

Water Resources

The county's water resources consist of surface water found in streams and lakes, and groundwater occurring in glacial and bedrock aquifers. The Big Sioux River is the major surface water feature along with the tributary streams of Skunk Creek, Split Rock Creek, Beaver Creek, Pipestone and West Pipestone Creeks, and Colton Creek. Discharge from groundwater storage areas contribute to surface flow.

There are nine major glacial aquifers in the county composed primarily of unconsolidated sand and gravel deposited as outwash from glacial activity. These aquifers are shown on Map 13 and collectively contain approximately 725,000 acre-feet of water storage. The Wall Lake, Howard and Valley Springs aquifers are buried, confined aquifers. The other glacial aquifers - Big Sioux, Skunk Creek, Pipestone Creek, Beaver Creek, Brandon and Colton - are predominately shallow, water table aquifers with an

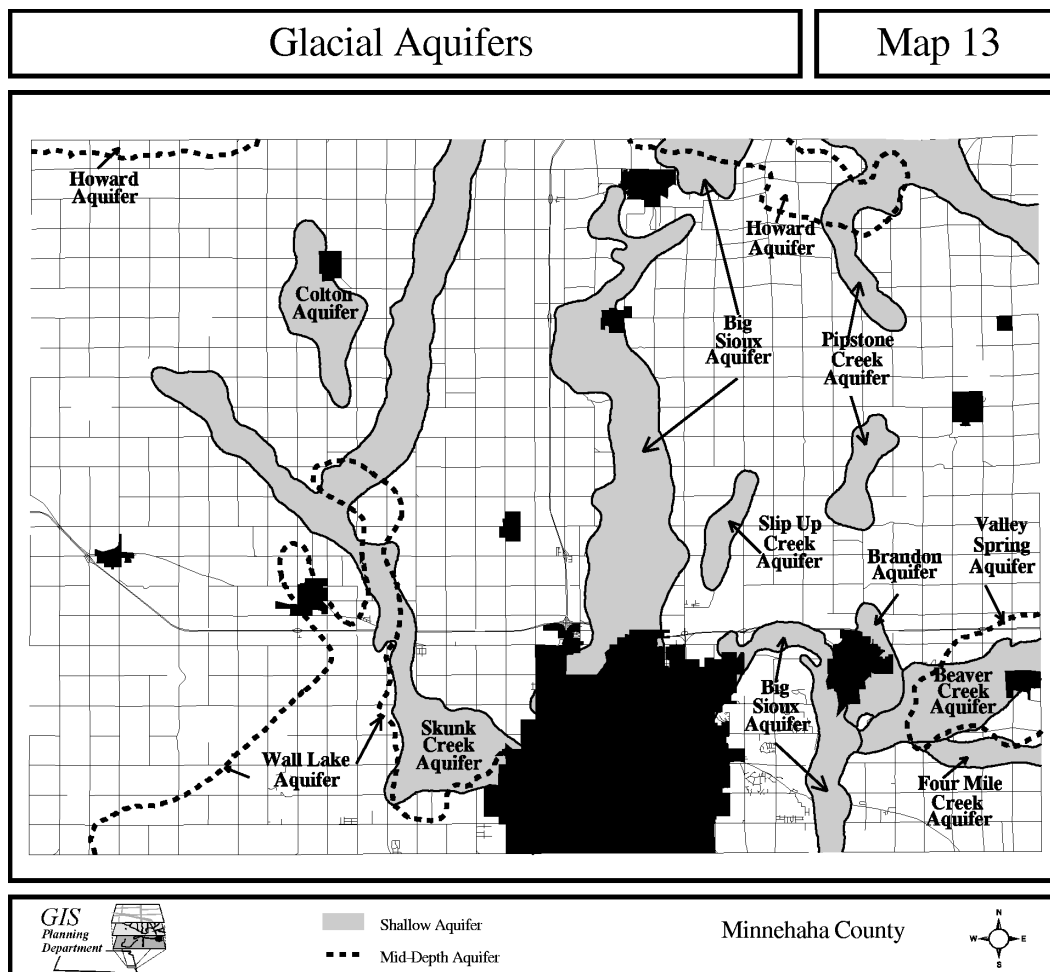


TABLE 13
Major Aquifers

Aquifer	Area (square miles)	Maximum Thickness (feet)	Average cumulative thickness (feet)	Range of depth below land surface (feet)	Average depth below land surface (feet)	Estimated volume of water in storage (acre-feet)
GLACIAL AQUIFERS						
Big Sioux	68	71 ¹	22	0-82	10	190,000
Skunk Creek	43	84 ¹	21	0-93	9	115,000
Pipestone Creek	19	36	15	1-52	11	35,000
Beaver Creek	11	49	17	0-118	22	25,000
