



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 9049-3, Rogge Excavating**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Agriculture and Natural Resources concerning Water Permit Application No. 9049-3, Rogge Excavating, 3065 170th Avenue, Ghent MN 56239.

The Chief Engineer is recommending APPROVAL of Application No. 9049-3 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 retention ponds approved under Water Permit No. 9049-3 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals must 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. Water Permit No. 9049-3 authorizes a total annual consumptive use of up to 10 acre-feet of water from the dry draw tributary to Bullhead Run and the Big Sioux: Brookings aquifer.
3. The Permit holder must report to the Chief Engineer annually the amount of water withdrawn from the retention ponds.

See report on application for additional information.

Adam Mathiowetz, PE
October 02, 2026
Chief Engineer
DANR-Water Rights Program

****Note**** Due to the recycling of water from the wash plant returning to the retention ponds, the **reported** volume of water pumped from the retention ponds may be greater than 10 ac-ft/yr. Reporting of the volume pumped from the ponds will allow for determination of the scale of likely consumptive use and if additional permitting may be required.

**Report to the Chief Engineer on
Water Permit Application No. 9049-3**

Rogge Excavating
September 30 2026

Water Permit Application No. 9049-3 proposes to appropriate up to 10 acre-feet of runoff and incidental groundwater annually, at a maximum pump rate of 3.34 cubic feet of water per second (cfs) for industrial use. The water will be captured and stored in a series of retention ponds (approximately 25 feet deep) located in the N $\frac{1}{2}$ SW $\frac{1}{4}$ of Section 18 then pumped to a wash plant located in the SW $\frac{1}{4}$ of Section 18; all T113N-R50W. The captured runoff would be a dry draw that drains into Bullhead Run. The aquifer underlying the two retention ponds is the Big Sioux: Brookings aquifer; with the depth of the ponds and the static water level reported in nearby well completion reports (Water Rights, 2026d), it is likely the retention ponds will also obtain water from the Big Sioux: Brookings aquifer. The applicant also indicated the water used in the wash plant would be captured in the ponds for reuse. Water to be used at the wash plant is not for continuous year-round use but for use on an as-needed basis. The site is located in Deuel County, approximately one mile northeast of Estelline, SD.

Water Sources: Dry draw (flows into Bullhead Run) and Big Sioux: Brookings aquifer

Description of Proposed Water Source

The primary water source requested for Water Permit Application No. 9049-3 is surface water runoff from a draw dry that drains into Bullhead Run. Bullhead Run drains into the Big Sioux River and the confluence is approximately five miles downstream from the project area. Bullhead Run flows through Deuel and Hamlin Counties and has a total drainage area of approximately 9,900 acres (Kume, 1985). Bullhead Run is classified as an intermittent stream meaning it will only flow when it receives water from rainfall runoff, springs, or another surface source like melting snow (USGS, 2013). Therefore, water availability for a dry draw that contributes water to Bullhead Run will be especially dependent on climatic conditions.

Hydrogeology

Water Permit Application No. 9049-3 is likely to also get a portion of the water from the Big Sioux: Brookings aquifer through upward seepage into the retention ponds. The Big Sioux aquifer, predominantly underlying the valleys of the Big Sioux River and its tributaries, is divided into twelve management units that have historically been recognized by the DANR Water Rights Program and SD Water Management Board (Water Rights, 2026c). The proposed diversion point is located in the Brooking management unit of the Big Sioux aquifer (Big Sioux: Brookings). The Big Sioux: Brookings aquifer is composed of meltwater stream and glacial outwash deposits (Kume, 1985). In Brookings, Deuel, Hamlin, and Moody Counties, the Big Sioux: Brookings aquifer is estimated to underly approximately 191,000 acres (Hedges et al.,

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1982). This estimate neglects a portion of the aquifer in Kingsbury County. To estimate the full areal extent of the Big Sioux: Brookings management unit, Stonesifer (2013) utilized the first occurrence of aquifer materials maps for all five counties and the previously delineated aquifer boundary to estimate that the Big Sioux: Brookings actually underlies approximately 323,000 acres (Stonesifer, 2013). The average thickness of the aquifer is estimated to be approximately 30 feet near the diversion point for this application with the top of aquifer material being at land surface or 1 to 4 feet below grade (Kume, 1985). The Big Sioux: Brookings aquifer is estimated to contain 1,453,000 acre-feet of water in storage (Stonesifer, 2013).

