

# THE UNIVERSITY OF TEXAS AT AUSTIN

Bureau of Economic Geology

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## MINERAL RESOURCE SURVEY

Circular No. 26

A mineral resource survey of Texas is being conducted by the Works Progress Administration, the Bureau of Economic Geology of The University of Texas acting as sponsor. The purpose of the survey is to assemble information and make it available to the public. The mineral resource survey is helping in the location of mineral products, from some of which it is reasonable to suppose industries of value to the State may be developed. The following report is based on work done in Erath County.

## REPORT ON MINERAL RESOURCE SURVEY OF ERATH COUNTY

by C. O. Nickell, Supervisor

The mineral resources survey of Erath County included planetable mapping of Pennsylvanian limestones exposed in the northwest part of the county. Most of the work was on the Goen limestone and the Santo limestone. The project was terminated before the Brannon Bridge limestone could be studied. The outcrops were picked up at the Palo Pinto-Erath County line and mapped southwestward to the Pennsylvanian-Cretaceous contact 7 miles south of Thurber. In order to show conditions farther west, to the Erath-Eastland County line, some work was done on a sandy limestone 140 feet above the Goen limestone, in the southern part of the area. The map, which may be consulted at the Bureau of Economic Geology, Main Campus Geology Building, UT-Austin, is on a scale of 1 inch equals 2000 feet.

The following results were obtained:

*Direction of dip* — northwest, with local variations toward the north and west.

*Rate of dip* — from 40 to 80 feet per mile, with one small area showing a dip of 140 feet per mile.

*Structure* — a small amount of gentle folding. A small fault is shown 3 miles east of Thurber on the Goen limestone, trending southwest, with a vertical displacement of 170 feet, the upthrow being on the northwest side. This fault is shown by a cross section diagram on planetable sheet No. 1 (on file with Bureau). It is of special interest because it gives a reasonable explanation of the line of outcrop shown for the Santo limestone (Sj.?) near the south line of the geologic map of Palo Pinto County which accompanies University of Texas Bulletin 3534. This work shows that the bed marked Sj. ? is not the Santo limestone but one lying 160 feet above the Santo and probably should be called the Goen limestone because it closely underlies the Thurber coal. Also, the reason why the line of outcrop for this bed is shown 6 miles west of the Santo limestone (proper) on the Palo Pinto County geologic map, instead of 3 miles as might be expected under normal conditions, is that faulting has produced a repetition of surface outcrops. Field observations suggest that this fault may extend northeast into Palo Pinto County 5 miles or more and southwest to the Erath-Eastland County line, with a total length of 20 miles. If such should be the case, it should have some economic significance in connection with the accumulation of oil and gas, the more favorable area being on the northwest side of the fault for production from shallow sands dipping toward the north on the southeast side for deep production from beds dipping toward the east or southeast on the east flank of the Bend arch.

### DESCRIPTION OF BEDS

Following is a description of the beds mapped in Erath County and indicated on the planetable sheets:

Bed F, the Santo limestone, is blue to gray, weathering gray, usually in thin slabs and plates; contains many crinoid stems and some other fossils; thickness is 1 foot. Forms a well defined escarpment in the eastern part of the area mapped and caps outliers in the southern part of the area.

Bed E is a brown hard limestone from 6 inches to 1 foot thick, containing crinoid stems; forms an escarpment in the southern part of the area.

Bed D, the Goen limestone, forms a good ledge, easily traced for several miles in the southern part of the area, but in the northern part it changes to sandy lime and sandstone locally. Some parts are very hard, gray to blue, weathering yellow, usually from 1 to 1½ feet thick, containing many crinoid stems and a few other fossils. Another limy stratum occurs 12 feet above the Goen locally, showing in places as a hard bed less than 1 foot thick, weathering to yellow rounded boulders, commonly 4 to 6 inches in diameter. This may sometimes be mistaken for the Goen proper, but a distinguishing feature is that the Goen usually weathers to blocks, often with well defined edges and corners, rather than to rounded boulders.

