

WATER PERMIT NO. 8426-3

Name of Applicant: Dakota Line Dairy

Address: 20803 Road 28, Tulare CA 93274

Phone: 559 799-0772

Amount of Water Claimed: 0.67 cfs (300 AF)

Total Acres: NA

Source of Water Supply: groundwater ^{three} ~~two~~ wells

Water to be used for: commercial

County: Minnehaha

Type of Waste Disposal System:

Location:

PRIORITY

Date Received: 3-23-20

Application/License Fee: \$ 1,150.00

Corrected Application Received:

Period of Annual Use: Jan 1 – Dec 31

Remarks: dairy cow confinement operation

Diversion Point: ^{S 1/2} SW 1/4 SE 1/4 Sec 20-T102N-
R52W

Facility located: SE 1/4 Sec 20-T102N-R52W

Depth of Well: 316 feet

Well Driller:

Remarks:

Type of Map: aerial

Prepared by:

Reviewed and the Number Assigned on: 3-23-20

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

			20		
			⊗		

**SOUTH DAKOTA
WATER PERMIT NO. 8426-3**

Date of first receipt of application March 23, 2020.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8426-3 to Dakota Line Dairy, c/o David Lemstra, 20803 Road 28, Tulare CA 93274 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 8426-3 appropriates 300 acre-feet of water annually at a maximum pump rate of 0.67 cubic feet of water per second from three wells to be completed into the Sioux Quartzite Aquifer (650-750 feet deep) located in the S 1/2 SE 1/4 Section 20 for commercial use in a dairy confinement operation located in the SE 1/4 Section 20; all in T102N-R52W. This site is located approximately 1 1/2 miles southwest of Humboldt SD.

An additional well, known as Well No. 1, was approved pursuant to SDCL 46-5-13.1 on November 23, 2020. This well which is also located in the S 1/2 SE 1/4 Section 20-T102N-R52W and for purposes of water management is the Sioux Quartzite aquifer. See report on the additional diversion point dated November 23, 2020, in the administrative record.

2. The water appropriated shall be used for the purpose of commercial use and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 8426-3 is November 2, 2020.
5. The date from which applicant may claim right is March 23, 2020.
6. One-fifth of the construction is to be completed on or before May 2, 2023.
7. All construction is to be completed on or before November 2, 2025.
8. Water is to be put to beneficial use on or before November 2, 2029.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. The wells approved under Water Permit No. 8426-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under these Permits shall control withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.

(continued)

2. Water Permit No. 8426-3 is subject to compliance with requirements of the Department's Water Pollution Control Permit issued pursuant to SDCL 34A-2-36 or 34A-2-36.2 or 34A-2-112 or 34A-2-124 for concentrated animal feeding operations.
3. Water Permit No. 8426-3 is subject to compliance with all existing and applicable Water Management Board Rules including but not limited to:

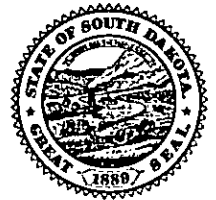
Chapter 74:54:01 Ground Water Quality Standards,
Chapter 74:54:02 Ground Water Discharge Permit,
Chapter 74:51:01 Surface Water Quality Standards,
Chapter 74:51:02 Uses Assigned to Lakes,
Chapter 74:51:03 Uses Assigned to Streams, and
Chapter 74:52:01 through 74:52:11 Surface Water Discharge Provisions

4. The Permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Sioux Quartzite aquifer.
5. Water Permit No. 8426-3 authorizes a total annual diversion of 300 acre feet of water from the Sioux Quartzite aquifer.

WATER MANAGEMENT BOARD

By: *Eric Gronlund*
Eric Gronlund, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

DEC 07 2020
date



PAID

MAR 23 2020

Ck# 16207

RECEIVED

MAR 23 2020

WATER RIGHTS

Mail to: DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>8426-3</u>	(office use only) Hydrologic Unit <u>10170203</u>
	Basin <u>Sioux River</u>	
	Newspaper <u>Argus Leader</u>	

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use(s) of water:

☐ Municipal	☐ Water Distribution System	☐ Recreational	☐ Institutional
☐ Rural Water System	☒ Commercial	☐ Fish & Wildlife	☐ Geothermal
☒ Domestic (over 18 gpm)	☐ Industrial	☐ Other	

Type of Application:
(check one)

☒ New	☐ Vested Right (Use predates Mar 2, 1955)	☐ Future Use Reservation
☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____		
☐ Amendment/Correction to Permit No. _____		

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.)

1. Name to Appear on Water Permit Dakota Line Dairy

Mailing Address 20803 Road 28 Tulare CA 93274
 (Address) (City) (State) (Zip Code)

Phone 559-799-0772 Mobile _____ Email dmlenstra@hotmail.com

2. Amount of water claimed 0.67 *CFS or 300 **GPM and 300 ***AF or _____ Gallons
 Flow rate and volume are both required. (*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use)

3. Source of water supply Cretaceous Undifferentiated aquifer Sioux Quartzite

4. Location of point of diversion 3 wells in SW 1/4 of the SE 1/4, Sec 20, T-102-N, R-52-W County Minnehaha
 (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)

If not a public water supply (e.g. municipal), will water be used outside of the area described above? ☒ Yes ☐ No

If "Yes," where will water be used? SE 1/4, Sec. 20, T-102-N, R-52-W

(example - NW1/4 section 12-T104N-R53W)

5. County or counties where water will be used Minnehaha

6. Annual period during which water is to be used Continuously Jan 1 - Dec 31

7. Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

Proposed 4,000 head mature dairy cow confinement operation.

I, David Lemstra, the applicant, certify under
 Name of Person Title (if applicable)

penalty of perjury that I have read this application, examined the attached map, and that the matters stated are true. I further certify, if acting on behalf of an entity or individual other than myself, that I am authorized to submit this application.

Supplemental Information

(type or print)

1. Well Information (check one or both as applicable) ☒ Drilling new well(s) ☐ Using existing well(s)

a) If new wells, how many 23 Have test holes been drilled ☒ Yes ☐ No Drilled by Dave Putzke Well Drilling
(if yes, please provide copies of logs)

b) If existing wells, how many Provide copy of log(s), if available. Drilled by

For either Existing or Proposed Wells:

c) Well Depth (required) 316 ⁶⁵⁰⁻⁷⁵⁰ Depth to Top of Water Bearing Material 290' Depth to Water from Surface 150'

d) Distance to nearest domestic well on applicant's property none Property owned by others 150'

2. Wastewater Disposal System Information

a) Type of System (i.e. septic tank, drain field)

b) System Capacity (gallons) Year Constructed

c) Connected to the City of Sanitary System

3. Dugout Information

a) Surface Dimensions Depth

b) Depth to water (ground surface to water level)

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:

b) Freeboard

c) Crest Width

Crest Length

d) Height

e) Primary Outlet Capacity

If pipe, diameter

f) Secondary Spillway Capacity

Spillway Width

g) X & Y Slope (e.g. 3 to 1 is a typical slope)

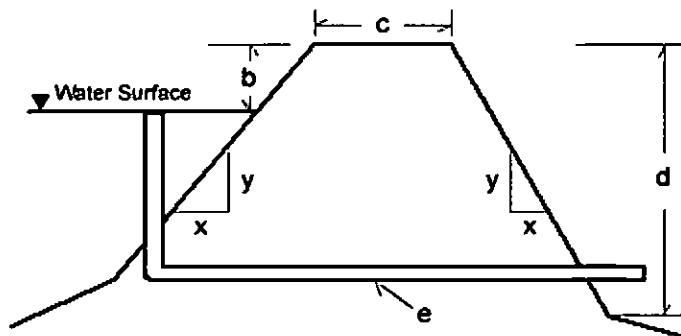
Upstream

Downstream

h) Surface Area of Impoundment

i) Storage Acre Feet

j) Drainage Area Above Dam Acres



Additional Diversion Point

NAME: Dakota Line Dairy

DATE: 11/23/2020

COUNTY: Minnehaha

General Description of Authorized Project

The permit holder is authorized to put to beneficial use a maximum of 300 acre-feet of water annually at a maximum instantaneous diversion rate of 0.67 cubic feet of water per second from three wells completed into the Sioux Quartzite located in the S ½ SE ¼ Section 20 in T102N-R52W for commercial use in a dairy confinement operation located in the SE ¼ Section 20 in T102N-R52W.

Authority

Pursuant to South Dakota Codified Law (SDCL) 46-5-13.1, the location of a diversion point may be changed, or additional diversion points may be approved without application or publication pursuant to SDCL 46-2A-4 provided the additional point is from the same water source and no additional water is appropriated and the potential for interference with other existing diversions is not increased.

Background and Discussion

The application for Water Permit No. 8426-3 was submitted in March of 2020 with the well completion report for Well 1 (see Figure 1 of the attached letter from LRE Water). The well completion report for Well 1 indicated that the Well 1 was completed into a "sandstone" from 290 to 316 feet below grade. The initial report to the Chief Engineer of the Water Rights Program identified the "sandstone" as most likely to be an undifferentiated Cretaceous aged sandstone aquifer based on the available information. The report also acknowledged potential for the "sandstone" to be Sioux Quartzite Wash, weathered Sioux Quartzite, or Split Rock Creek Formation and determined there was not sufficient information available to assess water availability or potential for unlawful impacts to existing users. The applicant then asked the application to be held in abeyance until additional information was gathered and retained LRE Water and a geologist familiar with the area to do further study of the water source. After additional exploratory drilling, the applicant opted to change water source to the Sioux Quartzite, Wells 2, 3, and 4 where completed into the Sioux Quartzite, and Water Permit No. 8426-3 was issued to Dakota Line Dairy authorizing diversions from Wells 2, 3, and 4. Additionally, test pumping was done to further assess the water source for Well 1.

Attached is the letter from LRE Water containing the information and conclusions of the additional assessment of Well 1. The additional assessment of Well 1 primarily consisted of a review of the available hydrogeologic information of the area, initial test pumping of the Sioux Quartzite wells on site, and aquifer performance test. The aquifer performance test consisted of pumping Well 4 while monitoring Wells 1, 2, and 3 by both manual and data-logging pressure transducers. The pumping portion of the test was originally planned for 48 hours but the pump failed after 25.8 hours of pumping. Although shorter than planned, LRE Water was able to analyze the test data and concluded that it was a clean test. After reviewing the attached letter from LRE Water and the included aquifer performance test data, the aquifer performance test was sufficient to draw a reasonably probable conclusion as to the water source of Well 1 (the "sandstone" well). Based the high correlation of the distance-drawdown for Well 1 to Well 2 and Well 3, the best currently available information indicates a reasonable probability that, for the purposes of water management by the Water Rights Program, the water source of Well 1 is the Sioux Quartzite aquifer.

The nearest water rights/permits authorized to appropriate water from the Sioux Quartzite is Water Right No. 4275-3 for the Town of Humboldt located approximately 2.1 miles to the north (Water Rights, 2020b). The Town of Humboldt purchases their water from Minnehaha Community Water Corp (Drinking Water, 2020). A review of the well completion reports on file with the South Dakota Water Rights Program indicate the nearest domestic well on file with the South Dakota Water Rights Program readily identifiable as completed into the Sioux Quartzite is located approximately 3.9 miles to the northwest of the Well 1 (Water Rights, 2020c). In examining the aerial imagery there are several farm sites closer to the Well 1 that could potentially have wells completed into the Sioux Quartzite without a well completion report on file (Water Rights, 2020c). But given the availability of rural water in the area, it is possible that many domestic users in the area are connected to rural water for their household needs (Drinking Water, 2020).

The well completion reports indicate the Sioux Quartzite is under confined conditions at the well sites for this application. For the aquifer performance test, Well 4 was pumped at 0.46 cfs (209 gpm) for 25.8 hours continuously, although as the pump started to fail, there may have been some loss of capacity. The maximum drawdowns at the well locations were Well 4 at 80.1 feet, Well 1 at 6.3 feet, Well 2 at 3.2 ft, and Well 3 at 3.2 feet. Based on the well completion report for Well 4, even with 80.1 feet of drawdown in the pumping well the water level was still above the top of the Sioux Quartzite. The well completion reports for the wells indicated there is approximately 124 to 157 feet of artesian head pressure in the Sioux Quartzite at the well sites for this application. When considering impacts to changes to artesian head pressure as a result of appropriative pumping in the case of Water Permit Application No. 2313-2 for the Coca-Cola Bottling Company of the Black Hills, the Water Management Board adopted findings noting if increased costs or decreased production as a result of the impacts of legitimate users on artesian head pressure is considered an adverse impact, it would conflict with SDCL 46-1-4 (Water Rights, 1995). SDCL 46-1-4 requires the water resources of the state be put to beneficial use to the maximum extent of which they are capable (Water Rights, 1995). Additionally, since this aquifer is primarily dominated by secondary porosity, any draw down as the result of pumping will also be governed by the extent and interconnectivity of secondary fractures in the area.

Administrative Rule of South Dakota (ARSD) 74:02:04:20(7) defines an adversely impacted domestic well 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.” While in most aquifers 20 feet is an adequate depth of water for prior users and domestic wells, in the Sioux Quartzite 20 feet below the top of the aquifer is seldom a sufficient depth for a well to be a dependable water supply. To further complicate the consideration of adverse impact in the Sioux Quartzite, maximum drawdown that could result from pumping a large capacity well is limited by well depth rather than aquifer thickness. Therefore, provided that a well is adequate as defined by ARSD 74:02:04:20(6), the assessment of well interference being an adverse impact would also have to consider well depth.

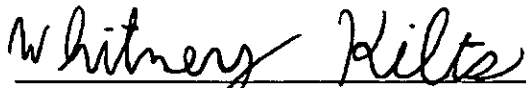
Minimum well depth is not regulated; however, ARSD 74:02:04:60 specifies requirements for the installation of pumps in wells. This rule requires that the depth of the pump placement be determined by dividing the specific capacity of the well into the required yield and adding at least 10 additional feet. Therefore, the minimum depth of the pump placement as determined by ARSD 74:02:04:60 could be used as a quasi-minimum well depth standard. If well depth allowed for pump placement per ARSD 74:02:04:60 and well interference requires the well be deepened, that interference could be considered an adverse impact. However, if the affected well is not deep enough to allow compliance with the requirements of ARSD 74:02:04:60, interference that would require

deepening of the well may not be considered an adverse impact. Additionally, the use of the pump placement standard does not fix the pump placement to the static water level or the specific capacity of the well at the time of construction. Instead the pump setting and well depth would need to allow for climatic fluctuations of the static water level and/or a change in specific capacity of the well. Ultimately, given the information and discussion presented, and given the close proximity of Well 1 to Wells 2, 3, and 4 (see Figure 1 of the attached letter from LRE Water), no increase in diversion rate is being requested, and no additional water is being appropriated, no increase in the potential for unlawful interference with other existing diversions is expected with approving Well 1 as an additional diversion point for Water Permit No. 8426-3.

Furthermore, allowing the permit holder to add Well 1 as an additional diversion point may even decrease the potential for unlawful interference with other existing diversions. This is due to Well 1 being shallower than Wells 2, 3, and 4, so Well 1 would be the first well likely to be negatively impacted by pumping from the four wells (should impacts occur) and, given the distances involved, would be likely to be negatively impacted by pumping (should impacts occur) before other existing diversions experienced unlawful impairment. So, since it is in the permit holder's best interest to manage pumping from their wells so their wells do not impact each other, the addition of a well that is likely to show impacts from pumping (should impacts occur) before the three currently authorized wells might decrease the potential for unlawful interference with other existing diversions.

Recommended Action

Based on the above discussion and criteria set forth in SDCL 46-5-13.1, it is recommended that Well 1 be approved as an additional diversion point for Water Permit Application No. 8426-3.



Whitney Kilts, Natural Resources Engineer
Water Rights Program

The Chief Engineer makes a finding pursuant SDCL 46-5-13.1 and ARSD 74:02:01:14.01 that:

This additional diversion point does not increase the potential for adverse effects to existing diversions.



Eric Gronlund, Chief Engineer
Water Rights Program

References

Drinking Water Program. 2020. Drinking Water System Information. SD DENR-Drinking Water Program Online Database. Accessed Nov. 13, 2020. <<https://denr.sd.gov/des/dw/sysinfo.aspx>>.

Water Rights. 2020b. Water Right/Permit Files. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2020c. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

SOUTH DAKOTA WATER WELL COMPLETION REPORT

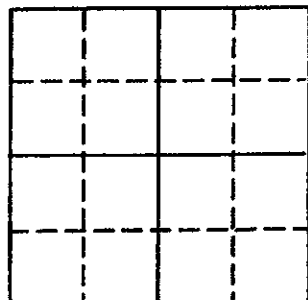
11-02

Location See Attached 1/4 1/4 Sec Twp Rg

County

minnehaha

North



Please mark well location with an "X"

Well completion Date

2-10-20

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? 2000 ft. from Feed lot (Identify source)

PROPOSED USE:

☒ Domestic/Stock ☐ Municipal ☒ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring
 well

METHOD OF DRILLING:

Rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>SDR17</u> LB/FT	<u>6 1/4</u> IN	<u>0</u> FT	<u>316</u> FT	<u>10</u> IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Grout DF</u>	<u>30</u>	Lb/gal	<u>0</u> FT	<u>285</u> FT
		Lb/gal	FT	FT

Describe grouting procedure Run 1" trimline line Top Per rock
Pumped w/ grout machine

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 6 Inches Length 20 Feet
 Material 55 S screen Johnson
 Slot Size 25 Set From 296 Feet to 316 Feet
 Other information Gravel Pack w/ 30 pack

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? 5 gallons of chlorine
☐ No, Why Not? Pumped & Pellets
w/ Per rock

Lab sample sent to for water quality analysis

Well Owner: David & Marie Lemstra
 Business Name: Dakota Line Dairy
 Address: 20803 Road 28
 City, State, Zip: Tulare, CA 93274

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Top Soil</u>	<u>0</u>	<u>3</u>
<u>Yellow clay</u>	<u>3</u>	<u>30</u>
<u>Blue clay</u>	<u>30</u>	<u>240</u>
<u>Chalk</u>	<u>240</u>	<u>250</u>
<u>Blue clay</u>	<u>250</u>	<u>290</u>
<u>Sandstone</u>	<u>290</u>	<u>316</u>
<u>Granite</u>	<u>316</u>	

STATIC WATER LEVEL

152

FEET

If flowing: closed in pressure

PSI

GPM flow through inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:

☐ Bailed

☐ Other:

Pumping Level Below Land Surface

260 Ft. After 24 Hrs. pumped 110 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

This well was drilled under license # 439

And this report is true and accurate.

Drilling firm: Dave Putzke well Drilling & repair, INC

Signature of License Representative:

RECEIVED

Signature of Well Owner or Equitable Property Holder:

FEB 20 2020

WATER RIGHTS PROGRAM

Date:

523 E Capitol Ave. Pierre SD 57501

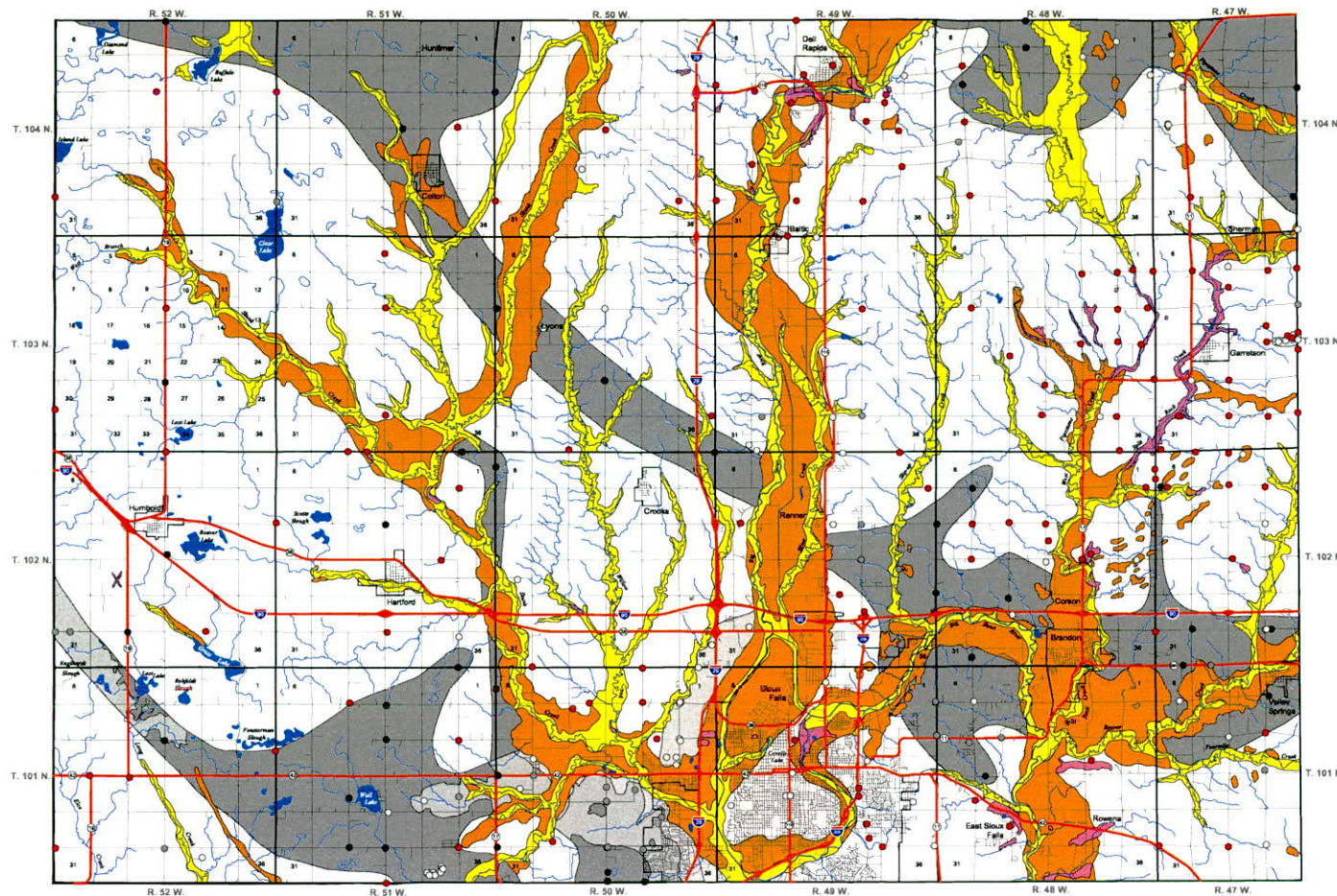
Please return **WHITE COPY** to: DENR Water Rights

First Occurrence of Aquifer Materials in Minnehaha County, South Dakota

Department of Environment and Natural Resources
Division of Financial and Technical Assistance
Geological Survey
Aquifer Materials Map 9
Dennis W. Tomhave, 2001

State of South Dakota
William J. Jackson, Governor

South Dakota Geological Survey
Dennis W. Tomhave, State Geologist



Explanation

This map is intended for use as a tool to aid in identifying areas underlain by aquifer material. The aquifer materials shown on this map are categorized below. This map does not show individual aquifers. There may be more than one type of aquifer material present in an area. However, only the aquifer material that would be first encountered is shown. Within the boundaries of any given map unit, there may be localized areas where aquifer material is absent. The thickness and permeability of aquifer material may vary significantly. Also, no attempt was made to distinguish between saturated and unsaturated material. Therefore, not all of the areas defined on this map may be an aquifer. Site-specific information should always be examined when making land management or water development decisions.

- Alluvium:** Consists of clay and silt with minor amounts of sand and gravel that, in general, directly overlies a major aquifer.
- Sand and Gravel:** First occurrence is generally at land surface.
- Sand and Gravel:** First occurrence is generally below land surface. May not be uniform in depth and thickness and may be discontinuous in lateral extent.
- Sioux Quartzite:** First occurrence is generally at land surface. The Sioux Quartzite consists of predominantly orthoquartzite with minor conglomerate, sandstone, and mudstone (Pipewrench) layers. The orthoquartzite portion of the formation, typically pale red in color, consists predominantly of fine grains of quartz sand cemented together by silica. The Sioux Quartzite is broken into blocks by well-developed fracturing, both vertical and horizontal. The Sioux Quartzite is generally not an aquifer material, however, locally it yields water from fractures or porous zones.

First occurrence is generally less than or equal to 50 feet below land surface

First occurrence is generally greater than 50 feet and less than or equal to 100 feet below land surface

First occurrence is generally greater than 100 feet below land surface

Sand and Gravel: May not be uniform in depth and thickness and may be discontinuous in lateral extent.

Sand and Gravel: May not be uniform in depth and thickness and may be discontinuous in lateral extent. Minor occurrences of aquifer material may be encountered less than 100 feet below land surface.

Area where continuous aquifer material has not been mapped between the land surface and Sioux Quartzite. Sioux Quartzite occurs from near land surface to greater than 300 feet below land surface. The Sioux Quartzite is generally not an aquifer material, however, locally it yields water from fractures or porous zones. Within this area aquifer material may exist. Where data are available, it is indicated on the map and described below.

● Data point where no aquifer material greater than 5 feet in thickness was encountered from land surface to the Sioux Quartzite.

○ Data point where the first occurrence of aquifer material, 10 feet or greater in thickness, was encountered from 0 through 50 feet below land surface.

⊙ Data point where the first occurrence of aquifer material, 10 feet or greater in thickness, was encountered from 51 through 100 feet below land surface.

● Data point where the first occurrence of aquifer material, 10 feet or greater in thickness, was encountered greater than 100 feet below land surface.

- Major highway
- Road
- Township boundary
- River or stream
- Lake
- Slough or intermittent lake

For township section numbering system, see T. 103 N., R. 52 W.

This map was developed from lithologic logs and published reports. The major sources of information were:

Filipponi, D., and Ponce, S.F., 2001, *The Wall Lake aquifer study*, South Dakota Geological Survey Open File Report 88-UR, 99 p.

Longdon, R., and Nichols, C.A., 1992, *Water resources of Minnehaha County, South Dakota*, U.S. Geological Survey Water Resources Investigations Report 91-4101, 86 p.

Ponce, S.F., 1997, *Summary of the Split Rock Creek aquifer study*, South Dakota Geological Survey Open File Report 87-UR, 109 p.

South Dakota Geological Survey, Lithologic logs database.

Tomhave, D.W., 1994, *Geology of Minnehaha County, South Dakota*, South Dakota Geological Survey Bulletin 37, 51 p.

The Geological Survey, Department of Environment and Natural Resources, engages in an ongoing data collection and interpretation process. An outcome of that process is to reflect those interpretations on maps such as this one. Reasonable efforts have been made to ensure that this map accurately reflects the source data used in its preparation. This map is data specific. As additional data become available, geologic interpretation may be revised and the map may be updated by the Geological Survey. This map should not be enlarged or otherwise used in an attempt to interpret more detail than can be seen at the 1:100,000 scale.

