.14S.-R.12E.	Wilmington	Viola	2991 - 3012	-1598 --1622	~ -1720 --1740	22 - 28	
20, 29-T.14S.-R.12E.	Wilmington	Simpson	3115 - 3133	-1716 --1742	~ -1720 --1740	21 - 22 ⁸	
31-T.14S.-R.12E.	Marais Des Cygnes	Viola	2940 - 2952	-1607 --1619	~ -1710 --1720	20	
22, 23, 24, 25, 26, 27, 34, 35-T.15S.-R.9E. 2-T.16S.-R.9E.	John Creek	Viola	2960 - 3184	-1635 --1753	~ -1720 --1840	25 - 28	
2, 11-T.15S.-R.10E.	Woodbury	Viola	3186 - 3228	-1765 --1807	~ -1870 --1880	20 - 26	
2, 11-T.15S.-R.10E.	Woodbury	Simpson	3270 - 3294	-1871 --1883	~ -1870 --1880	26	
16-T.15S.-R.11E.	Wheat	Simpson	3230 - 3234	-1799 - 1803	~ -1800	not available	
7-T.15S.-R.12E.	Waugh	Simpson	3055 - 3068	-1695 - 1702	~ -1690 --1700	25 - 26	
13, 24-T.16S.-R.7E. 18, 19-T.16S.-R.8E.	Bosch	Hunton	2719 - 2766	-1269 --1306	~ -1530 --1570	40 ⁵	
12, 13-T.16S.-R.9E.	John Creek Southeast	Viola	2958 - 2960	-1714 --1716	~ -1800	not available	

LOCATION	FIELD NAME	PAY ZONE	SUBSURFACE DEPTH (feet)	SUBSEA DEPTH	SUBSEA DEPTH of SIMPSON (feet)	GRAVITY RANGE (API°)	NOTES
13, 23-T.16S.-R.9E.	Comiskey Northeast	Viola	2915 - 2959	-1670 - -1702	~ -1760 - -1780	25	gravity from nearby DST
23, 24-T.16S.-R.9E.	Comiskey	Viola	2926 - 2959	-1679 - -1713	~ -1770 - -1790	23	
5-T.16S.-R.10E.	Agnes	Viola	3108 - 3125	-1722 - -1737	~ -1810 - -1820	28	
9, 16-T.16S.-R.10E.	Kizler North	Hunton	2916 - 2970	-1638 - -1649	~ -1840 - -1850	23 - 25	
16-T.16S.-R.10E.	Kizler	Simpson	3197 - 3292	-1823 - -1849	~ -1820 - -1840	28 - 30	
23, 26-T.16S.-R.10E.	Bushong	Hunton	2948 - 2968	-1601 - -1613	~ -1800 - -1810	29	
24-T.16S.-R.16E.	Vassar	Mississippian	1508 - 1510	-437 - -439	~ -1060	18	
13-T.17S.-R.11E.	Hagins	Simpson	2874 - 2876	-1617 - -1619	~ -1620	not available	

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²Personal communication, 9/96, Marvin Carlson (Nebraska Geological Survey) to K. David Newell (Kansas Geological Survey).

³Brandt, E.O., 1960, Falls City field, *in* Curtis, G.R., James, A., III, King, C.R., Lewis, J.P., eds., Kansas oil and fields, v. III (northeastern Kansas): Kansas Geological Society, Wichita, KS, p. 216 - 220.

⁴Longman, M.W., and Palmer, S.E., 1987, Organic geochemistry of Mid-Continent Middle and Late Ordovician oils: American Association of Petroleum Geologists, Bulletin, v. 71, p. 939 - 950.

⁵Beene, D.L., 1993, 1992 oil and gas production in Kansas: Kansas Geological Survey, Oil and Gas Production, Data Set 92, 269 p. (computer printout).

⁶Report from Mobil Field Research Laboratory (undated, but circa 1985) to K. David Newell (Kansas Geological Survey).

⁷Brinegar, W.L., Ashburn field, *in* Curtis, G.R., James, A., III, King, C.R., Lewis, J.P., eds., Kansas oil and fields, v. III (northeastern Kansas): Kansas Geological Society, Wichita, KS, p. 10 - 13.

