

WEST TENNESSEE (Possible Province) OIL AND GAS TESTS: 42 PRODUCTION TO 1943: None SHOWS: Reported in Upper Cretaceous and Paleozoic. DEEPEST TEST: 4202 feet; Haywood County

HIGHLAND RIM (Favorable Province) OIL AND GAS TESTS: 700+ PRODUCTION TO 1943: 525,300 bbl. SHOWS: Osage, Niagaran, Trenton, Black River, Stones River, Knox DEEPEST TEST: 2665 feet; Van Buren County. DEEPEST HORIZON TESTED: Knox dolomite

CENTRAL BASIN (Possible Province) OIL AND GAS TESTS: 90+ PRODUCTION TO 1943: Less than 200 bbl. SHOWS: Trenton (oil), Black River and Stones River (gas) DEEPEST TEST: 2280 feet; Rutherford County. DEEPEST HORIZON TESTED: Knox dolomite

CUMBERLAND PLATEAU (Favorable Province) OIL AND GAS TESTS: 125+ PRODUCTION TO 1943: 347,000 bbl. SHOWS: Chester-Meramec, Osage, Knox dolomite DEEPEST TEST: 4235 feet; Grundy County. DEEPEST HORIZON TESTED: Knox dolomite (2 wells)

EAST TENNESSEE (Unfavorable Province) OIL AND GAS TESTS: 10 PRODUCTION: None SHOWS: Reported in Knox dolomite DEEPEST TEST: 4219 feet; Campbell County. DEEPEST HORIZON TESTED: Cambrian.

LEGEND

WEST TENNESSEE (Possible Province) HIGHLAND RIM (Favorable Province) CENTRAL BASIN (Possible Province) CUMBERLAND PLATEAU (Favorable Province) EAST TENNESSEE (Unfavorable Province)

Oil and Gas Symbols: ● No commercial gas, ☀ No commercial oil, ☀ Oil and Gas

Generalized STRUCTURAL CONTOUR MAP on top of CHATTANOOGA SHALE in CENTRAL TENNESSEE