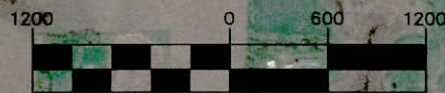
Publication Date: June 29, 2001



Index map of South Dakota showing the location of Minnehaha County



GRAPHIC SCALE



(IN FEET)

1 inch = 1200ft.

ProAg Engineering, Inc.
77402 US HWY 71, PO BOX 181
Jackson, MN 56143
(507) 849-7200

DAKOTA LINE DAIRY
PROPOSED DAIRY OPERATION
SE 1/4, SECTION 20, T102N, R52W
MINNEHAHA COUNTY, SOUTH DAKOTA

Date 3/4/2020
Drawn A.J.R.

Checked By N.J.R.

Project No. 19-086

SHEET 1/1

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date March 25, 2020

RECEIVED OF Lemstra Cattle Co LLC 20803 20803 Road 28 Tulare CA 93274

(Dakota Line Dairy)

The following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. <u>8426-3</u> to Appropriate Water, to construct and to put water to beneficial use	\$950.00
Fee for Application for Permit No. _____ to Appropriate Water for Future use	\$
Fee to retain Future Use Permit No. _____ after period of seven years.	\$
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>8426-3</u>	\$200.00
Fee for Filing Transfer Form _____	\$
Fee for _____	\$
Fee for Issuing New Well Driller's License No. _____	\$
Fee for Renewal of Well Driller's License No. _____	\$
Fee for Issuing Well Pump Installer's License No. _____	\$
Fee for Renewal of Well Pump Installer's License No. _____	\$
(Any Other Work Provided by Law)	
TOTAL	\$1150.00

By Eric Gronlund
Chief Engineer

DM

Schlaak, Karen

From: Schlaak, Karen
Sent: Tuesday, October 13, 2020 3:48 PM
To: 'dmlemstra@hotmail.com'
Cc: 'nic@proageng.com'; 'paulk@a1developmentsolutions.com'
Subject: Water Permit Application No. 8426-3, Dakota Line Dairy
Attachments: 0081.pdf

Attached is a copy of the report, chief engineer recommendation and information regarding the public notice for your water permit application. As stated in the letter, please contact the Argus Leader as soon as possible to authorize publication on October 22, 2020 and arrange for payment. This information is being mailed to you today.

Karen Schlaak
Water Rights Program
(605) 773-3352



STATE OF SOUTH DAKOTA

Doing Business As (DBA) Fictitious Business Name Registration

Dakota Line Dairy

ID: UB176114

The address where the main office of the above listed business is to be maintained:

Physical Address:
**25971 456TH AVENUE
HUMBOLT, SD 57035**

Mailing Address:
**20803 ROAD 28
TULARE, CA 93274**

The owners of the above listed business are:

Name	Address
David Lemstra	Physical: 20803 Road 28, Tulare, SD 93274, USA Mailing: 20803 Road 28, Tulare, SD 93274, USA
Maartje Lemstra	Physical: 20803 Road 28, Tulare, CA 93274, USA Mailing: 20803 Road 28, Tulare, CA 93274, USA

The DBA/Fictitious Business Name registered above has a filing date of January 21, 2020, and is effective for a term of 5 years and will expire on January 21, 2025.

Steve Barnett

SD Secretary of State





DL178277

B0131-5773 03/04/2020 11:42AM Rec'd by SD SOS

ARTICLES OF ORGANIZATION

Secretary of State
500 E. Capitol Ave
Pierre, SD 57501-5070
(605) 773-4845

DOMESTIC LIMITED LIABILITY COMPANY
SDCL 47-34A-203, 212

Please Type or Print Clearly in Ink
Please submit one Original
Make payable to the SECRETARY OF STATE

Filing Fee: \$150

Total Fee: \$150

Article I

The name of the Company: **Dakota Line Dairy, LLC**

Article II

The address of the initial designated office in or out of the State of South Dakota where the company conducts its business:

Actual Street Address
**25971 456TH AVENUE
HUMBOLT, SD 57035**

Mailing Address
**20803 ROAD 28
TULARE, CA 93274**

Article III

SDCL 59-11-6

The South Dakota Registered Agent's Name:

South Dakota law permits the registered agent to be either (a) a noncommercial registered agent or (b) a commercial registered agent.

(a) The South Dakota Noncommercial Registered Agent's name

Name **Paul Kostboth**

Actual Street Address in this State
**101 N MAIN AVENUE SUITE 321
SIOUX FALLS, SD 57104**

Mailing Address in this State
**101 N MAIN AVENUE SUITE 321
SIOUX FALLS, SD 57104**

Article IV

The name and address of each organizer

Name	Address
David Lemstra	20803 Road 28, Tulare, CA 93274
Maartje Lemstra	20803 Road 28, Tulare, CA 93274

Article V

The duration of the company if other than perpetual is: **Perpetual**

If the document is not to be effective upon filing by the Secretary of State, the delayed effective date is: _____



Article VI

☒ Member-Managed ☐ Manager-Managed

Article VII

Whether one or more of the members of the company are to be liable for its debts and obligations as set forth under SDCL 47-34A-303(c).

☒ Yes ☐ No

Article VIII

Beneficial Owners (optional): A beneficial owner is a person who has or in some manner controls an equity security. Please consult an attorney for legal advice if you have any questions concerning this entry. Any question under this heading is considered a request for legal advice and the secretary of state's office is, by statute, not permitted, to provide legal advice.

Signature/Authorization

The Articles of Organization must be executed by the organizers.

No person may execute this report knowing it is false in any material respect. Any violation may be subject to a criminal penalty (SDCL 22-39-36).

Paul Kostboth

Paul Kostboth

Registered Agent

03/04/2020

PRINTED NAME

SIGNATURE

TITLE

DATED

ProAg Engineering, Inc.

Nicholaus J. Rowe, P.E.
77402 US Hwy 71
P.O. Box 181
Jackson, MN 56143
507-841-3269
nic@proageng.com

March 9, 2020

RECEIVED

MAR 23 2020

**WATER RIGHTS
PROGRAM**

SD DENR – Water Rights
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501

RE: Dakota Line Dairy
Proposed Dairy Operation
Minnehaha County, South Dakota
ProAg Project #19-086

On behalf of Dakota Line Dairy we are submitting the SD DENR Water Use Permit application for the construction of a proposed 4,000 head mature dairy cow confinement operation located in Turner County. All of the mature dairy cows will be housed and milked in one confinement barn. The Dairy is proposing to drill two wells on cropland located approximately a quarter mile southwest of the dairy. The well water may require extensive treatment. The dairy needs a minimum pumping capacity of 150 gallons per minute but the treatment system could require a maximum rate of up to 300 gallons per minute. The annual volume required for the dairy is 300 acre-feet. The proposed wells will be located in the southwest corner of the SE ¼, Section 20, T-102-N, R-52-W, Minnehaha County. The proposed dairy is located southwest of Humboldt, South Dakota in the SE ¼, Section 20, T-102-N, R-52-W, Minnehaha County. The land for the dairy is currently farmland and the site will require about 60 acres.

Enclosed please find a copy of the following:

1. Completed Water Use Permit for Nonirrigation Uses w/ \$1,150.00 check for permit fee
2. Test Well Log
3. Site Plan Drawing

We trust the above information is adequate for your review and approval. Should you have any questions please do not hesitate to contact me at 507-849-7200.

Respectfully Submitted,



Nicholaus J. Rowe, P.E.
ProAg Engineering, Inc.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
<http://denr.sd.gov>

May 22, 2020

David Lemstra
Dakota Line Dairy
20803 Road 28
Tulare CA 93274

Dear Mr. Lemstra:

Water Permit Application No. 8426-3 for commercial use has been examined and found to comply with the South Dakota Water Laws and applicable rules. The recommendation is for DEFERRAL for further study to allow the applicant to provide additional information necessary to evaluate the application. For your information, a copy of the recommendation of the Chief Engineer and report on the application are enclosed.

Dakota Line Dairy can request to proceed to public notice of the application with a deferral recommendation. It is anticipated the Water Management Board will defer the application until the additional information is submitted for review. After review by the Water Rights Program if the recommendation can be revised to approval, the application will again have to be brought before the Board for final action. The other option is that Dakota Line Dairy can request the application be held while they work towards providing the additional information. Again, if the information gathered from an aquifer performance test provides sufficient information for the recommendation to be revised to approval, public notice can proceed in a manner that if no one petitions in opposition, the water permit can be issued based on the recommendation. Under either scenario, if a petition in opposition to the application is received, there are statutory provisions that can further delay bringing the matter before the Water Management Board.

This letter is being sent to you in order to open a dialogue on how Dakota Line Dairy wants to proceed and for discussion on the requirements for an aquifer performance test. Please feel free to contact us with questions.

Sincerely,


Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
<http://denr.sd.gov>

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 8426-3, Dakota Line Dairy**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 8426-3, Dakota Line Dairy, c/o David Lemstra, 20803 Road 28, Tulare CA 93274.

The Chief Engineer recommends DEFERRAL of Application No. 8426-3 for further study to allow the applicant to provide additional information necessary to adequately determine if there is a reasonable probability that unappropriated water is available for the proposed use and the proposed diversion can be developed without unlawful impairment of existing rights. It is recommended an aquifer performance test be conducted by a qualified individual to evaluate aquifer characteristics. Results of the aquifer performance test may aid in revising the deferral recommendation.

See report on application for additional information.

Eric Gronlund, Chief Engineer
May 22, 2020

NOTE: You are encouraged to review the report prepared by Whitney Kilts carefully. Please pay attention to the "Additional Notes" section of the report regarding an aquifer performance test. From past experience, it has been useful for the applicant or their consultant to consult with the Water Right Program regarding requirements for a suitable aquifer performance test. To discuss the requirements for an aquifer performance test, please contact Adam Mathiowetz and/or Whitney Kilts at (605) 773-3352.

Report to the Chief Engineer
Water Permit Application No. 8426-3
Dakota Line Dairy
May 22, 2020

Water Permit Application No. 8426-3 for the Dakota Line Dairy c/o David Lemstra proposes to put to beneficial use a maximum of 300 acre-feet of water annually at a maximum instantaneous diversion rate of 0.67 cubic feet of water per second (cfs) from two wells (316 feet deep, one existing and one proposed) completed into an undifferentiated sandstone of Cretaceous age. The wells are to be located in the SW ¼ SE ¼ Section 20 in T102N-R52W for commercial use in a dairy confinement operation located in the SE ¼ Section 20 in T102N-R52W. The site is located approximately 1.5 miles south of Humboldt, SD.

Aquifer: an undifferentiated Cretaceous aged sandstone aquifer

Aquifer Discussion

The lithology of the well completion report for this application is shown in Table 1. The driller indicated that the well was screened from 296 to 316 feet below grade into the sandstone 290 to 316 feet below grade. The reported static water at completion (February 10, 2020) was 152 feet below grade. This indicates that at the well location the aquifer is under confined conditions with an artesian head pressure of 138 feet.

Table 1: Geologic Material Description From Well Completion Report Submitted with
Application No. 8426-3

Description	Depth (ft)	Estimated Elevation (ft)	Additional Notes/Comments
top soil	0-3	1610-1607	
yellow clay	3-30	1607-1580	
blue clay	30-240	1580-1370	
chalk	240-250	1370-1360	
blue clay	250-290	1360-1320	
sandstone	290-316	1320-1294	well screen set from 296-316 ft
granite	316	1294	term used locally by drillers for Sioux Quartzite

The complex geology in the vicinity of the well locations for this application make the evaluation of the aquifer for this application problematic. The description of "sandstone" is indicative of the water source this application proposes to utilize being a bedrock aquifer. The portion of the 2004 map showing the configuration of the bedrock surface east of the Missouri River is shown in Figure 1. Tomhave and Schulz (2004) provided the following description of the Cretaceous, undifferentiated, "Black opaline spiculite, gray to black shale, yellow-brown to gray chalk, gray silty clay, and pink quartz-rich sandstone. Includes the Split Rock Creek Formation and other near-shore facies of the Dakota Formation, Graneros Shale, Greenhorn Formation,

Carlile Shale, Niobrara Formation, and Pierre Shale.” It should also be noted that the understanding of the extent of the Cretaceous undifferentiated in South Dakota is still evolving. This is illustrated by Holmes’ (2019) map of first occurrence of aquifer materials in McCook County, which suggests that the Cretaceous, undifferentiated bedrock extends further west than was mapped in Tomhave and Schulz (2004). The map of first occurrence of aquifer materials in McCook County is shown in Figure 2. Of the Cretaceous undifferentiated Holmes (2019) states, “unit is not uniform in depth or thickness, and lithologic types within it are discontinuous.” Holmes (2019) also goes on to note that due to low yield potential the deposits of the Cretaceous undifferentiated are not typically considered aquifer materials, however in some locations the sandstones and chinks for the unit can yield enough water for use in domestic and stock wells.

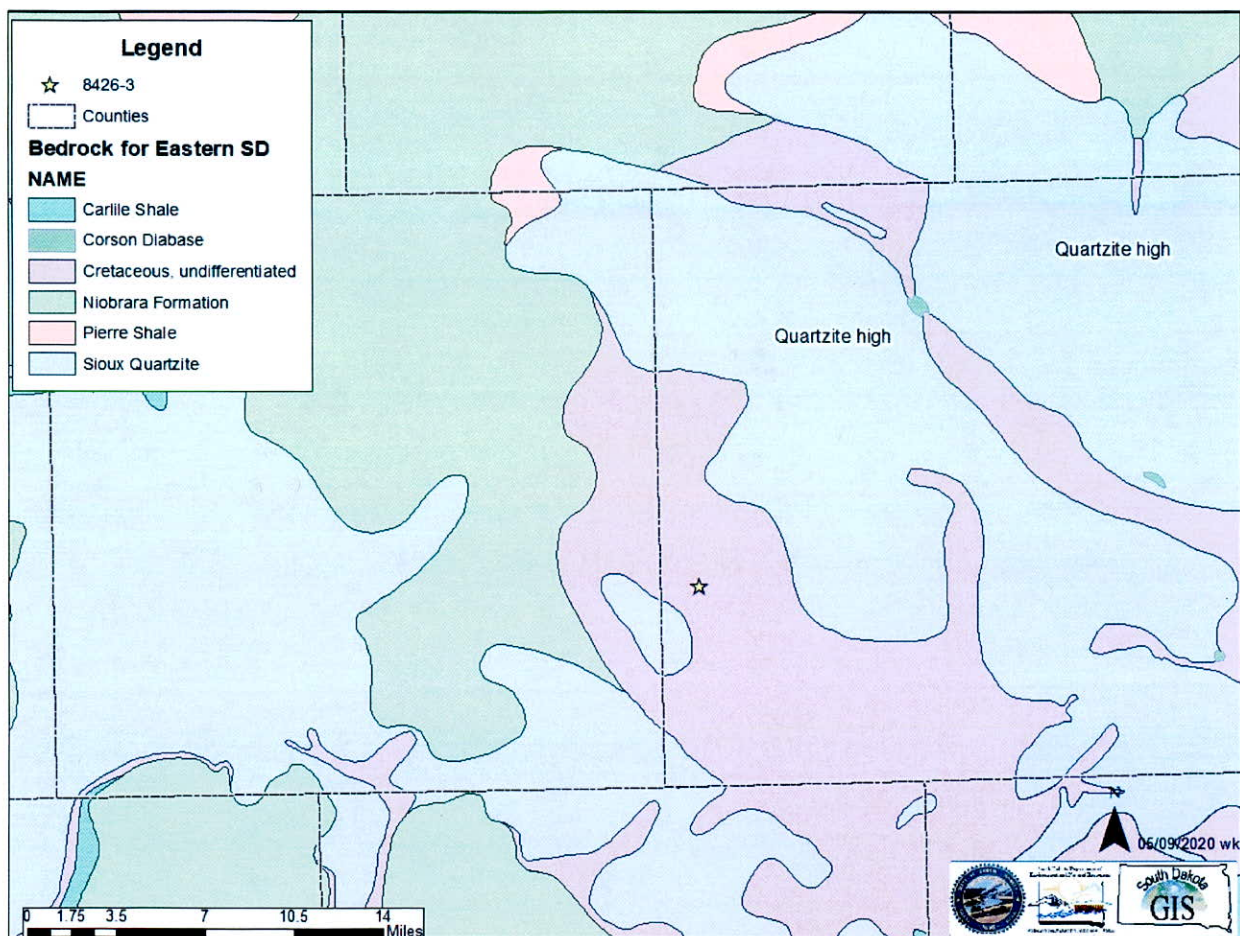


Figure 1: Configuration of the Bedrock Surface in the Area of the Existing Well Site for Application No. 8426-3 (modified from Tomhave and Schulz, 2004)

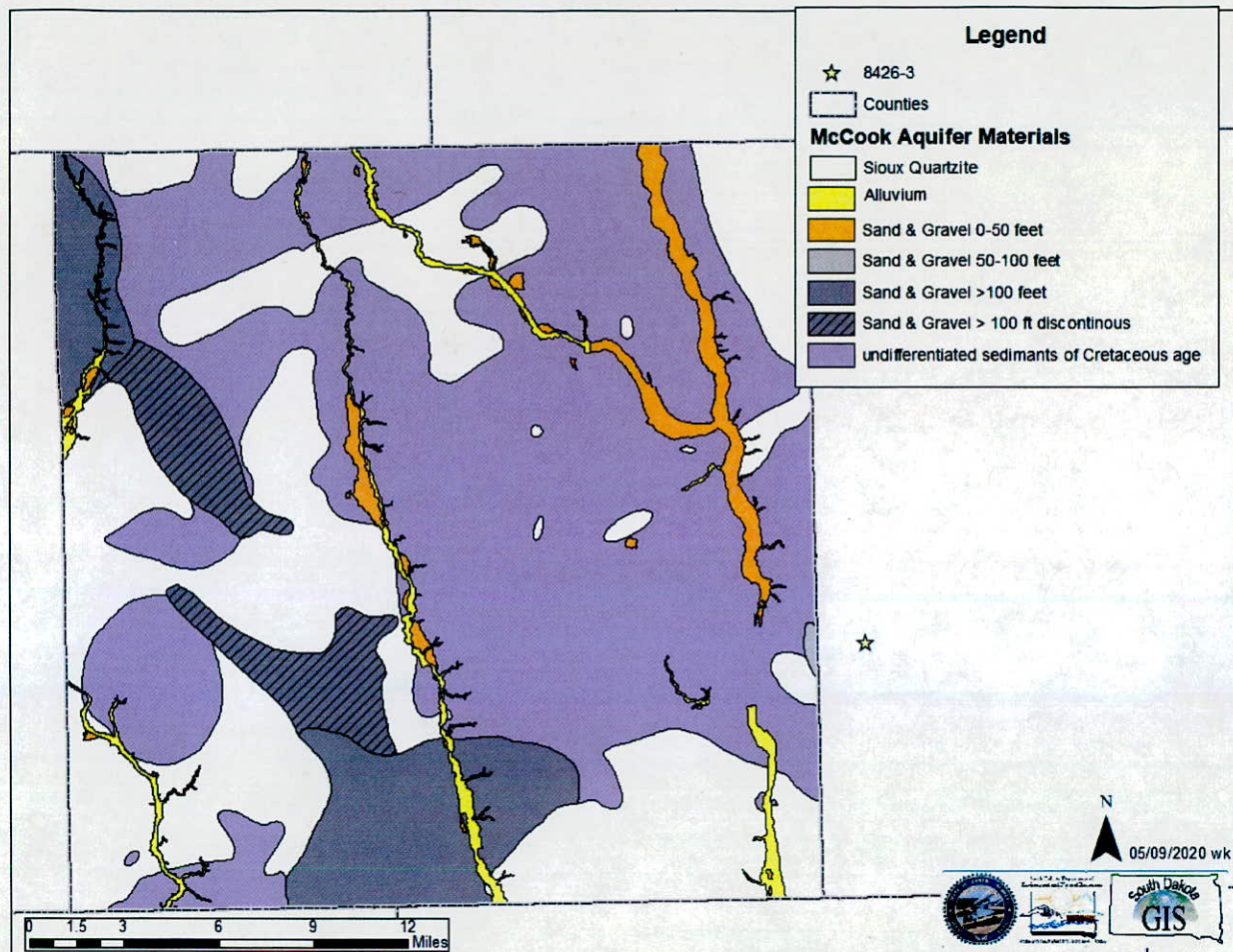


Figure 2: First Occurrence of Aquifer Materials in McCook County (modified from Holmes, 2019) (note that the McCook Aquifer Materials portion solely applies to McCook County and not other counties shown on the map)

During the Cretaceous age the midcontinental United States and Canada was variably inundated by the Western Interior Seaway. In southeast South Dakota, southwest Minnesota, and northwest Iowa, the erosion resistant Precambrian Sioux Quartzite developed a topographic high area. As Southeastern South Dakota was inundated by the various transgressions of the Western Interior Sea, the marine waters flooded valleys in the quartzite highland forming marine embayments, parts of the highland became shoreline, and shallower marine areas surrounded the highland (Holzheimer, 1987; Kairo, 1987). The higher areas of Sioux Quartzite in the area noted in Figure 1 by the label “Quartzite high.” The transgressions and regressions of the Western Interior Seaway resulted in localized impacts on sedimentation so the Cretaceous aged deposits on and around the Sioux Quartzite highland vary lithologically from the adjacent open marine deposits (Kairo, 1987). The Cretaceous aged deposits of differing lithology from the normal sequence of deposition in the area of the quartzite high are collectively referred to as Cretaceous undifferentiated. The Cretaceous section of the Sioux Ridge portion of the South Dakota Stratigraphic Correlation Chart is shown in Figure 3.

SIOUX RIDGE			
GROUP	FORMATION	MEMBER	INFORMAL UNIT NAME
Montana	Pierre Shale	Elk Butte	
		Mobridge	
		Virgin Creek	
		Verendrye	
		DeGrey	
		Crow Creek	
		Gregory	
		Sharon Springs	
		Smoky Hill Chalk	
		Fort Hays Limestone	
Colorado	Niobrara	Unnamed shale	
	Carlile Shale	Codell Sandstone	
		Blue Hill Shale	
		Fairport Chalk	
	Greenhorn Limestone		
Graneros	Belle Fourche Shale	Graneros Shale	
	Mowry Shale		
	Newcastle Sandstone	Dakota Sandstone	
	Skull Creek Shale		
Inyan Kara	Fall River Sandstone		
	Lakota		

Figure 3: Cretaceous section of Sioux Ridge portion of the South Dakota Stratigraphic Correlation Chart (modified from Fahrenbach et al, 2010)

In South Dakota, the Water Rights Program has several aquifer identifications that might apply to an undifferentiated sandstone directly overlying the Sioux Quartzite. One possibility is the Sioux Quartzite Wash aquifer. Hansen (1986) describes the Sioux Quartzite Wash aquifer as being composed of pink, uncemented, well rounded and well-sorted quartzose sand. Sioux Quartzite Wash aquifer has also been applied to sandstones directly overlying the Sioux Quartzite (Water Rights, 2020a). The Sioux Quartzite Wash aquifer has been identified as being present in several counties in South Dakota (Water Rights, 2020a and 2020b; Hansen, 1986). Additionally, due to its nature, the Sioux Quartzite Wash aquifer is unlikely to be a single continuous aquifer, but instead be various isolated pockets of Sioux Quartzite Wash that in some locations can yield sufficient quantities of water to be considered an aquifer. The term “wash” may also not properly characterize the sands and sandstones to which it has been applied. Geologically the term “wash” refers to a material that has been eroded, transported, and redeposited elsewhere. Where a potential issue arises with application of the term wash to sands and sandstone directly overlaying the Sioux

Quartzite is that the description also matches some areas of the Sioux Quartzite where the Sioux Quartzite is not cemented or lightly cemented due to weathering. Since the method of deposition can be very difficult to determine in the subsurface, the term Sioux Quartzite Wash has likely been applied to both weathered Sioux Quartzite and actual wash material. Although the term “wash” may not be an accurate geologic description, the consideration of Sioux Quartzite wash/weathered Sioux Quartzite being a separate aquifer from the Sioux Quartzite may be appropriate for the purposes of water management. The primary porosity of the Sioux Quartzite is generally extremely low so the Sioux Quartzite is not typically considered an aquifer. However, in areas where conditions are favorable, water can be transmitted through the quartzite through secondary porosity and permeability features (i.e. fractures) resulting in areas where the quartzite can be considered an aquifer. Since the Sioux Quartzite wash/weathered Sioux Quartzite are sands and sandstones they can have a much higher primary porosity than typical Sioux Quartzite, which means the mechanics of how groundwater moves could differ between the two indicating the potential need for the two to be managed as separate aquifers. It should be noted however that in the case of the final application report for Water Permit No. 8068-3 Thunder Ridge the water source was identified as an area of the Sioux Quartzite where the silica cement is absent due to weathering and the permit was considered to be appropriating water from the Sioux Quartzite (Water Rights, 2020d). Lindgren and Niehus (1997) do not identify the Sioux Quartzite Wash aquifer as being present as a distinct aquifer in Minnehaha County.

The Split Rock Creek Formation primarily consists of embayment deposits of a specific sequence of Cretaceous aged materials (Tomhave, 1994). Tomhave (1994) did map an area of the Split Rock Creek Formation in the west central to southwest portion of Minnehaha County shown in Figure 4. It is important to note that the Split Rock Creek Formation is made up of several different lithologies (including sands, clays, claystones, shales, siltstones, and sandstones) so the formation may not function as an aquifer over its entire extent and depth (Tomhave, 1994; Lindgren and Niehus, 1992). Lindgren and Niehus (1992) indicate the potential for a small area of aquifer within the Split Rock Creek Formation to the north of the existing well site for this application as shown in Figure 5. However, the use of a dashed boundary line indicates uncertainty in the extent of the potential aquifer area and the text of the Lindgren and Niehus (1992) and Niehus and Lindgren (1994) offer almost no information (recharge, discharge, water levels, potentiometric surface, etc.) specific to this small area of potential aquifer. The well sites for this application are approximately 1.1 miles south of the closest boundary for the potential aquifer area.

In looking at the three lithologic logs for the three points used by Lindgren and Niehus (1992) for the map shown in Figure 4, elevation differences of the aquifer materials from west to east of approximately 18 to 36 feet are noted over a distance of approximately 3 to 4 miles (SDGS, 2020). So, while the minimal elevation difference between the sands of the lithologic logs does suggest some potential for a hydraulic connection between them, the lack of water level data makes it difficult to prove. The lack of water level data also makes it difficult to determine the potential for the area identified by Lindgren and Niehus (1992) to be hydraulically connected to the existing well for this application. Extensive study and permitting of the Split Rock Creek aquifer has primarily been limited to the Brandon Embayment area of the Split Rock Creek Formation shown in Figure 3 and Figure 5. In reviewing Figures 3 and 5, it can be seen that the Brandon Embayment area is separated from the Split Rock Creek Formation in western Minnehaha County by a Sioux

Quartzite high, which would in turn indicate that the Split Rock Creek aquifer of the Brandon Embayment is likely a hydrologically separate aquifer from any aquifers that may occur in the geologic materials identified as the Split Rock Creek Formation in west central and southwest Minnehaha County. Review of the one Split Rock Creek aquifer water right located outside the Brandon Embayment area (Water Permit No. 6894-3), resulted in questioning if the aquifer is properly identified. Given the locations of the active water rights/permits for the Split Rock Creek aquifer and the area for which extensive study of the aquifer has been done, it is questionable given the currently available information on the sandstone unit if Split Rock Creek aquifer is the best designation for the water source being sought by Application No. 8426-3.

