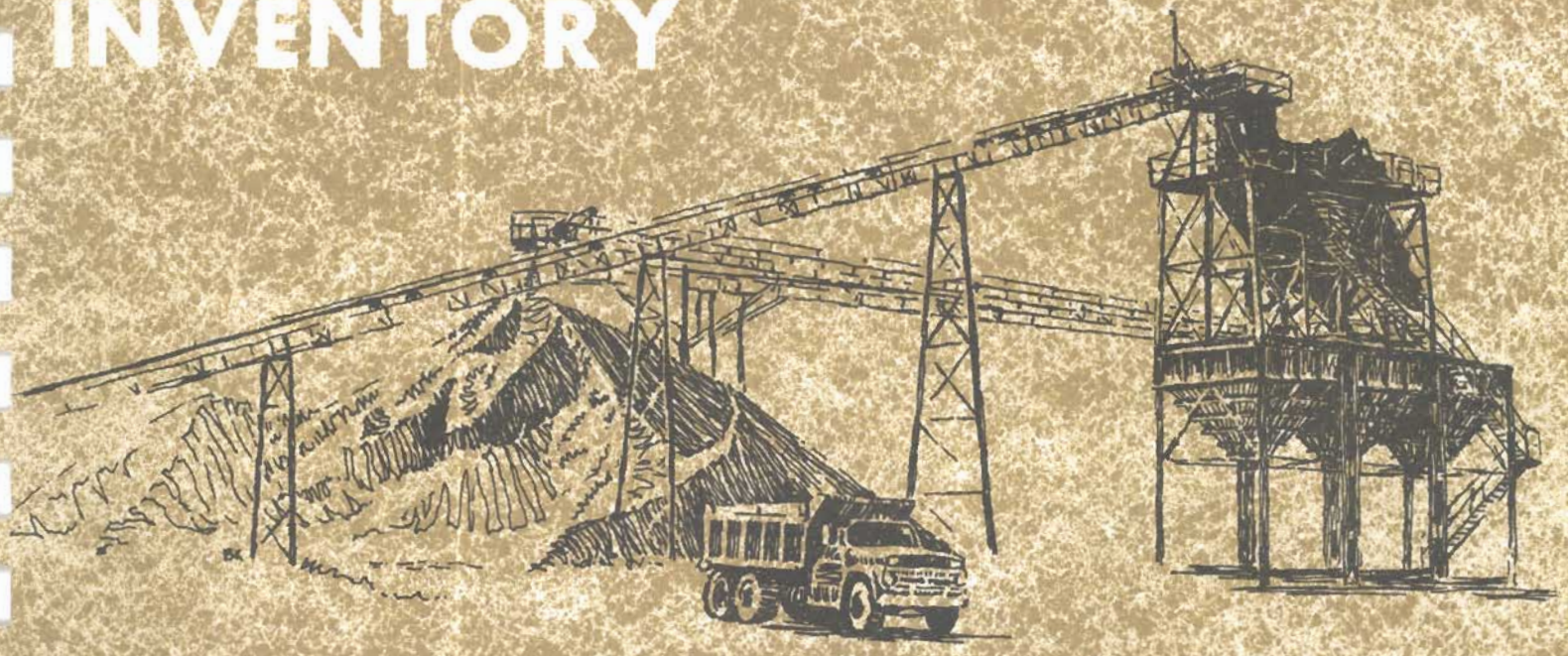
Environmental Geology Section

REPORT NO. 26

CONSTRUCTION MATERIALS INVENTORY



SHAWNEE COUNTY, KANSAS

STATE HIGHWAY COMMISSION OF KANSAS

State Highway Commission of Kansas
Location and Design Concepts Department
Planning and Development Department

CONSTRUCTION MATERIALS INVENTORY OF SHAWNEE COUNTY, KANSAS

by

George E. Petersen, Geologist
assisted by
Jim Riordan and Maurice Cummings,
Remote Sensing Section

Prepared in Cooperation with the
U. S. Department of Transportation
Federal Highway Administration

1974

Construction Materials Inventory Report No. 26

The WHY?

WHAT?

and HOW?

of This Report

This report was compiled for use as a guide when prospecting for construction material in Shawnee County.

> *Construction material includes all granular material, consolidated rock, and mineral filler suitable for use in highway construction.*

Known open sites, prospective sites, both sampled and unsampled, and all geologic units considered to be a source of construction material are described and mapped.

> *Prospective sites are select geologic locations where construction materials may be found.*

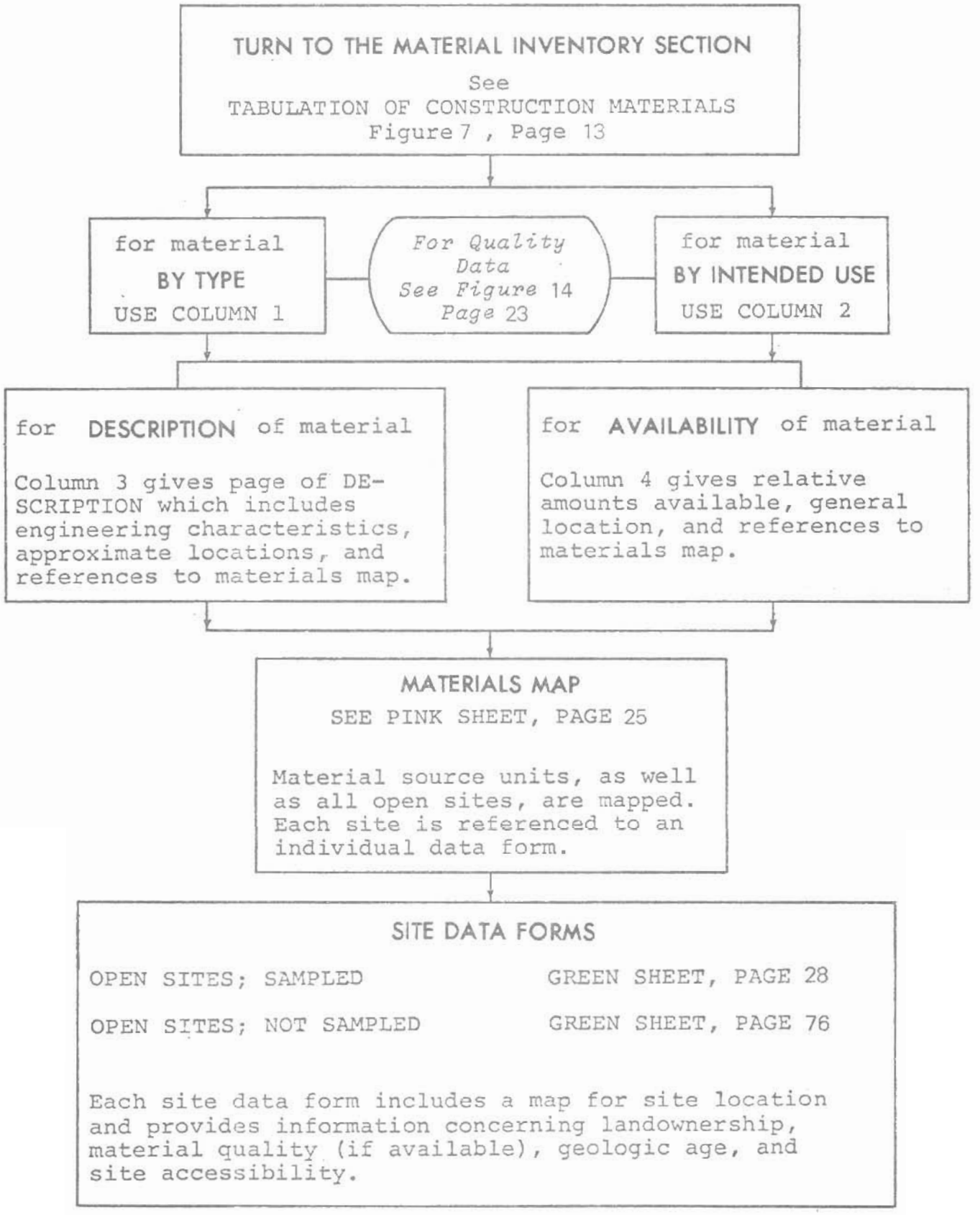
The diagram opposite shows how the MATERIALS INVENTORY SECTION may be used to evaluate and locate mapped sites.

The individually mapped sites certainly do not constitute the total construction material resources of the county. And, the data outlined in the diagram may be used for purposes other than the evaluation and location of these sites.

Beginning on Page 4 is a section explaining the geology of the county. This information (along with the maps, descriptions, and test data) provides the means of evaluating and locating additional construction material sources in the geologic units throughout Shawnee County.

TO LOCATE AND EVALUATE

A MAPPED SITE OF CONSTRUCTION MATERIAL IN SHAWNEE COUNTY



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PREFACE

This report is one of a series compiled for the Highway Planning and Research Program, 'Materials Inventory by Photo Interpretation'. The program is a cooperative effort of the Federal Highway Administration and the State Highway Commission of Kansas, financed by highway planning and research funds. The objective of the project is to ***provide a statewide inventory of construction materials,*** on a county basis, to help meet the demands of present and future construction needs.

Publications issued by the State Geological Survey of Kansas, the U. S. Geological Survey, and U.S.D.A. Soil Conservation Service, concerning Shawnee and surrounding counties, provided the basic geologic information used in this investigation. Detailed geologic and soil data were obtained from soil surveys and centerline geologic profiles prepared for design of major highways in the county by the State Highway Commission.

Appreciation is extended to Mr. H. F. Foley, Shawnee County Engineer, and John Griffith, First Division Materials Engineer, for verbal information concerning construction materials discussed in this report, and to the project leader, R. R. Biege, Jr., P.E., Engineer of Location and Design Concepts, and A. H. Stallard, Chief of the Remote Sensing Section.

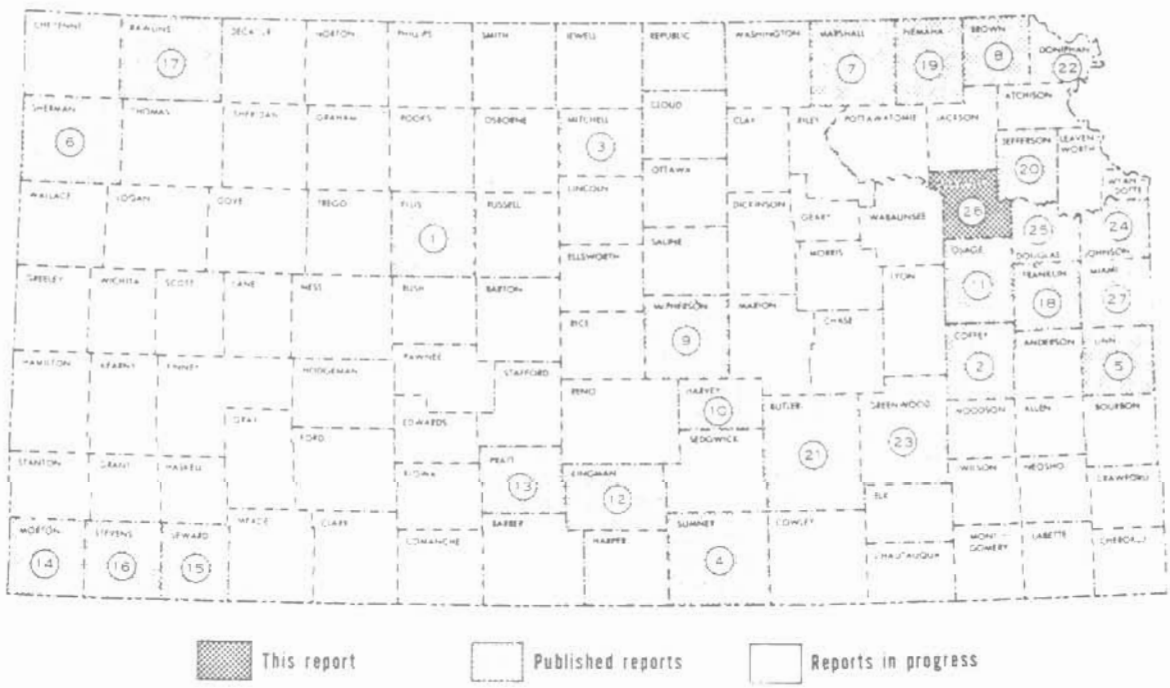


Fig. 1 Index map of Kansas showing the location of Shawnee County along with the report numbers and location of counties for which reports have been or are being completed.

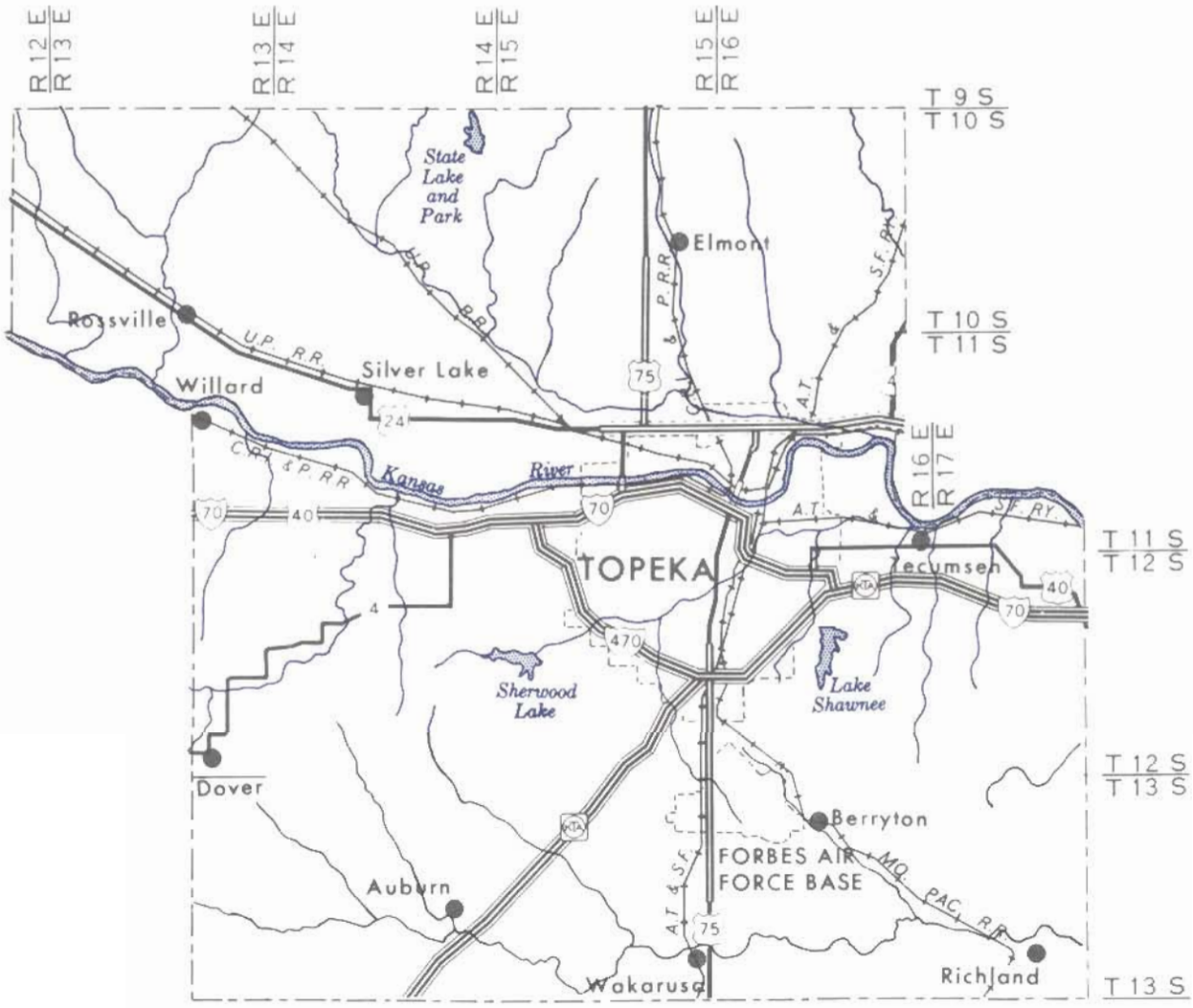
ABSTRACT

Shawnee County is located in northeastern Kansas, and lies in the Central Lowlands Physiographic Province. The topography is gently rolling in the uplands with steep slopes being prominent along major river valleys.

Sources of construction material in Shawnee County are limited to the thicker limestone beds of Pennsylvanian age, siliceous sand and gravel from the Kansas River valley, and a very limited amount of sand and gravel derived from Glacial Drift.

Sedimentary rocks of the Shawnee and Wabaunsee Groups of the late Pennsylvanian age are exposed in the eastern half of Shawnee County while sedimentary rocks of the Admire and Council Grove Groups of early Permian age cropout in western Shawnee County. Limestones of economic value as construction material are the Plattsmouth, Oread, Deer Creek, and Topeka Limestones of the Shawnee Group, and the Burlingame, Wakarusa, and Tarkio Limestones of the Wabaunsee Group. The quality and quantity of these units vary from one area of the county to another and quality tests should be run before use from a new location. Scattered deposits of chert gravel of pre-Kansan age occur in the area but are too small to be of economic value as construction material. River sands are being produced from the Kansas River; however, additional fines of minus 200 mesh size must be blended to meet specifications for concrete and bituminous aggregate.

Excellent water supplies of high quality are available from the Kansas River alluvium; however, the quality and quantity decrease in the Wakarusa River valley and its tributaries and only domestic water supplies are available in upland areas.



Scale in miles

Figure 2. Drainage and major transportation facilities in Shawnee County.

FACTS ABOUT SHAWNEE COUNTY

Shawnee County has an area of 545 square miles and a population of 171,999 as of January 1, 1972, according to the Kansas State Board of Agriculture. It lies in the Central Lowlands Physiographic Province. The elevations above sea level vary from 1,260 feet in the southwestern part of the county to 835 feet where the Kansas River leaves the county on the east.

A primary road system connects all major communities, and a well developed secondary road system provides access to all small communities. Figure 2 illustrates major drainage and transportation facilities in the county.

METHODS OF INVESTIGATION

Investigation and preparation of this report consisted of three phases: (1) research and review of available information, (2) photo interpretation, and (3) field reconnaissance.

During phase one, relevant information concerning geology, soils, and construction materials of the county was reviewed and the general geology determined. Quality-test results of samples taken in Shawnee County were then correlated with the various geologic units and unconsolidated deposits.

Phase two consisted of study and interpretation of aerial photographs taken by the Kansas Highway Commission at a scale of one inch equals 2000 feet. Figure 3 illustrates aerial photographic coverage of Shawnee County. Geologic source beds and all open materials sites were mapped and classified on aerial photographs. These materials sites were then correlated with the geology of the county.

Phase three was conducted after initial study of aerial photographs. A field reconnaissance was conducted by the author to examine construction materials, to verify doubtful mapping situations, and to acquire supplemental geologic information. Geologic classifications of open sites were confirmed, and prospective sites were observed.

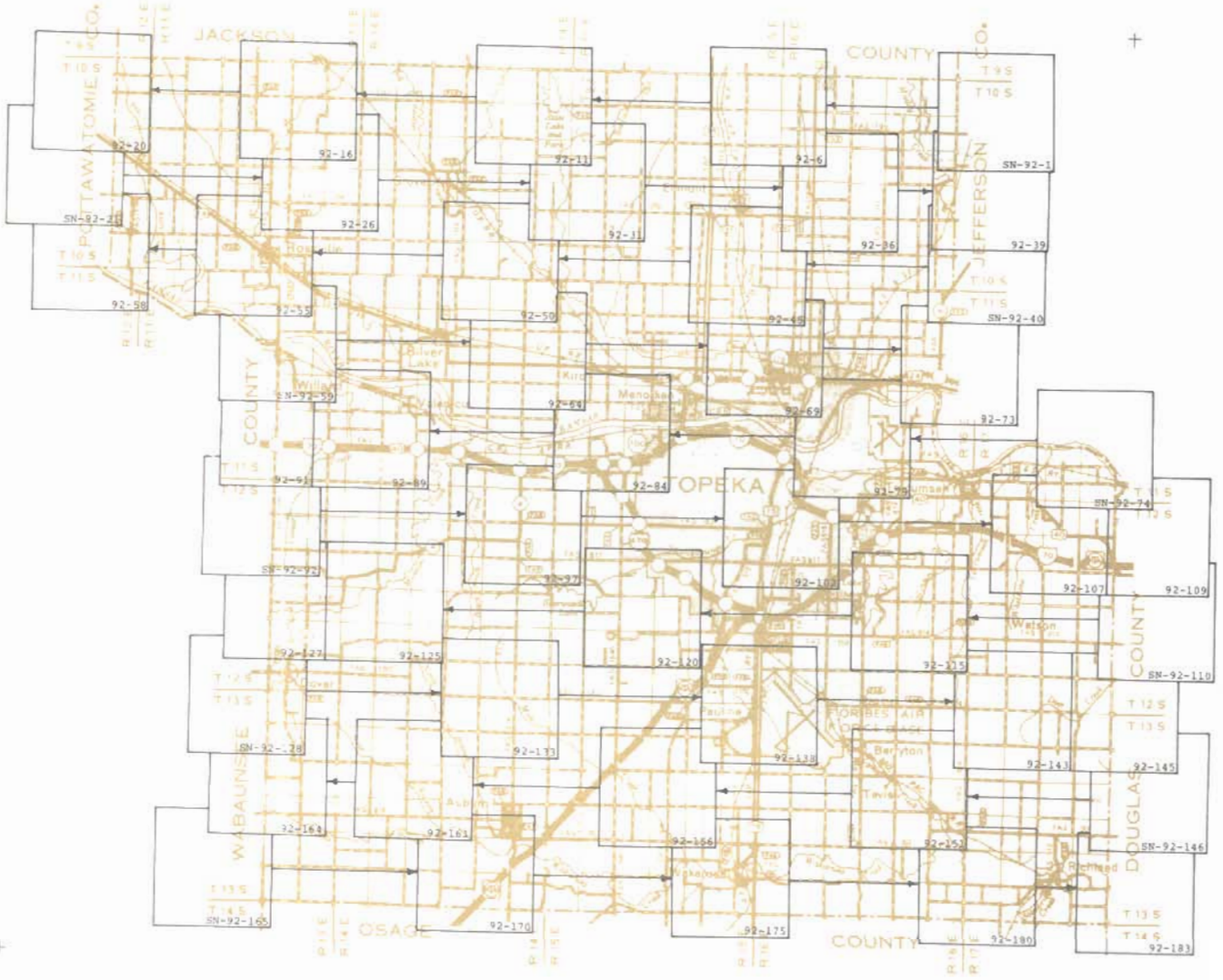


Figure 3. AERIAL PHOTOGRAPHIC COVERAGE MAP for Shawnee County. The numbers refer to photographs taken by the Photogrammetry Section, State Highway Commission of Kansas, on 4-10-69 at a scale of 1" = 2000. Aerial photographs are on file in the Photogrammetry Laboratory, State Office Building, Topeka, Kansas.

GEOLOGY SECTION

LEGEND

- Alluvium
- Glacial Drift
- Clinton Reservoir
- Wabaunsee Group
- Zendale Limestone Base
- Bern Limestone Base
- Shawnee Group
- Deer Creek Limestone Base
- Lecompton Limestone Base

GENERAL GEOLOGY

GEOLOGY is the basis for this materials inventory. Knowledge of the geology makes it possible to: (1) ascertain the general properties of the material source, (2) identify and classify each source according to current geologic nomenclature, and (3) establish a uniform system of material-source-bed classification. By knowing the geologic age, origin, landform, and quality information of the source units, one can derive general information for untested materials sites and prospective locations.

It is important to note that the quality of material from a given source may vary from one location to another, especially in unconsolidated deposits.

This discussion is based primarily on information obtained from The United States Geological Survey Bulletin 1215, 'Geology of Shawnee County, Kansas,' by William D. Johnson, W. L. Adkison, and H. C. Wagner. The geologic timetable, figure 4, shows in graphic form the major time periods and the approximate duration of each. Figure 5 illustrates the surface geology and stratigraphic position of each material source unit in Shawnee County.

Unexposed sedimentary rocks range in age from late Cambrian to late Pennsylvanian and vary in thickness from 2700 feet in the eastern part of the county to 3300 feet in the western part. Marine deposits of late Pennsylvanian and early Permian age are the oldest rocks exposed in Shawnee County. Limestones of the Shawnee and Wabaunsee Groups of late Pennsylvanian age are the most abundant and important materials source units in the county.

The Pleistocene Epoch of the Quaternary Period was a period of repeating glacial and interglacial cycles. These glacial activities reached their southern most terminus along the Wakarusa River in southeastern Shawnee County.

The Nebraskan, Kansan, Illinoisan, and Wisconsinan ages represent major glacial advances of which only the Kansan actually reached into Shawnee County. The Aftonian, Yarmouthian and Sangamonian Stages are periods of major glacial retreats. Glacial drift, glaciolacustrine and glaciofluvial deposits were laid down during this time. Alluvium of the Kansas and Wakarusa rivers in Shawnee County is composed of silt, sand, and gravel of late Wisconsinan and Recent age. Other unconsolidated sand and gravel deposits of Quaternary age are represented by the Menoken, Buck Creek, and Newman terraces; however, because of the difficulties in identification, the Menoken and a large portion of the Buck Creek terrace, has not been mapped. These are of limited value as a source of construction material. The Newman has been mapped where recognizable and could become a potential future source of sand and gravel.

ERAS	PERIODS	ESTIMATED LENGTH IN YEARS	TYPE OF ROCK IN KANSAS	PRINCIPAL MINERAL RESOURCES
CENOZOIC	QUATERNARY (PLEISTOCENE)	1,000,000	Glacial drift; river silt, sand, and gravel; dune sand; wind-blown silt (loess); volcanic ash.	Sand and gravel; volcanic ash; agricultural soils; water.
	TERTIARY	59,000,000	Silt, sand, and gravel; fresh-water limestone; volcanic ash; bentonite; diatomaceous marl; opaline sandstone.	Sand and gravel; volcanic ash; diatomaceous marl; water.
MESOZOIC	CRETACEOUS	70,000,000	Chalky shale, dark shale, vari-colored clay, sandstone, conglomerate; outcropping igneous rock.	Concrete and bituminous aggregate, light type surfacing, shoulder and subgrade material, riprap, and building stone; ceramic materials; water.
	JURASSIC	25,000,000	Sandstone and shale, chiefly subsurface.	
	TRIASSIC	30,000,000		
PALEOZOIC	PERMIAN	25,000,000	Limestone, shale, evaporites (salt, gypsum, anhydrite), red sandstone and siltstone, chert, and some dolomite.	Concrete and bituminous aggregate, light type surfacing, shoulder and subgrade material, riprap, and building stone; natural gas, salt, gypsum, water.
	PENNSYLVANIAN	25,000,000	Alternating marine and non-marine shale; limestone, sandstone, coal, and chert.	Concrete and bituminous aggregate, light type surfacing, shoulder and subgrade material, riprap, and limestone and shale for cement; ceramic materials; oil, coal, gas, and water.
	MISSISSIPPIAN	30,000,000	Mostly limestone, predominantly cherty.	Chat and other construction materials; oil, zinc, lead, and gas.
	DEVONIAN	55,000,000	Subsurface only. Limestone and black shale.	Oil.
	SILURIAN	40,000,000	Subsurface only. Limestone.	Oil.
	ORDOVICIAN	80,000,000	Subsurface only. Limestone, dolomite, sandstone, and shale.	Oil, gas, and water.
	CAMBRIAN	80,000,000	Subsurface only. Dolomite and sandstone.	Oil.
PRE-CAMBRIAN	(Including PROTEROZOIC and ARCHEOZOIC ERAS)	1,600,000,000+	Subsurface only. Granite, other igneous rocks, and metamorphic rocks.	Oil and gas.

Figure 4. Geologic timetable

System	Series	Stage	Graphic Legend	Thickness	Type of Deposit	Map Symbol	General Description	Construction Material
Quaternary	Pleistocene	Wisconsinan and Recent		0-74'	Alluvium	Qal	Clay, silt, and sand, grading downward to coarse gravel in river and stream valleys.	Fine and coarse aggregate, light type surfacing.
		Wisconsinan		0-90'	Terrace Deposit (Newman)	Qn	Clay, silt, and sand, grading downward to coarse gravel in river and stream valleys.	Construction aggregate, light type surfacing.
		Illinoisan		0-90'	Terrace Deposit (Buck Creek)	Qbc	Clay, silt, and sand, grading downward to coarse gravel in river and stream valley.	Construction aggregate, light type surfacing.
		Kansan		0-85'	Glacial Drift	Qd	Predominately clay, silt, and sandy clay, locally contains zones of sand, gravel, cobble and boulders.	Light type surfacing building stone.

System	Series	Group	Graphic Legend	Formations and Members		Map Symbol	Thickness	General Description	Construction Materials
Permian System	Lower Permian Series	Admire Group		Canesville Shale	Hamlin Shale		30 - 40		
					Five Point Limestone		4 - 8		
					West Branch Shale		26 - 47		
				Falls City Limestone			6 - 17		
				Onaga Shale	Bavaby Shale		12 - 26		
					Aspinwall Limestone		2 - 3		
					Towle Shale		6 - 17		
		Wabaunsee Group		Wood Siding	Brownville Limestone		1 - 3		
					Pony Creek Shale		5 - 11		
					Gray Horse Limestone		0 - 4		
					Plumb Shale		7 - 14		
					Nebraska City Limestone		0 - 3		
				Root Shale	French Creek Shale		19 - 29		
					Jim Creek Limestone		0 - 3		
					Friedrich Shale		12 - 30		
				Stotler Limestone	Grandhaven Limestone		3 - 6		
					Dry Shale		0 - 16		
					Dover Limestone		2 - 3		
				Pillsbury Shale			40		
				Zeandale Limestone	Maple Hill Limestone		1 - 3		
					Wamego Shale	Pz	12	Light-olive-gray, a very-finely-crystalline, slightly argillaceous, thin-to medium-bedded, hard and compact, weathers light-olive-gray to yellowish. Forms wedge-shaped slabs.	Light type surfacing and base course aggregate. Shoulder material, concrete and bituminous aggregate and riprap.
					Tarkio Limestone		2 - 5		
				Willard Shale			40 - 47		
				Emporia Limestone	Elmont Limestone		3 - 5		
					Harveyville Shale		10 - 15		
					Reading Limestone		3 - 3		
				Auburn Shale			25 - 45		
				Bern Limestone	Wakarusa Limestone		3 - 5	Two limestone beds separated by claystone limestone, light-olive-gray, finely crystalline very-thin-to medium-bedded, hard and compact weathers to platy fragments.	Concrete and bituminous construction aggregate, light type surfacing and riprap.
					Soldier Creek Shale	Pb	2 - 15	A light-gray, finely cyrstalline hard compact sparsely fossiliferous limestone with a brecciated appearance in the upper part.	Concrete and bituminous construction aggregate, light type surfacing and riprap.
					Burlingame Limestone		1 - 12		
				Scranton Shale	Silver Lake Shale		19 - 26		
					Rulo Limestone		0 - 4		
					Cedar Vale Shale		30 - 35		
					Happy Hollow Limestone		0 - 1		
					White Cloud Shale		80 - 105		
				Howard Limestone	Utopia Limestone		5 - 7		
					Winzeler Shale		1 - 5		
					Church Limestone		1 - 3		
					Aarde Shale		0 - 8		
				Severy Shale			30 - 55		
		Shawnee Group		Topeka Limestone	Coal Creek Limestone		5		
					Holt Shale		0 - 4		
					DuBois Limestone		0 - 3		
					Turner Creek Shale		2 - 6		
					Sheldon Limestone	Pt	1 - 4		
					Jones Point Shale		2 - 6	Predominately limestone but has some thin beds of claystone near the middle. Limestone is dense, light-gray crystalline that weathers to a yellow brown.	Light type surfacing material, riprap (marginal for bituminous and concrete construction).
					Curton Limestone		4 - 11		
					Iowa Point Shale		0 - 2	Medium-light gray and light-olive gray, very fine grained to very-finely-crystalline, hard, and thin-bedded to massive, weathers to small moderate-yellowish-brown subangular or lens-shaped blocks.	Light type surfacing material, riprap (marginal for bituminous and concrete construction).
					Hartford Limestone		3 - 8		
				Calhoun Shale			30 - 60		
				Deer Creek Limestone	Ervine Creek Limestone		13 - 18	Light-olive-gray to olive-gray or medium-light-gray to medium-gray. Dense to very-finely-crystalline in thin to medium wavy beds. Weathers to a light-olive gray to moderate yellowish brown.	Light type surfacing material.
					Lersh & Barrook Shale		4		
					Rock Bluff Limestone	Pd	1 - 3		
					Oskaloosa Shale		6 - 9	Light-gray to olive-gray and brownish-gray to pale-yellowish-brown, very-finely-crystalline to very fine grained, compact, and thin-bedded to massive. Weathers to dark-yellowish-orange.	Bituminous and concrete construction, light type surfacing and riprap.
					Ozawkie Limestone		6 - 10		
				Kanwaka Shale	Stull Shale		20 - 35		
					Clay Creek Limestone		3 - 4		
					Jackson Park Shale		44 - 47		
				Oread Limestone	Kereford Limestone		5 - 7		
					Heumader Shale		4		
					Plattsmouth Limestone	Io	12 - 16		
					Beebner Shale		5 - 6		
					Leavenworth Limestone		1 - 2		
					Snyderville Shale		6		
					Toronto Limestone		10		

Figure 5. Generalized geologic column of the surface geology in Shawnee County.