Datum Plane: Sea Level Contour Interval: 100 feet

TABLE OF OIL AND GAS DATA

Map No.	FIELD OR POOL NAME	COUNTY	DATE DISCOVERED	STATUS, 1943	OIL		GAS		PRODUCING HORIZON		STRUCTURE	DEEPEST HORIZON TESTED TO 1943
					WELLS DRILLED	PRODUCTION TO 1943 (Bbl.)	GRAVITY (Bc)	BASE	WELLS DRILLED	OPEN FLOW			INITIAL PRESSURE	AGE	CHARACTER
1	Tinleys Bottom	Clay-Jackson	1924	Abandoned	42	31,000	40.0	Paraffin	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
2	Mill Creek	Clay	1926	Abandoned	21	25,000	41.2	Paraffin	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
3	Acott School	Clay	1928	Producing	4	8,000	.....	.....	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
4	Pine Branch-Kettle Creek	Clay	1927	Producing	27	21,000	42.0	Paraffin	.....	.....	.....	Ordovician (Trenton-Stones River) Limestone Dome Upper Knox
5	Celina	Clay	1938	Producing	28	38,000	40.2	Paraffin	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
6	Peterman Bend	Clay	1925	Producing	19	95,000	40.0	Paraffin	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
7	Goodpasture Bend	Clay	1937	Abandoned	7	12,000	.....	.....	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Stones River
8	Fox Springs-Mitchell Creek	Clay	1926	Abandoned	27	100,000	40.0	Paraffin	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
9	Stillhouse Creek	Clay	1937	Producing	4	13,000	41.6	Paraffin	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
10	Willow Grove	Clay	1923	Producing	12	8,500	.....	.....	.....	.....	.....	Ordovician (Trenton-Stones River) Limestone Dome Stones River
11	Irons Creek	Clay-Pickett	1927	Abandoned	19	5,000	39.2	Paraffin	.....	.....	.....	Ordovician (Trenton-Stones River) Limestone Dome Stones River
12	Lilydale	Clay	1926	Abandoned	29	28,000	.....	.....	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
13	Ashburn Creek	Clay	1927	Abandoned	9	10,000	40.8	Paraffin	.....	.....	.....	Ordovician (Black River-Stones River) Limestone Dome Upper Knox
14	Noah Fork	Coffee	1938	Abandoned	6	1,200	38.3	Paraffin	.....	.....	.....	Ordovician (Trenton) Shaly Limestone Dome Upper Knox
15	Jonas Creek	Jackson	1866	Abandoned	4	1,500	39.1	Paraffin	.....	.....	.....	Silurian (Ordovician-Trenton) Limestone Dome Upper Knox
16	Harpheth Valley	Dickson	1930	Producing	.....	.....	.....	.....	6	4	10-100 M	Low Ordovician (Trenton) Limestone Dome Upper Knox
17	Forbush	Pickett-Fentress	1905	Abandoned	15	5,000	39.0	Paraffin	.....	.....	.....	Ordovician (Trenton-Knox) Limestone Anticline? Upper Knox
18	Spurrier	Pickett-Fentress	1892	Abandoned	3	25,000	.....	.....	.....	.....	.....	Ordovician (Trenton) Limestone Dome Upper Knox
19	Riverton	Fentress	1896	Abandoned	33	50,000	.....	.....	.....	.....	.....	Ordovician (Trenton) Limestone Anticline Upper Knox
20	Beary	Fentress	1957	Producing	8	7,500	40.0	Paraffin	.....	.....	.....	Ordovician (Trenton) Shaly Limestone Dome Upper Knox
21	Poplar Cove	Fentress	1896	Producing	.....	.....	36.0	Paraffin	.....	.....	.....	Ordovician (Trenton) Shaly Limestone Anticline? Upper Knox
22	Winchester	Franklin	1921	Abandoned	.....	.....	.....	.....	10	6	25-50 M	Low Ordovician (Trenton) Limestone Dome Upper Knox
23	Lock Branch	Jackson	1927	Abandoned	22	7,500	40.0	Paraffin	.....	.....	.....	Ordovician (Stones River-Knox) Limestone Dome Upper Knox
24	Smithland	Lincoln	1929	Abandoned	.....	.....	.....	.....	2	14	20-150 lb.	Ordovician (Trenton-Knox) Shaly Limestone Dome Upper Knox
25	Long Fork	Macon	1953	Producing	.....	.....	.....	.....	5	3	500M-35R	Ordovician (Trenton) Shaly Limestone Terrace Upper Knox
26	Boone Camp	Morgan	1924	Producing	16	119,000	39.0	Paraffin	.....	.....	.....	Mississippian (Lower) Shaly Limestone Terrace Lower Mississippian
27	Seabolt	Morgan	1928	Producing	5	21,000	.....	.....	.....	.....	.....	Mississippian (Middle) Limestone ? Lower Mississippian
28	Coon Hollow	Morgan	1929	Producing	6	50,000	41.1	Paraffin	.....	.....	.....	Mississippian (Middle) Limestone ? Lower Mississippian
29	Sunbright	Morgan	1928	Producing	.....	.....	.....	.....	18	9	100M-5 M	Mississippian (Lower and Middle) Limestone ? Upper Ordovician
30	Eagle Creek	Overton	1866	Producing	8	2,000	.....	.....	.....	.....	.....	Ordovician (Trenton) Limestone Anticline? Stones River
31	Spring Creek (Upper)	Overton	1866	Abandoned	3	30,000	40.5	Paraffin	.....	.....	.....	Mississippian (Lower) Limestone ? Upper Knox
32	Spring Creek (Lower)	Overton	1926	Abandoned	8	1,000	38.7	Paraffin	.....	.....	.....	Ordovician (Trenton) Limestone ? Upper Knox
33	Jouett Creek	Pickett	1928	Abandoned	9	15,000	39.0	Paraffin	.....	.....	.....	Ordovician (Trenton-Stones River) Limestone Anticline? Stones River
34	Cookeville	Putnam	1928	Producing	.....	.....	.....	.....	7	3	.....	Ordovician (Trenton) Limestone Anticline? Stones River
35	Barren Plains	Robertson	1931	Producing	.....	.....	.....	.....	7	4	10-100 M	Low Silurian; Devonian ? Ordovician Nose? Upper Ordovician
36	Onesida	Scott	1915	Abandoned	15	4	1,000	34.5	Paraffin	.....	.....	Mississippian (Chester) Limestone ? Upper Ordovician
37	Glenmary	Scott	1916	Producing	38	156,000	38.0	Paraffin	.....	.....	.....	Mississippian (Middle and Chester) Limestone ? Faulted anticline Lower Mississippian
38	Sugar Grove	Sumner	1920	Abandoned	11	3	1,000	33.2	Paraffin	.....	.....	Silurian (Niagaran) Limestone ? Upper Ordovician
39	Town Creek	Warren	1921	Abandoned	.....	.....	.....	.....	3	2	80-100 M	Ordovician (Trenton-Stones River) Limestone Anticline? Upper Knox
40	Collins River	Warren	1928	Producing	.....	.....	.....	.....	8	6	20M-2	Ordovician (Trenton-Stones River) Limestone ? Upper Knox
41	Sparta	White	1931	Abandoned	.....	.....	.....	.....	5	2	25-500 M	Low Ordovician (Trenton) Limestone ? Trenton

