



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 9026-3, Boadwine Farms, Inc.**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Acting Chief Engineer, Water Rights Program, Department of Agriculture and Natural Resources concerning Water Permit Application No. 9026-3, Boadwine Farms, Inc., 4909 West 49th Street, Suite 307, Sioux Falls, SD 57106.

The Acting Chief Engineer is recommending APPROVAL of Application No. 9026-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing domestic water uses and water rights, 3) the proposed use is a beneficial use and 4) it is in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board with the following qualifications:

1. The well approved under Water Permit No. 9026-3 is located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals shall be controlled so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The Water Management Board retains jurisdiction of Water Permit No. 9026-3 to manage use of water from the Big Sioux Middle Skunk Creek aquifer. Based on the historical average water use, unappropriated water is available. However, if the average use increases and begins to unlawfully impair senior water right holders or domestic water users with adequate wells, then curtailment of water use under this Permit may be necessary.
3. The well authorized by Permit No. 9026-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
4. The permit holder must report to the Chief Engineer annually the amount of water withdrawn from the Big Sioux: Middle Skunk Creek Aquifer.
5. This Permit authorizes an annual diversion of up to 146 acre-feet of water.

See report on application for additional information.

Adam Mathiowetz, PE
Acting Chief Engineer
April 21, 2026

(See note on following page)

NOTE: The saturated thickness of the aquifer in the area of the proposed well may be relatively thin. This may not allow pumping at the requested rate without pumping the well itself dry. This could result in cavitation and overheating causing damage to the pump. Also note, thin aquifer material increases the likelihood of reducing needed water supplies in adequate domestic wells or in adequate wells having prior water rights in similarly situated portions of the aquifer (see qualification No. 1).

Report to the Chief Engineer
On Water Permit Application No. 9026-3

Boadwine Farms Inc

April 21, 2026

Water Permit Application No. 9026-3 proposes to appropriate up to 146 acre-feet of water annually at a maximum instantaneous diversion rate of 0.33 cubic feet per second (cfs) from one well to be completed into the Big Sioux: Middle Skunk Creek aquifer (approximately 40 feet deep) located in the E ½ NW ¼ of Section 5 for commercial use in a dairy located in the NE ¼ of Section 5 and NW ¼ of Section 10; all in T103N-R50W. The site of interest is located in Minnehaha County approximately three and one-half miles southeast of Colton, SD.

AQUIFER: Big Sioux: Middle Skunk Creek (BS: MSC)

HYDROGEOLOGY:

The Big Sioux aquifer is primarily composed of meltwater stream and glacial outwash deposits that range from fine to medium, poorly to well sorted sand and medium gravel and occurs mostly in the floodplains of the Big Sioux River and its major tributaries (Lindgren and Niehus, 1992). The Big Sioux aquifer is divided into twelve management units that have been historically recognized by the DANR-Water Rights Program and SD Water Management Board (Water Rights, 2026c).

Lindgren and Niehus (1992) identified the aquifer that this application proposes to use as the Skunk Creek aquifer. Prior to the publication of Lindgren and Niehus (1992), the Water Rights Program adopted the naming convention and water management units from Hedges and others (1982) of Big Sioux: Northern Skunk Creek, Big Sioux: Middle Skunk Creek, and Big Sioux: Southern Skunk Creek. For consistency, the naming conventions from Hedges and others (1982) will be used for this report on the Big Sioux: Middle Skunk Creek aquifer.

The Big Sioux: Middle Skunk Creek aquifer is a Quaternary-aged shallow, glacial aquifer that underlies a portion of the Skunk Creek flood plain and portions of the Western Skunk Creek flood plain in western Minnehaha County and a small portion of southwestern Moody County (Lindgren and Niehus, 1992; Hedges and others, 1982). The aquifer consists of fine to coarse sand and gravel which can locally contain thin clay and till layers and is primarily under unconfined conditions (Lindgren and Niehus, 1992). The direction of groundwater movement in the aquifer is generally southward towards either Skunk Creek or Western Skunk Creek depending on location (Lindgren and Niehus, 1992), which is generally the direction of surface water flow.

No water well or test hole completion report was submitted with Water Permit Application No. 9026-3. Water well completion reports on file with the DANR-Water Rights Program for wells completed into the Big Sioux: Middle Skunk Creek aquifer within approximately one mile of the proposed diversion point indicate saturated aquifer thicknesses ranging from approximately 20 to 40 feet, with the depth to the top of aquifer materials ranging from approximately 5 to 10 feet

below the ground surface, and static water levels at well completion varying from approximately 5 to 10 feet below the ground surface (Water Rights, 2026d). Based on the water well completion reports on file for nearby wells completed into the aquifer, and the lithologic logs on file for nearby observation wells, the Big Sioux: Middle Skunk Creek aquifer is expected to be unconfined near the proposed diversion point (SDGS, 2026; Water Rights, 2026b and 2026d). The Big Sioux: Middle Skunk Creek aquifer is generally under unconfined aquifer conditions but confined aquifer conditions exist as well. The aquifer is expected to be unconfined at the proposed diversion point based on well completion reports for nearby wells and the lithologic logs on file for nearby observation wells (SDGS, 2026; Water Rights, 2026b and 2026d).

