TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ◐ ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
●	LEE, SOUTH	ALLEGAN	1949	TRAVERSE	1171	1 L		TRENTON	2960	12	ABANDONED 1953					91,117			120	759			
		LEE TWP., 1N-15W, SECTION 31 CASCO TWP., 1N-16W, SECTION 36																					
⊕	LENOX	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
☼	LEONARD	OAKLAND	1963	NIAGARAN	4245	21 D		CLINTON	4450	4	2	0	4	4			0	0	160				
		ADDISON TWP., 5N-11E, SECTION 15																					
●	LEROY	OSCEOLA	1965	REED CITY	3796	4 D		REED CITY	3800	2	0	0	2		4,010	22,989			80	287			
		LEROY TWP., 19N-10W, SECTION 27																					
◐	LIME LAKE	HILLSDALE	1960	PRAIRIE DU CHIEN	3461	5 D	44.6	PRAIRIE DU CHIEN	3533	1	ABANDONED 1965					7,842			20	392			
		WRIGHT TWP., 8S-1W, SECTION 11																					
●	LINCOLN, SEC. 18	ARENAC	1957	TRAVERSE	2717	1 L		DUNDEE	3062	2	0	0	2		331	COMBINED WITH SECTION 31 PRODUCTION			20		0	1	1
		LINCOLN TWP., 18N-4E, SECTION 18																					
◐	LINCOLN, SEC. 31	ARENAC	1963	DUNDEE	2942	10 D	34.9	DUNDEE	2986	1	ABANDONED 1968					2,706			10	271			
		LINCOLN TWP., 18N-4E, SECTION 31																					
☼	LOGAN	MASON	1941	RICHFIELD	3260	5 S		RICHFIELD	3330	2	0	0	2	2		228		13,289	80				
		LOGAN TWP., 17N-15W, SECTIONS 9, 16																					
☼	LOGAN	OGEMAW	1949	WEIR	1230	11 S		RICHFIELD	4537	PRODUCTION COMBINED WITH BEREA													
☼			1944	BEREA	1420	6 S				16	0	0	14	4			144,442	807,995	2240				
		LOGAN TWP., 22N-4E, SECTIONS 16, 17, 18, 20, 23, 25 CHURCHILL TWP., 22N-3E, SECTIONS 1, 12																					
●	LUCHT	BAY	1949	TRAVERSE	2230	3 L	37.2	DUNDEE	3240	5	0	0	1		778	191,880			50	3,838			
		PINCONNING TWP., 17N-4E, SECTION 29																					
●	LUTHER	LAKE	1965	TRAVERSE	2565	2 L	42.0	REED CITY	3362	1	0	0	1	1	218	27,716			20	1,386			
		NEWKIRK TWP., 19N-12W, SECTION 14																					
☼	LYNDON	WASHTENAW-LIVINGSTON	1958	TRAVERSE	1311	6 D		TRENTON	4702	6	0	0	6	4			0	375,600	960		DOMESTIC USE		
☼			1959	DETROIT RIVER	1733	11 D				PRODUCTION COMBINED WITH TRAVERSE													
		LYNDON TWP., 1S-3E, SECTIONS 6, 7 UNADILLA TWP., 1N-3E, SECTION 31																					
●	MACON CREEK	LENAWEE	1961	TRENTON-BLACK RIVER	2548	36+ D		TRENTON-BLACK RIVER	3303	1	0	0	1		0	783			40	20			
		MACON TWP., 5S-5E, SECTION 23																					
◐	MANISTEE	MANISTEE	1959	SALINA	3616	94 D		NIAGARAN	4165	1	ABANDONED 1961							0	160				
		FILER TWP., 21N-17W, SECTION 24																					
☼	MAPLE VALLEY, SEC. 16	MONTCALM	1958	MICHIGAN STRAY	1120	5 S		REED CITY	3365	1	0	0	1					0	160		DOMESTIC USE		
		MAPLE VALLEY TWP., 11N-9W, SECTION 16																					
●	MARATHON	LAPEER	1955	BEREA	1449	18 S		DETROIT RIVER	3090	4	0	0	4	3	0	186			40	5			
●			1969	DETROIT RIVER SZ	3013	47 D				2	2	0	2	1	2,524	2,524			120	21	0	4	4
		MARATHON TWP., 9N-9E, SECTIONS 16, 21																					
●	MARINE CITY	ST. CLAIR	1955	SALINA-NIAGARAN	2176	21 D	38.0	CLINTON	2428	18	0	0	14	3	21,665	298,865	311,319	3,376,786	660	453	94	0	94
		COTTRELLVILLE TWP., 3N-16E, SECTIONS 2, 3, 10, 11, 15																					
●	MARINE CITY, SOUTH	ST. CLAIR	1962	SALINA-NIAGARAN	2100	4 D	38.7	NIAGARAN	2251	12	2	0	11	4	12,514	89,269			480	186	7	0	7
☼			1962	SALINA A-1 CARB.	2100	4 D											21,403	665,470					
		COTTRELLVILLE TWP., 3N-16E, SECTIONS 23, 26, 27																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ◐ ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
⊕	MARION (WINTERFIELD)	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	MARNE	OTTAWA	1940	"BEREA"	1170	3 L		TRAVERSE	1904	2	ABANDONED 1946					6,253			20	313			
		TALLMADGE TWP., 7N-13W, SECTION 5 WRIGHT TWP., 8N-13W, SECTION 32																					
☼	MARSAC CREEK	ST. CLAIR	1965	SALINA-NIAGARAN	2450	190 D		CLINTON	2903	5	0	0	5	2	0	1,681	548,942	1,948,792	200	8	10	0	10
		CASCO TWP., 4N-15E, SECTIONS 29, 30						ONE WELL PRODUCING OIL AND GAS															
●	MARTIN	ALLEGAN	1948	TRAVERSE	1617	1 L	36.0	ST. PETER Ss	4290	2	ABANDONED 1960					2,188			20	109			
		MARTIN TWP., 2N-11W, SECTION 18																					
☼	MARTINY	MECOSTA	1934	MICHIGAN STRAY	1370	2 S		DETROIT RIVER	3807	5	0	0	4				23,712	1,164,319	680				
		MARTINY TWP., 15N-8W, SECTIONS 12, 22, 23																					
●	MCBAIN	MISSAUKEE	1959	DUNDEE	3969	15 L	45.0	DUNDEE	3973	24	0	0	23	1	112,171	2,694,784			920	2,929	6,081	0	6,081
		RIVERSIDE TWP., 21N-7W, SECTIONS 19, 20, 30 RICHLAND TWP., 21N-8W, SECTION 24																					
☼	MCKAY	CLARE	1929	MICHIGAN STRAY	1400	3 S		DETROIT RIVER	4055	9	0	0	2	1				712,626	360		DOMESTIC USE		
		GRANT TWP., 17N-4W, SECTION 6 SURREY TWP., 17N-5W, SECTION 1 HATTON TWP., 18N-4W, SECTION 31																					
●	MEARS	OCEANA	1951	TRAVERSE	1745	2.5 OL	36.1	REED CITY	2347	11	ABANDONED 1959					105,807			110	622			
◐			1949	DUNDEE	2210	3 L	32.2			3	ABANDONED 1959					PRODUCTION COMBINED WITH MEARS TRAVERSE							
		GOLDEN TWP., 15N-18W, SECTIONS 34, 35																					
●	MEDINA	LENAWEE	1961	TRENTON-BLACK RIVER	2921	18 D	40	PRAIRIE DU CHIEN	3487	1	0	0	1	1	0	4,324		0	40	108			
		MEDINA TWP., 8S-1E, SECTION 3								CONVERTED TO GAS WELL FOR DOMESTIC USE													
☼	MECOSTA	MECOSTA	1966	MICHIGAN STRAY	1345	10 S		DUNDEE	3709	2	0	0	2				25,471	96,853	320				
		MORTON TWP., 14N-8W, SECTION 10																					
◐	MECOSTA LAKE	MECOSTA	1953	MICHIGAN STRAY	1314	12 S		DUNDEE	3690	2	ABANDONED 1956							84,071	320				
		MORTON TWP., 14N-8W, SECTIONS 17, 20																					
☼	MIDDLE BRANCH	OSCEOLA	1964	MICHIGAN STRAY	1630	10 S		DETROIT RIVER	4283	4	0	1	2				16,598	243,130	640				
		MIDDLE BRANCH TWP., 19N-7W, SECTIONS 17, 18																					
●	MILLS, SEC. 1	MIDLAND	1957	DUNDEE	3450	2 D		DUNDEE	3463	1	0	0	1		109	7,784			10	778	0	2	2
		MILLS TWP., 16N-2E, SECTION 1																					
◐	MINERAL SPRINGS	OSCEOLA	1952	MICHIGAN STRAY	1397	3 S		DETROIT RIVER	3963	4	ABANDONED 1960							288,762	480				
●			1951	DUNDEE	3854	7 D	44.5			12	0	0	1		1,248	299,425			240	1,248	30	0	30
		SHERMAN TWP., 20N-9W, SECTIONS 16, 20, 21																					
●	MIO	OGEMAW-OSCODA	1946	RICHFIELD	4219	6 D	32.9	CLINTON	8544	4	0	0	2		1,599	52,647			160	329			
		MENTOR TWP., 25N-3E, SECTIONS 30, 32 ROSE TWP., 24N-3E, SECTIONS 3, 4																					
●	MOFFATT, SEC. 34	ARENAC	1964	TRAVERSE	2100	4 D		DUNDEE	3027	1	0	0	1	1	0	357			10	36			
◐			1953	DUNDEE	2984	4 L				1	ABANDONED 1956					8,392			10	839			
		MOFFATT TWP., 20N-3E, SECTION 34																					
☼	MONTAGUE	MUSKEGON	1953	SALINA-NIAGARAN	32342	80 D		TRENTON	4517	3	0	0	2	1				41,482	480		DOMESTIC USE		
		MONTAGUE TWP., 12N-17W, SECTION 7 WHITE RIVER TWP., 12N-18W, SECTION 12																					
●	MONTEREY	ALLEGAN	1938	TRAVERSE	1618	3 L	37.6	CINCINNATIAN	3266	99	0	0	11		2,380	1,005,931			1030	977	5	0	5
		MONTEREY TWP., 3N-13W, SECTIONS 2, 4, 8, 9, 10, 11, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 27, 32, 36																					
☼	MORTON	MECOSTA	1946	MICHIGAN STRAY	1279	2 S		DUNDEE	3691	2	0	0	1					118,377	320		DOMESTIC USE		
		MORTON TWP., 14N-8W, SECTIONS 15, 22																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
☼	MT. CLEMENS	MACOMB	1961	SALINA	2590	18 D		CAMBRIAN ?	4695	1	0	0	1			65		0	40	2	DOMESTIC USE		
		MACOMB TWP., 3N-13E, SECTION 34			ORIGINALLY OIL WELL CONVERTED TO A DOMESTIC GAS WELL 1967																		
●	MT. FOREST	BAY	1952	TRAVERSE	2124 2224	2 L 3 L	36.2	RICHFIELD	4305	4	0	0	2						80		20	1	21
●			1947	DUNDEE	3025	9 D	34.1			37	0	0	26	1	10,151	845,719			960	813	0	8	8
		PINCONNING TWP., 17N-4E, SECTIONS 18, 19 MT. FOREST TWP., 17N-3E, SECTIONS 13, 24																					
●	MT. FOREST, SEC. 1	BAY	1946	DUNDEE	2960	2 L		DUNDEE	3057	1	ABANDONED 1946					1,906			10	191			
		MT. FOREST TWP., 17N-3E, SECTION 1																					
●	MT. HALEY	MIDLAND	1934	DUNDEE	3477	3 D	39.6	DUNDEE	3500	1	ABANDONED 1947					36,069			10	3,607			
		MT. HALEY TWP., 13N-1E, SECTION 28																					
●	MT. PLEASANT	ISABELLA-MIDLAND	1928	DUNDEE	3545	15 L	41.8	SYLVANIA	4821	485	0	0	144	9	93,891	27,381,442		7,809,323	5710	4,795	1,026	49	1,075
		GREENDALE TWP., 14N-2W, SECTIONS 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19; LEE TWP., 14N-1W, SECTIONS 7, 8, 18 THE 144 WELLS INCLUDE 139 DUNDEE, 1 TRAVERSE AND 4 DUNDEE & TRAVERSE																					
		CHIPPEWA TWP., 14N-3W, SECTIONS 1, 2, 3, 4, 11, 12, 13 DENVER TWP., 15N-3W, SECTIONS 28, 33, 34																					
☼	MUSKEGON	MUSKEGON	1927	TRAVERSE-DUNDEE-DETROIT RIVER	1640 2025	6 L		ST. PETER Ss	4754	---	0	0	2					7,237,438	1520	DOMESTIC USE & LEASE FUEL			
		MUSKEGON TWP., 10N-16W, SECTIONS 4, 5, 6, 7, 8, 9, 15, 22 LAKETON TWP., 10N-17W, SECTION 12																					
●	MUSKEGON	MUSKEGON	1928	TRAVERSE & DUNDEE	1700	3.5 L	37.4	ST. PETER Ss	4754	---	0	0	13		2,751	7,006,076			3170	2,210	0	*211	211
		MUSKEGON TWP., 10N-16W, SECTIONS 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, 21, 22 LAKETON TWP., 10N-17W, SECTIONS 1, 11, 12, 13, 14																					
☼	MUTTONVILLE	MACOMB	1966	SALINA-NIAGARAN	2376	194 D		CLINTON	3039	7	0	0	7				1,625,028	4,855,375	280		14	0	14
		LENOX TWP., 4N-14E, SECTION 13																					
●	NELLSVILLE	ROSCOMMON	1957	DUNDEE	3710	6 D	40.3	DETROIT RIVER	5165		ABANDONED 1967					16,528			40	413			
●			1956	RICHFIELD	4932	17 D	42.2				ABANDONED 1967					10,912			10	109			
		ROSCOMMON TWP., 22N-4W, SECTIONS 8, 17																					
☼	NEWARK	GRATIOT	1948	MICHIGAN STRAY	979	5 S		DUNDEE	3255	6	ABANDONED 1968							441,757	960				
		NEW HAVEN TWP., 10N-4W, SECTIONS 23, 24, 25, 26																					
●	NEW BOSTON	WAYNE	1943	TRENTON	2635	4 L		TRENTON	2983	2	ABANDONED 1949					2,349			20	118			
		HURON TWP., 4S-9E, SECTION 18																					
●	NEW LOTHROP	SHIAWASSEE-GENESEE	1967	BEREA	1623	4 S	46	SYLVANIA	3494	13	1	1	11		17,675	39,512			260	152	5	0	5
		FLUSHING TWP., 8N-5E, SECTIONS 7, 18 HAZELTON TWP., 8N-4E, SECTIONS 1, 12																					
●	NEW RICHMOND	ALLEGAN	1965	TRAVERSE	1364	1 L		TRAVERSE	1365	1	ABANDONED 1966					104			10	10			
		MANLIUS TWP., 3N-15W, SECTION 16																					
●	NILES	BERRIEN	1940	TRAVERSE	602	7 L	21.5	TRENTON	2089	7	ABANDONED 1958					29,672			70	424			
		NILES TWP., 7S-17W, SECTIONS 1, 2, 3																					
☼	NORTH MORENCI	LENAWEE	1962	TRAVERSE	638	2 D		PRAIRIE DU CHIEN	3284	69	0	0	69	69	0	59	0	103,078	2840	FIELD SHUT IN			
		SENECA TWP., 8S-2E, SECTIONS 10, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30 MEDINA TWP., 8S-1E, SECTIONS 24, 25, 35																					
●	NORTH PORTER	CASS	1930	TRAVERSE	660	2 L	37.0	TRENTON	2382	2	ABANDONED 1953					1,424			20	71			
		PORTER TWP., 7S-13W, SECTION 32																					
☼	NORTH STAR	GRATIOT	1940	MICHIGAN STRAY	870	7 S		DUNDEE	3100	1	0	0	1				587	559,704	40				
		NORTH STAR TWP., 10N-2W, SECTION 4																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
☼	NORTHVILLE	WASHTENAW-WAYNE-OAKLAND	1948	DUNDEE	788	2 L		CAMBRO-ORDOVICIAN	5850	4	ABANDONED 1961							0	640				
☼			1937	SALINA-NIAGARAN	2905	2 D							6		FACILITY WELLS IN GAS STORAGE RESERVOIR				1200				
●			1960	NIAGARAN	3515	25 D	42.5										0	3,794,518					
●			1954	TRENTON-BLACK RIVER	4395	70 D	39.8						15	3	24,974	1,011,757	0	14,332,358	2835	357	0	*97	97
		SALEM TWP., 1S-7E, SECTIONS 1, 2; LYON TWP., 1N-7E, SECTION 36 (DUNDEE); LYON TWP., 1N-7E, SECTIONS 34, 35, 36; SALEM TWP., 1S-7E, SECTIONS 1, 2, 12; TRENTON-BLACK RIVER OIL COMBINED WITH NIAGARAN																					
		NORTHVILLE TWP., 1S-8E, SECTIONS 7, 16, 17; PLYMOUTH TWP., 1S-8E, SECTIONS 21, 22, 23, 25, 26 (SALINA-NIAGARAN AND TRENTON-BLACK RIVER)																					
⊕	NORTHVILLE	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS CONVERTED TO GAS STORAGE AND SECONDARY RECOVERY JULY 2, 1968																					
●	OLIVET	EATON	1969	TRENTON-BLACK RIVER	4450	5 D		PRAIRIE DU CHIEN	5020	1	1	0	1		340	340			20	170			
		BELLEVUE TWP., 1N-4W, SECTION 24																					
●	ONAWAY	PRESQUE ISLE	1969	NIAGARAN	2727	10 D		PRE-CAMBRIAN	5940	1	1	0	1		1,834	2,017			40	50	280	0	280
		NORTH ALLIS TWP., 35N-2E, SECTION 29																					
⊕	ORIENT	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	OTISVILLE	GENESEE-TUSCOLA	1945	BEREA	1500	3 S	35.5	DUNDEE	2694	9	0	0	5	2					100		8	0	8
●			1941	TRAVERSE	1895	2 L				1	ABANDONED 1946				PRODUCTION COMBINED WITH DUNDEE AND BEREA								
●			1944	DUNDEE	2450	3 L	37.0			5	0	0	2		2,671	109,428			40	782	1	0	1
		FOREST TWP., 9N-8E, SECTIONS 5, 6, 12 MILLINGTON TWP., 10N-8E, SECTIONS 31, 32 TRAVERSE PRODUCTION IN FOREST TWP., SECTION 5																					
●	OTSEGO	ALLEGAN	1938	TRAVERSE	1532	1 L		TRAVERSE	1600	7	1	0	1		0	2,290			110	21	0	10	10
		OTSEGO TWP., 1N-12W, SECTIONS 19, 30 TROWBRIDGE TWP., 1N-13W, SECTION 36																					
☼	OTSEGO	OTSEGO	1940	ANTRIM	1385	4 SH		DUNDEE	3944	9	0	1	3	1			14,053	375,679	840				
		BAGLEY TWP., 30N-3W, SECTIONS 21, 22, 27, 28, 34																					
●	OTSEGO, SEC. 9	ALLEGAN	1950	TRAVERSE	1456	1 L		TRAVERSE	1457	4	ABANDONED 1951					681			40	17			
		OTSEGO TWP., 1N-12W, SECTION 9						FIELD REACTIVATED AND ABANDONED IN 1958															
●	OTTO, SEC. 30	OGEANA	1958	"BEREA"	1428	9 S		TRAVERSE	1860	2	ABANDONED 1960					COMBINED WITH OTTO SECTION 32							
●			1955	TRAVERSE	1857	3 L					ABANDONED 1960					COMBINED WITH OTTO SECTION 32							
		OTTO TWP., 13N-16W, SECTIONS 19, 30																					
●	OTTO, SEC. 32	OGEANA	1950	"BEREA"	1445	1 L		TRAVERSE	1895	1	0	0	1		0	4,308			10	431			
		OTTO TWP., 13N-16W, SECTION 32																					
●	OVERISEL	ALLEGAN	1938	TRAVERSE	1478	3 L	42.1	TRENTON	4060	164	0	0	27	4	9,538	2,925,007			1770	1,653	53	12	65
		OVERISEL TWP., 4N-14W, SECTIONS 5, 8, 9, 15, 16, 21, 22, 27, 28, 34 HEATH TWP., 3N-14W, SECTIONS 3, 4, 9, 10																					
⊕	OVERISEL	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	OVERISEL, SEC. 11	ALLEGAN	1940	TRAVERSE	1553	4 L		TRAVERSE	1578	1	ABANDONED 1944					6,370			10	637			
		OVERISEL TWP., 4N-14W, SECTION 11																					
●	OXBOW	MASON	1958	TRAVERSE	1652	1 L	35.4	TRAVERSE	1660	4	0	1	2		1,581	85,247			40	2,131	22	0	22
		RIVERTON TWP., 17N-17W, SECTIONS 26, 27																					
☼	PARADISE	GRAND TRAVERSE	1965	TRAVERSE	1889	8 L		DUNDEE	1897	3	0	0	3	3			0	0	400				
		PARADISE TWP., 25N-10W, SECTIONS 9, 16																					
☼	PARIS	MECOSTA	1951	MICHIGAN STRAY	1217	5 S		REED CITY	3545	2	0	0	1				2,037	375,409	560				
●			1949	TRAVERSE	2890	10 D	43.6			22	0	0	12		12,810	1,217,714			440	2,768	512	*51	563
☼			1949	DUNDEE	3404	5 L				2	ABANDONED 1959							268,667	560				
		GREEN TWP., 16N-10W, SECTIONS 16, 21, 22, 27, 28																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION ● ACTIVE OIL FIELD OR POOL ◐ ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☒ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
☼	PARTELLO	CALHOUN	1959	SALINA A-1 CARB.	3192	30 D		TRENTON-BLACK RIVER	4905	4	0	0	4	1			458,378	1,504,256	200				
		LEE TWP., 1S-5W, SECTIONS 12, 13																					
●	PAW PAW	VAN BUREN	1963	TRAVERSE	1096	2 L	41.4	TRAVERSE	1098	8	0	0	3	2	328	20,089			160	126	5	0	5
		PAW PAW TWP., 3S-14W, SECTIONS 2, 10, 11, 15																					
●	PAW PAW, SEC. 33	VAN BUREN	1964	TRAVERSE	1028	1 L	38.0	TRAVERSE	1032	1	0	0	1	1	0	0			10				
		PAW PAW TWP., 3S-14W, SECTION 33																					
●	PEACOCK	LAKE	1966	TRAVERSE	2292	2 L	34.0	REED CITY	3047	27	15	2	25	1	193,814	247,750			1060	234	1,039	4	1,043
●			1966	REED CITY	3001	4 D				1	0	0	1		325	2,655			40	66			
		PEACOCK TWP., 19N-13W, SECTIONS 7, 8, 9, 16, 17, 18																					
◐	PECKS LAKE	OSCEOLA	1967	DUNDEE	3866	2 L		REED CITY	3854	1	0	1	0	ABANDONED 1969	0	2,885			40	72			
		EVART TWP., 17N-8W, SECTION 18																					
●	PENTWATER	OCEANA-MASON	1948	TRAVERSE	1585	8 L	40.4	PRAIRIE DU CHIEN	5383										1400				
●			1948	DUNDEE	2088	10 D	43.1			143	0	0	58	24	26,274	6,583,870	0	1,010,713	2000	1,936	2,375	1	2,376
										THE 58 WELLS INCLUDE 26 TRAVERSE, 13 DUNDEE AND 19 DUNDEE & TRAVERSE													
		WEARE TWP., 16N-17W, SECTIONS 4, 5, 6, 7, 8 PENTWATER TWP., 16N-18W, SECTIONS 1, 2, 12 SUMMIT TWP., 17N-17W, SECTION 31 SUMMIT TWP., 17N-18W, SECTIONS 26, 35, 36																					
●	PENTWATER LAKE	OCEANA	1969	TRAVERSE	1612	2 L		TRAVERSE	1651	1	1	0	1		0	0			40				
		PENTWATER TWP., 16N-18W, SECTION 26																					
●	PETERS	ST. CLAIR	1955	SALINA-NIAGARAN	2386	47 D	39.0	CLINTON	2842	89	0	0	82	13	203,112	4,093,458	829,313	12,921,924	2140	1,913	527	0	527
		CASCO TWP., 4N-15E, SECTIONS S½ 15, SE¼ 16, 22, 23, 26, 27, E½ 28, NE¼ 33, N½ 34																					
●	PETERS, EAST	ST. CLAIR	1961	SALINA-NIAGARAN	2590	17 D	41.6	CLINTON	2777	9	0	0	8	COMBINED WITH PETERS							95	0	95
		CASCO TWP., 4N-15E, SECTIONS 24, 25 CHINA TWP., 4N-16E, SECTION 19																					
◐	PINCONNING	BAY	1958	TRAVERSE	2151	1 L		DETROIT RIVER	3790	1	ABANDONED 1960				PRODUCTION COMBINED WITH PINCONNING DUNDEE								
●			1944	DUNDEE	2898	7 D	36.2			12	0	0	2		4,299	860,257			100	8,603	200	1	201
		PINCONNING TWP., 17N-4E, SECTIONS 25, 35, 36 FRASER TWP., 16N-4E, SECTION 2																					
◐	PINE	MONTCALM	1938	TRAVERSE	2836	1 L	45.0	DUNDEE	3308	2	ABANDONED 1963					105,506			20	5,275			
		PINE TWP., 11N-8W, SECTION 29																					
◐	PINE RIVER	GRATIOT	1956	TRAVERSE	2890	5 L		DUNDEE	3285	1	ABANDONED 1958					760			10	76			
◐			1942	DUNDEE	3280	2 L				2	ABANDONED 1956					13,285			90	148			
		PINE RIVER TWP., 12N-3W, SECTION 31 SEVILLE TWP., 12N-4W, SECTION 36																					
☼	PINE, SECS. 9 & 17	MONTCALM	1951	MICHIGAN STRAY	1251	1 S		DUNDEE	3469	2	0	0	2					37,272	80		DOMESTIC USE		
		PINE TWP., 11N-8W, SECTIONS 9, 17																					
☼	PIONEER	MISSAUKEE	1931	TRAVERSE	3025	5 L		DUNDEE	3583	1	0	0	1	1				0	40				
		PIONEER TWP., 24N-7W, SECTION 24																					
◐	PIPESTONE	BERRIEN	1962	TRAVERSE	822	2 L	22.4	NIAGARAN	1353	2	ABANDONED 1966					85			20				
		PIPESTONE TWP., 5S-17W, SECTION 24																					
●	POLKTON	OTTAWA	1942	TRAVERSE	1878	2 L	37.8	DUNDEE	2351	13	0	0	5	1	2,412	63,013			170	371	0	3	3
		POLKTON TWP., 8N-14W, SECTIONS 8, 9, 10, 11, 14, 15, 16																					
●	PORTER	MIDLAND	1933	DUNDEE	3415	12 L	40.6	BLACK RIVER	9519	529	0	0	132		136,780	49,003,712		4,992,995	6690	7,325	7,021	1	7,022
										THE 132 WELLS INCLUDE 128 DUNDEE, 1 TRAVERSE AND 3 DUNDEE & TRAVERSE													
		PORTER TWP., 13N-1W, SECTIONS 7, 8, 9, 10, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28 JASPER TWP., 13N-2W, SECTIONS 1, 2, 3, 11, 12 GREENDALE TWP., 14N-2W, SECTIONS 34, 35																					

MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION ● ACTIVE OIL FIELD OR POOL ◐ ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☒ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
◐	PORT HURON	ST. CLAIR	1886	DUNDEE	575	20 L		CAMBRIAN	4948	21	ABANDONED 1921				NO RECORD								
		FT. GRATIOT TWP., 7N-17E, SECTION 32																					
☼	PROSPER	MISSAUKEE	1948	MICHIGAN STRAY	1269	6 S		RICHFIELD	5254	3	0	0	2				0	152,882	480		LEASE FUEL		
		AETNA TWP., 22N-6W, SECTIONS 34, 35 CLAM UNION TWP., 21N-6W, SECTION 2																					
●	PROSPER	MISSAUKEE	1942	DUNDEE	3837	4 L	43.2	RICHFIELD	5254	13	0	0	6		13,730	1,719,285			520	3,306	2,138	0	2,138
◐			1954	RICHFIELD	5128	21 D				1	ABANDONED 1957					7,088			40	177			
		AETNA TWP., 22N-6W, SECTIONS 26, 35																					
●	PROSPER, SOUTH	MISSAUKEE	1967	DUNDEE	3798	8 D		DUNDEE	3808	7	3	0	7		113,234	193,344			280	691	325	0	325
		AETNA TWP., 22N-6W, SECTION 36 CLAM UNION TWP., 21N-6W, SECTIONS 1, 2																					
◐	PULLMAN	ALLEGAN	1949	TRAVERSE	1185	1 L		BASS ISLANDS	1942	9	ABANDONED 1951					26,840			90	298			
		CASCO TWP., 1N-16W, SECTIONS 11, 12																					
●	PULLMAN, EAST	ALLEGAN	1949	TRAVERSE	1131	2 L	39.0	TRENTON	3020	25	0	0	13	1	3,057	323,951			250	1,496	133	4	137
☒			1961	SALINA A-2 CARB.	1645	7 D				3	ABANDONED 1968							27,225	480				
		LEE TWP., 1N-15W, SECTIONS 5, 6, 7, 8 (TRAVERSE), SECTIONS 5, 6, 8 (SALINA A-2 CARB.)																					
☼	PUTTYGUT	ST. CLAIR	1960	SALINA-NIAGARAN	2423	60 D		NIAGARAN	2774	14	0	0	14	2			802,721	9,591,398	440		2	0	2
		CASCO TWP., 4N-15E, SECTIONS 11, 14, 15													(OIL PRODUCTION COMBINED WITH ADAIR)								
◐	RABBIT RIVER	ALLEGAN	1950	TRAVERSE	1655	3 L		TRAVERSE	1678	8	ABANDONED 1959					12,745			80	159			
		SALEM TWP., 4N-13W, SECTIONS 28, 29, 32, 33																					
☼	RAVENNA	MUSKEGON	1936	"BEREA"	1205	10 D		DUNDEE	2306	30	0	0	4					1,432,593	4480		DOMESTIC USE		
		RAVENNA TWP., 9N-14W, SECTIONS 4, 5, 6, 7, 8, 9, 17 SULLIVAN TWP., 9N-15W, SECTION 12 MOORLAND TWP., 10N-14W, SECTIONS 32, 33																					
●	RAVENNA	MUSKEGON	1952	TRAVERSE	1842	15 L		DETROIT RIVER	2601	37	0	0	4	4	167	458,756			730	628	TO BE ABANDONED		
		RAVENNA TWP., 9N-14W, SECTIONS 21, 27, 28, 29, 30, 31 SULLIVAN TWP., 9N-15W, SECTIONS 25, 36																					
☼	RAVENNA, SEC. 27	MUSKEGON	1953	"BEREA"	1182	6 D		DUNDEE	2500	3	0	0	2					32,243	480		DOMESTIC USE		
		RAVENNA TWP., 9N-14W, SECTIONS 22, 27, 28																					
⊕	RAY	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
☼	REDDING	CLARE	1940	MICHIGAN STRAY	1475	3 S		SYLVANIA	5462	---	0	0	5	4				36,692	160		LEASE FUEL		
		REDDING TWP., 19N-6W, SECTIONS 27, 32 FREEMAN TWP., 18N-6W, SECTION 2																					
●	REED CITY	LAKE-OSCEOLA	1941	TRAVERSE	2925	5 L	43.7	ST. PETER Ss	8917				10	5	7,974	3,634,727	0	388,638	1600	2,272	531	0	531
●			1940	DUNDEE	3490	3 L	46.3																
●			1941	REED CITY	3585	7 D	42.8	(LORCEO UNIT - SEE LAST PAGE, TABLE 4)					159		408,346	40,296,626			5320	7,575	2,081	0	2,081
●			1955	DETROIT RIVER SZ	4184	73 DL	48.2			45	0	2	28	2	94,402	1,807,410	52,769	3,427,963	1800	1,004	6	5	11
●			1954	RICHFIELD	4633	12 SL	45.8	(TWO WELLS COMMINGLED WITH SOUR ZONE)															
		LINCOLN TWP., 18N-10W, SECTIONS 17, 18, 19, 20, 29, 30, 31, 32 RICHMOND TWP., 17N-10W, SECTIONS 4, 5, 6, 7, 8, 9 PINORA TWP., 18N-11W, SECTIONS 24, 25, 36																					
⊕	REED CITY (STRAY)	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
⊕	REED CITY (LORCEO)	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	REED CITY, EAST	OSCEOLA	1947	TRAVERSE	3106	1 L	41.2	DETROIT RIVER	3840	8	0	1	3	1	6,770	378,235			80	4,728	900	0	900
		LINCOLN TWP., 18N-10W, SECTION 26																					
☒	REEDER	MISSAUKEE	1964	MICHIGAN STRAY	1385	4 S		DUNDEE	4002	3	ABANDONED 1966							0	320				
		REEDER TWP., 28N-7W, SECTION 32																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ◐ ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	*BAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
◐	REEMAN	NEWAYGO	1958	TRAVERSE	2099	1 L		TRAVERSE	2100	3	ABANDONED 1967					44,886			30	1,500			
		SHERIDAN TWP., 12N-14W, SECTION 8																					
●	REYNOLDS	MONTCALM-MECOSTA	1955	TRAVERSE	2787	4 D	39.8	BASS ISLANDS	4300	16	0	1	6	1					110		405	*70	475
●			1954	REED CITY	3343	2 D	44.3			53	0	1	20	4	51,609	4,401,362	0	408,555	2100	1,992	847	0	847
		REYNOLDS TWP., 12N-10W, SECTIONS 1, 2, 12, 13 WINFIELD TWP., 12N-9W, SECTIONS 6, 7, 8, 17, 18 AETNA TWP., 13N-10W, SECTION 36																					
●	RICH	LAPEER	1962	DETROIT RIVER SZ	3028	5 D	33.9	SYLVANIA	3267	15	0	0	15	1	68,921	329,536	40,693	133,307	600	549	2	*67	69
		RICH TWP., 10N-10E, SECTIONS 27, 28, 34																					
◐	RICHLAND	SAGINAW	1936	TRAVERSE	2739	10 L	46.0	DUNDEE	3264	1	ABANDONED 1936					1,871			10	187			
		RICHLAND TWP., 12N-2E, SECTION 31																					
☼	RICHLAND, SEC. 27	MONTCALM	1963	MICHIGAN STRAY	1247	1 S		DUNDEE	3530	1	ABANDONED 1964							0	160				
		RICHLAND TWP., 12N-5W, SECTION 27																					
☼	RICHMOND	MACOMB	1968	NIAGARAN	3195	12 D		NIAGARAN	3254	1	0	0	1	1		(SHUT-IN)			40				
		RICHMOND TWP., 5N-14E, SECTION 26																					
◐	RIDGEWAY, SEC. 1	LENAWEE	1934	TRENTON	2415	4 D		TRENTON	2491	1	ABANDONED 1962					47			10	5			
		RIDGEWAY TWP., 6S-5E, SECTION 1																					
●	RIVERSIDE	MISSAUKEE	1961	TRAVERSE	3220	2 L	42.6	DUNDEE	3953	1	0	0	1		1,551	15,675			10	1,568	0	*10	10
●			1942	DUNDEE	3944	3 L	44.5			3	0	0	3		2,505	115,495			100	1,155	300	0	300
		RIVERSIDE TWP., 21N-7W, SECTIONS 14, 23, 24																					
⊕	RIVERSIDE	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	RIVERTON	MASON	1957	TRAVERSE	1650	6 L	38.5	DUNDEE	2317	19	0	0	3		381	242,065			190	1,274	70	0	70
		RIVERTON TWP., 17N-17W, SECTIONS 10, 11, 15																					
●	RIVERTON, SEC. 21	MASON	1964	TRAVERSE	1683	4 L	38.2	DUNDEE	2290	3	0	0	3		1,398	11,436			30	381	0	7	7
		RIVERTON TWP., 17N-17W, SECTION 21																					
●	ROBINSON, SEC. 3	OTTAWA	1956	DUNDEE	2107	7 L		DUNDEE	2210	2	0	0	1		445	10,630			20	532			
		ROBINSON TWP., 7N-15W, SECTION 3																					
●	ROCKFORD	KENT	1945	TRAVERSE	2204	3 L	44.0	DETROIT RIVER	2850	23	0	2	3		5,844	530,654			210	2,499	540	0	540
		ALGOMA TWP., 9N-11W, SECTIONS 25, 35, 36 COURTLAND TWP., 9N-10W, SECTION 19																					
☼	ROMEO	MACOMB	1965	NIAGARAN	3290	? D		CLINTON	3686	1	0	0	1				625,360	625,360	40				
		WASHINGTON TWP., 4N-12E, SECTION 11																					
☼	ROMULUS	WAYNE	1955	SALINA A-1 CARB.	1980	20 D		NIAGARAN	2259	2	0	0	1	1		(SHUT-IN)		45,045	320				
		ROMULUS TWP., 3S-9E, SECTIONS 15, 16																					
●	ROSEBUSH	ISABELLA	1933	DUNDEE	3690	6 L	42.0	RICHFIELD	4838	45	2	0	37	3	42,078	2,085,106			1000	1,931	335	16	351
●			1969	RICHFIELD	4790	4 D		(Two wells commingled with Dundee)											80				
		ISABELLA TWP., 15N-4W, SECTIONS 1, 2, 11, 12, 13 DENVER TWP., 15N-3W, SECTIONS 7, 18 VERNON TWP., 16N-4W, SECTION 36																					
●	ROSE CITY	OGEMAW	1942	RICHFIELD	4125	9 D	41.2	CAMBRIAN	12996	131	0	0	77	2	98,920	5,260,537	294,311	7,137,237	5120	1,027	0	66	66
		FOSTER TWP., 24N-1E, SECTIONS 14, 20, 21, 23, 24, 25; FOSTER TWP., 24N-2E, SECTIONS 19, 20, 21, 28, 29, 30, 31, 32, 33; ROSE TWP., 24N-2E, SECTIONS 27, 34, 35; KLACKING TWP., 23N-2E, SECTIONS 2, 3, 11																					
●	ROSE LAKE	OSCEOLA	1943	TRAVERSE	3140	5 L	45.5	DETROIT RIVER	3990	18	0	0	6		21,263	1,760,563			720	2,445	595	0	595
		ROSE LAKE TWP., 19N-9W, SECTION 31 LEROY TWP., 19N-10W, SECTION 36 CEDAR TWP., 18N-9W, SECTION 6 LINCOLN TWP., 18N-10W, SECTION 1																					
●	SAGINAW	SAGINAW	1925	BEREA	1825	16 S	46.1	SYLVANIA	3920	---	0	0	13	1	4,968	1,664,679			1500	1,110	0	11	11
		SAGINAW TWP., 12N-4E, SECTIONS 10, 11, 12, 13, 14, 15, 24																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ◐ ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	*BAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
●	SALEM	ALLEGAN-OTTAWA	1937	TRAVERSE	1583	8 L	38.3	TRENTON	4347	337	0	1	96	3	36,733	9,022,195			3390	2,661	135	17	152
☼			1958	DETROIT RIVER	1969	6 D																	
●			1937	SALINA	2725	2 D				3	ABANDONED 1966							49,582	320				
		SALEM TWP., 4N-13W, SECTIONS 16, 21 (Detroit River); SALEM TWP., 4N-13W, SECTIONS 1, 2, 3, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 34; JAMESTOWN TWP., 5N-13W, SECTIONS 35, 36																					
⊕	SALEM	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	SANFORD	MIDLAND	1959	TRAVERSE	3125	2 L		DETROIT RIVER	4811	13	0	0	13	1	4,704	183,573			260	706	0	*5	5
●			1951	DUNDEE	3755	3 L	42.6			THE 13 WELLS INCLUDE 10 DUNDEE, 1 TRAVERSE AND 2 DUNDEE & TRAVERSE													
		JEROME TWP., 15N-1W, SECTIONS 12, 13																					
●	SAUBLE	LAKE	1942	TRAVERSE	2111	2 L	35.6	TRAVERSE	2156	5	0	0	2		165	144,447			200	722	1,000	0	1,000
		SAUBLE TWP., 19N-14W, SECTION 16																					
●	SCOTTVILLE	MASON	1961	TRAVERSE	1646	3 L	34.6	CINCINNATIAN	5129	17	0	0	7						340		610	0	610
●			1962	REED CITY	2319	3 L	37.2			11	0	2	6		18,683	477,277			220	852	10	0	10
		AMBER TWP., 18N-17W, SECTIONS 13, 14, 23																					
☼	SEARS	OSCEOLA	1964	MICHIGAN STRAY	1492	12 S		DUNDEE	3988	1	ABANDONED 1965							0	160				
		SYLVAN TWP., 18N-7W, SECTION 32																					
◐	SECORD	GLADWIN	1937	DUNDEE	3437	5 L	38.0	DUNDEE	3500	2	ABANDONED 1941					12,024			20	601			
		SECORD TWP., 19N-1E, SECTIONS 11, 12																					
⊕	SHAVER (Summer New Haven)	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	SHELBY	OCEANA	1951	TRAVERSE	1743	3 L	43.0	DUNDEE	2234	20	0	2	4	4	160	227,827			350	650			
		BENONA TWP., 14N-18W, SECTION 18 BENONA TWP., 14N-19W, SECTION 13																					
☼	SHERIDAN	MECOSTA	1935	MICHIGAN STRAY	1375	2 S		DUNDEE	3904	5	0	0	1					271,374	480		DOMESTIC USE		
		SHERIDAN TWP., 15N-7W, SECTIONS 13, 14																					
◐	SHERIDAN, SEC. 25	NEWAYGO	1951	TRAVERSE	2204	1 L		TRAVERSE	2205	1	ABANDONED 1955					628			10	63			
		SHERIDAN TWP., 12N-14W, SECTION 25																					
●	SHERMAN	ISABELLA	1936	DUNDEE	3650	4 D	42.0	SYLVANIA	4994	88	0	0	5	1	5,496	4,720,683		641,217	1020	4,628	235	0	235
		SHERMAN TWP., 15N-6W, SECTIONS 29, 32, 33, 34 BROOMFIELD TWP., 14N-6W, SECTIONS 3, 4, 5																					
◐	SHERMAN, SEC. 18	ISABELLA	1939	TRAVERSE	3217	4 L		DUNDEE	3835	3	ABANDONED 1947					1,364			20	68			
		SHERMAN TWP., 15N-6W, SECTION 18																					
⊕	SIX LAKES	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	SKEELS	CLARE-GLADWIN	1955	TRAVERSE	3102	6 L	38.4	SYLVANIA	6016	4	0	0	2	1	652	43,230			40	1,081	5	0	5
●			1950	DUNDEE	3840	7 D	39.6			5	0	0	4	1	6,191	958,139			50	19,163	250	0	250
●			1942	DETROIT RIVER SZ	4844	4 D	47.4			31	0	0	26	6	25,742	1,109,884			40	867	0	12	12
●			1953	RICHFIELD	5080	17 D	44.8			THE 26 WELLS INCLUDE 17 RICHFIELD, 5 SOUR ZONE & 4 RICHFIELD & SOUR ZONE									1240				
		SHERMAN TWP., 20N-2W, SECTIONS 30, 31 FRANKLIN TWP., 20N-3W, SECTIONS 25, 36																					
☼	SOUTH BOARDMAN	GRAND TRAVERSE	1969	NIAGARAN	6779	50 D	57.9 Condens.	NIAGARAN	6922	1	1	0	1	1	0	0	0	0	640				
		UNION TWP., 26N-9W, SECTION 12								SHUT-IN WAITING FOR MARKETING FACILITIES													
☼	SOUTH BRANCH	CRAWFORD	1968	RICHFIELD	4203	12 D		DETROIT RIVER	4436	1	0	0	1	1		(SHUT-IN)			40				
		SOUTH BRANCH TWP., 25N-1W, SECTION 32																					
