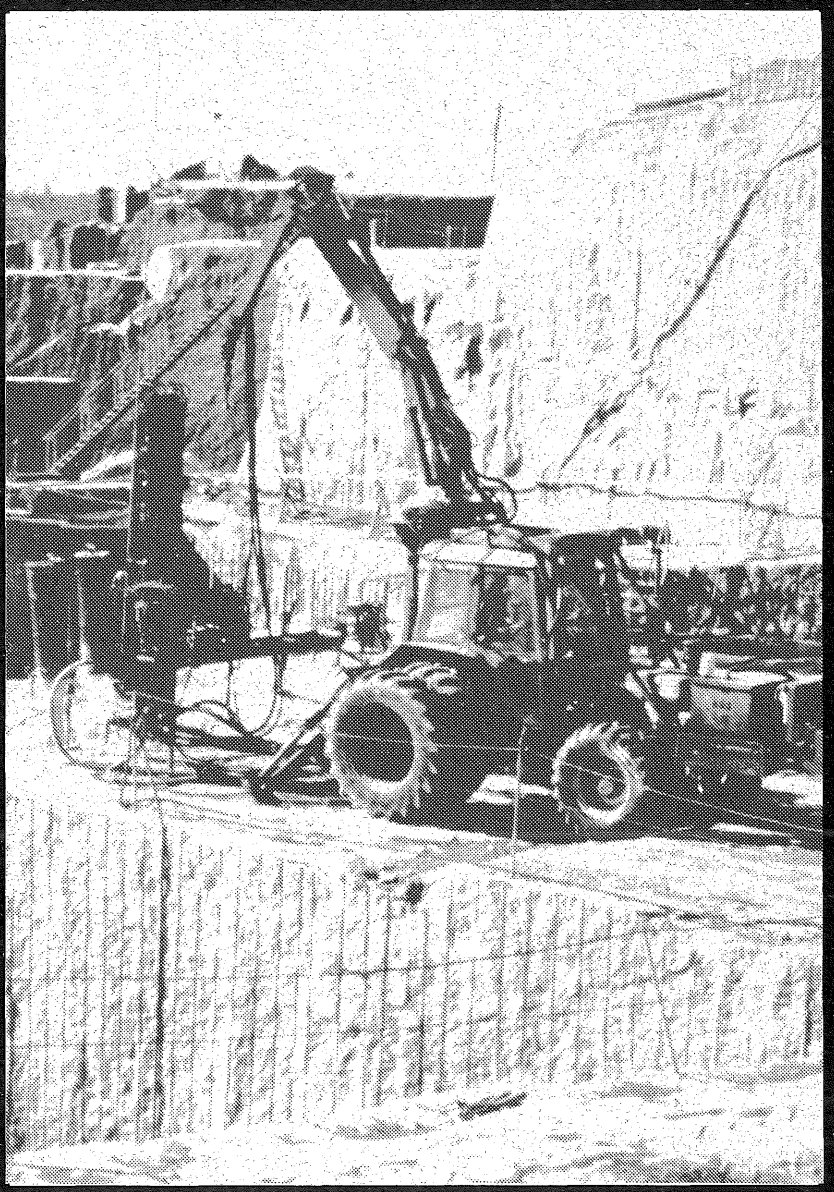
Industrial Minerals

Inventory of Industrial Mineral Pits and Quarries in Minnesota



1990
Report 282
Volume 1

Minnesota Department of Natural Resources

Division of Minerals

Celebrate MINNESOTA 1990

This report is available at various libraries in Minnesota. It may by purchased at the Hibbing office, DNR Minerals Division. For further information contact Mineral Resources Geologist at (218) 262-6767.

Inventory of Industrial Mineral Pits and Quarries in Minnesota

By

S. L. Nelson, M. W. Oberhelman, and D. J. Olson

1990

Report 282
Volume 1 of 2

Minnesota Department of Natural Resources
Division of Minerals
William C. Brice, Director

Contents: Volume 1

Contents: Volume 1 (continued)

Tables

Illustrations

Contents: Volume 2

Contents: Volume 2 (continued)

Abstract

The Department of Natural Resources, Division of Minerals, completed a comprehensive inventory of current and past industrial mineral mining activity in Minnesota, exclusive of sand and gravel extraction. The inventory data summarizes geologic and industry information maintained in the public record for pits and quarries that are active, inactive, or of historical interest.

The compilers collected the data through a questionnaire sent to the industry, subsequent discussions with the producers, and a search of data files and literature from public agencies and academic institutions.

A synopsis of activity at individual pits and quarries is presented in a reference format. The records for each commodity are sorted alphabetically by county, and within the county, by U. S. Public Land Survey location. Information reported includes the producing company, past operators, geologic formation, description of the rock or mineral, commodity uses, and a list of references for each pit or quarry.

The records are presented in two volumes. Volume 1 contains records of active pits and quarries and a Producer Directory; Volume 2 consists of records of inactive pits and quarries. The Producer Directory contains names, addresses, and telephone numbers of industrial mineral producers in Minnesota.

Industrial mineral commodities inventoried include: clay/shale, feldspar, marl, mica, natural cement, natural mineral pigments, peat, salt, silica sand, tripoli, and stone. Abrasive, crushed, and dimension stone commodities include carbonate rock, granite, greenstone, quartzite, sandstone, schist, slate, and trap rock.

The inventory indentifies 188 active industrial mineral pits and quarries. The catalog of inactive pits and quarries contains 1,799 records, some of which refer to several pits or quarries within a general location.

Inventory results are summarized in table form, listing the number of active and inactive pits and quarries by commodity and county. A series of page-sized maps of Minnesota depict the distribution of pits and quarries by commodity throughout the state.

Introduction

This report presents the results of a comprehensive inventory of industrial mineral mining activity in Minnesota, exclusive of sand and gravel extraction. The report summarizes geologic and industry information maintained in the public record for pits and quarries that are active, inactive, or of historical interest.

The report has several uses for geologists, engineers, managers, and developers. First, it is a guide to the state's current industrial minerals industry, containing a synopsis of the mining activity at each site. Second, it provides a reference to inactive pits and quarries that may have current and future value due to emerging and changing processing technologies and market conditions. Third, it provides the reader with a list of references that contain additional information on each pit or quarry.

Methodology

The first phase of the project, which began in the Spring of 1988, consisted of gathering information that is pertinent to the state's industrial minerals industry. Data were collected by two means: 1) a questionnaire sent to the industry, followed by discussions with the owners and operators; and 2) a search of literature and data from federal and state agencies, academic institutions, and local units of government.

As the information was collected for each mining activity, it was cataloged by commodity and location to facilitate the compilation. Information was then reviewed and summarized, and this summary was input into a text database manager that allows automated text-sorting and data retrieval.

The information for individual activities is compiled as a single "record." Typically, there are numerous current and historical sources for the information in each record, all of which are cited.

Inherent in the design of the inventory are a number of limitations. First, because this is the initial attempt to compile synopses of all information in the public record into a comprehensive document, it is likely that some sources of information may have been overlooked. Second, the locations of sites were not field-checked. Third, the authors could not, in all cases, resolve the discrepancies in the literature or determine the accuracy of the information.

In addition, because the scope of the inventory was constrained by time and the budget, reported occurrences of industrial minerals in outcrops, test pits, drill holes, and prospects were not included in the inventory.

The compilers did not collect production data or other proprietary information from the producers.

Commodities Reported

Individual records within the report are grouped according to commodity rather than by a geological classification system. The use of industry nomenclature reflects the end-use of these commodities.

The commodities included in this report, their definitions if these are called for, and the rocks and minerals associated with them are listed below.

- Clay/Shale - including catlinite (pipestone). The historical literature emphasizes brickyards and usually does not specifically mention the location of associated clay pits. Therefore, the compilers included brickyards in the inventory as a record of the general location of the associated clay or shale pits.
- Feldspar
- Marl
- Mica
- Mineral Pigments (Natural)
- Natural Cement
- Peat - only active operations are included in this report. For the purpose of the report, the terminology pits and quarries is to include peat mining areas.
- Salt
- Silica Sand (Industrial Sand)

  Stone:

  - Carbonate Rock - limestone, dolomite (dolostone), dolomitic limestone, travertine, and variations (industry typically uses the term limestone when referring to the carbonate rocks).
  - Granite - granite, gabbro, syenite, monzonite, diorite, grandodiorite, anorthosite, amphibolite, and gneiss, i.e., rocks that are defined as granite by the stone industry
  - Greenstone
  - Quartzite
  - Sandstone - including graywacke
  - Schist
  - Slate
  - Trap Rock - basalt, diabase, and felsite
  - Miscellaneous - including mine tailings, etc.
- Tripoli

Other terms used in defining the stone commodities include:

"Abrasive" - natural stone used to grind, polish, abrade, scour, or clean. Abrasive stone includes quartzite and sandstone.

"Crushed" - crushed or broken stone used for physical or chemical applications. Crushed stone includes carbonate rock, granite, greenstone, mine tailings, quartzite, sandstone, schist, and trap rock.

"Dimension" - cut stone and all forms of natural building stone. Dimension stone includes carbonate rock, granite, quartzite, sandstone, schist, slate, and trap rock.

"Undifferentiated" - the term used by the compilers when the literature did not identify the end-use of the stone. Undifferentiated stone includes carbonate rock, granite, quartzite, sandstone, slate, and trap rock.

Report Format

The report consists of two volumes: 1) Volume 1 contains records of active pits and quarries and a Producer Directory; 2) Volume 2 contains records of inactive pits and quarries.

Active pits and quarries include those that were active, intermittently active, or temporarily inactive at the time of compilation. Inactive pits and quarries include those that are inactive or abandoned. Unless current sources identified a pit or quarry as active, it was listed as inactive.

There is a slight variation in the arrangement of the commodity groupings between the two volumes. In Volume 1, active pits and quarries, the stone commodities are grouped according to end-use, i.e., abrasive, crushed or dimension stone. In contrast, within Volume 2, inactive pits and quarries, the stone commodities are grouped by rock type, i.e., granite, quartzite, sandstone, etc. The reason for this grouping is that the references for inactive quarries did not always indicate an end-use of the commodity.

Within each commodity grouping, the data are arranged according to location. Data are first sorted alphabetically by county and then numerically within the county, by U.S. Public Land Survey location, i.e., by ascending township, range, and section numbers. If more than one commodity is produced at a pit or quarry, the record will be listed only under the main commodity produced.

The Producer Directory contains an alphabetical listing of the companies with addresses and telephone numbers. References to the Producer Directory are contained in the records of some inactive pits and quarries in those cases where a producing company formerly operated the pit or quarry. Producing companies are also listed in a company index following the records in Volumes 1 and 2.

Record Format

A set of standardized headings is employed to organize the data within individual records. These headings are referred to as "field headings." In cases in which information pertaining to a specific field was not available, either in the literature or from the producers, that particular field heading is not contained in the record.

Because the volume of information necessitated that only a synopsis of each mining activity be reported, extreme care was taken to prevent misinterpretation of original work. Comments and clarifications by the compilers are enclosed by parentheses ( ), in contrast to the reference material, which is quoted directly or summarized. When the date of the reference is needed to provide a frame of reference for the reader, that date is also enclosed in parentheses ( ).

The field headings, as they appear in the records, and the conventions employed in presenting the information are listed below. Where necessary, comments to clarify the scope of the headings are given.

- **Company.** Name of the company operating the pit or quarry (this does not necessarily indicate ownership). See the Producer Directory for company address.
- **Main commodity.**
- **Other commodities.**
- **County.**
- **Quarry/pit name.**
- **Alternate name.** Other name(s) associated with the pit or quarry, e.g., such as those used by past operators.
- **Date opened.**
- **Status.** Either active, intermittently active, temporarily inactive, inactive, or abandoned. Abandoned does not imply depleted.
- **Past operator/owner.** Former operator, owner, or lessee of the quarry or pit.
- **MN/DOT source number.** Crushed stone aggregate source number assigned to the quarry by the Aggregate Unit, Minnesota Department of Transportation.
- **USGS quadrangle.** Name of the USGS 7.5 minute quadrangle map on which the site is located.
- **Township name.**
- **Location.** Township (T), range (R), section (Sec), and section locators. In cases where the pit or quarry is located in more than one township or section, all locators that apply are listed. In cases where location discrepancies exists between the references, all locations are listed, referenced to their source. And, in those cases where the references specified only a community, the location is the same as that community.

- **Location comments.** Additional comments concerning the location, such as a direction from the nearest community.
- **Geologic age.** Time interval (age) in which the rock formed, e.g., Ordovician, Middle Proterozoic, Archean, etc.; for chronology, please refer to "The Decade of North American Geology Geologic Time Scale", compiled by Palmer, 1983.
- **Geologic formation.** Geologic group (Gp.), formation (Fm.), or member (Mbr.) of the rock, as given in the reference (Note: The older references may include formation names that are not in current usage). If the compilers updated the nomenclature, the preferred usage is listed within parentheses ( ).
- **Description.** Description of the rock or mineral, including commercial names, rock type, color, variegation, texture, jointing, grain size, mineralogical composition, stratigraphic section, and lithological descriptions as given in the original references.
- **Chemical analyses.**
- **Physical test data.**
- **Extraction method.**
- **Processing plant.** Address, plant contact, and telephone number of processing plant are listed if different than company office.
- **Processing method.**
- **Uses of commodity.** Includes current and past uses.
- **Trade names.** Names used by the producer in marketing its commodities.
- **Marketing area.** Geographic area in which the company distributes its commodities.
- **Remarks.** Additional remarks relating to the pit or quarry that are not included within other fields.
- **References.** References are cited in two places within each record. First, as a number within parentheses ( ) immediately following the data in a field, and second, as an abbreviated citation at the end of the record. The complete citations are contained in the reference section, page 87.

Sources of Information

The following resources were used in compiling the data for this inventory: 1) a DNR questionnaire, including follow-up discussions with operators; 2) files on mining activities from public agencies, including the Aggregate Unit, Minnesota Department of Transportation (MN/DOT); the Mining Safety and Health Administration (MSHA), U. S. Department of Labor, Duluth District; and the U.S. Army Corps of Engineers, St. Paul and Detroit districts; 3) county offices, including county engineers, assessors, and zoning personnel; 4) historical societies and local historians; 5) field notes, maps, and publications of the Minnesota Geological Survey (MGS); 6) Mineral Industry Location System (MILS), U.S. Bureau of Mines (USBM); 7) brickyard information compiled by the Natural Resources Research

Institute (NRRI); 8) academic theses and journal papers; and 9) other selected literature.

Summary

This report presents the results of a comprehensive inventory of active and inactive industrial mineral pits and quarries in Minnesota. Of the pits and quarries identified, 188 were active, intermittently active, or temporarily inactive at the time of compilation. This number reflects the overall responsiveness to this inventory by the industry, in which over 90% responded to the questionaire or to subsequent inquiries. The listing of inactive or abandoned pits and quarries contains 1,799 records. However, the catalog of inactive records contains more than the 1,799 pits and quarries because the historical literature is often not precise enough to identify each pit or quarry. In these cases the records refer to more than one pit or quarry.

Tables 1 through 4 summarize the results of the inventory by commodity and county. Table 1 summarizes the number of active pits and quarries. Table 2 summarizes the number of inactive industrial mineral pits and quarries excluding clay and stone. Table 3 summarizes the number of inactive clay and shale pits or brickyards, and Table 4 summarizes the number of inactive stone quarries.

Figures 1, 2, and 3 depict the locations of active pits and quarries in the state, and figures 4 through 10 depict the distribution of inactive pits and quarries throughout the state. The scale of these maps required that sites be plotted in the township in which they occur. As an aid in interpreting the mapped data, see the bedrock geologic map of Minnesota in the appendix.

Table 1. Active Industrial Mineral Pits and Quarries

				Abrasive Stone	Crushed Stone					Dimension Stone		
	Clay/ Shale	Peat	Silica Sand	Quartzite	Carbonate Rock	Granite	Quartzite	Schist	Trap Rock	Carbonate Rock	Granite	Quartzite
Aitkin	-	2	-	-	-	-	-	-	-	-	-	-
Anoka	-	1	-	-	-	-	-	-	-	-	-	-
Big Stone	-	-	-	-	-	1	-	-	-	-	1	-
Blue Earth	-	-	-	-	2	-	-	-	-	3	-	-
Brown	2	-	-	-	-	-	-	-	-	-	-	-
Carlton	-	3	-	-	-	-	-	-	-	-	-	-
Cass	-	1	-	-	-	-	-	-	-	-	-	-
Dakota	-	-	-	-	6	-	-	-	-	-	-	-
Dodge	-	-	-	-	3	-	-	-	-	-	-	-
Fillmore	-	-	-	-	22	-	-	-	-	-	-	-
Goodhue	-	-	-	-	18	-	-	-	-	-	-	-
Hennepin	-	1	-	-	-	-	-	-	-	-	-	-
Houston	-	-	-	-	24	-	-	-	-	-	-	-
Isanti	-	1	-	-	-	-	-	-	-	-	-	-
Koochiching	-	-	-	-	-	-	-	1	-	-	-	-
Lac Qui Parle	-	-	-	-	-	-	-	-	-	-	1	-
Le Sueur	-	-	2	-	-	-	-	-	-	2	-	-
Mille Lacs	-	-	-	-	-	-	-	-	-	-	1	-
Mower	-	-	-	-	2	-	-	-	-	-	-	-
Nicollet	-	-	-	-	-	-	1	-	-	-	-	-
Olmsted	-	-	-	-	13	-	-	-	-	-	-	-
Otter Tail	-	1	-	-	-	-	-	-	-	-	-	-
Redwood	3	-	-	-	-	-	-	-	-	-	-	-
Renville	-	-	-	-	-	-	-	-	-	-	1	-
Rice	-	2	-	-	1	-	-	-	-	-	-	-
Rock	-	-	-	1	-	-	-	-	-	-	-	1
St. Louis	-	3	-	-	-	1	-	-	2	-	-	-
Scott	-	-	-	-	4	-	-	-	-	-	-	-
Stearns	-	-	-	-	-	1	-	-	-	-	5	-
Steele	-	-	-	-	1	-	-	-	-	-	-	-
Wabasha	-	-	-	-	18	-	-	-	-	-	-	-
Washington	-	-	1	-	3	-	-	-	-	-	-	-
Winona	-	-	-	-	23	-	-	-	-	1	-	-
Yellow Medicine	-	-	-	-	-	1	-	-	-	-	-	-
Total	5	15	3	1	140	4	1	1	2	6	9	1

Table 2. Inactive Industrial Mineral Pits and Quarries Excluding Clay and Stone

	Feldspar	Marl	Mica	Mineral Pigments	Natural Cement	Salt	Silica Sand	Tripoli	Miscellaneous Minerals
Aitkin	-	2	-	-	-	-	-	-	-
Anoka	-	2	-	-	-	-	1	-	-
Beltrami	-	1	-	-	-	-	-	-	-
Benton	-	2	-	-	-	-	-	-	-
Blue Earth	-	-	-	-	2	-	-	-	-
Carlton	-	-	-	-	-	-	-	-	1
Cass	-	1	-	-	-	-	-	-	-
Chisago	-	1	-	-	-	-	-	-	-
Crow Wing	-	9	-	-	-	-	-	-	-
Dakota	-	-	-	-	-	-	2	-	-
Goodhue	-	-	-	-	-	-	1	-	-
Hubbard	-	2	-	-	-	-	-	-	-
Kittson	-	-	-	-	-	1	-	-	-
Lake	2	-	-	-	-	-	-	-	-
Lake of the Woods	1	1	-	-	-	-	-	-	-
Le Sueur	-	-	-	-	-	-	6	-	-
Morrison	-	1	-	-	-	-	-	-	-
Mower	-	-	-	-	1	-	-	-	-
Pine	-	-	-	-	-	-	1	-	-
Ramsey	-	-	-	-	-	-	1	-	-
Redwood	-	-	-	1	-	-	-	-	-
St. Louis	1	-	1	-	-	-	-	-	-
Scott	-	-	-	-	-	1	2	-	-
Stearns	-	5	-	-	-	-	-	-	-
Todd	-	1	-	-	-	-	-	-	-
Wadena	-	2	-	-	-	-	-	-	-
Washington	-	1	-	-	-	-	-	1	-
Total	4	31	1	1	3	2	14	1	1

Table 3. Inactive Clay/Shale Pits or Brickyards

	Clay/Shale		Clay/Shale
Aitkin	2	Mille Lacs	4
Anoka	6	Morrison	6
Becker	5	Mower	7
Beltrami	2	Nicollet	7
Benton	2	Nobles	1
Blue Earth	9	Norman	1
Brown	13	Olmsted	7
Carlton	19	Otter Tail	7
Carver	7	Pennington	1
Chippewa	3	Pine	1
Chisago	8	Pipestone	1
Clay	2	Polk	7
Cottonwood	4	Pope	1
Crow Wing	2	Ramsey	5
Dakota	5	Red Lake	1
Dodge	3	Redwood	6
Douglas	6	Renville	3
Faribault	6	Rice	4
Fillmore	15	Rock	1
Freeborn	6	Roseau	2
Goodhue	26	St. Louis	2
Grant	1	Scott	7
Hennepin	11	Sherburne	3
Houston	6	Sibley	2
Hubbard	2	Stearns	18
Isanti	5	Steele	3
Itasca	3	Stevens	1
Jackson	3	Swift	3
Kanabec	5	Todd	15
Kandiyohi	3	Wabasha	8
Le Sueur	5	Waseca	3
Lincoln	1	Washington	2
Lyon	2	Watonwan	3
McLeod	2	Wilkin	1
Marshall	1	Winona	8
Martin	2	Wright	12
Meeker	3	Yellow Medicine	4
		Total	374

Note: This table lists the number of records in each county - in many cases one record represents numerous pits or brickyards at the given record location.

Table 4. Inactive Stone Quarries

	Carbonate Rock			Granite			Greenstone	Quartzite		
	*C	D	U	C	D	U	C	C	D	U
Aitkin	-	-	-	-	-	1	-	-	1	
Anoka	1	-	-	-	-	-	-	-	-	-
Beltrami	-	-	-	1	-	-	-	-	-	-
Benton	-	-	-	1	15	5	-	-	-	-
Big Stone	-	-	-	2	2	7	-	-	-	-
Blue Earth	6	29	2	-	-	-	-	-	-	-
Brown	1	-	-	-	-	-	-	-	-	-
Carlton	-	-	-	-	-	-	-	-	-	-
Carver	1	-	-	-	-	-	-	-	-	-
Cass	-	-	-	-	1	-	-	-	-	-
Chippewa	1	-	-	2	3	1	-	-	-	-
Chisago	1	-	-	-	-	-	-	-	-	-
Cook	-	-	-	1	-	-	-	-	-	-
Cottonwood	-	-	-	-	-	-	-	1	6	-
Crow Wing	-	-	-	-	-	-	-	-	-	-
Dakota	11	16	11	-	-	-	-	-	-	-
Dodge	15	11	2	-	-	-	-	-	-	-
Fillmore	120	23	41	-	-	-	-	-	-	-
Freeborn	-	-	-	-	-	-	-	1	-	-
Goodhue	43	42	12	-	-	-	-	-	-	-
Hennepin	7	16	3	-	-	-	-	-	-	-
Houston	76	20	3	-	-	-	-	-	-	-
Itasca	-	-	-	-	-	1	-	-	-	-
Kanabec	-	-	-	-	3	-	-	-	-	-
Lac Qui Parle	-	-	-	-	3	7	-	-	-	-
Lake	-	-	-	3	2	5	-	-	-	-
Le Sueur	9	12	8	-	-	-	-	-	-	-
Lincoln	-	-	-	-	-	-	-	-	-	-
Mille Lacs	-	-	-	-	1	-	-	-	-	-
Morrison	-	-	-	-	6	3	-	-	-	-
Mower	18	18	10	-	-	-	-	-	-	-
Nicollet	1	6	-	-	1	2	-	1	2	1
Olmsted	57	12	23	-	-	-	-	-	-	-
Pine	-	-	-	-	-	-	-	-	-	-
Pipestone	-	-	-	-	-	-	-	2	2	7
Ramsey	3	9	2	-	-	-	-	-	-	-
Redwood	-	-	-	-	5	20	-	-	-	-
Renville	-	-	-	1	9	5	-	-	-	-
Rice	7	17	2	-	-	-	-	-	-	-
Rock	-	-	-	-	-	-	-	1	6	3
St. Louis	-	-	-	4	8	14	2	1	-	-
Scott	9	2	1	-	-	-	-	-	-	-
Sherburne	-	-	-	-	6	1	-	-	-	-
Sibley	4	-	-	-	-	-	-	-	-	-
Stearns	-	-	-	1	91	17	-	-	-	-
Steele	3	2	-	-	-	-	-	-	-	-
Wabasha	37	8	5	-	-	-	-	-	-	-
Washington	10	16	24	-	-	-	-	-	-	-
Watonwan	1	-	-	-	-	-	-	-	-	-
Winona	66	22	6	-	-	-	-	-	-	-
Yellow Medicine	-	-	-	-	4	9	-	-	-	-
Total	508	281	155	16	160	98	2	7	17	11

* A = Abrasive Stone C = Crushed Stone D = Dimension Stone U = Undifferentiated Stone

Table 4. continued

	Sandstone				Schist	Slate		Trap Rock			Miscellaneous	
	A	C	D	U	D	D	U	C	D	U	C	U
Aitkin	-	-	-	-	-	-	-	-	-	-	-	-
Anoka	-	-	-	-	-	-	-	-	-	-	-	-
Beltrami	-	-	-	-	-	-	-	1	-	-	-	-
Benton	-	-	-	-	-	-	-	-	-	-	-	-
Big Stone	-	-	-	-	-	-	-	-	-	-	-	-
Blue Earth	-	-	-	-	-	-	-	-	-	-	-	-
Brown	-	-	1	-	-	-	-	-	-	-	-	-
Carlton	-	-	-	-	-	7	2	-	-	-	-	-
Carver	-	-	-	-	-	-	-	-	-	-	-	-
Cass	-	-	-	-	-	-	-	-	-	-	-	-
Chippewa	-	-	-	-	-	-	-	-	-	-	-	-
Chisago	-	-	2	-	-	-	-	1	1	-	-	-
Cook	-	-	-	1	-	-	-	4	-	-	-	-
Cottonwood	-	-	-	-	-	-	-	-	-	-	-	-
Crow Wing	-	-	-	-	-	-	-	-	-	-	1	-
Dakota	-	-	3	2	-	-	-	-	-	-	-	-
Dodge	-	-	-	-	-	-	-	-	-	-	-	-
Fillmore	-	4	1	-	-	-	-	-	-	-	-	-
Freeborn	-	-	-	-	-	-	-	-	-	-	-	-
Goodhue	-	1	-	3	-	-	-	-	-	-	-	-
Hennepin	-	-	-	-	-	-	-	-	-	-	-	-
Houston	-	3	2	-	-	-	-	-	-	-	-	-
Itasca	-	-	-	-	-	-	-	-	-	-	1	-
Kanabec	-	-	-	-	-	-	-	-	-	-	-	-
Lac Qui Parle	-	-	-	-	-	-	-	-	-	-	-	-
Lake	-	-	-	-	-	-	-	15	-	-	-	-
Le Sueur	-	-	-	-	-	-	-	-	-	-	-	-
Lincoln	-	-	1	-	-	-	-	-	-	-	-	-
Mille Lacs	-	-	-	-	-	-	-	-	-	-	-	-
Morrison	-	-	-	-	2	1	-	-	-	-	-	-
Mower	-	-	1	-	-	-	-	-	-	-	-	-
Nicollet	-	-	2	-	-	-	-	-	-	-	-	-
Olmsted	-	-	-	1	-	-	-	-	-	-	-	-
Pine	1	-	6	2	-	-	-	-	-	-	-	-
Pipestone	-	-	-	-	-	-	-	-	-	-	-	-
Ramsey	-	-	-	1	-	-	-	-	-	-	-	-
Redwood	-	-	-	-	-	-	-	-	-	-	-	-
Renville	-	-	-	-	-	-	-	-	-	-	-	-
Rice	-	1	-	-	1	-	-	-	-	-	-	-
Rock	-	-	-	-	-	-	-	-	-	-	-	-
St. Louis	-	-	3	1	-	-	-	9	-	3	2	1
Scott	-	1	1	1	-	-	-	-	-	-	-	-
Sherburne	-	-	-	-	-	-	-	-	-	-	-	-
Sibley	-	-	-	-	-	-	-	-	-	-	-	-
Stearns	-	-	-	-	-	-	-	-	-	-	-	-
Steele	-	-	-	-	-	-	-	-	-	-	-	-
Wabasha	-	-	1	-	-	-	-	-	-	-	-	-
Washington	-	-	-	4	-	-	-	-	-	-	-	-
Watonwan	-	-	-	-	-	-	-	-	-	-	-	-
Winona	-	5	2	2	-	-	-	-	-	-	-	-
Yellow Medicine	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	15	26	18	3	8	2	30	1	3	4	1

Note: This table lists the number of records in each county - occasionally one record represents several quarries.

