ILLINOIS STATE GEOLOGICAL SURVEY

John C. Frye, Chief

ILLINOIS MINERALS NOTE 49

CLAY AND SHALE RESOURCES OF PEORIA AND TAZEWELL COUNTIES, ILLINOIS

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Urbana, Illinois 61801

February 1973

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ABSTRACT

Thirty-six samples of clays and shales from Peoria and Tazewell Counties were tested to determine their potential ceramic properties. Areas that appear to contain minable shales or clays possibly suitable for the manufacture of red-fired clay products are located south of Glasford, west of Smithville, west of Peoria, northeast of Elmore, north of Chillicothe, and northeast of Pekin. A clay suitable for buff-burning clay products also occurs north of Chillicothe.

Shales located in several of the above areas might also be suitable for the manufacture of lightweight aggregate.

INTRODUCTION

Urbanization in Peoria and Tazewell Counties has progressed at a rapid rate during the past 10 years and appears likely to accelerate in the future. For several years the Illinois State Geological Survey has conducted studies of the geology and the rock and mineral resources in areas of rapid urban growth. The information derived from these studies is applicable to land-use planning, an important phase of which is the development of potentially recoverable mineral resources before they are made inaccessible by urban expansion.

This report locates and describes the clay and shale resources in Peoria and Tazewell Counties and suggests regions still free from dense urbanization that may contain deposits suitable for the manufacture of building

materials and other uses. The location, description, composition, and distribution of the clay and shale deposits are included in the report. Sample sites and geologic age of the samples are shown in figure 1.

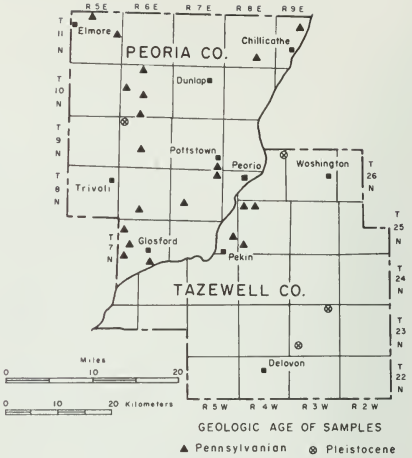

Fig. 1 - Locations from which samples of clay and shale were taken for testing in Peoria and Tazewell Counties.

STRATIGRAPHIC OCCURRENCE OF CLAYS AND SHALES

Pleistocene glacial deposits (drift), which overlie the bedrock in Illinois, range in thickness from a few feet in western Peoria County to over 100 feet along the Illinois River Valley and in eastern Tazewell County. The glacial drift is dominantly pebbly, silty clay (till) and clayey silt (loess and alluvial deposits). The glacial drift is usually calcareous and suitable for clay products only if they are fired at low temperature. Four samples of glacial till are included in this study (samples 2616, 2617, 2618, and 2619).

Bedrock formations cropping out along stream valleys in the area are part of the Pennsylvanian System (fig. 2). The Pennsylvanian contains clays and shales interbedded with sandstones, limestones, and coals. Except for the four glacial tills, all samples included in this study came from the Pennsylvanian System. The stratigraphic occurrence and description of the samples are given in the Appendix.

Mineralogy

The clay mineralogy of the clays and shales studied was determined by X-ray diffraction techniques. The amount of each clay mineral present in the less than 2-micron grain-size fraction was semiquantitatively evaluated. The major clay minerals in most of these samples are illite, chlorite, kaolinite, and a mixed-layer clay mineral that consists of an irregular interlayering of illite and montmorillonite.

Nonclay minerals were not evaluated quantitatively, but previous tests indicate that quartz is the chief nonclay mineral present in these clays and shales. Minor amounts of pyrite, siderite, and gypsum also are present in some samples. Calcite is abundant in the glacial till samples.

