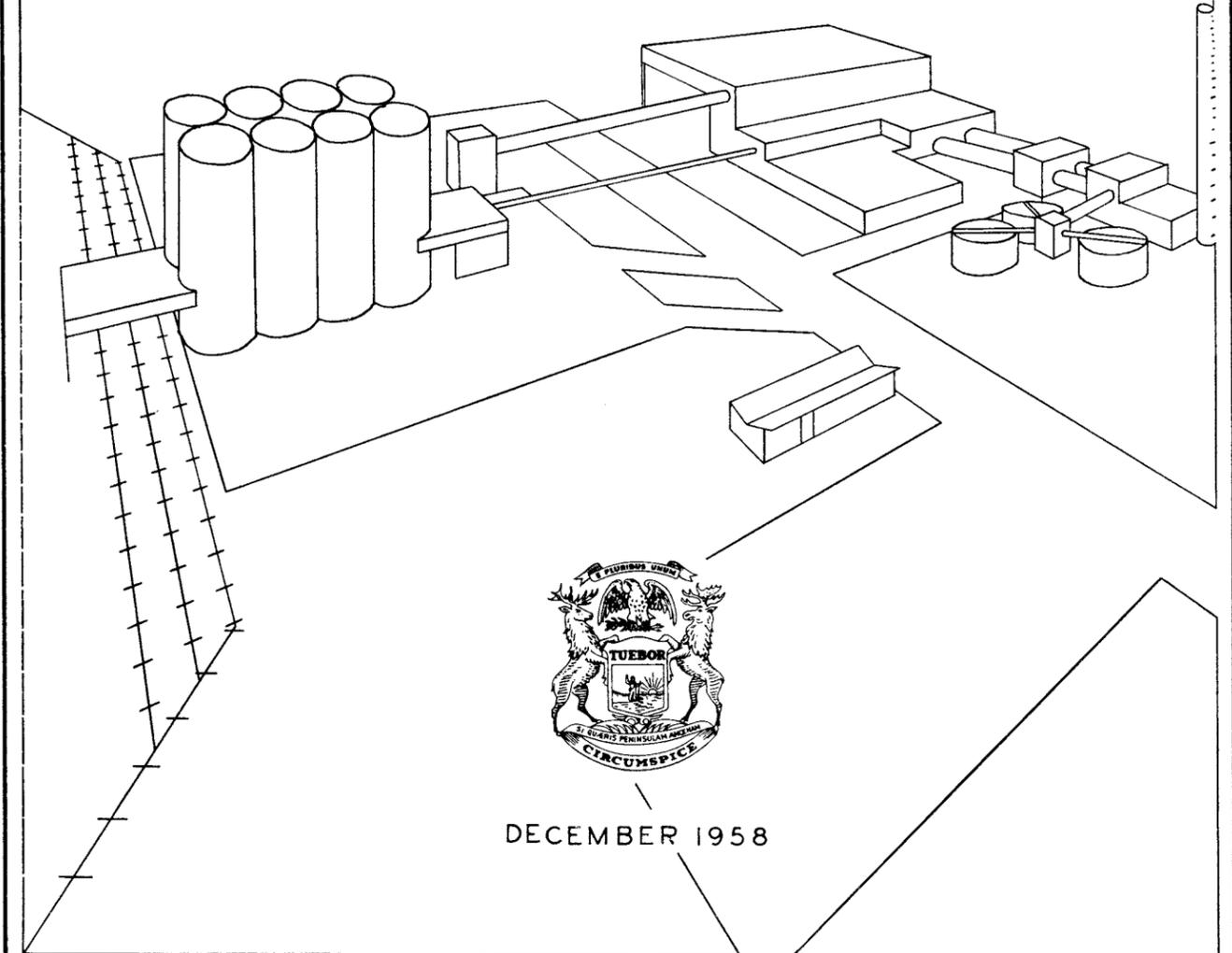


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MICHIGAN'S MINERAL INDUSTRIES 1957



DECEMBER 1958

MICHIGAN
MINERAL INDUSTRIES

1957

by

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FOREWORD

This report is a record of the Michigan Mineral Industries for the calendar year 1957. Metallic (iron and copper) and fuel (petroleum, natural gas, and natural gasoline) statistics were compiled by the Michigan Geological Survey. Non-metallic (all other) statistics were compiled in cooperation with the United States Bureau of Mines.

The estimated value of mineral production for 1958 was submitted by the United States Bureau of Mines on December 19, 1958. The section on developments in the mineral industries was prepared from office and field conferences with mineral producers, and from articles published in Pit and Quarry, Rock Products, Mining Journal, and other trade journals. The sketch on the cover represents The Dundee Cement Company's new cement plant near Dundee on which construction began in June, 1958.

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LATE DEVELOPMENTS IN MICHIGAN'S MINERAL INDUSTRIES

Economic accomplishments for 1957 were favorable despite a mild recessionary trend at the end of the year. A fairly good year for the industrial mineral concerns operating in the field was foreseen for 1958. A few noteworthy events recorded for the various mineral industries since the close of 1957 are here listed.

Marquette Iron Mining Company recently completed its program of diamond drilling on the low-grade Empire iron property at Palmer, six miles south of Negaunee. The Empire is a future source of low-grade ore for Marquette's Eagle Mills.

M. A. Hanna Company commenced construction of the Groveland plant east of Randville. The plant to consist of spirals and flotation will beneficiate ore comparable to those being treated at the Humboldt and Republic plants of Cleveland-Cliffs Iron Company. It is scheduled to be ready for operation in 1959.

In the efforts to save the Homer and Wauseca underground mines located in Iron County, Hanna continued the sinking of their new 20 foot circular shaft begun June 18, 1957. Sinking is advancing at the rate of 8 feet per day and is expected to be completed in December. When completed the new shaft will serve the two mines for an annual production of one million tons. The shaft will have three hoists - two for ore and one for men and materials. The two 9 ton ore skips will handle $15\frac{1}{2}$ tons each and will operate at 1890 feet per minute.

National Steel Corporation has acquired a little more than 80 percent of the Teal Lake Mining Company at Teal Lake. The property contains a substantial quantity of hematite ore with an average iron content reported to be about 39 percent. This ore can be converted into a high-grade concentrate, according to the firm.

Republic Steel Corporation during the year discontinued operations at its Tobin iron ore mine near Crystal Falls. The mine was closed for an indefinite period because of economic conditions and a surplus of iron ore.

The Buck mine of Pickands Mather and company on the Menominee Range closed operations at midnight, July 24, for an indefinite period. The Buck group includes the Buck, Zimmerman, and Fogerty mines in Caspian and Gaastra. In addition to the Buck, the Tobin, Book and Warner mines have suspended operations. Menominee Range mines still operating are the Sherwood and Bristol of Inland Steel Company and the Homer, Wauseca, Hiawatha No. 1 and 2 and the Cannon of the M. A. Hanna Company.

On August 25th Pickands, Mather and Co. recalled 619 men at the Newport and Geneva mines at Ironwood. Operations were resumed on a three weeks per month schedule. The mines have been idle for three months.

The copper industry entered 1958 with poor prospects. Prices charged by U. S. producers had tumbled from a high of 46 cents to 25 cents per pound. Custom smelter prices had fallen from $54\frac{1}{2}$ cents to 24 cents. Dealers in the U. S. were underselling smelters by nearly 1 cent. Electrolytic copper could be bought in Europe for 21 cents.

In spite of the sharp drop in copper prices exploration continued for copper in the Keweenaw formations. The United States Metal Refining Company, on their 20,000 acres of controlled property north of Wakefield completed during the year its year-long diamond drilling program. On the basis of 132,000 feet of drilling the company has estimated a deposit of about 50,600,000 short tons of copper-bearing shale with an average of 1.52 percent. An additional 54,000,000 short tons of lower grade shale with an average content of 1.04 percent also exists. A 215 foot shaft was excavated to determine the character of the formation and for sampling.

The Bear Creek Mining Company made lease application for copper exploration and development involving 933 acres of upland within the Porcupine Mountains State Park and 5,200 acres of Lake Superior bottom lands.

The Dundee Cement Company is proceeding with plans to construct a 4,500,000 bbl. capacity cement plant near Dundee. The plant scheduled for completion in 18 months will cost an estimated \$30,000,000 and will employ 200 persons. Gypsum for the new plant will be shipped in through the Monroe port and limestone and clay are available at Dundee where stripping of overburden for the new quarry is in progress.

Huron Portland Cement Company is erecting a building to house two new finishing mills which will add 5,000 barrels to its daily grinding capacity. An addition has been made to its powerhouse to enclose a 12,500 kilowatt turbine-generator. During 1957 Huron added a shop and storeroom building covering an area of 150,000 square feet. The company completed purchase of Wyandotte Chemical Corporation's limestone quarry at Alpena as of January 1, 1958. The approximately 146 employees of the quarry are now on the Huron payroll. The company employs 1,250 at the Alpena plant.

An historical marker was recently placed at the Huron Alpena location, marking the site of one of the world's largest cement plants. The Michigan Historical Commission said the plaque will recognize the company's contributions to Michigan's growth in the last 50 years. Cement production began at the plant in 1918.

Drummond Dolomite Corporation announced plans for a \$2,500,000 expansion program on Drummond Island. Plans include construction of a six mile railroad on the island between the old and new plants. The present plant now processes 10 sizes of crushed stone for metallurgical, chemical, and construction trades. The expansion program already started with clearing of timber is scheduled for completion in about 3 years.

Sale of the Limestone Products Company, Menominee, to the NorthWestern-Hanna Fuel Company, Minneapolis was announced during the year. Limestone Products founded in 1922 will retain its 40 employees.

National Gypsum Company has signed a 10 year contract with Boland and Cornelius Buffalo lake vessel operators, to transport gypsum ore from its quarry at Tawas City to the sites of new plants at Waukegon, Illinois and Lorain, Ohio.

Shipments are to start soon to the Waukegon plant site to build a stockpile in readiness for the plant scheduled to open in the spring of 1959. The Lorain plant will be in production in the spring of 1960.

Diamond Crystal Salt Company, St. Clair, is nearing completion on a \$400,000 addition to its main office building. The company announced the employment of a relatively new technique in the drilling method of extracting salt, known as hydrofracting.

Three Detroit business men announced that Foamcrete Inc. newly formed will manufacture a new kind of concrete so light it will float, so versatile it can be sawed or nailed and so strong it can be used for a roof. The product called "Betocel" is based on a secret formula developed by Belgian Technicians and exported to this country by a subsidiary of Borg-Warner Corp. Betocel, which is made of cement, sand, water and the secret, will be sold throughout Michigan by Panel Engineering Corp.

Michigan Chemical Corporation announced the completion of plans for the construction of a new sea water magnesium plant at Port St. Joe, Florida. The new plant, with a design capacity of 125 to 150 tons a day and subsequent enlargement to 300 tons will provide industry with high purity chemical and refractory grades of magnesium oxide and will have access to rail, ocean, and Mississippi River barge shipping.

MINERAL PRODUCTION

1957

GENERAL REVIEW

To appreciate Michigan's mineral resources it is necessary to have some knowledge of the general geology of the State.

In Michigan rocks of the Precambrian, Paleozoic, and Cenozoic eras are found. No deposits of the Mesozoic era are in Michigan and the Cenozoic is represented only by deposits of the Pleistocene and Recent Epochs.

The Precambrian rocks are chiefly igneous and metamorphic although some sedimentary rocks are present. These rocks are near or at the surface in the western part of the Northern Peninsula.

The Paleozoic rocks of Michigan are sedimentary - sandstones, conglomerates, shales, limestones and dolomites, gypsum, and salt. Paleozoic rocks are in the central part of the Southern Peninsula, and are flanked in circular fashion by older Paleozoic rocks, the oldest, the Cambrian, comes to the surface in the Northern Peninsula.

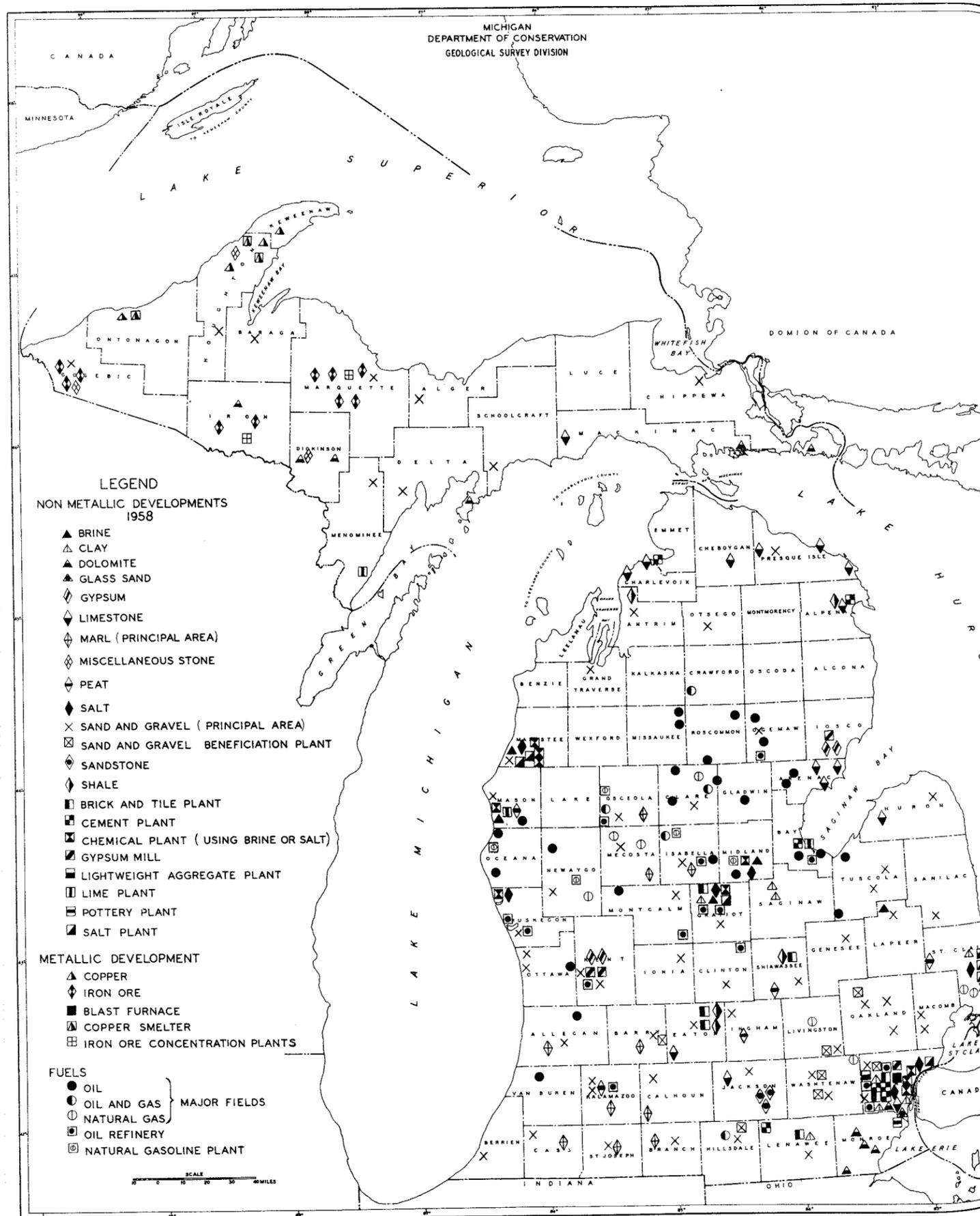
The youngest deposits, the Pleistocene, are known as glacial drift or till-gravels, sands, clays that cover the entire state.

An extensive system of capacious valleys dating from preglacial time which were enlarged by glacial scour and depressed regionally under the weight of the ice sheet gave rise beginning in Cary time to a sequence of glacial lakes that led to the modern Great Lakes.

During 1957 the value of all Michigan's mineral production increased .06 of a per cent. Metallic mineral value decreased 8 per cent and fuels 2 per cent. However the non-metallic minerals increased 6 per cent due to a \$12,000,000 increase in the value of cement, salt, and stone.

Approximately 40 per cent of the total value of Michigan's minerals entered into the Great Lakes trade. Large quantities of iron ore, cement, limestone, dolomite and gypsum were shipped from Marquette, Escanaba, Port Inland, Port Dolomite, Drummond Island, Petoskey, Rogers City, Stoneport, Alpena and Alabaster for destinations in Minnesota, Wisconsin, Illinois, Indiana, Ohio, Pennsylvania, and New York as well as in Michigan.

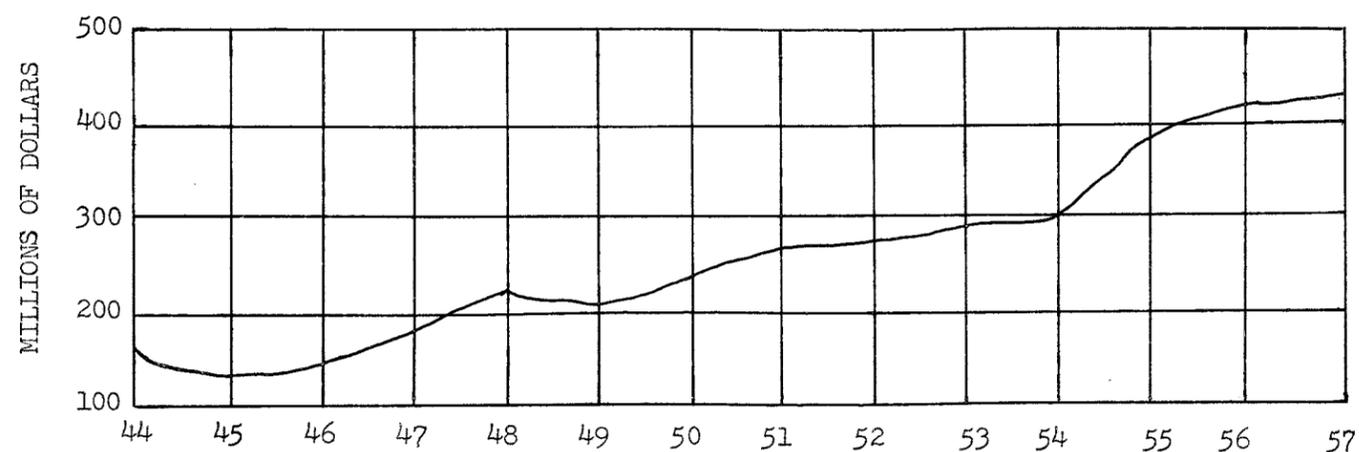
In volume of mineral production in 1957 in the United States Michigan ranks: First in gypsum, salt, peat and marl; Second in iron ore, bromine, magnesium compounds, sand and gravel and stone; Fourth in cement; Sixth in copper.



The following table gives the value of Michigan mineral production in 1957.

	Value	Per Cent
Non-Metallics	230,402,532	56.6
Metallics	144,622,118	35.6
Fuels	31,784,950	7.8
Total	406,809,600	100.0

GRAPH WHICH SHOWS INCREASE IN VALUE OF MINERAL PRODUCTION IN A 13 YEAR PERIOD



VALUE OF MINERAL PRODUCTION IN MICHIGAN, 1944 - 1957

Iron Ore

Geological formation - Animikie (formerly called Huronian). Iron ore is a mineral containing iron in such quantity, grade, and chemical combination as to make extraction commercially profitable. A large number of minerals are iron-bearing, however only four, magnetite, hematite, limonite, and siderite are important as a source of the metal. Hematite is the principal mineral utilized in Michigan. The most important iron-bearing zone is the middle Huronian or Animikie.

Shipments of iron ore in 1957, from 27 underground mines and 9 open pits comprised 13,126,746 long tons (2,240 lbs.) an increase of 4.7 per cent over 1956. Demand for iron ore was down in 1957 and the increased production was due primarily to labor strikes in 1956. Iron ore continued to rank first of minerals produced.

IRON ORE SHIPMENTS BY RANGES, 1957

Range	No. of Mines		Iron Ore Shipments		Long Tons
	Underground	Open Pit	Direct Shipping	Siliceous	Total
Marquette	10	5	5,710,489	282,283	5,992,772
Menominee	11	3	4,250,704	45,863	4,296,567
Gogebic	6	1	2,837,407		2,837,407
Total	27	9	12,798,600	328,146	13,126,746

Harry Hardenberg, Mining Geologist for the Geological Survey Division, estimated the 1957 iron ore reserve to be 154,208,852 tons a value of \$93,815,000. The Marquette Range had the largest reserves, 64,463,706 tons; the Menominee Range 63,536,097 tons; and the Gogebic Range 26,209,049 tons.

Four of the five old underground mines still operating on the Gogebic Range are Pickands Mather and Company properties; the Sunday Lake at Wakefield; the Newport at Ironwood; the Cary at Hurley and the Colby (now included in the Paterson) at Bessemer. All four mines were opened in the 1880's. M. A. Hanna Company continued sinking a new circular shaft and erection at its project in the Mineral Hill area, Iron County, Michigan of a new surface plant. Both projects are to save the Homer and Wauseca underground iron mines, by replacing existing facilities which will become inadequate as mining goes deeper. The new shaft will be 2,000 feet deep and will be ready for production in 1960.

Cleveland Cliffs Iron Company's Mather mine on the Marquette Range constructed a tunnel under the large mine rescue training room at "B" shaft which is used for training mining rescue squads. The tunnel can be filled with smoke closely simulating conditions in an actual mine fire. The men receiving the training enter with oxygen apparatus and are taught such things as building a brattice

*Metallic statistics compiled by Michigan Geological Survey

from planks and poles placed near the mouth of the tunnel. (A brattice is a partition or wall that prevents air circulation and thus smothers a fire.) The men receive the best possible preparation for the hazardous job of fighting a real underground fire.

SHIPMENTS AND VALUE OF IRON ORE, 1953 - 1957

Year	Shipments (Long Tons)	Value
1953	13,380,756	91,402,764
1954	9,722,882	69,226,417
1955	14,148,123	107,890,161
1956	12,536,302	105,688,087
1957	13,126,746	110,605,689

COPPER

Geological formation - Keweenawan. The production of copper in Michigan is entirely from rocks classified as Keweenawan. Copper is at many horizons throughout the Keweenawan series which extends from the Keweenaw Peninsula south and westward into Wisconsin. The copper mines of Houghton and Keweenaw counties produce native copper from the lava flows and interbedded conglomerates, but in Ontonagon county the copper produced is mainly ore in the Nonesuch shale a copper sulphide (chalcocite) and minor amounts of native copper.