No well completion report was submitted with this application, and one would not be expected to be submitted based on the proposed project specifications, but nearby well completion reports will be used to estimate the static water level that would likely be expected at the proposed location. The nearest well completion report to the proposed diversion point is located in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 19-T113N-R50W, approximately one half mile southwest of the proposed retention pond locations, which indicates the driller encountered yellow clay at approximately 2 feet below land surface to 76 feet and yellow fine sand from 76 feet to 80 feet below grade with a static water level of 20 feet was reported (Water Rights, 2026d). A lithologic log for a test hole completed in the NW corner of Sec 17-T113N-R50W, approximately one mile northeast of the proposed pond locations, indicates the geologist encountered coarse sand and fine gravel from approximately 4 feet below land surface to 10 feet below grade and till from 10 feet to 29 feet with a static water level of 4 feet (SDGS, 2026). A well completion report for a well completed in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec 24-T113N-R51W, approximately one mile southwest, indicates that the driller encountered gravel from approximately land surface to 1 feet, silty clay from 1 feet to 4 feet, fine sand from 4 feet to 8 feet, and coarse gravel from 8 to 208 feet below grade with a static water level of 5 feet (Water Rights, 2026d). A well completion report in the SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec 12-T113N-R51W, approximately one mile northwest, indicated aquifer material is likely 4.5 feet to 53.5 feet below land surface and reported a static water level of 7.5 feet (Water Rights, 2026d). These well completion reports indicate that while static water levels can vary across the aquifer, it is likely that the two retention ponds will be deep enough (proposed depth 25ft) to appropriate water from the Big Sioux: Brookings aquifer. Conversely, the ponds could also lose water to the aquifer during periods of lower water level in the aquifer. The aquifer is expected to be unconfined at the proposed pond sites.

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

Pursuant to SDCL 46-2A-9, "A permit to appropriate water may only be issued if there is reasonable probability that unappropriated water is available for the applicant's proposed use, the proposed diversion can be developed without unlawful impairment of existing domestic water uses and water rights, the proposed use is a beneficial use, and the permit is 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: Brookings aquifer, along the dry draw, and Bullhead Run.

SDCL 46-6-3.1

Pursuant to SDCL 46-6-3.1, “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.” Since the Big Sioux: Brookings is neither older than or stratigraphically lower than the Greenhorn Formation (Fahrenbach and others, 2010), nor is the applicant’s proposed use for use in a water distribution system as defined by SDCL 46-1-6(17), average annual recharge and discharge must be considered.

Water Availability:

Runoff

The NRCS annual surface yield Method A for South Dakota was used to estimate the annual surface yield for the drainage area found for the proposed pond location. This method estimates the volume of runoff which can be expected for a twelve-month period at certain annual exceedance probabilities using isogram map number, size of the contributing watershed, and soil cover index number (or runoff curve number, CN) for the basin’s location (USDA-NRCS, 1984). The volumes found with this method are general estimates over time and are not certain to occur each year. For example, the 80 percent exceedance estimate has an 80 percent chance of being met in any given year.

The drainage area to the proposed location for the two retention ponds was delineated using United States Geological Survey (USGS) StreamStats and was found to be approximately 26 acres (USGS, 2019). The CN is determined using the delineated watershed’s soil and cover conditions which considers the area’s hydrologic soil group, cover type, treatment, and hydrologic conditions. Using the USDA-NRCS Soil Survey (2026), the soils in this delineated area are primarily in hydrologic soil group B. The cover type was primarily pasture and hay with some areas of cultivated crops (USGS, 2024). The higher the CN, the greater the runoff that occurs. Pasture and hay covered lands have a lower CN than land covered by cultivated crops (that are assumed to have no conservation treatment), and a weighted average resulted in a CN of around 68. A CN of 70 was used as it was the minimum CN provided in the NRCS annual surface yield method. The isogram number for the area is 2.5. Combining all of this information gave the annual surface yields at the percent chances presented in Table 1 (USDA-NRCS, 1984).

Table 1: Annual surface yields found for select percent chances of occurrence (USDA-NRCS, 1984).

Percent Chance of Occurrence	Total Annual Runoff (acre-inches per acre)	Total Annual Runoff (acre-feet)
80	0.17	0.37
50	0.5	1.08
20	1.5	3.25
10	2.7	5.85

Water loss from the retention ponds is expected to occur through evaporation and seepage to the aquifer when water levels in the ponds are higher than the water levels in the aquifer. Estimated loss due to seepage is not available since this is not known until after years of operation and is typically not measured. The retention ponds will have a combined surface area of 150' x 50', according to the application, which results in a combined surface area of 0.17 acres. Poudyal (2006) estimated pan evaporation rates for South Dakota and found the pan evaporation to lake evaporation coefficient to be 0.7. An estimated value of 49 inches of evaporation per year multiplied by the pan evaporation coefficient results in an estimated 34.3 inches of free water surface evaporation per year (Poudyal, 2006). The site will gain water through precipitation. Average annual precipitation in Deuel County, SD from 1960 to 2026 is 25.4 inches per year (NOAA, 2026). Therefore, net loss between precipitation and evaporation is likely to be 8.9 inches per year or 0.13 acre-feet of loss per year. Net loss compared to annual surface yield indicates that it is likely sufficient runoff occurs to offset natural losses from evaporation. Additional water to maintain water levels will be dependent on the amount of water recycled after use in the wash plant by the applicant.