Kilts (2023) detailed the historical delineations of the Big Sioux: Middle Skunk Creek aquifer boundary and determined the aquifer boundary based on Tomhave (2001) and Jensen (2002) is the most reliable information at this time (Figure 1). The approximate areal extent of the Big Sioux: Middle Skunk Creek aquifer is 17,417 acres (Jensen, 2002; Tomhave, 2001).

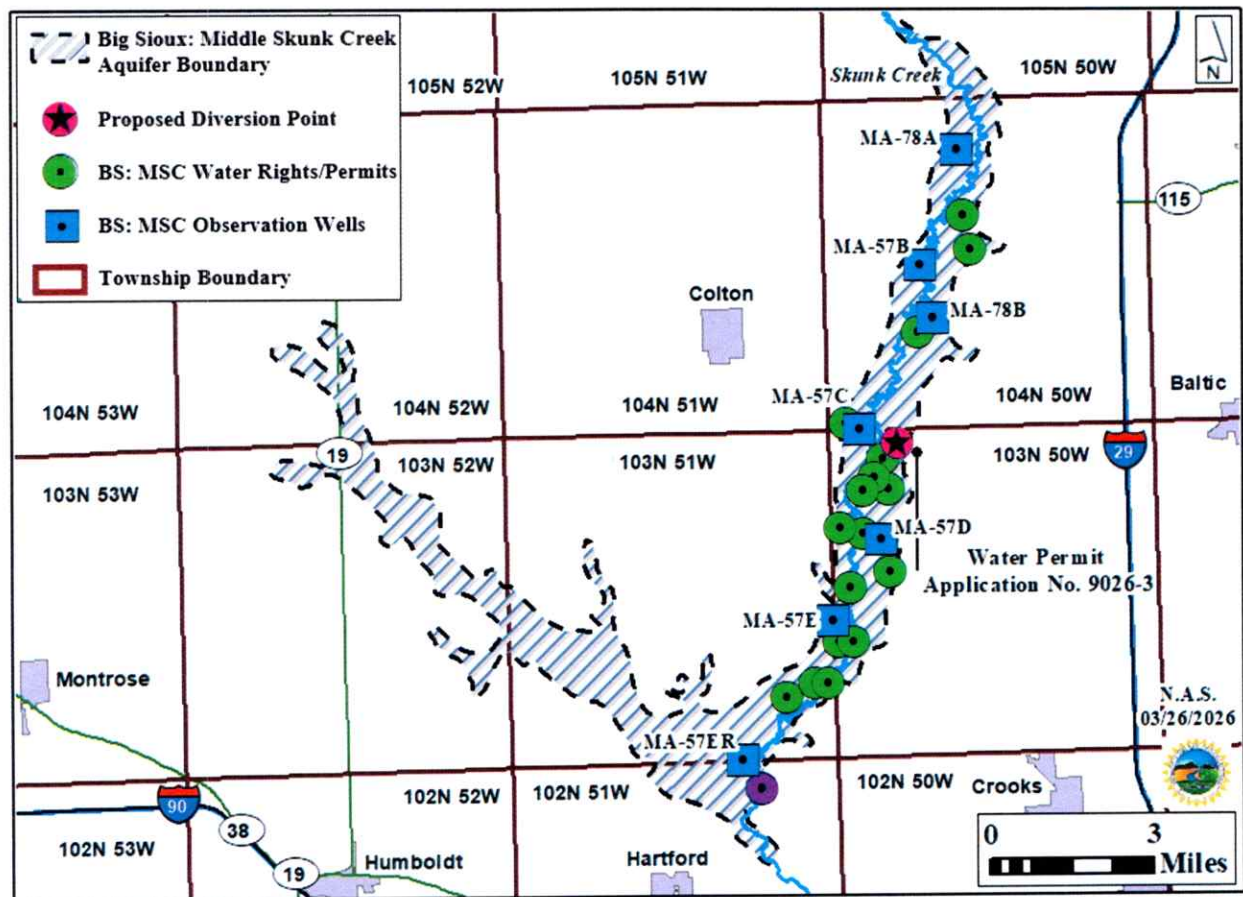


Figure 1. Delineation of the Big Sioux: Middle Skunk Creek aquifer by Kilts (2023) based on Tomhave (2001) and Jensen (2002), the location of the proposed diversion point, the Big Sioux: Middle Skunk Creek aquifer observation wells (Water Rights, 2026b) and the water rights/permits currently labeled as appropriating water from the aquifer (Water Rights, 2026c). Note: future use area for Sioux Falls not included at this scale for map clarity.