Michigan produced 113,647,143 pounds of copper during 1957, a decrease of 8 per cent in production and 35 per cent in value below 1956. A large percentage of the decrease in production was due to a strike at the White Pine Mine that lasted from September 23 to October 28. In mid-September Calumet and Hecla reduced operations because of lower prices for copper. Operations were suspended at the Iroquois, Osceola No. 6 and No. 13 shafts. Average price used for calculating the value of copper was 29.6 cents per pound in 1957 and 41.8 cents in 1956.

The 1957 valuation for copper mining properties totaled \$16,840,000. The White Pine Copper Company valued at \$11,000,000 was the largest Michigan copper property.

COPPER PRODUCTION BY COUNTIES 1957

County	Mines	Reclamations	Copper Production (Pounds)		
			Mines	Reclamation	Total
Houghton	6	3	12,860,068	8,921,814	21,781,882
Keweenaw	6		22,843,409		22,843,409
Ontonagon	2		69,021,852		69,021,852
Total	14	3	104,725,329	8,921,814	113,647,143

United States Metal Refining Company operated six diamond drills in exploring a large tract north of Wakefield, between the Gogebic Iron Range and the south shore of Lake Superior which is underlain by potentially valuable copper-bearing formations.

COPPER PRODUCTION 1953 - 1957

Year	Quantity (Pounds)	Value
1953	47,999,690	13,832,951
1954	44,786,803	13,298,994
1955	99,996,160	37,489,560
1956	123,280,235	51,531,138
1957	113,647,143	33,629,326

Petroleum

Petroleum production decreased for the 11th consecutive year in 1957 to 10,168,602 barrels 5 per cent below 1956 and the lowest recorded since 1933. At the end of 1957, 3,988 producing wells were in 39 counties. Approximately 63 per cent of the total output was from Isabella, Montcalm, Arenac, Bay, Clare, Ogemaw, Osceola, and Gladwin counties, more than half a million barrels were produced in each county.

During the year 423 wells were completed (176 oil producers, 40 gas producers, 207 dry holes). Of these completions 150 were wildcats (13 oil producers, 5 gas producers, and 132 dry holes). The remaining 273 completions were field wells (163 oil producers, 35 gas producers, and 75 dry holes).

Fifteen refineries, in ten counties, processed more than 99 per cent of the crude oil produced in Michigan during 1957. The combined normal daily capacity of all Michigan refineries is approximately 165,000 barrels.

Detailed information for oil and gas operations is recorded in "1957 Summary of Operations, Oil and Gas Fields", available from Michigan Geological Survey.

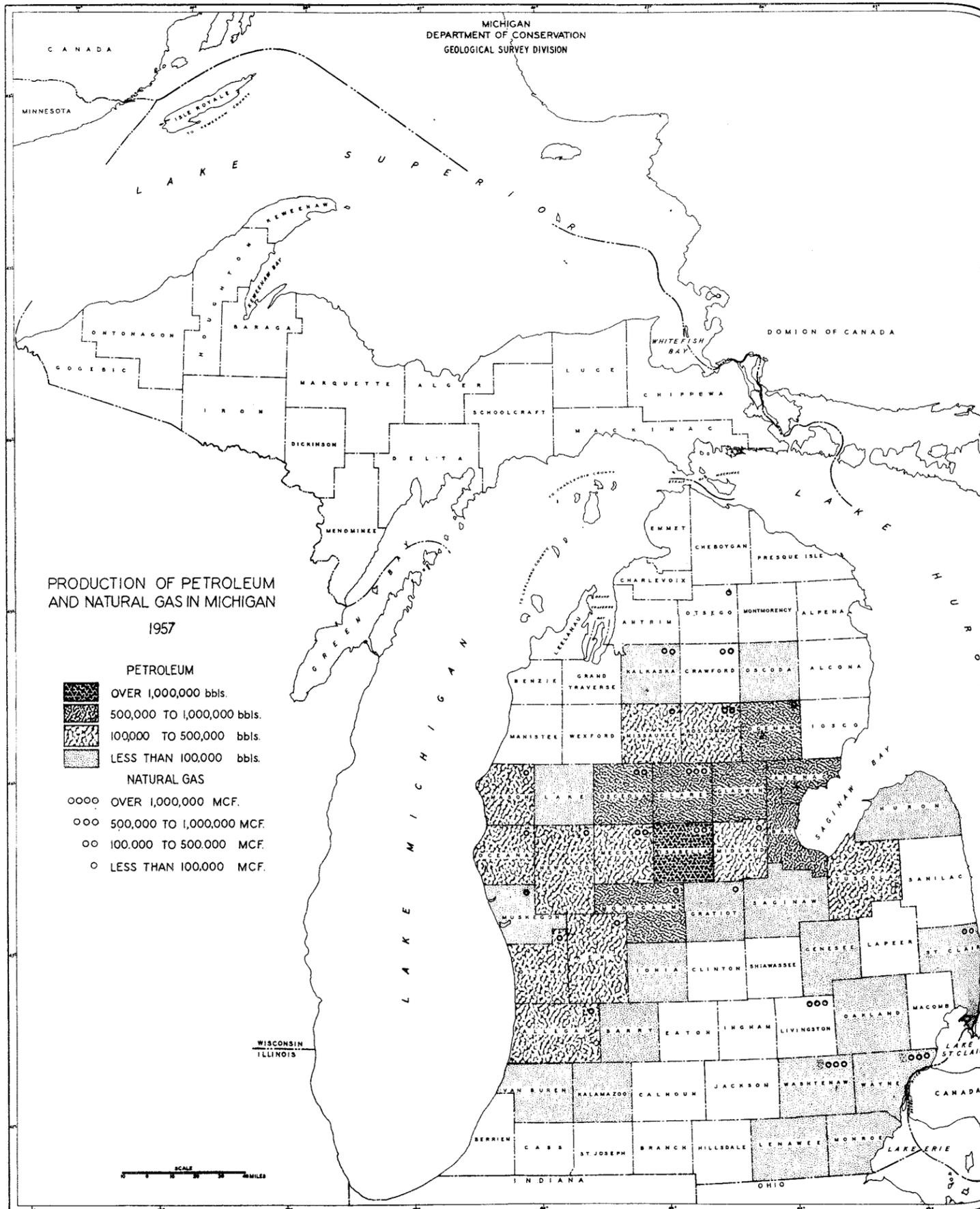
*Fuel statistics compiled by Michigan Geological Survey.

PETROLEUM PRODUCTION AND ACCUMULATED OIL BY FORMATION, 1957

Formation	Production		Accumulated	
	(Barrels)	Per Cent	(Barrels)	Per Cent
Marshall	1,830	.02	60,972	.02
Berea	19,926	.20	2,096,556	.52
Traverse	1,789,636	17.60	83,242,324	20.50
Dundee	5,359,284	52.70	293,618,083	72.31
Detroit River	2,811,865	27.65	25,828,548	6.36
Salina-Niagaran	24,082	.24	86,693	.02
Trenton	161,979	1.59	1,105,872	.27
Total	10,168,602	100.00	406,039,048	100.00

PETROLEUM AND NATURAL GAS PRODUCTION, 1953 - 1957

Year	Petroleum		Natural Gas	
	Barrels	Value	M. cu. ft.	Value
1953	12,284,510	35,644,982	7,089,985	1,246,106
1954	12,028,059	34,279,968	5,698,175	997,180
1955	11,265,832	32,074,018	6,787,697	1,187,846
1956	10,739,697	30,607,137	8,840,933	1,556,575
1957	10,168,602	30,505,806	6,639,813	929,574



Over 65 per cent of the natural gas produced in Michigan has been from the Michigan Stray - Marshall. Natural gas production decreased 25 per cent to 6,639,813,000 cubic feet in 1957. Of this amount 2.7 billion cubic feet was oil well gas. Natural gas was produced from 218 wells in 24 counties. Clare, Wayne, Washtenaw, and Livingston counties were the leading producers with 49 per cent of the State total.

GAS PRODUCTION AND ACCUMULATED GAS BY FORMATIONS - 1957

Formations	Production	Per Cent	Accumulated	Per Cent
	(M. cu. ft.)		(M. cu. ft.)	
Glacial Drift			8,020	.00
Michigan Stray				
Marshall	1,031,520	15.54	208,275,917	65.71
Berea	34,709	.52	10,268,809	3.24
Antrim	11,094	.17	138,588	.04
Traverse	13,289	.20	11,193,834	3.53
Dundee	431,422	6.50	42,145,263	13.30
Detroit River	804,546	12.12	1,542,545	.49
Richfield	1,526,406	22.99	11,537,585	3.64
Salina-Niagaran	1,617,909	24.36	24,466,846	7.72
Trenton	1,168,918	17.60	4,319,726	1.36
Unassigned			3,050,143	.97
Total	6,639,813	100.00	316,947,276	100.00

Natural Gasoline

Michigan in 1957 produced from oil well gas a total of 3,495,703 gallons of natural gasoline and allied products valued at \$349,570. Crawford County, with 76 per cent of the State total, ranked first among the six producing counties.

NATURAL GASOLINE PRODUCTION, 1953 - 1957

Year	Quantity (Gallons)	Value
1953	4,414,351	441,438
1954	3,898,312	389,831
1955	3,612,912	361,291
1956	3,740,916	374,092
1957	3,495,703	349,570

Portland Cement

Portland Cement is an artificial chemical combination of lime, silica, alumina, iron oxide, and small amounts of other ingredients to which gypsum is added to regulate the set. Chief raw materials used in cement manufacturing in Michigan are limestone, shale or clay and gypsum. These raw materials are obtained from Paleozoic limestones and shales and from Pleistocene clays.

Portland Cement was produced by eight cement plants in the State. Antrim shale from Alpena County and Ellsworth shale from Antrim county were used by the northern plants. All southern plants use local glacial or lake clays. The greater parts of the limestone used was from the Traverse and Dundee formations quarried in the northern part of the Southern Peninsula. All gypsum was purchased.

RAW MATERIAL USED IN THE MANUFACTURE OF PORTLAND CEMENT, 1957

Raw Material	Short Tons
Limestone	5,432,642
Clay and Shale	1,597,655
Gypsum	149,536

Shipments and value of Portland Cement increased for the thirteenth consecutive year. Nearly all plants operated at or near capacity during the year. Alpena County continued to be the leading producer; Wayne County ranked second. Portland Cement was produced also in Bay, Emmet, Lenawee, and St. Clair counties.

Garner A. Beckitt, president of the Riverside Cement Company, San Francisco, California, announced late in 1957 that negotiations were underway for a merger of the Riverside Cement Company, the Hercules Cement Corporation, Philadelphia, Pa., and the Peerless Cement Corporation, Detroit. The total annual capacity of the merged company is approximately 18,500,000 bbl., making it one of the largest cement firms in the country. Under the plans, the combined company will have a new name. Properties and businesses owned by the three corporations will operate as autonomous divisions of the combined company, but present brands and product names will not be changed.

Dannes Temple, a spokesman for the St. Lawrence Cement Company of Clarkston, Ontario, announced that a new multimillion-dollar cement plant will be built near Dundee, Monroe County. St. Lawrence Cement Company is controlled by Holderbank Finance SA., a Swiss Cement manufacturing group. A 2000 acre site had been acquired by Senned Realtors Corporation, a Delaware organization in which the St. Lawrence firm has an interest. St. Lawrence planned to ship a large part of the cement for the construction of the plant from its plants in Villeneuve, Quebec, and Clarkston, Ontario.

The Huron Portland Cement Company celebrated its Golden Anniversary during 1957. It was founded on January 29, 1907, in Detroit and now operates the largest single cement mill in the world at Alpena. Output was increased during 1957 when

two large new kilns, equipped with preheaters, were put into production. In 1915 Huron instituted a method of shipping cement in bulk from its main plant at Alpena to its processing and distributing plants throughout the Great Lakes region. Today Huron ships its production from Alpena, in its own fleet of six vessels, to Detroit, Duluth, Cleveland, Buffalo, Toledo, Saginaw, Oswego, Muskegon, Milwaukee, Green Bay, and Superior. A new storage plant on the St. Joseph River near Benton Harbor, Berrien County, was under construction. Desiring to have its own source of limestone, Huron bought the Wyandotte Chemical Corporation's mile-wide limestone quarry at Alpena, which had supplied Huron for 50 years. The sale did not include ownership of the limestone-carrying fleet of Wyandotte Transportation Company, a subsidiary of the Wyandotte Chemical firm.

Wyandotte Chemical Corporation, Wyandotte early in 1957 completed an expansion program started a year earlier which doubled the former capacity of 1,200,000 bbls. annually. Included were facilities for production of Portland slag cement. Of \$2,500,000 invested over \$500,000 was for air pollution control which included electrical precipitators. New equipment included primary and secondary crushers.

PORTLAND CEMENT SHIPMENTS, 1953 - 1957

Year	Shipments (Barrels)	Value	Rank in U.S.	Number of Plants
1953	15,853,096	41,860,464	5	7
1954	18,106,975	50,460,566	5	7
1955	19,738,400	58,048,378	4	7
1956	21,880,222	67,798,262	4	8
1957	22,045,034	71,605,137	4	8

Salt

Geological formation - Detroit River, Sylvania, Salina.

Almost the entire Southern Peninsula of Michigan is underlain by great thicknesses of rock salt - one of the largest basins of salt deposition in the world. Artificial brines produced by dissolving salt from the Salina formation are recovered by six plants in Muskegon, St. Clair, and Wayne counties. The brine is used for production of evaporated salt and for use in chemical plants. Salina rock salt mined at Detroit is reached by a shaft approximately 1,100 feet in depth. Evaporated salt is produced from natural brines drawn from the Sylvania formation at St. Louis, Gratiot county and from artificial brines from the Detroit River formation at Manistee, Manistee county. Artificial brines from the Detroit River formation are used at the chemical plant in Midland, Midland county.

Approximately 67 per cent of the salt was used by chemical plants in Wayne, Midland and Muskegon counties. Over 1.8 million tons of salt were used in soda ash plants, and 1.6 million tons were used for the manufacture of chlorine and other chemicals. Approximately 16 per cent of the total production was dried and evaporated salt.

During 1957 5,225,425 short tons of salt valued at \$41,072,497 were produced. Wayne ranked first of the six counties producing salt - Gratiot, Manistee, Midland, Muskegon, St. Clair, and Wayne. Four companies in Wayne county reported a combined total of 3,849,797 tons or approximately 74 per cent of the State's total output.

USES OF SALT, 1957

Uses	Quantity (Short Tons)
Chemical	3,479,252
Highway, dust and ice control	667,131
Livestock	160,787
Textile, hides, and packers	180,320
Food Processing	107,019
Table and other household	63,896
Water treatment	47,061
Other	153,256
Undistributed	366,703

Total

5,225,425

The first two international pipe lines used to transport brine were laid in November of 1957 from Canadian Brine, Ltd., just north of Ojibway, Ontario, to the Solvay Process Division plant on Zug Island, Wayne County. The twin 10-inch heavy iron pipe, 20 feet apart and each a mile in length, will deliver brine amounting to a million tons of dry salt annually.

International Salt Company, Inc., Scranton, Pa. (owner and operator of the salt mine under Detroit) was granted a 50-year lease by the State of Ohio for \$7,500,000 salt mine project under the water of Lake Erie. The company will sink a 2000-foot shaft on Whiskey Island where the company has purchased 16 acres and will tunnel from the bottom of the shaft to the salt deposit.

SALT PRODUCTION, 1953 - 1957

Year	Quantity (Short Tons)	Value	Per Cent of U. S. Total	Rank in U.S.
1953	5,127,387	22,171,988	24.7	1
1954	5,063,633	29,396,812	24.5	1
1955	4,975,442	31,668,351	21.9	1
1956	5,548,178	35,643,860	22.9	1
1957	5,225,425	41,072,497	21.9	1

Geological formations - Sylvania, Detroit River.

Natural brine recovered from the Sylvania formation is used by chemical companies of Midland and Gratiot counties. Brine from the Filer sandstone of the Detroit River formation is produced in Mason and Manistee counties. These natural brines are source material for many chemicals and chemical compounds.

Elemental bromine was produced in 1957 by four companies in six plants in Gratiot, Manistee, Mason and Midland counties. Bromine compounds were produced by three companies in Gratiot, Manistee, and Midland counties. Magnesium compounds were produced by four companies in Gratiot, Manistee, Mason, and Midland counties. Calcium chloride, and calcium-magnesium chloride were produced by three companies in Gratiot, Lapeer, Mason, and Midland counties. Only one company (Dow Chemical Company, Midland) reported production of potassium salts from natural brines.

Most of the calcium-magnesium chloride produced was sold for stabilization of dirt roads and for dust control. Other important uses for calcium chloride are the "freeze-proofing" of coal, iron ore and other materials shipped in bulk in railroad cars or stockpiled in the open and for the freeze-proof curing of cement. Magnesium compounds have various uses and are particularly important in the manufacture of fertilizers, oxychloride cement, rayon and rubber. Magnesium chloride is at present the principal raw material used in the production of metallic magnesium. Magnesium sulfate, carbonate, oxide and hydroxide are used extensively in pharmaceuticals.

The value of the natural salines recovered from natural brines in 1957 by the chemical plants decreased 0.5 per cent below the 1956 value. The highest value was recorded for bromine, followed by magnesium compounds, calcium-magnesium chloride and potash.

The chemical industry, our sixth largest employer, providing jobs for nearly 40,000 persons, continued to expand and to turn out innumerable varieties of chemical goods. Dow Chemical Company of Midland which employs 10,500 persons planned to build within the next two years a two-million dollar catalyst plant at Ludington, a petro-chemical plant in Bay City, and a half mile long new headquarters at Midland.

To take full advantage of the economics of the Seaway development and the New York State Barge Canal, Dow was in the process of building a marine terminal along the Saginaw River at Bay City. The facilities scheduled to be opened in the Spring of 1958 is to serve for shipping products to Europe and to the company's eastern terminals at Philadelphia, Pa., and Port Newark, N. J.

Michigan Chemical Company planned a \$2½ million expansion, Parke Davis Co. of Detroit planned a new research unit at Ann Arbor and the Upjohn Company of Kalamazoo expanded operations in the state. The Ott Chemical Company was constructing a \$300,000 unit in Dalton Township, Muskegon County, to produce intermediate chemicals. The American Nitrogen Corporation built a plant in Traverse City, and Cowles Chemical Company of Cleveland acquired a site for a new plant near Monroe, Monroe county. Wyandotte Chemical Corporation planned an oxide products plant in Wyandotte to process polyethers which are said to improve and lower manufacturing costs of items using polyurethane foam plastic.

Year	Value
1954	31,099,382
1955	34,282,204
1956	37,873,042
1957	37,664,914

*Includes: bromine, calcium chloride and calcium-magnesium chloride, magnesium compounds, and potash.

Sand and Gravel

Sand and gravel are obtained from glacial deposits - kames, eskers, outwash plains, deltas of glacial streams, beach ridges, glacial drainage channels, beds of former glacial lakes and in less concentrated deposits in the glacial drift; from present day beaches, river channels, and lakes; and from sand dunes. Sand is also obtained from the Lower Devonian Sylvania sandstone, a very pure quartz sandstone with grains of uniform fineness very loosely cemented.

Production and value of sand and gravel decreased slightly in 1957 to 41,837,894 short tons valued at \$35,144,352. Sixty-seven per cent of the total sand and gravel output was used in road construction and 20 per cent for structural purposes.

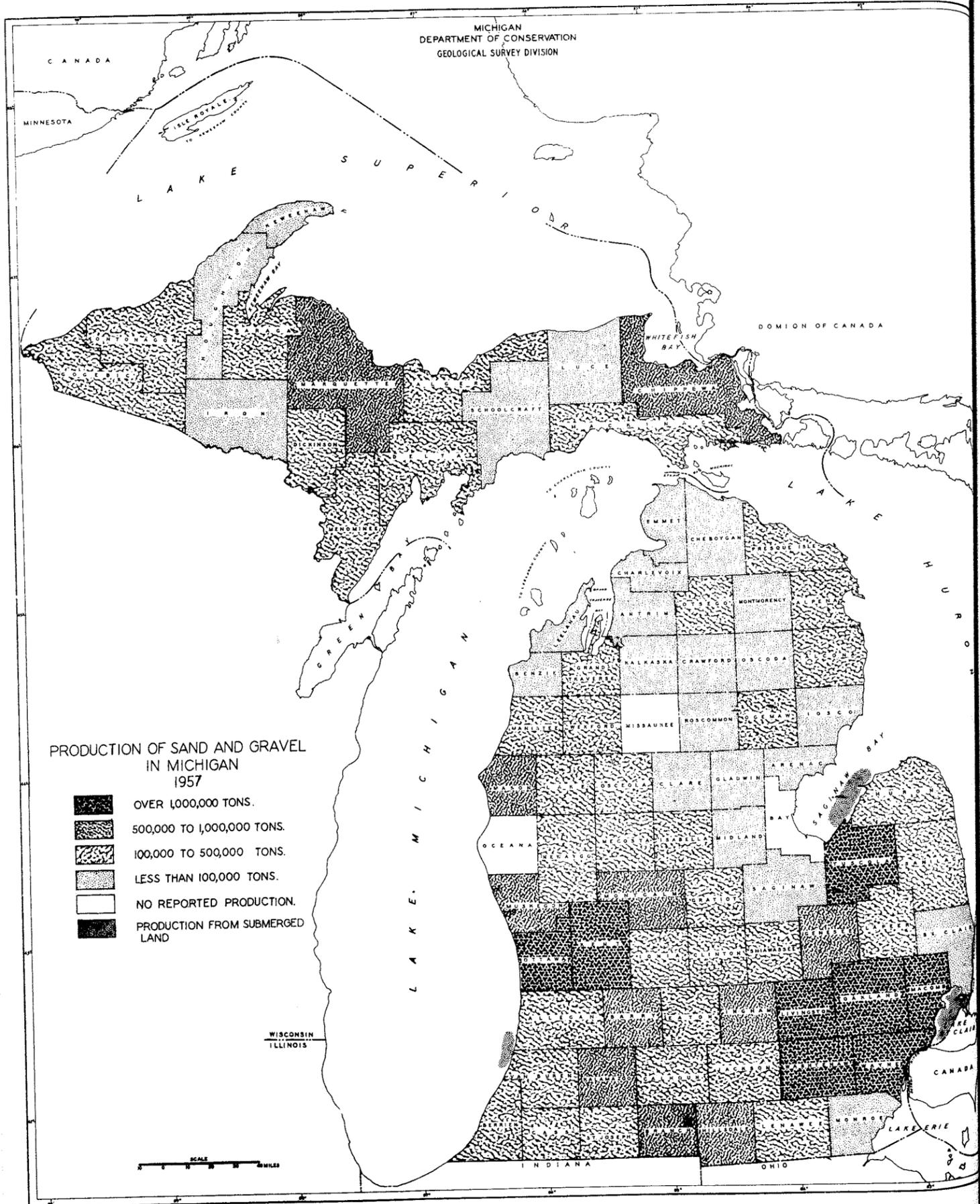
Production of sand and gravel was reported from 80 counties of Michigan. Approximately 51 per cent of the total production was from eight counties in order of rank: Oakland, Livingston, Wayne, Kent, Ottawa, Tuscola, Washtenaw, and Macomb. About 15 per cent of the state total was produced in Oakland county. Each of the other counties produced more than 1,000,000 tons. About 81 per cent of the State's total was reported by commercial producers and the remaining 19 per cent was non-commercial production by county road commissions and other governmental agencies.

