SOUTH DAKOTA Aquifer Susceptibility of the Minnelusa Formation, Piedmont Quadrangle Development District A.L. Lisenbee, A.D. Davis, and M.H. Price 2011 27'30" ⁶²³ R. 5 E. R. 6 E. ⁶24 Aguifer 13 Spring Recharge 27 25 T. 3 N. T. 2 N. 103° 30' 27'30" 25' (PACTOLA DAM) Map base modified from U.S.G.S. 1:24,000-scale Piedmont digital line graph. REFERENCE SCALE 1:24,000 NORTH Geology layer from J.A. Redden, 2006. Water well data digitized from SD Dept. of Environment & Natural Resources "Online Oil/Gas/Injection Well Data" database. South Dakota Projection is Universal Transverse Mercator, Zone 13, North American Datum 1983. 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Digital Cartography: K.M. Grigg and S.L. Saxton, 2011. Department of Geology and Geological Engineering South Dakota School of Mines and Technology 231 MILS 21 MILS TOPOGRAPHIC CONTOUR INTERVAL 20 FEET Quadrangle location (IF SHOWN) UTM GRID AND 1971 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET The preparation of this map was financed 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** Geologic Units - Color indicates degree of susceptibility; see chart to left. Aquifer susceptibility is the inherent ability of a formation to accept and transmit liquids (potentially including contaminants). Floodplain Surficial Deposits - HIGH SUSCEPTIBILITY Contact Quaternary Includes alluvium (Qal) deposits. Increased potential for infiltration of water. Susceptibility Ranges for Hydrogeologic Units Solid where location certain; dashed where approximately located. Very High Terrace Deposit - MEDIUM TO HIGH SUSCEPTIBILITY Includes debris flow deposits (Qd). Decreased potential for infiltration **Hydrogeologic Units** Solid where location certain; dashed where Qt" " Quaternary approximately located; queried where uncertain. Minnelusa Recharge Area Bar and ball on downthrown side. Terrace (Gravel/Sand/Clay) Deposits over Minnelusa Formation - HIGH SUSCEPTIBILITY Minnelusa aquifer Showing crestline and direction of plunge. Solid where location certain; dashed where Susceptibility rating ranges between 25 to 37. No distinction was Alluvium over Minnelusa aquifer Pennsylvanian approximately located. made between the upper sandstone and the lower sandstone beds Showing troughline and direction of plunge. Solid where location certain; dashed where Summary of ratings associated with the Minnelusa aquifer. Number falling within the range area indicates approximately located. **Minnelusa Formation Present in Subsurface** 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, Black Hills National Forest Boundary overlying material, joints, minor karst, breccia and minor faults affecting the hydrogeologic units of the Minnelusa Fm. The ratings for these parameters are: **Minnelusa Formation Absent** 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.)