Divisions of the Quaternary Period				
Period	Epoch	Age	Estimated length of age duration in years	Estimated time in years elapsed to present
Quaternary	Pleistocene	Recent		10,000
		Wisconsinan Glacial	45,000	55,000
		Sangamonian Interglacial	135,000	190,000
		Illinoisan Glacial	100,000	290,000
		Yarmouthian Interglacial	310,000	600,000
		Kansan Glacial	100,000	700,000
		Aftonian Interglacial	200,000	900,000
		Nebraskan Glacial	100,000	1,000,000

Figure 6. Geologic Timetable of the Quaternary Period.

GEO-ENGINEERING

This section provides a general appraisal of the geo-engineering problems that may be encountered in Shawnee County during highway construction. Potential ground- water problems and the quality of water available for concrete are briefly reviewed along with engineering soil types present in the area. ***Detailed field investigations may be necessary to ascertain the severity of specific problems and to make recommendations in design and construction procedures.***

Because of the diversification of Shawnee County geology, the nature of geo-engineering problems varies considerably from one part of the county to another.

The area north of the Kansas River flood plain in Shawnee County is characterized by alluvial filled valleys, interbedded limestone and shale beds of moderate thickness and glacial drift of varying thickness capping the higher elevations. Moderate cuts

and fills will be required for construction in northern Shawnee County. Most cuts will be common excavation except in valley walls along major drainage channels where limestone beds will be encountered. In areas where cuts may encounter the White Cloud Shale, excess swelling may occur due to the high montmorillonite content. Large quartzite boulders may be encountered in the area along with isolated sand and gravel lenses in the glacial deposits. Ground water may be encountered along the base of many of the limestones in this area as well as in any lenses of sand and gravel which might occur in the glacial deposits. Most of the soils in this area are derived from glacial drift and are composed of silty clay, clay loam, and in severe cases clay. Most soil material is an A-6 or A-7 type of soil according to AASHO classification. Water is limited in both quality and quantity in this area although there is usually sufficient water available for domestic and stock usage.

The Kansas River valley is composed of relatively flat terrace deposits of Pleistocene age. The surface material is generally composed of clay, silt, and fine sand with granular material being prominent in the lower part of the alluvium. All excavation will be in common material and will generally encounter soils of A-6 or A-7 according to A.A.S.H.O. classification; however, better quality soil may be encountered in many areas. Soils of high organic content may be found in many old meander scars. Water problems will be minimal unless very deep excavation dips below the water table in the alluvium; however, poorly drained soils and perched water may be encountered in the Newman Terrace.

Southeastern Shawnee County (the area east of highway 75 and south of the Kansas River) is characterized by alluvium filled stream valleys, moderately thick limestone and shale sequences, and glacial deposits which cap much of the higher elevations near the Wakarusa River at Richland. Most cuts will be common excavation except in valley walls along major drainage channels where bedrock may be encountered. Large quarzite boulders and sand and gravel lenses may be encountered in the glacial deposits. Ground water may be encountered in the glacial deposits and along the base of many limestones, particularly the Hartford Member of the Topeka Formation. Soils will be predominantly A-6 or A-7 as in other parts of the county. Water supplies are limited, with larger supplies being found in the alluvium of the stream valleys.

Southwestern Shawnee County includes the area west of highway 75 and south of the Kansas River. The topography is gently rolling due to the thick shale, thin limestone sequence found in this area. Limited amounts of glacial deposits are found in the northeastern and northern edges of the area. Cuts and excavations will be in common material except where limestone units and unweathered shale are encountered. In areas where the White Cloud Shale is encountered, severe swelling of the shale can be expected upon contact with water. Where cuts and excavations intersect the Calhoun Shale, slope stability problems may be anticipated. Soils will generally be classified as A-6 or A-7 by A.A.S.H.O. standards, although other soil types may be found in the area. Water is limited in both quality and quantity with most supplies adequate for domestic use only. Minor water problems may be encountered in cut sections at the base of limestones.

Various coal beds including the Nodaway and Elmo coal beds have been mined county wide. Old drifts, shafts, strip pits, and unconsolidated mine tailings may be encountered in many areas of the county. There are no known coal mining operations now in existence in Shawnee County.

MATERIALS INVENTORY SECTION

GENERAL INFORMATION

Pennsylvanian limestones make up a major part of the construction materials resources in Shawnee County. Siliceous sand and gravel could be produced from Pleistocene terraces and the Kansas River floodplain, but it is much more economical to produce such material from the Kansas River. Sand and gravel has also been produced from glaciofluvial deposits; however, the material is poorly sorted and quantities limited.

Construction material types, their uses, and availability are tabulated in figure 7. Test results from a limited amount of sampling and testing are presented in figure 14 (page 23).

MATERIALS INVENTORY SECTION

TYPE material and geologic source	USE	page	AVAILABILITY
LIMESTONE			
Spring Branch Limestone Member	Light type surfacing material		Very limited source in southeast part of the county. Plate VI.
Beil Limestone Member	Light type surfacing material.		Very limited source in southeast part of the county. Plate VI.
Ozawkie Limestone Member	Concrete and Bituminous aggregate. Light type surfacing, riprap.		Moderate source in eastern central Shawnee County. Plates IV and VI.
Ervine Creek Limestone Member	Concrete and Bituminous aggregate. Light type surfacing, riprap.		Moderate source in east central Shawnee County. Plates IV and VI.
Hartford Limestone Member	Light type surfacing, riprap.		Moderate source in eastern part of the county. Plates II, IV and VI.
Curzon Limestone Member	Light type surfacing, riprap.		Moderate source in eastern part of the county. Plates II, IV and VI.
Burlingame Limestone Member	Concrete and Bituminous aggregate. Light type surfacing, riprap.		Moderate source in northern and western parts of the county. Plates I, II, III and V.
Wakarusa Limestone Member	Concrete and Bituminous aggregate. Light type surfacing, riprap.		Moderate source in northern and western parts of the county. Plates I, II, III and V.
Tarkio Limestone Member	Concrete and Bituminous aggregate. Light type surfacing, riprap.		Limited source in western half of the county. Plates I, III and V.
SILICEOUS SAND AND GRAVEL			
Quaternary Glacial Drift	Light type surfacing. Building stone.		Very limited source. Plates I, II, III, IV and VI.
Terrace Deposits	Construction aggregate. Light type surfacing.		Moderate source in stream and river valleys. All plates.
Quaternary Alluvium	Fine and Coarse aggregate. Light type surfacing.		Good source in Kansas River Valley. Plates I, II, III and IV.

Figure 7. Tabulation of the construction materials types and their availability in Shawnee County.

DESCRIPTION OF CONSTRUCTION MATERIAL

Limestone

Lecompton Limestone Formation

The Lecompton Limestone Formation is composed of four limestone and three shale members which are, in ascending order, the Spring Branch Limestone, Doniphan Shale, Big Springs Limestone, Queen Hill Shale, Beil Limestone, King Hill Shale, and Avoca Limestone.

The Lecompton Limestone outcrops in the southeastern part of Shawnee County along the Wakarusa River, in the northeastern part along Deer Creek, and on the south side of the Kansas River.

The formation ranges in thickness from about 40 feet in the Kansas River valley to about 46 feet in the Wakarusa River valley.

Due to weathering characteristics of the upper beds only the Spring Branch and the Beil Members are considered potential sources of construction materials.

Spring Branch Limestone Member

The Spring Branch Limestone is made up of two units, a lower ledge-forming limestone ranging in thickness from five and one half - nine feet and an upper less resistant unit of interbedded limestone, claystone, and siltstone varying from two - seven feet thick. The limestone is a dark gray, finely-crystalline limestone that weathers yellow brownish in color and into rather massive ledges.

The Spring Branch has been quarried on a very limited basis in eastern Kansas and not at all in Shawnee County. No quality test data are available for this unit in Shawnee County; however, in most cases it will not meet specifications for concrete and bituminous aggregate due to the high clay content, but would be suitable for light type surfacing material. The Spring Branch is exposed in the southeastern part of the county and has been mapped as a part of The Lecompton Formation in this report (plate VI).

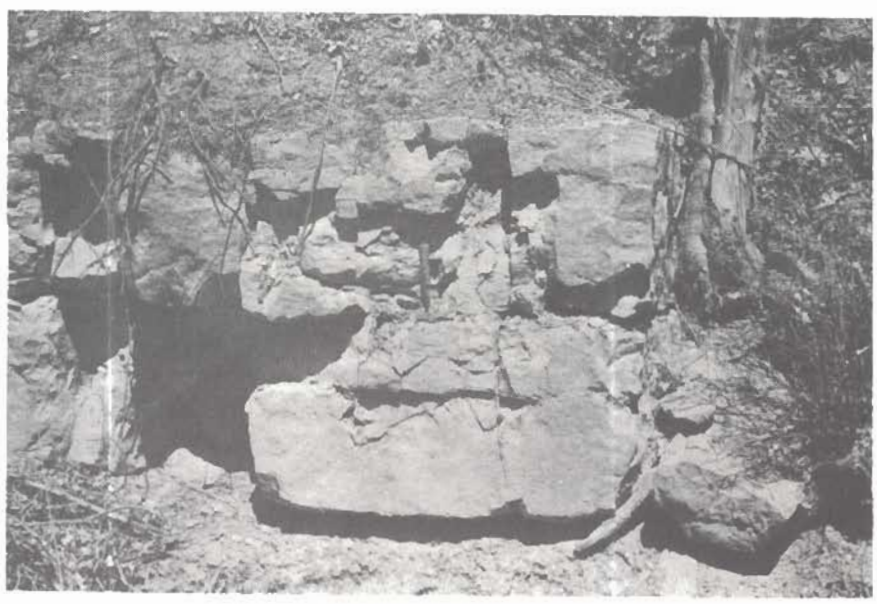


Figure 8. Exposure of the Spring Branch Limestone Member in the NE ¼ sec. 33, T.13 S. R. 17E.

Beil Limestone Member

The Beil Limestone Member is a light-gray, wavy-bedded limestone with interbedded shale. It weathers to a yellowish brown to light-olive-gray, and ranges from eight - ten feet in thickness in Shawnee County.

The Beil has not been produced in the county and only on a limited basis elsewhere in eastern Kansas. No quality test results are available for the Beil in Shawnee County; however, the soft shaly nature of the rock limits its use to light type surfacing material. In areas where the Beil has been produced and tested, it fails to meet specifications for concrete and bituminous construction aggregrate. The Beil is exposed in southeast Shawnee County and has been mapped as a part of the Lecompton Formation in this report (plate VI).

Deer Creek Limestone Formation

The Deer Creek Limestone Formation is composed of five members. They are, in ascending order, the Ozawkie Limestone, Oskaloosa Shale, Rock Bluff Limestone, Larsh and Burroak Shale, and the Ervine Creek Limestone Members. The full thickness of the Deer Creek Formation varies from 32-43 feet in Shawnee County and is mapped as one unit. However, only two limestone members, the Ozawkie and the Ervine Creek are considered to be source units of construction materials (plates IV & VI).

Ozawkie Limestone Member

The Ozawkie Limestone Member is a six - ten foot thick, light-gray limestone that weathers to a yellow-brown color. In most localities in Shawnee County, the member is divided into two limestone units by a thin shale parting.

The Ozawkie Limestone has been produced for riprap on dams and embankments associated with Pamona Dam and Reservoir in Osage County, and Perry Dam and Reservoir in Jefferson County. Test data available for the Ozawkie in Shawnee, Osage, and Jefferson Counties indicate the limestone is variable and wear and absorption qualities are marginal; however, test results on rock produced in some areas in Shawnee County show the material will meet specifications for bituminous and concrete construction as well as light type surfacing and riprap. The Ozawkie has been mapped as a member of the Deer Creek Formation in this report (plates IV & VI) .

Ervine Creek Limestone Member

The Ervine Creek Limestone Member is a light-gray to white, fine-grained limestone containing scattered chert nodules. It varies in thickness from 13-18 feet. A fresh surface appears somewhat massive but it weathers into thin, wavy beds that are light brown in color. Small shale seams prominent in most weathered exposures lower the quality of the limestone.

The Ervine Creek has been quarried extensively in Jefferson County, in Shawnee County east of Topeka, and in other counties on a limited basis. Quality data on samples from these quarries indicate that most sources were good to marginal for concrete and bituminous construction; however, material quality is erratic due to weathering and changes

in lithology. Material produced from the Ervine Creek is acceptable for light type surfacing. The Ervine Creek has been mapped as a part of the Deer Creek Formation for this report (plates IV & VI).

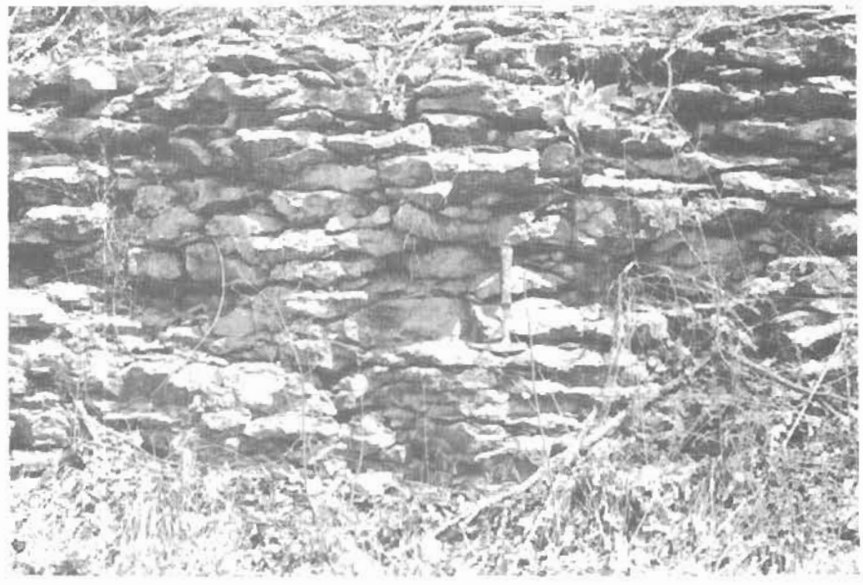


Figure 7. Exposure of the Ervine Creek Limestone Member located in the west side of sec. 33, T. 11S, R. 17E.

Topeka Limestone Formation

The Topeka Limestone Formation is composed of nine members. They are in ascending order: the Hartford Limestone, the Iowa Point Shale, the Curzon Limestone, the Jones Point Shale, the Sheldon Limestone, the Turner Creek Shale, the Du Bois Limestone, the Holt Shale, and the Coal Creek Limestone. The Topeka Limestone varies in thickness from ten feet in the Wakarusa River valley to 33 feet just east of Topeka.

The main sources of construction material are the Hartford and Curzon Limestone Members of the Topeka Formation which are shown on plates II, IV and VI.

Hartford Limestone Member.

The Hartford Limestone is a light-gray, fine-grained, thin-bedded to massive unit that weathers to a yellowish-brown color. It has a thickness of three - eight feet and a shale bed that varies in thickness near the base of the unit. The Hartford has been quarried on a limited basis in Shawnee County and no quality test results are available for this area; however, test results on samples obtained in Osage County indicate that the unit would be acceptable for light type surfacing and riprap, but marginal for concrete and bituminous construction aggregrate. The Topeka Formation of which the Hartford is a member, is shown on plates II, IV & VI.

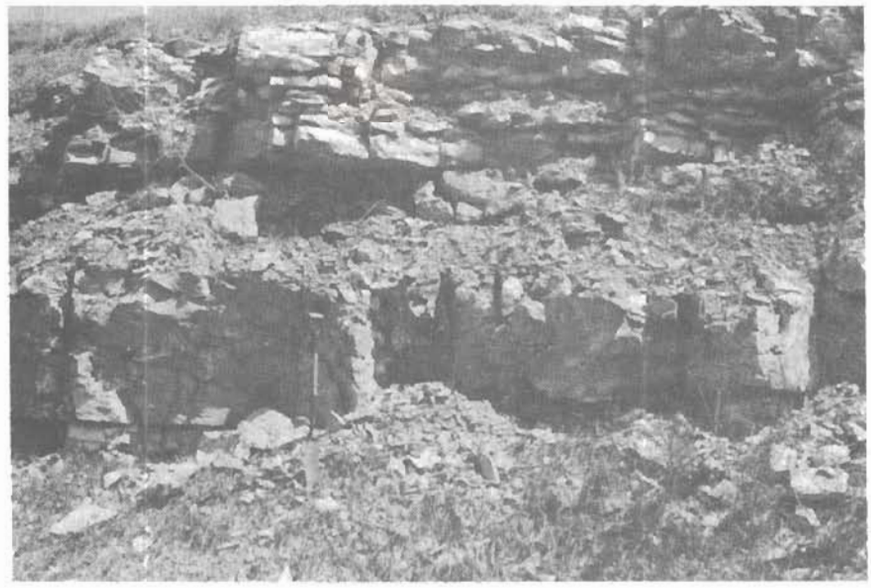


Figure 10. Hartford and Curzon Limestone exposures in the N.E. corner, SE ¼ sec. 10, T. 12S., R. 17E.

Curzon Limestone Member

The Curzon Limestone is a dense, light-gray, crystalline limestone that weathers to a yellow brown, and varies in thickness from four and one half - ten and one half feet with thin shale beds occurring near the middle of the unit. Quality test data are not available for the Curzon in Shawnee County but tests completed on samples obtained in Jefferson County indicate that the material is marginal for bituminous and concrete construction but acceptable for light type surfacing material and riprap. The Topeka Formation of which the Curzon is a member, is shown on plates II, IV, & VI.

Bern Limestone Formation

The Bern Limestone ranges in thickness from 12-24 feet and is comprised of the Burlingame Limestone, Soldier Creek Shale, and the Wakarusa Limestone Members. The Burlingame is the primary material source of construction material; however, the Wakarusa Member is sometimes quarried in conjunction with it. The outcrop pattern of the Bern Formation is shown on plates I, II, III and V.

Burlingame Limestone Member

The Burlingame is a light-gray limestone that weathers to a dark-brown color. It ranges in thickness from 1.5 to 12 feet and varies from a brecciated limestone north of the Kansas River to a dense crystalline rock south of the river. Quality tests of the Burlingame in Shawnee County show that in most areas the material is acceptable for concrete and bituminous aggregrate as well as light type surfacing and riprap. The limestone is quarried extensively in north central Shawnee County where up to 70 feet of overburden has been removed.

Quality tests run on the Burlingame in Jackson, Jefferson, and Osage Counties

show the material to be marginal and that the unit is much thinner. The Burlingame is the basal member of the Bern Formation which is shown on plates I, II, III & V.

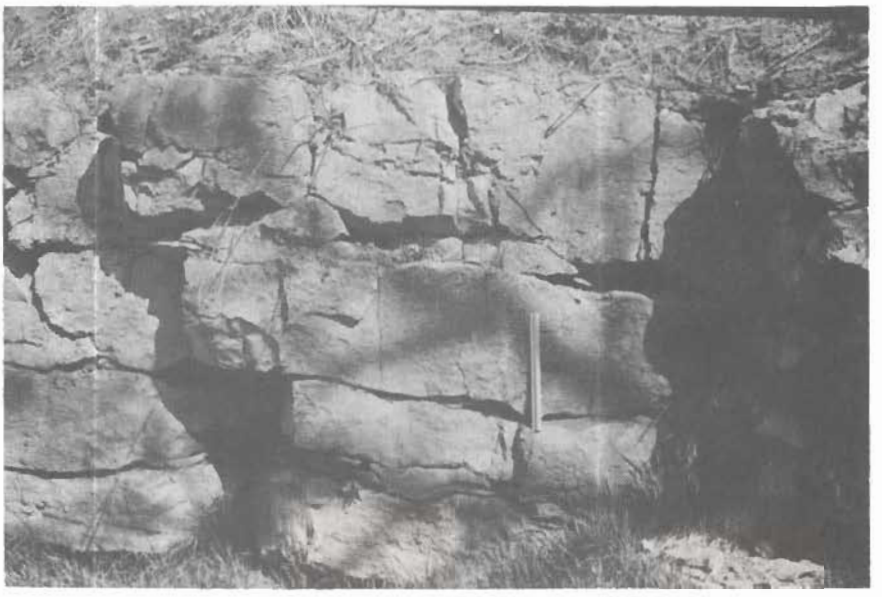


Figure 11. The Burlingame Limestone Member exposed in a roadcut in the SE ¼ sec. 36, T. 11S., R. 14E.

Wakarusa Limestone Member

The Wakarusa Limestone is a light-gray crystalline, dense limestone that weathers to a yellow brown, varies from three to four and one third feet in thickness, and is usually divided into two separate beds by a thin shale seam.

Quality test results on samples taken from the Wakarusa in Shawnee County show that it will generally meet specifications for concrete and bituminous construction aggregate as well as light type surfacing and riprap; however, due to its limited thickness, the Wakarusa is usually only produced in conjunction with the Burlingame Limestone. The Bern Formation of which the Wakarusa is the uppermost member, is shown on plates I, II, III and V.

Zeandale Limestone Formation

The Zeandale Limestone is composed of the Tarkio Limestone which is the basal member of the formation, Wamego Shale, and the Maple Hill Limestone which is the uppermost unit. It varies in thickness from 15-18 feet; however, the Tarkio Limestone is the only member of the Zeandale Formation that is quarried in Shawnee County. The Zeandale Formation is shown on plates I, II, III, and V.

Tarkio Limestone Member

The Tarkio is a light-gray, finely-cyrstalline limestone that weathers to a dark brown color. It forms a prominent ledge with widely spaced vertical joints and contains numerous small fossils called fusilinids which resemble wheat grains. The limestone is highly variable in both quality and quantity throughout eastern Kansas. In Shawnee County its thickness varying from one and eight tenths feet in the north central part to four and one half feet in the southwestern corner. In Wabaunsee County to the west, the Tarkio is approximately ten feet thick in the eastern part and thins to four feet to the west. In Osage County it varies from seven feet in the northern part to approximately two feet on the southern edge of the county.

Quality test results on selected outcrops show that the Tarkio meets specifications for concrete aggregrate as well as light type surfacing material and riprap; however, the quality is highly erratic and tests should be run on any potential quarry sites. The Tarkio Limestone is mapped as part of the Zeandale Formation shown on plates I, III and V.

Figure 12. The Tarkio Limestone Member exposed in the SE ¼ sec. 30, T.11S., R.14E.

Sand and Gravel

Glacial Drift

Glacial Drift is the term used here to include all material deposited directly or indirectly by glacial ice. These deposits, covering approximately 40 percent of Shawnee County, vary from a thin veneer to about 25 feet in thickness south of the Kansas River and up to 76 feet on some slopes north of the river. Deposits are also found in varying thicknesses in Wabaunsee and Pottawatomie Counties, to the north in Jackson County, and to the east in Jefferson and Douglas Counties. These deposits are composed of till, outwash and scattered erratics, with concentrations of sand and gravel in scattered lenses. Quality test data available for these deposits indicate a high percentage of clay and silt, therefore,

the material must be washed and graded to meet specifications. Sand and gravel produced from glacial deposits in Shawnee and surrounding counties is generally used in the immediate locality. The Glacial Drift is mapped on plates I, II, III, IV & VI.

Figure 13. Glacial boulders resting in a field in the SW ¼ NW ¼ sec. 11, T. 13S., R. 16E.

Terrace Deposits

Terrace deposits of Quaternary age are present in most of the stream valleys in Shawnee County but only two have been mapped, the Buck Creek Terrace of Illinoisan age and the Newman Terrace of Wisconsinan age. These terraces do not add to the construction material reserves of Shawnee County since the upper part of each terrace is composed of varying combinations of fine sand, silt, and clay. Granular material is found at lower depths but no material has been produced from this source in the county or elsewhere due mainly to the availability of siliceous sand and gravel from more recent deposits of the Kansas River alluvium and material pumped from the Kansas River channel. The greatest thickness of the Buck Creek was measured in Wabaunsee County just west of Willard where 49 feet of sediment was recorded while the Newman was found to be 75 feet thick just west of Silver Lake.

The Quaternary Terraces will assume a greater economic importance as a source of sand and gravel in coming years inasmuch as dams constructed on the tributaries of the Kansas River have eliminated the natural replenishment of sand and gravel from their sources to the north and west. These terrace deposits have been mapped on all plates.

Quaternary Alluvium

Kansas River alluvium is an excellent source of sand and gravel. The upper alluvium is composed of clay, silt, and fine sand. Test holes drilled in the Silver Lake area show a thickness of 50 to 75 feet with the lower 2/3 to 3/4 of the deposit containing sand with substantial amounts of gravel being encountered near the base.

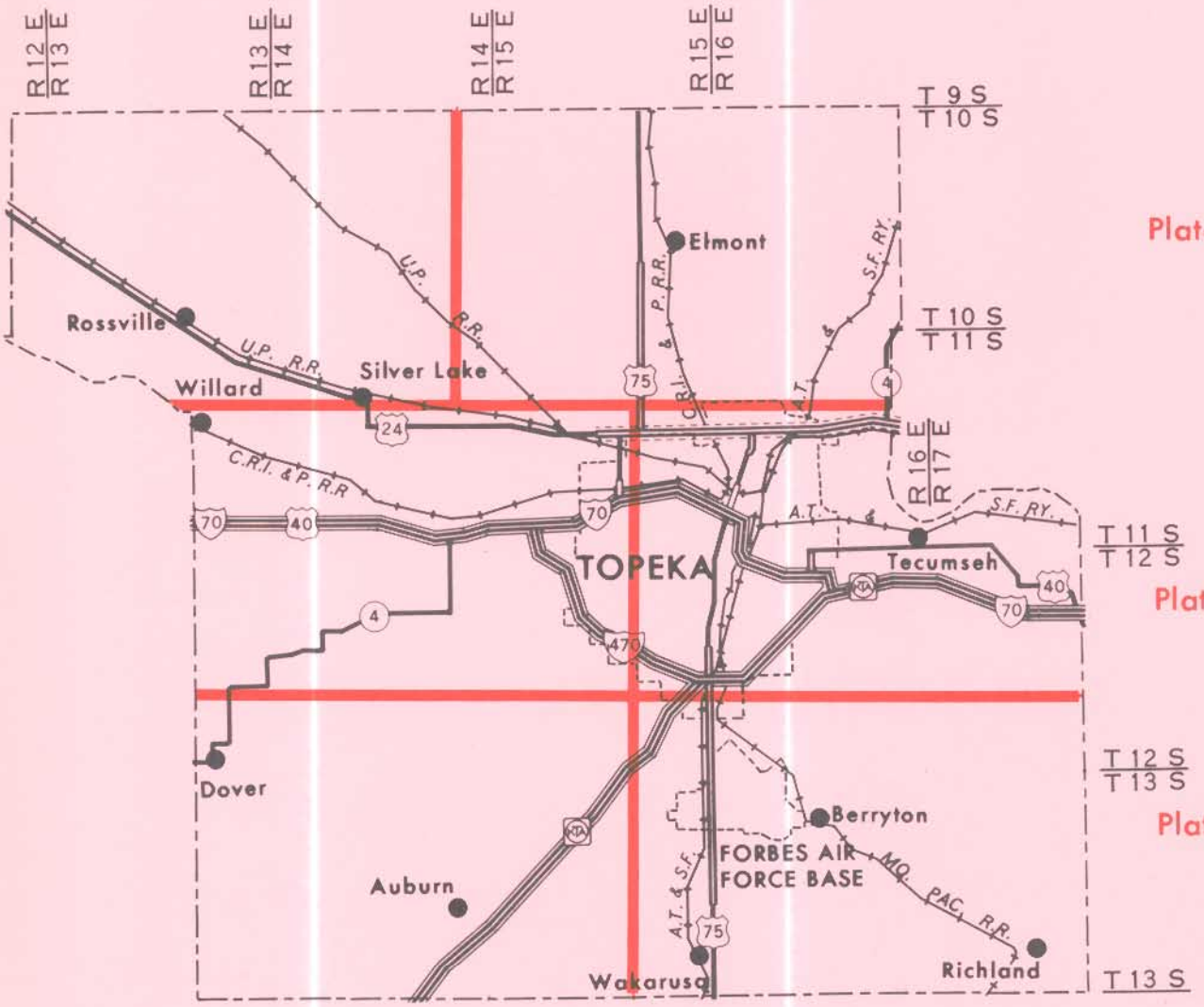
The alluvium of the Wakarusa River valley and other smaller stream valleys in Shawnee County contain such a limited amount of sand and gravel that they have been mapped as a part of the Newman Terrace and therefore will not be discussed here. Also, because of their clay and silt content and the relative ease of obtaining sand and gravel by pumping from the Kansas River, no material is presently being produced from the alluvium. The alluvium has been mapped on all plates.