Figure 1. Active Peat Mines and Clay/Shale and Silica Sand Pits

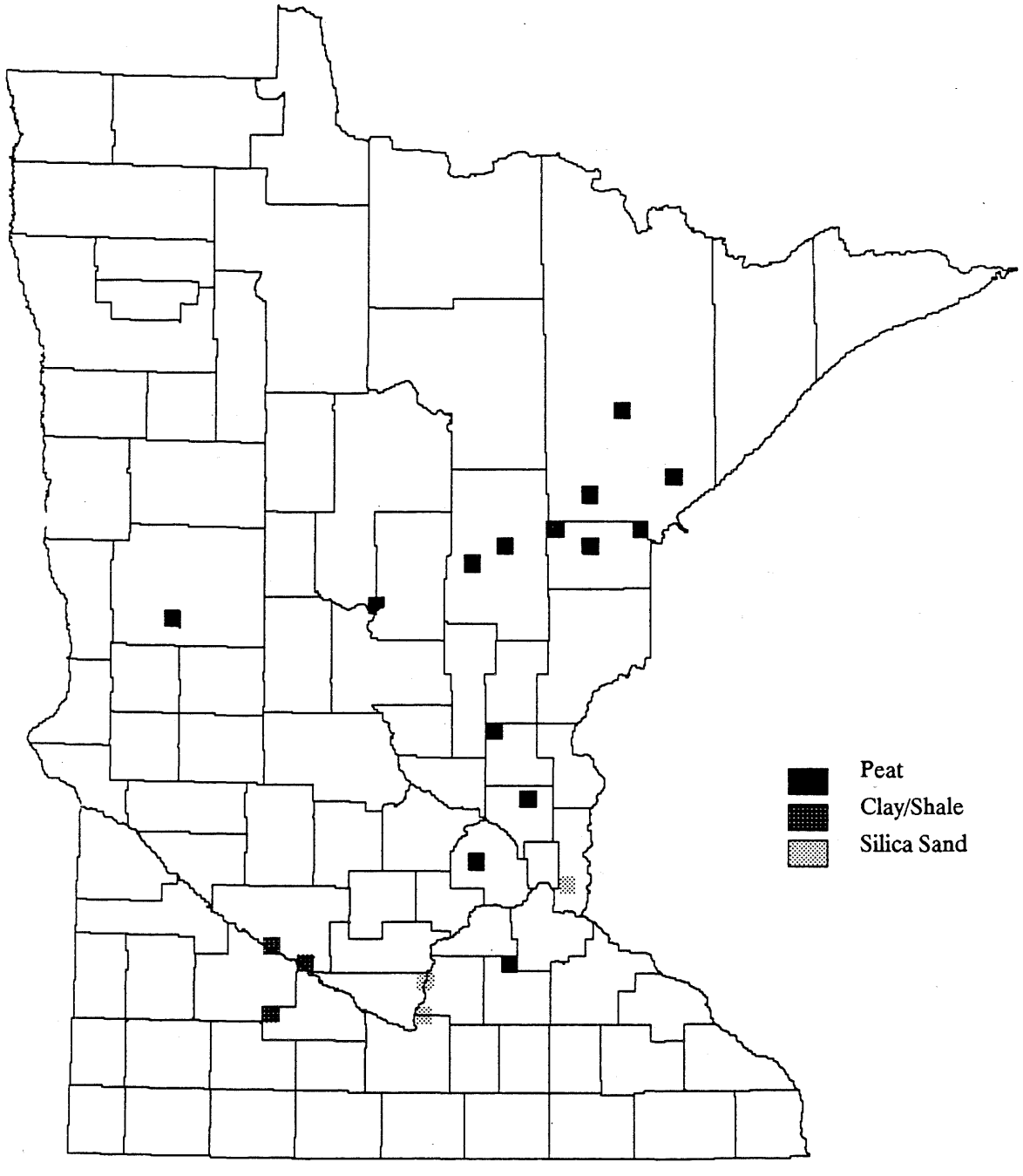


Figure 2. Active Abrasive Stone and Dimension Stone Quarries

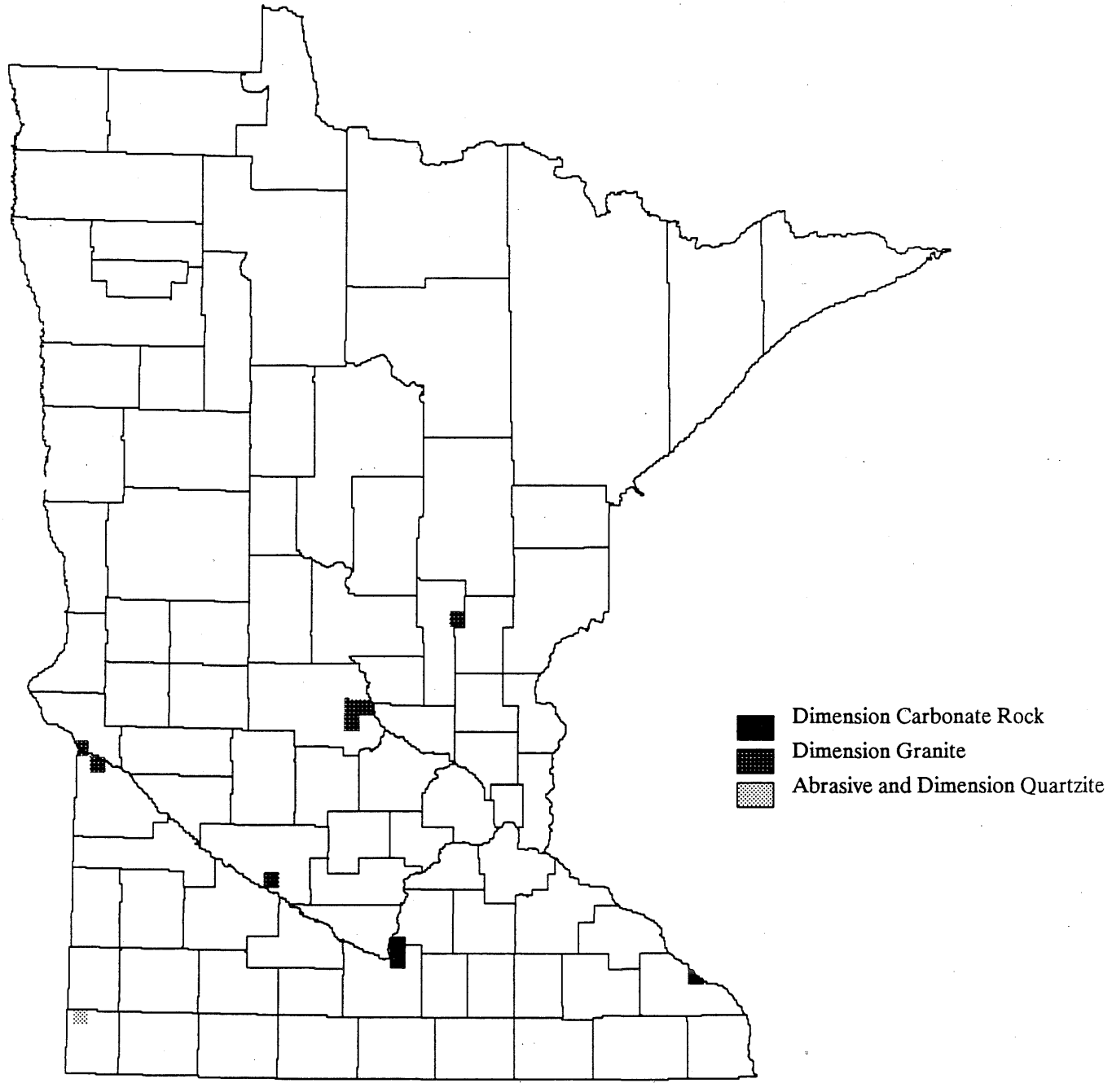


Figure 3. Active Crushed Stone Quarries

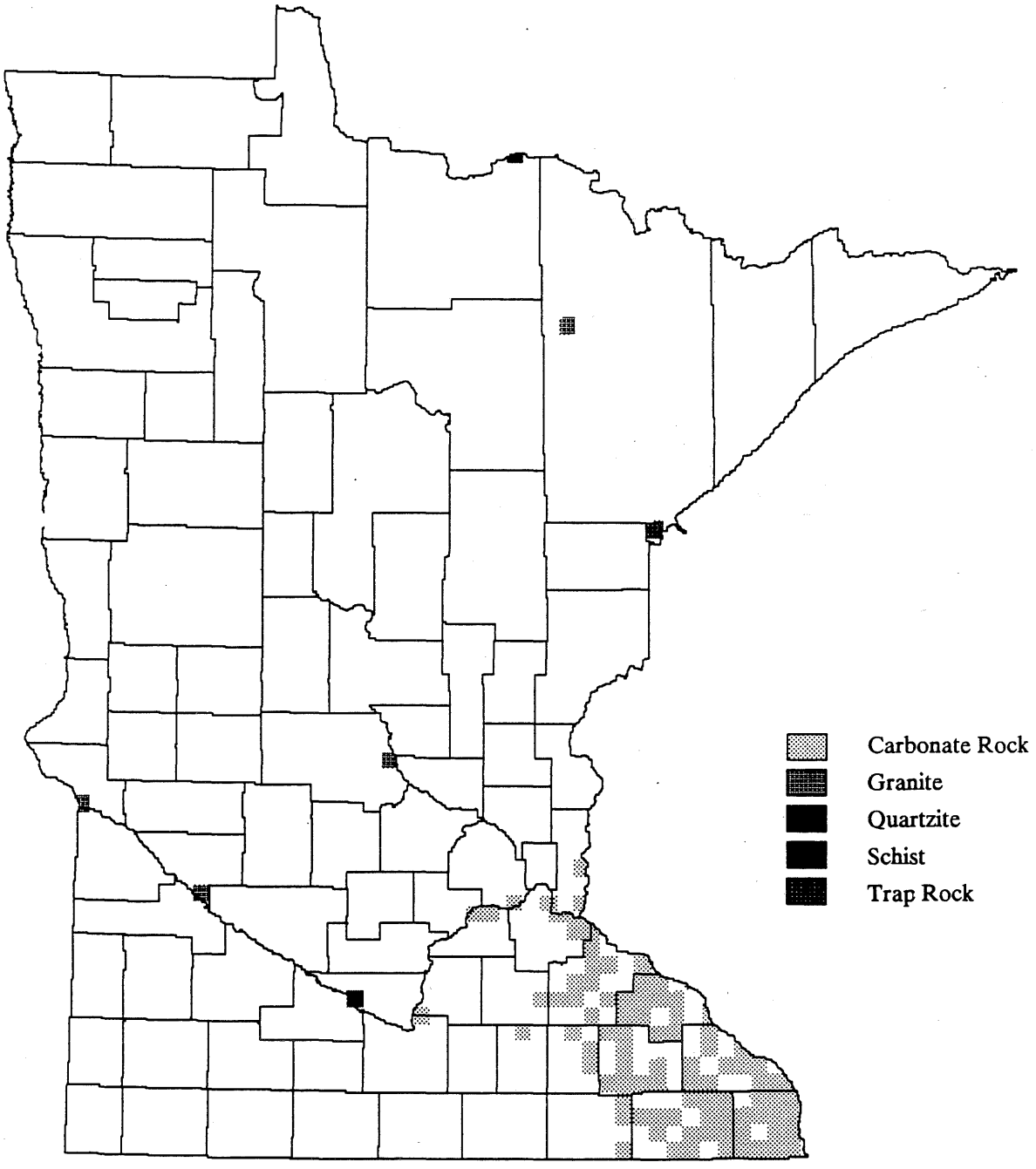


Figure 4. Inactive Feldspar, Marl, and Mica Pits and Quarries

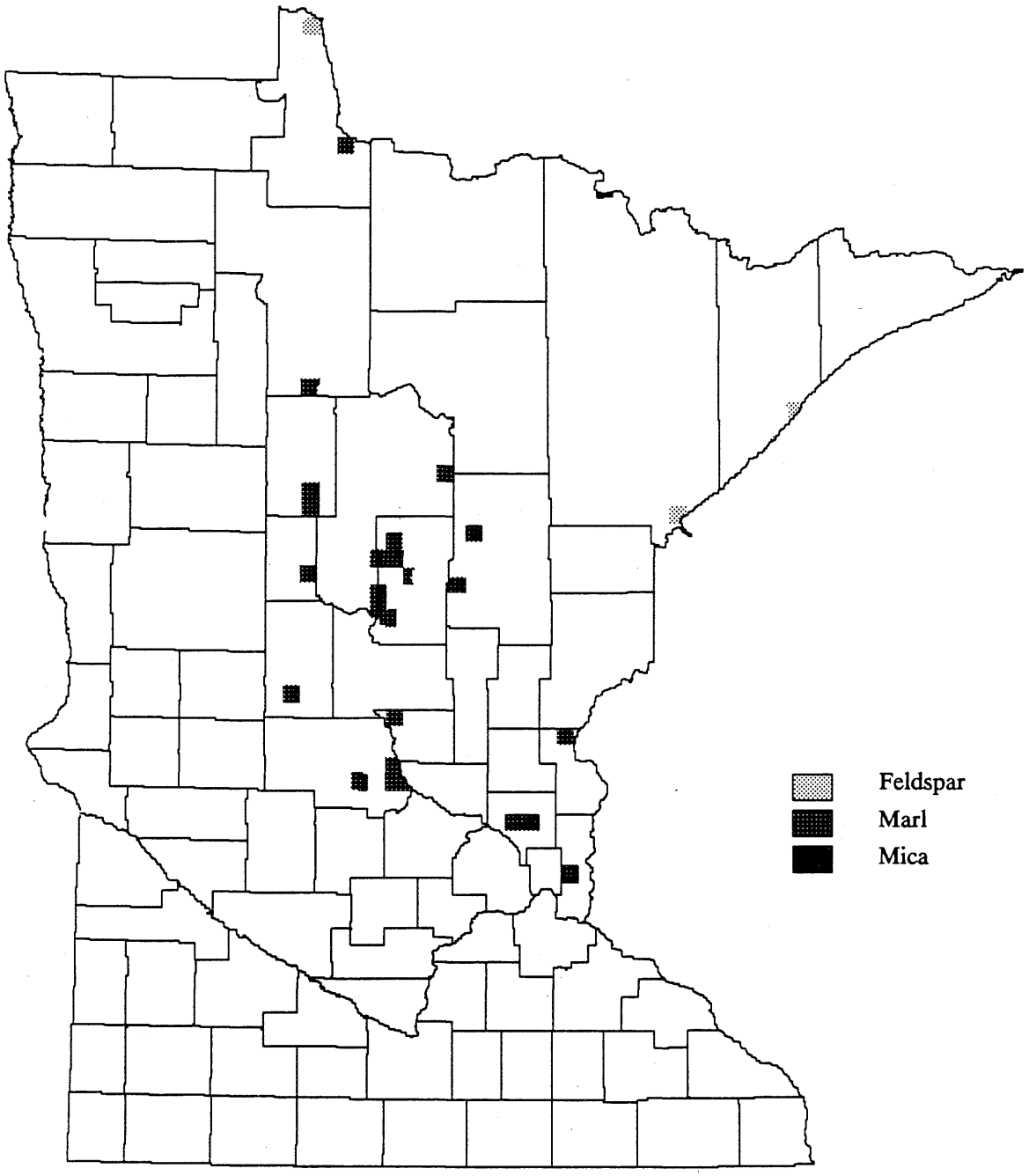


Figure 5. Inactive Mineral Pigments, Natural Cement, and Salt Pits and Quarries

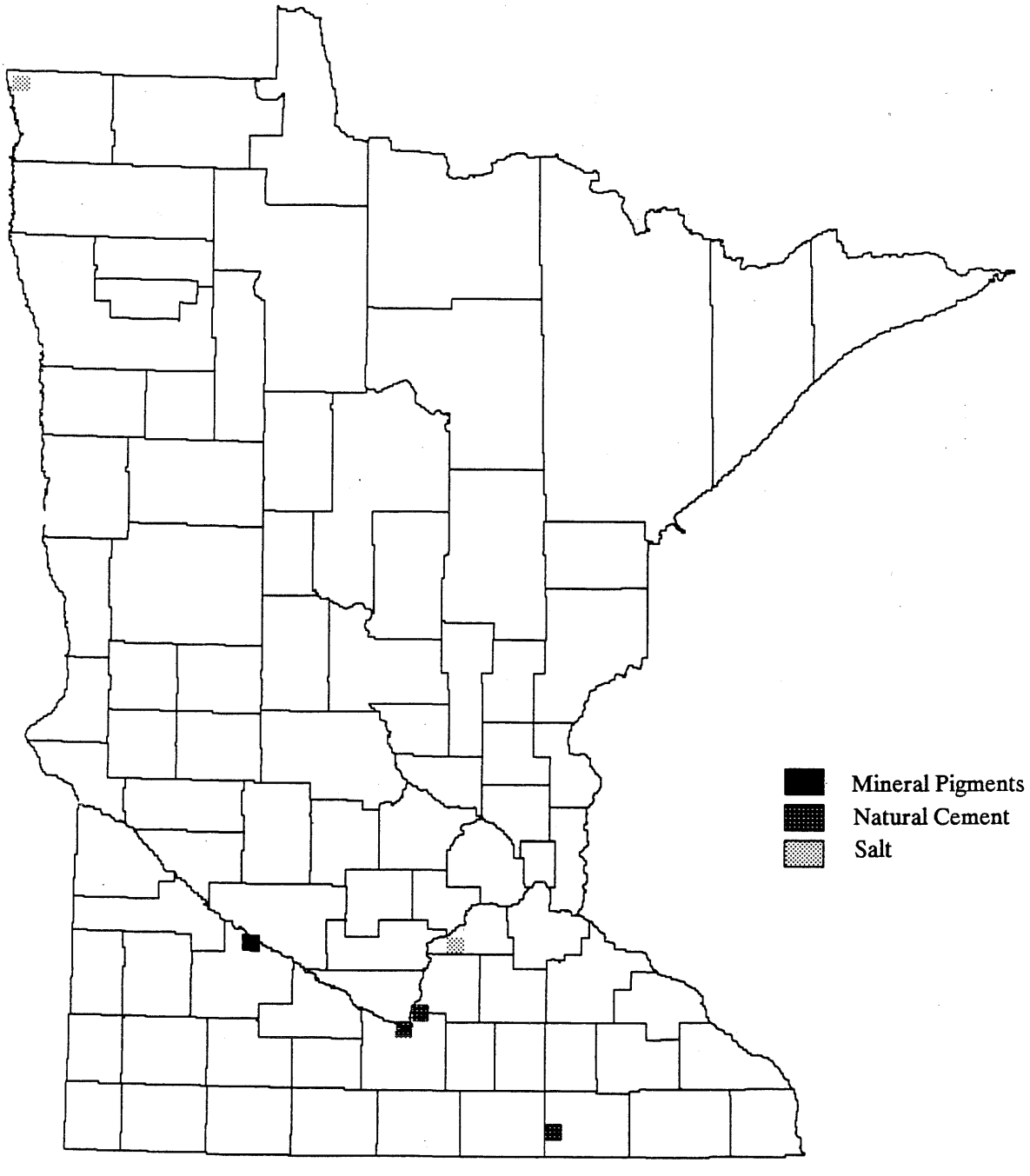


Figure 6. Inactive Silica Sand, Tripoli, and Miscellaneous Minerals Pits and Quarries

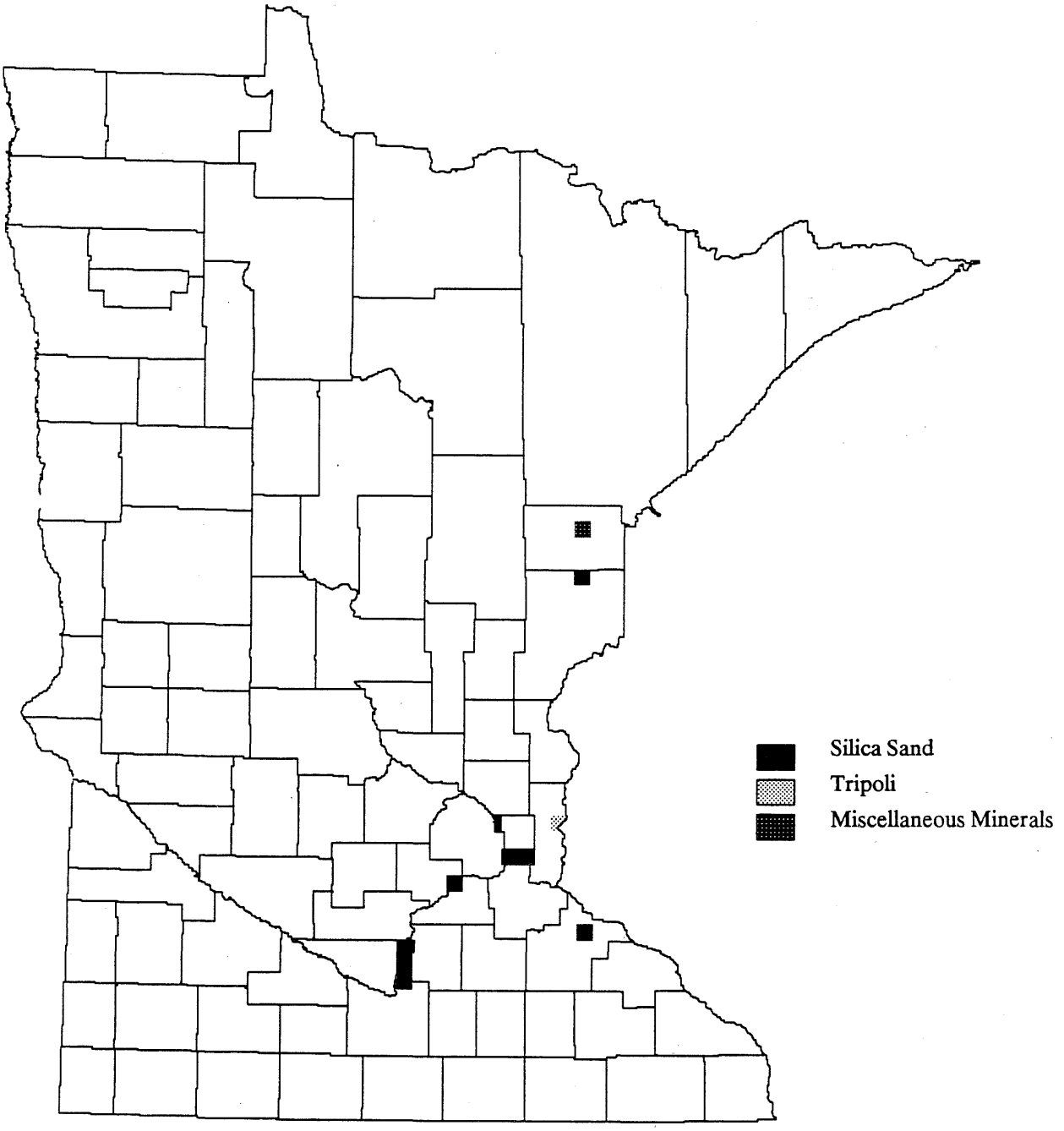


Figure 7. Inactive Clay/Shale Pits or Brickyards

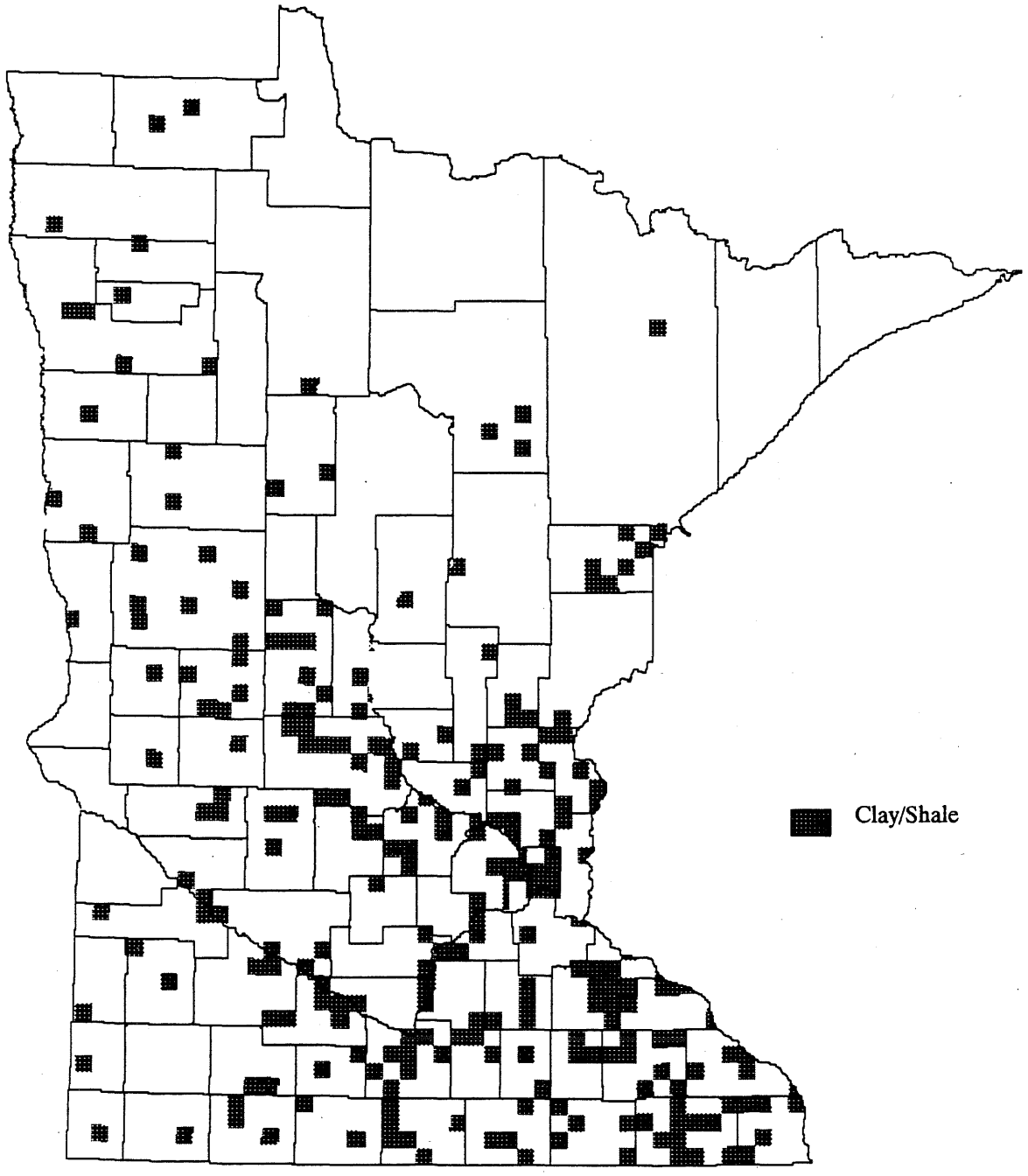


Figure 8. Inactive Carbonate Rock, Granite, and Greenstone Quarries

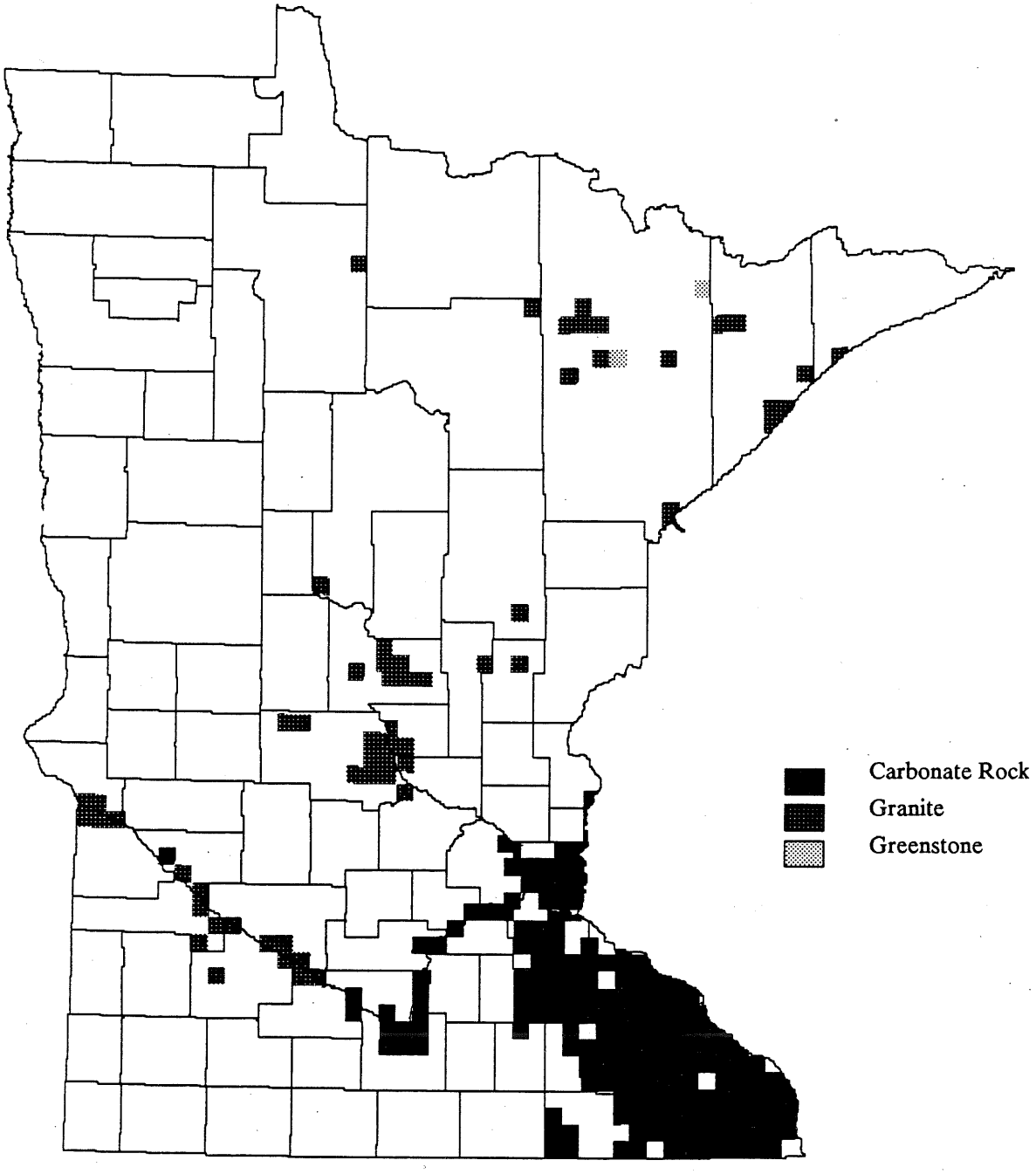


Figure 9. Inactive Quartzite, Sandstone, and Schist Quarries

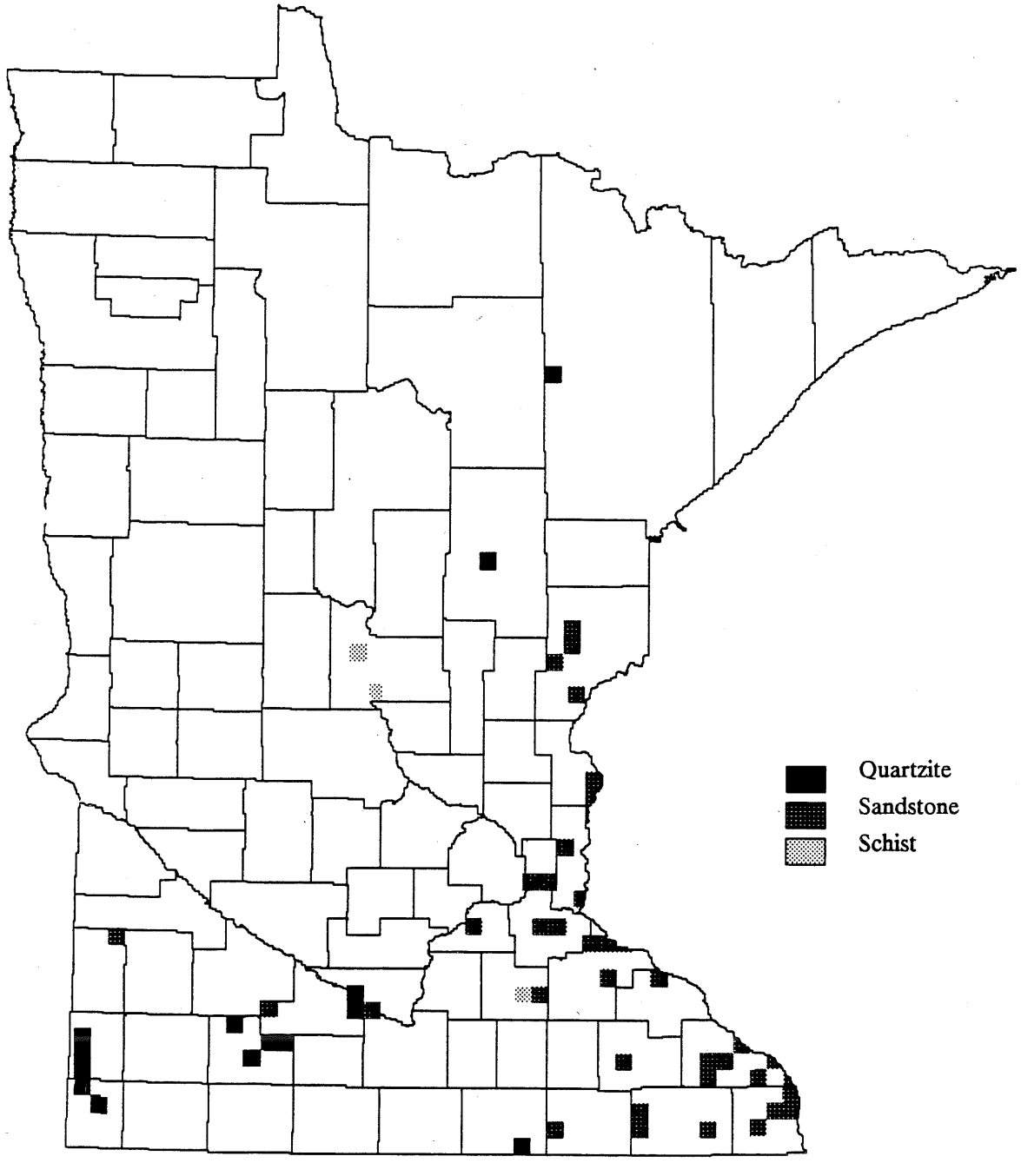
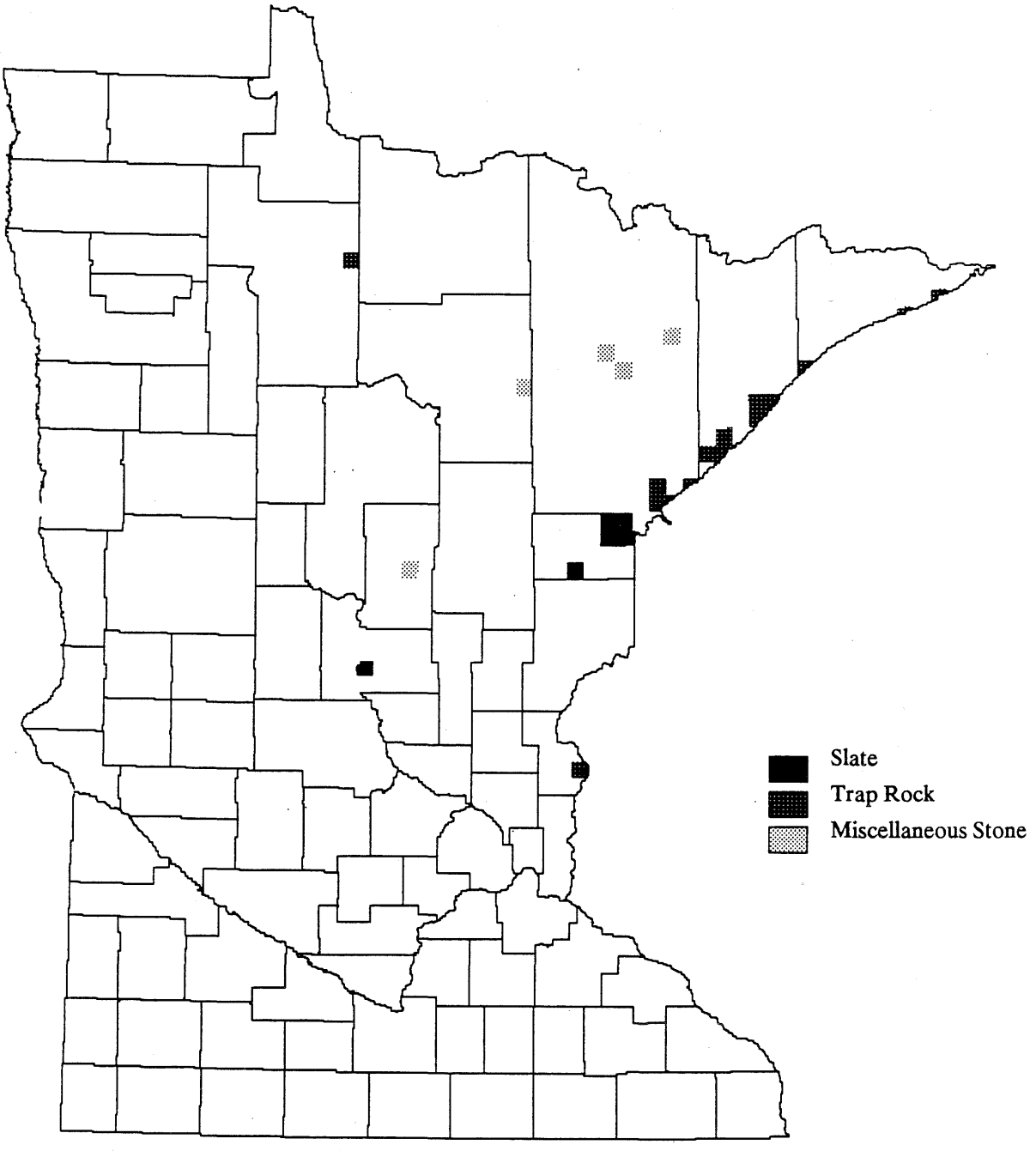


Figure 10. Inactive Slate, Trap Rock, and Miscellaneous Stone Quarries



Acknowledgements

The authors would first like to express their appreciation to Minnesota's industrial minerals industry for providing the information for this inventory, without which would have made the inventory impossible. The authors would also like to acknowledge the following public agencies for providing access to their files, field notes, and unpublished maps: the Minnesota Department of Transportation; the Minnesota Geological Survey; the Natural Resources Research Institute; the U.S. Bureau of Mines; the Mining Safety and Health Administration, U.S. Department of Labor; and the U.S. Army Corps of Engineers. Finally, the authors would like to thank the local units of government as well as the many other individuals, whose cooperation allowed us to complete this inventory.

Additions, corrections, and comments are encouraged from the reader and will be incorporated into the division's database. Please contact the Division of Minerals, Department of Natural Resources, at (218) 262-6767, with your comments.

Records of Active Pits and Quarries

Company: Ochs Brick & Tile Co. (1)
Main commodity: Clay/Shale
County: **Brown**
Quarry/pit name: Springfield Red Pit (1)
Alternate name: Springfield Pit (11)
Date opened: 1956? (1)
Status: Active (1)
Location: T 109 R 35 W Sec 26 SE1/4 NE1/4 (1,16)
T 109 R 35 W Sec 26 NE1/4 NE1/4 (2,11-13,16)
Location comments: Near Springfield (1-10,12-17)
Geologic age: Cretaceous
Description: Clay and shale (1); see Refs. 2-4 and 7-9 for lithologic section descriptions
Physical test data: See Refs. 4, 5, 10, and 17 for test data
Extraction method: Strip pit - backhoe (1)
Processing plant: Processing plant at office location (1)
Processing method: Hammer mills and vibrating screens (1)
Uses of commodity: Face brick (1)
Marketing area: Midwest and upper tiers of states to coasts (1)
Remarks: This pit was studied by NRRI (1)
References:
1) Ochs Brick & Tile Co. 1988, MN/DNR questionnaire
2) Parham. 1970, p. 18, 20, 95
3) Stauffer. [1948?], p. 11
4) Bradley. 1949, p. 13-34
5) Grout. 1919, p. 132, 133
6) Emmons; Grout. 1943, p. 94-96
7) Sloan. 1964, p. 21, 22, 49
8) Humphrey. 1958, p. 46, 54
9) Thiel. 1944, p. 119
10) Prokopovich; Schwartz. 1957, p. 58
11) USBM. [1979], MILS
12) Hogberg. 1969, p. 3
13) Hogberg. 1966, p. 3
14) Hogberg. 1964, p. 2
15) Grout. 1947, p. 3
16) NRRI. clay sample site
17) Grout; Soper. 1914, p. 78, 79

Company: Northern Con-Agg (1)
Main commodity: Clay/Shale
County: **Brown**
Quarry/pit name: Northern Con-Agg Kaolin Clay Pit (1)
Alternate name: Lester Frohrip Pit (1)
Date opened: 1988 (1)
Status: Active (1)
Location: T 112 R 33 W Sec 33 LOT 2, NE1/4 (1)
T 112 R 33 W Sec 33 NE1/4 SE1/4 (3)
Location comments: Near Sleepy Eye (1)
Description: Kaolin clay, light gray (1)
Extraction method: Backhoe (1)
Uses of commodity: Cement products (1)
Marketing area: Raw material now shipped to Iowa to a cement manufacturer (1)
Remarks: Northern Con-Agg plans to open two new pits near this area soon (1989) (1); Lester Frohrip owns pit (1989) (1)
References:
1) Northern Con-Agg 1989, personal communication
2) Brown County Zoning and Planning. 1989, personal communication
3) NRRI. clay sample site

Company: Nova Natural Resources (1)
Main commodity: Clay/Shale
County: **Redwood**
Date opened: 1988 (1)
Status: Active (1)
Township name: Honner
Location: T 113 R 35 W Sec 33 PART OF SE1/4 NW1/4 AND
T 113 R 35 W Sec 33 NE1/4 SW1/4 (1-3)
T 113 R 35 W Sec 33 SW1/4 NW1/4 (3)
Location comments: Near Redwood Falls (1)
Description: Kaolin, light gray, gray-green to blue (1)
Extraction method: Open pit, bulldozer, front end loader to truck or railroad (1)
Uses of commodity: Cement (1)
Marketing area: Raw kaolin material shipped to cement manufacturer in Mason City, Iowa (NW Portland and Lehigh) (1)
Remarks: Kaolin utilized in cement without processing (1)
References:
1) Nova Natural Resources 1988, MN/DNR questionnaire
2) Redwood County Zoning. 1989, personal communication
3) NRRI. clay sample site

Company: Northwestern States Portland Cement Co. (1)
Main commodity: Clay/Shale
County: **Redwood**
Quarry/pit name: Redwood Falls Kaolin Mine (1)
Date opened: 1984 (1)
Status: Active (1)
Location: T 113 R 35 W Sec 33 (1)
T 113 R 35 W Sec 33 SE1/4 NW1/4 (2-4)
Location comments: Near Redwood Falls (1)
Description: Kaolinitic clay, blue white, fine to medium XLN (1)
Chemical analyses: 39.5% Al2O3, 46.5% SiO2, and 14% H2O (1)
Extraction method: Open pit (1)
Processing plant: Processing plant at Iowa office location (1)
Processing method: Drying plant (1)
Uses of commodity: Portland cement; Type I, II, IA, Mason, M, N, S, and type III cements (1)

Marketing area: Iowa, Minnesota, Wisconsin, and South Dakota (1)

References:
1) Northwestern States Portland Cement Co. 1988, MN/DNR questionnaire
2) Dale Setterholm, MGS. 1989, personal communication
3) NRRI. clay sample site
4) Redwood County Zoning. 1989, personal communication

Company: Ochs Brick & Tile Co. (1-9)

Main commodity: Clay/Shale

County: **Redwood**

Quarry/pit name: Morton Buff Pit (1)

Alternate name: Morton Clay Pit (2,3)

Status: Active (1)

Location: T 113 R 35 W Sec 35 SW1/4 SW1/4 (1,4)
T 113 R 35 W Sec 35 SE1/4 SW1/4 (2,3,5-8)
T 113 R 35 W Sec 35 Part of SE1/4 (9)

Location comments: Near Redwood Falls (1); near Morton (3,7,8)

Geologic age: Cretaceous

Description: Pisolitic kaolinite clay (1); see Refs. 2 and 3 for further descriptions

Physical test data: See Ref. 2 for test data

Extraction method: Strip pit - backhoe and dozers (1)

Processing plant: Processing plant at office location (1)

Processing method: Hammer mills, vibrating screens (1)

Uses of commodity: Face brick (1)

Marketing area: Midwest and upper tiers of states to coasts (1)

Remarks: This pit studied by NRRI (1)

References:
1) Ochs Brick & Tile Co. 1988, MN/DNR questionnaire
2) Parham; Hogberg. 1964, p. 8, 10, 25
3) Parham. 1970, p. 12, 18, 25, 42, 75
4) Grosh; Hamlin. 1963, p. 10-13
5) USBM. [1979], MILS
6) NRRI. clay sample site
7) Hogberg. 1969, p. 3
8) Hogberg. 1966, p. 3
9) Redwood County Zoning. 1989, personal communication

Company: Peat Associates of America (1,2)
Main commodity: Peat
County: **Aitkin**
Date opened: 1987 (1)
Status: Active (1)
Past operator/owner: Fran Nuytten - Peat Minnesota (1)
USGS quadrangle: Hassman
Township name: Spencer
Location: T 47 R 26 W Sec 22 NE1/4 SW1/4 AND
T 47 R 26 W Sec 22 E1/2 NW1/4 AND
T 47 R 26 W Sec 22 NW1/4 SE1/4 AND
T 47 R 26 W Sec 22 W1/2 NE1/4 (2)
Description: Bryales (brown moss) peat (2)
Extraction method: Vacuum harvest; extruded sods (1)
Processing method: Air dry (1)
Uses of commodity: Horticultural uses, carrier in animal feed, turkey litter (1)
Marketing area: Minnesota (1)
References: 1) Dave Hasskamp, Aitkin County Growth, Inc. 1989, personal communication
2) MN/DNR. 1987, Peat Associates of America, Peatland Reclamation Permit