USES OF SAND AND GRAVEL, 1957

Uses	Quantity (Short Tons)	Value	Per Cent of Total
Structural Sand	4,377,889	3,336,771	10.5
Paving and Road Sand	5,891,859	4,360,677	14.1
Molding Sand	2,237,004	3,002,990	5.3
Other Sand*	2,326,880	2,046,955	5.6
Paving and Road Gravel	22,353,499	17,371,340	53.4
Structural Gravel	3,874,350	4,449,698	9.2
Railroad Ballast Gravel	324,256	255,795	0.8
Other Gravel	452,157	320,126	1.1

Total 41,837,894 35,144,352 100.0

*Includes: Glass sand, engine sand, filter sand, railroad ballast sand, grinding and polishing sand and other sand.



Six commercial sand and gravel plants employing heavy-media separation and one using a new process "elastic fractionation", based on difference in elastic nodule of sound hard stone and the deleterious soft and absorbent stones, were in operation in the state in pits and deposits that were considered incapable of producing quality gravel suitable for specified highway concrete. These concerns were: American Aggregate Corp., Green Oaks, Livingston county; Bundy Hill Gravel Company, Somerset Center, Hillsdale county; Harry Pickett, Northville, Wayne county; Killians Gravel Company, Ann Arbor, Washtenaw county; Groverland Gravel Company, near Davisburg, Oakland county; Nashville Gravel Company, Nashville, Barry county; and Whittaker and Gooding Gravel Company (elastic fractionation process), near Dexter, Washtenaw county.

PRODUCTION OF SAND AND GRAVEL, 1953 - 1957

Year	Quantity (Short Tons)	Value	Rank In U. S.
1953	30,459,663	23,170,802	2
1954	32,035,729	25,458,503	2
1955	37,269,709	29,565,730	2
1956	42,149,946	35,145,953	2
1957	41,837,894	35,144,352	2

Stone

Geological formation - Bayport, Marshall, Traverse, Dundee-Rogers City, Detroit River, Bass Island, Engadine, Burnt Bluff, Keweenaw, Animikie.

Approximately 65 per cent of the stone produced in Michigan in 1957 was quarried from the Rogers City - Dundee, and Traverse limestone formations in Presque Isle, Cheboygan, Alpena, and Wayne counties. The remaining 35 per cent was from the Niagaran, Engadine and Burnt Bluff limestone and dolomites in Mackinac and Chippewa counties, the Bass Island and Detroit River dolomites in Monroe county, and the Bayport limestone from Huron, Eaton, Jackson and Arenac counties. Dimensional limestone was produced in Eaton, Huron, and Presque Isle counties.

Sandstone for rough construction, rubble, and flagging stone was quarried from the Marshall sandstone of Mississippian age in Jackson and Calhoun counties.

Basalt and granite from Precambrian rocks was crushed and used for road construction in Houghton and Gogebic counties.

STONE PRODUCTION, 1957

Commodity	Quantity (Short Tons)	Value
Limestone and Dolomite:		
Crushed	34,284,037	33,894,536
Dimensional	34,741	105,854
Sandstone:		
Dimensional	17,889	70,142
Basalt:		
Crushed	40,593	60,138
Granite:		
Crushed	700	1,375
Total	34,377,960	34,132,045

USES OF CRUSHED LIMESTONE AND DOLOMITE, 1957

Uses	Per Cent of Total	Quantity (Short Tons)	Value
Cement and Lime	28.1	9,622,625	6,920,246
Flux	42.7	14,624,595	15,299,610
Concrete and Road Metal	14.4	4,954,171	6,102,099
Chemical*	10.4	3,574,323	3,265,398
Agricultural	1.7	586,558	740,042
Railroad Ballast	1.0	339,718	457,462
Other**	1.7	582,047	1,109,679
Total	100.0	34,284,037	33,894,536

* Includes: Alkali, calcium-carbide, sugar, glass and paper.

**Includes: Paint filler, asphalt, dust for coal mines, mineral food, store sand, and others.

The long abandoned Woolmuth quarry, located about one mile northeast of Maybee, Monroe county, was dewatered late in 1956. Quarrying commenced in 1957 by Kramer and Sons to supply stone for Borin Aggregates of Detroit.

Renaming ceremonies for two self-unloading vessels of the Bardley Transportation Line, operated by the Michigan Limestone Division of the United States Steel Corporation took place during the spring of 1957. The B. H. Taylor was rechristened the "Rogers City" in honor of the "Limestone Capitol of the World", and the A. F. Harvey became the "Cedarville", in honor of the division's newest dolomite quarry at Cedarville, Mackinac county.

PRODUCTION OF STONE, 1953 - 1957

Year	Quantity (Short Tons)	Value	Rank in U. S.
1953	21,053,866	17,442,250	3
1954	19,461,818	17,526,743	3
1955	25,312,294	23,361,852	3
1956*	33,926,000	30,951,782	2
1957*	34,377,960	34,132,045	2

* Includes Limestone used in the manufacture of cement and lime.

Clay and Shale

Geological formation - Glacial Drift, Saginaw, Ellsworth, Antrim.

Clay and shale are produced at widespread localities throughout the state. Antrim shale from Alpena County and Ellsworth shale from Antrim county quarries are used in the manufacture of Portland Cement. Saginaw shale is used by three plants for manufacture of tile. In Eaton and Shiawassee counties, all other tile, brick, pottery, light weight aggregate and cement plants operating in the state use clay from local surface deposits. Clay, produced in Saginaw county, is sold for oil well drilling mud, for molding sand bond and for fertilizers.

During 1957 2,031,890 short tons of clay and shale valued at \$2,266,599 were produced. Wayne county led in production and value with 32 per cent of the state's total output, followed by Alpena, Saginaw, and St. Clair counties. Approximately 79 per cent of all raw clay and shale produced was used by the cement industry. The remaining 21 per cent was used for the manufacture of a small quantity of prepared clays and for clay products - brick, tile, pottery, and lightweight aggregates.

About 82 per cent of the raw material for the manufacture of clay products is from glacial clay and about 18 per cent is from shale deposits.

PRODUCTION OF CLAY AND SHALE, AND CLAY PRODUCTS, 1953 - 1957

Year	Raw Clay and Shale		Clay Products Estimated Value
	Quantity (Short Tons)	Value	
1953	1,605,804	\$1,646,113	\$6,995,181
1954	1,890,950	1,940,408	7,331,998
1955	1,937,593	2,091,077	7,292,477
1956	2,110,030	2,401,051	6,951,866
1957	2,031,890	2,266,599	6,851,113

Geological formation - Michigan.

Gypsum is quarried at Alabaster and National City, Iosco county, and is mined in two mines at Grand Rapids, Kent county. The raw material is processed in gypsum mills at National City, Grand Rapids, and at River Rouge, Wayne county. Principal uses for gypsum are in the manufacture of plaster, wallboard, and allied building materials and as a Portland cement retarder.

Since 1945 Michigan, producing about 18 per cent of the national total, has ranked first in the production of crude gypsum. In 1957, Michigan produced 1,385,952 short tons of crude gypsum valued at \$4,822,810.

Industry activities in gypsum was lower than in the proceeding 12 months primarily as a result of the lower rate of residential construction. Coupled with the decline and partically offsetting it was an increase in construction of publicly owned schools, highways, sewers and water facilities.

National Gypsum Company proceeded with development of its Tawas City gypsum quarry. Stripping operations at the new quarry moved steadily forward and construction was started on the crushing plant and dock site. A year's supply of rock will be stockpiled at National City, and the remainder shipped to new plants at Waukegan, Ill., and Lorain, Ohio. The new plants are being built to serve markets outside the reach of the present National City Plant. As they will be supplied with raw material from the new quarry, the lake shipping facility below Tawas City is necessary.

PRODUCTION OF GYPSUM, 1953 - 1957

Year	Quantity (Short Tons)	Value	Per Cent of U. S.	Rank In U. S.
1953	1,446,973	\$4,091,002	18	1
1954	1,693,279	5,035,550	18	1
1955	1,762,105	5,660,587	17	1
1956	1,715,832	5,861,152	-	1
1957	1,385,952	4,822,810	-	1

Lime

Geological formation - Dundee, Burnt Bluff.

Raw stone for the manufacture of lime was obtained from the high calcium Dundee limestone in Presque Isle county and from the Burnt Bluff limestone in Mackinac county.

Three companies produced quick lime and hydrated lime in Bay, Mason, and Menominee counties. Production of lime in Michigan decreased approximately 3 per cent, but increased 5 per cent in value during 1957. Mason county continued to rank first in production, followed by Menominee and Bay counties. Ninety-four per cent of the lime sold and used was quick lime.

Until the turn of the century, when the chemical industries began to grow rapidly, lime was used almost entirely in building and for agriculture. Since then, progressively larger amounts have been employed in chemical tests and processes. All lime produced in the state is now sold or used for chemical and industrial use.

Lime is used to soften and purify water, to make glass, petrochemicals, bleaches, pharmaceuticals, insecticides, sugar and leather, as a causticizing agent in paper and pulp manufacturing and as flux in the purification of steel.

Peat

Geological formation - Pleistocene. Peat is partly decomposed and more or less disintegrated vegetable matter that has accumulated in places where ordinary decay or chemical decomposition of the material has been retarded by immersion in water. A peat deposit is an accumulation of many generations of plants from one or several groups of vegetation, thus an individual bog may contain several different types of peat. Peat deposits of Michigan are largely in muskegs and grass-sedge marshes in basins of glacial origin. Although the principal deposits are in the Northern Peninsula it is the bogs near centers of population in the Southern Peninsula that are of importance commercially. It has been estimated that the reserves of peat in Michigan total 1 billion tons.

Production in 1957 was larger than in 1956 principally because 2 producing companies added to the industry. Michigan was first in production during the year; Washington second; and Florida third.

Most of the peat produced was used for general soil improvement purposes. Small amounts were used in pottery, in mixed fertilizers, for packing flowers for shipment, and for several miscellaneous uses.

PRODUCTION OF PEAT, 1953 - 1957

Year	Quantity (Short Tons)	Value	Per Cent of U. S.	Rank In U. S.
1953	25,439	257,176	12.5	4
1954	27,847	429,116	11.4	3
1955	30,000	465,000	11.0	3
1956	31,111	474,899	10.7	3
1957	80,271	1,406,195	25.4	1

Marl

Geological formation - Pleistocene.

Many of the large and some of the smaller lakes of the state are floored with marl of different thicknesses. In some lakes the marl is a narrow rim or shelf around the margin which in places has developed considerable thickness. The deposits of marl are limited in extent and thickness by the depression which confines them. Deposits range in area from merely a fraction of an acre to

several square miles in some localities and may be from 10 to 15 feet thick. More than 30 feet of marl is of rare occurrence.

All marl produced in the state is used for agricultural purposes. Commercial marl production was reported in 13 counties during 1957. Calhoun County ranked first, followed by Kalamazoo, Isabella, and Osceola counties. These counties produced approximately 60 per cent of the state output. Michigan was the leading producer of calcareous marl in 1957 with a reported production of 137,020 tons.

PRODUCTION OF MARL, 1953 - 1957

Year	Quantity (Short Tons)	Value	Rank in U. S.
1953	183,685	72,781	1
1954	106,668	37,724	1
1955	119,313	57,176	1
1956	157,246	94,821	1
1957	137,020	70,635	1

Gem Stones

The gem-stone collecting and cutting hobby continued to increase in 1957. An increased number of amateur rock collectors were in the field. However the only reported gem stones collected in Michigan during the year were a small quantity of semi-precious gems, chiefly agates, thomsonite, and native copper from the beaches and mines of the Keweenaw Peninsula. The following minerals and stones are frequently collected in the state, some when cut and polished are attractive enough to be classed as gem stones.

chlorastrolite	actionolite	psilomelane	domeykite
carnelian	celestite	grunerite	natrolite
prehnite	native copper	topaz	manganite
amethyst	rose quartz	pyrite	verde antique
algonite	datolite	gypsum	garnet
jaspilite	chalcocite	chalcedony	tremolite
pyrolusite	chalcopyrite	epiodte	calcite (dog-tooth spar)
martite	whitneyite	bornite	Petoskey stone
tourmaline	goethite		

Publication 42 "Rocks and Minerals of Michigan" may be purchased for fifty cents from the Publications Room, Department of Conservation, Lansing 26, Michigan. This booklet of 120 pages describes the ordinary rocks and minerals of the state, their origin, location, uses and importance. Anyone desiring to persue this interest in more detail should provide themselves with a copy of our recent Publication 50 "An Index to Michigan Geology" (\$5.00). A partial list of the contents of this 450 page volume includes an index of all Michigan Geological Survey publications and maps, an index and chart of the rock formation names used in Michigan, a list of all reported Paleozoic rock outcrops, and a comprehensive listing of references to Michigan geology and mineral resources. These publications are available in libraries or may be purchased from the Publication Room, Michigan Department of Conservation, Lansing 26, Michigan.

Water, the most important resource man uses and needs, is the liquid which descends from the clouds as rain, and which forms rivers, lakes, and seas and is stored also as underground water.

Water evaporated from the earth's surface and precipitated from the atmosphere is the source of all water supply. Only a small part of the rain-snow fall on the land is converted by man to his use. Of the average rainfall of 30 to 33 inches per year only about 5 inches becomes useful groundwater. The remainder runs off to streams on its way back to the sea or enters the ground only to be transpired by plants.

Michigan is blessed with an abundance of water, but rainfall is not concentrated where water is most needed, in the industrial and irrigation areas. Since water resources are renewable (from rains and snows) and are transient (much water run off to rivers, much is transpired to the air by plants) a great deal of information is required to adequately plan their development and uses. Appraisal of water resources is becoming more and more important to insure a lasting supply sufficient to meet the needs of expanding industries and an ever increasing population. Such appraisal includes consideration of climate, surface, and sub-surface, land forms, land uses, stream flow and other seemingly remote bits of information. Hydrological conditions regarding rainfall, run off, and percolation must be understood in developing a water supply.

Underground water is a source of supply for many communities in the state. During the retreat of the continental glacier deposits of glacial drift - sand, clay, gravel, boulders - were laid down on the bed rock. Many Michigan cities, villages, and rural areas now obtain fresh water from the sands and gravel beds of the drift, from sands and gravels deposited in the moraines and outwash plains, or from the beaches and delta deposits of ancient glacial lakes and rivers. In other localities where the drift is relatively thin fresh water is recovered from underlying porous bedrock formations. In some places, however, it has been necessary to pipe large volumes of water from the Great Lakes to industrial areas or cities where ground-water resources are inadequate or contain salty or brackish waters.

Cities and areas plagued by water shortages grow in number every year. With adequate hydrological investigations, however, shortage in most communities can be met intelligently or avoided, by making an approximate analysis of the quantity and quality of water needed and by designing the systems on the basis of reliable information on the source of the water supply to be developed. Water can be provided in adequate quantity and quality in any part of the state if funds are available to construct the necessary facilities.

No data has been compiled on the gallons of water used for domestic, industrial, agricultural, scenic and recreational purposes and no dollar value has been assessed, however, best estimates available from the U. S. Department of Commerce are that 30,000 water wells are drilled in Michigan each year. Approximately one million water wells are in use for all purposes. Each citizen of modern society requires more than 1300 gallons daily to meet direct and indirect needs. Industry uses tremendous quantities for man's direct needs especially when we consider that for every 100 gallons of water a person uses directly, many times that amount is used for him by industry and service facilities. It takes 14,400

gallons of water to produce one ton of pig iron; 65,000 gallons to produce one ton of finished steel; 18 barrels of water to refine a barrel of oil; 15,000 gallons of water to make an automobile; 100 gallons of water to produce one slice of breakfast bacon.

VALUE OF MICHIGAN'S MINERALS AND MINERAL PRODUCTS 1942-1957

Year		Year	
1942	152,624,946	1950	238,474,008
1943	147,113,888	1951	257,529,882
1944	140,493,319	1952	267,089,423
1945	128,046,408	1953	287,693,135
1946	133,682,135	1954	286,549,922
1947	170,269,272	1955	371,356,604
1948	214,115,771	1956	406,563,233
1949	207,607,694	1957	406,809,600

TABLE I
MINERAL PRODUCTS OF MICHIGAN, 1957 (1)

PRODUCT	UNIT	QUANTITY	VALUE	RANK IN U. S. (2)
Iron Ore	Long Tons	13,126,746	\$110,605,689	2
Cement	Barrels	22,045,034	71,605,137	4
Salt	Short Tons	5,225,425	41,072,497	1
Natural Salines (3)	-----	-----	37,664,914	1
Sand and Gravel	Short Tons	41,837,894	35,144,352	2
Copper	Pounds	113,647,143	33,629,326	6
Petroleum	Barrels	10,168,602	30,505,806	13
Stone (4)	Short Tons	28,599,562	30,008,637	2
Clay Products	-----	-----	6,851,113	-
Gypsum	Short Tons	1,385,952	4,822,810	1
Clay and Shale (5)	Short Tons	2,031,890	-----	8
Natural Gas	M. Cu. Ft.	6,639,813	929,574	17
Natural Gasoline	Gallons	3,495,703	349,570	15
Marl	Short Tons	137,020	70,635	1
Miscellaneous (6)	-----	-----	3,509,340	-

TOTAL

\$406,809,600

- (1) Metallic and fuel statistics compiled by Michigan Geological Survey
- (2) Based upon quantity
- (3) Includes: bromine, magnesium compounds, calcium-magnesium chloride, and potash
- (4) Does not include 5,778,398 short tons of limestone valued at \$4,123,408 used in the manufacture of cement and lime.
- (5) Used in the manufacture of cement and clay products
- (6) Includes: lime, silver, sulfur, mineral pigments, peat, gem stones, and clay.

MINERAL PRODUCTS OF MICHIGAN, 1956 (1)

PRODUCT	UNIT	QUANTITY	VALUE	RANK IN U. S. (2)
Iron Ore	Long Tons	12,536,302	\$105,688,087	2
Cement	Barrels	21,880,222	67,798,262	4
Copper	Pounds	123,280,235	51,531,138	6
Natural Salines (3)	-----	-----	37,873,042	1
Salt	Short Tons	5,548,178	35,643,860	1
Sand and Gravel	Short Tons	42,149,946	35,145,953	2
Stone (4)	Short Tons	33,926,000	30,951,782	2
Petroleum	Barrels	10,739,697	30,607,137	12
Clay Products	-----	-----	6,951,866	-
Gypsum	Short Tons	1,715,832	5,861,152	1
Clay and Shale	Short Tons	2,110,030	2,401,051	9
Natural Gas	M. Cu. Ft.	8,840,933	1,556,575	16
Peat	Short Tons	31,111	474,899	3
Natural Gasoline	Gallons	3,740,916	374,092	15
Marl	Short Tons	157,246	94,821	1
Miscellaneous (5)			2,807,704	

TOTAL

\$406,563,233 (6)

- (1) Statistics compiled in co-operation with the United States Bureau of Mines
- (2) Based upon quantity
- (3) Includes: bromine, magnesium compounds, calcium-magnesium chloride and potash.
- (4) Includes: 9,223,513 short tons of limestone valued at \$6,815,785 used in the manufacture of cement and lime.
- (5) Includes: lime, silver, mineral pigments, and gem stones.
- (6) Value of limestone used in the manufacture of cement and lime and value of clay and shale used in cement and clay products not included in state total.

PRODUCTION AND VALUE
OF
MINERALS AND MINERAL PRODUCTS
BY COUNTIES

1957

All counties reported mineral production for 1957. Marquette, Wayne, Iron, Midland, Alpena, Gogebic, and Ontonagon led all others in value, contributing 60 per cent of the state's total.

The quantity and value of mineral production are given on a county basis, where possible. In some cases it has been necessary to show the county value as an undistributed total or to combine them as one group at the end of the county breakdown portion to avoid disclosure of individual company operations. The number in parentheses, following the county name, indicates the county's rank in the state in value of mineral production. Figures in parentheses, following a mineral resource, show the rank of the county in the production.

All indicated tonnage is in short tons (2,000 lbs.) with the exception of iron ore, which is reported in long tons (2,340 lbs.)

Mineral producers contributing production data for 1957 are listed, by county, below production data. Location of the operation, when known, is given by section, township, and range, or nearest city to operation.

