

EXPLANATION

- Area in which bentonite is under less than 30 feet of overburden. Dashed line indicates position of inferred 30 foot overburden limit.
- Bentonite outcrop where only a small amount of clay is minable. Dashed where approximately located, dotted where concealed.
- Bentonitic shale.
- Area in which bentonite has been removed by strip mining.
- Location for which information on bentonite is given in accompanying sheet.
- Fault, dashed where approximate, dotted where concealed. U, upthrown side; D, downthrown side.
- Axis of anticline.
- Axis of syncline.
- Structure contours on top of Mowry shale; interval 100 feet; datum is mean sea level. Dashed where inferred.

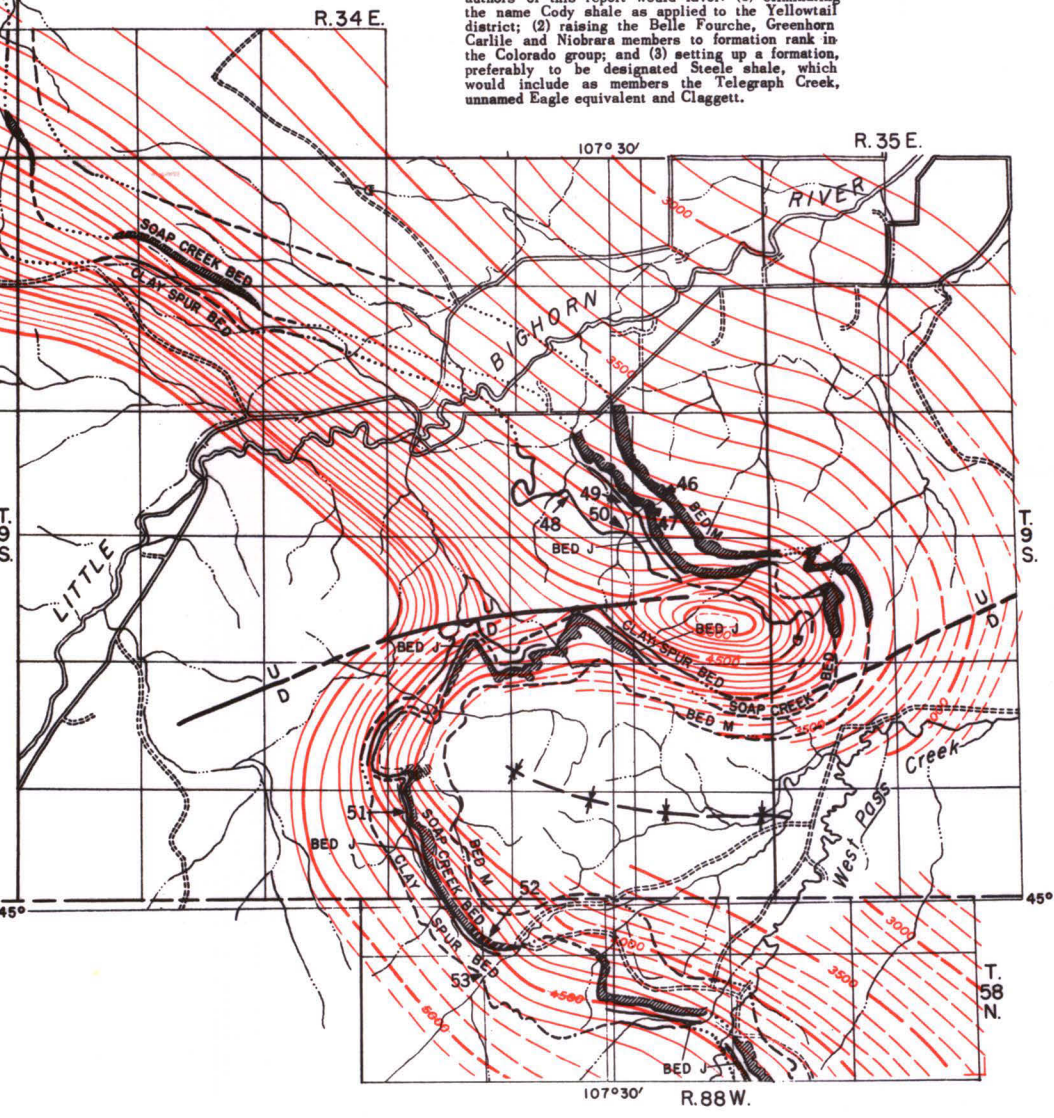
Structure of area north of and including T. 7 S. adapted from U.S. Geological Survey Oil and Gas Investigations Map OM 111. Geology of the Hardin area, Big Horn and Yellowstone Counties, Montana, 1951 by P. W. Richards and C. P. Rodgers. Remainder of area and bentonite beds mapped by S. H. Patterson in 1948.