---

Company: Aitkin Agri-Peat (1,2)
Main commodity: Peat
County: **Aitkin**
Date opened: 1986 (1)
Status: Active (1)
USGS quadrangle: Minnewawa
Township name: Jevne
Location: T 48 R 24 W Sec 13 S1/2 NE1/4 AND
T 48 R 24 W Sec 13 N1/2 SE1/4 (1)
Description: Reed-sedge peat (1)
Extraction method: Bulldozer (2)
Processing plant: Located 2 miles north of McGregor on Hwy. 65 (1)
Processing method: Air dry (2)
Uses of commodity: Horticultural product sold in bulk (1)
References: 1) Aitkin Agri-Peat. 1989, MN/DNR peat producers questionnaire
2) Harold Kosbau, Aitkin Agri-Peat. 1986, personal communication

---

Company: Renollett Trucking, Inc. (1)
Main commodity: Peat
County: **Anoka**
Date opened: 1988 (1)
Status: Active (1)
USGS quadrangle: Coon Lake Beach
Township name: East Bethel
Location: T 33 R 23 W Sec 15 SW1/4 (1)
Location comments: 206th and County Road 15 (1)
Description: Blackdirt peat (1)
Uses of commodity: Blackdirt (1)
Marketing area: Local (1)
References: 1) Renollett Trucking, Inc. 1989, MN/DNR peat producers questionnaire

---

Company: Solwold Peat (1)
Main commodity: Peat
County: **Carlton**
Date opened: 1982 (1)
Status: Active (1)
USGS quadrangle: Esko
Township name: Thompson
Location: T 49 R 16 W Sec 22 (1)
Location comments: 53 Church Rd., Esko (1)
Description: Reed-sedge peat (1)
Uses of commodity: Horticultural - bulk product (1)
Marketing area: Local greenhouses and growers (1)
References: 1) Solwold Peat. 1989, MN/DNR peat producers questionnaire

---

Company: Michigan Peat Co. (1-3)
Main commodity: Peat
County: **Carlton**
Date opened: 1958 (1)
Status: Active (2)
Township name: Corona
Location: T 48 R 19 W Sec 4 AND
T 48 R 19 W Sec 3 AND
T 49 R 19 W Sec 33 (3)
Location comments: Mining operation located five miles east of Cromwell on Hwy. 200 (2); (active fields lie within sections listed above); inactive, open fields lie within T. 48, R. 19 W., Secs. 5, 8, and 9 (3)
Description: Sphagnum peat and reed-sedge peat (2)
Extraction method: Vacuum harvest (1)
Processing plant: Located at mining operation site (2)
Processing method: Air dry, screen, compressed/baled or value added and bagged (1)
Uses of commodity: Horticultural: compressed, baled sphagnum; potting soil; peat/manure; peat/sand (2)
Marketing area: Nationwide (1)
References: 1) Ted Tower, Michigan Peat Co. 1988, personal communication
2) Michigan Peat Co. 1989, MN/DNR peat producers questionnaire
3) MN/DNR. 1986, Michigan Peat Co., Peatland Reclamation Permit

Company: Peatrex, Ltd. (1)
Main commodity: Peat
County: **Carlton**
Date opened: 1987 (1)
Status: Active (1)
Past operator/owner: Vapo Oy (2)
USGS quadrangle: Cromwell West
Township name: Beseman
Location: T 49 R 21 W Sec 24 S1/2 NE1/4 AND
T 49 R 20 W Sec 19 NW1/4 AND
T 49 R 21 W Sec 24 N1/2 SE1/4 (3)
Location comments: Five miles northwest of Cromwell (1)
Description: Sphagnum peat (1)
Extraction method: Vacuum harvest (1)
Processing plant: Located 2 miles west of Cromwell (1)
Processing method: Air dry, screen, compressed/baled (2)
Uses of commodity: Horticultural: compressed bales, grower's mixes (1)
Trade names: "For Peat's Sake" (1)
Marketing area: Nationwide
References: 1) Peatrex, Ltd. Div. of Premier Enterprises. 1989, MN/DNR peat producers questionnaire
2) Dan Flotterud, Peatrex, Ltd. 1989, personal communication
3) MN/DNR. 1986, Peatrex, Ltd., Peatland Reclamation Permit

Company: Gull River Peat (1)
Main commodity: Peat
County: **Cass**
Status: Active (1)
USGS quadrangle: Baxter
Township name: Sylvan
Location: T 133 R 29 W Sec 16 NW1/4 NE1/4 (1)
Description: Peat (1)
References: 1) MPCA. 1988, Letter to Michael Gendron, dated February 3, 1988

Company: Chippewa Topsoil (1)
Main commodity: Peat
County: **Hennepin**
Status: Active (1)
USGS quadrangle: Rockford
Township name: Medina
Location: T 118 R 23 W Sec 3 NE1/4 (1)
Description: Peat (1)
References: 1) MPCA. 1987, Letter to Reg Pederson, dated June 8, 1987

Company: Quostar Productions, Inc. (1)
Main commodity: Peat
County: **Isanti**
Date opened: 1989 (1)
Status: Active (1)
USGS quadrangle: Dalbo
Township name: Dalbo
Location: T 37 R 25 W Sec 3 W1/2 SW1/4 AND
T 37 R 25 W Sec 4 SE1/4 (1)
Description: Hypnum peat (1)
Extraction method: Bulldozer (2)
Processing method: Air dry (2)
Uses of commodity: Horticultural - bulk product (1)
Marketing area: Local (2)
References: 1) Quostar Productions, Inc. 1989, MN/DNR peat producers questionnaire
2) Tony Sandler, Quostar Productions, Inc. 1986, personal communication

---

Company: Tamarack Peat Moss (1)
Main commodity: Peat
County: **Otter Tail**
Status: Active (1)
USGS quadrangle: Stalker Lake
Township name: Tordenskjold
Location: T 132 R 41 W Sec 22 (1)
Description: Peat (1)
Extraction method: Dragline (2)
Processing method: Air dry (2)
Uses of commodity: Bulk to golf courses (2)
Trade names: Tamarack Peat Moss (2)
Marketing area: Local (Fergus Falls area) (2)
References: 1) MN/DNR. 1986, Letter to Jerry Ewert, Tamarack Peat Moss, dated June 3, 1986
2) Jerry Ewert, Tamarack Peat Moss. 1984, personal communication

---

Company: Pelant (1,2)
Main commodity: Peat
County: **Rice**
Date opened: 1983 (1)
Status: Active (2)
USGS quadrangle: New Market
Township name: Webster
Location: T 112 R 21 W Sec 1 NW1/4 NW1/4 (1)
Description: Peat (2)
References: 1) Rice County. 1983, Conditional Use Permit
2) Pelant. 1987, Letter to MN/DNR, dated May 18, 1987

Company: Fisons Western (U.S.), Inc.

Main commodity: Peat
County: **Rice**
Date opened: 1969 (2)
Status: Temporarily inactive (1)
Past operator/owner: Eli Colby Co.(2)
USGS quadrangle: Little Chicago
Township name: Webster
Location: T 112 R 21 W Sec 25 NW1/4 (3)
Description: Hypnum peat (1)
Extraction method: Bulldozer (2)
Processing method: Air dry, screen, bag (2)
Uses of commodity: Horticultural - growing medias (1)
Marketing area: Nationwide (2)
References: 1) Fisons Western (U.S.), Inc. 1989, MN/DNR peat producers questionnaire
2) John Colby, Jr. 1987, personal communication
3) MN/DNR. 1987, Fisons Western (U.S.) Inc., Peatland Reclamation Permit

---

Company: Minnesota Sphagnum, Inc. (1)
Main commodity: Peat
County: **St. Louis**
Date opened: 1988 (1)
Status: Active (1)
USGS quadrangle: Brookston NW
Township name: Arrowhead
Location: T 51 R 19 W Sec 2 SW1/4 AND
T 51 R 19 W Sec 3 SE1/4 (3)
Location comments: Near Floodwood (1)
Description: Sphagnum peat (1)
Extraction method: Vacuum harvest (2)
Processing plant: Located at mining operation site, near Floodwood (1)
Processing method: Air dry, screen, compressed baled (2)
Uses of commodity: Horticultural - baled sphagnum (1)
Marketing area: Nationwide (2)
References: 1) Minnesota Sphagnum, Inc. 1989, MN/DNR peat producers questionnaire
2) Boyd Baughman, Minnesota Sphagnum, Inc. 1987, personal communication
3) MN/DNR. 1987, Minnesota Sphagnum Inc., Peatland Reclamation Permit

---

Company: Twin Ports Blacktop (1)
Main commodity: Peat
County: **St. Louis**
Date opened: 1988 (1)
Status: Active (1)
USGS quadrangle: Fredenberg
Township name: Gnesen
Location: T 52 R 14 W Sec 29 NW1/4 NW1/4 AND
T 52 R 14 W Sec 29 N1/2 SW1/4 NW1/4 (2)
Location comments: Mining operation and plant at 7688 Rice Lake Rd. (1)
Description: Sphagnum and carex (reed-sedge) peat; fairly dense and decomposed (3)
Extraction method: Dredge (3)
Processing method: Air dry, value added (2)
Uses of commodity: Horticultural (1)
Marketing area: Local (3)
References: 1) Twin Ports Blacktop. 1989, MN/DNR peat producers questionnaire
2) Klaers, J. M. 1988, Letter to Julie Jordan, dated March 17, 1988
3) Ben Pearson, Twin Ports Blacktop. 1988, site visit and personal communication

---

Company: Power-O-Peat (1)
Main commodity: Peat
County: **St. Louis**
Date opened: 1962 (1)
Status: Temporarily inactive (1)
USGS quadrangle: Central Lakes
Location: T 56 R 17 W Sec 34 E1/2 SE1/4 AND
T 56 R 17 W Sec 35 SW1/4 SW1/4; W1/2 NW1/4 SW1/4 AND
T 55 R 17 W Sec 2 W1/2 NW1/4 AND
T 55 R 17 W Sec 3 NE1/4 NE1/4 (1)
Description: Reed-sedge peat (1)
Extraction method: Bulldozer (1)
Processing method: Air dry, screen, value added (perlite, vermiculite, polystyrene beads) (1)
Uses of commodity: Horticultural (1)
Trade names: Power-O-Peat, Gardner Kay (2)
Marketing area: Nationwide (2)
References: 1) MN/DNR. 1986, Power-O-Peat, Inc., Peatland Reclamation Permit
2) Todd Leoni, Power-O-Peat, Inc. 1986, personal communication

Company: Unimin Corp. (1,2)
Main commodity: Silica Sand
County: **Le Sueur**
Quarry/pit name: Kasota Pit (1)
Date opened: 1982 (1)
Status: Active (1,2)
Township name: Kasota
Location: T 109 R 26 W Sec 5 AND
T 109 R 26 W Sec 6 (2)
Location comments: Near St. Peter (1)
Geologic age: Cambrian
Geologic formation: Jordan Sandstone (1)
Description: Sandstone (1)
Extraction method: Open pit (1)
Processing plant: Kasota Plant (at pit location) (2)
Processing method: Drying and screening (1)
Uses of commodity: Petroleum industry (1)
Marketing area: Primarily in U.S. and Canada (1)
References:
1) Unimin Corp. 1988, MN/DNR questionnaire
2) Unimin Corp. 1989, personal communication

Company: Unimin Corp. (1-3)
Main commodity: Silica Sand
County: **Le Sueur**
Quarry/pit name: Ottawa Pit (1-3)
Date opened: 1950 (1)
Status: Active (1-3)
Township name: Ottawa
Location: T 111 R 26 W Sec 33 AND
T 111 R 26 W Sec 34 (2)
Geologic age: Cambrian
Geologic formation: Jordan Sandstone (1)
Description: Sandstone (1)
Extraction method: Open pit (1)
Processing plant: Ottawa Plant (at pit location) (2)
Processing method: Drying and screening (1)
Uses of commodity: Petroleum, glass, foundry and construction industries (1)
Marketing area: Primarily in U.S. and Canada (1)
References:
1) Unimin Corp. 1988, MN/DNR questionnaire
2) Unimin Corp. 1989, personal communication
3) USDL. MSHA mine reference list

Company: Twin City Silica, Inc. (1,2,4)
Main commodity: Silica Sand
County: **Washington**
Quarry/pit name: Twin City Silica Pit (1)
Date opened: Late 1950's or early 1960's, current company reopened pit in early 1970's (1)
Status: Active since early 1970's, inactive mid 1960's to early 1970's (1)
Past operator/owner: Durox Management Co. (3)
Location: T 28 R 21 W Sec 1 W1/2 (1)
T 28 R 21 W Sec 1 SW1/4 (3)
Location comments: Near Woodbury (1); near Lake Elmo (3)
Geologic age: Ordovician
Geologic formation: St. Peter Sandstone (1)
Description: Sandstone (1)
Processing plant: Plant, sand pit, and office at same location (1)
Processing method: Drying, screening, ball-mill (1)
Uses of commodity: Foundry sand and sand blasting medium used as abrasives, ball-mill silica flour used in cement block industry (1); from early to mid 1960's the silica sand was used for making lightweight concrete (1); building panels (3)
Marketing area: Regional (1)
References:
1) Twin City Silica, Inc. 1989, personal communication
2) USBM. [1980], MILS
3) Hogberg. 1966, p. 4
4) Hill; West. 1985, p. 11

Company: Jasper Stone Co. (1-10)
Main commodity: Abrasive Quartzite
Other commodities: Dimension Quartzite
County: **Rock**
Quarry/pit name: Jasper Stone Co. Quarry (1)
Date opened: 1890? (1)
Status: Active (1)
Location: T 104 R 46 W Sec 6 NE1/4 (1)
Location comments: Near Jasper (1,3,4)
Geologic age: Middle Proterozoic
Geologic formation: Sioux Quartzite (1)
Description: Rose quartzite (1); "This material is rock consisting of quartz grains very firmly compacted and containing Potassium Aluminum Silicate (Feldspar) and Iron Sesquioxide (Hematite) as a binder." (1)
Chemical analyses: 98.7% silicon dioxide (1); detailed chemical analyses available from Jasper Stone Co. (1)
Extraction method: Open pit (1)

Processing plant: Jasper Stone Co. (plant, quarry, and office at same location) (2)
Processing method: Hydraulic splitters, wire saws, tumbler mill, polisher (2)
Uses of commodity: Mill and chute liner blocks approx. 70% of production, some acid blocks, grinding media cubes and pebbles approx. 20% of production, but probably 50% of tonnage, building stones and memorials approx. 5% now, this amount will be increasing (2)
References:

1) Jasper Stone Co. 1988, MN/DNR questionnaire
2) Jasper Stone Co. 1988, personal communication
3) Herod. 1969
4) Bowles. 1918, p. 204
5) USBM. [1979], MILS
6) USDL. MSHA mine reference list
7) Hogberg. 1969, p. 42
8) Hogberg. 1966, p. 34, 39
9) Sikich. 1959, p. 541
10) Thiel; Dutton. 1935, p. 148, 149

Company: Southern Minnesota Construction Co., Inc.(1)
Main commodity: Crushed Carbonate Rock
Other commodities: Dimension Carbonate Rock
County: **Blue Earth**
Quarry/pit name: Kasota Quarry (1)
Alternate name: North Quarry, Brooks Quarry (2)
Status: Active (1)
Past operator/owner: Lundin Construction Co. (1,2); Morgon Brooks (1918) (3)
Township name: Lime
Location: T 109 R 26 W Sec 20 (1-3)
Location comments: Ref. 2 location map shows quarry in W1/2 of Sec. 20, on west side of RR tracks
Geologic age: Ordovician
Geologic formation: (Oneota Fm.)
Description: Dolomite (2)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Uses of commodity: Riprap, 4 in. to 6 in. rock, 1-1/2 in. dust free, CL 2, CL 5, agricultural lime (1); polished rock (1918) (3)
Trade names: Kasota Stone (1)
Marketing area: Within 50 miles of Mankato (1)
References:
1) Southern Minnesota Construction Co., Inc. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Bowles. 1918, p. 155

Company: Mankato Aglime & Rock Co. (1-8)
Main commodity: Crushed Carbonate Rock
County: **Blue Earth**
Quarry/pit name: Mankato Aglime & Rock Co. Quarry (1-6)
Alternate name: Carney Quarry (6); Carney Cement Co. Quarry (9-12)
Date opened: 1860's (1)
Status: Active (1)
Past operator/owner: Carney Cement Co. (1933) (9,10); Carney Bricklayer's Cement Co. (11)
MN/DOT source no: 7-2
Location: T 109 R 26 W Sec 30 AND
T 109 R 26 W Sec 31 (1)
T 109 R 26 W Sec 30 SE1/4 SW1/4 (2,3)
T 109 R 26 W Sec 31 N1/2 (2,3,6-8)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (3,9,10,12); Shakopee-Oneota Fms. (2,6)
Description: Buff colored limestone (1); dolomitic limestone (2); see Refs. 6, 9, 10 and 12 for stratigraphic section descriptions
Chemical analyses: $CaCO_3$ 45%, $MgCO_3$ 40% (1); see Refs. 9 and 10 for further analyses
Physical test data: Available from U.S. Army Corps of Engineers (2)
Extraction method: Blasting (1)
Processing method: Impact and jaw crushing, screening (1)
Uses of commodity: Road base, agricultural lime (1); bricklayer's cement (1918) (11)
Trade names: Aglime (1)
Marketing area: 30-50 miles from Mankato (1)
References:
1) Mankato Aglime & Rock Co. 1988, MN/DNR questionnaire
2) U.S. Army Corps of Engineers files
3) Mossler. 1975, station 303
4) USBM. [1978], MILS
5) USDL. MSHA mine reference list
6) MN/DOT Aggregate Unit files
7) Hogberg. 1969, p. 43
8) Hogberg. 1966, p. 34
9) Stauffer; Thiel. 1933, p. 42, 43, 68, 69, 73
10) Thiel; Dutton. 1935, p. 119, 120
11) Bowles. 1918, p. 158
12) Stauffer; Thiel. 1914, p. 126

Company: R. B. McGowan, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Dakota**
Quarry/pit name: McGowan Quarry (1-4)
Status: Active (1)
Location: T 27 R 24 W Sec 28 SE1/4 (2,4)
Location comments: Located immediately south of the Minnesota River and adjacent on west side of I-35W (1,2)
Geologic age: Ordovician
Geologic formation: Shakopee Fm. (2)
Description: The rock is generally a medium-grained dolomite, gray to brown with some sandy dolomite (2)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Uses of commodity: Crushed aggregate (1)
Marketing area: Greater Twin Cities area (1)
References:
1) McGowan Development Corporation. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) MN/PCA. 1989, personal communication
4) Dakota County Assessor. 1989, personal communication

Company: Edward Kraemer & Sons, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Dakota**
Quarry/pit name: Burnsville Quarry (1,3,5,6)
Alternate name: Edward Kraemer & Sons Quarry (3); Kraemer Quarry (2)
Date opened: 1958 (1)
Status: Active (1)
USGS quadrangle: Bloomington
Location: T 27 R 24 W Sec 33 SW1/4 NE1/4 (3,4)
T 27 R 24 W Sec 33 SE1/4 NW1/4 (4)
T 27 R 24 W Sec 33 NE1/4 SW1/4 (4)

T 27 R 24 W Sec 33 NW1/4 SE1/4 (4)

Location comments: Quarry just west of the intersection of Cliff Rd. and 35W in Burnsville (1); quarry in center of Sec. 33 (2,6); (Ref. 3 listed R. 21, instead of R. 24, I've assumed a typographical error, since other information matched this site)

Geologic age: Ordovician

Geologic formation: Shakopee-Oneota Fms. (1); Shakopee Fm. (2)

Description: Dolomitic limestone (1); see Ref. 2 for stratigraphic sections

Physical test data: Available at MN/DOT Aggregate Unit and U.S. Army Corps of Engineers (2,6)

Extraction method: Blasting (1)

Processing plant: Plant, quarry, and office at same location (1)

Processing method: Crushing, screening, washing (1)

Uses of commodity: Washed concrete aggregate, bituminous aggregate, base products, riprap, agricultural lime (1)

Remarks: Very large quarry (4)

References:
1) Edward Kraemer & Sons, Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) Mossler. 1974a, Dakota County station 112
5) USDL. MSHA mine reference list
6) U.S. Army Corps of Engineers files

Company: Bryan Rock Products, Inc. (1)

Main commodity: Crushed Carbonate Rock

County: **Dakota**

Quarry/pit name: Hasting Pit No. 4 (1)

Alternate name: Davies Pit (2); Davies Quarry (3); Mann Construction Co. Quarry (3); Frier Quarry (4,5)

Status: Active (1)

Past operator/owner: Davies Excavating, Inc. (previous operator) (1-3); Mann Construction Co. (abandoned quarry in 1975) (4,5); Bernard Frier (abandoned quarry in 1973) (5)

Township name: Ravenna

Location: T 114 R 16 W Sec 29 NW1/4 SW1/4 (2,3) AND
T 114 R 16 W Sec 29 SW1/4 NW1/4 (2,4)

Location comments: Near Hastings (1); 1 mile SW of Etter (4)

Description: Dolomitic limestone (1)

Chemical analyses: Calcium carbonate 50-95%, magnesium carbonate 5-40%, silicon dioxide 5-15%, iron oxide 0-2% (1)

Physical test data: Available at U.S. Army Corps of Engineers (4)

Extraction method: Surface mining (1)

Processing method: Blasting, crushing, screening (1)

Uses of commodity: Road base, pipe bedding, concrete aggregate, decorative (1)

Marketing area: St. Paul, Hastings, and surrounding southeastern areas of Twin Cities (1)

References:
1) Bryan Rock Products, Inc. 1988, MN/DNR questionnaire
2) Barton Sand & Gravel Co. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) U.S. Army Corps of Engineers files
5) USDL. MSHA mine reference list

Company: Holst Excavating, Inc. (1)

Main commodity: Crushed Carbonate Rock

County: **Dakota**

Quarry/pit name: Bauer Quarry (1)

Status: Active (1)

Township name: Marshan

Location: T 114 R 17 W Sec 34 (1)
T 114 R 17 W Sec 34 NE1/4 SW1/4 (2)

Description: Dolomitic limestone (1)

Processing plant: Portable crushing plant (1)

Processing method: Crushing, screening, washing (1)

Uses of commodity: Crushed aggregates, riprap, agricultural lime, road base, any other limestone products (1)

Marketing area: 30-50 mile radius (1)

Remarks: Holst Excavating, Inc. Minnesota's office is located in Hastings (1); Steve Bauer, owner of quarry (2)

References:
1) Holst Excavating, Inc. 1989, personal communication
2) Dakota County Assessor. 1989, personal communication

Main commodity: Crushed Carbonate Rock

County: **Dakota**

Quarry/pit name: Bauer Quarry (1,3,4)

Status: Active (1)

USGS quadrangle: Vermillion

Location: T 115 R 17 W Sec 31 NW1/4 SE1/4 (1-4)

Location comments: Four miles west of Hastings, on east side of Jacobs Ave. Rd. (4)

Geologic age: Ordovician

Geologic formation: Prairie du Chien Gp. (2,3)

Physical test data: Available from U.S. Army Corps of Engineers (3)

Remarks: Loren and Will Bauer, owners of quarry (1989) (1)

References:
1) Dakota County Assessor. 1989, personal communication
2) Mossler. 1974a, Dakota County station 51
3) U.S. Army Corps of Engineers files
4) MN/DOT Aggregate Unit files

Main commodity: Crushed Carbonate Rock

County: **Dakota**

Quarry/pit name: Hastings Quarry (1,2)

Status: Intermittently active (4/88 list) (2)

USGS quadrangle: Hastings, 15 min.

Location: T 115 R 18 W Sec 34 SW1/4 SW1/4 (1,3)

References:
1) USBM. [1979], MILS
2) USDL. MSHA mine reference list
3) Dakota County Assessor. 1989, personal communication

Company: Stussy Construction, Inc. (1-4)
Main commodity: Crushed Carbonate Rock
County: **Dodge**
Quarry/pit name: Brown Quarry (1-4)
Date opened: 1950's (1)
Status: Intermittently active since 1986 (2)
Past operator/owner: Brown (1921) (4)
MN/DOT source no: 20049
Township name: Canisteo
Location: T 106 R 16 W Sec 24 NW1/4 (1)
T 106 R 16 W Sec 24 NW1/4 NW1/4 (4)
Location comments: Near Kasson (1)
Geologic age: Ordovician
Geologic formation: Galena Gp., Stewartville Fm. (4); Stewartville and Prosser Fms. (5)
Description: Dolomitic limestone in yellow shades (1); light buff, medium to thick bedded dolomitic limestone, thin bedded at very top of formation, mottled gray and buff (1969) (4)
Processing plant: Portable crushing plant (2)
Processing method: Crushing, screening (2)
Uses of commodity: Crushed road rock products, screened rock, agricultural lime (2)
Marketing area: Dodge County and western part of Olmsted County (2)
References:
1) Stussy Construction, Inc. 1988, MN/DNR questionnaire
2) Stussy Construction, Inc. 1989, personal communication
3) USDL. MSHA mine reference list
4) MN/DOT Aggregate Unit files
5) Niles. [1988a], table 1

Company: Stussy Construction, Inc. (1-8)
Main commodity: Crushed Carbonate Rock
County: **Dodge**
Quarry/pit name: Stussy's Quarry (1,2,4-7)
Date opened: 1930's (1)
Status: Active (1)
MN/DOT source no: 20051
USGS quadrangle: Dodge Center
Township name: Mantorville
Location: T 107 R 16 W Sec 21 SW1/4 (2)
T 107 R 16 W Sec 21 SW1/4 SW1/4 (5-8)
Location comments: Situated 1/2 mile west and 3/4 mile south of Mantorville (6)
Geologic age: Ordovician
Geologic formation: Prosser or Stewartville Fm. (7); Prosser Fm. (9); Wise Lake and Dunleith Fms. (5); Mantorville Fm., Cannon Falls and Sogn Mbrs. (6)
Description: Dolomitic limestone in gray white to yellow color (1); medium to thick bedded gray dolomite, fine grained, weathers buff to brown (7); see Refs. 5 and 6 for detailed stratigraphic section descriptions
Physical test data: Available from MN/DOT Aggregate Unit (7)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening, washing (2)
Uses of commodity: Crushed road rock products 75%, screened rock 10%, agricultural lime 10%, washed rock 5% (1)
Marketing area: Dodge County (1)
References:
1) Stussy Construction, Inc. 1988, MN/DNR questionnaire
2) Stussy Construction, Inc. 1989, personal communication
3) USDL. MSHA mine reference list
4) USBM. [1979], MILS
5) Stone. 1980, p. A-35, A-36
6) Leverson; Gerk. undated, location M-113
7) MN/DOT Aggregate Unit files
8) Hogberg. 1969, p. 47
9) Niles. [1988a], table 1

Company: Quarve & Anderson Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Dodge**
Quarry/pit name: Granger Quarry (1-3)
Date opened: 1952 (1)
Status: Active (1)
Past operator/owner: Bruce Granger (1969) (3)
MN/DOT source no: 20045
Township name: Concord
Location: T 108 R 17 W Sec 14 SW1/4 (1)
T 108 R 17 W Sec 14 SE1/4 SE1/4 (2)
T 108 R 17 W Sec 14 SW1/4 SE1/4 (1969) (3)
T 108 R 17 W Sec 13 NW1/4 (1921) (3)
Location comments: West Concord nearest town (1); 1/2 mile northeast of Concord (2)
Geologic age: Ordovician
Geologic formation: Galena Gp. (1,3); Stewartville Fm. ? (3); Dunleith Fm. (2)
Description: Limestone, buff colored, stratified, dolomitic limestone (1); thin to thick bedded, gray dolomite or limestone, fine grained, weathering to buff (3); see Ref. 2 for stratigraphic section
Physical test data: Available from MN/DOT Aggregate Unit (3)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed and screened limestone aggregate for aggregate base (1)
Marketing area: Dodge County (1)

References: 1) Quarve & Anderson Co. 1988, MN/DNR questionnaire
2) Stone. 1980, p. A-32
3) MN/DOT Aggregate Unit files

Company: Pederson Brothers of Harmony, Inc. (2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Status: Active (2)
Location: T 101 R 8 W Sec 15 SE1/4 SW1/4 (2)
T 101 R 8 W Sec 15 SW1/4 (1)
Location comments: Quarry by Mabel (1)
Geologic age: Ordovician
Geologic formation: Platteville Fm. (1)
References: 1) Mossler. 1971
2) Fillmore County Zoning. 1989, personal communication

Company: Pederson Brothers of Harmony, Inc. (1,2,4,15,16)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Big Springs Quarry (1-3)
Alternate name: Pederson Quarry (3-9)
Date opened: 40-50 years ago (1989) (1)
Status: Active (1,14)
Past operator/owner: Ellsworth Duxbury (1965) (3)
MN/DOT source no: 23096
Township name: Harmony
Location: T 101 R 10 W Sec 9 NW1/4 SW1/4 (3,4,11,14)
T 101 R 10 W Sec 9 SW1/4 (5,6,8,10,15)
T 101 R 10 W Sec 9 NE1/4 SW1/4 (16)
Location comments: Situated 1/2 mile and 1-1/2 miles west of Harmony (7); at about the middle of the north edge of SW1/4 of section 9 (6,8)
Geologic age: Ordovician
Geologic formation: Galena Gp. (5,6,15); Prosser and Cummingsville Fms. (6,15)
Description: Limestone, light gray or white, high calcium, low magnesium (1)

See Ref. 6 for detailed stratigraphic section and paleontology, brief summary follows:
Galena Gp. 59 ft 4 in.
Prosser Fm. 40 ft 7 in.
Cummingsville Fm. 18 ft 9 in.

Also see Refs. 7 and 13 for detailed stratigraphic sections

Chemical analyses: See Ref. 9 for chemical analyses
Physical test data: Available from MN/DOT Aggregate Unit (3) and U.S. Army Corps of Engineers (5)
Extraction method: Blasting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening, washing (1)
Uses of commodity: Crush rock products, agricultural lime (1)
Marketing area: Approximately 16 mile radius of Harmony (1)
Remarks: Large quarry (6)
References: 1) Pederson Brothers of Harmony, Inc. 1989, personal communication
2) USDL. MSHA mine reference list
3) MN/DOT Aggregate Unit files
4) USBM. [1979], MILS
5) U.S. Army Corps of Engineers files
6) Weiss. 1953, p. 233-236
7) Levorson; Gerk. undated, locality M-107
8) Weiss. 1955, p. 767
9) Prokopovich; Schwartz. 1956, p. 35
10) Thiel; Stauffer. 1947, p. 5, 12, 13
11) Hogberg. 1969, p. 45
12) Hogberg. 1966, p. 35
13) Stone. 1980, p. A-9, A-10
14) Fillmore County Assessor. 1988, personal communication
15) Niles. [1988c], table 3
16) Fillmore County Zoning. 1989, personal communication

Company: Pederson Brothers of Harmony, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Franks Quarry (1-3)
Alternate name: Ed Thacher Quarry (5); George Drury Quarry (5,6)
Status: Active (1)
Past operator/owner: Roverud Construction Co. (see Producer Directory) (2,3); Ed Thacher (1965) (4); George Drury (1884) (5,6)
MN/DOT source no: 23091
Township name: Bristol
Location: T 101 R 11 W Sec 3 NE1/4 NE1/4 (2,4)
Location comments: Preston nearest town (1); Ed Thacher Quarry on east side of road and the newer quarry on west side of road is owned by Ray Thacher (1953) (5)
Geologic age: Ordovician
Geologic formation: Galena Gp., Prosser and Cummingsville Fms. (5); Platteville Fm. (7)
Description: Limestone (1); see Ref. 5 for detailed stratigraphic section
Physical test data: Available from MN/DOT Aggregate Unit (4)
Extraction method: Blasting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed road rock products (1)
Marketing area: Approximately 16 mile radius of Harmony (1)
References: 1) Pederson Brothers of Harmony, Inc. 1989, personal communication
2) USBM. [1979], MILS
3) USDL. MSHA mine reference list
4) MN/DOT Aggregate Unit files
5) Weiss. 1953, p. 546-550

6) Winchell and others. 1884, p. 323
7) Thiel; Dutton. 1935, p. 152

Company: Roverud Construction Co. (1,3,4)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Brumm Quarry (1,3,4)
Status: Active (1)
Past operator/owner: J. Gjerdrum (2)
MN/DOT source no: 23135
Location: T 102 R 8 W Sec 33 NE1/4 (1)
T 102 R 8 W Sec 33 S1/2 NE1/4 (2)
Location comments: Mabel nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Oneota dolomite, buff, residual, calcitic (1)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire and personal communication
2) MN/DOT Aggregate Unit files
3) USDL. MSHA mine reference list
4) USBM. [1979], MILS

Company: Orval Sorum & Sons (2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Sorum Quarry (1,2)
Status: Active (2)
MN/DOT source no: 23126
Location: T 102 R 9 W Sec 17 NW1/4 SW1/4 (1)
Physical test data: Available from MN/DOT Aggregate Unit (1)
References: 1) MN/DOT Aggregate Unit files
2) USDL. MSHA mine reference list

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Hanson Quarry (1,2)
Date opened: 1960 (1)
Status: Active (1,2)
Location: T 102 R 10 W Sec 11 NW1/4 NW1/4 (1)
T 102 R 10 W Sec 11 W1/2 NW1/4 (2)
Location comments: Near Preston (1)
Geologic age: Ordovician
Geologic formation: Shakopee Fm. (1)
Description: Shakopee dolomite, 40 ft face (1)
Extraction method: Drilling, shooting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Remarks: (This possibly is MN/DOT Source No. 23094, listed under inactive crushed carbonate rock quarries)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire and personal communication
2) Fillmore County Zoning. 1989, personal communication

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,7)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Grabau Quarry (1-4,7)
Alternate name: Gills Quarry (5); Highway Quarry (6)
Status: Active (1,7)
Past operator/owner: Grabau (1968) (2); Kappers Construction Co. (4)
MN/DOT source no: 23128
Location: T 102 R 12 W Sec 17 SE1/4 SE1/4 (1-7)
Location comments: Four miles east and 3-1/2 miles south of Spring Valley (3,4)
Geologic age: Ordovician
Geologic formation: Galena Gp., Stewartville Fm. (3-6)
Description: Dolomite (4,6); 60 ft face (1); see Refs. 3, 4, and 6 for stratigraphic section descriptions; Dubuque and Maquoketa Fms. also exposed in quarry (3-6)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Extraction method: Drilling, shooting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire and personal communication
2) MN/DOT Aggregate Unit files
3) Leverson and others. 1979, p. 59, 65
4) Leverson; Gerk. undated, locality M-100
5) Weiss. 1957, p. 1035
6) Stauffer; Thiel. 1914, p. 152
7) Fillmore County Zoning. 1989, personal communication

Company: Kappers Aggregates, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Rifle Hill Quarry (1,2)
Alternate name: Hadland & Vreeman Quarry (2)
Status: Active (1)
Past operator/owner: Raymond Adenhorst (1965) (2); Hadland and Vreeman (1965) (2-4)

MN/DOT source no: 23089
Township name: Forestville
Location: T 102 R 12 W Sec 35 NW1/4 NE1/4 (1-4)
Location comments: Cherry Grove nearest town (1); near Ostrander (3,4)
Geologic age: Ordovician
Geologic formation: Prosser Fm. (2)
Description: Limestone (1)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Extraction method: Drilling, blasting (1)
Uses of commodity: Road gravel 70%, agricultural lime 30% (1)
Marketing area: Fillmore County, Howard and Winneshiek counties, Iowa (1)
References:
1) Kappers Aggregates, Inc. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Hogberg. 1969, p. 41
4) Hogberg. 1966, p. 32

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Rifle Hill Quarry (1-11)
Status: Active (1)
Past operator/owner: Kappers Construction Co. (3,4,11)
Location: T 102 R 12 W Sec 35 NE1/4 NW1/4 (1-6)
T 102 R 12 W Sec 35 NW1/4 (7-10)
Location comments: One mile north and 2-1/2 miles east of Cherry Grove (3,4,6,11)
Geologic age: Ordovician
Geologic formation: Galena Gp., Prosser and Stewartville Fms. (2-4)
Description: 130 ft face (1); see Refs. 3-5, 8 and 11 for detailed stratigraphic sections; see Refs. 2, 6, and 7 for additional descriptions
Extraction method: Drilling, shooting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, MN/DNR questionnaire and personal communication
2) Mossler. 1987, p. 23, 24
3) Sloan; Kolata. 1987, p. 85-91
4) Sloan and others. 1987, p. 203, 208
5) Stone. 1980, p. A-4
6) Leverson and others. 1979, p. 59, 65
7) Webers. 1966, p. 118-120
8) Weiss. 1953, p. 454-464
9) Weiss. 1955, p. 767
10) Weiss. 1957, p. 1053
11) Leverson; Gerk. undated, locality M-106

Company: Roverud Construction Co. (1,2,4)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Peterson Quarry (1,2,4)
Alternate name: Thompson Quarry (3)
Status: Active (1)
Past operator/owner: Thompson (1965,1921) (3)
MN/DOT source no: 23085
Location: T 103 R 8 W Sec 8 SW1/4 (1)
T 103 R 8 W Sec 8 SW1/4 SW1/4 (2,3)
Location comments: Peterson nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Oneota dolomite, vuggy, chert nodules, medium brown, massive, argonite buff zone (1)
Physical test data: Available from MN/DOT Aggregate Unit (3)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References:
1) Roverud Construction Co., 1988, MN/DNR questionnaire
2) USBM. [1979], MILS
3) MN/DOT Aggregate Unit files
4) USDL. MSHA mine reference list

Company: Orval Sorum & Sons (2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Status: Active (2)
Past operator/owner: Howard Gossman (1965) (1)
MN/DOT source no: 23082
Township name: Holt
Location: T 103 R 9 W Sec 34 SE1/4 NW1/4 (1,2)
References:
1) MN/DOT Aggregate Unit files
2) Fillmore County Zoning. 1989, personal communication

