# CRETACEOUS ROCKS AND COAL RESOURCES OF THE MAGDLENA NEW MEXICO 1:100,000 SHEET

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Open-file Report 254

October 1986

DESCRIPTION OF UNITS

Q - QUATERNARY DEPOSITS (0-50 ft) Comprising alluvial deposits, talus and colluvium. Shown only for clarity in complex areas.

Tb - TERTIARY BACA FORMATION (0-1000 ft) Continental sequence including alluvial plain, meander belt, and lacustrine sedimentation. Shown only for clarity in complex areas.

Ti - TERTIARY INTRUSIONS (5-100 ft) shown in black.

CRETACEOUS UNITS

KCC - CREVASSE CANYON FORMATION - (600-1100 ft) Continental sequence of thinly bedded sandstones, gray shales, carbonaceous shales, and coals. Coals are concentrated in lower third of formation.

Kg - GALLUP SANDSTONE (0-120 ft) Marine, fine- to medium grained sandstone sequences characterized by stacked, planar, crossbedded sets, burrows (Ophiomorpha) and a distinctive bedding plane split often containing the guide fossil Lopha Sannionis. Unit thickens to the west and pinches out completely in range 5W.

Kth - TRES HERMANOS FORMATION, undivided (240 ft) Marginal marine sequence consisting at a basal regressive sandstone, a continental, shale-dominated unit in the center, and a transgressive sandstone at the top.

MANCOS SHALE - Offshore silty shale, lower two members intertongue with Dakota Sandstone.

Kmd - D-CROSS TONGUE (78-133 ft) Noncalcareous to calcareous, bioturbated, silty mudstone. Contains abundant fossil-bearing concretions.

Kmr - RIO SALADO TONGUE (210-280 ft) Calcareous basal shale grading to noncalcareous shale near top of unit. Guide fossil Pycnodonte newberry; occurs abundantly near base. Defined as fine-grained unit between Two Wells Tongue of Dakota Sandstone and the base of Tres Hermanos Formation.

Kml - LOWER PART OF THE MANCOS (70-280 ft) Medium to dark gray shale. Thickness increases dramatically in range 5W. where TwoWells Tongue of the Dakota pinches out.

DAKOTA SANDSTONE - Fine to very fine grained, shoreface sandstones that intertongue with the Mancos Shale.

Kdt - TWOWELLS TONGUE (10-20 ft) fine grained, bioturbated sandstones.

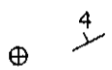
Kdl - LOWER PART OF THE DAKOTA SANDSTONE (10-30 ft) fine to very fine grained, crossbedded sandstone.

$T_{RC}$ - CHINLE FORMATION (0-1900 ft) poorly exposed alluvial unit of interbedded siltstones and shales. Shown only for clarity in complex areas.

SYMBOLS

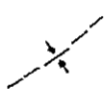
geologic contact, dashed where approximate

