

STATE OF ILLINOIS
DWIGHT H. GREEN, *Governor*
DEPARTMENT OF REGISTRATION AND EDUCATION
FRANK H. THOMPSON, *Director*

DIVISION OF THE
STATE GEOLOGICAL SURVEY
M. M. LEIGHTON, *Chief*
URBANA

No. 53

ILLINOIS PETROLEUM
PRINTED BY AUTHORITY OF THE STATE OF ILLINOIS

August 3, 1946

DEVELOPMENTS IN EASTERN INTERIOR BASIN IN 1945¹

ALFRED H. BELL²
Urbana, Illinois

ABSTRACT

Drilling in the Eastern Interior basin decreased 15 per cent and production decreased 2½ per cent in 1945. The removal of well-spacing restrictions by the Federal Government about September 1 did not result in any noticeable increase in drilling. There was little deep testing in 1945, and nearly all of the new wells produced from sandstones and limestones of the Mississippian system.

Production in Kentucky reached a new high of slightly more than 10 million barrels.

Drilling is expected to continue in 1946 at nearly the same rate as in 1945, with possibly an increase in wildcat testing due to the expiration of a large acreage of 10-year leases in the Illinois basin.

INTRODUCTION

Drilling in the Eastern Interior basin decreased by 15 per cent in 1945 as compared with 1944. The removal of well-spacing restrictions by the Federal Government about September 1 did not result in any noticeable increase in drilling. Forty-six new pools were discovered, all of them small. Total production in 1945 was approximately 88 million barrels, which amounted to 5.1 per cent of the total for the United States.

Total production in Illinois was 75,210,000 barrels of oil, of which it is estimated that 90 per cent came from Mississippian strata, a little less than 4 per cent each came from Pennsylvanian and Devonian strata, and a little more than 1 per cent each from Silurian and Ordovician strata.

Production in both western Kentucky and southwestern Indiana came dominantly from the Mississippian system.

¹ Reprinted from *Bull. Amer. Assoc. Petrol. Geol.*, Vol. 30, No. 6 (June, 1946), pp. 879-885.

² Geologist and head, Oil and Gas Division, Illinois State Geological Survey.