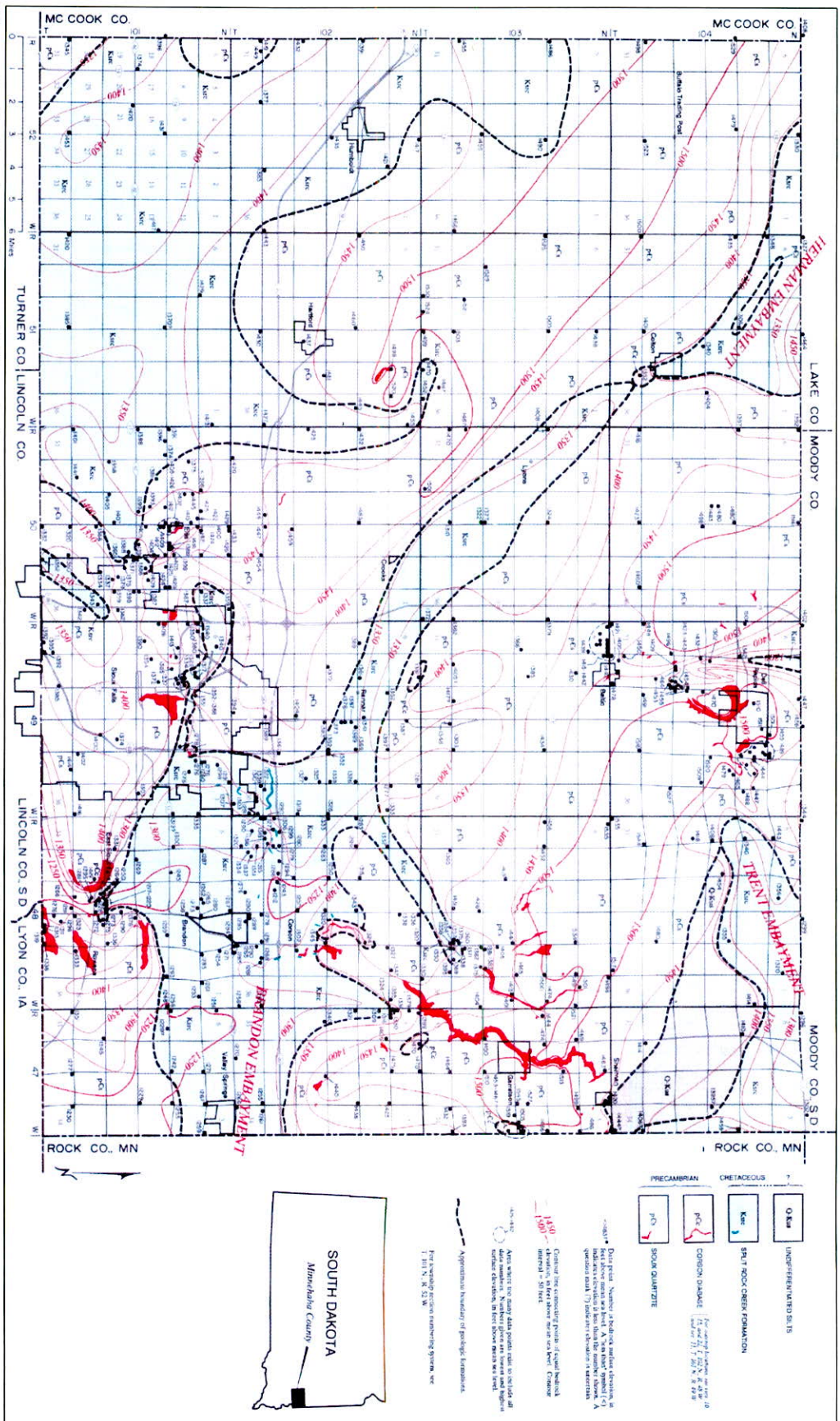


Figure 3: Bedrock Geology of Minnehaha County, SD (modified from Tomhave, 1994)

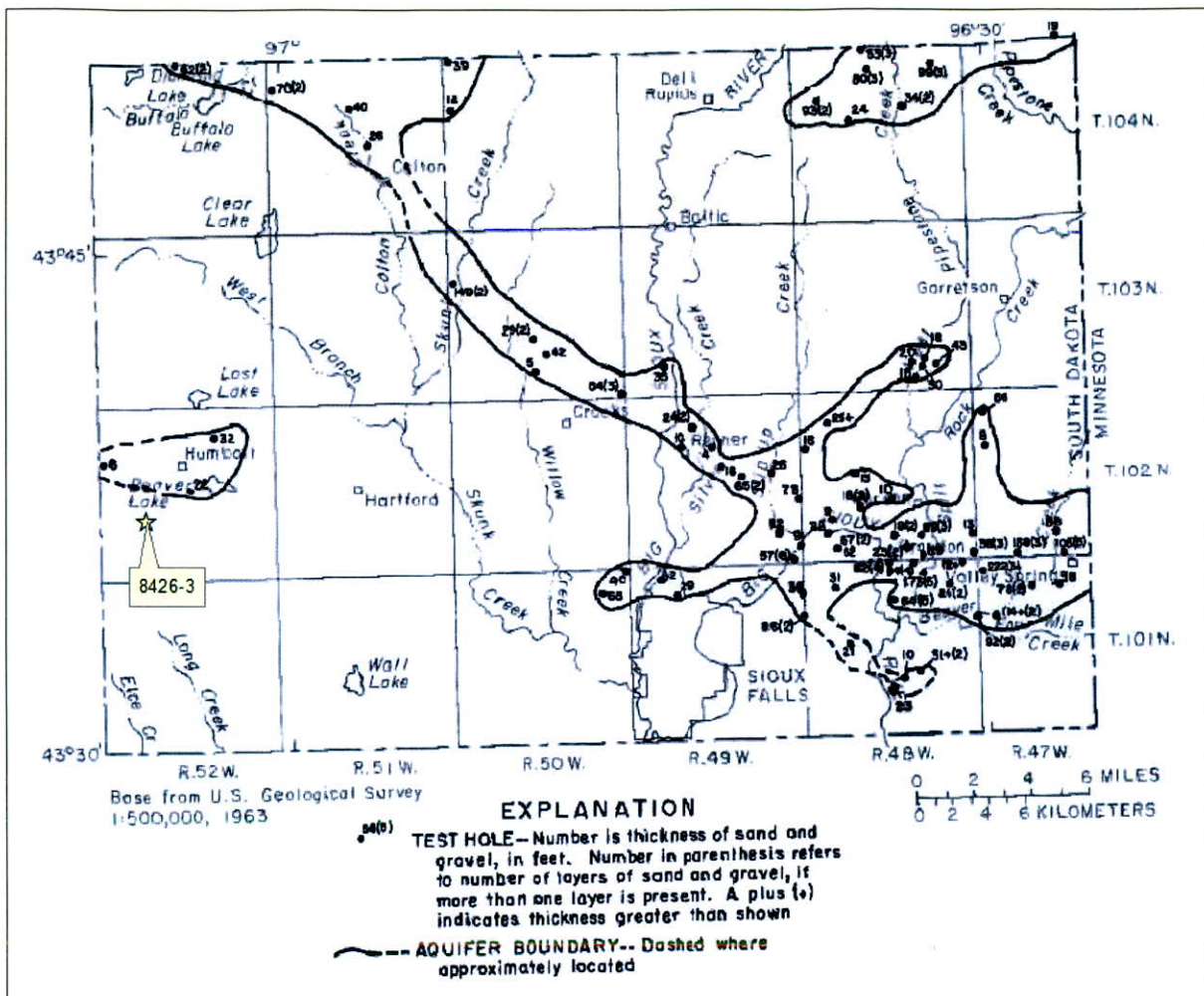


Figure 4: Split Rock Creek Aquifer Map of Lindgren and Niehus (1992) (modified Lindgren and Niehus, 1992) (Note that additional work has refined the map of the aquifer in the southeast and northwest parts of Minnehaha County, however this map was utilized due to the western extent of the map's study area)

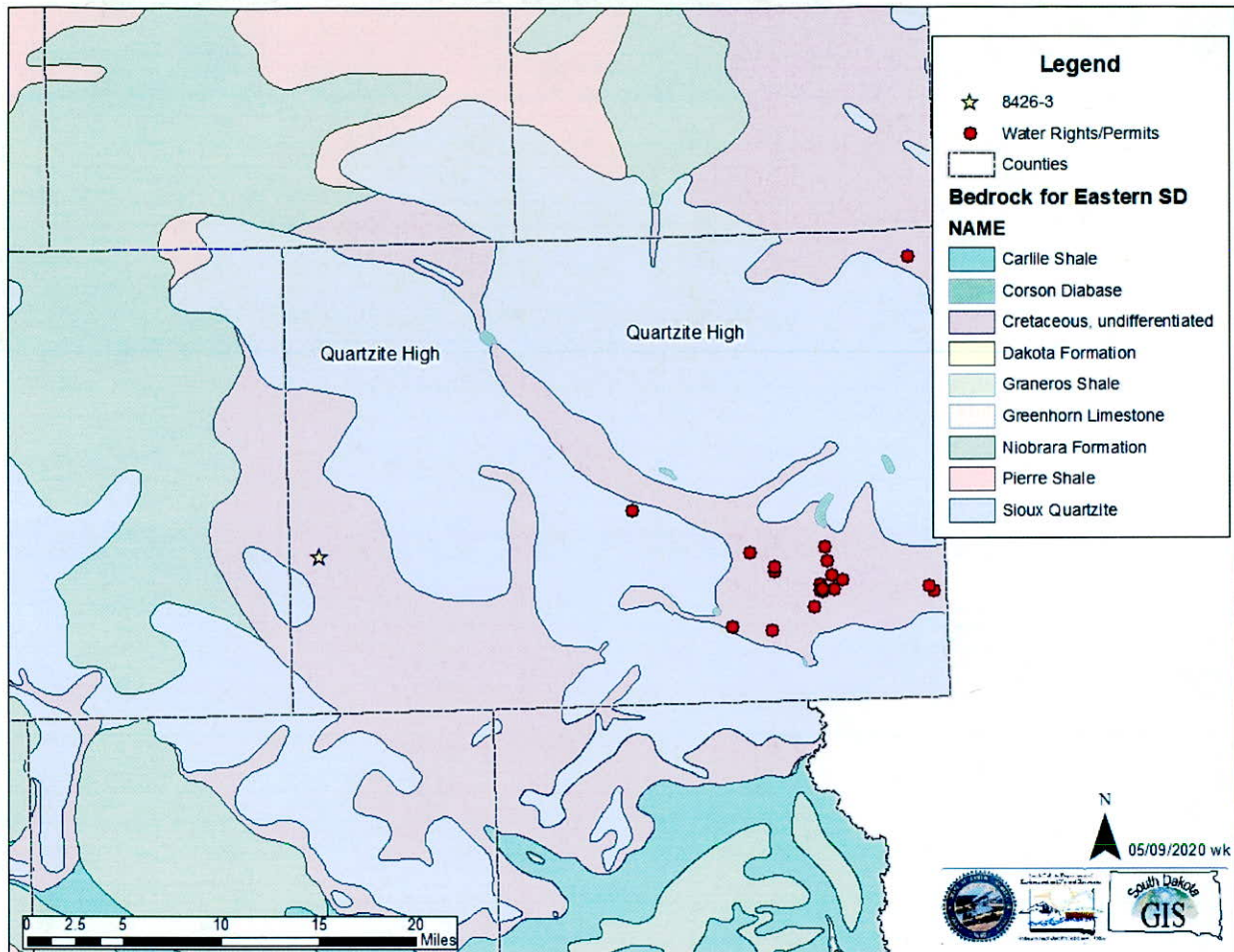


Figure 5: Location of Water Rights/Permits in the Split Rock Creek Aquifer in Relation to the Configuration of the Bedrock Surface (Water Rights, 2020b; modified from Tomhave and Schulz, 2004)

Where an aquifer name cannot be identified for a specific sediment or where aquifer information is extremely limited on a unit that lies within the Cretaceous undifferentiated, the general term Cretaceous undifferentiated aquifer can be utilized. In some cases the type of material making up the aquifer is included in the naming convention of the aquifer, one example would be a sandstone unit within the Cretaceous undifferentiated being identified as a Cretaceous aged undifferentiated sandstone (Water Rights, 2020a). Cretaceous aged undifferentiated sandstones can also directly overlie the Sioux Quartzite and can be difficult or impossible in some cases to distinguish from weathered Sioux Quartzite when the sandstone directly overlies the Sioux Quartzite. What aids in distinguishing Cretaceous undifferentiated from weathered Sioux Quartzite is the presence of other Cretaceous undifferentiated units (i.e. shales, chinks, etc.) separating the sandstone from the Sioux Quartzite. Therefore, the sandstone unit that this application proposes to utilize is either an undifferentiated Cretaceous aged sandstone or weathered Sioux Quartzite. Given the limited information on the sandstone unit that this application proposes to utilize, it is recommended the name undifferentiated Cretaceous aged sandstone aquifer be utilized until additional information is available to further evaluate the

aquifer. The term is also suggested because the bedrock Cretaceous undifferentiated unit is inclusive of the Split Rock Creek Formation (Tomhave and Schulz, 2004). So, use of the term undifferentiated Cretaceous aged sandstone aquifer to identify the aquifer allows for the possibility that with additional information, the aquifer named could be refined to Split Rock Creek aquifer.

Information is not available in sufficient detail to delineate the extent of the specific sandstone unit that this application proposes to use. The sandstone unit this application proposes to use appears to be in a slight low in the Sioux Quartzite (around elevation 1300 feet), and it appears that the sandstone could potentially be fairly limited in extent (SDGS, 2020). The elevation contours for the Precambrian surface in the area of the well sites for this application are shown in Figure 6. In this area of South Dakota where the well site for this application is located the Sioux Quartzite is typically at the Precambrian surface. Another possibility is that other SDGS test holes in the area indicate sandy units at a similar elevation or at slightly higher elevations directly overlying the Sioux Quartzite, that if significantly hydraulically connected, could contribute additional areal extent to the aquifer for this application (SDGS, 2020). The location of lithologic logs with a depth greater than 150 feet below ground surface in the area of the well sites for this application are shown in Figure 6. One of these is SDGS test hole SFB-93 located 1.1 miles to the southeast which identifies a “sand; rounded, mostly quartz” at elevation 1301 to 1317 feet (SDGS, 2020). The sand of SFB-93 is separated from the Sioux Quartzite by a “clay” and a “siltstone.” Additionally, SDGS test holes SFB-92, R2-85-2, and R2-85-3 all identify sand units directly overlying the Sioux Quartzite at elevations similar to the sandstone unit for this application. In considering the potential for the sandstone unit for this application to be hydraulically connected to sandy units of a similar elevation, it is noted the slight low in the Sioux Quartzite extends northwest and opens into a wider and deeper valley in the Sioux Quartzite and SDGS test hole R2-85-3 does indicate a sandy unit directly overlying the Sioux Quartzite in the slight low. Within this wider and deeper valley in the Sioux Quartzite to the northwest and west of the well sites, observation well MC-2018A monitors an undifferentiated Cretaceous aged sandstone (Water Rights, 2020a). Observation well MC-2018A was required as a qualification for Water Permit 8280-3 for Dylbrook Farms which appropriates water from a Cretaceous aged sandstone unit (Water Rights, 2020e). The geologists log for Dylbrook Well No. 3 identifies undifferentiated Cretaceous aged sandstone at elevations 1246-1253 feet and directly overlying the Sioux Quartzite at elevations 1227-1243 feet (Schulz, 2017). The radius of influence of the aquifer performance test for Water Permit 8280-3 was not sufficient to extend to the location of SDGS testhole R2-85-3 (Water Rights, 2020e). Sufficient information is not available to indicate if the sandstone monitored by observation well MC-2018A could have a significant hydraulic connection to the sandstone unit for this application (SDGS, 2020; Water Rights, 2020a). However, until there is more information available, it also cannot be ruled out as a possibility in terms of a conservative estimate of average annual withdrawals from the sandstone unit for this application.

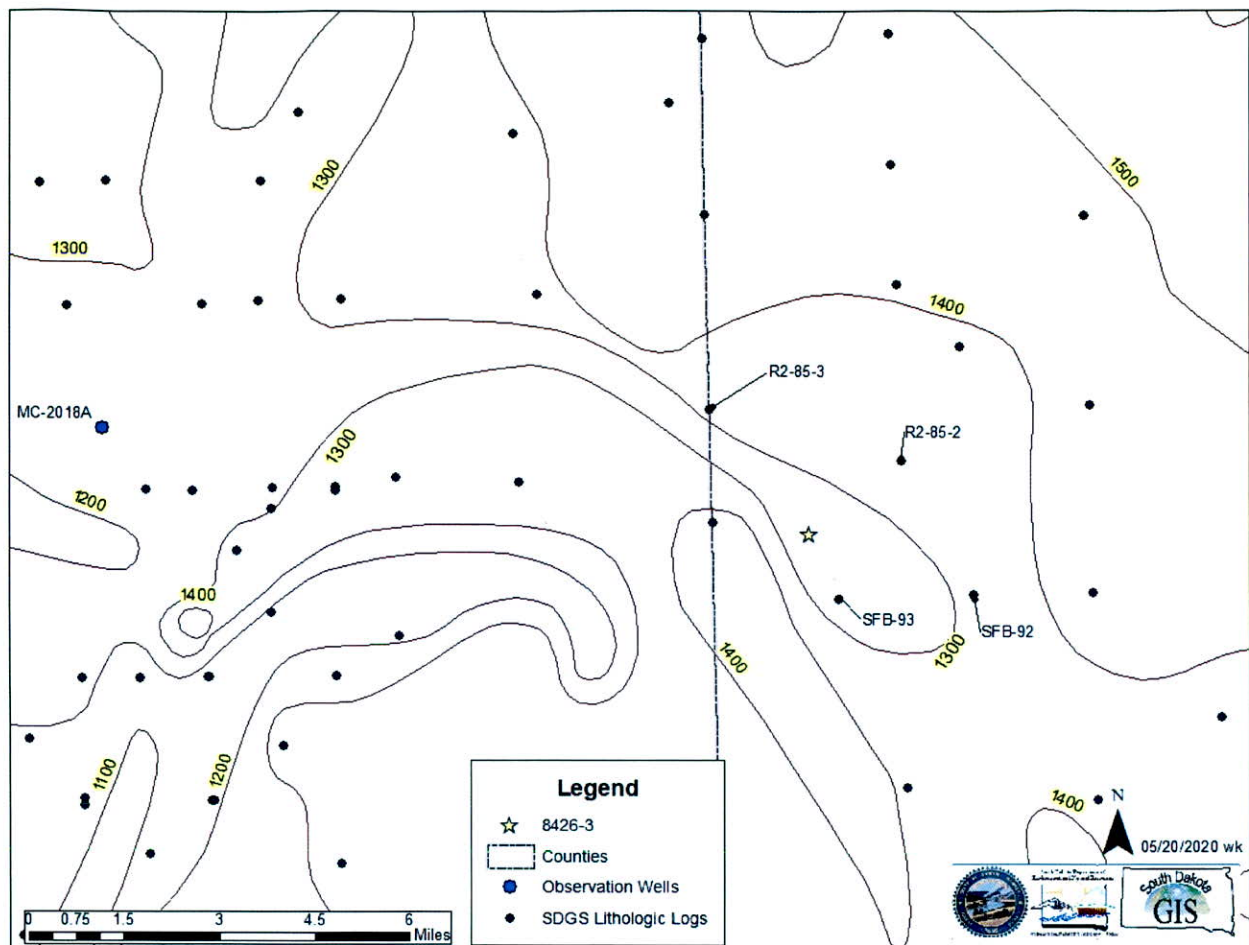


Figure 6: Elevation Contours for the Precambrian Surface and SDGS Lithologic Logs (SDGS, 2020; modified from McCormick, 2010)

South Dakota Codified Law (SDCL) 46-2A-9 Criteria for Granting a Water Permit

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 proposed diversion can be developed without unlawful impairment of existing rights, that the proposed use is a beneficial use, and in the public interest. This report will address the availability of unappropriated water and the potential for unlawful impairment to existing rights.

Water Availability

Water Permit Application No. 8426-3 proposes to appropriate water for commercial use in a dairy operation. The probability of unappropriated water being available from an 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." If the source of the water is older or lower than the Greenhorn Formation and the application is for a water distribution system defined pursuant to SDCL 46-1-6 (17), the Board need not consider the

recharge/withdrawal issue. Since the aquifer for this application is identified as Cretaceous undifferentiated, which can correspond to Cretaceous aged units above, below, older, younger and equivalent to the Greenhorn Formation, information is not available to classify the water source for this application as older or lower than the Greenhorn Formation. Also, the withdrawal/recharge issue must be considered since a water distribution system is not involved.

Observation Wells

In determining the availability of unappropriated water for a permit application, Administrative Rule of South Dakota 74:02:05:07 requires the Water Management Board to rely on 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. Information is not available to link the sandstone unit that this application proposes to utilize to any observation wells monitored by the Water Rights Program (Water Rights, 2020a). However, information is not available to eliminate the possibility that the undifferentiated Cretaceous aged sandstone monitored by observation well MC-2018A is hydraulically connected to the sandstone unit for this application. The hydrograph for observation well MC-2018A is shown in Figure 7. The period of record for observation well MC-2018A is extremely limited, so no conclusions can be drawn from it yet in regards long-term water availability. Therefore, observation well data cannot currently be utilized as a method to evaluate the availability of unappropriated water in this aquifer.

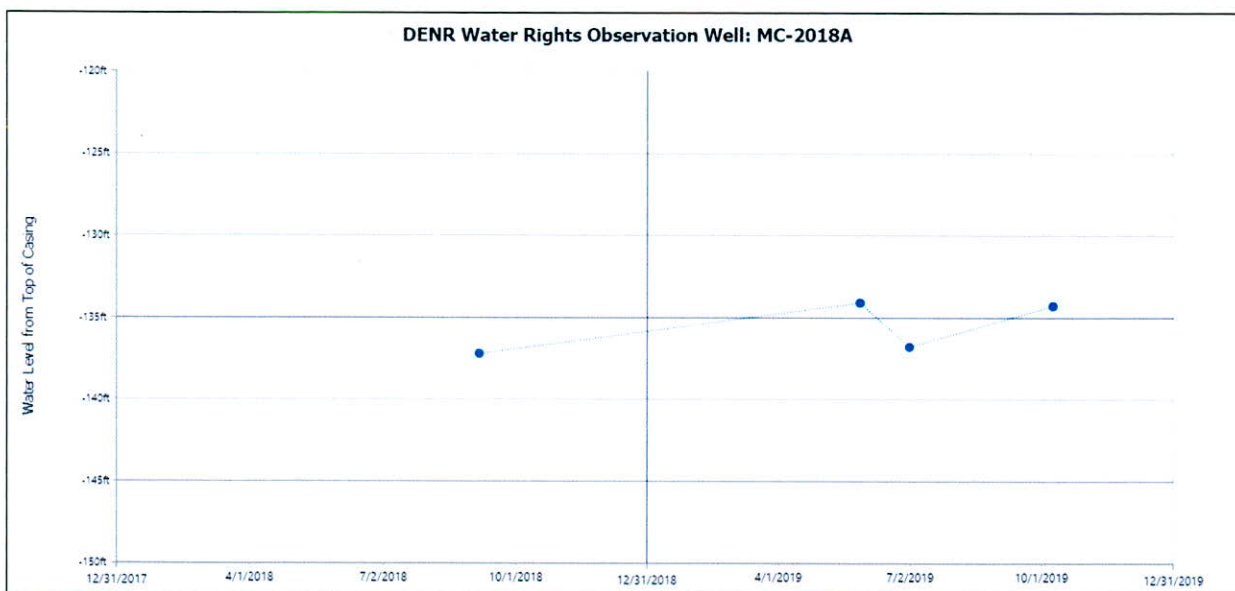


Figure 7: Hydrograph of observation well MC-2018A located approximately 11 miles west of the well sites for this application (Water Rights, 2020a)

For aquifers with limited to no observation wells, some insight into historic water levels can be gained by reviewing the well completion reports on file with the Water Rights Program. However, evaluating historic water levels using domestic well data is more subjective than the use of dedicated observation wells because of the additional interpretations necessary (i.e. well

locations/elevations, groundwater gradients, lack of wells completed into the aquifer, aquifer characteristics, and seasonal and climatic water level fluctuations). A review of well completion reports in the area of the well site for this application did not yield a sufficient number of well completion reports to provide a picture of historic water levels in the sandstone that this application evaluate water availability (Water Rights, 2020c).

Hydrologic Budget

This application is requesting an annual appropriation of 300 acre-feet per year. Information is not available to determine if there is a reasonable probability that average annual recharge to the sandstone unit in the area of the proposed diversion is available on an average annual basis to meet the requested appropriation or to identify whether the sandstone unit is part of a more laterally extensive aquifer. One of the more likely sources of recharge, if any, to the sandstone unit for this application is inflow from adjacent bedrock aquifers. Well completion reports in the region of the well sites indicates the Sioux Quartzite can act as an aquifer in the region (Water Rights, 2020b and 2020c) and could be a potential recharge source to the sand unit assuming the unpredictable fractures and joints of the Sioux Quartzite intersect this sandstone unit. However, the best information available is not sufficient to reach any conclusion on the amount of recharge versus discharge.

Additionally, since the need to include Water Permit No. 8280-3 in the hydrologic budget cannot be ruled out, it is possible the additional information needed to show an average annual recharge to the sandstone unit of 300 acre-feet of water for this application annually, plus any domestic use, would also need to demonstrate sufficient recharge for the appropriation of Water Permit No. 8280-3. Water Permit No. 8280-3 has an annual limit of 121 acre-feet per year (Water Rights, 2020e). Additionally, the report for Water Permit 8280-3 could not completely rule out several other water rights/permits within 10 miles of the well sites for Water Permit No. 8280-3 from appropriating water from the aquifer it utilizes. Those water rights/permits were Water Right Nos. 6762-3 for Van Winkle Dairy, 6874-3 for McCook Country Club, and 6862-3 for the City of Salem (Water Rights, 2020e). In March of 2017, the report for Water Permit No. 8280-3 estimated the average annual withdrawals for those water rights to be approximately 254 acre-feet per year (Water Rights, 2020e).