Test Bar Formation and Firing Procedure

In the field, a 40- to 50-pound composite sample was collected from each stratigraphic unit sampled. Each sample was then air dried and ground in

the laboratory. Water was added to make the clay plastic, and solid test bars measuring 1 x 1 x 4.5 inches were then made with an extrusion machine. The behavior of the clay during the extrusion procedure indicated its workability, which was recorded as good, fair, or poor. The percentage of water necessary to extrude a test bar (water of plasticity) was determined from 1-inch cubes as the bars were formed. All bars were air dried and then dried overnight in an oven at 230° F (110° C). Three test bars were made for each sample; one bar was fired to 1832° F (1000° C), another to 1922° F (1050° C), and the third to 2012° F (1100° C).

Linear shrinkage during drying was determined for all bars, and total linear shrinkage was determined for each set of fired bars. The linear firing shrinkage, the additional shrinkage caused by firing, was then noted, as was the color of the fired bars. Table 1 describes the samples.

Areas of Shale or Clay Deposits Having Economic Potential

Several areas in Peoria and Tazewell Counties may contain bedrock shale or clay deposits of possible economic interest (fig. 3). Available geologic information indicates these areas contain near-surface shale deposits more than 15 feet thick or somewhat thinner clay deposits. Firing tests indicate these deposits have special mineralogical properties that might make them economically useful. The boundaries of the suggested regions (fig. 3) are generalized, and if mining the shale or clay is considered, the actual extent, characteristics, and thickness of the deposits should be determined by drilling. The areas are described below.

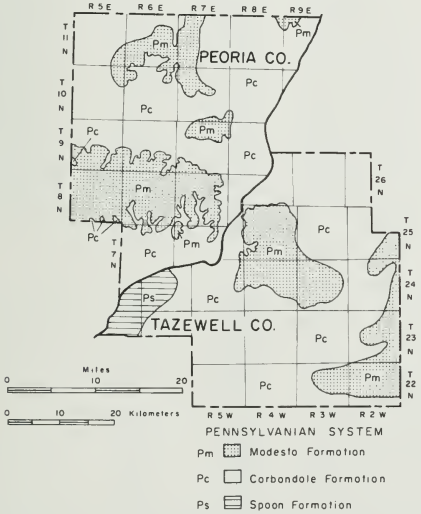

Fig. 2 - Generalized geologic map of the bedrock of Peoria and Tazewell Counties (from Willman and others, 1967).

AREA 1

Secs. 26 and 27, T. 7 N., R. 6 E.,
Peoria County

Samples 2582, 2583

Area 1, located along the Illinois River south of Glasford, contains more than 27 feet of shale that may be used for red clay products and lightweight aggregate. In some places overburden is less than 25 feet thick, but in others the overlying Pleistocene drift and Pennsylvanian sediments are more than 50 feet thick. Geologic information on this area was given by Wanless (1957) and by Smith and Berggren (1963).

AREA 2

Secs. 21, 22, 27, and 28, T. 8 N., R. 6 E.,
Peoria County

Sample 2620

Area 2 is west and southwest of Smithville, and it contains shale more than 22 feet thick