BRIEF HISTORY OF OIL AND GAS DEVELOPMENTS IN TENNESSEE

INTRODUCTION—The presence of oil seeps in Tennessee along the eastern Highland Rim was noted more than one hundred years ago by Gerard Troost, the first State Geologist of Tennessee. The first commercial oil was found along Spring Creek (38) in southern Overton County in 1866, seven years after Drake's discovery in Pennsylvania. Since that time the history of oil and gas developments in Tennessee has been essentially one of sporadic drilling with the discovery of small fields, many of which have been short-lived. Most of the production has been relatively shallow, the deepest being less than 2,000 feet. The small initial capital required for shallow testing has resulted in numerous wildcat drilling operations preceded by little or no geologic work. This has naturally resulted in an unusually high percentage of dry and nearly dry holes. In the past there have been no laws in the State which required the filing of drilling permits, well records, or production figures. An attempt has been made to tabulate above the more pertinent data for Tennessee production.

The following is a brief outline of oil and gas developments in the State according to physiographic divisions:

WEST TENNESSEE—The strata of East Tennessee, including the Great Smokies and the Valley and Ridge regions, are of pre-Cambrian, Cambrian, Ordovician, and Silurian ages which are generally so intensely folded and faulted as to preclude the chance of finding oil and gas in commercial quantities. Despite this fact ten wells have been drilled in East Tennessee, only one of which found encouraging shows of oil.

CUMBERLAND PLATEAU—Cumberland Plateau, a tableland with an average elevation of approximately 2,000 feet, is capped with sandstones, shales, and coals of Pennsylvanian age, which reach a maximum thickness of more than 3,000 feet in the northern part of the area. Limestones, shales, and sandstones of upper Mississippian (Chester) age crop out along the western escarpment of the Plateau. Structurally, the major part of the Plateau is a monocline dipping gently to the east and southeast toward the highly folded and faulted Appalachian structural province.

Although several widely separated oil tests have been drilled in the Appalachian part of Cumberland Plateau, most of the activity has been in the northern part, especially in Morgan and Scott Counties. In 1916, oil was found in limestones of Chester age, approximately 5 miles northwest of Onesida, Scott County (37). This production, found at approximately 1,000 feet, was short-lived and soon abandoned. The following year, oil was found at Glenmary (38) in southwestern Scott County. This production is from Trenton limestones at depths of 1,100-1,150 feet. This field is now 25 years old and only a few wells are pumped at present. Structural work by this Division indicates that accumulation has resulted from a faulted east-west anticline.

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Oil was discovered along Boone Camp Creek in Morgan County (27) in 1924 and there has been small but steady production since that time. The producing horizon is in the Fort Payne formation of lower Mississippian age. Most wells have been completed at depths of 1,400-1,600 feet. No pronounced structural feature has been discovered by surface work or subsurface studies and apparently porous conditions in the Fort Payne formation are the major factor. In 1929, the first commercial reservoir of gas in rocks of middle and lower Mississippian ages, although there has been no development. The accumulation appears to be governed largely by porous and fissured zones with structure of secondary importance.

