

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY

Distribution of the basal clastic unit of the Oligocene
Chadron Formation in the Alliance 2-degree quadrangle,
northwestern Nebraska

K. A. Dickinson

U. S. GEOLOGICAL SURVEY
OPEN-FILE REPORT 90-416

This report is preliminary and has not been reviewed for
conformity with Geological Survey standards and nomenclature

DISTRIBUTION OF THE BASAL CLASTIC UNIT OF THE OLIGOCENE
CHADRON FORMATION IN THE ALLIANCE 2-DEGREE QUADRANGLE,
NORTHWESTERN NEBRASKA

K. A. Dickinson

INTRODUCTION

This report briefly describes the distribution and thickness of the basal clastic unit of the Oligocene Chadron Formation in the Alliance 1 x 2 degree quadrangle in northwestern Nebraska. This 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 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 (fig. 1; Colling and Knode, 1984; Gjelsteen and Collings, 1988). The basal clastic unit is primarily a subsurface unit in the report area although some outcrops are found north of Crawford, Nebraska (fig. 1).

METHODS

The study is based mostly 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. No rock samples were available for study. Thickness differences between the contoured data in Townships 29 North and northward on figure 1 and those shown on the cross section in figure 2 resulted from the different data sources (Figs. 1-2) and could not be rectified.

STRATIGRAPHY

In the Alliance quadrangle the basal clastic unit was deposited primarily in a major fluvial belt, about 10 to 20 miles wide that extends eastward in Nebraska from the Wyoming-Nebraska line through north-central Sioux County and southeastward through southwest Dawes and Box Butte Counties. Another ancestral fluvial belt containing the Chadron sandstone crosses the southwest corner of the Alliance quadrangle and two isolated areas of the basal clastic unit are found west of the main fluvial belt in the western part of the quadrangle. These isolated occurrences

probably represent segments of earlier channels that were eroded during deposition of later channels. The fluvial facies in the southwest corner of the Alliance quadrangle extends into a larger fluvial belt in Wyoming (fig. 1; Dickinson and Wise, 1990).

The thickness of the clastic unit ranges from zero in much of the quadrangle to its maximum recorded thickness of 350 feet in north central Sioux County (Gjelsteen and Collings, 1988). The basal clastic unit is absent in most of the eastern part of the Alliance quadrangle east of the Chadron Arch (figs. 2-4).

REFERENCES CITED

- AAA Engineering and Drafting Inc., Geology of the Alliance quadrangle for United States department of Energy, Salt Lake City Utah.
- Collings, S. P. and Knode, R. H., 1984, Geology and discovery of the Crow Butte uranium deposit, Dawes County, Nebraska: American Institute of Mining Engineers, Practical Hydromet '83, 7th Annual Symposium on uranium and precious metals, p. 5-14.
- Dickinson, K. A. and Wise, R. A. 1989, Distribution of the basal clastic unit of the Oligocene White River Formation in the Torrington and NewCastle one by two degree quadrangles, Wyoming, Nebraska, and South Dakota,
- 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.

Table 1

Letter on figure	Company	Thickness of basal clastic unit	Section	Location Township	Range
		Boreholes used in figure 2			
A	M.J. Freeman and R.L. Poundstone	22	23	31N	56W
B	Ashby Drig. Co.	131	18	31N	55W
C	Miami Petroleum	200	28	31N	54W
D	Sam Jacinto Petroleum	194	23	31N	54W
E	Campbell and Brinkerhoff	55	26	31N	52W
		Boreholes used in figure 3			
F	Ashby Drilling Co.	0	28	28N	57W
G	Cleary Petroleum Inc.	171	31	28N	56W
H	K & M Associates	97	23	28N	56W
I	King Resources Co.	0	28	28N	55W
J	W.K. Davis	0	21	28N	54W
K	Mountain Petroleum and others	19	30	28N	53W
L	Cyclone Drig.	0	25	28N	52W
M	Donnell Drig.	63	17	28N	51W
N	Toltec Drig. and O.N. Beer	65	3	28N	51W
O	Calvert Drig.	12	9	28N	50W
P	Larson Drig.	0	31	28N	49W
		Boreholes used in figure 4			
Q	Cleary Petroleum Corp.	36	2	24N	57W
R	Regal Drig. Co. and others	40	11	24N	56W
S	Brack Drig. Co.	41	26	24N	55W
T	L.J. Williamson	0	24	24N	54W
U	D.G. Hamilton	0	28	24N	53W
V	Wolf Exploration Co.	140	12	24N	52W
W	J-W Operating Co.	142	21	24N	51W
X	Calvert Drig. Co. and others	39	14	24N	50W
Y	Calvert Drig. Co.	0	17	24N	49W
		6			