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Fountain Quarry (1-3)
Alternate name: Kappers Quarry (2,3,7); Larson's Quarry (9)
Status: Active (1)
Past operator/owner: Kappers Construction Co. (5,6,9); Larson, owner (1953) (9); August Jung Estate (1965) (3)
MN/DOT source no: 23122
Location: T 103 R 11 W Sec 3 SW1/4 SW1/4 (1,2,5-8)
T 103 R 11 W Sec 3 S1/2 SW1/4 (3,9)
Location comments: Quarry 1/2 mile west of Fountain (2,4); see Ref. 7, fig. 3 for location map

Geologic age: Ordovician
Geologic formation: Galena Gp. (1,7); Prosser Fm. (9)
Description: Limestone, 60 ft face (1); thick-bedded, gray, argillaceous limestone, over 55 ft exposed in four benches (8); Prosser Fm. upper 47 ft (10); see Refs. 2, 4, and 10 for detailed stratigraphic sections and paleontology
Chemical analyses: See Ref. 8 for chemical analyses
Physical test data: Available from MN/DOT Aggregate Unit (3)
Extraction method: Drilling, shooting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, MN/DNR questionnaire and personal communication
2) Leverson; Gerk. undated, locality M-102
3) MN/DOT Aggregate Unit files
4) Stone. 1980, p. A-7, A-8
5) Hogberg. 1966, p. 34
6) Hogberg. 1969, p. 42
7) Alexander. 1987, p. 4, 5
8) Prokopovich; Schwartz. 1956, p. 32
9) Weiss. 1953, p. 484-487

Company: Kappers Aggregates, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Fountain Quarry (1)
Status: Active (1)
Location: T 103 R 11 W Sec 4 E1/2 SE1/4 (1)
Geologic age: Ordovician
Geologic formation: (Galena Gp.)
Description: Limestone (1)
Extraction method: Drilling, blasting (1)
Uses of commodity: Road gravel 70%, agricultural lime 30% (1)
Marketing area: Fillmore County, Howard and Winneshiek counties, Iowa (1)
References: 1) Kappers Aggregates, Inc. 1988, MN/DNR questionnaire

---

Company: Kappers Aggregates, Inc. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Wykoff Quarry (1,2)
Alternate name: Kappers Quarry (2)
Status: Active (1)
Past operator/owner: Edwin C. Kappers (1965) (2)
MN/DOT source no: 23132
Location: T 103 R 12 W Sec 25 NW1/4 SE1/4 (2)
T 103 R 12 W Sec 26 NW1/4 SE1/4 AND
T 103 R 12 W Sec 26 SW1/4 SE1/4 (1)
Description: Limestone (1)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Extraction method: Drilling, blasting (1)
Uses of commodity: Road gravel 70%, lime 30% (1)
Marketing area: Fillmore County, Howard and Winneshiek counties, Iowa (1)
References:
1) Kappers Aggregates, Inc. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Wykoff Quarry (1,2)
Date opened: 1979 (1)
Status: Active (1,2)
Location: T 103 R 12 W Sec 26 SW1/4 SE1/4 (1,2)
Geologic age: Ordovician
Geologic formation: Galena Gp. (1)
Description: 30 ft face (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) Fillmore County Zoning. 1989, personal communication

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Bly Quarry (1-3,5,6)
Date opened: 1878 (6)
Status: Active (1,2)
Past operator/owner: Lloyd Bly (1965) (3); T. M. Bly (1918) (6); Kappers Aggregates (1969) (4)
MN/DOT source no: 23053
Location: T 103 R 13 W Sec 3 SE1/4 NW1/4 (2-4)
Geologic age: Ordovician
Geologic formation: Galena Gp. (1,5); Stewartville Fm. (5)
Description: Dolomitic limestone, 56 ft (5); see Refs. 5 and 6 for descriptions
Physical test data: Available from MN/DOT Aggregate Unit (3)
Extraction method: Drilling, blasting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, MN/DNR questionnaire and personal communication
2) Fillmore County Zoning. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) Hogberg. 1969, p. 43

5) Weiss. 1953, p. 271-275
6) Bowles. 1918, p. 163
7) Kirk. 1926, p. 88

Company: Kappers Aggregates, Inc. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Bly Quarry (1)
Status: Active (1)
Location: T 103 R 13 W Sec 3 NE1/4 SE1/4 (1)
Description: Limestone (1)
Extraction method: Drilling, blasting (1)
Uses of commodity: Road gravel 70%, agricultural lime 30% (1)
Marketing area: Fillmore County, Howard and Winneshiek counties, Iowa (1)
References: 1) Kappers Aggregates, Inc. 1988, MN/DNR questionnaire
2) USDL. MSHA mine reference list

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Eggert Quarry (1-3)
Alternate name: Eckert Quarry (4)
Date opened: Pre-1967 (1)
Status: Active (1)
Past operator/owner: Bertha Eggert (1965), Roverud (1921) (2); Quarve and Anderson Co. (1978) (3); G. & Q. Construction (4)
MN/DOT source no: 23114
USGS quadrangle: Rushford West
Location: T 104 R 8 W Sec 2 NE1/4 NE1/4 (1,2)
T 104 R 8 W Sec 2 NW1/4 NE1/4 (3,4)
Location comments: Near Rushford (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,2,4)
Description: Oneota dolomite, 125 ft face (1)
Physical test data: L.A. abrasion 35, absorption 2.0%, specific gravity 2.60 (1)
Extraction method: Drilling, shooting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Remarks: Large quarry (2)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire and personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) U.S. Army Corps of Engineers files

Company: Roverud Construction Co. (1,4-6)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: La Fleur Quarry (1-5)
Status: Active (1)
Past operator/owner: John Peterson (1965), Le Fluer (1941) (2)
MN/DOT source no: 23083
Location: T 104 R 8 W Sec 27 S1/2 (1)
T 104 R 8 W Sec 27 SE1/4 SW1/4 (2,6)
T 104 R 8 W Sec 27 SE1/4 (2,3)
T 104 R 8 W Sec 27 SW1/4 SE1/4 (7)
Location comments: Rushford nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1-3)
Description: Oneota dolomite, light brown, massive (1)
Physical test data: Available from MN/DOT Aggregate Unit (2) and U.S. Army Corps of Engineers (3)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) U.S. Army Corps of Engineers files
4) USBM. [1979], MILS
5) USDL. MSHA mine reference list
6) Hogberg. 1969, p. 47
7) Fillmore County Assessor. 1988, personal communication

Company: Roverud Construction Co. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Brown Quarry (1)
Alternate name: Arendahl Quarry (1,2)
Status: Active (1)
Location: T 104 R 9 W Sec 16 NE1/4 (1)
Location comments: Arendahl nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Dolomite (1)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) USDL. MSHA mine reference list

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,4)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Quarry/pit name: Kingsbury Quarry (1,4)
Alternate name: Pilot Mound Quarry, Bradt Quarry (2)
Date opened: Pre-1970 (1)
Status: Active (1,4)
Past operator/owner: Claude Bradt (2)
MN/DOT source no: 23067
Location: T 104 R 10 W Sec 3 SW1/4 SW1/4 (1-3)
Location comments: Pilot Mound nearest town (1)
Geologic age: Ordovician
Geologic formation: Shakopee Fm. (1)
Description: Shakopee dolomite (1); approximately 30+ ft face (3)
Physical test data: L.A. abrasion 36 (1); further test data available from MN/DOT Aggregate Unit (2)
Extraction method: Drilling, shooting (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, MN/DNR questionnaire and personal communication
2) MN/DOT Aggregate Unit files
3) Mossler. 1983, station 40
4) Fillmore County Zoning. 1989, personal communication

Company: Orval Sorum & Sons (2)
Main commodity: Crushed Carbonate Rock
County: **Fillmore**
Status: Active (2)
Past operator/owner: Milton Moen (1965) (1)
MN/DOT source no: 23072
Township name: Mound
Location: T 104 R 10 W Sec 28 SW1/4 NE1/4 (1)
T 104 R 10 W Sec 28 NE1/4 AND
T 104 R 10 W Sec 28 SE1/4 (2)
Remarks: Small quarry (1)
References:
1) MN/DOT Aggregate Unit files
2) Fillmore County Zoning. 1989, personal communication

Company: Kielmeyer Construction Co. (1-4)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Roscoe Quarry (1,3)
Alternate name: Peterson Quarry (1-3)
Status: Active (1)
Past operator/owner: Ted Peterson (1968) (2)
MN/DOT source no: 25090
Township name: Roscoe
Location: T 109 R 16 W Sec 29 SW1/4 SW1/4 (1,3)
Geologic age: Ordovician
Geologic formation: Prosser Fm. (2); Dunleith Fm. (5)
Description: Dolomite top 11 ft, limestone lower 23 ft (5)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References:
1) Kielmeyer Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list
5) Stone. 1980, p. A-31

Company: Holm Brothers Construction Co. (1,3)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Holm Quarry (1)
Alternate name: Betcher Quarry (2,3); O'Conner Quarry (3)
Status: Active (1)
Past operator/owner: Fred Betcher, owner (1989) (2,4)
MN/DOT source no: 25094
Township name: Zumbrota
Location: T 110 R 15 W Sec 24 SE1/4 SW1/4 (2-4)
Geologic age: Ordovician
Geologic formation: Shakopee-Oneota Fms. (2)
Description: Dolomitic limestone, 43+ ft face (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime, riprap (1)
Marketing area: Local area (1)
References:
1) Holm Brothers Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) Goodhue County Zoning. 1989, personal communication

Company: Kielmeyer Construction Co. (1-3)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Zumbrota Quarry (1)
Alternate name: Dedan Quarry (1-3); Bredohoft Quarry (4)
Status: Active (1)
Past operator/owner: Mrs. Schultz, current quarry owner (1989) (1); Mann Construction Co. (1965) (4,5); H. Bredohoft (1968) (4)
MN/DOT source no: 25099

Township name: Zumbrota
Location: T 110 R 15 W Sec 30 NW1/4 SE1/4 (2,4,5) AND
T 110 R 15 W Sec 30 SW1/4 NE1/4 (4,5)
Location comments: Two miles NE of Zumbrota (4)
Geologic age: Ordovician
Geologic formation: Shakopee and Oneota Fms. (4)
Description: About a 35 ft face in Shakopee-Oneota dolomite (4); see Ref. 4 for further description
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References:
1) Kielmeyer Construction Co. 1989, personal communication
2) USBM. [1979], MILS
3) USDL. MSHA mine reference list
4) MN/DOT Aggregate Unit files
5) Hogberg. 1969, p. 44

Company: Kielmeyer Construction Co. (1,3)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Foss Quarry (1)
Alternate name: Goodhue County Quarry (1,3); Aspelund Quarry (2,4); Nesseth Quarry (1)
Status: Active (1)
Past operator/owner: Quarve & Anderson Co. (4); Goodhue County, owner (1968) (2)
MN/DOT source no: 25085
Township name: Wanimingo
Location: T 110 R 17 W Sec 8 SE1/4 NE1/4 (2,3)
Geologic age: Ordovician
Geologic formation: Prosser Fm. (2,5,6)
Description: Limestone, medium to thick beds, becoming thin at top, gray weathering to buff, argillaceous, face 42 ft (2)
Chemical analyses: See Ref. 6, station 5 for chemical analyses
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References:
1) Kielmeyer Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list
5) Prokopovich; Schwartz. 1957, p. 51
6) Prokopovich; Schwartz. 1956, p. 8, 13

Company: Kielmeyer Construction Co. (1-4)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Jacobson Quarry (1-4)
Status: Active (1)
Past operator/owner: Lawrence Jacobson (1968) (2)
MN/DOT source no: 25101
Township name: Holden
Location: T 110 R 18 W Sec 14 SE1/4 SE1/4 (1-3) AND
T 110 R 18 W Sec 23 (1)
Location comments: Quarry now expanding into section 23 (1)
Geologic age: Ordovician
Geologic formation: Prosser Fm. and Cummingsville Fm. ? (2)
Description: Limestone (1,2)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References:
1) Kielmeyer Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list

Company: Kielmeyer Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: O'Connor Quarry (1-3)
Alternate name: Connors Quarry (4)
Status: Active (1)
Past operator/owner: Holm Brothers Construction Co. until 1985 (2,3); Michael Conners (1968) (4)
MN/DOT source no: 25098
Township name: Belle Creek
Location: T 111 R 16 W Sec 4 NW1/4 NE1/4 (2,4)
Geologic age: Ordovician
Geologic formation: Platteville Fm. (4)
Description: Limestone (4)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References:
1) Kielmeyer Construction Co. 1989, personal communication
2) USBM. [1979], MILS
3) USDL. MSHA mine reference list
4) MN/DOT Aggregate Unit files

Company: Kielmeyer Construction Co. (1,3)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Ryan Quarry (1-3)
Status: Active (1)
Past operator/owner: Gerald Ryan (1968) (2)
MN/DOT source no: 25109
Township name: Belle Creek
Location: T 111 R 16 W Sec 11 SE1/4 NW1/4 (2)

Geologic age: Ordovician
Geologic formation: Platteville Fm. (2)
Description: Probably Platteville limestone (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References: 1) Kielmeyer Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS

Company: Kielmeyer Construction Co. (1,3,4)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Gadinet Quarry (1)
Alternate name: Tongen Quarry (1,2,4); Tougen Quarry (3)
Status: Active (1)
Past operator/owner: Oscar Tongen (1968) (2)
MN/DOT source no: 25081
Township name: Belle Creek
Location: T 111 R 16 W Sec 21 SE1/4 SE1/4 (2,3)
Geologic age: Ordovician
Geologic formation: Platteville Fm. (2,5)
Description: Platteville limestone (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References: 1) Kielmeyer Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list
5) Hoeft. 1959, p. 60, 61

Company: Holst Excavating, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Banks Quarry (1)
Status: Active (1)
Township name: Leon
Location: T 111 R 17 W Sec 10 (1)
T 111 R 17 W Sec 10 NW1/4 SW1/4 (2)
Description: Dolomitic limestone (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening, washing (1)
Uses of commodity: Crushed aggregate, riprap, agricultural lime, road base, etc. (1)
Marketing area: 30-50 mile radius (1)
Remarks: Holst Excavating, Inc., Minnesota's office is located in Hastings (1)
References: 1) Holst Excavating, Inc. 1989, personal communication
2) Goodhue County Zoning. 1989, personal communication

Company: Kielmeyer Construction Co. (1-4)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Spring Garden Quarry (1-4)
Status: Active (1)
Past operator/owner: Milton Swenson, current (1989) owner (1); Mann Construction Co. (1,3)
MN/DOT source no: 25108
Township name: Leon
Location: T 111 R 17 W Sec 14 SW1/4 SW1/4 (2,3,5,6)
Geologic age: Ordovician
Geologic formation: Prosser Fm. (3,6); Dunleith Fm. (5)
Description: Limestone, 40 ft face (3); see Ref. 5 for stratigraphic section; see Refs. 3 and 6 for brief descriptions
Chemical analyses: See Ref. 6 for chemical analyses
Physical test data: Available from MN/DOT Aggregate Unit (3)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References: 1) Kielmeyer Construction Co. 1989, personal communication
2) USBM. [1979], MILS
3) MN/DOT Aggregate Unit files
4) USDL. MSHA mine reference list
5) Stone. 1980, p. A-33, A-34
6) Prokopovich; Schwartz. 1956, p. 14
7) Prokopovich; Schwartz. 1957, p. 51

Company: Kielmeyer Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Herneke Quarry (1)
Status: Active (1)
Past operator/owner: Henke, owner (1988) (2)
Township name: Leon
Location: T 111 R 17 W Sec 30 (1)
T 111 R 17 W Sec 30 S1/2 NW1/4 (2)
Geologic age: Ordovician
Geologic formation: Prosser Fm. (2)
Description: Limestone (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References: 1) Kielmeyer Construction Co. 1989, personal communication
2) Niles. [1988a], table 1

Company: Valley Limestone Co. (1-4)

Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Valley Limestone Co. Quarry (1,2)
Alternate name: Hader Quarry (2-4)
Status: Active (1)
MN/DOT source no: 25089
Location: T 111 R 17 W Sec 36 SE1/4 SW1/4 (2,3,5)
Location comments: Seven miles northwest of Zumbrota on U.S. Hwy. 52 (1); there is a group of quarries at Hader in the SE1/4 SW1/4 Sec. 36 (5)
Geologic age: Ordovician
Geologic formation: Prosser Fm. (2,5,6)
Description: See Ref. 5 for description
Chemical analyses: See Ref. 5 for chemical analyses
References:
1) Valley Limestone Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list
5) Prokopovich; Schwartz. 1956, p. 14
6) Prokopovich; Schwartz. 1977, p. 51

Company: Holst Excavating, Inc. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Prokash Quarry (1)
Alternate name: Cordes Quarry (2)
Status: Active (1)
MN/DOT source no: 25119
Township name: Florence
Location: T 112 R 13 W Sec 9 NW1/4 (2)
Location comments: Frontenac nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (2)
Description: Oneota dolomitic limestone (1,2)
Physical test data: Available from U.S. Army Corps of Engineers (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening, washing (1)
Uses of commodity: Crushed aggregates, riprap, agricultural lime, road base, etc. (1)
Marketing area: 30-50 mile radius (1)
Remarks: Holst Excavating, Inc., Minnesota's office is located in Hastings (1)
References:
1) Holst Excavating, Inc. 1989, personal communication
2) U.S. Army Corps of Engineers files
3) MN/DOT Aggregate Unit files

Company: Roberson Lime & Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Bowe Quarry (1)
Alternate name: Bremer Quarry (3)
Status: Active (1)
Past operator/owner: Walter Bremer, owner (1968) (3)
MN/DOT source no: 25107
Township name: Florence
Location: T 112 R 13 W Sec 32 NW1/4 SE1/4 (3,4)
Location comments: South of road (2)
Geologic age: Ordovician
Geologic formation: Shakopee-Oneota Fms. (3)
Description: Dolomitic limestone (2)
Processing plant: Portable crushing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References:
1) Roberson Lime & Rock Products. 1988 MN/DNR questionnaire
2) Roberson Lime & Rock Products. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) Goodhue County Zoning. 1989, personal communication

Company: Holst Excavating, Inc. (1,4,5)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Holst Quarry (1)
Alternate name: Pit No. 6 (1); Charlson Quarry (2)
Status: Active (1)
MN/DOT source no: 25123
Township name: Featherstone
Location: T 112 R 15 W Sec 6 (1)
T 112 R 15 W Sec 6 SE1/4 (3)
T 112 R 15 W Sec 6 NE1/4 SE1/4 (4)
T 112 R 15 W Sec 5 NW1/4 SW1/4 (5)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (3); Shakopee-Oneota Fms. (5)
Description: Dolomitic limestone (1)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening, washing (1)
Uses of commodity: Crushed aggregate, riprap, agricultural lime, road base, etc. (1)
Marketing area: 30-50 miles radius (1)
References:
1) Holst Excavating, Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) Mossler. field notes on Goodhue County highway map
4) Goodhue County Zoning. 1989, personal communication
5) Niles. [1988a], table 1

Company: Holm Brothers Construction Co. (1)
Main commodity: Crushed Carbonate Rock

County: **Goodhue**
Quarry/pit name: Keller Quarry (1)
Status: Active (1)
Past operator/owner: Keller, quarry owner (1988) (2)
MN/DOT source no: 25125
Township name: Featherstone
Location: T 112 R 15 W Sec 7 SW1/4 (2)
Description: Limestone (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime, riprap (1)
Marketing area: Local area (1)
References: 1) Holm Brothers Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files

Company: Holm Brothers Construction Co. (1,3)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Carlton Quarry (1)
Alternate name: Holm's Quarry (2,3)
Status: Active (1)
MN/DOT source no: 25122
Township name: Vasa
Location: T 112 R 16 W Sec 10 (2)
T 112 R 16 W Sec 10 S1/2 (4)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (4)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime, riprap (1)
Marketing area: Local area (1)
References: 1) Holm Brothers Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USDL. MSHA mine reference list
4) Niles. [1988b], table 2

Company: Luhman's Construction Co. (1-4)
Main commodity: Crushed Carbonate Rock
County: **Goodhue**
Quarry/pit name: Luhman's Quarry (1,3,4)
Date opened: 1969-1970 (1)
Status: Active (1)
MN/DOT source no: 25120
Township name: Welch
Location: T 113 R 16 W Sec 13 NE1/4 SE1/4 (1)
T 113 R 16 W Sec 13 SE1/4 SW1/4 (3)
Location comments: Located 1/2 mile off Hwy. 61, near junction of County Rd. 46 (1)
Description: Limestone, pale yellow (1)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Extraction method: Drilling, blasting (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock 3/4 in. and 1 in., riprap, screened rock 1-1/2 to 6 in. (1)
Marketing area: Within 20 miles of quarry (1)
References: 1) Luhman's Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USBM. [1978], MILS
4) USDL. MSHA mine reference list

Company: Roverud Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Gillen Quarry (1,2)
Alternate name: Gillan Quarry (3)
Status: Active (1)
Past operator/owner: Hector Construction Co. until 1975 (3)
MN/DOT source no: 28086
Township name: Crooked Creek
Location: T 101 R 4 W Sec 6 NE1/4 (1)
T 101 R 4 W Sec 5 NW1/4 NW1/4 (4,5)
Location comments: New Albin, Iowa nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Dolomite, medium brown, cherty, abrasive (1)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USDL. MSHA mine reference list
4) Houston County Planning and Zoning. 1989, personal communication
5) Houston County Highway Dept. 1983, quarry list

Company: Roverud Construction Co. (1,3-6)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Pool Hill Quarry (1-3)
Alternate name: Beneke Quarry (2-4)
Status: Active (1)

Past operator/owner: Alvin Beneke (1965), Wm. Wiemeralag (1921) (2)
MN/DOT source no: 28066
Township name: Jefferson
Location: T 101 R 4 W Sec 33 SW1/4 (1,4)
T 101 R 4 W Sec 33 SE1/4 SW1/4 (2,3,5)
Location comments: Near New Albin, Iowa (1,5)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Gray to buff, medium grained, dolomite, calcite, chert nodules, vuggy, massive at basal (1)
Physical test data: Available from U.S. Army Corps of Engineers (4)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) U.S. Army Corps of Engineers files
5) Hogberg. 1969, p. 46
6) USDL. MSHA mine reference list

Company: Roverud Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Winnebago Quarry (1,2)
Status: Active (1)
Past operator/owner: Hector Construction Co. (2)
Township name: Winnebago
Location: T 101 R 5 W Sec 7 NE1/4 (1)
Location comments: Caledonia nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Buff to medium brown, dolomite, vugular, close chert nodules, layered to massive (1)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) USDL. MSHA mine reference list

Company: Roverud Construction Co. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Eitzen Quarry (1,2)
Status: Active (1)
Township name: Winnebago
Location: T 101 R 5 W Sec 18 SE1/4 (1)
Location comments: Eitzen nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Oneota dolomite, gray to brown to dark brown, medium grained, also buff zones, scattered chert nodules, massive, calcite nests (1)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) USDL. MSHA mine reference list

Company: Roverud Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Kinneberg Quarry (1,2)
Status: Active (1)
Past operator/owner: Glen Kinneberg (1965), John Asleson (1941) (2)
MN/DOT source no: 28070
Location: T 101 R 6 W Sec 22 NW1/4 (1)
T 101 R 6 W Sec 21 NE1/4 NE1/4 (2)
Location comments: Spring Grove nearest town (1)
Geologic age: Ordovician
Geologic formation: Platteville Fm. (1)
Description: Medium gray, layered limestone (1)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files

Company: Roverud Construction Co. (1,5,6,11-13)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Underpass Quarry (1,3-6)
Alternate name: Newhouse Quarry (3,4); Spring Grove Underpass Quarry (7-13)
Status: Active (1)
Past operator/owner: Kenneth Buxengard (1965) (4)
MN/DOT source no: 28053
Location: T 101 R 7 W Sec 17 SE1/4 (1-3)

T 101 R 7 W Sec 17 S1/2 SE1/4 (4)
T 101 R 7 W Sec 17 SE1/4 SE1/4 (5-10)
T 101 R 7 W Sec 17 SW1/4 SE1/4 (11-13)

Location comments: North side of Hwy. 44, 3.2 miles west of Spring Grove (11-13)
Geologic age: Ordovician
Geologic formation: Platteville Fm. (1-4,7,11-13)
Description: Platteville, medium to light gray, hard layered, lithographic limestone (1); see Ref. 3 for section description; see Refs. 7, 11-13 for detailed stratigraphic sections, Ref. 7 also includes paleontology
Chemical analyses: See Ref. 3 for chemical analyses
Physical test data: Available from MN/DOT Aggregate Unit (4)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References:
1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) Mossler. 1987, p. 18
3) Mossler. 1971
4) MN/DOT Aggregate Unit files
5) USBM. [1979], MILS
6) USDL. MSHA mine reference list
7) Weiss. 1953, p. 215-224
8) Hoeft. 1959, p. 278
9) Weiss. 1957, p. 1053
10) Weiss. 1955, p. 767
11) Sloan and others. 1987, p. 213
12) Sloan; Kolata. 1987, p. 92-95
13 Leverson; Gerk. undated, locality M-120

Company: Botcher Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Hambert Quarry (1)
Status: Active (1)
Township name: Crooked Creek
Location: T 102 R 4 W Sec 17 (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Riprap, crushed rock, agricultural lime (1)
Marketing area: Houston, Fillmore, and Winona counties (1)
References: 1) Botcher Construction Co. 1989, personal communication

---

Company: Roverud Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Gengler Quarry (1,2)
Status: Active (1)
Past operator/owner: Hector Construction Co. (2)
Township name: Mayville
Location: T 102 R 5 W Sec 16 SW1/4 (1)
T 102 R 5 W Sec 16 SE1/4 SW1/4 (2)
Location comments: Caledonia nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,2)
Description: Oneota dolomite, top-medium to dark brown; lower-light to medium brown/gray buff areas; abrasive, massive, chert nodules, calcitic, quartz zones, vuggy, coarse to medium grained (1)
Physical test data: Available from U.S. Army Corps of Engineers (2)
Extraction method: Quarry benched; explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References:
1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) U.S. Army Corps of Engineers files

Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Kruckow Quarry (2)
Status: Active (1)
MN/DOT source no: 28088
Township name: Mayville
Location: T 102 R 5 W Sec 16 SE1/4 SW1/4 (1)
T 102 R 5 W Sec 16 NE1/4 SW1/4 (2,3)
T 102 R 5 W Sec 16 SE1/4 (3)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (3)
Physical test data: Available from MN/DOT Aggregate Unit (2) and U.S. Army Corps of Engineers (3)
References:
1) Houston County Planning and Zoning. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) U.S. Army Corps of Engineers files
4) USDL. MSHA mine reference list

Company: Roverud Construction Co. (1,3,4)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Rauk Quarry (1,3,4)
Status: Active (1)
Past operator/owner: Elvin Danielson Estate (1965) (1)
MN/DOT source no: 28047
Location: T 102 R 7 W Sec 35 NW1/4 (1)
T 102 R 7 W Sec 35 S1/2 NW1/4 (2,3)
Location comments: Spring Grove nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,5); Shakopee Fm. (5)

Description: Oneota dolomite, massive (1)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list
5) Mossler. field notes on Houston County highway map

Company: Botcher Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Welke Quarry (1)
Status: Active (1)
Township name: Hokah
Location: T 103 R 4 W Sec 3 (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Riprap, crushed rock, agricultural lime (1)
Marketing area: Houston, Fillmore, and Winona counties (1)
References: 1) Botcher Construction Co. 1989, personal communication

---

Company: Roverud Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Zeiger Quarry (1)
Alternate name: Brownsville Quarry (1); Zaiger Quarry (2,3)
Status: Active (1)
Past operator/owner: Hector Construction Co. (3-5); John Zaiger (1965) (2)
MN/DOT source no: 28080
Township name: Brownsville
Location: T 103 R 4 W Sec 22 NE1/4 (1)
T 103 R 4 W Sec 22 N1/2 SE1/4 (2,4)
Location comments: Brownsville nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Oneota dolomite (1)
Physical test data: Available from MN/DOT Aggregate Unit (2) and U.S. Army Corps of Engineers (3)
Extraction method: Explosive, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) U.S. Army Corps of Engineers files
4) USBM. [1979], MILS
5) USDL. MSHA mine reference list

Company: Haefs & Sons, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Sanden Quarry (1)
Status: Active (1)
Township name: Union
Location: T 103 R 5 W Sec 6 SE1/4 (1)
Description: Limestone (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing (1)
Uses of commodity: Road rock (1)
Marketing area: Within 10-15 miles (1)
References: 1) Haefs & Sons, Inc. 1989, personal communications

---

Company: Roverud Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Badger Quarry (1)
Status: Active (1)
Location: T 103 R 6 W Sec 27 NW1/4 (1)
Location comments: Caledonia nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Oneota dolomite, light to medium brown, medium grained (1)
Extraction method: Quarry benched; explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire

---

Company: Roverud Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Yucatan Quarry (1,2)
Status: Active (1)
Past operator/owner: Hector Construction Co. until 1984 (2)
Township name: Yucatan
Location: T 103 R 7 W Sec 15 NW1/4 (1)
Location comments: Houston nearest town (1)

Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Oneota dolomite (1)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) USDL. MSHA mine reference list

Company: Roverud Construction Co. (1,3,4)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Sherry Quarry (1,4)
Alternate name: Gaustad Quarry (2); Cherry Quarry (3)
Status: Active (1)
Past operator/owner: Albert Sherry (1965), Gaustad (1921) (1)
MN/DOT source no: 28045
Location: T 103 R 7 W Sec 36 SW1/4 (1)
T 103 R 7 W Sec 36 NE1/4 SW1/4 (2)
T 103 R 7 W Sec 36 NW1/4 SW1/4 (3)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Oneota dolomite (1)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References: 1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list

Company: Haefs & Sons, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Horn Quarry (1-3,5)
Status: Active (1)
Past operator/owner: Hector Contruction Co. (2,3); Horn (2,4,5)
MN/DOT source no: 28001
Township name: La Cresent
Location: T 104 R 4 W Sec 8 SE1/4 SW1/4 (1)
T 104 R 4 W Sec 8 SE1/4 SE1/4 SW1/4 (2,5)
Description: Limestone (1)
Physical test data: Available from MN/DOT Aggregate Unit - COPES file (4)
Processing plant: Portable rock crusher (1)
Processing method: Crushing (1)
Uses of commodity: Road rock (1)
Marketing area: Within 10-15 miles (1)
References: 1) Haefs & Sons, Inc. 1989, personal communication
2) USBM. [1979], MILS
3) USDL. MSHA mine reference list
4) MN/DOT Aggregate Unit files
5) Houston County Highway Dept. 1982, quarry list

Company: Haefs & Sons, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Schiel Quarry (1)
Status: Active (1)
Township name: La Crescent
Location: T 104 R 4 W Sec 8 SW1/4 SW1/4 (1)
Description: Limestone (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing (1)
Uses of commodity: Road rock (1)
Marketing area: Within 10-15 miles (1)
References: 1) Haefs & Sons, Inc. 1988, personal communication

---

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Horn Quarry (1)
Date opened: 1971 (1)
Status: Active (1)
Township name: La Crescent
Location: T 104 R 4 W Sec 8 SW1/4 SE1/4 (1)
Location comments: La Crescent nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Dolomite, 50 ft face (1)
Extraction method: Drilling, blasting (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Houston County (1)
References: 1) Mathy Construction Co. 1988, MN/DNR questionnaire

---

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Mathy Quarry (1)

Alternate name: La Crescent-Schiel Quarry (1); Schiel Quarry (2,3)
Status: Active (1)
Past operator/owner: Hector Construction Co. (3,4); Leslie Schiel (2)
MN/DOT source no: 28079
Township name: La Crescent
Location: T 104 R 4 W Sec 17 NW1/4 NW1/4 (1,2,4)
Location comments: Near La Crescent (4)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USDL. MSHA mine reference list
4) Hogberg. 1969, p. 42

Company: Haefs & Sons, Inc. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Abnet Quarry (1,2)
Status: Active (1)
Township name: La Crescent
Location: T 104 R 5 W Sec 2 E1/2 NW1/4 (1)
Location comments: Pine Creek nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (2)
Description: Dolomite and limestone (1)
Physical test data: Available from U.S. Army Corps of Engineers (2)
Processing method: Crushing, screening, washing (1)
Uses of commodity: Washed concrete products, drainage rock, seal coat chips, agricultural lime, road rock (1)
Marketing area: Within 25-30 miles (1)
References:
1) Haefs & Sons, Inc. 1989, personal communication
2) U.S. Army Corps of Engineers files

Company: Haefs & Sons, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Verenkemp Quarry (1)
Status: Active (1)
Township name: Mound Prairie
Location: T 104 R 5 W Sec 6 NW1/4 NW1/4 (1)
Description: Limestone (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing (1)
Uses of commodity: Road rock (1)
Marketing area: Within 10 miles (1)
References: 1) Haefs & Sons, Inc. 1989, personal communication

---

Company: Roverud Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Kelly Quarry (1)
Status: Active (1)
Location: T 104 R 6 W Sec 28 NE1/4 (1)
T 104 R 6 W Sec 28 SW1/4 NE1/4 (2)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Oneota dolomite (1)
Extraction method: Explosives, crushing (1)
Processing plant: Portable rock crusher (1)
Processing method: Screening (1)
Uses of commodity: Riprap, crushed stone, lime, filter stone (1)
Marketing area: SE Minnesota, NE Iowa (1)
References:
1) Roverud Construction Co. 1988, MN/DNR questionnaire
2) USGS. 1980, Houston quadrangle

Company: Botcher Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Houston**
Quarry/pit name: Birkeland Quarry (1)
Status: Active (1)
Township name: Houston
Location: T 104 R 6 W Sec 28 (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Riprap, crushed rock, agricultural lime (1)
Marketing area: Houston, Fillmore and Winona counties (1)
References: 1) Botcher Construction Co. 1989, personal communication

---

Company: Osmundson Brothers Contractors, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Mower**
Quarry/pit name: Leroy/Le Roy Quarry (1-3)
Alternate name: Osmundson Quarry (2,6)
Date opened: 1950's (1)
Status: Active (1)
MN/DOT source no: 50064
Township name: Le Roy
Location: T 101 R 14 W Sec 27 SW1/4 SW1/4 (1)
T 101 R 14 W Sec 27 NW1/4 SW1/4 (2,5)
T 101 R 14 W Sec 27 NW1/4 NW1/4 (6)
Location comments: Quarry 1/2 mile north of Le Roy (1)

Geologic age: Devonian
Geologic formation: Cedar Valley Fm. (2,5,6)
Description: Dolomitic limestone (1); quarry exposes 28 ft of white, lithographic, buff, fine-grained dolomite/limestone beds (5); see Ref. 6, fig. A6, for lithologic section description
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime (1)
References:
1) Osmundson Brothers Contractors, Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USDL. MSHA mine reference list
4) Hogberg. 1966, p. 35
5) Kohls. 1961, p. 149-152, 191
6) Mossler. 1987, p. 27,36

Company: Osmundson Brothers Contractors, Inc. (1-3,6)
Main commodity: Crushed Carbonate Rock
County: **Mower**
Quarry/pit name: Grand Meadow Quarry (1-5)
Alternate name: Osmundson Quarry (2)
Status: Active (1)
MN/DOT source no: 50069, 50011
Township name: Frankford
Location: T 103 R 14 W Sec 9 S1/2 NW1/4 (1)
T 103 R 14 W Sec 9 S2/3 NW1/4 (2)
T 103 R 14 W Sec 9 N1/2 (4,5)
Location comments: Grand Meadow nearest town (1)
Geologic age: Devonian
Geologic formation: Cedar Valley Fm. (2,4,5)
Description: Dolomitic limestone (1); see Refs. 2, 4 and 5 for stratigraphic section descriptions
Physical test data: Available from MN/DOT Aggregate Unit - COPES file (2)
Processing method: Crushing, screening, washing (1)
Uses of commodity: Crushed rock products, agricultural lime, concrete aggregate (1)
References:
1) Osmundson Brothers Contractors, Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USDL. MSHA mine reference list
4) Kohls. 1961, p. 124-127,188
5) Mossler. 1978, p. 33, plate 1
6) Hogberg. 1969, p. 44

Company: Quarve & Anderson Co. (1,3)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Panhandle Quarry (1,2)
Alternate name: High Forest Quarry (3); Rasmussen Quarry (3)
Date opened: 1953 (1)
Status: Active (1)
Past operator/owner: Melvin Rasmussen (1969) (3)
MN/DOT source no: 55035
USGS quadrangle: High Forest
Township name: Racine
Location: T 104 R 14 W Sec 5 NE1/4 NE1/4 (1-3,6)
T 104 R 14 W Sec 5 NW1/4 NE1/4 NE1/4 (4,5)
T 104 R 14 W Sec 5 SW1/4 NE1/4 NE1/4 (7)
Location comments: Quarry 2-1/4 miles west of south edge of Stewartville (4,5)
Geologic age: Ordovician
Geologic formation: Stewartville and Dubuque Fms. (3-7)
Description: Limestone, buff, stratified, dolomitic limestone (1); Dubuque thin bedded limestone, argillaceous limestone and shale, 5-15 ft exposed, underlain by Stewartville medium-bedded gray dolomitic limestone, fine grained, hard, prominent bedding planes, 15 ft exposed (3); see Refs. 3 and 5 for detailed stratigraphic sections; see Ref. 4, p. 57-65 for a discussion of the stratigraphy of the Dubuque Fm.
Physical test data: Available from MN/DOT Aggregate Unit (3)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed and screened limestone aggregate (1)
Marketing area: Olmsted and Mower counties (1)
References:
1) Quarve & Anderson Co. 1988, MN/DNR questionnaire
2) Hobbs. 1987, p. 179
3) MN/DOT Aggregate Unit files
4) Leverson and others. 1979, p. 59, 65
5) Leverson; Gerk. undated, locality M-121
6) Bleifuss. 1966, p. 115, 121
7) Kohls. 1961, p. 187

