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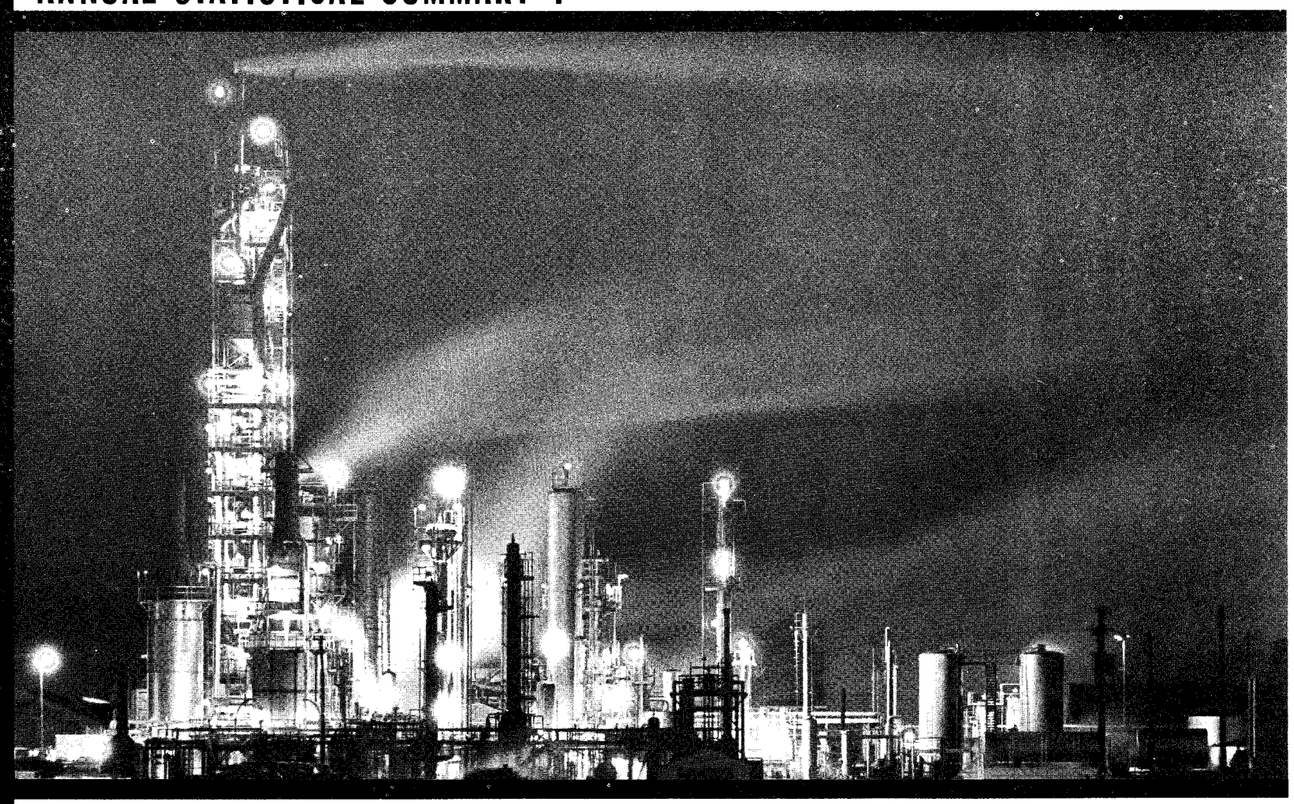
MICHIGAN'S OIL AND GAS FIELDS, 1965

ANNUAL STATISTICAL SUMMARY 4



1966

GEOLOGICAL SURVEY

THE STATE GEOLOGICAL SURVEY OF MICHIGAN

History

The State Geological Survey was established originally in 1837 by the First Legislature, which provided funds through 1845. The office was instituted again from 1859 through 1862. The present Survey was organized in 1869, and has served from that date without interruption. In 1921, however, agencies administering natural resources were combined into a single organization. Thus the Geological Survey, headed by the State Geologist, became part of the Department of Conservation.

Mission

To collect, interpret, and disseminate basic geologic information for understanding and developing the mineral and water resources in this state, to carry out the oil and gas conservation laws, and to evaluate all metallic mining properties.

Principal Governing Statutes (Compiled Laws, 1948):

Geological Survey, organic act	321.1
Department of Conservation, organic act.	299.2
Oil and gas conservation	319.1
Mines appraisal.	211.24
Mineral statistics	319.202
Aerial and topographic surveys	321.51, 321.101, 321.151

GEOLOGICAL SURVEY

ANNUAL STATISTICAL SUMMARY 4

MICHIGAN'S OIL AND GAS FIELDS, 1965

LANSING
1966

STATE OF MICHIGAN
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DEPARTMENT OF CONSERVATION
Ralph A. MacMullan, Director

GEOLOGICAL SURVEY
Gerald E. Eddy, State Geologist, Chief, and Supervisor of Wells

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PREFACE

This publication relating essentially to petroleum exploration and production activities is the fourth of a new series of annual statistical summaries. It brings together under one cover many related oil and gas field statistical data not usually found in any other industry or government publication. Information of historical and general interest is thus preserved herein for future reference. It is a source of information most useful in evaluating Michigan's past history and future prospects as a petroleum and natural gas province. Furthermore, the gathering, maintenance, and compilation of the many statistical data reflects, in part, the varied functions of the Oil and Gas Section of the Survey.

New and useful items have been included in this issue. Addition of oil and gas field maps, together with specific field location data, make this publication more functional than previous oil and gas summaries. Field location lists, which specified township, range, and producing sections, were previously published as mimeograph separates. Such charts will probably be included periodically in the oil and gas summaries.

Current oil and gas production figures are provided by the Michigan Department of Revenue. Other statistics are based upon data gathered and maintained by the Geological Survey.

This report is compiled from records kept by staff members of the Oil and Gas Section supervised by L. W. Price. Oil and gas unit supervisors who assembled and provided the major basic records for this summary are:

R. M. Acker, geologist and head, Regulatory Control

W. G. Smiley, geologist and head, Production and Proration.

R. E. Ives, geologist and head, Petroleum Geology

James L. Lorenz, T. L. Culver, and A. B. Collins, Production and Proration, provided the chart, graphs, and special resume on the Albion-Scipio Trend.

Publication design, arrangements, and manuscript preparation was made by G. D. Ells.

Technical advise on publication preparation was provided by R. W. Kelley, Editor, Geological Survey.

Preparation of manuscript plates was made by the secretarial and technical staff, Geological Survey.

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G. D. Ells
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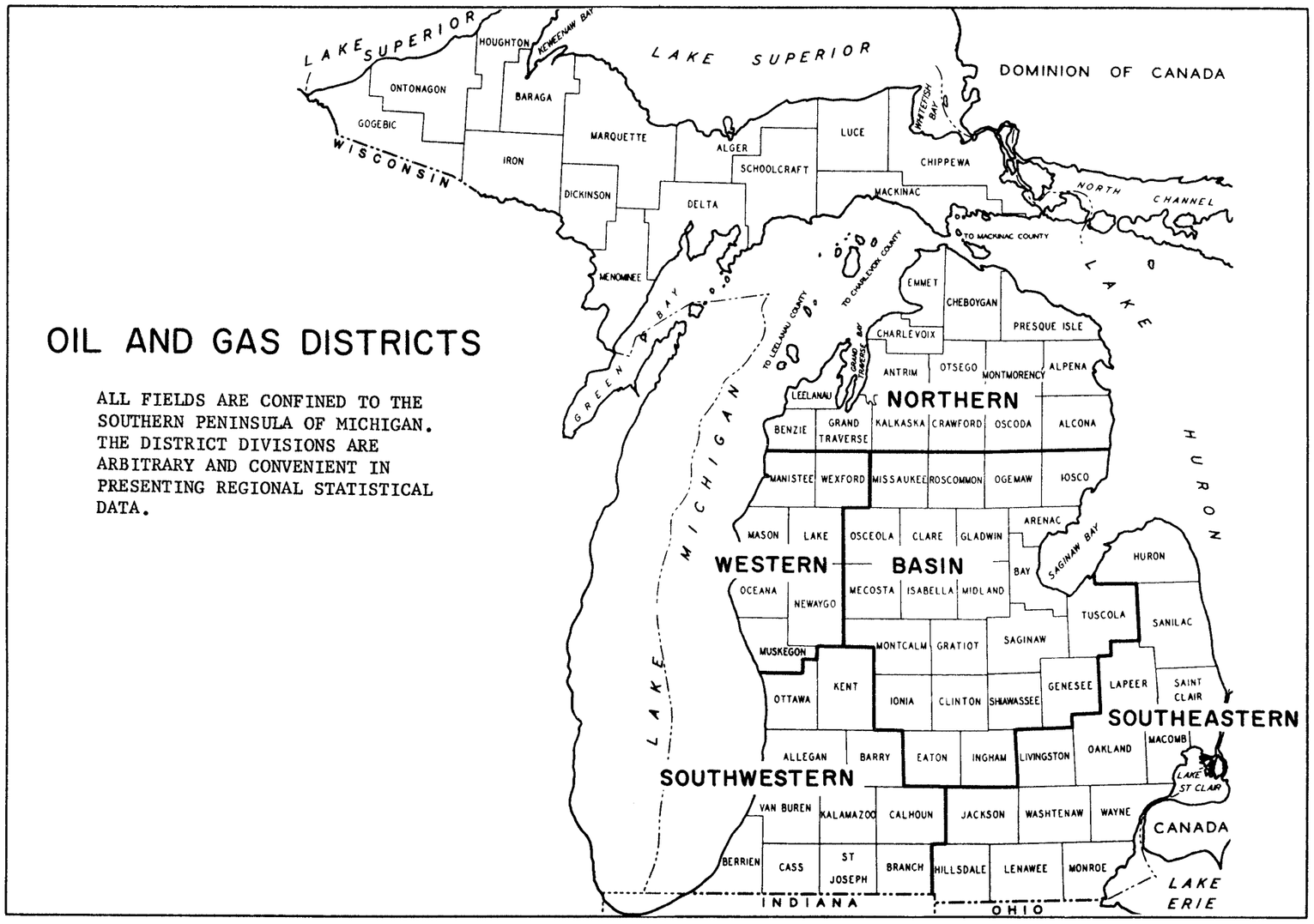
ABBREVIATIONS

A.P.I.	American Petroleum Institute
(A) I.P.	(Acid) Initial Production or Potential
A-1 Carb.	A-1 Carbonate
A-2 Carb.	A-2 Carbonate
Bbls.	Barrels
B.B.	Bois Blanc formation
B.D.	Brine Disposal
BDW	Brine Disposal Well
BOPD	Barrels Oil Per Day
B.R.	Black River
Camb.	Cambrian
"Camb."	Unidentified Cambrian
Cat.	Cataract formation
c.f.p.b.	Cubic feet per barrel
C.H.	Cabot Head formation
Cinn.	Cincinnatian
Cl.	Clinton formation
Cold.	Coldwater formation
Compl.	Completion
Coop.	Cooperative
D & A	Dry and Abandoned
Dev.	Devonian
D.R.	Detroit River formation
D.R. SZ	Detroit River Sour Zone
Dres.	Dresbach formation
Dd., DD	Dundee
Dd.- R.C	Dundee-Reed City
DPT	Deeper Pool Test
E.C.	Eau Claire formation
Explor.	Exploratory
Fran.	Franconia formation
Geo. Test	Geological Test
G.O.R.	Gas-Oil Ratio
Grav.	Gravity Gravimeter
GS	Gas Storage
GSW	Gas Storage Service Well
Gw	Glenwood
Incs.	Includes
Inj.	Injection
L P.G	Liquid Petroleum Gas
Marsh	Marshall formation
MCF	Thousand Cubic Feet
MCFGPD	Thousand Cubic Feet Gas Per Day
Mich.	Michigan formation
Miss.	Mississippian
M.S.	Mt Simon ss.
NFW	New Field Wildcat
(N) I.P.	(Natural) Initial Production or Potential
Niag.	Niagaran
Nt.	Nontechnical
OBS	Observation Well
OP	Out Post Well
Ord.	Ordovician
OWDD	Old Well Drilled Deeper
P.D.C.	Prairie du Chien formation
Penn.	Pennsylvanian
Pilot Wtr.	Pilot Water
P.M.	Pressure Maintenance
Prod. Form.	Producing Formation
R.C.	Reed City formation
RW	Reworked Well
Rich.	Richfield formation
Sag.	Saginaw formation
Sal.-Niag.	Salina-Niagaran
SD	Shut Down
Seis.	Seismograph
S.P.	St. Peter formation
Stray	Michigan Stray formation
Sub.	Subsurface geology
SW	Service Well
SWD	Salt Water Disposal
Sylv.	Sylvania formation
SZ	Sour Zone (in Detroit River)
Thick.	Thickness
(T) I.P.	(Treatment) Initial Production or Potential
Trav.	Traverse
Tremp.	Trempealeau formation
Trenton-Blk. River	Trenton-Black River
Trent.	Trenton
Unit.	Unitized



PETROLEUM INDUSTRY IN MICHIGAN IN 1965

INTRODUCTION

Overall exploratory and field development activity continued to decline during 1965. No large fields were found in 1965 or during the preceding year. Lack of large new field discoveries, smaller size of newly found fields, and greater well spacing, contribute to the decline in oil and gas field activities.

Contributions by the petroleum exploration industry to Michigan's economy are considerable. Total oil and gas production was valued at more than $50,340,000 as compared with $52,000,000 in 1964. In addition, a greater sum was no doubt spent in drilling, in field development, leasing, and the many other activities related to the search for new oil and gas fields.

Part I of this publication is a discussion and summary of significant information on last year's oil and gas field activities and related work of the Oil and Gas Section of the Geological Survey. Part 2 contains specific information related to oil and gas fields, production, and related data. Part 3 contains cumulative records of lesser importance to the petroleum industry.

* * * DRILLING PERMITS * * *

Fewer permits were issued for oil or gas well tests, gas storage reservoir wells, and other types drilled under oil and gas permits. Geographic distribution by district (see above map) of permits issued through a 3-year period is shown on the following chart.

DRILLING PERMITS BY DISTRICT

DISTRICT	Permits Issued		
	1963	1964	1965
Basin	147	166	117
Northern	7	9	7
Southeastern	375	267	247
Southwestern	100	77	63
Western	75	64	60
Totals	704	583	494

Permits for 106 service wells, drilled mainly in gas storage reservoirs, are included in the above figures. The fluctuation in the number of permits issued for this type of well through a 3-year period is shown as follows.

Service Wells	1963	1964	1965
Gas Storage, Observation, Injection, Etc.	83	122	106

Permits for Geological Tests are not included in any of the preceding figures. None were issued in 1964 but 9 were issued in 1965. Five were issued for Bay County, and 1 each for Clare, Missaukee, Newaygo, and Mecosta Counties.

* * * WELL COMPLETIONS * * *

The number and class of well completions by month and district for 1965 is shown on Table 1. The number and class of well completions by counties for 1965 is shown on Table 2. Cumulative completions by year and county are shown on Tables 17 and 22.

The following tabulation shows exploratory and development well completions over a 3-year period. The figures do not include deepened wells, reworked wells, gas storage reservoir wells, or others not directly related to exploratory or oil and gas pool development drilling.