Ultimately, runoff from the proposed collection area is likely to be variable. Surface runoff alone has less than a 10 percent chance per year of being able to support this application. Since the drainage area is very small, climatic conditions will heavily dictate if water is available from surface water runoff. Water availability will be dependent on the amount and intensity of rainfall events in any given year. During drier years or in periods of drought, it is possible there will be no surface runoff and pond water levels will be dependent on water levels in the aquifer and recycled water from wash plant operations.

Hydrologic Budget

Recharge

Recharge to the Big Sioux: Brookings aquifer is primarily through infiltration of precipitation and runoff, leakage from adjacent till, and seepage from the Big Sioux River (Kume, 1985). Using observation well analysis, Hedges and others (1985) estimated an annual recharge rate to the Big Sioux: Brookings aquifer of approximately 4.0 inches per year. With the aquifer extent

estimated by Stonesifer (2013), this would result in an estimated annual recharge rate of approximately 107,700 acre-feet per year.

Discharge

Discharge from the Big Sioux: Brookings aquifer is primarily seepage to the Big Sioux River and other hydrologically connected surface water features, evapotranspiration, and well withdrawals (Kume, 1985; Water Rights, 2026d). Currently, there are 259 water rights/permits authorized to appropriate water from Big Sioux: Brookings aquifer and fifteen future use permits reserving water from the aquifer (Water Rights, 2026c). The fifteen future use permits are summarized below in Table 2. In order to estimate average annual withdrawals, future use permits are assumed to be fully developed for a total of 5,811 acre-feet per year (Water Rights, 2026c).

Table 2: Future Use Permits reserving water from the Big Sioux: Brookings aquifer (Water Rights, 2026c)

Permit Holder	Permit Nos.	Total Acre-Feet Reserved
Brookings-Deuel Rural Water System	8893-3	720
City of Castlewood	558A-3	123
Joint Well Field Inc	3982-3, 3982A-3, 3982B-3, 6988-3, 6988A-3, 6988B-3, & 8956-3	1,425
City of Lake Norden	4055-3 & 6261-3	0
Sioux Rural Water System	5094-3 & 7853-3	2,400
City of Volga	5872-3 & 6259-3	1,143
Total:		5,811

There are 213 irrigation water rights/permits authorized to appropriate water from the Big Sioux: Brookings aquifer (Water Rights, 2026c). Irrigation water rights/permits are required to report their annual usage on an irrigation questionnaire since 1979. The estimated average annual withdrawal for the period of record (1979 to 2025) is approximately 9,010 acre-feet per year (Water Rights, 2026a). To reflect current development of irrigation water rights/permits more accurately, the average annual withdrawals from 2016 to 2025 was approximately 9,659 acre-feet and will be used in the determination of the hydrologic budget for the Big Sioux: Brookings aquifer (Water Rights, 2026a). Table 3 lists 212 water rights/permits as reporting in 2025. Water Permit No. 8981-3 was approved in March 2026, which increases the total number of active irrigation water rights/permits in the aquifer from 212 to 213. Water Permit No. 8981-3 is authorized to irrigate 256 acres (Water Rights, 2026c). Crop irrigation in eastern South Dakota on average typically uses less than 10 inches of water per acre per year (Water Rights, 2026c). Therefore, Water Permit No. 8981-3 is estimated to withdraw approximately 213 acre-feet per year (Water Rights, 2026c). Using the average annual withdrawal rates from 2016 to 2025 plus the estimated use from Water Permit No. 8981-3, the average annual withdrawal rate for

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irrigation water rights/permits from the Big Sioux: Brookings aquifer is approximately 9,872 acre-feet per year.

Table 3: Irrigation Questionnaire results showing reported usage from the Big Sioux: Brookings aquifer (Water Rights, 2026a)

Year	Number of Permits	Acre-Feet
1979	184	6,144
1980	187	9,837
1981	198	9,040
1982	155	4,552
1983	161	8,227
1984	188	8,178
1985	181	4,951
1986	179	2,855
1987	171	10,015
1988	167	18,521
1989	166	13,931
1990	175	5,863
1991	165	7,772
1992	162	2,332
1993	162	1,043
1994	160	2,855
1995	161	3,862
1996	154	7,221
1997	153	5,650
1998	157	8,110
1999	155	7,841
2000	153	8,934
2001	149	8,385
2002	149	12,411
2003	149	11,381
2004	156	11,810