Hedges et al. (1982) appears to have based the northern and southern boundaries of the Middle Skunk Creek aquifer management unit on horizontal constrictions in the glacial aquifer deposit. In reviewing the aquifer delineation based on Tomhave (2001) and Jensen (2002) these horizontal constrictions are even thinner especially near the northern boundary, indicating that inflow if any, from the Northern Skunk Creek aquifer management unit to the Middle Skunk Creek aquifer management unit would be extremely limited. Appropriative development in the aquifer has all been concentrated in the portion of the aquifer underlying the Skunk Creek floodplain (Water Rights, 2026b). In part, this is likely due to the portion of the aquifer underlying the floodplain of Western Skunk Creek generally having limited saturated thickness and therefore storage (SDGS 2026). Based on the mapping in Figure 1 the portion of the aquifer associated with the floodplain of Western Skunk Creek is approximately 6,477 acres and the portion of the aquifer associated with the floodplain of Skunk Creek is approximately 10,940 acres (Jensen, 2002; Tomhave, 2001).

South Dakota Codified Law (SDCL) 46-2A-9

Pursuant to SDCL 46-2A-9, “A permit to appropriate water may be issued only if there is a reasonable probability that there is unappropriated water available for the applicant’s proposed use, that the diversion point can be developed without unlawful impairment of existing domestic water uses and water rights, and that the proposed use is a beneficial use and in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board as defined by SDCL 46-2-9 and 46-2-11.” This report will address the availability of unappropriated water and the potential for unlawful impairment of existing domestic water uses and water rights within the Big Sioux: Middle Skunk Creek aquifer.

SDCL 46-5-39. Authorization for Temporary use permits

Pursuant to SDCL 46-5-39, “Before an entity described in SDCL 46-5-38 is ready to use part or all of the water subject to a future use permit or permits, temporary appropriations may be made of the water. Any person desiring to appropriate the water shall make an application to the chief engineer for a temporary permit pursuant to the procedure contained in chapter 46-2A.”

SDCL 46-5-40. Temporary use permits--Cancellation.

Pursuant to SDCL 46-5-40, “The chief engineer may not cancel a temporary use permit with less than six months notice to the permit holder. In no case may a temporary use permit be cancelled prior to the time at which facilities are constructed and water may be put to beneficial use by an entity described in SDCL 46-5-38 holding a permit under the provisions of SDCL 46-5-38.1. No person may acquire any right under a temporary permit to the use of water beyond the time of cancellation of the temporary use permit.”

WATER AVAILABILITY:

Water Permit Application No. 9026-3 proposes to appropriate water from the Big Sioux: Middle Skunk Creek aquifer. The probability of unappropriated water being available from the aquifer can be evaluated by considering SDCL 46-6-3.1, which requires “No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is

probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source. An application may be approved, however, for withdrawals of groundwater from any groundwater formation older than or stratigraphically lower than the greenhorn formation in excess of the average estimated annual recharge for use by water distribution systems.” The Big Sioux: Middle Skunk Creek aquifer is not older than or stratigraphically lower than the Greenhorn Formation (Fahrenbach et al., 2010), and the applicant’s proposed use is not for use in a water distribution system as defined by SDCL 46-1-6(17). Therefore, the average annual recharge and average annual withdrawal rates to and from the Big Sioux: Middle Skunk Creek aquifer must be considered.

HYDROLOGIC BUDGET:

Recharge

Recharge to the Big Sioux: Middle Skunk Creek aquifer is from infiltration of precipitation (Lindgren and Niehus, 1992) and limited groundwater inflow from the Big Sioux: Northern Skunk Creek aquifer (Hedges et al., 1982). Utilizing observation well analysis, Hedges and others (1985) estimated the average annual recharge rate to the Big Sioux: Middle Skunk Creek aquifer to be approximately 3.2 inches per year. By multiplying the average annual recharge rate estimated by Hedges and others (1985) by the approximate areal extent of 17,417 acres, the estimated average annual recharge rate to the Big Sioux: Northern Skunk Creek aquifer is 4,644 acre-feet per year.

Discharge

Discharge from the Big Sioux: Middle Skunk Creek aquifer is through evapotranspiration where the aquifer is at or near the ground surface, seepage to Skunk Creek, outflow to the Big Sioux: Southern Skunk Creek aquifer, and through well withdrawals (Lindgren and Niehus, 1992; Water Rights, 2026d).

Currently, there are 13 water rights/permits appropriating water from the Big Sioux: Middle Skunk Creek aquifer and one future use permit reserving water (Water Rights, 2026c). Future Use Permit No. 5522-3 is held by the City of Sioux Falls and reserves 183 acre-feet per year. For the purpose of estimating average annual withdrawals, the future use permit is assumed to be fully developable for a total of 183 acre-feet per year.

