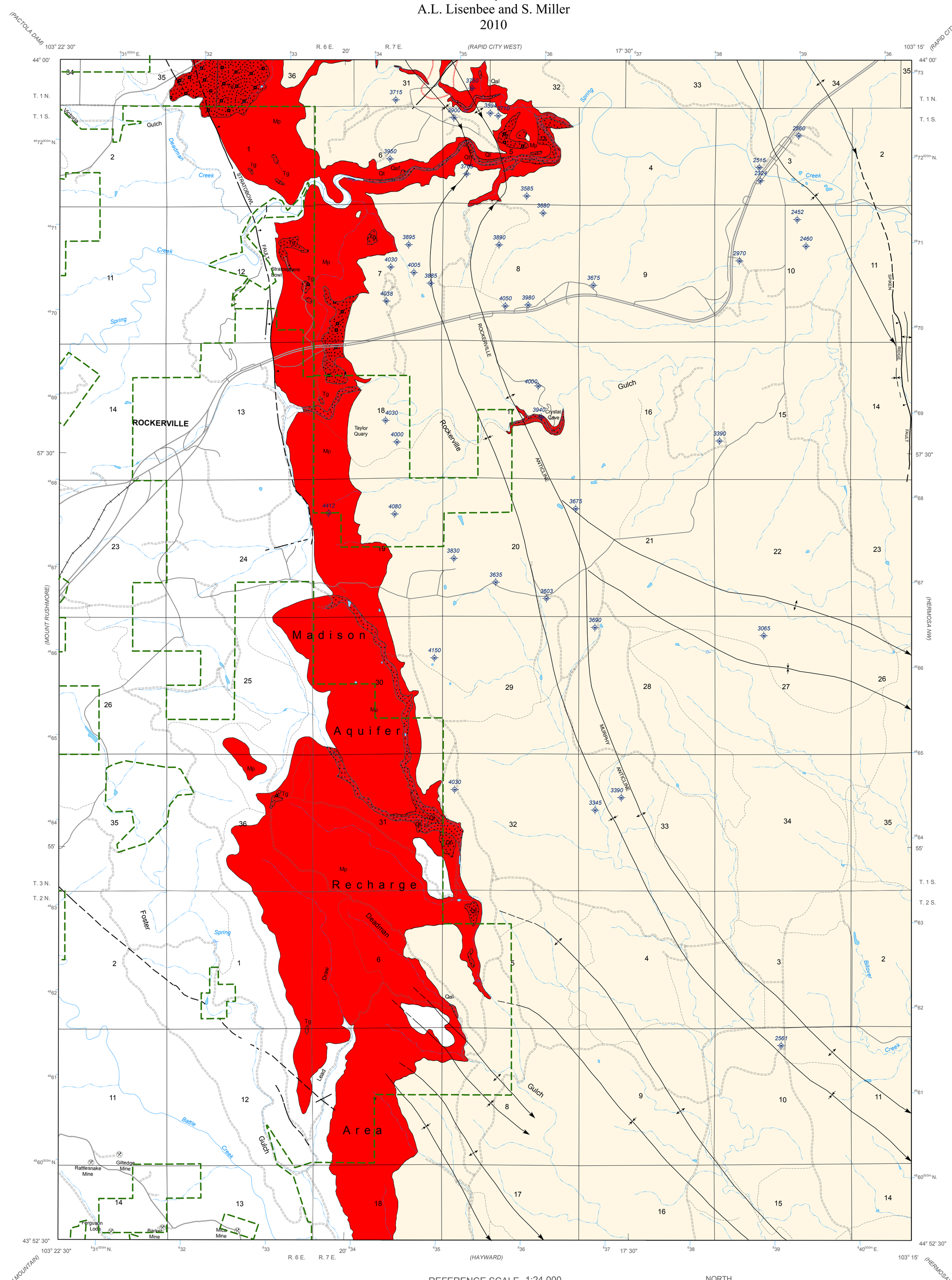
Aquifer Susceptibility Map of the Pahasapa Limestone (Madison Aquifer), Rockerville Quadrangle

By
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2010



Map base modified from U.S.G.S. 1:24,000-scale Rockerville digital line graph.
Geology layer from J.L. Lester and P.H. Rahn, 2001; S.L. Miller, 2005.
Water well data collected and digitized from SD Dept. of Environment and Natural Resources "Online Oil/Gas/Injection Well Data" database.
Projection is Universal Transverse Mercator, Zone 13, North American Datum 1983.