Year	Number of Permits	Acre-Feet
2005	159	11,514
2006	161	14,325
2007	164	12,730
2008	166	12,506
2009	174	9,173
2010	172	2,713
2011	174	8,528
2012	177	19,483
2013	198	15,432
2014	212	9,948
2015	209	8,796
2016	210	10,267
2017	209	9,572
2018	211	7,953
2019	211	106
2020	209	10,001
2021	205	17,955
2022	206	14,509
2023	214	15,670
2024	213	8,828
2025	212	1,730
Max	214	19,483
Min	149	106
Avg (1979-2025)	178	9,010
Avg (2016-2025)	210	9,659

There are currently 46 non-irrigation water rights/permits authorized to appropriate water from the Big Sioux: Brookings aquifer. The estimated annual use for each water right/permit was determined by their permitted maximum diversion rate or annual volume. Historically, average water use by non-irrigation appropriations limited by an instantaneous diversion rate have been assumed to be pumping 60% of full time at the full diversion rate. Water rights/permits limited by an annual volume are assumed to withdraw their entire respective annual volume limitation. Nine municipal water rights (Nos. 534A-3, 558B-3, 558D-3, 617-3, 1317-3, 3117-3, 4950-3, 5071-3, and 5645-3) have been found to be connected to rural water systems and likely maintain

their wells for standby purposes only (Drinking Water Program, 2026; Water Rights, 2026c). The average annual water use for these water rights has been estimated to be zero acre-feet per year on Table 4. The total average annual withdraw rate from the Big Sioux: Brookings aquifer by non-irrigation water rights/permits is approximately 14,700 acre-feet per year (Water Rights, 2026c).

Hydrologic Budget Summary

The estimated average annual recharge rate to the Big Sioux: Brookings aquifer is approximately 107,700 acre-feet per year. The estimated average annual withdrawal rate from the Big Sioux: Brookings aquifer is approximately 30,383 acre-feet per year (future use reservations: 5,811 acre-feet/year; irrigation usage: 9,872 acre-feet/year; non-irrigation usage: 14,700 acre-feet/year). Water Permit Application No. 9049-3 would, if approved, authorize withdrawal of up to 10.0 acre-feet of water per year. Considering the high variability of surface water availability and unknown amount of reuse from the wash plant, assuming use of the full appropriation of 10 ac-ft/yr is reasonable. Based on the hydrologic budget, there is a reasonable probability unappropriated water is available from the Big Sioux: Brookings aquifer for the proposed appropriation.

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Table 4: Non-irrigation water rights/permits authorized to withdraw from the Big Sioux: Brookings aquifer listed in order of priority date (Water Rights, 2026c)

Permit No.	Permit Holder	Status	Type of Use	Estimated Usage (acre-feet/year)
1317-3*	City of Estelline	LC	MUN	0
558D-3*	City of Castlewood	LC	MUN	0
557-3	City of Lake Norden	LC	MUN	260.64
534A-3*	City of Clear Lake	LC	MUN	0
617-3*	City of Hayti	LC	MUN	0
558B-3*	City of Castlewood	LC	MUN	0
3117-3*	Town of Hayti	LC	MUN	0
1759-3	City of Volga	LC	MUN	647.26
1956-3A	Neil Hamilton	LC	SHD	17.38
1956-3	H.E. Meyer	LC	SHD	13.03
2033-3	Sioux Rural Water System	LC	RWS	286.7
2111-3	Gopher Sign Co.	LC	COM	17.38
2245B-3	Brookings-Deuel RWS	LC	RWS	270
8185-3	Joint Well Field Inc.	PE	RWS	603
5815-3	City of Lake Norden	LC	MUN	378
6417-3	City of Lake Norden	LC	MUN	630
4830-3	Brookings-Deuel RWS	LC	RWS	868.8
5079-3	Brookings-Deuel-Kingbrook	LC	RWS	1,259.76
5602-3	Brookings-Deuel-Kingbrook	LC	RWS	434
6002-3	Brookings-Deuel-Kingbrook	LC	RWS	362
6718-3	Brookings-Deuel-Kingbrook	LC	RWS	300
4950-3*	City of Bruce	LC	MUN	0
5071-3*	City of Clear Lake	LC	MUN	0
7852A-3	Sioux Rural Water System	PE	RWS	0
7852-3	Sioux Rural Water System	LC	RWS	2,100
5129-3	Technical Ordnance Inc	LC	IND	43.44
5167-3	City of Volga	LC	MUN	195.48
5434-3	Brookings-Deuel-Kingsbrook	LC	RWS	434
5645-3*	City of Estelline	LC	MUN	0
5675-3	Lake Poinsett Estates	LC	COM	39.09
5941-3	City of Volga	LC	MUN	644
6019-3	Dakota Wholesale Bait Inc	LC	COM, DOM	154.21
6146-3	SD Soybean Processors	LC	IND	62.55
6542-3	City of Lake Norden	LC	MUN	262
8640-3	City of Volga	LC	MUN	645
6329-3	Greg Oswald	LC	COM	556.03
6745-3	Kenneth Hansen	LC	COM	47.78
6786-3	David Nystrom	LC	COM	122.5
6785-3	Drumgoon Dairy LP	LC	COM	86.88
8371-3	Joint Well Field Inc	PE	RWS	434
7259-3	Old Apostolic Lutheran Church	LC	GEO	120
7277-3	Old Tree Farms	LC	COM	43.44
7854-3	David Ulvestad	LC	COM	191
8895-3	David Nystrom	PE	COM	117.5
8918-3	Plainview Dairy LLC	PE	COM	550
8922-3	Joint Well Field Inc.	PE	RWS	1500
Total:				14,696.85
*indicates connected to a rural water system				