Site Data Form No.	Material Type	Date of Test	Percent Retained 3/4	3/8	4	8	16	30	50	100	Wash	G. F.	Sp. Gr. Sat.	Sp. Gr. Dry	Weight Cu. Ft.	% Wear	% Soundness	% Absorption	Source of Data SHC Lab No.	Type of Sample
Source of Material: Alluvium - Qal																				
56+29	Sand and Gravel	12-20-60	0	0	2	5	24	48	87	99	1.0	2.65	2.62		112.00	38.0	0.98	0.4	14520	
		3-18-59	0	0	4	13	26	40	87	99	0.53	2.69	2.61		111.1	32.2	0.98	0.5	5874	
		8-23-61	-	0	2	9	22	48	90	99	0.39	2.70	2.62		111.55	-	-	0.5	18665	
56-33	Sand and Gravel	12-20-60	0	0	1	9	24	48	87	99	1.0	2.68	2.62		111.93	35.6	0.97	0.6	14519	
		7-02-63	-	2	6	17	33	55	86	97	0.11	2.96	2.62		115.02	37.5	0.99	0.4	29052	
		3-03-59	-	0	1	9	25	53	90	99	0.27	2.77	2.61		112.5	33.0	0.96	0.4	5733	
		5-18-62	0	1	2	10	26	49	88	98	1.18	2.74	2.60		113.56	37.5	0.97	0.6	22443	
		8-17-62	-	0	1	8	23	48	87	98	0.38	2.65	2.61		112.8	-	-	0.5	24037	
		7-02-63	-	-	1	8	25	53	87	98	0.64	2.72	2.60		111.57	34.9	0.98	0.4	29051	
56-27	Sand and Gravel	3-01-61	-	0	3	14	39	79	98	100	0.18	3.33	2.62		110.87	38.8	0.95	0.6	15361	
		2-02-61	-	0	1	8	24	55	91	98	0.90	2.77	2.61		112.28	35.4	0.95	0.6	15045	
		6-04-63	-	1	13	25	42	68	92	99	0.57	3.40	2.61		115.70	37.4	0.97	0.6	28485	
		5-18-62	-	0	2	8	25	63	90	99	0.46	2.87	2.62		112.90	-	-	0.4	22216	
		3-05-59	-	0	1	7	24	56	87	98	0.42	2.73	2.62		112.4	34.3	0.96	0.6	5767	
56-30	Sand and Gravel	2-01-61	-	0	1	13	37	64	87	95	2.12	2.97	2.60		116.63	32.7	0.98	0.6	15041	
		1-08-57	-	0	2	13	35	65	88	97	0.67	3.00	2.62		113.5	34.2	0.98	0.03	96171	
		4-28-61	0	3	9	24	47	75	93	98	0.67	3.49	2.62		113.16	-	-	0.4	16406	
56-33	Sand and Gravel	2-03-61	-	0	2	13	33	58	85	95	2.10	2.86	2.62		111.49	33.8	0.96	1.1	15042	
		3-01-61	0	4	14	40	81	97	99	99	0.44	4.34	2.61		108.07	35.8	0.96	0.9	15359	
		3-18-59	0	1	5	19	41	67	89	97	1.20	3.10	2.63		112.8	33.0	0.97	0.6	5873	
		4-04-63	-	4	11	23	40	57	82	98	0.18	3.15	2.60		115.74	38.3	0.98	0.8	27559	
56-26	Sand and Gravel	2-01-61	0	1	4	13	30	64	95	98	1.73	3.05	2.62		112.06	34.0	0.97	0.7	15046	
		3-05-59	-	-	0	3	21	60	94	99	0.42	2.77	2.62		110.2	31.8	0.97	0.5	5768	
		4-04-63	-	0	6	17	40	73	98	99	0.21	3.33	2.61		112.28	35.0	0.97	-.8	27560	
		3-01-61	0	2	12	50	79	92	99	100	0.08	4.34	2.61		111.51	37.1	0.94	0.7	15360	
56-17	Sand and Gravel	9-16-58	0	2	6	22	51	76	94	99	0.26	3.50	2.62		114.8	32.7	0.97	0.5	3397	
56-18	Sand and Gravel	7-25-60	0	2	7	23	49	70	90	97	1.04	3.38	2.62		115.83	36.5	0.97	0.6	12424	
56-32	Sand and Gravel	4-04-63	0	0	4	19	46	72	91	98	0.65	3.30	2.62		112.28	38.7	0.97	0.8	27561	
		3-02-61	0	1	8	36	75	90	94	97	1.68	4.01	2.62		111.49	39.2	0.98	1.00	15362	
56-31	Sand and Gravel	2-17-64	0	1	3	7	30	77	90	93	5.94	3.01	2.57			30.0	0.91	2.42	31917	
Source of Material: Glacial Deposits Qgd																				
SG-15	Clay-Sand & Gravel	3-02-61	0	1	3	7	30	77	90	93	5.94	3.01	2.57	-	96.19	30.0	0.91	2.42	15498	
SG+1	Clay-Sand & Gravel	3-03-61	19	35	52	60	67	75	80	81	17.6	4.69	2.48	2.36	-	30.2	0.93	4.82	15499	
SG+16	Clay-Gravel	3-06-61	16	29	40	51	63	71	74	78	25.2	4.22	2.52	2.43	99.78	31.1	0.94	3.80	15363	
SG+44	Sand-Gravel	2----61	0	1	2	4	10	19	25	31	.56	-	-	-	-	-	-	-	AB710	
Source of Material: Zeandale Limestone Formation (Tarkio Limestone Member) Pzt																				
LS+40	Limestone	2-09-61											2.65	2.60		27.9	0.96	1.95	15143	Crushed
LS+23	Limestone	10-06-61											2.49	2.40		28.0B	0.97	3.77	19382	Crushed
													2.48B	2.38		-	-	4.00	19382	Crushed
													2.47C	2.37		-	-	4.18	19382	Crushed
													2.45D	2.35		-	-	4.35	19382	Crushed
Source of Material: Bern Limestone Formation Pbb																				
	Limestone	7-03-63											2.62	2.58		25.2	0.98	1.67	29189	Crushed
LS+14	Limestone	3-01-59											2.62	-		28.6B	0.97	1.50	96537	Crushed
LS+7	Limestone	2-09-61											2.57	2.53		23.4	0.96	1.96	15145	Crushed
LS+21	Limestone	2-14-61											2.63	2.59		23.5	0.96	1.56	15271	Crushed
	Limestone	12-20-60											2.64	2.58		37.7	0.94	2.63	14521	Crushed
		1-31-61											2.63	2.58		25.4	0.94	1.93	15043	Crushed
		2----61											2.64A	2.59		-	-		15044	Crushed
LS+19	Limestone	2----61											2.63B	2.57		-	-		15044	Crushed
		2----61											2.63C	2.57		-	-		15044	Crushed
LS+3	Limestone	2-09-61											2.63	2.60		27.6	0.97	1.16	15146	Crushed
		1-27-61											2.58A	2.52		27.2	0.97		14990	Crushed
LS+22		2----61											2.58B	2.52		28.0	0.96	2.14	15272	Crushed
LS+6	Limestone	2-14-61											2.61	2.56		25.2	0.97	1.89	15274	Crushed
LS+12	Limestone	3-05-59											2.61	2.57		26.7	0.98	1.80	5776	Crushed
LS+41	Limestone	5-24-60											2.52	2.43		35.9	0.95	3.65	11576	Crushed
LS+5	Limestone	4-09-63											2.60	2.55		25.2B	0.98	2.04	27459	Crushed
LS+9	Limestone	12-20-63											2.62	2.56		27.7B	0.94	2.62	29837	Crushed
	Limestone	12-20-63											2.57	2.49		28.7	0.96		29838	Crushed
													2.62	2.57		-	-		29190	Crushed
													2.62	2.58		25.2	0.98		29189	Crushed
LS+13	Limestone												2.65	2.60		27.0	0.92	2.11	30707	Crushed
LS+11	Limestone	2-20-66											2.57	2.48		31.0B	-	3.27	65-4361	Crushed
LS+20	Limestone	1-28-68											2.60	2.56		25.5B	-	1.60	65-1245	Crushed
LS+8	Limestone	2-28-68											2.65	2.62		23.8B	0.97	1.33	67-5005	Crushed
LS+10	Limestone	8-10-71											2.60	2.54		28.0	0.96	2.26	71-2441	Crushed
LS+2	Limestone	8-09-72											2.60	2.53		29B	0.97	2.66	72-2483	Crushed
		6-20-72											2.62	2.56		2.70	0.94		72-1828	Crushed
	Limestone	7-09-70											2.62	2.57		26.4	0.97	1.85	69-2354	Crushed
LS+4	Limestone												2.62	2.57		27.5B	0.97	1.88	70428	Crushed
Source of Material: Topeka Limestone Formation Pth																				
LS+43	Limestone	2-09-61											2.59	2.54		28.0	0.95	1.88	15147	Crushed
LS+39	Limestone	2-09-61											2.44	2.34		29.6	0.97	4.16	15144	Crushed
	Limestone	3-04-59											2.58	-		24.0	0.97	4.00	91542	Crushed
LS+24		2-27-56											2.47	-		29.8	0.96	4.71	91543	Crushed
Source of Material: Deer Creek Limestone Formation Pdc																				
LS+46	Limestone	3-04-59											2.65	2.61		25.8	0.94	1.43	50445	Crushed
													2.59	2.55		25.7	0.93	1.76	50446	Crushed
													2.56	2.52		27.4	0.91	1.87	50447	Crushed
	Limestone	3-04-59											2.54	-		31.1	0.95	2.14	62086	Crushed
													2.58	-		26.2	0.82	2.21	62087	Crushed
LS+34	Limestone												2.53	-		28.6B	0.89	2.74	62088	Crushed
	Limestone	2-14-61											2.52	2.39		37.4	0.87	5.45	15273	Crushed
LS+42	Limestone												2.45	2.32		35.7	0.93	5.53	15269	Crushed
LS+35	Limestone	2-09-61											2.49	2.42		29.5	0.96	2.96	15149	Crushed
LS+37	Limestone	3-05-59											2.48	-		30.2	0.94	3.21	2058	Crushed
LS+38	Limestone	1-04-61											2.55	2.47		32.9	0.95	3.25	14672	Crushed
		2----61											2.54A	2.46		-	-	3.31	14673	Crushed
													2.57B	2.49		-	-	3.11	14673	Crushed
													2.56C	2.48		-	-	3.08	14673	Crushed
LS+36	Limestone	3-16-61											2.56	2.49		32.4	0.92	2.82	15699	Crushed
	Limestone	9-28-60											2.50	2.40		39.3	0.97	4.11	13349	Ledge
		9-28-60											2.55	2.44		38.6	0.94	4.43	13348	Ledge
LS+25	Limestone	10-20-60											2.52	2.39		36.9	0.89	5.09	13657	Crushed
		2----61											2.50	2.37		-	-	5.31	13658	Crushed
LS+45	Limestone	2----61											2.51	2.38		-	-	5.32	13658	Crushed
		7-13-61											2.56	2.48		32.6	0.96	2.98	17560	Crushed

Figure 14 . Results of tests completed on samples of material from the various geologic source beds in Shawnee County.

SHAWNEE COUNTY MATERIALS MAP INDEX

On the following pages are six plates covering Shawnee County as shown below



Note: The individual site data forms follow Plate VI.

LEGEND

MATERIALS SITE DESIGNATIONS

Open materials sites; sampled — Page 28

Open materials sites; not sampled — Page 76

Material Type

SG Sand and Gravel
LS Limestone

SG+1
Qgd

Estimated Quantity
+ indicates more than 20,000 cubic yards
- indicates less than 20,000 cubic yards

Reference to site number on following data forms

Geologic Age and Unit

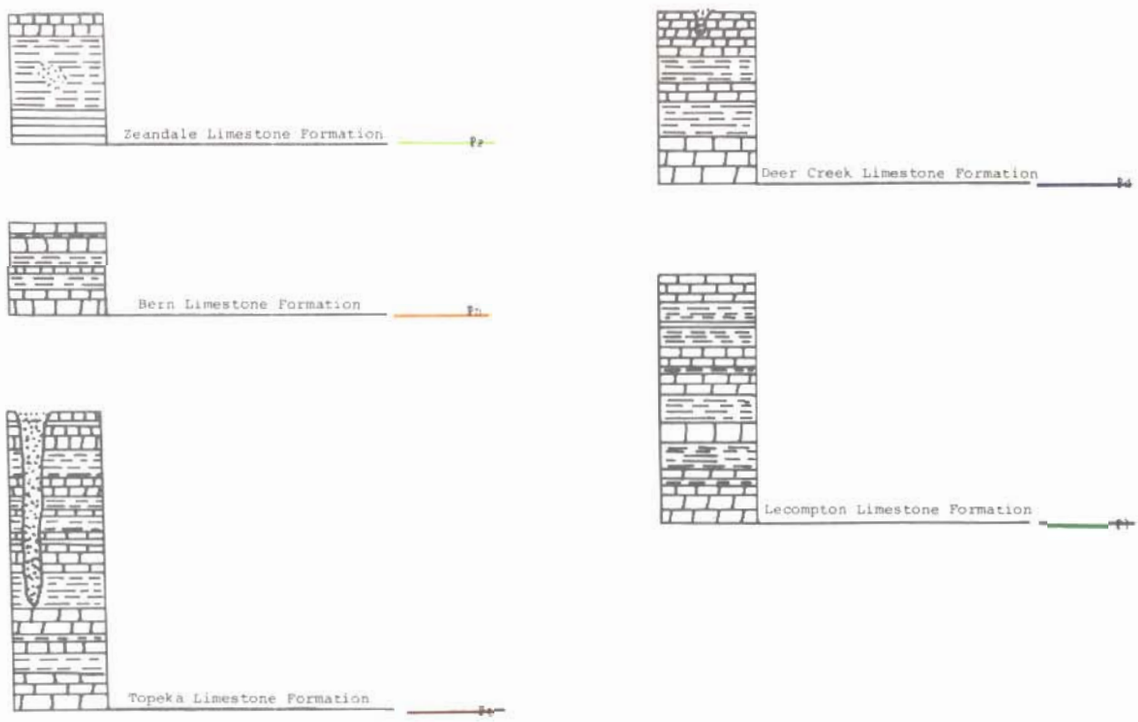
GEOLOGY

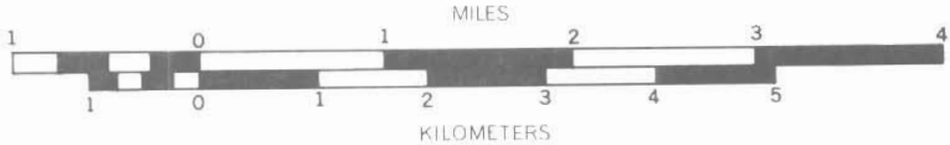
Newman Terrace

Alluvium

Buck Creek Terrace

Glacial Drift





SHAWNEE COUNTY MATERIALS MAP

Plate I

R 12 E | R 13 E — R 13 E | R 14 E

JACKSON COUNTY

T 10 S

Pottawatomie County

SG+1
Qgd

SG-47
Qgd

T 10 S
T 11 S

III

V

SHAWNE

LEGEND

MATERIALS SITE DESIGNATIONS

Open materials sites; sampled — Page 28

Open materials sites; not sampled — Page 76

Material Type

SG Sand and Gravel
LS Limestone

SG+1
Qgd

Estimated Quantity
+ indicates more than 20,000 cubic yards
- indicates less than 20,000 cubic yards

Reference to site number on following data forms

Geologic Age and Unit

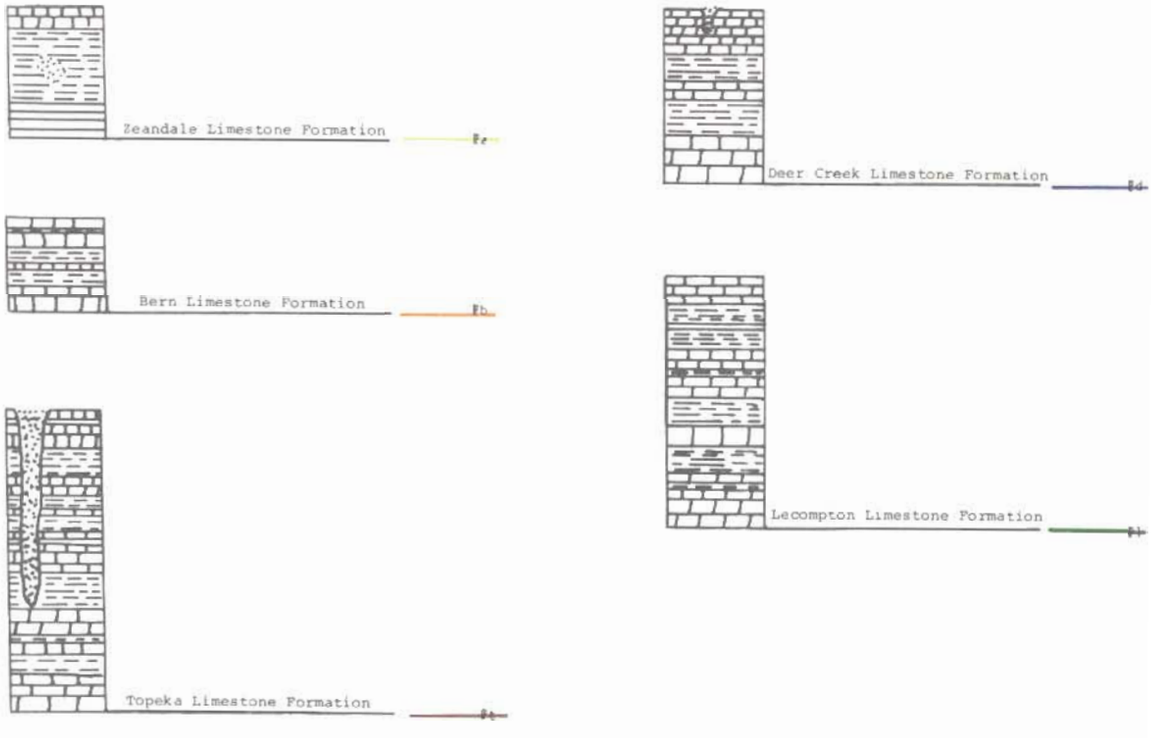
GEOLOGY

Newman Terrace

Alluvium

Buck Creek Terrace

Glacial Drift



SHAWNEE COUNTY MATERIALS MAP

Plate II

R 14 E
R 15 E
R 15 E
R 16 E

Jackson County

T 10 S

Jefferson County

T 10 S
T 11 S

I | II | III | IV | V | VI

SHAWNEE COUNTY

LS+2 Pbb
LS+3 Pbb
LS+4 Pbb
LS+6 Pbb
LS+7 Pbb
LS+8 Pbb
LS+9 Pbb
LS+10 Pbb
LS+11 Pbb
LS+12 Pbb
LS+13 Pbb
LS+14 Pbb
SG-15 Qgd

Qgd Qn Pz Pb

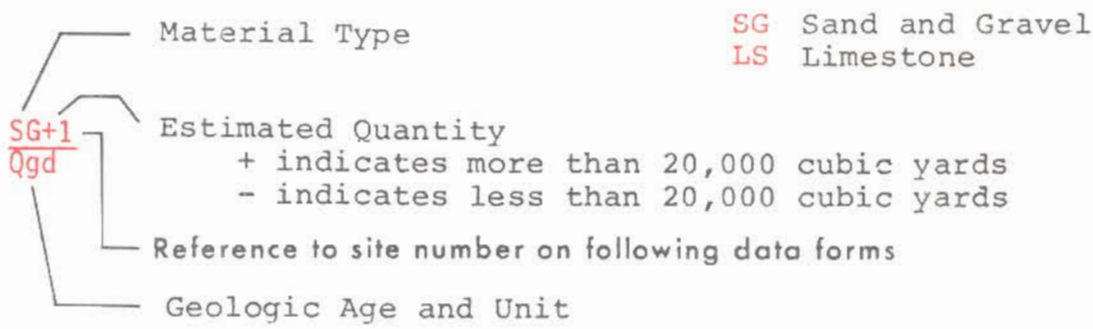
Little Lake and Park
Soldier Creek
Indian Creek
Pacific
Elmont

LEGEND

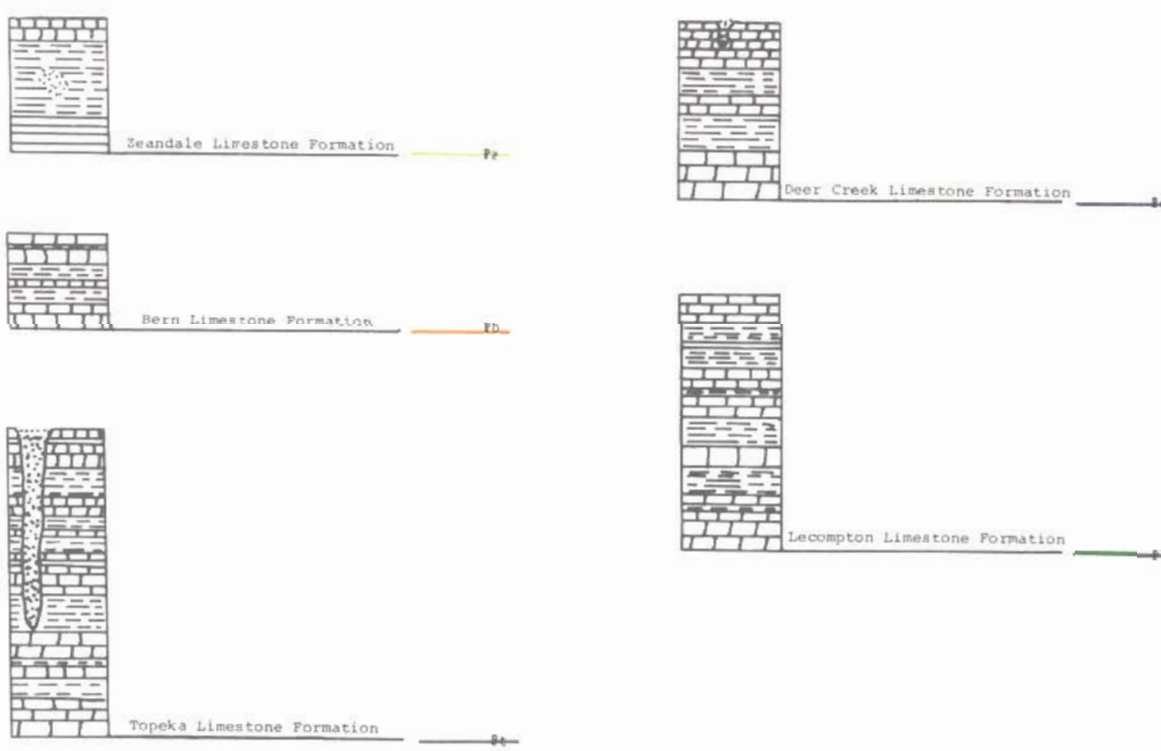
MATERIALS SITE DESIGNATIONS

Open materials sites; sampled — Page 28

Open materials sites; not sampled — Page 76



GEOLOGY



SHAWNEE COUNTY MATERIALS MAP

Plate III

R13 E
R14 E

R14 E
R15 E

Willard
POP.124

Silver Lake
POP.811

Valencia

Menoken

Kro

KANSAS RIVER

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD

SG-17
Qal

SG-16
Qgd

LS+48
Pzt

SG-18
Qal

LS+49
Pbb

LS+19
Pbb

LS+20
Pbb

LS+21
Pbb

LS+22
Pbb

LS+50
Pzt

LS+23
Pzt

24

4

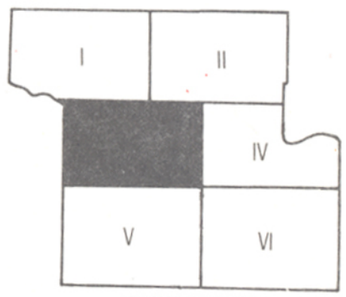
100

70

470

Wabaunsee County

S
S



SHAWNEE COUNTY

LEGEND

MATERIALS SITE DESIGNATIONS

Open materials sites; sampled — Page 28

Open materials sites; not sampled — Page 76

Material Type

SG Sand and Gravel
LS Limestone

SG+1
Qgd

Estimated Quantity
+ indicates more than 20,000 cubic yards
- indicates less than 20,000 cubic yards

Reference to site number on following data forms

Geologic Age and Unit

GEOLOGY

Newman Terrace

Buck Creek Terrace

Alluvium

Glacial Drift

SHAWNEE COUNTY MATERIALS MAP

Plate IV

TOPEKA
POP. 125,011

LS+24
Pth

LS+25
Pde

SG-26
Qal

SG-27
Qal

SG-28
Qal

SG+29
Qal

SG-30
Qal

SG-31
Qal

SG-32
Qal

SG-33
Qal

LS+34
Pde

LS+35
Pde

LS+36
Pde

LS+37
Pde

LS+38
Pde

LS+39
Pde

R16E
R17E

T 11 S
T 12 S

Jefferson County

Douglas County

SHAWNEE COUNTY

LEGEND

MATERIALS SITE DESIGNATIONS

Open materials sites; sampled — Page 28

Open materials sites; not sampled — Page 76

SG Sand and Gravel
LS Limestone

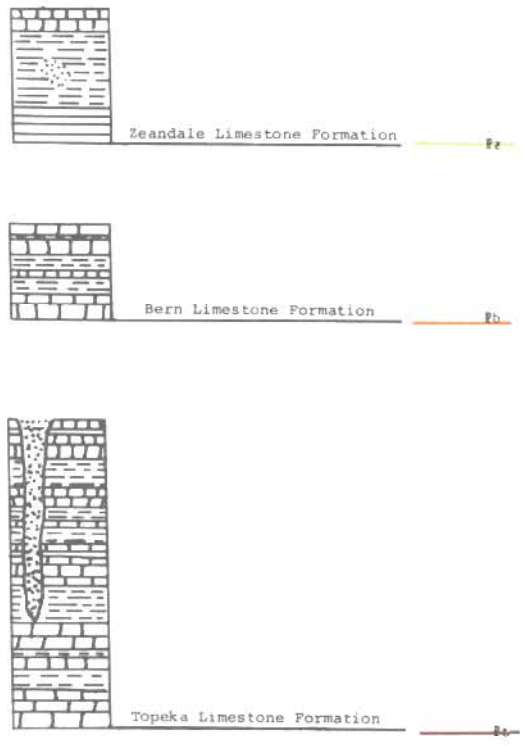
GEOLOGY

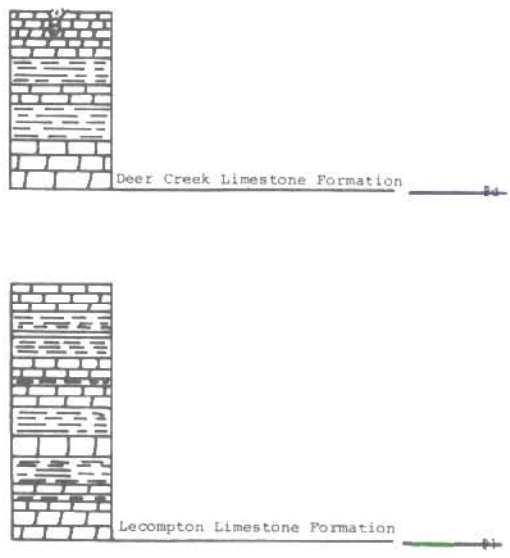
Newman Terrace

Alluvium

Buck Creek Terrace

Glacial Drift





SHAWNEE COUNTY MATERIALS MAP

Plate V

R13 E
R14 E

R14 E
R15 E

OLD POTTAWATOMIE INDIAN RESERVATION BOUNDARY

Dover

Auburn

Wakarusa

LS+40
Pzt

LS+41
Pbb

T 12 S
T 13 S

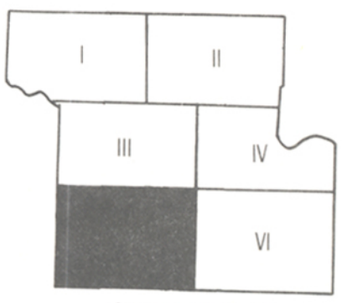
T 13 S

COUNTY

WABAUNSEE

Osage

County



SHAWNEE COUNTY

LEGEND

MATERIALS SITE DESIGNATIONS

Open materials sites; sampled — Page 28

Open materials sites; not sampled — Page 76

Material Type

SG Sand and Gravel
LS Limestone

SG+1
Qgd

Estimated Quantity
+ indicates more than 20,000 cubic yards
- indicates less than 20,000 cubic yards

Reference to site number on following data forms

Geologic Age and Unit

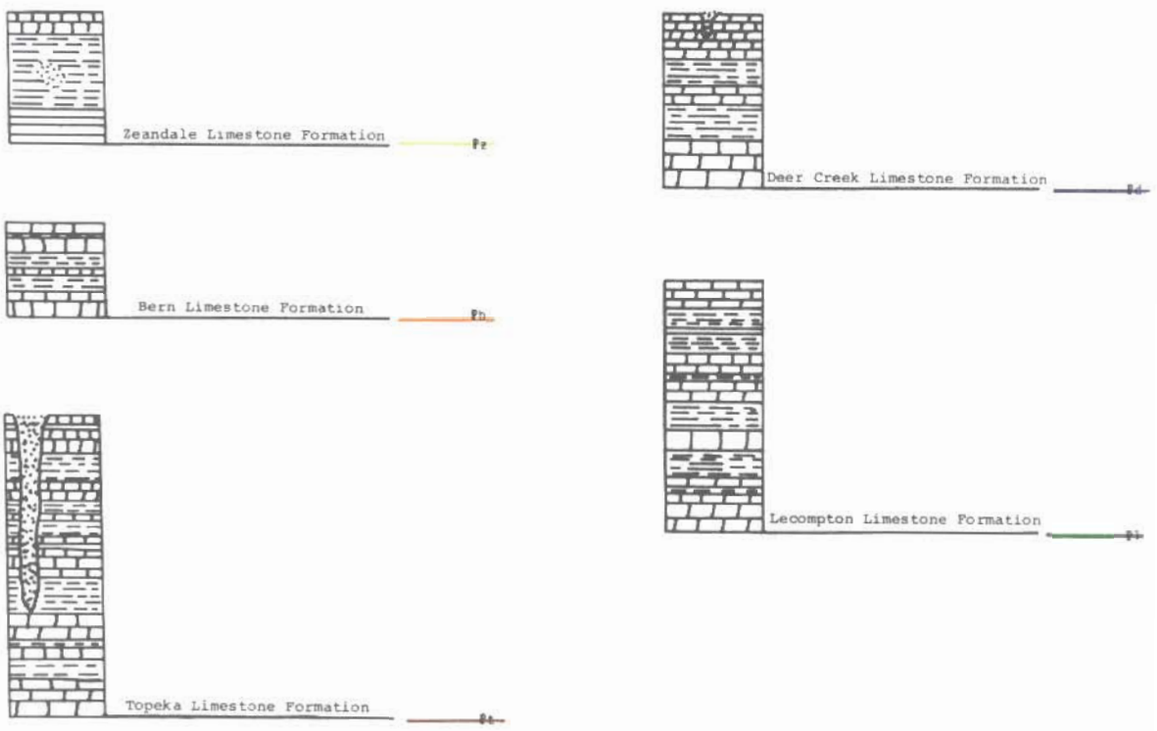
GEOLOGY

Newman Terrace

Alluvium

Buck Creek Terrace

Glacial Drift



SHAWNEE COUNTY MATERIALS MAP

Plate VI

R 15 E
R 16 E

R 16 E
R 17 E

T 12 S
T 13 S

T 13 S

Pauline

Gulley Village

Tevis

Wakarusa

FORBES AIR FORCE BASE

MISSOURI

LS+42
Pde

LS+43
Pt

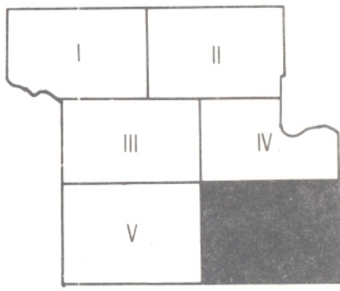
Qgd

LS+45
Pde

LS+46
Pde

Osage County

Douglas County

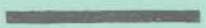


SHAWNEE COUNTY

OPEN MATERIALS SITES; SAMPLED

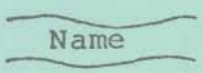
LEGEND


Trail or lane


Road


Railroad


Hedge or trees



Major streams


Intermittent streams

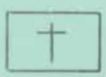

Pond or lake


Open materials sites; sampled


Open materials sites; not sampled

Center of section


Dwelling


Cemetery


School


Church


Town or city

Shawnee #2

MATERIAL SITE DATA FORM

Site No. SG+1 / Qgd Date September, 1973

Material Sand-Gravel (Clay Gravel) County Shawnee

Location SE ¼ Sec. 9 Twp. 10 S Range 14E

Owner James E. & Evelyn M. Rezac (name) Rossville, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate I

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of Over-burden	Depth of Material	Percent Retained 1 1/2	3/4	3/8	4	8	16	30	50	100	Wash 200	G.I.	L.L.	P.I.
				9	19	35	52	60	67	75	80	81	17.6	4.69		

CORRELATION DATA

Geological Age Quaternary

Geological Source Glacial Drift

Material Similar To SHC Lab. No. 15499

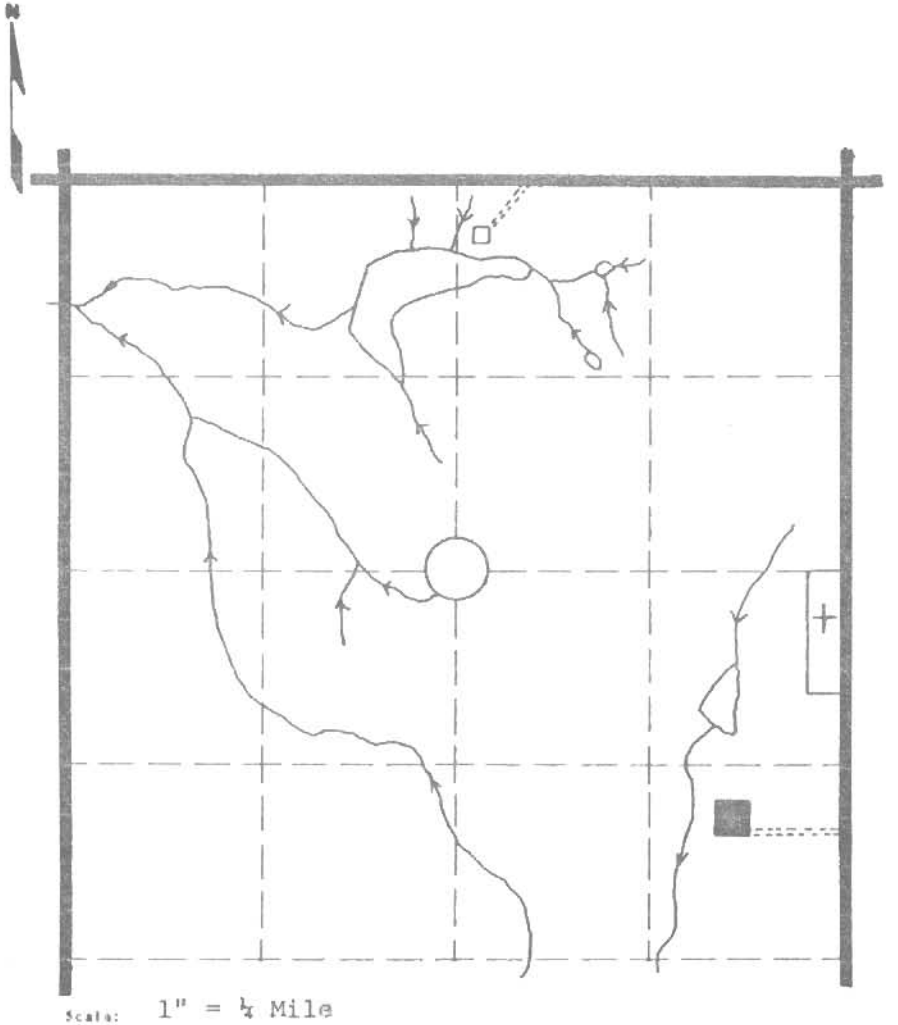
Specific Gravity (Sat.) 2.48 (Dry) 2.36

Los Angeles Wear 30.2

Absorption 4.82 Soundness 0.93

Wt. Cu. Ft. ____ Str. Ratio ____

Remarks ____



Scale: 1" = ¼ Mile

89-68

MATERIAL SITE DATA FORM

Site No. LS+2 / Fbb Date September, 1973

Material Limestone County Shawnee

Location SE¼ Sec. 10 Twp. 10S Range 15E

Owner Dan & Wanda L. Graybeal (name), 5439 Greenhills Road-Topeka, Kans. (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 72-2483