		<u>Quantity</u>	<u>Value</u>
	ALCONA (75)		
Sand and gravel		205,200 tons	\$ 65,610
Alcona County Road Comm.	NE SW 7 25N 6E SE SW 7 26N 9E NW NE 11 26N 9E	Sand and gravel " " " "	
	ALGER (72)		
Sand and gravel		188,519 tons	\$ 93,067
Alger County Rd. Comm. Duluth, South Shore and Atlantic Railroad Co. Fox Valley Construction Co.	NW NE 4 45N 21W Near Au Train	Sand and gravel " " " "	

	<u>Quantity</u>	<u>Value</u>
ALLEGAN (44)		
Petroleum	244,126 bbls.	\$ 732,378
Sand and gravel	357,506 tons	229,707
Natural gas	59,864 M.cu.ft.	8,381
Marl (5th, 8%)	11,613 tons	<u>6,203</u>
Total value		\$ 976,669
Allegan Co. Rd. Comm. Cleo L. Arndt	Douglas (3½ mi. E. on 130th St.) NW 23 3N 16W	Sand and gravel Marl
Gerald Arnsman Michigan State Hwy. Dept. Huitt and Son Mid-American Eng. Corp. Emil Pavlak Pickitt and Schreuer	Hopkins NE SW 9 2N 13W near Allegan NE NW 12 2N 12W NW SE 5 1N 14W SW NE 34 3N 13W NE 1 3N 13W	Sand and gravel Marl Sand and gravel Sand and gravel Marl Sand and gravel
H. R. Vernon Ben Waanders John G. Yerington	NW 5 2N 16W NE NE 20 2N 13W NE NE 22 3N 15W	Sand and gravel Sand and gravel Sand and gravel
ALPENA (5)		
Cement (1st), Stone - crushed limestone (3rd), Shale* (2nd), Sand and gravel		**
Gilliland Gravel Co. Huron Portland Cement Co.	NE 30 31N 7E 24 31N 8E	Sand and gravel Shale
Michigan State Hwy. Dept. Wyandotte Chemical Corp.	13 31N 8E	Portment cement Sand and gravel Limestone-crushed

* Value of shale used in manufacture of cement not included in county total.

** Mineral value included under undistributed at end of county breakdown.

	<u>Quantity</u>	<u>Value</u>
ANTRIM (80)		
Sand and Gravel, Shale*		**
Antrim Co. Rd. Comm.	NE NE 16 31N 6W SE 26 32N 8W NE SW 36 32N 9W	Sand and gravel " "
Michigan State Hwy. Dept. Penn-Dixie Portland Cement Co. The Taber Co.	SE 23 32N 8W NE SW 16 31N 6W	" " Shale
ARENAC (26)		
Petroleum (3rd, 9%) Stone Sand and gravel Total value		909,041 bbls. \$ 2,727,123 173,052 tons 205,582 77,166 tons <u>38,397</u> \$ 2,971,102
Arenac County Rd. Comm.	NW 5 19N 7E NW SW 16 19N 6E	Limestone Sand and gravel
Bay County Rd. Comm. Eastman Gravel Pit Iosco Co. Rd. Comm. Michigan State Hwy. Dept. The Taber Co.	SW NW 36 19N 5E SW 24 20N 7E	Limestone Sand and gravel Limestone Sand and gravel Sand and gravel
BARAGA (43)		
Iron Ore Sand and gravel Total value		116,701 tons \$ 900,815 148,067 tons <u>83,634</u> \$ 984,449
Baraga Co. Rd. Comm. The Cleveland Cliffs Iron Co. Ohio-Webster (Open Pit) Michigan State Hwy. Dept.	NW 23 51N 31W 22, 26, 27, 48N 31W	Sand and gravel Iron Ore Sand and gravel

* Value of shale used in manufacture of cement not included in county total.

** Mineral value included under undistributed at end of county breakdown.

	<u>Quantity</u>	<u>Value</u>
BARRY (51)		
Sand and Gravel	630,099 tons	\$ 525,613
Undistributed: Petroleum		<u>102,987</u>
Marl		\$ 628,600
Total value		
Barry County Rd. Comm.	SW NW 25 2N 10W SW NW 29 3N 9W SE NW 4 4N 9W	Sand and gravel
Bender Gravel Co.	SW NW 12 3N 9W	Sand and gravel
Cole Gravel Co.	7 4N 10W	Sand and gravel
Nashville Gravel Co.	14 2N 7W	Sand and gravel
Pickitt and Schreur	SW NW 1 2N 7W 28 2N 10W	Sand and gravel
Schau Bros.	28 2N 10W	Marl
West Shore Constr. Co.	13 3N 9W	Sand and gravel
John G. Yerington	SW SW 18 2N 8W SW NW 12 3N 9W Briggs Pit Powers Pit Gaskill Pit Longstrout Pit	Sand and gravel

BAY (11)

Portland cement (3rd)		
Petroleum (4th, 8%), Lime		**
Aetna Portland Cement Co.	Bay City	Portland cement
Monitor Sugar Co. Div.	Bay City	Lime

BENZIE (83)

Sand and Gravel	2,160 tons	\$ 2,160
Michigan State Hwy. Dept.		Sand and gravel

** Mineral value included under undistributed at end of county breakdown.

	<u>Quantity</u>	<u>Value</u>
BERRIEN (62)		
Sand and Gravel	331,117 tons	\$ 265,514
Ireland and Lester Co.	NW NW 24 4S 19W	Sand and Gravel
Harold Kiell	Niles (2 mi. N on US 31)	Sand and Gravel
Michigan State Hwy. Dept.		Sand and Gravel
Producers Core Sand Corp.	Sawyer	Sand
Wakeman and Neva Ryno	Coloma	Sand and Gravel
John G. Yerington	NE SW 36 7S 18W NE SE 2 7S 17W NW NW 20 5S 17W NW SE 28 6S 18W Ryne Pit Phiscator Pit Sill Pit	Sand and Gravel

BRANCH (57)

Undistributed: Sand and Gravel, Marl		\$ 361,373
Branch Co. Rd. Comm.	1 Pit near Bronson 2 Pits near Coldwater	Sand and Gravel
Case Bros.	21 6S 7W	Marl
H. Stukey Co.	SW SE 4 6S 6W	Sand and Gravel
Union City Gravel Co.	Union City	Sand and Gravel
Woodward-Pollock Lbr. Co.	NW SW 21 6S 6W	Sand and Gravel
John G. Yerington		Sand and Gravel

CALHOUN (61)

Sand and Gravel	358,343 tons	\$ 281,175
Marl (1st, 22%)	30,023 tons	<u>13,418</u>
Total value		\$ 294,593
Carl Avery	2 Pits near Marshall	Marl
Battle Creek Gravel Co.	SW NE 15 1S 7W NW SE 33 1S 8W SW SE 4 2S 8W	Sand and Gravel
Case Bros.	3 Pits near Marshall 1 Pit near Union City	Marl
Emil Combs	NE SE 18 4S 5W	Sand and Gravel
Arnie Delebaugh	Union City	Marl
Michigan State Hwy. Dept.		Sand and Gravel
Pickitt and Schreur	NW NW Sec. 19 6S 6W	Sand and Gravel
Clyde M. Reed	Sec. 22 4S 7W	Marl
West Shore Constr. Co.	9 3S 7W	Sand and Gravel
John G. Yerington		Sand and Gravel

		<u>Quantity</u>	<u>Value</u>
CASS (69)			
Undistributed: Sand and Gravel, Marl			\$ 100,985
Cass Co. Rd. Comm.	SE 20 6S 14W	Sand and Gravel	
Frank R. Hixon	W NE 28 5S 13W	Sand and Gravel	
Nieb Concrete Products Co.	NW NW 15 7S 16W	Sand and Gravel	
John G. Yerington	Eby Pit	Sand and Gravel	

CHARLEVOIX (82)

Stone	6,600 tons	\$ 13,600
Sand and Gravel	8,283 tons	<u>3,250</u>
Total value		\$ 16,850
Charlevoix Lime and Stone Co.	29 34N 8W	Limestone-crushed
Otsego Co. Rd. Comm.		Sand and Gravel

CHEBOYGAN (77)

Sand and Gravel	23,110 tons	\$ 23,198
Stone	28,378 tons	<u>19,439</u>
Total value		\$ 42,637
Afton Stone and Lime Co.	SE 25 35N 2W	Limestone-crushed
Hugh H. Mason and Sons	SE SW 32 33N 3W	Sand and Gravel
Michigan State Hwy. Dept.		Sand and Gravel

CHIPPEWA (24)

Stone (4th)		**
Sand and Gravel		
Chippewa Co. Rd. Comm.	E 6 46N 5W	Sand and Gravel
Corp. of Engineers	NW SW 32 51N 5W	Sand and Gravel
Drummond Dolomite, Inc.	36 42N 5E	Dolomite-crushed
Michigan State Hwy. Dept.		Sand and Gravel
I. L. Whitehead Co.	N NW 23 45N 2W	Sand and Gravel
	E 6 46N 5W	
	NE 17 46N 7W	
	NE SE 35 47N 1W	
	SE SW 14 47N 1W	
	NW NW 28 47N 3W	

** Mineral value included under undistributed at end of county breakdown.

		<u>Quantity</u>	<u>Value</u>
CLARE (27)			
Petroleum (5th, 8%)	788,573 bbls.	\$ 2,365,719	
Natural gas (1st, 14%)	910,624 M.cu.ft.	127,487	
Sand and gravel	31,121 tons	<u>31,121</u>	
		\$ 2,524,327	
Adrian Blades	SE 15 18N 4W	Sand and Gravel	
Michigan State Hwy. Dept.		Sand and Gravel	

CLINTON (56)

Sand and gravel	380,873 tons	\$ 374,022
Shale*		
American Vitrified Products	SE 34 5N 4W	Shale
Boichot Concrete Products	NE SW 3 5N 2W	Sand and Gravel
	NW NW 27 5N 2W	
Grand Ledge Clay Products	SE 34 5N 4W	Shale
Pickitt and Schreur	N $\frac{1}{2}$ SE 25 8N 2W	Sand and Gravel
	NE 32 5N 1W	
The Taber Co.		Sand and Gravel
Walling Gravel Co.	SE NW 34 8N 2W	Sand and Gravel
Ronald Weaver	13 6N 1W	Sand and Gravel
West Shore Constr. Co.	13 6N 1W	Sand and Gravel

CRAWFORD (45)

Petroleum	198,787 bbls.	\$ 596,361
Natural gasoline (1st, 76%)	2,665,300 gals.	266,530
Undistributed: Natural gas, Sand and gravel		<u>98,772</u>
Total value		\$ 961,663
Crawford Co. Rd. Comm.	34 26N 3W	Sand and Gravel

* Value of shale used in manufacture of clay products not included in county total.

	<u>Quantity</u>	<u>Value</u>
DELTA (58)		
Undistributed: Sand and gravel, Stone		\$ 323,428
Bichler Bros.	2 39N 23W SE 7 41N 21W	Sand and Gravel Stone
Cloverland Milling and Supply Co.	Gladstone	Sand and Gravel
Days River Sand and Gravel Co.	Gladstone	Sand and Gravel
Delta Co. Rd. Comm.	SE SW 10 37N 24W NE NE 5 38N 24W SW NE 12 39N 23W NE SW 24 40N 20W NW NE 28 40N 23W	Sand and Gravel
Michigan State Hwy. Dept.		Sand and Gravel

DICKINSON (60)

Iron	45,863 tons	\$ 122,890
Sand and gravel	131,728 sh. tons	79,613
Stone	4,984 sh. tons	98,543
Total value		\$ 301,046
Dickinson Co. Rd. Comm.	C SE 20 42N 28W	Sand and Gravel
Fox Valley Construction Co.		Sand and Gravel
Globe Iron Co.		
Globe-Cornell Open Pit	20 40N 30W	Iron Ore
Jackson Iron and Steel Co.		
Bradley Open Pit	25 40N 31W	Iron Ore
The Metro-Nite Co.	NW 35 42N 28W	Dolomite-crushed
Superior Rock Products Co.	SW SE 30 42N 29W SE SE 19 42N 29W NW SW 35 42N 30W	Hornblende Schist-crushed Feldspar-crushed Dolomite-crushed

EATON (37)

Undistributed: Clay products (3rd), Stone, Sand and gravel, Shale*		\$ 1,575,368
American Vitrified Products	NE 10 41N 4W	Tile
Cheney Limestone Co.	SE 29 1 N 6W	Limestone-crushed
Eaton Co. Rd. Comm.	SE SW 32 1N 3W SE NW 23 4N 6W	Sand and Gravel
Grand Ledge Clay Products	SE 3 4N 6W	Shale-Tile
Pryor Bros.	SE NW 15 3N 3W SW SE 3 3N 3W	Sand and Gravel Sand and Gravel

*Value of Shale used in manufacture of clay products not included in county total.

	<u>Quantity</u>	<u>Value</u>
EATON (contd.)		
Vermontville Gravel Co.	W $\frac{1}{2}$ NE $\frac{1}{4}$ 20 3N 6W	Sand and Gravel
West Shore Constr. Co.	NW NE 18 1N 5W 34 1N 6W 20 1N 6W 8 2N 4W	Sand and Gravel
EMMET (15)		
Portland Cement, Stone, Sand and Gravel		**
Michigan State Hwy. Dept. Penn-Dixie Cement Corp.	2 34N 6W	Sand and Gravel Limestone-crushed, Portland cement

GENESEE (52)

Sand and Gravel	557,561 tons	\$ 536,886
Petroleum	4,113 bbls.	12,339
Total value		\$ 549,225
Ferguson Excavating Co.	6N 7E	Sand and Gravel
Hansen Gravel Co.	SW SE 25 8N 5E	Sand and Gravel
Kurtz Gravel Co.	SE SW 1 8N 7E	Sand and Gravel
Michigan State Hwy. Dept.		Sand and Gravel
Otisville Stone Co.	NE 28 9N 8E	Sand and Gravel
John Post and Sons	SW NW 7 6N 5E	Sand and Gravel
Saginaw Core Sand Co.	NE 28 9N 8E	Sand and Gravel
Justus Snellenberger	SE 16 9N 5E	Sand and Gravel

GLADWIN (35)

Petroleum (8th, 5%)	547,184 bbls.	\$ 1,641,552
Sand and Gravel	52,894 tons	30,944
Total value		\$ 1,672,496
Gladwin Co. Rd. Comm.		Sand and Gravel
Michigan State Hwy. Dept.		Sand and Gravel
Pickitt and Schreur		Sand and Gravel

** Mineral value included under undistributed at end of county breakdown.

	<u>Quantity</u>	<u>Value</u>
GOGEBIC (6)		
Iron Ore (3rd, 22%)	2,837,407 tons	\$ 23,748,867
Sand and gravel	187,480 tons	140,117
Stone	700 tons	<u>1,375</u>
Total value		\$ 23,890,359
City of Iron Mountain	Stone	
Fox Valley Construction Co.	Sand and Gravel	
Gogebic Co. Rd. Comm.	Sand and Gravel	
	Sand and Gravel	
	Sand and Gravel	
Ironwood Concrete Products Co.	Sand and Gravel	
Lake Superior Gravel Co.	Sand and Gravel	
Michigan State Hwy. Dept.	Sand and Gravel	
North Range Mining Co.	Iron Ore	
Penokee Group		
Elmer Puspanen	Sand and Gravel	
Pickands Mather & Co.	Iron Ore	
Anvil-Palms-Keweenaw Mine		
Davis Geneva Mine		
Newport Bonnie Mine		
Peterson Mine		
Sunday Lake Mine		

GRAND TRAVERSE (73)

Sand and gravel	**	
Michigan State Hwy. Dept.	Sand and Gravel	
Paul C. Miller	Sand and Gravel	

GRATIOT (18)

Bromine (3rd), Salt, Magnesium Compounds (3rd), Calcium-Magnesium Chloride (3rd), Sand and gravel, Petroleum, Clay Products, Natural gas, Clay*	**	
Clay Products Co.	Clay-Tile	
Roy Dayringer	Sand and Gravel	
Gratiot Co. Rd. Comm.	Sand and Gravel	

*Value of clay used in manufacture of clay products not included in county total.

**Mineral value included under undistributed at end of county breakdown.

	<u>Quantity</u>	<u>Value</u>
GRATIOT (contd.)		
Michigan Chemical Corp.	St. Louis	Bromine, Calcium-Magnesium Chloride, Magnesium Compounds, Salt
Michigan State Hwy. Dept.		Sand and Gravel
North Star Washed Sand and Gravel Co.	NW SE 22 10N 2W	Sand and Gravel
P and B Gravel Co.	NE SE 34 11N 4W	
The Taber Co.	W $\frac{1}{2}$ SE 8 10N 1W	Sand and Gravel
		Sand and Gravel
HILLSDALE (47)		
Sand and Gravel (9th, 2%)	931,823 tons	\$ 552,586
Petroleum	86,230 bbls.	<u>258,690</u>
Total value		\$ 811,276
Bundy Hill Gravel Co.	NE 7 5S 1W	Sand and Gravel
Comstock Construction Co.		Sand and Gravel
Elliott Ice and Coal Co.	SE SE 15 6S 3W	Sand and Gravel
Hillsdale Co. Rd. Comm.	NE SE 11 5S 3W	Sand and Gravel
	SE SE 9 6S 3W	
	SW SE 5 7S 2W	
	SE NE 30 7S 4W	
Hoover Bros.	NE SW 23 8S 2W	Sand and Gravel
Northwest Materials, Inc.	SW 23 8S 2W	Sand and Gravel
Art Russell's Concrete	14 6S 3W	Sand and Gravel
Southern Mich. Materials, Inc.	23 8S 2W	Sand and Gravel

HOUGHTON (14)

Copper (3rd, 19%)	21,781,882 lbs.	\$6,445,477
Stone	40,593 tons	60,138
Sand and gravel	81,823 tons	<u>50,040</u>
Total value		\$6,555,655
Calumet and Hecla, Inc.		Copper
Centennial Mine	18 56N 32W	
North Kearsarge Mine	5 56N 32W	
Osceola Mine	23 56N 33W	
Reclamation	12 55N 33W	
Copper Range Co.		Copper
Champion Mine	31 54N 34W	

HOUGHTON (contd.)

		<u>Quantity</u>	<u>Value</u>
Copper Range Railroad Co. Duluth, South Shore and Atlantic Railroad Co.			Sand and Gravel
Houghton Co. Rd. Comm.	Near Houghton Superior, Arcadian, and Mayflower Mines		Sand and Gravel Trap Rock - crushed
Michigan State Hwy. Dept. Quincy Mining Co. - Reclamation			Sand and Gravel Copper

HURON (46)

Stone	532,098 tons	\$ 812,172	
Sand and Gravel	215,154 tons	88,803	
Petroleum	1,977 bbls.	5,931	
Total value		\$ 906,906	
Huron Co. Rd. Comm.	SE SE 17 16N 13E		Sand and Gravel
Wagner Sand and Gravel	NE SW 22 16N 15E		Sand and Gravel
The Wallace Stone Co.	5 16N 10E		Limestone-crushed and dimensional

INGHAM (50)

Sand and Gravel		810,034 tons	\$ 646,545
Central Michigan Sand and Gravel	SE SW 24 3N 2W		Sand and Gravel
Cheney Gravel Co.	SW SE 11 3N 2W		Sand and Gravel
Ingham Co. Rd. Comm.	SE 18 2N 2W SE 11 1N 2W NE 3 2N 1E SW SE 34 3N 1E NW 5 2N 1W 11 2N 1E NE 31 3N 2W SE 5 2N 1W SE 24 2N 2W NW 11 3N 2W		Sand and Gravel Sand and Gravel
Mason Gravel Co.	25 2N 2W		
Ronald Weaver	7, 24, 25, 34 2N 2W 14, 34 2N 1E 25, 35 3N 2W 9 2N 1W 11 1N 2W		
West Lansing Gravel Co.	SE 3 4N 2W		Sand and Gravel

IONIA (55)

		<u>Quantity</u>	<u>Value</u>
Sand and Gravel, Petroleum			**
Ionia Co. Rd. Comm.	NE SW 18 5N 5W SE SE 8 6N 5W SW SE 21 7N 6W NW NE 33 7N 7W		Sand and Gravel
Pickitt and Schreur	NW SE 21 7N 6W NE NE 16 7N 5W		

IOSCO (19)

Gypsum (1st), Sand and Gravel			**
Iosco Co. Rd. Comm.	NE NW 1 21N 5E SE NE 30 21N 5E		Sand and Gravel
National Gypsum Co.	16 21N 6E		Gypsum
U.S. Gypsum Co.	27 21N 7E		Gypsum

IRON (3)

Iron (2nd, 32%) Undistributed: Sand and Gravel, Stone Total value		4,250,704 tons	\$ 34,406,104 98,887 \$ 34,504,991
Caspian Lbr. and Coal Co. On M-73			Dolomite-crushed and dimensional Iron Ore
The Cleveland-Cliffs Iron Co. Soies-Virgil Mine	24 43N 35W		
M.A. Hanna Co. Cannon Mine	36 43N 35W		
Hiawatha Mine	35, 36, 43N 35W		
Homer-Cardiff-Minckler	22, 23, 43N 35W		
Wauseca-Aronson Mine	23, 43N 35W		
Inland Steel Co. Bristol-Youngstown Mine	19, 20, 43N 32W		Iron Ore
Sherwood Mine	23 43N 35W		
Iron Co. Rd. Comm.	SW SW 7 43N 35W		Sand and Gravel Dolomite-crushed
Iron River Lbr. and Fuel Co.			
Michigan State Hwy. Dept. North Range Mining Co.	NW NW 13 42N 35W		Sand and Gravel Iron Ore
Book Mine	12 42N 33W		
Warner	9 44N 33W		

** Mineral value included under undistributed at end of county breakdown.

IRON (contd.)