TABLE I
POOLS DISCOVERED IN EASTERN INTERIOR BASIN IN 1945

Pool	County	Company and Farm	Location	Total Depth (Feet)	Depth to Top (Feet)	Producing Formation	Initial Production (Barrels) ^a	Date of Completion	No. of Wells Producing in Pool Dec. 27, 1945
ILLINOIS									
1. Alder South	Hamilton	Rudy Marlow I	26-35-7E	3,450	3,384	McClosky	25±9	7/24/45	1
2. Barraco W.	Clinton	Mosebach, J. Meyers I	18-1N-3W	970	933	Cypress	9±12	10/30/45	1
3. Brownsville	White	H. H. Wehner, Kistner I	31-3S-9E	3,186	3,118,	Rosicarie; McClosky	187	3/13/45	32
4. Gallagher	Richland	Pure, J. C. Howard A I	13-2N-0E	3,243	3,107	McClosky	96±81	10/16/45	1
5. Goldenstate N.	Wayne	Dell & Duncan, I. A. Leach I	9-2S-9E	3,497	3,303;	Lower O'Hara	122	11/ 6/45	2
6. Hney	Clinton	Goldschmidt & Schlemmer, Jentzen I	3-2N-2W	1,266	1,250	Rosicarie	96±2	8/14/45	3
7. Hunt City	Jasper	W. W. Shafer, M. Stifel I	27-1N-0E	2,715	2,542	Rosicarie	25±0	9/25/45	1
8. Ingraham W.	Clay	Kingsford, Fulk I	13-3N-7E	2,577	2,532	Cypress	34±67	8/25/45	1
9. Iola W.	Clay	Texas W. Yette Jones I	18-5N-4E	2,593	2,494	McClosky	12±8	1/16/45	2
10. Kenaville	Wayne	Gull, M. Anderson	20-1S-5E	3,158	2,998	Aux Vases	80±240	2/ 5/45	1
11. Maplegrove S.	Edwards	Cerna & Hayes, C. Greathouse I	23-1N-0E	3,329	3,244	Lower O'Hara	90±120	3/20/45	1
12. Mantle City W.	Jefferson	Cull, F. W. Nuclell Storms I	4-3S-4E	3,195	2,918	Aux Vases	56±4	11/15/45	1
13. Mantle West	White	R. M. Hathi, North Storms I	2-0S-4E	2,893	2,858	McClosky	36±4	11/21/45	1
14. Menton North	Jasper	Shuning Bros., Ben Runion I	31-7N-1E	1,893	1,758	Cypress	137±30	5/20/45	21
15. Olin	Richland	Ruell, D. W., Lee Bunn I	12-2N-1W	1,760	1,758	McClosky	18±30	10/30/45	1
16. Passport	Clay	Cent. Pipe Line, Lee Bunn I	28-2N-4W	3,132	3,078	Rosicarie	36±30	10/30/45	1
17. Parkersburg N.	Hamilton	Magnolia, F. Staley I	12-4S-5E	3,093	3,083	Aux Vases	35±30	3/15/45	1
18. Rural Hill W.	Edwards	Wide Water, W. B. Johnson I	33-0S-5E	3,483	3,459	Betha Vases	91±25	10/29/45	2
19. Samsville N.	Richland	Cent. Pipe Line, C. Oboold I	20-2N-1W	2,890	2,882	McClosky	24	6/25/45	2
20. Shattury	Callion	H. W. Carter, D. C. Boyan I	28-2N-1W	1,886	1,728	Cypress	73	6/11/45	1
21. Shatturston	Callion	Murphy & Conney, L. Noller I	24-2S-9E	2,837	2,804	Aux Vases	19±6	9/ 4/45	3
