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MINERAL RESOURCE SURVEY
Circular No. 51

The information contained in this circular was gathered by a unit of the WPA Mineral Resource Survey of Texas, a project sponsored by The University of Texas, Bureau of Economic Geology. The purpose of this survey is to assemble information concerning mineral products and to gather other geological data and make it available to the public. With this information in the hands of the public, it is reasonable to suppose that industries of value to the State may be developed. The following report is based on work done in Wilson County by Work Project No. 18644 and 18928 from February 24, 1942 to May 9, 1942.

CLAYS IN WILSON COUNTY, TEXAS*
by Wayne M. Cowan, Supervisor

INTRODUCTION

A Mineral Resources Survey Project was conducted in Wilson County for the purpose of investigating occurrences of high alumina clays. Fifteen WPA laborers, under the supervision of the writer, were employed on the project. Since formations in the county are composed of relatively soft rocks (Gulf Coast Eocene), hand augering with 3-inch post augers was used to good advantage in searching for and outlining clay deposits. None of the several small deposits of kaolin, bentonitic clays, and volcanic ash located during the course of the survey are of any importance from an economic standpoint; however, data collected pertaining to the mode of occurrence of those minerals should prove helpful in subsequent investigations.

LOCATION

Wilson County is located in south-central Texas. It is bounded on the northwest by Bexar County, of which San Antonio is the county seat, on the north by Guadalupe County, on the northeast by Gonzales County, and on the southeast by Atascosa County. Floresville, the county seat located approximately in the center of the county, is 30 miles southeast of San Antonio on U.S. Highway No. 181.

STRATIGRAPHY

All of Wilson County lies within the outcrop belt of the Gulf Coastal Eocene. The formations dip to the southeast, the oldest formations outcropping in the northwestern part of the county. The normal sequence of formations in the county in order of age is as follows:

Jackson group
Claiborne group
Yegua formation
Crockett formation
Sparta formation
Weches formation
Queen City formation
Reklaw formation
Marquez member
Newby member
Carrizo sand
Wilcox group
Sabinetown formation
Rockdale formation

The areal extent and contact of these formations are shown on the accompanying map. A brief discussion of the outcropping formations in the county is given below. For a more detailed discussion of these formations, see The University of Texas Bulletin 3232, The Geology of Texas, Volume I, Stratigraphy, 1932.

WILCOX GROUP

Rockdale formation

The Rockdale formation outcrops over a small area in the extreme northwestern part of the county. It is composed of brown and light brown sands and sandy clays. The sands are fine and often silty, and ferruginous layers are not uncommon.

Sabinetown formation

The Sabinetown formation outcrops in a narrow belt through the northwestern part of the county. This formation is regarded as including a near-shore or shallow water facies. Yellow gray clay, fine sand, and ferruginous concretions are common.

*Assistance in the preparation of these materials was furnished by the personnel of Works Project Administration Official Project Nos. 165-1-66-695 and 265-1-66-214.

CLAIBORNE GROUP

Carrizo sand

The Carrizo sand outcrops in a belt from 7 to 8 miles in width extending northeast-southwest across the county between La Vernia and Sutherland Springs. The formation is composed of medium and large-grained quartz sands, the medium-sized grains being predominant. Colors most common are light yellows and grays; however, many exposures are red and buff.

Section of Carrizo sand exposed on the east bank of Calaveras Creek, 1/4 mile north of Calaveras.

	Feet	Thickness Inches
Sandstone, interbedded brown and gray.....	10	
Sand, light brown.....	11	
Clay.....		8
Sand, light yellow.....	21	
Total section.....	42	8

Reklaw Formation

The Reklaw formation, including the Newby sand and the Marquez shale, outcrops in a belt approximately 2 miles wide extending from the southwest corner of the county near Fairview to the northeast corner of the county near the common boundary of Wilson, Guadalupe, and Gonzales counties. The Newby sand member is glauconitic and ferruginous, but the gradation from the Carrizo sand is usually so gradual that it is difficult to distinguish the contact. Loose Carrizo sand often obscures the Newby sand.

The Marquez shale member is distinctive at each extremity in the county but through the central portion of the outcrop becomes difficult to trace. In general, it is gypsiferous and arenaceous, with chocolate-brown and gray clays being common. The top soil of the Marquez shale is often well indurated.

Black jack and post oaks do not seem to thrive as well on the Reklaw formation as on the Carrizo, and in general the Reklaw produces less vegetation than the Queen City.