Observation Wells

Administrative Rule of South Dakota (ARSD) 74:02:05:07 requires that the Water Management Board rely upon the record of observation well measurements in addition to other data to determine 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 climatic conditions and local pumping from the aquifer. Currently, the DNR Water Rights Program monitors 77 observation wells completed into the Big Sioux: Brookings aquifer (Water Rights, 2026b). Hydrograph data points are measurements of the elevation of the static water level in the observation wells. The nearest observation wells to the proposed point of diversion (also shown in Figure 2) are DU-71D (approximately 1.5 miles southeast of the proposed diversion point), HN-75B (approximately 1.25 miles to the southwest), and HN-77H (approximately 1.75 miles to the southwest) (Water Rights, 2026b). The hydrographs for these observation wells are displayed in Figure 1 (Water Rights, 2026b). The hydrographs for these three observation wells were compared to hydrographs of other observation wells completed into the Big Sioux: Brookings aquifer which show a generally similar trend as shown on the hydrographs displayed below (Water Rights, 2026b). The observation wells readings suggest that the aquifer responds well to climatic conditions as water levels are rising during wetter periods and declining during drier periods. Additionally, the water levels in the observation wells indicate that the amount of recharge to and natural discharge from the aquifer exceeds pumping as the water levels return to pre-pumping conditions between irrigation seasons. Aquifer recovery indicates climatic conditions and therefore, the effects of recharge to and natural discharge from the aquifer govern the long-term fluctuations of the water levels in the aquifer rather than the impacts of pumping from the Big Sioux: Brookings aquifer. By recognizing that both recharge to and natural discharge from an aquifer can be captured for pumping and the record of observation wells, there is reasonable probability that unappropriated water is available for this application.

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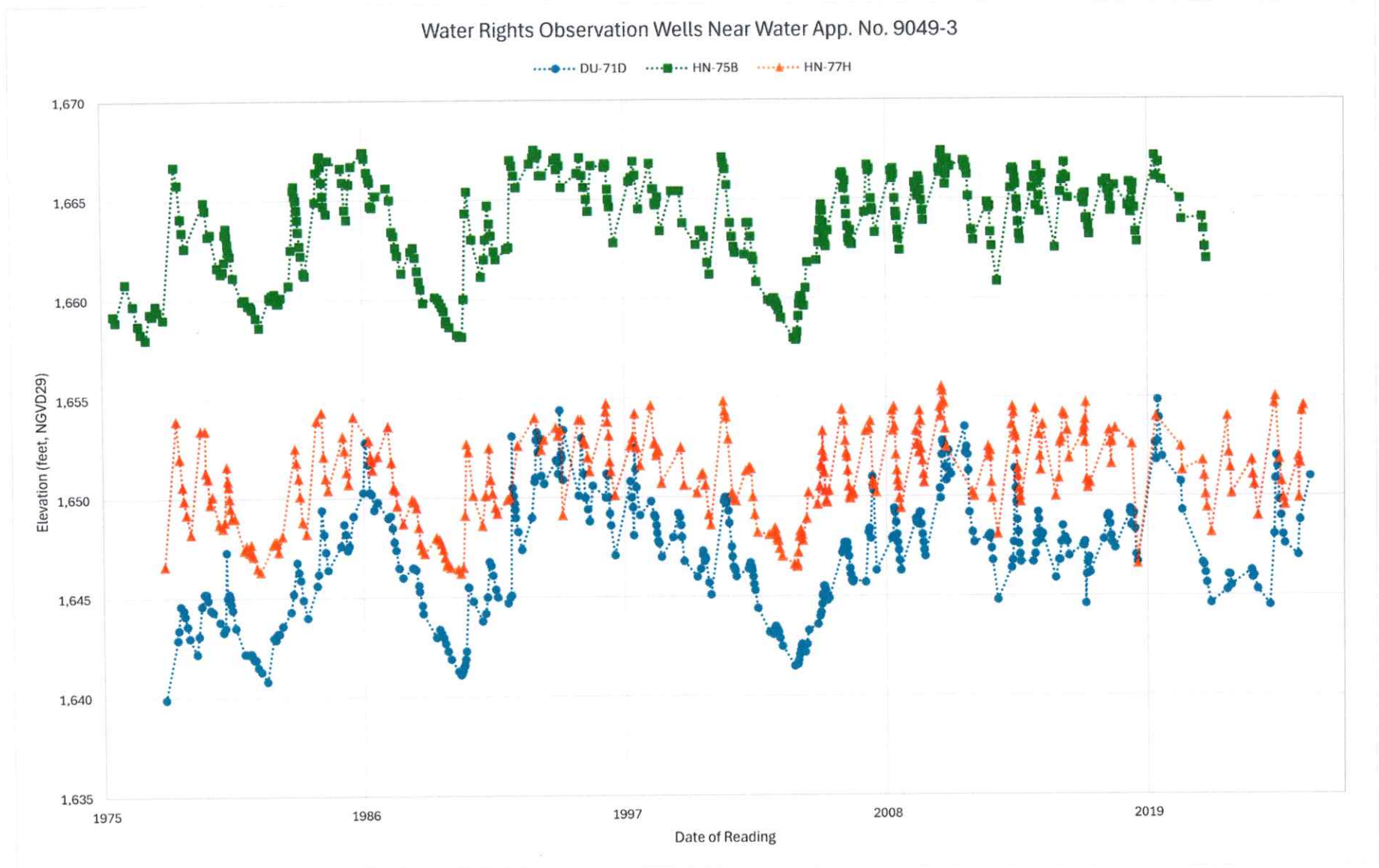