22. Smartestown	Hamilton	Ceral, C. Oldham, I	14-2S-7E	3,587	3,493	Aux Vases	88±	10/ 4/45	9
23. Spangerton	Clay	Cartee Oil, Frey Witt. Ins. I-A	24-2N-7E	3,936	3,929	McClosky	83±	11/13/45	1
24. Stander	White	Lute & Lynn, J. Goungs I	35-2S-9E	3,379	2,509	Tra Springs	33±38	11/13/45	1
25. Sumpter	White	Lato, E. O'gan I	26-7N-0E	2,000	2,599	McClosky	180	5/13/45	2
26. Willow Hill N.	Jasper	Robinson & Puckett, Roberts I	16-2S-12W	2,712	2,765	McClosky	48	Jan.	1
INDIANA									
27. Crunk	Posey	W. Duncan, A. Meinschein I	20-5S-12W	1,167	1,142	Mansfield	1,118 MCFG	Jan.	4
28. Farmersville	Posey	Central States, E. Blackburn, I-A	30-5S-7W	1,160	1,148	Tra Springs	1,168 MCFG	Oct.	1
29. French	Spencer	F. H. Rhodes, McGometry-Engley I	14-7S-12W	2,092	2,073	Tra Springs	1,08±113	July	4
30. Jeffries	Posey	Cartee Oil, A. S. Cox I	25-2S-13W	2,893	2,855	Aux Vases	128	July	1
31. Johnson W.	Gibson	Magnolia, E. L. Dike I	1-2S-12W	2,867	2,867	Aux Vases	172	June	1
32. Lysle	Gibson	Deep Vein Coal, Fee I	26-5S-12W	2,456	2,134	Bethel	1,658 MCFG	June	3
33. Mt. Carmel E.	Gibson	Reson Oil, F. C. Putnam I	14-6S-12W	1,786	1,799	Hardsburg	10±50	June	1
34. Oliver	Posey	J. T. Peck, A. Renckel I	24-5S-12W	2,772	2,588	Penn.			
35. St. Wendell E.	Posey	E. Hackbush, H. Goettle I	0-0-24	2,916	2,915	Water			
KENTUCKY									
36. Anthosten	Henderson	Ryan Oil Co., Crafton I	9-0-30	2,846	2,915	Jackson	15	Dec.	
37. Beaver Pond	Davies	Spender & Slaughter, Hollis I	9-0-30	2,846	2,846	Tra Springs	18	June	
38. Corvdon East	Henderson	Shelving-Swan, Pitterson I	1-0-22	2,272	2,265	Cypress	125	May	
39. Dixie	Henderson	Hobson, Pitt. et al., Filteson I	8-D-22	1,382	1,380	Cypress	375	May	
40. Elkton	Todd	Bas. Drig. Co., Stinson I	8-P-29	1,582	1,389	Dextronian	4	August	
41. Henderson	Henderson	Bas. Drig. Co., Kasey Bros. I	7-K-23	2,448	2,448	McClosky	370	Dec.	
42. Phney	Crittenden	J. Esauik, Woodall I	7-P-20	1,460	1,589	Benoist	30	Sept.	
43. Robinsville	Union	J. Enchig, Blake I	17-P-20	2,350	2,339	Cypress	210	Oct.	
44. Uniontown E.	Union	Ryan Oil Co., Greenwell I	7-O-21	2,287	2,283	Cypress	130	May	
45. Waverly	Union	Ashland, Verona Coal "A" I	17-P-21	2,287	2,283	Waltersburg	591,000 cu. ft.	Sept.	
46. Unnamed (shut in gas well)	Davies	Sohio, Sauer I	17-P-27	1,131	1,122				