Queen City Formation

The outcropping belt of the Queen City formation, averaging 4 or 5 miles in width, extends northeast-southwest across Wilson County from south of Fairview through Floresville, Stockdale, Caddo, and Union. This formation in Wilson County is composed chiefly of loose, light brown, micaceous, fine to medium-grained sands and light gray clays, and contains a great deal of ferruginous material throughout.

Section of the Queen City formation at a road out on the Floresville-Pleasanton highway 2 1/4 miles southwest of Floresville, north side of the road. Lower portion of section taken by hand auger.

	Feet	Thickness Inches
Queen City sand:		
Topsoil, brown, gravelly, sandy clay.....	2	9
Subsoil, gray to brown sandy clay.....		6
Subsoil, brown to red clayey sand.....		2
Clay, glauconitic, brown to gray, sandy, calcareous.....		7
Red sand.....		1
Clay, gray to brown, sandy.....	1	0
Limonite, reddish brown, sandy.....		1
Sand, brown, micaceous, gray streaks.....		10
Ironstone, reddish brown.....		3
Sand, brown to yellow, micaceous, pinkish, iron-streaked.....	2	3
Conglomerate, limonitic and calcareous.....		1
Sand, pink, red, brown, micaceous.....		9
Sand, yellow, micaceous, limonitic, and calcareous.....		2
Sand, brown, micaceous, calcareous, and bentonitic clay streaks.....	5	0
Conglomerate, limonitic and calcareous.....		3
Sand, light yellow, micaceous.....	3	0
Streak, white, calcareous.....		1/2
Sands, brown and yellow, micaceous.....	1	1
Conglomerate, brown, limonitic, and calcareous.....		1/2
Sand, brown, micaceous, clay partings.....	1	2
Sand, red to orange, micaceous.....		6
Sand, brown, micaceous, gray clay and red, yellow, gray micaceous sand streaks.....	5	10
Sand, purple, micaceous, glauconitic.....	3	0
Sand, brown, micaceous.....		4
Sand, conglomerate, brown, limonitic, gray clay.....	1	0
Sand, brown and yellow, micaceous, pink sand and limonitic streaks.....	4	4

	Thickness	
	Feet	Inches
Sand, light brown, micaceous with yellow and gray sand streaks, limonitic and gray clay partings	9	11
Sand, deep brown, micaceous, pink streak		3
Sand, purple-brown, clayey, reddish streak	2	4
Sand, gray and yellow, clayey	2	5
Sand, gray to brown, micaceous	6	3
Sand and clay, dark gray to black and brown clayey	7	1
Total section	61	4

Weches Formation

The outcrop of the Weches formation in Wilson County averages 1 mile in width. Exposures may be seen 2 miles south of Floresville and 1½ miles south of Stockdale. The deep red to black color of the Weches distinguishes it from the light brown sands of the Queen City and Sparta formations. It is fossiliferous, gypsiferous, glauconitic, and ferruginous and is predominantly gray, brown, and yellow clay.

Sparta Formation

The Sparta formation outcrop is only one-half mile wide south of Floresville, but to the west and east it widens to 1 and sometimes 1½ miles. It is exposed in this county along the Floresville-Pleasanton highway and can be traced through Pandora to the east. This formation consists of loose, light brown and yellow, clayey sands, containing little or no iron. Its contact with the underlying Weches formation is often marked by swamp-like areas due to perched ground water.

Crockett Formation

The Crockett formation outcrops in a belt 3 miles wide extending across the county and passing north of Poth, through Denhawken to Nixon in Gonzales County. Black and buff clays with a great amount of crystallized gypsum characterize the Crockett formation in Wilson County. Clays are chocolate-brown, gray, and yellow. Much of the Crockett is fossiliferous, and one excellent fossil locality is 2½ miles west of Poth on the Ridout School road. The Crockett formation is distinctive across the county and can be easily traced.

Yegua Formation

The outcrop of the Yegua formation occupies a belt averaging 6 miles in width. Poth and Kosciusko are within this belt. Only the lower half of the section is represented in the eastern part of the county. The formation consists of gray clays, brown and reddish-brown sands, and clayey sands. Much silicified wood is present, and many beds are gypsiferous. Numerous streaks of volcanic ash were noted. One small lentil of bentonitic clay was encountered. Much of the Yegua is covered with mesquite, prickly pear, and chaparral.

JACKSON GROUP

Only the lower part of the Jackson group is present in the southwestern part of Wilson County. Gray to black clays and sands are common in the Jackson outcrop. The clays are silty and sometimes slightly bentonitic; volcanic ash is often present. In areas of extreme weathering the ash leaches to a kaolin-like material.