The northern part of Cumberland Plateau has attracted interest within the past few years and surface work has been carried on by at least one of the major oil companies. There has been little deep drilling in this area and the oil and gas possibilities of pre-Mississippian rocks are essentially unknown. In the light of present and past Ordovician production to the northwest the Cumberland Plateau is considered one of the most favorable areas for prospecting in the State.

HIGHLAND RIM—The Highland Rim, which encircles the Nashville basin, is capped by strata of middle and lower Mississippian age. This physiographic province is subdivided according to its relation to the Central Basin into eastern, northern, and western parts. The major structural feature in the Nashville dome. Detailed structural work in several areas on the Rim has shown that the regional dip of the axis has been interrupted in many places, giving rise to numerous small, but generally sharp, basins.

The Highland Rim, especially the northeastern part, has attracted more oil exploration than any other part of the State. Testing began in this area in the early 1860's and more than 700 wells have been drilled. Several pools have been discovered, the more important including: Celina (37) Peterman Bend (6), Fox Springs-Mitchell Creek (8), all in Clay County; the Spurrier (18) and Riverton (19) pools in Pickett and Fentress Counties; and the old Upper Knox-Creek (32) district in Overton County. With the exception of the latter pool, in which the lower Mississippian was productive, the production in this area has been from Ordovician strata ranging in depth from 250 to approximately 1,600 feet. The more important horizons are: (1) In rocks of Trenton age ("Upper and Lower Sunbrybuck") about 280 and 475 feet, respectively, below the Chattanooga black shale; and (2) in strata of the Black River and Stones River groups, the more prolific zones occurring from 10 to about 250 feet below the base of the Trenton. A few of the deeper tests have found small production in sandy horizons and encouraging shows in the upper part of the Knox dolomite group.

Along the eastern Highland Rim small gas fields (26, 35, 40, 41, 42) have been developed during the past fifteen years, but are now essentially abandoned. The gas comes from fissured Ordovician limestones from depths of less than 500 feet to approximately 850 feet.

In Sumner County, on the northern Highland Rim, a few wells (39) have produced small amounts of oil from dolomitic limestones of Silurian age at depths of 200-250 feet. The undeveloped Bary (3) limestones gas field (36) in northern Robertson County produced from rocks of Devonian (?) and Silurian ages.