There are six non-irrigation water rights/permits authorized to appropriate water from the Big Sioux: Middle Skunk Creek aquifer (Water Rights, 2026c). Five (5611-3, 5612-3, 5614-3, 5615-3, and 5726-3) of the six non-irrigation water rights/permits are held by the City of Sioux Falls and are collectively limited to an annual volume of 4,883 acre-feet per year. The City of Sioux Falls is required to report its annual usage from the aquifer and the reported use by the city from 1994 to 1999 and 2003 to 2025 is shown in Table 1. The average reported use from the aquifer is 1,455.2 acre-feet per year by the City of Sioux Falls. However, since the city has been experiencing rapid growth for a number of years, the full allowable annual volume will be used to estimate average annual withdrawals, which is consistent with past practice for municipal

water rights held by growing municipalities by the Water Rights Program (Water Rights, 2026c). The remaining non-irrigation use permit is Water Right No. 6446-3 held by Central States Fire Apparatus LLC (Rosenbauer) limited only by a maximum instantaneous of 0.44 cfs. Historically the Water Rights Program has estimated average water use by non-irrigation appropriations limited by an instantaneous diversion rate by assuming they pump at 60% of full time at the respective permitted diversion rate (Water Rights, 2026b). This results in an estimated average annual use for Water Right No. 6446-3 of 191 acre-feet per year. Currently, Water Right No. 6446-3 is the only permit in the aquifer not required to report annual water use (Water Rights, 2026c). Overall, the estimated average annual withdrawal rate for the Big Sioux: Middle Skunk Creek aquifer non-irrigation water rights/permits is approximately 5,074 acre-feet per year assuming full use of the City of Sioux Falls’s water rights (Water Rights, 2026c).

Table 1. Reported water use from the Big Sioux: Middle Skunk Creek aquifer by the City of Sioux Falls (Water Rights, 2026f)

Year	Reported Use (acre-feet/year)	Year	Reported Use (acre-feet/year)
1994	152	2009	2,017
1995	1,702.6	2010	2,229
1996	857.8	2011	1,609
1997	1,673.8	2012	1,158
1998	1,837	2013	1,075.7
1999	2,472	2014	511
2000	N/A	2015	959
2001	N/A	2016	1,256.3
2002	N/A	2017	958
2003	1,682	2018	924
2004	1,445	2019	1,755
2005	1,281	2020	1,971.3
2006	1,699	2021	1,772.3
2007	2,225	2022	1,069
2008	2,077	2023	1,020.8
2009	2,017	2024	1,142.8
2010	2,229	2025	1,667.85
		Average	1,455.2

Currently, there are seven irrigation water rights/permits authorized to appropriate water from the Big Sioux: Middle Skunk Creek aquifer (Water Rights, 2026c). Irrigation water rights/permits have been typically required to report their annual usage on an irrigation questionnaire since 1979. The estimated average annual withdrawal rate for the Big Sioux: Middle Skunk Creek aquifer irrigation water rights/permits that have reported over the period of record (1979 to 2024) is approximately 228.9 acre-feet per year (Table 2) (Water Rights, 2026a). A more recent average period is likely to better reflect the current development of irrigation water rights/permits; thus, the average annual withdrawal rate for irrigation appropriations from 2015 to 2024 is approximately 265.5 acre-feet per year (Table 2) (Water Rights, 2026a).

Report on Water Permit Application No. 9026-3

Table 2. Reported historic irrigation use from Big Sioux: Middle Skunk Creek aquifer (Water Rights, 2026a)

Year	No. of Permits Reporting	Reported Pumpage (acre-feet)
1979	14	91
1980	14	221
1981	14	620
1982	9	131.15
1983	9	372.57
1984	15	176
1985	12	497
1986	11	117
1987	9	260
1988	9	724
1989	8	494.1
1990	8	4
1991	8	460
1992	7	11
1993	7	7
1994	6	40.92
1995	8	95.45
1996	8	287.93
1997	8	140
1998	8	77.86
1999	8	145.1
2000	8	116.44
2001	9	269.13
2002	9	244.37
2003	9	181.27
2004	9	128.03
2005	9	193.69
2006	9	237.59
2007	8	193.19
2008	7	223.39
2009	7	114.23
2010	7	51.48
2011	6	43.42
2012	6	359.39
2013	6	347.85
2014	6	197.21
2015	6	193.99
2016	6	230.76
2017	6	184.86
2018	6	115.78
2019	6	61.66
2020	7	241.65
2021	7	388.86
2022	7	362.61
2023	7	399.9
2024	7	474.7
Min	6.0	4.0
Max	15	724
Avg (1979 to 2024)	8.3	228.9
Avg (2015 to 2024)	6.5	265.5

There are domestic wells completed into the Big Sioux: Middle Skunk Creek aquifer that do not require a water right/permit, so the withdrawal amount from those wells is unknown (Water Rights, 2026d). Due to their relatively low diversion rates, withdrawals from domestic wells are not considered to be a significant portion of the hydrologic budget. Additionally, with the development of rural water systems in areas where the Big Sioux: Middle Skunk Creek aquifer is the uppermost aquifer available; it is likely some domestic users may have transitioned to rural water. Therefore, the quantity of water withdrawn by domestic wells is estimated to be negligible to the hydrologic budget for the Big Sioux: Middle Skunk Creek aquifer.

Hydrologic Budget Summary

The estimated average annual recharge rate to the Big Sioux: Middle Skunk Creek aquifer is approximately 4,644 acre-feet per year. The estimated average annual withdrawal rate from the Big Sioux: Middle Skunk Creek aquifer is approximately 5,668.5 acre-feet per year (future use: 183 acre-feet/year; non-irrigation: 5,074 acre-feet/year; irrigation (average from 2015 to 2024): 265.5 acre-feet/year; Water Permit Application No. 9026-3 (if approved, assuming full volume): 146 acre-feet/year) assuming full use of the City of Sioux Falls's water rights.