●	SPRINGPORT	JACKSON	1960	TRENTON-BLACK RIVER	4696	12+ D	46.5	PRAIRIE DU CHIEN	5250	2	0	0	1	1	0	3,430			80	43	TO BE ABANDONED		
		SPRINGPORT TWP., 1S-3W, SECTIONS 11, 14																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
●	ST. CHARLES	SAGINAW	1957	TRAVERSE	2305	3 L	51.6	TRAVERSE	2308	1	ABANDONED 1967					13,250			10	1,325			
		ST. CHARLES TWP., 10N-3E, SECTION 26																					
☼	ST. CLAIR, SEC. 18	ST. CLAIR	1953	SALINA-NIAGARAN	3567	2 D		CINCINNATIAN	3240	1	ABANDONED 1961						16,101	160					
		ST. CLAIR TWP., 5N-17E, SECTION 18																					
●	ST. HELEN	ROSCOMMON	1941	RICHFIELD	4180	11 D	43.3	SALINA	5440	99	0	0	54	11	93,176	4,009,670	268,262	8,986,922	3960	1,013	57	0	57
		AU SABLE TWP., 24N-1W, SECTIONS 10, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32																					
●	ST. MARY'S LAKE	MASON	1968	TRAVERSE	1641	3 L		TRAVERSE	1644	2	1	0	2		6,379	8,035			40	201	0	*12	12
		RIVERTON TWP., 17N-17W, SECTION 35																					
●	STANDISH	ARENAC	1948	RICHFIELD	4108	3 D	35.4	RICHFIELD	4210	9	ABANDONED 1967					147,062			360	409			
		LINCOLN TWP., 18N-4E, SECTIONS 10, 11, 15																					
●	STANTON	MONTCALM	1951	TRAVERSE	2916	7 DL	43.0	DUNDEE	3492	17	0	0	11	3	12,669	921,059			340	2,709	390	0	390
		DOUGLASS TWP., 11N-7W, SECTIONS 26, 27, 34, 35																					
●	STARRVILLE	ST. CLAIR	1967	NIAGARAN	2336	5 D		NIAGARAN	2396	3	0	0	3		28,475	62,915			120	524	0	*10	10
		COTTRELLVILLE TWP., 3N-16E, SECTION 9																					
●	STERLING	ARENAC	1948	TRAVERSE	1970	5 L	36.2	RICHFIELD	4285	22	0	0	16		5,828	249,826			220	1,136	6	3	9
●			1947	DUNDEE	2872	17 L	33.6			20	0	0	19	1	11,659	382,865			200	1,914	4	11	15
●			1952	DETROIT RIVER SZ	3918	5 D	41.1	}		41	0	0	36	4	47,275	1,531,227			1600	957	0	0	0
●			1950	RICHFIELD	5153	8 D	37.6	}		THE 36 WELLS INCLUDE 13 RICHFIELD, 13 SOUR ZONE AND 10 RICHFIELD & SOUR ZONE														
		DEEP RIVER TWP., 19N-4E, SECTIONS 9, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23																					
●	STONY LAKE	OCEANA	1949	"BEREA"	930	1 SL	48.0	NIAGARAN	3837	2	ABANDONED 1965				PRODUCTION COMBINED WITH STONY LAKE TRAVERSE								
●			1946	TRAVERSE	1630	19 L	44.9			78	0	0	15	2	6,120	7,517,999			1540	4,882	1,100	2	1,102
		CLAYBANKS TWP., 13N-18W, SECTIONS 9, 10, 11, 14, 15, 16																					
●	SUMMERFIELD	MONROE-LENAWEE	1958	TRENTON-BLACK RIVER	1940	10 DL		TRENTON-BLACK RIVER	2382	2	ABANDONED 1964					2,142			20	107			
		SUMMERFIELD TWP., 7S-6E, SECTION 30 DEERFIELD TWP., 7S-5E, SECTION 24																					
●	SUMNER	GRATIOT	1953	TRAVERSE	2853	1 L	44.5	DUNDEE	3366	35	0	1	19	7	11,683	1,060,268			350	3,029	161	0	161
		SUMNER TWP., 13N-4W, SECTIONS 11, 12																					
☼	SURREY	CLARE	1945	MICHIGAN STRAY	1460	3 S		DUNDEE	4000	---	0	0	2					12,667	320		DOMESTIC USE		
		SURREY TWP., 17N-5W, SECTIONS 23, 24																					
☼	SWAN CREEK	ST. CLAIR	1967	SALINA-NIAGARAN	2256	245 D		CLINTON	2638	1	0	0	1				114,551	154,161	40				
		CASCO TWP., 4N-15E, SECTION 36																					
☼	SYLVAN	OSCEOLA	1941	MICHIGAN STRAY	1525	10 S		DETROIT RIVER	4100	1	ABANDONED 1953												
●			1948	DUNDEE	3925	13.7 D	48.0			11	0	0	2	1	1,852	1,185,058		80,714	440	2,693	600	0	600
		SYLVAN TWP., 18N-7W, SECTION 7 (MICHIGAN STRAY); SYLVAN TWP., 18N-7W, SECTIONS 8, 9, 16 (DUNDEE)																					
☼	TAYMOUTH	SAGINAW	1957	TRAVERSE	2085	6 L		TRAVERSE	2135	1	0	0	1		90	200		0	160	1	DOMESTIC USE		
		TAYMOUTH TWP., 10N-5E, SECTION 11																					
●	TEKONSHA	CALHOUN	1959	TRENTON	3553	? DL	34.5	PRAIRIE DU CHIEN	4147	2	0	1	0		150	18,785	ABANDONED 1969		30	626			
		TEKONSHA TWP., 4S-6W, SECTION 17																					
●	THORNAPPLE, SEC. 4	BARRY	1952	TRAVERSE	1951	2 L		TRAVERSE	1973	2	ABANDONED 1961					2,716			20	136			
		THORNAPPLE TWP., 4N-10W, SECTIONS 3, 4																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
●	THOMPSON CORNERS	NEWAYGO	1968	TRAVERSE	2138	2 L		TRAVERSE	2140	1	0	0	1		2,397	6,936			40	173	30	0	30
		BEAVER TWP., 15N-14W, SECTION 30																					
●	TRENT	MUSKEGON	1949	TRAVERSE	2039	1 L		TRAVERSE	2118	2	0	1	0		0	30,771	ABANDONED 1969		40	769			
		CASNOVIA TWP., 10N-13W, SECTION 19																					
●	TROWBRIDGE	ALLEGAN	1937	TRAVERSE	1358	2 L	41.2	CINCINNATIAN	2952	162	0	2	9	3	3,079	511,237			1840	278	48	7	55
		TROWBRIDGE TWP., 1N-13W, SECTIONS 1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 27, 28, 29, 30, 31, 32 OTSEGO TWP., 1N-12W, SECTIONS 7, 18																					
☼	TURK LAKE	MONTCALM	1947	MICHIGAN STRAY	1081	4 S		DETROIT RIVER	3413	4	0	0	2					217,584	640		DOMESTIC USE		
		MONTCALM TWP., 10N-8W, SECTIONS 9, 10, 14, 15																					
●	TYRONE	KENT	1952	TRAVERSE	2379	2 L		DETROIT RIVER	2900	7	ABANDONED 1956					31,558			140	225			
		TYRONE TWP., 10N-12W, SECTIONS 10, 11, 14, 15																					
●	UNION	ISABELLA	1950	TRAVERSE	3191	2 L		DETROIT RIVER	4096	1	ABANDONED 1963					58,263		55,354	20	2,913			
		UNION TWP., 14N-4W, SECTION 20																					
☼	UNION, SEC. 6	ISABELLA	1965	MICHIGAN STRAY	1382	3 S		DUNDEE	3777	2	0	0	2	2		(SHUT-IN)		0	240				
		UNION TWP., 14N-4W, SECTION 6																					
●	VERNON	ISABELLA	1930	DUNDEE	3755	3 DL	38.6	BOIS BLANC	5118	78	0	0	3		6,156	5,038,034			890	5,661	2,250	0	2,250
		VERNON TWP., 16N-4W, SECTIONS 15, 16, 21, 22, 23, 26, 27																					
☼	VERNON	ISABELLA	1939	MICHIGAN STRAY	1300	2 S		DETROIT RIVER	3907	25	ABANDONED 1956							1,464,249	920				
		VERNON TWP., 16N-4W, SECTIONS 25, 26, 35, 36 ISABELLA TWP., 15N-4W, SECTION 1																					
●	VICTORY, SEC. 10	MASON	1957	TRAVERSE	1603	9 L	36.0	TRAVERSE	1616	1	ABANDONED 1958					580			10	58	DOMESTIC USE		
		VICTORY TWP., 19N-17W, SECTION 10			NON COMMERCIAL GAS PRODUCTION IN BASE OF GLACIAL DRIFT																		
●	VOGEL CENTER	MISSAUKEE	1966	DUNDEE	3892	3 L		DUNDEE	3895	2	0	0	2		4,420	29,937			80	374	585	0	585
		CLAM UNION TWP., 21N-6W, SECTION 32																					
●	WALKER	KENT-OTTAWA	1940	"BEREA"	1121	21 SL		ST. PETER Ss	5222														
●			1938	TRAVERSE	1872	8 L	36.0			782	0	17	402	11	132,132	16,314,803	0	3,678,731	8560	1,904	17	121	138
					THE 402 WELLS INCLUDE 397 TRAVERSE & 5 "BEREA"																		
●			1957	DETROIT RIVER	2132	12 D				1	0	0	1						10		0	1	1
☼	WALKER	KENT-OTTAWA		"BEREA", TRAVERSE & DETROIT RIVER						14	0	1	5		THE 5 WELLS INCLUDE 3 BEREA - 1 DETROIT RIVER - 1 TRAVERSE		13,417	1,260,896	DOMESTIC USE & LEASE FUEL				
		WALKER TWP., 7N-12W, SECTIONS 19, 20, 27, 28, 29, 30, 31, 32, 33, 34; WALKER TWP., 6N-12W, SECTIONS 3, 4, 5, 6; WYOMING TWP., 6N-12W, SECTIONS 2, 3, 4, 7, 8																					
		TALLMADGE TWP., 7N-13W, SECTIONS 14, 15, 22, 23, 24, 25, 26, 27, 28, 33, 34, 35, 36; TALLMADGE TWP., 6N-13W, SECTIONS 1, 12; GEORGETOWN TWP., 6N-13W, SECTIONS 1, 2; GEORGETOWN TWP., 7N-13W, SECTION 35																					
●	WAYLAND	ALLEGAN	1944	TRAVERSE	1799	6 L	36.0	TRENTON-BLACK RIVER	4400	54	0	0	3	1	498	261,312			530	493	0	2	2
●			1960	SALINA	3132	12 D	28.0			31	0	1	29	3	65,369	1,055,188			1240	851	0	11	11
		WAYLAND TWP., 3N-11W, SECTIONS E½ 8, 9, 16, 17, 18, 20, 21																					
●	WAYLAND, NORTH	ALLEGAN	1957	TRAVERSE	1696	7 L		TRAVERSE	1712	15	0	0	6		1,100	104,980			150	700			
		WAYLAND TWP., 3N-11W, SECTIONS 6, 7, NW¼ 8																					
●	WEARE	OCEANA	1961	TRAVERSE	1681	2 L		TRAVERSE	1737	3	ABANDONED 1964					6,919			30	231			
		WEARE TWP., 16N-12W, SECTIONS 12, 13																					
●	WEARE, SEC. 14	OCEANA	1952	TRAVERSE	1674	1 L	41.4	DUNDEE	2217	1	ABANDONED 1954					1,096			10	110			
		WEARE TWP., 16N-12W, SECTION 14																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
●	WEST BRANCH	OGEMAW	1933	TRAVERSE	1796	2 L		CAMBRO-ORDOVICIAN	11012						PRODUCTION COMBINED WITH WEST BRANCH DUNDEE				SOME TRAVERSE OIL PRODUCED IN CONNECTION WITH WATER FLOOD PROJECT				
●			1933	DUNDEE	2650	20 L	36.8			276	0	1	167	3	87,118	8,679,842			2750	3,156	908	20	928
●			1951	DETROIT RIVER SZ	3585	9 D	38.9	}					THE 167 WELLS INCLUDE 164 DUNDEE AND 3 TRAVERSE										
●			1952	RICHFIELD	4127		33.0	}		63	0	0	62	3	84,968	2,667,537	0	61,430	2520	1,059	0	6	6
													THE 62 WELLS INCLUDE 30 RICHFIELD, 27 SOUR ZONE, AND 5 RICHFIELD & SOUR ZONE										
		WEST BRANCH TWP., 22N-2E, SECTIONS 18, 19, 20, 21, 26, 27, 28, 29, 34, 35, 36 OGEMAW TWP., 22N-1E, SECTIONS 10, 13, 14, 23, 24 CHURCHILL TWP., 22N-3E, SECTION 31																					
		HORTON TWP., 21N-2E, SECTIONS 1, 2 MILLS TWP., 21N-3E, SECTIONS 5, 6																					
☼	WHEATLAND	MECOSTA	1947	MICHIGAN STRAY	1399	3 S		DETROIT RIVER	3849	4	0	0	3				1,179	504,449	160				
●			1945	DUNDEE	3690	2 L	43.0			6	ABANDONED 1960					141,631			100	1,416			
		WHEATLAND TWP. 14N-7W, SECTIONS 7, 8, 9																					
●	WHITE CLOUD	NEWAYGO	1963	TRAVERSE	2537	1 L		TRAVERSE	2540	1	ABANDONED 1964					1,295			40	32			
		WILCOX TWP., 14N-12W, SECTION 19																					
●	WHITE RIVER	MUSKEGON	1950	DUNDEE	2053	2 L	28.0	DUNDEE	2055	1	ABANDONED 1951					7,061			20	353			
		WHITE RIVER TWP., 12N-18W, SECTION 15																					
●	WILEY	MASON	1962	TRAVERSE	1663	5 L	39.9	ST. PETER Ss	5890	17	0	0	10		12,859	403,971			360	1,122	631	2	633
		EDEN TWP., 17N-16W, SECTION 18 RIVERTON TWP., 17N-17W, SECTION 12																					
●	WINFIELD	MONTCALM	1936	DUNDEE-REED CITY	3340	1 L	43.2	REED CITY	3500	8	0	0	2		2,908	112,460			120	937	0	*10	10
		WINFIELD TWP., 12N-9W, SECTIONS 20, 28, 29																					
⊕	WINFIELD	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	WINTERFIELD	CLARE	1940	TRAVERSE	3105	1 L		SYLVANIA	5273	10	2	0	9						260		3	11	14
●			1940	DUNDEE	3794	3 L	44.2			37	0	0	4						740		1,850	0	1,850
●			1942	RICHFIELD	5015	15 D				3	1	1 RW	1		34,663	5,133,544	(3 PAYS COMBINED)		100	4,667	0	0	0
		WINTERFIELD TWP., 20N-6W, SECTIONS 28, 29, 30, 32, 35, 36 REDDING TWP., 19N-6W, SECTIONS 1, 5 GREENWOOD TWP., 19N-5W, SECTION 6 (1 RICHFIELD WELL COMMINGLED WITH TRAVERSE)																					
☼	WISE	ISABELLA	1940	MICHIGAN STRAY	1250	5 S		SYLVANIA	5205	---	0	0	5	1			291	1,704,122	1280	DOMESTIC USE & LEASE FUEL			
●			1953	TRAVERSE	3090	31 L	43.0																
●			1938	DUNDEE	3700	11 L	45.2			79	0	0	24	2	23,346	3,904,485			1640	2,381	1,751	0	1,751
●			1955	DETROIT RIVER SZ	4415	48 DL	42.6			2	0	0	1		2,594	52,144			80	652	30	0	30
		WISE TWP., 16N-3W, SECTIONS 8, 9, 16, 17, 20, 21, 28, 29, 32, 33 THE 24 WELLS INCLUDE 18 DUNDEE, 1 STRAY, 4 TRAVERSE & DUNDEE AND 1 DUNDEE & DETROIT RIVER																					
☼	WOLF LAKE	MUSKEGON	1949	"BEREA"	1050	7 D		DETROIT RIVER	2250	2	ABANDONED 1956							99,756	320				
●			1968	TRAVERSE	1741	23 L				2	0	0	2		2,208	3,387			40	85	0	2	2
		EGELSTON TWP., 10N-15W, SECTIONS 7, 8																					
☼	WOODSTOCK	LENAWEE	1969	TRAVERSE	1465	2 L		TRAVERSE	1467	2	2	0	2	2					80				
		WOODSTOCK TWP., 5S-1E, SECTION 18																					
●	WOODVILLE	NEWAYGO	1943	TRAVERSE	2820	5 L	43.5	DETROIT RIVER	3534	10	0	0	10	1	8,755	538,567			350	1,539	58	13	71
		NORWICH TWP., 15N-11W, SECTIONS 20, 28, 29																					
⊕	WOODVILLE(NORWICH)	REFER TO TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS																					
●	WRIGHT	OTTAWA	1954	"BEREA"	1170	3 L		DETROIT RIVER	2337	7	0	0	6	1	2,161	47,164			60	786	13	*7	20
●			1953	TRAVERSE	1920	1 L				7	0	0	2	1	172	17,613			70	252	0	0	0
		WRIGHT TWP., 8N-13W, SECTIONS 28, 32, 33 TALLMADGE TWP., 7N-13W, SECTION 4																					