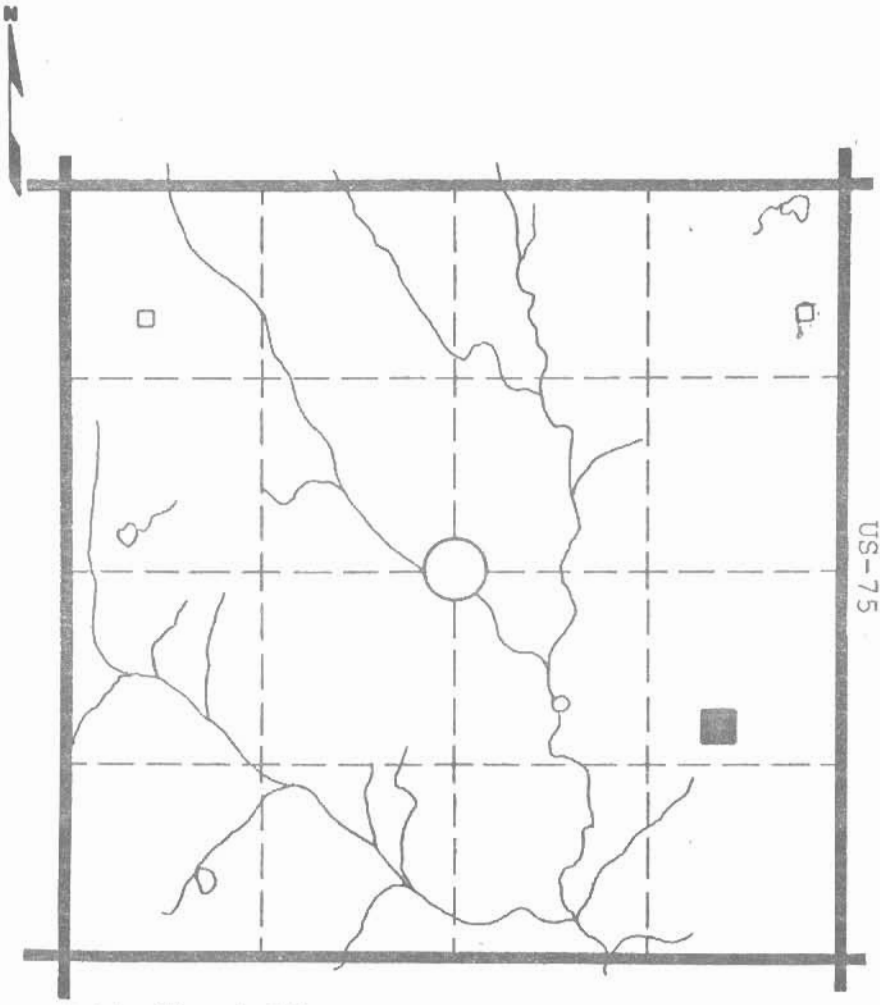
Specific Gravity (Sat.) 2.60 (Dry) 2.53

Los Angeles Wear 29B

Absorption 2.66 Soundness 0.97

Wt. Cu.Ft. ____ Str. Ratio ____

Remarks ____



Scale: 1" = ¼ Mile

89-41

MATERIAL SITE DATA FORM

Site No. LS+3 / Fbb Date September, 1973

Material Limestone County Shawnee

Location SE¼ Sec. 11 Twp. 10S Range 15E

Owner Keith L. & JoAnn L. Hildebrandt (name) - Shawnee Federal-Topeka (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 15146

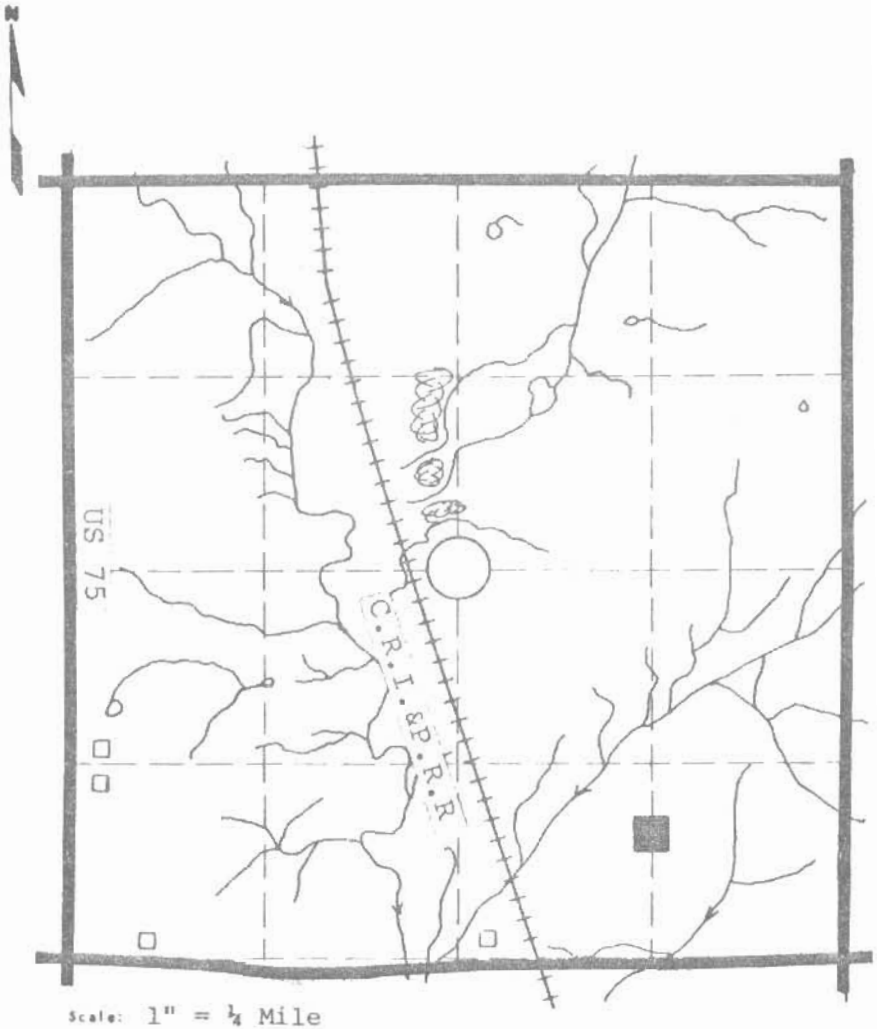
Specific Gravity (Sat.) 2.63 (Dry) 2.60

Los Angeles Wear 27.6

Absorption 1.16 Soundness 0.97

Wt. Cu.Ft. —— Str. Ratio ——

Remarks ——



Scale: 1" = ¼ Mile

89-66

MATERIAL SITE DATA FORM

Site No. LS+4 Fbb Date September, 1973

Material Limestone County Shawnee

Location SE¼ Sec. 15 Twp. 10S Range 15E

Owner E.A. & Evelyn A. Bronson (name) Route 1 Meriden, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 70428

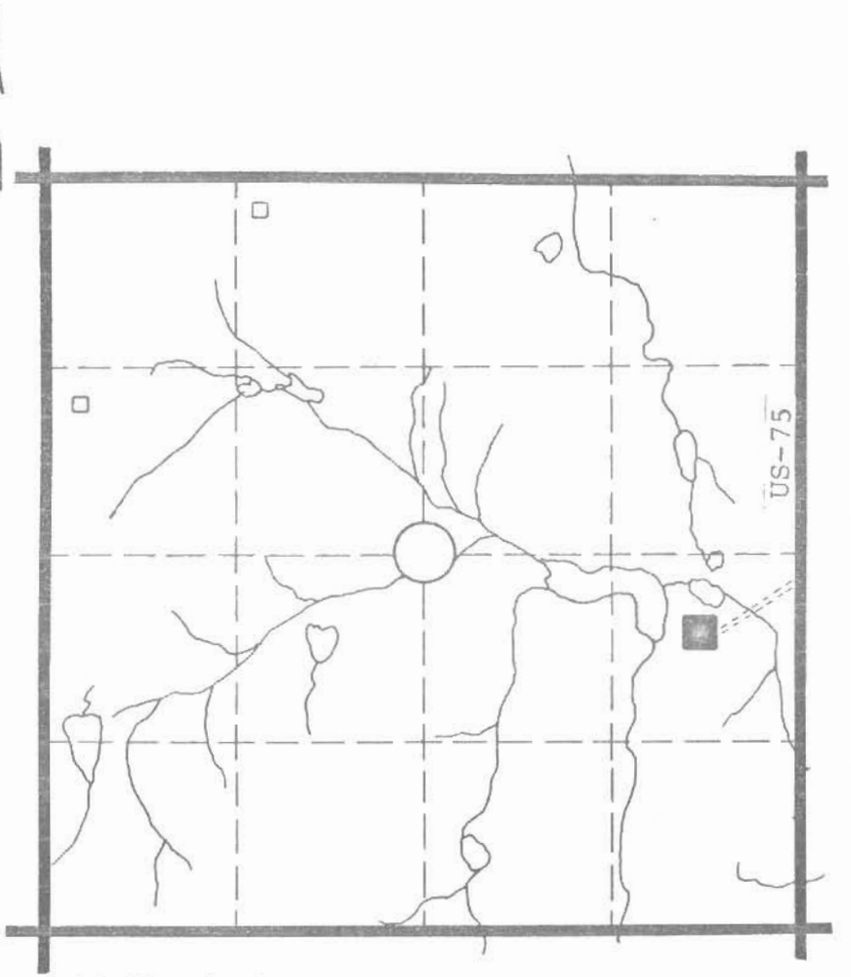
Specific Gravity (Sat.) 2.62 (Dry) 2.57

Los Angeles Wear 27.5 B

Absorption 1.88 Soundness 0.97

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+5 Fbb Date September, 1973

Material Limestone County Shawnee

Location NE¼ Sec. 14 Twp. 10S Range 15E

Owner Chas. E. & Edith Maus (name) 7233 NW Elmont, Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	1/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar to SHC Lab. No. 27459

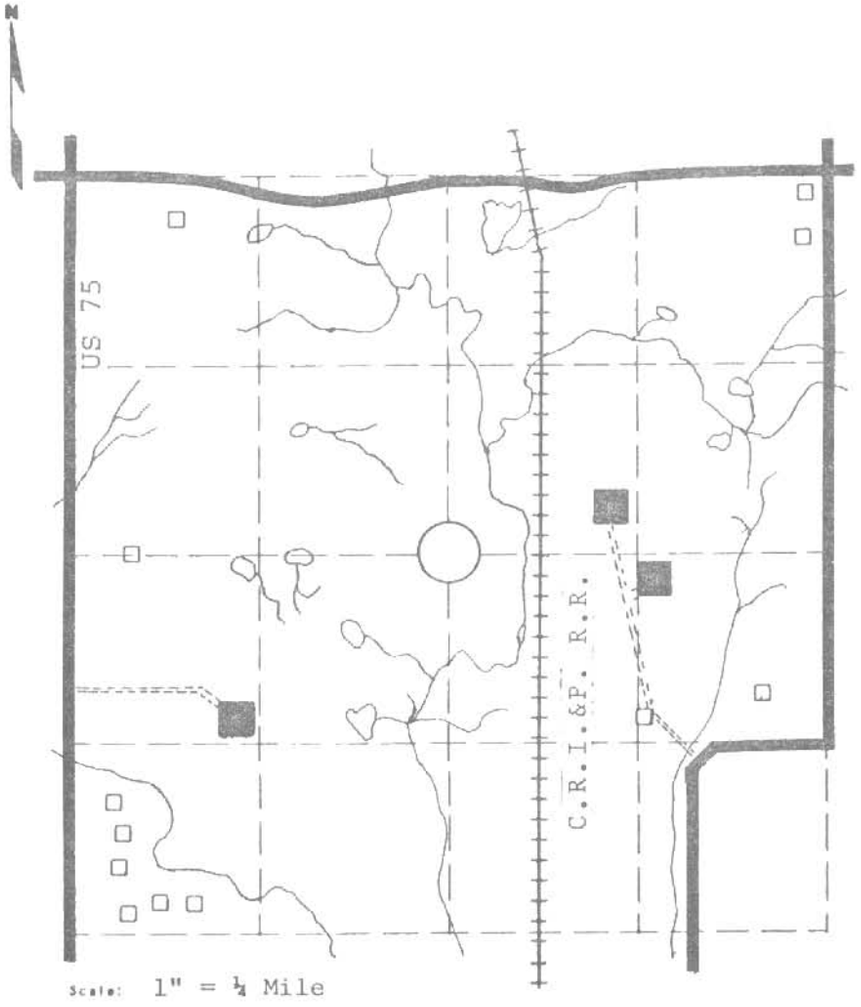
Specific Gravity (Sat.) 2.60 (Dry) 2.55

Los Angeles Wear 25.2B

Absorption 2.04 Soundness 0.98

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ½ Mile

89-45

MATERIAL SITE DATA FORM

Site No. LS+6 / Pbb Date September, 1973

Material Limestone County Shawnee

Location NW¼ SW¼ Sec. 14 Twp. 10S Range II

Owner Ed & Elsie R. Becker (name) Route 2 Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 15274

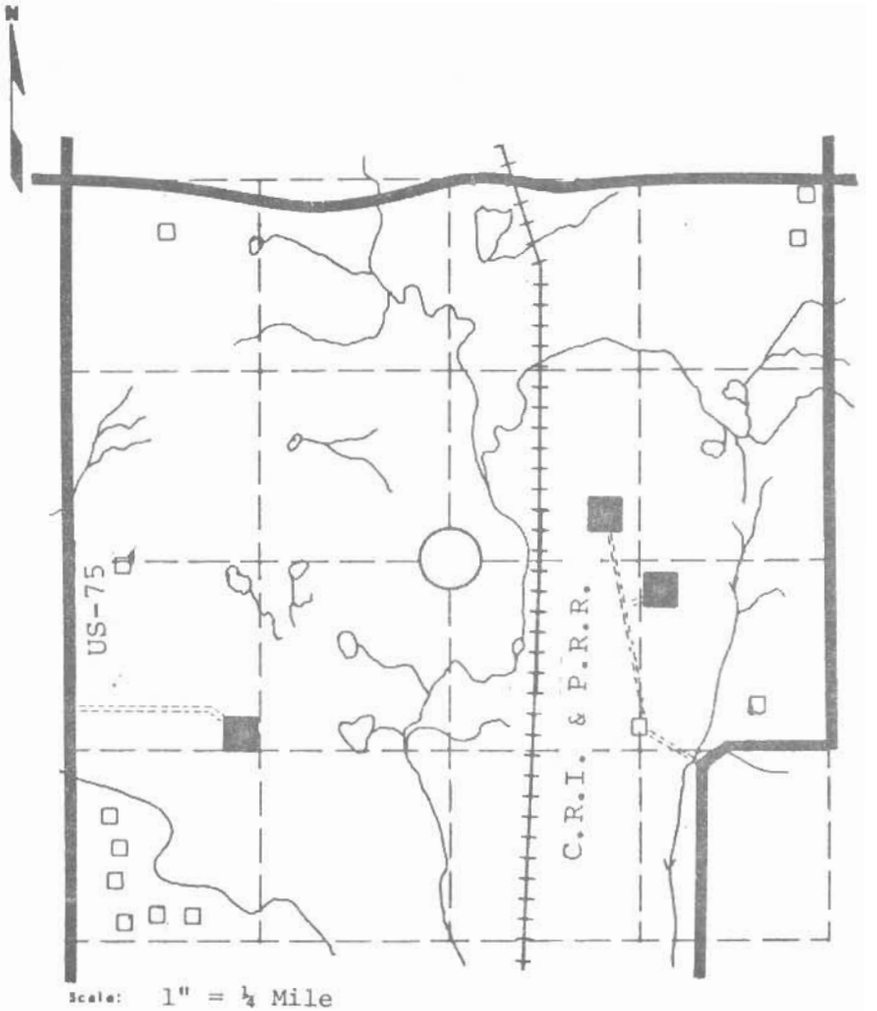
Specific Gravity (Sat.) 2.61 (Dry) 2.56

Los Angeles Wear 25.2

Absorption 1.89 Soundness 0.97

Wt. Cu.Ft. ____ Str. Ratio ____

Remarks ____



Scale: 1" = ¼ Mile

89-29

MATERIAL SITE DATA FORM

Site No. LS+7 / ~~Fbb~~ Date September, 1973

Material Limestone County Shawnee

Location SE¼ Sec. 14 Twp. 10S Range 15E

Owner William E. Maus (name) Silver Lake State Bank, Silver Lake, Ks. (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	S.E.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 15145

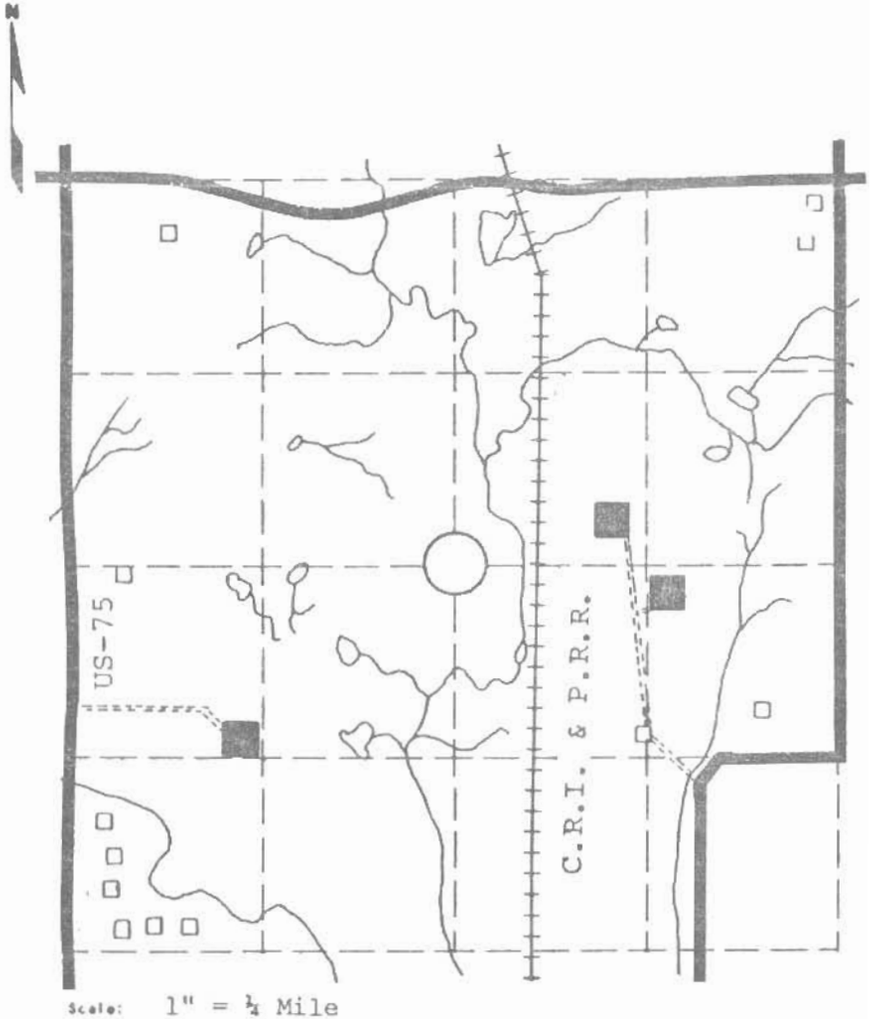
Specific Gravity (Sat.) 2.57 (Dry) 2.53

Los Angeles Wear 23.4

Absorption 1.96 Soundness 0.96

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

89-65

MATERIAL SITE DATA FORM

Site No. LS+8 / Pbb Date September, 1973

Material Limestone County Shawnee

Location E½ SW¼ Sec. 13 Twp. 10S Range 15E

Owner N. R. Hamm, Inc. (name) Perry, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 67-5005

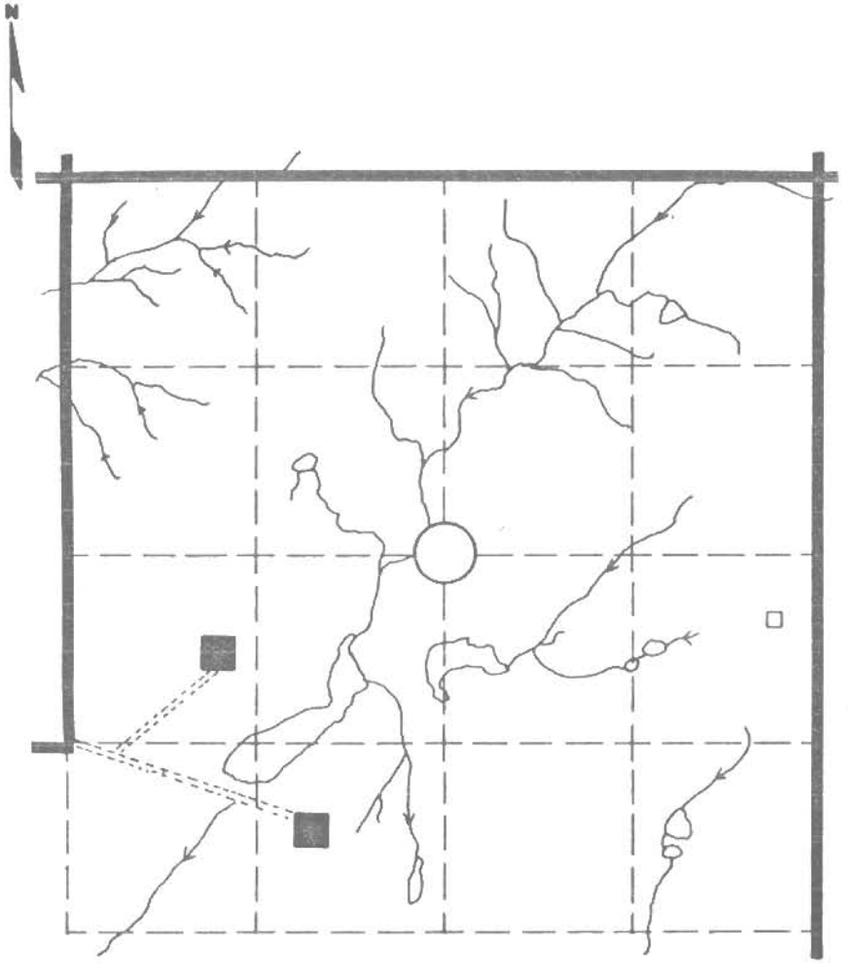
Specific Gravity (Sat.) 2.65 (Dry) 2.62

Los Angeles Wear 23.8B

Absorption 1.33 Soundness 0.97

Wt. Cu.Ft. ____ Str. Ratio ____

Remarks ____



Scale: 1" = ¼ Mile

89-58

MATERIAL SITE DATA FORM

Site No. LS+9 Pbb Date September, 1973

Material Limestone County Shawnee

Location W½ - SW¼ Sec. 13 Twp. 10S Range 15E

Owner N.R. Hamm Quarries (name) Perry, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	¾	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 29837

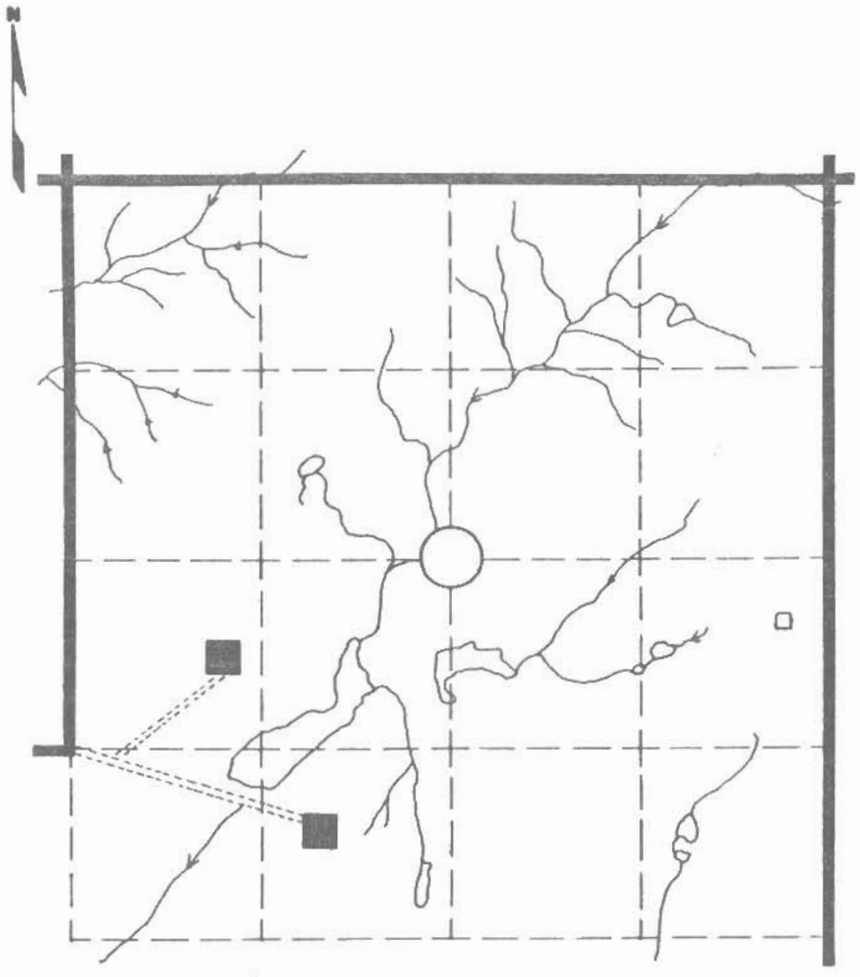
Specific Gravity (Sat.) 2.62 (Dry) 2.56

Los Angeles Wear 27.7B

Absorption 2.62 Soundness 0.95

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

89-67

MATERIAL SITE DATA FORM

Site No. LS+10 Fbb Date September, 1973

Material Limestone County Shawnee

Location SE¼ Sec. 22 Twp. 10S Range 15E

Owner Paul E & Helen E. Wendel (name) 4045 NW 62nd Topeka, Kansas (address)

Nature of Deposit ____ Accessibility ____ Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 71-2441

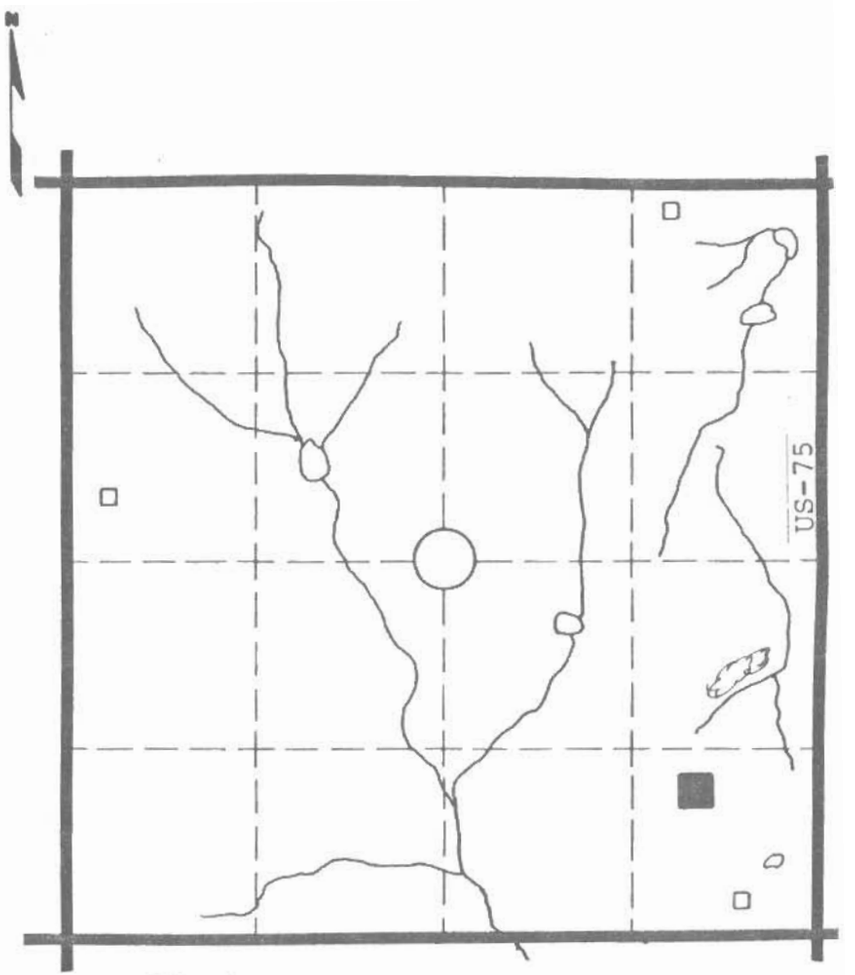
Specific Gravity (Sat.) 2.60 (Dry) 2.54

Los Angeles Wear 28.0

Absorption 2.26 Soundness 0.96

Wt. Cu.Ft. ____ Str. Ratio ____

Remarks ____



Scale: 1" = ¼ Mile

89-63

MATERIAL SITE DATA FORM

Site No. LS+11 Fbb Date September, 1973

Material Limestone County Shawnee

Location SW¼ Sec. 23 Twp. 10S Range 15E

Owner Alice Rowe & Helen E. Wendel (name) Route 2 Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site, Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	S.E.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 65 -4361

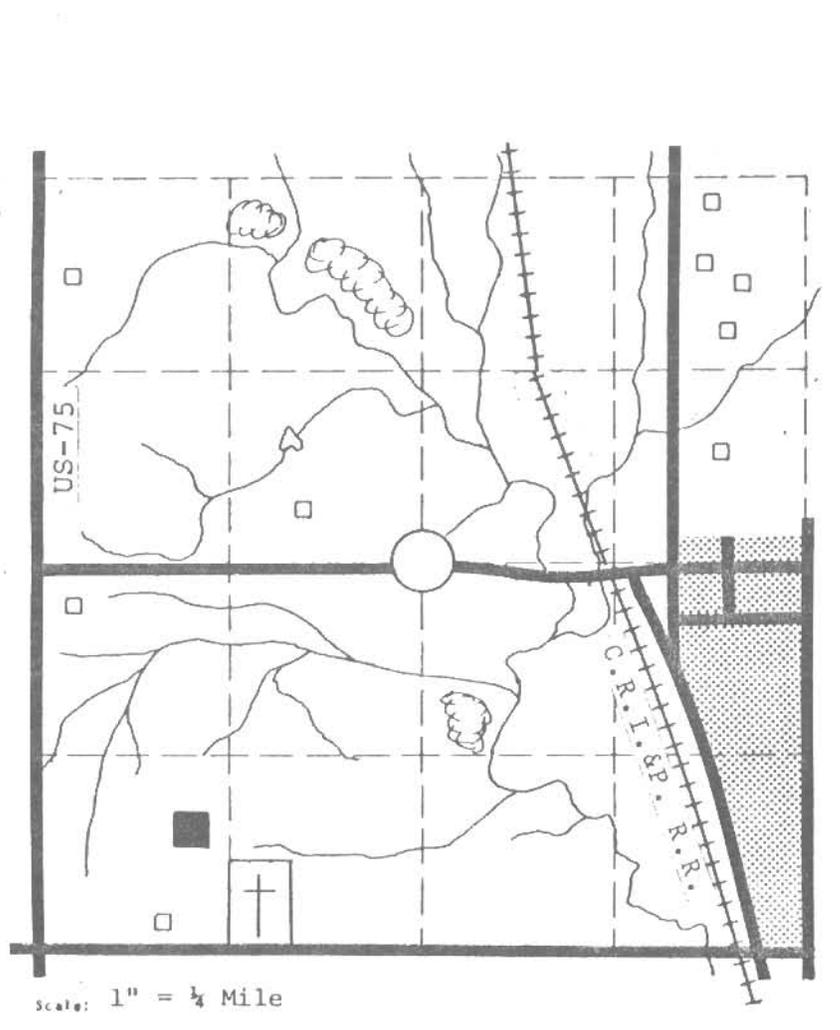
Specific Gravity (Sat.) 2.57 (Dry) 2.48

Los Angeles Wear 31.0B

Absorption 3.27 Soundness

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+12 Pbb Date September

Material Limestone County Shawnee

Location SE¼ SE¼ Sec. 29 Twp. 10S Range 15E

Owner Dana Priddy (name) Route 2 N. Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To S.H.C. Lab. No. 5776

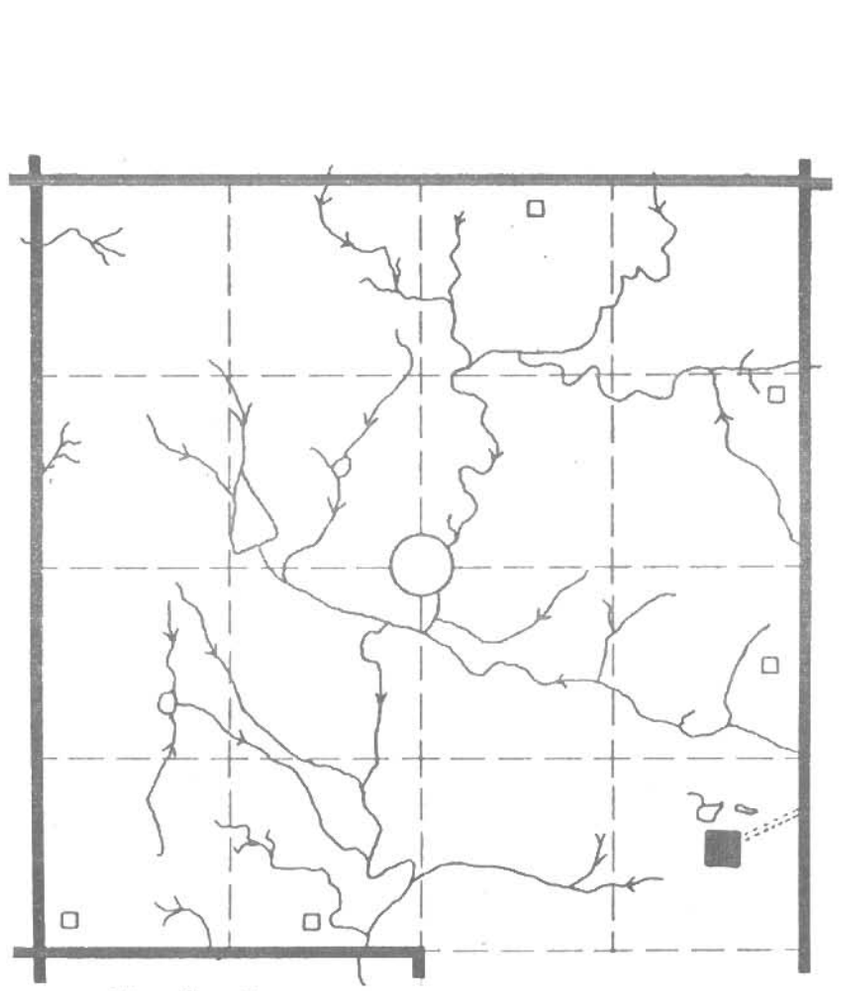
Specific Gravity (Sat.) 2.61 (Dry) 2.57

Los Angeles Wear 26.7

Absorption 1.80 Soundness 0.98

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

89-59

MATERIAL SITE DATA FORM

Site No. LS+13 Pbb Date September, 1973

Material Limestone County Shawnee

Location W½ NW¼ Sec. 26 Twp. 10S Range 15E

Owner P.H. & Maggie Lee Netherland (name) Route 2 Topeka, Ks. (address)