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Willey Quarry (1-4)
Date opened: 1950's (1)
Status: Active (1)
Past operator/owner: Emilind and Willey (1969) (2)
MN/DOT source no: 55097
USGS quadrangle: Eyota
Location: T 105 R 12 W Sec 2 NE1/4 NW1/4 (1-3)
Location comments: Eyota nearest town (1)
Geologic age: Ordovician
Geologic formation: Galena Gp. (1,2); Prosser Fm. or Stewartville ? Fm. (2)
Description: Dolomite, 40 ft face (1); gray, thick-bedded limestone, good quality (2)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Extraction method: Drilling and blasting (1)
Processing plant: Portable crushing plant (1)

Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Olmsted County (1)
References: 1) Mathy Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USBM. [1980], MILS
4) USDL. MSHA mine reference list

Company: Quarve & Anderson Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Predmore Quarry (1,2)
Alternate name: Welch Quarry (2)
Date opened: 1947 (1)
Status: Active (1)
Past operator/owner: Earl Welch (1969) (2)
MN/DOT source no: 55049
Location: T 105 R 13 W Sec 13 NE1/4 (1)
T 105 R 13 W Sec 13 NE1/4 SW1/4 (2,3)
T 105 R 13 W Sec 13 NW1/4 SW1/4 (1965) (2)
T 105 R 13 W Sec 13 SW1/4 (4)
Location comments: Three miles east and one mile north of Cummingsville (3)
Geologic age: Ordovician
Geologic formation: Galena Gp. (1,2); Prosser Fm. (2); Dunleith Fm. (3); Stewartville and Prosser Fms. (4)
Description: Limestone, buff, stratified, dolomitic limestone (1); gray, thick bedded limestone, fine grained, fossiliferous in places, 45 ft face (2); see Ref. 3 for detailed stratigraphic section
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed and screened limestone aggregate (1)
Marketing area: Olmsted and Fillmore counties (1)
References: 1) Quarve & Anderson Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Stone. 1980, p. A-19, A-20
4) Niles. [1988b], table 2

Company: Quarve & Anderson Co. (1-3)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Sixty-Three South Quarry (1)
Alternate name: Quarve No. 63 Quarry (2,7); Sattre Quarry, Airport Quarry (5); Hwy. 63 Quarry (3)
Status: Active (1)
Past operator/owner: Clarence Sattre (1969) (5)
MN/DOT source no: 55085
USGS quadrangle: Stewartville
Location: T 105 R 14 W Sec 2 NE1/4 (1-3)
T 105 R 14 W Sec 2 NW1/4 NE1/4 (5)
T 105 R 14 W Sec 2 NE1/4 NE1/4 (5)
Geologic age: Ordovician
Geologic formation: Galena Gp., Prosser Fm. (1,3-6)
Description: Limestone, buff, stratified, dolomitic limestone (1); thick bedded, gray, fine grained limestone, prominent bedding planes, fossiliferous in places, weathers buff, pitted brown surface on top of ledge, face 75 ft, Prosser Fm. except some Stewartville Fm. on top, stripping 3-8 ft of soil and 5 ft of thin-bedded weathered limestone (5)
Physical test data: Available from MN/DOT Aggregate Unit (5) and U.S. Army Corps of Engineers (3)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed and screened limestone aggregate (1)
Marketing area: Rochester, Olmsted County (1)
References: 1) Quarve & Anderson Co. 1988, MN/DNR questionnaire
2) USBM. [1978], MILS
3) U.S. Army Corps of Engineers files
4) Austin. 1968, p. 19-21
5) MN/DOT Aggregate Unit files
6) Austin. 1972, p. 77, 78
7) USDL. MSHA mine reference list

Company: Shamrock Enterprises (1)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Doty Quarry (1,2)
Alternate name: Pit No. 418 (1921) (2)
Status: Active (1)
Past operator/owner: Edward Doty (1969), J. W. Shanahan (1921) (2); J. A. Steiner (4)
MN/DOT source no: 55077
Location: T 105 R 14 W Sec 4 SE1/4 NW1/4 AND
T 105 R 14 W Sec 4 NE1/4 SW1/4 (2,4)
T 105 R 14 W Sec 4 NW1/4 SW1/4 (3)
Location comments: Quarry 1/2 mile north of Rochester airport (3)
Geologic age: Ordovician
Geologic formation: Prosser Fm. (5); Dunleith Fm. (3); Stewartville and Prosser Fms. (4)
Description: Medium bedded gray limestone, weathering to buff, fine grained, hard, fossiliferous, face 35-45 ft, stripping 5-10 ft of brown till and soil (2); see Ref. 3 for detailed lithologic section
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Uses of commodity: Road base products, riprap (1)
Marketing area: Southeastern Minnesota (1)
References: 1) Shamrock Enterprises. 1989 personal communication
2) MN/DOT Aggregate Unit files

3) Stone. 1980, p. A-47
4) Niles. [1988a], table 1
5) Kuhns. 1988, plate 9

Company: Stussy Construction, Inc. and Paulson Rock Products (1,2)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Rock Dell Quarry (1,2,4)
Alternate name: Nereson Quarry (3,5)
Date opened: 1950's (1)
Status: Active (1,2)
Past operator/owner: Nereson Estate (1969) (3); Quarve & Anderson Co. (5,6)
MN/DOT source no: 55092
Location: T 105 R 15 W Sec 9 NE1/4 (2,7)
T 105 R 15 W Sec 9 NW1/4 NE1/4 (3,5,6,8)
T 105 R 15 W Sec 9 NE1/4 NW1/4 (4)
Location comments: One mile east of Rock Dell (4); on south side of County Rd. 126 and 1-1/2 miles east of Rock Dell (7); center of NW1/4 NE1/4 (5)
Geologic age: Ordovician
Geologic formation: Stewartville Fm. (3,7); Wise Lake and Dunleith Fms. (4); Prosser Fm. (8)
Description: Dolomitic limestone in gray white to yellow color (1); medium to thick bedded, gray weathering to buff, fine dolomite with prominent bedding planes at about 2-3 ft intervals, face 40-55 ft, stripping 2 ft topsoil and 2 ft weathered dolomite (3); quarry exposes rather fresh gray limestone with beds up to 3-4 feet thick (7); see Ref. 4 for detailed stratigraphic section
Physical test data: Available from MN/DOT Aggregate Unit (3)
Processing plant: Portable processing plant (1)
Processing method: Crushing, screening (2)
Uses of commodity: Crushed road rock products 80%, screened rock 10%, agricultural lime 10% (1)
Marketing area: Southwest part of Olmsted County, northern edge of Mower County and southeast edge of Dodge County (1)
References:
1) Stussy Construction, Inc. 1988, MN/DNR questionnaire
2) Stussy Construction, Inc. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) Stone. 1980, p. A-29
5) USBM. [1979], MILS
6) Hogberg. 1969, p. 45
7) Prokopovich; Schwartz. 1956, p. 20
8) Niles. [1988a], table 1

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,2,4,6)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Eyota Quarry (1)
Alternate name: Walsh Quarry (2,4,5); Patterson Quarry (3,5,8)
Date opened: 1936 (1)
Status: Active (1)
Past operator/owner: Quarve & Anderson (1969) (9); Tom Walsh Estate (1969) (5)
MN/DOT source no: 55052
Township name: Eyota
Location: T 106 R 12 W Sec 8 SW1/4 NE1/4 (1,3,11)
T 106 R 12 W Sec 8 SE1/4 NW1/4 (4,5,9)
T 106 R 12 W Sec 8 SW1/4 NW1/4 (1921) (5)
Location comments: Three miles west of Eyota (8); nine miles east of Rochester (3); north of U.S. Hwy. 14 at the railroad underpass (7)
Geologic age: Ordovician
Geologic formation: Galena Gp., Prosser Fm. (1,5,8,11); Dunleith Fm., Sherwood, Rivoli, and Mortimer Mbrs. (3)
Description: Dolomite, 40 ft face (1); medium and thick bedded gray, fine grained limestone (5); see Refs. 3 and 8 for stratigraphic sections
Chemical analyses: See Ref. 7, p. 26 and Ref. 8, p. 12 and 13 for chemical analyses
Physical test data: Available from MN/DOT Aggregate Unit (5)
Extraction method: Drilling and blasting (1)
Processing plant: Portable crushing plant (2)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Olmsted County (1)
References:
1) Mathy Construction Co. 1988, MN/DNR questionnaire
2) Patterson Quarries. 1988, personal communication
3) Stone. 1980, p. A-27, A-28
4) USBM. [1979], MILS
5) MN/DOT Aggregate Unit files
6) USDL. MSHA mine reference list
7) Prokopovich; Schwartz. 1956, p. 26
8) Thiel; Stauffer. 1947, p. 4, 12, 13
9) Hogberg. 1969, p. 46
10) Hogberg. 1966, p. 35
11) Niles. [1988a], table 1

Company: Paulson Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Mayowood Quarry (1,3,5)
Alternate name: Mayo Quarry (2)
Status: Active (1)
Past operator/owner: Dorothy Mayo Estate (1969) (2); Stussy Construction, Inc. (5)
MN/DOT source no: 55071
USGS quadrangle: Salem Corners
Township name: Rochester
Location: T 106 R 14 W Sec 21 NW1/4 NW1/4 (1,2)
AND

T 106 R 14 W Sec 16 SW1/4 (1,2,4)
T 106 R 14 W Sec 16 SE1/4 SE1/4 SW1/4 (3)

Geologic age: Ordovician
Geologic formation: Galena Gp., Prosser Fm. (2,4) and Cummingsville Fm. (2)
Description: Dolomitic limestone (1)
Chemical analyses: See Ref. 4, p. 19 for chemical analyses
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed road rock products 75%, screened rock 15%, agricultural lime 10% (1)
Marketing area: Northwestern and southern part of Olmsted County (1)
References:
1) Stussy Construction, Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) Prokopovich; Schwartz. 1956, p. 18, 19
5) USDL. MSHA mine reference list

Company: Rochester Sand & Gravel, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Rochester Sand & Gravel No.1 Quarry (1)
Date opened: 1976 (1)
Status: Active (1)
Location: T 107 R 14 W Sec 11 NE1/4 SE1/4 (1)
Location comments: Near Rochester (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Dolomite (1)
Extraction method: Drill, blast, crush (1)
Uses of commodity: MN/DOT Class 2 aggregate base (1)
Marketing area: Local (1)
References:
1) Rochester Sand & Gravel, Inc. 1988, MN/DNR questionnaire

Company: Rochester Sand & Gravel, Inc. (1-4)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Rochester Sand & Gravel No. 2 Quarry (1)
Alternate name: Rochester Sand & Gravel Co. Quarry (2,4)
Status: Active (1)
MN/DOT source no: 55099
Location: T 107 R 14 W Sec 14 SE1/4 SE1/4 (1)
T 107 R 14 W Sec 14 NE1/4 SW1/4 SE1/4 (3)
Location comments: North of Rochester (3)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1); Shakopee Fm. (3,4)
Description: Dolomite (1); Shakopee dolomite, 34 ft (3); see Ref. 3 for detailed stratigraphic section
Physical test data: Available from MN/DOT Aggregate Unit (2)
Uses of commodity: Bituminous aggregate 65%, MN/DOT Class 2 20%, oversize 15% (1)
Marketing area: Local (1)
References:
1) Rochester Sand & Gravel, Inc. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Austin. 1971, p. 196-198
4) Austin. 1968, p. 19, 27

Company: Shamrock Enterprises (1)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Kelley Quarry (1)
Status: Active (1,2)
Location: T 108 R 14 W Sec 28 E1/2 SW1/4 (1,2)
Description: Limestone (1)
Processing plant: Portable crushing plant (1)
Uses of commodity: Road base products, riprap (1)
Marketing area: Southeastern Minnesota (1)
References:
1) Shamrock Enterprises. 1989, personal communication
2) Olmsted County Planning and Zoning. 1989, personal communication

---

Company: Quarve & Anderson Co. (1-5)
Main commodity: Crushed Carbonate Rock
County: **Olmsted**
Quarry/pit name: Goldberg Quarry (1-5)
Date opened: 1958 (1)
Status: Active (1)
Past operator/owner: Harold Goldberg, Robert Leary (1969) (2)
MN/DOT source no: 55037
USGS quadrangle: Rochester
Location: T 108 R 14 W Sec 36 SE1/4 (1)
T 108 R 14 W Sec 36 SE1/4 SW1/4 (2,3) AND
T 108 R 14 W Sec 36 SW1/4 SE1/4 (2)
T 108 R 14 W Sec 36 S1/2 (6)
Location comments: Center of SE1/4 SW1/4 (3)
Geologic age: Ordovician
Geologic formation: Prairie du Chien Gp., Shakopee Fm. (1,2,5,6)
Description: Limestone, buff to tan, stratified, dolomitic limestone (1); gray dolomitic limestone, face 50+ ft (2); see Refs. 2 and 6 for detailed stratigraphic sections
Physical test data: Available from MN/DOT Aggregate Unit (2) and U.S. Army Corps of Engineers (5)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening, washing (1)

Uses of commodity: Crushed, screened, and washed limestone aggregate used for aggregate base, concrete aggregate, and drainage aggregate (1)

Marketing area: Rochester, Olmsted County (1)

References:
1) Quarve & Anderson Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list
5) U.S. Army Corps of Engineers files
6) Austin. 1971, p. 190-193

Company: Shamrock Enterprises (1)

Main commodity: Crushed Carbonate Rock

County: **Olmsted**

Quarry/pit name: Keller Quarry (1)

Alternate name: Penz Quarry (1)

Status: Active (1,2)

MN/DOT source no: 55098

Location: T 108 R 15 W Sec 26 NE1/4 SW1/4 (2)
T 108 R 15 W Sec 26 NW1/4 SE1/4 (4)
T 108 R 15 W Sec 26 S1/2 NW1/4 SE1/4 (5)

Location comments: Two miles north of Douglas on County Rd. 3, south side of road (1,2); quarry south of MN/DOT Source No. 55066 (3)

Geologic age: Ordovician

Geologic formation: Platteville Fm. (3-5)

Description: Limestone (1); see Ref. 5 for trace fossil distribution

Processing plant: Portable crushing plant (1)

Uses of commodity: Road base products, riprap (1)

Marketing area: Southeastern Minnesota (1)

References:
1) Shamrock Enterprises. 1989, personal communication
2) Olmsted County Planning and Zoning. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) Niles. [1988a], table 1
5) Dokken. 1987, p. 194, locality 17

Company: Kielmeyer Construction Co. (1-4)

Main commodity: Crushed Carbonate Rock

County: **Rice**

Quarry/pit name: Kielmeyer Quarry (1,2)

Status: Active (1)

MN/DOT source no: 66080

Location: T 110 R 19 W Sec 10 NE1/4 NW1/4 (2,3)

Geologic age: Ordovician

Geologic formation: Platteville Fm., McGregor and Carimona Mbrs. (2)

Description: Limestone (1,2)

Processing plant: Portable crushing plant (1)

Processing method: Crushing, screening (1)

Uses of commodity: Crushed rock products, agricultural lime (1)

References:
1) Kielmeyer Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) Hogberg. 1969, p. 43
4) USDL. MSHA mine reference list

Company: J. L. Shiely Co. (1,2,4-7)

Main commodity: Crushed Carbonate Rock

County: **Scott**

Quarry/pit name: Shakopee Quarry (1)

Alternate name: Shiely Savage Quarry (2); Savage Quarry (5); Landers Quarry (6)

Date opened: Late 1950's (10)

Status: Active (1)

Past operator/owner: Landers, Nordblom & Christensen until 1963 when Shiely acquired quarry (1,3,10)

MN/DOT source no: 70008

USGS quadrangle: Eden Prairie

Township name: Eagle Creek

Location: T 115 R 22 W Sec 2 S1/2 SW1/4 AND
T 115 R 22 W Sec 11 N1/2 NW1/4 (1)

Location comments: Near Shakopee, quarry just south of Chicago and North Western RR in Sec. 2 (1); on County Rd. 101 west of Jct 101 and 13, south of racetrack (6); Ref. 6 lists the S1/2 SE1/4 of Sec. 2; Ref. 7 lists the SW1/4 SW1/4 and SW1/4 SE1/4 of Sec. 2; more than one quarry in SW1/4 of Sec. 2 (8)

Geologic age: Ordovician

Geologic formation: Oneota Fm. (1)

Description: Oneota dolomitic limestone (1)

Physical test data: Available from MN/DOT Aggregate Unit - COPES file (4) and U.S. Army Corps of Engineers (6)

Processing plant: Shakopee Plant (1)

6896 Highway 101
Shakopee, MN 55379

Processing method: Primary crushed material is screened to produce roadbase material and secondary crushing to produce smaller size rock products. The 1 in. x 1/8 in. material is fed from bins to filler processing plant which produces a powder-like filler material. (1)

Uses of commodity: #4 Keystone - crushed rock (for drainfields and base); #67 Keystone (for landscaping, rail ballast, driveways); Class 5 (roadbase); Class 2 (roadbase); mineral filler (roofing products and pet litter) (1)

Marketing area: Throughout Minnesota and western Wisconsin, concentrated in central Minnesota and seven county metropolitan area (1)

References:
1) J. L. Shiely Co. 1988, MN/DNR questionnaire
2) USBM. [1979], MILS
3) Hogberg. 1966, p. 34
4) MN/DOT Aggregate Unit files
5) USDL. MSHA mine reference list
6) U.S. Army Corps of Engineers files

7) Hogberg. 1969, p. 47
8) Mossler. 1974a, Scott County station 1
9) Beissel; Ford. 1981, p. 425, 426
10) Sikich. 1959, p. 543

Company: Midwest Asphalt Corp. (1)
Main commodity: Crushed Carbonate Rock
County: **Scott**
Quarry/pit name: River Warren Aggregates Quarry (1)
Alternate name: Malkerson Quarry (2,3)
Status: Active (1)
Past operator/owner: River Warren Aggregates, Inc. (2,3)
USGS quadrangle: Shakopee
Township name: Louisville
Location: T 115 R 23 W Sec 16 (1)
T 115 R 23 W Sec 16 NE1/4 SW1/4 (2)
Location comments: Near Chaska (1)
Geologic age: Cambrian
Geologic formation: St. Lawrence Fm. (4)
Description: Limestone, reddish in color (1)
Extraction method: Surface mine (1)
Processing method: Crushing (1)
Uses of commodity: Crushed stone, agricultural lime, riprap (1)
Marketing area: Metro area (1)
References: 1) Midwest Asphalt Corp. 1988, MN/DNR questionnaire
2) USBM. [1979], MILS
3) USDL. MSHA mine reference list
4) Olsen. 1982, plate 5

Company: Bryan Rock Products, Inc. (1,3,5,6,8)
Main commodity: Crushed Carbonate Rock
County: **Scott**
Quarry/pit name: Aggregate Quarry (1)
Alternate name: Highway Quarry (3,5); Edina Sand & Gravel Co. Quarry (4); Halverson Bros. Quarry (7)
Status: Active (1)
MN/DOT source no: 70005
USGS quadrangle: Shakopee
Township name: Louisville
Location: T 115 R 23 W Sec 21 N1/2 SE1/4 (1,4)
T 115 R 23 W Sec 21 SW1/4 NE1/4 (2,3)
T 115 R 23 W Sec 21 NW1/4 SE1/4 (2,3)
T 115 R 23 W Sec 21 SE1/4 NW1/4 (8)
Geologic age: Ordovician
Geologic formation: Praire de Chien Gp. (2); Oneota Fm. (7)
Description: Dolomitic limestone (1); Oneota dolomite (7)
Chemical analyses: CaCO3 50-95%, MgCO3 5-40%, SiO2 5-15%, Fe2O3 0-2% (1); see Ref. 7 for further analyses
Physical test data: Available from MN/DOT Aggregate Unit - ASIS and COPES files (6) and U.S. Army Corps of Engineers (4)
Extraction method: Surface mining, blasting (1)
Processing plant: Aggregate Quarry Plant (1)
13580 Johnson Memorial Dr.
Shakopee, MN 55379
Processing method: Crushing, screening (1)
Uses of commodity: Road base, pipe bedding, concrete aggregate, decorative (1)
Marketing area: Entire Twin City area (1)
References: 1) Bryan Rock Products, Inc. 1988, MN/DNR questionnaire
2) Mossler. 1974a, Scott County station 5
3) USBM. [1980], MILS
4) U.S. Army Corps of Engineers files
5) USDL. MSHA mine reference list
6) MN/DOT Aggregate Unit files
7) Stauffer. 1950, p. 19, 27
8) Hogberg. 1969, p. 40

Company: Bryan Rock Products, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Scott**
Quarry/pit name: Merriam Quarry (1,2,7)
Alternate name: Bryan Quarry (3,8); Bryan Red Rock Quarry (8); Bryan Rock Products Quarry (9)
Date opened: 1941 (1)
Status: Active (1)
MN/DOT source no: 70006
USGS quadrangle: Jordon East
Township name: Louisville
Location: T 115 R 23 W Sec 29 NE1/4 (2-6)
Location comments: Near Shakopee (1); quarry near Merriam Junction, southwest of Shakopee (4)
Geologic age: Ordovician
Geologic formation: Shakopee and Oneota Fms. (4)
Description: Dolomitic limestone (1); see Ref. 9 for description

See Ref. 4 for detailed stratigraphic section, summary of section on west face follows:
Shakopee Fm.
Willow River Mbr. 12.5 ft, dolomite, red to yellow
New Richmond Mbr.
Prairie Island facies 10.6 ft, dolomite, red to yellow
Oneota Fm. 21.9 ft, dolomite

Chemical analyses: CaCO3 50-95%, MgCO3 5-40%, SiO2 5-15%, Fe2O3 0-2% (1)
Physical test data: Available from U.S. Army Corps of Engineers (3) and MN/DOT Aggregate Unit - ASIS and COPES files (8)
Extraction method: Surface mining (1)
Processing plant: Merriam Quarry Plant (1)
3750 W. 145th St.
Shakopee, MN 55379
Processing method: Blasting, crushing, screening, wash plant (1)

Uses of commodity: Road base, pipe bedding, concrete aggregate, decorative (1)

Marketing area: Entire Twin City area and outlying areas and cities (1)

References:
1) Bryan Rock Products, Inc. 1988, MN/DNR questionnaire
2) Barton Sand & Gravel Co. 1989, personal communication
3) U.S. Army Corps of Engineers files
4) Austin. 1971, p. 136-138
5) Hogberg. 1966, p. 31
6) Mossler. 1974a, Scott County station 9
7) USDL. MSHA mine reference list
8) MN/DOT Aggregate Unit files
9) Webers; Austin. 1972, p. 90, 91

Company: Southern Minnesota Construction Co., Inc. (1)

Main commodity: Crushed Carbonate Rock

County: **Steele**

Quarry/pit name: Owatonna Quarry (1)

Alternate name: Lundin Quarry (2-6); Fretham Quarry (2,3,5); Lundin Cashman Quarry (5)

Status: Active (1,2)

Past operator/owner: Lundin Constructin Co. (1-6); Fretham Quarry Enterprises (2,3,5)

MN/DOT source no: 74063, 74062

USGS quadrangle: Owatonna

Township name: Clinton Falls

Location: T 108 R 20 W Sec 33 S1/2 SE1/4 (2)
T 108 R 20 W Sec 33 SE1/4 (3,6)

Geologic age: Ordovician

Geologic formation: Prosser Fm. (3)

Description: Medium to thick bedded, massive, fine grained limestone, some thin bedded, sandy towards top (3)

Physical test data: Available from MN/DOT Aggregate Unit (3)

Uses of commodity: Riprap, 4 in. to 6 in. rock, 1-1/2 in. dust free, CL 2, CL 5, agricultural lime (1)

Marketing area: Within 50 miles of Owatonna (1)

References:
1) Southern Minnesota Construction Co., Inc. 1988, MN/DNR questionnaire
2) Steel County Planning and Zoning. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) U.S. Army Corps of Engineers files
5) USBM. [1979], MILS
6) Niles. [1988c], table 3

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,2,4)

Main commodity: Crushed Carbonate Rock

County: **Wabasha**

Quarry/pit name: Becker Quarry (1,4)

Alternate name: Dickerman Quarry (3,4)

Date opened: 1950's (1)

Status: Active (1)

Past operator/owner: Gordon Becker (1965), Dickerman (1941) (3)

MN/DOT source no: 79073

Township name: Plainview

Location: T 108 R 11 W Sec 22 SW1/4 SW1/4 (1-4)

Location comments: Plainview nearest town (1)

Geologic age: Ordovician

Geologic formation: Shakopee Fm. (1); Oneota Fm. (4)

Description: Dolomite, 70 ft face (1)

Physical test data: Available from U.S. Army Corps of Engineers (4) and MN/DOT Aggregate Unit (3)

Extraction method: Drilling, blasting (1)

Processing plant: Portable crushing plant (2)

Processing method: Crushing, screening (1)

Uses of commodity: Crushed rock, agricultural lime, riprap (1)

Marketing area: Wabasha County (1)

References:
1) Mathy Construction Co. 1988, MN/DNR questionnaire
2) Patterson Quarries. 1988, personal communication
3) MN/DOT Aggregate Unit files
4) U.S. Army Corps of Engineers files

Company: Roberson Lime & Rock Products (1)

Main commodity: Crushed Carbonate Rock

County: **Wabasha**

Quarry/pit name: Siegenthaler Quarry (1-3)

Status: Active (1,2)

Past operator/owner: Siegenthaler (1965) (3)

MN/DOT source no: 79083

Location: T 108 R 12 W Sec 5 N1/2 SW1/4 (2)
T 108 R 12 W Sec 5 NE1/4 SW1/4 (3)

Description: Dolomitic limestone (2)

Physical test data: Available from MN/DOT Aggregate Unit (1)

Processing plant: Portable processing plant (1)

Uses of commodity: Crushed stone, agricultural lime (1)

References:
1) Roberson Lime & Rock Products. 1988, MN/DNR questionnaire
2) Roberson Lime & Rock Products. 1989, personal communication
3) MN/DOT Aggregate Unit files

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)

Main commodity: Crushed Carbonate Rock

County: **Wabasha**

Quarry/pit name: Tesmer Quarry (1)

Alternate name: Anderson Quarry (1)

Status: Active (1)

Location: T 108 R 12 W Sec 5 S1/2 SW1/4 (1)

Processing plant: Portable crushing plant (1)

Processing method: Crushing, screening (1)

Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire

---

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Weaver Quarry (1)
Alternate name: Blattner Quarry (2)
Status: Active (1)
Past operator/owner: Milton Blattner (1965) (1)
MN/DOT source no: 79070
Township name: Minneiska
Location: T 109 R 9 W Sec 30 W1/2 SW1/4 NW1/4 (1,2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files

Company: Roberson Lime & Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Zickrich Quarry (1)
Date opened: Re-opened in 1989, inactive the past 40-50 years (1)
Status: Active (1)
Township name: Highland
Location: T 109 R 11 W Sec 2 S1/2 SE1/4 (1)
Description: Dolomitic limestone (1)
Processing plant: Portable crushing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References: 1) Roberson Lime & Rock Products. 1989, personal communication

---

Company: Roberson Lime & Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Klassan Quarry (1)
Alternate name: Halverson Quarry (2)
Status: Temporarily inactive (1989) (1)
Past operator/owner: Felix Klassen (1965), Markus and Halverson (1921) (2)
MN/DOT source no: 79053
Township name: Highland
Location: T 109 R 11 W Sec 28 S1/2 SE1/4 (1)
T 109 R 11 W Sec 28 SE1/4 SE1/4 (2)
Geologic age: Ordovician
Geologic formation: Shakopee-Oneota Fms. (2)
Description: Dolomitic limestone (1)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References: 1) Roberson Lime & Rock Products. 1989, personal communication
2) MN/DOT Aggregate Unit files

Company: Roberson Lime & Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Doane Quarry (1,2)
Status: Active (1,2)
Township name: Highland
Location: T 109 R 11 W Sec 30 S1/2 SE1/4 (2)
Description: Dolomitic limestone (2)
Processing plant: Portable crushing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References: 1) Roberson Lime & Rock Products. 1988, MN/DNR questionnaire
2) Roberson Lime & Rock Products. 1989, personal communication

---

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Hammond Quarry (1,2)
Date opened: 1988 (1)
Status: Active (1)
Location: T 109 R 13 W Sec 29 SE1/4 (1)
Location comments: Hammond nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Dolomite, 60 ft face (1)
Extraction method: Drilling, blasting (1)
Processing plant: Portable crushing plant (2)
Mike Gerady
507-753-2458
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Olmsted and Wabasha counties (1)
References: 1) Mathy Construction Co. 1988, MN/DNR questionnaire
2) Patterson Quarries. 1988, personal communication

Company: Roberson Lime and Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**

Quarry/pit name: Grossbauch Quarry (1)
Status: Active (1)
Past operator/owner: G. Grossbach, owner (3)
Location: T 109 R 14 W Sec 28 N1/2 NW1/4 (2)
T 109 R 14 W Sec 28 NW1/4 NE1/4 (3)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (3)
Description: Dolomitic limestone (1)
Processing plant: Portable processing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References:
1) Roberson Lime & Rock Products. 1988, MN/DNR questionnaire
2) Roberson Lime & Rock Products. 1989, personal communication
3) Niles. [1988a], table 1

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Olson Quarry (1-3)
Alternate name: Dumfries Quarry (2); Concidine Quarry (4)
Date opened: 1950's (1)
Status: Active (1)
Past operator/owner: D. Brown and E. Concidine (1965), E. B. Christine (1921) (4)
MN/DOT source no: 79058
Township name: Glasgow
Location: T 110 R 11 W Sec 8 NW1/4 NW1/4 (1-5)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,3,5)
Description: Dolomite, 90 ft face (1)
Physical test data: Available from U.S. Army Corps of Engineers (3) and MN/DOT Aggregate Unit (4)
Extraction method: Drilling, blasting (1)
Processing plant: Portable crushing plant (2)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Wabasha County (1)
References:
1) Mathy Construction Co. 1988, MN/DNR questionnaire
2) Patterson Quarries. 1988, personal communication
3) U.S. Army Corps of Engineers files
4) MN/DOT Aggregate Unit files
5) Mossler. 1974b, Wabasha station 51

Company: Roberson Lime and Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Moeching Quarry (1,2)
Status: Active (1)
Past operator/owner: Wesley Moeching (1965) (4)
MN/DOT source no: 79062
Township name: West Albany
Location: T 110 R 12 W Sec 15 SW1/4 (2,4)
T 110 R 12 W Sec 15 SE1/4 SW1/4 (3)
Location comments: North side of T.H. 60 (3)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (4)
Description: Dolomitic limestone (2)
Physical test data: Available from MN/DOT Aggregate Unit (3)
Processing plant: Portable crushing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References:
1) Roberson Lime & Rock Products. 1988, MN/DNR questionnaire
2) Roberson Lime & Rock Products. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) Mossler. 1974b, Wabasha station 74

Company: Roberson Lime & Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Fick Quarry (1-3)
Status: Active (1)
Past operator/owner: Peter Fick (1965) (3)
MN/DOT source no: 79076
Location: T 110 R 13 W Sec 1 W1/2 SW1/4 (2)
T 110 R 13 W Sec 1 SW1/4 SW1/4 (3)
Description: Dolomitic limestone (2)
Physical test data: Available from MN/DOT Aggregate Unit (3)
Processing plant: Portable crushing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References:
1) Roberson Lime & Rock Products. 1988, MN/DNR questionnaire
2) Roberson Lime & Rock Products. 1989, personal communication
3) MN/DOT Aggregate Unit files

Company: Roberson Lime & Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Robertson Quarry (1,2)
Date opened: 1930's (1)
Status: Active (1)
Township name: Gillford
Location: T 110 R 13 W Sec 27 N1/2 SW1/4 (2)
Description: Dolomitic limestone (2)
Processing plant: Portable processing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References:
1) Roberson Lime & Rock Products. 1988, MN/DNR questionnaire

2) Roberson Lime & Rock Products. 1989, personal communication

---

Company: Shamrock Enterprises (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Oelkers Quarry (1-4,6)
Alternate name: Kohrs Quarry (2); Zumbro Falls Quarry (3)
Status: Active (1)
Past operator/owner: Quarve & Anderson Co. (3-6); Arnold Oelkers (1965) (2)
MN/DOT source no: 79077
Location: T 110 R 13 W Sec 31 SE1/4 SE1/4 (1-4,6)
Location comments: Zumbro Falls nearest town (1)
Geologic age: Ordovician
Geologic formation: Shakopee-Oneota Fms. (3)
Description: Dolomitic limestone (3)
Physical test data: Available at U.S. Army Corps of Engineers (3) and MN/DOT Aggregate Unit (2)
Processing plant: Portable processing plant (1)
Uses of commodity: Road base products, riprap (1)
Marketing area: Southeastern Minnesota (1)
References:
1) Shamrock Enterprises. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) U.S. Army Corps of Engineers files
4) USBM. [1980], MILS
5) USDL. MSHA mine reference list
6) Hogberg. 1969, p. 46

Company: Roberson Lime & Rock Products (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Reuter Quarry (1)
Status: Active (1)
Location: T 110 R 14 W Sec 16 S1/2 SE1/4 (2)
Description: Dolomitic limestone (2)
Processing plant: Portable processing plant (1)
Uses of commodity: Crushed stone, agricultural lime (1)
References:
1) Roberson Lime & Rock Products. 1988, MN/DNR questionnaire
2) Roberson Lime & Rock Products. 1989, personal communication

---

Company: Holm Brothers Construction Co. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Berger Quarry (1)
Status: Active (1)
Township name: Wabasha
Location: T 111 R 10 W Sec 31 NW1/4 (2)
Location comments: Located in Wabasha city limits (1); on north side of County Rd. 30 (2)
Description: Limestone (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime, riprap (1)
Marketing area: Local area (1)
References:
1) Holm Brothers Construction Co. 1989, personal communication
2) Wabasha County Zoning. 1989, personal communication

Company: Holm Brothers Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Bremer Quarry (1,2)
Status: Active (1)
Past operator/owner: Martin Bremer (1965) (2)
MN/DOT source no: 79065
Township name: Lake
Location: T 111 R 12 W Sec 8 SE1/4 (1)
T 111 R 12 W Sec 8 SW1/4 SE1/4 (2)
Description: Limestone (1)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock products, agricultural lime, riprap (1)
Marketing area: Local area (1)
References:
1) Holm Brothers Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Wabasha**
Quarry/pit name: Moyer Quarry (1,2)
Date opened: 1950's (1)
Status: Active (1)
Location: T 111 R 13 W Sec 14 SE1/4 SE1/4 (1)
Location comments: Lake City nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Dolomite, 120 ft face (1)
Extraction method: Drilling, blasting (1)
Processing plant: Portable crushing plant (2)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Wabasha and Goodhue counties (1)

References: 1) Mathy Construction Co. 1988, MN/DNR questionnaire
2) Patterson Quarries. 1988, personal communication

Company: Bryan Rock Products, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Washington**
Quarry/pit name: Hastings Pit No. 1 Quarry (1)
Alternate name: Davies Quarry (2-4)
Date opened: 1942 (1)
Status: Active (1)
Past operator/owner: Davies Excavating, Inc. (1979) (2,4)
Location: T 27 R 20 W Sec 15 S1/2 NE1/4 AND
T 27 R 20 W Sec 15 N1/2 SE1/4 (1)
T 27 R 20 W Sec 15 NW1/4 SE1/4 (2,3)
Geologic age: Ordovician
Geologic formation: Prairie du Chien Gp. (2,3)
Description: Dolomitic limestone (1-3)
Chemical analyses: CaCO3 50-95%, MgCO3 5-40%, SiO2 5-15%, Fe2O3 0-2% (1)
Extraction method: Blasting (1)
Processing plant: Hastings Plant (1)
15672 87th St. S.
Hastings, MN 55033
Processing method: Crushing, screening (1)
Uses of commodity: Road base, pipe bedding, concrete aggregate, decorative (1)
Marketing area: St. Paul, Hastings, and surrounding southeastern areas of Twin Cities (1)
References: 1) Bryan Rock Products, Inc. 1988, MN/DNR questionnaire
2) U.S. Army Corps of Engineers files
3) MN/DOT Aggregate Unit files
4) USBM. [1980], MILS

Company: J. L. Shiely Co. (1-3,5,7-9)
Main commodity: Crushed Carbonate Rock
County: **Washington**
Quarry/pit name: Larson Quarry (1,5,9)
Alternate name: Van Der Weyer Quarry (2,3)
Date opened: 1958 (1)
Status: Active (1,5)
MN/DOT source no: 82002
Location: T 27 R 22 W Sec 26 NE1/4 (1-4,7-9) AND
T 27 R 22 W Sec 23 SE1/4 (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,2)
Description: Dolomitic limestone (1)
Physical test data: Available from MN/DOT Aggregate Unit - COPES file (2) and U.S. Army Corps of Engineers (3)
Extraction method: Drilling, blasting (1)
Processing plant: Larson Plant (1)
10120 Grey Cloud Island Drive
St. Paul Park, MN 55071
Processing method: Crushing, screening, washing (1)
Uses of commodity: #2 Keystone (for drain fields); CA 3 Keystone (for concrete, rail ballast, landscape); #67 Keystone (for concrete, rail ballast); #89 Keystone (for concrete); 1-1/2" base (for road base); #1 base (for road base); aglime (farming); riprap (for erosion control) (1)
Marketing area: Throughout Minnesota and western Wisconsin, concentrated in central Minnesota and the seven county metro area (1)
References: 1) J. L. Shiely Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) U.S. Army Corps of Engineers files
4) Mossler. 1974a, Inver Grove Heights station 176
5) USDL. MSHA mine reference list
6) Schwartz. 1936, p. 198
7) Hogberg. 1969, p. 47
8) Hogberg. 1966, p. 36
9) USBM. [1980], MILS