EXPLORATORY AND DEVELOPMENT WELL COMPLETIONS

	Exploratory Wells			Development Wells			Totals
	Oil	Gas	Dry	Oil	Gas	Dry	
1963	11	7	220	124	66	163	591
1964	7	5	221	75	43	155	506
1965	6	6	189	47	28	102	378

Exploratory well completions were about 15 percent fewer than in 1964. St. Clair and Macomb Counties which have been the most active part of the State in exploratory and development drilling the past several years, again accounted for nearly 36 percent of the exploratory wells drilled.

* * * DRILLED FOOTAGE * * *

Total drilled footage for exploratory and field development wells continued to decline. The average drilled footage per exploratory well was about 3,000 feet and for development wells, 3,320 feet. Total drilled footage for service wells (gas storage, etc.) increased in 1965. The average drilled footage for service wells was about 2,377 feet. The fluctuation in drilled footage through a 3-year period is as follows:

Footage Class	Amount of Drilled Footage		
	1963	1964	1965
Exploratory	698,551	654,224	602,682
Development	1,064,645	924,584	587,457
Service	88,800	217,027	254,403
Total	1,851,996	1,795,835	1,444,542

* * * GEOPHYSICAL EXPLORATION * * *

Accurate data on geophysical exploration is not available, but most was done in the St. Clair - Macomb County area of eastern Michigan. Gravimeter exploration was reported to be well below the 38 crew-months reported for 1964. Seismograph exploration was reported to exceed that of previous years. Reports indicate that between 30 and 36 crew-months were spent at this type of survey.

* * * DISCOVERY WELLS * * *

The ratio of discoveries to exploratory tests was 1:16 as compared to about 1:19 in 1964. Over a third of the exploratory wells were drilled in St. Clair and Macomb Counties. The discovery to dry hole ratio for these counties was about 1:18 as compared with 1:64 in the previous year. Details on all 1965 discoveries are shown on the page below. The following chart gives an analysis of discoveries by geologic system through a 3-year period.

ANALYSIS OF DISCOVERY WELLS BY GEOLOGIC SYSTEM

System	Formation or Pay	Number of Discoveries		
		1963	1964	1965
Pennsylvanian		0	0	0
Mississippian	"Michigan Stray Ss."	1	3	1
	"Berea"	0	0	0
	Antrim Shale	0	0	1
Devonian	"Traverse Lime"	7	5	5
	Dundee	4	1	1
	"Reed City"	0	0	1
	Detroit River "Sour Zone"	0	1	0
	Richfield	0	1	0
Silurian	Salina-Niagaran reef			
	Niagaran reef	5	1	4
Ordovician	Trenton-Black River	3	0	0
	Prairie du Chien	0	0	0
Cambrian		0	0	0

* * * UNDEVELOPED ACREAGE * * *

Figures for the amount of privately-owned undeveloped acreage under lease for oil and gas at the end of 1965 is not available. But it is thought to be considerably less than the estimated 1,064,000 held in 1964.

Records indicate 329,110 acres of state-owned land under lease for gas and oil at the end of 1965, a substantial decrease from the 410,000 acres held at the end of 1964. The total revenue from oil and gas bonus, rental,

1965 DISCOVERY WELLS

Field	County and Location	Operator and Lease	Permit Number	Comp. Date	Total Depth	Depth to Pay	Initial Production (N) IP=n (T)IP=t BOPD MCFGPD	Prod. Form.	Basis for Loc.
* * NEW FIELDS * *									
New Richmond	Allegan 16-3N-15W	J. Ely, Godfrey #1	25776	1-8	1365	1363	P10+wtr. t (Abandoned in 1965)	Trav.	Nt.
Paradise	Grand Traverse 16-25N-10W	Miller Bros., Weaver #1	25948	6-22	1897	1889	850t	Trav.	Sub.
Union, Sec. 6	Isabella 6-14N-4W	Merrill Drlg. Co., Thering #1	25935	9-8	1385	1382	Est. 5400t	Stray	Sub.
Luther	Lake 14-19N-12W	The MOCO, Hoover Heirs #1	25855	3-2	2567	2565	P45t	Trav.	Sub.
Romeo	Macomb 11-4N-12E	J.Barwick Van Den Brouck #1	25957	8-25	2565	3290	2200n	Niag.	Sub.
Laketon	Muskegon 15-10N-17W	C.P. Co. & Calvert McMahan #1	26193	10-29	2198 PBTD	1697	50t P20t	Trav.	Sub.
Forest River	Oceana 12-16N-15W	J. W. Lang, Forest River Land Co. #1	26018	7-12	2598	1954	(Abandoned in 1965)	Trav.	Sub.
Leroy	Osceola 27-19N-10W	The MOCO, Gustafson & Garnett #1	25897	6-9	3800	3796	P10t	R.C.	Sub.
Marsac Creek	St. Clair 30-4N-15E	Cons. Power Co. Kuskowski #1	26008	6-25	2775	2438	Est. 1647n	Niag.	Grav.
Columbus, Sec. 23	St. Clair 23-5N-15E	Sun Oil Co., Chase #1	26257	12-10	3211	2900	Est. 9000n	Niag.	Seis.
Hessen	St. Clair 3-4N-15E	Sun Oil Co.&C.P.Co. Swierkosz-May #1	25952	6-11	2887	2499	No gauge	Niag.	Grav.
* * NEW POOLS * *									
Big Rapids	Mecosta 10-15N-10W	N. Donley, Toth #1 (Reworked dry hole)	20833	6-19	3475	3420	Est. 500t	Dd.	Sub.
Chester, Sec. 15	Otsego 14-29N-2W	M. Welch State-Chester #1	26074	9-15	1505	1439	Est. 4000n	Antrim	Sub.

NOTE: (T) IP refers to Initial Potential after acid, sand-fracture, or a combination of well stimulation methods.
(N) IP refers to Natural Initial Potential or Production.

and royalty amounted to $516,074 in 1965 as compared with $553,692 in 1964. The fluctuations in the amount of state lands under lease and the derived revenue over a period of years are shown graphically on page 5.

* * * OIL AND GAS PRODUCTION * * *

Oil production continued to dip slightly. No significant oil reserves were found or developed in 1965 that would offset the decline. Production dropped to 14,728,223 barrels as compared with 15,601,704 barrels in 1964. Gas production which has steadily increased the past 7 years continued to rise during 1965. Gas production amounted to 35,120,368 MCF as compared with 32,615,685 MCF in 1964. Oil and gas production by county in 1965 is shown on Table 2. Production by individual fields or pools is found in Part 2 of this summary.

Oil and gas production by month and by geographic district is shown on the following charts.

OIL AND GAS PRODUCTION BY MONTH

Month	Production	
	Barrels Oil	MCF Gas
January	1,216,931	3,719,449
February	1,125,468	3,312,132
March	1,259,872	3,932,219
April	1,226,366	2,304,578
May	1,234,889	3,333,974
June	1,204,800	3,447,896
July	1,244,639	2,685,838
August	1,220,344	2,321,656
September	1,272,452	2,334,837
October	1,237,630	2,494,869
November	1,227,441	2,473,895
December	1,257,390	2,759,025
Totals	14,728,223	35,120,368

OIL AND GAS PRODUCTION BY DISTRICT

District	Production	
	Barrels Oil	MCF Gas
Basin	4,000,431	2,773,358
Northern	81,423	379,116
Southeastern	7,450,001	27,427,725
Southwestern	2,892,116	4,471,041
Western	304,252	69,128
Totals	14,728,223	35,120,368

The Albion-Scipio Trend fields produced over 59 percent of the states oil and 29 percent of the states gas production in 1965. The impact of the Albion-Scipio field on the Michigan industry has prompted the publishing of supplemental data to demonstrate in part, the outstanding performance of this field. The supplemental data are presented on pages 10 through 12.

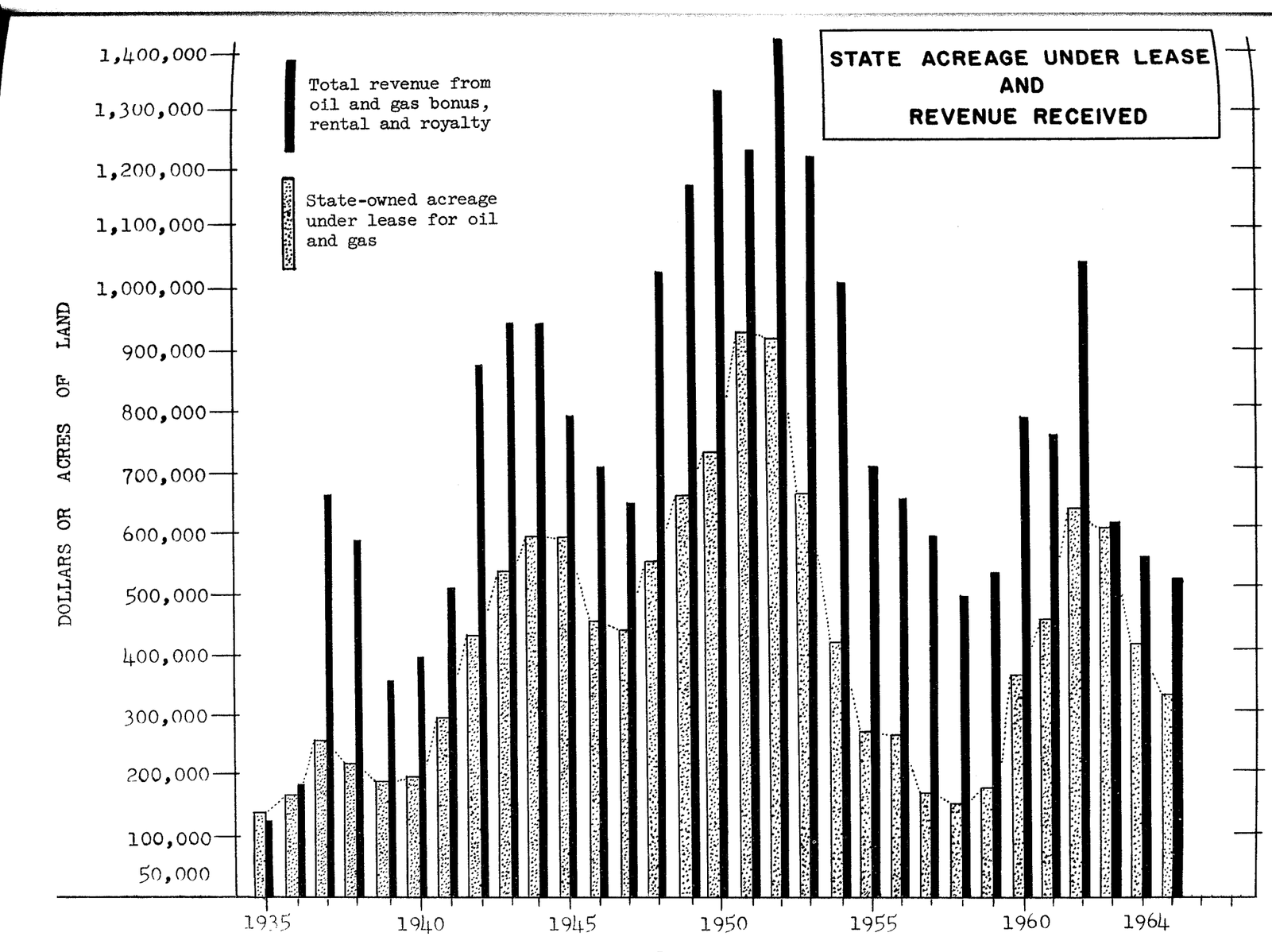
* * * OIL FIELDS * * *

New oil field discoveries in 1965 increased the number of active oil fields to 187. There were 5 fields or pools abandoned and 1 pool re-activated during the year. New well completions, including reworks and wells deepened to new pay zones, increased the year-end total of producible wells in the state to 4,368. These wells include 332 wells which were shut down or shut in, but it does not include gas wells or injection wells which produced some oil during the year. The number of producing wells at year's end was 4,036.

There were 155 well abandonments. These included pay zones where wells were deepened, re-completed in new pay zones, or converted to injection wells. Data on individual oil fields are found in Part 2.

* * * GAS FIELDS * * *

New gas field discoveries in 1965 increased the number of producible dry gas fields and pools to 89, but only 34 of these fields produce gas for commercial sale. The total number of wells in the fields amounted to 424. Four small gas fields were abandoned in 1965.



* * * DEEP TESTS * * *

General information on wells selected as important deep tests is shown on the chart below. Wells that reached total depth in Cambrian or older rocks were drilled mainly in the shallower part of the Basin. The deepest hole drilled during 1965 bottomed-out at 8,372 feet in the Trempealeau formation. Two Precambrian tests were drilled, one on Harsen's Island, St. Clair County and the other in Berrien County. The Berrien County well was reported to have drilled over 1,000 feet of granite before reaching a total depth of 5,647 feet. The hole was drilled by rotary with water as the primary drilling fluid. Drilling rate in the "granite" was reported to be about 4 minutes to the foot, although the contractors daily drilling record does not seem to verify this. A preliminary study of the samples suggests that the section is detrital, mainly quartz with biotite mica and some feldspar. Petrographic and spectrographic examination is needed to determine whether or not the rock is detrital or unweathered granite. The Harsen's Island well (cable tool hole) bottomed-out in a rock containing quartz, biotite, magnetite, and other dark rock. This rock appears to be a schist containing biotite and chlorite.

Attention is called to the omission on page viii, Annual Statistical Summary 2, 1965, of an important test drilled to a depth greater than 10,000 feet. The omitted

IMPORTANT 1965 DEEP TESTS

County	Location	Operator and Lease	Permit Number	Basis for Location	Total Depth	System and Formation	Expl. Class	Results
Barry	23-4N-7W	J. O'Neill, Jr. Farley #1	25775	Subsurface	3505	Sil., Cl.	NFW	D & A
Barry	34-4N-10W	C.J. Moskowitz, Janose #1	26182	Gravity ?	3708	Sil., Cl.	NFW	D & A
Berrien	10-6S-17W	Security Oil & Gas, Thalman #1	26112	Nt.	5647	Granite	NFW	D & A
Livingston	14-2N-4E	Brazos Oil & Gas Co., Kizer #1	25868	Subsurface	7210	Camb., Dres.	NFW	D & A
Macomb	1-4N-13E	Cons. Power Co., Halmich #3-1 (Drilled as BDW in Boyd Field)	26214	- - - -	5214	Camb., Tremp.	- -	- - -
Manistee	10-24N-14W	P. Fulk, Cons. Power Co. #1	26176	Gravity	5220	Sil., Cl.	NFW	D & A
Osceola	9-20N-7W	Cons. Power Co., Dahmer #1	25984	Subsurface	5184	Dev., D.R.	NFW	D & A
Otsego	2-29N-4W	C. J. Simpson. Lake Horicon Corp. #1	25873	Gravity	8372	Camb., Tremp.	NFW	D & A
Otsego	16-29N-3W	C. J. Simpson, State-Otsego Lake #1	26216	Gravity	6094	Sil., Cl.	NFW	D & A
Ottawa	34-7N-13W	Smith Petroleum Co., Fenske #4-A (DPT in Walker Field)	25800	Subsurface	3106	Sil., Sal	DPT	D & A
Ottawa	27-7N-16W	Miller Bros., Retzlaff #1	25813	Subsurface	3960	Ord., B.R.	NFW	D & A
Ottawa	30-5N-15W	Holland Suco Color Co. - Disposal #1 (Drilled as an Industrial Waste Disposal Well)	None	- - - -	5894	Camb., Jacob.	- -	- - -
Sanilac	9-10N-15E	C. J. Simpson, Hontar #1	25939	Gravity	6793	Camb.,	NFW	D & A
St. Clair	1-6N-15E	Nadco., Conrad #1	26086	Gravity	5498	Camb.,	NFW	D & A
St. Clair	2N-16E	L. Bernhardt, Puzzuoli #1	25780	Nt.	4188	Granite	NFW	D & A
St. Clair	34-8N-13E	Sunray DX, Holcomb & Capac Bank #1 (DPT in Capac Field)	25786	Subsurface	6300	Ord., B.R.	DPT	D & A
Washtenaw	20-4S-3E	Trolz & Assoc., Trolz #1	25950	Subsurface	4650	Ord., P.D.C.	NFW	D & A
Washtenaw	26-2S-7E	E. Rovsek, Jorgensen #1	25714	Subsurface	5002	Ord., P.D.C.	NFW	D & A
Wexford	20-24N-9W	Texaco, State - Liberty #A-1	26022	Subsurface	4901	Dev., Sylv.	NFW	D & A