Nature of Deposit Dry Accessibility Good Site located on Plate II

Status of Site Open Materials Site; Sample

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of Over-Burden	Depth of Material	Percent Retained									Wash 200	L.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age ~~Pennsylvanian~~

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 30707

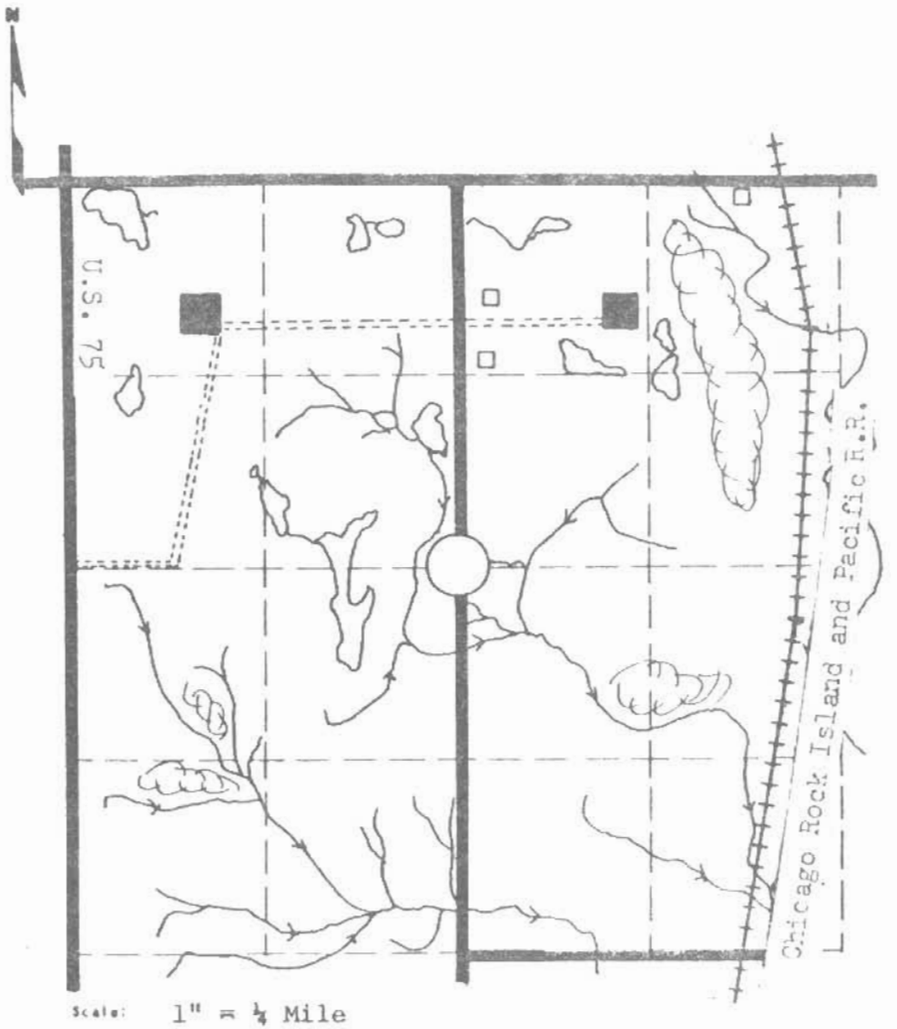
Specific Gravity (Sat.) 2.65 (Dry) 2.60

Los Angeles Wear 27.0

Absorption 2.11 Soundness 0.92

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+14 / Fbb Date September, 1973

Material Limestone County Shawnee

Location W½ NE¼ Sec. 26 Twp. 10S Range 15E

Owner P.H. & Maggie Lee Netherland (name) Route 2 Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of Over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 96537

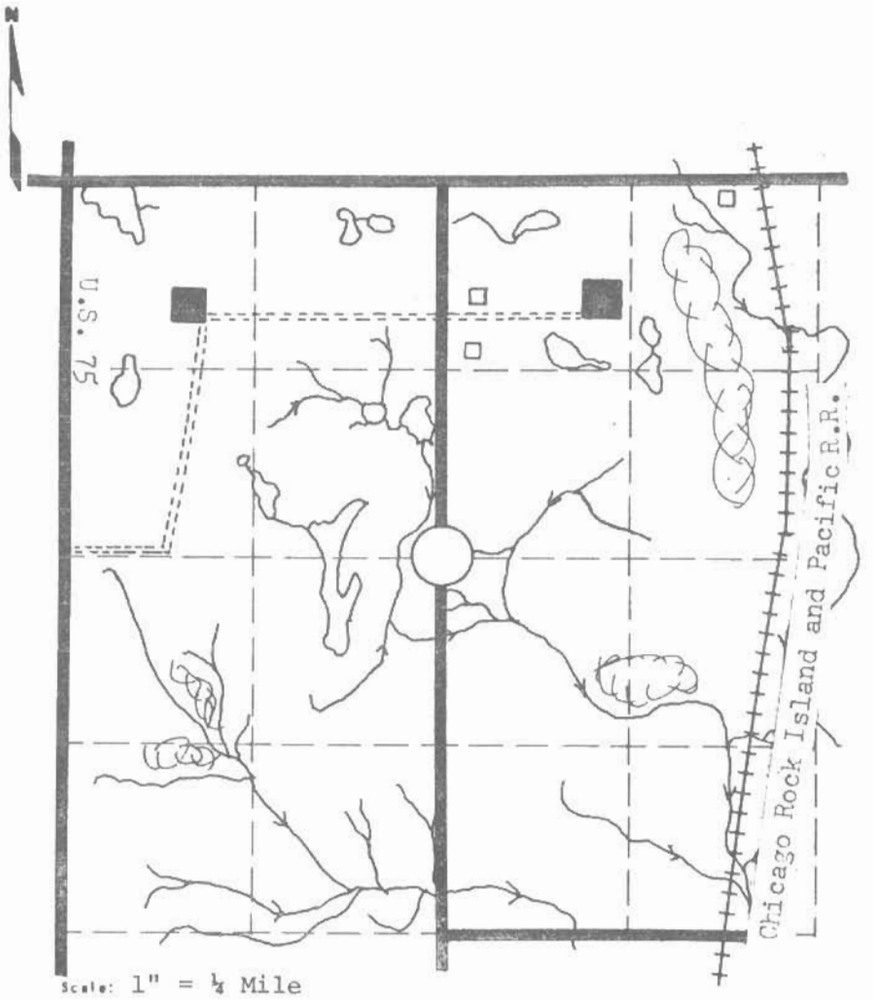
Specific Gravity (Sat.) 2.62 (Dry)

Los Angeles Wear 28.6B

Absorption 1.50 Soundness 0.97

Wt. Cu.Ft. Str. Ratio

Remarks



Shawnee Co. #1

MATERIAL SITE DATA FORM

Site No. SG-15 Qgd Date September, 1973

Material Sand, Clay-Gravel County Shawnee

Location NE¼ SW¼ Sec. 9 Twp. 11S Range 15E

Owner Fred & Laura E. Doyle (name) 1246 College Ottawa, Kansas (address)

Nature of Deposit Dry Accessibility Fair Site Located on Plate II

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of Overburden	Depth of Material	Percent Retained 1 1/2	3/4	3/8	4	8	16	30	50	100	Wash 200	G.F.	L.L.	P.I.
					0	1	3	7	30	77	90	93	5.94	3.01		

CORRELATION DATA

Geological Age Quaternary

Geological Source Glacial Drift

Material Similar To S.H.C. Lab. No. 15498

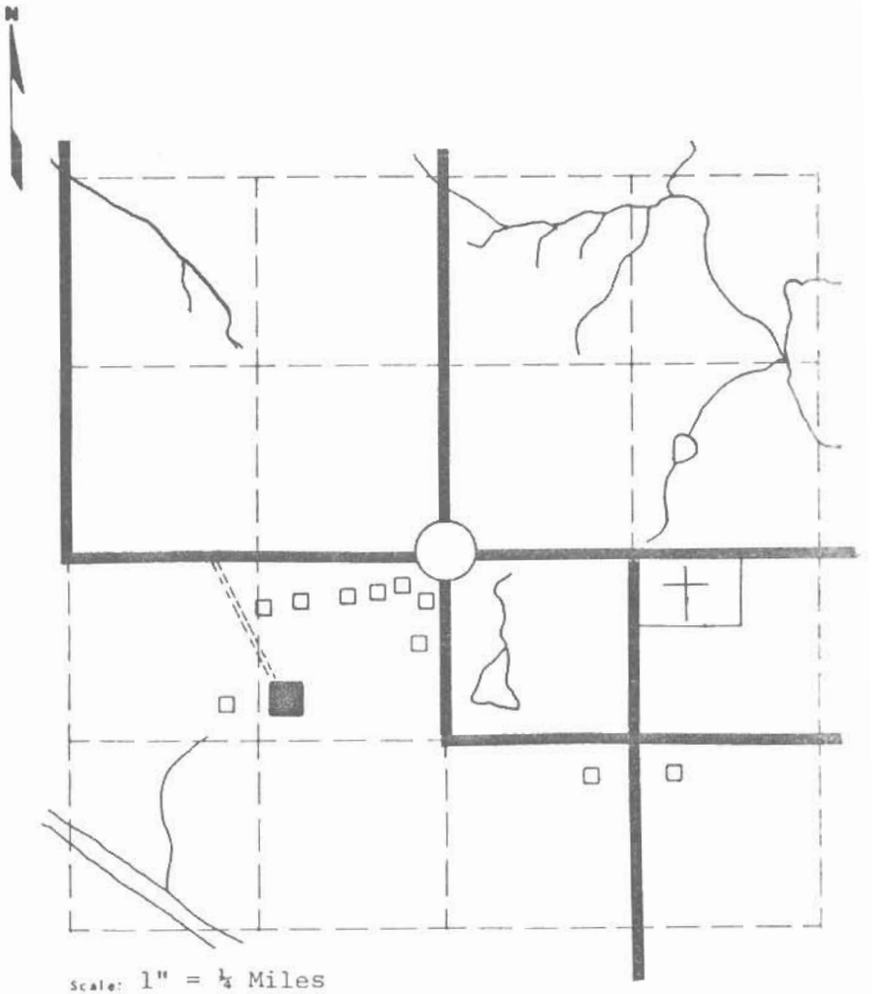
Specific Gravity (Sat.) 2.57 (Dry)

Los Angeles Wear 30.0

Absorption 2.42 Soundness 0.91

Wt. Cu.Ft. 96.19 Str. Ratio

Remarks



Scale: 1" = ¼ Miles

89-32

MATERIAL SITE DATA FORM

Site No. SG+16 Qgd Date September, 1973

Material Glacial Clay Gravel County Shawnee

Location SW¼ SE¼ Sec. 24 Twp. 11S Range 13E

Owner Floyd Taber (name) 1225 Jewell Avenue Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate III

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
				13	16	29	40	51	63	71	74	78	25	4.22		

CORRELATION DATA

Geological Age Quaternary

Geological Source Glacial Drift

Material Similar To S.H.C. Lab. No. 15363

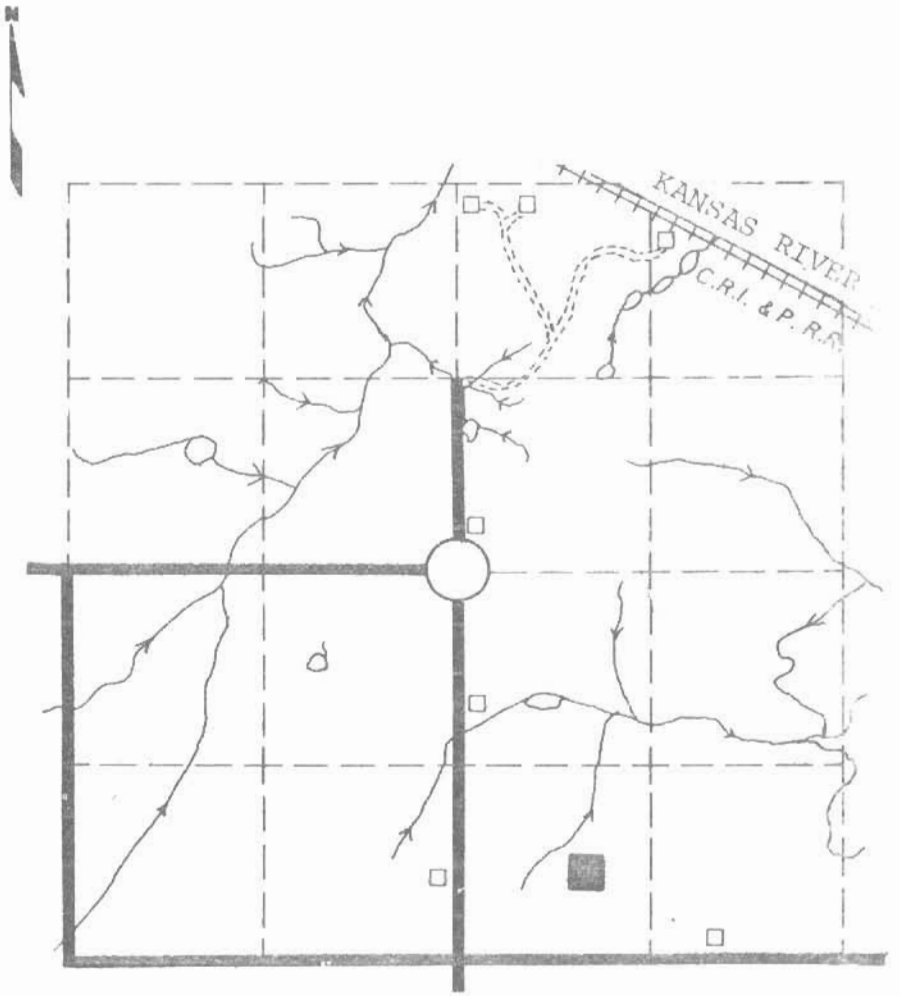
Specific Gravity (Sat.) 2.52 (Dry) 2.43

Los Angeles Wear 31.1

Absorption 3.80 Soundness 0.94

Wt. Cu.Ft. 99.78 Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. SG-17 Qal Date September, 1973

Material Sand-Gravel County Shawnee

Location SE¼, NW¼ Sec. 21 Twp. 11S Range 14E

Owner Arthur Atwood (name) Route 2 Silver Lake, Kansas (address)

Nature of Deposit Wet Accessibility Fair Site Located on Plate III

Status of Site Open Material Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
					0	2	6	22	51	76	94	99	0.26	3.50		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 3397

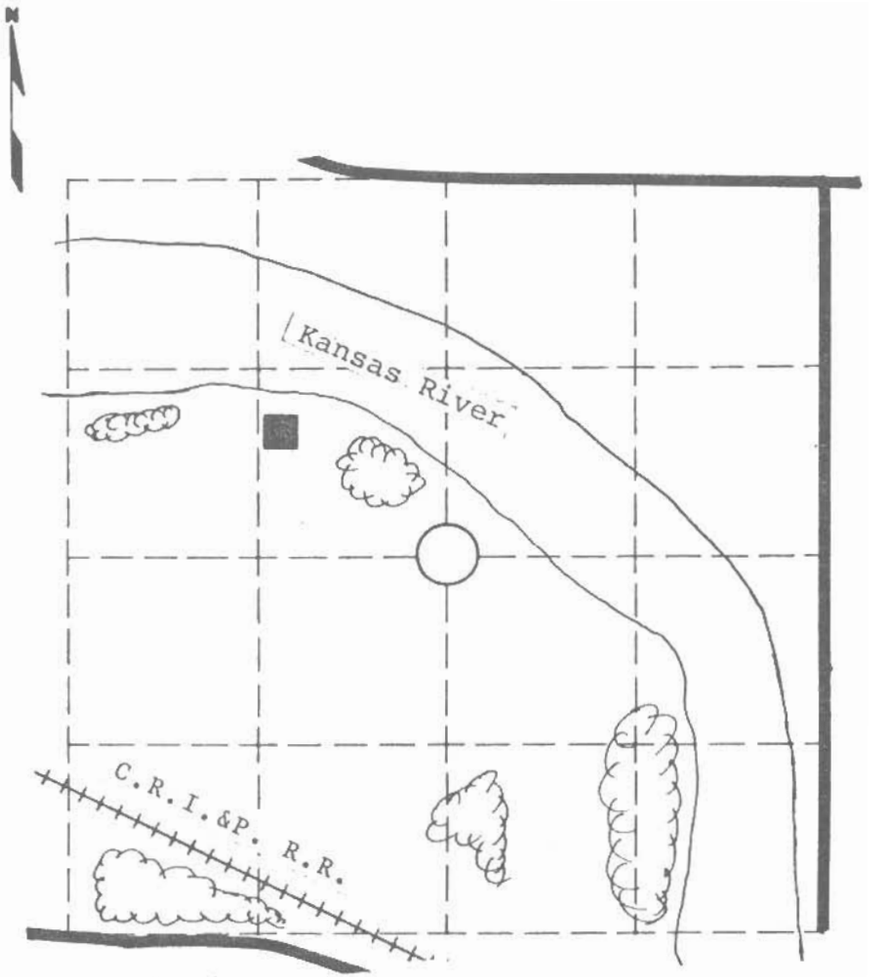
Specific Gravity (Sat.) 2.62 (Dry)

Los Angeles Wear 32.7

Absorption 0.5 Soundness 0.97

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

89-53

MATERIAL SITE DATA FORM

SG-18

Site No. Qal Date September, 1973

Material Sand-Gravel County Shawnee

Location N½ Sec. 29 Twp. 11S Range 15E

Owner Florence Richardson (name) 3516 N.W. 44th, Oklahoma City, Okla. (address)

Nature of Deposit Wet Accessibility Fair Site Located on Plate III

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	S.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
					0	2	7	23	49	70	90	97	1.0	43.38		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 12424

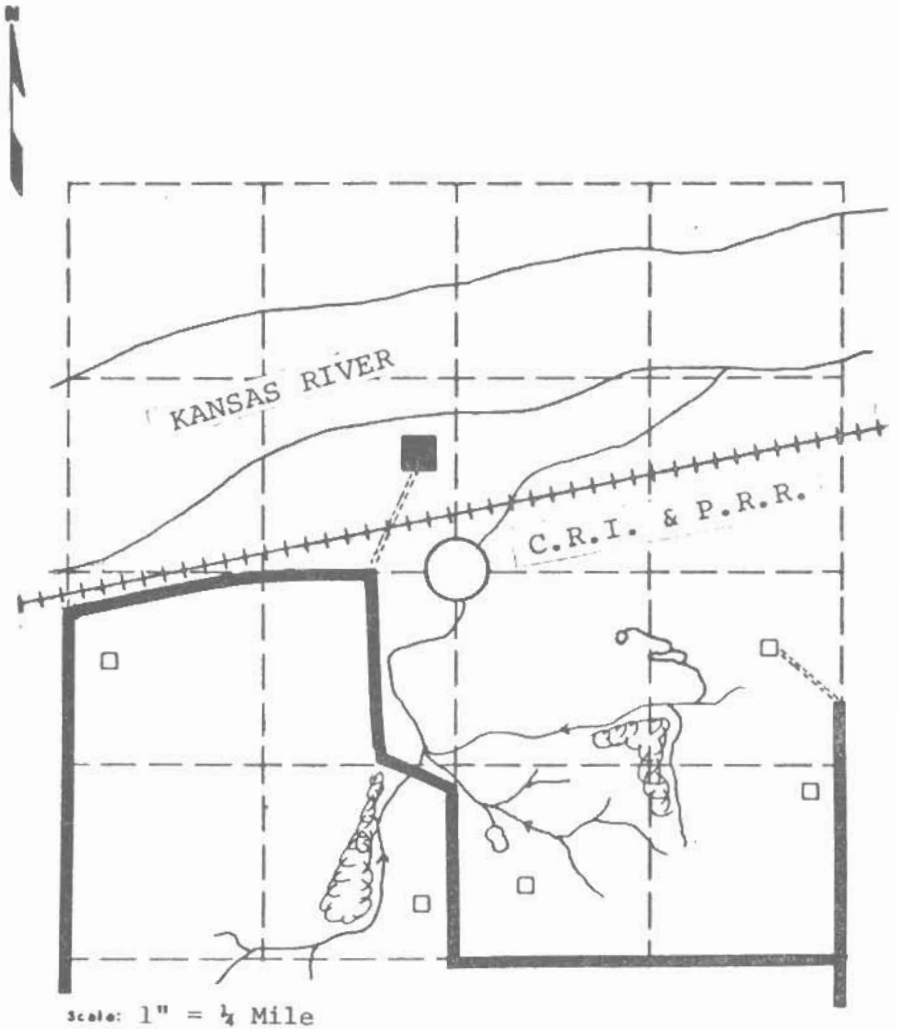
Specific Gravity (Sat.) 2.62 (Dry)

Los Angeles Wear 36.5

Absorption 0.6 Soundness 0.97

Wt. Cu.Ft. 115.83 Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+19 / Pbb Date September, 1973

Material Limestone Embankment County Shawnee

Location N½ Sec. 2 Twp. 12S Range 14E

Owner Martin Marietta Corp (name) Box 789 Cedar Rapids, Iowa (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate III

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained 1 1/2	3/4	3/8	4	8	16	30	50	100	Wash 200	G.F.	L.L.	P.I.

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar to SHC Lab. No. 15043

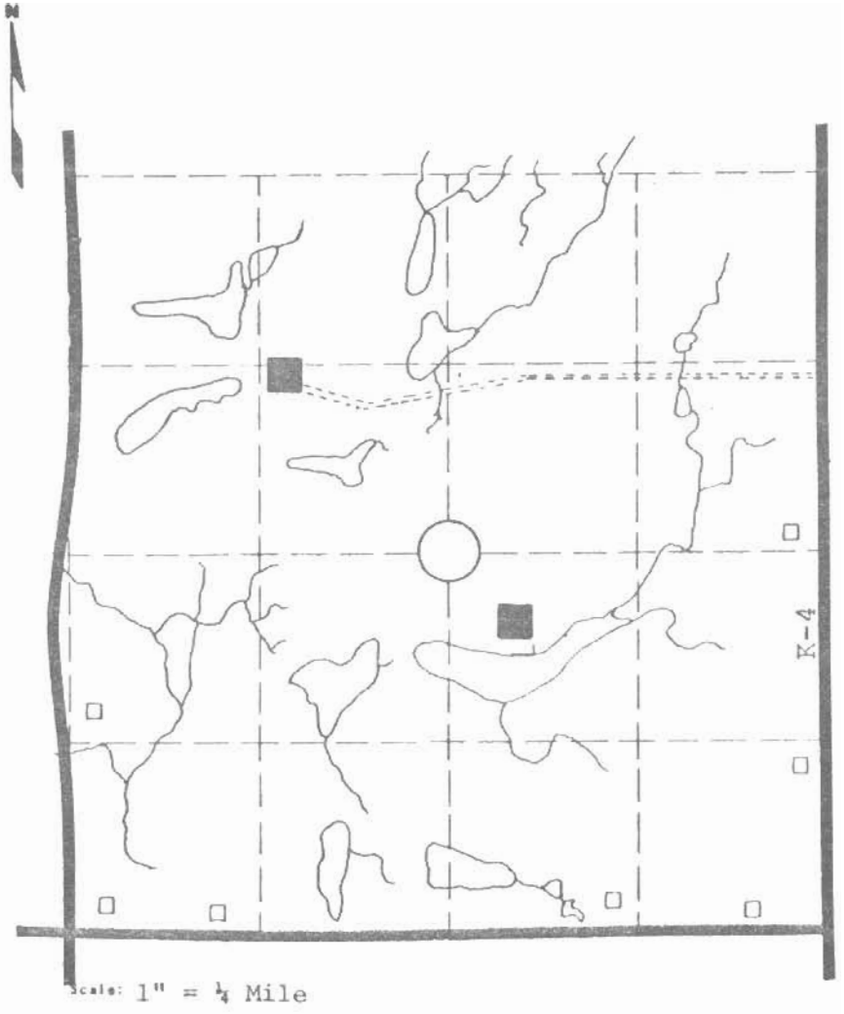
Specific Gravity (Sat.) 2.63 (Dry) 2.58

Los Angeles Wear 25.4

Absorption 1.93 Soundness 0.94

Wt. Cu.Ft. Str. Ratio

Remarks



MATERIAL SITE DATA FORM

Site No. LS+20 Pbb Date September, 1973

Material Limestone Burlingame Member County Shawnee

Location SW¼ Sec. 31 Twp. 11S Range 15E

Owner Albert H. Fisher (name) Route 8 Topeka, Ks. (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate III

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 65-1245

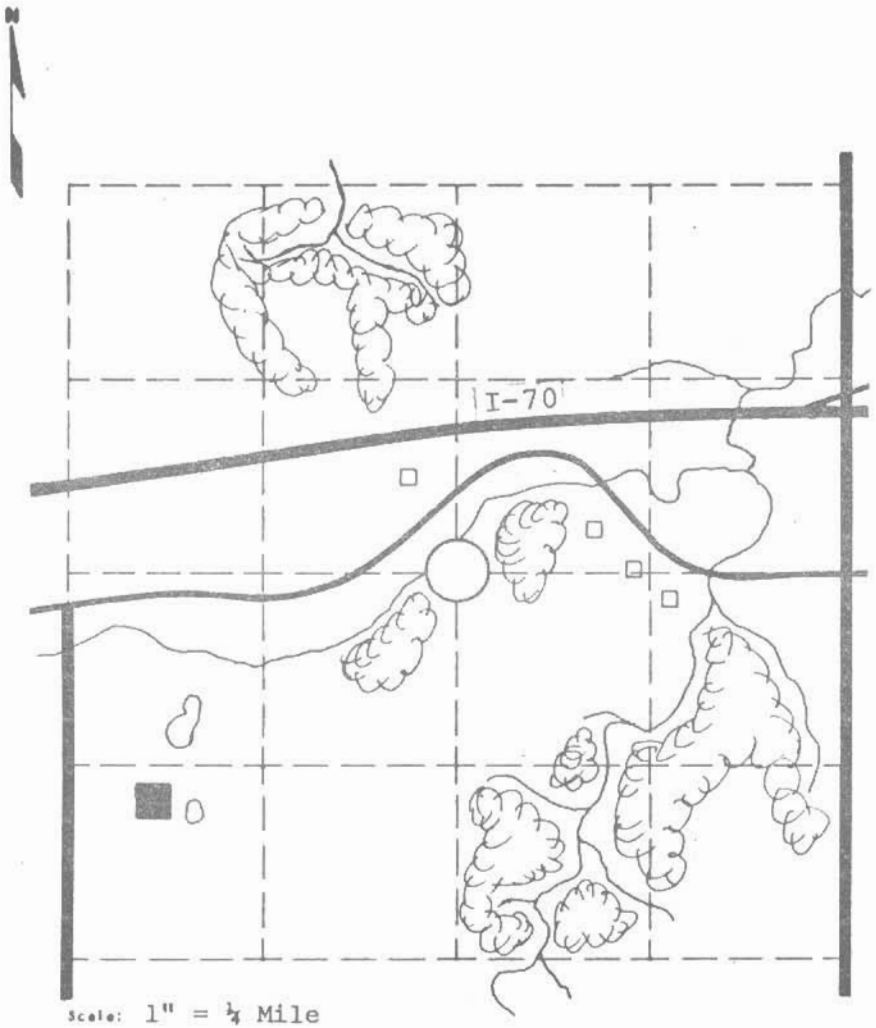
Specific Gravity (Sat.) 2.60 (Dry) 2.56

Los Angeles Wear 25.5B

Absorption 1.60 Soundness

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

89-35

MATERIAL SITE DATA FORM

Site No. LS+21 / Pbb Date September, 1973

Material Limestone, Burlingame b' County Shawnee

Location W½ E½ Sec. 3 Twp. 12S Range 14E

Owner Ned N. Fleming (name) P.O. Box 1160 Topeka, Ks. (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate III

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	S.E.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 15271

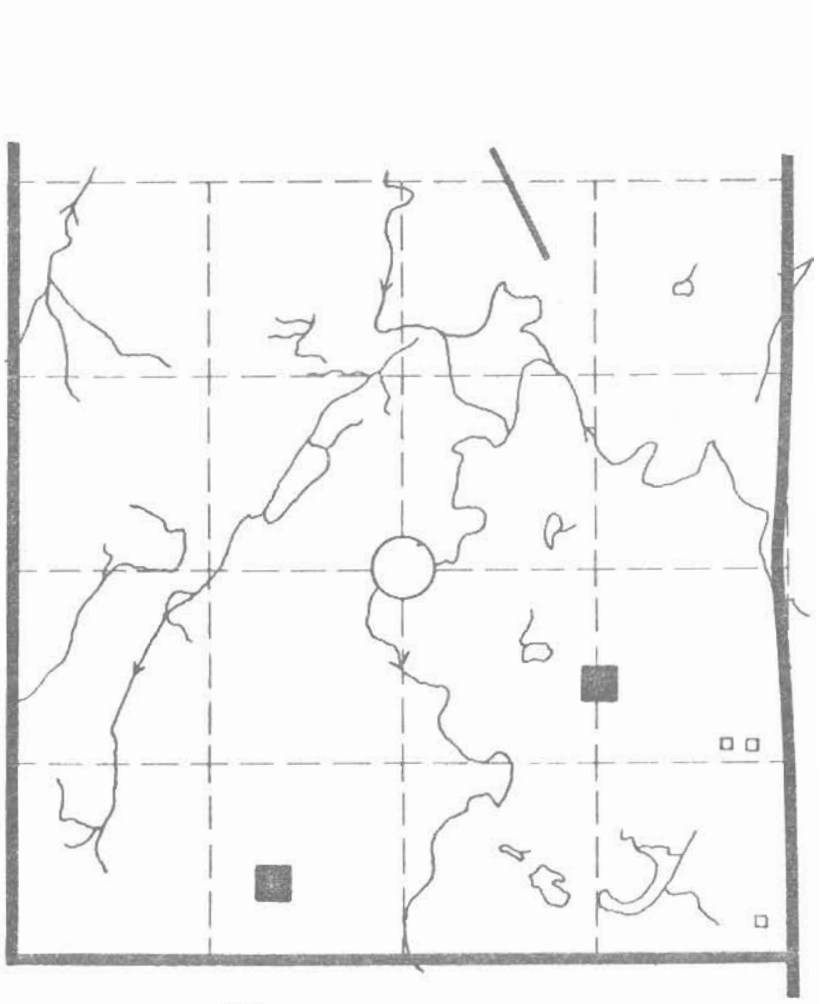
Specific Gravity (Sat.) 2.63 (Dry) 2.59

Los Angeles Wear 23.5

Absorption 1.56 Soundness 0.96

Mt. Cu.Ft. Str. Ratio

Remarks The two symbols are in the same quarry



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+ 22 / Pbb Date September, 1973

Material Limestone County Shawnee

Location SE¼ Sec. 2 Twp. 12S Range 14E

Owner W. W. Stogsdill (name) Route 8 Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate III

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of Over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 15272

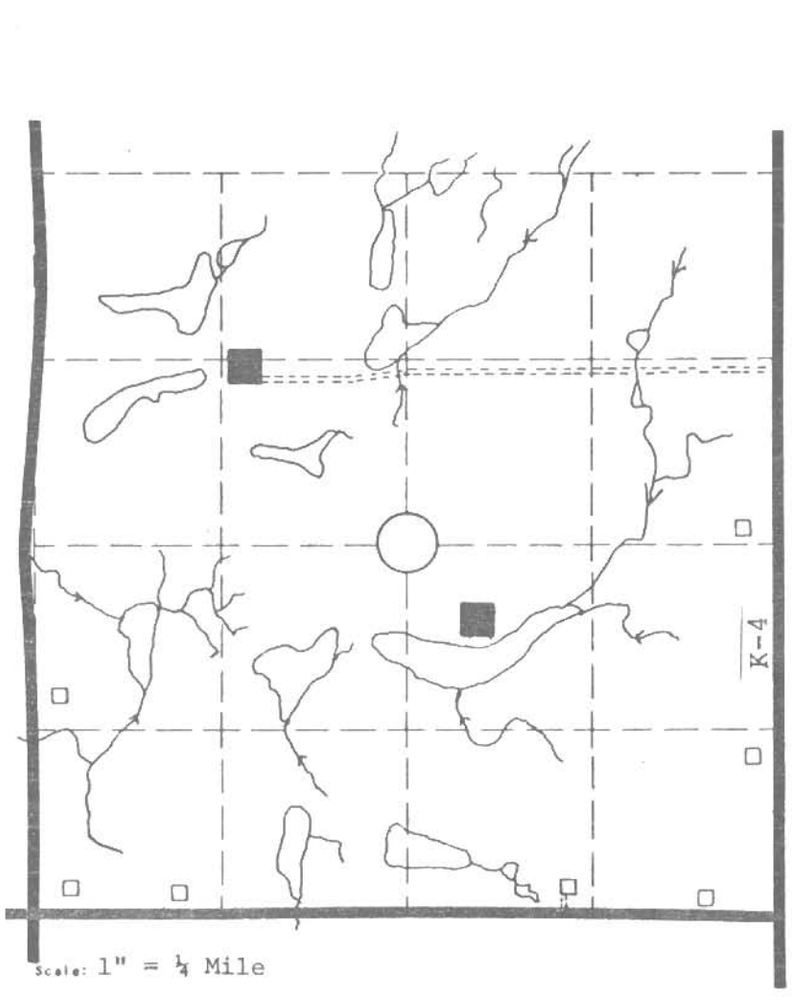
Specific Gravity (Sat.) 2.58B (Dry) 2.52

Los Angeles Wear 28.0

Absorption 2.14 Soundness 0.97

Wt. Cu.Ft. ____ Str. Ratio ____

Remarks ____



89-55

MATERIAL SITE DATA FORM

Site No. LS+ 23 Pat Date September, 1973

Material Limestone County Shawnee

Location SW¼ Sec. 23 Twp. 12S Range 13E

Owner Richard H. Hamilton (name) 5000 Redbud Court Topeka, Ks. (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate III

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of Over-Burden	Depth of Material	Percent Retained 1 1/2	1/4	3/8	4	8	16	30	50	100	Wash 200	G.F.	L.L.	P.I.