TABLE 4 MICHIGAN OIL AND GAS FIELDS Continued

POOL CLASSIFICATION: ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS 1969: TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
●	WYOMING PARK	KENT	1939	TRAVERSE	1870	6 L	39.0	DETROIT RIVER	2255	21	0	0	1		424	157,592			300	525			
		WYOMING TWP., 6N-12W, SECTIONS 13, 14, 23																					
☼	YANKEE	ST. CLAIR	1963	NIAGARAN	2620	20 D		CLINTON	2829	2	0	0	2	2		(SHUT-IN)		0	80				
		ST. CLAIR TWP., 5N-16E, SECTION 25																					
☼	ZEELAND	OTTAWA	1946	"BEREA"	945	9 D		NIAGARAN	3388	7	0	0	1					0	280		DOMESTIC USE		
		ZEELAND TWP., 5N-14W, SECTIONS 2, 11, 12, 13, 14																					
●	ZEELAND	OTTAWA	1942	TRAVERSE	1514	3 L	41.9	NIAGARAN	3052	21	ABANDONED 1967					310,085			400	775			
●			1958	SALINA	2792	5 D	20.5			1	ABANDONED 1962					1,606			10	161			
		ZEELAND TWP., 5N-14W, SECTIONS 25, 30, 31, 36 HOLLAND TWP., 5N-15W, SECTIONS E½ 35, 36 (SALINA); ZEELAND TWP., 5N-14W, SECTION 32 (TRAVERSE)																					
●	ZEELAND, SEC. 28	OTTAWA	1954	TRAVERSE	1491	1 L		DETROIT RIVER	2215	3	ABANDONED 1956					4,437			30	148			
		ZEELAND TWP., 5N-14W, SECTIONS 21, 28																					

12,212,882 577,126,564 36,162,164 655,379,567 130,489 3,234 133,723

INCLUDES GAS FROM ABANDONED FIELDS OR POOLS.

DOES NOT INCLUDE 3,050,143 MCF OF UNASSIGNED GAS FROM EARLY RECORDS.

LISTING OF A SECTION OR PART OF A SECTION DOES NOT NECESSARILY MEAN THE ENTIRE SECTION TO BE PRODUCTIVE OF OIL OR GAS IN ANY OR ALL POTENTIALLY PRODUCTIVE FORMATIONS. ONLY THOSE SECTIONS OR PARTS OF SECTIONS, WHICH HAVE HAD AT LEAST ONE WELL COMPLETED AS AN OIL OR GAS WELL ARE LISTED.

INCLUDES OIL FROM ABANDONED FIELDS OR POOLS.

* BRINE USED ON COUNTY ROADS, LEASE ROADS, ETC., FOR DUST CONTROL.

THE TABLE SHOWING OIL AND GAS FIELD BRINE PRODUCTION FIGURES AND DISPOSAL METHOD FROM THE YEAR 1937 THROUGH 1968 HAS BEEN DISCONTINUED. BRINE PRODUCTION FIGURES ARE NOT ENTIRELY ACCURATE. THE AMOUNT AND METHOD OF DISPOSAL OR USE, IN BARRELS PER DAY, FOR 1969 IS AS FOLLOWS:

PITS	ROADS	CHEMICAL COMPANIES	SUBSURFACE	TOTAL
624	2543	67	130,489	133,723

TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS

POOL CLASSIFICATION ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS (1969): TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
⊕	AUSTIN	MECOSTA	1933	MICHIGAN STRAY	1380	14 S		DETROIT RIVER	4043		0	0	93					6,109,033	3970				
	AUSTIN TWP., 14N-9W, SECTIONS 2, 3, 4, 9, 10, 11, 12, 13, 14 COLFAX TWP., 15N-9W, SECTIONS 32, 33 MORTON TWP., 14N-8W, SECTIONS 6, 7																						
⊕	BELLE RIVER MILLS	ST. CLAIR	1961	SALINA-NIAGARAN	2215	305 D		CLINTON	2694		1	0	40			1,212		22,399,941	840				
	CHINA TWP., 4N-16E, SECTIONS 11, 14, 15																						
⊕	CRANBERRY LAKE	CLARE-MISSAUKEE	1943	MICHIGAN STRAY	1321	10 S		RICHFIELD	5201		0	0	171					7,537,451	7000				
	SUMMERFIELD TWP., 20N-5W, SECTIONS 4, 5, 6, 7, 8, 9, 15, 16, 17, 18, 22, 23 WINTERFIELD TWP., 20N-6W, SECTIONS 1, 2, 3, 10, 11, 12 CLAM UNION TWP., 21N-6W, SECTIONS 25, 34, 35																						
⊕	CROTON	NEWAYGO	1951	MARSHALL	917	4 S		SALINA	3993		0	0	7					1,320,835	860				
	CROTON TWP., 12N-11W, SECTIONS 29, 32																						
⊕	FREEMAN-LINCOLN	CLARE	1938	MICHIGAN STRAY	1500	10 S		DETROIT RIVER	3957		0	0	81					18,099,490	6600				
	LINCOLN TWP., 18N-5W, SECTIONS 7, 16, 17, 18, 19, 20, 21, 27, 28, 29 FREEMAN TWP., 18N-6W, SECTIONS 2, 3, 4, 9, 10, 11, 13, 14, 15, 23, 24																						
⊕	GOODWELL	NEWAYGO	1943	MICHIGAN STRAY	1142	20 S		DETROIT RIVER	3562		0	0	63					5,875,670	3020				
	GOODWELL TWP., 14N-11W, SECTIONS 5, 6, 7, 8, 9, 16, 17 WILCOX TWP., 14N-12W, SECTION 1 NORWICH TWP., 15N-11W, SECTION 31																						
⊕	HAMILTON, NORTH	CLARE	1952	MICHIGAN STRAY - MARSHALL	1487	8 S		RICHFIELD	5395		0	0	62					5,450,065	3040				
	HAMILTON TWP., 19N-3W, SECTIONS 5, 6, 7, 8 HAYES TWP., 19N-4W, SECTION 1 FROST TWP., 20N-4W, SECTIONS 35, 36																						
⊕	HOWELL	LIVINGSTON	1935	SALINA	3920	9 D		ST. PETER Ss	5958		0	0	69					23,678,120	2400				
	GENOA TWP., 2N-5E, SECTIONS 5, 6, 7, 8, 17 MARION TWP., 2N-4E, SECTIONS 1, 2, 12 HOWELL TWP., 3N-4E, SECTION 35																						
⊕	IRA	ST. CLAIR	1953	SALINA-NIAGARAN	2276	33 D		CLINTON	2632		0	0	15					3,498,666	680				
	IRA TWP., 3N-15E, SECTIONS 1, 2, 11																						
⊕	LENOX	MACOMB	1960	SALINA-NIAGARAN	2734	46 D		CLINTON	3018		0	0	11			2,565		2,152,679	300				
	LENOX TWP., 4N-14E, SECTION 32 CHESTERFIELD TWP., 3N-14E, SECTION 5																						
⊕	MARION(WINTERFIELD)	CLARE-OSCEOLA	1940	MICHIGAN STRAY	1344	15 S		SYLVANIA	5100		0	0	282					20,084,934	10720				
	WINTERFIELD TWP., 20N-6W, SECTIONS 17, 18, 19, 20, 21, 27, 28, 29, 30, 31, 32, 33, 34, 35 REDDING TWP., 19N-6W, SECTIONS 1, 2, 3, 4, 6 MARION TWP., 20N-7W, SECTIONS 24, 25, 36 MIDDLE BRANCH TWP., 19N-7W, SECTION 1																						
⊕	NORTHVILLE	WAYNE-WASHTENAW	1954	TRENTON-BLACK RIVER	4395	70 D		CAMBRO-ORDOVICIAN	5850		0	0	70					18,126,876	2825+				
	FOR LOCATION SEE NORTHVILLE, TABLE 4																	INCLUDES BOTH SALINA-NIAGARAN & TRENTON GAS					
⊕	ORIENT	OSCEOLA	1945	MICHIGAN STRAY	1508	11 S		SYLVANIA	5307		0	0	51					5,350,856	2600				
	ORIENT TWP., 17N-7W, SECTIONS 2, 3, 10, 11, 12, 13, 14, 18, 19																						
⊕	OVERISEL	ALLEGAN	1956	SALINA	2650	12 D		TRENTON	4060		0	0	186					14,645,048	6660				
	OVERISEL TWP., 4N-14W, SECTIONS 4, 5, 8, 9, 10, 14, 15, 16, 21, 22, 23, 27, 28																						