TABLE 1. DRILLING PERMITS AND NEW WELL COMPLETIONS BY DISTRICTS AND BY MONTHS, 1965

	DISTRICTS					Totals
	Basin	Northern	Western	Southwestern	Southeastern	
PERMITS ISSUED 1/	117	7	60	63	247	494
CLASSIFICATION OF NEW WELL COMPLETIONS						
Oil Wells 2/	7	0	8	18	20	53
Gas Wells 3/	2	3	0	1	28	34
Gas Storage Wells	60	0	1	5	40	106
Geological Information Test	1	0	0	0	0	1
Dry Holes	49	4	46	41	151	291
Total Well Completions 4/	119	7	55	65	239	485
EXPLORATORY WELLS COMPLETED						
Exploratory Tests D & A	35	4	40	21	89	189
Successful Exploratory Tests	2	2	3	1	4	12
Total Exploratory Tests	37	6	43	22	93	201

	MONTHS												Totals
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
PERMITS ISSUED 1/	42	24	29	32	42	76	45	52	37	39	37	39	494
CLASSIFICATION OF NEW WELL COMPLETIONS													
Oil Wells 2/	4	4	4	1	5	3	7	6	5	3	7	4	53
Gas Wells 3/	9	2	3	0	1	5	2	3	3	3	0	3	34
Gas Storage Wells	2	1	1	5	14	15	16	9	16	20	7	0	106
Geological Information Test	0	0	0	0	0	0	0	0	0	0	0	1	1
Dry Holes	20	18	8	16	21	28	34	31	30	27	31	27	291
Total Well Completions 4/	35	25	16	22	41	51	59	49	54	53	45	35	485
EXPLORATORY WELLS COMPLETED													
Exploratory Tests D & A	13	7	3	10	14	21	25	19	17	18	19	23	189
Successful Exploratory Tests	1	0	1	0	0	4	1	1	2	1	0	1	12
Total Exploratory Tests	14	7	4	10	14	25	26	20	19	19	19	24	201

1/ Includes 101 gas storage permits, and 1 permit for geological information.

2/ Does not include 8 oil wells resulting from rework operations.

3/ Does not include 2 gas wells resulting from rework operations.

4/ Does not include reworks and deepened wells, but does include service wells.

TABLE 2. DRILLING PERMITS, WELL COMPLETIONS, OIL AND GAS PRODUCTION BY COUNTY, 1965 (Sheet 1 of 2)

County	Permits Issued	Classification of 1965 Well Completions (Does not include reworked wells)								County Production	
		Oil Wells	Gas Wells	Service Wells				Dry Holes	Total Completions	Barrels Oil	MCF Gas
				SWD	GS	Wtr. Inj.	Geol. Info.				
Allegan	25	13			5			9	27	253,425	310,055
Antrim								1	1		
Arenac	3							4	4	303,389	
Barry	1							2	2	14,240	
Bay	1							2	2	333,913	
Berrien	1							1	1		
Branch	2							1	1		
Calhoun	17	3	1					8	12	2,319,337	3,982,879
Cass	1							1	1	5,229	
Clare	25				22			3	25	651,231	187,067
Clinton	1							1	1		
Crawford										65,664	344,518
Genesee										2,209	
Gladwin	4	2						1	3	438,889	
Grand Traverse	3		1					1	2		
Gratiot	1							1	1	45,627	5,549
Hillsdale	36	6						27	33	4,975,783	4,217,380
Huron	1									2,620	
Ionia	1										
Isabella	3		1					2	3	308,209	4,173
Jackson	17	2						10	12	1,575,997	2,026,253
Kalamazoo	2							3	3		
Kalkaska										14,079	18,709
Kent	2	1						2	3	108,233	
Lake	15	1						12	13	15,346	
Lapeer										26,214	
Lenawee	4		2					3	5	292	
Livingston	21				20			2	22		10,006

TABLE 2. DRILLING PERMITS, WELL COMPLETIONS, OIL AND GAS PRODUCTION BY COUNTY, 1965 Continued (Sheet 2 of 2)

Macomb	36		3		6			28	37	4,027	7,852,714
Manistee	2							2	2		
Mason	11	4						5	9	157,092	
Mecosta	21				14			8	22	23,453	75,466
Midland	2							1	1	236,434	12,000
Missaukee	2		1		1			2	4	432,977	810,703
Monroe	1							1	1	7,668	
Montcalm	23				17			11	28	238,553	42,966
Montmorency											
Muskegon	9	2						4	6	11,418	6,228
Newaygo	9				1			7	8	19,662	963
Oakland	1									286	
Oceana	12	1						13	14	100,734	
Ogemaw	2						1		1	281,088	552,935
Osceola	23	2			6			10	18	404,183	160,844
Oscoda										1,680	
Otsego	4		2					2	4		15,889
Ottawa	6	1						7	8	176,265	178,107
Roscommon								1	1	195,921	921,655
Saginaw	2							2	2	30,815	
Sanilac	1							1	1		
St. Clair	117	12	19		11			69	111	807,792	12,422,513
Tuscola	3	3							3	73,540	
Van Buren	6							7	7	15,387	
Washtenaw	5							5	5	27,903	190,957
Wayne	7		4		3			5	12	21,419	707,902
Wexford	2							3	3		61,937
Totals											
55 Counties	494	53	34		106		1	291	485	14,728,223	35,120,368

-Includes gas storage field observation wells.

Does not include 2 reworks resulting in gas wells.

Does not include 8 reworks resulting in oil wells.

well was drilled in 1962 by C. J. Simpson and Sun Oil Company. It was drilled in section 8, T.13N., R.9E., Tuscola County, and reached a total depth of 10,130 feet in Cambrian rocks.

BRIEF PRODUCTION HISTORY OF ALBION-SCIPIO TREND

The Albion-Scipio Field has produced the greatest cumulative oil production of any field in Michigan and will, in the coming year, peak the major gas producing field (51.6 Billion Cu. Ft.) in Michigan in cumulative gas production. This is especially significant considering this field has many years of productive life remaining.

These data represent total field performance only, and although they reflect the effect of the more recent development, primarily in Hillsdale County, they also demonstrate the benefits of prorated production and energy control.

It should be noted here that many of the benefits accruing to producers in this field can be attributed in great part to the efforts of the field engineering committee, representing field operators, working in close harmony with the regulatory agency.

This arrangement has been effective in many ways, some of which are as follows: (1) Resolving production problems in critical areas. (2) Scheduling and planning of sub-surface pressure and gas-oil ratio surveys. (3) Compiling comprehensive well and field data. In general it has provided a forum for discussion and resolution of many common problems, and has contributed a large measure to the following outstanding field history.

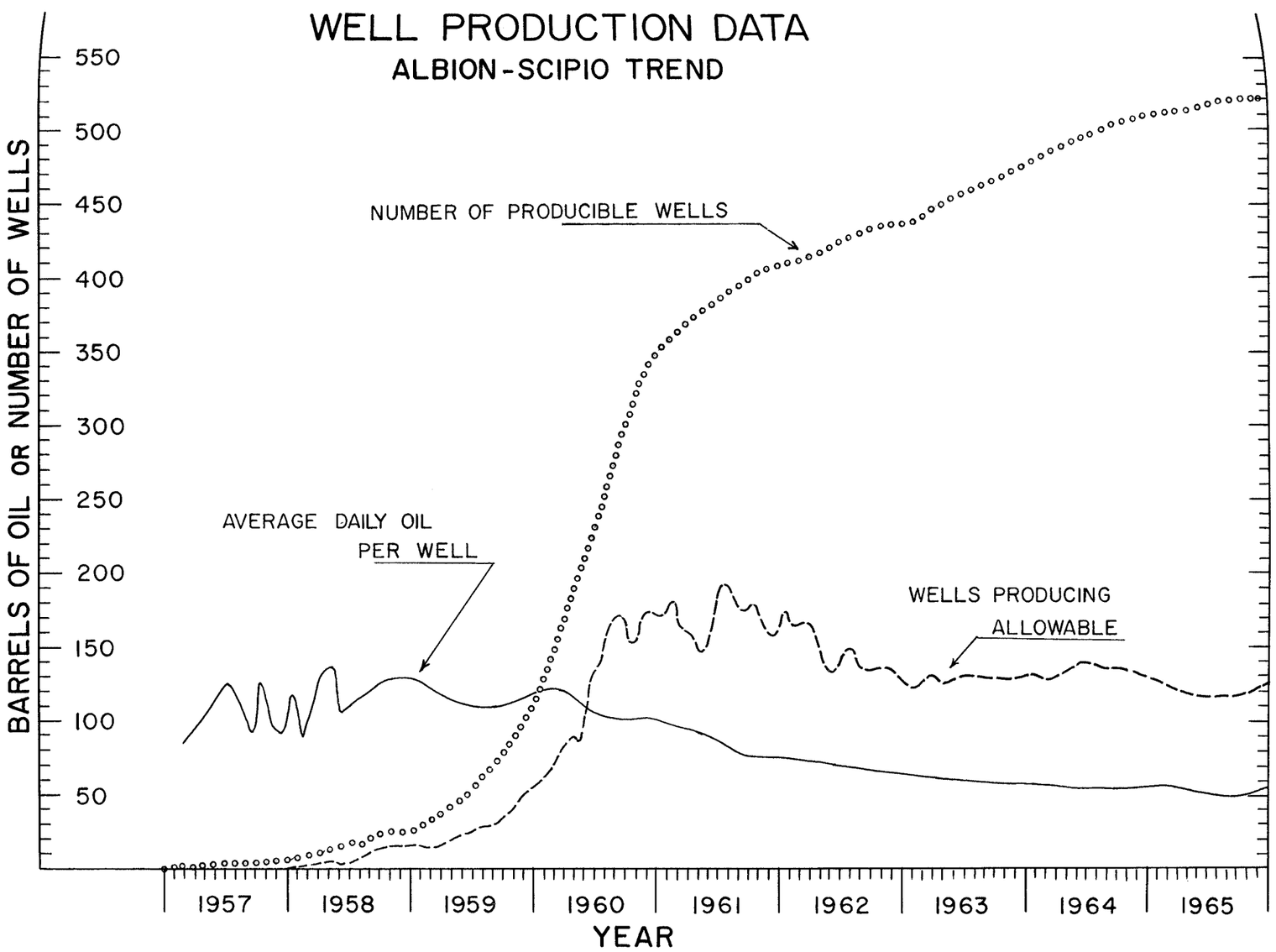
These data shown on the chart and graphs are developed from proration files and may differ slightly from data presented elsewhere in the summary. Example: No. of wells in column 2 represent producible wells whereas the total of last two columns represent producing wells and exclude temporary down or reworking wells.

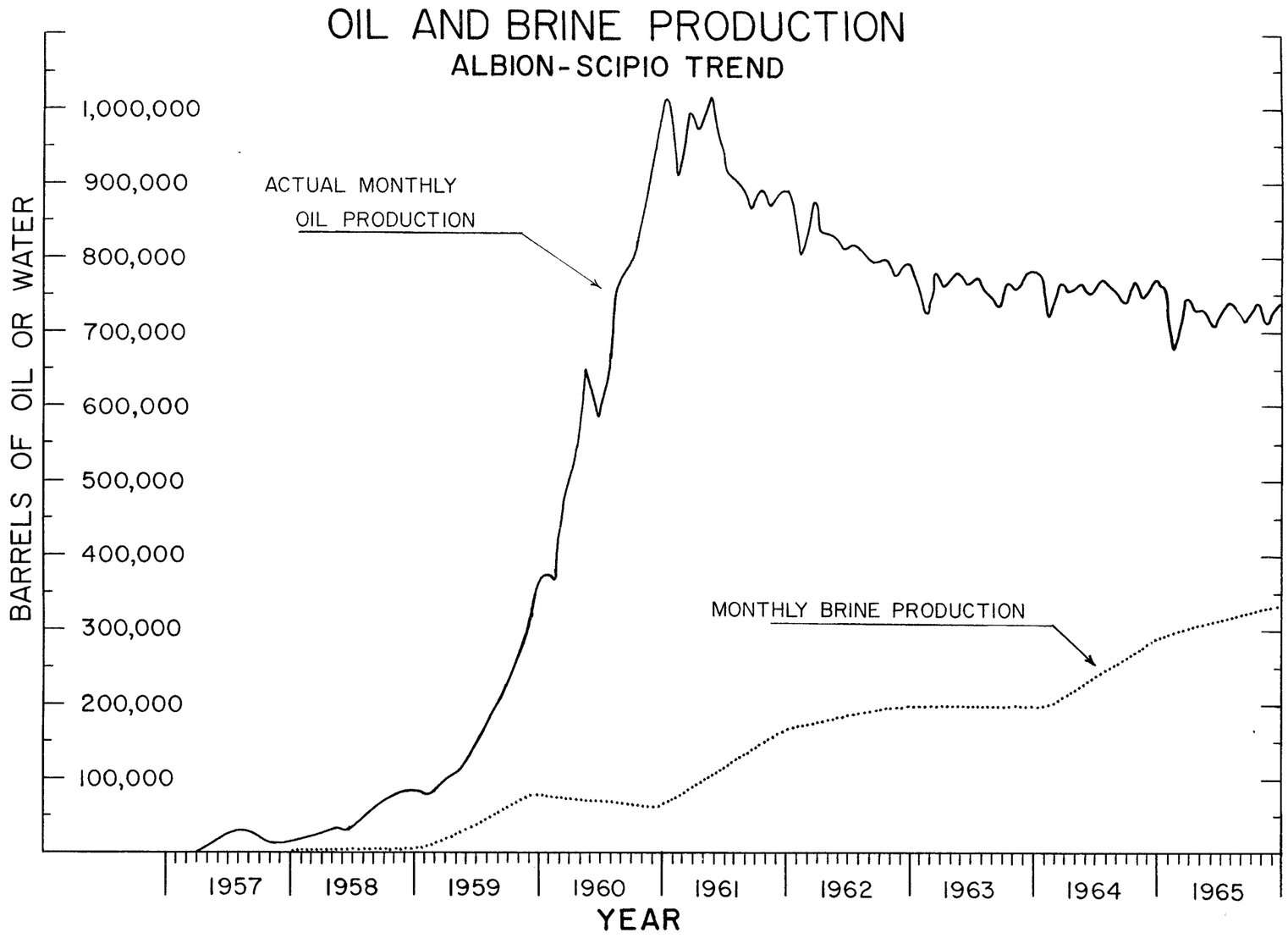
* * * OIL AND GAS VALUATION * * *

The valuation of oil produced in Michigan in 1965 amounted to about $41,036,743 as compared to $43,879,393 in 1964. The average price paid per barrel of oil at the

PRODUCTION HISTORY OF ALBION-SCIPIO TREND

END OF YEAR	NUMBER OF PROD. WELLS	NUMBER OF DEVELOPED ACRES	PIPE LINE RUNS - BBLS. CUMULATIVE RUNS PER PROD. WELLS	CUMULATIVE RUNS PER DEVELOPED ACRE	TOTAL FIELD	PER YEAR	DAILY	DAILY AVERAGE GAS MCF	G.O.R. c.f.p.b.	WATER BBLS.	NO. WELLS PRODUCING ALLOWABLE BY OIL	GAS	PUMP	FLOW
1957	6	120	13,895	694	83,307	83,307	466	767.3	2,290	0	1	3	0	4
1958	25	500	24,540	1,227	613,506	530,199	2,384	1,457.4	524	213	17	0	0	24
1959	102	2,040	25,589	1,279	2,610,094	1,996,588	11,795	11,046.0	883	2,406	56	17	8	95
1960	346	6,920	30,580	1,529	10,580,680	7,970,586	32,358	26,491.5	801	2,053	169	35	79	251
1961	406	8,060	53,551	2,697	21,741,645	11,160,965	28,555	26,700.0	928	5,390	178	62	137	261
1962	436	8,580	71,992	3,658	31,388,636	9,646,991	25,211	26,357.0	1,079	6,564	123	42	174	240
1963	479	9,370	84,621	4,326	40,533,495	9,144,859	25,260	23,308.0	1,143	6,431	133	51	205	257
1964	509	9,830	97,490	5,048	49,622,360	9,088,865	24,897	27,411.0	1,171	9,402	134	68	237	239
1965	519	9,930	112,377	5,873	58,323,809	8,701,449	23,695	27,629.0	1,237	10,899	124	65	271	215





wellhead was $2.79. The valuation of gas produced from Michigan fields amounted to about $9,303,334 as compared with $8,466,921 in 1964. The average price of gas sold at the wellhead was about $.27 per MCF.