TABLE 1—PLASTIC AND FIRING PROPERTIES OF CLAYS

Sample	Location ¼	¼	¼	Sec.	T.	R.	Lith-ology	Thickness of unit (ft)	Work-ability	Water of plasti-city (%)	Linear drying shrink-age (%)
PEORIA											
2580	SW	NE		7	7N	6E	Sh	15+	Good	20.5	2.2
2581	SW	NW	NW	19	7N	6E	Sh	12+	Good	19.6	2.2
2582	NW	SW	SE	27	7N	6E	Sh	12+	Good	22.5	4.4
2583	NW	SW	SE	27	7N	6E	Sh	15	Good	22.2	4.4
2584	NE	NW		17	7N	7E	Cl	2	Good	27.0	6.7
2585	NE	NW		17	7N	7E	Sh	15	Good	21.4	2.2
2586	SW	SE	NW	1	8N	7E	Cl	3	Good	23.8	4.4
2587	SW	SE	NW	1	8N	7E	Sh	39+	Good	20.6	2.2
2588	SW	SE	NW	1	8N	7E	Sh	10+	Good	20.8	2.2
2589	SW	NE	SE	36	9N	7E	Sh	20	Good	23.3	6.7
2614	NE	NE	NE	4	11N	5E	Sh	25+	Good	21.2	4.4
2615	SE	SW	SW	33	10N	6E	Sh	15+	Good	17.7	4.4
†2616	NE	SE	NE	6	9N	6E	Till	15	Good	13.3	3.3
2620	NE	NE	NE	28	8N	6E	Sh	22+	Good	22.6	5.5
2622	SE	NW	SE	27	11N	8E	Sh	15+	Good	19.2	3.3
2623	SW	NE	NE	21	10N	6E	Sh	20+	Good	21.4	4.4
2624	SW	NW		9	11N	9E	Sh	20+	Good	13.9	2.2
2625	SW	NW		9	11N	9E	Cl	8	Good	20.4	8.8
2626	SW	NW		9	11N	9E	Sh	10	Good	20.5	2.2
2627	SW	NW		9	11N	9E	Cl	7	Good	18.3	7.7
2628	NW	NE	NE	4	10N	6E	Sh	5+	Good	24.2	8.8
2629	NE	NE	NE	13	11N	5E	Sh	5+	Good	21.5	4.4
2630	SW	NW	SW	20	8N	7E	Cl	4	Good	31.0	12.0
2631	SE	SW	SE	18	10N	6E	Sh	15+	Good	21.6	4.4
2632	NW	NW	NE	21	9N	6E	Cl	3	Good	21.8	8.8
2633	NW	NW	NE	21	9N	6E	Cl	3	Good	20.3	---
TAZEWELL											
2574	NW	SW	SW	30	25N	4W	Cl	2	Good	26.9	11.0
2575	NW	SW	SW	30	25N	4W	Sh	6	Good	25.1	11.0
2576	SE	SE	NE	24	25N	5W	Sh	7	Good	23.2	6.7
2577	SE	SE	NE	24	25N	5W	Cl	2	Good	26.9	11.0
2578	SE	SE	NE	24	25N	5W	Sh	6	Good	22.4	4.4
2579	NW	NE	NE	6	25N	4W	Sh	25+	Good	20.0	4.4
†2617	SW	SW	SE	1	26N	4W	Till	70	Good	14.2	5.5
†2618	NE	NE	SE	29	23N	3E	Till	20+	Good	15.3	5.5
†2619	SW	SW		2	23N	3E	Till	15+	Good	30.8	5.5
2621	NW	SW	NE	5	25N	4W	Sh	---	Good	19.3	5.5