TABLE 5 DEVELOPED GAS STORAGE RESERVOIRS Continued

POOL CLASSIFICATION ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS (1969): TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
⊕	RAY	MACOMB	1961	SALINA-NIAGARAN	2945	101 D		NIAGARAN	3273		0	0	31			1,689	5,115,204	31,473,258	660				
	RAY TWP., 4N-13E, SECTIONS 1, 2, 11																						
⊕	REED CITY	OSCEOLA-LAKE	1940	MICHIGAN STRAY	1217	12 S		ST. PETER Ss	8960		4	0	82					7,642,246	4880				
			1941	REED CITY	3585	7 D					7	0	169										
	LINCOLN TWP., 18N-10W, SECTIONS 8, 9, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32 PINORA TWP., 18N-11W, SECTIONS 24, 25 COMBINATION GAS STORAGE AND SECONDARY RECOVERY PROJECT - REFER TO TABLE 8 FOR DETAILS																						
⊕	RIVERSIDE	MISSAUKEE	1940	MICHIGAN STRAY	1435	7 S		DUNDEE	3953		0	0	97					5,188,481	3680				
	RIVERSIDE TWP., 21N-7W, SECTIONS 15, 16, 17, 19, 20, 21, 22, 23																						
⊕	SALEM	ALLEGAN	1937	SALINA	2725	2 D		TRENTON	3792		0	0	88			2,973		11,310,698	4960				
	SALEM TWP., 4N-13W, SECTIONS 2, 3, 9, 10, 11, 12, 14, 15, 16, 17, 21, 22, 23 JAMESTOWN TWP., 5N-13W, SECTIONS 34, 35																						
⊕	SHAVER (SUMNER - NEW HAVEN)	GRATIOT-MONTCALM	1935	MICHIGAN STRAY	1020	11 S		DUNDEE	3536		1	0	49					11,114,906	3920				
	NEW HAVEN TWP., 10N-4W, SECTIONS 2, 3, 4, 5, 8, 9, 10, 11 SUMNER TWP., 11N-4W, SECTIONS 31, 32, 33, 34 CRYSTAL TWP., 10N-5W, SECTIONS 1, 2, 3, 5, 6 FERRIS TWP., 11N-5W, SECTIONS 22, 36																						
⊕	SIX LAKES	ISABELLA-MECOSTA-MONTCALM	1934	MICHIGAN STRAY	1270	25 S		DETROIT RIVER	3790		0	0	268					51,604,719	11480				
	ROLLAND TWP., 13N-6W, SECTIONS 29, 30; HINTON TWP., 13N-8W, SECTIONS 23, 24, 25; MILLBROOK TWP., 13N-7W, SECTIONS 27, 28, 29, 30, 31, 32, 33, 34, 35, 36; BELVIDERE TWP., 12N-7W, SECTIONS 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 20, 21																						
⊕	WINFIELD	MONTCALM	1935	MICHIGAN STRAY	1125	8 S		DETROIT RIVER	3405		0	0	8					4,836,132	3240				
	WINFIELD TWP., 12N-9W, SECTIONS 6, 7, 8, 16, 17, 18 REYNOLDS TWP., 12N-10W, SECTIONS 1, 12																						
⊕	WOODVILLE(NORWICH)	NEWAYGO	1943	MICHIGAN STRAY	1185	13 S		DETROIT RIVER	3405		0	0	41					2,683,259	2240				
	NORWICH TWP., 15N-11W, SECTIONS 16, 17, 20, 21, 28, 29																						
	NOT INCLUDED WITH ABOVE FIELDS IS ONE SMALL STORAGE RESERVOIR LOCATED NEAR MARYSVILLE, ST. CLAIR CO.. GAS IS STORED IN A SALT CAVERN AT A DEPTH OF ABOUT 2050 FT. GAS CAPACITY OF THE CAVERN, IN SALINA SALT, IS ABOUT 341 MMCF AT A WELLHEAD PRESSURE OF 1100 PSI.										13	0	2034			8,439	5,115,204	280,183,363					

TABLE 6 UNDEVELOPED GAS STORAGE RESERVOIRS

POOL CLASSIFICATION ● ACTIVE OIL FIELD OR POOL ● ABANDONED OIL FIELD OR POOL ☼ ACTIVE GAS FIELD OR POOL ☼ ABANDONED GAS FIELD OR POOL ⊕ GAS STORAGE RESERVOIR ⊖ UNDEVELOPED GAS STORAGE RESERVOIR

	FIELD NAME	COUNTY TOWNSHIP PRODUCING SECTIONS	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 or GAS WELLS (1969): TO END	COMP. IN	ABAND. IN	PRODUCING AT END	SHUT IN OR SHUT DOWN	OIL PRODUCTION - BBLS.: PRODUCED IN 1969	OIL PRODUCTION - BBLS.: CUMULATIVE THROUGH 1969	GAS PRODUCTION - Mcf.: PRODUCED IN 1969	GAS PRODUCTION - Mcf.: CUMULATIVE THROUGH 1969	DRILLED ACRES	RECOVERY PER ACRE DRILLED (BBLS.)	BRINE PRODUCTION: DISPOSAL SUBSURFACE	BRINE PRODUCTION: DISPOSAL SURFACE	BRINE PRODUCTION: TOTAL BBLS. DAY
⊖	BROOMFIELD-DEERFIELD	ISABELLA	1930	MICHIGAN STRAY	1355	5 S		SYLVANIA	4994	91	0	0	12					13,069,069	8080				
	BROOMFIELD TWP., 14N-6W, SECTIONS 1, 2, 3, 4, 5, 9, 10, 11, 13, 14, 15, 23, 24, 25 DEERFIELD TWP., 14N-5W, SECTIONS 7, 17, 18, 19, 20, 29, 30																						
⊖	COLDWATER	ISABELLA	1945	MICHIGAN STRAY	1390	10 S		SYLVANIA	5090	22	7	0	19					7,352,605	2400				
	COLDWATER TWP., 16N-6W, SECTIONS 28, 29, 30, 31, 32, 33 SHERMAN TWP., 15N-6W, SECTION 6																						
⊖	EDMORE-RICHLAND	MONTCALM	1936	MICHIGAN STRAY	1300	8 S		DUNDEE	3700	47	0	0	11				4,043	8,953,096	6800				
	HOME TWP., 12N-6W, SECTIONS 11, 12, 13, 14, 15, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 33 RICHLAND TWP., 12N-5W, SECTIONS 7, 8, 17, 18																						
⊖	EVART	OSCEOLA	1941	MICHIGAN STRAY	1410	7 S		DETROIT RIVER	4457	33	0	0	7					4,895,722	5120				
	OSCEOLA TWP., 18N-8W, SECTIONS 19, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35																						
								TOTALS		193	7	0	49				4,043	34,270,492					

TABLE 7 MISCELLANEOUS OIL WELLS

Field Name*	Location and Producing Sections				Completion and Abandonment		Formation	Production
Big Prairie	Newaygo	Big Prairie	13N-11W	3	1967	1967	Dundee	78
Bloomfield, Sec. 20	Huron	Bloomfield	17N-14E	20	1940	1941	Traverse	71
Blue Lake, Sec. 5	Muskegon	Blue Lake	12N-16W	5	1940	1941	Traverse	26
Calvin	Cass	Calvin	7S-14W	1	1954	1955	Traverse	67
Colfax, Sec. 35	Oceana	Colfax	16N-15W	35	1952	1954	Traverse	35
Dayton, Sec. 16	Newaygo	Dayton	13N-14W	16	1957	1957	Traverse	314
Decatur, Sec. 4	Van Buren	Decatur	4S-14W	4	1942	1942	Traverse	38
Edwardsburg	Cass	Ontwa	8S-15W	22, 23	1940	1950	Traverse	277
Evergreen, Sec. 22	Montcalm	Evergreen	10N-6W	22	1953	1954	Traverse	455
Fremont, Sec. 27	Isabella	Fremont	13N-5W	27	1962	1963	Traverse	488
Gaines, Sec. 8	Kent	Gaines	5N-11W	8	1945	1945	Traverse	47
Ganges, Sec. 4	Allegan	Ganges	2N-16W	4	1954	1955	Traverse	64
Hinton, Sec. 21	Mecosta	Hinton	13N-8W	21	1948	1948	Traverse	66
Hume, Sec. 12	Huron	Hume	18N-12E	12	1953	1953	Detroit River SZ	71
Indian Hills, Sec. 26	Oceana	Crystal	16N-16W	26	1961	1962	Dundee	305
Jamestown, Sec. 29	Ottawa	Jamestown	5N-13W	29	1942	1942	Traverse	52
Jonesfield, Sec. 9	Saginaw	Jonesfield	12N-1E	9	1949	1949	Dundee	35
Jonesfield, Sec. 24	Saginaw	Jonesfield	12N-1E	24	1942	1943	Dundee	63
Lincoln, Sec. 9	Midland	Lincoln	15N-1E	9	1939	1949	Traverse	71
North Plains, Sec. 18	Ionia	North Plains	8N-5W	18	1950	1951	Dundee	239
North Plains, Sec. 19	Ionia	North Plains	8N-5W	19	1953	1955	Traverse	59
Oshtemo, Sec. 5	Kalamazoo	Oshtemo	2S-12W	5	1944	1944	Traverse	50
Sheridan, Sec. 26	Mecosta	Sheridan	15N-7W	26	1952	1953	Traverse	173
Sheridan, Sec. 29	Newaygo	Sheridan	12N-14W	29	1958	1958	Traverse	199
Sherman, Sec. 4	Isabella	Sherman	15N-6W	4, 18	1953	1955	Traverse	63
Shiawassee, Sec. 11	Shiawassee	Shiawassee	6N-3E	11	1930	1931	Traverse	236
Silver Creek	Cass	Silver Creek	5S-16W	22, 23	1939	1964	Traverse	25
Springfield, Sec. 22	Oakland	Springfield	4N-8E	22	1955	1955	Salina-Niagaran	649
St. Charles, Sec. 7	Saginaw	St. Charles	10N-3E	7	1956	1957	Traverse	111
Sumpter, Sec. 22	Wayne	Sumpter	4S-8E	22	1941	1942	Trenton	227
Tyrone, Sec. 15	Kent	Tyrone	10N-12W	15	1946	1948	Traverse	191
Watson, Salina	Allegan	Watson	2N-12W		1964	1965	Salina-Niagaran	296
Watson, Sec. 8	Allegan	Watson	2N-12W	8	1949	1950	Traverse	374
Zeeland, Sec. 4	Ottawa	Zeeland	5N-14W	4	1956	1957	Traverse	0

* This list also includes single wells that have made small amounts of oil and have been included in the oil field tables in previous summaries as pool discoveries. All have been abandoned and should not be considered as a part of Table 4.

TABLE 8 FIELDS UTILIZING PRODUCED AND EXTRANEOUS FLUIDS IN SECONDARY RECOVERY OPERATIONS

FIELD AND COUNTY		OPERATOR OR COMPANY	TYPE OF PROJECT	DISC. YEAR	PAY ZONE			TOTAL UNIT ACRES	INJECTION FLUIDS	VOLUME OF INJECTED FLUID 1969			CUMULATIVE VOLUME OF INJECTED FLUID		UNIT PRODUCTION IN 1969				UNIT CUMULATIVE 1-1-70		
				YEAR PROJECT BEGAN	FORM.	THICK.	DEPTH		PRESS.-PSIG	MCF GAS	BARRELS WATER	INJ. WELLS	MCF GAS	BARRELS WATER	BARRELS OIL	SALES MCF GAS	WATER PRODUCED	NO. WELLS	BARRELS OIL	SALES MCF GAS	BARRELS WATER
BEAVER CREEK	CRAWFORD-KALKASKA	UNION OIL CO.	UNIT WTR. FLOOD	1947 1963	RICH.	20	4160	4560	FRESH WTR. 2450		5,901,388	59		20,666,592	542,674	422,080	69,350	50	(P) 6,378,173 (S) 970,951	16,846,778	1,411,756
BEAVERTON,SOUTH	GLADWIN	SUN OIL CO.	UNIT WTR. FLOOD	1936 1959	DD.	12	3845	640	FRESH WTR. 2100		204,441	4		1,747,270	14,270		74,460	12	(P) 986,930 (S) 39,700		747,154
BEAVERTON, WEST	GLADWIN	PEAKE PET. CO.	UNIT WTR. FLOOD	1943 1966	DD.	2	3876	480	FRESH WTR. 2650		144,933	3		360,008	11,065		6,935	4	(P) 193,188 (S) 1,800		23,180
EAST NORWICH	MISSAUKEE	SUN OIL CO.	UNIT-RECY. GAS & WTR. FLOOD	1942 1947	RICH.	13	4390	4640	RECYCLED GAS & FRESH WTR. 2500	DISCONT. 1962	1,582,333	45	11,699,478	8,902,240	255,021	673,683	71,540	71	(P) 5,800,000 (S) 2,282,371	5,639,305	1,048,138
ENTERPRISE	MISSAUKEE	SUN OIL CO.	UNIT-RECY. GAS & WTR. FLOOD	1943 1955	RICH.	15	4405	1280	RECYCLED GAS & FRESH WTR. 2300	DISCONT. 1961	513,762	13	1,419,641	3,337,111	81,701	40,975	15,695	20	(P) 1,925,000 (S) 313,764	707,417	645,189
GROUT	GLADWIN	SUN OIL CO.	UNIT WTR. FLOOD	1956 1960	RICH.	10	5039	640	FRESH WTR. 2400		167,591	3		1,783,174	68,217		63,510	13	(P) 900,000 (S) 447,954		273,633
HAMILTON	CLARE	SUN OIL CO.	UNIT WTR. FLOOD	1952 1958	RICH.	12	5145	2200	FRESH WTR. 2700		926,461	17		8,886,985	313,709	150,654	282,875	27	(P) 2,800,000 (S) 1,913,186	3,297,561	1,581,588
HEADQUARTERS	ROSCOMMON	FARM. PETRO. COOP.	UNIT WTR. FLOOD	1952 1969	RICH.	23	4946	720	FRESH WTR. 2950		309,484	11		309,484	20,481		2,920	7	(P) 684,937 (S) NONE		66,065
KAWKAWLIN	BAY	GULF OIL CO.	UNIT WTR. FLOOD	1938 1953	DD.	45	2830	1180	FRESH & BRINE WATER 1000		162,955	7 ACTIVE		5,075,101	42,340		88,330	34	(P) 2,145,799 (S) 339,473		1,719,167
REED CITY *	OSCEOLA	MICH. CONS. GAS CO.	UNIT-GAS STORAGE IN OIL RESERVOIR	1940 1963	DD.-R.C.	10	3585	5000	PRODUCED BRINE & EXTRANEOUS GAS	3,128,638	953,380	9 WTR. 139 GAS	34,435,972	144,121,906	408,346	0	731,825	169	(P)39,294,000 (S) 992,626	16,257,876	164,458,484
RICHMOND **	OSCEOLA	ISBRANDSTEN CO., INC.	UNIT WTR. FLOOD	1955 1965	D.R.(SZ)	11	4184	1093	FRESH WTR. 2200		273,260	8		1,478,659	63,424	35,257	4,745	13	(P) 943,208 (S) 84,000	2,431,589	77,935
ROSE CITY	OGEMAW	MUSKEGON DEV. CO.	UNIT WTR. FLOOD	1943 1955	RICH.	9	4125	4640	FRESH WTR. 2500		452,016	38		3,277,678	56,090	172,604	19,345	61	(P) 3,496,205 (S) NONE	5,250,461	200,932
ROSE CITY, WEST	OGEMAW	SUN OIL CO.	UNIT WTR. FLOOD	1952 1968	RICH.	10	4150	320	FRESH WTR. 2400		190,951	5		342,539	5,603		547	4	(P) 506,791 (S) NONE		29,382
ST. HELEN	ROSCOMMON	SUN OIL CO.	UNIT-RECY. GAS & WTR. FLOOD	1941 1958	RICH.	9.3	4180	3920	RECYCLED GAS & FRESH WTR. 2500	DISCONT. 1957	840,728	39	3,151,610	5,224,207	93,176	268,262	14,965	54	(P) 3,760,000 (S) 249,670	8,986,922	417,588
WEST BRANCH	OGEMAW	MARATHON OIL CO.	UNIT WTR. FLOOD	1933 1966	DD.	20	2650	2730	BRINE 1080		272,394	10		562,501	58,888		44,530	61	(P) 3,258,505 (S) 58,000*		310,210

* LOREED UNIT IN REED CITY FIELD.

** RICHMOND UNIT - THIS UNIT PRODUCES FROM THE DETROIT RIVER SOUR ZONE

* 16,520 BBLS. OF THIS SECONDARY OIL IS FROM A WATER SOURCE WELL IN THE TRAVERSE FORMATION.

NOTE: THE LOREED UNIT IN THE REED CITY FIELD, A MULTI-POOL FIELD, IS A GAS STORAGE - SECONDARY OIL RECOVERY OPERATION ENCOMPASSING SEVERAL RESERVOIRS. THE RESERVOIR FORMATIONS INCLUDED IN THE LOREED UNIT ARE SHOWN IN THE STRATIGRAPHIC SECTION TO THE RIGHT.

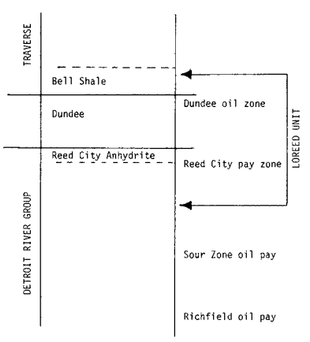
THE RICHMOND SHOULD NOT BE CONSIDERED AS A FIELD. IT IS THE DETROIT RIVER SOUR ZONE POOL RESERVOIR IN THE REED CITY FIELD. THE PROJECT IS NOT RELATED TO THE LOREED OPERATION.

ROSE CITY, WEST, AS NOTED ABOVE IS A UNIT OPERATION IN THE ROSE CITY FIELD.

TOTAL UNIT ACRES AND OTHER DATA DOES NOT NECESSARILY CORRESPOND WITH DRILLED ACRES AS NOTED ON TABLE 4.

ALL DATA AND OTHER EXPLANATIONS WERE ASSEMBLED AND PROVIDED BY THE PRODUCTION AND PRORATION UNIT, OIL AND GAS SECTION.

COMPILERS.



FIGURES DEFINED AS SECONDARY OIL (S), UNDER THE CUMULATIVE COLUMN, REPRESENT THE DIFFERENCE BETWEEN UNIT CUMULATIVE RECOVERY AT THE END OF 1969 AND EXTRAPOLATED ULTIMATE PRIMARY RECOVERY (P) AT THE BEGINNING OF SECONDARY OPERATIONS.

INJECTION OF EXTRANEOUS WATER IN KAWKAWLIN FIELD WAS SUSPENDED AT END OF 1966. FROM THAT DATE, ONLY UNIT PRODUCED WATER IS BEING INJECTED.