fault, dashed where approximate, ball on downthrown block

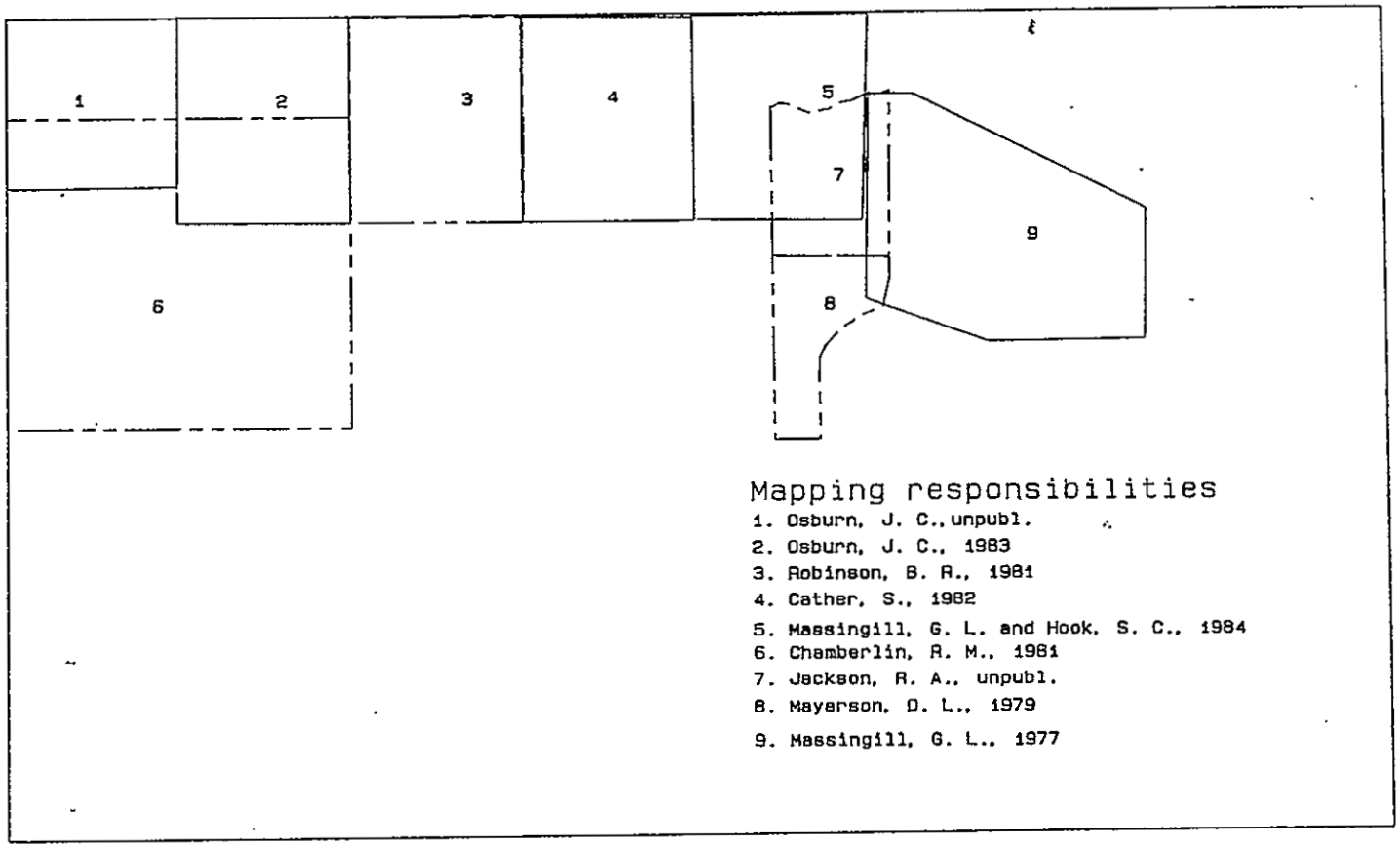


strike and dip of bedding

trace of anticlinal axis, dashed where approximate



trace of synclinal axis, dashed where approximate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Mapping responsibilities
1. Osburn, J. C., unpubl.
2. Osburn, J. C., 1983
3. Robinson, B. R., 1981
4. Cather, S., 1982
5. Massingill, G. L. and Hook, S. C., 1984
6. Chamberlin, R. M., 1981
7. Jackson, R. A., unpubl.
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## Coal Resources

The Magdalena 1:100,000 sheet includes the southern part of the Datil Mountains coalfield. The coal in the field is restricted to the lower part of the Crevasse Canyon Formation. Most of the coal beds known from both surface mapping and limited drilling data are less than 2.3 feet thick. Demonstrated coal resources comprise nearly 100 million short tons (Table 1). These data should be considered minimum resource estimates because drilling has been largely restricted to the region east of the Red Lake Fault (Plate 1) and over 100 $mi^2$ remain to be tested.

The quality of the coals of this area is high within the range of high volatile B bituminous coal. Based on 12 published analyses, heating values range from 848° to 13,145 BTU/lb. (as received), the percentage of sulfur is consistently less than 13% (Table 2). The large standard deviations listed in Table 2 reflect both the small sample size and two anomalous samples published by Ellis (1936). The anomalus samples probably were grab samples collected from outcrop coals.

Table 1: Demonstrated Coal Resources in the Magdalena 1:100,000 sheet, New Mexico, (in millions of short tons, all values rounded, 1800 short tons/acre-foot used in calculations, depth cutoff 250 ft.)

| Location | | Measured Resources Thickness of Coal bed in ft. | | | Indicated Resources Thickness of coal bed in ft. | | | Demonstrated Resources measured + indicated | |
|---|---|---|---|---|---|---|---|---|---|
| TWp | Rng | 1.2-2.3 | 2.3-3.5 | >3.5 | 1.2-2.3 | 2.3-3.5 | >3.5 | | |
| 1N. | 3W. | 0.25 | - | - | - | - | - | 0.25 | |
| 1N. | 4W. | 0.60 | - | - | - | - | - | 0.60 | |
| 1N. | 5W. | 0.82 | - | - | - | - | - | 0.82 | |
| 1N. | 6W. | 1.88 | - | - | - | - | - | 1.88 | |
| 2N. | 4W. | 2.29 | - | - | - | - | - | 2.29 | |
| 2N. | 5W. | 0.73 | 0.44 | - | - | - | - | 1.17 | |
| 2N. | 6W. | 3.44 | 0.57 | 0.52 | 10.73 | 1.75 | - | 17.01 | |
| 2N. | 7W. | 2.41 | 0.96 | 1.28 | 9.76 | 3.99 | 7.46 | 25.86 | |
| 3N. | 7W. | 1.95 | 0.18 | 0.24 | 8.05 | - | - | 10.42 | |
| 3N. | 9W. | 2.99 | 2.28 | - | 5.39 | 13.68 | - | 24.34 | |
| 3N. | 10W. | 1.45 | - | - | 4.67 | - | - | 6.12 | |
| 3N. | 11W. | 0.33 | 0.63 | - | 2.71 | 5.08 | | 8.75 | |
| | | 19.14 | 5.06 | 2.04 | 41.31 | 24.50 | 7.46 | 99.51 | Totals |