^a Oil and water.

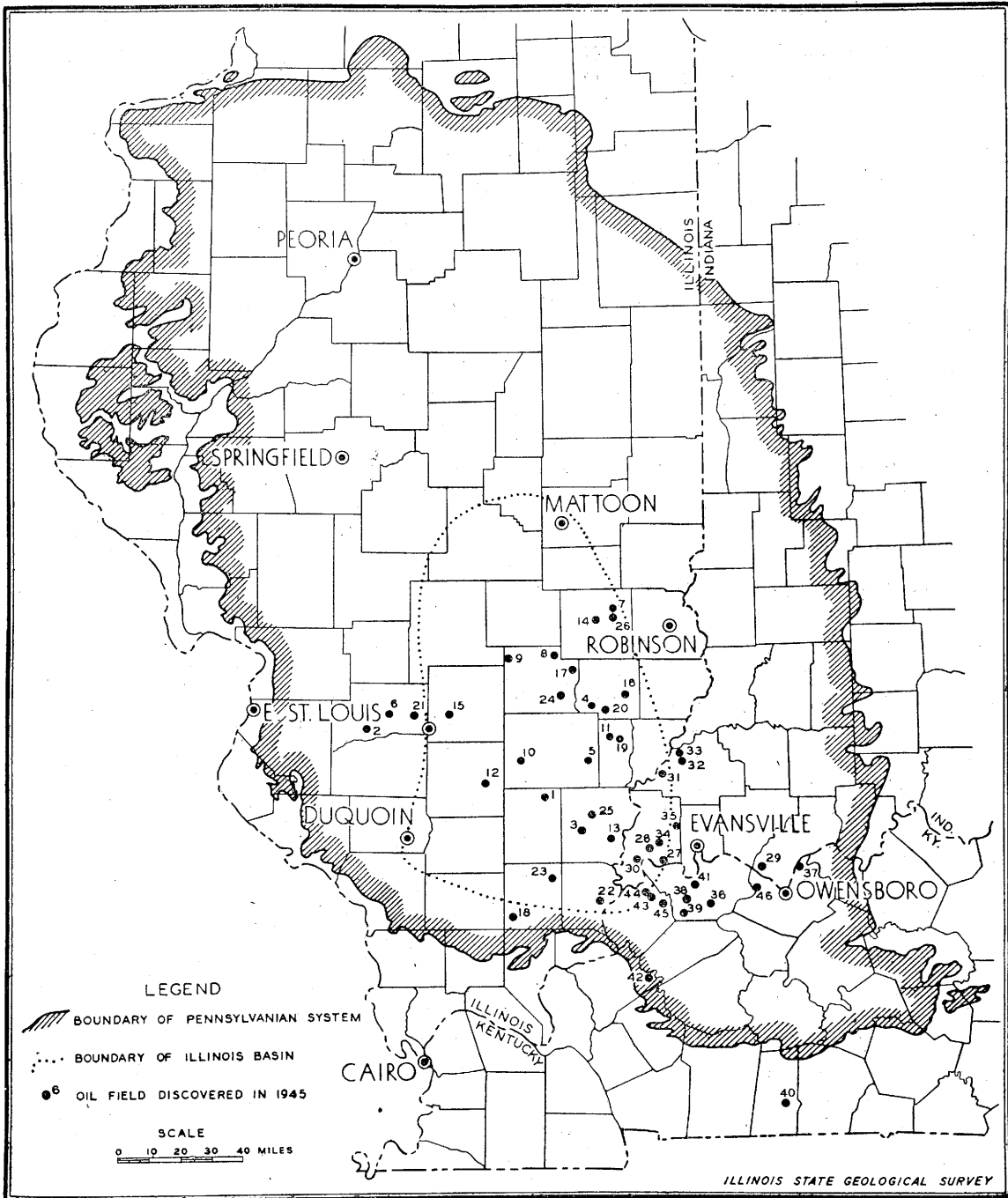


FIG. 1.—Map of Eastern Interior basin showing new oil pools discovered in 1945.
For list of pools see Table I.

DEVELOPMENT

Approximately 2,538 wells were drilled for oil or gas in the Eastern Interior basin in 1945 as compared with 2,967 in 1944, a decrease of 15 per cent. The following table shows the distribution by states.

NUMBER OF COMPLETED WELLS (Excluding water and gas input wells, salt-water disposal wells and old wells worked over)		
	1944	1945
Illinois	1,991	1,761
Southwestern Indiana	276	259
Western Kentucky	700	518
	<hr/> 2,967	<hr/> 2,538

NEW POOLS DISCOVERED

As shown in Table I, 46 new pools were discovered in 1945 in the Eastern Interior basin. Of these new pools, 26 are in Illinois, 9 are in Indiana, and 11 are in Kentucky.

The most noteworthy of the Illinois pools discovered in 1945 are: Brownsville, White County, with 32 wells and a total production to the end of 1945 of 205,000 barrels; Odin, Marion County, with 21 wells and a total production of 84,000 barrels; and Stanford, Clay County, with 9 wells and a total production of 105,000 barrels.

ILLINOIS

All of the new pool discovery wells in Illinois in 1945 produced from Mississippian formations, 12 in Chester series sandstones, and 14 in the Ste. Genevieve formation of the Lower Mississippian series.

New producing formations.—Additional producing formations discovered in Illinois oil pools in 1945 numbered 26, of which 11 were in the Chester series, 14 in the Ste. Genevieve formation of the Lower Mississippian series, and 1 in the Devonian limestone. The Devonian discovery was in the Woodlawn pool, Jefferson County. It was The Texas Company's E. Eubanks Community well No. 1 in Sec. 35, T. 2 S., R. 1 E., total depth 3,746 feet, top of the Devonian at 3,663 feet, initial production 65 barrels of oil.

Extensions.—Extensions to pools discovered by outpost wells (from $\frac{1}{4}$ mile to 2 miles from production) in Illinois numbered 47, of which 1 was in the Pennsylvanian, 16 were in the Chester series, 23 in the Ste. Genevieve, 5 in combinations of Chester and Ste. Genevieve, and 2 in Silurian.