TABLE 9 GAS PLANT OPERATIONS BY PLANT OR FIELD, 1969 (All figures in MCF)

Plant or Field	Input Totals	Plant Fuel	Lease Fuel	Storage and/or Repressuring Recycling	Line Loss	Vented	Extraction Loss	To Pipe Line	L.P.G. Recovery Gallons
*Albion-Scipio	12,033,734	1,134,620	0	0	0	67,170	938,237	9,893,707	28,330,024
*Beaver Creek	497,040	17,574	113,439	0	0	20,368	11,114	334,545	98,300
Belle River Mills	9,306,688	161,834	0	3,020,005	0	0	377,654	5,747,195	11,681,517
Belle River Mills plant functions as a combined recycling and storage operation.									
Boyd	11,333,977	176,240	137,901	3,313,798	98,275	17,726	377,027	7,213,010	12,104,896
Boyd Plant, serving 10 fields receives both dry and oil well gas.									
*Hamilton	229,344	16,156	53,730	0	0	0	9,516	149,942	238,910
*Hanover	52,446	3,711	0	0	0	5,431	590	42,714	0
*Norwich East	889,711	88,681	68,642	20,664 **	0	0	0	711,724	0
Reed City	18,179,815	273,714	0	0	0	0	326,719	17,579,382	10,334,889
Reed City plant serves a combination storage and secondary recovery operation in an oil reservoir.									
*Rose City	283,378	7,176	0	0	0	0	0	276,202	0
*St. Helen	568,677	29,274	52,064	0	0	0	2,152	485,187	53,806
Willow Run	192,498,605	462,624	0	0	0	0	770,842	191,265,139	26,024,031
Totals	245,873,415	2,371,604	425,776	6,354,467	98,275	110,695	2,813,851	233,698,747	88,866,373

* Receives and processes oil well gas only.

NOTE: The above table is the record of plants which are serving oil field operations, or which are extracting natural gas liquids from designated dry gas sources (Belle River Mills and Willow Run). Transmission and dry gas storage facilities are excluded.

** Gas Lift

TABLE 10. PRIMARY SUPPLY LOCATIONS AND STORAGE FACILITIES FOR LIQUIFIED PETROLEUM GAS

Company	Plant Location County	Locality	Type of Facility	Facility Capacity Gallons of LPG
Bay Refining Company	Bay	Bay City	Refinery Storage	155,200
Dow Chemical Company	Midland	Midland	Chemical Plant (Underground)	8,820,000
Leonard Refineries, Inc.	Gratiot	Alma	Refinery Storage	120,000
Marathon Oil Company	Hillsdale	Mosherville	Natural Gas Processing Plant	294,000
Cities Service Oil Company	Kent	Lowell	Underground Storage	48,150,000
Skelly Oil Company (1)	Kent	Alto	Underground Storage	10,890,748
Consumers Power Company	Macomb	New Baltimore	Natural Gas Processing Plant	150,000
Michigan Consolidated Gas Co.	St. Clair	St. Clair	Natural Gas Processing Plant	450,000
Michigan Consolidated Gas Co.	Washtenaw	Ypsilanti	Natural Gas Processing Plant	450,000
Mobil Oil Company	Wayne	Trenton	Underground Storage	15,201,000
Sun Oil Company	Wayne	Wayne	Underground Storage	25,620,000
Marathon Oil Company	Wayne	Wayne	Underground Storage	24,671,178
Phillips Petroleum Company	Wayne	Wyandotte	Underground Storage	8,400,000
Wyandotte Chemical Corp.	Wayne	Wyandotte	Underground Storage	4,500,000

TOTAL PRIMARY STORAGE BY COUNTY, GALLONS LPG	
Bay	155,200
Gratiot	120,000
Hillsdale	294,000
Kent	59,040,748
Macomb	150,000
Midland	8,820,000
St. Clair	450,000
Washtenaw	450,000
Wayne	78,392,178
Combined Primary Storage	147,872,126

TOTAL PRIMARY STORAGE, GALLONS LPG	
Refinery Storage	275,200
Gas Plant Storage	1,344,000
Underground Storage	146,252,926
Combined Primary Storage	147,872,126

LPG underground storage reservoirs are in man-made caverns dissolved from Salina Group (Silurian) salt beds. The depth to storage reservoir salt beds varies with locality within the state.

(1) Skelly Oil Co. discontinued use of this facility in 1966.

Data updated April, 1970

* * MICHIGAN OIL REFINERIES * *

COMPANY	REFINERY LOCATION	NOMINAL CAPACITY* BBLS. DAY
Bay Refining, Division Dow Chemical Company	Bay City	17,000
Crystal Refining Company	Carson City	6,200
Lakeside Refining Company	Kalamazoo	4,000
Leonard Refineries, Inc.		
Leonard Division	Alma	29,000
Roosevelt Division	Mt. Pleasant	7,500
Marathon Oil Company	Detroit	50,000
Naph-Sol Refining Company (Shut down, 1968)	Muskegon	(1) (10,000)
Osceola Refining Company	West Branch	5,000
Petroleum Specialties, Inc. (Shut down)	Flat Rock	(1) 6,500
Socony Mobil Oil Company	Trenton	40,700
	Total Refinery Capacity	159,400

(1) Not included in total refinery capacity.

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

PART 3, CUMULATIVE RECORDS
EXPLANATION

Part 3 contains cumulative statistics principally of oil and gas production, well completions, and oil field brine production and disposal from 1925 through the most recent year-end compilations.

OIL AND GAS PRODUCTION TABLES. Oil and gas production figures for individual years prior to 1960 can be found in issues of "Summary of Operations, Oil and Gas Fields" for 1962 and prior years, and in "Michigan's Oil and Gas Fields" 1963 to present. The tables show the year of the first recorded production from a particular formation, and the yearly and cumulative production totals from 1925 through the most recent year-end compilations. Cumulative oil and gas production by county is shown on a separate table. Refer to Part 1 for county production figures for the past year, and prior issues for previous years.

CUMULATIVE WELL COMPLETIONS. These tables show the cumulative number of yearly completions in a county. Well density figures include field development wells, exploratory wells, and service wells of all types.

DRILLING PERMITS, WELL COMPLETIONS, FIELDS DISCOVERED. These tables show the number of drilling permits issued by year from 1927 through the most recent year-end compilations. Initial classification of well completions by year, the number of new fields or pools discovered, and the number of producible oil or gas wells on a yearly basis are all shown on the same table.

BRINE PRODUCTION AND DISPOSAL. Oil field brine production records prior to 1937 are incomplete. This table shows the reported amount of produced brine and the method of disposal from 1937 to present. Most oil field brine is now returned to subsurface formations. Small quantities are used for dust control or ice and snow removal on county roads in local areas. A small amount of brine is also disposed in burning pits. Brine production and disposal figures should not be considered entirely accurate.

SERVICE WELLS. Service wells as listed in this publication are those wells which were drilled to serve some purpose other than the initial production of oil or gas. Oil or gas wells are sometimes converted to salt water disposal, observation, or facility wells in gas storage or pressure maintenance projects. There are several types of service wells:

LPG Wells. These are wells drilled for underground storage of liquified petroleum gas. In Michigan, these storage reservoirs are in man-made cavities in salt beds. The cavities have been made by dissolving the salt with water and then pumping out the brine.

Gas Storage Wells. These are wells drilled in gas storage reservoirs. They are frequently referred to as facility wells, and are generally used to inject gas into or extract gas from the reservoir. Certain facility wells may sometime in the history of the field be used as salt water disposal wells or observation wells.

Observation Wells. Most observation wells are related to gas storage projects. They are used to observe underground movement of gas, brines, and other fluids, or to observe pressures.

Brine Disposal Wells. These wells are used in the disposal of oil and gas field brines back into some suitable subsurface formation. Brine disposal well permits are issued for these wells.

Injection and Pressure Maintenance Wells. These are wells used in secondary recovery, or pressure maintenance projects. They may be new wells drilled specifically for injection or pressure maintenance, or they may be converted oil or gas wells; their status can change from time to time.

Oil or gas wells are sometimes converted to salt water disposal, observation, facility wells in gas storage reservoirs, or water injection wells used in secondary recovery or pressure maintenance projects. The types of service wells listed under "Classification of Well Completions" does not include oil or gas wells converted to service wells.

TESTS REPORTED TO HAVE PENETRATED PRE-CAMBRIAN ROCK IN THE SOUTHERN PENINSULA OF MICHIGAN

Permit				Pre-Cambrian Total Depth	Year Completed			
26112	Berrien Co. Berrien Twp.	10-6S-17W	Security Oil & Gas Thalman #1	4604 (-3800) 5647 (-4843)	1965			
23478	Charlevoix Co. Peaine Twp.	6-37N-10W	McClure Oil Co. State-Beaver Island #2	4718 (-3977) 4803 (-4062)	1961	Age Biotite Feldspar	Rb-Sr 1100 1110	K-Ar 1090
23435	Charlevoix Co. Peaine Twp.	27-38N10W	McClure Oil Co. State-Beaver Island #1	4566 (-3888) 5383 (-4705)	1961			
10448	Lenawee Co. Riga Twp.	32-8S-5E	Walter H. Eckert Harry Taylor #1	3865 (-3150) 3902 (-3186)	1944			
11221	Monroe Co. Berlin Twp.	29-5S-10E	Joseph W. Sturman D.L. & R.L. Chapman #1	3342 (-2745) 3377 (-2780)	1945			
7702	Monroe Co. Ida Twp.	19-7S-7E	Jacob Beck Mrs. James Sancrant #1	3595 (-2926) 5495 (-4826)	1954			
25494	Monroe Co. Summerfield Twp.	16-7S-6E	Ferguson & Garrison Merlin Shimp #1	3637 (=2951) 3671 (-2985)	1964			
27199	Presque Isle Co. North Allis Twp.	29-35N-2E	Pan American Petro. Corp. D. E. Draysey #1	5877 (-5069) 5940 (-5132)	1968			
BD139	St. Clair Co. Casco Twp.	31-4N-15E	Consumers Power Co. Consumers Power Co. BD#1	4605 (-3989) 4627 (-4011)	1964			
25780	St. Clair Co. Clay Twp.	Projected 17-2N-16E	L. Bernhardt Puzzuoli #1	4152 (-3572) 4188 (-3608)	1965			
196	St. Clair Co. St. Clair Twp.	26-5N-16E	St. Clair Oil & Gas Corp. Hurst #1	4730 (-4080) 4770 (-4110)	1929	Age Biotite	Rb-Sr 1020	
10792	Washtenaw Co. Salem Twp.	27-1S-7E	I. C. Chamness Troy-Roddenberry Comm. #1	6075 (-5189) 6094 (-5208)	1944			
10141	Washtenaw Co. Salem Twp.	16-1S-7E	Colvin & Assoc. & Elec. Wm. F. Voss Comm. #1	6374 (-5459) 6410 (-5495)	1944	Age Biotite	Rb-Sr 950	
11341	Washtenaw Co. Superior Twp.	12-2S-7E	Colvin & Assoc. & Rot.St. Viola Meinzinger #1	5670 (-4852) 5692 (-4874)	1945	Age Biotite	Rb-Sr 1050	
BD146	Wayne Co., City of Woodhaven	22-4S-10E	Marathon Oil Co. Woodhaven BD#1	3704 (-3095) 3752 (-3143)	1969			
10430	Wayne Co. Huron Twp.	16-4S-9E	Colvin & Assoc. & Elec. Theisen Estate #1	3985 (-3360) 4046 (-3321)	1944			

DEEPEST EXPLORATORY WELL DRILLED IN MICHIGAN

25099	Ogemaw Co. Foster Twp.	28-24N-2E	Brazos Oil & Gas etal State-Foster #1	Trenton 9766 (-8290) 12,966 (-11520)	Cambrian

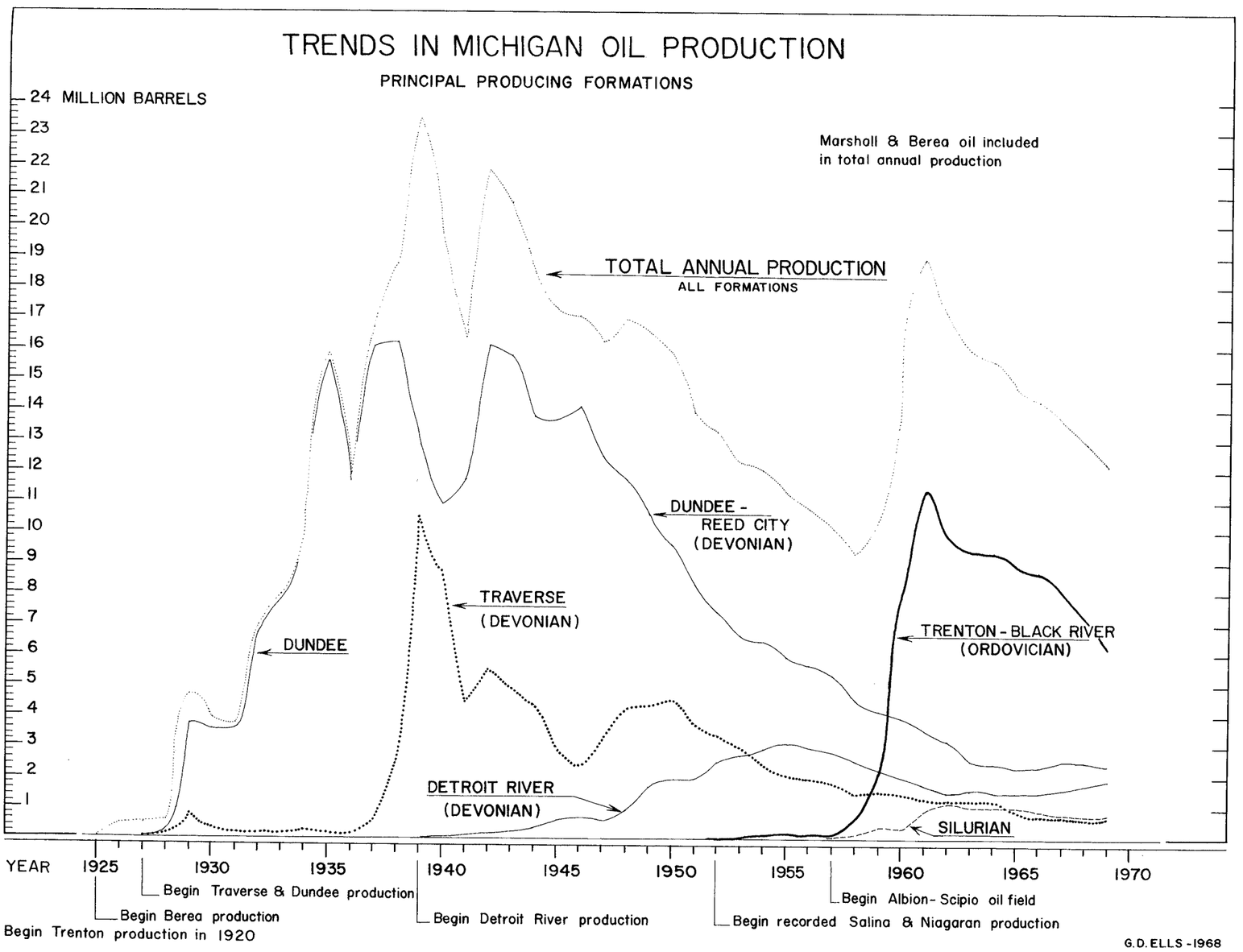


TABLE 11 OIL PRODUCTION BY GEOLOGIC SYSTEM AND FORMATION - 1969 AND PRIOR YEARS

These data include estimates for multiple pay wells and leases when an accurate breakdown was not available

YEAR	MISSISSIPPIAN		DEVONIAN			SILURIAN	ORDOVICIAN	Total Barrels Oil All Formations
	Marshall	Berea	Traverse	Dundee-Reed City	Detroit River	Salina-Niagaran	Trenton-Black River	
	First Year of Recorded Oil Production by Formation							
	1938	1925	1927	1927	1939	1952	1935	
1925 Through 1929	(Cumulative)	876,559	873,777	4,017,451				5,767,787
1930 Through 1934	(Cumulative)	318,171	995,439	31,870,671				33,184,281
1935 Through 1939	7,411 (Cumulative)	310,313	13,814,816	72,339,293	14,000		43,565	86,529,398
1940 Through 1944	22,040 (Cumulative)	229,262	27,856,377	67,939,211	727,418		348,477	97,122,785
1945 Through 1949	17,283 (Cumulative)	166,687	16,914,771	62,438,443	4,302,309		106,510	83,946,003
1950 Through 1954	9,068 (Cumulative)	125,089	16,974,863	38,058,703	11,878,669	43,091	225,180	67,314,663
1955 Through 1959	8,183 (Cumulative)	110,639	8,788,785	25,618,934	13,716,790	568,085	3,108,341	51,920,757
1960 Through 1964	6,090 (Cumulative)	84,222	6,777,853	15,725,957	8,260,636	4,611,123	48,022,216	83,488,097
1965	1,290	17,046	923,300	2,343,628	1,538,696	976,836	8,927,427	14,728,223
1966	1,007	15,741	799,745	2,372,040	1,513,847	900,480	8,690,239	14,273,099
1967	1,051	18,821	707,385	2,527,607	1,602,212	797,594	8,009,515	13,664,185
1968	822	31,569	667,189	2,516,164	1,782,464	704,547	7,271,649	12,974,404
1969	1,123	30,721	753,702	2,426,758	1,950,556	816,237	6,233,785	12,212,882

TABLE 12 CUMULATIVE OIL PRODUCTION BY GEOLOGIC SYSTEM AND FORMATION - 1969 AND PRIOR YEARS

These data include estimates for multiple pay wells and leases when an accurate breakdown was not available