⁸Young, R.T., 1960, Wilmington field, *in* Curtis, G.R., James, A., III, King, C.R., Lewis, J.P., eds., Kansas oil and fields, v. III (northeastern Kansas): Kansas Geological Society, Wichita, KS, p. 173 - 180.

Figure 1.

API GRAVITY of OILS in the CENTRAL PART of the FOREST CITY BASIN

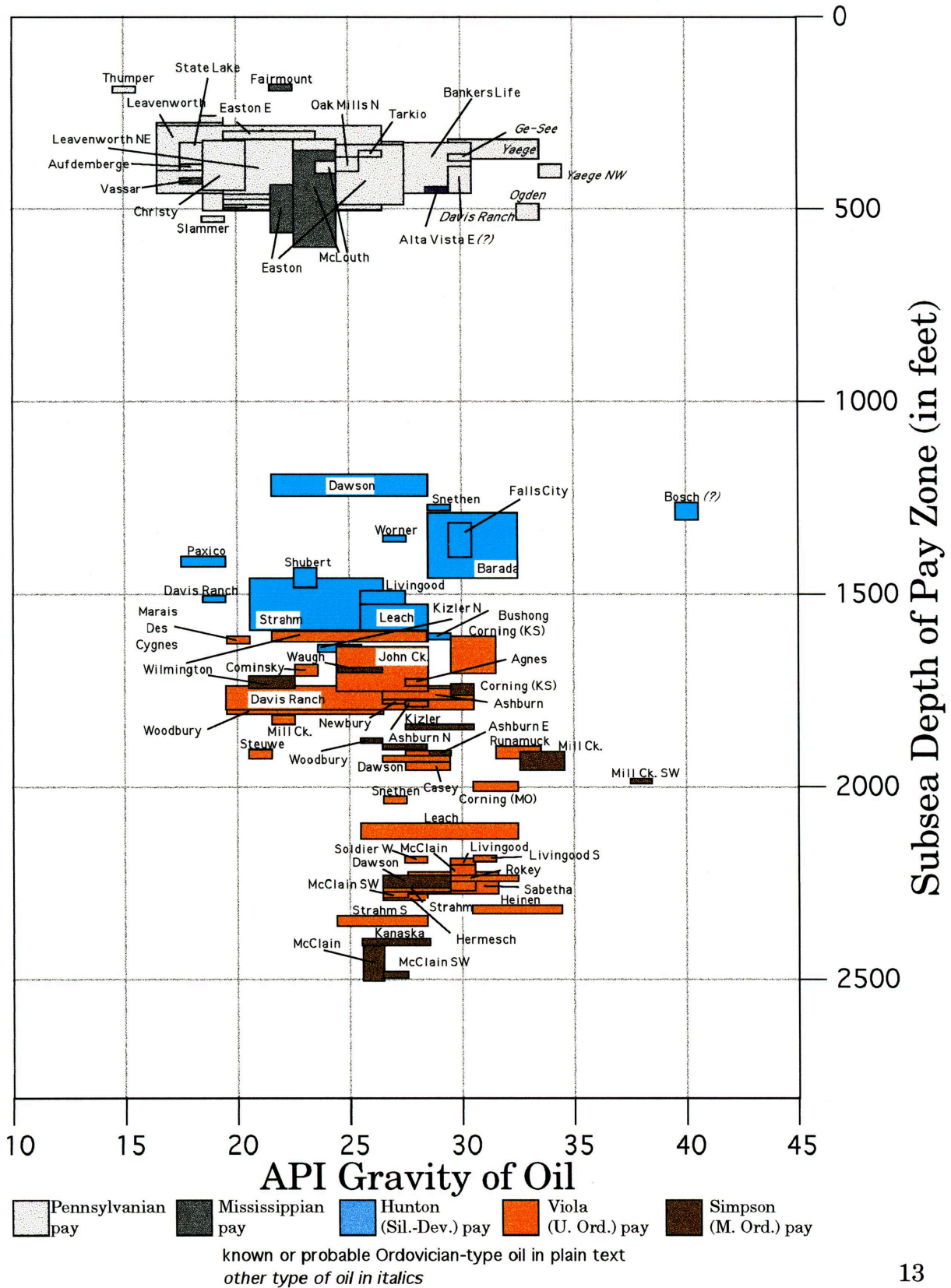


Figure 2

API GRAVITY of OILS in the CENTRAL PART of the FOREST CITY BASIN (at depth of Simpson Gp.)