Section of Jackson formation 6½ miles south-southeast of Poth on Las Moras Creek.

	Thickness	
	Feet	Inches
Jackson formation:		
Clay, silty, ashy, bentonitic, gray	8	
Clay, ashy, bentonitic, gray		8
Clay, ashy, gray	10	0
Total section	18	8

Section of Jackson formation on Las Moras Creek ¼ mile north of above section.

Clay, kaolin-like, ashy	1	0
Ash, volcanic, pink to white	2	3
Clay, ashy, bentonitic, gray	1	0
Clay, silty, ashy, gray	17	0
Total section	21	3

KAOLIN

Hayden occurrence. — Attention was directed to an occurrence of kaolin located on property belonging to Mr. J. M. Hayden, 2.25 miles southwest of Fairview in Wilson County, when samples were brought to the Bureau of Economic Geology by F. K. Pence of the Bureau of Industrial Chemistry. This locality was visited, and an ostensible outcrop approximately 150 feet wide and 500 feet long extending across property belonging to Messrs. Joe Tackett and J. M. Hayden and Mrs. A. W. Irwin seemed to indicate that a sizeable deposit might be present. Consequently, a project was started to investigate this occurrence and to search for others.

Numerous test pits and auger holes put down across the Hayden area revealed that kaolin was present only as disseminated boulders and fragments in the topsoil, indicated the material to be either erosional remnants of an old deposit or a small residual occurrence. The material is chalk-white, soft and earthy to hard porcelain-like, and breaks with a conchoidal fracture. Stratigraphically, it occurs in the lower portion of the Queen City formation. Kaolin-like clays were found in small amounts at three other localities in the county at approximately the same geologic horizon. In the Hayden area and at two other localities the kaolin occurs near beds of conglomeratic sulphurous ironstone. The Hayden kaolin lies along the gentle slope of a hill capped by ferruginous gray and brown clay

and gray and yellow sand. The index of refraction for a sample of the clay from this locality, ascertained by Dr. Virgil E. Barnes, geologist with the Bureau of Economic Geology, is 1.570+.005.

Road log to Hayden locality: From Floresville go west 12 miles to Fairview; turn south and continue 1.5 miles; turn west and continue 1.1 miles through gate into Joe Tackett farm, then follow road bearing left for 0.2 mile.

Other kaolin occurrences in the Queen City formation. — Small amounts of kaolin-like clays were found 1.25 miles and 7.75 miles, respectively, northeast of Floresville and the old Stockdale road. At both of these localities the material is associated with a conglomerate composed largely of limonitic concretions. The color of the clay at these localities ranges from white to purple and yellow, and some of it has an oolitic texture resembling bauxite.

At a site located 2.75 miles north of Stockdale a thin 2 to 3-inch layer of kaolin-like material is traceable for about 200 feet until it grades into a thin layer of sulphurous limonite.

A small quantity of kaolin was found in the upper Queen City, approximately at the contact of the Queen City and Weches formations, at a site 2.25 miles east of Floresville; another small occurrence in the same geologic horizon was located 4.5 miles northeast of Stockdale. The latter occurrence was associated with a small amount of volcanic ash.

Contact occurrences. — Kaolin very similar to that found at the Hayden locality was found 6 miles north of Stockdale at or very near the contact between the Carrizo and Reklaw formations.

Kaolin-like material was found at two places along the contact between the Yegua and Jackson formations on the J. P. Hosek farm, 13 miles south of Floresville, and on the Jarzombek farm, 5.5 miles southeast of Poth. Material from these localities is white, soft and earthy, and frequently ashy. It is underlain by a light gray silty, ashy to bentonitic clay which averages 40 feet in thickness. The kaolin-like material occurs only on the surface, which would seem to indicate that it is produced by the weathering of the associated clay.

Mode of occurrence. — Most of the kaolin occurrences are at or near formational contacts or along old zones of weathering such as the conglomeratic beds of the Queen City. Such a conglomeratic bed of brown limonite and gray clay occurs 1¼ miles E. 5° N. of Floresville. The gray clay grades into kaolin-like material, which in turn grades into a white to purple and yellow bauxite-like material. Some is interbedded with purple and brown sandstone. Parts of the material are bluish, and much of it is perforated as though by leaching action. It is hard and breaks conchoidally and adheres to the tongue. Light brown sandstones of the Queen City underlie the conglomerate.