Digital Cartography: E.M. Franscisco, 2007 and S.L. Saxton, 2010.
Department of Geology and Geological Engineering
South Dakota School of Mines and Technology

REFERENCE SCALE 1:24,000

1 0.5 0 1 Miles

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometers

TOPOGRAPHIC CONTOUR INTERVAL 20 FEET
(IF SHOWN)

NORTH

GN — 1° 10' — 21 MILS

MN — 13° — 231 MILS

UTM GRID AND 1971 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

Quadrangle location

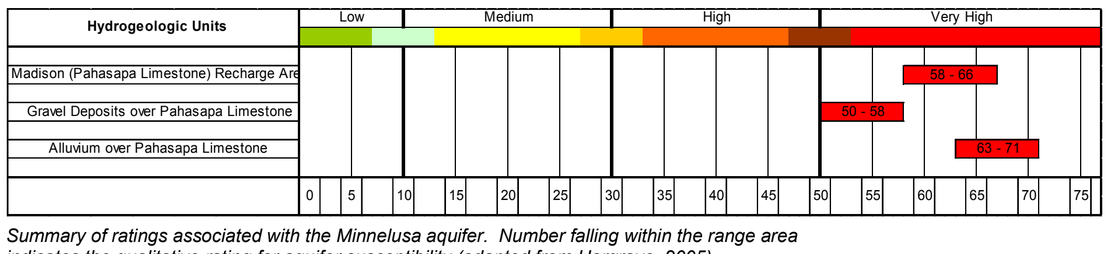
The preparation of this map was funded by the West Dakota Water Development District in association with the Department of Geology and Geological Engineering South Dakota School of Mines and Technology

EXPLANATION

Definition of Susceptibility

Aquifer susceptibility is the inherent ability of a formation to accept and transmit liquids (potentially including contaminants).

Susceptibility Ranges for Hydrogeologic Units



Summary of ratings associated with the Minnelusa aquifer. Number falling within the range area indicates the qualitative rating for aquifer susceptibility (adapted from Hargrave, 2005).

Susceptibility Ratings Explanation:
The susceptibility range is the sum of ratings for susceptibility parameters of the aquifer. The parameters used for the Minnelusa aquifer are rock type, overlying material, joints, minor karst, breccia and minor faults affecting the hydrogeologic units of the Minnelusa Fm.
The ratings for these parameters are: Rock Type; 5-8 for sandstone; Overlying Material; 5-10 for alluvium and negative 5-10 for gravel, sand and clay mixture; Joints; 5-7; Minor Karst; 5-8; Breccia; 5-7 and; Minor Faults; 4-6.
The ratings suggested for the parameters are from Aller et al. (1987) and Davis et al., (1994.)

Contact
Solid where location certain; dashed where approximately located.

Fault
Solid where location certain; dashed where approximately located; queried where uncertain. Bar and ball on downthrown side.

Anticline
Showing crestline and direction of plunge. Solid where location certain; dashed where approximately located.

Syncline
Showing troughline and direction of plunge. Solid where location certain; dashed where approximately located.

Monocline - Anticlinal bend
Axis located on steepest part of structure. Solid where location certain; dashed where approximately located.

Monocline - Synclinal bend
Axis located on steepest part of structure. Solid where location certain; dashed where approximately located.

Geologic Units - Color indicates degree of susceptibility; see chart to left.

Quaternary — **Floodplain Surficial Deposits**
Susceptibility rating ranges between 63 to 71 where alluvium (Qal) and alluvial fan (Qaf) overlies the Pahasapa Limestone.

Quaternary/Tertiary — **Other Surficial Deposits**
Susceptibility rating ranges between 50 to 58 where gravel deposits (Tg) and terrace deposits (Qt) overlies the aquifer.

Unconformity

Lower Mississippian — Mp — **Pahasapa Limestone (Madison Aquifer)**
Susceptibility rating ranges between 58 to 65.

Pahasapa Limestone Absent

Pahasapa Limestone Present in Subsurface