Company: Bryan Rock Products, Inc. (1,2)
Main commodity: Crushed Carbonate Rock
County: **Washington**
Quarry/pit name: Bayport Quarry (1,2)
Status: Active (1,2)
Location: T 29 R 20 W Sec 20 NW1/4 NE1/4 AND
T 29 R 20 W Sec 15 SE1/4 SE1/4 (1)
Location comments: Bayport nearest town (1)
Description: Dolomitic limestone (1)
Extraction method: Blasting (1)
Processing plant: Bayport Quarry Plant (1)
2938 Quant Ave. N.
Stillwater, MN 55082
Processing method: Crushing, screening (1)
Uses of commodity: Road base, pipe bedding, concrete aggregate, decorative (1)
Marketing area: St. Paul and surrounding areas (1)
References: 1) Bryan Rock Products, Inc. 1988, MN/DNR questionnaire
2) USDL. MSHA mine reference list

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Dresbach Quarry (1)
Status: Active (1)
Township name: Dresbach
Location: T 105 R 4 W Sec 19 NE1/4 NE1/4 (1)

Processing plant: Portable crushing plant (1)
Processing method: Crushing screening (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire

---

Company: Haefs & Sons, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Dresbach Quarry (1-5,7)
Alternate name: Pit No. 2266 (2)
Status: Active (1)
Past operator/owner: Hector Construction Co. (3,5); August Miller (1965), Underdahl (1921) (2)
MN/DOT source no: 85034
Township name: Dresbach
Location: T 105 R 4 W Sec 19 NW1/4 (1)
T 105 R 4 W Sec 19 NE1/4 NW1/4 (2)
T 105 R 4 W Sec 19 SW1/4 NE1/4 NW1/4 (3,4,6)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (4,7)
Description: Limestone (1); upper part of Oneota Fm. (4)
Physical test data: Available from MN/DOT Aggregate Unit (2)
Processing plant: Portable crushing plant (1)
Processing method: Crushing (1)
Uses of commodity: Road rock (1); riprap (2,7)
Marketing area: Within 10-15 miles (1)
References: 1) Haefs & Sons, Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) USBM. [1980], MILS
4) Jirsa; Meyer. 1984, plate 8
5) USDL. MSHA mine reference list
6) Mossler. 1983, station 129
7) Bowles. 1918, p. 194, 198

Company: Botcher Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Humfeld Quarry (1)
Status: Active (1)
Township name: New Hartford
Location: T 105 R 5 W Sec 23 S1/2 (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Riprap, crushed rock, agricultural lime (1)
Marketing area: Houston, Fillmore, and Winona counties (1)
References: 1) Botcher Construction Co. 1989, personal communication

---

Company: Haefs & Sons, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Pickwick Quarry (1-3)
Alternate name: Spouts Springs Quarry (2)
Status: Active (1)
Past operator/owner: Max Braatz Estate (1965) (2)
MN/DOT source no: 85035
Township name: Pleasant Hill
Location: T 105 R 6 W Sec 1 NW1/4 (1)
T 105 R 6 W Sec 1 SW1/4 NW1/4 (2,3)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1)
Description: Dolomite, lower part of Oneota Fm. (1)
Processing plant: Portable processing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Road rock, agricultural lime (1)
Marketing area: Within 10-15 miles (1)
References: 1) Haefs & Sons, Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) Jirsa; Meyer. 1984, plate 8

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Pickwick Quarry (1-3)
Alternate name: Spouts Spring Quarry (2,5)
Status: Active (1)
Past operator/owner: Quarve & Anderson Co. (3); William Lee, Ray McNally (1965) (1)
MN/DOT source no: 85037
Township name: Pleasant Hill
Location: T 105 R 6 W Sec 1 NW1/4 NW1/4 (1-4)
T 105 R 06 W Sec 01 SW1/4 NW1/4 NW1/4 (5)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (3-5)
Description: Lower part of Oneota Fm. (5); dolomitic limestone (3); 40-45 ft face (4)
Physical test data: Available from MN/DOT Aggregate Unit (2), U.S. Army Corps of Engineers (3), and Ref. 5
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) U.S. Army Corps of Engineers files
4) Mossler. 1983, station 119
5) Jirsa; Meyer. 1984, plate 8

Company: Botcher Construction Co. (1)

Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Spout Springs Quarry (1,2)
Status: Active (1)
MN/DOT source no: 85035
Township name: Pleasant Hill
Location: T 105 R 6 W Sec 1 NW1/4 (1,2)
Geologic age: Ordovician
Geologic formation: (Oneota Fm.)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Riprap, crushed rock, agricultural lime (1)
Marketing area: Houston, Fillmore, and Winona counties (1)
References:
1) Botcher Construction Co. 1989, personal communication
2) MN/DOT Aggregate Unit files

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Groth Quarry (1-3)
Status: Active (1)
MN/DOT source no: 85056
Township name: Pleasant Hill
Location: T 105 R 6 W Sec 8 SW1/4 (1)
T 105 R 6 W Sec 8 NE1/4 SW1/4 (2,3)
Location comments: Near Ridgeway (2)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,2)
Description: Lower part of Oneota Fm. (3); Oneota Fm. or possibly the Shakopee Fm., buff colored dolomite (2); see Ref. 2 for section description
Physical test data: Available from MN/DOT Aggregate Unit - ASIS and COPES files (2); also see Ref. 3
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co., 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Jirsa; Meyer. 1984, plate 8

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Frickson Quarry (1-5)
Status: Active (1)
Past operator/owner: Hector Construction Co. (3,5,6); Ben Frickson (1971) (2)
MN/DOT source no: 85071
Township name: Pleasant Hill
Location: T 105 R 6 W Sec 21 SW1/4 NE1/4 (1-5)
T 105 R 6 W Sec 21 NW1/4 SE1/4 (1)
Location comments: Ridgeway nearest town (1); on east side of County Rd. 13 (2)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (2,4)
Description: Oneota dolomite, 70 ft face, medium to thick beds (2); lower part of Oneota Fm. (4)
Physical test data: Available from MN/DOT Aggregate Unit (2); also see Ref. 4
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4) Jirsa; Meyer. 1984, plate 8
5) Hogberg. 1969, p. 42
6) USDL. MSHA mine reference list

Company: Haefs & Sons, Inc. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Frickson Quarry (1)
Alternate name: Campbell Valley Quarry (2,3)
Status: Active (1)
Past operator/owner: Hector Construction Co. (1971) (2); Ben Frickson, owner (1965), D. A. Tiffany (1921) (2)
MN/DOT source no: 85057
Township name: Pleasant Hill
Location: T 105 R 6 W Sec 21 NW1/4 SE1/4 (1-3)
T 105 R 6 W Sec 21 NE1/4 SE1/4 (2)
Location comments: On west side of County Rd. 13 (2)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (2,3)
Description: Oneota dolomite, 30-40 ft face (2); lower part of Oneota Fm. (3)
Physical test data: Available from MN/DOT Aggregate Unit (2); also see Ref. 3
Processing plant: Portable crushing plant (1)
Processing method: Crushing (1)
Uses of commodity: Road rock (1)
Marketing area: Within 10-15 miles (1)
References:
1) Haefs & Sons, Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) Jirsa; Meyer. 1984, plate 8

Company: Botcher Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**

Quarry/pit name: Mueller Quarry (1)
Alternate name: Wyattville Quarry (2,4)
Status: Active (1)
MN/DOT source no: 85-61
Township name: Fremont
Location: T 105 R 9 W Sec 1 (1)
T 105 R 9 W Sec 1 SW1/4 NE1/4 (2,3)
T 105 R 9 W Sec 1 NW1/4 NE1/4 (4)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (2)
Description: Middle part of Oneota Fm. (2)
Physical test data: See Ref. 2 for physical test data
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Riprap, crushed rock, agricultural lime (1)
Marketing area: Houston, Fillmore, and Winona counties (1)
References: 1) Botcher Construction Co. 1989, personal communication
2) Jirsa; Meyer. 1984, plate 8
3) Mossler. 1983, station 85
4) USBM. [1979], MILS

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Enterprise Quarry (1-3,5,6)
Alternate name: Beech/Beach Quarry (2,3)
Status: Active (1)
Past operator/owner: Quarve & Anderson Co. (5,6); George Beech (1965) (2)
MN/DOT source no: 85062
Township name: Fremont
Location: T 105 R 9 W Sec 2 SE1/4 NE1/4 (1)
T 105 R 9 W Sec 2 NW1/4 NE1/4 (2-5)
T 106 R 9 W Sec 35 SW1/4 SE1/4 (1965) (2)
Location comments: Fremont nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (3,4)
Description: Upper part of Oneota Fm. (3)
Physical test data: Available from MN/DOT Aggregate Unit (2); also see Ref. 3
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Jirsa; Meyer. 1984, plate 8
4) Mossler. 1983, station 87
5) USBM. [1979], MILS
6) USDL. MSHA mine reference list

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Buckbee Quarry (1-3,5,6)
Status: Active (1)
Past operator/owner: Quarve & Anderson Co. (5,6); Ralph Buckbee (1971) (1)
MN/DOT source no: 85082
Township name: Fremont
Location: T 105 R 9 W Sec 6 NE1/4 NW1/4 (1-4)
Geologic age: Ordovician
Geologic formation: Platteville Fm. (3,4)
Physical test data: Available from MN/DOT Aggregate Unit (2); also see Ref. 3
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Jirsa; Meyer. 1984, plate 8
4) Mossler. 1983, station 71
5) USBM. [1979], MILS
6) USDL. MSHA mine reference list

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: McGuire Quarry (1-3)
Alternate name: Troy Quarry (2,3)
Status: Active (1)
Past operator/owner: McGuire (1970) (2)
MN/DOT source no: 85080
Township name: Saratoga
Location: T 105 R 10 W Sec 30 NW1/4 NE1/4 (1)
T 105 R 10 W Sec 30 SW1/4 NW1/4 NE1/4 (3,4)
Location comments: Troy nearest town (1); quarry located between Hwy. 74 and County Rd. 6 (5)
Geologic age: Ordovician
Geologic formation: Shakopee Fm. (3,5); Willow River Mbr. (5)
Description: Dolomite (5); see Ref. 5 for detailed stratigraphic section
Physical test data: Available from MN/DOT Aggregate Unit (2); also see Ref. 3
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files

3) Jirsa; Meyer. 1984, plate 8
4) Mossler. 1983, station 29
5) Austin. 1971, p. 202-205

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Yeadke Quarry (1)
Alternate name: Witoka Quarry (2)
Status: Active (1)
USGS quadrangle: Witoka
Township name: Homer
Location: T 106 R 6 W Sec 20 NE1/4 NE1/4 (1-3)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (2,3)
Description: Lower part of Oneota Fm. (2); 40-45 ft face (3)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) Jirsa; Meyer. 1984, plate 8
3) Mossler. 1983, station 133

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: 43 Quarry (1)
Alternate name: West Burns Quarry (2); Quarve & Anderson Quarry (4)
Date opened: 1940's (1)
Status: Active (1)
Past operator/owner: Quarve & Anderson Co. (4); G & Q Construction (1971) (3)
MN/DOT source no: 85040
Township name: Wilson
Location: T 106 R 7 W Sec 16 SE1/4 NW1/4 (1-4)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,3)
Description: Dolomite (1); dolomitic limestone, medium to thick bedded, white crystalline, weathers to buff (3)
Extraction method: Blasting; quarry benched, top bench 60 ft, bottom 56 ft (1)
Processing plant: Portable crushing plant (2)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Winona County (1)
References: 1) Mathy Construction Co., 1988, MN/DNR questionnaire
2) Patterson Quarries. 1988, personal communication
3) MN/DOT Aggregate Unit files
4) USBM. [1980], MILS

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Gudmundson Quarry (1)
Alternate name: Schoeniger Valley Quarry (2)
Status: Active (1)
MN/DOT source no: 85084
Township name: Warren
Location: T 106 R 8 W Sec 16 SW1/4 (1)
T 106 R 8 W Sec 16 NW1/4 SW1/4 (2,3,5)
Location comments: The Arches nearest town (1); see Ref. 2, fig. 8 for location map
Geologic age: Ordovician
Geologic formation: Oneota Fm. (2,3)
Description: Upper part of Oneota Fm. (3)
Physical test data: Available from MN/DOT Aggregate Unit (4)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) Hobbs. 1987, p. 169, 170
3) Jirsa; Meyer. 1984, plate 8
4) MN/DOT Aggregate Unit files
5) Mossler; Book. 1981, station 43

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Fabian Quarry (1)
Date opened: 1950's (1)
Status: Active (1)
MN/DOT source no: 85-67
Township name: St. Charles
Location: T 106 R 10 W Sec 11 NW1/4 NW1/4 (1)
Location comments: St. Charles nearest town (1)
Geologic age: Ordovician
Geologic formation: Shakopee Fm. (1,3)
Description: Dolomite, 50 ft face (1)
Extraction method: Drilling, blasting (1)
Processing plant: Portable crushing plant (2)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Winona County (1)

References: 1) Mathy Construction Co. 1988, MN/DNR questionnaire
2) Patterson Quarries. 1988, personal communication
3) Jirsa; Meyer. 1984, plate 8

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Woodward Quarry (1-3)
Status: Active (1)
MN/DOT source no: 85079
Township name: St. Charles
Location: T 106 R 10 W Sec 24 SE1/4 SW1/4 (1)
T 106 R 10 W Sec 24 SW1/4 SW1/4 (2-4)
Location comments: Utica nearest town (1)
Geologic age: Ordovician
Geologic formation: Platteville Fm. (3,4)
Physical test data: Available from MN/DOT Aggregate Unit (2); also see Ref. 3
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Jirsa; Meyer. 1984, plate 8
4) Mossler. 1983, station 65

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Bailey Quarry (1)
Status: Active (1)
Township name: St. Charles
Location: T 106 R 10 W Sec 31 SE1/4 NE1/4 (1)
Location comments: St. Charles nearest town (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire

---

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Bronk Quarry (1)
Status: Active (1)
Township name: Winona
Location: T 107 R 7 W Sec 36 NE1/4 NE1/4 (1)
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References: 1) Mathy Construction Co. 1989, MN/DNR questionnaire

---

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Meyer Quarry (1)
Alternate name: Straight Valley Quarry (3,4); Roverud Rollingstone Quarry (3,4)
Date opened: 1950's (1)
Status: Active (1)
Past operator/owner: Roverud (3); Joseph Ries (1965) (4)
MN/DOT source no: 85045
Township name: Norton
Location: T 107 R 9 W Sec 4 NW1/4 SE1/4 (1)
T 107 R 9 W Sec 4 SE1/4 NW1/4 SE1/4 (3)
Location comments: Altura nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,3)
Description: Dolomite, 75 ft face (1); middle part of Oneota Fm. (3)
Physical test data: Available from MN/DOT Aggregate Unit (4); also see Ref. 3
Extraction method: Drilling, blasting (1)
Processing plant: Portable crushing plant (2)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
Marketing area: Winona County (1)
References: 1) Mathy Construction Co. 1988, MN/DNR questionnaire
2) Patterson Quarries. 1988, personal communication
3) Jirsa; Meyer. 1984, plate 8
4) MN/DOT Aggregate Unit files

Company: Patterson Quarries, Div. of Mathy Construction Co. (1)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Silo Quarry (1-5)
Alternate name: Dorn Quarry (2,3)
Status: Active (1)
Past operator/owner: Quarve & Anderson Co. (4,5); Egar Dorn (1966) (2)
MN/DOT source no: 85055
Township name: Norton
Location: T 107 R 9 W Sec 35 SW1/4 SW1/4 (1)

T 107 R 9 W Sec 35 SE1/4 SW1/4 (3,4,6)
T 107 R 9 W Sec 35 SW1/4 SE1/4 (2)

Geologic age: Ordovician
Geologic formation: Oneota Fm. (3)
Description: Middle part of Oneota Fm. (3)
Physical test data: Available from MN/DOT Aggregate Unit (2); also see Ref. 3
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Jirsa; Meyer. 1984, plate 8
4) USBM. [1980], MILS
5) USDL. MSHA mine reference list
6) USGS. 1972, Rollingstone quadrangle

Company: Patterson Quarries, Div. of Mathy Construction Co. (1,4-6)
Main commodity: Crushed Carbonate Rock
County: **Winona**
Quarry/pit name: Kreidermacher Quarry (1-5)
Alternate name: Patterson Quarry (6)
Status: Active (1)
Past operator/owner: Kreidermacher (1967) (2)

MN/DOT source no: 85076
Township name: Mount Vernon
Location: T 108 R 9 W Sec 34 SW1/4 NW1/4 NE1/4 (1) AND
T 108 R 9 W Sec 34 SE1/4 NE1/4 NW1/4 (1,3,7)
T 108 R 9 W Sec 34 NW1/4 (2,6)
T 108 R 9 W Sec 28 SE1/4 SE1/4 (5)
Location comments: Oakridge nearest town (1)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (3)
Description: Middle part of Oneota Fm. (3)
Physical test data: Available from U.S. Army Corps of Engineers (6) and MN/DOT Aggregate Unit (2); also see Ref. 3
Processing plant: Portable crushing plant (1)
Processing method: Crushing, screening (1)
Uses of commodity: Crushed rock, agricultural lime, riprap (1)
References:
1) Mathy Construction Co. 1989, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) Jirsa; Meyer. 1984, plate 8
4) USDL. MSHA mine reference list
5) USBM. [1980], MILS
6) U.S. Army Corps of Engineers files
7) USGS. 1972, Altura quadrangle

Company: Ortonville Stone Co. (1,2,4,6)
Main commodity: Crushed Granite
Other commodities: Dimension Granite
County: **Big Stone**
Quarry/pit name: Ortonville Stone Co. Quarry (1)
Alternate name: Ortonville Quarry and Mill (2)
Date opened: 1971 (1)
Status: Active (1)
USGS quadrangle: Ortonville
Location: T 121 R 46 W Sec 26 S1/2 (2)
T 121 R 46 W Sec 26 NE1/4 SW1/4 (4)
Location comments: Nearest town is Ortonville (1); 2720 ft west and 2920 ft south of NE corner (5); Sec. 26, Gov. Lots 1-4 (3); see Ref. 7, plate 12 for location map; section 26 (1)
Geologic age: Archean
Geologic formation: Ortonville Granite (5,7)
Description: Medium-grained light pink granite (4); red medium granitoid facies of leucogranite (5)
Modal Analyses: potash feldspar 42%, plagioclase 22%, quartz 31%, biotite 4%, accessories (magnetite, apatite, zircon, epidote, muscovite) 1% (5); see Ref. 7, p. 77 for further modal analyses
Extraction method: Drill, blast (1)
Processing plant: Ortonville Stone Co. (1)
Box 67
Ortonville, MN 56278
Dale Aesoph, Plant Manager
612-839-6131
Uses of commodity: Crushed rock for concrete, asphalt, railroad ballast, bank protection stone, precast panels (1)
Marketing area: Minnesota, South Dakota, and elsewhere for certain products (1)
References:
1) Ortonville Stone Co. 1988, MN/DNR questionnaire
2) USBM. [1979], MILS
3) Big Stone County Assessor. 1989, personal communication
4) U.S. Army Corps of Engineers files
5) Lund. 1956, p. 1487
6) USDL. MSHA mine reference list
7) Lund. 1950, p. 77

Company: Ferweda General Contracting (1)
Main commodity: Crushed Granite
County: **St. Louis**
Status: Active (1)
Location: T 61 R 20 W Sec 23 NE1/4 NE1/4 (1)
Description: Blue granite (1)
Uses of commodity: Crushed aggregate, ornamental stone (1)
Remarks: Started crushing stockpiled stone in 1988 (1)
References: 1) Eugene Ferweda. 1989, personal communication

Company: Meridian Aggregate Co. (1)
Main commodity: Crushed Granite
County: **Stearns**
Quarry/pit name: St. Cloud Quarry (1)
Alternate name: Shiely Quarry (3); Petters Quarry (2); Shiely-Petters Crushed Stone Co., Inc. (4,5)
Date opened: 1947 (1)
Status: Active (1)
Past operator/owner: J. L. Shiely Co. (2); Shiely-Petters Crushed Stone Co. Inc. (4,5)
Location: T 124 R 28 W Sec 18 NE1/4 SE1/4 AND
T 124 R 28 W Sec 17 NW1/4 SW1/4 (3)
Location comments: 1 mile west of St. Cloud city limits in Waite Park (2); sections 18 and 17 (1)
Description: Granite (1-3)
Extraction method: Drill and blast (1)
Processing method: Crushed and screened (1)
Uses of commodity: Crushed aggregate for roads, concrete, railroad ballast (1)
References:
1) Meridian Aggregate Co. 1988, MN/DNR questionnaire
2) U.S. Army Corps of Engineers files
3) MGS. [1978-1979?]
4) Hogberg. 1969, p. 47
5) Hogberg. 1966, p. 36

Company: Meridian Aggregate Co. (1)
Main commodity: Crushed Granite
County: **Yellow Medicine**
Quarry/pit name: Yellow Medicine Quarry (1)
Alternate name: Green Quarry(2,3,5,6,8,10,12)
Status: Active (1)
Past operator/owner: Green Co. (2,3,5,6,8,10,11,14,15,16)
MN/DOT source no: 87002
USGS quadrangle: Granite Falls
Location: T 116 R 39 W Sec 33 NW1/4 NW1/4 (9,13,15,16)
T 116 R 39 W Sec 32 NE1/4 NE1/4 (13)
T 116 R 39 W Sec 29 S1/2 SE1/4 (14)
T 116 R 39 W Sec 29 NW1/4 SE1/4 (14)
Location comments: Northwest edge of Granite Falls (2); in sections 29, 32, and 33 (1)
Geologic age: Archean
Geologic formation: Montevideo Gneiss (4)
Description: Hard medium-grained pink and gray gneiss (6); see Ref. 2, 7, and 9 for modal analyses
Physical test data: Available from MN/DOT Aggregate Unit and U.S. Army Corps of Engineers (5,6)
Processing plant: Meridian Aggregate Yellow Medicine Quarry (1)

Box 129
Granite Falls, MN 56241

Gordon Phipps, Manager
612-564-2125

Processing method: Crushed and screened (1)

Uses of commodity: Railroad ballast, concrete stone, asphalt stone (1)

Marketing area: Minnesota (1)

Remarks: There is also an abandoned quarry at this location (10)

References:
1) Meridian Aggregate Co. 1988, MN/DNR questionnaire
2) Goldich and others. 1980a, p. 21-24, 42
3) USBM. [1980], MILS
4) Goldich and others. 1970, p. 3675
5) MN/DOT Aggregate Unit files
6) U.S. Army Corps of Engineers files
7) Himmelberg. 1968, p. 6
8) USDL. MSHA mine reference list
9) Bauer. 1974, p. 50, 53, 108
10) Farhat. 1975, p. 173
11) Goldich and others. 1961, p. 179
12) MGS. [1978-1979?]
13) Meridian Aggregate Co. 1989, personal communication
14) Yellow Medicine County Assessor. 1989, personal communication
15) Hogberg. 1969, p. 41
16) Hogberg. 1966, p. 32
17) Parham and others. 1966?, p. 20-22

Company: New Ulm Quartzite Quarries, Inc. (1-3,6,8-13)
Main commodity: Crushed Quartzite
County: **Nicollet**
Quarry/pit name: New Ulm Quartzite Quarry (1,3)
Alternate name: New Ulm Quarry (2)
Date opened: 1861, current company reopened in 1955 (1)
Status: Active since 1955, previously active 1861-1920's (1)
Past operator/owner: Lost Stone Co. (1); New Ulm Stone Co. (1,18)
MN/DOT source no: 52003
Township name: Courtland
Location: T 110 R 30 W Sec 35 (1, 17)
T 110 R 30 W Sec 35 SW1/4 SW1/4 (2,11)
T 110 R 30 W Sec 35 SE1/4 SW1/4 (4,5)
T 110 R 30 W Sec 35 SW1/4 (6,8,12)
Location comments: Near New Ulm (1); see Ref. 14, plate 2 and Ref. 15, fig. 6 for location maps; four quarries are shown in the S1/2 SW1/4, Sec. 35 in Ref. 14, plate 2
Geologic age: Middle Proterozoic
Geologic formation: Sioux Quartzite (6-8,14-17)
Description: Quartzite (1)
Chemical analyses: 96% silica (1); see Ref. 5 for further analyses

Physical test data: Available from the U.S. Army Corps of Engineers (4) and MN/DOT Aggregate Unit (5)
Extraction method: Open surface (1)
Processing plant: Processing plant, quarry, and office at same location (1)
Uses of commodity: Concrete aggregate, bituminous aggregate, riprap, seal coat chips, gannister, poultry grit (1)
Trade names: "Cherry Stone" trade name of poultry grit (1)
Marketing area: National and Canada (1)
References:

1) New Ulm Quartzite Quarries, Inc. 1988, personal communication
2) USBM. [1979], MILS
3) USDL. MSHA mine reference list
4) U.S. Army Corps of Engineers files
5) MN/DOT Aggregate Unit files
6) Parham. 1970, p. 51
7) Austin. 1972, p. 254
8) Parham. 1972, p. 62
9) Sikich. 1959
10) Hill; West. 1985, p. 13
11) Hogberg. 1969, p. 44
12) Hogberg. 1966, p. 35
13) Hogberg. 1964, p. 29
14) Miller. 1961, p. 8, 9, 32
15) Baldwin. 1951, fig. 6
16) Webers; Austin. 1972, p. 86
17) Cooley. 1911, p. 14
18) Bowles. 1918, p. 202

Company: Bowman Construction Co. (1-4)

Main commodity: Crushed Schist

County: **Koochiching**

Quarry/pit name: Ranier Quarry (1)

Alternate name: Laidlow Quarry (1); Pit No. 519 (2); The Rock Quarry (3,4)

Status: Active (1)

Location: T 71 R 23 W Sec 32 NW1/4 (1)

T 71 R 23 W Sec 31 NE1/4NE1/4 (3)

Location comments: Near Ranier (1); just east of International Falls (2)

Description: Dark gray to black biotite schist, with some thin stringers of white quartz (2); the rock is a fine grained biotite schist consisting primarily of quartz and biotite with minor amounts of phyllite and graywacke present (1)

Physical test data: Available from MN/DOT Aggregate Unit - COPES file (2)

Extraction method: Drill, shoot and crush (1)

Uses of commodity: Crushed rock for concrete, bituminous aggregate (2)

References:

1) Bowman Construction Co. 1988, MN/DNR questionnaire
2) MN/DOT Aggregate Unit files
3) USBM. [1979], MILS
4)USDL.MSHA mine reference list

Company: Arrowhead Blacktop Co. (1,2,4,5,14)
Main commodity: Crushed Trap Rock
County: **St. Louis**
Quarry/pit name: Beck's Road Quarry (1)
Alternate name: Zenith Dredge Quarry (2,3,15); Zenith Quarry (14)
Status: Active (1)
Past operator/owner: Zenith Dredge Co. (2,12)
MN/DOT source no: 69011
Location: T 49 R 15 W Sec 32 SE1/4 NE1/4 (2,4,5,8)
T 49 R 15 W Sec 32 SW1/4 NE1/4 (6)
T 49 R 15 W Sec 33 SW1/4 NW1/4 (5)
T 49 R 15 W Sec 33 SE1/4 NW1/4 (4)
Location comments: Ely's Peak (7,10,11,13); see Ref. 8, p. 76 for location map; section 32 (1)
Geologic age: Middle Proterozoic
Description: Basalt (1,3-6,8,10,12,13); gabbro (1,14); diabase (3); see Ref. 14 for further lithologic description
Physical test data: Specific gravity 2.87 (6); see Ref. 14, p. 7 for further test data; test data available from MN/DOT Aggregate Unit - COPES file (9)
Processing plant: Beck's Road Plant (at quarry location) (1)
Processing method: Crushing, screening (1)
Uses of commodity: Bituminous aggregate, construction aggregate (1)
Remarks: Quarry mined for over 100 years (1988) (14)
References:
1) Arrowhead Blacktop Co. 1989, personal communication
2) USBM. [1979], MILS
3) U.S. Army Corps of Engineers files
4) Hogberg. 1969, p. 39
5) Hogberg. 1966, p. 31
6) Bleifuss. 1952, p. xvi, viii
7) Schwartz. 1949, p. 127
8) Green and others. 1977, p. 74-88
9) MN/DOT Aggregate Unit files
10) Taylor. 1963, p. 11
11) Green. 1972, p. 331
12) Sikich. 1959, p. 543
13) MN Dept. of Conservation. 1964a, p. 40
14) Warzyn. 1988
15) Sikich. 1959, p. 531

Company: Del Zotto Manufacturing Co., Inc. (1-4)
Main commodity: Crushed Trap Rock
County: **St. Louis**
Quarry/pit name: Del Zotto Quarry (1,3,4)
Status: Active (1)
MN/DOT source no: 69500
Location: T 49 R 15 W Sec 34 (2,3)
Location comments: Located in West Duluth (1)
Description: Basalt (1); gabbro (4); see Ref. 4 for lithologic description
Physical test data: Tests show high abrasion resistance and high hardness (1); test data available from MN/DOT Aggregate Unit - COPES file (2); see Ref. 4, p. 6 for further test data
Processing plant: Stationary plant located at quarry (1)
Processing method: Crushing, screening, washing (1)
Uses of commodity: Concrete aggregate, bituminous aggregate, railroad ballast, riprap (1)
Marketing area: Greater Duluth area (1)
Remarks: Very durable rock (1)
References:
1) Del Zotto Manufacturing Co., Inc. 1989, personal communication
2) MN/DOT Aggregate Unit files
3) MN/DOT Duluth District. 1989, personal communication
4) Warzyn. 1988

Company: Mankato-Kasota Stone, Inc. (1-3)
Main commodity: Dimension Carbonate Rock
Other commodities: Crushed Carbonate Rock, Natural Cement
County: **Blue Earth**
Quarry/pit name: Jefferson Quarry (1-4)
Date opened: 1868 (7)
Status: Temporarily inactive (1988) (2)
Past operator/owner: A. Jefferson & Sons (1911) (4,6); Adam Jefferson (1884) (7)
Township name: Mankato
Location: T 108 R 26 W Sec 6 SW1/4 NW1/4 LOT 2 (2)
T 108 R 26 W Sec 6 NW1/4 (3,7)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1,5); Shakopee Fm. (7)
Description: Oneota dolomite (1); see Ref. 4 for brief section description
Physical test data: Contact Mankato-Kasota Stone, Inc. for physical test data (1)
Extraction method: Plug and feather (1)
Processing plant: Mankato-Kasota Stone, Inc. (1)
820 North Willow Street
Mankato, MN 56001
Processing method: Dimensional limestone fabricator (1)
Uses of commodity: Cut stone 90%, split face 10% (1); past uses include: building stone, flagging stone, natural cement (1918) (4); bridge masonry, cut stone for window caps and sills, lime (1884) (7)
Trade names: Mankato-Kasota Stone: Pink Buff, Gray, Cream, and Golden Buff (1)
Marketing area: U.S.A. (1)
Remarks: Mankato-Kasota Stone, Inc. is in the process of reopening quarry (1988) (2)
References:
1) Mankato-Kasota Stone, Inc. 1988, MN/DNR questionnaire
2) Mankato-Kasota Stone, Inc. 1989, personal communication
3) Blue Earth County Zoning. 1989, personal communication
4) Bowles. 1918, p. 156
5) Thiel; Dutton. 1935, p. 128
6) Cooley. 1911, p. 10
7) Winchell and others. 1884, p. 447-449

Company: Mankato-Kasota Stone, Inc. (1-8,12)
Main commodity: Dimension Carbonate Rock
Other commodities: Crushed Carbonate Rock
County: **Blue Earth**
Quarry/pit name: Mankato Quarry (1)
Alternate name: Mankato Stone Quarry (5,10-12); Coughlin Quarry (9,11); T. R. Coughlan Quarry (13-18)
Status: Active (1)
Past operator/owner: Mankato Stone Co. (10,14); Babcock Co. (2,10-12); T. R. Coughlan Co. (13-18)
Township name: Mankato
Location: T 108 R 26 W Sec 7 SW1/4 NE1/4 (2-6)
T 108 R 26 W Sec 7 NW1/4 NW1/4 (11)
Geologic age: Ordovician
Geologic formation: Oneota Fm. (1-6,9,10,13-17)
Description: Oneota dolomite (1); see Refs. 3, 6, 13-17 for stratigraphic sections and further descriptions
Chemical analyses: See Refs. 9, 14-16 for chemical analyses
Physical test data: Contact Mankato-Kasota Stone, Inc. for physical test data (1)
Extraction method: Plug and feather (1)
Processing plant: Mankato-Kasota Stone, Inc. (1)
820 North Willow St.
Mankato, MN 56001
Processing method: Dimensional limestone fabricator (1)
Uses of commodity: Cut stone 90%, split face 10% (1); past uses include: bridge rock, building stone, crushed rock, riprap, lime, cut stone (17); macadam, concrete (18)
Trade names: Mankato-Kasota Stone: Pink Buff, Gray, Cream, and Golden Buff (1)
Marketing area: U.S.A. (1)
References:
1) Mankato-Kasota Stone, Inc. 1988, MN/DNR questionnaire
2) Mankato-Kasota Stone, Inc. 1989, personal communication
3) Austin. 1971, p. 175-177
4) Mossler. 1975, station 291
5) U.S. Army Corps of Engineers files
6) Stubblefield. 1971, p. 141-143
7) Hogberg. 1969, p. 50
8) Hogberg. 1966, p. 39
9) Stauffer. 1950, p. 21, 22, 27
10) MN/DOT Aggregate Unit files
11) USBM. [1979], MILS
12) USDL. MSHA mine reference list
13) Emmons; Grout. 1943, p. 76
14) Stauffer; Thiel. 1933, p. 42-44, 71, 74
15) Thiel; Dutton. 1935, p. 119-123
16) Stauffer; Thiel. 1914, p. 116, 119, 126
17) Bowles. 1918, p. 157, 158
18) Cooley. 1911, p. 11

Company: Vetter Stone Co. (1-11)
Main commodity: Dimension Carbonate Rock
County: **Blue Earth**
Quarry/pit name: Vetter Stone Co. Main Quarries (1-4,6,11)
Alternate name: Vetter No. 1 Quarry (5)
Date opened: 1954 (1)
Status: Active (1)
MN/DOT source no: 07003
Location: T 109 R 26 W Sec 20 SW1/4 SW1/4 (1,2,8)
T 109 R 26 W Sec 20 SW1/4 NE1/4 SW1/4 (11)
Location comments: Several "quarry pits" in this area (2); 3-1/8 map miles north of Mankato on local road no. 5 (11)
Geologic age: Ordovician

Geologic formation: Oneota Fm. (1,7,11)

Description: Dolomite, pink buff, cream gray and variations, fine grained and fine textured (1); see Ref. 11 for detailed lithologic description

Physical test data: Available from U.S. Army Corps of Engineers (5) and MN/DOT Aggregate Unit - COPES files (6)

Extraction method: Overburden blasted, drilled, and quarry chain saw (1)

Processing plant: Vetter Stone Co. (main office) (1)

Processing method: Sawing, honing, polishing and other hand and machine cutting methods (1)

Uses of commodity: Splitter stone and cut stone used for building stone (1)

Trade names: Golden Buff Minnesota Stone, Ka-Kato Cream Minnesota Stone, Minnesota Cathedral Stone, Minnesota Plains Stone, Minnesota Quarry Creek Stone, Minnesota Ranch Stone, Minnesota River Stone, Minnesota Skyrose Stone, Minnesota Travernelle (Stone), Minnesota Valley Stone, Northern Hills Stone, Northern Forest Stone, Northern Frontier Stone, Northern Tan Minnesota Stone, Silver Gray Minnesota Stone, Veined Pink Minnesota Stone (2)

Marketing area: Nationally and internationally (1)

References:
1) Vetter Stone Co. 1988, MN/DNR questionnaire
2) Vetter Stone Co. 1989, personal communication
3) USBM. [1979], MILS
4) USDL. MSHA mine reference list
5) U.S. Army Corps of Engineers files
6) MN/DOT Aggregate Unit files
7) Mossler. 1975, station 298
8) Hogberg. 1969, p. 50
9) Hogberg. 1966, p. 40
10) Humphey. 1958, p. 55, 56
11) Stubblefield. 1971, p. 139, 140

Company: Vetter Stone Co. (1-3)

Main commodity: Dimension Carbonate Rock

County: **Le Sueur**

Quarry/pit name: Far North Quarries (1)

Alternate name: Caroline & Moses Quarry (4,5); Kasota Quarries (8)

Date opened: Approx. 1920 (1)

Status: Active (1)

Past operator/owner: Babcock Stone Co. (3-8); Mankato Stone Co. (4); Kasota Stone Co., Ed Swartout (10)

Location: T 109 R 26 W Sec 5 SE1/4 SW1/4 AND
T 109 R 26 W Sec 8 E1/2 NW1/4 (1)
T 109 R 26 W Sec 8 SE1/4 SE1/4 NW1/4 (3)
T 109 R 26 W Sec 8 N1/2 S1/2 NW1/4 (4)

Geologic age: Ordovician

Geologic formation: Oneota Fm. (1,3,10)

Description: Dolomite, pink buff, cream gray and variations, fine grained and fine textured (1); see Ref. 3 for lithologic section description

Physical test data: Available from U.S. Army Corps of Engineers (10)

Extraction method: Blasting and shovel overburden, drill and chain saw (1)

Processing plant: Vetter Stone Co. (main office) (1)

Processing method: Sawing, honing, polishing and other hand and machine cutting methods (1)

Uses of commodity: Splitter stone and cut stone used as building stone (1)

Trade names: Northern Buff Minnesota Stone, Northern Gray Minnesota Stone, Northern Pink Minnesota Stone (2); in the past, stone from this quarry was called Kasota Stone in pink, buff, or cream (2); "Kasota Stone" (8)

Marketing area: Nationally and internationally (1)

Remarks: Several "quarry pits" in this area (2,3)