		<u>Quantity</u>	<u>Value</u>	
Pickands Mather Co.				Iron Ore
Baltic Group	6, 7, 42N 34W			
Fortune Lake Open Pit	24, 25, 26 43N 33W			
Lawrence Mine	36 43N 33W			
Volunteer-Maitland Mine	30 47N 26W			
Republic Steel Corp.				Iron Ore
Monongahela Mine	36 43N 33W			
Tobin-Columbia Mine	30, 31, 43N 32W			

ISABELLA (22)

Petroleum (1st, 10%)	1,032,095 bbls.	\$ 3,096,285
Sand and gravel	341,490 tons	252,740
Natural gas (5th, 7%)	472,800 M.cu.ft.	66,192
Natural gasoline (2nd, 9%)	319,494 gallons	31,949
Marl (3rd, 14%)	18,750 tons	9,375
Total value		\$ 3,456,541

George Hubscher and Son	22 14N 5W	Sand and gravel
	7 16N 3W	
Michigan State Hwy. Dept.		Sand and gravel
William Stuart	12 15N 5W	Marl
C. Utterback		Sand and gravel

JACKSON (53)

Sand and gravel	483,587 tons	\$ 358,073
Stone	54,256 tons	147,382
Marl	4,750 tons	1,663
Total value		\$ 507,118

Barnes and Van Antwerp	Horton	Marl
W. A. Cecil and Sons	Concord	Sand and gravel
Jackson Co. Rd. Comm.	SE SE 29 1S 1W	Sand and gravel
John C. Jeffery	SE 30 2S 2W	Limestone-crushed
Klumpp Bros.	SE SE 1 2S 2E	Sand and gravel
Michigan State Hwy. Dept.		Sand and gravel
Original Sandstone Quarry	NE NW 6 4S 2E	Sandstone
Ed. Palmer and Sons	SW NW 8 3S 1E	Sand and gravel
Pickitt and Schreur		Sand and gravel
Ray Sandstone Quarry	NE NW 6 4S 2E	Sandstone
Star Sandstone Co.	SW SE 31 3S 2E	Sandstone
Gordon D. Stevick	NW SE 26 2S 1W	Sand and gravel
	SE SW 17 3S 2E	
Whitetaker & Gooding	SW SE 35 1S 2E	Sand and gravel

KALAMAZOO (40)

		<u>Quantity</u>	<u>Value</u>
Sand and Gravel (10th, 2%)		899,280 tons	\$ 744,521
Marl (2nd, 15%)		19,938 tons	11,963
Petroleum		4,934 bbls.	14,802
Total value			\$ 771,286
American Aggregates Corp.	SW NW 15 1S 11W		Sand and Gravel
Casper H. Hass Co.	NE SE 8 2S 11W		Sand and Gravel
City Eng.-Kalamazoo	NW SW 2 3N 11W		Sand and Gravel
Gravel Producers, Inc.	Portage and Cooper Twps.		Sand and Gravel
Lawrence Hayward	Scotts		Marl
Michigan State Hwy. Dept.			Sand and Gravel
Pickitt and Schreur	NE NW 34 1S 11W		Sand and Gravel
Dan Slack	9 1S 12W		Marl
John G. Yerington	NW SW 19 1S 9W		Sand and Gravel
	NW SW 24 1S 9W		
	NE NE 5 4S 12W		
	Jordine Pit		
	Avery Pit		

KALKASKA (64)

Petroleum	44,669 bbls.	\$ 134,007
Undistributed: Natural gas,		
Sand and gravel		75,442
Total value		\$ 209,449

Kalkaska Co. Rd. Comm.	25 N 8W	Sand and Gravel
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KENT (23)

Sand and Gravel (4th, 6%)	2,367,085 tons	\$ 2,045,949
Undistributed: Gypsum (2nd),		
Petroleum, Natural gas		1,234,594
Total value		\$ 3,280,543

Bestwall Gypsum Co.	SW 34 7N 12W	Gypsum
The Chesapeake and		
Ohio R. R. Co.	NW 6N 12W	Sand and Gravel
Coit Ave. Gravel Co.	Grand Rapids	Sand and Gravel
Cross and White	Grand Rapids	Sand and Gravel
Ed. DeVries and Sons	NE 22 7N 12W	Sand and Gravel
Grande Brick Co.	Grand Rapids	Sand and Gravel
Grand Rapids Gravel Co.	SE SW 3 6N 12W	Sand and Gravel
	NW NE 9 6N 12W	Sand and Gravel
	33 7N 12W	
	16 6N 12W	
	SW 18 6N 12W	Sand and Gravel

KENT (contd.)

		<u>Quantity</u>	<u>Value</u>
Grand Rapids Plaster Co.	NE 34 7N 12W		Gypsum
Kent Co. Rd. Comm.	NE SW 27 5N 10W		Sand and Gravel
	SE SE 20 6N 9 W		Sand and Gravel
	NE NE 32 7N 9 W		Sand and Gravel
	SE SW 11 10N 12W		Sand and Gravel
Lowell Gravel Co.			Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Paul C. Miller	NW NW 15 10N 12W		Sand and Gravel
Northeast Gravel Co.	24 8 N 11W		Sand and Gravel
Pickitt and Schreur	Williams Pit		Sand and Gravel
	NE NW 25 5N 12W		
	SW SE 23 8N 11W		
H. F. Postma Gravel Co.	SW SE 9 6N 12W		Sand and Gravel
	SE SW 8 6N 12W		
Riverside Sand and Gravel Co.	SE SW 33 7N 12W		
United States Gypsum Co.	NE 34 7N 12W		Gypsum
West Shore Constr. Co.	NW NE 16 6N 12W		Sand and Gravel

KEWEENAW (13)

Copper (2nd, 20%)	22,843,409 lbs.	\$ 6,759,593
Sand and gravel	37,333 tons	24,672
Total value		\$ 6,784,265
Calumet and Hecla, Inc.		Copper
Ahmeek and Allouez	28 57N 32W	
Allouez No. 3	32 57N 32W	
Douglass	28 57N 32W	
Iroquois	22 57N 32W	
Peninsula	28 57N 32W	
Seneca No. 2	27 57N 32W	
Keweenaw Co. Rd. Comm.		Sand and Gravel
Michigan State Hwy. Dept.		Sand and Gravel

LAKE (67)

Sand and gravel	147,290 tons	\$ 108,770
Petroleum	8,735 bbls.	26,205
Total value		\$ 134,975
Michigan State Hwy. Dept.		Sand and Gravel
Lake Co. Rd. Comm.	SE NE 23 18N 13W	Sand and Gravel
	NW SE 10 20N 14W	Sand and Gravel

LAPEER (66)

		<u>Quantity</u>	<u>Value</u>
Sand and Gravel		311,429 tons	\$ 160,906
Lapeer Co. Rd. Comm.	SE SW 30 8N 10E		Sand and Gravel
	SW SE 16 9N 10E		
	SW NW 28 9N 12E		
Michigan State Hwy. Dept.			Sand and Gravel
Pine Sand and Gravel	NW 12 7N 10E		Sand and Gravel

LEELANAU (79)

Sand and Gravel		**
Leelanau Co. Rd. Comm.	NE NW 16 28N 13W	Sand and Gravel
	SW SE 12 29N 13W	
	SW NW 19 32N 10W	

LENAWEE (20)

Undistributed: Cement, Sand and Gravel, Clay Products, Clay* (5th)		\$ 3,787,811
Adrian Sand and Gravel	Adrian	Sand and Gravel
Comfort Brick and Tile Co.	SW 2 6S 5E	Clay and Tile
Consolidated Cement Corp.	NE 5 5S 1E	Portland Cement
	SW 5 7S 1E	Clay
Lenawee Co. Rd. Comm.	NW NW 9 6S 4E	Sand and Gravel
	SE SE 4 6S 4E	
Michigan State Hwy. Dept.		Sand and Gravel
Stamm Bros. Gravel Co.	SW NE 19 7S 3E	Sand and Gravel
Tecumseh Gravel Co.	SW NE 4 6S 4E	Sand and Gravel
John Woerner	SE SW 28 6S 3E	Sand and Gravel

*Value of clay used in manufacture of cement and clay products not included in county total.

**Mineral value included under undistributed at end of county breakdown.

LIVINGSTON (21)

		Quantity	Value
Sand and Gravel (2nd, 7%)		2,876,197 tons	\$ 3,529,937
Natural Gas (4th, 12%)		775,732 M.cu.ft.	108,502
Total value			\$ 3,638,439
American Aggregates Corp.	NE NE 11 1N 6E	Sand and Gravel	
D. and J. Gravel Co.	SW SW 32 3N 4E	Sand and Gravel	
Van E. Daily	W NE 4 2N 4E	Sand and Gravel	
Michigan State Hwy. Dept.		Sand and Gravel	
Pickitt and Schreur	NW 3 4N 6E	Sand and Gravel	
Ronald Weaver	32 3N 4E	Sand and Gravel	

LUCE (81)

Sand and Gravel		34,088 tons	\$ 19,431
Luce Co. Rd. Comm.	NW NE 45N 10W	Sand and Gravel	

MACKINAC (12)

Stone (2nd), Sand and Gravel		**	
Duluth, South Shore and Atlantic R.R. Co.	NW SW 7 40N 3W	Sand and Gravel	
Inland Lime and Stone Co.	6 42N 12W	Limestone-crushed	
Mike Mangene	24 42N 1E	Sand and Gravel	
Michigan Limestone Div.			
U.S. Steel Corp.	Cedarville	Limestone-crushed	
Michigan State Hwy. Dept.		Sand and Gravel	

MACOMB (39)

Sand and Gravel (8th, 4%)		1,610,256 tons	\$ 1,413,451
Advance Bldg. Materials Inc.	NE NW 8 4N 12E	Sand and Gravel	
	SE NE 31 3N 12E		
Great Lakes Gravel Co.	NW NW 31 2N 12E	Sand and Gravel	
Hygrade Sand and Gravel Co.	NE 8 4N 12E	Sand and Gravel	
Fred Kaatz	SE NW 21 4N 14E	Sand and Gravel	
Macomb Co. Rd. Comm.	17 4N 12E	Sand and Gravel	
Macomb Sand and Gravel	SW SW 30 3N 12E	Sand and Gravel	
Maertens Sand and Gravel	SE NE 30 3N 12E	Sand and Gravel	
	SE SW 5 4N 12E	Sand and Gravel	
Louis Marsack and Sons	NW NW 3 1N 13E	Sand and Gravel	
Michigan Sand and Gravel	SW NE 19 3N 12E	Sand and Gravel	
Michigan State Hwy. Dept.		Sand and Gravel	
Morgan Sand and Gravel	3 2N 12E	Sand and Gravel	

** Mineral value included under undistributed at end of county breakdown.

MACOMB (contd.)

		Quantity	Value
Ray Industries, Inc.	NE SW 18 3N 12E	Sand and Gravel	
Bernie Rief	Fraser	Sand and Gravel	
S. K. Rogers	New Baltimore	Sand and Gravel	
Smith Sand and Gravel Co.	NW SE 8 4N 12E	Sand and Gravel	
Underwood Sand and Gravel Co.	30 3N 12E	Sand and Gravel	
Allen Zavitz	2N 14E	Sand and Gravel	

MANISTEE (10)

Undistributed: Salt (4th), Magnesium Compounds (1st), Bromine (2nd), Sand and Gravel, Calcium-Magnesium Chloride			\$ 11,261,619
The Ann Arbor Railroad Co.		Sand and Gravel	
Frank L. Gauthier	23 23N 16W	Sand and Gravel	
Great Lakes Chemical Corp.	SE SW 18, 21N 16W	Bromine	
Manistee Co. Rd. Comm.	6 & 7 23N 14W	Sand and Gravel	
Manistee Salt Works	Manistee	Salt	
Michigan Chemical Corp.	NW 7 21N 16W	Bromine	
Paul C. Miller		Sand and Gravel	
Morton Salt Co.	12 21N 7W	Bromine, Calcium Magnesium Chloride, Magnesium Compounds, Salt	
Sand Products Corp.	N $\frac{1}{2}$ 11 21N 17W	Sand	
Standard Lime and Cement Co.	SE 18 21N 16W	Magnesium Compounds	

MARQUETTE (1)

Iron (1st, 45%)	5,876,071 tons	\$51,427,013
Sand and Gravel	514,250 tons	500,199
Total value		\$51,927,212

City Eng. Ishpeming		Sand and Gravel
City Eng. Marquette		Sand and Gravel
The Cleveland Cliffs Iron Co.		Iron Ore
Bunker Hill Mine	6 47N 26W	
Cambria-Jackson Mine	35, 36, 48N 27W	
Cliffs Shaft Mine	3, 9, 10 47N 27W	
Humbolt Open Pit	10, 15 47N 29W	
Maas Race Course Mine	31 48N 26W	
Mather "A" Mine	2 47N 27W	
Mather "B" Mine	1 47N 27W	
Republic Open Pit	7 46N 29W	
Tilden Open Pit	26 47N 27W	

MARQUETTE (contd.)

		<u>Quantity</u>	<u>Value</u>
M. A. Hanna Co.			Iron Ore
New Richmond Open Pit	24 47N 27W		
Inland Steel Co.			Iron Ore
Morris Mine	1, 2 47N 28W		
Greenwood Mine	14, 23 47N 28W		
Jones and Laughlin Steel Corp.			Iron Ore
Tracy Mine	7, 8 48N 26W		
A. Lindberg and Sons, Inc.	NW SE 8 47N 25W		Sand and Gravel
Marquette Co. Rd. Comm.	NE NW 17 47N 25W		Sand and Gravel
	SE SW 30 46N 23W		
Michigan State Hwy. Dept.			Sand and Gravel
North Range Mining Co.			Iron Ore
Champion Mine	31 48N 29W		
Pickands Mather and Co.			Iron Ore
Volunteer-Maitland			
Open Pit	25, 30 47N 26W		

MASON (17)

Calcium-Magnesium Chloride (2nd), Lime (1st), Petroleum, Magnesium Compounds (4th), Sand and Gravel, Bromine, Natural Gasoline (3rd, 5%), Natural Gas			**
The Dow Chemical Co.	NW SW 23 18N 18 W		Bromine, Calcium- Magnesium Chloride, Magnesium Compounds, Lime
Mason Co. Rd. Comm.	SW SW 11 18N 15W		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Sargent Sand Co.	SW 33 19N 18W		Sand and Gravel

** Mineral value included under undistributed at end of county breakdown.

MECOSTA (54)

	<u>Quantity</u>	<u>Value</u>	
Petroleum	103,355 bbls.	\$ 310,065	
Natural Gas	334,216 M.cu.ft.	46,790	
Undistributed: Sand and Gravel, Marl (6th)		88,880	
Total value		\$ 445,735	
Central Concrete Products	14 15N 10W		Sand and Gravel
Wilson Frost	17 13N 7W		Marl
Mecosta Co. Rd. Comm.	NE NE 32 15N 9W		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Paul C. Miller	SW SE 31 51N 7W		Sand and Gravel
	NE SE 9 16N 7W		

MENOMINEE (42)

Undistributed; Lime (2nd), Sand and Gravel			\$1,063,470
Limestone Products Co.	Menominee		Lime
Menominee Co. Rd. Comm.	NE NE 9 39N 25W		Sand and Gravel
Walsh Sand and Gravel Co.	SW SW 21 33N 27W		Sand and Gravel

MIDLAND (4)

Bromine (1st), Salt (2nd), Calcium- Magnesium Chloride (1st), Magnesium Compounds (2nd), Petroleum, Potash (1st), Sand and Gravel, Natural Gasoline, Natural Gas			**
The Dow Chemical Co.	Midland		Bromine, Calcium- Magnesium Chloride, Potash, Magnesium Compounds, Salt
Michigan State Hwy. Dept.			Sand and Gravel
Saginaw Core Sand Co.	SE 21 13N 2E		Sand
	NW 34 13N 2E		

MISSAUKEE (38)

Petroleum (9th, 5%)	476,307 bbls.	\$1,428,921	
Natural Gasoline	138,763 gals.	13,877	
Undistributed: Natural Gas, Marl		10,160	
Total value		\$1,452,958	
C. Stanley Hooker	27 22N 7W		Marl

** Mineral value included under undistributed at end of county breakdown.

MONROE (32)

		<u>Quantity</u>	<u>Value</u>
Undistributed: Stone (5th), Clay Products, Petroleum, Clay* Sand and Gravel			
			\$2,020,696
The France Stone Co.	SE 7 7S 9E	Dolomite-crushed	
Kraemer and Sons	29 5S 8E	Dolomite-crushed	
Michigan State Hwy. Dept.		Sand and Gravel	
Michigan Stone Co.	SW 25 8S 6E	Dolomite-crushed	
Monroe Co. Rd. Comm.	SW 13 6S 7E	Dolomite-crushed	
F.W. Ritter Sons Co., Inc.	SE 16 5S 10E	Clay-Pottery	

MONTCALM (25)

Petroleum (2nd, 10%)		981,406 bbls.	\$ 2,944,218
Sand and Gravel		644,123 tons	254,203
Natural Gas		37,524 M.cu.ft.	5,253
Total value			\$ 3,203,674
A. L. Dyer and Sons	SE SE 8 12N 5W	Sand and Gravel	
Michigan State Hwy. Dept.		Sand and Gravel	
Montcalm Co. Rd. Comm.	NE SE 13 10N 6W NE NE 24 10N 6W	Sand and Gravel	
Frank H. Stoerk	Pierson	Sand and Gravel	

MONTMORENCY (78)

Sand and Gravel		61,989 tons	\$ 33,040
Petroleum		175 bbls.	525
Total value			\$ 33,565
Michigan State Hwy. Dept.		Sand and Gravel	
Montmorency Co. Rd. Comm.	SW NW 27 30N 1E NE NW 9 32N 4E	Sand and Gravel	

*Value of clay used in manufacture of clay products not included in county total.

MUSKEGON (34)

		<u>Quantity</u>	<u>Value</u>
Undistributed: Sand and Gravel, Salt, Petroleum, Natural Gas			
			\$1,868,411
Hooker Electro-Chemical Co.	NE 31 12N 17W	Salt	
Michigan State Hwy. Dept.		Sand and Gravel	
Nugent Sand Co., Inc.	9N 16W	Sand	
Paul C. Miller		Sand and Gravel	
Sand Products Corp.	E $\frac{1}{2}$ 28 10N 17W	Sand	

NEWAYGO (48)

Undistributed: Petroleum, Sand and Gravel, Natural Gas			
			\$ 795,831
K. and V. Gravel Co.	Fremont	Sand and Gravel	
Michigan State Hwy. Dept.		Sand and Gravel	
Paul C. Miller		Sand and Gravel	

OAKLAND (16)

Sand and Gravel (1st, 15%)		6,193,413 tons	\$5,967,959
Petroleum		456 bbls.	1,368
Total value			\$5,969,327
American Aggregates Corp.	NE NW 22 5N 10E	Sand and Gravel	
Floyd Bearslee	NE NW 11 2N 10E	Sand and Gravel	
	S $\frac{1}{2}$ SE 2 2N 10E		
The Benjamin Pit	SW 35 2N 9 E	Sand and Gravel	
Foley and Beardslee	NW NW 7 3N 9 E	Sand and Gravel	
	SW SE 36 4N 8 E		
J. Gladstone and Son	NE 8 3N 11E	Sand and Gravel	
Groveland Gravel Co.	SW NE 32 5N 8E	Sand and Gravel	
Holly Sand and Gravel Co.	23 5N 8E	Sand and Gravel	
John R. Sand and Gravel Co.	SE 4 4N 10E	Sand and Gravel	
Kemler Bros.	SW SW 36 5N 11E	Sand and Gravel	
Koan Gravel Co.	SE NE 28 5N 7 E	Sand and Gravel	
Koenig Coal and Supply Co.	NW 1 3N 8 E	Sand and Gravel	
	SW SE 24 5N 10E	Sand and Gravel	
A.S. Leffler Gravel Co.	NE NE 5 4N 8E	Sand and Gravel	
	NW NW 4 4N 8E	Sand and Gravel	
New Hudson Sand and Gravel	NW NE 33 2N 7E	Sand and Gravel	
Oakland Sand and Gravel	SE SE 8 2N 8E	Sand and Gravel	
Oxford Mining Co.		Sand and Gravel	

OAKLAND (contd.)