Figure 1: Observation Well Readings near App. No. 9049-3 (Water Rights, 2026b).

Potential for Unlawful Impairment of Existing Water Rights

Currently, there are 259 water rights/permits authorized to appropriate water from Big Sioux: Brookings aquifer with an additional fifteen future use permits reserving water. There are no water rights/permits authorized to withdraw water from Bullhead Run (Water Rights, 2026c). The closest water rights to the proposed diversion point are Water Right No 2157-3 which is located approximately one mile south and Water Right No. 4342-3 which is located approximately 1.1 mile south of the proposed diversion point (Water Rights, 2026c). The location of the proposed ponds and Water Right Nos. 2157-3 and 4342-3 are shown in Figure 2.

Table 5: Existing groundwater water rights/permits shown in Figure 1 (Water Rights, 2026c)

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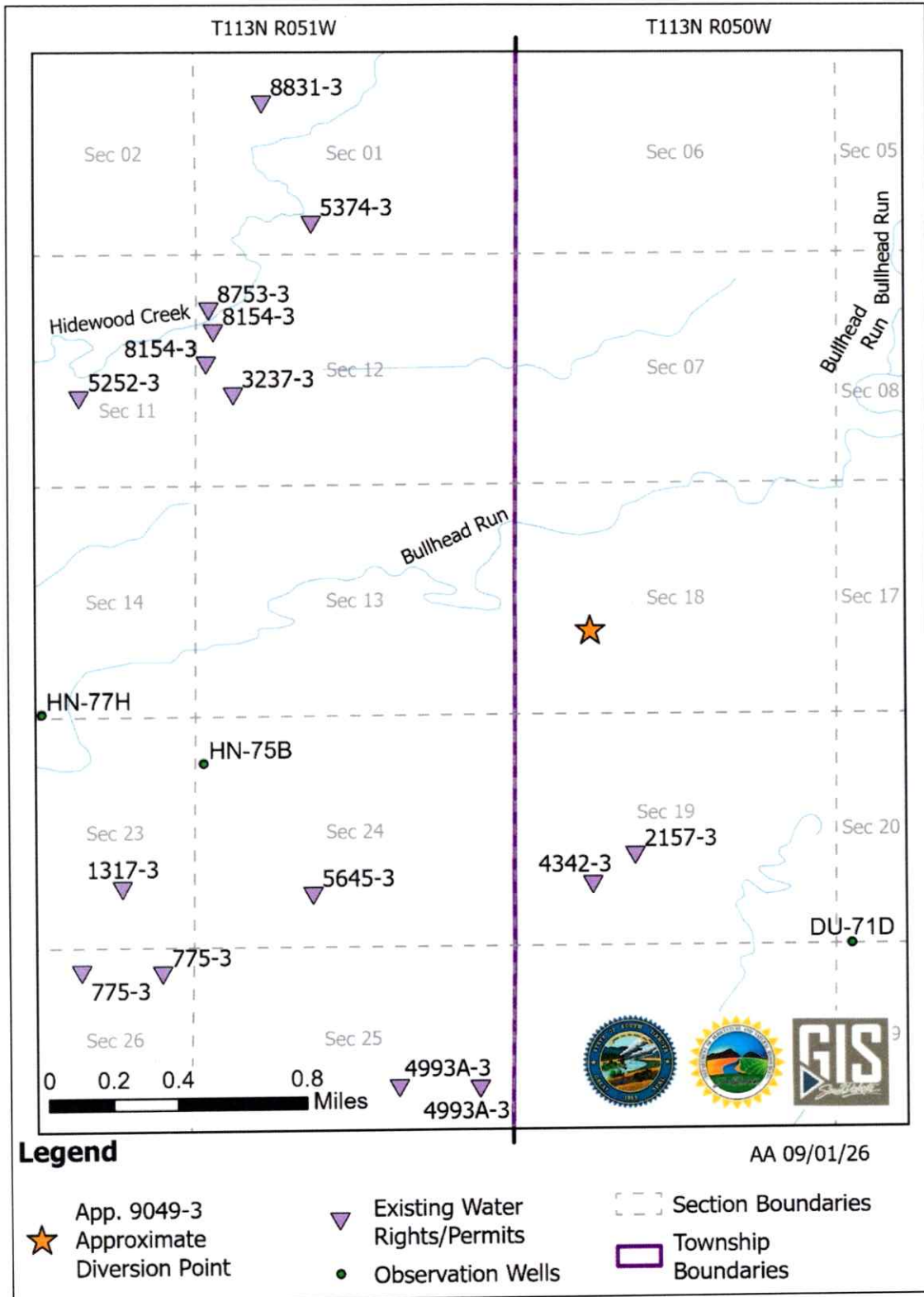