The repeated occurrence of kaolin-like material at or near the contacts between formations, such as Carrizo-Reklaw, Reklaw-Queen City, Queen City-Weches, and the Yegua-Jackson, and upon erosion surfaces within formations, such as the conglomeratic beds of the Queen City, supports the conclusion that this material is the result of weathering, or supergene processes. The proximity of ferruginous materials in most cases and of sulphurous material in one may indicate that sulphur and iron-bearing materials were present and oxidizing processes active.

BENTONITE

Two minor deposits of bentonite or bentonitic clay were found in Wilson County. Bentonitic clay is useful in the refining of oil, manufacture of soaps, cosmetics, adhesives, absorbents, medicines, and numerous other materials.

The larger and better bentonitic clay found is 3 miles east of Floresville, on the farm of Baylor Bryant. Stratigraphically the deposit is in the upper part of the Weches formation. Highly lenticular in shape and striking northeast, the main part of the bed is at the northern edge of the Bryant field bounded by the Floresville road intersecting Highway 181.

The bentonitic clay of the Bryant area is dark green, breaks with a conchoidal fracture, has a soapy feel, can be cut into thin shavings like soap, but is hard nevertheless. It is interlayered with small streaks of volcanic ash, inches of yellow sandy bentonitic clay, and sand with small gypsum crystals.

The Bryant deposit was explored by means of hand augers and test pits. It does not outcrop, the overburden being from 3 to 6 feet. The thickness of the purer bentonite averages 1 foot, together with the impure approximately 1½ feet. Lenticular in shape, the deposit is approximately 1300 feet long and averages 15 feet in width.

The second area of bentonite or bentonitic clay was located in the lower part of the Yegua formation 7½ miles south-southeast of Floresville or 2¼ miles east of DeWees community.

This bentonite is yellowish, soft, soapy, and disintegrates rapidly upon exposure. It is covered by 2 to 16 feet of overburden, is lenticular in shape, and covers an area approximately 50 feet long and 15 feet wide. Its average thickness is 1½ feet. It is interlayered with yellow and gray sandy clays and dark gray clay.

VOLCANIC ASH

Small amounts of volcanic ash at the Yegua-Jackson contact and near the top of the Weches have been mentioned. In addition a small lentil of ash was encountered in the lower part of the Queen City formation 4¾ miles northeast of Floresville on the Serita Hill road. The deposit covers approximately 1½ acres and averages 1¼ feet in thickness. Overburden averages 3 feet.

In general the volcanic ash of this deposit is limonitic, though some is very pure. It is interbedded with ironstone, yellow and brown sands, and gray clay.

OTHER CLAYS

During the investigation in Wilson County some deposits of clay which may be suitable for the manufacture of brick, tile, sewer pipe, and such were encountered; these are mentioned briefly below.

On the Jewel Westerman farm, 2 miles west of Fairview, in the Marquez member of the Reklaw formation, are chocolate-brown to gray clays of comparative purity. The deposit extends over 4 acres and averages 6 feet in thickness and has an overburden averaging 7 feet.

On the Jess Bruce farm, 2½ miles northwest of Fairview, in the Newby member of the Reklaw formation, there is 2 to 3 acres of gray clay averaging 2 feet in thickness, covered with 5 feet of overburden. This clay grades from very good to an impure gypsiferous and arenaceous clay.

On the Joe Tackett farm, at the Hayden kaolin area in the Queen City outcrop, there is approximately 3 acres of gray and chocolate-brown clay which averages 8 feet in thickness and has an overburden of 8 feet.

The Dickey Clay Manufacturing Company owns and operates clay deposits at Sasamco, Texas, producing tile, brick, and sewer pipe.

LIGNITE

Two reports of lignite were investigated and one verified. It was half a mile south of the old Stockdale-Floresville road on Cibolo Creek. Depth of overburden was 30 feet; thickness of the lignite was 3 to 4 inches. Only a few particles of the material was recovered by augering.

ROPER	LAVER	WOMER	BRUCE	HALL	SHADE
SEELY	LING	HILL	PLATT	HOTLEY	COFFE
EDMON	WISLEY	WHEELER	TRAPP	BECKING	WINS
VERNON	YORR	LYNN	DALE	HEAT	STONER

SALARY	SAVINGS	DEBITAL	SLURRY	STIMUL
AMOUNTS	REPTON	HOBBING	WHEEL	WELAN

	LAND	SHORE	STORM	COSE	
	CRANE	UPPER	DOWN	FOR DOWN	

STATE
S

WILSON
COUNTY

[illegible]

JONES	SHAW, FORD	STEWART	RAIL	POWELL	WHEELER	THORNTON
WYLLIE	CALLAHAN	LESLAND	LEWIS	WOOD	JOHNSON	RAIL

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