		Quantity	Value
Oakland Co. Rd. Comm.	SW SE 36 5N 11E	Sand and Gravel	
	SE SE 9 2N 8E		
	SE SW 32 5N 9E		
	SE SW 8 4N 8E		
	NW NW 1 3N 10E		
Slaters Bald Mountain Gravel Pit	SW 36 4N 10E	Sand and Gravel	
Underwood Sand and Gravel Co.	SW 2 3N 10E	Sand and Gravel	
Lyle J. Walker Sand and Gravel	SE SW 2 2N 11E	Sand and Gravel	
	NE SE 34 2N 7E		
F. S. Ward	NW NE 7 3N 9E	Sand and Gravel	
White Lake Gravel, Inc.	SE 10 4N 9E	Sand and Gravel	

OCEANA (40)

Petroleum (10th, 5%)	466,004 bbls.	\$ 1,398,012
Natural Gas	227 M.cu.ft.	32
Total value		\$ 1,398,044

OGEMAW (30)

Petroleum (6th, 7%)	714,352 bbls.	\$ 2,143,056
Sand and Gravel	102,817 tons	41,173
Natural Gas	37,504 M.cu.ft.	5,251
Total value		\$ 2,189,480

Michigan State Hwy. Dept. Ogemaw Co. Rd. Comm.	NE SE 3 21N 1E	Sand and Gravel
	NE SE 6 22N 2E	Sand and Gravel
	NW NW 28 22N 3E	
Walter Rosevear The Taber Co.	NE SE 6 22N 2E	Sand and Gravel
		Sand and Gravel

ONTONAGON (7)

	Quantity	Value
Copper (1st, 61%)	69,021,852 lbs.	\$ 20,424,256
Sand and Gravel	247,434 tons	194,954
Total value		\$ 20,619,210

Calumet and Hecla Inc. Caledonia Mine		Copper
Fox Valley Construction Co.	NE SE 13 51N 43W NW SW 18 51N 42W	Sand and Gravel
Michigan State Hwy. Dept. Ontonagon Co. Rd. Comm.		Sand and Gravel Sand and Gravel
White Pine Copper Co. White Pine Mine	4, 5, 9 5N 42W	Copper

OSCEOLA (29)

Petroleum (7th, 6%)	633,363 bbls.	\$ 1,900,089
Natural Gas	433,569 M.cu.ft.	60,700
Undistributed: Sand and Gravel, Marl (4th)		240,574
Total value		\$ 2,201,363

C. Stanley Hooker	24 20N 10W	Marl
	13 18N 10W	
	1 20N 8W	
The Wallace Stone Co. Hersey Sand and Gravel Div.	NW SW 20 17N 9W	Sand and Gravel

OSCODA (76)

Sand and Gravel, Petroleum	**
Michigan State Hwy. Dept. Pickitt and Schreur	Sand and Gravel Sand and Gravel

OTSEGO (68)

Sand and Gravel, Natural Gas		\$ 102,572
Hutchins Sand and Gravel	SE NE 17 29N 3W	Sand and Gravel
Otsego Co. Rd. Comm.	NW SW 2 30N 3W	Sand and Gravel
	NW NW 3 31N 3W	
	NW NE 29 31N 3W	
The Taber Co.		Sand and Gravel

**Mineral value included under undistributed at end of county breakdown.

OTTAWA (28)

	Quantity	Value
Sand and Gravel (5th, 5%)	2,126,715 tons	\$ 1,947,932
Petroleum	120,886 bbls.	362,658
Natural Gas	8,416 M.cu.ft.	1,178
Marl	1,375 tons	825
Total value		\$ 2,312,593

Construction Aggregates

Corp.	SE SW 16 8N 15W	Sand and Gravel
Henry DeWent	SW SW 22 6N 13W	Sand and Gravel
William Huizenge	24 5N 15W	Sand and Gravel
Thomas F. Johnston	Ferrysburg	Sand and Gravel
Ralph Meyers	West Olive	Marl
Michigan State Hwy. Dept.		Sand and Gravel
Pickitt and Schreur	Ottawa Co. Pit	Sand and Gravel
Standard Sand Co.	NW 4 7N 16W	Sand
West Shore Constr. Co.	SW 9 6N 13W	Sand and Gravel
	20 5N 14W	
	10 7N 14W	
	4 9N 13W	
	15 5N 13W	
	3 6N 13W	

PRESQUE ISLE (8)

Stone (1st), Sand and Gravel

**

Michigan Limestone Div. -		
U.S. Steel Corp.	23 35N 5E	Limestone-crushed
Michigan State Hwy. Dept.		Sand and Gravel
Onaway Stone Co.	5 34N 2E	Limestone-dimensional
Straits Aggregate and		
Equipment Corp.	Millersburg	Sand and Gravel
Presque Isle Corp.	2 33N 8E	Limestone-crushed

ROSCOMMON (41)

Petroleum	408,920 bbls.	\$ 1,226,760
Natural Gasoline	76,593 gals.	7,659
Undistributed: Sand and Gravel,		
Natural Gas		78,612
Total value		\$ 1,313,031

Michigan State Hwy. Dept. Sand and Gravel
 Pickitt and Schreur Sand and Gravel

**Mineral value included under undistributed at end of county breakdown.

SAGINAW (65)

	Quantity	Value
Petroleum, Clay* (3rd), Sand and Gravel		\$ 201,361
Aetna Portland Cement Co.	SW 35 12N 3E	Clay
Michigan State Hwy. Dept.		Sand and Gravel
Minco Products Corp.	NW NW 1 11N 3E	Clay

SANILAC (71)

Sand and Gravel	271,941 tons	\$ 100,055
Harold Peters	Deckerville	Sand and Gravel
Sanilac Co. Rd. Comm.	SW SW 23 9N 14E	Sand and Gravel
Robert Van Camp	SW SE 28 10N 15E	Sand and Gravel

SCHOOLCRAFT (74)

Sand and Gravel	89,222 tons	\$ 68,029
Michigan State Hwy. Dept.		Sand and Gravel
Schoolcraft Co. Rd. Comm.	SE SW 7 41N 17W	Sand and Gravel
Thornton Constr. Co., Inc.	NE NW 5 43N 13W	Stone

SHIAWASSEE (33)

Undistributed: Clay Products (2nd),		
Sand and Gravel, Shale*		\$ 1,984,475
Comstock Constr. Co.	SW NW 22 8N 2E	Sand and Gravel
Harry Fuoss	Durand	Sand and Gravel
Michigan State Hwy. Dept.		Sand and Gravel
The Michigan Vitrified		
Tile Co.	SE 22 7N 3E	Shale - Tile
Shenk Gravel Co.	NW NW 2 6N 4E	Sand and Gravel
	NE NE 2 6N 4E	
Delmar Stanley		Sand and Gravel
Valley Gravel Co.	3 mi. South of Owosso	Sand and Gravel
Ronald Weaver	E $\frac{1}{2}$ SW 16 5N 2E	Sand and Gravel
	17 5N 4E	

* Value of Shale used in manufacture of clay products not included in state total.

*Value of shale used in manufacture of clay products not included in state total.

ST. CLAIR (9)

		<u>Quantity</u>	<u>Value</u>
Salt (3rd), Cement, Sand and Gravel, Natural Gas, Clay *(4th), Petroleum			**
William Click, Sr. The Diamond Crystal Salt Co.	NE NW 27 7N 15E St. Clair	Sand and Gravel	
Harvey G. Hall	Port Huron	Evaporated Salt	
Lakeport Sand and Gravel Co.	Port Huron	Sand and Gravel	
Michigan State Hwy. Dept.	Port Huron	Sand and Gravel	
Morton Salt Co.	Marysville	Evaporated Salt	
Peerless Cement Corp.	Port Huron	Portland Cement	
	32 6N 16E	Clay	
Port Huron Sand and Gravel	Port Huron	Sand and Gravel	

ST. JOSEPH (63)

Undistributed: Sand and Gravel, Marl			\$ 255,218
Aggregates Processors, Inc.	NW 8 8S 11W	Sand and Gravel	
Case Bros.	Colon (5 mi. N)	Marl	
Michigan State Hwy. Dept.		Sand and Gravel	
Pickitt and Schreur	SE NW 15 5S 12W	Sand and Gravel	
St. Joseph Co. Rd. Comm.	NW 8 8S 11W	Sand and Gravel	

TUSCOLA (31)

Undistributed: Sand and Gravel (6th, 5%) Petroleum, Calcium-Magnesium Chloride			\$ 2,110,414
Anderson Sand and Gravel Co.	NE NE 20 11N 9E	Sand and Gravel	
Bernthel Sand and Gravel Co.	SW SE 6 11N 9E	Sand and Gravel	
Cass City Concrete Products	S $\frac{1}{2}$ SW 4 13N 11E	Sand and Gravel	
Comstock Constr. Co.	NW 33 10N 9E	Sand and Gravel	
	Engil Pit		
Great Lakes Foundry Sand Co.		Sand	
Hile Bros.	NW SE 3 12N 8E	Sand and Gravel	
C. R. Hunt	Cass City (Several Pits)	Sand and Gravel	
Michigan State Hwy. Dept.		Sand and Gravel	
Peterhans Bros.	SW NE 35 13N 9E	Sand and Gravel	
Tuscola Co. Rd. Comm.		Sand and Gravel	
Vaughans Sand and Gravel	NE NE 25 12N 8E	Sand and Gravel	
Saginaw Core Sand Co.	NW 27 10N 7E	Sand	
Wilkinson Chemical Co.		Calcium-Magnesium Chloride	

*Value of clay used in manufacture of cement not included in county total.

** Mineral value included under undistributed at end of county breakdown.

VAN BUREN (59)

	<u>Quantity</u>	<u>Value</u>
Petroleum	36,105 bbls.	\$ 108,315
Sand and Gravel	255,646 tons	209,332
Total value		\$ 317,647

Garrett Sand Co.	NE 5 2S 17W	Sand
Michigan State Hwy. Dept.		Sand and Gravel
Pickitt and Schreur	NW SW 24 3S 14W	Sand and Gravel
South Haven Sand Co.	South Haven	Sand and Gravel
John G. Yerington	SE SE 12 3S 15W	Sand and Gravel
	SW NE 36 3S 15W	

WASHTENAW (36)

Sand and Gravel (7th, 4%)	1,821,262 tons	\$1,371,719
Petroleum	58,948 bbls.	176,844
Natural Gas (3rd, 12%)	781,175 M.cu.ft.	109,365
Total value		\$1,657,928

Dexter Gravel Co.	SW SE 5 2S 5E	Sand and Gravel
Killins Gravel Co.	SE SE 25 2S 3E	Sand and Gravel
	SW SW 25 2S 5E	
Kruse Gravel Pit	5 3S 7E	Sand and Gravel
	32 2S 7E	
Michigan State Hwy. Dept.		Sand and Gravel
Pickitt and Schreur	26 3S 7E	Sand and Gravel
Scio Gravel Co.		Sand and Gravel
Lawrence B. Skinner		Sand and Gravel
Lamar Thumm	SW NE 25 3S 7E	Sand and Gravel
Whittaker and Gooding Co.	NW 10 2S 5E	Sand and Gravel
	SW NE 19 2S 7E	
	C 16 2S 7E	
Youngs Sand and Gravel	NE NE 15 3S 6E	Sand and Gravel
	SW 23 3S 7E	
	SW SW 16 1S 3E	
Washtenaw Co. Rd. Comm.	24 3S 5E	Sand and Gravel
Zahns Sand and Gravel	SE 9 3S 6E	Sand and Gravel

WAYNE (2)

Salt (1st)	3,849,797 tons	\$ 17,062,534
Clay Products (1st)		3,321,588
Sand and Gravel (3rd, 6%)	2,426,139 tons	2,928,414
Natural Gas (2nd, 12%)	798,765 M.cu.ft.	111,827
Petroleum	10,365 bbls.	31,095
Clay* (1st)	649,882 tons	
Undistributed: Portland Cement (2nd), Stone, Sulfur		19,949,363
Total value		\$43,304,821

* Value of clay used in manufacture of Portland Cement and clay products not included in county total.

WAYNE (contd.)

		<u>Quantity</u>	<u>Value</u>
Allied Chemical Dye Corp.	Trenton		Soda Ash
Clippert Brick Co.	NW 21 2S 11E		Clay-Brick
Dachille Trucking Co.			Sand and Gravel
Flat Rock Clay Products	NW SE 39 4S 10E		Clay-Tile
International Salt Co., Inc.	SW 32 2S 11E		Rock Salt
Lightweight Aggregate Corp.	NE 27 2S 11E		Clay-Lightweight Aggregate
Manning and Locklin Gravel Co.	NW SW 2 1S 8 E		Sand and Gravel
Michigan Foundation Quarry Co.	7 4S 11E		Limestone-crushed
Michigan Silica Co.	SW NE 15 5S 10E		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Moore Bros. Sand and Gravel	E SE 9 3S 9 E		Sand and Gravel
Northville Sand and Gravel	SE NE 8 1S 8E		Sand and Gravel
Peerless Cement Corp.	Detroit		Cement
Pennsylvania Salt Mfg. Co.	Wyandotte		Chlorine, Caustic Soda
Pickitt and Schreur	SE NE 8 1S 8E		Sand and Gravel
Thomson Sand and Gravel	Northville 8 1S 8E		Sand and Gravel
U. S. Gypsum Co.	River Rouge		Gypsum Products
Wayne Sand and Gravel Co.	NW SE 2 3S 8E		Sand and Gravel
Wolverine Contr. Inc.	Roseville		Sand and Gravel
Wyandotte Chemical Corp.	Wyandotte		Chlorine, Soda Ash, Portland Cement

WEXFORD (70)

Sand and Gravel		116,026 tons	\$ 100,141
Leo Dunbar	Cadillac		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
The Taber Co.			Sand and Gravel
Wexford Gravel Co.	Cadillac		Sand and Gravel

<u>Quantity</u>	<u>Value</u>
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UNDISTRIBUTED

Not segregated by counties (includes Alpena, Antrim, Bay, Chippewa, Emmet, Grand Traverse, Gratiot, Ionia, Iosco, Leelanau, Mackinac, Mason, Midland, Oscoda, Presque Isle, St. Clair)		\$ 138,172,743
Undistributed: Sand and Gravel, Peat, Silver, Mineral Pigments, and Gem Stones		<u>1,792,346</u>
Total value		\$ 139,965,089
Champion, Inc.		Sand and Gravel
Phil Cieszynski	Ontonaton	Gem Stones
The Cleveland-Cliffs Iron Co.		Mineral Pigments
Comstock Construction Co.		Sand and Gravel
Cravens Peat Moss	NW SE 3 3S 10E	Peat
O. E. Gooding and Co.		Sand and Gravel
Green Thumb Peat Humus Co.	24 7N 12E	Peat
M. A. Hanna Co.		Mineral Pigments
Irving L. Pratt and sons	SE SW 35 19N 17W	Peat
Keweenaw Agate Shop	Ahmeek	Gem Stones
Michigan Peat, Inc.	24 7N 12E	Peat
Perry Peat Co., Inc.	Morris	Peat
Pickands Mather and Co.		Mineral Pigments
U. S. Forest Service		Sand and Gravel
TOTAL STATE VALUE		\$ 406,809,600

COUNTY MINERAL PRODUCTION

1957

County	Rank	Value	County	Rank	Value
Alcona	75	\$ 65,610	Genesee	52	\$ 549,225
Alger	72	93,067	Gladwin	35	1,672,496
Allegan	44	976,669	Gogebic	6	23,890,359
Alpena	5	*	Grand Traverse	73	*
Antrim	80	*	Gratiot	18	*
Arenac	26	2,971,102	Hillsdale	47	811,276
Baraga	43	984,449	Houghton	14	6,555,655
Barry	51	628,610	Huron	46	906,906
Bay	11	*	Ingham	50	646,545
Benzie	83	2,160	Ionia	55	*
Berrien	62	265,514	Iosco	19	*
Branch	57	361,373	Iron	3	34,504,991
Calhoun	61	294,593	Isabella	22	3,456,541
Cass	69	100,985	Jackson	53	507,118
Charlevoix	82	16,850	Kalamazoo	49	771,286
Cheboygan	77	42,637	Kalkaska	64	209,449
Chippewa	24	*	Kent	23	3,280,543
Clare	27	2,524,327	Keweenaw	13	6,784,265
Clinton	56	374,022	Lake	67	134,975
Crawford	45	961,663	Lapeer	66	160,906
Delta	58	323,428	Leelanau	79	*
Dickinson	60	301,046	Lenawee	20	3,787,811
Eaton	37	1,575,368	Livingston	21	3,638,439
Emmet	15	*	Luce	81	19,431

County	Rank	Value	County	Rank	Value
Mackinac	12	\$ *	Schoolcraft	74	\$ 68,129
Macomb	39	1,413,451	Shiawassee	33	1,984,475
Manistee	10	11,261,619	St. Clair	9	*
Marquette	1	51,927,212	St. Joseph	63	255,218
Mason	17	*	Tuscola	31	2,110,414
Mecosta	54	445,735	Van Buren	59	317,647
Menominee	42	1,063,470	Washtenaw	36	1,657,928
Midland	4	*	Wayne	2	43,304,821
Missaukee	38	1,452,958	Wexford	70	100,141
Monroe	32	2,020,696			
Montcalm	25	3,203,674			
Montmorency	78	33,565			
Muskegon	34	1,868,411			
Newaygo	48	795,831			
Oakland	16	5,969,327			
Oceana	40	1,398,044			
Ogemaw	30	2,189,480			
Ontonagon	7	20,619,210			
Osceola	29	2,201,363			
Oscoda	76	45,829			
Otsego	68	102,572			
Ottawa	28	2,312,593			
Presque Isle	8	*			
Roscommon	41	1,313,031			
Saginaw	65	201,361			
Sanilac	71	100,055			

*Not segregated by counties (also includes Alpena, Antrim, Bay, Chippewa, Emmet, Grand Traverse, Gratiot, Ionia, Iosco, Leelanau, Mackinac, Mason, Midland, Oscoda, Presque Isle, St. Clair)

\$ 139,965,089

TOTAL STATE VALUE \$ 406,809,600

THE MINERAL INDUSTRY OF MICHIGAN IN 1958*

(Preliminary)

The value of mineral production in Michigan in 1958 was estimated at \$341.2 million, according to the Bureau of Mines, United States Department of the Interior a decrease in minerals value of over \$63.6 million and 16 percent less than the 1957 total. The decline in industrial production, particularly of steel, caused sharp decreases in demand for iron ore and limestone for flux. Although copper production was slightly higher than in 1957, lower average weighted unit prices, as used by the Bureau in calculating copper values in the United States, resulted in a drop in value of \$3.6 million.

Sand and gravel production was off substantially because of decreased road construction and of a lesser demand for materials by the building industry.

Production of other mineral products - cement, clay, gypsum, lime, mineral fuels, and salines derived from well-brines - remained closer to 1957 levels.

Cement ranked first in value, followed by iron ore, salt, copper, sand and gravel, petroleum, and stone.

METALS

Metallic minerals accounted for 30 percent of the total value of the State mineral production in 1958 compared to 37 percent in 1957.

Copper. - Although prices for copper were somewhat less in 1958, production was slightly greater. Calumet and Hecla, Inc. discontinued production from the Caledonia mine in June and the Iroquois mine and Osceola Number 13 in October, but maintained their overall production rate. Their other producing mines in 1958 included the Ahmeek No. 2, Ahmeek No. 3, Allouez, Centennial No. 2, Centennial No. 3, Osceola No. 6, Peninsula, Seneca, and the Tamarack reclamation plant. Copper Range Co. operated the Champion mine and continued treatment of Redridge tailings. The White Pine Copper Co. produced from its mine throughout the year, increasing output in October, November, and December. Much of their copper was sold at a guaranteed price. Quincy Mining Co. resumed operation of their tailing reclamation plant in November. The plant was shut down December 31, 1957 because of the low copper price. No companies reported shipments of copper concentrate or blister copper to electrolytic refineries; consequently, no silver was recovered during 1958.

The United States' average weighted price of 26.5 cents per pound was used to calculate the value of copper produced in 1958. The average price used in 1957 was 30.1 cents per pound, delivered Connecticut Valley.

*Prepared December 19, 1958 by Donald F. Klyce, Commodity Industry Analyst, under the supervision of Samuel A. Gustavson, Chief, Minneapolis Field Office, Division of Mineral Industries, Region V.

Iron and Manganese. - Iron ore shipments, totaling 8,150,000 long tons in 1958, declined about 38 percent from 1957. Value of shipments dropped \$42.6 million. During the latter part of the year mining activity increased as demand from the steel industry improved.

During 1958 about 112,000 short tons of ironore, containing over 5 percent manganese natural, was mined in Michigan.

Dates of first and last Lake shipments of ore in 1958 from Michigan and Wisconsin ports were: Ashland - C&NW - Soo, May 18-November 20; Escanaba - C&NW, May 1-December 5; Marquette - DSSA, June 10-October 27; Marquette - LS&I, April 26-December 7; Superior - G.N., May 2-December 1; Superior - NP - Soo, May 11-November 29.

NONMETALS

Nonmetallic mineral products (except mineral fuels) including cement, clay, gypsum, lime, salt, sand and gravel, stone, sulfur, and chemicals derived from well-brines represented nearly 62 percent of the value of the State mineral production. In terms of value, about two-thirds of the nonmetallics were used in the construction industry while the balance, principally salines, was used by the chemical industry to produce bromine and magnesium compounds, calcium chloride, potassium, and salt.

Demand for salt declined about 10 percent in 1958. A contributing factor was reduced demand for use as a road de-icer because of relatively mild weather conditions.

Production of magnesium compounds was augmented by the new plant of Harbison-Walker Refractories Co. at Ludington which was operated the first full year in 1958. Refractory magnesia was produced.

Although cement shipments declined nearly half a million barrels in 1958, value reported was slightly higher than in 1957 because of increased prices.

MINERAL FUELS

Mineral fuels (natural gas and natural-gas products, peat, and petroleum) valued at \$29.7 million accounted for nearly 9 percent of the 1958 State total, about the same proportion as in 1957. Peat, although classified as a mineral fuel, was sold only for soil conditioning. No coal production has been reported since 1951. The last coal mining operation was abandoned in April, 1952.

Mineral Production in Michigan, 1958⁽¹⁾
(Estimated)

Commodity	Short Tons (unless other- wise states)	Value
Cement:		
portland	20,381,000	\$68,073,000
masonry	1,230,000	4,723,000
Clays	1,800,000	1,950,000
Copper (recoverable content of ores, etc.)	59,500	31,535,000
Gem stones	(2)	500
Gypsum (crude)	1,428,000	4,968,000
Iron ore (usable) long tons	8,150,000	68,900,000
Manganiferous ore (5 to 35 percent Mn)	112,000	(3)
Natural gas (million cubic feet)	9,000	1,600,000
Peat	87,100	1,550,000
Petroleum (crude) thousand 42-gal. bbls.	9,299	26,409,000
Salt (common)	4,750,000	38,600,000
Sand and gravel (4)	35,500,000	31,000,000
Silver (recoverable content of ores, etc.) troy ounces	-	-
Stone	26,200,000	25,750,000
Value of items that cannot be disclosed: Bromine, calcium chloride and calcium magne- sium chloride, lime, magnesium compounds, manganiferous ore, natural gasoline and LP gases, potassium salts, recovered sulfur	-	41,795,640
Total Michigan (5)	-	\$341,174,000

- (1) Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
(2) Weight not recorded.
(3) Figure withheld to avoid disclosing individual company confidential data.
(4) Includes friable sandstone.
(5) Total adjusted to eliminate duplicating value of clays and stone.

DIRECTORY OF PRODUCERS OF MINERALS
AND
MINERAL PRODUCTS, 1957

CHEMICAL PLANTS
(Using Natural Brine or Salt)

Name and Address	Raw Material	Plant Location
Allied Chemical & Dye Corp. The Solvay Process Division P.O. Box 271 Syracuse 1 New York	Salt	Detroit, Wayne Co.
The Dow Chemical Company Midland, Michigan	Natural brine and salt	Midland, Midland Co. Ludington, Mason Co
Great Lakes Chemical Corp. 502 Michigan National Bank Building Grand Rapids 2 Michigan	Natural brine	Filer City, Manistee Co.
Hooker Electrochemical Co. Niagara Falls, New York	Salt	Montague, Muskegon Co.
Michigan Chemical Corp. 500 North Bankson St. Louis, Michigan	Natural brine	St. Louis, Gratiot Co. East Lake, Manistee Co.
Morton Salt Company 120 South LaSalle Street Chicago, Illinois	Natural brine	Manistee, Manistee Co.
Pennsalt Chemicals Corp. Wyandotte, Michigan	Salt	Wyandotte, Wayne Co.
Standard Lime & Cement Co. 2000 First National Bank Building Baltimore 3 Maryland	Natural brine	Stronack, Manistee Co.
Wyandotte Chemical Corp. Wyandotte, Michigan	Salt	Wyandotte, Wayne Co.