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Zeandale Limestone Formation - Tarkio Member

Material Similar to SHC Lab. No. 19382

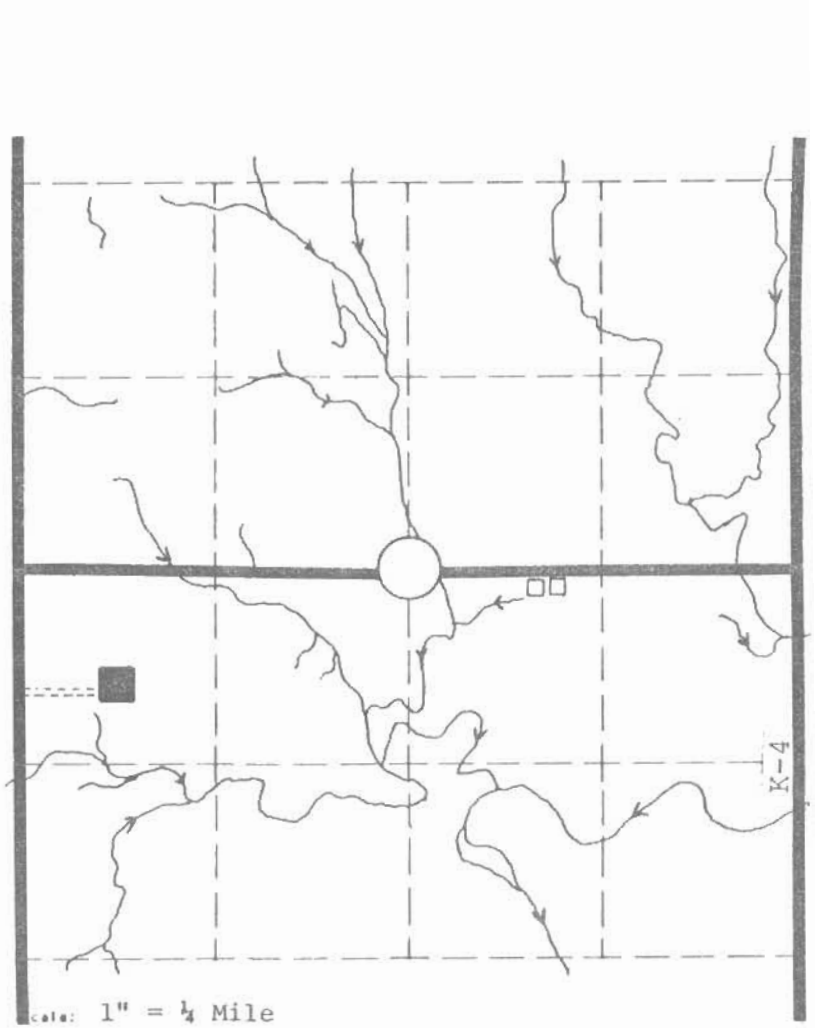
Specific Gravity (Sat.) 2.49 (Dry) 2.40

Los Angeles Wear 28.0B

Absorption 3.77 Soundness 0.97

Wt. Cu. Ft. Str. Ratio

Remarks



MATERIAL SITE DATA FORM

Site No. LS+24 Pth Date September, 1973

Material Limestone County Shawnee

Location NW¼ Sec. 16 Twp. 11S Range 16E

Owner O. W. Griffin (name) Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Topeka Limestone Formation - Hartford Member

Material Similar To SHC Lab. No. 91543

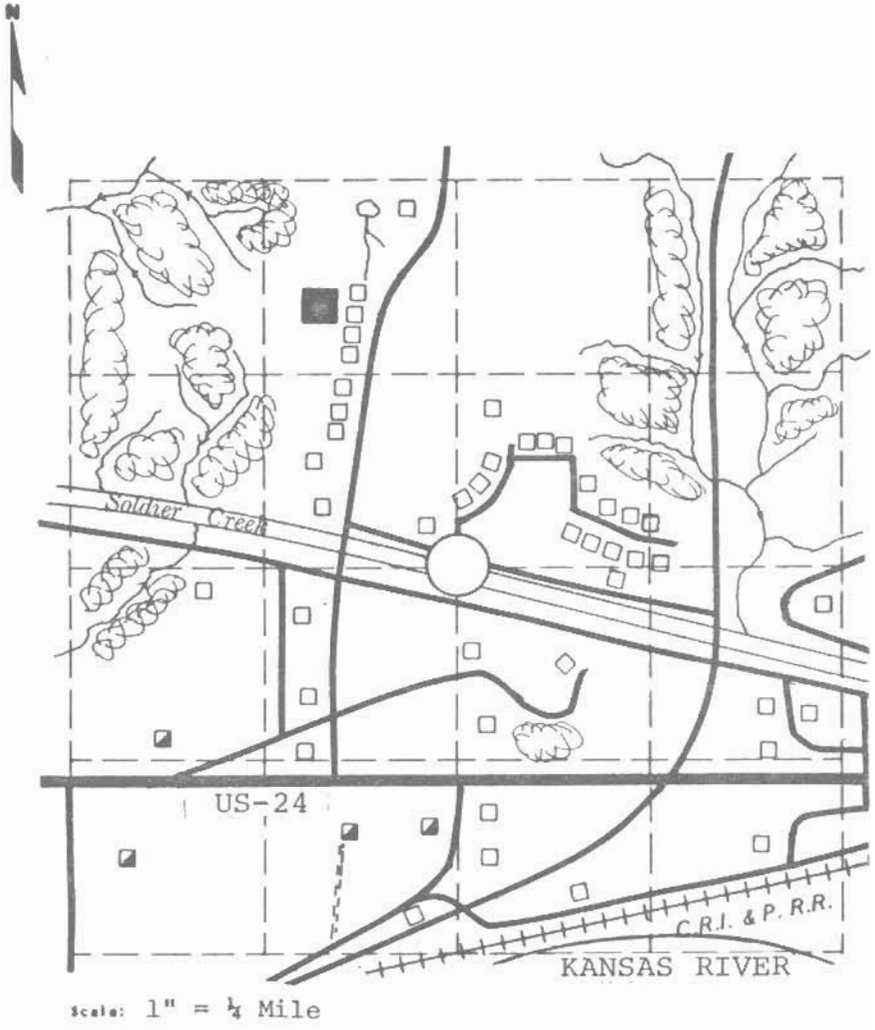
Specific Gravity (Sat.) 2.47 (Dry)

Los Angeles Wear 29.8

Absorption 4.71 Soundness 0.96

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+25 / Pde Date September, 1973

Material Limestone County Shawnee

Location NW¼ SE¼ Sec. 15 Twp. 11S Range 16E

Owner Robert Gladfelter, Jr., (name) State Bank, Lancaster, Ks. (address)

Nature of Deposit Dry Accessibility Poor Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	S.E.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	14	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation - Ervine Creek Member

Material Similar To SHC Lab. No. 13657

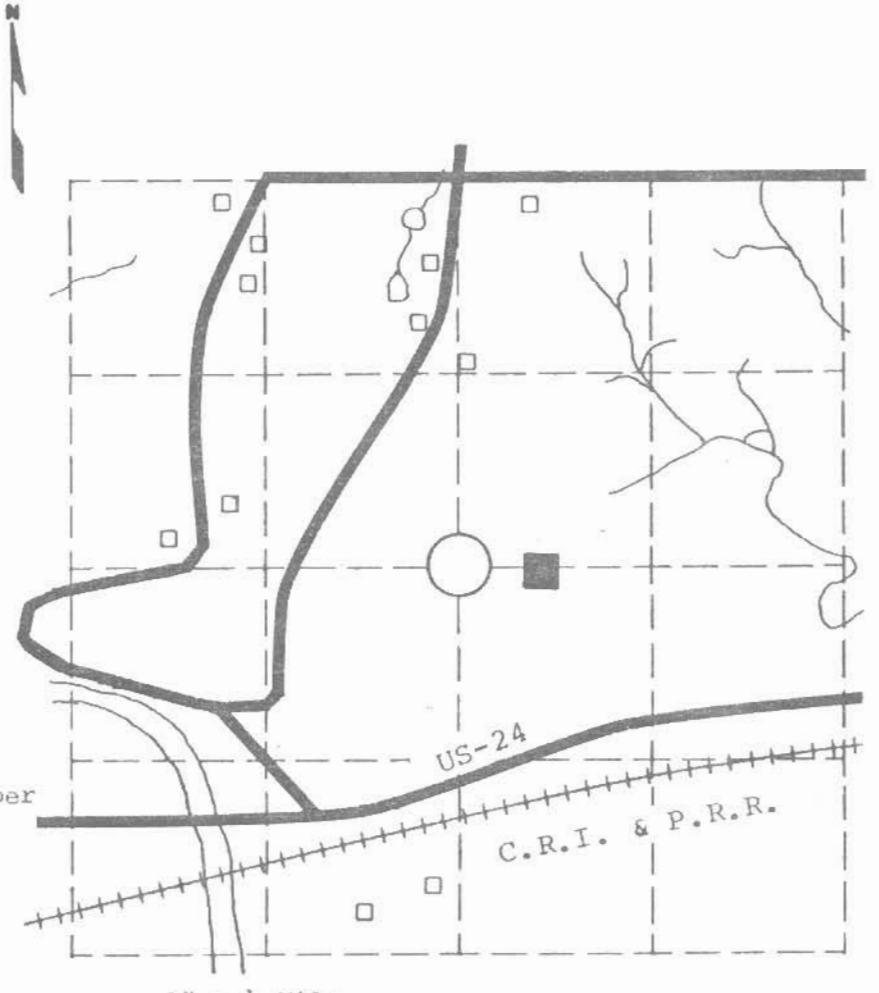
Specific Gravity (Sat.) 2.52 (Dry) 2.39

Los Angeles Wear 36.9

Absorption 5.09 Soundness 0.89

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. SG- 26 Qal Date September, 1973

Material Sand-Sand Gravel County Shawnee

Location N½ Sec. 26 Twp. 11S Range 15E

Owner State of Kansas (name) Topeka, Kansas (address)

Nature of Deposit Wet Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
					0	1	4	13	30	64	95	98	1.73	3.05		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 15046

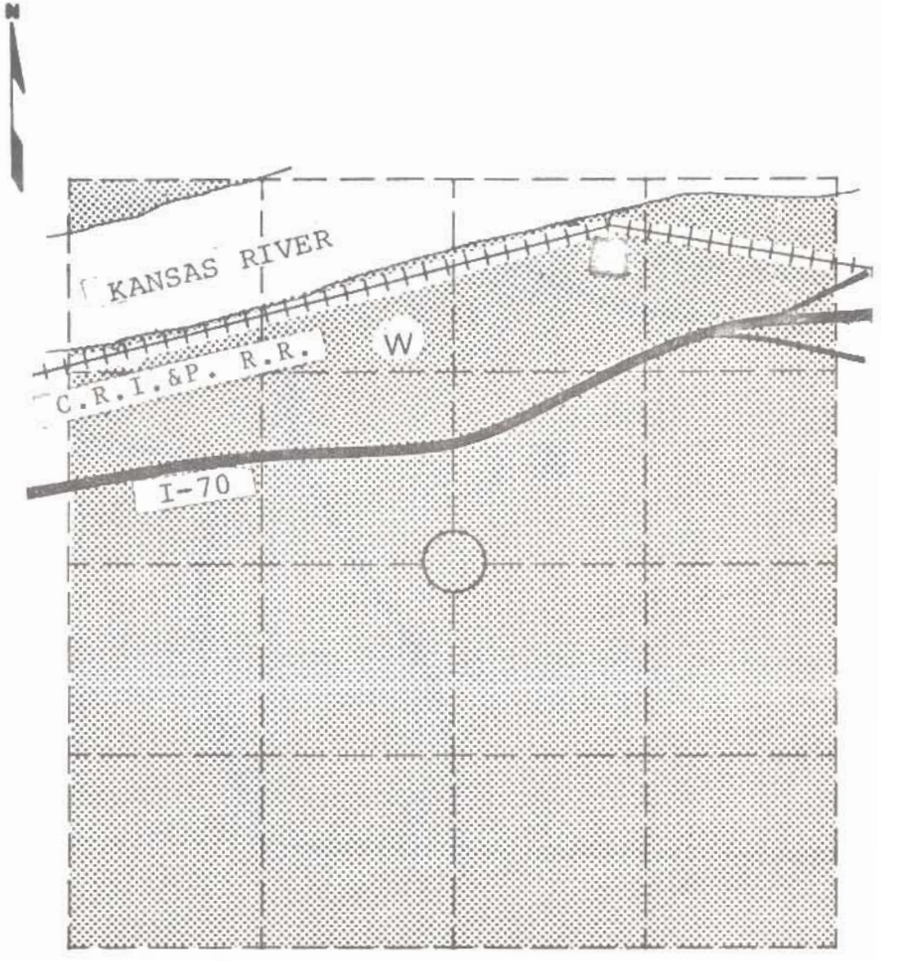
Specific Gravity (Sat.) 2.62 (Dry)

Los Angeles Wear 34.0

Absorption 0.7 Soundness 0.97

Wt. Cu.Ft. 112.06 Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. SG- 27 Qal Date September, 1973

Material Sand & Sand Gravel County Shawnee

Location Foot of Waite Street Sec. 25 Twp. 11S Range 15E

Owner Victory Sand Co. (name) Topeka, Kansas (address)

Nature of Deposit Wet Accessibility Good Site located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
						0	3	14	39	79	98	100	0.18	3.33		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 15361

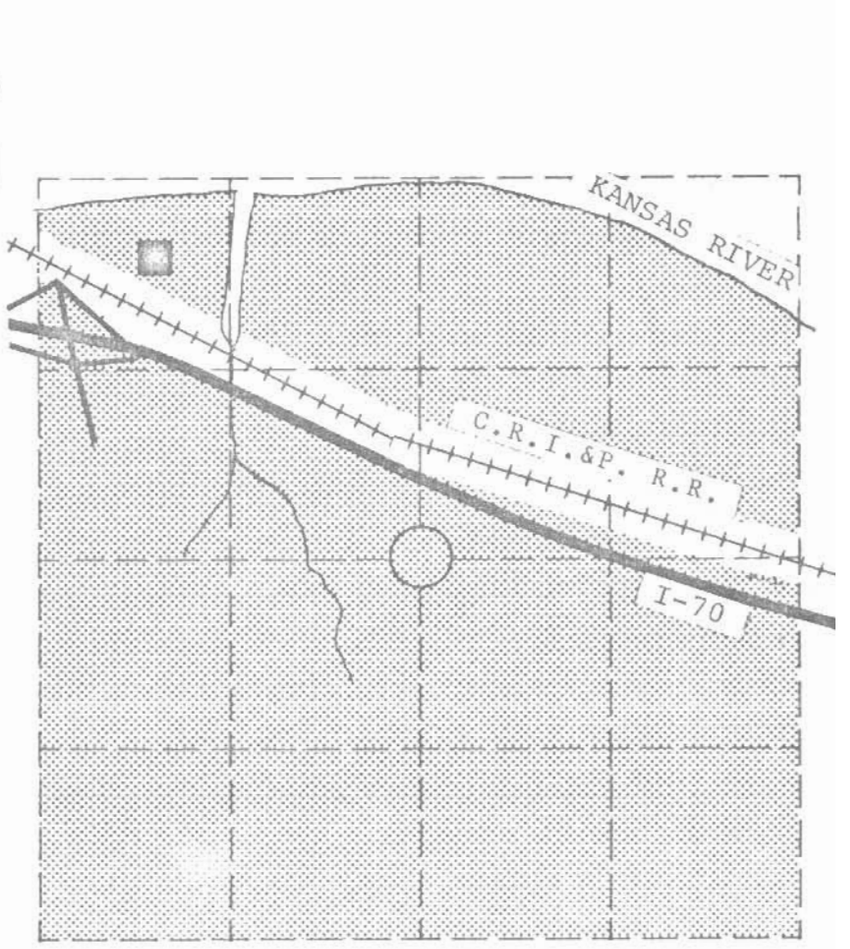
Specific Gravity (Sat.) 2.62 (Dry)

Los Angeles Wear 38.8

Absorption 0.6 Soundness 0.95

Wt. Cu.Ft. 110.87 Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. SG-28 Qal Date September, 1973

Material Sand & Sand Gravel County Shawnee

Location Kansas Half Breed Reserve #3 Sec. 30 Twp. 11S Range 16E

Owner Consumers Sand Co. (name) 1101 W. Railroad St. Topeka, Ks. (address)

Nature of Deposit Wet Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained								Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100					
						0	1	9	24	48	87	99	1	2.68		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 14519

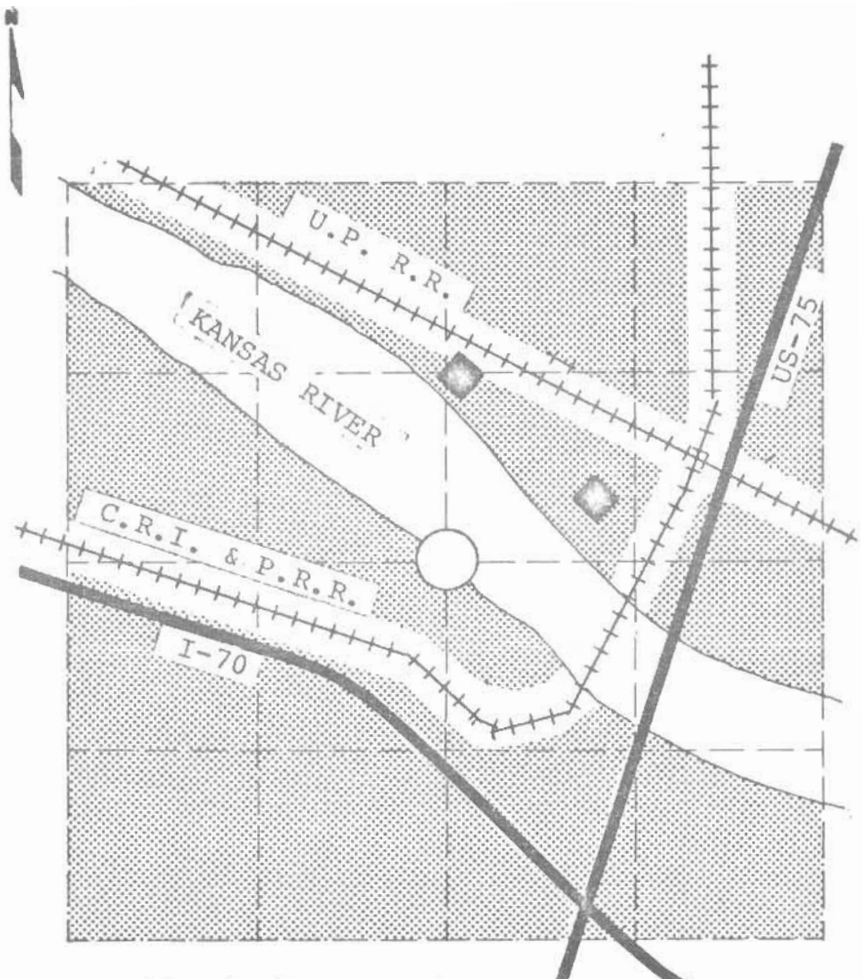
Specific Gravity (Sat.) 2.57 (Dry)

Los Angeles Wear 30.0

Absorption 2.42 Soundness 0.91

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. SG+29 Qal Date September, 1973

Material Sand-Sand Gravel County Shawnee

Location Kansas Half Breed Reserve #4 Sec. 30 Twp. 11S Range 16E

Owner Kansas Sand Co., Inc. (name) 531 N. Tyler, Topeka, Kansas (address)

Nature of Deposit Wet Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
						0	2	5	24	48	87	99	1	2.65		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 14520

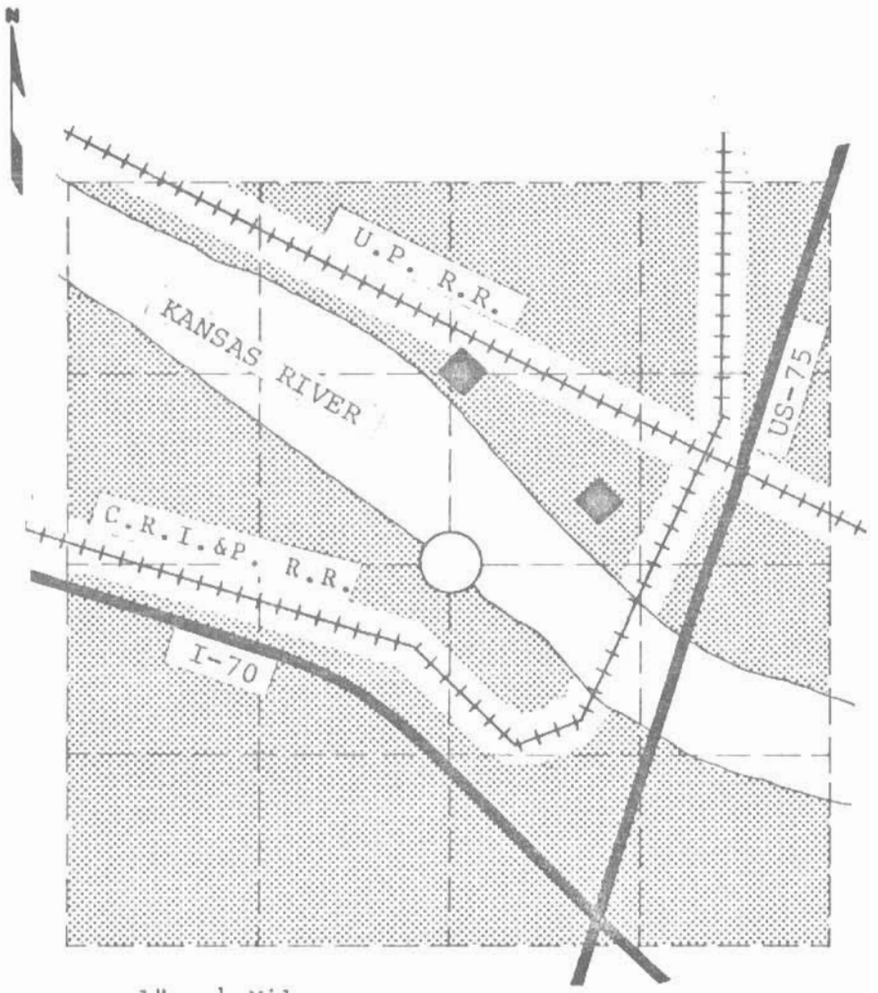
Specific Gravity (Sat.) 2.62 (Dry)

Los Angeles Wear 38.0

Absorption 0.4 Soundness 0.98

Wt. Cu.Ft. 112.0 Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. SG-30 Qal Date September, 1973

Material Sand and Sand-Gravel County Shawnee

Location NW¼, SW¼ Sec. 23 Twp. 11S Range 16E

Owner Shoffner Sand Co., Inc. (name) Topeka, Kansas (address)

Nature of Deposit Wet Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of Over-Burden	Depth of Material	Percent Retained												
				1 1/2	3/4	3/8	4	8	16	30	50	100	Wash 200	G.F.	L.L.	P.I.
							1	13	37	64	87	95	2	2.97		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 15041

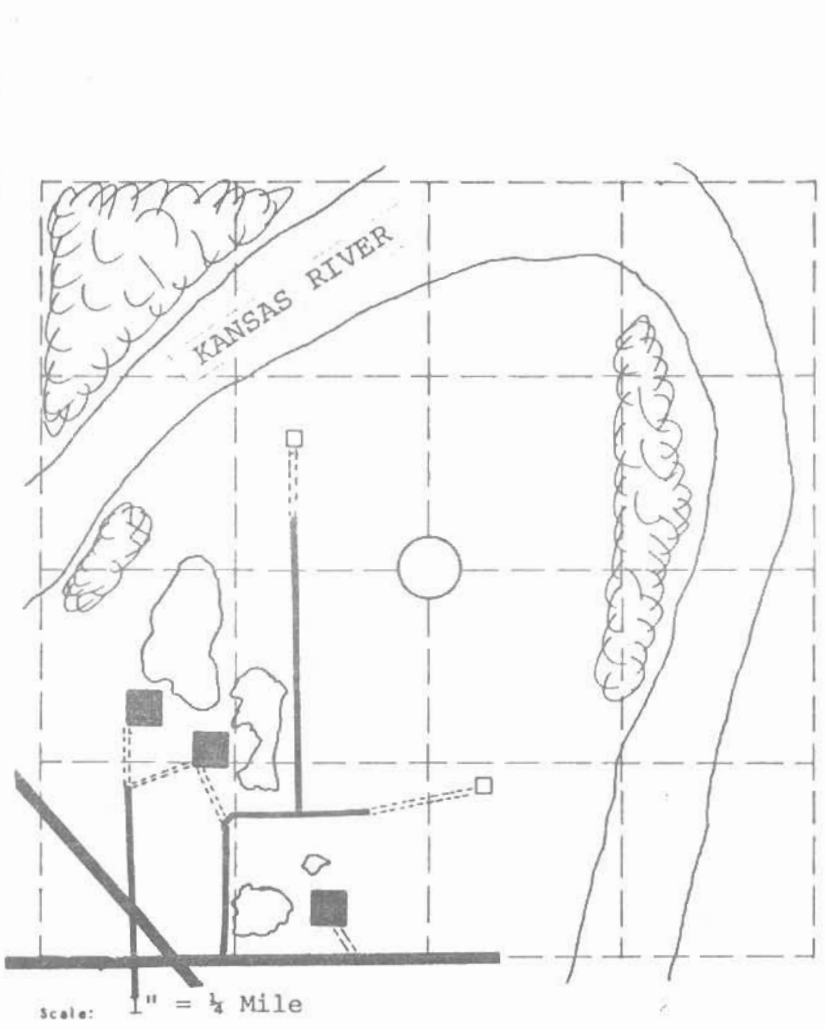
Specific Gravity (Sat.) 2.60 (Dry)

Los Angeles Wear 32.7

Absorption 0.6 Soundness 0.98

Wt. Cu.Ft. 116.63 Str. Ratio

Remarks



MATERIAL SITE DATA FORM

Site No. SG- 31 Qal Date September, 1973

Material Sand Gravel County Shawnee

Location SW¼ Sec. 23 Twp. 11S Range 16E

Owner Merle D. & Helen M. Winter (name) Route 4 Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	S.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
						1	3	7	30	77	90	93	5.94	3.01	34.0	11.6

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 31917

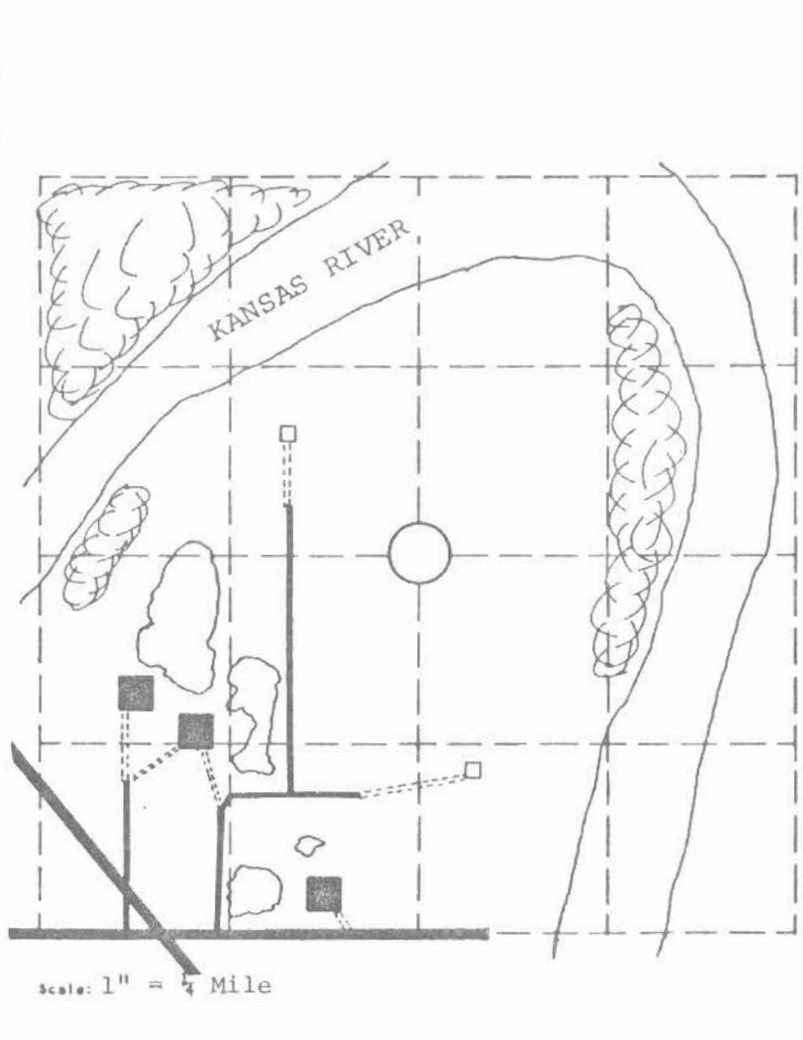
Specific Gravity (Sat.) 2.57 (Dry)

Los Angeles Wear 30.0

Absorption 2.42 Soundness 0.91

Wt. Cu.Ft. Str. Ratio

Remarks



MATERIAL SITE DATA FORM

Site No. SG-32 Qal Date September, 1973

Material Sand-Gravel County Shawnee

Location SE¼ Sec. 23 Twp. 11S Range 16E

Owner Albert, Jr. & Vivian R. Jackson, 924 W. Railroad, Topeka, Ks.
(name / address)

Nature of Deposit Wet Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
					0	0	4	19	46	72	91	98	.65	3.30		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 27561

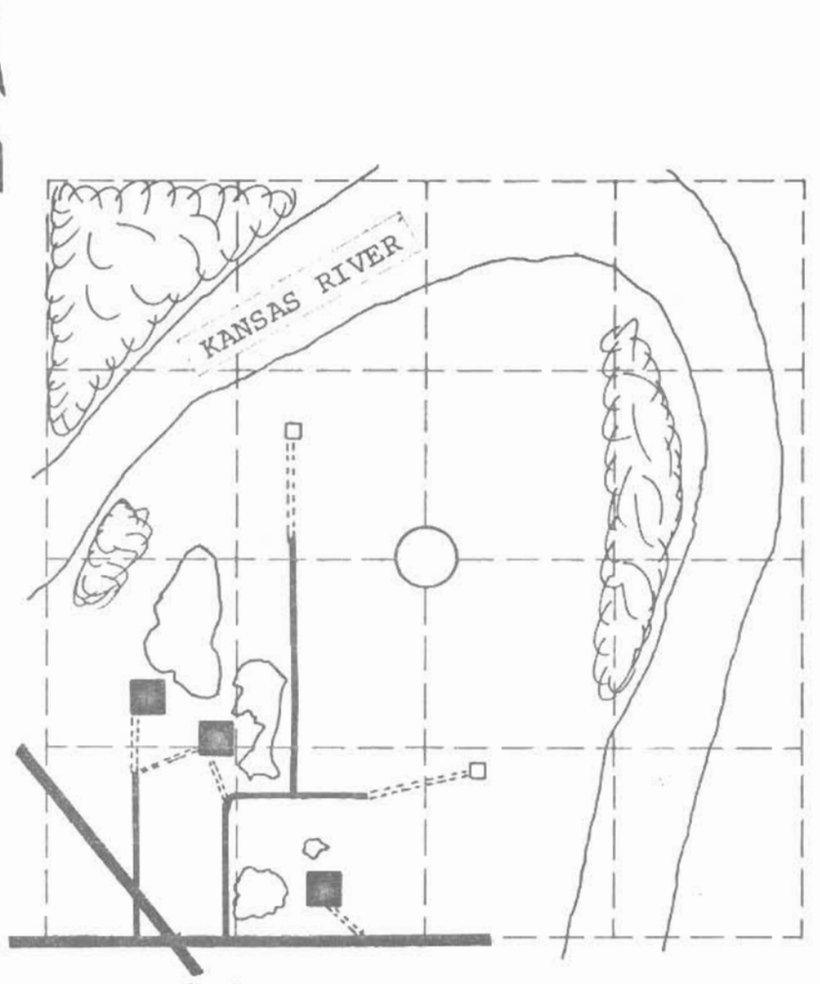
Specific Gravity (Sat.) 2.62 (Dry)