* * * CRUDE OIL IMPORTS AND EXPORTS * * *

Crude oil imports to Michigan refineries amounted to 36,468,716 barrels in 1965. Of this amount, 31,223,464 barrels came from western and mid-western states, and 5,245,252 barrels came via pipeline from western Canada oil fields.

Oil exported to northern Indiana (Ft. Wayne) refineries amounted to 23,245 barrels as compared with 170,779 barrels in 1965.

* * * NATURAL GAS IMPORTS * * *

Records of the Gas Section, Michigan Public Service Commission, indicate 546,690,411 MCF gas was imported by pipeline to Michigan storage fields and markets. Gas imports were from Texas, Louisiana, Oklahoma, and Kansas fields.

* * * LPG EXTRACTION * * *

LPG recovery from gas plant operations increased from 66,187,177 gallons in 1964 to 86,891,724 gallons in 1965. The top 5 fields or plants in LPG production were: Albion-Scipio, 30,083,894 gallons; Belle River Mills, 18,359,800 gallons; Boyd, 16,987,534 gallons; Willow Run, 10,730,995 gallons; and Reed City, 9,716,173 gallons. Most of the increase in LPG recovery came from the Belle River Mills, Boyd, and Reed City plants. Details on gas plant operations are found on Table 15. LPG surface and subsurface storage facilities are shown on Table 14, page 50.

* * * DESCRIPTIVE WELL LOG LIBRARY * * *

About 475 new well logs and 210 well rework records were received in 1965 by the Regulatory Unit of the Oil and Gas Section. Many of these logs and rework records were processed for public distribution by the Petroleum Geology Unit during the year.

The Petroleum Geology Unit processed, published, and incorporated into the well log library 565 new logs. More than 25,565 published well logs are now available for purchase or use and inspection at Survey offices.

During 1965, over 14,200 descriptive well logs were printed and distributed, upon request, to individuals and companies interested in Michigan's oil and gas exploration industry. Individual log orders ranged from a single log to as many as 3,500. In addition, 45 subscription log orders were mailed out each month to individuals, companies, government agencies, and universities.

* * * SAMPLE LIBRARY * * *

The Geological Survey maintains a library of well cuttings (sample sets) as a part of its function in gathering and preserving geological data useful to industry, government agencies, universities, and individuals. In 1965, 122 new sets (about 30,830 individual cuts) were acquired, catalogued, and placed in the active library which now contains about 7,470 individual well sets.

In 1965, major oil companies borrowed or examined at the Survey about 150 sample sets. Independent oil companies and consulting geologist borrowed and examined 126 sets, and 114 sets were loaned to universities for post-graduate studies and other projects.

The sample library is operated as a lending library; no fee is charged for use or examination of the sample sets. Some restrictions are necessary for orderly management, service, and preservation of the sets. Individual sets, or parts of sets, may not be "robbed" of cuttings for insoluble residue studies or otherwise destroyed or mutilated. The Survey attempts to supply, on a limited basis, well cutting for use in insoluble residue studies. Sample sets may not be shipped by mail or

freight, and they may not be removed from the State of Michigan. In general, most sets may be placed on loan for periods of 2 to 3 weeks and for longer periods depending on demand for particular sets. Policy is geared to general oil and gas field activities which vary from year to year. The Survey has limited space for sample examination on the premises. Operators are encouraged to make sample examinations at their own facilities and with their own equipment.

* * * OIL FIELD BRINE PRODUCTION * * *

Oil field brine production in 1965 amounted to about 145,102 barrels as compared with 148,972 in 1964. There were 18 fields that produced brine in excess of 2,000 barrels per day. These fields account for over 70 percent of the state's daily brine production. The 18 major brine producing fields are shown on the adjacent chart. The table below on this page shows details on brine disposal. Other oil field brine production data are shown on Table 24. See Oil and Gas Field Tables for brine production by individual field.

MAJOR BRINE PRODUCING FIELDS

Field	Rank	1965	1964	1963
Coldwater	1	29,557	31,945	35,701
Albion-Scipio Trend	2	10,273	8,798	6,323
Porter	3	8,685	8,547	9,677
Deep River	4	7,870	7,570	8,800
McBain	5	6,467	5,524	4,526
Freeman-Redding	6	5,560	6,695	7,630
Stony Lake	7	4,397	6,362	6,371
Reynolds	8	3,656	4,210	4,031
Reed City	9	3,416	4,951	6,532
Adams, North	10	3,262	2,857	3,664
Vernon	11	3,240	3,850	2,925
Scottville	12	2,978	2,404	1,714
Prosper	13	2,750	2,925	2,600
Fork	14	2,650	2,475	2,486
Evart	15	2,300	3,025	2,410
Clayton	16	2,079	1,863	1,968
Buckeye, North	17	2,058	2,115	1,710
Gilmore	18	2,000	1,850	1,650
Total		103,198	106,472	108,981
State Total		145,102	148,972	149,696

TABLE 3. OIL FIELD BRINE PRODUCTION AND DISPOSAL DATA IN 1965

BARRELS OF BRINE PRODUCED PER DAY			BARRELS OF BRINE RETURNED TO SUBSURFACE PER DAY									SURFACE DISPOSAL	
			Formations used in Subsurface Disposal									Barrels Per Day	
Producing Formation	Amount Produced	Amount Returned to Producing Formation	Parma	Marshall	Coldwater	Berea	Traverse	Dundee Reed City	Detroit River	Salina Niagaran	Cambrian	Roads	Pits
Marshall	0	0	-	-	-	-	-	-	-	-	-	-	-
Berea	39	0	0	9	0	0	0	0	0	0	0	12	18
Traverse	29,538	18,660	1,794	2,573	789	0	18,660	2,999	200	0	0	2,215	308
Dundee	101,028	86,950	4,608	2,591	27	176	6,033	86,950	0	0	0	405	238
Detroit River	1,474	5	15	215	0	5	326	627	5	0	0	171	110
Salina-Niagaran	1,875	0	0	0	0	0	61	0	1,609	0	59	96	50
Trenton	11,148	0	0	0	0	0	553	61	0	10,083	0	400	51
Totals	145,102	105,615	6,417	5,388	816	181	25,633	90,637	1,814	10,083	59	3,299	775
	Total brine returned to subsurface: 141,028												
Per cent	100	72.80	4.42	3.71	0.56	0.13	17.67	62.47	1.25	6.95	0.04	2.27	0.53

* * * PUBLIC HEARINGS * * *

Act No. 61 of the Public Acts of 1939, as amended, provides for hearings on oil and gas matters. Act No. 326 of the Public Acts of 1937, as amended, provides for hearings on matters pertaining to natural dry gas. Hearings on matters of local concern involving the administration of rules and regulations, such as exceptions to spacing orders, or pooling of interests to form drilling units, are conducted by the Supervisor of Wells. Hearings on matters involving broad policies and practices having field-wide or state-wide application are conducted by the Supervisor of Wells and before the Advisory Board. Oil and gas hearings held during 1965 are summarized on the following chart.

OIL AND GAS HEARINGS IN 1965

Hearing Per Month	January	February	March	April	May	June	July	August	September	October	November	December	Totals
	3	1	3	4	1	3	6	2	3	2	5	4	37
Items or Causes Heard													
Spacing Orders:													
Adopted		1		1			1		1		1	1	7
Amended		1			1		2		1				5
Abrogated		3								1			4
Proration Orders:													
Adopted													0
Amended													0
Abrogated													0
Unitization:													
Adopted												1	1
Denied							1						1
Pooling Orders:													
Adopted								1			1	1	3
Denied													0
Exceptions to Spacing Orders:													
Approved	2		6	2		4	4	1	1	1	5	1	27
Denied													0
Order to Plug and Abandon:									1				1
Items heard, no action, or matter tabled:	1						1						2
Total Items or Causes	3	5	6	3	1	4	9	2	4	3	7	4	51

* * ACTIVE MICHIGAN OIL REFINERIES * *

COMPANY	REFINERY LOCATION	*NOMINAL CAPACITY BBLS. DAY
Bay Refining, Division Dow Chemical Company	Bay City	15,000
Crystal Refining Company	Carson City	6,200
Delta Terminal Company	Rapid River	4,000
Lakeside Refining Company	Kalamazoo	3,500
Leonard Refineries, Inc.		
Leonard Division	Alma	29,000
Roosevelt Division	Mt. Pleasant	7,500
Marathon Oil Company	Detroit	45,000
Marathon Oil Company	Muskegon	15,000
Naph-Sol Refining Company	Muskegon	10,000
Osceola Refining Company	West Branch	5,000
Petroleum Specialties, Inc.	Flat Rock (Inactive)	6,500
Socony Mobil Oil Company	Trenton	40,500
	Total Refinery Capacity	187,200

*Individual refinery operating rates may be less or slightly more than nominal rates shown.

PART 2, OIL AND GAS FIELDS
EXPLANATION

Part 2 brings together general information on Michigan's oil and gas fields, gas storage reservoirs and related items. The tables summarize information relating to oil and gas accumulations which have been designated and named as oil or gas fields.

OIL AND GAS FIELDS. Most fields consist of one pool with oil or gas production coming from a single formation. A few fields have 2 or more separate pools each producing from a different formation of stratigraphic interval and a different depth. Pools for individual fields are shown under PRODUCING FORMATION OR POOL. The PAY ZONE part of the table generally refers to the discovery well for the specific pool. The PAY THICKNESS shown on the tables does not necessarily indicate net producing pay for the reservoir. The DEEPEST FORMATION TESTED column indicates the deepest total depth and formation penetrated in the field.

LOCATION OF OIL FIELDS, GAS FIELDS, ETC. These tables show the specific locations of the fields and the sections which have, or have had producing wells. Miscellaneous wells which produced some oil but were eventually abandoned as dry holes are also included. Miscellaneous wells reporting some gas production are also included.

OIL AND GAS FIELD MAPS. It is not practical to outline and show the names of all the hydrocarbon accumulations that have been designated fields or pools. In general, the field names shown on the several maps are in agreement with the field names shown on the oil and gas field tables. Certain miscellaneous or single well fields are not shown on the maps but are listed in the tables.

ABANDONED OIL AND GAS FIELDS OR POOLS. Oil and gas fields or pools are considered abandoned when all wells have been plugged to the surface and the equipment has been removed from the area. Fields abandoned during a given year are entered into the abandoned field tables in the following year. Abandoned oil fields with less than 500 barrels of cumulative oil production are not shown in the tables. Production from fields having less than 500 barrels cumulative production is accounted for in the table summaries. Fields or pools may be re-activated from time to time when new producing wells are drilled.

GAS FIELDS. Many gas fields are listed as "shut in" because of lack of marketing facilities slow field development, or lack of substantial reserves. Production from fields listed as "Domestic" or "Lease Fuel" is not metered or considered commercial.

GAS STORAGE RESERVOIRS. Most gas storage reservoirs were originally classified as gas fields or pools and upon depletion or near depletion, they were converted to storage reservoirs. Undeveloped gas storage reservoirs are gas pools that have been designated to become storage reservoirs at some future time.

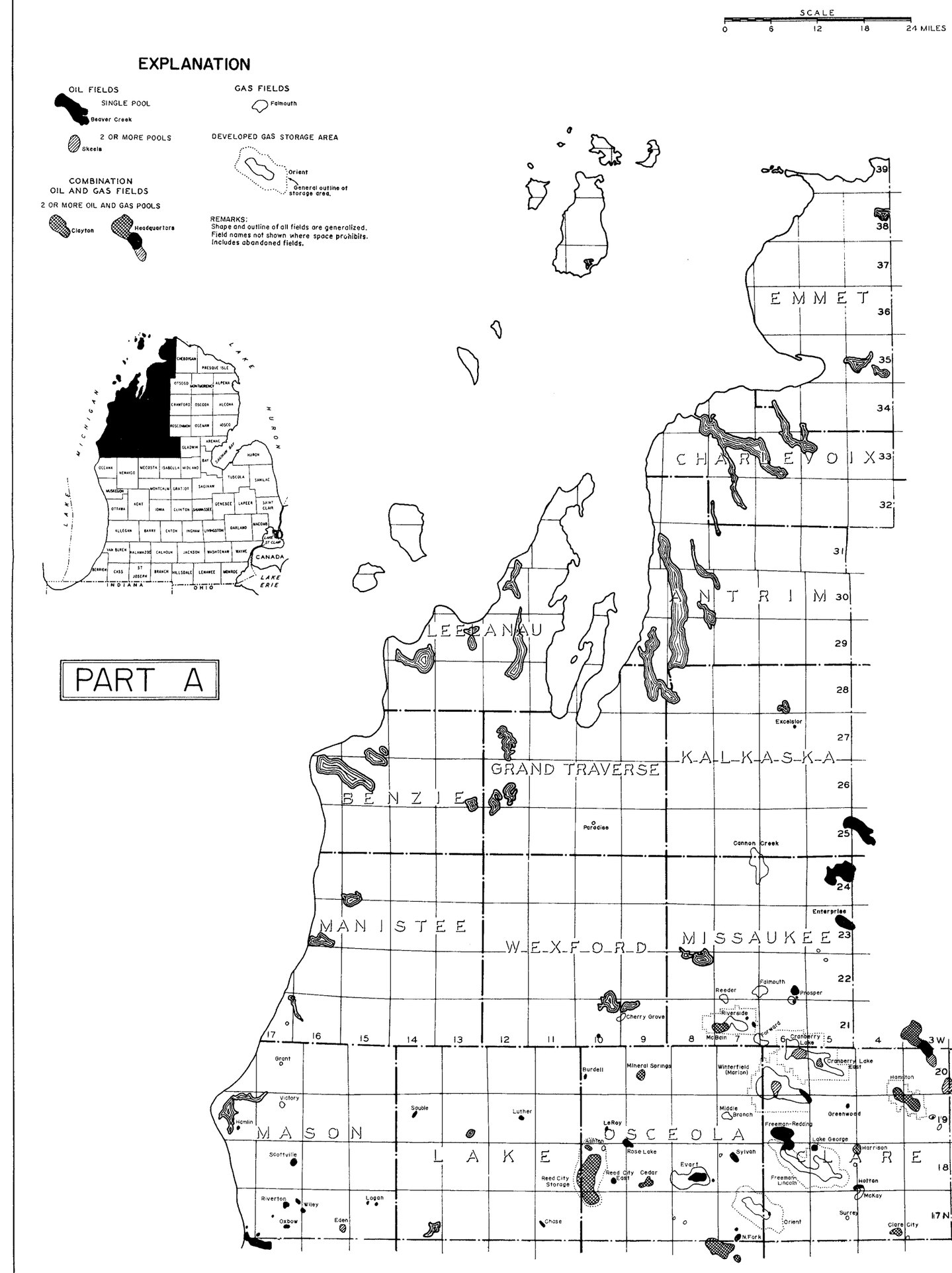
LPG STORAGE. Surface and underground storage facilities for liquified petroleum gas.