Potential for Unlawful Impairment of Existing Water Rights

There are no water rights/permits that appear to be clearly appropriating water from the sandstone unit this application proposes to use (Water Rights, 2020b). However, if the sandstone unit is identified as part of a sandy unit of a similar elevation acting as a more laterally extensive aquifer or as part of the Sioux Quartzite, the more extensive aquifer may have water rights/permits authorized to appropriate water from it. The nearest domestic well to the well sites for this application is for Shumaker Dairy Inc. located approximately 0.35 miles to the northeast of the well sites of this application (Water Rights, 2020c). The Shumaker Dairy well is completed into “med coarse sand” at 241 to 263 feet below grade (estimate elevation 1,367 to 1,389 feet) suggests that the Shumaker Dairy is potentially completed into a different aquifer than the existing well for this application (Water Rights, 2020c). The Shumaker Dairy is the same site as the proposed

Dakota Line Dairy. Additionally, information is needed about the extent of the sandstone unit for this application to further evaluate the potential for the diversion for this application to unlawfully impair existing rights.

Additional Notes

In the case of this application, consideration of the best information reasonably available, including consultation with the South Dakota Geologic Survey, has not resulted in sufficient information to assess water availability or sufficient information to assess the potential impacts to existing users (SDGS, 2020; Water Rights, 2020a, 2020b. and 2020c). To evaluate these factors for this application additional information will be required. The applicant should consult with the Water Rights Program to determine the most prudent and practical method to obtain the additional information needed to complete the evaluation of this application.

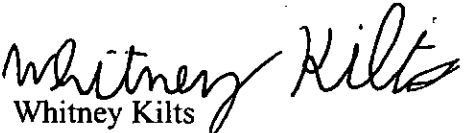
The diversion points for Water Permit No. 8280-3 for Dylbrook Farms are located about 11.2 miles to the west of the well sites for this application. The wells for Dylbrook Farms are completed into an undifferentiated Cretaceous aged sandstone (Water Rights, 2020e). The initial review of the application for Water Permit No. 8280-3 concluded that sufficient information was not available to identify and evaluate the aquifer for the application. To provide additional information an aquifer performance test was designed, monitored, and analyzed by an engineer experienced with aquifer performance tests and the hydrogeology of South Dakota, which met requirements set by the Water Rights Program prior to the start of the test. For comparison Water Permit 8280-3 has an annual limit of 121 acre-feet per year and this application is requesting up to 300 acre-feet of water per year.

While an aquifer performance test does not provide a recharge estimate for an aquifer, it does serve as a check for red flags that would indicate an aquifer does not receive sufficient recharge to support an application's requested diversion and provide aquifer characteristics that are useful for the evaluation of the potential for this proposed diversion to unlawfully impair existing water rights if this application is approved. However, it should be noted that an aquifer performance test with no red flags does not guarantee that information is available to sufficiently evaluate water availability.

Water permits that required an aquifer performance test for more information in order to recommend approval, typically carry a qualification that the applicant provide the Water Rights Program an observation well for long-term monitoring of the aquifer. The long-term monitoring of aquifer the by observation wells would indicate if long-term average annual withdrawals might be exceeding an aquifer's average annual recharge. If long term average annual withdrawals exceed average annual recharge, existing appropriators and domestic wells owners would likely with time become unlawfully impaired. Water permits that required an aquifer performance test for approval also typically carry a qualification that a water permit holder shall control withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.

Conclusions

1. Water Permit Application No. 8426-3 for the Dakota Line Dairy c/o David Lemstra proposes to put to beneficial use a maximum of 300 acre-feet of water annually at a maximum instantaneous diversion rate of 0.67 cfs from two wells (one existing and one proposed) completed into a undifferentiated sandstone of Cretaceous age for commercial use in a dairy confinement operation.
2. There is not sufficient information available to estimate recharge to the undifferentiated sandstone of Cretaceous age, therefore data is not available to utilize a hydrologic budget analysis to evaluate water availability in the aquifer.
3. There is not sufficient observation well data available to use observation well data to evaluate water availability in the aquifer.
4. There is not sufficient information available to evaluate the potential for the diversion requested by this application to unlawfully impair existing water rights.
5. If the applicant choses to pursue further study of the aquifer it is recommend the applicant consult with the Water Rights Program regarding any requirements and recommendations before doing any work to acquire additional information on the aquifer.


Whitney Kilts
SD DENR- Water Rights Program

References

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Water Rights. 2020b. Water Right/Permit Files. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2020c. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2020d. Water Permit File 8068-3: Thunder Ridge. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2020e. Water Permit 8280-3: Dylbrook Farms. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.



RECEIVED
by email
AUG 21 2020
WATER RIGHTS
PROGRAM

August 21, 2020

Eric Gronlund, Chief Engineer
Water Rights Program
South Dakota Department of Environment & Natural Resources
Joe Foss Building
523 E. Capitol Avenue
Pierre, SD 57501

RE: Request to Amend Water Permit Application
Water Permit Application No. 8426-3
Dakota Line Dairy c/o David Lemstra
Southeast Quarter of Section 20, Township 102 North, Range 52 West
Minnehaha County, South Dakota

Dear Mr. Gronlund:

LRE Water (LRE) is pleased to provide this letter requesting, on behalf of Dakota Line Dairy, an amendment to Water Permit Application No. 8426-3 (WPA #8426-3). WPA #8426-3 requests authorization for Dakota Line Dairy to withdraw 300 acre-feet per year (ac-ft/yr), at a maximum instantaneous diversion rate of 0.67 cubic feet per second (cfs), from two wells completed in an undifferentiated Cretaceous sandstone.

Dakota Line Dairy is requesting that WPA #8426-3 be amended by changing the water source from two wells completed in the undifferentiated Cretaceous sandstone, to three wells to be completed in the Precambrian Sioux Quartzite. In our telephone conversation today, you requested that a site map be provided showing the well locations.

A site map is attached (Figure 1). Three wells have been constructed to date, all by Dave Putzke Well Drilling & Repair, Inc. (Putzke). Well #1 is completed in the undifferentiated Cretaceous sandstone. Well #2 and Well #3 are both completed in the Sioux Quartzite. Well construction logs for Well #1 and Well #2 are attached. A log is not yet available for Well #3, but it is reportedly an 8-inch diameter well that was completed in the Sioux Quartzite with a total depth of approximately 740 feet. A well construction log for Well #3 will be provided to the Water Rights Program by Putzke.

It is LRE's understanding that Dakota Line Dairy is hiring Putzke to construct an additional well in the Sioux Quartzite (Well #4), at the approximate location shown in Figure 1.

Mr. Eric Gronlund
Chief Engineer – Water Rights Program
August 21, 2020
Page 2 of 2

Subsequent to the completion of Well #4, a limited well yield pumping test is planned, with either Well #2 or Well #4 serving as the pumping well. During the pumping test, water-levels will be monitored in the other three wells. As we have discussed in previous telephone conversations, it is possible that the undifferentiated Cretaceous sandstone is hydraulically connected to the Sioux Quartzite, but that connection, or degree of connection, is unknown at this time. Additional information will be provided subsequent to the completion of the limited well yield pumping test.

To summarize, Dakota Line Dairy is requesting that the water source for WPA #8426-3 be amended, with the revised source consisting of three wells to be completed in the Sioux Quartzite. The point of diversion remains in the southeast quarter of Section 20, Township 102 North, Range 52 West. The annual withdrawal volume and maximum diversion rate is to remain unchanged from the original application.

Thank you very much for your assistance with this project. Please email me at mitch.kannenberg@lrewater.com or call me at (605) 310-1721 if you have any questions, or need any additional information.

Sincerely,

LRE WATER



Mitch Kannenberg, PE
Sr. Project Manager

Attachments:

Figure 1. Well Locations

Well Construction Logs for Well #1 (dated 2/10/20) and Well #2 (dated 7/31/20)

cc: Mr. Paul Kostboth, A1 Development Solutions, Sioux Falls, SD



D:\GIS\GIS\SDakota Line Dairy\maps\5506ADS01_01a.mxd, 8/21/2020, 1:31:30 PM, NAD 1983 UTM Zone 14N

- Well
- Possible Well #4 Location

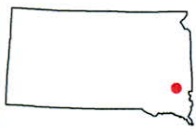
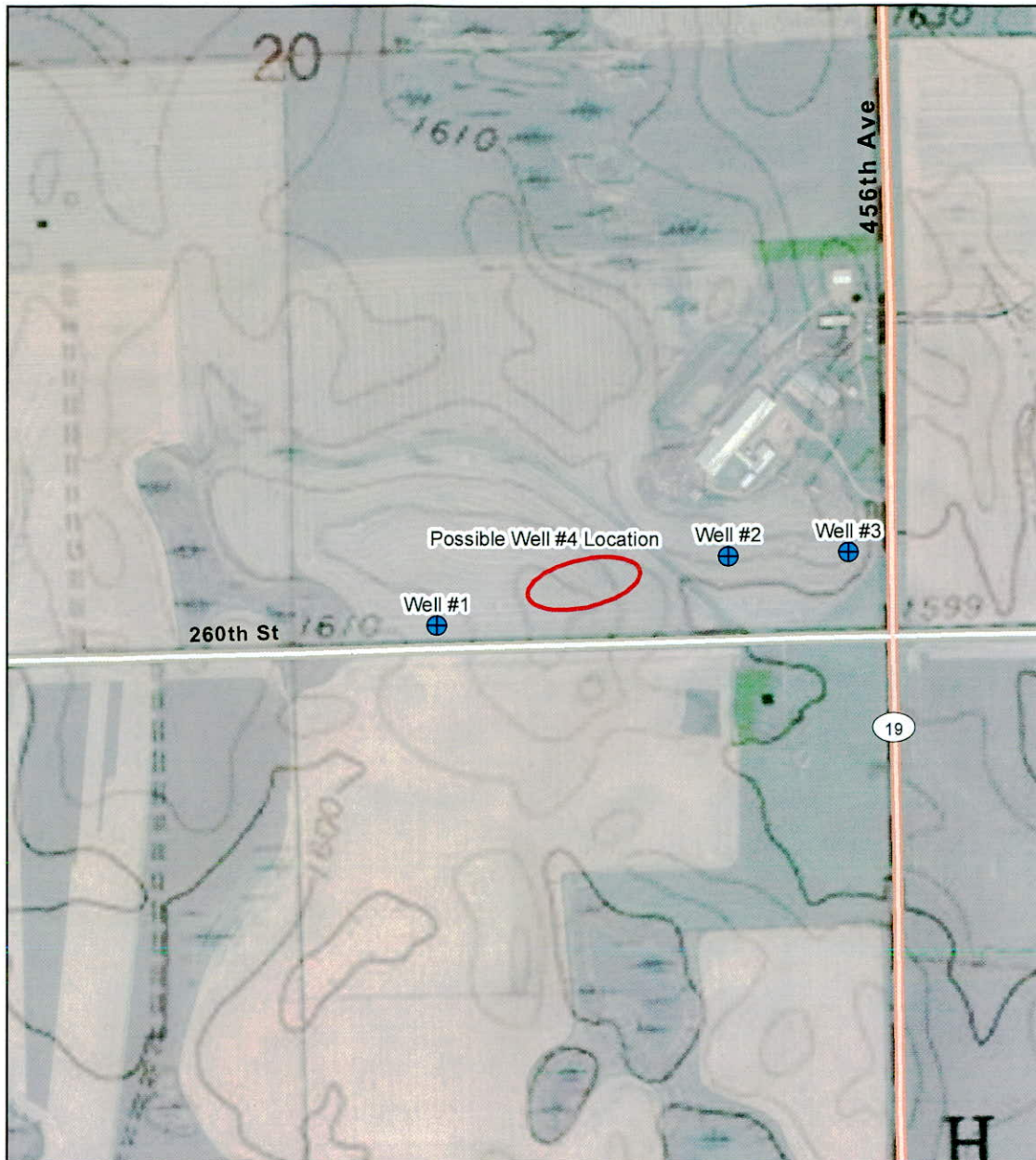


0 800 Feet

Notes:

Sources:

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Copyright © 2013 National Geographic Society, Inc.



Prepared By:
LRE Water
Innovative Water Resource Solutions
South Dakota Office
Sioux Falls, South Dakota
(605) 310-1721

DAKOTA LINE
AQUIFER PUMPING TEST AND WATER
HUMBOLDT, SOUTH DAKOTA

EXISTING AND PROPOSED

FILE: 5506ADS01_01a.MXD

SOUTH DAKOTA WATER WELL COMPLETION REPORT

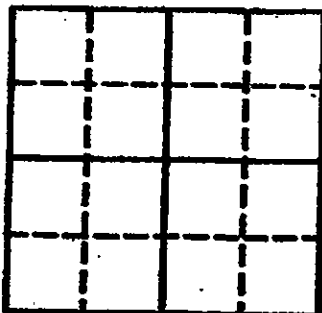
11-02

Location 1/4 1/4 Sec 1 Twp 1 Rg

County

Minnehaha

North



Please mark well location with an 'X'

Well completion Date

7-31-20

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

200' from Dairy (Specify)

PROPOSED USE:

☒ Domestic Stock ☐ Municipal ☐ Business ☐ Test Hole
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring

METHOD OF DRILLING:

Rotary

USING DATA:

☒ Core ☐ Packer ☐ Other

For describe

DEPTH	DIAMETER	FROM	TO	HOLE DIAMETER
18 LF	6 IN	0 FT	279 FT	10 IN
LF	IN	FT	FT	IN
LF	IN	FT	FT	IN

ROUTING DATA:

As Type	No. of Sacks	Gross Weight	From	To
<u>Portland</u>		<u>1000</u>	<u>R</u>	<u>R</u>
		<u>1000</u>	<u>R</u>	<u>R</u>

Grout grouting procedure 5 yds of Slurry
compacted w/ Drilling Rig

REMARKS:

☐ Perforated pipe ☐ Manufactured
Size 10 inches Length 10 feet
Set From 0 feet to 10 feet

S A PACKER OR SEAL USED?

☐ Yes ☐ No

What material?

Site packer(s) and location

INFECTION: Was well disinfected upon completion?

☒ Yes, How? 5 Gallons of Chlorine

sample sent to for quality analysis

☐ No, Why Not? Pumped

Well Owner:

David & Marie Lemstra

Business Name:

Dakota Line Dairy (42)

30803 Road 28

City, State, Zip:

Tulare, Ca 93274

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Top Soil	0	3
Yellow clay	3	32
Blue clay	32	200
Shale	200	275
Sandstone	275	279
Granite	279	645

STATIC WATER LEVEL

140

FEET

If flowing, closed in pressure

PSI

GPM flow

through

inch pipe

Controlled by

☐ Valve

☐ Reducer

☐ Other

Reduced flow rate

GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe

AIR

☐ Bailed

☐ Other

Pumping Level Below Land Surface

400

FL After 48

Has pumped

200

GPM

FL After

Has pumped

GPM

If pump installed, pump rate

GPM

REMARKS

This well was drilled under license #

439

And this report is true and accurate.

Drilling firm: Ogave Putake well Drilling & repair LLC

Signature of License Representative:

Dave Putake

Signature of Well Owner or Eligible Property Holder:

Date:

Use return WHITE COPY to:

DNR Water Rights

523 E Capitol Ave.

Pierre SD 57501

SOUTH DAKOTA WATER WELL COMPLETION REPORT

Mo3H Rock well

11-02

Location 1/4 1/4 Sec Twp Rg

County

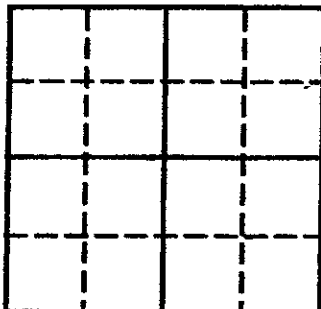
Minnehaha

North

Please mark well location with an "X"

W

E



1 Mile

Well completion Date

9-18-20

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? 300 ft. from Dairy (Identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☒ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring

METHOD OF DRILLING:

Rotary

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>19.18 LB/FT</u>	<u>6 IN</u>	<u>0 FT</u>	<u>317 FT</u>	<u>10 IN</u>
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Portland</u>		<u>Lb/gal</u>	<u>R</u>	<u>R</u>
		<u>Lb/gal</u>	<u>R</u>	<u>R</u>

Describe grouting procedure 7 yds of slurry pumped w/ Drill rig

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter inches Length Feet

Material

Slot Size Set From Feet to Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How?

5 gallons of F Chlorine

☐ No, Why Not?

lab sample sent to for water quality analysis

Well Owner:

David & Marie Lemstra

Business Name:

Dakota Lime Dairy

Address:

25971 - 456th St

City, State, Zip:

Humboldt SD 57035

WELL LOG:

DEPTH

FORMATION

FROM

TO

TOP Soil

0

3

Yellow Clay

3

35

Blue Clay

35

200

Shale

200

307

Sandstone

307

317

Granite

317

319

Granite

319

595

STATIC WATER LEVEL

160

FEET

If flowing: closed in pressure

PSI

GPM flow

through

inch pipe

Controlled by ☐ Valve

☐ Reducers

☐ Other

Reduced flow rate

GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped

Describe:

AIR

☐ Bailed

☐ Other

Pumping Level Below Land Surface

400

ft. After

3 Days

Hrs. pumped

120

GPM

ft. After

Hrs. pumped

GPM

If pump installed, pump rate:

GPM

REMARKS

This well was drilled under license #

439

And this report is true and accurate.

Drilling firm:

Dave Putzke well Drilling & repair, Inc

Signature of License Representative:

[Signature]

RECEIVED

Signature of Well Owner or Equitable Property Holder:

SEP 23 2020

WATER RIGHTS PROGRAM

Date:

523 E Capitol Ave.

Pierre SD 57501

Please return WHITE COPY to:

DENR Water Rights

The Southeast Quarter (SE1/4), Except Lots H1 and H2 contained therein and except Tracts 1 & 2 of Shumaker's Third Addition contained therein, of Section 20, Township 102 North, Range 52 West of the 5th P.M., Minnehaha County, South Dakota.

Copied

No 2nd Rockwell

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

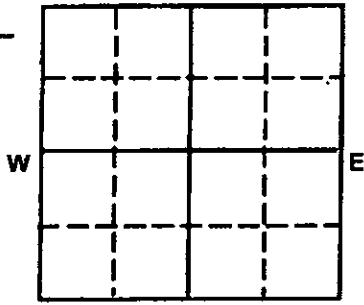
Location $\frac{1}{4}$ $\frac{1}{4}$ Sec Twp Rg

County (See Attached)

Minnehaha

North

Please mark well location with an "X"



Well completion Date
8-13-20

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? 200 ft. from Dairy (identify source)

PROPOSED USE:

- ☐ Domestic/Stock ☐ Municipal ☒ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Rotary

CASING DATA:

- ☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
19.18 LB/FT	6 IN	0 FT	264 FT	10 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Portland</u>		Lb/gal	R	R
		Lb/gal	R	R

Describe grouting procedure 6 1/2 yds of slurry

Pumped w/ Drilling rig

SCREEN:

- ☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

- ☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

- ☒ Yes, How? 5 gallons of chlorine
☐ No, Why Not? pumped

Lab sample sent to for water quality analysis

Well Owner:

David & Marie Lemstra

Business Name:

Dakota Line Dairy

Address:

55971 - 456th Ave

City, State, Zip:

Humboldt SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Top Soil</u>	<u>0</u>	<u>8</u>
<u>yellow clay</u>	<u>3</u>	<u>30</u>
<u>Blue clay</u>	<u>30</u>	<u>195</u>
<u>Shale</u>	<u>195</u>	<u>264</u>
<u>Granite</u>	<u>264</u>	<u>740</u>

STATIC WATER LEVEL

140

FEET

If flowing: closed in pressure

PSI

GPM flow

through

inch pipe

Controlled by

- ☐ Valve

- ☐ Reducers

- ☐ Other

Reduced flow rate

GPM

Can well be completely shut in?

WELL TEST DATA:

- ☐ Pumped Describe:

AIR

- ☐ Bailed

- ☐ Other

Pumping Level Below Land Surface

ft. After

Hrs. pumped

GPM

ft. After

Hrs. pumped

GPM

If pump installed, pump rate:

GPM

REMARKS

500' w/ AIR 35 gpm.

This well was drilled under license #

439

And this report is true and accurate.

Drilling firm:

Dave Putzke well Drilling & repair, Inc

Signature of License Representative:

Dave Putzke

RECEIVED

Signature of Well Owner or Equitable Property Holder:

AUG 26 2020

WATER RIGHTS PROGRAM

Date:

523 E Capitol Ave.

Pierre SD 57501

Please return WHITE COPY to: DENR Water Rights

The Southeast Quarter (SE1/4), Except Lots H1 and H2 contained therein and except Tracts 1 & 2 of Shumaker's Third Addition contained therein, of Section 20, Township 102 North, Range 52 West of the 5th P.M., Minnehaha County, South Dakota.

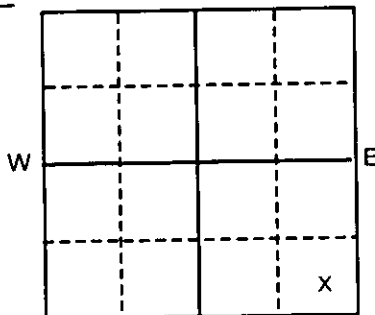
Copies

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE ¼ SE ¼ Sec 20 Twp 102N Rg 52WCounty Minnehaha

North

Please mark well
location with an "X"

Well Completion Date

06-17-2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?

700.0 ft. from Abandoned Well (identify source)

PROPOSED USE:

☐ Domestic/Stock Irrigation
 ☐ Municipal Industrial
 ☐ Business Institutional
 ☒ Test holes Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel
 ☐ Plastic
 ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	5.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	12	9.5 Lb/gal	0.0 Ft	277.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

TREMIE

SCREEN:

☐ Perforated pipe
 ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED? ☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____☐ No, Why Not? _____Lab to which water
quality sample sent for analysisWell Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN SILTY CLAY	3	34
BLUE CLAY	34	58
SANDY BLUE CLAY WITH GRAVEL	58	75
SANDY BLUE CLAY	75	125
MED TO CORSE SAND AND GRAV.	125	134
BROWN SANDY CLAY	134	159
BROWN SAND FINE	159	169
CONTINUED ON ATTACHMENT		

STATIC WATER LEVEL _____ FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #1

This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner of Equitable Property Holder: _____

RECEIVED

AUG 24 2020

Date: 8-11-20WATER RIGHTS
PROGRAM

Heine Electric & Irrigation, Inc.

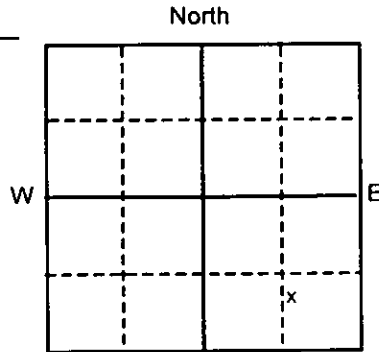
***31585 460th Ave
Vermillion, SD 57069
605-670-9567***

Well log of test hole #1 continued for Dakota Line Dairy:

Depth	Formation
169-203	SANDY BROWN CLAY
203-230	SANDY BLUE CLAY
230-238	MEDIUM SAND
238-254	GRAY SANDY CLAY
254-276	SHALE
276-277	QUARTZITE WASH

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE ¼ SE ¼ Sec 20 Twp 102N Rg 52WCounty MinnehahaPlease mark well
location with an "X"

Well Completion Date

June 26, 2020Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
1,000.0 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

☐ Domestic/Stock
☐ Irrigation
 ☐ Municipal
☐ Industrial
 ☐ Business
☐ Institutional
 ☒ Test holes
☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel
 ☐ Plastic
 ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	5.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	18	9.5 Lb/gal	0.0 Ft	312.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe
 ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes
 ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____
☐ No, Why Not? _____
Lab to which water
quality sample sent for analysis _____Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
SANDY BROWN CLAY	3	155
BLUE CLAY	155	157
BROWN SANDY CLAY	157	194
GRAY CLAY	194	246
GRAY CHALK	246	303
SAND STONE	303	312
QUARTZITE	312	

STATIC WATER LEVEL

_____ FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: _____☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #2

This well was drilled under license # 810 and this
report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

RECEIVED

Date: 8-11-20

AUG 24 2020

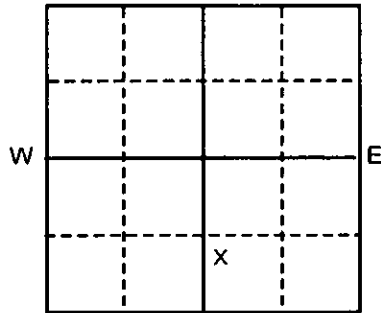
WATER RIGHTS
PROGRAM

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW 1/4 SE 1/4 Sec 20 Twp 102N Rg 52WCounty Minnehaha

North

Please mark well
location with an "X"

Well Completion Date

June 30, 2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
ft. from _____ (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	5.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	18	9.5 Lb/gal	0.0 Ft	301.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____
 Lab to which water quality sample sent for analysis _____
Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN STICKY CLAY	3	22
BLUE STICKY CLAY	22	47
SAND AND GRAVEL MEDIUM	47	50
GRAY SANDY CLAY	50	109
SAND AND GRAVEL MEDIUM	109	111
BROWN SANDY CLAY	111	159
SAND FINE	159	162
CONTINUED ON ATTACHMENT		

STATIC WATER LEVEL

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: _____☐ Bailed☐ Other _____

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #3

This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

RECEIVED

Date: 8-11-20

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PROGRAM

Heine Electric & Irrigation, Inc.

31585 460th Ave

Vermillion, SD 57069

605-670-9567

Well log of test hole #3 continued for Dakota Line Dairy:

Depth	Formation
162-171	BROWN SANDY CLAY
171-227	GRAY SANDY CLAY
227-251	GRAY CHALK
251-290	SHALE
290-294	SANDSTONE
294-301	SHALE
301	QUARTZITE

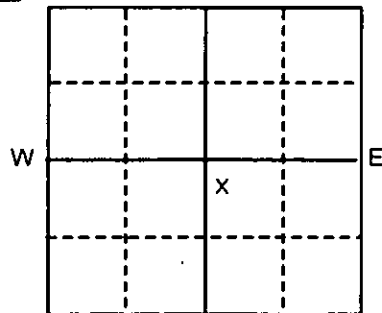
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW ¼ SE ¼ Sec 20 Twp 102N Rg 52W

County Minnehaha

North

Please mark well
location with an "X"

Well Completion Date

July 2, 2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?

1,500.0 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	5.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	10	9.5 Lb/gal	0.0 Ft	244.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____

Lab to which water

quality sample sent for analysis _____

Well Owner: DAVID LEMSTRA

Business Name: DAKOTA LINE DAIRY

Address: 25971 456th AVE

City, State, Zip: HUMBOLT SD 57035

WELL LOG:

DEPTH

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN SANDY CLAY	3	54
BLUE CLAY	54	135
BROWN SANDY CLAY	135	209
GRAY SANDY CLAY	209	241
QUARTZITE	241	244

STATIC WATER LEVEL

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____

through _____

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____

GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: _____☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #4

This well was drilled under license # 810 and this report is true and accurate.

Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

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WATER RIGHTS
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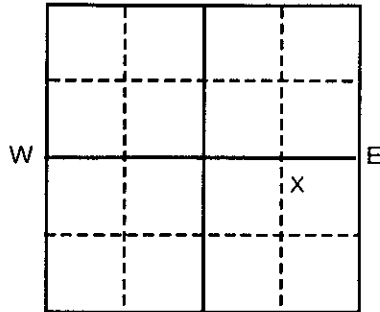
Date: 8-11-20

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE 1/4 SW 1/4 Sec 20 Twp 102N Rg 52WCounty Minnehaha

North

Please mark well
location with an "X"

Well Completion Date

July 13, 2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
2,500.0 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

If other describe

☐ Steel ☐ Plastic ☐ Other

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
GROUT WEL	32	9.5 Lb/gal	0.0 Ft	273.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____
 Lab to which water quality sample sent for analysis _____
Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

DEPTH

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN CLAY	3	32
SAND AND GRAVEL	93	113
BLUE CLAY	113	122
SAND WITH CLAY STREAKS GRAY	122	132
SANDY BROWN CLAY	132	195
SHALE	195	237
GRAY CHALK	237	266

CONTINUED IN REMARKS

STATIC WATER LEVEL

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____

through _____

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____

GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #7

WELL LOG CONTINUED:

SOFT SAND 266-271

HARD SAND STONE 271-273

QUARTZITE 273

This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Owner: _____

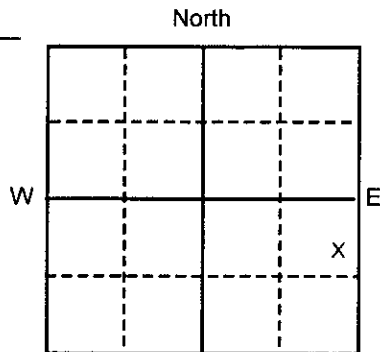
RECEIVED

AUG 24 2020

WATER RIGHTS
PROGRAMDate: 8-11-20

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE 1/4 SW 1/4 Sec 20 Twp 102N Rg 52WCounty MinnehahaPlease mark well
location with an "X"

Well Completion Date

July 15, 2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?

500.0 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	8.75 IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
GROUT WEL	34	9.5 Lb/gal	0.0 Ft	294.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How?

☐ No, Why Not?

Lab to which water

quality sample sent for analysis

Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN CLAY	3	50
BLUE CLAY	50	93
ROCK	93	99
BLUE SANDY CLAY	99	116
BROWN SANDY CLAY	116	171
MEDIUM TO CORSE SAND	171	178
SANDY BLUE CLAY	178	248

CONTINUED ON ATTACHMENT

STATIC WATER LEVEL

FEET

If flowing: closed in pressure

PSI

GPM flow

through

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate

GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #8

LATITUDE: 43.61944

LONGITUDE: -97.090849

ELEVATION: 1630

This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder

RECEIVED

AUG 24 2020

Date:

8-11-20WATER RIGHTS
PROGRAM

Heine Electric & Irrigation, Inc.

31585 460th Ave

Vermillion, SD 57069

605-670-9567

Well log of test hole #8 continued for Dakota Line Dairy:

Depth	Formation
248-264	MEDIUM TO CORSE SAND WITH CLAY LAYERS
264-288	SHALE
288-294	SANDSTONE
294	QUARTZITE



DENR
SOUTH DAKOTA

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 8426-3, Dakota Line Dairy

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 8426-3, Dakota Line Dairy, c/o David Lemstra, 20803 Road 28, Tulare CA 93274.

The Chief Engineer is recommending APPROVAL of Application No. 8426-3 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 rights, 3) the proposed use is a beneficial use and, 4) it is in the public interest with the following qualifications:

1. The wells approved under Water Permit No. 8426-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under these Permits shall control withdrawals 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. 8426-3 is subject to compliance with requirements of the Department's Water Pollution Control Permit issued pursuant to SDCL 34A-2-36 or 34A-2-36.2 or 34A-2-112 or 34A-2-124 for concentrated animal feeding operations.
3. Water Permit No. 8426-3 is subject to compliance with all existing and applicable Water Management Board Rules including but not limited to:
 - a) Chapter 74:54:01 Ground Water Quality Standards,
 - b) Chapter 74:54:02 Ground Water Discharge Permit,
 - c) Chapter 74:51:01 Surface Water Quality Standards,
 - d) Chapter 74:51:02 Uses Assigned to Lakes,
 - e) Chapter 74:51:03 Uses Assigned to Streams, and
 - f) Chapter 74:52:01 through 74:52:11 Surface Water Discharge Provisions

(continued)

Recommendation for Application No. 8426-3

Page 2

4. The Permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Sioux Quartzite aquifer.
5. Water Permit No. 8426-3 authorizes a total annual diversion of 300 acre feet of water from the Sioux Quartzite aquifer.

See report on application for additional information.



Eric Gronlund, Chief Engineer
October 13, 2020

Report to the Chief Engineer
Water Permit Application No. 8426-3
Dakota Line Dairy
October 13, 2020

Dakota Line Dairy c/o David Lemstra proposes to put to beneficial use a maximum of 300 acre-feet of water annually at a maximum instantaneous diversion rate of 0.67 cubic feet of water per second (cfs) from three wells (approximately 650 to 750 feet deep) completed into the Sioux Quartzite. The wells are to be located in the S ½ SE ¼ Section 20 in T102N-R52W for commercial use in a dairy confinement operation located in the SE ¼ Section 20 in T102N-R52W. The site is located approximately 1.5 miles south of Humboldt, SD.

Aquifer: Sioux Quartzite (SOUX)

Hydrogeology and Aquifer Characteristics

The Sioux Quartzite is a Precambrian aged fine to coarse grained ortho-quartzite, that consists of primarily pink and red colored quartz sand cemented into a nonporous quartzite by silica (Baldwin, 1949; Martin, et al., 2004). The Sioux Quartzite extends over a regional scale underlying portions of southeastern South Dakota, southwestern Minnesota, and northwestern Iowa (Tomhave, 1994; Southwick, 1984). The approximate extent of the Sioux Quartzite in southeastern South Dakota is shown in Figure 1. Mapping of the Precambrian surface by McCormick (2010) indicates that depth to the Sioux Quartzite can significantly change over a short distance. This rugged and craggy upper surface is likely the product of pre-glacial streams that incised irregular valleys on the quartzite surface (Baldwin, 1949).

The primary porosity of the Sioux Quartzite is generally extremely low, except in areas where the silica cement is not present due to either weathering or non-deposition (Baldwin, 1949). In areas where conditions are favorable, water can be transmitted through the Quartzite via secondary porosity and permeability features (i.e. fractures) resulting in areas where the Quartzite can be considered an aquifer. Aquifer characteristics within the Sioux Quartzite are site specific and highly variable due to the unpredictable nature of the fractures and joints in the aquifer.

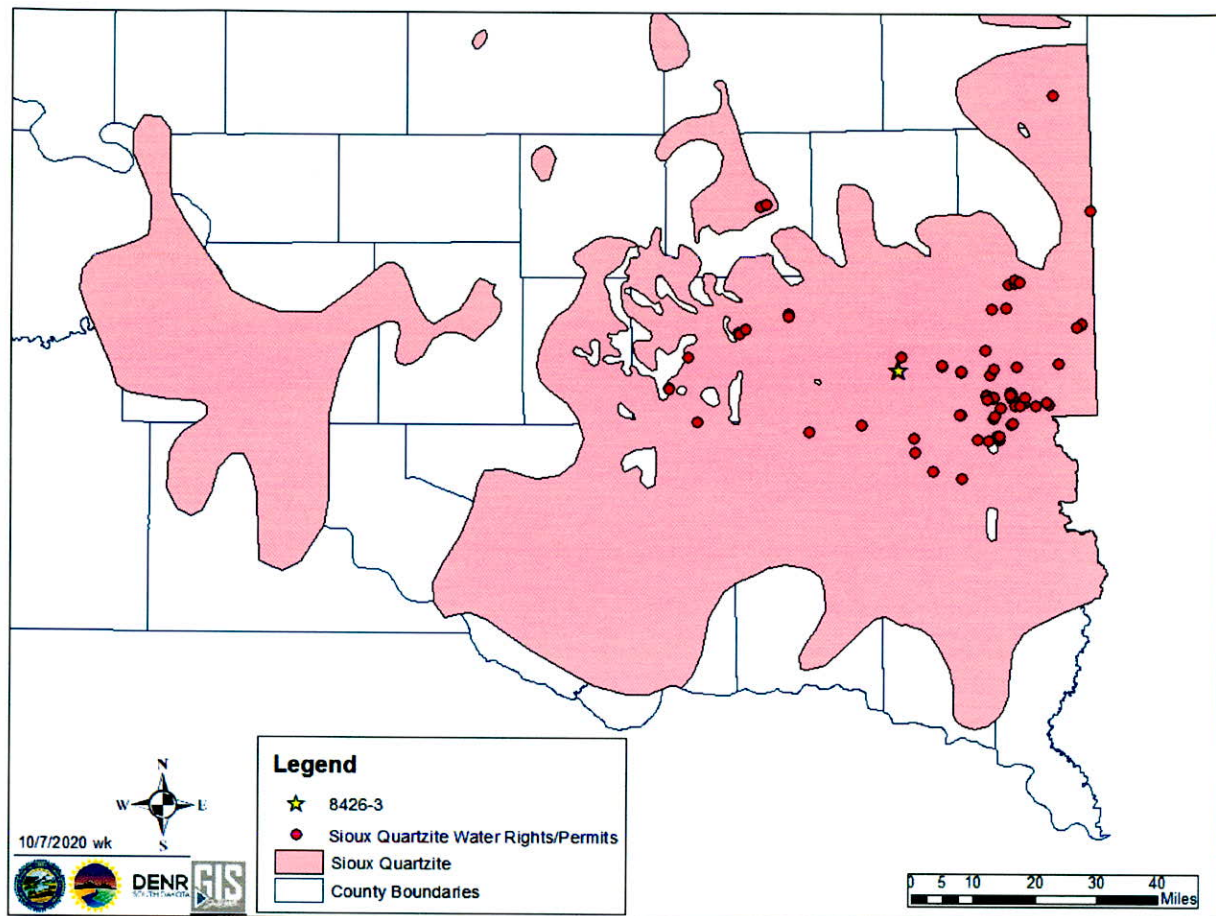


Figure 1: Extent of the Sioux Quartzite in southeastern South Dakota (Water Rights, 2020b; modified from McCormick, 2010)

Estimates of the maximum thickness of the Sioux Quartzite vary from 3,000 feet (Baldwin, 1949) to less than 1,000 feet (Gries, 1983). However, wells for water supply typically only penetrate the Sioux Quartzite to a depth of 200 feet or less (Lindgren and Niehus, 1992). The Sioux Quartzite is likely hydraulically connected to overlying aquifers in direct contact with the quartzite to some extent. However, the extent of any hydraulic connections between the quartzite and other aquifers in Minnehaha County likely varies by locality and are not well understood due to the lack of a detailed hydrogeologic study of the Sioux Quartzite in Minnehaha County (Lindgren and Niehus, 1992).

Well completion reports for the three wells for this application have been submitted to the Water Rights Program. The Sioux Quartzite well completed July 31, 2020, has a reported total depth of 645 feet with the top of the quartzite at a depth of 279 feet and a static water level at 140 feet below the measuring point. The Sioux Quartzite well completed August 13, 2020, has a reported total depth of 740 feet, reported the top of the Sioux Quartzite at a depth of 264 feet, and a static water level at 140 feet below the measuring point. The third well was completed September 18, 2020, has a reported total depth of 595 feet with the top of the quartzite at a depth of 317 feet, and a static water level at 160 feet below the measuring point. This indicates that the aquifer is

under confined conditions at the well sites with approximately 124 to 157 feet of artesian head pressure at the time of completion.

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 there is unappropriated water available for the applicant's proposed use, the proposed diversion can be developed without unlawful impairment of existing rights, and the proposed use is a beneficial use and in the public interest. This report will address the availability of unappropriated water and potential for unlawful impairment of existing rights from the aquifer that are pertinent to this application.

Water Availability

The probability of unappropriated water being available from the Sioux Quartzite 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 formation older than or stratigraphically lower than the greenhorn formation in excess of the average estimated annual recharge for use by water distribution systems." Here, the Sioux Quartzite aquifer is older and lower than the Greenhorn Formation, but a water distribution system as defined by SDCL 46-1-6 (17) is not involved. Therefore, the issue of recharge versus discharge must be considered.

Hydrologic Budget

Discharge from the Sioux Quartzite is from well withdrawals and leakage to hydraulically connected aquifers where the potentiometric gradients are favorable (a higher water level in the quartzite than in an overlying or adjacent aquifer would indicate potential for upward leakage). There are currently 65 water rights/permits authorized to appropriate water from the Sioux Quartzite of which 57 are for non-irrigation use (Water Rights, 2020b). There is also one pending application for the Sioux Quartzite aquifer with a junior application date to this application, which is Water Permit Application No. 8437-3 for United Concrete Materials for a maximum annual diversion of 18.4 acre-feet per year. The amount of water withdrawn by domestic uses is not considered a significant portion of the hydraulic budget of the aquifer due to the relatively low diversion rate of domestic wells; additionally, with the development of rural water systems in the area some of the domestic wells completed into the Sioux Quartzite may no longer be in use. Therefore, the hydrologic budget will only consider appropriative usage from the aquifer.

There are five water rights/permits that are for or include quarry dewatering as part of their use (summarized in Table 1). Reported water use from 2003 to 2018 by these water rights/permits is shown in Table 2. The reported data demonstrates these water rights typically use less than full time pumping at their maximum permitted diversion rates. Water Permit No. 8345-3 limits both

Water Right No. 5784-3 and Water Permit No. 8345-3 to a combined total annual volume of 1,105 acre-feet. Therefore, combined average annual use for Water Permit No. 8345-3 and Water Right No. 5784-3 is estimated at 1,105 acre-feet per year. Water Right No. 4493-3 is not required to report annual use, however it is for the same quarry as Water Right No. 6070-3. Water Right No. 6070-3 reports their annual use based on water discharged from the quarry, therefore the reported use is likely reflective of both Water Right No. 4493-3 and No. 6070-3 (Water Rights, 2004-2020). Average annual water use for the remaining water rights/permits that include quarry dewatering as a use is estimated to be 100% of their instantaneous diversion rate. However, in considering Table 2, actual use is likely less than 100% pumping. Therefore, the average annual use for the water rights that include quarry dewatering as a use is estimated to be less than 13,521 acre-feet per year.

Table 1: Summary of Water Rights in the Sioux Quartzite that Include Quarry Dewatering as a Use (Water Rights, 2020b)

Permit No.	Name	Status	Use	Rate (cfs)	Annual Limit
4493-3	SPENCER QUARRIES INC	LC	COM	1.8	n/a
6070-3	SPENCER QUARRIES INC	LC	COM	3.1	n/a
5400-3	EVERIST INC	LC	IND	12.25	n/a
5784-3	LG EVERIST	LC	COM	3.33	limited by 8345-3
8345-3	LG EVERIST	PE	IND	3.36	1105 acre-ft

LC- Water Right, COM- commercial, IND-industrial, PE-permit

Table 2: Reported Water Use for Water Rights/Permits in the Sioux Quartzite that include Quarry Dewatering as a Use (Water Rights, 2004-2020;2020b)

Year	5400-3	5784-3 & 8345-3*	6070-3
2019	3,436	423	1,135
2018	2,767	513	1,120
2017	2,664	0	1,120
2016	2,557	1	1,120
2015	2,114	0	1,248
2014	2,222	0	1,120
2013	2,027	10	1,120
2012	2,309	10	1,111
2011	2,692	113	1,680
2010	2,752	132	1,690
2009	2,355	63	1,680
2008	2,115	70	1,680
2007	2,100	66	1,680
2006	2,101	0	2,190
2005	1,790	28	2,240
2004	1,801	640	2,190
2003	1,984	3	2,240
Average (acre-feet)	2,340	122	1,551
*8245-3 issued in 2018			

For water rights/permits limited to an annual volume, full use of that volume is assumed for estimation of average annual withdrawal. Water rights/permits limited by annual volume not discussed previously, total to 414.33 acre-feet per year. Historically, average water use by non-irrigation appropriations limited solely by instantaneous diversion rate have been less than 60% of full time pumping at the maximum permitted diversion rate. Of the municipalities that have water rights for the Sioux Quartzite, the majority have connected to rural water systems and do not use much or any water from their wells (Drinking Water Program, 2020). Water Right No. 6552A-3 held by GV LLC is required to report annual use. Average water use by 6552A-3 is estimated at 8.97 acre-feet per year based on reported use (Water Rights, 2004-2019). The remaining non-irrigation water rights/permits that authorize withdrawals by maximum instantaneous diversion rate have a total instantaneous diversion rate of 7.456 cfs; at 60% usage this results in an estimated average annual use of less than 3,239 acre-feet per year. This totals to an estimated average annual non-irrigation use of less than 17,183 acre-feet per year. The inclusion of the annual volume requested by this application (300 acre-feet per year) results in total estimated appropriative non-irrigation use from the aquifer of less than approximately 17,483 acre-feet per year.

There are eight water rights/permits appropriating water from the Sioux Quartzite for irrigation use. The average reported irrigation use for these water rights/permits is summarized in Table 3. Water Right Nos. 6451-3 and 6553-3 do not have a qualification for reporting annual irrigation use (Water Rights, 2020b). Average annual irrigation use by Water Right Nos. 6451-3

and 6553-3 is estimated to be less than their permitted limitations of two acre feet annually per acre, especially in the case of Water Right No. 6451-3, which is qualified for use only when water restrictions for the City of Sioux Falls are implemented. Authorizing a total of seven acres for irrigation the average annual withdrawal for Water Right Nos. 6451-3 and 6553-3 is estimated at less than 14 acre-feet per year. This results in an estimated average annual irrigation use of less than approximately 286 acre-feet per year.

Table 3: Irrigation Water Rights/Permits from the Sioux Quartzite (Water Rights, 1991-2019)

Permit No.	Status	Acres	Average Reported Use (acre-feet)	Years of Constructed System Data
5365-3	LC	1.5	1.21	6 (1990-1995)
6195-3	LC	61	89.11	20
6451-3	LC	3	no data	not reporting
6553-3	LC	4	no data	not reporting
6618-3	LC	71	76.74	14
6910-3	LC	80	5.80	10
7805-3	LC	8	4.44	7
7415-3	PE	34	94.66	7
Total		262.5	271.96	
LC-license, PE-permit				

Recharge to the Sioux Quartzite is from infiltration of precipitation where the Sioux Quartzite is at or near land surface and streamflow losses where streams and rivers flow across outcrops with secondary porosity features, or leakage from overlying aquifers where the potentiometric gradients are favorable (a lower water level in the quartzite than in an overlying hydraulically connected aquifer would indicate potential for downward leakage) (Lindgren and Niehus, 1992). Recharge to the Sioux Quartzite has not been quantified. Therefore, data is not available to quantitatively compare the estimated average annual recharge to estimated average annual withdrawal in the aquifer.

A qualitative examination of average annual recharge against average annual withdrawals from the aquifer can be accomplished by considering water level trends in the aquifer. The Water Rights Program does not monitor any observation wells completed into the Sioux Quartzite aquifer (Water Rights, 2020a), so the availability of historical water level data is limited. Some insight into historic water levels can be gained by reviewing the well completion reports on file with the Water Rights Program in the vicinity of the well locations for the application, however evaluating historic water levels using well completion report data is much more subjective than the use of dedicated observation wells because of the additional interpretations necessary (i.e. well locations/elevations, groundwater gradients, lack of wells completed into the aquifer, aquifer characteristics, unpredictability of fracture systems, and seasonal and climatic water level fluctuations).

Data from Lindgren and Niehus (1992) indicates water levels in the Sioux Quartzite show a correlation with long-term precipitation trends. Water levels that follow long-term precipitation trends typically undergo cyclic conditions, rising during wet years and declining during dry years. A review of well completion reports on file with the Water Rights Program (Water Rights, 2020c) indicates water levels in the Sioux Quartzite have historically been relatively stable in the vicinity for this application. Table 2 contains a summary of the Sioux Quartzite water levels interpreted from well completion report data in the vicinity of the well location for this application. If water levels in an aquifer decline over time, it may be suggestive of withdrawal exceeding recharge. Since available water level information is indicating relatively stable water levels in the Sioux Quartzite in the vicinity of the well site for this application, this indicates that withdrawals from the aquifer have not exceeded recharge (Water Rights, 2020c). Since recharge to and groundwater outflow from an aquifer can be captured for well withdrawals, the water level information derived from the well completion reports on file with the Water Rights Program is suggestive of unappropriated water being available in the Sioux Quartzite in the vicinity of this application.

Table 2: Data Points Used To Examine Historic Water Levels in the Sioux Quartzite (Water Rights, 2020c)

Last Name/Permit No.	Year Drilled	Distance From Application	Direction From Application	Approximate Ground Elevation (ft)	Estimated Potentiometric Surface (ft)	Approximate Elevation Top of the Sioux Quartzite (ft)
Dakota Line Dairy	2020	0.0	n/a	1610	1470	1331
Dakota Line Dairy	2020	0.0	n/a	1610	1470	1346
Oyen	1978	12.0	ENE	1610	1574	1511
Rise	1982	10.1	ENE	1580	1470	1482
Schafer	2005	12.3	ENE	1560	1494	1443
Hill	2007	14.7	ENE	1600	1459	1325
songstad (5712-3)	1973	10.6	ESE	1470	1440	1416
Luke	1977	11.2	ESE	1540	1447	1461
Kloxin	1977	11.7	ESE	1510	1412	1402
Amato	1985	10.6	ESE	1470	1388	1330
Kloxin	1991	11.2	ESE	1550	1458	1430
Goos (5064-3)	1992	10.5	ESE	1520	1495	1478
Nimick	1992	11.0	ESE	1550	1452	1420
Steenholdt	1994	12.5	ESE	1500	1444	1409
Anderson	1977	4.0	N	1495	1212	1315
Holmberg	1981	7.4	N	1770	1530	1476
Zimmer	2018	6.1	N	1630	1507	1458
Meisenhelder	1974	10.5	NE	1650	1530	1490
Boggs	1991	7.9	NE	1570	1521	1520
McFarland	2010	9.6	NE	1580	1540	1510
Bies	1977	12.4	NW	1590	1135	1328
Streff	1980	14.9	NW	1565	1435	1333
Eichacker	1982	15.1	NW	1535	1417	1307
Eichacker	1983	15.2	NW	1540	1425	1312
McGreger	1986	11.3	NW	1575	1445	1307
Farmers Pork-west (8289-3)	1998	20.2	NW	1515	1425	1317
Farmers Pork-east (8290-3)	2016	20.1	NW	1510	1425	1292
Turner Co (6255-3)	2000	11.6	S	1430	1340	1342
Fox Run LLC	2017	14.0	S	1370	1323	1289
Turner Co (6255-3)	2019	11.6	S	1430	1340	1335
Brandt	1973	14.0	SE	1520	1430	1395
Dubbe	1980	5.9	SE	1630	1395	1395
Ellens	1981	9.1	SE	1580	1420	1379
Wild West Waterpark (5656-3)	1990	12.0	SE	1490	1315	1330
Haibeck	1998	9.8	SE	1570	1413	1371
Begerman	1979	7.0	SW	1420	1230	1356
Pullman	1980	6.5	SW	1460	1378	1370
Pullman	1980	7.7	SW	1450	1368	1360
Kondra	1984	11.3	SW	1500	1350	1225
Town of Monroe (5466-3)	1990	10.9	SW	1480	1327	1270
Ortman	2018	13.9	SW	1440	1325	1146
Pittman	1983	9.0	W	1560	1320	1340

Existing Users

Water rights/permits currently authorized to appropriate water from the Sioux Quartzite in the area of the well site for this application are shown in Figure 2 and summarized in Table 4. The nearest water rights/permits authorized to appropriate water from the Sioux Quartzite is Water Right No. 4275-3 for the Town of Humboldt located approximately 2.1 miles to the north. The Town of Humboldt purchases their water from Minnehaha Community Water Corp (Drinking Water, 2020).

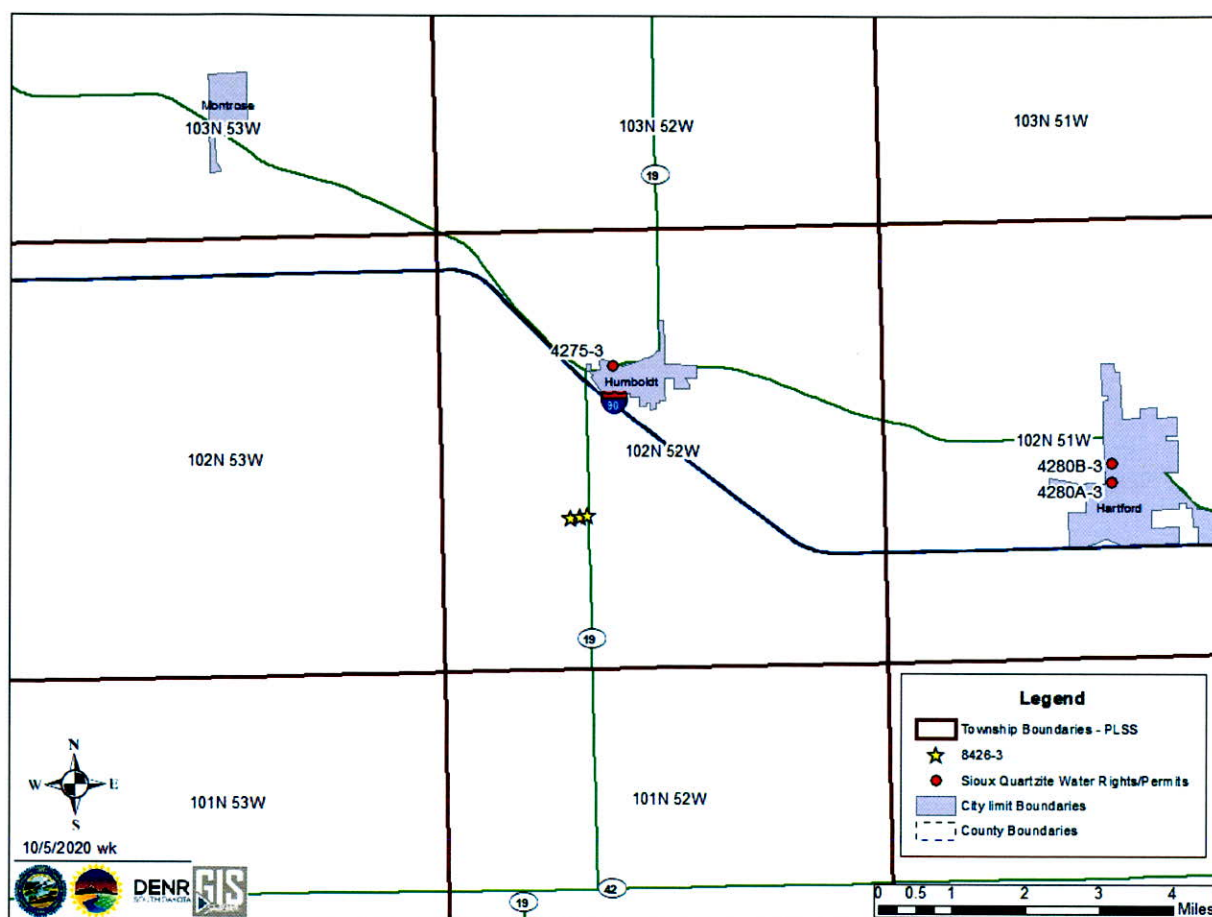


Figure 2: South Dakota water rights/permits currently authorized to appropriate water from the Sioux Quartzite in the area of the wells for this application (Water Rights, 2020b)

Table 4: Summary of Water Rights Shown in Figure 2 (Water Rights, 2020b)

Permit No.	Name	Priority Date	Status	Use	Rate (cfs)
4275-3	Town of Humboldt	01/01/1953	LC	Municipal	0.22
4280A-3	City of Hartford	01/01/1912	LC	Municipal	0.43
4280B-3	City of Hartford	04/26/1978	LC	Municipal	0.34

A review of the well completion reports on file with the South Dakota Water Rights Program indicate the nearest domestic well on file with the South Dakota Water Rights Program readily identifiable as completed into the Sioux Quartzite is located approximately 4 miles to the northwest of the well locations for this application (Water Rights, 2020c). However, in examining the aerial imagery there are several farm sites closer to the well locations to this permit that could potentially have wells completed into the Sioux Quartzite without a well completion report on file (Water Rights, 2020c). However, given the availability of rural water in the area, it is possible that many domestic users in the area are connected to rural water for their household needs (SDGS, 2020; Drinking Water, 2020).