* Bloated

† Pleistocene samples

AND SHALES IN PEORIA AND TAZEWELL COUNTIES

Firing temperature in degrees Fahrenheit									Clay mineral composition (in parts in 10 of diffraction effects)			
Linear firing shrinkage			Total linear shrinkage			Fired color						
1832°	1922°	2012°	1832°	1922°	2012°	1832°	1922°	2012°	Il	Chl	Ka	Mx
4.5	4.5	6.8	6.7	6.7	9.0	red	red	red	4.0	2.0	2.0	2.0
6.8	6.8	9.1	9.0	9.0	11.3	red	red	red	4.2	2.2	3.5	---
7.0	7.0	11.5	11.4	11.4	15.9	red	red	red	5.0	2.0	2.0	1.0
11.5	11.5	11.5	15.9	15.9	15.9	red	red	red	5.0	2.0	1.0	2.0
2.1	2.1	4.8	8.8	8.8	11.5	red	red	red	3.0	---	3.0	4.0
2.3	4.5	6.8	4.5	6.7	9.0	red	red	red	4.6	2.8	2.6	---
2.3	2.3	2.3	6.7	6.7	6.7	buff	buff	buff	2.7	---	5.2	2.0
4.5	6.8	6.8	6.7	9.0	9.0	red	red	red	4.2	1.2	2.5	1.9
4.5	6.8	9.1	6.7	9.0	11.3	red	red	red	5.5	1.5	2.0	1.0
2.4	2.4	9.5	9.1	9.1	16.2	red	red	red	3.7	2.0	2.0	3.2
5.7	11.4	*	10.1	15.8	*	red	red	*	5.3	2.3	1.7	---
1.5	4.3	5.8	5.9	8.7	10.2	red	red	*	4.3	3.0	1.7	0.9
0.0	0.2	3.5	3.3	3.5	7.1	brown	brown	brown	4.5	2.0	1.0	2.4
11.7	*	*	17.2	*	*	red	*	*	5.5	1.0	2.3	1.1
4.6	7.0	7.1	7.9	10.3	10.4	red	red	red	4.2	1.9	1.2	2.9
10.0	10.5	*	14.4	14.9	*	red	red	*	3.7	1.7	1.1	3.5
11.0	11.5	*	13.2	13.7	*	red	red	*	6.1	2.4	1.6	---
0.2	4.8	*	9.0	13.6	*	buff	tan	*	4.1	2.9	1.5	1.9
5.7	7.0	8.0	7.9	9.2	10.2	red	red	red	4.3	2.5	1.8	1.4
0.0	3.6	11.0	7.7	11.3	18.7	buff	buff	tan	4.3	2.8	1.1	1.6
4.9	*	*	13.7	*	*	red	*	*	5.1	1.7	---	3.2
2.2	5.6	9.0	6.6	10.0	13.4	red	red	red	3.2	---	2.4	4.4
6.3	*	*	18.3	*	*	red	*	*	5.5	2.5	1.6	---
10.5	*	*	14.9	*	*	red	*	*	3.6	---	4.7	1.8
2.4	3.6	*	11.2	12.4	*	tan	tan	*	4.4	2.2	1.3	2.1
---	---	---	---	---	---	brown	brown	brown	4.5	2.5	1.3	1.6
7.5	7.5	7.5	18.5	18.5	18.5	red	red	red	3.0	---	1.0	6.0
5.0	5.0	5.0	16.0	16.0	16.0	red	red	red	3.0	---	2.0	5.0
9.5	9.5	*	16.2	16.2	*	red	red	*	4.0	1.2	1.2	3.6
5.0	5.0	7.5	16.0	16.0	18.5	red	red	red	2.3	---	2.7	5.0
7.0	7.0	9.3	11.4	11.4	13.7	red	red	red	5.0	2.6	1.5	1.0
2.3	4.6	9.1	6.7	9.0	13.5	red	red	red	4.9	2.2	1.8	1.0
0.0	2.3	*	5.5	7.8	*	brown	brown	*	4.2	4.7	---	1.1
0.0	2.3	6.9	5.5	7.8	12.4	brown	brown	brown	4.3	---	4.7	0.9
0.0	2.3	*	5.5	7.8	*	red	red	*	4.8	3.8	---	1.5
4.7	7.0	7.2	10.2	12.5	12.7	red	red	brown	5.0	2.0	1.7	1.3

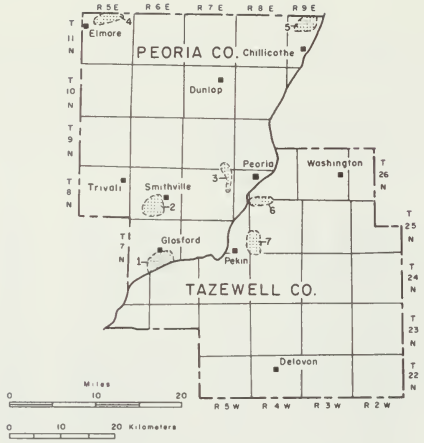

Fig. 3 - Areas thought to contain bedrock shale or clay deposits of economic potential. Numbered areas are described in text.

that is suitable for red clay products. Overburden is thin, averaging about 25 feet. The Smithville area is sparsely populated, yet it is within 10 miles of Peoria. The shale also has good potential for use in the manufacturing of lightweight aggregate (table 2).