OIL WELL GAS. This is casinghead gas produced incidental to the production of oil from pools or fields generally classified as oil accumulations.

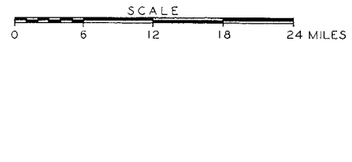
CASINGHEAD GAS PLANT DATA. These tables indicate the distribution of gross input gas to plants and the resulting net hydrocarbons available for market.

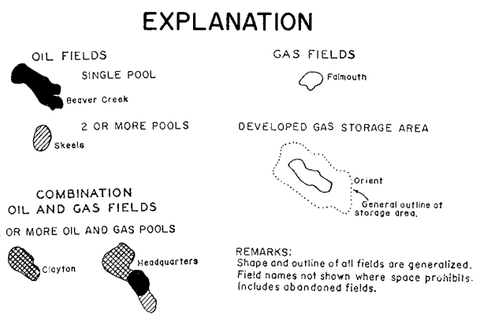
FLUID INJECTION INTO PRODUCING FORMATIONS. A number of fields have secondary recovery projects in operation. In most fields listed in these tables the injection of oil field brines back into the producing formation is a combination brine disposal and pressure maintenance project.

MICHIGAN OIL AND GAS FIELDS
SOUTHERN PENINSULA

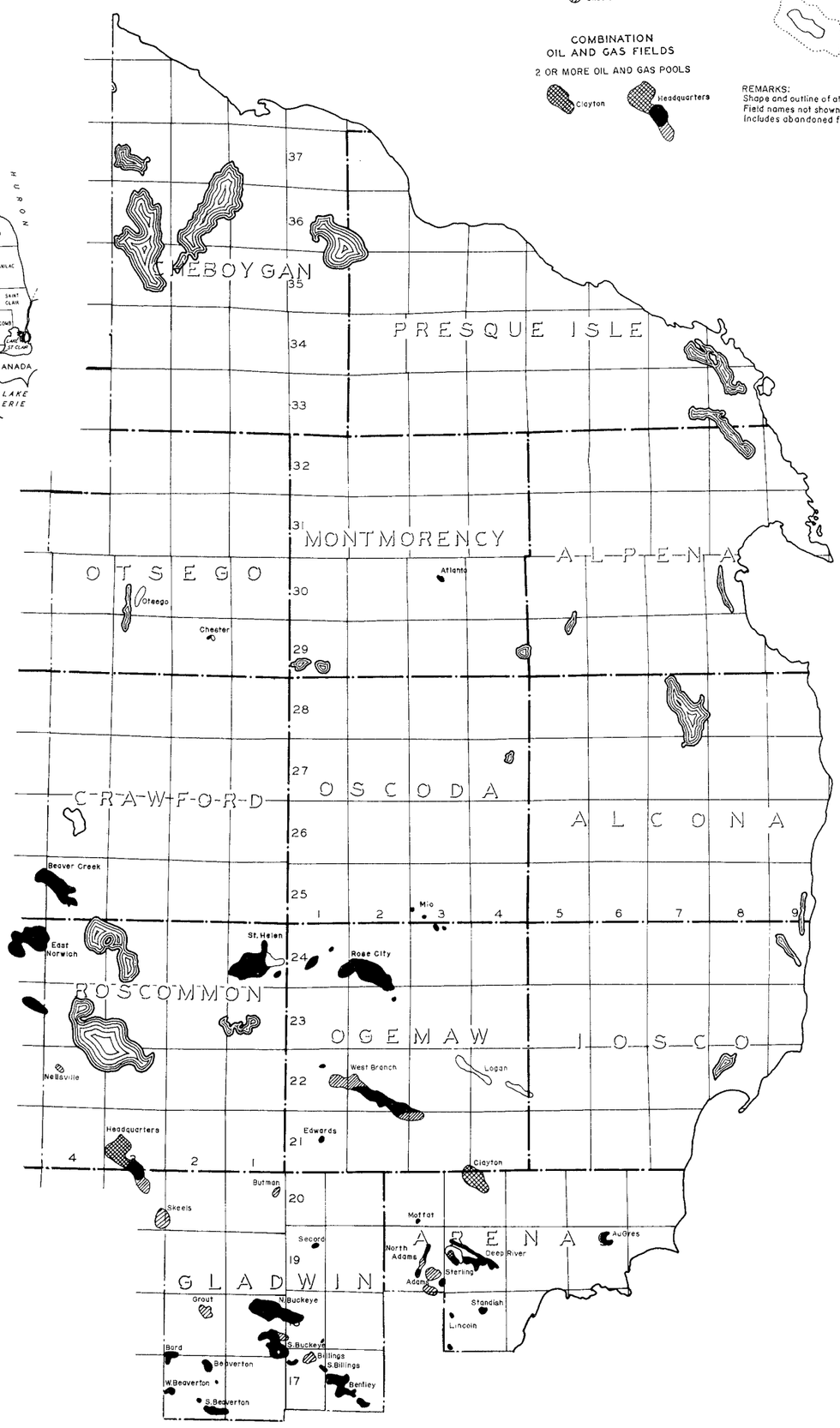


MICHIGAN OIL AND GAS FIELDS
SOUTHERN PENINSULA





PART B



MICHIGAN OIL AND GAS FIELDS

MICHIGAN OIL AND GAS FIELDS

SOUTHERN PENINSULA

EXPLANATION

OIL FIELDS
SINGLE POOL — Beaver Creek
2 OR MORE POOLS — Skeels

GAS FIELDS — Falmouth

DEVELOPED GAS STORAGE AREA — Orient — General outline of storage area.

COMBINATION OIL AND GAS FIELDS
2 OR MORE OIL AND GAS POOLS — Clayton — Headquarters

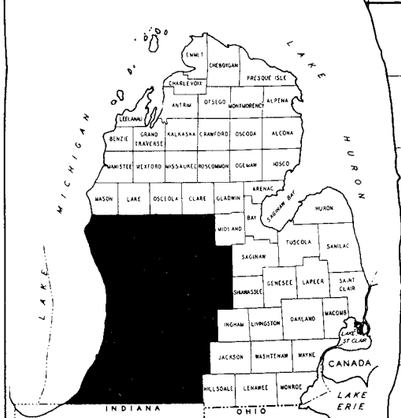
REMARKS:
Shape and outline of oil fields are generalized.
Field names not shown where space prohibits.
Includes abandoned fields.

SCALE
0 6 12 18 24 MILES

OCEANA
NEWAYGO
MECOSTA
ISABELLA
MONTCALM
GRATIOT
MUSKEGON
OTTAWA
KENT
IONIA
CLINTON
ALLEGAN
BARRY
EATON
VAN BUREN
KALAMAZOO
CALHOUN
BERRIEN
CASS
ST JOSEPH
BRANCH

Pentwater, Ware, Crystal Valley, Forrest River, Indian Hills, Gilbert Lake, Elbridge, Mears, Hart, Shelby, Benona, Ferry, Huber, Stoney Lake, Otto, Montague, White River, Blue Lake, Holton, Reman, Sheridan, Kimball Lake, Bishop, Croton, Dalton, Cedar Creek, Ashland, Enaley, Muskegon, Egelston, Wolf Lake, Trent, Tyrone, Ravenna, Rockford, Polkton, Cooperaville, Dennison, Wright, Marne, Robinson, Walker, Wyoming Park, Gaines, Zeeland, Jamestown, Fillmore, Overisel, Salem, Diamond Springs, Robbin R, Dorr, Hilliards, Hopkins W, Hopkins, Wayland N, Wayland, Thornapple, Freeport, New Richmond, Monterey, Hopkins S, Ganges, Watson, Martin, Allegan, Kellogg, Crooked Lake, Hope, Pullman, Pullman E, Hawkhead, Lee, Johnstown, Cheshire, Trowbridge, Otsego, Locora, Coffee L, Clear Lake, Portello, Cal-Lee, Genova, Breedsville, Bloomingdale, Alamo, Oshtemo, Comstock, Bangor, Paw Paw, Lawton, Tekonsha, Albion, Silver Creek, Niles, Calvin, Jefferson, North Porter, Edwardsburg, Barton, Green, Beverly Lake, Paris, Fork, Coldwater, Gilmore, Currie, Vernon, Wise, Rosebush, Leaton, Coffax, Big Rapids, Woodville, Martiny, Sheridan, S. Coldwater, Isabella, Sherman, Austin, Goodwell, E. Goodwell, White Cloud, Morton, Wheatland, Broomfield, Deerfield, Mecosta Lake, Union, Chippewa, Freemont, Big Prairie, Deerfield, Hinton, Six Lakes, Winfield, Reynolds, Cato, Edmore, Belly Acres, Edmore-Richland, Lakeview, Douglass, Pine River, Sumner, Maple Valley, Pine, Douglass, Shaver (Sumner-New Haven), Crystal, Ithaca, Stanton, Day, North Star, Turk Lake, Newark, Bushnell, Elba, Bloomer, Hubbardston, Lebanon, Dallas, Freeport, Johnstown, Portello, Cal-Lee, Albion, Tekonsha, Comstock, Oshtemo, Alamo, Clear Lake, Bloomingdale, Breedsville, Genova, Locora, Coffee L, Lawton, Paw Paw, Bangor, Silver Creek, Niles, Calvin, Jefferson, North Porter, Edwardsburg, Ganges, Watson, Martin, Allegan, Kellogg, Crooked Lake, Hope, Pullman, Pullman E, Hawkhead, Lee, Johnstown, Cheshire, Trowbridge, Otsego, Wayland N, Wayland, Hopkins S, Hopkins W, Monterey, New Richmond, Thornapple, Freeport, Hilliards, Dorr, Diamond Springs, Robbin R, Salem, Fillmore, Overisel, Zeeland, Jamestown, Gaines, Wyoming Park, Walker, Robinson, Marne, Dennison, Wright, Cooperaville, Polkton, Rockford, Ravenna, Tyrone, Trent, Wolf Lake, Egelston, Muskegon, Ashland, Enaley, Cedar Creek, Dalton, Croton, Bishop, Sheridan, Reman, Kimball Lake, Holton, Blue Lake, White River, Montague, Otto, Dayton, Big Prairie, Deerfield, Hinton, Six Lakes, Winfield, Reynolds, Cato, Edmore, Belly Acres, Edmore-Richland, Lakeview, Douglass, Pine River, Sumner, Maple Valley, Pine, Douglass, Shaver (Sumner-New Haven), Crystal, Ithaca, Stanton, Day, North Star, Turk Lake, Newark, Bushnell, Elba, Bloomer, Hubbardston, Lebanon, Dallas, Freeport, Johnstown, Portello, Cal-Lee, Albion, Tekonsha, Comstock, Oshtemo, Alamo, Clear Lake, Bloomingdale, Breedsville, Genova, Locora, Coffee L, Lawton, Paw Paw, Bangor, Silver Creek, Niles, Calvin, Jefferson, North Porter, Edwardsburg, Ganges, Watson, Martin, Allegan, Kellogg, Crooked Lake, Hope, Pullman, Pullman E, Hawkhead, Lee, Johnstown, Cheshire, Trowbridge, Otsego, Wayland N, Wayland, Hopkins S, Hopkins W, Monterey, New Richmond, Thornapple, Freeport, Hilliards, Dorr, Diamond Springs, Robbin R, Salem, Fillmore, Overisel, Zeeland, Jamestown, Gaines, Wyoming Park, Walker, Robinson, Marne, Dennison, Wright, Cooperaville, Polkton, Rockford, Ravenna, Tyrone, Trent, Wolf Lake, Egelston, Muskegon, Ashland, Enaley, Cedar Creek, Dalton, Croton, Bishop, Sheridan, Reman, Kimball Lake, Holton, Blue Lake, White River, Montague, Otto, Dayton, Big Prairie, Deerfield, Hinton, Six Lakes, Winfield, Reynolds, Cato, Edmore, Belly Acres, Edmore-Richland, Lakeview, Douglass, Pine River, Sumner, Maple Valley, Pine, Douglass, Shaver (Sumner-New Haven), Crystal, Ithaca, Stanton, Day, North Star, Turk Lake, Newark, Bushnell, Elba, Bloomer, Hubbardston, Lebanon, Dallas, Freeport, Johnstown, Portello, Cal-Lee, Albion, Tekonsha, Comstock, Oshtemo, Alamo, Clear Lake, Bloomingdale, Breedsville, Genova, Locora, Coffee L, Lawton, Paw Paw, Bangor, Silver Creek, Niles, Calvin, Jefferson, North Porter, Edwardsburg

16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 IW 1N 1S 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 3W