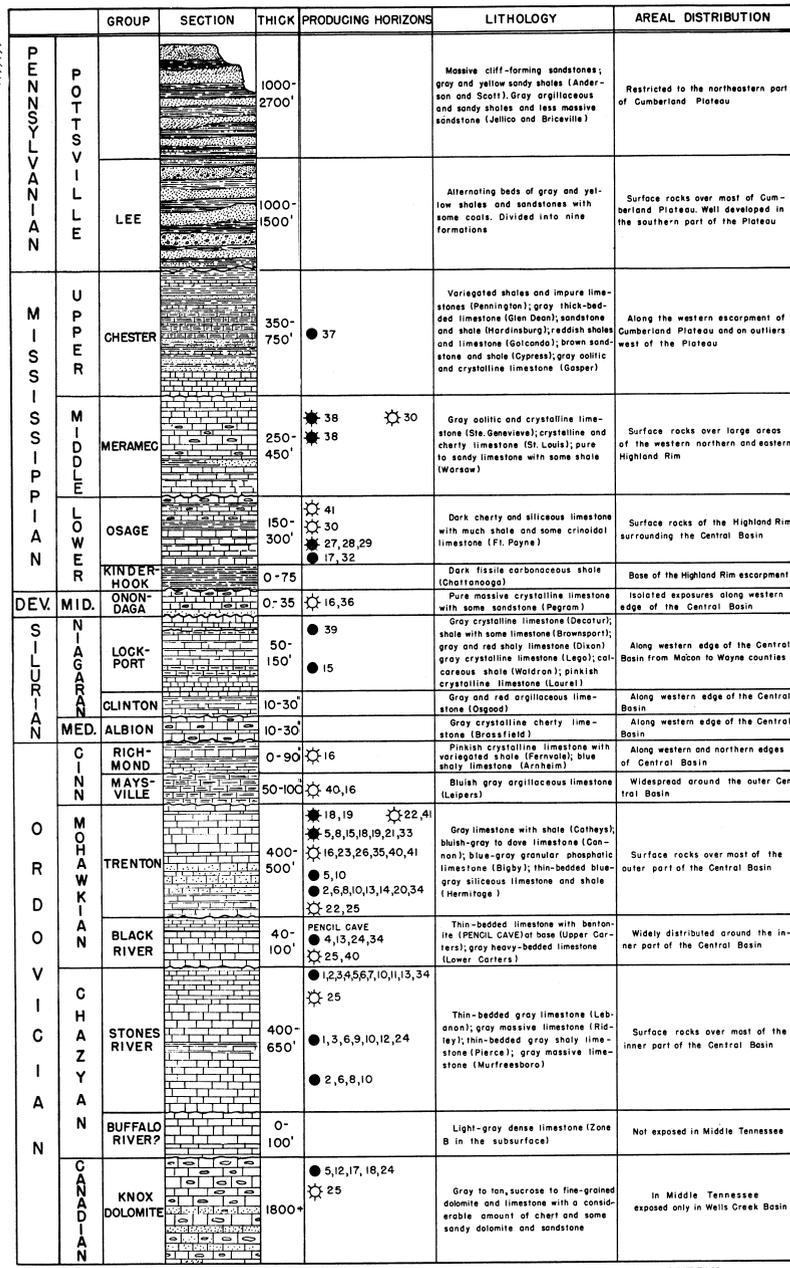
Detailed studies in many parts of the Highland Rim province have demonstrated that geologic structure is of major importance in the accumulation of oil and gas in this area. While not all of the favorable structures have been productive, there has been no significant production in areas which are definitely known to be structurally low.

CENTRAL BASIN—The surface rocks of the Central Basin are generally dense to fine-grained limestones, with some shales, of middle and lower Ordovician age. Silurian strata crop out along the western edge of the Basin. The major structural feature in the Nashville dome. With the exception of a small amount of oil in Coffee County (14) and the new abandoned Smithland gas field (25) in southeastern Lincoln County, there has been no production in this part of the State and the possibilities must be considered less favorable than in the Highland Rim and Cumberland Plateau provinces. A few of the deeper wells have penetrated sandy dolomites, in the upper part of the Knox group, which have yielded small shows of oil and gas.

WEST TENNESSEE—Most of West Tennessee falls within the Gulf embayment, a basin of Paleozoic rocks filled with generally unconsolidated sands and clay of Upper Cretaceous and Eocene ages. Paleozoic rocks, ranging in age from Ordovician (Trenton) to Mississippian, crop out along the western edge of the Basin. The western limb of this arch is practically unknown due to cover by the sediments of the Mississippi embayment. The Upper Cretaceous and Tertiary beds dip gently to the west at a rate of 20-40 feet per mile toward the axis of the embayment. Since most of the beds are essentially unconsolidated, surface structural mapping is difficult and the results are questionable. It is an area for geophysical prospecting.

Thirty-five wells have been drilled in the embayment area in Tennessee and seven in the Western Valley. Oil and gas shows have been reported in the Upper Cretaceous and Paleozoic rocks, but there has been no production.

* Numbers in parentheses refer to oil pool location on map above.



GENERALIZED COLUMNAR SECTION SHOWING STRATIGRAPHIC POSITION OF PRODUCING HORIZONS (Numbers refer to pool locations on map)

STATE OF TENNESSEE
DEPARTMENT OF CONSERVATION
DIVISION OF GEOLOGY
Walter F. Pond, State Geologist

**OIL AND GAS
IN
MIDDLE TENNESSEE**

WITH
MAP OF POOLS, COLUMNAR SECTION, TABLE OF
DATA, AND HISTORY OF DEVELOPMENTS

BY
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