PRODUCERS OF BROMINE, CALCIUM-MAGNESIUM CHLORIDE,
MAGNESIUM COMPOUNDS AND POTASH

(From Well Brines)

	Bromine	Calcium- Magnesium Chloride	Magnesium Compounds	Potash	
Dow Chemical Company	X	X	X		Mason
Dow Chemical Company	X	X	X	X	Midland
Great Lakes Chemical Corp.	X				Manistee
Michigan Chemical Corp.	X	X	X		Gratiot
Michigan Chemical Corp.	X				Manistee
Morton Salt Company	X	X	X		Manistee
Standard Lime & Cement Co.			X		Manistee
Wilkinson Chemical Co.		X			Lapeer

CEMENT MANUFACTURERS

<u>Name and Address</u>	<u>Plant Location</u>
Aetna Portland Cement Company P. O. Box 392 Bay City, Michigan	Bay City, Bay Co.
Consolidated Cement Corporation 1003 National Bank Building Jackson, Michigan	Cement City, Lenawee Co.
Huron Portland Cement Co. 1325 Ford Building Detroit, Michigan	Alpena, Alpena Co.
Peerless Cement Company Division of American Cement Corp. 1144 Free Press Building Detroit, 26, Michigan	Detroit, Wayne Co. (2 plants) Port Huron, St. Clair Co.
Penn-Dixie Cement Corp. P. O. Box No. 152 Nazareth, Pa.	Petoskey, Emmet Co.
Wyandotte Chemical Corporation Wyandotte, Michigan (Operated by Huron Portland Cement Co.)	Wyandotte, Wayne Co.

CLAY PRODUCERS*

<u>Name and Address</u>	<u>Pit Location</u>
Minco Products Corporation Box 367 2305 Miller Road South Saginaw, Michigan	Near Paines, Saginaw Co. Section 1, T 11 N, R 3 E
Robinson Clay Products Company 65 West State Street Akron, 9, Ohio	Near Rockland, Ontonagon Co. Section 17, T 50 N, R 39 W

*Producers of clay used in clay products, Portland cement, and lightweight aggregate manufacturers not included.

CLAY PRODUCTS PRODUCERS

(Brick, Tile, Pottery, Lightweight Aggregate)

<u>Name and Address</u>	<u>Raw Material</u>	<u>Plant Location</u>
American Vitrified Products Co. 701 National City Bank Bldg. Cleveland, Ohio	Shale	Grand Ledge, Eaton (Tile)
Clay Products Company R.F.D. 2 St. Louis, Michigan	Clay	St. Louis, Gratiot Co. (Tile)
Clippert Brick Company Wyoming and Southern Avenues Detroit 10 Michigan	Clay	Near Dearborn, Wayne Co. (Brick)
Comfort Brick and Tile Co. R.F.D. 1 Tecumseh, Michigan	Clay	Tecumseh, Lenawee Co. (Tile)
Flat Rock Clay Products Co. Flat Rock 3 Michigan	Clay	Flat Rock, Wayne Co. (Tile)
Grand Ledge Clay Products Co. West Jefferson Street Grand Ledge, Michigan	Shale	Grand Ledge, Eaton Co. (Tile)
Lightweight Aggregate Corp. 12720 Merriman Road Livonia, Michigan	Clay	Livonia, Wayne Co. (Lightweight aggregate)
The Michigan Vitrified Tile Co. P. O. Box 450 Findlay, Ohio	Shale	Corunna, Shiawassee Co. (Tile)
F.W. Ritter Sons Company, Inc. South Rockwood, Michigan	Clay	South Rockwood, Monroe Co. (Pottery)

GYPSUM PRODUCERS

<u>Name and Address</u>	<u>Mine or Quarry Location</u>	<u>Mill Location</u>
Bestwall Gypsum Co. 120 East Lancaster Avenue Ardmore, Pennsylvania	Grand Rapids, Kent County (mine)	Grand Rapids, Kent Co.
Grand Rapids Plaster Company 1204 Peoples National Bank Bldg. Grand Rapids 2 Michigan	Grand Rapids, Kent County (mine)	Grand Rapids, Kent Co.
National Gypsum Company 325 Delaware Avenue Buffalo 2 New York	National City, Iosco Co. (quarry)	National City, Iosco County
United States Gypsum Company 300 West Adams Street Chicago 6 Illinois	Alabaster, Iosco Co. (quarry)	Grand Rapids, Kent Co. River Rouge, Wayne Co.

LIME PRODUCERS

<u>Name and Address</u>	<u>Plant Location</u>
The Dow Chemical Company Ludington Division Midland, Michigan	Ludington, Mason County
Limestone Products Company 320 First Street Menominee, Michigan	Menominee, Menominee Co.
Monitor Sugar Company Division Robert Gage Coal Company South Euclid Avenue Bay City, Michigan	Bay City, Bay County

IRON MINING COMPANIES

<u>Name and Address</u>	<u>Mine Locations (Counties)</u>
The Cleveland-Cliffs Iron Company 14th Floor Union Commerce Building Cleveland, 14, Ohio	Baraga, Iron, Marquette
Globe Iron Company Jackson, Ohio	Dickinson
M. A. Hanna Company 1300 Leader Building Cleveland, 14 Ohio	Iron and Marquette
Inland Steel Company 38 South Dearborn Street Chicago 3 Illinois	Iron and Marquette
Jackson Iron and Steel Company Jackson, Ohio	Dickinson
Jones and Laughlin Steel Corporation 401 Liberty Avenue Gateway Center Pittsburgh 30 Pennsylvania	Marquette
North Range Mining Company Negaunee, Michigan	Iron, Marquette, Gogebic
Pickands Mather and Company 2000 Union Commerce Building Cleveland 14 Ohio	Gogebic, Iron, Marquette, Dickinson
Republic Steel Corporation Republic Building Cleveland 1 Ohio	Iron

COPPER PRODUCERS

<u>Name and Address</u>	<u>Mine Locations(Counties)</u>
Calumet and Hecla, Incorporated Calumet, Michigan	Houghton and Keweenaw
Copper Range Co. Painsdale, Michigan	Houghton
Quincy Mining Co. Hancock, Michigan	Houghton
White Pine Copper Co. 53 West Jackson Blvd. Chicago, Illinois	Ontonagon

MARL PRODUCERS

Name	Address	Pit Location (County)
A.		
Frank Alfredson	Whitehall	Muskegon
James Anger	Big Rapids	Mecosta
Cleo L. Arndt	R.R. #1, Fennville	Allegan
Gerld Arnsman	R.R. #1, Hopkins	Allegan
D. C. Austin	R.R. #2, Coldwater	Branch
Carl Avery	R.R. #1, Athens	Calhoun
B.		
Barnes and Van Antwerp	Horton	Jackson
Lee Bertrand	Mattawan	Van Buren
La Verne Brizendine	308 Pennsylvania Ave., Dowagiac	Cass
Mathew J. Brown	R.F.D. #3, Byron Center	Kent
C.		
Case Brothers	R.R. #1, Sherwood	Branch, Calhoun, St. Joseph
Lawrence Chipman	Fenwick	Montcalm
Cleveland and Taylor	R.R. #2, Fremont, Ind.	Branch, Hillsdale
Roy Coville	R.R. #1, Climax	Kalamazoo
William Currier	R.R. #1, Caledonia	Kent
D.		
Bernard Damvelo	R.R. #1, Dorr	Allegan
Arnie Delebaugh	R.F.D. #2, Union City	Calhoun
Calvin Dixon	Bronson	Branch
Coy Drake	R.R. #1, Three Rivers	St. Joseph
F.		
David Flora	1306 Fulford Street, Kalamazoo	Kalamazoo
Wilson Frost	R.R. #2, Blanchard	Mecosta
G.		
Gatehouse Bros.	Weidman	Isabella
Richard Grabmeyer	R.R. #1, Dowagiac	Cass

Marl Producers (Contd.)

Name	Address	Pit Location County
H.		
William Hacker	R.R. #1, Athens	Calhoun
E. R. Hamilton	R.R. #3, Nashville	Barry
Clarence Harter	R.R. #3, Paw Paw	Van Buren
Glen Hayward	R.R. #3, Quincy	Branch
Lawrence Hayward	Box 371, Vicksburg	Kalamazoo
John Hess	R.R. #1, Hanover	Jackson
Frank R. Hixon	R.F.D. #2, Marcellus	Cass
C. Stanley Hooker	608 Colfax Street, Cadillac	Missaukee, Osceola
K.		
Glen Kermeen	R.R. #1, Middleville	Barry
Leslie Knox	Colon	St. Joseph
Henry Koster	1090 Rosewood, Jenison	Ottawa
L.		
Ted Lambrich	R.R. #3, Hart	Oceana
Dennis Lettinga	Grant	Newaygo
Ray Luegge	R.R. #1, Three Rivers	St. Joseph
Emmet J. Lutz	R.R. #1, Sherwood	Branch
M.		
Hugh Martel	Three Oaks	Berrien
Robert Martin	Three Oaks	Berrien
Claude Mastin	Climax	Kalamazoo
Robert Medley	R.R. #1, Onondaga	Ingham
Ralph Meyers	R.F.D. #2 West Olive	Ottawa
Loren A. Mills	Kalamazoo	Kalamazoo
O.		
Outman Bros.	Six Lakes	Montcalm
P.		
Emil Pavlak	R.R. #2, Hopkins	Allegan
Bernard Pipher	Jones	Cass
Otto Poehlman, Jr.	R.R. #2, Cassopolis	Cass
R.		
C. E. Reed	R.R. #2, Union City	Calhoun
Reed and Frisbie	Colon	St. Joseph
Robert Brothers	R.R. #1, Three Rivers	St. Joseph
Fred Runz	R.R. #2, Vicksburg	Kalamazoo

Marl Producers (Contd.)

S.

Carleton E. Schau	2882 Bronson Blvd., Kalamazoo	Barry
Donald Schau	1132 Bronson, Kalamazoo	Kalamazoo
Dan Slack	R. R. #4, Kalamazoo	Kalamazoo
Murland Smart	Burr Oak	St. Joseph
Harlan Spoor	R.R. #1, Burlington	Calhoun
C. H. Spies	R.F.D. #2, Box 414, Benton Harbor	Berrien
Thomas Springer	R.R. #2, Vicksburg	Kalamazoo
Bert Stenger	Doster	Allegan
Stewart and Schaefer	R.R. #1, Weidman	Isabella
Lowell W. Stukey	R.R. #1, Reading	Hillsdale
William Stuart	R.F.D. #2, Mt. Pleasant	Isabella

T.

Orville Truman	Mecosta	Mecosta
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W.

Wierenga Bros.	Spring Lake	Ottawa
Clifford Williams	Nottawa	St. Joseph
Marion E. Wolkins	R.R. #1, Bristol	Lake
Kenneth L. Wood	Colon	St. Joseph

Z.

Zylstra Bros.	Howard City	Montcalm
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PEAT PRODUCERS

<u>Name and Address</u>	<u>Pit Location</u>
Anderson Peat Co. Inlay City, Michigan	Near Capac, Lapeer County
Appleman Peat Ida, Michigan	Near Ida, Monroe County
Cravens Peat Moss R.F.D. #4, Box 359 Kalamazoo, Michigan	Near Kalamazoo, Kalamazoo County
Green Thumb Peat Humus Co. Capac, Michigan	Near Capac, St. Clair and Lapeer counties
Bud Green's Genuine Peat Moss 726 Stockbridge Avenue Kalamazoo, Michigan	Near Kalamazoo, Kalamazoo County
Michigan Peat, Inc. 267 Fifth Avenue New York, 16, New York	Near Capac, Lapeer and St. Clair counties
Perry Peat Co., Inc. Box 667 Morrice, Michigan	Near Morrice, Shiawassee County
Irving L. Pratt and Son Scottville, Michigan	Near Scottville, Mason County
Royal Peat Company 3137 Phillips Avenue Berkeley, Michigan	
Howard Smith Peat Fair Acres Farm Mason, Michigan	Near Mason, Ingham County

SALT COMPANIES

<u>Name and Address</u>	<u>Product</u>	<u>Plant Location</u>
Diamond Crystal Salt Co. St. Clair, Michigan	Evaporated Salt	St. Clair, St. Clair Co.
International Salt Co., Inc. Scranton, Pennsylvania	Rock Salt	Detroit, Wayne County
Manistee Salt Works 800 South Vandeventer Ave. St. Louis, 10, Missouri	Evaporated Salt	Manistee, Manistee Co.
Michigan Chemical Corp. 500 North Bankson St. Louis, Michigan	Evaporated Salt	St. Louis, Gratiot Co.
Morton Salt Company 120 South LaSalle St. Chicago, Illinois	Evaporated Salt	Manistee, Manistee Co. Marysville, St. Clair Co.

COMMERCIAL SAND AND GRAVEL PRODUCERS

(Addresses are all in Michigan unless otherwise designated)

<u>Name and Address</u>	<u>Pit Location</u>
A.	
Adrian Sand and Gravel, Adrian	Lenawee
Advance Bldg. Materials Co., 46461 Ryan Road Utica	Macomb
Aggregates Processors, White Pigeon	St. Joseph
American Aggregates Corp., Greenville, Ohio	Kalamazoo, Livingston** Oakland
American Stone Products, Sashabow Rd., Oxford	Oakland
Andersen Sand & Gravel Co., 1700 S. Werdock St., Saginaw	Tuscola
Aremaughs Gravel Pit, Ithaca	Gratiot
Arndt, Cleo L., Fennville	Allegan
Augusta Sand and Gravel Co., Augusta	Calhoun
B.	
Battle Creek Gravel Co.	Calhoun
3800 Dickman Highway, Battle Creek	
Floyd Beardslee, 725 E. Square Lake Rd., Pontiac	Oakland
Bender Gravel Co., 822 Benton St., Hastings	Barry
The Benjamin Pit, 30404 W. 14 Mile Rd., Farmington	Oakland
Berthel Sand & Gravel Co., R.F.D. #2, Reese	Tuscola
Bichler Bros., 1615 Ludington, Escanaba	Delta
Blades Construction Co., Beaverton	Clare
Boichot Concrete Products Corp. 1800 Turner St., Lansing	Clinton
E.P. Brady & Co., 1115 So. Dort Hwy., Flint 3	Various
Bundy Hill Gravel Co., Somerset Center	Hillsdale**
C.	
Caspian Lbr. Co., Caspian	Iron, Baraga, Gogebic, Houghton, Marquette, Ontonagon
Cass City Concrete Products Co., Cass City	Tuscola
W.A. Cecil & Son, 400 Albion Rd., Concord	Jackson
Central Concrete Products Co. Inc., Route #2 Big Rapids	Mecosta
Central Michigan Sand and Gravel, P.O. Box 5, East Lansing	Ingham
Champion, Inc., Iron Mountain	Dickinson, Iron, Mackinac, Marquette, Menominee
Cheney Gravel Co., Inc., Willoughby Rd., Holt	Ingham

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
C. (contd.)	
William Click, Sr., 8783 Bryce Road., Goodells Cloverland Milling Supply Co., 801 Superior Ave., Gladstone	St. Clair
Coit Avenue Gravel Co., 4772 Coit Ave., N.E. Grand Rapids	Delta
Cole Gravel Co., Route #1, Dorr	Kent
Emil Combs, Route #1, Tekonsha Comstock Constr., Co., Box 172, Bay City	Barry, Calhoun, Clare, Kalamazoo
Construction Aggregates Corp., 33 N. LaSalle St. Chicago, Illinois	Calhoun
Construction Materials Corp., Cleveland	Shiawassee, Tuscola, Lapeer Hillsdale, Sanilac
Consumers Sand and Gravel, Kalamazoo	Ottawa (Dredge)
Cross and White, 3849 Three Mile Road, Grand Rapids	St. Clair (Dredge)
H. C. Cushman, Star Route, Sears	Kalamazoo
D.	
D. & J. Gravel Co., Route 1, Fowlerville	Kent
Dachill Trucking Co., 18945 W. 8 Mile Rd., Detroit	Osceola
Van E. Daily, 410 W. Sibley St., Howell	Livingston
Daily Block Plant, Route #2, Cassopolis	Wayne
Roy Dayringer, Route 4, Ithaca	Livingston
Days River Sand & Gravel Co., Route #1, Gladstone	Berrien
Emil DeSander, 321 W. Sheridan Rd., Lansing	Gratiot
Edward De Vries & Sons, 959 Bristol Ave., Grand Rapids 4	Delta
Henry De Went, U. S. 21, Hudsonville	Ingham
De Will Gravel Co., U.S. 27 at Clark Rd., Lansing	Kent
Dexter Gravel Co., 7100 Dexter Ann Arbor Road, Dexter	Ottawa
Leo Dunbar, 7658 U.S. 131, Cadillac	Clinton
Dyer Company, McBrides	Washtenaw
E.	
East Side Gravel Co., 205 E. Valley Rd., Lansing	Wexford
Eastman Gravel Pit, Route #1, Standish	Clare
Ehinger Bros., West Branch	Ingham
Elliott Ice & Coal Co., 37 Monroe, Hillsdale	Arenac
W. L. Emery Co., 1375 E. Jefferson Ave., Detroit	Ogemaw
	Hillsdale
	Wayne (Dredge)

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
F.	
Orville J. Fair, Route 2, Deckerville	Sanilac
Ferguson Excavating Co., 5360 N. State Rd. Davison	Genesee
The Ferris Co., Mason	Ingham
Fiser Supply Co., 1617 E. Jolly Rd., Lansing	Ingham
Fisher Sand & Gravel Co., 921 S. Jefferson Ave. Midland	Midland
Foley & Beardslee, Route #3, Clarkston	Oakland
Ford and Co., 5960 S. Cedar, Holt	Ingham
Harry Fuoss, Route 1, Durand	Shiawassee
Fox Valley Constr. Co., Box 827, Appleton, Wisc.	Alger, Dickinson, Gogebic, Ontonagon
G.	
Garrett Sand Co., 411 Phoenix St., South Haven	Van Buren
Frank L. Gauthier, Onkama	Manistee
Gillett Sand and Gravel, M-78, East Lansing	Ingham
Gilliland Gravel Co., Route #2, Alpena	Alpena, Cheboygan, Delta, Grand Traverse, Ogemaw, Otsego, Mason, Jackson
J. Gladstone and Son, 423 Oak St., Rochester	Oakland
O.E. Gooding Co., 5800 Cherry Hill Rd., Ypsilanti	Genesee, Washtenaw, Sanilac, Tuscola, Livingston, Jackson** Wayne
Goodwin and Sons, Allegan	Allegan
Grande Brick Co., 1456 Fuller Ave., S.E. Grand Rapids 7	Kent
Grand Rapids Gravel Co., 2200 Chicago Dr., S.W. Grand Rapids 9	Kent
Gravel Producers, Inc., 106 E. Kilgore Rd. Kalamazoo	Kalamazoo
Great Lakes Foundry Sand Co., 720 United Artists Building, Detroit	Tuscola
Great Lakes Gravel Co., 2900 Auburn Road, Utica	Macomb
Groveland Gravel Co., 1620 Tyndall Road, Holly	Oakland**
H.	
Harvey G. Hall, 2854 20th Ave., Port Huron	St. Clair
Hansen Gravel Co., Harry Hansen, Pierson Rd. Flushing	Genesee
Casper H. Hass Co., 1800 Ravine Rd, Kalamazoo	Kalamazoo
Hatch Crushing Co., Alpena	Alpena
Kenneth Hodgins and Sons, Marquette	Marquette
Hale Bros., Rt. #2, Caro	Tuscola
Holland Construction Co., Holland	Allegan
Holly Sand & Gravel Co., Grange Hall, Route #1, Holly	Oakland

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
H. (contd.)	
Hoover Bros., 1137 Tripp Rd., Waldron George Huescher & Son, 1111 E. Pickard St., Mt. Pleasant	Hillsdale
Huitt & Sons, 322 Water St., Allegan William Huizenga, Route #2, Zeeland C. R. Hunt, Cass City E.J. Hurley Sand and Gravel Co., 4811 Hughes Rd., Lansing	Isabella Allegan Ottawa Huron, Ogemaw, Sanilac
Hutchins Sand & Gravel, Rodney C. Hutchins 320 S. Maple, Gaylord	Ingham
Hygrade Sand & Gravel Corp., 5000 E. 31 Mile Rd., Romeo	Otsego Macomb
I.	
Ireland & Lester Co., 220 N. Wayne St., St. Joseph Iron River Lbr. and Fuel Co., Iron River Ironwood Concrete & Products Co., Route #1, Box 7A Ironwood	Berrien (Dredge) Iron Gogebic
J.	
John R. Sand and Gravel Co., 1865 Indianwood Rd. Lake Orion	Oakland
Tom Johnston Gravel Co., 114 LaFayette St., Grand Haven	Ottawa
K.	
K. & V. Gravel Co., Route #1, Fremont Fred Kaatz, 62701 Richmond Road, Richmond Kaiser Sand and Gravel, 4767 N. Okemos Rd., Okemos	Newaygo Macomb Ingham Berrien
Harold Keill. Route #3, Niles Kemler Bros., 5900 Cobb Creek Ct., Rochester S.E. Ketchum & Sons, Route #3, Mason Killins Gravel Co., 3305 Liberty Rd., Ann Arbor Klumpp Bros., 4950 Loveland Rd., Grass Lake Koan Gravel Co., Route #1, Holly Koenig Sand and Gravel, Oxford Kruse Gravel Pit, 1090 Clark Rd., Ypsilanti Kurtz Gravel Co., G-5300 N. Dort Hwy., Flint	Oakland Ingham Washtenaw** Jackson Oakland Oakland Washtenaw Genesee

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
L.	
Lake Superior Gravel Co., 640 $\frac{1}{2}$ Lake Ave., Ironwood Lakeport Sand and Gravel Co., 7244 2nd St. Lakeport	Gogebic St. Clair Oakland
A.S. Leffler Gravel Co., Davison A. Lindberg & Sons, Inc., Box 154, Ishpeming Lowell Gravel Co., Grand River Drive R.F.D., Lowell	Marquette, Schoolcraft Kent
M.	
Macomb Sand & Gravel, 3295 Auburn Road, Utica Maertens Sand and Gravel Co., 1036 Buckingham Grosse Pointe	Macomb Macomb Ingham Mackinac Wayne
Hugh T. McKenzie, 140 $\frac{1}{2}$ Glenrose, Lansing Mike Mangine, Cedarville Manning-Locklin Gravel Co., Box 216, Northville Louis Marsack & Sons, 23633 Denhurst, St. Clair Shores	Macomb Clinton Ingham
H.L. Martin Gravel Co., Box 154, Westphalia Mason Gravel Co., Mason Hugh H. Mason and Sons, 302 N. Center Ave., Gaylord	Cheboygan
Mathews Gravel Co., G-6226 E. Mt. Morris Rd. Mt. Morris	Genesee Macomb Wayne
Michigan Sand and Gravel, 3405 Hamlin Rd. Utica Michigan Silica Co., Rockwood Mickelson Bros., 1745 Seymore Lake Road, Oxford Mid American Eng. Corp., 716 Old Orchard Prof. Bldg., Skokie, Illinois	Oakland Ionia, Mecosta, Oceana, Osceola, Washtenaw, Manistee, Allegan, Gratiot
Paul C. Miller, 10300 Sparta Ave., Sparta	Benzie, Kent, Grand Traverse, Manistee, Newaygo, Muskegon, Mecosta, Sanilac
Vern Molesworth, Yale	St. Clair
Moore Bros. Sand & Gravel, 7635 Wayne Rd., Wayne Morgan Sand & Gravel Co., 45095 Ryan Rd., Utica Muskegon Gravel Co., 5395 D angl Rd., Muskegon	Wayne Macomb Muskegon
N.	
Nashville Gravel Co., R.F.D. #2, Nashville New Hudson Sand and Gravel, New Hudson Nieb Concrete Products, 1406 South 11th St., Niles North Star Washed Sand & Gravel Co., Ithaca Northeast Gravel and Excavating Co., 4300 Cannosburg Road, Belmont	Barry** Oakland Cass Gratiot Kent
Northville Sand & Gravel Co., 18275 Beck Rd. Northville	Wayne
Northwest Materials, Inc., Bryan, Ohio Nugent Sand Co., Inc., 2875 Lincoln St., Muskegon	Hillsdale Muskegon

Commercial Sand and Gravel Producers (contd.)