Figure 2: Existing Big Sioux: Brookings aquifer water rights/permits and observation wells near proposed diversion point for Water Permit App. No. 9049-3

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The Big Sioux: Brookings aquifer is expected to be under unconfined conditions at the applicant's proposed diversion point. Drawdown created by pumping a well generally does not extend far from the pumped well in an unconfined aquifer; however, in a confined aquifer, drawdown from pumping could extend a distance from the diversion point. The exact drawdown behavior of a well cannot be known without an aquifer performance test. The Water Management Board has recognized in the past that in order to place water to maximum beneficial use some drawdown may occur. In order to protect domestic users, the Water Management Board defined an "adversely impacted domestic well" in ARSD 74:02:04:20(7) as:

"a well in which the pump intake was set at least 20 feet below the top of the aquifer at the time of construction or, if the aquifer is less than 20 feet thick, is as near to the bottom of the aquifer as is practical and the water level of the aquifer has declined to a level that the pump will no longer deliver sufficient water for the well owner's needs."

There are domestic wells on file with the DNR-Water Rights Program that are completed into the Big Sioux: Brookings aquifer. The closest domestic well on file that is not held by the applicant is located approximately one half mile south of the proposed pond locations based on the legal location provided by the well driller (Water Rights, 2026d). There could potentially be other domestic wells completed into the Big Sioux: Brookings aquifer near the proposed project location that are not on file with the DNR-Water Rights Program that were completed before drillers were required to file a well completion report.

Within approximately one mile of the proposed diversion point of this application, the Big Sioux: Brookings aquifer is estimated to have an average aquifer thickness of 30 feet, but has been noted to have a saturated aquifer thickness ranging from 20 to 60 feet with the depth to the top of aquifer materials at approximately 4 feet below land surface and static water levels ranging from approximately 4 to 20 feet below land surface (SDGS, 2026; Water Rights, 2026d). Any drawdown caused by this proposed diversion is not expected to unlawfully impair nearby adequate wells. An adequate well is defined by ARSD 74:02:04:20(6) as:

"a well constructed or rehabilitated to allow various withdrawal methods to be used, to allow the inlet to the pump to be placed not less than 20 feet into the saturated aquifer or formation material when the well is constructed, or to allow the pump to be placed as near to the bottom of the aquifer as is practical if the aquifer thickness is less than 20 feet."

In 2023, the Water Rights Program received a complaint regarding a well interference issue for a well likely completed in the Big Sioux: Brookings aquifer (Water Rights, 2026e). The filer stated their well was experiencing pressure loss since a new irrigation system had been installed and began running, but stated the loss of pressure may also be due to issues with the well screen plugging up. Water Rights staff stated that if an irrigation schedule between the two permit holders could not be agreed upon, then the junior permit may need to be shut down. No further

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information is provided regarding the outcome of this complaint, but there have been no further issues reported to the Water Rights staff. There are no other complaints in Deuel County regarding the Big Sioux: Brookings aquifer or Bullhead Run.

