North Dakota Geological Survey
100K Series: Crsb - c

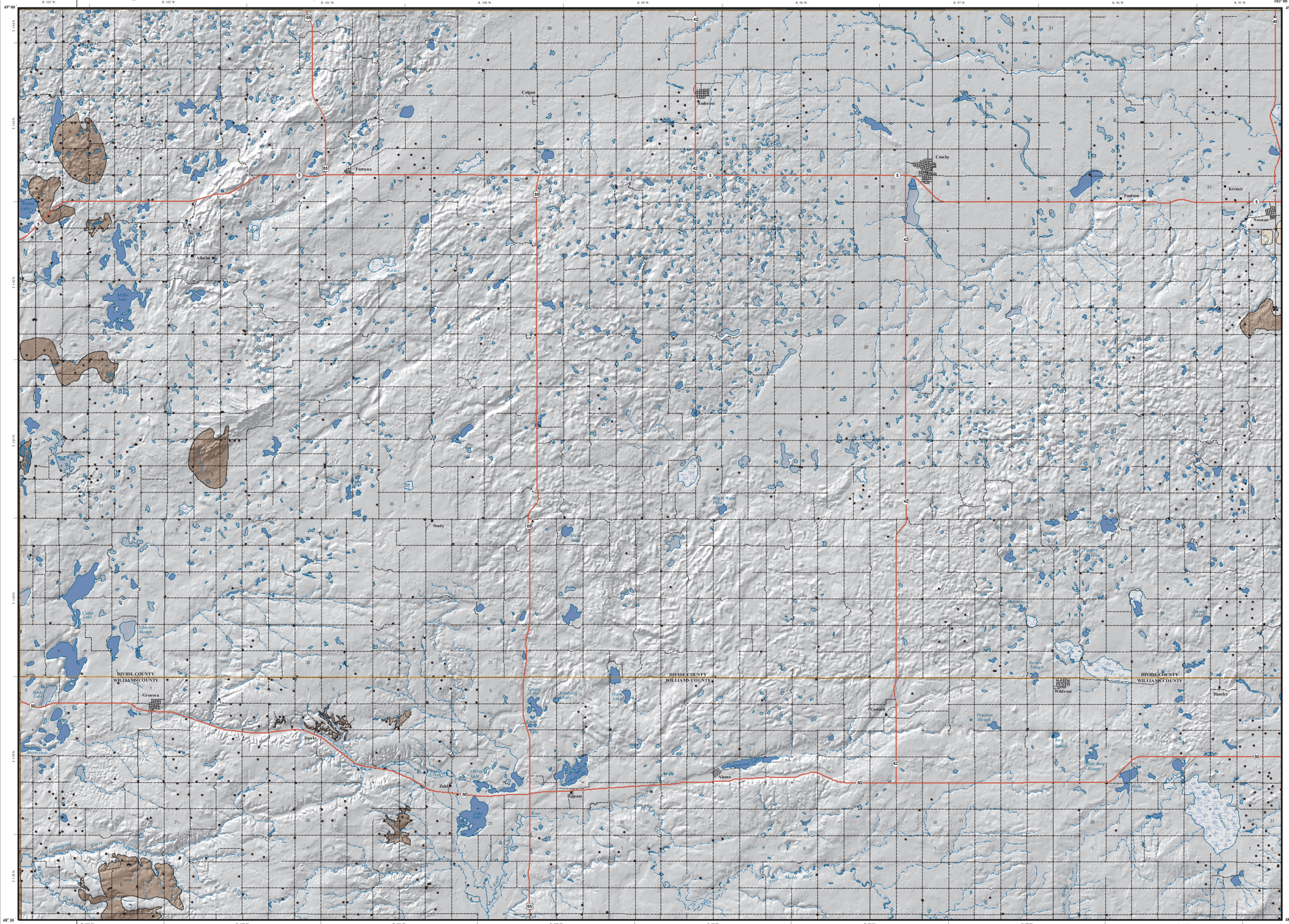
Lignite Reserves
Crosby 100K Sheet, North Dakota

Plentywood		Kenmare
Culbertson	Williston	Stanley
Sidney	Watford City	Parshall

Adjoining 100K Maps

13°
1984 Magnetic North
Declination at Center of Sheet

Edward C. Murphy, State Geologist
Lynn D. Helms, Director Dept. of Mineral Resources



Edward C. Murphy
2005

The Crosby 100k sheet contains approximately 450 million tons of economically mineable lignite. Three lignite deposits each contain around 100 million tons of mineable coal: McCone Lake (T163N, Rs 102&103W); Writing Rock (T161N, R102W); and Willow Lake (T158N, Rs 102&103W). The Alkabo bed accounts for about 70% of the mineable coal (almost 300 million tons) in this area (Murphy et al., in press). The Alkabo bed can be traced throughout western Divide County, but correlation can be difficult due to removal of the coal by glacial or preglacial erosion. The Alkabo bed is more than 20 feet thick over portions of seven townships in western Divide County and reaches a maximum thickness of 31 feet in T161N, R102W, only one of three coals in the state known to be this thick.

Most of the surface of the Crosby 100k map sheet is covered by glacial deposits. The underlying coal-bearing rocks of the Fort Union Group are typically only exposed along drainages such as Long Creek north of Crosby and within meltwater channels or their associated ravines, like those in the vicinity of Hanks. Hanks and Noonan were early mining centers. Underground mining began at Noonan in the early 1900s and operated until the mid-1940s. The Noonan surface mine was in operation from 1929 to 1962.

References
Murphy, E.C., 2006, in press. The Lignite Reserves of North Dakota: North Dakota Geological Survey Report of Investigation No. 104.

UNIT DESCRIPTIONS

Geology Undifferentiated

Area of Mined Lignite

Economic Coal Deposits

Economic coal deposits are those that meet the minimum criteria established by coal companies operating surface mines in North Dakota. These economic criteria include a minimum cumulative coal thickness of ten feet-typicallyoccuring in less than two beds, a minimum individual bed thickness of at least 2.5 feet, a ratio of overburden to coalthickness of not more than 10:1, a minimum of 25 feet of overburden, and a maximum depth to coal of approximately 150 feet.

Geologic Symbols

Extent of Local Lignite Reserves

Data Points

Includes coal exploration NDGS/USGS drill holes, sub-surface mineral drill holes, oil & gas wells, and NDSWC drill holes.

Other Features

- Water
- Water - Intermittent
- Marsh
- River/Stream - Perennial
- River/Stream - Intermittent
- Section Corners
- County Boundary
- US Highway
- State Highway
- Paved Road
- Unpaved Road

Scale 1:100,000

0 1 2 3 4
Miles

Mercator Projection — 1927 North American Datum
Standard parallel 48° 30' — Central meridian 103° 30'
USGS NED Shaded Relief - Vertical Exaggeration 9x

The North Dakota Geological Survey can publish on demand 1:24,000 scale quadrangle maps (24k - c series) of the mineable coal deposits in the Crosby 100k sheet. These maps would include information on mineable coal thicknesses.

Note: This map was expanded beyond the normal Crosby 100k Sheet to include an additional width of two miles to the Montana border.

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Cartographic Compilation: Elroy L. Kadrmas