Exploratory methods and results.—Subsurface geology and the reflection seismograph continue to be the methods most used in the location of exploratory wells. Of the 26 pools discovered in 1945, the discovery wells of 19 were located on the basis of geology, 4 on a combination of seismograph and geology, 1 on seismograph, and 2 not on any scientific basis.

DEVELOPMENTS IN EASTERN INTERIOR BASIN IN 1945 883

The only kind of geophysical work reported to have been done in Illinois in 1945 was reflection seismograph, the total amount of which declined from 33 party-months in 1944 to 25 party-months in 1945, a decline of about 24 per cent.

Wildcat drilling.—The total number of wildcat completions in Illinois increased from 441 in 1944 to 460 in 1945, an increase of 5 per cent. Of the total, 73 or 16 per cent were successful in obtaining production.

Of the 460 wildcat wells completed in 1945, 232 were located more than 2 miles from production as compared with 261 in 1944. Of the 232 wildcats, 26 or 11 per cent were successful, the same percentage as in 1944.

Deep testing.—There was little deep testing in Illinois in 1945. In the Illinois basin (central deeper part of the Eastern Interior basin) only 1 test was drilled below the Mississippian, namely, the well which discovered Devonian production in the Woodlawn pool, Jefferson County.

Pool development drilling.—The pools which had the most producing wells added during 1945 were: Clay City Consolidated, Clay and Wayne counties, 112 wells added; Boyd, Jefferson County, 77 wells added; Mattoon, Coles County, 61 wells added; Albion Consolidated, Edwards County, 54 wells added; Bible Grove, Clay, and Effingham counties, 53 wells added.

Most of the drilling in Illinois was in the deep basin area, especially in the following ten counties: Clay, Coles, Edwards, Effingham, Hamilton, Jefferson, Richland, Wabash, Wayne, and White. White ranked first with 230 completions of which 159 were producing wells.

An outstanding feature of 1945 development was the growth of the Mattoon pool, Coles County, in the latter part of the year. This pool was discovered in 1939, but to the end of 1944 it had only 12 producing wells. The successful com-

TABLE II
SELECTED LIST OF MOST NOTEWORTHY DRY TESTS IN ILLINOIS IN 1945

Pool	County	Company and Farm	Location	Total Depth	Deepest Formation	Depth to Top	Date of Completion	
1.	Clark	Loyd, Bays 1	21-11N-12W	2,432	Devonian	2,376	4-24-45	
2.	Huey	Clinton	Mosebach, Jentzen 1	29-2N-2W	2,720	Devonian	2,685	10-2-45
3.	Clinton	Big Chief, Gieseke 1	9-2N-5W	2,042	Plattin	2,866	8-7-45	
4.	Hancock	Heavener, Broadhead 1	14-5N-5W	1,090	St. Peter	941	6-26-45	
5.	Collinsville	Madison	Benoist, Keller 4	8-3N-8W	2,195	St. Peter	2,177	1-9-45
6.	Madison	Eason, Albrecht 1	20-5N-5W	2,719	Trenton	2,618	10-9-45	
7.	Tazewell	Guengerich, Mathis 2	24-25N-3W	2,235	Shakopee	2,210	11-20-45	
8.	Union	Mims, Potashnick 1	26-13S-3W	1,525	Joachim	?	11-20-45	
9.	Cordes	Washington	Shell, Sharkowski 13-D	2,887	Devonian	2,735	12-18-45	
10.	Washington	Inland Oil, Lichtenfels 1	22-18S-3W	2,808	Devonian	2,734	9-4-45	

pletion of a wildcat well in July of 1945 extended the pool 2 miles southwest and started an active drilling campaign. There were extensions toward the north, west, and south until by the end of 1945 the pool was 8 miles long north and south, and about 2 miles wide at the widest part. At the end of 1945 there were 68 wells in the Mattoon pool with a total daily yield of about 6,500 barrels of oil, and there were about 100 drilling wells in the area or about one third of the total

drilling in the state. Production is mainly from the Rosiclare sandstone member of the Ste. Genevieve formation and the Cypress sandstone.