GEOLOGIC STRUCTURE, OUTCROPS, AND STRATIGRAPHIC POSITIONS OF BENTONITE BEDS OF SOUTHERN PART OF THE YELLOWTAIL DISTRICT, MONTANA AND WYOMING

Columnar section of rocks exposed in Yellowtail district, showing stratigraphic positions of bentonite beds. (Based on field data obtained by W. A. Cobban in 1947.)

Bentonite beds	Section	Thickness (in feet)	Character of rocks	Formation and member	Group	Series	System
			Sandstone, massive, with green sandy clay.		Montana group		
Bed X Bed W Bed V		285	Shale, dark gray, with many bentonite beds and calcareous concretions weathering gray or brown. Three thick bentonite beds near middle of formation.	Bearpaw shale			
		255	Sandstone, massive in part, containing lenses of resistant ferruginous sandstone. Lower 100 feet composed of gray sandy shale with calcareous concretions.	Parkman sandstone	Colorado group		
Bed U Bed T Bed S		400	Shale, dark gray, with brown and gray calcareous concretions and many bentonite beds.	Claggett member			
Bed R		375	Sandy shale, gray, with many ferruginous and calcareous concretions.	Unnamed sandy member equivalent to Eagle sandstone	Upper Cretaceous		
		867	Sandy shale, gray, much of which is interbedded with thin layers of soft sandstone.	Telegraph Creek sandy member			
		410	Shale, dark gray, calcareous in lower part, with many calcareous concretions and several beds of bentonite. Bentonite beds P and Q occur near middle of formation north of area shown on Plate 1.	Niobrara member	Cody shale		Cretaceous
Bed O Bed N		280	Shale, dark gray, with several beds of bentonite and abundant calcareous concretions, many of them septarian. Sandy horizons in lower part.	Carlile member			
Bed M		116	Shale, calcareous, containing limestone concretions; appears bright gray on dry, weathered surfaces.	Greenhorn calcareous member	Colorado group		
Bed L Soap Creek bed		474	Shale, dark gray, with calcareous concretions in upper part. Thick Soap Creek bentonite bed and bentonite bed L in upper half. Many ferruginous concretions and bentonite beds I and J in lower third.	Belle Fourche member			
Bed J Bed I Clay Spur bed Bed G Bed F		394	In southeastern part of district, strata between bed L and base of Colorado group include a few obscure sandy beds and lenses and are designated Frontier formation.	Frontier formation	Lower Cretaceous		
Bed E			Shale, dark gray, siliceous, sandy in middle part, with many bentonite beds. Forms ridges and scarps. Contains four thick bentonite beds, most persistent of which is the Clay Spur bentonite bed near top of formation.	Mowry shale			
Bed D Bed C Bed B Bed A		468	Shale, dark gray, with many bentonite beds and ferruginous concretions. Contains four thick bentonite beds near middle of formation.	Thermopolis shale			

* The stratigraphic nomenclature employed is that officially recognized by the Geological Survey. The authors of this report would favor: (1) eliminating the name Cody shale as applied to the Yellowtail district; (2) raising the Belle Fourche, Greenhorn, Carlile and Niobrara members to formation rank in the Colorado group; and (3) setting up a formation, preferably to be designated Steele shale, which would include as members the Telegraph Creek, unnamed Eagle equivalent and Claggett.



MONTANA
WYOMING