YEAR	MISSISSIPPIAN		DEVONIAN			SILURIAN	ORDOVICIAN	Total Barrels Oil All Formations
	Marshall	Berea	Traverse	Dundee-Reed City	Detroit River	Salina-Niagaran	Trenton-Black River	
	First Year of Recorded Oil Production by Formation							
	1938	1925	1927	1927	1939	1952	1935	
1925 Through 1929		876,559	873,777	4,017,451				5,767,787
1930 Through 1934		1,194,730	1,869,216	35,888,122				38,952,068
1935 Through 1939	7,411	1,505,043	15,684,032	108,227,415	14,000		43,565	125,481,466
1940 Through 1944	29,451	1,734,305	43,540,409	176,166,626	741,418		392,042	222,604,251
1945 Through 1949	46,734	1,900,992	60,455,180	238,605,069	5,043,727		498,552	306,550,254
1950 Through 1954	55,802	2,026,081	77,430,043	276,663,772	16,922,396	43,091	723,732	373,864,917
1955 Through 1959	63,985	2,136,720	86,218,828	302,282,706	30,640,186	611,176	3,832,073	425,785,674
1960 Through 1964	70,075	2,220,942	92,996,681	318,008,663	38,900,822	5,222,299	51,854,289	509,273,771
1965	71,365	2,237,988	93,919,981	320,352,291	40,439,518	6,199,135	60,781,716	524,001,994
1966	72,372	2,253,729	94,699,726	322,724,331	41,953,365	7,099,615	69,471,955	538,275,093
1967	73,423	2,272,550	95,407,111	325,251,938	43,555,577	7,897,209	77,481,470	551,939,278
1968	74,245	2,304,119	96,074,300	327,768,102	45,338,041	8,601,756	84,753,119	564,913,682
1969	75,368	2,334,840	96,828,002	330,194,860	47,288,597	9,417,993	90,986,904	577,126,564

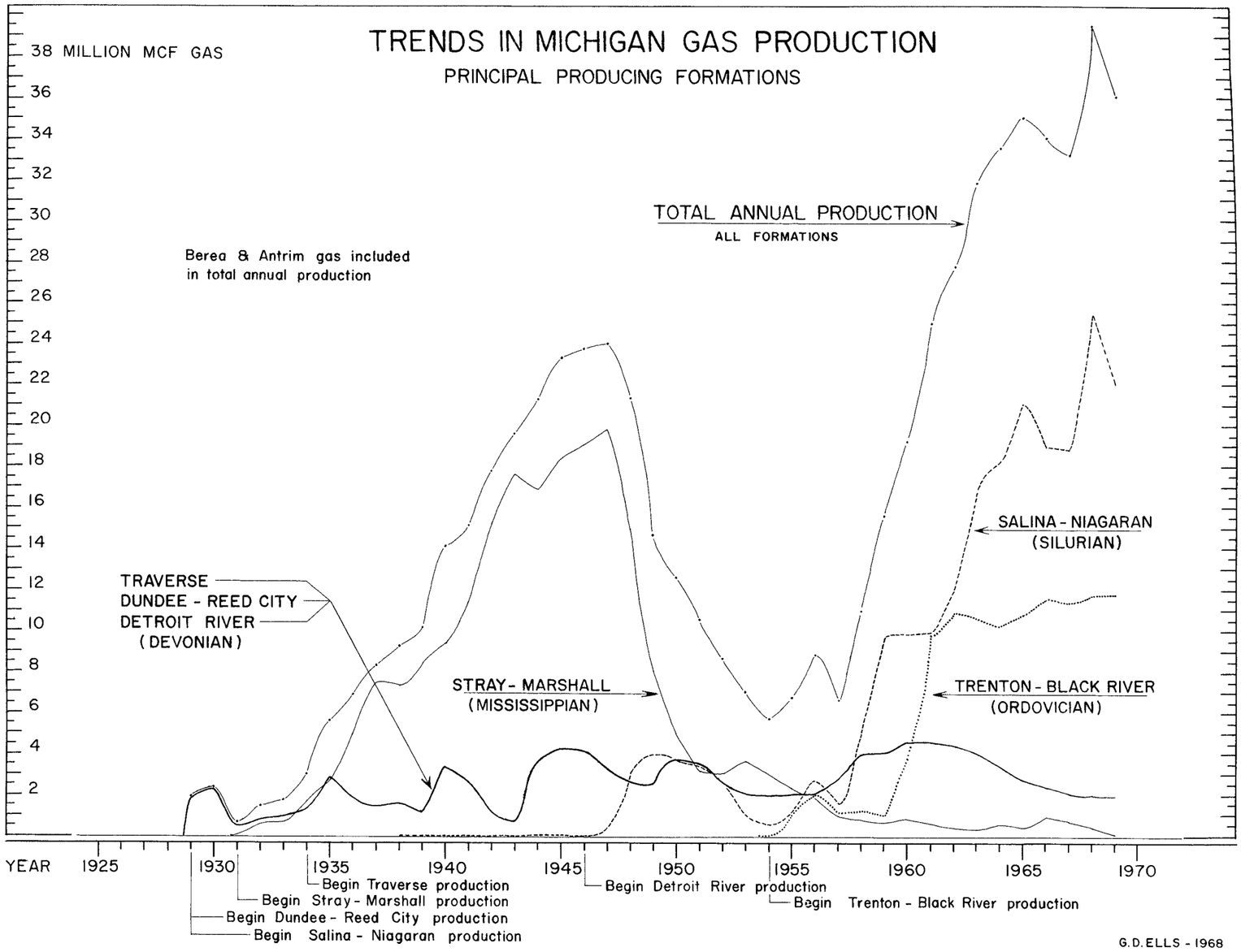


TABLE 13 GAS PRODUCTION BY GEOLOGIC SYSTEM AND FORMATION - 1969 AND PRIOR YEARS

YEAR	CENOZOIC	MISSISSIPPIAN		DEVONIAN				SILURIAN	ORDOVICIAN	
	Glacial Drift	Stray-Marshall	Berea	Antrim Shale	Traverse	Dundee-Reed City	Detroit River	Salina-Niagaran	Trenton-Black River	Total MCF Gas All Formations
	First Year of Recorded Gas Production by Formation									
	1949	1931	1936	1947	1934	1929	1946	1929	1954	
1925 Through 1929	(Cumulative-5 year interval)					1,887,732		74,867		1,962,599
1930 Through 1934		3,001,963			3,744	6,034,206		61,578		9,101,491
	(Cumulative-5 year interval)									
1935 Through 1939		30,769,471	1,391,076		69,894	8,862,165		6,331		41,098,937
	(Cumulative-5 year interval)									
1940 Through 1944		70,498,989	5,860,831		3,716,132	7,647,510		79,983		87,803,445
	(Cumulative-5 year interval)									
1945 Through 1949	8,020	80,217,680	1,467,460	52,495	1,414,004	15,710,636	793,763	7,393,744		107,057,802
	(Cumulative-5 year interval)									
1950 Through 1954	0	18,033,449	916,202	55,626	1,913,497	5,361,578	6,997,257	11,316,082	10,725	44,604,416
	(Cumulative-5 year interval)									
1955 Through 1959	0	6,834,419	148,085	56,686	266,623	2,287,066	12,539,252	20,117,524	6,609,393	48,859,048
	(Cumulative-5 year interval)									
1960 Through 1964	0	2,874,824	42,020	156,485	876,356	1,117,064	19,252,334	66,799,392	45,443,994	136,562,469
	(Cumulative-5 year interval)									
1965	0	404,485	114,926	15,889	105,848	27,135	2,626,290	21,027,896	10,797,899	35,120,368
1966	0	963,211	192,529	985	84,458	31,054	2,299,643	18,992,758	11,555,377	34,120,015
1967	0	736,901	184,751	6,950	148,281	47,516	1,908,777	18,844,819	11,363,645	33,241,640
1968	0	393,299	177,575	31,644	115,611	13,231	1,858,049	25,367,506	11,728,248	39,685,163
1969	0	138,961	144,442	164,837	0	31,723	1,956,844	21,916,622	11,808,745	36,162,174

TABLE 14 CUMULATIVE GAS PRODUCTION BY GEOLOGIC SYSTEM AND FORMATION - 1969 AND PRIOR YEARS

YEAR	CENOZOIC	MISSISSIPPIAN		DEVONIAN				SILURIAN	ORDOVICIAN	Cumulative MCF All Formations
	Glacial Drift	Stray-Marshall	Berea	Antrim Shale	Traverse	Dundee-Reed City	Detroit River	Salina-Niagaran	Trenton-Black River	
	First Year of Recorded Gas Production by Formation									
	1949	1931	1936	1947	1934	1929	1946	1929	1954	
1925 Through 1929						1,887,732		74,867		1,962,599
1930 Through 1934		3,001,963			3,744	7,921,938		136,445		11,064,090
1935 Through 1939		33,771,434	1,391,076		73,638	16,784,103		142,776		52,163,027
1940 Through 1944		104,270,423	7,251,907		3,789,770	24,431,613		222,759		139,966,472
1945 Through 1949	8,020	184,488,103	8,719,367	52,495	5,203,774	40,142,249	793,763	7,616,503		247,024,274
1950 Through 1954	8,020	202,521,522	9,635,569	108,121	7,117,271	45,503,827	7,791,020	18,932,585	10,725	291,628,690
1955 Through 1959	8,020	209,355,971	9,783,654	164,807	7,383,894	47,790,893	20,330,272	39,050,109	6,620,118	340,487,738
1960 Through 1964	8,020	212,230,795	9,825,674	321,292	8,260,250	48,907,957	39,582,606	105,849,501	52,064,112	477,050,207
1965	8,020	212,635,280	9,940,600	337,181	8,366,098	48,935,092	42,208,896	126,877,397	62,862,011	512,170,575
1966	8,020	213,598,491	10,133,129	338,166	8,450,556	48,966,146	44,508,539	145,870,155	74,417,388	546,290,590
1967	8,020	214,335,392	10,317,880	345,116	8,598,837	49,013,662	46,417,316	164,714,974	85,781,033	579,532,230
1968	8,020	214,728,691	10,495,455	376,760	8,714,448	49,026,893	48,275,365	190,082,480	97,509,281	619,217,393
1969	8,020	214,867,652	10,639,897	541,597	8,714,448	49,058,616	50,232,209	211,999,102	109,318,026	655,379,567*

*Does not include 3,050,143 mcf of unassigned gas from early records.

TABLE 15. CUMULATIVE OIL AND GAS PRODUCTION BY COUNTY THROUGH 1969

COUNTY	CUMULATIVE PRODUCTION	
	Barrels Oil	MCF Gas
Allegan	19,268,803	30,516,748
Arenac	45,502,914	6,722,136
Barry	654,297	0
Bay	19,262,249	7,857
Berrien	29,757	0
Calhoun	26,516,494	37,414,294
Cass	103,121	0
Clare	34,606,565	56,601,725
Clinton	4,121	0
Crawford	6,002,121	14,806,546
Eaton	340	0
Genesee	116,535	0
Gladwin	32,995,706	9,834
Gratiot	1,117,238	12,936,592
Hillsdale	43,280,596	38,659,165
Huron	58,875	0
Ionia	381,328	0
Isabella	52,645,580	32,990,844
Jackson	19,387,498	20,856,486
Kalamazoo	28,868	0
Kalkaska	1,356,040	2,133,910
Kent	9,627,662	3,742,516
Lake	2,436,526	182,438
Lapeer	326,025	129,902
Lenawee	12,281	146,160
Livingston	2,411	23,741,734
Macomb	41,134	39,303,646
Mason	4,648,484	297,116
Mecosta	10,081,274	30,977,905
Midland	66,382,284	12,444,916
Missaukee	14,310,730	14,492,860
Monroe	711,292	0
Montcalm	17,828,708	52,572,579
Montmorency	7,688	0
Muskegon	7,909,369	9,759,149
Newaygo	8,727,912	13,132,193
Oakland	31,171	13,737
Oceana	14,958,298	1,172,788
Ogemaw	16,758,928	8,017,064
Osceola	53,108,901	45,076,690
Oscoda	34,717	0
Otsego	15,759	533,769
Ottawa	8,660,368	3,017,652
Presque Isle	1,314	0
Roscommon	11,259,370	12,889,182
Saginaw	2,442,365	0
Shiawassee	24,441	0
St. Clair	7,984,103	110,687,468
Tuscola	2,447,810	0
Van Buren	12,031,395	0
Washtenaw	766,068	7,518,343
Wayne	223,916	10,948,906
Wexford	4,814	924,719
53 Counties	577,126,564	*655,379,569

*Does not include 3,050,143 MCF of unassigned gas from early records. Also not included on Table 14.

TABLE 16. CUMULATIVE WELL COMPLETIONS BY COUNTY THROUGH 1969 (Sheet 1 of 2)

County	Area of County (including inland water)		Classification of Completed Wells (New Hole) (does not include reworked wells)						Approximate Well Density (All Classes)
	Square Miles	Acres	Oil Wells	Gas Wells	Service Wells GS - OBS - SWD	Service Wells LPG	Dry Holes	Total Completions	Wells:Sq. Miles
Alcona	694	444,160					20	20	1:35
Allegan	837	535,680	1,305	89	174		1,689	3,257	4:1
Alpena	590	377,600					10	10	1:59
Antrim	520	332,800		1			33	34	1:15
Arenac	369	236,160	406	44			399	849	2:1
Barry	571	365,440	74				129	203	1:3
Bay	451	288,640	458	1			215	674	1:1
Benzie	342	218,880					3	3	1:114
Berrien	584	373,760	9				70	79	1:7
Branch	517	330,880					53	53	1:10
Calhoun	716	458,240	230	14			289	533	1:1
Cass	505	323,200	30				124	154	1:3
Charlevoix	451	288,640					11	11	1:41
Cheboygan	798	510,720					16	16	1:50
Chippewa	1,651	1,056,640	Northern Peninsula County				4	4	1:413
Clare	577	369,280	384	172	406		361	1,323	2:1
Clinton	573	366,720	4				79	83	1:7
Crawford	566	362,240	83	1	8		23	115	1:5
Delta	1,202	769,280	Northern Peninsula County				1	1	1:1200
Eaton	572	366,080	1				28	29	1:20
Emmet	477	305,280					3	3	1:159
Genesee	649	415,360	16				42	58	1:11
Gladwin	512	327,680	736				262	998	2:1
Grand Traverse	490	313,600		4			11	15	1:33
Gratiot	566	362,240	46	74	20		266	406	1:1
Hillsdale	604	386,560	245	1			441	687	1:1
Huron	824	527,360	5				75	80	1:10
Ingham	560	358,400					17	17	1:33
Ionia	578	369,920	9				80	89	1:6
Iosco	563	360,320					26	26	1:22
Isabella	573	366,720	655	161	7		470	1,293	2:1
Jackson	717	458,880	136	3			250	389	1:2
Kalamazoo	580	371,200	18				108	126	1:5
Kalkaska	573	366,720	22	7			46	75	1:8
Kent	868	555,520	461	6	1	8	347	823	1:1
Lake	577	369,280	47	1			154	202	1:3

TABLE 16. CUMULATIVE WELL COMPLETIONS BY COUNTY THROUGH 1969 Continued (Sheet 2 of 2)

Lapeer	662	423,680	22				61	83	1:8
Leelanau	374	239,360					9	9	1:42
Lenawee	760	486,400	3	72			103	178	1:4
Livingston	583	373,120	1	20	55		77	153	1:4
Luce	929	594,560	Northern Peninsula County				2	2	1:465
Mackinac	1,081	691,840	Northern Peninsula County				2	2	1:541
Macomb	481	307,840	5	44	12		283	344	1:1
Manistee	568	363,520		1			31	32	1:18
Mason	505	323,200	125	7			287	419	1:1
Mecosta	570	364,800	127	196	183		398	904	2:1
Midland	523	334,720	899	2		2	273	1,176	2:1
Missaukee	572	366,080	178	63	102		207	550	1:1
Monroe	564	360,960	45				112	157	1:4
Montcalm	720	460,800	378	221	181		572	1,352	2:1
Montmorency	567	362,880	3	1			17	21	1:27
Muskegon	519	332,160	442	119			384	945	2:1
Newaygo	867	554,880	200	46	70		384	700	1:1
Oakland	899	575,360	6	6			62	74	1:12
Oceana	541	346,240	329	7			500	836	2:1
Ogemaw	580	371,200	503	21	1		168	693	1:1
Osceola	585	374,400	343	114	138		364	959	2:1
Oscoda	568	363,520	2				10	12	1:47
Otsego	538	344,320	3	26			34	63	1:9
Ottawa	572	366,080	473	19	2		492	986	2:1
Presque Isle	678	433,920	1				14	15	1:45
Roscommon	573	366,720	180	14			103	297	1:2
Saginaw	814	520,960	378	2			174	554	1:1
Sanilac	961	615,040					50	50	1:20
Schoolcraft	1,229	786,560	Northern Peninsula County				2	2	1:615
Shiawassee	540	345,600	9				55	64	1:8
St. Clair	751	480,640	255	174	22		793	1,244	2:1
St. Joseph	518	331,520					15	15	1:35
Tuscola	820	524,800	152	1			103	256	1:3
Van Buren	615	393,600	722				996	1,718	3:1
Washtenaw	723	462,720	10	18	5	1	101	135	1:5
Wayne	625	400,000	12	24	17	25	54	132	1:5
Wexford	570	364,800	1	4			55	60	1:10
73 Counties	47,342	Totals:	11,187	1,801	1,404	36	13,502	27,930	

Total includes gas storage, observation, salt water disposal, water injection wells, and brine wells.