AREA 3

Secs. 1 and 2, T. 8 N., R. 7 E.,
Peoria County

Samples 2586-2588

Area 3 lies along Kickapoo Creek Valley south of Pottstown. This area has more than 40 feet of shale suitable for making red clay products (samples 2587, 2588). A thin clay overlying the shale sequence is suitable for buff clay products (sample 2586). Overburden averages approximately 30 feet. The area has not as yet been heavily urbanized.

AREA 4

Secs. 3 and 4, T. 11 N., R. 5 E.,
Peoria County

Sample 2614

Area 4, which is northeast of Elmore, contains shale more than 25 feet thick that is suitable for making red clay products and lightweight aggregate (table 2). Overburden averages 20 to 30 feet thick.

AREA 5

Secs. 4, 5, 8, and 9, T. 11 N., R. 9 E.,
Peoria County

Samples 2624-2627

Area 5 lies along the Illinois River Valley north of Chillicothe. It contains shales more than 30 feet thick that are suitable for red clay products. Two clays, one 8 feet thick (2625) and one 7 feet thick (2627) are present that are suitable for making buff or tan clay products. Lightweight aggregate could be made from the shale represented by sample 2624. Overburden varies from 10 to more than 100 feet.

AREA 6

Secs. 4, 5, and 6, T. 25 N., R. 4 W.,
Tazewell County

Samples 2579, 2621

Part of area 6 is in East Peoria and part in Creve Coeur. The Peoria Brick and Tile Company has mined shale from this area for many years for making red clay products. However, the area is considered to have limited economic potential because of the rapid urban development that is now occurring.

AREA 7

Secs. 24 and 25, T. 25 N., R. 5 W., sec. 29, T. 23 N., R. 3 E., and secs. 30 and 31, T. 25 N., R. 4 W.,
Tazewell County

Samples 2574-2578, 2618

Area 7 is between Pekin and Marquette Heights. It contains several shales and clays, but their thickness is difficult to determine because outcrops are few in most of the area. Numerous outcrops occur along Lick Creek and its tributaries, however. The shales and clays are suitable for making red clay products.

TABLE 2—LIGHTWEIGHT AGGREGATE BULK DENSITY*

Sample	Bulk density
2580	1.03
2581	1.01
2582	0.76
2583	0.73
2584	0.88
2585	1.08
2586	1.13
2587	1.03
2588	0.70
2589	1.02
2614	0.86
2615	1.07
2616	1.09
2617	1.05
2618	1.16
2619	1.02
2620	0.74
2621	1.17
2622	0.83
2623	0.70
2624	0.73
2625	0.94
2626	1.02
2627	1.07
2628	0.71
2629	0.98
2630	0.82
2631	0.85
2632	0.99
2633	0.95

*Aggregate bulk density is the ratio of the weight of the aggregate to the weight of an equal volume of water. Lumps of each sample were fired at 1200° C for one hour. The fired aggregate was crushed to -8 mesh before the bulk density was evaluated.

SUMMARY AND CONCLUSIONS

Shales and clays occurring in outcrop in Peoria and Tazewell Counties were investigated to determine their suitability for various ceramic and industrial uses. Several areas were found in these counties that contain shales suitable in both thickness and ceramic properties for manufacturing red clay products. A few areas in southern and western Peoria County contain shale deposits probably suitable for manufacturing lightweight aggregate.

Areas still unurbanized that are considered to contain possible commercial shale or clay deposits are suggested for further exploration. These areas contain shale deposits more than 15 feet thick or clay deposits less than 15 feet thick that have special mineralogical properties.

REFERENCES

Smith, W. H., and D. J. Berggren, 1963, Strippable coal reserves of Illinois. Part 5A—Fulton, Henry, Knox, Peoria, Stark, Tazewell, and parts of Bureau, Marshall, Mercer, and Warren Counties: Illinois Geol. Survey Circ. 348, 59 p.