The well completion reports for this application indicate the Sioux Quartzite is under confined or artesian conditions (water level is above the top of the aquifer) at the well sites for this application. The exact amount of drawdown as the result of pumping due to this proposed diversion cannot be quantified without more extensive aquifer testing. Since the aquifer is under confined conditions in the area of the well, some amount of drawn down from pumping is expected. The well completion reports submitted with this application indicated there is approximately 124 to 157 feet of artesian head pressure in the Sioux Quartzite at the well sites for this application. When considering impacts to changes to artesian head pressure as a result of appropriative pumping in the case of Water Permit Application No. 2313-2 for the Coca-Cola Bottling Company of the Black Hills, the Water Management Board adopted findings noting if increased costs or decreased production as a result of the impacts of legitimate users on artesian head pressure is considered an adverse impact, it would conflict with SDCL 46-1-4 (Water Rights, 1995). SDCL 46-1-4 requires the water resources of the state be put to beneficial use to the maximum extent of which they are capable (Water Rights, 1995). Additionally, since this aquifer is primarily dominated by secondary porosity, any draw down as the result of pumping will also be governed by the extent and interconnectivity of secondary fractures in the area.

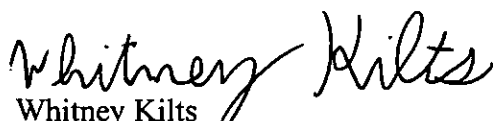
Administrative Rule of South Dakota (ARSD) 74:02:04:20(7) defines an adversely impacted domestic well as “a well in which the pump intake was set at least 20 feet below the top of the aquifer at the time of construction or, if the aquifer is less than 20 feet thick, is as near to the bottom of the aquifer 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.” While in most aquifers 20 feet is an adequate depth of water for prior users and domestic wells, in the Sioux Quartzite 20 feet below the top of the aquifer is seldom a sufficient depth for a well to be a dependable water supply. To further complicate the consideration of adverse impact in the Sioux Quartzite, maximum drawdown that could result from pumping a large capacity well is limited by well depth rather than aquifer thickness. Therefore, provided that a well is adequate as defined by ARSD 74:02:04:20(6), the assessment of well interference being an adverse impact would also have to consider well depth.

Minimum well depth is not regulated; however, ARSD 74:02:04:60 specifies requirements for the installation of pumps in wells. The rule requires that the depth of the pump placement be determined by dividing the specific capacity of the well into the required yield and adding at least 10 additional feet. Therefore, the minimum depth of the pump placement as determined by ARSD 74:02:04:60 could be used as a quasi-minimum well depth standard. If well depth allowed for pump placement per ARSD 74:02:04:60 and well interference requires the well be deepened, that interference could be considered an adverse impact. However, if the affected well is not deep enough to allow compliance with the requirements of ARSD 74:02:04:60, interference that would require deepening of the well may not be considered an adverse impact. Additionally, the use of the pump placement standard does not fix the pump placement to the static water level or the specific capacity of the well at the time of construction. Instead the pump setting and well depth would need to allow for climatic fluctuations of the static water level and/or a change in

specific capacity of the well. Ultimately, given the information and discussion presented, the appropriation requested by this application, if approved, is not expected to cause unlawful impairment of domestic or appropriative existing users of the Sioux Quartzite with adequate wells pursuant to both ARSD 74:02:04:20(7) and ARSD 74:02:04:60.

Conclusions

1. Dakota Line Dairy proposes to appropriate a maximum of 300 acre-feet of water annually at a maximum instantaneous diversion rate of 0.67 cfs from three wells completed into the Sioux Quartzite. The wells are in the S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 20 in T102N-R52W for commercial use in a dairy confinement operation located in the SE $\frac{1}{4}$ Section 20 in T102N-R52W.
2. The Sioux Quartzite can act as an aquifer in the area of the well sites for this application.
3. Average annual recharge to the Sioux Quartzite in South Dakota has not been quantified. However, the reasonably available information suggests that withdrawals from the Sioux Quartzite have not exceeded recharge.
4. The Water Rights Program does not monitor any observation wells completed into the Sioux Quartzite.
5. Due to the characteristics of the formation, potential for unlawful impairment of well completed into the Sioux Quartzite would need to be assessed pursuant to both ARSD 74:02:04:20(7) and ARSD 74:02:04:60.
6. Existing water users, (either appropriative or domestic), are not expected to be unlawfully impaired by this application with adequate wells pursuant to both ARSD 74:02:04:20(7) and ARSD 74:02:04:60.


Whitney Kilts
SD DENR-Water Rights Program

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Water Rights. 2020c. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Argus Leader

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Account No: 5597990772

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DAKOTA LINE DAIRY
20803 ROAD 28
TULARE, CA 93274

Account No.: 5597990772
Ad No.: 0004420446

Argus Leader AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

COUNTY OF MINNEHAHA

I being duly sworn, says: That The Argus Leader is, and during all the times hereinafter mentioned was, a daily legal newspaper as defined by SDCL 17-2-21, as amended published at Sioux Falls, Minnehaha County, South Dakota; that affiant is and during all of said times, was an employee of the publisher of such newspaper and has personal knowledge of the facts stated in this affidavit; that the notice, order or advertisement, a printed copy of which is hereto attached, was published in said newspaper upon

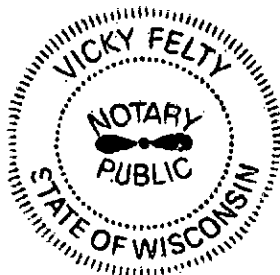
Thursday, October 22, 2020

Sworn to and subscribed before me this 2 day of November, 2020.

Marta Stankart
Legal Clerk

Vicky Felty
Notary Public, State of Wisconsin, County of Brown

9/19/21
My Commission expires



NOTICE OF
APPLICATION NO. 8426-3
to Appropriate Water

Notice is given that Dakota Line Dairy, c/o David Lemstra, 20803 Road 28, Tulare CA 93274 has filed an application for a water permit to appropriate 300 acre-feet of water annually at a maximum pump rate of 0.67 cubic feet of water per second from three wells to be completed into the Sloux Quartzite Aquifer (650-750 feet deep) located in the S 1/2 SE 1/4 Section 20 for commercial use in a dairy confinement operation located in the SE 1/4 Section 20; all in T102N-R57W. This site is located approximately 1 1/2 miles southwest of Humboldt SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8426-3 with qualifications because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <http://denr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is: "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by November 2, 2020.

The petition may be informal but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

If the applicant does not contest the recommendation of the Chief Engineer and no petition to oppose the application is received, the Chief Engineer shall act on the application pursuant to the recommendation with no hearing held before the Water Management Board. If a petition opposing the

application or contesting the recommendation is filed, then a hearing will be scheduled, and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition. Published once at the total approximate cost of \$66.64
4420446 Oct 22, 2020

Schlaak, Karen

From: Schlaak, Karen
Sent: Tuesday, October 13, 2020 10:45 AM
To: legals@argusleader.com
Subject: 8426-3, Dakota Line Dairy
Attachments: 8426-3public.short.docx; FORM8.FRM.doc

Attached is a notice to be published on October 22, 2020.

Dakota Line Dairy, c/o David Lemstra, 20803 Road 28, Tulare CA 93274 (559-799-0772) has been notified to contact you to authorize publication and arrange for payment.

Please send the affidavit or return the attached Proof of Publication form ASAP to the Water Rights Program, 523 E Capitol, Pierre SD 57501.

Let me know if you have questions. Please acknowledge receipt of this email.

Karen Schlaak
Water Rights Program
(605) 773-3352





DENR
SOUTH DAKOTA

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

**NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPER RIGHT AWAY.**

October 13, 2020

Dakota Line Dairy
c/o David Lemstra
20803 Road 28
Tulare CA 93274

Dear Mr. Lemstra:

Water Permit Application No. 8426-3 for commercial use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Argus Leader printed at Sioux Falls SD (Ph # 605 331-2200). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspaper to authorize publication of your Notice and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization from you, the publisher has been instructed to publish your notice. The newspaper has also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Karen Schlaak

Karen Schlaak
Water Rights Program
(605) 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.

NOTICE OF APPLICATION NO. 8426-3 to Appropriate Water

Notice is given that Dakota Line Dairy, c/o David Lemstra, 20803 Road 28, Tulare CA 93274 has filed an application for a water permit to appropriate 300 acre-feet of water annually at a maximum pump rate of 0.67 cubic feet of water per second from three wells to be completed into the Sioux Quartzite Aquifer (650-750 feet deep) located in the S 1/2 SE 1/4 Section 20 for commercial use in a dairy confinement operation located in the SE 1/4 Section 20; all in T102N-R52W. This site is located approximately 1 1/2 miles southwest of Humboldt SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8426-3 with qualifications because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <http://denr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by November 2, 2020.

The petition may be informal but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

If the applicant does not contest the recommendation of the Chief Engineer and no petition to oppose the application is received, the Chief Engineer shall act on the application pursuant to the recommendation with no hearing held before the Water Management Board. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled, and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Published once at the total approximate cost of

Schlaak, Karen

From: Schlaak, Karen
Sent: Monday, December 7, 2020 8:46 AM
To: 'paulk@a1developmentsolutions.com'
Subject: Water Permit No. 8426-3, Dakota Line Dairy
Attachments: 0168.pdf

Attached is a copy of the Water Permit No. 8426-3, Dakota Line Dairy.

Karen Schlaak

Water Rights Program
(605) 773-3352



DENR
SOUTH DAKOTA

December 1, 2020

PAYMENT REQUEST FORM

PAYEE: Lemstra Cattle Co., LLC
20803 Road 28
Tulare CA 93274

FROM: DENR Water Rights Program
523 E. Capitol Ave
Pierre, SD 57501-3181

DESCRIPTION OF SERVICE, PRODUCE OR TRANSFER

Over Payment of Water Permit Application

AMOUNT: \$100.00

FUNDING SOURCE:

GENERAL: X

FEDERAL:

OTHER:

COMMENTS:

AUTHORIZATION: *Eric Menlund 12/4/2020*

I declare and affirm under the penalties of perjury that this claim is in all things, true and correct. I further agree to comply with the provisions of the Civil Rights Act of 1964 and regulations issued thereunder relating to nondiscrimination in federal assisted programs.



DENR
SOUTH DAKOTA

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

DEC 07 2020

Dakota Line Dairy
c/o David Lemstra
20803 Road 28
Tulare CA 93274

Dear Mr. Lemstra:

Enclosed is Water Permit No. 8426-3 authorizing construction of the water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

An application/license filing fee of \$1,150.00 was submitted with the application. The fee should have been \$1,050.00. \$100.00 will be refunded to you. The refund check should be received within the next couple of weeks.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Eric Gronlund, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures



October 29, 2020

Paul Kostboth
A1 Development Solutions
101 N. Main Ave., Suite 321
Sioux Falls, SD 57104

RE: Aquifer Pumping Test Report

Dear Mr. Kostboth,

The purpose of this letter report is to provide A1 Development Solutions (A1) with the results of the aquifer pumping test (Test) completed on September 28, 2020 at the Dakota Line Dairy (DLD). DLD is currently under construction at a location approximately two miles south of Humboldt, SD (Project Site), in the southeast quarter of Section 20, Township 102 North, Range 52 West, in Minnehaha County. This project was authorized by signed contract between A1 and LRE, dated June 24, 2020.

The primary purpose of the Test was to provide additional information regarding the aquifer from which DLD plans to appropriate 300 acre-feet per year (ac-ft/yr) of groundwater (for commercial use) under water permit application #8426-3 (WPA #8426-3). WPA #8426-3 was originally submitted in March 2020, and requested authorization to pump groundwater from a well completed in an undifferentiated Cretaceous-age sandstone (un-K SS). In a letter to the South Dakota Department of Environment & Natural Resources (DENR) dated August 21, 2020, LRE submitted a request on behalf of DLD to amend WPA #8426-3 by changing the proposed water source from the un-K SS to the Precambrian Sioux Quartzite aquifer, while leaving the annual withdrawal volume and maximum instantaneous diversion rate un-changed from the original application. The maximum instantaneous diversion rate under WPA #8426-3 is 0.67 cubic feet per second, which is equivalent to approximately 300 gallons per minute (gpm).

BACKGROUND INFORMATION

It was originally planned to develop the un-K SS as a water source, and one well (hereinafter referred to as Well 1) completed in the un-K SS was constructed in February 2020 by Dave Putzke Well Drilling & Repair, Inc. (Putzke). DLD hired Heine Electric & Irrigation, Inc. (HEI) to conduct test hole drilling for the purpose of identifying another suitable well location and to conduct an aquifer-pumping test of the un-K SS. The aquifer-pumping test for the un-K SS was required by the DENR in support of the original WP #8426-3 application.

ACTIVITIES

The following activities were completed by LRE during work on this project:

- Reviewed the available information regarding the project site geology, including, well log and lithologic log databases maintained by the DENR and the South Dakota Geological Survey (SDGS);
- Corresponded and collaborated with HEI, as needed, regarding the construction of four wells (one to be used as the pumping well and the remaining three as observation wells);
- Provided, installed, and programmed four data-logging pressure transducers (transducers) in the pumping well and three observation wells;
- Provided and programmed a barometric pressure data-logging pressure transducer;
- Assisted in conducting the Test, using Well 4 as the pumping well and Wells 1, 2, and 3 as observation wells. The Test included 20 hours of background monitoring, 26 hours of constant-rate pumping, and 96 hours of groundwater level recovery monitoring after pumping shut-down;
- Provided Test oversight, which included collecting manual water-level measurements at the pumping and observation wells to confirm the transducers were working properly and periodically checking the pumping rate;
- Conducted a qualitative analysis of the aquifer test data; and,
- Provided this report including the water level and barometric data collected during the Test and the results of the qualitative analysis of the Test data.

TEST HOLE DRILLING

Eight test holes (TH1 through TH8) were drilled at the Project Site between June 17, 2020 and July 15, 2020 by HEI using the forward mud-rotary drilling method. The locations of the eight test holes, as well as geologic logs for TH5 and TH6, have not been provided as of the date of this report. The stratigraphic units (rock layers) encountered in the test holes is summarized in Table 1. Those test hole geologic logs provided to LRE are included in Attachment 1. HEI concluded that none of the eight test holes were suitable for completion as a water supply well, and the test holes were properly sealed and abandoned.

Table 1. HEI Test Hole Drilling Results

Location	Date Drilled	Total Depth (ft bgs)	Stratigraphic Units (ft bgs)
TH1	6/17/2020	277	0 – 254 Unconsolidated 254 – 276 Shale 276 – 277 Quartzite Wash
TH2	6/26/2020	312	0 – 246 Unconsolidated 246 – 303 Chalk 303 – 312 Sandstone 312 Quartzite
TH3	6/30/2020	301	0 – 227 Unconsolidated 227 – 251 Chalk 251 – 290 Shale 290 – 294 Sandstone 294 – 301 Shale 301 Quartzite
TH4	7/2/2020	244	0 – 241 Unconsolidated 241 – 244 Quartzite
TH5	na	na	na
TH6	na	na	na
TH7	7/13/2020	273	0 – 195 Unconsolidated 195 – 237 Shale 237 – 266 Chalk 266 – 271 Soft Sand 271 – 273 Hard Sandstone 273 Quartzite
TH8	7/15/2020	294	0 – 264 Unconsolidated 264 – 288 Shale 288 – 294 Sandstone 294 Quartzite

Notes:

na: not available

ft bgs: feet below ground surface

WELL INSTALLATION

During the period from July through September 2020, Putzke constructed three additional well (Wells 2, 3 and 4) at the Project Site. Wells 2, 3 and 4 are completed as open boreholes in the Sioux Quartzite (referred to as “Granite” in the well logs completed by Putzke). The approximate locations of the three wells completed in the Sioux Quartzite (Well 2, Well 3, and Well 4), and the well completed in the un-K SS (Well 1), are shown in Figure 1.

The stratigraphic units encountered in the four wells are summarized in Table 2. Well construction and geologic logs are provided in Attachment 2.

Table 2. Stratigraphic Unit and Construction Details Summary for Wells 1 through 4

Location	Date Completed	Total Depth (ft bgs)	Static Water Level (ft bTOC)	Well Construction (ft bgs)	Stratigraphic Units (ft bgs)
Well 1	2/10/2020	316	157	0 – 296 PVC Casing 296 – 316 SS Screen	0 – 240 Unconsolidated 240 – 250 Shale 250 – 290 Clay 290 – 316 Sandstone 316 Quartzite
Well 2	7/31/2020	645	140	0 – 279 Steel Casing 279 – 645 Open Hole	0 – 200 Unconsolidated 200 – 275 Shale 275 – 279 Sandstone 279 – 645 Quartzite
Well 3	8/13/2020	740	140	0 – 264 Steel Casing 264 – 740 Open Hole	0 – 195 Unconsolidated 195 – 264 Shale 264 – 740 Quartzite
Well 4	9/18/2020	595	160	0 – 317 Steel Casing 317 – 595 Open Hole	0 – 200 Unconsolidated 200 – 307 Shale 307 – 317 Sandstone 317 – 595 Quartzite

Notes:

SS: stainless steel

ft bgs: feet below ground surface

ft bTOC: feet below top of casing

Following installation, the wells were developed using the airlift pumping development method. Development time on each well is unknown. The wells were also disinfected after completion using chlorine pellets and pumped circulation.

SITE HYDROGEOLOGY

In general, the upper 200 to 265 feet of material at the Project Site is comprised of unconsolidated, Quaternary-age, glacial sediments called till, which is consistent with the information in the geologic map of Minnehaha county (Tomhave, 1994). Till is a heterogeneous mixture of clay, silt, sand, gravel and boulders, and the clay-rich till at the Project Site is not suitable for a commercial water supply well. The HEI test hole logs and the Putzke well logs from the Project Site indicate that the first bedrock underlying the till at the Project Site varies with location, and consists of the Precambrian Sioux Quartzite, the un-K SS, and Cretaceous-age shale or chalk deposits.

These undifferentiated Cretaceous sediments in the vicinity of the Project Site could possibly include the Split Rock Creek Formation, Dakota Formation, Graneros Shale, Greenhorn Formation, Carlile Shale, Niobrara Formation, and Pierre Shale; and potentially also quartzite wash (a local term for unconsolidated pink sands believed to have been eroded from the Sioux Quartzite and re-deposited, typically in a topographic low of the Sioux Quartzite surface). A substantial geologic discussion is provided in the “Report to the Chief Engineer, Water Permit Application No. 8426-3, Dakota Line Dairy, May 22, 2020” (DENR, 2020) and is not reiterated herein. As stated in DENR (2020), the extent of the Cretaceous undifferentiated in South Dakota is still evolving. Therefore, it is unclear which of the above listed formations are consistently present at the Project Site, aside from the regionally extensive Sioux Quartzite.

Well 1 is constructed in Cretaceous sandstone or quartzite wash immediately overlying the Sioux Quartzite. Wells 2, 3, and 4 are completed in the underlying Sioux Quartzite. However, as discussed further in a later section of this report, regardless if Well 1 is completed in the un-K SS or in quartzite wash, the Sioux Quartzite and overlying sandstones at the Project Site behave hydraulically as one aquifer system.

AQUIFER TEST

Putzke provided the submersible pump for the Test, which was installed in Well 4 by HEI. HEI provided the generator to power the pump, and a circular orifice plate weir for pumping rate measurements. As indicated previously, LRE provided and installed the transducers to measure and record water-level data displacement data (drawdown and recovery) from the pumping well and the three observation wells.

TEST SCHEDULE

The Test was conducted between 9:00 am on September 23, 2020 and 10:45 am on September 24, 2020, and includes 1,545 minutes (25.8 hours) of continuous pumping. Start and stop times, pumping duration, pumping rate, and recovery period information are provided in the Aquifer Test Summary Sheet in Attachment 3. The pumping portion of the Test was planned to be 48 hours in duration; however, a pump motor malfunction resulted in an unexpected shut down of the Test. Pump diagnostics concluded that the pump motor failed and could not be restarted. Therefore, it was decided to leave the pump in Well 4 and collect groundwater level recovery data. Although the Test was shorter than planned, the Test data illustrate that it was a clean test.

MONITORING EQUIPMENT

Water levels were monitored during the Test using dedicated transducers installed by LRE. The transducers were vented and automatically compensate for changes in barometric pressure. In addition, manual water-level measurements were collected periodically in Wells 1 through 4 with an electronic water-level meter. Data were downloaded from the transducers and graphed by

LRE to monitor the progress during the Test. Details specific to the Test are provided in the Aquifer Test Summary Data Sheet in Attachment 3.

PUMPING RATE

The pumping rate was measured with a circular orifice plate weir installed by HEI, and the flow rate was periodically recorded. The pumping rate averaged approximately 206 gpm for the duration of the Test. Power for the submersible pump in Well 4 was obtained from a generator provided by HEI.

BAROMETRIC PRESSURE

A barometric pressure transducer was placed near Well 4 to monitor variations in barometric pressure throughout the Test and its potential influence on observed water-level fluctuations. Barometric pressure data throughout the Test is shown on hydrographs in Attachment 4. Fluctuations in barometric pressure did not influence the water levels in the four wells during the Test.

AQUIFER TEST RESULTS AND DISCUSSION

Drawdown in response to pumping during the Test was measured in all four wells. A hydrograph showing the groundwater elevation data measured in the four wells, from 9/22/20 to 9/28/20 is provided in Attachment 4, as is a graph showing the drawdown-versus-time data for Wells 1 through 4. The changes in the water levels over time in response to pumping at Well 4 indicate that the Sioux Quartzite aquifer is capable of providing water to Well 4 at the tested rate (206 gpm), and that pumping influence is observed in each of the three observation wells. At the end of the pumping portion of the Test, Well 4 had a maximum drawdown of 80.1 feet of drawdown, Well 1 had 6.3 feet of drawdown, Well 2 had 5.8 feet of drawdown, and Well 3 had 3.2 feet of drawdown. Note that the Well 4 hydrographs in Attachment 4 indicate the pump likely began failing prior to its ultimate shutdown on September 24. The maximum drawdown listed above for Well 4 is the maximum observed during the entire pumping portion of the Test, prior to pump failure.

Upon shutdown of Well 4, the recovery of each well was reviewed after a recovery duration of 1,545 minutes (the equivalent duration of pumping). Well 4 reached 98% recovery, Wells 1 and 2 reached 85% recovery, and Well 3 reached 87% recovery. When the transducers were removed from the wells on September 28, 2020, Well 4 had achieved 99% recovery and Wells 1, 2, and 3 had reached 100% recovery. A summary of the maximum drawdown observed at the end of the Test, the recovery percentages relative to the pumping period, and other pertinent Test information is provided in the Aquifer Test Summary Sheet in Attachment 3.

The pumping water level in Well 4 at the average pumping rate of 206 gpm was approximately 227 to 233 ft bgs. A specific capacity graph for Well 4 is provided in Attachment 4 and illustrates

that, for the duration of the test, the specific capacity of Well 4 ranged from approximately 2.6 gallons per minute per foot (gpm/ft) to 2.8 gpm/ft.

A distance-drawdown plot provided in Attachment 4 illustrates the amount of drawdown observed with distance from the pumping well. The distance-drawdown plot shows that the drawdown data from Wells 1, 2, and 3 fall on a straight line and indicate that all three wells are in good hydraulic connection with the pumped aquifer. This is particularly notable for Well 1, which is completed in the un-K SS directly overlying the Sioux Quartzite. As previously indicated, it is unknown if the un-K SS is comprised of quartzite wash, is part of the Split Rock Creek formation, or is a sandstone layer of another Cretaceous-age formation. Regardless of formation association, the Test data illustrates that Well 1 is in direct hydraulic connection with the pumped Sioux Quartzite aquifer.

The distance-drawdown plot was also used to estimate a Well 4 efficiency of 54%.

CONCLUSIONS DRAWN FROM THE AQUIFER TEST DATA

The results provided in this letter report indicate that the Sioux Quartzite aquifer is capable of providing 200 gpm to Well 4. Assuming a conservative specific capacity of 2.4 gpm/ft (specific capacity decreases with increased pumping rate), a pump setting at Well 4 at 310 feet bgs (above the bottom of well casing), a maximum pumping level of 290 ft bgs (310 ft pump setting minus a 20 ft safety factor to avoid cavitation), and a static water level of approximately 150 ft bgs, Well 4 may be able to be pumped at a rate as high as 330 gpm.

It is LRE's understanding that DLD intends to use all four wells as water supply wells. The results from the Test indicate that all four wells when pumped would be producing from the Sioux Quartzite aquifer. Consequently, it is appropriate to include all four wells as points of diversion in WPA #8426-3.

RECOMMENDATIONS

While the primary purpose of the Test was to provide information regarding the source of groundwater for the four wells at the Project Site, LRE recommends that DLD consider the following operational items intended to facilitate the monitoring of the well field production and to provide data for determining when to conduct well and pump maintenance activities.