Based on the hydrologic budget for the Big Sioux: Middle Skunk Creek, annual appropriations currently exceed estimated recharge to the aquifer based on the amount of water appropriated by existing water rights. As noted, the reported pumping by the City of Sioux Falls (Table 1) has consistently been notably less than the total collective annual volume limit on the city's water rights for this aquifer (reported average estimated non-irrigation withdrawal rate (average from 1994 to 2025, omitting 2000 to 2002): 1,455.2 acre-feet per year).

Temporary Permits Pursuant to SDCL 46-5-39

SDCL 46-5-39 allows for the issuance of temporary use permits for the temporary use of water reserved by future use permits. Currently, there are no temporary use permits per SDCL 46-5-39 issued from the Big Sioux: Middle Skunk Creek aquifer. Currently, there is 183 acre-feet of water annually reserved by Future Use Permit No. 5522-3 held by the City of Sioux Falls (Water Rights, 2026c).

Water Permit Application No. 9026-3 seeks to appropriate 146 acre-feet per year. Therefore, the full proposed annual allocation by this application could be temporarily fulfilled by the amount of water held in future use reservations.

OBSERVATION WELL DATA:

Administrative Rule of South Dakota (ARSD) 74:02:05:07 requires that the Water Management Board shall rely upon the record of observation well measurements in addition to other data to determine that the quantity of water withdrawn annually from the aquifer does not exceed the estimated average annual recharge of the aquifer.

Observation wells provide data on how the aquifer reacts to regional climatic conditions and local pumping. The DANR-Water Rights Program monitors seven observation wells completed into the Big Sioux: Middle Skunk Creek aquifer (Water Rights, 2026b). The three closest

observation wells to the proposed diversion point are MA-78C (approximately 0.7 miles northwest), MA-78D (approximately 1.7 miles south-southwest), and MA-78B (approximately 2.4 miles northeast) (as shown in Figure 1) (Water Rights, 2026b). The hydrographs for these observation wells are displayed in Figure 2 (Water Rights, 2026b). The data points utilized to construct the hydrographs are measurements of the static water level in the observation wells from the top of the well casing.