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APPENDIX

STRATIGRAPHIC OCCURRENCE AND DESCRIPTION OF SAMPLES

PEORIA COUNTY

Sample 2580

SW NE Sec. 7, T. 7 N., R. 6 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Till and loess	30
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale, silty, micaceous, gray (2580)	15+

Sample 2581

SW NW NW Sec. 19, T. 7 N., R. 6 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Till and loess	20
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Sandstone, fine grained, micaceous	5
Shale, dark gray, massive; base not exposed (2581)	12

Samples 2582, 2583

NW SW SE Sec. 27, T. 7 N., R. 6 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess	5
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale, silty, micaceous, gray, thinly bedded; a few concretions (2582)	12
Shale, black, thinly bedded; a few concretions (2583)	15

Samples 2584, 2585

NE NW Sec. 17, T. 7 N., R. 7 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Till and loess	20+
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale, micaceous, gray; a few concretions (2585)	15
Sandstone, micaceous, fine grained	20
Shale, black, thinly bedded	3
Springfield (No. 5) Coal Member	4.5
Underclay, massive; calcareous nodules at base (2584)	2

Samples 2586, 2587, 2588

SW SE NW Sec. 1, T. 8 N., R. 7 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess	5
Pennsylvanian System	
Kewanee Group	

	Thickness (ft)
Carbondale Formation	
Shale, green, massive.	8
Clay, green to dark gray (2586)	3
Shale, silty, green to dark gray, massive; numerous plant fragments (2587)	39+
Covered interval	25+
Shale, silty, micaceous; dark gray, massive; numerous plant fragments; base not exposed (2588)	10

Sample 2589

SW NE SE Sec. 36, T. 9 N., R. 7 E.

Quaternary System	
Pleistocene Series	
Loess.	2
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale and sandstone; numerous concretions.	15
Shale, silty, micaceous, gray; numerous concretions (2589). . .	20

Sample 2614

NE NE NE Sec. 4, T. 11 N., R. 5 E.

Quaternary System	
Pleistocene Series	
Till and loess	20
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale, silty, gray (2614) . . .	25+

Sample 2615

SE SW SW Sec. 33, T. 10 N., R. 6 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess.	3
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale, gray, thinly bedded; a few sand lenses (2615)	15

Sample 2616

NE SE NE Sec. 6, T. 9 N., R. 6 E.

Quaternary System	
Pleistocene Series	
Loess.	8
Till, calcareous, brown (2616)	15

Sample 2620

NE NE NE Sec. 28, T. 8 N., R. 6 E.

Quaternary System	
Pleistocene Series	
Till and loess	6-10
Pennsylvanian System	
McLeansboro Group	
Modesto Formation	
Shale, gray, massive; a few concretions (2620)	22+

Sample 2622

SE NW SE Sec. 27, T. 11 N., R. 8 E.

Quaternary System	
Pleistocene Series	
Loess and till	10-15
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale and sandstone.	5
Shale, silty, micaceous, dark gray, thinly bedded (2622) . .	10-15

Sample 2623

SW NE NE Sec. 21, T. 10 N., R. 6 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Till and loess	20+
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale, gray, thinly bedded; a few concretions (2623)	20
Shale, black, massive; grades into shale below	2
Shale, black, fissile.	2
Springfield (No. 5) Coal Member	2

Samples 2624, 2625, 2626, 2627

SW NW Sec. 9, T. 11 N., R. 9 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess and till	15+
Pennsylvanian System	
McLeansboro Group	
Modesto Formation	
Shale, silty, gray, massive; many concretions; grades into shale below (2624)	15-20
Shale, gray to black, thinly bedded	4
Kewanee Group	
Carbondale Formation	
Danville (No. 7) Coal Member	2-3
Clay, gray, massive (2625)	8
Shale, sandy, gray, thinly bedded; numerous concretions (2626)	10-20
Shale, gray, thinly bedded; a few concretions.	3
Herrin (No. 6) Coal Member	1
Clay, gray; calcareous nodules near base (2627).	7