PART C

INDIANA

MICHIGAN OIL AND GAS FIELDS

SOUTHERN PENINSULA

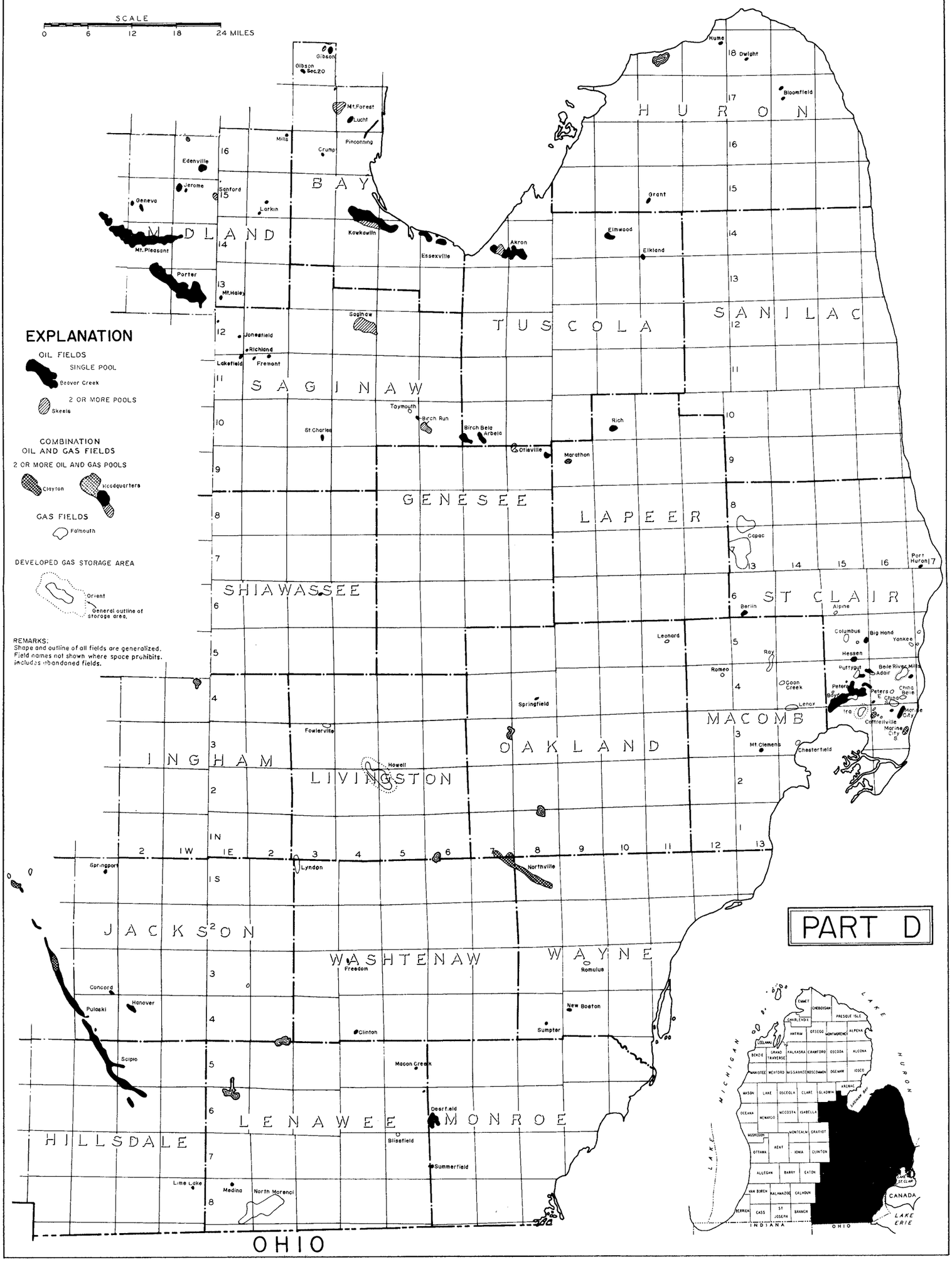


TABLE 4. — MICHIGAN OIL FIELDS, 1965 (Sheet 1 of 7)

FIELD NAME	COUNTY	YEAR OF DISC.	PRODUCING FORMATION OR POOL	PAY ZONE				DEEPEST FORMATION OR POOL TESTED	DEPTH IN FEET	NUMBER OF OIL WELLS					OIL PRODUCTION IN BARRELS		DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION BBLS./DAY		
				DEPTH IN FEET	THICKNESS AND LITHOLOGY		OIL GRAVITY A.P.I.			TO END 1965	COMP. IN 1965	ABAND. IN 1965	PRODUCING AT END 1965	SHUT IN OR SHUT DOWN	PRODUCED IN 1965	CUMULATIVE THROUGH 1965			DISPOSAL		TOTAL PRODUCTION
																			SUBSURFACE	SURFACE	
ADAIR	ST. CLAIR	1961	SALINA-NIAGARAN	2719	10	D	41.4	NIAGARAN	2755	17	0	0	16	0	29,528	201,294	520	387	226	0	226
ADAMS	ARENAC-BAY	1937	TRAVERSE	2032	15	L	37.0	BOIS BLANC	5079	24	0	0	8	4			240		1	5	6
		1937	DUNDEE	2958	15	L	34.7			31	0	0	17	0			310		15	8	23
		1941	RICHFIELD	4278	5	L	35.5														

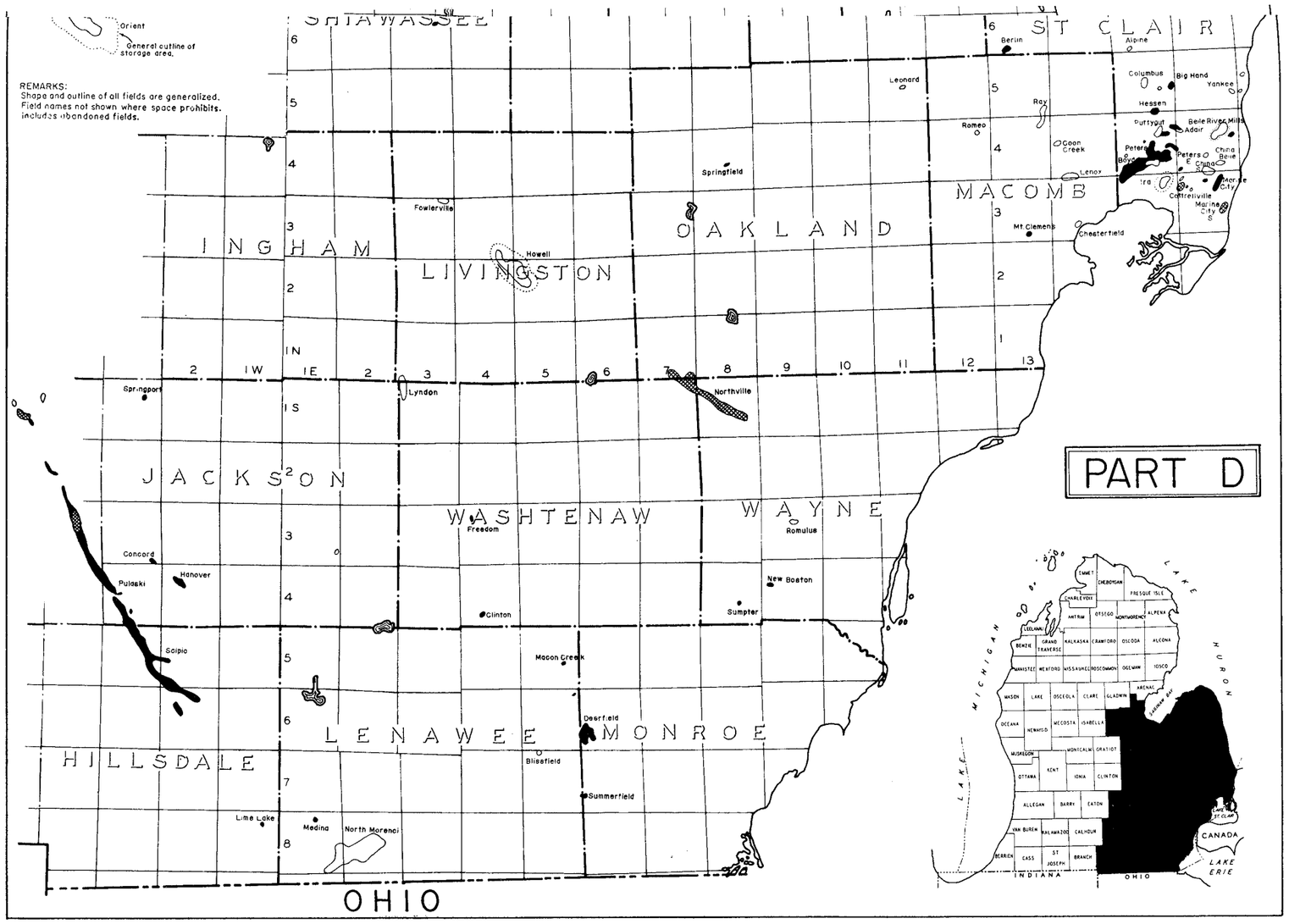


TABLE 4. — MICHIGAN OIL FIELDS, 1965 (Sheet 1 of 7)

FIELD NAME	COUNTY	YEAR OF DISC.	PRODUCING FORMATION OR POOL	PAY ZONE: DEPTH IN FEET	PAY ZONE: THICKNESS AND LITHOLOGY		PAY ZONE: OIL GRAVITY A.P.I.	DEEPEST FORMATION OR POOL TESTED	DEPTH IN FEET	NUMBER OF OIL WELLS: TO END 1965	NUMBER OF OIL WELLS: COMP. IN 1965	NUMBER OF OIL WELLS: ABAND. IN 1965	NUMBER OF OIL WELLS: PRODUCING AT END 1965	NUMBER OF OIL WELLS: SHUT IN OR SHUT DOWN	OIL PRODUCTION IN BARRELS: PRODUCED IN 1965	OIL PRODUCTION IN BARRELS: CUMULATIVE THROUGH 1965	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION BBLS./DAY: DISPOSAL SUBSURFACE	BRINE PRODUCTION BBLS./DAY: DISPOSAL SURFACE	BRINE PRODUCTION BBLS./DAY: TOTAL PRODUCTION
ADAIR	ST. CLAIR	1961	SALINA-NIAGARAN	2719	10	D	41.4	NIAGARAN	2755	17	0	0	16	0	29,528	201,294	520	387	226	0	226
ADAMS	ARENAC-BAY	1937	TRAVERSE	2032	15	L	37.0	BOIS BLANC	5079	24	0	0	8	4			240		1	5	6
		1937	DUNDEE	2958	15	L	34.7			31	0	0	17	0			310		15	8	23
		1941	RICHFIELD	4278	5	L	35.5														
		1956	DETROIT RIVER SZ	3943	5	L	39.6			31	0	0	8	1	19,879	1,361,134	1080	835	24	2	26
										The 8 wells include 5 Richfield, 1 Sour Zone and 2 Richfield & Sour Zone.										
ADAMS, NORTH	ARENAC	1940	DUNDEE	2905	15	D	32.0	DETROIT RIVER	4489	49	1RW	1	19	0	27,349	9,092,975	470	19,347	3,260	2	3,262
AKRON	TUSCOLA	1936	DUNDEE	2678	17	L	37.3	SYLVANIA	4130	50	0	0	34	6			800		134	4	138
		1938	DETROIT RIVER SZ	3422	11	D	35.9										500				
		1954	RICHFIELD	3774	6	D	39.2			27	0	0	19	2	44,580	1,632,938	40	1,219	71	0	71
										The 19 wells include 2 Richfield, 12 Sour Zone and 5 Sour Zone and Dundee.										
ALBION-PULASKI-SCIPIO TREND:	FIELD AND PRODUCTION DATA LISTED BY TOWNSHIP AND COUNTY																				
LEE TWP.	CALHOUN	1961	NIAGARAN	3060	20	D	24.2	PRAIRIE DU CHIEN	4912								80				
		1960	TRENTON-BLACK RIVER	4600	24+	D				12	0	0	10	4	135,426	823,314	200	2,940	0	120	120
										The 10 wells include 9 Trenton and 1 Niagaran.										
SHERIDAN TWP.	CALHOUN	1960	TRENTON-BLACK RIVER	4179	10+	D	40.0	PRAIRIE DU CHIEN	4791	24	2	2	22	2	284,203	1,524,897	460	3,315	736	50	786
ALBION TWP.	CALHOUN	1958	TRENTON-BLACK RIVER	3952	?	D	44.0	PRAIRIE DU CHIEN	4623	139	1	1	136	9	1,625,593	12,746,073	2710	4,703	2,155	14	2,169
PULASKI-HOMER TWPS.	JACKSON	1959	TRENTON-BLACK RIVER	3766	66+	D	39.6	PRAIRIE DU CHIEN	4395												
		1960	TRENTON-BLACK RIVER	4197	48+	D	39.6	PRAIRIE DU CHIEN	4528	132	0	1	129	3	1,680,643	15,162,656	2580	5,877	3,464	0	3,464
SCIPIO-FAYETTE-MOSCOW TWPS.	HILLSDALE	1957	TRENTON-BLACK RIVER	3576	50+	D	41.4	PRAIRIE DU CHIEN	4202	183	4+1RW	1	172	6	3,995,805	24,725,325	3250	7,608	2,632	4	2,636
ADAMS TWP.	HILLSDALE	1959	TRENTON-BLACK RIVER	3984	6+	D	42.0	PRAIRIE DU CHIEN	4162	50	2	2	44	3	979,750	3,484,817	920	3,788	1,096	2	1,098
TREND TOTAL:										540	9+1RW	7	513	27	8,701,420	58,467,082	10,200	5,732	10,083	190	10,273
ARBELA	TUSCOLA	1946	DUNDEE	2557	7	L	35.3	DETROIT RIVER	3375	35	0	0	2	0	7,043	292,878	350	837	0	0	0
ASHTON	OSCEOLA	1945	TRAVERSE	2950	4	L	42.0	DETROIT RIVER	3686	2	0	0	1	0			80		180	0	180
		1945	DUNDEE	3645	5	L	40.0			4	0	0	4	0	6,272	399,981	200	1,428	0	0	0
ATLANTA	MONTMORENCY	1945	DETROIT RIVER	2183	5	D	36.2	DETROIT RIVER	2550	3	0	0	1	0	0	7,688	30	256	0	0	0
AU GRES	ARENAC	1953	RICHFIELD	4152	11	L	36.5														
		1956	DETROIT RIVER SZ	3822	14	L	31.4	RICHFIELD	4315	4	0	0	3	0	2,812	38,277	160	239	0	1	1
										The 3 wells include 2 Richfield and 1 Richfield and Sour Zone.										
BARD	GLADWIN	1949	DUNDEE	3933	6	L	42.8	DUNDEE	4017	17	0	0	8	1	6,655	558,161	170	3,283	205	0	205
BEAVER CREEK UNIT	CRAWFORD-KALKASKA	1947	RICHFIELD	4160	20	D	44.7	SYLVANIA	4503	100	0	0	59	1	79,211	6,084,813	4040	1,506	171	0	171
BEAVERTON	GLADWIN	1934	DUNDEE	3929	12	L	41.3	RICHFIELD	5225	26	0	0	4	1	5,133	850,546	330	2,597	71	0	71
BEAVERTON, SOUTH	GLADWIN	1936	DUNDEE	3845	12	L	34.5	DETROIT RIVER	4977								700				
		1956	TRAVERSE	3231	6	L	41.0			33	0	0	19	0	30,308	1,539,530	10	2,168	220	3	223
										The 19 wells include 18 Dundee and 1 Dundee and Traverse.										
BEAVERTON, WEST	GLADWIN	1943	DUNDEE	3876	2	L	41.2	DETROIT RIVER	5094	7	0	0	6	1	12,476	113,262	260	436	3	1	4
BELLE RIVER MILLS	ST. CLAIR	1961	NIAGARAN	(REFER TO GAS FIELDS) GAS FIELD PRODUCING MINOR QUANTITY OF OIL.																	
BELLY ACRES	MONTCALM	1944	DUNDEE	3470	1.3	D	48.2	DUNDEE	3615	7	0	0	3	0	1,306	333,150	220	1,514	725	0	725
BENTLEY	GLADWIN	1937	DUNDEE	3510	13	L	42.1	SYLVANIA	5114	87	0	0	50	2			1920		87	28	115
		1952	RICHFIELD	4440	14	L	40.0								41,718	2,643,061	40	1,349			
		1952	TRAVERSE	2855	6	L	34.1			1	0	0	1	0							
BERLIN	ST. CLAIR	1960	NIAGARAN	3800	25	D	42.8	CINCINNATIAN	4310	4	0	0	4	0	45,730	250,024	140	1,786	0	0	0

TABLE 4.— MICHIGAN OIL FIELDS, 1965 Continued (Sheet 2 of 7)