Los Angeles Wear 38.7

Absorption 0.8 Soundness 0.97

Wt. Cu.Ft. 112.28 Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. SG-33 Qal Date September, 1973

Material Sand-Sand Gravel County Shawnee

Location NE¼ NW¼ Sec. 26 Twp. 11S Range 16E

Owner Edward E. & Opal L. Day (name) 2400 Central Park, Topeka, Ks. (address)

Nature of Deposit Wet Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
						0	2	13	33	58	85	95	2.10	2.86		

CORRELATION DATA

Geological Age Quaternary

Geological Source Alluvium

Material Similar To SHC Lab. No. 15042

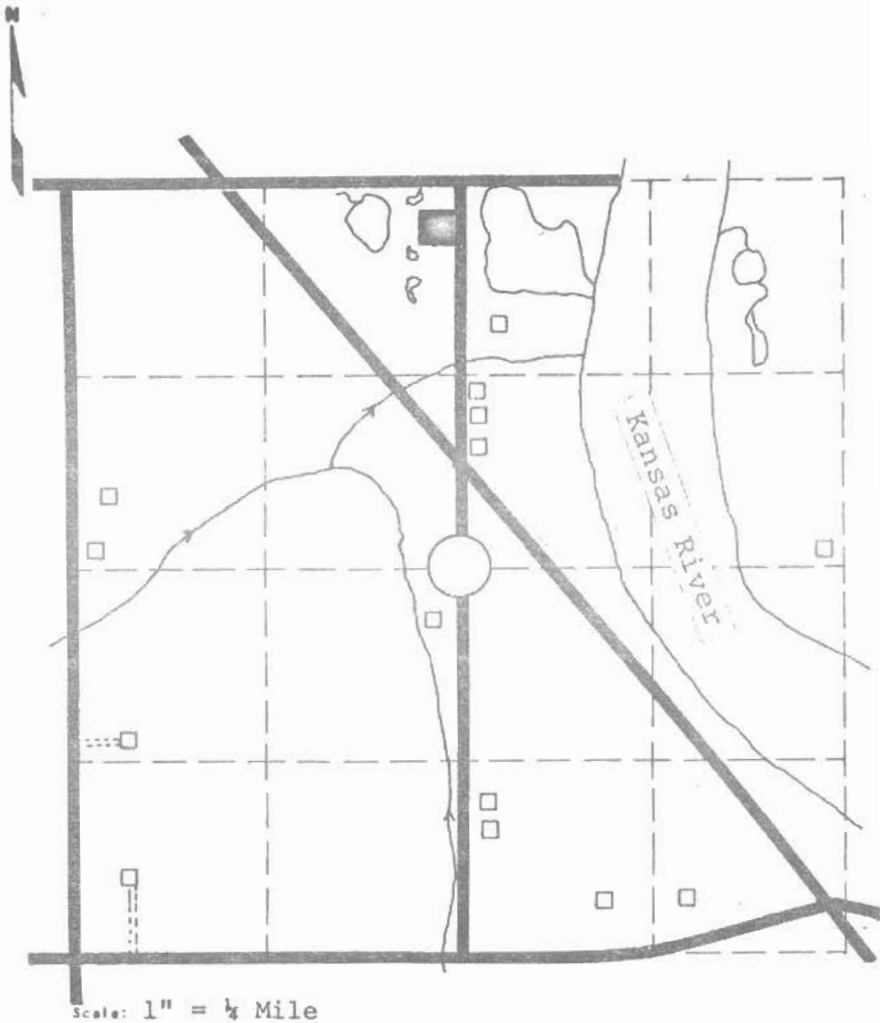
Specific Gravity (Sat.) 2.62 (Dry)

Los Angeles Wear 33.8

Absorption 1.1 Soundness 0.96

Wt. Cu.Ft. 111.49 Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+34 Pde Date September, 1973

Material Limestone County Shawnee

Location W½ SE¼ Sec. 33 Twp. 11S Range 17E

Owner Wm. & Katheryn Spurny (name) Route 1 Tecumseh, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation - Ervine Creek Member

Material Similar To SHC Lab. No. 62088

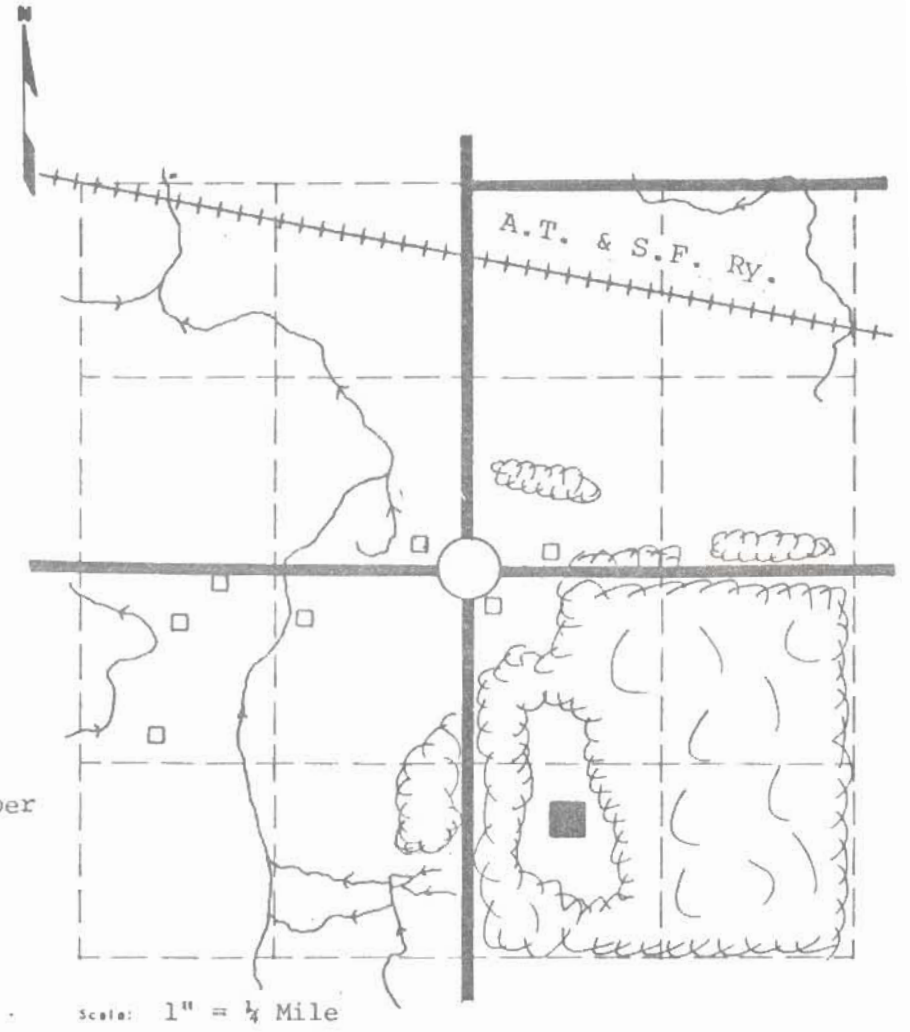
Specific Gravity (Sat.) 2.53 (Dry)

Los Angeles Wear 28.6B

Absorption 2.74 Soundness 0.89

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS-35 Pde Date September, 1973

Material Limestone County Shawnee

Location NW¼ NW¼ Sec. 4 Twp. 12S Range 17E

Owner Norma Keller (name) 1229 Lakeside Drive Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	½	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation-Ervine Creek Member

Material Similar To SHC Lab. No. 15149

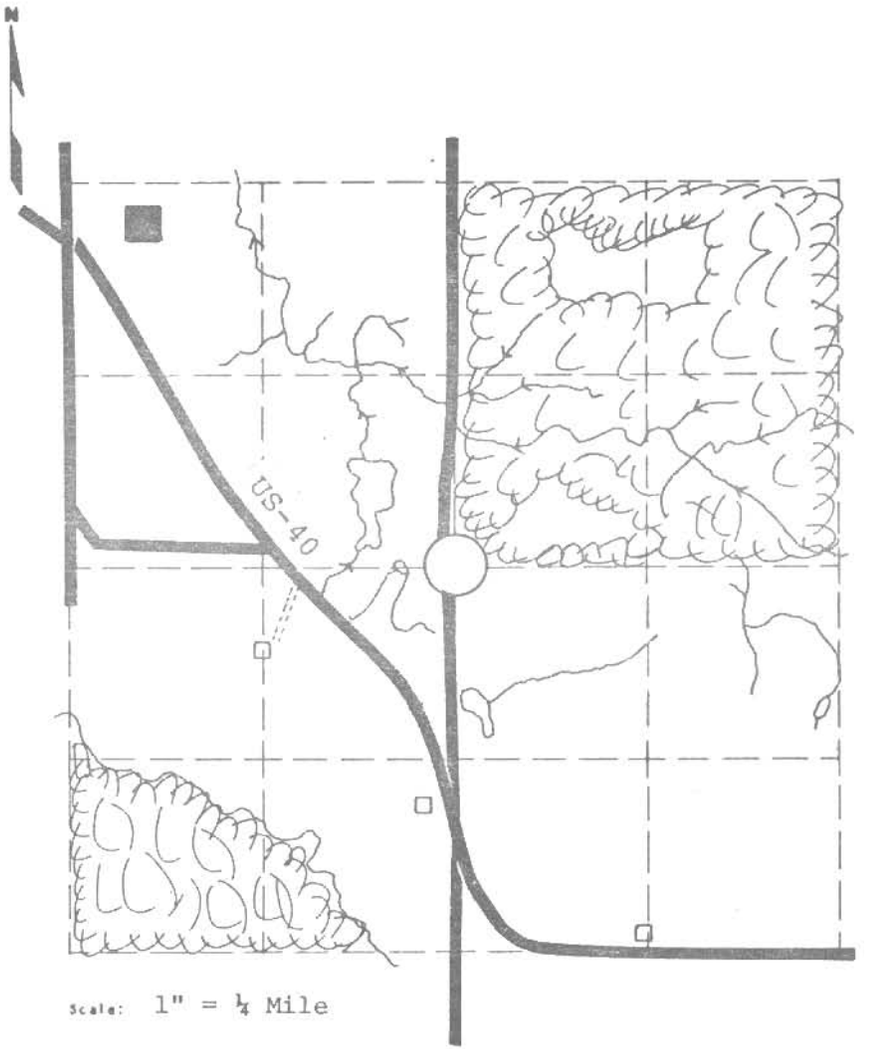
Specific Gravity (Sat.) 2.49 (Dry) 2.42

Los Angeles Wear 29.5

Absorption 2.96 Soundness 0.96

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+ 36 Pde Date September, 1973

Material Limestone County Shawnee

Location NE¼ Sec. 11 Twp. 12S Range 16E

Owner Wilbur & Nellie Frakes (name) Route 4 Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L	P.I
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation-Ervine Creek Member

Material Similar To SHC Lab. No. 15699

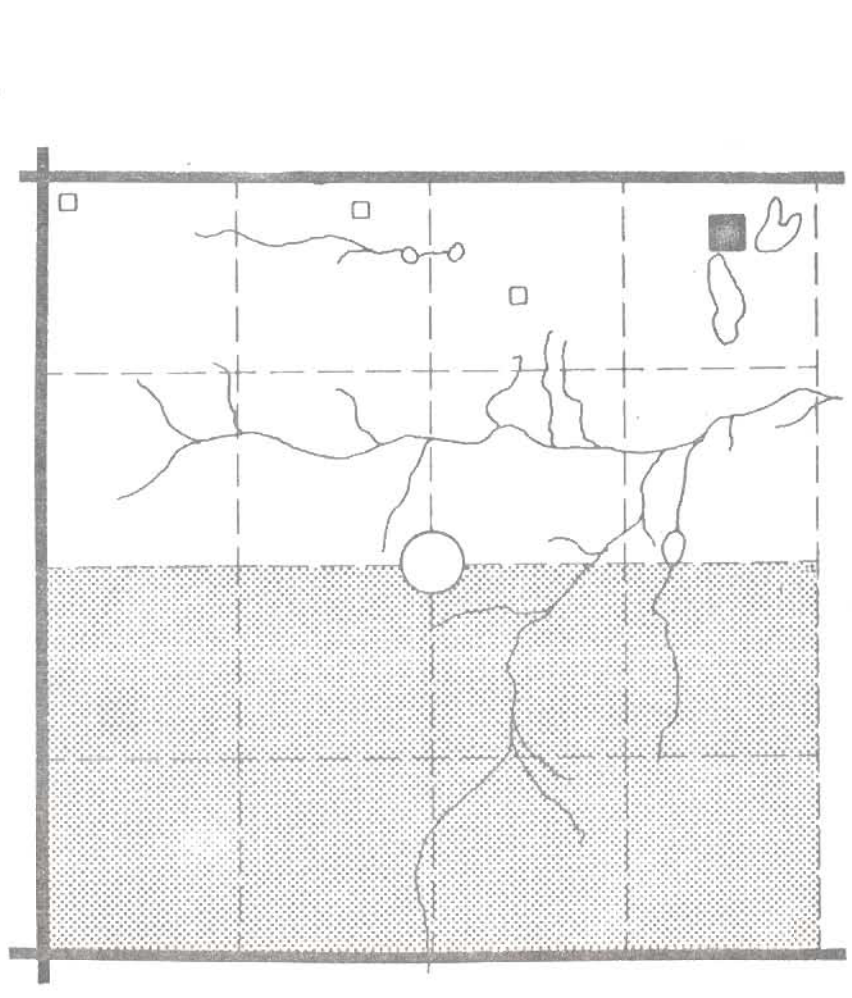
Specific Gravity (Sat.) 2.56 (Dry) 2.49

Los Angeles Wear 32.4

Absorption 2.82 Soundness 0.92

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+ 37 Ede Date September, 1973

Material Limestone County Shawnee

Location SE¼ Sec. 12 Twp. 12S Range 16E

Owner Lavina Haefele etal (name) Route 4 Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation-Ervine Creek Member

Material Similar To SHC Lab. No. 2057

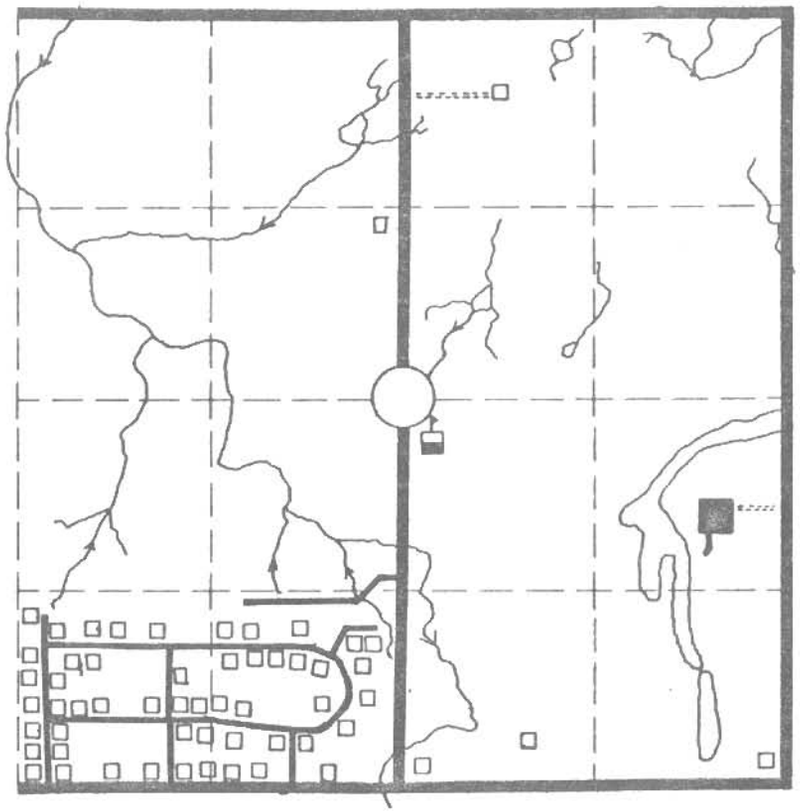
Specific Gravity (Sat.) 2.48 (Dry)

Los Angeles Wear 30.2

Absorption 3.21 Soundness 0.94

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+38 Ede Date September, 1973

Material Limestone County Shawnee

Location W½ Sec. 18 Twp. 12S Range 17E

Owner Martin-Marietta Corp. (name) Box 789 Cedar Rapids, Iowa (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation-Ervine Creek Member

Material Similar To SHC Lab. No. 14672

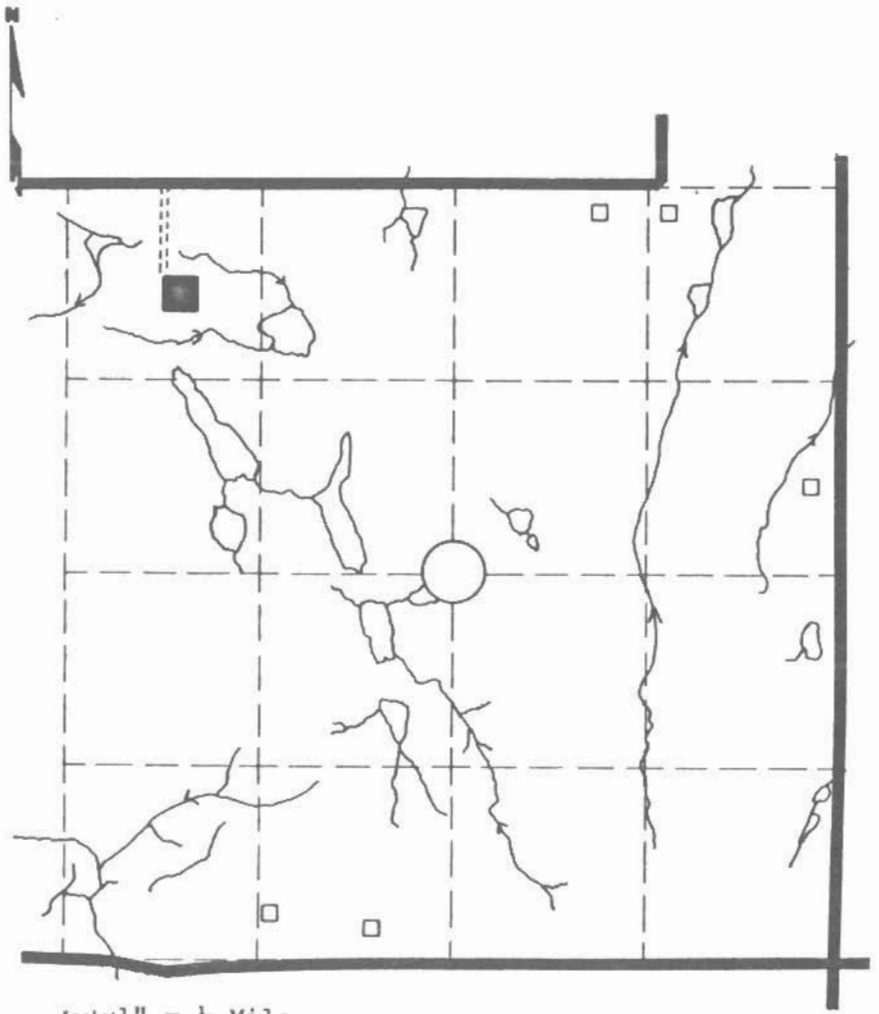
Specific Gravity (Sat.) 2.55 (Dry) 2.47

Los Angeles Wear 32.9

Absorption 3.25 Soundness 0.95

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+39 Rch Date September, 1973

Material Limestone County Shawnee

Location SE¼ NE¼ Sec. 22 Twp. 12S Range 16E

Owner Shawnee County (name) Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate IV

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Topeka Limestone Formation-Hartford Member

Material Similar To SHC Lab. No. 15144

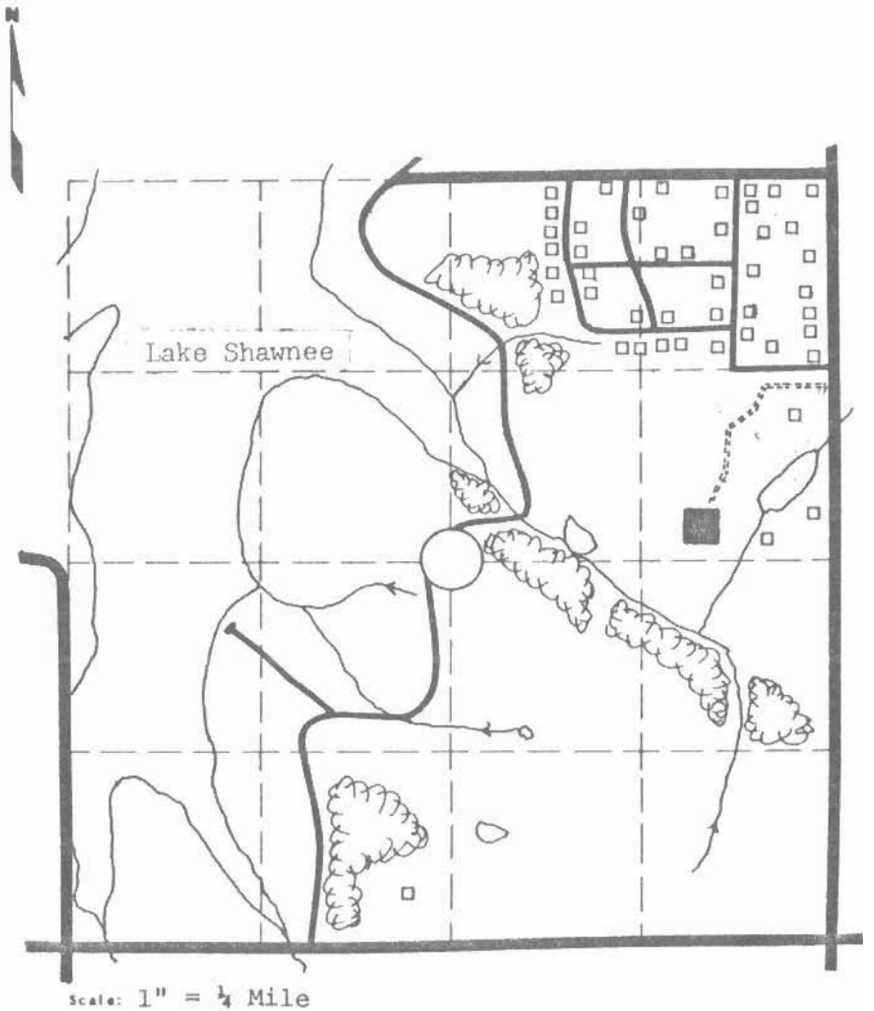
Specific Gravity (Sat.) 2.44 (Dry) 2.34

Los Angeles Wear 29.6

Absorption 4.16 Soundness 0.97

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+40 Pzt Date September, 1973

Material Limestone County Shawnee

Location SE¼ SE¼ Sec. 17 Twp. 13S Range 14E

Owner A.R. & Mabel C. Henderson (name) Route 9 Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate V

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained 1 1/2	3/4	3/8	4	8	16	30	50	100	Wash 200	S.F.	L.L.	P.I.

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Zeandale Limestone Formation-Tarkio Member

Material Similar To SHC Lab. No. 15143

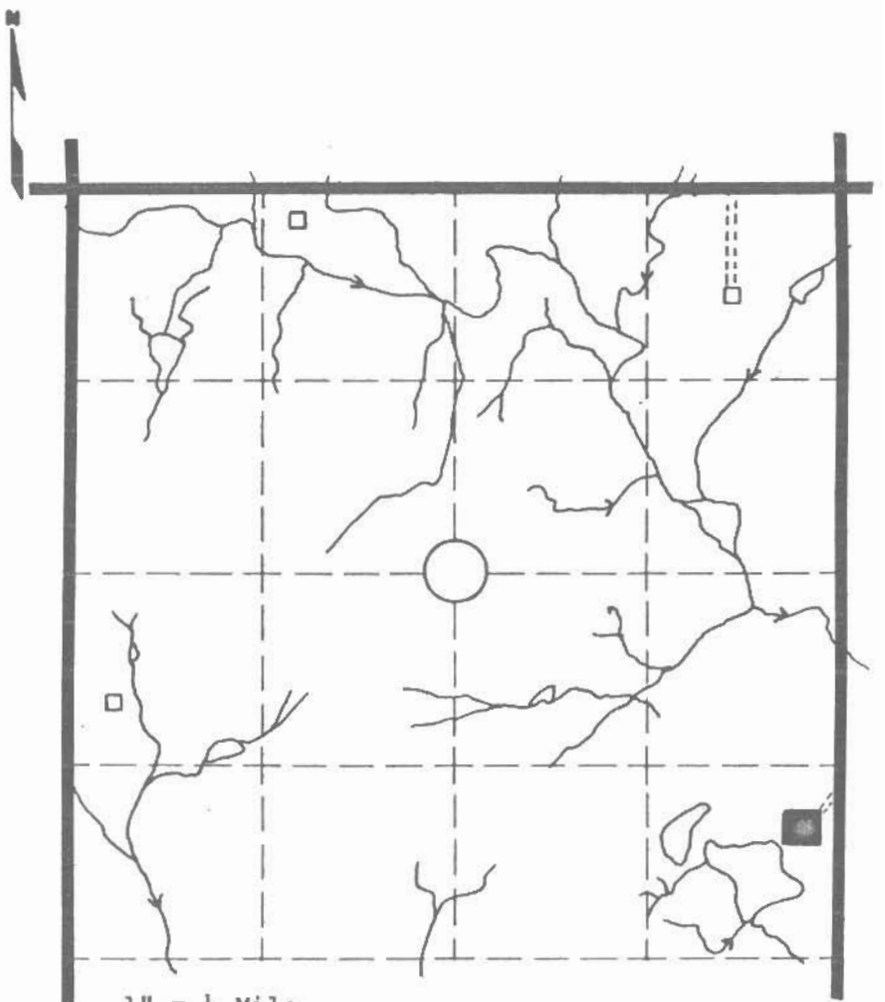
Specific Gravity (Sat.) 2.65 (Dry) 2.60

Los Angeles Wear 27.9

Absorption 1.95 Soundness 0.96

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS-41 Fbb Date September, 1973

Material Limestone . County Shawnee

Location SW¼ Sec. 30 Twp. 13S Range 15E

Owner Dorothy A. Henderson (Name) Auburn, Kansas (Address)

Nature of Deposit Dry Accessibility Good Site Located on Plate V

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation-Burlingame Member

Material Similar To SHC Lab. No. 11576

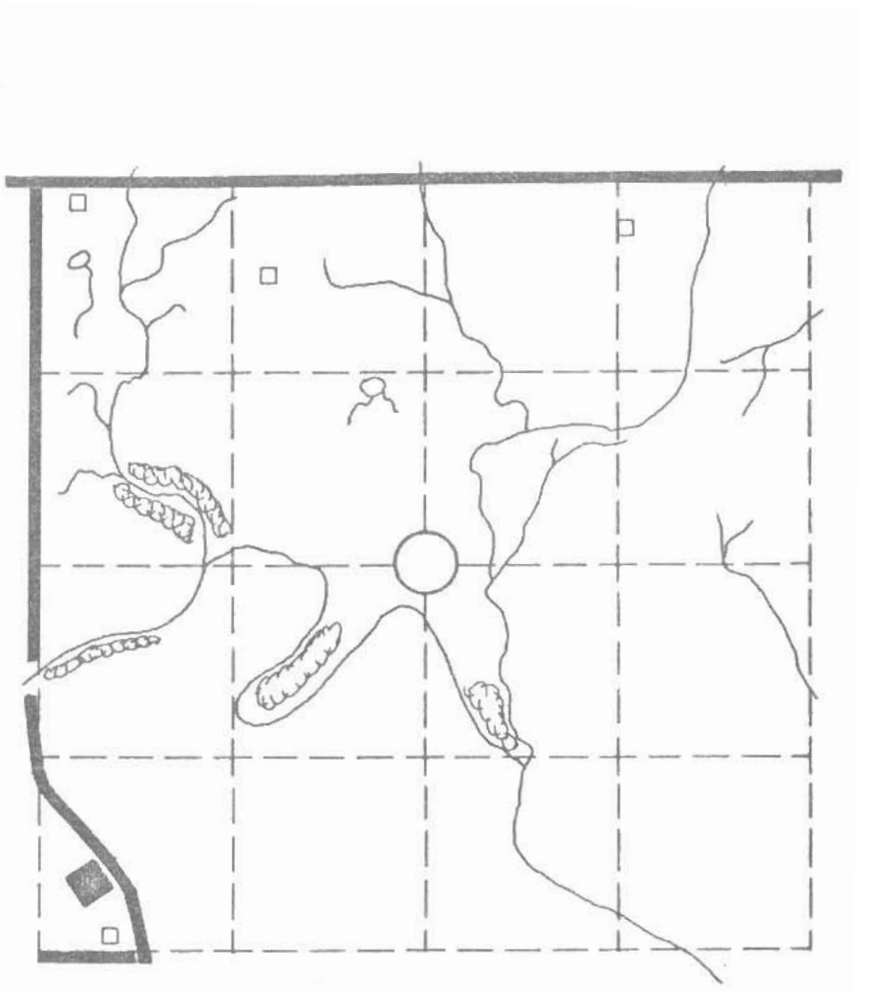
Specific Gravity (Sat.) 2.52 (Dry) 2.43

Los Angeles Wear 35.9

Absorption 3.65 Soundness 0.95

Wt. Cu. Ft. Str. Ratio

Remarks



Scale: 1" = ½ Mile

MATERIAL SITE DATA FORM

Site No. LS+42 Erie Date September, 1973

Material Limestone County Shawnee

Location SW¼ Sec. 4 Twp. 13S Range 16E

Owner Alley, Ella M. (name) 1125 Taylor Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate VI

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation-Ervine Creek Member

Material Similar To SHC Lab. No. 15269

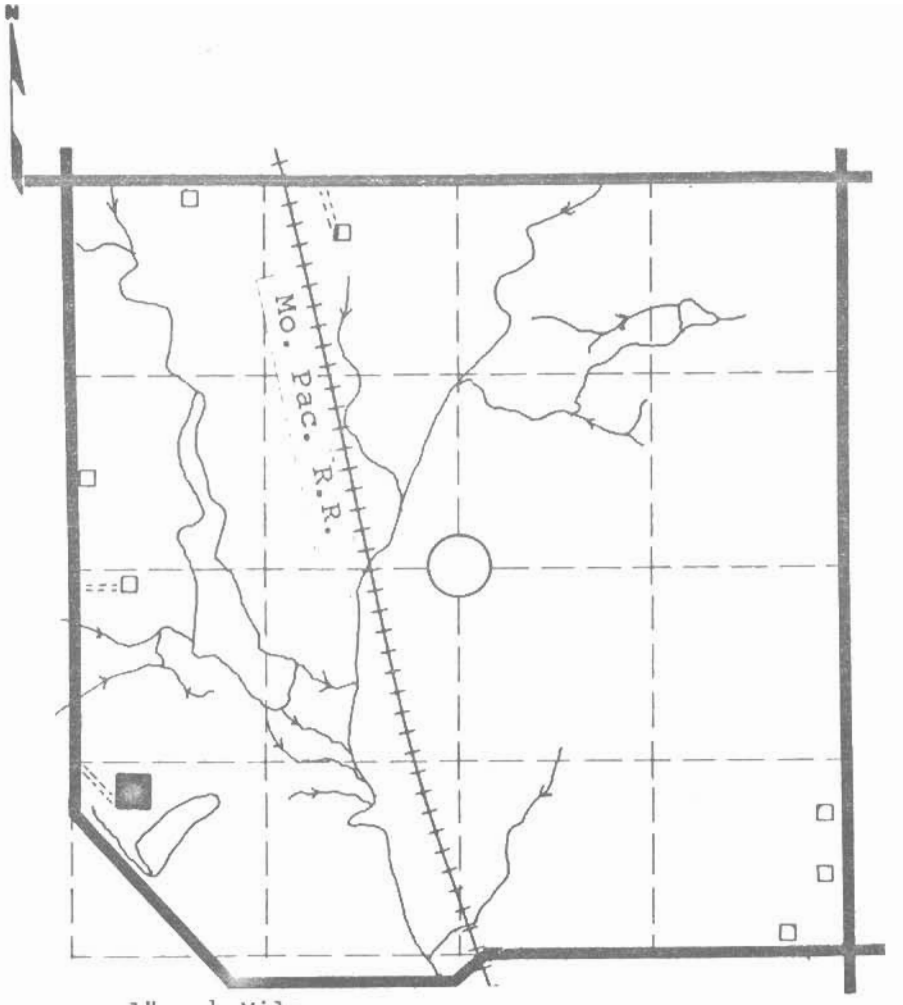
Specific Gravity (Sat.) 2.45 (Dry) 2.32

Los Angeles Wear 35.7

Absorption 5.53 Soundness 0.93

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+43 / Pth Date September, 1973