- Install permanent transducers in the wells to monitor the water-levels in the wells over time, and to provide information regarding the effect of well interference between the four wells (which will occur, based on the hydraulic connection observed among the four wells during the Test). The transducers should be capable of measuring water levels accurate to 0.01 ft.
- Measure and record periodic manual water-level measurements from the wells to compare against the transducer data. The manual water-level measurement data will validate the transducer data and indicate if the transducers are working properly.
- Install individual flow meters with totalizers on each pumping well, and keep accurate, long-term pumping records for each well.
- Maintain a database of water-level measurements (manual measurements and transducer data) and pumping rates and volumes for each well, and assess the well field production and static and pumping water levels on a monthly basis for the first year of operation to provide information regarding the long-term viability of the aquifer.
- Conduct periodic short-term specific capacity testing on the pumping wells to monitor yield and evaluate well performance. Future specific capacity testing results for Well 4 should be operated for 1 hour at a similar rate as the initial Test (206 gpm) so the results can be compared to the 1-hour specific capacity test provided in this report (2.6 gpm/ft). The specific capacity testing can be utilized to determine when well maintenance or rehabilitation is necessary.

Approximate specific capacities for the other three wells can be estimated from the well construction logs (Attachment 2), although the accuracy of the pumping water level data (and therefore the specific capacity) obtained during airlifting is marginal. It is estimated that the specific capacity of Well 2 could be similar to that of Well 4. The specific capacity of Well 1 is estimated to be on the order of 0.5 to 1 gpm/ft, and the specific capacity of Well 3 is likely less than 0.25 gpm/ft. It is recommended that an initial specific capacity test be conducted in Wells 2, 3, and 4 after their permanent pumps are installed. The initial and subsequent specific capacity tests should be conducted for a duration of 1 hour.

Sincerely,

LRE WATER



Mitch Kannenberg, PE
Senior Project Manager



Michael Plante, GISP
Lead Hydrogeologist

5506ADS01
MWK/mcp

REFERENCES CITED

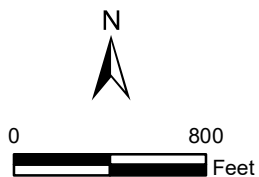
DENR, 2020. Report to the Chief Engineer, Water Permit Application No. 8426-3, Dakota Line Dairy, May 22, 2020, 17 p.

Tomhave, D.W., 1994. Geology of Minnehaha County, South Dakota. South Dakota Geological Survey Bulletin 37, South Dakota Geological Survey, Vermillion, South Dakota, 49 p.

FIGURE

D:\GIS\GISIDakota Line Dairy\maps\5506ADS01_01b.mxd, 10/9/2020, 4:17:29 PM, NAD 1983 UTM Zone 14N

Well

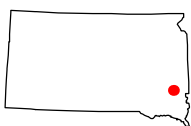
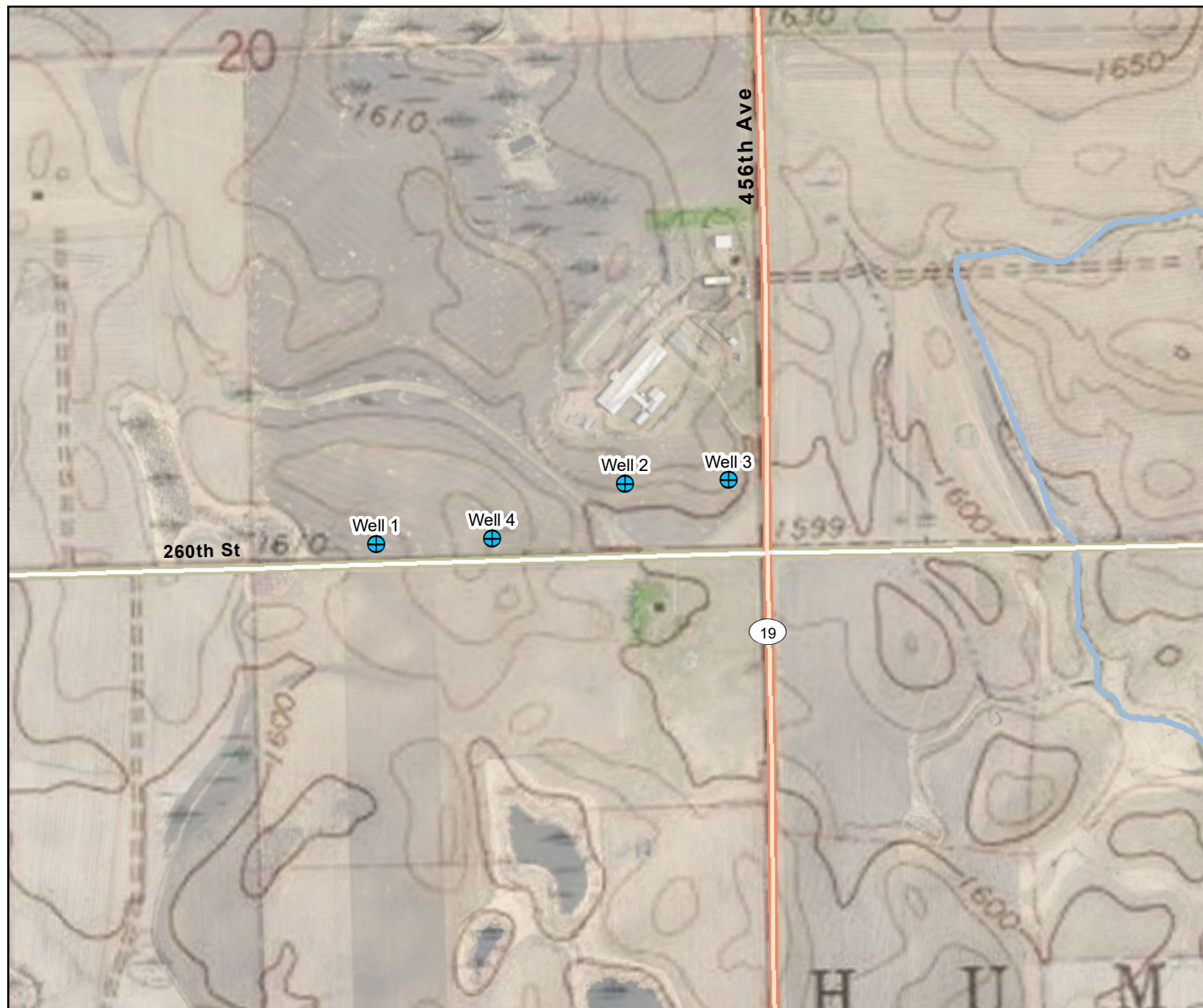


Notes:

Sources:

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Copyright:© 2013 National Geographic Society, i-cubed

ESRI StreetMap North America, v10.2



Prepared By:
LRE Water
Innovative Water Resource Solutions
South Dakota Office
Sioux Falls, South Dakota
(605) 310-1721

DAKOTA LINE DAIRY
AQUIFER PUMPING TEST
HUMBOLDT, SOUTH DAKOTA

EXISTING WELL LOCATIONS

FILE: 5506ADS01_01b.MXD

DATE: 10/9/2020

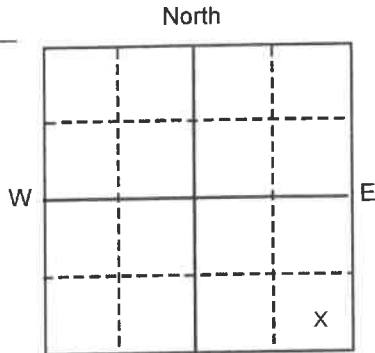
FIGURE: 1

ATTACHMENT 1
TEST HOLE GEOLOGIC LOGS

Copies

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE ¼ SE ¼ Sec 20 Twp 102N Rg 52WCounty MinnehahaPlease mark well
location with an "X"

Well Completion Date

06-17-2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
700.0 ft. from Abandoned Well (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	5.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	12	9.5 Lb/gal	0.0 Ft	277.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured
 Diameter _____ Inches Length _____ Feet
 Material _____
 Slot Size _____ Set From _____ Feet to _____ Feet
 Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____
☐ No, Why Not? _____
 Lab to which water quality sample sent for analysis _____
Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN SILTY CLAY	3	34
BLUE CLAY	34	58
SANDY BLUE CLAY WITH GRAVEL	58	75
SANDY BLUE CLAY	75	125
MED TO CORSE SAND AND GRAV.	125	134
BROWN SANDY CLAY	134	159
BROWN SAND FINE	159	169
CONTINUED ON ATTACHMENT		

STATIC WATER LEVEL

_____ FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #1

This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

RECEIVED

AUG 24 2020

Date: 8-11-20WATER RIGHTS
PROGRAM

Heine Electric & Irrigation, Inc.

***31585 460th Ave
Vermillion, SD 57069
605-670-9567***

Well log of test hole #1 continued for Dakota Line Dairy:

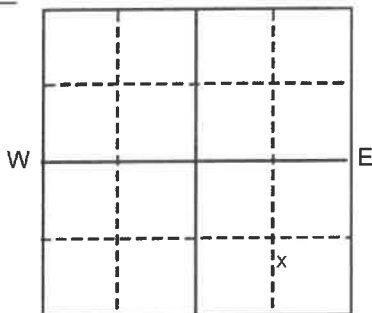
Depth	Formation
169-203	SANDY BROWN CLAY
203-230	SANDY BLUE CLAY
230-238	MEDIUM SAND
238-254	GRAY SANDY CLAY
254-276	SHALE
276-277	QUARTZITE WASH

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11- 02

Location SE ¼ SE ¼ Sec 20 Twp 102N Rg 52WCounty Minnehaha

North

Please mark well
location with an "X"

Well Completion Date

June 26, 2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
1,000.0 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	5.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	18	9.5 Lb/gal	0.0 Ft	312.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____
Lab to which water
quality sample sent for analysis _____Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
SANDY BROWN CLAY	3	155
BLUE CLAY	155	157
BROWN SANDY CLAY	157	194
GRAY CLAY	194	246
GRAY CHALK	246	303
SAND STONE	303	312
QUARTZITE	312	

STATIC WATER LEVEL

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____ through _____

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____

GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: _____☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #2

This well was drilled under license # 810 and this
report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

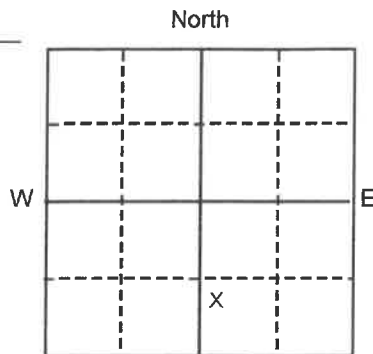
RECEIVED

AUG 24 2020

Date: 8-11-20WATER RIGHTS
PROGRAM

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW ¼ SE ¼ Sec 20 Twp 102N Rg 52WCounty MinnehahaPlease mark well
location with an "X"

Well Completion Date

June 30, 2020

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
ft. from _____ (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well
METHOD OF DRILLING:
MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	5.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	18	9.5 Lb/gal	0.0 Ft	301.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____
Lab to which water
quality sample sent for analysis _____Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN STICKY CLAY	3	22
BLUE STICKY CLAY	22	47
SAND AND GRAVEL MEDIUM	47	50
GRAY SANDY CLAY	50	109
SAND AND GRAVEL MEDIUM	109	111
BROWN SANDY CLAY	111	159
SAND FINE	159	162
CONTINUED ON ATTACHMENT		

STATIC WATER LEVEL

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____ through _____

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: _____☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #3

This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

RECEIVED

AUG 24 2020

WATER RIGHTS
PROGRAMDate: 8-11-20

Heine Electric & Irrigation, Inc.

31585 460th Ave

Vermillion, SD 57069

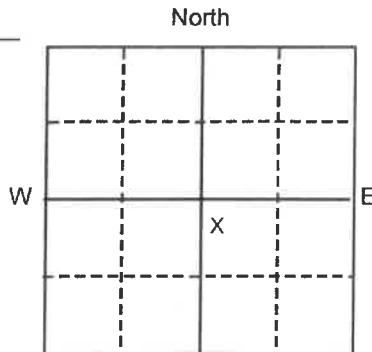
605-670-9567

Well log of test hole #3 continued for Dakota Line Dairy:

Depth	Formation
162-171	BROWN SANDY CLAY
171-227	GRAY SANDY CLAY
227-251	GRAY CHALK
251-290	SHALE
290-294	SANDSTONE
294-301	SHALE
301	QUARTZITE

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW 1/4 SE 1/4 Sec 20 Twp 102N Rg 52WCounty MinnehahaPlease mark well
location with an "X"

Well Completion Date

July 2, 2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?

1,500.0 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	5.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	10	9.5 Lb/gal	0.0 Ft	244.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____
Lab to which water
quality sample sent for analysis _____Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN SANDY CLAY	3	54
BLUE CLAY	54	135
BROWN SANDY CLAY	135	209
GRAY SANDY CLAY	209	241
QUARTZITE	241	244

STATIC WATER LEVEL

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____ through _____

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____

GPM

Can well be completely shut in? _____

WELL TEST DATA:

☐ Pumped Describe: _____☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #4

This well was drilled under license # 810 and this
report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

RECEIVED

AUG 24 2020

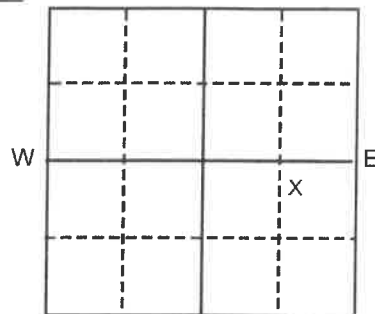
WATER RIGHTS
PROGRAMDate: 8-11-20

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE 1/4 SW 1/4 Sec 20 Twp 102N Rg 52WCounty Minnehaha

North

Please mark well
location with an "X"

Well Completion Date

July 13, 2020

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
2,500.0 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
GROUT WEL	32	9.5 Lb/gal	0.0 Ft	273.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____
 Lab to which water quality sample sent for analysis _____
Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN CLAY	3	32
SAND AND GRAVEL	93	113
BLUE CLAY	113	122
SAND WITH CLAY STREAKS GRAY	122	132
SANDY BROWN CLAY	132	195
SHALE	195	237
GRAY CHALK	237	266

CONTINUED IN REMARKS

STATIC WATER LEVEL

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____ through _____

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____

GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: _____☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #7

WELL LOG CONTINUED:

SOFT SAND 266-271

HARD SAND STONE 271-273

QUARTZITE 273

This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Owner: _____

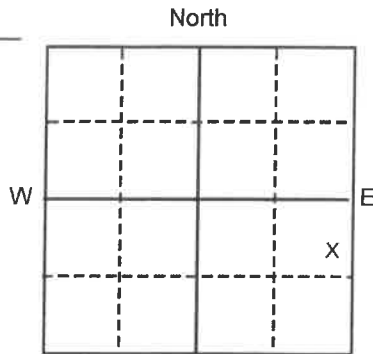
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AUG 24 2020

Date: 8-11-20WATER RIGHTS
PROGRAM

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE ¼ SW ¼ Sec 20 Twp 102N Rg 52WCounty MinnehahaPlease mark well
location with an "X"

Well Completion Date

July 15, 2020

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
500.0 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☒ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well
METHOD OF DRILLING:
MUD ROTARY

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
GROUT WEL	34	9.5 Lb/gal	0.0 Ft	294.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____
 Lab to which water quality sample sent for analysis _____
Well Owner: DAVID LEMSTRABusiness Name: DAKOTA LINE DAIRYAddress: 25971 456th AVECity, State, Zip: HUMBOLT SD 57035

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
BROWN CLAY	3	50
BLUE CLAY	50	93
ROCK	93	99
BLUE SANDY CLAY	99	116
BROWN SANDY CLAY	116	171
MEDIUM TO CORSE SAND	171	178
SANDY BLUE CLAY	178	248
CONTINUED ON ATTACHMENT		

STATIC WATER LEVEL

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____ through _____

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____

GPM

Can well be completely shut in? _____

WELL TEST DATA:

☐ Pumped Describe: _____☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

TEST HOLE #8

LATITUDE: 43.61944

LONGITUDE: -97.090849

ELEVATION: 1630

This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION, INC.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

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AUG 24 2020

Date: 8-11-20WATER RIGHTS
PROGRAM

Heine Electric & Irrigation, Inc.

31585 460th Ave

Vermillion, SD 57069

605-670-9567

Well log of test hole #8 continued for Dakota Line Dairy:

Depth	Formation
248-264	MEDIUM TO CORSE SAND WITH CLAY LAYERS
264-288	SHALE
288-294	SANDSTONE
294	QUARTZITE

ATTACHMENT 2

WELL CONSTRUCTION AND GEOLOGIC LOGS

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

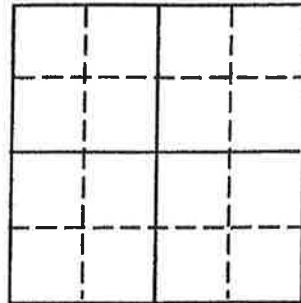
Location See Attached 1/4 1/4 Sec Twp Rg

County

minnehaha

North

Please mark well location with an "X"



Well completion Date

2-10-20

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? 2000 ft. from Feed lot (Identify source)

PROPOSED USE:

☒ Domestic/Stock ☐ Municipal ☒ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring

METHOD OF DRILLING:

Rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>SPR17</u> LB/FT	<u>6 1/2</u> IN	<u>0</u> FT	<u>316</u> FT	<u>10</u> IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Grout DF</u>	<u>30</u>	Lb/gal	<u>0</u> Ft	<u>285</u> Ft
		Lb/gal	Ft	Ft

Describe grouting procedure Run 1" trimmie line TOP Pea rockPumped w/ grout machine

SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 6 Inches Length 20 FeetMaterial SSS Green JohnsonSlot Size 25 Set From 296 Feet to 316 FeetOther information Manual Pack w/ 30 pack

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? 5 gallons of chlorine
☐ No, Why Not? Pumped & Pellets
Lab sample sent to for water quality analysis w/ Pea rock

Well Owner:

David & Marie Lemstra

Business Name:

Dakota Line Dairy

Address:

20803 Road 28

City, State, Zip:

Tulare, CA 93274

WELL LOG:

DEPTH

FORMATION

FROM

TO

Top Soil03Yellow clay330Blue clay30240Chalk240250Blue clay250290Sandstone290316Granite316

STATIC WATER LEVEL

157

FEET

If flowing: closed in pressure

PSI

GPM flow

through

Inch pipe

Controlled by ☐ Valve☐ Reducers☐ Other

Reduced flow rate

GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

260Ft. After 24

Hrs. pumped

110

GPM

Ft. After

Hrs. pumped

GPM

If pump installed, pump rate:

GPM

REMARKS

This well was drilled under license #

439

And this report is true and accurate.

Drilling firm:

Dave Putzke well Drilling & repair, Inc

Signature of License Representative:

RECEIVED

Signature of Well Owner or Equitable Property Holder:

FEB 20 2020

WATER RIGHTS PROGRAM

Date:

Please return WHITE COPY to: DENR Water Rights

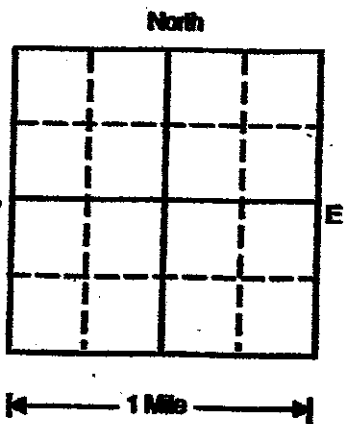
523 E Capitol Ave. Pierre SD 57501

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location 1/4 1/4 Sec Twp Rg

County Minnehaha



Please mark well location with an "X"

Well completion Date 7-31-20

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.) 2500' ft. from Dairy (identify source)

PROPOSED USE:
☒ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring

METHOD OF DRILLING: Rotary

CASING DATA: ☒ Gal ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
9.18 LB/FT	6 IN	0 FT	279 FT	10 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Portland		Lb/ft	R	R
		Lb/ft	R	R

Describe grouting procedure 6 1/2 yds of Slurry
Pumped w/ Drilling Rig

SCREEN: ☐ Perforated pipe ☐ Manufactured

Diameter Inches Length Feet

Material

Slot Size Set From Feet to Feet

Other information

WAS A PACKER OR SEAL USED? ☐ Yes ☐ No

so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? 5 gallons of Chlorine

☐ No, Why Not? Pumped

Is sample sent to for ster quality analysis

Well Owner: David + Marir Lemstra
 Business Name: Dakota Line Dairy #2
 Address: 20803 Road 28
 City, State, Zip: Tulare, Ca 93274

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Top Soil	0	3
Yellow clay	3	32
Blue clay	32	200
Shale	200	275
Sandstone	275	279
Granite	279	645

STATIC WATER LEVEL 140 FEET

If flowing: closed in pressure PSI

GPM flow through inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: AIR

☐ Bailed

☐ Other

Pumping Level Below Land Surface

Flow Rate	After	His. pumped	GPM
400	48	200	GPM
			GPM

If pump installed, pump rate: GPM

REMARKS

This well was drilled under license # 439

And this report is true and accurate.

Drilling firm: Dave Putzke well Drilling & repair LLC

Signature of License Representative: Dave Putzke

Signature of Well Owner or Equitable Property Holder:

SOUTH DAKOTA WATER WELL COMPLETION REPORT

DPWD. No 2# Rockwell

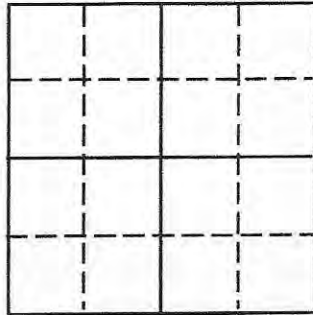
11-02

Location 1/4 1/4 Sec Twp Rg

County Minnehaha (See Attached) North

Minnehaha

Please mark well location with an "X"



Well completion Date

8-13-20

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? 200 ft. from Dairy (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☒ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Rotary

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
19.18 LB/FT	6 IN	0 FT	264 FT	10 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Portland</u>		Lb/gal	Ft	Ft
		Lb/gal	Ft	Ft

Describe grouting procedure 6 1/2 yds of Slurry

Pumped w/ Drilling rig

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter Inches Length Feet

Material

Slot Size Set From Feet to Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? 5 gallons of Chlorine

Lab sample sent to for ☐ No, Why Not? pumped

water quality analysis

Well Owner: David & Marie Lemstra

Business Name: Dakota Line Dairy

Address: 55971 - 456th Ave

City, State, Zip: Humboldt S.D 57035

WELL LOG:

DEPTH

FORMATION	FROM	TO
<u>Top Soil</u>	<u>0</u>	<u>3</u>
<u>yellow clay</u>	<u>3</u>	<u>30</u>
<u>Blue clay</u>	<u>30</u>	<u>195</u>
<u>Shale</u>	<u>195</u>	<u>264</u>
<u>Dramite</u>	<u>264</u>	<u>740</u>

STATIC WATER LEVEL

140

FEET

If flowing: closed in pressure PSI

GPM flow through Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: AIR

☐ Bailed

☐ Other

Pumping Level Below Land Surface

 Ft. After Hrs. pumped GPM

 Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

600' w/ AIR 35 gpm.

This well was drilled under license # 439

And this report is true and accurate.

Drilling firm: Dave Putzke well Drilling & repair Inc

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:

Please return **WHITE COPY** to: DENR Water Rights

523 E Capitol Ave. Pierre SD 57501

SOUTH DAKOTA WATER WELL COMPLETION REPORT

DPWD

2034 Rockwell

11-02

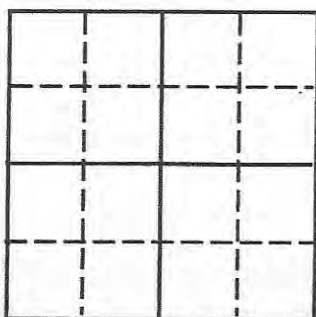
Location 1/4 1/4 Sec Twp Rg

County

Minnehaha

North

Please mark well location with an "X"



Well completion Date

9-18-20

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? 300 ft. from Dairy (Identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☒ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Rotary

CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>19.18 LB/FT</u>	<u>6 IN</u>	<u>0 FT</u>	<u>317 FT</u>	<u>10 IN</u>
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Portland</u>		Lb/gal	Ft	Ft
		Lb/gal	Ft	Ft

Describe grouting procedure 7 Yds of Slurry pump
W/ Drill rig

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter Inches Length Feet

Material

Slot Size Set From Feet to Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How?

5 gallons of Chlorine

☐ No, Why Not?

Lab sample sent to for water quality analysis

Well Owner:

David & Marie Lemstra

Business Name:

Dakota Line Dairy

Address:

25971 - 456th St

City, State, Zip:

Humboldt S.D. 57035

WELL LOG:

DEPTH

FORMATION

FROM

TO

<u>Top Soil</u>	<u>0</u>	<u>3</u>
<u>Yellow Clay</u>	<u>3</u>	<u>35</u>
<u>Blue Clay</u>	<u>35</u>	<u>200</u>
<u>Shale</u>	<u>200</u>	<u>307</u>
<u>Sandstone</u>	<u>307</u>	<u>317</u>
<u>Granite</u>	<u>317</u>	<u>319</u>
<u>Diorite</u>	<u>319</u>	<u>595</u>

STATIC WATER LEVEL

160

FEET

If flowing: closed in pressure

PSI

GPM flow

through

Inch pipe

Controlled by ☐ Valve

☐ Reducers

☐ Other

Reduced flow rate

GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:

AIR

☐ Bailed

☐ Other

Pumping Level Below Land Surface

400

Ft. After

3 Days

Hrs. pumped

220

GPM

Ft. After

Hrs. pumped

GPM

If pump installed, pump rate:

GPM

REMARKS

This well was drilled under license #

439

And this report is true and accurate.