Name and AddressPit Location (County)

O.

Oakland Sand & Gravel Co., 741 Glengary Road
Route 3, Walled Lake
Oldfield Co., Adrian
Okemos Sand and Gravel, 1873 Hamilton Rd., Okemos
Otisville Stone Co., 5300 N. Dort Hwy., Flint
Fred M. Ott, Bridgman
Oxford Mining Co., Davisburg

Oakland
Lenawee
Ingham
Genesee
Berrien
Oakland

P.

P. and B. Gravel Co., Route #3, Ithaca
Cy Page, Manitou Beach
Edward Palmer & Son, 2531 E. South, Jackson
Pekaar & Van Doorn, 2774 28th St., Grand Rapids 9
William Perry & Son, Peffer S., Harbor Springs
Harold Peters, Washed Sand & Gravel, Decker
Pickitt and Schreur, Box #149, Allegan

Gratiot
Lenawee
Jackson
Kent
Emmet
Sanilac
Allegan, Barry, Calhoun,
Clinton, Genesee, Gladwin,
Ionia, Kalamazoo, Jackson,
Kent, Livingston, Oscoda,
Roscommon, Ottawa, Wayne,
Gratiot, Shiawassee, St.
Joseph, Washtenaw**

Elmer Pilspanen, Route #1, Box 80, Bessemer
Pine Sand & Gravel, 2690 Imlay City Rd., Lapeer
Polhamus Gravel Co., Ovid
Port Huron Sand and Gravel, 2854 20th Ave.,
Port Huron
John Post & Sons, R.F.D. 2, Swartz Creek
H.F. Postma, 3643 28th St., S.W., Grand Rapids
Producers Core Sand Corp., 323 Warren Bldg.,
Michigan City, Ind.
Pryor Bros., 725 N. Cochran, Charlotte

Gogebic
Lapeer
Shiawassee
St. Clair
Genesee
Kent
Berrien
Eaton

R.

Ray Industries, Inc., P.O. Box 165, Oxford
Ed Reetz, Box 58, W. Branch
Bernie Rief, Fraser
Riverside Sand & Gravel Co., 1050 Maynard Ave.,
S.W., Grand Rapids 4
Kay Robinson, Contractor, 4491 Vrooman Road,
Jackson
Rock Sand and Gravel Co., 2500 Chicago Drive,
Grand Rapids
Walter Rosevear Pit, West Branch

Macomb
Ogemaw
Macomb
Kent
Jackson
Kent
Ogemaw

Commercial Sand and Gravel Producers (contd.)

Name and AddressPit Location (County)

R. (contd.)

Rosteck Contractors, 32634 Utica Rd.,
Fraser
Art Russell's Concrete Products, R.F.D. #1
Hillsdale
S.K. Rogers, 48301 Sugar Bush Rd., New Baltimore
Wakeman and Neva Ryno, Route #1, Coloma

Macomb
Hillsdale
Macomb
Berrien

S.

Ray Sablain, Inc., 2827 S. Cedar St., Lansing
Saginaw Core Sand Co., Saginaw
Salem Gravel and Constr. Co., Inc., Box 45,
5 Mile and Curtis Rd., Salem
Mrs. Hilma Samuelson, Chatham
Sand Products Corp., 2489 First Nat'l. Bank
Bldg., Detroit
Saunders and Son, Ravenna
Scarlett Gravel, 1721 S. Cedar, Holt
Sargent Sand Co., 2840 Bay Rd., Saginaw
Justus Snellenberger, 1545 W. Fry Road, Burt
Scio Gravel Co., 2911 W. Delhi, Box 233,
Ann Arbor
William Sell, Adrian
Shenk Gravel Co., Donald Shenk, Sr., Durand
Lawrence B. Skinner, 4536 Packard Rd., Ypsilanti
Slaters Bald Mtn., 451 E. Wilson Ave., Pontiac, 16
Smith Sand and Gravel Co., Inc. 65985 Mound
Road, Romeo
South Haven Sand Co., P.O. 290, Grand Haven
Southern Michigan Materials Co., Bryan, Ohio
Stamm Bros. Gravel Co., Route 1, Adrian
Standard Sand Co., 14201 Lake Shore Ave.,
P.O. Box 290, Grand Haven
Gordon D. Stevick, 424 Patty Ave., Jackson
Frank H. Stoerk, Pierson
Straits Aggregate & Equipment Corp., Box 569
East Tawas
H. Stukey, R.F.D. #2, Coldwater
Delmar Stanley Gravel Co., Durand

Ingham
Genesee, Midland, Tuscola
Oakland
Alger
Manistee, Muskegon
Genesee, Ingham
Ingham
Tuscola, Mason, Washtenaw
Genesee
Washtenaw
Saginaw
Shiawassee, Saginaw
Washtenaw
Oakland
Macomb
Van Buren
Hillsdale
Lenawee
Ottawa
Jackson
Montcalm
Ogemaw, Emmet, Cheboygan,
Presque Isle, Alpena
Branch, Calhoun, Ingham
Shiawassee, Roscommon,
Genesee, Ingham

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
T.	
The Taber Co., 125 Front Ave., N.W. Grand Rapids	Arenac, Clinton, Ogemaw, Gratiot, Otsego, Wexford
Lawrence Tamlyn, 125 Burdette St., St. Ignace	Mackinac
Tecumseh Gravel Co., P.O. Box 496, Tecumseh	Lenawee
Tecumseh Materials, Inc., Tecumseh	Luce
Thompson Sand & Gravel, 48399 W. 7 Mile Road Northville	Wayne
Lamar Thumm, 117 S. Grove St., Ypsilanti	Washtenaw
Robert Thiel, Chesaning	Saginaw
U.	
Underwood Sand & Gravel Co., 2255 Hamlin Rd., Utica	Oakland, Macomb
C. Utterback, R.F.D. #2, Mt. Pleasant	Isabella
Union City Gravel Co., Union City	Branch
V.	
Valley Gravel Co., Route 4, Owosso	Shiawassee
John Vandenberg, Kalamazoo	Kalamazoo
Van Camps, 2405 Peck Rd., Crosswell	Sanilac
Shirley Van Deusen, Route 1, Standish	Arenac
Van Enkevorts Bros., Bark River	Delta
Chuck Vaughan Gravel and Excavating, 2685 Deckerville Rd., Caro	Tuscola
Vermontville Gravel Co., Karl S. Benson, Route 1, Vermontville	Eaton
*H.R. Vernon, Route 2, Fennville	Allegan
W.	
Ben Waanders, Box 30, Allegan	Allegan
Aubrey Wagner, Harbor Beach	Huron
Lyle J. Walker Sand & Gravel, 21040 Coolidge Hwy. Detroit 35	Oakland
Wallace Stone Co., Hersey Sand & Gravel Div., Hersey	Osceola
Walling Gravel Co., P.O. Box 52, St. Johns	Clinton
Walsh Sand and Gravel Co., 13th St., Menominee	Menominee
F.S. Ward, Route 1, Clarkston	Oakland
I.J. Warren, 8570 Moms Dr., Belleville	Wayne
Wayne Sand & Gravel Co., 40330 Tyler Road, Wayne	Wayne
Ronald Weaver, Box 116, Dansville	Shiawassee, Clinton, Ingham
West Lansing Gravel Co., 1911 Pattengill Ave.	Ingham (Livingston)
West Shore Constr. Co., Zeeland	Barry, Eaton, Calhoun, Kent, Ottawa

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
W. (contd.)	
Wexford Gravel Co., P.O. Box 472, Cadillac	Wexford
I.L. Whitehead Co., Sault Ste. Marie	Alger, Chippewa, Luce, Schoolcraft, Dickinson, Iron, Mackinac, Menominee
White Lake Gravel, Inc., 622 S. Main, Clawson	Alger, Oakland
Whittaker & Gooding Co., 5800 Cherry Hill Rd., Ypsilanti	Washtenaw, Jackson
Williams Bros., Ionia	Ionia
Olga Winkka, 404 Center St., Marquette	Alger
John Woerner, R.F.D. #4, Adrian	Lenawee
Wolverine Contractors, Inc., 19440 James Couzens Highway, Detroit 35	Wayne
Woodward-Pollock Lbr. Co., 120 W. Chicago St., Coldwater	Branch
Y.	
Earl Yaklin, Seymour Rd., Montrose	Ogemaw
John G. Yerington, Route 3, Box 34, Benton Harbor	Barry, Berrien, Branch, Allegan, Calhoun, Cass, Kalamazoo, Van Buren
Youngs Sand & Gravel, Harold-George Young 9095 S. Huron River Drive, Ypsilanti	Washtenaw
Z.	
Zahns Sand & Gravel, 2315 Ellsworth Rd. Ann Arbor	Washtenaw
Allen Zavitz, 37835 Mallast, Mt. Clemens	Macomb
Zeigler Sand and Gravel, 901 W. State, Hastings	Barry
Harry Zeeff-Sons Gravel Co., 1029 Maynard Ave., S. Grand Rapids 4	Kent

** Includes heavy-media separation

STONE PRODUCERS

<u>Name and Address</u>	<u>Type of Stone</u>	<u>Quarry Location</u>
Afton Stone and Lime Co. Afton, Michigan	Limestone, crushed	North of Afton Sec. 25, T.35N., R2W. Cheboygan County
Delbert W. Turner 1607 N. Rose St Kalamazoo, Michigan	Sandstone	Marshall Sec. 29, T.2S., R.6W. Calhoun County
Arenac County Road Commission	Limestone, crushed (non-commercial)	Northeast of Au Gres Sec. 5, T.19N., R.7E. Arenac County
Bichler Bros. 1615 Ludington Escanaba, Michigan	Limestone, crushed	Sec. 2, T. 39N., 23E. Delta County
Bay County Road Commission	Limestone, crushed (non-commercial)	near Sec. 34 T.20N., R5E Arenac County
Borin Aggregates 14210 W. Chicago Detroit, Michigan	Dolomite, crushed	Monroe County Sec. 29, 5S., 8E.
Charlevoix Lime & Stone Co. Vanderbilt, Michigan	Limestone, crushed	West of Charlevoix Sec. 29, T.34N., R8W. Charlevoix County
Cheney Limestone Company Bellevue, Michigan	Limestone, crushed and dimensional	West of Bellevue Sec. 20, T.1N., R.6W. Eaton County
Presque Isle Corporation P O. Box 321 Alpena, Michigan	Limestone, crushed	Sec. 2, T.33N., R.8E. Presque Isle County
Drummond Dolomite, Inc P.O. Box 688 Sheboygan Wisconsin	Dolomite, crushed	Western end Drummond Is. Sec. 24, T.42N., R.5E. Chippewa County
Fiborn Limestone Co. Saulte Ste Marie Ontario, Canada	Limestone, crushed	Sec. 16, T.44N., R 7W. Mackinac County
Earl A. Flock 50 Waubascon Rd Battle Creek, Michigan	Sandstone	East of Battle Creek Sec. 22, T.2S., R.7W. Calhoun County
The France Stone Co. 1800 Toledo Trust Bldg. Toledo 14 Ohio	Dolomite, crushed	Monroe Sec. 7, T.7S., R.9E. Monroe County

Stone Producers - contd.

<u>Name and Address</u>	<u>Type of Stone</u>	<u>Quarry Location</u>
Gierke Brothers Fairport, Michigan	Dolomite, dimensional	North of Fairport Sec. 4, T.37N., R.19W. Delta County
Gogebic County Road Commission	Miscellaneous stone (non-commercial)	Gogebic County
Houghton County Road Commission Hancock, Michigan	Basalt, crushed (non-commercial)	Houghton County
Huron River Quarry Corp. Flat Rock, Michigan	Dolomite, crushed	Sec. 36, T.4S., R.9E. Wayne County
Inland Lime and Stone Co. Manistique, Michigan	Limestone, crushed	North of Hunt Spur Sec. 6, T.42N., R.12W. Mackinac County
Iosco County Road Commission	Limestone, crushed (non-commercial)	Northeast of Au Gres Sec. 24, T.20N., R.7E.
City of Iron Mountain Iron Mountain, Michigan	Granite, crushed	Arenac County Dickinson County
John C. Jeffery Box 107 Parma, Michigan	Limestone, crushed	Northeast of Parma Sec. 19, R.2S., R.2W. Jackson County
The Metro-nite Company P.O. Box 116, Station F. Milwaukee 9 Wisconsin	Dolomite, crushed	Near Felch Sec. 26, T.42N., R.28W. Dickinson County
Michigan Foundation Quarry Company 1110 W. Jefferson Ave. Trenton, Michigan	Limestone, crushed	Trenton Sec. 7, T.4S., R.11E. Wayne County
Michigan Limestone Div. U.S. Steel Corporation 170 East Woodward Ave. Rogers City, Michigan	Limestone, crushed	Near Rogers City Sec. 23, T.35N., R.5E. Presque Isle County and
" " "	Dolomite, crushed	near Cedarville Sec. 10, R.42N., R.1.E. Mackinac County
Michigan Silica Co.	Sandstone, crushed	near Rockwood Sec. 15, T.5S., R.10E. Wayne County
Michigan Stone Company R.F.D. #2 Ottawa Lake, Michigan	Dolomite, crushed	East of Ottawa Lake Sec. 25, T.8S., R.6E. Monroe County

Stone Producers - contd.

Name and Address	Type of Stone	Quarry Location
Monroe County Road Commission Monroe, Michigan	Dolomite, crushed (non-commercial)	East of Dundee Sec. 13, T.6S., R.7E. Monroe County
Onaway Stone Company Onaway, Michigan	Limestone, dimensional	North of Onaway Sec. 5, T.34N., R.2E. Presque Isle County
The Original Sandstone Quarry Napoleon, Michigan	Sandstone	East of Napoleon Sec. 6, T.4S., R.2E. Jackson County
Penn-Dixie Cement Corp. 60 E. 42nd St. New York 17 New York	Limestone, crushed	West of Petoskey Sec. 3, T.34N., R.6W. Emmet County
Ray Sandstone Quarry 303 Nottawasippe Napoleon, Michigan	Sandstone	East of Napoleon Sec. 6, T.4S., R.2E. Jackson County
Somes' Quarry P.O. Box 41 Drummond Drummond Island, Michigan	Dolomite, dimensional	West of Drummond Sec. 23, T.42N., R.5E. Chippewa County
Star Sandstone Company Box 102 Napoleon, Michigan	Sandstone	East of Napoleon Sec. 31, T.3S., R.2E. Jackson County
Superior Rock Products Company Sagola, Michigan	Dolomite, crushed Mica Schist, crushed Feldspar, crushed	East of Randville Sec. 35, T.42N., R.30W. Secs. 19 and 30, T.42N., R.29W. Dickinson County
Thornton Construction Co. Hancock, Michigan	Dolomite, crushed	Sec. 28, T.39N., R.23W. Delta County
The Wallace Stone Company Bayport, Michigan	Limestone, crushed and dimensional	Southeast of Bayport Sec. 6, R.16N., R.10E. Huron County
Wyandotte Chemicals Corporation 1609 Biddle Ave. Wyandotte, Michigan	Limestone, crushed	Alpena Sec. 24, T.31N., R.8E. Alpena County
Delbert W. Turner 1607 N. Rose St. Kalamazoo, Michigan	Sandstone	Marshall Sec. 29, T.19N., R.7E. Calhoun County

GENERALIZED COLUMNAR SECTION OF MICHIGAN

MICHIGAN GEOLOGICAL SURVEY DIVISION

SYSTEM. SERIES	FORMATION. GROUP	LITHOLOGY	THICKNESS	ECONOMIC PRODUCTS
RECENT				
PLEISTOCENE	GLACIAL DRIFT	SAND, GRAVEL, CLAY, boulders, marl	0-1000	SAND, GRAVEL, PEAT, MARL, FRESH WATER
"PERMO-CARBONIFEROUS"	"RED-BEDS"	SHALE, CLAY, SANDY SHALE, gypsum		
	GRAND RIVER	SANDSTONE, sandy shale	80-95	BUILDING STONE, FRESH WATER
PENNSYLVANIAN	SAGINAW	SHALE, SANDSTONE, limestone, coal	20-535	SHALE, COAL, FRESH WATER, BRINE, GAS
	BAY PORT	LIMESTONE, SANDY OR CHERTY LIMESTONE, SANDSTONE	2-100	LIMESTONE, FRESH WATER
	MICHIGAN	SHALE, gypsum, anhydrite, sandstone	0-500	GYPSUM
	"MICHIGAN STRAY"	SANDSTONE	0-80	GAS
MISSISSIPPIAN	MARSHALL	SANDSTONE, sandy shale	100-400	FRESH WATER, BRINE BUILDING STONE
	COLDWATER	SHALE, sandstone, limestone	500-1100	SHALE, FRESH WATER
	SUNBURY	SHALE	0-140	
	BEREA - BEDFORD	SANDSTONE, SHALE	0-325	GAS, OIL
	ELLSWORTH - ANTRIM	SHALE, limestone	100-950	SHALE, GAS
	TRAVERSE	LIMESTONE, SHALE	100-800	LIMESTONE, OIL, GAS, FRESH WATER
	BELL	SHALE, Limestone	0-80	SHALE
DEVONIAN	ROGERS CITY - DUNDEE	LIMESTONE	0-475	LIMESTONE, OIL, GAS, FRESH WATER
	DETROIT RIVER	DOLOMITE, limestone, salt anhydrite	150-1400	LIMESTONE, DOLOMITE, OIL, GAS, SALT, BRINE, FRESH WATER
	SYLVANIA	SANDSTONE, SANDY DOLOMITE	0-550	GLASS SAND, FRESH WATER
	BOIS BLANC	DOLOMITE, CHERTY DOLOMITE	0-1000	
	BASS ISLAND	DOLOMITE	50-570	DOLOMITE, FRESH WATER
SILURIAN	SALINA	SALT, DOLOMITE, Shale, anhydrite	50-4000	SALT, GAS, OIL
	NIAGARAN (Guelfh - Lockport - Engadine) (Manistique - Burnt Bluff) (Cataract)	DOLOMITE, Limestone, shale	150-800	LIMESTONE, DOLOMITE, OIL, GAS, FRESH WATER
	CINCINNATIAN (Richmond) (Maysville - Eden)	SHALE, LIMESTONE	250-800	
ORDOVICIAN	TRENTON - BLACK RIVER	LIMESTONE, DOLOMITE	200-1000	OIL, GAS, LIMESTONE, FRESH WATER
	ST. PETER	SANDSTONE	0-150	FRESH WATER
OZARKIAN OR CANADIAN	PRAIRIE DU CHIEN	DOLOMITE, Shale	0-410	
	HERMANVILLE	DOLOMITE, SANDY DOLOMITE, sandstone	15-500	
CAMBRIAN	LAKE SUPERIOR (Munising) (Jacobsville)	SANDSTONE	500-2000	BUILDING STONE FRESH WATER
	KEWEENAW (Copper formations)	LAVA FLOWS, conglomerate, shale, sandstone	9800-35000	COPPER, SILVER, ROAD METAL, SEMI-PRECIOUS GEM STONES
ALGONKIAN	KILLARNEY GRANITE	GRANITE, GNEISS, diorite, syenite		
	HURONIAN (Iron formations)	SLATES, HEMATITE, SCHIST, QUARTZITE, GRANITE, marble, dolomite	2000+	IRON ORE, ROOFING SLATE, ROAD METAL, GRAPHITE MARBLE
ARCHEAN	LAURENTIAN	SCHIST, GNEISS, GRANITE		ROAD METAL, BUILDING STONE, VERDE ANTIQUE, TALC, GOLD
	KEEWATIN	SCHIST, GREENSTONE, SLATE		ROAD METAL