FIELD NAME	COUNTY	YEAR OF DISC.	PRODUCING FORMATION OR POOL	PAY ZONE DEPTH IN FEET	PAY ZONE THICKNESS AND LITHOLOGY		PAY ZONE OIL GRAVITY A.P.I.	DEEPEST FORMATION OR POOL TESTED	DEPTH IN FEET	NUMBER OF OIL WELLS TO END 1965	COMP. IN 1965	ABAND. IN 1965	PRODUCING AT END 1965	SHUT IN OR SHUT DOWN	OIL PRODUCTION IN BARRELS PRODUCED IN 1965	CUMULATIVE THROUGH 1965	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION BBLS./DAY DISPOSAL SUBSURFACE	DISPOSAL SURFACE	TOTAL PRODUCTION
BEVANS LAKE	MECOSTA	1951	TRAVERSE	2997	1	L	44.2	REED CITY	3731	4	0	0	1	0	1,430	85,589	40	2,140	40	0	40
BIG HAND	ST. CLAIR	1961	NIAGARAN	2898	5+	D	39.5	CLINTON	3097	10	1RW	0	10	0	112,310	327,113	220	1,487	51	0	51
BILLINGS	GLADWIN	1949	DUNDEE	3549	6	L	39.7	RICHFIELD	4995	20	0	0	19	0			400		2	0	2
		1950	DETROIT RIVER	4070	7	D	43.3			10	0	0	9	0	17,658	703,805	200	1,173	0	0	0
BILLINGS, SOUTH	GLADWIN	1957	DUNDEE	3540	5		39.5	DETROIT RIVER	4152	8	1	0	8	0	10,601	106,516	60	1,775	0	1	1
BIRCH-BELA	SAGINAW-TUSCOLA	1951	DUNDEE	2504	7	L	36.0	DETROIT RIVER	3263	26	2	0	26	1	21,303	178,896	300	596	0	7	7
BIRCH RUN	SAGINAW	1954	DUNDEE	2536	10	L	36.2	DUNDEE	2716	34	0	0	32	2	20,083	431,954	480	900	0	1	1
		1934	BEREA	(REFER TO ABANDONED FIELDS)																	
BLOOMER	MONTCALM-IONIA	1944	TRAVERSE	2640	3.3	L	42.3	DETROIT RIVER	3271	29	0	0	9	0	22,641	1,876,389	530	3,540	1,060	309	1,369
BLOOMINGDALE	VAN BUREN	1938	Traverse	1244	4	L	42.0	TRENTON	3090	431	0	1	30	6	9,845	9,948,118	4040	2,462	1,175	22	1,197
BOYD	ST. CLAIR	1958	SALINA-NIAGARAN	2457	292	D	37.7	PRECAMBRIAN	4634	49	1	0	46	3	200,080	1,092,643	1840	594	468	10	478
BUCKEYE, NORTH	GLADWIN	1936	DUNDEE	3615	14	L	39.0	SYLVANIA	5351	287	0	0	66	11	126,270	18,587,631	3030	6,135	2,044	14	2,058
BUCKEYE, SOUTH	GLADWIN	1936	DUNDEE	3570	11	L	39.0	DETROIT RIVER	4802	197	1	0	28	2	24,380	4,878,630	2270	2,149	10	14	24
		1956	TRAVERSE	(REFER TO ABANDONED FIELDS)																	
		1964	DETROIT RIVER SZ	4481	14	D	46.0			1	0	0	1	0	13,478	27,929	40	698	0	0	0
BURDELL	OSCEOLA	1959	DUNDEE	3678	4	L		REED CITY	3804	5	0	0	3	0			120		235	0	235
		1960	REED CITY	3802	2	D				1	0	0	1	1	6,734	132,846	40	830	0	0	0
BUTMAN	GLADWIN	1949	DUNDEE	(REFER TO ABANDONED FIELDS)																	
		1949	RICHFIELD	4921	10	D	41.6	SYLVANIA	5027	5	0	0	5	0	7,347	269,117	230	1,170	35	3	38
		1950	TRAVERSE	(REFER TO ABANDONED FIELDS)																	
CAPAC	ST. CLAIR	1961	NIAGARAN	(GAS RESERVOIR PRODUCING SMALL QUANTITIES OF OIL)																	
CATO	MONTCALM	1944	REED CITY	3542	3	D	44.7	DETROIT RIVER	3731	17	0	0	7	0	22,366	881,874	590	1,495	1,715	0	1,715
CEDAR	OSCEOLA	1943	DUNDEE	3810	2	L	46.0	SYLVANIA	5165	10	0	0	7	0			400		1,850	0	1,850
		1945	RICHFIELD	5060	6	L	44.7			2	0	0	2	0	17,057	1,034,343	60	2,249	0	0	0
CHASE	LAKE	1943	BEREA	2460	4	SL		DETROIT RIVER	3734	2	0	0	1	0	142	7,140	20	357	0	0	0
CHESTERFIELD	MACOMB	1962	NIAGARAN	2508	7	D	40.3	NIAGARAN	2691	5	0	0	1	0	3,338	14,402	200	72	25	0	25
CHINA, SEC. 12	ST. CLAIR	1962	NIAGARAN	2509	11	D	39.1	CLINTON	2631	2	0	0	2	0	2,869	6,967	80	87	0	58	58
CHINA, SOUTH	ST. CLAIR	1961	NIAGARAN	(REFER TO GAS FIELDS)													10				
CHINA, SEC. 31	ST. CLAIR	1959	SALINA	(COMBINED WITH COTTRELLVILLE IN 1962)																	
CLARE CITY	CLARE	1938	MICHIGAN STRAY	1303	2	S	30.2	DUNDEE	3853	7	0	0	4	1	1,290	71,365	120	595	0	0	0
CLAYTON	ARENAC-OGEMAW	1935	DUNDEE	2465	12	DL	34.2	SYLVANIA	4163	80	0	1	47	2			1290		2,048	31	2,079
		1947	RICHFIELD	3790	9	D	36.2														
		1953	DETROIT RIVER	3507	9	D	45.9			5	0	0	5	0	52,156	6,096,419	200	4,092	0	0	0
													The 5 wells include 3 Richfield, 1 Sour Zone and 1 Richfield and Sour Zone								
COLDWATER	ISABELLA	1944	DUNDEE	3692	25	L	48.0	DETROIT RIVER	5090	81	0	0	54	17	169,376	21,226,685	3200	6,633	29,557	0	29,557
COLFAX	MECOSTA	1964	DUNDEE	3503	25	L	43.0	DETROIT RIVER	4043	1	0	0	1	0	870	870	20	43	0	0	0
COTTRELLVILLE	ST. CLAIR	1961	SALINA-NIAGARAN	2262	6	D	38.7	CLINTON	2511	12	0	0	9	2	13,377	69,464	280	248	0	4	4
CRANBERRY LAKE	CLARE	1943	DUNDEE	3835	2	L	42.8	RICHFIELD	5223	8	1RW	0	3	0			70		270	0	270
		1952	TRAVERSE	3120	7	L	39.0			7	0	1	0	Abandoned 1965			70				
		1953	DETROIT RIVER	(REFER TO ABANDONED FIELDS)																	
		1951	RICHFIELD	5048	15	D	51.0			17	0	0	13	1	50,353	1,320,732	680	1,611	47	0	47
CRANBERRY LAKE, EAST	CLARE	1963	DUNDEE	3760	6		43.5	DETROIT RIVER	5139	4	0	0	4	0			200		20	0	20
		1963	TRAVERSE	3057	6		39.2	Abandoned 1964, Production combined with Dundee and Richfield									40				
		1964	RICHFIELD	5087	12	D	44.0			2	0	0	2	0	101,918	171,125	80	535	10	0	10

TABLE 4.— MICHIGAN OIL FIELDS, 1965 Continued (Sheet 3 of 7)

CRYSTAL	MONTCALM	1935	DUNDEE	3187	4	D	43.5	DETROIT RIVER	3391	193	0	0	7	0			2000		1,245	0	1,245
		1954	TRAVERSE	2769	4	L	41.8			2	0	0	1	0	11,327	7,751,838	20	3,837	330	0	330
CRYSTAL VALLEY	OCEANA	1945	TRAVERSE	1809	3	L	37.0	ST. PETER Ss.	6062	5	0	0	1	0			50		175	0	175
		1957	DUNDEE	2575	12	D	42.5			19	0	0	2	1	378	202,883	420	432	0	4	4
CURRIE	ISABELLA	1936	DUNDEE	3918	2	D	45.9	DUNDEE	4042	2	0	0	2	0	994	197,986	40	4,950	0	0	0
DALTON	MUSKEGON	1940	TRAVERSE	1851	5	L	40.0	DUNDEE	2515	16	0	0	7	0	1,211	104,347	300	348	0	6	6
DAY	MONTCALM	1946	TRAVERSE	2900	2	L	43.0	DUNDEE	3387	1	0	0	1	0	895	2,815	30	94	200	0	200
DEEP RIVER	ARENAC	1944	DUNDEE	2795	145	D	43.2	RICHFIELD	4258	106	0	0	44	13	113,957	25,979,237	1060	24,509	7,870	0	7,870
													The 44 wells include 43 Dundee and 1 Traverse								
		1953	RICHFIELD	(CONSOLIDATED WITH STERLING DETROIT RIVER-RICHFIELD IN 1954)																	
DEERFIELD	MONROE	1920	TRENTON	2115	10	L	42.7	CAMBRIAN	3250	47	0	1	21	13	7,668	689,518	450	1,532	61	6	67
DENNISON	OTTAWA	1963	TRAVERSE	1874	4	L	38.0	SALINA	3202	15	0	0	14	2	65,119	252,295	300	841	405	0	405
DIAMOND SPRINGS	ALLEGAN	1938	TRAVERSE	1461	3	L	41.0	SALINA	2651	56	0	0	8	0	3,802	990,609	420	2,359	164	1	165
		1958	SALINA	2389	21	D				3	0	0	3	0	4,778	42,926	30	1,431	13	0	13
DORR	ALLEGAN	1938	TRAVERSE	1617	4	L	41.0	NIAGARAN	3319	41	0	1	4	0	1,675	413,864	410	1,009	0	3	3
		1955	DETROIT RIVER	2082	6	D	38.0			14	0	0	4	0	2,453	66,011	280	236	11	0	11
		1956	SALINA	2922	7	D	17.0			18	0	0	12	0	12,933	261,887	540	485	61	2	63
DOUGLASS	MONTCALM	1945	DUNDEE	3400	2	L	47.1	DUNDEE	3458	6	0	0	1	0	789	243,928	120	2,033	175	0	175
DUNNINGVILLE	ALLEGAN	1950	TRAVERSE	1435	3	L	38.0	TRAVERSE	1438	5	0	0	1	0	1,069	116,989	50	2,340	35	0	35
DWIGHT	HURON	1945	DETROIT RIVER	2862	4	L	36.2	SYLVANIA	3290	1	0	0	1	0	1,222	34,630	40	866	3	0	3
EAST NORWICH	MISSAUKEE-ROSCOMMON	1942	RICHFIELD	4390	14	D	40.9	BASS ISLANDS	5520	109	0	0	79	5	160,734	7,194,277	4360	1,650	0	79	79
													The 79 wells include 76 Richfield and 3 Sour Zone								
EDEN	MASON	1948	TRAVERSE	1679	3	L	34.5	CAMBRIAN	7249	9	3	0	5	2			80		305	0	305
		1948	DUNDEE	2240	2	L	45.3			38	0	3	30	13			380		1,790	0	1,790
		1948	REED CITY	2345	8	D	42.8			4	0	0	1	0	27,204	2,842,886	40	5,686	6	0	6
EDENVILLE	MIDLAND	1938	DUNDEE	3790	8	L	41.0	DUNDEE	3962	36	0	0	2	0	1,138	1,360,720	370	3,678	2	4	6
EDMORE	MONTCALM	1933	TRAVERSE	3102	4	L	43.2	DUNDEE	3613	35	0	0	29	2	27,370	1,284,116	500	2,568	1,227	0	1,227
ELSBRIDGE	OCEANA	1961	TRAVERSE	2112	2	L	39.4	REED CITY	2725	19	0	1	16	8	19,748	390,032	380	1,026	1,390	0	1,390
ELMWOOD	TUSCOLA	1945	DUNDEE	2740	8	L	31.3	BOIS BLANC	3945	10	1	0	7	2	3,155	61,896	90	688	27	0	27
ENTERPRISE	MISSAUKEE-ROSCOMMON	1943	RICHFIELD	4405	15	D	41.8	RICHFIELD	4625	32	0	6	22	0	60,505	1,951,345	1280	1,524	44	0	44
ESSEXVILLE	BAY	1944	DUNDEE	2835	17	L	35.3	SYLVANIA	4130	50	0	0	41	0	59,610	3,079,085	1730	1,780	109	0	109
EVART	OSCEOLA	1942	DUNDEE	3755	6	L	46.3	SYLVANIA	5292	29	0	0	9	2	10,847	3,787,447	1100	3,443	2,300	0	2,300
EXCELSIOR	KALKASKA	1950	TRAVERSE	2003	2	L	33.4	TRAVERSE	2136	1	0	0	1	0	531	9,491	10	949	0	0	0
FERRY	OCEANA	1960	TRAVERSE	1949	2	L	41.0	REED CITY	2581	14	0	0	6	2	173	163,226	280	583	695	0	695
FILLMORE	ALLEGAN	1940	TRAVERSE	1516	2.7	L	41.1	SALINA	3045	63	0	0	11	0	4,821	949,597	770	1,233	81	4	85
FOREST RIVER	OCEANA	1965	TRAVERSE	1965	1	L		DUNDEE	2598	1	1	1	0	(Abandoned 1965)	667	667	40	17			
FORK	MECOSTA	1942	DUNDEE	3845	8	L	49.0	BOIS BLANC	5294	64	0	0	4	0			2700		2,650	0	2,650
		1945	RICHFIELD	5001	11	D	54.8			1	0	0	1	1	4,240	7,767,337	40	2,835			
FORK, NORTH	OSCEOLA	1951	DUNDEE	3788	3	D	45.8	DUNDEE	3865	6	0	0	1	1	0	153,661	120	1,281			
FREEMAN, SEC. 15	CLARE	1963	DUNDEE	3894	8	L	41.0	DUNDEE	3902	1	0	1	0	(Abandoned 1965)	736	736	40	18			
FREEMAN-REDDING	CLARE	1938	DUNDEE	3885	19	L	44.4	SYLVANIA	5462	170	0	0	23	3	35,710	16,432,241	2800	5,869	5,500	60	5,560
GENEVA	VAN BUREN	1940	TRAVERSE	1042	2	L	31.5	TRENTON	2950	77	0	1	1	0	1,534	494,370	750	659	250	0	250
GIBSON, SEC. 20	BAY	1951	DUNDEE	3097	11	L		DETROIT RIVER	4343	3	0	0	3	0	1,143	23,874	30	796	0	0	0
GILBERT LAKE	OCEANA	1956	TRAVERSE	2032	8	L	42.5	REED CITY	2711	3	0	0	1	0	559	50,146	30	1,672	0	1	1
GILMORE	ISABELLA	1955	DUNDEE	3803	3	L	48.6	DUNDEE	3813	12	0	0	8	0	12,452	346,932	120	2,891	2,000	0	2,000
GOODWELL	NEWAYGO	1943	TRAVERSE	2760	12	L	43.0	BASS ISLANDS	4342	31	0	0	2	0	3,473	1,098,542	1240	886	5	4	9
GRANT, SEC. 29	HURON	1953	DETROIT RIVER	3358	8	D	38.8	BOIS BLANC	3918	3	0	0	3	0	1,398	14,485	120	121	0	0	0

TABLE 4.— MICHIGAN OIL FIELDS, 1965 Continued (Sheet 4 of 7)