When considering the generally unconfined nature of the aquifer near the proposed diversion point and the number of water rights/permits completed into the Big Sioux: Brookings in the vicinity of the applicant's proposed diversion point with few complaints, any drawdown created from the Water Permit Application No. 9049-3 is not expected to cause unlawful impairment to existing water right/permit holders or domestic users with adequate wells. It should be noted that a pit/pond, such as the retention ponds this application proposes to use, is not an adequate well as defined in ARSD 74:02:04:20(6) and the diversion for this application would not necessarily be afforded the same protections against drawdown as other appropriative groundwater permits that do have adequate wells.

Conclusions

1. Water Permit Application No. 9049-3 proposes to appropriate up to 10 acre-feet of runoff and incidental groundwater annually at a maximum pump rate of 3.34 cfs for industrial use. The water will be stored in two retention ponds (approximately 25 feet deep) located in the N $\frac{1}{2}$ SW $\frac{1}{4}$ of Section 18 for use in a wash plant located in the SW $\frac{1}{4}$ of Section 18; all T113N-R50W.
2. While there is a less than a 10 percent chance of there being sufficient runoff available to supply the entire appropriation, the reuse of water from the wash plant and incidental groundwater from the Big Sioux: Brookings aquifer means there is reasonable probability that unappropriated water is available from the Big Sioux: Brookings aquifer and Bullhead Run to supply the proposed appropriation.
3. There is reasonable probability the diversion proposed by this application can be met without adversely impacting existing water rights/permits or domestic users with adequate wells.
4. The retention ponds this application proposes to use will not be considered an adequate well as defined in ARSD 74:02:04:20(6) and would not be afforded the same protection against drawdown as water rights/permits or domestic user with adequate wells.

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References

- Drinking Water Program, 2026. Drinking Water Reports, SD DANR-Drinking Water Program, Joe Foss Bldg, Pierre, SD.
- Fahrenbach, M.D., Steece, F.V., Sawyer, J.F., McCormick, K.A., McGillivray, G.L., Schulz, L.D., and Redden, J.A. 2010. South Dakota Stratigraphic Correlation Chart. Oil and Gas Investigations 3. SD DANR-Geological Survey, Vermillion, SD.
- Hedges, L.S., Burch, S.L., Iles, D.L., Barari, R.A., and Schoon, R.A., 1982. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa. Task 1: Bedrock Topography and Distribution, Task 2: Extent of Aquifers, Task 3: Ground-Water Storage, Task 4: Computerized Data Base, Final Report. U.S. Army Corps of Engineers Contract DACW 45-80-C-0185.
- Kume, J. 1985. Water Resources of Deuel and Hamlin Counties, South Dakota. Water-Resources Investigations Report 84-4069. USGS, Huron, South Dakota.
- NOAA. 2026. Climate at a glance. County Time Series. National Centers for Environmental Information (NCEI). <<https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series/SD-039/pcp/1/0/1960-2026>>. Accessed August 14, 2026.
- Poudyal, S. 2006. Annual, Monthly and Daily Pan Evaporation Maps for the State of South Dakota. Master's Thesis, South Dakota State University
- SD DANR Geological Survey Program (SDGS), 2026. "Lithologic Logs," Vermillion, South Dakota, . <<https://usd-asp.usd.edu/SDGS/LithologicLogs>>
- Stonesifer, J.R., 2013. Report to the Chief Engineer on Water Permit Application No. 7854-3, David Ulverstad. SD DANR-Water Rights Program, Joe Foss Building Pierre, SD.
- USDA-NRCS. 1984. Engineering Field Manual - Annual Surface Yield (Method A). US Department of Agriculture (USDA). Natural Resources Conservation Service (NRCS).
- USDA-NRCS. 2026. USA SSURGO- Soil Hydrologic Group. Accessed August 10, 2026.
- U.S. Geological Survey (USGS). 2013. USGS Water Resources of the United States. Water Basic Glossary. Accessed August 11, 2026.

Report on Water Permit Application No. 9049-3

U.S. Geological Survey (USGS). 2019. The StreamStats program, online at <https://streamstats.usgs.gov/ss/>, accessed on August 10, 2026.

U.S. Geological Survey (USGS), 2024, Annual NLCD Collection 1 Science Products: U.S. Geological Survey data release, <https://doi.org/10.5066/P94UXNTS>

Water Rights, 2026a. "1979-2025 Irrigation Summaries by Aquifer", SD DANR-Water Rights Program, Joe Foss Building, Pierre, SD.

Water Rights, 2026b. Observation Well Data, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.

Water Rights, 2026c. Water Right/Permit Files, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.

Water Rights, 2026d. Well Completion Reports, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.

Water Rights, 2026e. "Complaints Database," S.D. Dept. of Ag. And Nat. Resources, Joe Foss Building, Pierre, SD.