Table 2 Average values for the 12 published coal analyses for the Magdalena 1:100,000 sheet (Osburn, 1982)

| | Mean Percent | Std. Dev. |
|---|---|---|
| Volatile matter | 37.84 | 4.16 |
| Fixed Carbon | 42.85 | 4.14 |
| Moisture | 4.70 | 2.97 |
| Ash | 12.47 | 6.51 |
| Carbon | 64.39 | 6.20 |
| Hydrogen | 5.07 | 0.40 |
| Nitrogen | 1.14 | 0.23 |
| Sulfur | 0.54 | 0.10 |
| Oxygen | 9.89 | 1.57 |
| BTU/lb (as received) | 11,292 | 1595 |

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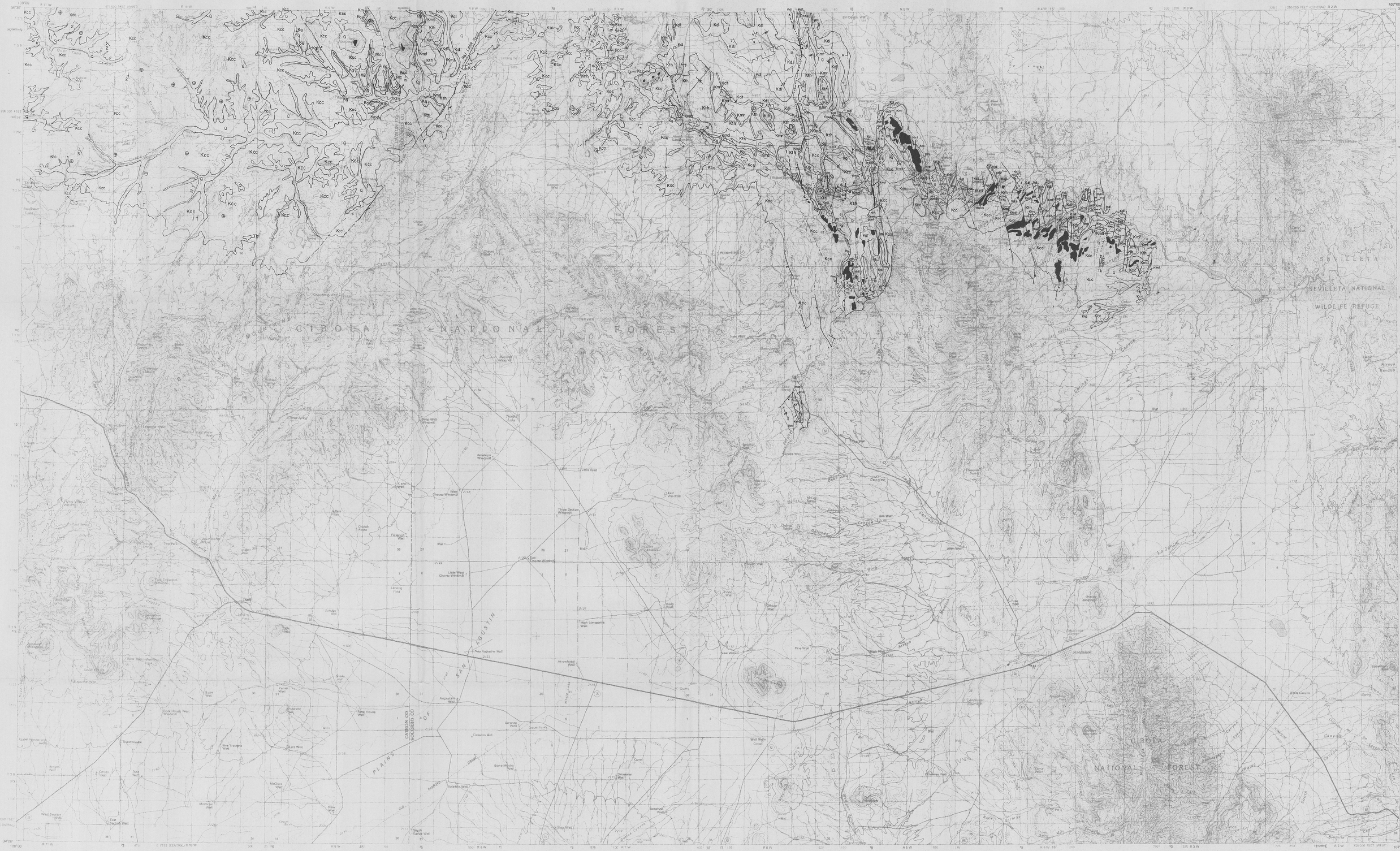


SCALE 1:100 000

KILOMETERS 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

1 CENTIMETER ON THE MAP REPRESENTS 1 KILOMETER ON THE GROUND

CONTOUR INTERVAL 20 METERS

MILES 0 1 2 3 4 5 6 7 8 9 10 11 12

0 5000 10 000 15 000 20 000 25 000 30 000 35 000 40 000 45 000 50 000 55 000 60 000 65 000 FEET

0 5000 10 000 15 000 20 000 25 000 30 000 35 000 METERS

MAGDALENA, NEW MEXICO
N3400—W10700/30x60
1979

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