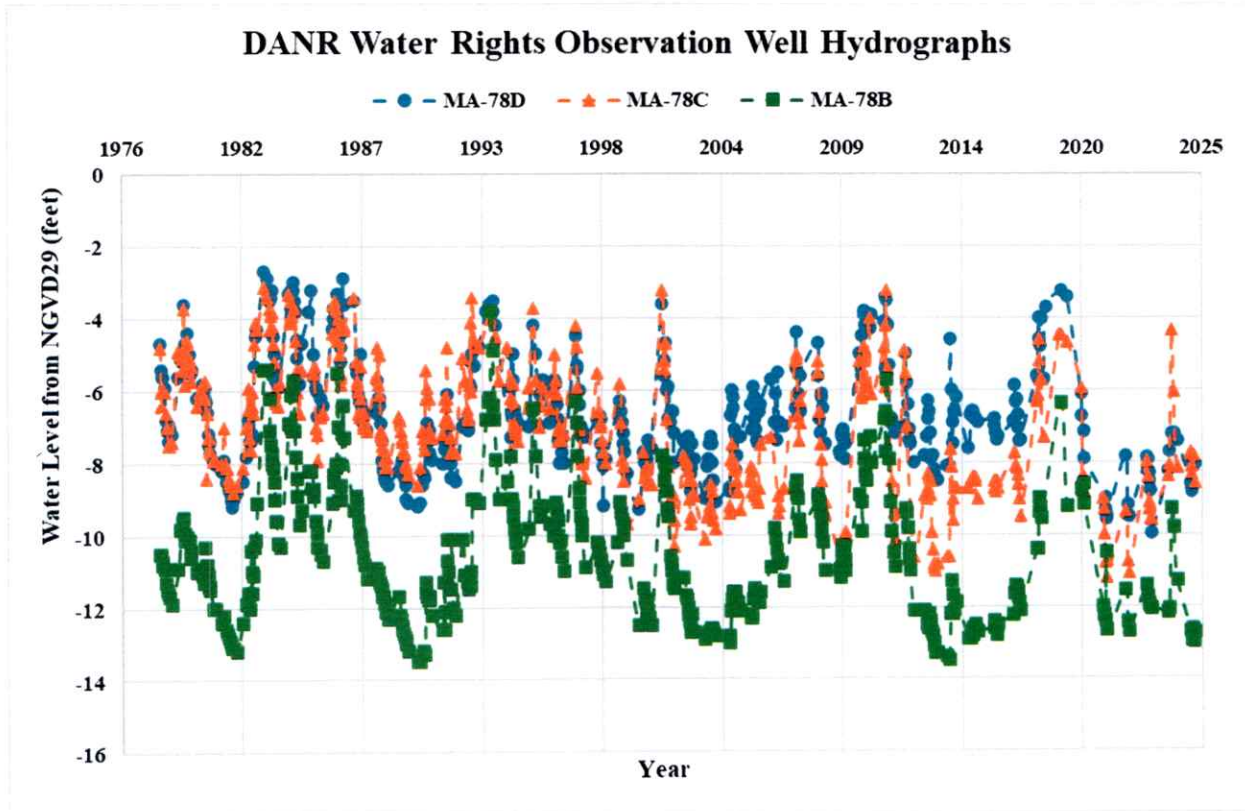


Figure 2. Hydrograph for observation wells MA-78C, MA-78D, and MA-78B (Water Rights, 2026b)

The hydrographs for the observation wells display stable (MA-78B) to slightly declining (MA-78D and MA78C) water levels over their respective periods of record. However, in the case of observation well MA-78C the decrease that starts around 1997 stabilizes around 2007. Observation well MA-78D is approximately 0.19 and 0.36 miles from the two wells for Water Right No. 5726-3 held by the City of Sioux Falls. Observation well MA-78C is approximately 0.11 and 0.38 miles from the two wells for Water Right No. 5615-3 and approximately 0.38 miles from one of the wells from Water Right No. 5614- 3, both held by the City of Sioux Falls.

While drawdown as the result of pumping in an unconfined aquifer typically does not extend far from the pumping well, observation wells MA-78D and MA-78C are both in close enough proximity (approximately 0.25 miles) to high yield wells that year-round pumping causing that some amount of observable effect would be expected. Observation Well MA-78C appears to have stabilized in relation to the current level of pumping in the area. Taking this into consideration, observation well MA-78D is likely not as reflective of the overall conditions of the aquifer as observation wells MA-78C and MA-78B. Observation well MA-78B (and the

other observation wells completed into the aquifer apart from MA-78C and MA-78D) indicate that the aquifer responds well to climatic conditions because water levels are rising during wetter periods and declining to a stable water level during drier periods. The water levels in these observation wells display that the amount of recharge to and natural discharge from the aquifer exceed pumping within the aquifer. Aquifer recovery indicates that climatic conditions and therefore, the effects of recharge to and natural discharges from the aquifer govern the long-term fluctuations of waters levels in the aquifer rather than the impacts of pumping. Based on this, the current level of pumping is likely not exceeding recharge on an aquifer-wide scale. However, the observation well data is not representative of the development of the future use permit from this aquifer (Future Use Permit No. 5522-3) or the fact the City of Sioux Falls is currently, on average, only pumping approximately 30 percent of their total permitted annual volume allocation from the aquifer (Kilts, 2023; Water Rights, 2026c and 2026f). Kilts (2023) noted the City of Sioux Falls has significant projected growth and thus an increase in water use. The city uses multiple sources, including several aquifers, Lewis & Clark Regional Water System, and the Big Sioux River. The susceptibility of the river to drought and PFC contamination of several of the city's wells, this means use of the Big Sioux: Middle Skunk Creek aquifer by the City of Sioux Falls may increase depending on the city's preferred and available water sources from all of their sources.

POTENTIAL FOR UNLAWFUL IMPAIRMENT OF EXISTING WATER RIGHTS:

Currently, there are 13 water rights/permits appropriating water from the Big Sioux: Middle Skunk Creek aquifer and one future use permit reserving water (Water Rights, 2026c). The closest water right/permit to the proposed diversion point is Water Right No. 3437-3, which is held by Ronald Thompson. The diversion point for Water Right No. 3437-3 is located approximately 0.4 miles southwest of the proposed diversion point for this application (Table 3) (Figure 3) (Water Rights, 2026c). The proposed diversion point for this application is located within the future use area for Future Use Permit No. 5522-3 held by the Sioux Falls (Water Rights, 2026c).

There are domestic wells on file with the DANR-Water Rights Program that are completed into the Big Sioux: Middle Skunk Creek aquifer, with the closest domestic well on file (not held by the applicant) approximately 1.3 miles southwest of the proposed diversion point (Water Rights, 2026d). There could potentially be other domestic wells completed into the Big Sioux: Middle Skunk Creek aquifer near the proposed diversion point that are not on file with the DANR-Water Rights Program. The location of the domestic wells in the well completion report database maintained by the Water Rights Program is based on the location listed by the driller on the well completion report.