References:
1) Vetter Stone Co. 1988, MN/DNR questionnaire
2) Vetter Stone Co. 1989, personal communication
3) Stubblefield. 1971, p. 137, 138
4) USBM. [1979], MILS
5) USDL. MSHA mine reference list
6) Hogberg. 1969, p. 48
7) Hogberg. 1966, p. 37
8) MN/DOT Aggregate Unit files
9) U.S. Army Corps of Engineers files

Company: Vetter Stone Co. (1-5)

Main commodity: Dimension Carbonate Rock

Other commodities: Crushed Carbonate Rock

County: **Le Sueur**

Quarry/pit name: North Quarries (1-5)

Date opened: Approx. 1960 (1)

Status: Active (1)

Location: T 109 R 26 W Sec 17 E1/2 NW1/4 (1)

Geologic age: Ordovician

Geologic formation: Oneota Fm. (1,3)

Description: Dolomite, pink buff, cream gray and variations, fine grained and fine textured (1); see Ref. 3 for stratigraphic section description

Physical test data: Available from MN/DOT Aggregate Unit (3)

Extraction method: Blasting and shovel overburden, drill and chain saw (1)

Processing plant: Vetter Stone Co. (main office) (1)

Processing method: Sawing, honing, polishing and other hand and machine cutting methods (1)

Uses of commodity: Splitter stone and cut stone used as building stone (1)

Trade names: Glacier Buff Minnesota Stone, Northern Cream Minnesota Stone, Northern Pink Buff Minnesota Stone, Northern Gray Minnesota Stone (2)

Marketing area: Nationally and internationally (1)

Remarks: Several "quarry pits" in this area (2)

References:
1) Vetter Stone Co. 1988, MN/DNR questionnaire
2) Vetter Stone Co. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) USDL. MSHA mine reference list
5) USBM. [1979], MILS

Company: Biesanz Stone Co., Inc. (1-4,6,7,10-13)

Main commodity: Dimension Carbonate Rock

Other commodities: Crushed Carbonate Rock

County: **Winona**

Quarry/pit name: Biesanz Stone Quarry (1,2,10-12)

Alternate name: Biesanz Quarry (3-6,13); Winona Quarry (6,7)

Date opened: 1906 (1)

Status: Active (1)

Past operator/owner: Winona Rock Products produced crushed stone for Biesanz Stone Co., Inc. (1979) (6)

MN/DOT source no: 85042

USGS quadrangle: Winona West

Township name: Winona

Location: T 107 R 7 W Sec 19 (1)
T 107 R 7 W Sec 19 SW1/4 (3-6,8-10,13)
T 107 R 7 W Sec 19 SW1/4 NE1/4 (14)
T 107 R 7 W Sec 19 NW1/4 SE1/4 (6)

Location comments: Quarry on a bluff facing east over the Minnesota River Valley, three miles north (northwest) of Winona on Hwy. 61 (10)

Geologic age: Ordovician

Geologic formation: Oneota Fm. (3,5,8-13)

Description: Dolomitic limestone, buff/grey/off-white; mostly solid with small fissures, resembling travertine (1); see Refs. 10-13 for stratigraphic sections and for descriptions and history of the quarry

Chemical analyses: See Refs. 5, 12, and 13 for chemical analyses

Physical test data: Absorption 3.8%, bulk density 159.7 PCF, compressive strength 15,100 psi, flexural strength 1,270 psi (1); test data available from MN/DOT Aggregate Unit (3) and U.S. Army Corps of Engineers (4)

Extraction method: Drilling, blasting for crushed rock, channeling for dimensional limestone blocks (1)

Processing plant: Biesanz Stone Co., Inc. (1)

Processing method: Diamond saws (1)

Uses of commodity: Building veneers (1); crushed rock (2); building stone (3,11); agricultural lime (5,11)

Trade names: Winona "Travertine" (1)

Marketing area: National (1)

Remarks: Crushed rock, from above the dimension stone level, is being removed by a private contractor (2)

References:
1) Biesanz Stone Co., Inc. 1988, MN/DNR questionnaire
2) Biesanz Stone Co., Inc. 1989, personal communication
3) MN/DOT Aggregate Unit files
4) U.S. Army Corps of Engineers files
5) Jirsa; Meyer. 1984, plate 8
6) USBM. [1979], MILS
7) USDL. MSHA mine reference list
8) Mossler; Book. 1981, station 167
9) Mossler. 1983, station 167
10) Stubblefield. 1971, p. 144-147
11) Thiel; Dutton. 1935, p. 130-134
12) Stauffer; Thiel. 1933, p. 50, 51, 71, 74
13) Stauffer; Thiel. 1914, p. 116, 119, 120, 221
14) Mossler. field notes on Winona West quadrangle

Company: Cold Spring Granite Co. (6)
Main commodity: Dimension Granite
Other commodities: Crushed Granite
County: **Big Stone**
Quarry/pit name: Agate Quarry (1,2,6)
Status: Intermittently active (2); active (6)
USGS quadrangle: Ortonville
Location: T 121 R 46 W Sec 22 NE1/4 SW1/4 SE1/4 (1)
T 121 R 46 W Sec 22 SE1/4 SW1/4 (5,6)
Location comments: Ortonville (7)
Description: Brownish red, medium grained (7)
Processing plant: Cold Spring Granite Co. (at Cold Spring office)
Uses of commodity: Dimension stone, crushed and broken (1)
References:
1) USBM. [1979], MILS
2) USDL. MSHA mine reference list
3) Big Stone County Assessor. 1989, personal communication
4) Hogberg. 1969, p. 48
5) Hogberg. 1966, p. 37
6) USDL. MSHA Duluth Field Office, 1989, personal communication
7) National Building Granite Quarries Association, Inc. 1988, p. 6, 7

Company: Field Granite International, Ltd. (1)
Main commodity: Dimension Granite
County: **Lac Qui Parle**
Quarry/pit name: Bellingham Quarry (1)
Alternate name: Dewar Quarry (5); View Quarry (2)
Status: Intermittently active (1)
Past operator/owner: Georgia Field, Inc. (4); Bellingham Granite Co. (8,9)
USGS quadrangle: Bellingham
Location: T 120 R 45 W Sec 16 NE1/4 SE1/4 SE1/4 (2)
Location comments: Nearest town Bellingham (1,8,9); see Ref. 6, plate 11 for location map
Geologic age: Archean
Geologic formation: Bellingham Granite (3,7); Ortonville Granite (3,5,6)
Description: "Medium grained granite with a mottled reddish-brown color. Mottling is due to primary igneous flow fabrics in the presence of creamy white feldspar crystals. Black mica is the main dark constituent in the stone. Stone turns from dark to medium variegation." (1)

Modal Analyses: potash feldspar 51%, plagioclase 17%, quartz 23%, biotite 4%, accessories (magnetite, apatite, zircon, epidote, muscovite) 1% (5)

Chemical analyses: See Ref. 3, table 25 for chemical analyses
Extraction method: Drilling, burning, blasting (1)
Uses of commodity: Rough granite, random sized saw blocks, memorials, building facing (1)
Trade names: Bellingham Granite (1)
Marketing area: U.S.A. (1)
References:
1) Field Granite International, Ltd. 1988, MN/DNR questionnaire
2) USBM. [1979], MILS
3) Goldich and others. 1961, p.129, 145, 146, 179
4) USDL. MSHA mine reference list
5) Mangen. 1956, p. 7, 11, 12
6) Lund. 1950, p. 51
7) Sloan. 1964, p. 15, 47
8) Hogberg. 1969, p. 48
9) Hogberg. 1966, p. 37

Company: Cold Spring Granite Co. (14)
Main commodity: Dimension Granite
County: **Mille Lacs**
Quarry/pit name: Diamond Gray Quarry (1,3)
Status: Intermittently active (3); active (14)
MN/DOT source no: 48-1
USGS quadrangle: Isle SW
Location: T 41 R 25 W Sec 3 SW1/4 SE1/4 NE1/4 (1)
T 41 R 25 W Sec 3 NE1/4 NE1/4 (11,12)
Location comments: About 5 miles SE of Wahkon, located along a bend in the Knife River (4); about 5 miles south of Isle (10,13); junction of County Hwys. 27 and 156, south of Isle (14)
Geologic age: Early Proterozoic
Geologic formation: Isle Granite (2)
Description: The quarry contains granites of two types. An older, light pinkish-gray, porphyritic facies characterized by plagioclase phenocrysts as much as 2.5 cm. long. This facies contains 40-45% sodic plagioclase, 29-32% quartz, 16-20% K-feldspar, 8-9% biotite and trace amounts of augite. (2)

The quarry also contains a younger, light-gray, fine to medium-grained facies that resembles the Warman Granite. It is generally equigranular and structureless except for scattered small, blocky inclusions of biotite schist. It is fairly homogenuous and consists of 25-35% sodic plagioclase, 20-30% K-feldspar (dominantly microcline), 25-40% quartz and 1-10% biotite. (2)

Modal Analyses: quartz 31%, oligoclase-andesine 34%, microcline 20%, biotite 14%, accessories (apatite, opaque, zircon) generally less than 0.5% (8)

See Refs. 2, 4, 5, and 8 for additional lithologic descriptions

Physical test data: Available from U.S. Army Corps of Engineers and MN/DOT Aggregate Unit (6,7)
Processing plant: Cold Spring Granite Co. (at Cold Spring office)
Trade names: Iridian (15)
References:
1) USBM. [1979], MILS
2) Morey. 1979, p. 24
3) USDL. MSHA mine reference list
4) Harder; Johnston. 1918, p. 42, 43

5) Goldich and others. 1961, p. 112, 113, 177
6) MN/DOT Aggregate Unit files
7) U.S. Army Corps of Engineers files
8) Keighin and others. 1982, p. 250, 251, 254
9) Thiel. 1947, p. 168
10) Skillman. 1945, p. 38, 39, 74-76
11) Hogberg. 1969, p. 49
12) Hogberg. 1966, p. 38
13) Schwartz; Thiel. 1954, p. 174, 179, 270
14) USDL. MSHA Duluth Field Office, 1989, personal communication
15) National Building Granite Quarry Association, Inc. 1988, p. 6, 7

Company: Cold Spring Granite Co. (1,3,18,19)
Main commodity: Dimension Granite
County: **Renville**
Quarry/pit name: Rainbow Quarry (3,18)
Status: Active (1,3,19)
Location: T 113 R 34 W Sec 31 NE1/4 SE1/4 (1)
Geologic age: Archean
Geologic formation: (Morton Gneiss)
Description: Red quartz monzonite gneiss (2); variegated pink and black (18)
Processing plant: Cold Spring Granite Co. (at Cold Spring office)
Remarks: See references for location maps, detailed lithologic descriptions including modal analyses, and chemical test data of the Morton area.
References:
1) Renville County Assessor. 1989, personal communication
2) Farhat. 1975, p. 172
3) USDL. MSHA mine reference list
4) Goldich and others. 1980b, p. 45-56
5) Suda. 1975
6) Lund. 1956, p. 1475-1490
7) Lund. 1953, p. 46-52
8) Lund. 1950 16, 66, 73, 74, plate 4
9) Goldich. 1936, p. 15-29
10) Goldich and others. 1970, p. 3671-3695
11) Goldich and others. 1961, p. 123-146
12) Manges. 1956, p. 7-11
13) Thiel; Dutton. 1935, p. 88-94
14) Bowles. 1918, p. 47-49
15) Nielsen; Weiblen. 1980 p. 57-75
16) Wooden and others. 1980
17) Ankenbauer. 1975
18) National Building Granite Quarries Association, Inc. 1988, p. 6, 7
19) USDL. MSHA Duluth Field Office, 1989, personal communication

---

Company: Cold Spring Granite Co. (1,2,4,5,8-10,13)
Main commodity: Dimension Granite
County: **Stearns**
Quarry/pit name: Rockville Quarry No. 1 (1)
Status: Active (5,13)
Location: T 123 R 29 W Sec 9 NE1/4 SE1/4 SW1/4 (2)
T 123 R 29 W Sec 9 SE1/4 SE1/4 SW1/4 (9)
Location comments: Rockville (13)
Geologic age: Early Proterozoic
Geologic formation: (Rockville Granite)
Description: Reddish-gray to pink-colored, "Rockville quartz monzonite, a rock composed of unusually large, 1-6cm long, light pink (potassic) feldspar crystals (phenocrysts) within a matrix (groundmass) of about equal quantities of gray quartz and white feldspar (albite) and about 10 percent black biotite. The Rockville also contains minor quantities of hornblende, andesine-oligioclase feldspar and magnetite." (1)

"The shape, limits, and quarrying practices, particularly within the Rockville Quarry No. 1, are governed by natural planar zones that break the rock mass. Two steeply-dipping intersecting fracture sets, that are seen in the quarry walls and floor, trend respectively N. 35 deg. - 45 deg. W. and N. 55 deg. E.; spacings between the fracture sets range from 25 to 55 feet. Fracture sets that are oriented N. 5 deg. - 10 deg. E. and that dip 60 deg. - 70 deg. NW are seen in the wall rocks as diagonal planes. Sheeting (near-horizontal) fractures, that dip gently toward the southwest, have spacing intervals that range from 5 feet near the top, to 30 feet near the base of the quarry." (1); porphyritic quartz monzonite (6); see Refs. 3 and 4 for further lithologic descriptions
Chemical analyses: See Ref. 7, table 23 for chemical analyses
Processing plant: Cold Spring Granite Co. (at Cold Spring office)
References:
1) Hoagberg. 1986, p. 2
2) USBM. [1979], MILS
3) Morey. 1979, p. 36
4) Morey. 1976, p. 7
5) USDL. MSHA mine reference list
6) Keighin and others. 1972, p. 255
7) Goldich and others. 1961, p. 117
8) Hogberg. 1969, p. 50
9) Hogberg. 1966, p. 38
10) Hogberg; Matsch. [1966?], p. 5, 9, 10
11) Johnson. 1978, p. 220
12) MGS. [1978-1979?]
13) USDL. MSHA Duluth Field Office, 1989, personal communication

---

Company: Cold Spring Granite Co. (1-4)
Main commodity: Dimension Granite
County: **Stearns**
Quarry/pit name: Rockville Quarry No. 2 (1-3)
Status: Active (4)
Location: T 123 R 29 W Sec 16 SE1/4 NE1/4 NW1/4 (2)
Location comments: 1/2 mile south of Rockville off State Hwy. 23 (4)
Geologic age: Early Proterozoic
Geologic formation: (Rockville Granite)
Description: White/black granite with few pink-colored feldspar crystals, "Rockville quartz monzonite, a rock composed of unusually large, 1-6 cm long, light pink (potassic) feldspar crystals

(phenocrysts) within a matrix (groundmass) of about equal quantities of gray quartz and white feldspar (albite) and about 10 percent black biotite. The Rockville also contains minor quantities of hornblende, andesine-oligoclase feldspar and magnetite." (1)

Processing plant: Cold Spring Granite Co. (at Cold Spring office)

References:
1) Hoagberg. 1986, p. 2
2) USBM. [1980], MILS
3) USDL. MSHA mine reference list
4) USDL. MSHA Duluth Field Office, 1989, personal communication

---

Company: Cold Spring Granite Co. (1,2)
Main commodity: Dimension Granite
County: **Stearns**
Quarry/pit name: (Charcoal Quarry)
Status: Active (1,2)
Location: T 124 R 28 W Sec 21 E1/2 SE1/4 (1)
Location comments: 1 mile south of St. Cloud (2)
Processing plant: Cold Spring Granite Co. (at Cold Spring office)
References:
1) Stearns County Assessor. 1989, personal communication
2) USDL. MSHA Duluth Field Office, 1989, personal communication

---

Company: Cold Spring Granite Co. (1,3-6,8)
Main commodity: Dimension Granite
County: **Stearns**
Quarry/pit name: Charcoal Gray Quarry (1,5,6)
Alternate name: Charcoal Quarry (2,3)
Status: Active (8)
Location: T 124 R 28 W Sec 34 SW1/4 NW1/4 (1,3,6)
Location comments: Two miles south of St. Cloud, off County Rd. 136 (8)
Geologic age: Early Proterozoic
Geologic formation: (St. Cloud Granite)
Description: Gray granodiorite, medium-to fine-grained consisting of plagioclase (andesine-oligioclase), hornblende, augite, quartz and potassium feldspar. Accessory minerals include opaque oxide, pyrite, and chalcopyrite. (2); sheeting fractures are approximately 3 to 15 feet apart (3)
Processing plant: Cold Spring Granite Co. (at Cold Spring office)
Uses of commodity: Building panels (3)
Remarks: Slightly pinkish-light gray color on a polished surface (3)
References:
1) USBM. [1979], MILS
2) Morey. 1976, p. 9
3) Hogberg; Matsch [1966?] p. 5, 6
4) Hogberg. 1966, p. 38
5) USDL. MSHA mine reference list
6) MGS. [1978-1979?]
7) Stearns County Assessor. 1989, personal communication
8) USDL. MSHA Duluth Field Office, 1989, personal communication

---

Company: Cold Spring Granite Co. (1-5)
Main commodity: Dimension Granite
County: **Stearns**
Quarry/pit name: Diamond Pink Quarry (1,3)
Status: Active (4)
Location: T 124 R 29 W Sec 26 NW1/4 NW1/4 (2)
Location comments: Five miles south of Waite Park on Quarry Road (4)
Description: Gray-pink with black-pink and dark spots, medium to coarse grained (5)
Processing plant: Cold Spring Granite Co. (at Cold Spring office)
References:
1) USBM. [1979], MILS
2) Hogberg. 1969, p. 49
3) USDL. MSHA mine reference list
4) USDL. MSHA Duluth Field Office, 1989 personal communication
5) National Building Granite Quarries Association, Inc. 1988, p. 6, 7

Company: Jasper Stone Co. (1-10)
Main commodity: Dimension Quartzite
Other commodities: Abrasive Quartzite
County: **Rock**
Quarry/pit name: Jasper Stone Co. Quarry (1)
Date opened: 1890? (1)
Status: Active (1)
Location: T 104 R 46 W Sec 6 NE1/4 (1)
Location comments: Near Jasper (1,3,4)
Geologic age: Middle Proterozoic
Geologic formation: Sioux Quartzite (1)
Description: Rose quartzite (1); "This material is rock consisting of quartz grains very firmly compacted and containing Potassium Aluminum Silicate (Feldspar) and Iron Sesquioxide (Hematite) as a binder." (1)
Chemical analyses: 98.7% silicon dioxide (1); detailed chemical analyses available from Jasper Stone Co. (1)
Extraction method: Open pit (1)

Processing plant: Jasper Stone Co. (plant, quarry, and office at same location) (2)
Processing method: Hydraulic splitters, wire saws, tumbler mill, polisher (2)
Uses of commodity: Mill and chute liner blocks approx. 70% of production, some acid blocks, grinding media cubes and pebbles approx. 20% of production, but probably 50% of tonnage, building stones and memorials approx. 5% now, this amount will be increasing (2)
References:

1) Jasper Stone Co. 1988, MN/DNR questionnaire
2) Jasper Stone Co. 1988, personal communication
3) Herod. 1969
4) Bowles. 1918, p. 204
5) USBM. [1979], MILS
6) USDL. MSHA mine reference list
7) Hogberg. 1969, p. 42
8) Hogberg. 1966, p. 34, 39
9) Sikich. 1959, p. 541
10) Thiel; Dutton. 1935, p. 148, 149

Producer Directory

Aitkin Agri-Peat

Fleming Route
P.O. Box 35
Aitkin, MN 56431

Harold Kosbau
218-326-5456

Arrowhead Blacktop Co.

Box 6568
Duluth, MN 55816-0568

Frank Pickar, Vice President
218-624-5725

Biesanz Stone Co., Inc.

P.O. Box 768
4600 Goodview Road
Winona, MN 55987

Charles W. Biesanz, Jr., President
507-454-4336

Botcher Construction Co.

Rt. 2
Houston, MN 55943

James Botcher or Lowell Botcher
507-896-3723

Bowman Construction Co.

P. O. Box 151
International Falls, MN 56649

Frank L. Bowman
218-283-4305

Bryan Rock Products, Inc.

Box 215
Shakopee, MN 55379

Dale Westin, Sales Manager
612-445-3900

Chippewa Topsoil

P.O. Box 98
Hamel, MN 55340

Reg Pederson
612-478-6045

Cold Spring Granite Co.

202 South Third Ave.
Cold Spring, MN 56320-2593

612-259-3400 or 1-800-551-7502

Dakota Granite Co.

P.O. Box 1351
Milbank, SD 57252

J. L. Stengel, President
605-432-5580

Del Zotto Manufacturing Co., Inc.

2300 Commonwealth Ave.
Duluth, MN 55808

William Del Zotto, Jr.
218-626-3089 FAX 218-626-3607

Ferweda General Contracting

11325 Hwy. 22
Angora, MN 55703

Eugene Ferweda
218-254-5441

Field Granite International, Ltd.

3434 Heritage Dr.
Edina, MN 55435

Gary Zitzlsperger, Exec. Vice President
612-920-9145

Fisons Western (U.S.), Inc.

Rural Route 2
Box 803
Terrell, TX 75160

Mr. Letcher
214-563-3381

Gull River Peat

5900 Hwy. 210 West
Baxter, MN 56401

Michael Gendron

Haefs & Sons, Inc.

1210 County Hwy. 25
La Crescent, MN 55947

Don Haefs or Mell Haefs
507-895-2348

Holm Brothers Construction Co.

Box 235
Goodhue, MN 55027

Willard Holm or Al Holm
612-923-4300

Holst Excavating, Inc.

Rt 1, Box 36
Prescott, WI 54021

2750 Glendale Rd.
Hastings, MN 55033

Ray Schafer or Greg Bethel
(Hastings office)
612-437-1732 or 715-792-5301

Jasper Stone Co.

Jasper, MN 56144

C. F. Lytle, Manager
605-334-6766

Kappers Aggregates, Inc.

PO Box 191
Hwy. 16 East
Spring Valley, MN 55975

Ken Fick, Manager
507-346-7601

Kielmeyer Construction Co.

P.O. Box 158
Nerstrand, MN 55053

Douglas Kielmeyer
507-334-6088

Edward Kraemer & Sons, Inc.

1020 West Cliff Road
Burnsville, MN 55337

Scott Falconner, Sales Manager
612-890-3611 FAX 612-890-2996

Luhman's Construction Co.

Route 2
Red Wing, MN 55066

Harry Luhman, C.E.O.
612-388-3086

Mankato Aglime & Rock Co.

P.O. Box 254
Mankato, MN 56001

Bob Brielmaier, Vice President
507-387-3111

Mankato-Kasota Stone, Inc.

P.O. Box 1358
Mankato, MN 56002-1358

T. William Coughlan, Vice President
507-625-2746

R. B. McGowan, Inc.

1001 Black Dog Road
Burnsville, MN 55337

Michael McGowan
612-890-1081

Meridian Aggregate Co.

P.O. Box 69
St. Cloud, MN 56302

Don Vry, Regional Manager
612-251-7141

Michigan Peat Co.

Rt. 1, Box 44C
Cromwell, MN 55726

Ted Tower
218-644-3993

Midwest Asphalt Corp.

P.O. Box 5477
Hopkins, MN 55343

David Blanski, Vice President of Operations
612-937-8033

Minnesota Sphagnum, Inc.

c/o Hyde Park Products, Inc.
P.O. Box "X"
Mamaroneck, NY 10543-0572

Raymond Hughes
914-381-6050

New Ulm Quartzite Quarries, Inc.

Route 5, Box 21
New Ulm, MN 56073

Bradley Carlstrom, Manager
507-354-2925 FAX 507-359-7870

Northern Con-Agg

P.O. Box 90
St. Peter, MN 56082

Lewis Seely, Vice President
507-931-3500

Northwestern States Portland Cement Co.

P.O. Box 1008
Mason City, Iowa 50401

V. A. Stuessy, Geologist
515-421-3232

Nova Natural Resources

P.O. Box 11630
Salt Lake City, UT 84147

Robert McDonald, President
801-359-8348

Ochs Brick & Tile Co.

P.O. Box 106
Springfield, MN 56087

Ron Schutt, Plant Manager
507-723-4221

Ortonville Stone Co.

P.O. Box 829
Sioux Falls, SD 57117

H. J. Schmidt, Secretary-Treasurer
605-334-5000

Osmundson Brothers Contractors, Inc.

P.O. Box 269
211 W. Main St.
Adams, MN 55909

Jim Osmundson
507-582-3360

Patterson Quarries, Div. of Mathy Construction Co.

Rt. 3, Box 15
St. Charles, MN 55972

Dean Gaulke
507-932-3200

Paulson Rock Products

510 9th Ave. S.W.
Rochester, MN 55902

James Paulson
507-289-2566 or 507-635-2421

Peat Associates of America

c/o Aitkin County Growth, Inc.
316 First Ave. N.W.
Aitkin, MN 56431

Dave Hasskamp
218-927-2172

Peatrex, Ltd.

P.O. Box 67
Cromwell, MN 55726

Dan Flotterud
218-644-3321

Pederson Brothers of Harmony, Inc.

Box 606
Harmony, MN 55939

Jeff Roverud, President
507-886-3371

Pelant

1780 30th Street West
Route 1
Webster, MN 55088

William Pelant

Power-O-Peat

770 Sandy Lane
Gilbert, MN 55741

Terry Leoni
218-262-6127

Quarve & Anderson Co.

2430 Marion Road S.E.
Rochester, MN 55904

Donald J. Lawson, Office Manager
507-289-8506

Quostar Productions, Inc.

Rt. 1, Box 669
Ogilvie, MN 56358

Mimi Sandler
612-983-3274

Renollett Trucking, Inc.

927 Andover Blvd. N.E.
Anoka, MN 55304

Daniel Renollett
612-755-3126

Roberson Lime & Rock Products

RR Box 224
Zumbro Falls, MN 55991

David Roberson
507-753-2516

Rochester Sand & Gravel, Inc.

4105 E. River Road N.E.
Rochester, MN 55904

Mark J. Hindermann, President
507-288-7447

Roverud Construction Co.

Box 606, Hwy. 44 East
Spring Grove, MN 55974

Roy W. Prestsater, Materials Inspector
507-498-3377

Shamrock Enterprises

6415 Bandle Road
Rochester, MN 55901

Donna Mann
507-288-9494 FAX 507-285-0029

J. L. Shiely Co.

1101 Snelling Ave. North
St. Paul, MN 55108

Public Affairs Department
612-646-8601

Solwold Peat

53 Church Road
Esko, MN 55733

Don Solwold
218-879-4177

Orval Sorum & Sons

RR 3, Box 283B
Winona, MN 55987

Southern Minnesota Construction Co., Inc.

1905 Third Ave.
Mankato, MN 56001

Bruce Goodrich, Material Supt.
507-625-4848

Stussy Construction, Inc.

416 North Main St.
P.O. Box 187
Mantorville, MN 55955-0187

James Paulson, President
507-635-2421 or 507-635-3441

Tamarack Peat Moss

Rt. 1
Underwood, MN 56568

Jerry Ewert
218-826-6620

Twin City Silica, Inc.

499 Cottage Grove Drive
Woodbury, MN 55125

Patrick Braegelmann, Plant Manager
612-436-6025

Twin Ports Blacktop

7688 Rice Lake Road
Duluth, MN 55803

Cary McManus
218-721-3631

Unimin Corp.

R.R. 1 Box 119A
Le Sueur, MN 56058

R.R. 1 Box 269
Kasota, MN 56050

Paul Peterson, Plant Manager
612-665-3386

Valley Limestone Co.

Box 127
Zumbrota, MN 55992

Lloyd Johnson, Jr.
507-732-5532

Vetter Stone Co.

P.O. Box 38
Kasota, MN 56050

Willard O. Vetter,
Chairman/Treasurer
507-345-4568

References

Alexander, E.C., 1987, Karst hydrogeology of southeastern Minnesota, *in* Balaban, N.H., ed., Field trip guide for the Upper Mississippi Valley Minnesota, Iowa, and Wisconsin: Prepared for the Geological Society of America, North-Central Section, 21st Annual Meeting, St. Paul, Minnesota: Minnesota Geological Survey Guidebook 15.

Ankenbauer, G.A., Jr., 1975, Early Precambrian tonalites, Morton area, Minnesota: Unpublished M.S. thesis, Northern Illinois University, De Kalb.

Austin, G.S., 1963, Geology of clay deposits, Red Wing area, Goodhue and Wabasha counties, Minnesota: Minnesota Geological Survey Report of Investigations 2, 23 p.

____[1966?], A teachers guide for geologic field investigations in southwestern Minnesota, *in* Phinney, W.C., ed., A teachers guide for geologic field investigations in Minnesota: St. Paul, Minnesota Department of Education, in cooperation with the Minnesota Geological Survey.

____1968, A geological field trip in the Rochester, Minnesota area, October 5, 1968: Variant series title: Field trip no. 1: Minnesota Geological Survey Guidebook Series 1, 35 p.

____1971, The stratigraphy and petrology of the Shakopee Formation, Minnesota: Unpublished Ph.D. dissertation, University of Iowa, Iowa City.

____1972, Cretaceous rocks, *in* Sims, P.K., and Morey, G.B., eds., Geology of Minnesota: A centennial volume: Minnesota Geological Survey, p. 509-512.

Austin, G.S., Grant, J.A., Ikola, R.J., and Sims, P.K., 1970, Geologic map of Minnesota, New Ulm sheet: Minnesota Geological Survey, scale 1:250,000.

Balaban, N.H., ed., 1987, Field trip guide book for the Upper Mississippi Valley Minnesota, Iowa, and Wisconsin: Prepared for the Geological Society of America, North-Central Section, 21st Annual Meeting, St. Paul, Minnesota: Minnesota Geological Survey Guidebook 15.

Baldwin, W.B., 1951, Geology of the Sioux Formation: Unpublished Ph.D. dissertation, Columbia University, New York.

Bauer, R.L., 1974, Gneisses at Granite Falls and Montivideo, Minnesota: Unpublished M.S. thesis, University of Missouri, Columbia.

Bayer, T.N., 1965, The Maquoketa Formation in Minnesota and an analysis of its benthonic communities: Unpublished Ph.D. dissertation, University of Minnesota, Minneapolis.

Beissel, D.R., and Ford, D.R., 1981, Hydrologic effects of quarry dewatering on Dean Lake, Scott County, Minnesota--a case study, *in* 1981 International symposium on urban hydrology, hydraulics and sediment control: University of Kentucky, Lexington, Kentucky--July 27-30, 1981: OES Publications, College of Engineering, p. 425-429.

Berg, E.L., 1938, Notes on catlinite and the Sioux Quartzite [Minnesota]: American Mineralogist, v. 23, no. 4, p. 258-268.

Berkey, C.P., 1902, Origin and distribution of Minnesota clays: American Geologist, v. 29, p. 171-177.

Bickford, K.F., and Price, D., 1947, Report on work done on clays in summer of 1947: Minnesota Geological Survey.

Bleifuss, R.L., 1952, Correlation of magnetite content with magnetic susceptibility measurements of Minnesota Precambrian rocks: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

____1966, The origin of the iron ores of southeastern Minnesota: Unpublished Ph.D. dissertation, University of Minnesota, Minneapolis.

Bolin, E.J., 1956, Upper Cretaceous Foraminifera, Ostracoda, and Radiolaria from Minnesota: Journal of Paleontology, v. 30, no. 2, p. 278-298.

Bonnichsen, B., 1972, Southern part of Duluth Complex, *in* Sims, P.K., and Morey, G.B., eds., Geology of Minnesota: A centennial volume: Minnesota Geological Survey, p. 361-387.

Book, P.R., 1983, Winona County field notes: Minnesota Geological Survey file report.

Bowles, O., 1918, The structural and ornamental stones of Minnesota: U.S. Geological Survey Bulletin 663, 225 p.

Bradley, E., 1949, The physical and mineralogical properties of several groups of Minnesota clays: Unpublished M.A. thesis, University of Minnesota, Minneapolis.

Briggs, R.C., and West, W.J., 1979, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1976, v. 2.

Broughton, P.L., 1973, The catlinite quarries of southwestern Minnesota: Earth Sciences, v. 26, no. 3, p. 126-131.

Brown, N.J., 1956, The geology of the Stillwater, Minnesota, quadrangle: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Burchard, E.F., 1910, Structural materials available in the vicinity of Minneapolis, Minnesota: U.S. Geological Survey Bulletin 430, p. 280-291.

____1913, Stone (in Minnesota): U.S. Geological Survey Mineral Resources, pt. 2, p. 757-764.

Chatard, T.M., 1890, Brick clay from New Ulm (analysis): U.S. Geological Survey Bulletin 60, p. 151.

Cobban, W.A., and Merewether, E.A., 1983, Stratigraphy and paleontology of mid-Cretaceous rocks in Minnesota and contiguous areas: U.S. Geological Survey Professional Paper 1253, 52 p.

Cooley, G.W., 1911, The road material resources of Minnesota: U.S. Department of Agriculture Road Bulletin 4, 24 p.

Cornell, J.R., 1956, The Ostracode zones of the Decorah Shale: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Coventry, W.D., 1987, Duluth's age of brownstone: St. Louis County Historical Society, Duluth, Minnesota, 72 p.

Cowie, R.H., 1941, Geology of the Zumbro Valley region: Unpublished Ph.D. thesis, University of Minnesota, Minneapolis.

Dacre, G.J., 1981, Granulite facies metamorphism, east-central Minnesota: Unpublished M.A. thesis, University of Missouri, Columbia, 112 p.

Dacre, G.J., Himmelberg, G.R., and Morey, G.B., 1984, Pre-Penokean igneous and metamorphic rocks, Benton and Stearns counties, central Minnesota: Minnesota Geological Survey Report of Investigations 31, 16 p.

DesAutels, D.A., 1978, The paleoecology of an Ordovician marine community in the Galena Limestone, Goodhue County, Minnesota: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Dokken, K., 1987, Trace fossils from middle Ordovician Platteville Formation, *in* Sloan, R.E., ed., Middle and Late Ordovician biostratigraphy of the Upper Mississippi Valley: Minnesota Geological Survey Report of Investigations 35, 194 p.

Dolence, J.D., 1961, The Pokegama Quartzite in the Mesabi Range: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Dow, C.H., 1923, The use of marl in road construction: University of Minnesota, Engineering Experiment Station Bulletin 1, 67 p.

Emmons, W.H., and Grout, F.F., eds., 1943, Mineral resources of Minnesota: Minnesota Geological Survey Bulletin 30, 149 p.

Farhat, J.S., 1975, Geochemical and geochronological investigation of the Early Archaean of the Minnesota River Valley, and the effect of metamorphism on Rb-Sr whole rock isochrons: Unpublished Ph.D. thesis, University of California, Los Angeles.

Ford, G.R., 1958, A study of the Platteville Formation in Dakota, Goodhue and Rice counties, Minnesota: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Froelich, L.L., 1961, Non-metallic resources of Minnesota, *in* Holland, F.D., Jr., and Tuthill, S.J., eds., Guidebook to the geology of southeastern Minnesota and northeastern Iowa: University of North Dakota, Geology Department Guidebook 2, variously paged.

Goldich, S.S., 1936, A study in rock-weathering: Unpublished Ph.D. thesis, University of Minnesota, Minneapolis.

Goldich, S.S., Hedge, C.E., and Stern, T.W., 1970, Age of the Morton and Montevideo gneisses and related rocks, southwestern Minnesota: Geological Society of America Bulletin, v. 81, no. 12, p. 3671-3695.

Goldich, S.S., Hedge, C.E., Stern, T.W., Wooden, J.L., Bodkin, J.B., and North, R.M., 1980a, Archean rocks of the Granite Falls area, southwestern Minnesota, *in* Morey, G.B., and Hanson, G.N., eds., Selected studies of Archean gneisses and Lower Proterozoic rocks in the southern Canadian Shield: Geological Society of America Special Paper 182, p. 19-43.

Goldich, S.S., Nier, A.O., Baadsgaard, H., Hoffman, J.H., and Krueger, H.W., 1961, The Precambrian geology and geochronology of Minnesota: Minnesota Geological Survey Bulletin 41, 193 p.

Goldich, S.S., Taylor, R.B., and Lucia, F.J., 1956, Geology of the Enger Tower area, Duluth, Minnesota, *in* Schwartz, G.M., and others, eds., Precambrian of northeastern Minnesota: Geological Society of America, Annual Meeting, 1956, Guidebook for field trip no. 1, p. 67-90.

Goldich, S.S., Wooden, J.L., Ankenbauer, G.A., Jr., Levy, T.M., and Suda, R.U., 1980b, Origin of the Morton Gneiss, southwestern Minnesota: Part 1, Lithology, *in* Morey, G.B., and Hanson, G.N., eds., Selected studies of Archean gneisses and Lower Proterozoic rocks in the southern Canadian Shield: Geological Society of America Special Paper 182, p. 45-56.

Grant, J.A., Himmelberg, G.R., and Goldich, S.S., leaders, 1972, Field trip guidebook for Precambrian migmatitic terrane of the Minnesota River Valley: Minnesota Geological Survey Guidebook Series 5, 52 p.

Green, J.C., 1972, North Shore Volcanic Group, *in* Sims, P.K., and Morey, G.B., eds., Geology of Minnesota: A centennial volume: Minnesota Geological Survey, p. 294-332.

____1982, Geology of the Milepost 7 area, Lake County, Minnesota: Minnesota Geological Survey Report of Investigations 26, 12 p.

Green, J.C., Jirsa, M.A., and Moss, C.M., 1977, Environmental geology of the North Shore: Minnesota Geological Survey, 99 p.

Grosh, W.A., and Hamlin, H.P., 1963, Lightweight aggregates: Expansion properties of clays, shales, and argillites of Minnesota: U.S. Bureau of Mines Report of Investigations 6313, 30 p.

Grout, F.F., 1916, The clays of Minnesota: Journal of Geography, v. 14, p. 185-187.

____1919, Clays and shales of Minnesota; with contributions by E.K. Soper: U.S. Geological Survey Bulletin 678, 259 p.

____1925, Relation of texture and composition of clays: Geological Society of America Bulletin, v. 36, no. 2, p. 396-401.