TABLE 17. PERMITS, DISCOVERIES, WELL COMPLETIONS, WELLS AT END OF YEAR, 1969 AND PRIOR YEARS (Sheet 1 of 2)

Year	Permits Issued	Classification of Well Completions						Fields or Pools Discovered		Wells at End of Year				
		Oil Wells	Gas Wells	Service Wells GS-OBS-SWD	Service Wells LPG	Dry Holes	Total Completions	Oil	Gas	Oil Wells	Gas Wells	GS OBS	Inj.* P.M.	LPG*
1925	0	3					3	1		Incomplete records from 1925 through 1930				
1926	0	89				16	105		1					
1927	16	218	3			46	267	1	1					
1928	283	79	30			49	158	1						
1929	576	324	22			137	483			*LPG injection and extraction wells in LPG storage facilities.				
1930	257	154	19			158	331	2	3					
1931	111	59	17			52	128		1	634	64			
1932	184	109	10			64	183	1		645	72			
1933	429	223	10			85	318	3	1	831	70			
1934	444	272	47			150	469	3	2	977	117			
1935	700	319	101			221	641	1	5	1,167	212			
1936	777	333	206			268	807	6	5	1,360	402			
1937	973	622	66			267	985	6	1	1,778	442			
1938	996	580	27			411	1,018	17	2	2,141	448			
1939	1,465	845	56			578	1,479	8	2	2,684	485			
1940	1,121	557	59			565	1,181	8	13	2,928	510			
1941	1,044	441	97			413	951	7	8	3,158	577	13		
1942	570	297	74			331	682	14	4	3,324	631	13		
1943	627	233	47			355	635	12	8	3,386	639	13		
1944	741	246	64			400	710	10	2	3,433	651	13		
1945	755	271	57	6		467	801	11	11	3,536	663	19		
1946	822	223	53	86		461	823	19	10	3,520	547	226		
1947	886	318	43	148		387	896	10	4	3,532	534	409		
1948	918	371	32	77		437	917	10	5	3,554	502	482		
1949	999	439	22	73		473	1,007	21	2	3,818	471	554		
1950	901	336	28	47		473	884	18	4	3,954	471	610		
1951	744	227	20	43	1	466	757	16	6	3,911	417	673		1
1952	694	261	30	51	2	370	714	14	5	3,979	388	732		3
1953	824	258	18	110	1	360	747	11	6	4,089	313	901		4
1954	573	214	15	2	2	338	571	18		4,167	316	903		6

TABLE 17. PERMITS, DISCOVERIES, WELL COMPLETIONS, WELLS AT END OF YEAR, 1969 AND PRIOR YEARS Continued (Sheet 2 of 2)

1955	484	204	13	1	1	291	510	12	2	4,223	321	904		7
1956	476	196	12	28		227	463	12	2	4,191	310	932		7
1957	461	176	40	35	3	207	461	12	5	4,233	335	977		10
1958	481	166	20	36	4	227	453	10	7	4,201	345	1,025		14
1959	727	257	47	72	4	272	652	8	7	4,327	323	1,094		18
1960	904	372	19	79	1	441	912	7	4	4,555	249	1,337	242	19
1961	849	207	57	74	3	476	817	13	10	4,619	292	1,420	260	22
1962	711	148	62	53	4	474	741	5	7	4,603	300	1,531	287	26
1963	704	135	72	56	2	384	650	7		4,598	367	1,601	287	28
1964	583	82	48	126		376	632	6	4	4,588	404	1,632	288	28
1965	494	53	34	107		291	485	6	7	4,368	424	1,859	341	28
1966	430	56	45	11	2	290	404	8	3	4,315	429	1,896	233	30
1967	405	69	38	26		287	420	8	2	4,273	481	1,921	333	30
1968	378	70	12	30	6	251	369	9	4	4,372	414	---	394	36
1969	379	73	9	26*		239	347	7	3	-----	---	---	---	

*Includes 5 wtr. Inj., 1 BDW, and 20 GS

These data discontinued. See Tables 4, 5, 6 and 8.

STRATIGRAPHIC SUCCESSION IN MICHIGAN

PALEOZOIC THROUGH RECENT

MICHIGAN DEPARTMENT OF CONSERVATION

Ralph A. MacMullan, Director

GEOLOGICAL SURVEY

Gerald E. Eddy, State Geologist

ACKNOWLEDGEMENT. Compiled with the counsel of colleagues in this department, the U. S. Geological Survey, Michigan's universities, other state Geological Surveys, and geologists within Michigan's oil and gas industry. Dr. Aureal T. Cross, Department of Geology, Michigan State University, identified rocks of Mesozoic age and suggested provisional age assignments.

GEOLOGIC NAMES COMMITTEE

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Harry J. Hardenberg, L. David Johnson, Harry O. Sorensen

PLEISTOCENE NOMENCLATURE

ERA	SYSTEM	SERIES	STAGE	
CENOZOIC	QUATERNARY	RECENT		
		PLEISTOCENE	Wisconsin Glaciation	Valders Stade
				Two Creeks Interstade
				Mankato Stade (Pt. Huron?)
				Cary Stade
				Tazewell Stade
			Sangamon Interglaciation	
			Illinoian Glaciation	

OUTCROP NOMENCLATURE

GEOLOGIC TIME: ERA	PERIOD	EPOCH	SYSTEM	TIME-STRATIGRAPHIC: SERIES	ROCK-STRATIGRAPHIC: GROUP	FORMATION	MEMBER
MESOZOIC	JURASSIC	LATE	JURASSIC	KIMERIDGIAN			
PALEOZOIC	PENNSYLVANIAN	LATE	PENNSYLVANIAN	CONEMAUGH		Grand River Fm.	Ionia, Eaton, and Woodville Sandstones
		EARLY		POTTSVILLE		Saginaw Fm.	Verne Ls.
	MISSISSIPPIAN	LATE	MISSISSIPPIAN	MERAMECIAN	GRAND RAPIDS	Bayport Ls.	
						Michigan Fm.	
		EARLY		OSAGIAN		Marshall Ss.	Napoleon Ss.
				KINDERHOOKIAN		Coldwater Sh.	
	MISSISSIPPIAN-DEVONIAN Unassigned					Ellsworth Sh. (Western Michigan)	
	DEVONIAN	LATE		CHAUTAUQUAN		Antrim Sh.	
				SENECAN			
		MIDDLE		ERIAN	TRAVERSE	Squaw Bay Ls.	
						Thunder Bay Ls.	
						Potter Farm Fm.	
						Norway Point Fm.	
						Four Mile Dam Fm.	
						Alpena Ls.	
						Newton Creek Ls.	
						Genshaw Fm.	Killians
						Ferron Point Fm.	
						Rockport Quarry Ls.	
						Bell Sh.	
						Rogers City Ls.	
						Dundee Ls.	
	SILURIAN	EARLY		ULSTERIAN	DETROIT RIVER	Anderdon Fm.	
						Lucas Fm.	
						Amherstburg Fm.	
						Sylvania Ss.	
						Bois Blanc Fm.	
					MACKINAC BRECCIA	Garden Island Fm.	
		LATE		CAYUGAN	BASS ISLANDS	Raisin River Dol.	
						Put-in-Bay Dol.	
						St. Ignace Dol. (Northern Peninsula)	
					SALINA	Pte. aux Chenes Sh.	
		MIDDLE		NIAGARAN		Engadine Dol.	
					MANISTIQUE	Cordell Dol.	
						Schoolcraft Dol.	
					BURNT BLUFF	Hendricks Dol.	Fiborn Ls.
						Byron Dol.	
						Lime Island Dol.	
		EARLY		ALEXANDRIAN	CATARACT	Cabot Head Sh.	
						Manitoulin Dol.	
	ORDOVICIAN	LATE	ORDOVICIAN	CINCINNATIAN	RICHMOND	Big Hill Fm.	
						Stonington Fm.	Ogontz
							Bay de Noc
						Bill's Creek Sh.	
							Collingwood
		MIDDLE		MOHAWKIAN	TRENTON	Groos Quarry Fm.	
						Chandler Falls Fm.	
					BLACK RIVER	Bony Falls Fm.	
				CHAZYAN			
		EARLY		CANADIAN	PRAIRIE DU CHIEN		
						Oneota Dol.	
	CAMBRIAN	LATE	CAMBRIAN	ST. CROIXAN	LAKE SUPERIOR	Trempealeau Fm.	Jordan Ss.
							Lodi
							St. Lawrence
						Munising Fm.	Miner's Castle Ss.
							Chapel Rock Ss.
		EARLY, MIDDLE				Jacobsville Ss.	
	PRECAMBRIAN						

SUBSURFACE NOMENCLATURE

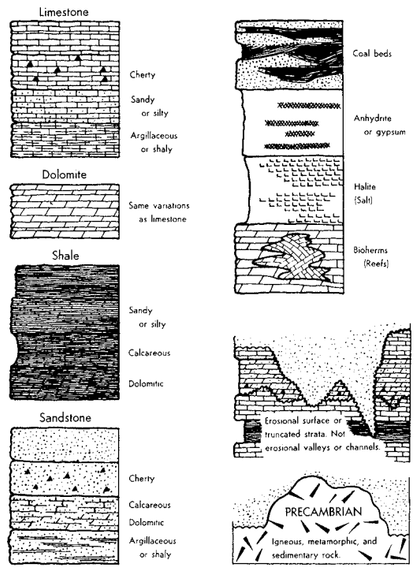
DOMINANT LITHOLOGY	ROCK-STRATIGRAPHIC: FORMATION	MEMBER	GROUP	
Approximate maximum thickness, in feet, of rock units in the subsurface. NO SCALE				
Glacial Drift				
Subsurface only(?)	"Red Beds" (unnamed)			220
	Grand River Fm.			750
	Saginaw Fm.			
	Bayport Ls.		GRAND RAPIDS	160
	Michigan Fm.			600
	Marshall Ss.	Napoleon Ss.		330
	Coldwater Sh.			1300
	Sunbury Sh.			160
Ellsworth Sh.	Berea Ss.	(Eastern Michigan)		260
	Bedford Sh.			240
	Antrim Sh.			660
	Squaw Bay Ls.			
	Alpena Ls.		TRAVERSE	830
	Generally undivided in subsurface.			
	Bell Sh.			
	Rogers City Ls.			475
	Lucas Fm.			
	Amherstburg Fm.		DETROIT RIVER	1450
	Sylvania Ss.			
	Bois Blanc Fm.			800
	Garden Island Fm.			100
			BASS ISLANDS	700
	G Unit			
	F Evaporites			
	E Unit			
	D Evaporite			
	C Unit		SALINA	3150
	B Evaporite			
	A-2 Carbonate			
	A-2 Evaporite			
	A-1 Carbonate			
	A-1 Evaporite			
			NIAGARA	980
	Generally undivided in subsurface.			
	Cabot Head Sh.		CATARACT	200?
	Manitoulin Dol.			
	Queenston Sh.		RICHMOND	950
	Utica Sh.	Collingwood		
	Generally undivided in subsurface.		TRENTON	1100+
		Glenwood	BLACK RIVER	
	St. Peter Ss.			260
	Shakopee Dol.			
	New Richmond Ss.		PRAIRIE DU CHIEN	
	Oneota Dol.			425
		Jordan Ss.		
	Trempealeau Fm.	Lodi		750
		St. Lawrence		
		Franconia Ss.	LAKE SUPERIOR	
	Munising Fm.	Dresbach Ss.		
		Eau Claire		1175?
		Mount Simon Ss.		
	Jacobsville Ss.			1100+
PRECAMBRIAN				

INFORMAL TERMS

Principal oil and gas pays, and informal terms used in petroleum exploration and applied to parts of formations or groups in the subsurface.

STRATIGRAPHIC POSITION	INFORMAL TERMS	PAYS
Basal sandstones of Saginaw Fm.	Parma sandstone	
In lower part of Michigan	triple gyp. / brown lime / stray stray ss	Gas
	stray dol / stray ss.	Gas & Oil
Marshall Ss.		Gas & Oil
Coldwater Sh.	Coldwater lime / Weir sand / Coldwater red rock	Gas
In upper part of Ellsworth Sh.	"Berea" (Western Michigan)	Oil & Gas
Berea Ss.	Berea sand (Eastern Michigan)	Oil & Gas
Squaw Bay Ls.	Squaw Bay	Oil & Gas
Upper part of Traverse Group in Western Michigan	Traverse formation / Traverse lime	Oil & Gas
	Stoney Lake zone	Oil & Gas
Rogers City Ls.		Oil & Gas
Dundee Ls.		Oil & Gas
Dundee Ls. (?), Upper part of Lucas Fm. (?)	Reed City zone	Oil & Gas
In Lucas Fm.	massive salt / big salt / sour zone	Oil & Gas
	massive anhydrite / big anhydrite	
	Richfield zone	Oil & Gas
Amherstburg Fm.	black lime	
Part of Salina Group E Unit	E zone (or Kintigh zone)	Oil
Divisions of A-2 Carbonate in Western Michigan	A-2 dolomite / A-2 lime	Gas
A-1 Carbonate	A-1 dolomite	Oil & Gas
Upper part of Niagaran Series	brown Niagaran / gray Niagaran / white Niagaran	Oil & Gas
Part of Niagaran Series	Clinton shale (Eastern Michigan)	
Trenton Group		Oil & Gas
Black River Group	Black River formation / Black River shale / Van Wert zone	Oil & Gas
Oneota Dol.		Oil

EXPLANATION



GEOLOGIC NAMES COMPILATIONS: Harry O. Sorensen, Cambrian and Ordovician; Robert W. Kelley, Early and Middle Silurian; Garland D. Ells, Late Silurian through Detroit River Group of Devonian age; Harry J. Hardenberg, Dundee Limestone through Traverse Group of Devonian age; L. David Johnson, Antrim Shale through the Pennsylvanian System; F. Wells Terwilliger, glacial geology of the Cenozoic.

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ABBREVIATIONS

A.A.P.G.	American Assoc. Petrol. Geol.
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
SO & G	Show Oil and Gas
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
Trent.-Blk River	Trenton-Black River
Unit.	Unitized

TECHNICAL STAFF and ORGANIZATION CHART

Geological Survey Division
DEPARTMENT OF NATURAL RESOURCES

ADVISORY BOARD

Oil and gas industry representatives appointed to advise Supervisor of Wells.

DIVISION CHIEF

Gerald E. Eddy, *State Geologist and Supervisor of Wells*

As State Geologist formulates policy, supervises budget, and directs the overall program of the Geological Survey. As Supervisor of Wells administers the oil and gas conservation laws. Represents Governor in Interstate Oil Compact Commission.

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GLACIAL AND ENVIRONMENTAL GEOLOGY

Maps surface formations. Investigates and reports on glacial features and Pleistocene geology. Advises on the occurrence and significance of glacial deposits relative to land use and environmental planning

John R. Byerlay, *Geologist*

ADMINISTRATIVE SERVICES

Manages fiscal and property accounts and personnel records Liaison with Administrative Services Division. Coordinates stenographic and clerical services in the Survey.

Bernard O. Crothers, *Office Manager*

UPPER PENINSULA OFFICE

Conducts geological investigations in Upper Peninsula as consultant to State Geologist. Reports on geology, hydrology, quality, and development of water resources. Water Well consultant to other divisions. Participates in education-oriented activities.
203 State Office Building
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Kenneth A. Gravelle, *Geologist & Supervisor*
Donald R. Brackenbury, *Geologist*
Jack L. VanAlstine, *Geologist*

GENERAL GEOLOGY SECTION

Manages geological information center, including reference indexes and library services. Supervises publication and distribution of reports and maps. Coordinates mapping programs, participates in education-oriented activities, and supervises in-service training.

Robert W. Kelley, *Geologist & Head*
Irvin V. Kuehner, *Geologist*

MINING AND ECONOMIC GEOLOGY SECTION

Prepares valuations of all metallic mining properties. Investigates economic minerals as consultant to State Geologist and other state administrators. Represents Division in cooperative geologic mapping programs involving Precambrian formations of western Upper Peninsula. Compiles mineral statistics in cooperation with U.S. Bureau of Mines. Prepares mineral kits.

Harry J. Hardenberg, *Geologist in Charge*
Robert C. Reed, *Geologist*
Harry O. Sorensen, *Geologist*
R. Thomas Segall, *Geologist*

OIL AND GAS SECTION

Supervises and coordinates overall oil and gas program. As Secretary to the Advisory Board, schedules hearings conducted by the Board and promulgates the formal orders of the Supervisor of Wells. Liaison with the State Public Service Commission which supervises the production of natural gas.

Lyle W. Price, *Geologist in Charge*

WATER SECTION

Investigates the geology, hydrology, quality and development of water resources, frequently as consultant to the State Health Department and the Water Resources Division. Represents Survey in cooperative programs involving water resources. Liaison with water well industry. Water well consultant to other divisions. Supervises preparation and distribution of water well logs.

Arthur E. Slaughter, *Geologist & Head*
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William A. Walden, *Geologist*
Elmore E. Eltzroth, *Geologist*

PETROLEUM GEOLOGY UNIT

Supervises collecting and interpreting petroleum geology data, as consultant to Supervisor of Wells and other state administrators. Supervises oil well sample program. Prepares and distributes oil well logs and oil and gas maps. Publishes oil and gas field development and statistical data.

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Beverly L. Champion, *Geologist*
Floyd L. Layton, Jr., *Geologist*
Lyle D. Taylor, *Cartographic Draftsman*

REGULATORY CONTROL UNIT

Supervises issuance of permits to drill oil and gas tests and wells. Implements orders of Supervisor of Wells on drilling locations and patterns, casing programs, and brine disposal. Supervises plugging and abandoning procedures. Supervises collecting oil well drilling records.

Robert M. Acker, *Geologist & Head*
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Harold E. Rickard, *Department Executive*
Robert A. Dunn, *Geologist*

PRODUCTION AND PRORATION UNIT

Supervises collecting and interpreting reservoir engineering and production data for applying production controls. Implements proration orders of the Supervisor of Wells. Liaison with oil producers on proration and production regulations.

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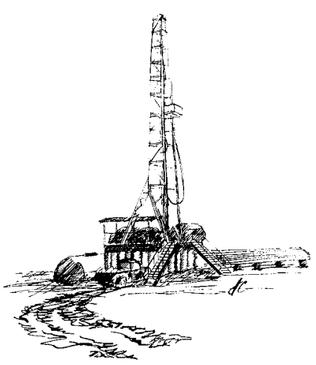
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