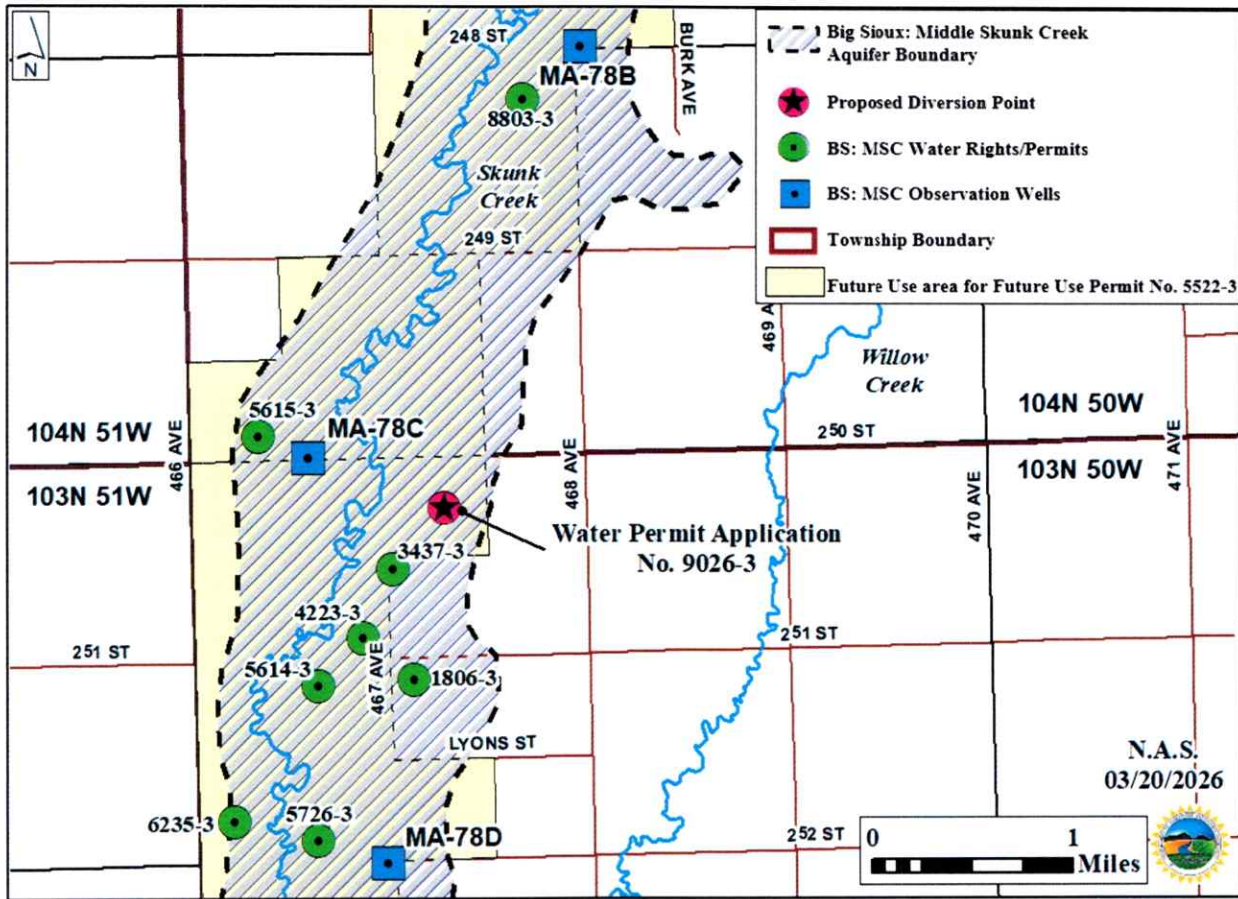


Figure 3. Location of the proposed diversion point for Water Permit Application No. 9026-3 with the Big Sioux: Middle Skunk Creek aquifer water rights/permits within approximately two miles (Water Rights, 2026c)

Table 3. Water rights/permits authorized to withdraw water from the Big Sioux: Middle Skunk Creek aquifer within approximately two miles of the proposed diversion point, as shown in Figure 3 (Water Rights, 2026c)

Permit No.	Name	Status	Use	Authorized Acres if IRR	Authorized Diversion Rate (cfs)	Licensed/Permitted Volume (acre-foot/year)
1806-3	Ronald Thompson	LC	IRR	126	1.8	N/A
3437-3	Ronald Thompson	LC	IRR	80	1.1	N/A
4223-3	Boer Investments LLLP	LC	IRR	95	1.11	N/A
5614-3	City of Sioux Falls	LC	MUN	N/A	2.14	570
5615-3	City of Sioux Falls	LC	MUN	N/A	3	907
5726-3	City of Sioux Falls	LC	MUN	N/A	3	671
6235-3	Harold Boer	LC	IRR	3	0.11	N/A
8803-3	Jeffrey Thompson	PE	IRR	116	1.78	N/A

LC: Licensed Water Right; PE: Water Permit; IRR: Irrigation; MUN: Municipal

The Big Sioux: Middle Skunk Creek aquifer is generally under unconfined aquifer conditions but confined aquifer conditions exist as well. The aquifer is expected to be unconfined at the proposed diversion point based on well completion reports for nearby wells and the lithologic logs on file for nearby observation wells (SDGS, 2026; Water Rights, 2026b and 2026d). Drawdown created by pumping a well generally does not extend far from the pumped well in an unconfined aquifer. The exact drawdown behavior of a well cannot be known without an aquifer performance test.