FIELD NAME	COUNTY	YEAR OF DISC.	PRODUCING FORMATION OR POOL	PAY ZONE				DEEPEST FORMATION OR POOL TESTED	DEPTH IN FEET	NUMBER OF OIL WELLS					OIL PRODUCTION IN BARRELS		DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION BBLS./DAY		
				DEPTH IN FEET	THICKNESS AND LITHOLOGY		OIL GRAVITY A.P.I.			TO END 1965	COMP. IN 1965	ABAND. IN 1965	PRODUCING AT END 1965	SHUT IN OR SHUT DOWN	PRODUCED IN 1965	CUMULATIVE THROUGH 1965			DISPOSAL		TOTAL PRODUCTION
																			SUBSURFACE	SURFACE	
GROUT	GLADWIN	1956	RICHFIELD	5039	10	D	41.7	DETROIT RIVER	5240	17	0	0	13	1	137,680	1,034,979	680	1,522	38	1	39
		1940	DUNDEE	(REFER TO ABANDONED FIELDS)																	
		1958	DETROIT RIVER SZ	(REFER TO ABANDONED FIELDS)																	
HAMILTON	CLARE	1952	RICHFIELD	5145	12	D	42.2	RICHFIELD	5395	45	0	0	28	0	358,506	3,429,027	1800	1,905	481	0	481
		1940	DUNDEE	(REFER TO ABANDONED FIELDS)																	
HANOVER	JACKSON	1959	TRENTON-BLACK RIVER	4012	120+	D	43.0	PRAIRIE DU CHIEN	4604	10	2	0	10	0	169,469	750,279	180	4,168	553	25	578
HARRISON	CLARE	1945	DUNDEE	4190	13	L	39.7	SYLVANIA	5633	2	0	0	2	0	2,918	136,327	80	1,704	0	11	11
HEADQUARTERS	CLARE-ROSCOMMON	1941	TRAVERSE	3356	5	L	42.3	BOIS BLANC	5929	47	0	0	6	3			1400		600	2	602
		1958	DUNDEE	3899	12		39.9			1	0	0	1	0			10		0	1	1
		1942	DETROIT RIVER SZ	4946	13	D	43.7														
		1952	RICHFIELD	5147	23	D	42.6			60	0	0	56	3	107,030	9,788,379	2320	2,624	3	14	17
													The 56 wells include 18 Richfield, 28 Sour Zone and 10 Richfield and Sour Zone.								
HEATH	ALLEGAN	1948	TRAVERSE	1498	2	L	38.0	SALINA	2716	25	0	0	8	0	2,445	199,590	270	739	0	9	9
HESSEN	ST. CLAIR	1965	NIAGARAN	2499	261	D	43	NIAGARAN	2887	9	9	0	9	6	4,850	4,850	360	13	5	0	5
HILLIARDS	ALLEGAN	1960	SALINA	GAS RESERVOIR PRODUCING SMALL QUANTITIES OF OIL.											957	5,816					
HOME, SEC. 26	MONTCALM	1964	TRAVERSE	3096	10	L	45.3	REED CITY	3618	1	0	0	1	0	230	531	10	53	0	2	2
HOPE	BARRY	1939	TRAVERSE	1869	3	L	37.6	PRAIRIE DU CHIEN	4944	66	0	0	40	1	13,023	560,038	650	862	0	7	7
HOPKINS, SOUTH	ALLEGAN	1948	TRAVERSE	1538	3	L	38.0	TRAVERSE	1611	35	0	0	2	0	712	264,445	330	801	0	7	7
HOPKINS, WEST	ALLEGAN	1956	SALINA	2755	7	D	17.9	CLINTON	3140	2	1	0	1	1	0	0	20				
HUBER	NEWAYGO	1955	TRAVERSE	2109	2	L	41.3	REED CITY	2730	13	0	1	7	1	4,943	538,672	260	2,072	530	0	530
ISABELLA	ISABELLA	1948	DUNDEE	3783	9	D	46.9	DETROIT RIVER	3993	20	0	0	2	1	794	821,120	370	2,219	0	0	0
JEFFERSON	CASS	1961	TRAVERSE	710	3	L	32.0	PRAIRIE DU CHIEN	2603	20	0	1	10	3	5,230	91,371	400	228	460	0	460
JEROME	MIDLAND	1947	DUNDEE	3763	10	L	39.0	DETROIT RIVER	4001	12	0	0	3	0	3,156	220,885	260	850	0	0	0
JOHNSTOWN	BARRY	1951	TRAVERSE	1870	2	L	37.0	TRAVERSE	1899	5	0	0	2	0	1,217	24,165	50	483	0	0	0
KAWKAWLIN	BAY	1938	DUNDEE	2830	45	L	35.0	ST. PETER Ss.	10,477	320	1RW	1	297	3			6400		1,030	24	1,054
		1939	DETROIT RIVER	3515	5	D	42.0			7	0	0	6	1			280		0	1	1
		1941	BEREA	1505	4	S	38.0			4	0	0	4	0	251,805	12,982,078	40	1,932	0	0	0
KIMBALL LAKE	NEWAYGO	1947	TRAVERSE	2332	6	L	43.0	ST. PETER Ss.	6689	106	0	0	3	0			2120		0	1,680	1,680
		1955	REED CITY	2852	37	?	39.2			1	0	0	1	1	1,041	6,218,449	20	2,906			
LAKEFIELD	SAGINAW	1937	DUNDEE	3185	12	L	39.0	DUNDEE	3197	1	0	0	1	0	807	24,111	10	2,411	0	0	0
LAKETON	MUSKEGON	1965	TRAVERSE	1698	4	L	41.4	REED CITY	2199	1	1	0	1	1	0	0	10				
LAKEVIEW	MONTCALM	1961	TRAVERSE	2941	4	L	42.5	REED CITY	3495	2	0	0	2	0	569	5,183	20	259	0	0	0
LAKE GEORGE	CLARE	1954	DUNDEE	3968	2	L	43.8	DUNDEE	3997	10	0	0	7	2	7,641	329,973	100	3,230	310	0	310
LAWTON	VAN BUREN	1939	TRAVERSE	1140	1	L	37.5	TRENTON	2775	65	0	0	11	0	2,211	203,754	650	313	22	2	24
LEATON	ISABELLA	1929	DUNDEE	3657	7.5	L	43.0	DETROIT RIVER	4390	40	0	0	2	0	4,774	1,733,975	500	3,468	125	0	125
LENOX	MACOMB	1960	SALINA-NIAGARAN	(GAS STORAGE RESERVOIR PRODUCING SMALL QUANTITY OF OIL)											102	2,565					
LEROY	OSCEOLA	1965	REED CITY	3796	4	D		REED CITY	3800	2	2	0	2	0	1,265	1,265	80	16	0	0	0
LIME LAKE	HILLSDALE	1960	PRAIRIE DU CHIEN	3461	5	D	44.6	PRAIRIE DU CHIEN	3533	1	0	1	0	(Abandoned 1965)	228	7,842	20	392			
LINCOLN, SEC. 18	ARENAC	1957	TRAVERSE	2717	1	L		DUNDEE	3062	2	0	0	2	0	0	0	20		0	0	0
LINCOLN, SEC. 31	ARENAC	1963	DUNDEE	2942	10	D	34.9	DUNDEE	2986	1	0	0	1	0	403	1,976	10	198	0	30	30
LUCHT	BAY	1949	TRAVERSE	2230	3	L	37.2	DUNDEE	3240	5	0	0	1	0	1,109	188,317	50	3,766	0	0	0
LUTHER	LAKE	1965	TRAVERSE	2565	2	L	42.0	REED CITY	3362	1	1	0	1	0	13,366	13,366	20	668	0	0	0
McBAIN	MISSAUKEE	1959	DUNDEE	3969	15	L	45.0	DUNDEE	3973	24	0	0	24	1	204,277	2,137,882	920	2,324	6,465	2	6,467
MACON CREEK	LENAWEE	1961	TRENTON-BLACK RIVER	2548	36+	D		TRENTON-BLACK RIVER	3303	1	0	0	1	0	292	483	40	12	0	12	12

TABLE 4.—MICHIGAN OIL FIELDS, 1965 Continued (Sheet 5 of 7)

MARATHON	LAPEER	1955	BEREA	1449	18	S		BEREA	1467	4	0	0	4	4	0	186	40	5			
MARINE CITY	ST. CLAIR	1955	SALINA-NIAGARAN	2176	21	D	38.0	CLINTON	2428	18	0	2	15	3	30,203	193,621	660	293	92	0	92
MARINE CITY, SOUTH	ST. CLAIR	1962	SALINA-NIAGARAN	2100	4	D	38.7	NIAGARAN	2251	8	1	1	7	0	18,523	34,069	320	106	3	0	3
MEDINA	LENAWEE	1961	TRENTON-BLACK RIVER	2921	18	D	40	PRAIRIE DU CHIEN	3487	1	0	0	1	1	0	4,249	40	106			
MILLS, SEC. 1	MIDLAND	1957	DUNDEE	3450	2			DUNDEE	3463	1	0	0	1	0	534	6,379	10	638	0	3	3
MINERAL SPRINGS	OSCEOLA	1951	DUNDEE	3854	7	D	44.5	DETROIT RIVER	3963	12	0	0	3	0	3,083	291,974	240	1,216	160	2	162
MIO	OGEMAW-OSCODA	1946	RICHFIELD	4219	6	D	32.9	CLINTON	8544	4	0	0	2	0	1,681	46,148	160	288	0	0	0
MOFFATT, SEC. 34	ARENAC	1964	TRAVERSE	2100	4	D		DUNDEE	3027	1	0	0	1	1	0	357	10	36			
		1953	DUNDEE	(REFER TO ABANDONED FIELDS)																	
MONTEREY	ALLEGAN	1938	TRAVERSE	1618	3	L	37.6	CINCINNATIAN	3266	99	0	0	11	0	3,306	994,183	1030	965	0	8	8
MT. CLEMENS	MACOMB	1961	SALINA	2590	18	D		CAMBRIAN ?	4695	1	0	0	1	1	0	65	10	7			
MT. FOREST	BAY	1947	DUNDEE	3025	9	D	34.1	RICHFIELD	4305	37	0	0	26	3			960		0	7	7
		1952	TRAVERSE	2124 2224	2 3	L L	36.2			4	0	0	2	0	14,826	797,136	80	766	7	0	7
MT. PLEASANT	ISABELLA	1928	DUNDEE	3545	15	L	41.8	SYLVANIA	4821	485	0	0	144	11	102,586	26,992,839	5710	4,727	777	45	822
													The 144 wells include 139 Dundee, 1 Traverse and 4 Dundee and Traverse								
MUSKEGON	MUSKEGON	1928	TRAVERSE	1700	3.5	L	37.4	ST. PETER	4754	?	1	1	19	0	6,671	6,988,424	3170	2,205	23	300	323
NELLSVILLE	ROSCOMMON	1956	RICHFIELD	4932	17		42.2	DETROIT RIVER	4165	1	0	0	1	0			40		0	0	0
		1957	DUNDEE	3710	6		40.3			1	0	0	1	1	655	26,070	10	521			
NEW RICHMOND	ALLEGAN	1965	TRAVERSE	1364	1	L		TRAVERSE	1365	1	1	0	1	1	0	0	10				
NORTHVILLE	WASHTENAW-WAYNE-OAKLAND	1954	TRENTON-BLACK RIVER	4395	2+	D	39.8	CAMBRO-ORDOVICIAN	5850	20	0	0	16	2					0	232	232
													The 16 wells include gas wells producing some oil.								
		1960	NIAGARAN	3515	25	D	42.5			1	0	0	1	0	49,606	870,122	2828	308	0	1	1
OTISVILLE	GENESEE	1941	TRAVERSE	(REFER TO ABANDONED FIELDS)																	
		1944	DUNDEE	2450	3	L	37.0	DUNDEE	2674	5	0	0	2	0			40		0	1	1
		1945	BEREA	1500	3	S	35.5			9	0	0	5	1	2,209	99,026	110	660	12	0	12
OTTO, SEC. 32	OCEANA	1950	"BEREA"	1445	1	L		TRAVERSE	1895	1	0	0	1	0	0	3,940	10	394	0	0	0
OVERISEL	ALLEGAN	1938	TRAVERSE	1478	3	L	42.1	TRENTON	4060	164	0	1	29	2	10,966	2,878,955	1770	1,627	50	17	67
OXBOW	MASON	1958	TRAVERSE	1652	1	L	35.4	TRAVERSE	1660	3	0	0	3	0	3,689	76,040	30	2,535	52	0	52
PARIS	MECOSTA	1949	TRAVERSE	2890	10	D	43.6	REED CITY	3545	22	0	1	16	0	15,893	1,161,400	440	2,640	710	0	710
PAW PAW	VAN BUREN	1963	TRAVERSE	1096	2	L	41.4	TRAVERSE	1098	7	0	1	4	0	1,800	17,771	140	127	25	0	25
PAW PAW, SEC. 33	VAN BUREN	1964	TRAVERSE	1028	1	L	38.0	TRAVERSE	1032	1	0	0	1	1	0	0	10				
PENTWATER	OCEANA	1948	DUNDEE	2088	10	D	43.1	PRAIRIE DU CHIEN	5383								2000				
		1948	TRAVERSE	1585	8	L	40.4			143	0	32	60	20	50,582	6,421,546	1400	1,883	1,926	1	1,927
													The 60 wells include 19 Traverse, 16 Dundee and 25 Traverse and Dundee.								
PETERS	ST. CLAIR	1957	SALINA-NIAGARAN	2615	2+	D	39.0	CLINTON	2862	86	1	0	81	5	325,981	2,859,871	1720	1,663	740	0	740
PETERS, EAST	ST. CLAIR	1961	SALINA-NIAGARAN	2590	17	D	41.6	CLINTON	2134	9	0	0	8	1	24,339	161,128	320	504	45	38	83
PINCONNING	BAY	1944	DUNDEE	2898	7	D	36.2	DETROIT RIVER	3790	12	0	0	2	0	5,423	840,816	100	8,408	200	1	201
		1958	TRAVERSE	(REFER TO ABANDONED FIELDS)																	
PIPESTONE	BERRIEN	1962	TRAVERSE	822	2	L	22.4	NIAGARAN	1353	2	0	1	1	0	0	0	20		0	1	1
POLKTON	OTTAWA	1942	TRAVERSE	1878	2	L	37.8	DUNDEE	2351	13	1	0	6	1	4,313	50,662	170	298	0	2	2
PORTER	MIDLAND	1933	DUNDEE	3415	12	L	40.6	BLACK RIVER	9519	529	0	2	154	16	162,657	48,427,149	6690	7,239	8,672	13	8,685
													The 154 wells include 146 Dundee, 2 Traverse and 6 Dundee and Traverse.								
PROSPER	MISSAUKEE	1942	DUNDEE	3837	4	L	43.2	RICHFIELD	5254	13	0	1	7	1	13,956	1,662,852	520	3,198	2,750	0	2,750
		1954	RICHFIELD	(REFER TO ABANDONED FIELDS)																	
PULLMAN, EAST	ALLEGAN	1949	TRAVERSE	1131	2	L	39.0	TRENTON	3020	25	0	0	13	0	5,080	358,813	250	1,435	175	3	178
PUTTYGUT	ST. CLAIR	1960	SALINA-NIAGARAN	(REFER TO GAS FIELDS - OIL PRODUCTION COMBINED WITH ADAIR)																	
RAVENNA	MUSKEGON	1952	TRAVERSE	1842	15	L		DETROIT RIVER	2601	37	0	1	7	1	3,123	454,391	730	622	0	7	7