Brandon	6	62 ¹	35	0-24	7	25,000
Colton	8	26	12	1-57	20	10,000
Wall Lake	58	88	33	19-205	106	245,000
Howard	15	63	28	123-265	202	55,000
Valley Springs	14	26 ¹	15	93-207	131	25,000
BEDROCK AQUIFERS						
Split Rock Creek	139	222 ¹	48	21-337	160	855,000
Sioux Quartzite	815	NA	NA	2-510	120	NA

¹ Includes multiple layers.

average depth of 20 feet below the land surface. The minor glacial aquifers of Slip Up Creek and Four Mile Creek underlie the flood plains of these two streams. Detailed information on these aquifers is shown in Table 13.

Two major bedrock aquifers, Split Rock Creek and Sioux Quartzite, are also important water sources in Minnehaha County. These aquifers are shown on Map 14. The Split Rock aquifer has a substantial storage capacity consisting of 855,000 acre-feet. The Sioux Quartzite aquifer, which underlies all of Minnehaha County, has an unknown storage capacity because of insufficient data concerning aquifer depth and development of the fracture system.

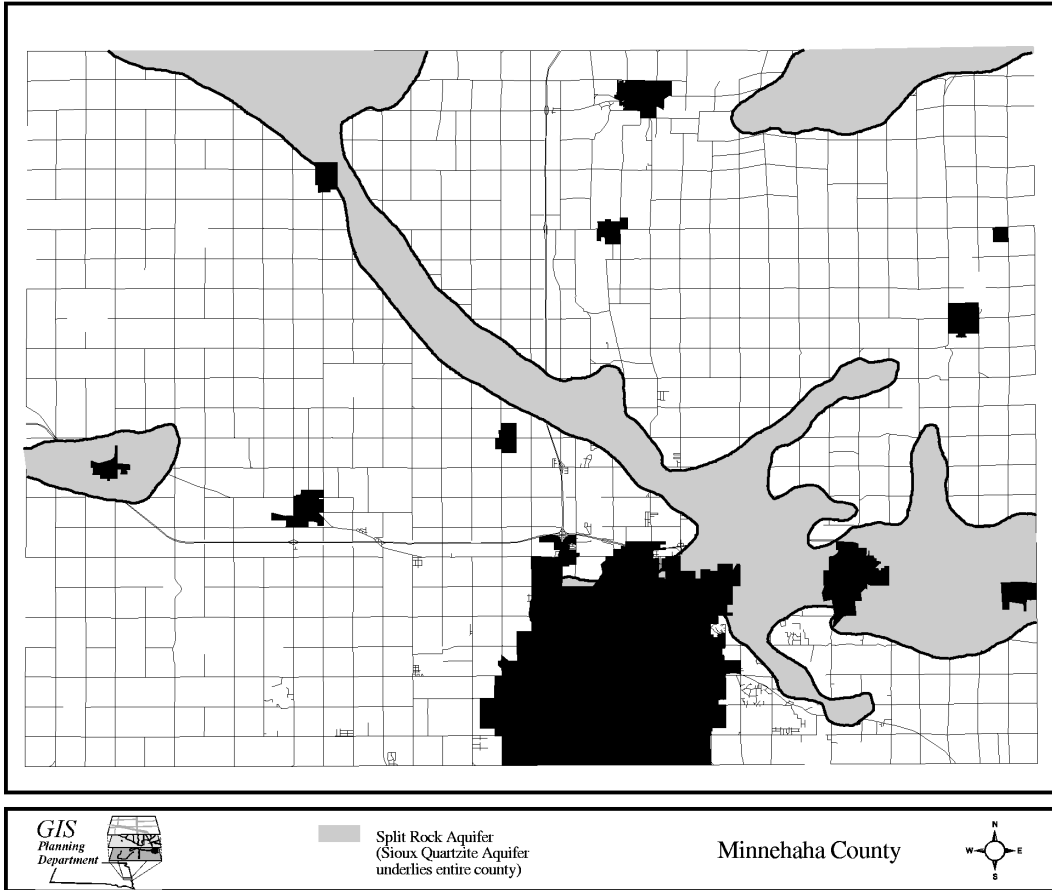
Table 14 details these aquifers as a source of water for municipal, rural domestic, livestock and irrigation use. In 1995, glacial aquifers accounted for 98 percent of the total groundwater use with the remainder coming from bedrock aquifers. Estimated water use from all groundwater sources totaled 4.7 billion gallons in 1995.