The development of the Mattoon pool has led to increased interest in the possibilities of the northern part of the Illinois basin which has had relatively few wildcat tests as compared with the southern part. As a result Coles, Cumberland, Shelby, Moultrie, and some adjacent counties will probably have increased exploratory drilling in 1946.

Drilling is expected to continue through 1946 at about the same rate as in 1945. The expiration during the year of a large acreage of 10-year leases in the Illinois basin will probably result in increased wildcat testing.

SOUTHWESTERN INDIANA

The following statement on southwestern Indiana was furnished by R. E. Esarey, professor of geology, Indiana University, Bloomington, Indiana.

The most important discoveries in southwestern Indiana during the year 1945 were made in western Gibson County (Table I, Nos. 31, 32, 33). One of these, the Lysle pool, opened by the Deep Vein Coal Company's Fee 1, might develop into a major pool. In addition to the present producing sands, other Chester beds and the Ste. Genevieve may be saturated. The entire area is under lease and will be thoroughly tested during the coming drilling season.

Extensions to several of the old pools in northeastern Gibson County have been made with the finding of saturation in both shallower and deeper beds. Most of the wells were small producers, but the Shoultz well of the Chester Oil Company had an initial production of 250 barrels. There is continued activity in this area.

New producing beds were found in the Jeffries pool in Posey County, which will add materially to that county's total production. Mink Island and Point Township have had several good completions during the year. Knox County is being prospected more thoroughly (core-drilling and slim-hole testing) but only a few locations have been made. Extensions to the St. Thomas and St. Francisville pools look encouraging, but the areas are not sufficiently developed to make satisfactory evaluations.

Some prospecting for Devonian production by coring and geophysical work is being carried on in Sullivan and Vigo counties. However, no leasing or testing is known to have started yet.

An interesting deep test³ was R. D. Brown's Ada Bingham No. 1, Sec. 16, T. 1 S., R. 11 W., in the abandoned Patoka pool, Gibson County, Indiana, total depth 6,198 feet, completed in December, 1945. It was abandoned with a hole full of sulphur water after penetrating the St. Peter sandstone for 118 feet.

WESTERN KENTUCKY

The following statement regarding developments in Kentucky in 1945 was

³ *Oil and Gas Jour.*, Vol. 44, No. 41 (February 16, 1946), p. 111.

furnished by D. J. Jones, State geologist, Lexington, Kentucky.

Preliminary figures for 1945 indicate that Kentucky oil production slightly exceeded 10,000,000 barrels, and for the second year in succession has topped all previous records.

Since the close of the war the number of exploratory wells has fallen off, and the total number drilled in western Kentucky in 1945 was slightly more than 500 as compared with 700 for the previous year. The decrease in wildcat tests is especially evident in the counties where there is little or no production, in spite of the fact that a number of them may become important producers. This observation applies particularly to those counties in the southern part of the basin.

Continued development in Henderson, Union, and Webster counties has been responsible for a very large percentage of the increase in production, and a total of 323 wells were drilled in these counties.

Production has been developed from eleven formations, ranging from basal Pottsville to the "Corniferous." A small well producing from the "Corniferous" was reported from Todd County. This outpost should stimulate Devonian testing throughout much of this part of the basin.

The formations furnishing the greater part of the new production were the Palestine, Tar Springs, Hardinsburg, Cypress, Bethel, and the McClosky. A summary of drilling operations reveals that out of a total initial production of approximately 30,000 barrels, a total of 28,900 barrels was produced from these formations.

Five tests penetrated beds of Ordovician age, none of which was productive.

Ten new pools were developed during the year.

Daily production for the month of December, 1945, averaged approximately 29,400 barrels as compared with 29,000 for the same month of 1944. This indicates the probability that 1946 production figures will exceed those of 1945.