In Minnehaha County, the Big Sioux: Middle Skunk Creek aquifer has an average thickness of approximately 22 feet (Lindgren and Niehus, 1992). Within one mile of the proposed diversion point, the Big Sioux: Middle Skunk Creek aquifer has a saturated aquifer thickness of approximately 15 to 40 feet Water Rights, 2026d). A saturated aquifer thickness of 15 feet would not allow for enough thickness for a pump to be placed 20 feet below the top of the aquifer. Therefore, to be considered an adequate well at that location, the inlet of the pump would need to be placed as near as practical to the bottom of the saturated aquifer to qualify as an adequate well under ARSD 74:02:04:20(6). In Minnehaha County, there has been one complaint filed with the DANR-Water Rights Program regarding well interference in a glacial aquifer identified as the Big Sioux: Middle Skunk Creek aquifer; however, after an investigation, the complaint was determined to be unsubstantiated (Water Rights, 2026e).

When considering the average saturated thickness of the Big Sioux: Middle Skunk Creek aquifer in Minnehaha County, the generally unconfined nature of the aquifer, and the lack of well interference complaints for adequate wells completed into the aquifer, any drawdown created from the proposed diversion is not expected to cause an unlawful impairment to existing water right/permit holders or domestic users with adequate wells. Therefore, there is a reasonable probability that any interference from the proposed appropriation will not impose unlawful impairment to existing users with adequate wells. A qualification stating the applicant should control their water withdrawals, so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights is recommended.

Additional Considerations

Cumulative Effects of Pumping

The Big Sioux: Middle Skunk Creek aquifer is a relatively thin aquifer with a limited amount of water in storage. While current reported average annual pumpage of 1,720.7 acre-feet per year (reported average irrigation pumpage (2015 to 2024): 265.5 acre-feet per year and reported average estimated non-irrigation pumpage: 1,455.2 acre-feet per year) does not exceed average annual recharge (4,644 acre-feet per year), short term conditions may occur when pumping exceeds recharge in the short term. When this occurs, water will be removed from storage, consequently reducing the saturated thickness of the aquifer. If this occurs for an extended period of time such that the saturated thickness is reduced to the extent that the water rights/permits can no longer pump at their developed or "historically established" rates, this may be considered an adverse impact. If this occurred, the water source would need to be managed to mitigate the potential adverse impact as much as possible to prevent any unlawful impairment.

Appropriative development in the aquifer has all been concentrated in the portion of the aquifer underlying the Skunk Creek floodplain (Water Rights, 2026c). Given that the direction of groundwater movement in this aquifer generally follows the movement of surface water, recharge occurring to the portion of the aquifer underlying the floodplain of Western Skunk Creek is likely not contributing to the area where the development is concentrated in the aquifer. The portion of the aquifer associated with the floodplain of Skunk Creek is approximately 10,940 acres. So, unlawful impairment issues due to cumulative pumping could start at closer to approximately 2,900 acre-feet per year of average annual pumping. A qualification on this permit, if approved, is recommended indicating that the long-term curtailment of pumping of this permit may be required to manage water usage from this aquifer if water rights with senior priority dates increase their average annual pumpage from the aquifer to their permitted annual volume.

It is worth noting the reported average annual withdrawal rate does not include the 183 acre-feet per year for the future use reservation or the estimated use for Water Right No. 6446-3 of 191 acre-feet per year. These are the only two permits not accounted for under the reported average annual withdrawal rate. With these estimated withdrawal rates included, the reported average annual withdrawal rate does not exceed recharge.

CONCLUSIONS:

1. Water Permit Application No. 9026-3 proposes to appropriate up to 146 acre-feet of water annually at a maximum instantaneous diversion rate of 0.33 cfs from one well to be completed into the Big Sioux: Middle Skunk Creek aquifer (approximately 40 feet deep) for commercial use in a dairy. The site of interest is located in Minnehaha County approximately three and one-half miles southeast of Colton, SD.
2. Based on a review of the observation well data for the aquifer, the current level of pumping is likely not exceeding recharge on an aquifer-wide scale.
3. Based on an analysis of the hydrologic budget for the Big Sioux: Middle Skunk Creek aquifer, annual appropriations exceed recharge to the aquifer based on the amount of water appropriated by existing water rights. However, due to the City of Sioux Falls consistently not pumping their full annual volume allocation from the aquifer, average annual appropriative pumpage from the aquifer is currently not exceeding average annual recharge.
4. No temporary use permits pursuant to SDCL 46-5-39 have been issued from this aquifer. However, as noted in Conclusion No. 3, the annual appropriative pumpage from the aquifer is currently not exceeding average annual recharge, so issuing as a temporary use permit is not a necessity.

5. Existing water rights with adequate wells and domestic users with adequate wells are not expected to be unlawfully impaired by drawdown due to pumping by this application, if approved. Out of an abundance of caution, a qualification on this permit, if approved, is recommended that water withdrawals under this permit be controlled so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
6. Since non-irrigation water rights with senior priority dates in this aquifer can, under their current water rights, substantially increase their average annual pumping at a future date, a qualification on this permit, if approved, is recommended indicating that the long-term curtailment of pumping of this permit may be required to manage water usage from this aquifer.

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