The Big Sioux aquifer accounted for 90 percent of the total groundwater withdrawn in 1995 and 80 percent of this volume was used by Sioux Falls. The aquifer is also the only water source for the Minnehaha Community Water Corporation. This means that the aquifer is serving most of the county's domestic and industrial water needs. Sioux Falls recently expanded into the Skunk Creek aquifer near Lyons to supplement water supply needs and reduce dependence on a single aquifer.

Another 3.4 billion gallons was withdrawn directly from streams in 1995. The Sioux Falls intake structure on the Big Sioux River accounted for nearly all of this total. Over 8 billion gallons were withdrawn from groundwater and rivers sources in 1995.

Bedrock Aquifers

Map 14



Two projects are being considered to meet future water supply demands. The Lewis and Clark Water System project proposes the construction of a pipeline from the Missouri River to supply treated water to municipalities and rural water systems in southeastern South Dakota, northwestern Iowa and southwestern Minnesota. Sioux Falls is also investigating a project involving the construction of a reservoir on Slip Up Creek northeast of the city. Water from the Big Sioux River would be pumped into the reservoir during high flow periods for use during dry months.

TABLE 14
Major Groundwater and River Withdrawals in 1995
(in millions of gallons)

	Total	Sioux Falls	Other Cities¹	Rural Water²	Irrigation
Glacial Aquifers					
Beaver Creek	0	na	na	na	na
Big Sioux	4267.97	3449.60	14.53	639.00	164.84
Brandon	0	na	na	na	na
Colton	23.14	na	23.14	na	na
Howard	0	na	na	na	na
Pipestone	0	na	na	na	na
Skunk Creek	339.42	279.50	na	na	59.92
Valley Springs	0	na	na	na	na
Wall Lake	8.28	na	na	na	8.28
Bedrock Aquifers					
Sioux Quartzite	45.78	na	45.40	na	0.38
Split Rock Creek	32.27	0.16	32.11	na	na
Aquifer Total	4716.86	3729.26	115.18	639.00	233.42
Rivers					
Beaver Creek	0.31	na	na	na	0.31
Big Sioux River	3297.39	3239.00	na	na	58.39
Split Rock Creek	74.67	na	na	na	74.67
River Total	3372.37	3239.00	0.00	0.00	133.37
Total Water Usage	8089.23	6968.26	115.18	639.00	366.79

¹ Includes Brandon, Colton, Garretson and Valley Springs

² Includes Baltic, Crooks, Dell Rapids, Hartford, Humboldt and Sherman