Several outcrops of the Thurber coal were noted, but none was of thickness and quality to suggest commercial value even under conditions of price favorable to coal mining. However, they served as an aid in field work in checking correlations. The best outcrop seen is on Rush Creek and is the southern one of three outcrops spotted near the west edge of planetable sheet No. 2, located on land belonging to Mr. Ivy. This coal has a total thickness of 18 inches, of which 9 inches near the center is considerably harder than most of the Thurber coal.

Bed B is a sandy limestone, usually about 3½ feet thick, containing crinoid stems. Forms a good ledge in the southwest part of the area.

Bed A evidently belongs to the lower part of the Brazos River sandstone. In this area it is an ordinary brown sandstone from 3 to 5 feet thick, weathers to large blocks several feet across, and caps the escarpment on the west side of highway No. 281 southeast of Thurber. In the broken topography west of this escarpment, this sandstone caps the hills westward to the county line and on into Eastland County.

*Section measured by hand level westward from the south end of Thurber Lake.*

|                                                                                                  | Thickness |        |
|--------------------------------------------------------------------------------------------------|-----------|--------|
|                                                                                                  | Feet      | Inches |
| Garner.                                                                                          |           |        |
| Brazos River sandstone:                                                                          |           |        |
| 10. Sandstone, brown, hard; weathers to large blocks .....                                       | 5         |        |
| Mingus shale:                                                                                    |           |        |
| 9. Shale, gray, with shades of yellow and green .....                                            | 40        |        |
| 8. Limestone, gray, hard, some fossils; weathers to rounded small boulders .....                 |           | 6      |
| 7. Shale, gray, with shades of green .....                                                       | 30        |        |
| 6. Sandstone, brown, hard; forms bench .....                                                     | 4         |        |
| 5. Shale, gray, with shades of green .....                                                       | 45        |        |
| 4. Sandstone, brown, hard; forms pronounced bench .....                                          | 5         |        |
| 3. Shale, gray, shades of green .....                                                            | 88        |        |
| Millsap Lake:                                                                                    |           |        |
| 2. Sandstone, brown, hard; approximate horizon of the Goen limestone which is not present here . | 2         |        |
| 1. Shale, not well exposed .....                                                                 | 14        |        |
| Lake level.                                                                                      |           |        |
| Total section measured .....                                                                     | 233       | 6      |

Section measured by hand level westward from planetable station No. 20, 3½ miles southeast of Thurber on highway No. 281. (See planetable sheet No. 1.)

|                                                                                              | Thickness |        |
|----------------------------------------------------------------------------------------------|-----------|--------|
|                                                                                              | Feet      | Inches |
| Garner.                                                                                      |           |        |
| Brazos River sandstone:                                                                      |           |        |
| 12. Sandstone, brown, hard .....                                                             | 2         |        |
| 11. Shale, not well exposed .....                                                            | 18        |        |
| 10. Sandstone, brown, hard, breaks off in large blocks .....                                 | 5         |        |
| Mingus shale:                                                                                |           |        |
| 9. Shale, not well exposed .....                                                             | 50        |        |
| 8. Limestone, yellow, soft, contains many crinoid stems .....                                | 1         |        |
| 7. Shale, not well exposed .....                                                             | 135       |        |
| 6. Coal, badly weathered at outcrop .....                                                    |           | 6      |
| Millsap Lake:                                                                                |           |        |
| 5. Shale, not well exposed .....                                                             | 3         |        |
| 4. Limestone, hard, crinoid stems; weathers to rounded boulders .....                        | 1         |        |
| 3. Shale, yellow .....                                                                       | 10        |        |
| 2. Goen limestone, hard, gray; weathers dark yellow angular blocks; many crinoid stems ..... | 1         | 6      |
| 1. Shale, yellow, exposed .....                                                              | 1         |        |
| Total section measured .....                                                                 | 248       |        |