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Distribution of the basal clastic unit of the Oligocene White River Formation in the Torrington and New Castle1 1°x2° quadrangles, Wyoming, Nebraska, and South Dakota

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DISTRIBUTION OF THE BASAL CLASTIC UNIT OF THE OLIGOCENE WHITE RIVER FORMATION IN THE TORRINGTON AND NEWCASTLE 1°x2° QUADRANGLES, WYOMING, NEBRASKA, AND SOUTH DAKOTA

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INTRODUCTION

This report briefly describes the distribution and thickness of the basal clastic unit of the Oligocene White River Formation in the Torrington 1° x 2° quadrangle in eastern Wyoming and western Nebraska and an adjacent part of the NewCastle 1° x 2° quadrangle in eastern Wyoming, western Nebraska, and western South Dakota. The clastic unit consists mostly of sandstone and conglomerate that was deposited by streams in channels scoured into the underlying Cretaceous Pierre Formation. The Chadron sandstone is the host rock for the Crow Butte uranium deposit near Crawford, Nebraska (Gjelsteen and Collings, 1988). The basal clastic unit is primarily a subsurface unit in the report area although some outcrops are found in the Douglas, Wyoming, area and some near the southeast corner of the NewCastle quadrangle (fig. 1).

METHODS

The study is based entirely on electric log analysis. A thickness map and three lines of bore-hole sections (figs. 1-4) were prepared from electric log data. Table 1 lists the names and locations of boreholes used in the sections. The thickness map was plotted by computer from stratigraphic tops retrieved from the Well History Control System (WHCS); Petroleum Information Systems data base[1]. The WHCS data was checked against and slightly modified from the logs in our limited files. No rock samples were available for study.

STRATIGRAPHY

The basal clastic unit forms a belt about 5 to 20 miles wide that extends from the north central part of the Torrington quadrangle in the vicinity of Douglas, Wyoming, northeastward extending into the southeastern corner of the NewCastle quadrangle and thence southward to the general area of the the southeastern corner of the Torrington quadrangle where it bifurcates (fig. 1). Its maximum recorded thickness in the report area is 130 feet in eastern Niobrara County, but it was 100 feet thick or more in only two other boreholes. The average thickness in 129 holes that penetrated the unit in the study area is 42 feet.

1 Any use of trade names and trademarks in this publication is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey.

The basal clastic unit has been informally called the Chadron sandstone in northwestern Nebraska where the White River is divided into the Brule Formation (upper) and the Chadron Formation (lower). The clastic unit thickness reaches 350 feet in the uranium area in northwestern Nebraska (Gjelsteen and Collings, 1988) where the depositional channels were better developed than in the study area.

REFERENCES CITED

Gjelsteen, Thor W., and Collings, Stephen P., 1988, Relationship between ground water flow and uranium mineralization in the Chadron Formation, northwest Nebraska: Wyoming Geological Association Guidebook, Thirty-ninth Field Conference, p. 271-284.

Love, J. D., Christiansen, A. C., and Sever, C. K., Preliminary Geologic map of the Torrington 1° x 2° quadrangle, southeastern Wyoming and western Nebraska: U. S. Geological Survey, Open-File Report 78-735.

Love, J. D., Christiansen, A. C., and McGrew, L. W., 1987, Geologic map of the Newcastle 1° x 2° quadrangle, northeastern Wyoming and western South Dakota: U. S. Geological Survey, Map series 25-I.

Table 1. Boreholes used for correlation of electric logs

Numbers used on diagram	Company	Well	Thickness of clastic unit (feet)	Section	Location Township North	Location Range West
1	Ryan Oil Company	Sheep #1	15	31	33	73
2	Saturn Oil and Gas	Powell #1	23	5	32	72
3	Emitt Smith	Simms #2	36	20	32	71
4	McCulloch Oil of California	Peterson Gov't #1	29	30	32	70
5	Davis Oil Company	Joss #1	32	21	33	67
6	Texaco Incorporated	Podolak #1	0	29	30	61
7	Carrl Oil Company	State #32-1	62	32	32	61
8	Carrl Oil Company	State #1	60	16	31	61
9	Buttes Gas and Oil Company	Sides #1-30	67	30	33	60
10	Raymond Oil Company	Christiansen #1	0	29	34	60
11	Shell Oil Company	Government #31-32	28	32	24	66
12	General Petroleum Corporation	Gray Rocks #84-2P	27	2	24	66
13	Holly Resources Corporation	Federal #41-23	20	23	25	65
14	Shell Oil Company	O'Brien #13-14	21	14	26	64
15	Arapahoe Petroleum Company	Federal #15-1	29	15	26	63
16	Shell Oil Company	Richling #12-5	20	5	25	62