Sample 2628

NW NE NE Sec. 4, T. 10 N., R. 6 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess and till	10+
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Limestone, argillaceous, gray, nodular.	4
Shale, dark gray, thinly bedded (2628)	5+

Sample 2629

NE NE NE Sec. 13, T. 11 N., R. 5 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess and till	20+
Pennsylvanian System	
Kewanee Group	
Carbondale Formation	
Shale, silty, micaceous, gray, massive (2629)	5+

Sample 2630

SW NW SW Sec. 20, T. 8 N., R. 7 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess.	7
Pennsylvanian System	
McLeansboro Group	
Modesto Formation	
Shale and sandstone.	4

Kewanee Group Carbondale Formation	Thickness (ft)
Danville (No. 7) Coal Member	1.3
Clay, gray, massive; base not exposed (2630)	4

Sample 2631

SE SW SE Sec. 18, T. 10 N., R. 6 E.

Quaternary System Pleistocene Series	
Loess and till	25
Pennsylvanian System Kewanee Group Carbondale Formation	
Shale, gray, thinly bedded (2631)	15+

Samples 2632, 2633

NW NW NE Sec. 21, T. 9 N., R. 6 E.

Quaternary System Pleistocene Series	
Loess	10
Pennsylvanian System Kewanee Group Carbondale Formation	
Coal	1.5
Clay, gray, massive (2632)	3
Limestone, gray, nodular	1.5
Clay, gray, massive (2633)	3

TAZEWELL COUNTY

Samples 2574, 2575

NW SW SW Sec. 30, T. 25 N., R. 4 W.

Quaternary System Pleistocene Series	
Loess	3

Pennsylvanian System Kewanee Group Carbondale Formation	Thickness (ft)
Shale, black, fissile	1
Herrin (No. 6) Coal Member	4
Clay, gray, massive (2574)	2
Limestone, nodular	0.5
Shale, gray, thinly bedded (2575)	6

Samples 2576, 2577, 2578

SE SE NE Sec. 24, T. 25 N., R. 5 W.

Quaternary System Pleistocene Series	
Loess	5
Pennsylvanian System Kewanee Group Carbondale Formation	
Shale, micaceous, gray; a few sandstone lenses (2576)	7
Limestone, argillaceous, gray, fossiliferous, discontinuous	1.5
Shale, black, thinly bedded	1
Herrin (No. 6) Coal Member	1.5
Clay, gray, massive (2577)	1.5
Clay and limestone	1.5
Shale, gray, massive to thinly bedded; base not exposed (2578)	6

Sample 2579

NW NE NE Sec. 6, T. 25 N., R. 4 W.

Quaternary System Pleistocene Series	
Loess and till	0-25
Pennsylvanian System Kewanee Group Carbondale Formation	
Shale, micaceous, gray, thinly bedded to massive (2579) (may be up to 40 feet thick locally)	25

Sample 2617

SW SW SE Sec. 1, T. 26 N., R. 4 W.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Till, pinkish brown, pebbly, massive.	70

Sample 2618

NE NE SE Sec. 29, T. 23 N., R. 3 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess.	4
Till, pinkish brown, pebbly, massive (2618)	20+

Sample 2619

SW SW Sec. 2, T. 23 N., R. 3 E.

	Thickness (ft)
Quaternary System	
Pleistocene Series	
Loess.	2
Till, pinkish brown, massive, pebbly (2619).	15+

Sample 2621

NW SW NE Sec. 5, T. 25 N., R. 4 W.

Pennsylvanian System
Kewanee Group
Carbondale Formation

Shale (sample from abandoned pit of Peoria Brick and Tile Co.). Section obscured by slumping.

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48. Illinois Mineral Production by Counties, 1970. 1972.