Material Limestone County Shawnee

Location E½ SE¼ Sec. 10 Twp. 13S Range 16E

Owner Frank L. Snell (name) Berryton, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate VI

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	B.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Topeka Limestone Formation-Hartford Member

Material Similar To SHC Lab. No. 15147

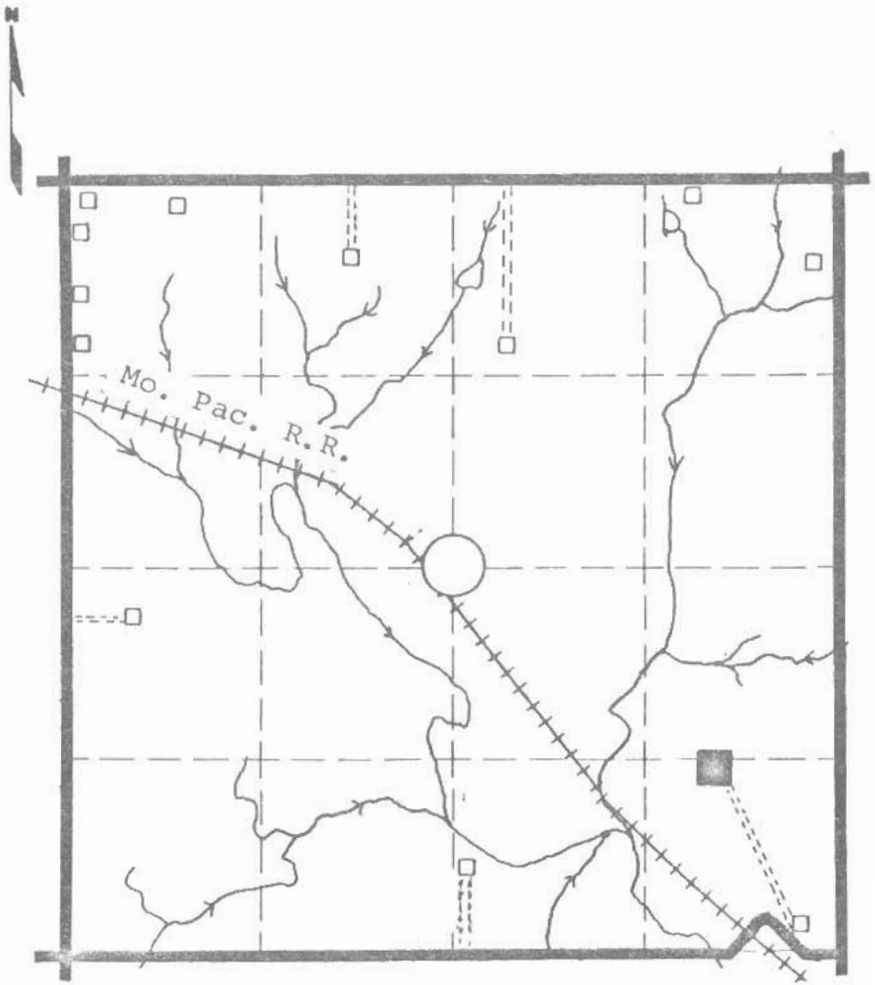
Specific Gravity (Sat.) 2.59 (Dry) 2.54

Los Angeles Wear 28.0

Absorption 1.88 Soundness 0.95

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ½ Mile

MATERIAL SITE DATA FORM

Site No. SG-44 Qgd Date September, 1973

Material Sand Gravel County Shawnee

Location SW¼ NW¼ Sec. 24 Twp. 13S Range 16E

Owner T. M. Murrell (name) 3310 Harrison, Topeka, Kansas (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate VI

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				
					0	1	2	4	10	19	25	31	56		25	5

CORRELATION DATA

Geological Age Quaternary

Geological Source Glacial Drift

Material Similar To SHC Lab. No. AB-710

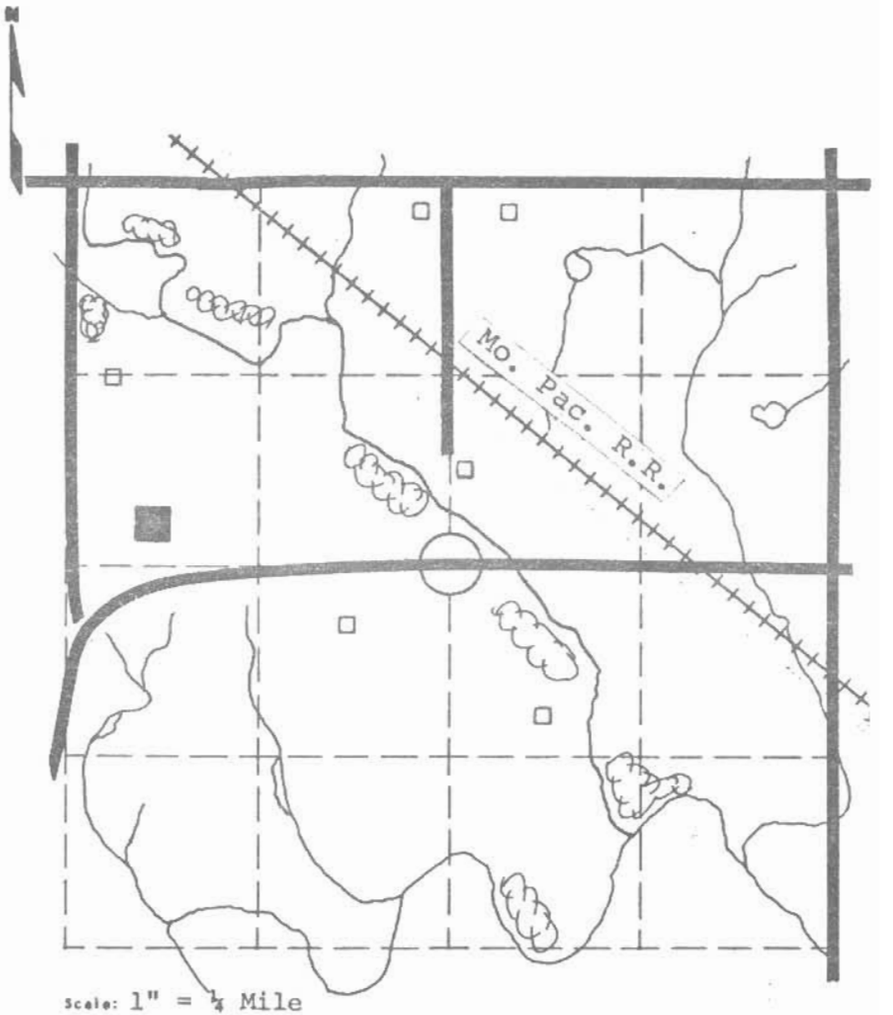
Specific Gravity (Sat.) (Dry)

Los Angeles Wear

Absorption Soundness

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+45 / Pde Date September, 1973

Material Limestone County Shawnee

Location SE¼ Sec. 20 Twp. 13S Range 16E

Owner Guy & Eva McQueen (name) Urbana, Missouri (address)

Nature of Deposit Dry Accessibility Good Site Located on Plate VI

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation-Ervine Creek Member

Material Similar To SHC Lab. No. 17560

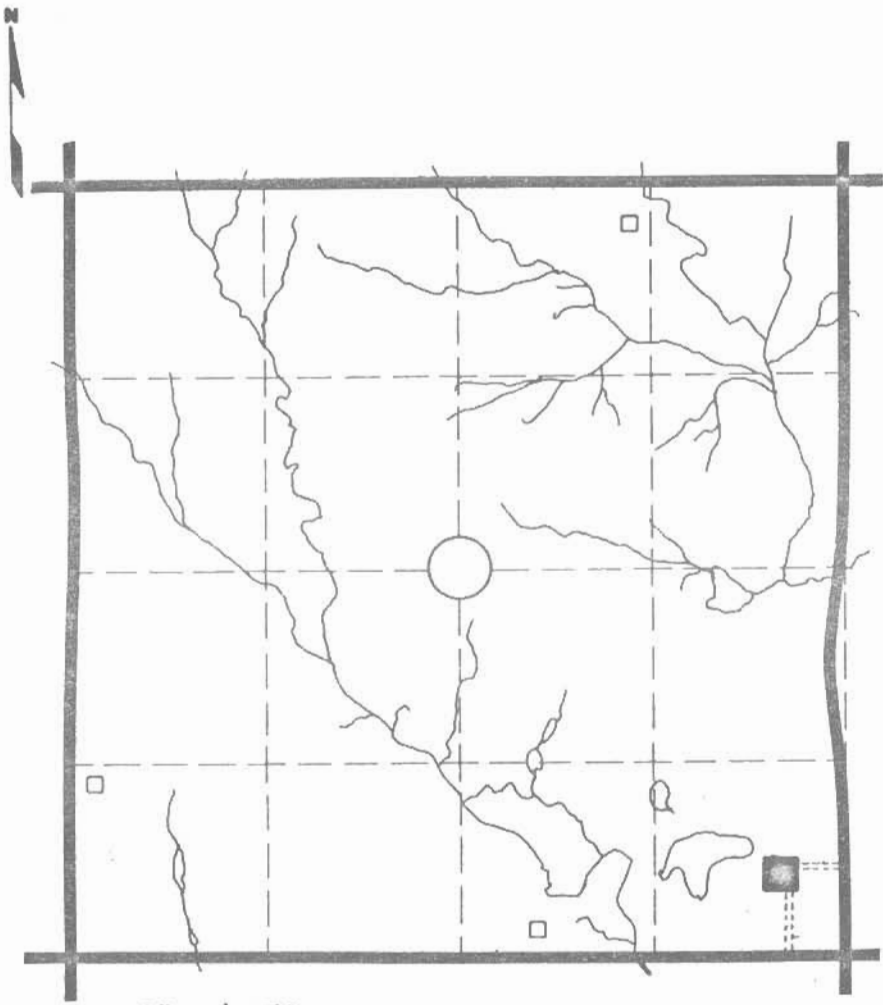
Specific Gravity (Sat.) 2.56 (Dry) 2.48

Los Angeles Wear 32.6

Absorption 2.98 Soundness 0.96

Wt. Cu.Ft. Str. Ratio

Remarks



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+46 Pde Date September, 1973

Material Limestone County Shawnee

Location NW¼ Sec. 31 Twp. 13S Range 16E

Owner A. F. & Sarah Robb (name) 3114 Stafford (address) Topeka, Kansas

Nature of Deposit Dry Accessibility Good Site Located on Plate VI

Status of Site Open Materials Site; Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	S.E.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Deer Creek Limestone Formation-Ervine Creek Member

Material Similar To SHC Lab. No. 50445-50446-50447

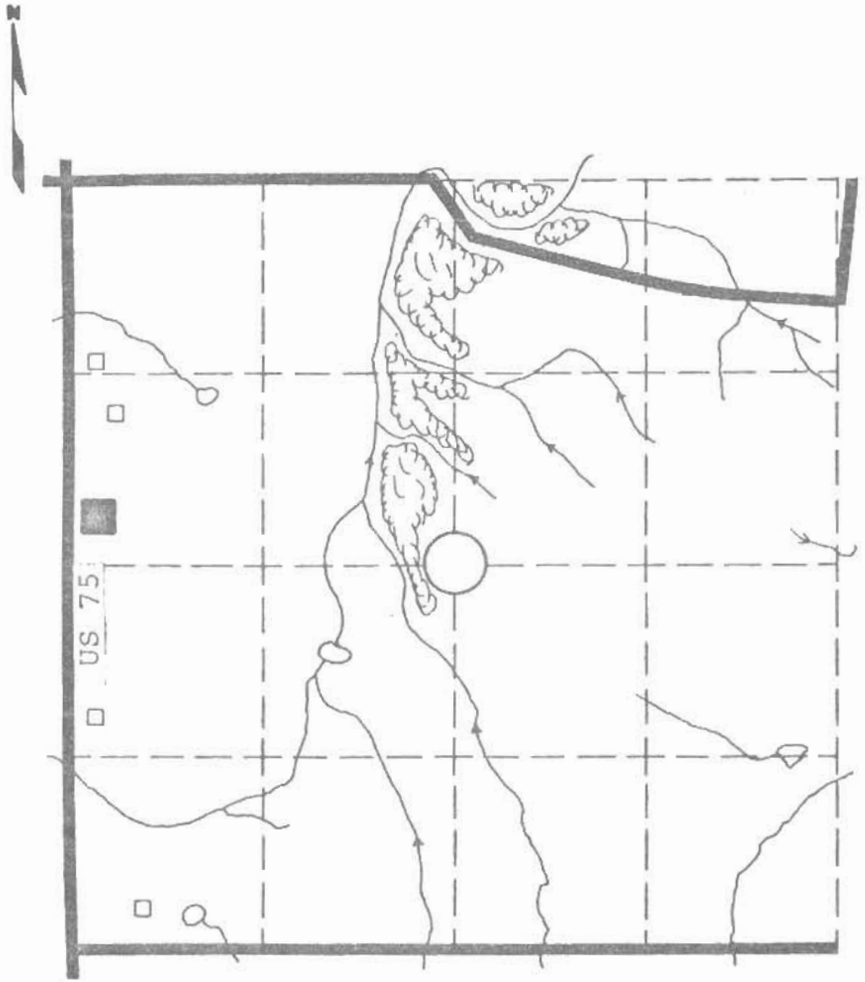
Specific Gravity (Sat.) 2.65-2.59-2.56 (Dry) 2.61-2.55-2.52

Los Angeles Wear 25.8A-25.7A-27.4A

Absorption 1.43-1.76-1.87 Soundness 0.94-0.93-0.91

Wt. Cu.Ft. Str. Ratio

Remarks



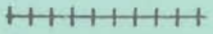
Scale: 1" = ¼ Mile

OPEN MATERIALS SITES; NOT SAMPLED

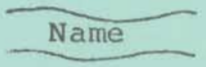
LEGEND


Trail or lane


Road


Railroad


Hedge or trees



Major streams


Intermittent streams

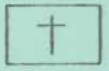

Pond or lake


Open materials sites; not sampled


Open materials sites; sampled

Center of section


Dwelling


Cemetery


School


Church


Town or city

MATERIAL SITE DATA FORM

Site No. SG-47 Qgd Date September, 1973

Material Sand-Gravel County Shawnee

Location SW¼ Sec. 36 Twp. 10S Range 13E

Owner R. D. Parr & Virginia J. Gentry (name) Rossville, Kansas (address)

Nature of Deposit ——— Accessibility ——— Site Located on Plate I

Status of Site Open Materials Site; Not Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-Burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Quaternary

Geological Source Glacial Drift

Material Similar To ———

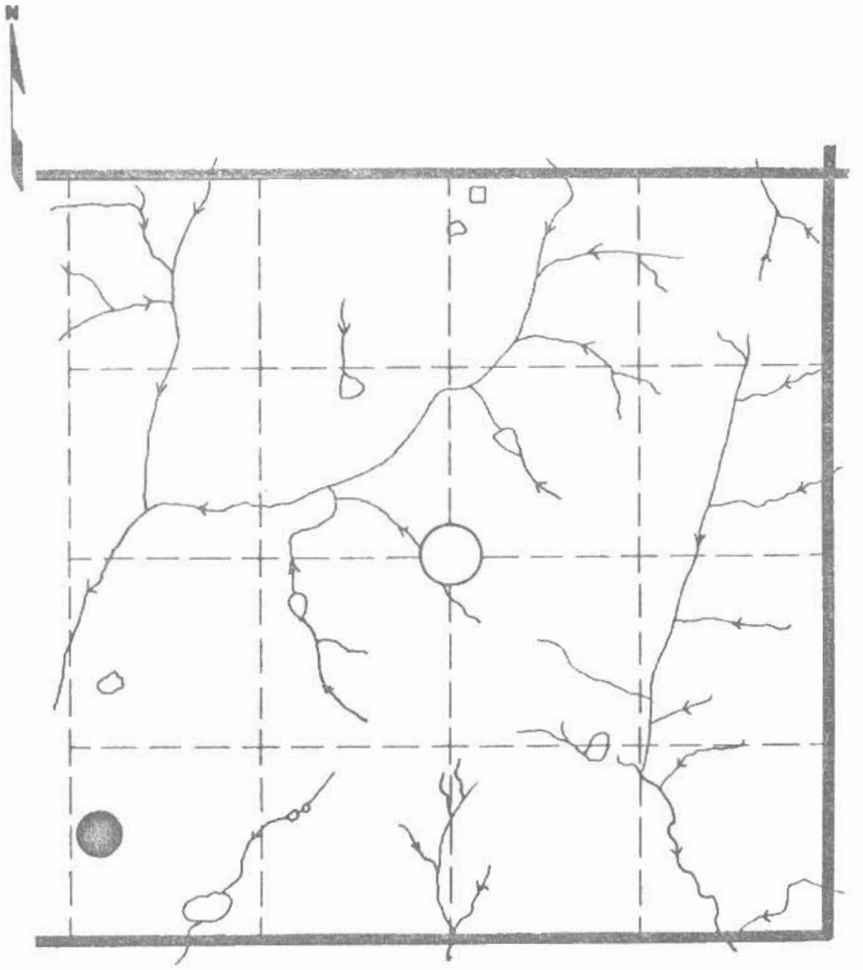
Specific Gravity (Sat.) ——— (Dry) ———

Los Angeles Wear ———

Description ——— Soundness ———

Wt. (s.f.) ——— Str. Ratio ———

Remarks ———



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+48 Pzt Date September, 1973

Material Limestone County Shawnee

Location NW¼ SW¼ Sec. 29 Twp. 11S Range 14E

Owner Edd L. & Helen M. Miller (name) 111334 S.W. Highway 40, Topeka, Ks. (address)

Nature of Deposit ____ Accessibility ____ Site Located on Plate III

Status of Site Open Materials Site; Not Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Zeandale Limestone Formation-Tarkio Member

Material Similar To ____

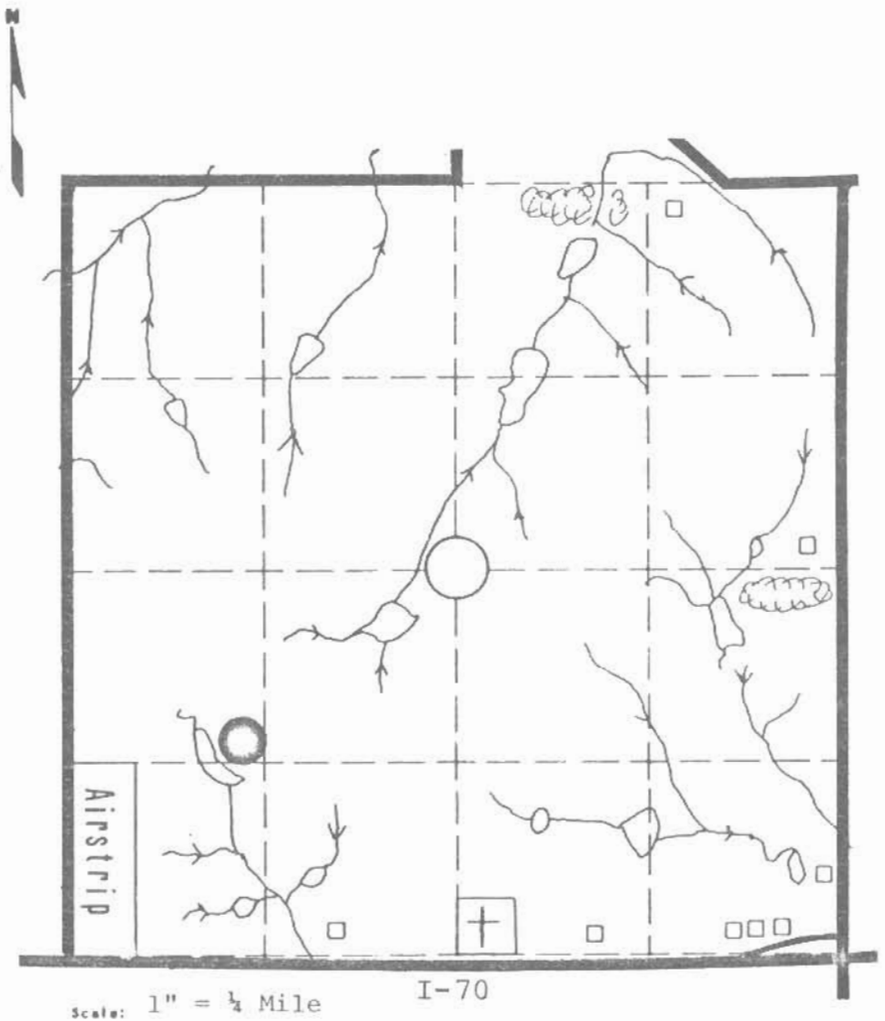
Specific Gravity (Sat.) ____ (Dry) ____

Los Angeles Wear ____

Absorption ____ Soundness ____

Wt. Cu.Ft. ____ Str. Ratio ____

Remarks Abandoned



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+49 Fbb Date September, 1973

Material Limestone County Shawnee

Location NE¼ NE¼ Sec. 36 Twp. 11S Range 14E

Owner Oscar H. & Inga V. Swanson (name) Route 8 Topeka, Ks. (address)

Nature of Deposit ——— Accessibility ——— Site Located on Plate III

Status of Site Open Materials Site; Not Sampled

EXPLORATION DATA

Test Hole	Material at Bottom of Hole	Depth of Over-Burden	Depth of Material	Percent Retained									Wash 200	S.E.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation-Burlingame Member

Material Similar To ———

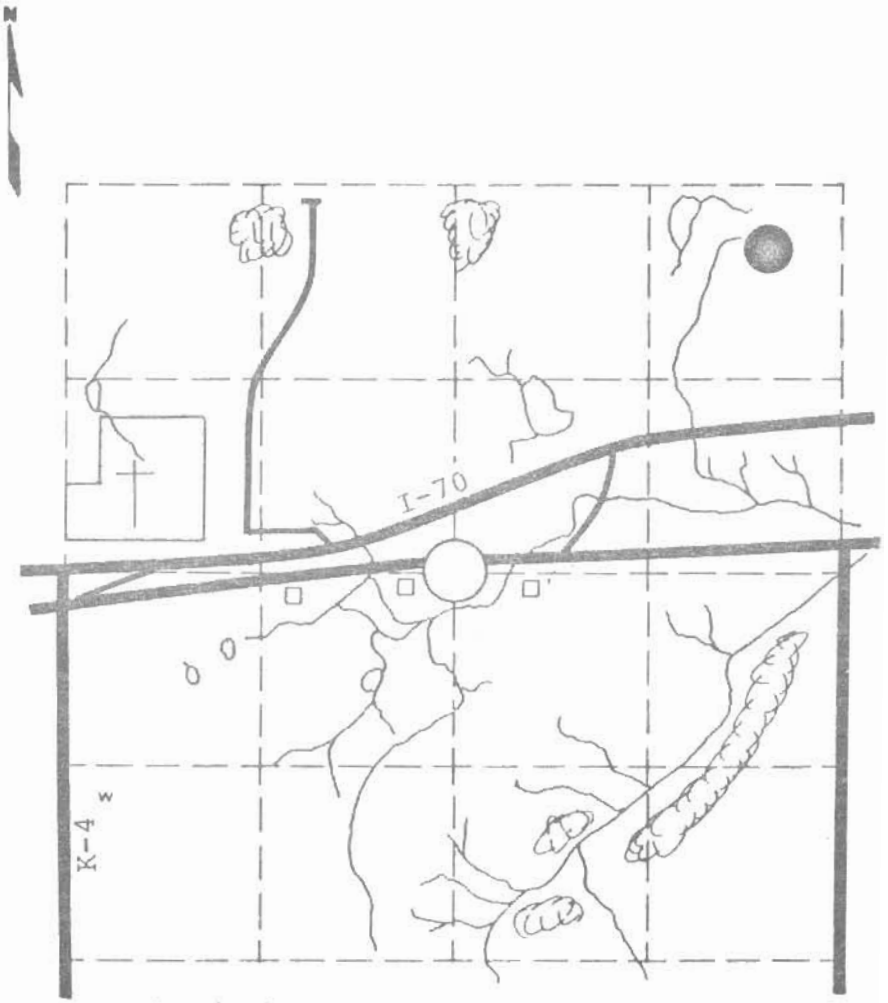
Specific Gravity (Sat.) ——— (Dry) ———

Los Angeles Wear ———

Absorption ——— Soundness ———

Wt. Cu.Ft. ——— Str. Ratio ———

Remarks ———



Scale: 1" = ¼ Mile

MATERIAL SITE DATA FORM

Site No. LS+50 Pzt Date September, 1973

Material Limestone County Shawnee

Location N½ Sec. 2 Twp. 12S Range 13E

* Owner J. C. Miller and R. Hatch
name address

Nature of Deposit Accessibility Site Located on Plate III

Status of Site Open Materials Site; Not Sampled

EXPLORATION DATA

Test Hole	Material at bottom of Hole	Depth of over-burden	Depth of Material	Percent Retained									Wash 200	G.F.	L.L.	P.I.
				1 1/2	3/4	3/8	4	8	16	30	50	100				

CORRELATION DATA

Geological Age Pennsylvanian

Geological Source Zeandale Limestone Formation-Tarkio Member

Material Similar To

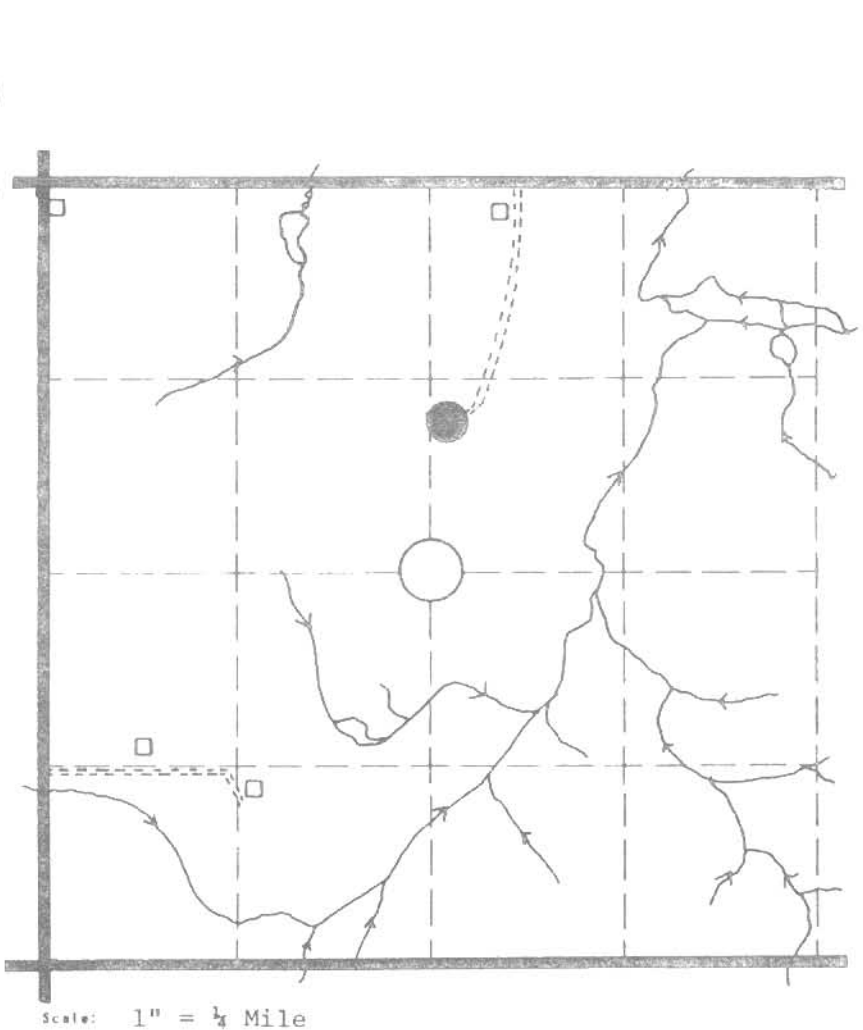
Specific Gravity (Sat.) (Dry)

Los Angeles Wear

Absorption Soundness

Wt. Cu.Ft. Str. Ratio

* Remarks % J. A. Liebehardt 491 E. 400 N. Provo, Utah



Scale: 1" = ¼ Mile

GLOSSARY

A.A.S.H.O.: American Association of State Highway Officials.

Absorption: Determined by tests performed in accordance with A.A.S.H.O. designation T85.

Alluvium: Deposit of clay, silt, sand, or gravel laid down by flowing water.

Aquifer: Water-bearing geologic unit.

Arkosic gravel: Gravel composed of mineral fragments derived from weathered granite.

Bedding: Characteristic of some rock units which shows distinct layers due to the manner in which they were deposited.

Chert: A dull, flint-like, siliceous rock.

Coarse sand: An aggregate of unconsolidated mineral or rock particles, the dimensions of which are not less than 0.42 of a millimeter and not more than 2.00 millimeters.

Degrade: To lower the level of a stream or river valley by stream erosive action.

Exposure pattern: Topographic feature formed on the land surface by the exposure of geologic units.

Fine sand: An aggregate of unconsolidated minerals or rock particles the dimensions of which are not less than 0.05 of a millimeter and not more than 0.42 of a millimeter. The term refers to size of grain and not to composition; however, since most sands are composed of quartz and feldspar, and the term is used without qualifications, a siliceous composition is implied.

Fluvial deposit: Deposits laid down by a river or stream.

Formation: A layer of persistent strata of one general kind of rock.

Fusilinids: Small marine fossils, about the shape and size of a grain of wheat, belonging to the Foraminifera.

Geologic era: Largest unit of geologic time (e.g. Paleozoic, Mesozoic, and Cenozoic).

Geologic period: A unit of geologic time, shorter than an era and longer than an epoch (e.g. Cambrian, Cretaceous, and Tertiary).

Geologic process: Term pertaining to erosion, deposition, and disastrophic methods by which the earth's surface has been shaped.

Glacial drift: A general term for all rock debris which has been transported and deposited either directly by the ice or from the accompanying meltwater of the glacier.

Glaciolacustrine: Term applied to deposits laid down in glacial lakes.

Grading A, B, C, and D: Determined by the abrasive charge for the Los Angeles wear test as specified in A.A.S.H.O. designation T96 and section Y1-14 of the State Highway Commission of Kansas Standard Specifications, 1966 edition.

Ground-water: Water in the zone of saturation, that is, below the water table.

Light type surfacing: A surface course constructed from aggregate which is not bound by water, cement, or bituminous material.

Lithology: Physical properties or rocks such as grain size, mineral content, and color.

Los Angeles wear: Determined by tests performed in accordance with A.A.S.H.O. designation T96 as modified by section Y1-14 of the State Highway Commission of Kansas Standard Specifications, 1966 edition.

Outwash: Material that is transported and deposited by glacial meltwater.

Material source bed: A geologic unit from which construction material is being or can be produced.

Matrix: The fine components of a rock that binds the larger components, sometimes called groundmass.

Member: A division of a formation, generally of distinct lithologic character or of only local extent.

Montmorillonite: A clay mineral which has the outstanding feature of allowing water and other polar molecules to enter into the lattice causing it to expand.

Open materials site: A pit or quarry from which material is produced for possible construction purposes.

Perched groundwater: Groundwater separated from an underlying body of groundwater by unsaturated material.

Physiographic division: A division of the state, based on general geologic and (or) geographic features.

Plasticity index: Determined by tests performed in accordance with section Y1-18 of the State Highway Commission of Kansas Standard Specifications, 1966 edition.

Pleistocene Series: Deposits laid down during the Pleistocene Epoch.

Pliocene Epoch: The youngest major subdivision of the Tertiary Period.

Prospective materials site: A location where the geologic conditions are favorable for finding construction materials.

Quartzite: Metamorphic rock produced by recrystallization of primarily quartz sandstone under heat and pressure. Term is sometimes misapplied for unmetamorphosed sandstone.

Residual soil: In place material resulting from the decomposition of rocks.

Soundness: Determined by tests performed in accordance with section Y1-15 of the State Highway Commission of Kansas Standard Specifications, 1966 edition.

Specific gravity: Determined by tests performed in accordance with A.A.S.H.O. designation T84 for fine aggregate and T85 for coarse aggregate.

Stereoscopic vision: Three-dimensional vision by means of viewing identical images on two photographs exposed from equal distance but at different angles.

Stratigraphic position: The vertical position of a geologic unit in relation to other geologic units.

Terrace: A plain built up by the deposition of sediments by water.

Wash: (Material passing the no. 200 sieve). Determined by tests performed in accordance with A.A.S.H.O. designation T11.

Weathering: The disintegration (physical change) or decomposition (chemical change) of rock by atmospheric agents.

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