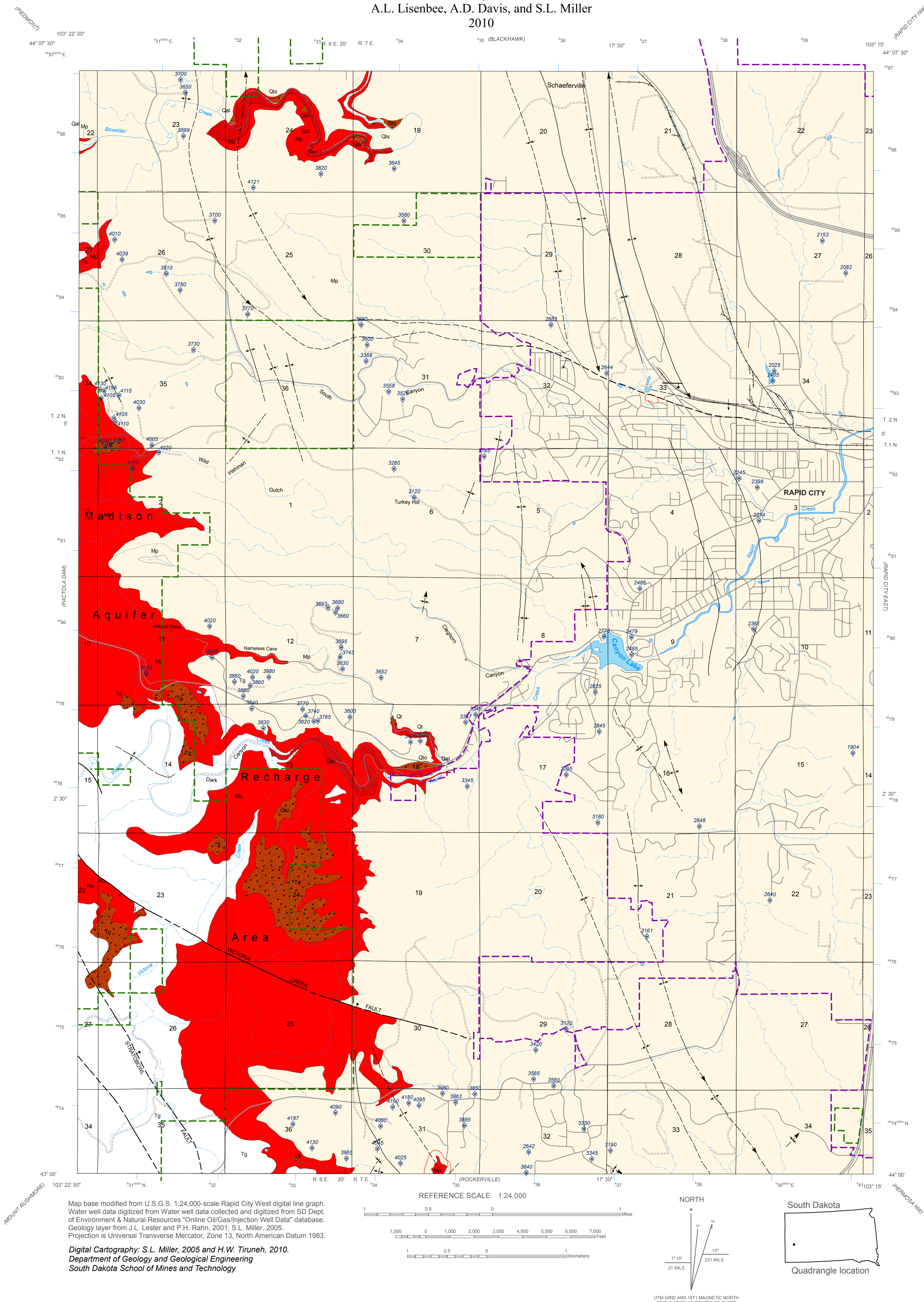


Aquifer Susceptibility Map of the Pahasapa Limestone (Madison Aquifer), Rapid City West Quadrangle

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

Digital Cartography: S.L. Miller, 2005 and H.W. Tiruneh, 2010.
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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

Hydrogeologic Units	Low	Medium	High	Very High
Madison (Pahasapa Limestone) Recharge Area				63-71
Gravel Deposits over Pahasapa Limestone			50-58	
Alluvium over Pahasapa Limestone				58-66
	0	5	10	15
	20	25	30	35
	40	45	50	55
	60	65	70	75

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

Susceptibility Ratings Explanation:
The susceptibility range is the sum of ratings for susceptibility parameters of the aquifer. The parameters used for the Madison aquifer ratings are: Rock Type; 10 for Karstic Limestone; Overlying Material; 5-10 for alluvium and negative 5-10 for gravel, sand and clay mixture; Joints; 8-10; Major Karst; 8-10; Minor Karst; 5-8; Breccia; 4-7 and; Minor Faults; 4-6. The ratings suggested for the parameters are from Aller et al. (1987) and Davis et al., (1994.)

EXPLANATION

Wells penetrating Madison aquifer
Number indicates elevation of top of Pahasapa Fm, in feet

- Trail
- Unimproved Road
- Paved Road
- Highway
- Railroad
- Lake
- Springs
- Intermittent Stream
- Perennial Stream
- Karst Features

- Contact
Solid where location certain; dashed where approximately located
- Fault
Solid where location certain; dashed where approximately located. 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

- Quaternary
- Quaternary and Tertiary
- Lower Mississippian

- Qal
- QsGr/TgQs
- Mp

- Alluvium - VERY HIGH SUSCEPTIBILITY
Susceptibility rating ranges between 63 to 71 where alluvium overlies the Pahasapa Formation.
- Gravel deposits - HIGH TO VERY HIGH SUSCEPTIBILITY
Susceptibility rating ranges between 50 to 58 where gravel deposit overlies the Pahasapa Formation
- Pahasapa Limestone - VERY HIGH SUSCEPTIBILITY
Susceptibility rating ranges between 58 to 66
- Pahasapa Limestone Absent
- Pahasapa Limestone Present in Subsurface