____1926, The geology and magnetite deposits of northern St. Louis County, Minnesota: Minnesota Geological Survey Bulletin 21, 220 p.

____1947, Minnesota building brick and tile: Minnesota Geological Survey Summary Report 2, 6 p.

Grout, F.F., Gruner, J.W., Schwartz, G.M., and Thiel, G.A., 1951, Precambrian stratigraphy of Minnesota: Geological Society of America Bulletin, v. 62, no. 9, p. 1017-1078.

Grout, F.F., and Longley, W.W., 1935, Relations of anorthosite to granite: Journal of Geology, v. 43, p. 133-141.

Grout, F.F., and Schwartz, G.M., 1939, The geology of the anorthosites of the Minnesota coast of Lake Superior: Minnesota Geological Survey Bulletin 28, 119 p.

Grout, F.F., and Soper, E.K., Preliminary report on the clays and shales of Minnesota: Minnesota Geological Survey Bulletin 11, 175 p.

Hansen, D.L., 1951, Distribution of Ostracoda in the Decorah Shale Formation at St. Paul, Minnesota: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Hanson, G.N., 1968, K-Ar ages for hornblende from granites and gneisses and for basaltic intrusives in Minnesota: Minnesota Geological Survey Report of Investigations 8, 20 p.

Harder, E.C., and Johnston, A.W., 1918, Preliminary report on the geology of east central Minnesota, including the Cuyuna iron-ore district: Minnesota Geological Survey Bulletin 15, 178 p.

Hayden, F.V., On a visit to Pipestone quarry, Minnesota: American Philosophical Society Proceedings, v. 10, p. 274-275.

Heine, J., and Hauck, S., 1988, Preliminary assessment of the industrial clays at Wrenshall, Minnesota: Natural Resources Research Institute, Technical Report NRRI/GMIN-TR-88-05.

Heising, L.F., and Briggs, R.C., 1964, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1963, v. 2.

Herod, B., 1969, Jasper Stone Company: Pit and Quarry, July 1969 reprint.

Hill, J.J., 1988, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1986, v. 2.

Hill, J.J., and West, W.J., 1987, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1985, v. 2.

Himmelberg, G.R., 1965, Precambrian geology of the Granite Falls-Montevideo area, Minnesota: Unpublished Ph.D. dissertation, University of Minnesota, Minneapolis.

____1968, Geology of Precambrian rocks, Granite Falls-Montevideo area, southwestern Minnesota: Minnesota Geological Survey Special Publication Series SP-5, 33 p.

Hoagberg, R.K., Associates, Inc., preparer, 1986, Guide for the Cold Spring Granite Company's Rockville quarry and Cold Spring processing plant: Prepared for the Seventh Aggregate Conference, St. Cloud, Minnesota.

Hobbs, H.C., 1987, Quaternary geology of southeastern Minnesota, *in* Balaban, N.H., ed., Field trip guide for the Upper Mississippi Valley Minnesota, Iowa, and Wisconsin: Prepared for the Geological Society of America, North-Central Section, 21st Annual Meeting, St. Paul, Minnesota: Minnesota Geological Survey Guidebook 15.

Hoeft, D.R., 1959, The lithostratigraphy of the Glenwood and Platteville formations of southeastern Minnesota: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Hogberg, R.K., compiler, 1964, Directory of Minnesota mineral producers, 1962: Minnesota Geological Survey Information Circular 1, 32 p.

____1966, Directory of Minnesota mineral producers, 1964: Minnesota Geological Survey Information Circular 4, 49 p.

____1969, Directory of Minnesota industrial mineral producers, 1967: Minnesota Geological Survey Information Circular 5, 61 p.

Hogberg, R., and Matsch, C.L., [1966?], A teachers guide to geologic field investigations in central Minnesota, *in* Phinney, W.C., ed., A teachers guide for geologic field investigations in Minnesota: St. Paul, Minnesota Department of Education, in cooperation with the Minnesota Geological Survey.

Houston County Highway Department, [1982], List of quarry locations.

Houston County Highway Department, [1983], List of quarry locations.

Humphrey, W.R., 1958, A study of the lithologic relations of the Early Paleozoic and Cretaceous rocks in the Mankato, Minnesota area: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Jirsa, M.A., and Meyer, G.N., 1984, Geologic resources, pl. 8 *of* Balaban, N.H., and Olsen, B.M., eds., Geologic atlas of Winona County, Minnesota: Minnesota Geological Survey County Atlas Series C-2, scale 1:250,000.

Johnson, E.L., and Waibel, P.E., 1959, The relationship of marl to the supply of calcium for poultry rations, *in* Schwartz, G.M., and others, Investigation of the commercial possibilities of marl in Minnesota: St. Paul, Office of the Commissioner of Iron Range Resources and Rehabilitation, in cooperation with the Minnesota Geological Survey, p. 28-35.

Johnson, E.W., 1933, The geology of the region about Faribault, Minnesota: Unpublished M.A. thesis, University of Minnesota, Minneapolis.

Johnson, M.C., 1978, Mineral chemistry of four quartz-bearing monzonites in east-central Minnesota: Unpublished M.S. thesis, University of Iowa, Iowa City.

Karklins, O.L., 1960, Ordovician Bryozoa of Family Rhinidictyidae from the Decorah Shale Formation of Minnesota: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

____1966, Cryptostome Bryozoa from Middle Ordovician Decorah Shale of Minnesota: Unpublished Ph.D. dissertation, University of Minnesota, Minneapolis.

____1969, The Cryptostome Bryozoa from the Middle Ordovician Decorah Shale, Minnesota: Minnesota Geological Survey Special Publication Series SP-6, 121 p.

Keighin, C.W., Morey, G.B., and Goldich, S.S., 1972, East-central Minnesota, *in* Sims, P.K., and Morey, G.B., eds., Geology of Minnesota: A centennial volume: Minnesota Geological Survey, p. 240-255.

Kelley, D.W., 1951, Continued investigations of abandoned granite quarries near St. Cloud, Minnesota: Minnesota Department of Conservation, Division of Game and Fish, Section of Fisheries Investigational Report 125.

Kirk, R.E., 1926, The manufacture of portland cement from marl: University of Minnesota, Engineering Experiment Station Bulletin 4.

Knapp, G.N., 1923, The foundry sands of Minnesota: Minnesota Geological Survey Bulletin 18, 105 p.

Knutson, K.M., 1969, Morphology and water quality in three abandoned granite quarries: Journal of Minnesota Academy of Science, v. 35, no. 2-3, p. 107-110.

Kohls, D.W., 1958, The geology of the Prescott quadrangle: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

____1961, Lithostratigraphy of the Cedar Valley Formation in Minnesota and northern Iowa: Unpublished Ph.D. dissertation, University of Minnesota, Minneapolis.

Kuhns, M.P., 1988, Geologic resources, pl. 9 *of* Balaban, N.H., ed., Geologic atlas, Olmsted County, Minnesota: Minnesota Geological Survey County Atlas Series C-3, scale 1:100,000.

Lesquereux, L., Woodward, A., Thomas, B.W., Schuchert, C., Ulrich, E.O., and Winchell, N.H., 1895, The geology of Minnesota, v. 3, pt. 1, of the final report, 1885-1892: Minnesota Geological and Natural History Survey.

Leverson, C.O., and Gerk, A.J., undated, The Galena Group of Minnesota and the Platteville and Maquoketa of Iowa: unpublished report, unnumbered pages.

Levorson, C.O., and Gerk, A.J., 1983, Field recognition of stratigraphic position within the Galena Group of northeast Iowa (limestone facies), *in* Delgado, D.J., ed., Ordolvician Galena Group of the Upper Mississippi Valley--deposition, diagenesis, and paleoecology: Society of Economic Paleontologists and Mineralogists, Great Lakes Section, 13th Annual Field Conference, 1983, Guidebook, p. C1-C11.

Leverson, C.O., Gerk, A.J., and Broadhead, T.W., 1979, Stratigraphy of the Dubuque Formation (Upper Ordovician) in Iowa: Iowa Academy of Science Proceedings, v. 86, no. 2, p. 57-65.

Lund, E.H., 1950, The igneous and metamorphic rocks of the Minnesota River Valley: Unpublished Ph.D. thesis, University of Minnesota, Minneapolis.

____1953, Morton Granite Gneiss: Economic Geology, v. 48, no. 1, p. 46-52.

____1956, Igneous and metamorphic rocks of the Minnesota River Valley: Geological Society of America Bulletin, v. 67, no. 11, p. 1475-1490.

Majewske, O.P., 1953, The Platteville Formation: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Mangen, L.R., 1956, Age relationships of igneous and metamorphic rocks of the Minnesota River Valley: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Martin, D.P., 1985, A compilation of ore mineral occurrences, drill core, and testpits in the state of Minnesota: Minnesota Department of Natural Resources, Division of Minerals Report 231, 266 p., 4 pls.

McGannon, D.E., Jr., 1957, A lithofacies study of the St. Lawrence Formation of Minnesota: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

____1960, A study of the St. Lawrence Formation in the Upper Mississippi Valley: Unpublished Ph.D. dissertation, University of Minnesota, Minneapolis.

Merrill, G.P., 1884, Building stones and the quarry industry [Minnesota]: U.S. Census Office, 10th Census, 1880, v. 10, p. 244-256.

Meyer, G.N., and Jirsa, M.A., 1984, Aggregate resources inventory, Twin Cities metropolitan area, Minnesota: Minnesota Geological Survey Information Circular 20, 16 p., 2 pls.

MGS, [1978-1979?], [Sample location maps]: Minnesota Geological Survey file map, (prepared as part of the National Uranium Research Evaluation Project).

Miller, T.P., 1961, A study of the Sioux Formation of the New Ulm area: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Minnesota Miscellany, 1886, Description of the celebrated Dresbach stone quarries; testimonials of the value of the stone for building, for grindstone, etc., *in* Minnesota Miscellany, v. 7: D. Sinclair Publishing Company, 13 p.

Minnesota State Planning Board, 1937, Minnesota commercial clay deposits: W.P.A. Project 3053, map, scale 1:1,000,000.

Minneapolis Tribune, Sunday July 21, 1968, newspaper clipping.

MN Business Gazette, 1880-1920, (referenced data from this publication was compiled by Natural Resources Research Institute, University of Minnesota, Duluth).

MN Census. 1870, 1880, and 1890, (referenced data from the Minnesota Census was compiled by Natural Resources Research Institute, University of Minnesota, Duluth).

MN Dept. of Conservation, 1964a, The geology of Carlton and Pine counties, Minnesota: State of Minnesota Department of Conservation, Division of Lands and Minerals.

____1964b, The geology of Morrison County, Minnesota: State of Minnesota Department of Conservation, Division of Lands and Minerals.

MN/DNR, 1981, Banning State Park summer trails: Minnesota Department of Natural Resources, Division of Parks and Recreation, brochure.

MN/DOT Aggregate Unit files, [Records dated 1921-1988]: Minnesota Department of Transportation, Aggregate Unit, St. Paul, Minnesota.

Morey, G.B., 1967, Stratigraphy and petrology of the type Fond du Lac Formation, Duluth, Minnesota: Minnesota Geological Survey Report of Investigations 7, 35 p.

____1976, Field trip guidebook for the Precambrian geology of the St. Cloud granite district, east-central Minnesota: National Association of Geology Teachers, Central Section, St. Cloud State University.

____1976b, Geologic map of Minnesota, bedrock geology: Minnesota Geological Survey Miscellaneous Map M-24, scale 1:3,168,000.

____1979, Field trip guidebook for the Precambrian geology of east-central Minnesota: Minnesota Geological Survey Guidebook Series 12, 38 p.

____1981, Geologic terranes of Minnesota and their uranium potential. Minnesota Geological Survey Information Circular 19, p. 2.

____1984, Sedimentology of the Sioux Quartzite in the Fulda Basin, Pipestone County, southwestern Minnesota, *in* Southwick, D.L., ed., Shorter contributions to the geology of the Sioux Quartzite (Early Proterozoic), southwestern Minnesota: Minnesota Geological Survey Report of Investigations 32, p. 59-74.

Morey, G.B., Olsen, B.M., and Southwick, D.L., 1981, Geologic map of Minnesota, east-central Minnesota (includes Duluth, Stillwater, and parts of St. Cloud and Brainerd geologic map sheets), bedrock geology: Minnesota Geological Survey, scale 1:250,000.

Mossler, J.H., 1971, Platteville Formation field notes and field quadrangles: Minnesota Geological Survey file report.

____1974a, Outcrop inventory for the seven county metropolitan area: Minnesota Geological Survey file report.

____1974b, Wabasha County field notes and field quadrangles: Minnesota Geological Survey file report.

____1975, Blue Earth and Nicollet counties field notes and field quadrangles: Minnesota Geological Survey file report.

____1978, Cedar Valley Formation (Devonian) of Minnesota and northern Iowa: Minnesota Geological Survey Report of Investigations 18, 44 p.

____1983, Winona County field notes and field quadrangles: Minnesota Geological Survey file report.

____1987, Paleozoic lithostratigraphic nomenclature for Minnesota: Minnesota Geological Survey Report of Investigations 36.

____Field notes on Elba quadrangle: Minnesota Geological Survey file report.

____Field notes on Goodhue County highway map: Minnesota Geological Survey file report.

____Field notes on Houston County highway map: Minnesota Geological Survey file report.

____Field notes on Winona West quadrangle: Minnesota Geological Survey file report.

Mossler, J.H., and Book, P.R., 1981, Garvin Brook, Winona County field notes and field quadrangles: Minnesota Geological Survey file report.

National Building Granite Quarries Association, Inc., 1988, Specifications for architectural granite: National Building Granite Quarries Association, no. 4, 8 p.

Nielsen, B.V., and Weiblen, P.W., 1980, Mineral and rock compositions of mafic enclaves in the Morton Gneiss, *in* Morey, G.B., and Hanson, G.N., eds., Selected studies of Archean gneisses and Lower Proterozoic rocks in the southern Canadian Shield: Geological Society of America Special Paper 182, p. 95-103.

Niles, H.B., [1988a], Carbonate resource locations of 1988 channel sampling sites, table 1: Natural Resources Research Institute, University of Minnesota, Duluth, unpublished file report.

____[1988b], Carbonate resource proposed locations for channel sampling, table 2: Natural Resources Research Institute, University of Minnesota, Duluth, unpublished file report.

____[1988c], Carbonate resource proposed locations for diamond drilling, table 3: Natural Resources Research Institute, University of Minnesota, Duluth, unpublished file report.

NRRI, [Clay sample site locations]: Natural Resources Research Institute, University of Minnesota, Duluth.

NRRI, [Compiled the referenced data]: Natural Resources Research Institute, University of Minnesota, Duluth.

Ojakangas, R.W., and Matsch, C.L., 1982, Minnesota's geology: University of Minnesota Press, Minneapolis, 255 p.

Olsen, B.M., 1982, Bedrock geology, pl. 5 *of* Balaban, N.H., and McSwiggen, P.L., eds., Geologic atlas, Scott County, Minnesota: Minnesota Geological Survey County Atlas Series C-1, scale 1:100,000.

Olson, K.S., 1967, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1966, v. 3.

Olson, K.S., and Humenansky, E.R., 1971, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1976, v. 3.

Palmer, A.R., compiler, 1983, The decade of North American geology geologic time scale: Boulder, Colorado, Geological Society of America.

Parham, W.E., 1970, Clay mineralogy and geology of Minnesota's kaolin clays: Minnesota Geological Survey Special Publication Series SP-10, 142 p., second printing 1976.

____1972, A possible peneplain of early Late Cretaceous age in Minnesota, *in* Field trip guidebook for geomorphology and Quaternary stratigraphy of western Minnesota and eastern South Dakota: Minnesota Geological Survey Guidebook Series 7, p. 58-68.

Parham, W.E., and Austin, G.S., 1967, Clay mineralogy of the Glenwood Formation, southeastern Minnesota and adjacent areas: Journal of Sedimentary Petrology, v. 37, no. 3, p. 863-868.

Parham, W.E., and Hogberg, R.K., 1964, Kaolin clay resources of the Minnesota River Valley, Brown, Redwood and Renville counties, a preliminary report: Minnesota Geological Survey Report of Investigations 3, 43 p.

Parham, W.E., Phinney, W.C., and Grant, J.A., [1966?], A teachers guide for geologic field investigations in the Minnesota River Valley, *in* Phinney, W.C., ed., A teachers guide for geologic field investigations in Minnesota: St. Paul, Department of Education, in cooperation with the Minnesota Geological Survey, 24 p.

Pawluk, S., Crava, J., and Martin, W.P., 1959, Agricultural lime, *in* Schwartz, G.M., ed., Investigation of the commercial possibilities of marl in Minnesota: St. Paul, Office of the Commissioner of Iron Range Resources and Rehabilitation, in cooperation with the Minnesota Geological Survey, p. 12-18.

Payne, C.M., 1967, Engineering aspects of the St. Peter Sandstone in the Minneapolis, St. Paul area of Minnesota: Unpublished M.S. thesis, University of Arizona, Tucson.

Pine County Historical Society, 1956, Historic sites of Pine County, Minnesota with brief description of same: Pine County Historical Society, brochure.

Prokopovich, N., and Schwartz, G.M., 1956, Minnesota limestone suitable for Portland cement: Minnesota Geological Survey Summary Report 8, 39 p.

____1957, Preliminary survey of bloating clays and shales of Minnesota: Minnesota Geological Survey Summary Report 10, 69 p.

Rassam, G.N., 1967, Studies on the Platteville Formation of Minnesota, Iowa, and Wisconsin: Unpublished Ph.D. dissertation, University of Minnesota, Minneapolis.

Rice, W.F., 1985, The systematics and biostratigraphy of the Brachiopoda of the Decorah Shale at St. Paul, Minnesota: Unpublished M.S. thesis, University of Minnesota, Minneapolis, 141 p.

____1987, The systematics and biostratigraphy of the Brachiopoda of the Decorah Shale at St. Paul, *in* Sloan, R.E., ed., Middle and Late Ordovician lithostratigraphy and biostratigraphy of the Upper Mississippi Valley: Minnesota Geological Survey Report of Investigations 35, p. 136-166.

Ries, H., 1906, Clays of Minnesota, *in* Clays, their occurrence, properties and uses: p. 348-351.

Ries, H., and Leighton, H., 1909, Minnesota clay products, *in* History of the clay-working industry in the U.S.: p. 115-118.

Riley, C.M., 1950a, The possibilities of bloating clays in Minnesota: Minnesota Geological Survey Summary Report 5, 19 p.

____1950b, The relations of the physical and chemical properties to the bloating of clays [Minnesota clays]: Unpublished Ph.D. thesis, University of Minnesota, Minneapolis, 53 p.

Samson, S.D., 1986, Chemistry, mineralogy, and correlation of Ordovician bentonites: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Schrader, F.C., Stone, R.F., and Sandford, S., 1917, Minnesota, *in* Useful minerals of the United States: U.S. Geological Survey Bulletin 624, p. 169-171.

Schwartz, G.M. 1936, The geology of the Minneapolis-St. Paul metropolitan area: Minnesota Geological Survey Bulletin 27, 267 p.

____1943, Metamorphism of extrusives by basic intrusives in the Keweenawan of Minnesota: Geological Society of America Bulletin, v. 54, p. 1211-1226.

____1949, The geology of the Duluth metropolitan area: Minnesota Geological Survey Bulletin 33, 136 p.

Schwartz, G.M., and Prokopovich, N., compilers, 1954, Map of mineral resources of Minnesota: Minnesota Geological Survey, scale 1:1,000,000.

____1956, Map of mineral resources of Minnesota: Minnesota Geological Survey, scale 1:1,000,000.

____1966, Map of mineral resources of Minnesota, rev. ed.: Minnesota Geological Survey, scale 1:1,000,000.

Schwartz, G.M., and Thiel, G.A., 1952, Dimension stone in Minnesota: Mining Engineering, v. 4, no. 1, sec. 1, p. 77-80.

____1963, Minnesota's rocks and waters: A geological story, rev. ed.: Minnesota Geological Survey Bulletin 37, 366 p.

Schwartz, G.M., and others, 1959, Investigation of the commercial possibilities of marl in Minnesota: St. Paul, Office of the Commissioner of Iron Range Resources and Rehabilitation, in cooperation with the Minnesota Geological Survey, 190 p.

Sikich, M.G., 1956, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1953, v. 2.

____1957, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1954, v. 3.

____1958, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1955, v. 3.

____1959, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1957, v. 3.

____1960, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1959, v. 3.

____1961, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1960, v. 3.

Sikich, M.G., and Heising, L.F., 1963, The mineral industry of Minnesota, *in* Area reports, domestic: U.S. Bureau of Mines, Minerals Yearbook, 1962, v. 3.

Sims, P.K., and Morey, G.B., [1966?], A teachers guide for geologic field investigations in north-central Minnesota, *in* Phinney, W.C., ed., A teachers guide for geologic field investigations in Minnesota: St. Paul, Minnesota Department of Education, in cooperation with the Minnesota Geological Survey.

Sims, P.K., and Morey, G.B., eds., 1972, Geology of Minnesota: A centennial volume: Minnesota Geological Survey, 632 p.

Sloan, R.E., 1964, The Cretaceous system in Minnesota: Minnesota Geological Survey Report of Investigations 5, 64 p.

____[1966?], A teachers guide for geologic field investigations in southeastern Minnesota, *in* Phinney, W.C., ed., A teachers guide for geologic field investigations in Minnesota: St. Paul, Minnesota Department of Education, in cooperation with the Minnesota Geological Survey.

Sloan, R.E., and DesAutels, D.A., 1987, The Wagner quarry cystoid bed: A study in Prosser (Sherwood) paleocology, *in* Sloan, R.E., ed., Middle and Late Ordovician biostratigraphy of the Upper Mississippi Valley: Minnesota Geological Survey Report of Investigations 35, p. 60, 61.

Sloan, R.E., and Kolata, D.R., 1987, The Middle and Late Ordovician strata and fossils of southeastern Minnesota, *in* Balaban, N.H., ed., Field trip guide for the Upper Mississippi Valley Minnesota, Iowa, and Wisconsin: Prepared for the Geological Society of America, North-Central Section, 21st Annual Meeting, St. Paul, Minnesota: Minnesota Geological Survey Guidebook 15.

Sloan, R.E., Kolata, D.R., Witzke, B.J., and Ludvigson, G.A., 1987a, Description of major outcrops in Minnesota and Iowa, *in* Sloan, R.E., ed., Middle and Late Ordovician biostratigraphy of the Upper Mississippi Valley: Minnesota Geological Survey Report of Investigations 35, p. 197-223.

Sloan, R.E., Rice, W.F., Hedblom, E., and Mazzullo, J.M., 1987b, The Middle Ordovician fossils of the Twin Cities, Minnesota, *in* Balaban, N.H., ed., Field trip guide for the Upper Mississippi Valley Minnesota, Iowa, and Wisconsin: prepared for the Geological Society of America, North-Central Section, 21st Annual Meeting, St. Paul, Minnesota: Minnesota Geological Survey Guidebook 15.

Skillman, M.W., 1945, Some silicic intrusives of eastern central Minnesota: Unpublished M.S. thesis, University of Minnesota, Minneapolis.

Squillace, P.J., 1979, The geology of the New Richmond Member of the Shakopee Formation (Lower Ordovician), Upper Mississippi Valley: Unpublished M.S. thesis, University of Minnesota, Duluth.

Stauffer, C.R., 1935, The conodont fauna of the Decorah Shale (Ordovician): Journal of Paleontology, v. 9, no. 7, p. 596-620.

____1940, Conodonts from the Devonian and associated clays of Minnesota: Journal of Paleontology, v. 14, no. 5, p. 417-435.

____[1948?], The Minnesota Cretaceous and its Ostrander Member: Minnesota Geological Survey file report.

____1950, The high magnesium dolomites and dolomitic limestones of Minnesota: Minnesota Geological Survey Summary Report 4, 29 p.

Stauffer, C.R., and Thiel, G.A., 1933, The limestones and marls of Minnesota; pt. 1, The limestones and dolomites of Minnesota, by C.R. Stauffer; pt. 2, The marls of Minnesota, by G.A. Thiel: Minnesota Geological Survey Bulletin 23, 193 p.

____1941, The Paleozoic and related rocks of southeastern Minnesota: Minnesota Geological Survey Bulletin 29, 261 p.

Stone, D.J., 1980, The geology of the upper Dunleith Formation (Prosser Member, Galena Formation) of Middle Ordovician age in southeastern Minnesota: Unpublished M.S. thesis, University of Minnesota, Duluth.

Stone, J.E., 1966, Surficial geology of the New Brighton quadrangle, Minnesota: Minnesota Geological Survey Map Series GM-2, scale 1:24,000, text.

Stubblefield, W.L., 1971, Petrographic and geochemical examination of the Ordovician Oneota Dolomite in the building stone districts of southeastern Minnesota: Unpublished M.S. thesis, University of Iowa, Iowa City.

Suda, R.U., 1975, The Morton Gneiss, Morton, Minnesota: Unpublished M.S. thesis, Northern Illinois University, De Kalb.

Swain, F.M., and Cornell, J.R., 1987, Ostrocoda of the super families Drepanellacea, Hollinacea, Leperditellacea, and Healdiacea from the Decorah Shale of Minnesota, *in* Sloan, R.E., ed., Middle and Late Ordovician lithostratigraphy and biostratigraphy of the Upper Mississippi Valley: Minnesota Geological Survey Report of Investigations 35.

Sweet, W.C., 1987, Distribution and significance of conodonts in Middle and Upper Ordovician strata of the Upper Mississippi Valley region, *in* Sloan, R.E., ed., Middle and Late Ordovician biostratigraphy of the Upper Mississippi Valley: Minnesota Geological Survey Report of Investigations 35.

Taylor, H.P., Jr., 1956, The Duluth Gabbro Complex, Duluth, Minnesota, *in* Schwartz, G.M., and others, eds., Precambrian of northeastern Minnesota: Geological Society of America, Annual Meeting, 1956, Guidebook for field trip no. 1, p. 42-66.

____1964, Bedrock geology of Duluth and vicinity, St. Louis County, Minnesota: Minnesota Geological Survey Geologic Map Series GM-1, 12 p.

Thiel, G.A., 1941, Newly discovered, non-metallic mineral deposits of economic value in Minnesota [abstract]: Minnesota Academy of Science Proceedings, v. 9, p. 69-70.

____1944, The geology and underground waters of southern Minnesota: Minnesota Geological Survey Bulletin 31, 506 p.

____1947, The geology and underground waters of northeastern Minnesota: Minnesota Geological Survey Bulletin 32, 247 p.

____1957, High-silica sands of Minnesota: Minnesota Geological Survey Summary Report 9, 33 p.

____1958, Mineral development other than iron in Minnesota's future, *in* The future of Minnesota resources: 2nd Governor's Conference on State Resources, Virginia, Minnesota, April 23-25, 1958, Report: St. Paul, Iron Range Resources and Rehabilitation Commission, p. 74-97.

Thiel, G.A., and Dutton, C.E., 1935, The architectural, structural, and monumental stones of Minnesota: Minnesota Geological Survey Bulletin 25, 160 p.

Thiel, G.A., and Schwartz, G.M., 1932, Geology and development of Minnesota's nonmetallic mineral resources: Pit and Quarry, v. 24, no. 4, p. 24-28.

Thiel, G.A., and Stauffer, C.R., 1947, The high calcium limestones of Minnesota: Minnesota Geological Survey Summary Report 1, 13 p.

Thomes, M.S., 1937, Textural and petrographic analyses of certain marine clays and shales with special reference to the Decorah Shale of Minnesota: Unpublished M.A. thesis, University of Minnesota, Minneapolis.

Thwaites, F.T., 1912, Sandstones of the Wisconsin coast of Lake Superior, pl. 15: Wisconsin Geological and Natural History Survey Bulletin 25, 109 p.

Tryhorn, A.D., and Ojakangas, R.W., 1972, Sedimentation and petrology of the Upper Precambrian Hinckley Sandstone of east-central Minnesota, *in* Sims, P.K., and Morey, G.B., eds., Geology of Minnesota: A centennial volume: Minnesota Geological Survey, p. 431-435.

Ulrich, E.O., Clarke, J.M., Scofield, W.H., and Winchell, N.H., 1897, The geology of Minnesota: Minnesota Geological Survey Final Report, v. 3, pt. 2, p. 475-1081.

Upham, W., 1884, Notes on rock outcrops in central Minnesota, *in* Winchell, N.H., The eleventh annual report for the year 1882: Published in the Regents Report for 1881-1882, p. 86-136.

U.S. Army Corps of Engineers files, [List of sources of construction materials]: U.S. Army Corps of Engineers, St. Paul, Minnesota and Detroit, Michigan district offices.

USBM, [1978], Mineral industry location system (MILS): U.S. Bureau of Mines Minerals Availability System, Denver, Colorado field office, unpublished working files.

____[1979], Mineral industry location system (MILS): U.S. Bureau of Mines Minerals Availability System, Denver, Colorado field office, unpublished working files.

____[1980], Mineral industry location system (MILS): U.S. Bureau of Mines Minerals Availability System, Denver, Colorado field office, unpublished working files.

____[1983], Mineral industry location system (MILS): U.S. Bureau of Mines Minerals Availability System, Denver, Colorado field office, unpublished working files.

USDL, Mine Safety and Health Administration (MSHA), [Mine reference list]: U.S. Department of Labor, MSHA, Duluth, Minnesota field office.

Warzyn Engineering, 1988, Material source and cost investigation Brighton Beach water access facility, Duluth, Minnesota: Prepared for Minnesota Department of Natural Resources Trails and Waterway Unit Report 50258.

Webers, G.F., 1966, The Middle and Upper Ordovician conodont faunas of Minnesota: Minnesota Geological Survey Special Publication Series SP-4, 123 p.

Webers, G.F., and Austin, G.S., 1972, Field trip guidebook for Paleozoic and Mesozoic rocks of southeastern Minnesota: Minnesota Geological Survey Guidebook Series 4, 91 p.

Weiblen, P.W., 1982, Field trip guidebook for the Precambrian rocks of the Minnesota River Valley: Minnesota Geological Survey Guidebook Series 14, 25 p.

Weiss, M.P., 1953, The stratigraphy and stratigraphic paleontology of the upper Middle Ordovician rocks of Fillmore County, Minnesota: Unpublished Ph.D. dissertation, University of Minnesota, Minneapolis.

____1955, Some Ordovician brachiopods from Minnesota and their stratigraphic relations: Journal of Paleontology, v. 29, no. 5, p. 759-774; correction, 1956, v. 30, no. 1, p. 219.

____1957, Upper Middle Ordovician stratigraphy of Fillmore County, Minnesota: Geological Society of America Bulletin, v. 68, no. 8, p. 1027-1062.

Winchell, N.H., 1875, Third annual report for the year 1874: Minnesota Geological and Natural History Survey.

____1880, Preliminary report on the building stones, clays, limes, cements, roofing, flagging and paving stones of Minnesota: Minnesota Geological Survey Miscellaneous Publication 8, 37 p.

____1884, Minnesota building stones: U.S. 10th Census, 1880, v. 10, p. 244-256.

Winchell, N.H., *with a contribution* by Twining, E.H., 1873, First annual report for the year 1872: Minnesota Geological and Natural History Survey.

Winchell, N.H., *with contributions by* Upham, W., Dodge, J.A., Williamson, A.W., Oestlund, O.W., Bechdolt, A.F., Holzinger, J.M., Dawson, G.M., Woodward, A., Thomas, B.W., and Herrick, C.L., 1885, Thirteenth annual report for the year 1884: Minnesota Geological and Natural History Survey.

Winchell, N.H., *with* Grant, U.S., assistant, 1900, The geology of Minnesota, v. 5 of the final report, 1898-1900: Minnesota Geological and Natural History Survey.

Winchell, N.H., *with* Grant, U.S., Todd, J.E., Upham, W., and Winchell, H.V., assistants, 1899, The geology of Minnesota, v. 4 of the final report, 1896-1898: Minnesota Geological and Natural History Survey.

Winchell, N.H., and Peckham, S.F., 1874, Second annual report for the year 1873: Minnesota Geological and Natural History Survey.

Winchell, N.H., *with* Upham, W., assistant, 1888, The geology of Minnesota, v. 2 of the final report, 1882-1885: Minnesota Geological and Natural History Survey.

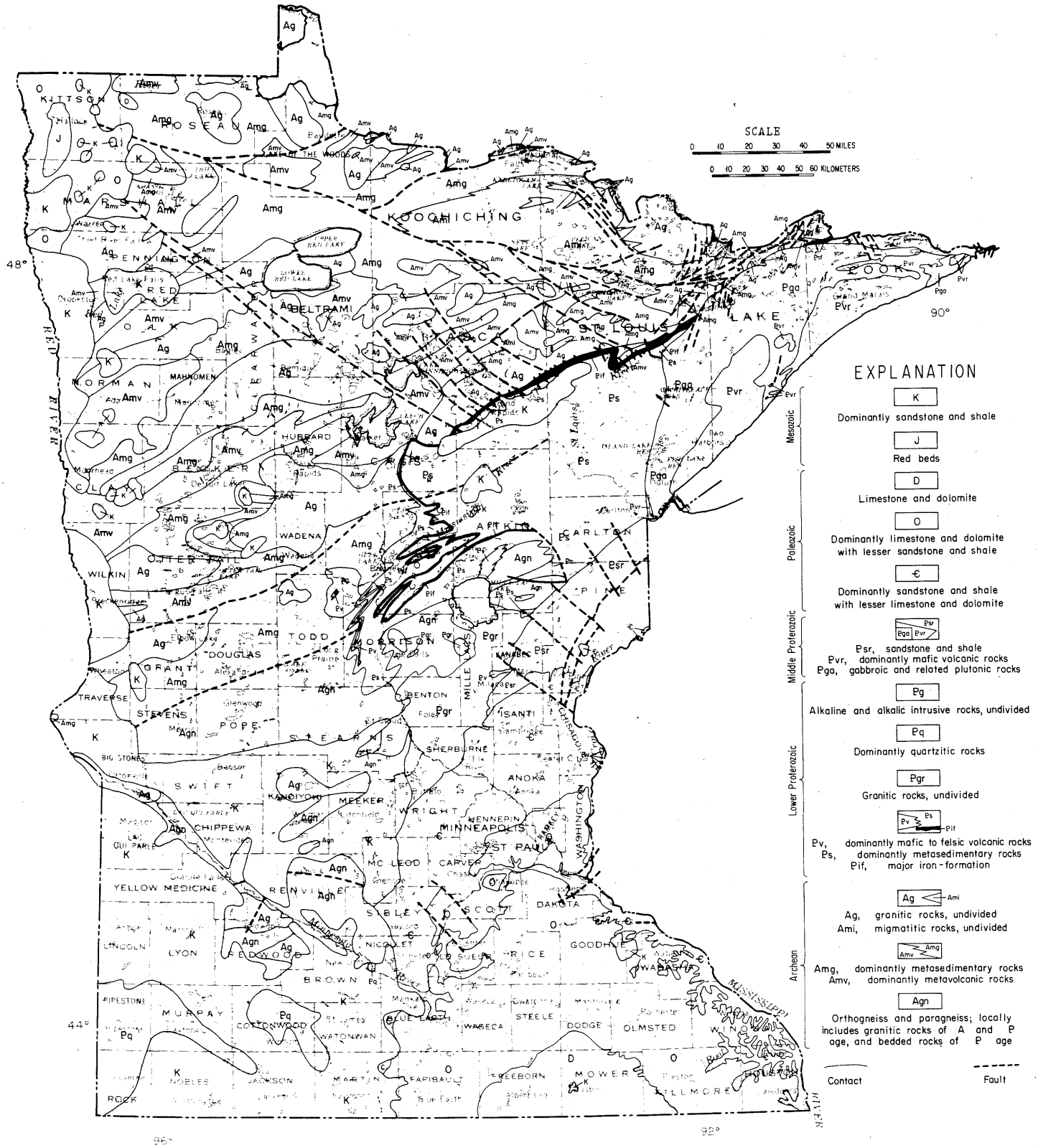
Winchell, N.H., *with* Upham, W., assistant, and Harrington, M.W., 1884, The geology of Minnesota, v. 1 of the final report, 1872-1882: Minnesota Geological and Natural History Survey.

Wooden, J.L., Goldich, S.S., and Suhr, N.H., 1980, Origin of the Morton Gneiss, southwestern Minnesota: Pt. 2, Geochemistry, *in* Morey, G.B., and Hanson, G.N., eds., Selected studies of Archean gneisses and Lower Proterozoic rocks in the southern Canadian Shield: Geological Society of American Special Paper 182, p. 57-75.

Woyski, M.S., 1949, Intrusives in central Minnesota: Geological Society of America Bulletin, v. 60, no. 6, p. 999-1016.

Wright, H.E., Jr., Mattson, L.A., and Thomas, J.A., 1970, Geology of the Cloquet quadrangle, Carlton County, Minnesota: Minnesota Geological Survey Geologic Map Series GM-3, 30 p.

Appendix: Generalized Bedrock Geologic Map of Minnesota



Morey, G.B., 1981, Geologic terranes of Minnesota and their uranium potential (modified from Morey, G.B., 1976, Geologic map of Minnesota, bedrock geology: Minnesota Geological Survey Miscellaneous Map M-24, scale 1:3,168,000). Minnesota Geological Survey Information Circular 19. p. 2

Index of Active Companies (Volume 1)

Index of Active Companies (Volume 1 continued)

DNR TN24.M6 N45 1990 v. 1
Nelson, S. L.
Inventory of industrial
mineral pits and

DATE DUE	BORROWER'S NAME	ROOM NUMBER

Equal op
of Natural R
age or disab
Paul, MN 55
D.C. 20240.

artment
gin, sex,
oad, St.
hington,


Minnesota
DEPARTMENT OF
NATURAL RESOURCES