Drilling firm:

Dave Putzke well Drilling & repair, Inc

Signature of License Representative:

[Signature]

Signature of Well Owner or Equitable Property Holder:

Date:

523 E Capitol Ave.

Pierre SD 57501

Please return **WHITE COPY** to: DENR Water Rights

ATTACHMENT 3
AQUIFER TEST SUMMARY SHEET

Aquifer Test Summary Data Sheet

Client: A1 Development Solutions Task: Well 4 constant-rate aquifer test. Project Number: 5506ADS01	Site: Dakota Line Dairy City/State: approximately 2 miles south of Humboldt, SD
--	--

Pumping Well Information

Pumping Well		Pump	Generator or Power Supply
Pumping Well(s):	Well 4	Make:	Atlas Copco
Screen Setting (ft bg):	Open Hole 317-595	Intake (ft bg):	400
Well Radius (in):	3	Column Diameter (in):	4
Stickup Height (ft):	0.833	Power (ie. 3 ph, 480 V):	3 ph, 480 V
Static Water Level (ft):	154.10	Horsepower:	15
Measuring/Reference Point:	top of casing	Owner / Rental Source:	Dave Putzke Well Drilling Drilling
Sand Meter Type:	---	Type:	Submersible
	none		
Sand Concentration (mg/L):	na		
Notes:			

Aquifer Test Information

Test Type: Constant-Rate Test									
Purpose of Test: Other: qualitative analysis									
Date of Test: 9/22/2020 to 9/28/2020									
Flow Rate Measurement: ☐ Totalizer, ☐ Acoustic Meter, ☐ Mag Meter, ☒ Orifice Weir, ☐ Other:									
Assisting Subcontractor: ☐ not applicable, ☒ Name: Heine Electric & Irrigation, Inc.									
Wellhead Manifold and Discharge: 4-inch tee to flexible discharge hose and circular orifice plate weir.									
Pumping Well(s): Well 4									
	Pumping Rate (gpm)	Pumping Duration (hr)	Recovery Duration (hr)	Start Date	Start Time	End Date	End Time	Maximum Drawdown (ft)	Specific Capacity (gpm/ft)
Well 4 (pumping)	206	25.8		9/23/2020	9:00 AM	9/24/2020	10:45 AM	80.11	2.57
Well 4 (recovery)	---	---	95.7	9/24/2020	10:45 AM	9/28/2020	10:12 AM	---	---
Notes:									

Aquifer Test Summary Data Sheet

Client: A1 Development Solutions Task: Well 4 constant-rate aquifer test. Project Number: 5506ADS01	Site: Dakota Line Dairy City/State: approximately 2 miles south of Humboldt, SD
---	--

Observation Well(s) Information

Well ID	Well Depth (ft bg)	Screen Setting (ft bg)	Stickup Height (ft)	Distance to Pumping Well (ft)	Static Water Level (ft bTOC)	Water Level Type (M/T)	Measuring/ Reference Point	Transducer Type	Logger Sample Rate (min)	Drawdown at End of Test (ft)	Recovery (Recovery= Pumping Period) (%)
Well 4	595	217-595 OH	0.83	0	154.00	M/T	top of casing	LevelTroll 700, 300 psig	1	73.92	98
Well 1	316	296-216	2.5	602	149.83	M/T	top of casing	LevelTroll 700, 30 psig	1	6.26	85
Well 2	645	279-645 OH	0.83	744	143.09	M/T	top of casing	LevelTroll 700, 30 psig	1	5.78	85
Well 3	740	264-740 OH	1.02	1260	126.01	M/T	top of casing	LevelTroll 700, 15 psig	1	3.22	87

Notes: OH = open hole

Additional Information

- Weather Data: ☐ Precipitation, ☒ Barometric Pressure, ☐ Temperature
Discussion:
- Permits: na
- Nearby High Capacity or Domestic Wells (Yes, No, or describe): None
- Water Quality Samples: none
Notes:

Footnotes:

F = fahrenheit

ft = feet

ft bg = feet below grade/ground

hr = hour

Hz = Hertz

in = inch

mg/L = milligrams per Liter

min = minute

na = not applicable

ph = phase

TOC = top of casing

TOP = top of port

TOS = top of sounding tube

V = volt

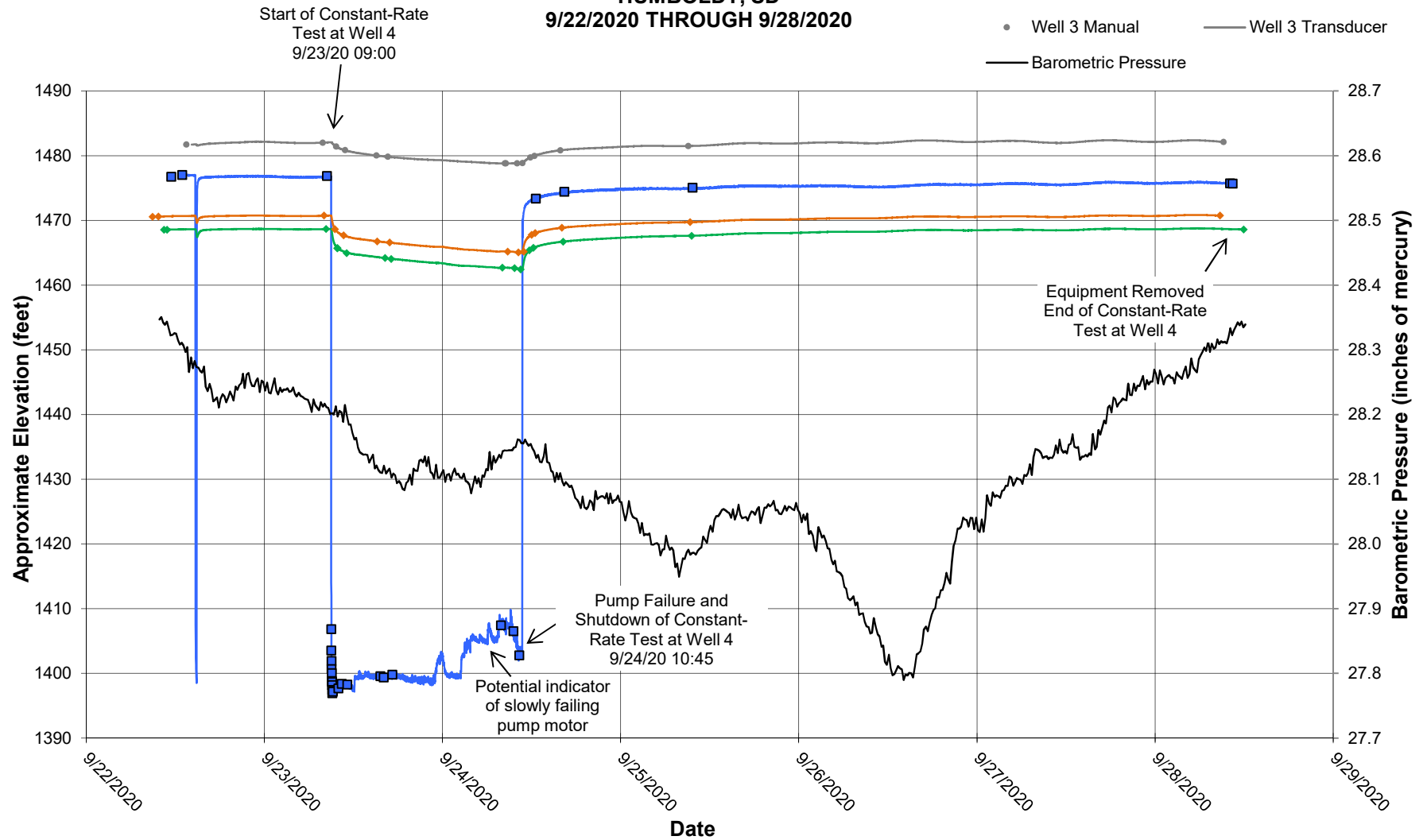
gpm/ft = gallons per minute per foot of drawdown

M/T = Manual Measurement or Transducer

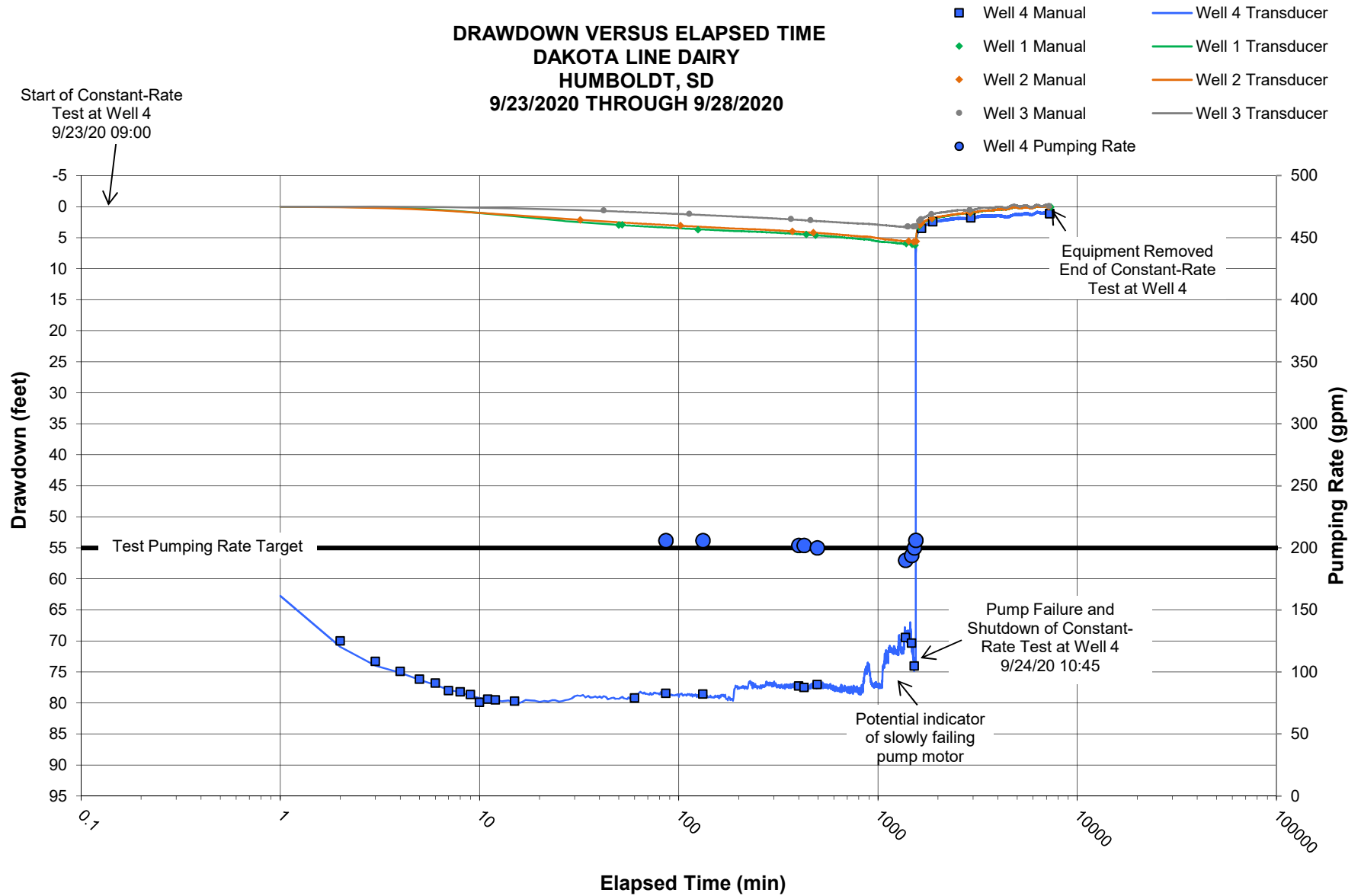
ATTACHMENT 4
QUALITATIVE ANALYSIS

**GROUNDWATER ELEVATIONS VERSUS DATE
DAKOTA LINE DAIRY
HUMBOLDT, SD
9/22/2020 THROUGH 9/28/2020**

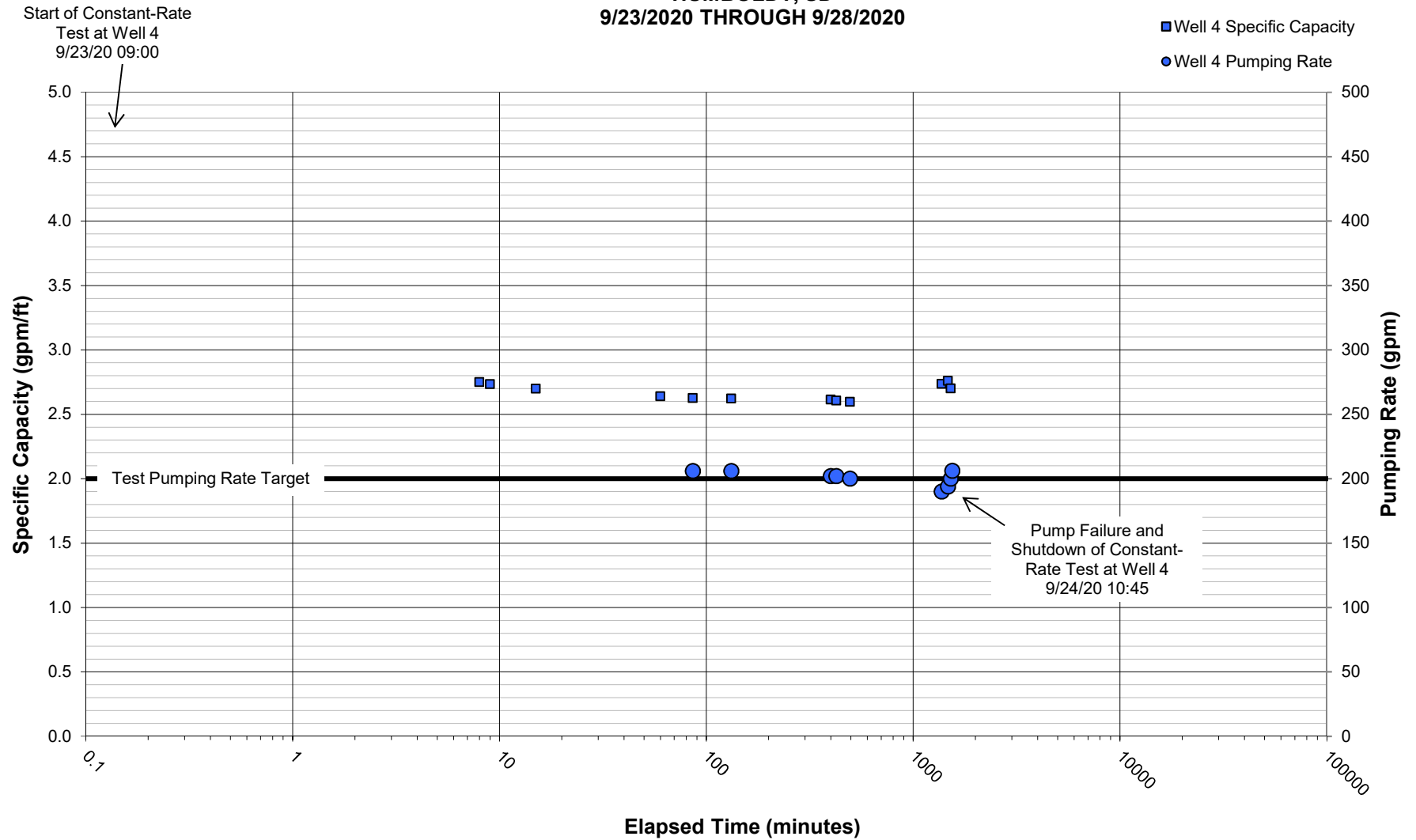
- Well 4 Manual Well 4 Transducer
- Well 1 Manual Well 1 Transducer
- Well 2 Manual Well 2 Transducer
- Well 3 Manual Well 3 Transducer
- Barometric Pressure



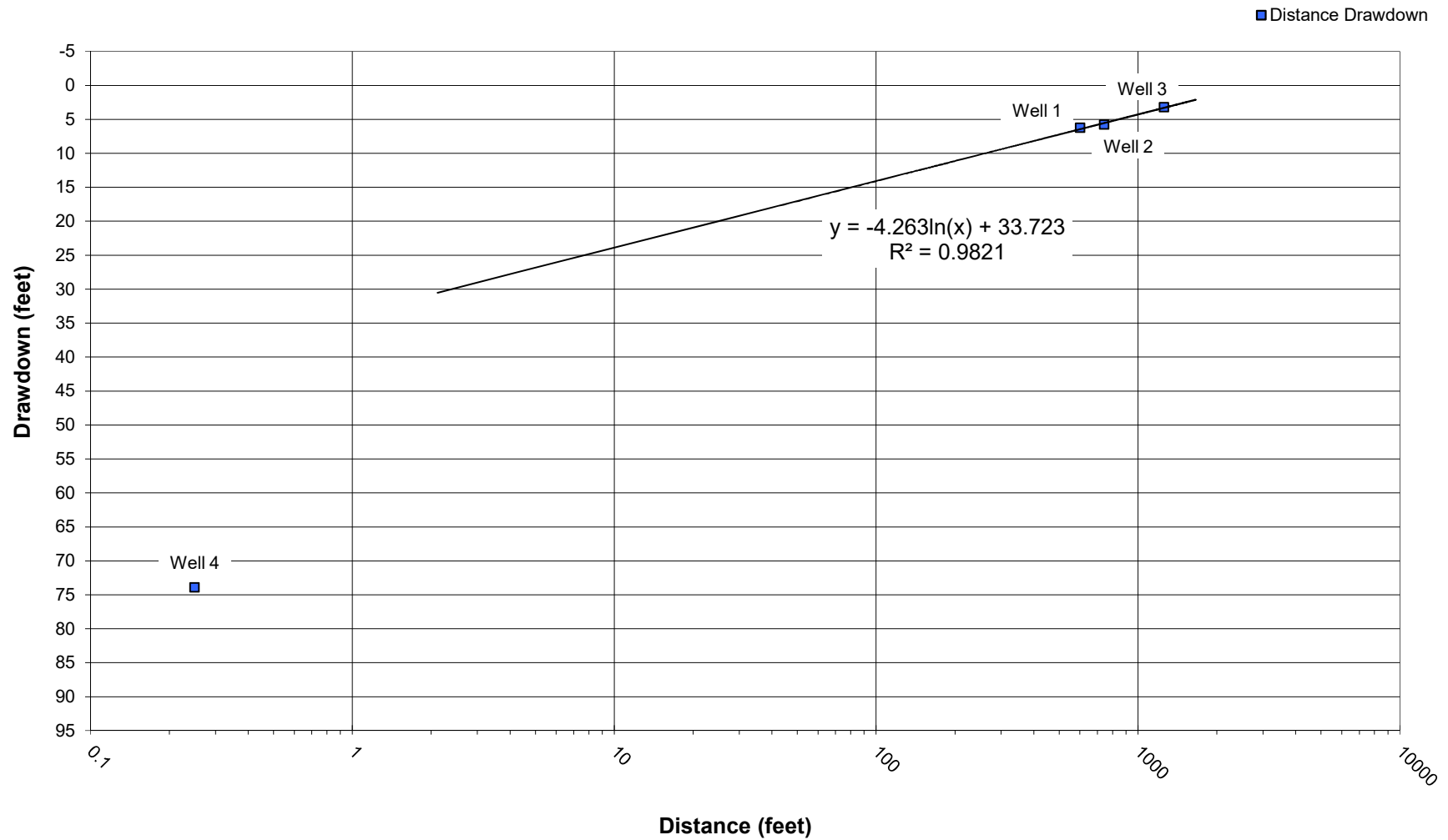
**DRAWDOWN VERSUS ELAPSED TIME
DAKOTA LINE DAIRY
HUMBOLDT, SD
9/23/2020 THROUGH 9/28/2020**



**WELL 4 SPECIFIC CAPACITY AND TEST PUMPING RATE
DAKOTA LINE DAIRY
HUMBOLDT, SD
9/23/2020 THROUGH 9/28/2020**



**DISTANCE-DRAWDOWN GRAPH
DAKOTA LINE DAIRY
HUMBOLDT, SD
9/23/2020 THROUGH 9/28/2020**



8426-3



DENR
SOUTH DAKOTA

RECEIVED DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JAN 21 2021

WATER RIGHTS
PROGRAM

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

DEC 07 2020

Please:

△ to

25971 456th Ave.
Humboldt, SD 57035

Dakota Line Dairy
c/o David Lemstra
20803 Road 28
Tulare CA 93274

Dear Mr. Lemstra:

Enclosed is Water Permit No. 8426-3 authorizing construction of the water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

An application/license filing fee of \$1,150.00 was submitted with the application. The fee should have been \$1,050.00. \$100.00 will be refunded to you. The refund check should be received within the next couple of weeks.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Eric Gronlund

Eric Gronlund, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

Thanks

Maarty Lemstra

(559) 799-0771

1/15/21

RECEIVED

JAN 21 2021

WATER RIGHTS
PROGRAMNOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USE

Date

1/7/21

TO: Water Rights Program, DENR
523 E. Capitol
Pierre, SD 57501-3181

FROM:

Dakota Line Dairy LLC
(name)25971 456th Ave.
(address)Humboldt, SD 57035
(city, state, zip)(559) 799-0772
(phone)

I have completed the construction of the water use system and I have put the water to beneficial use to the maximum extent it is going to be used.

Water Permit No. 8426-3 states that the water use system is to be constructed by

11/15/20
(date)

, and water is to be put to beneficial use by

12/15/20
(date)

The water use system was completed on

12/15/20
(date)

Applying the water to beneficial use was completed on

12/15/20
(date)

You may schedule an investigation so that the water license may be issued.

[Signature]
(signature)



Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 8426-3

I have this day, July 7, 2021, made a thorough examination of the water use system constructed by Dakota Line Dairy, c/o David Lemstra, 25971 456th Ave, Humboldt SD 57035 of Permit No. 8426-3, bearing the priority of March 23, 2020 authorizing the diversion of 0.67 cu. ft. per second of the waters of the Sioux Quartzite Aquifer for commercial purposes, in Minnehaha County.

A. Works used to divert the water:

Well Information:

- 1) Well Drilling Firm: Dave Putzke Well Drilling
- 2) No. of Wells 4
- 3) Depth(s) 316 feet
- 4) Well log is available Y

Comments: none

Casing:

- 1) Diameter 6 inches
- 2) Length 296 feet
- 3) Type Plastic

Screen:

- 1) Type Stainless steel
- 2) Length 20 feet
- 3) Static water level 157 feet

Pump:

- 1) Make NA
- 2) Model Submersibles
- 3) Size NA
- 4) Capacity 100, 200, 200 & 40 GPM

Motor:

- 1) Make NA
- 2) Model No. NA
- 3) Horsepower rating NA hp

B. Works used to transport water to place of use:

Comments: Buried pipelines

D. Compliance with Permit Requirements:

1) Permit qualifications being abided by Y

If no, describe: See Section F

2) Exceptions to compliance are: None

E. Condition and Location:

1. The system is in excellent condition with the point(s) of diversion located as follows: From the SE corner of Sec 20 T102N-R52W: WELL # 1 - 110 ft N & 2020 ft W, Lat 43.61649 Long -97.09721; WELL # 2 - 260 ft N & 1410 ft W, Lat 43.61692 Long -97.09467; WELL # 3 - 365 ft N & 775 ft W, Lat 43.61719 Long -97.09224; WELL #4 - 370 ft N & 230 ft W, Lat 43.61725 Long -97.09025 (#1 & #2 SW SE, #3 & #4 SE SE Sec 20

WELL # 1 - 100 GPM, WELL # 2 - 200 GPM, WELL # 3 - 200 GPM, WELL # 4 - 40 GPM

2. The works are capable of diverting and conveying to the place of use 1.2 cu. ft. per second of water which is to be used for commercial (dairy) purposes. Water has been put to beneficial and the license should be issued for 0.67 cfs.

3. All structures, wells and lands on map Y

F. Comments or other permit(s) associated with the project:

The well discharge values were supplied by Mr. David Lemstra during a recent site visit. His telephone number on the submitted review materials is current. However, his contact address is now 25971 456th Ave, Humboldt, SD 57035, the location of the dairy.

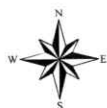
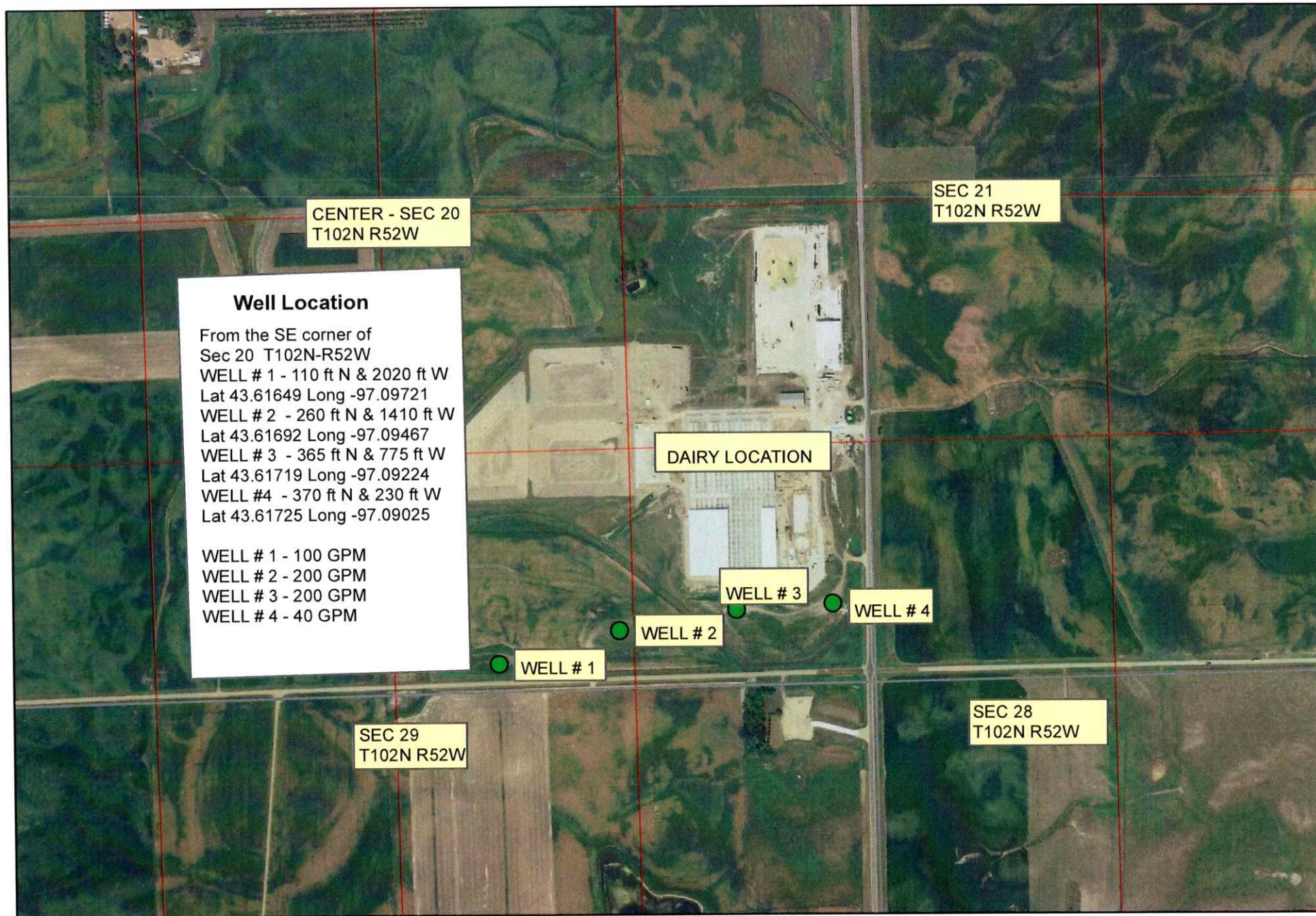
There are four (4) wells being used to supply the dairy but not all are used at one time or continuously.

As a note of interest to an old farm boy, there is concrete everywhere so no mud to fight ever.



Darrell W DeBoer
Water Rights Inspector
DANR, Water Rights Program

Date report completed: July 7, 2021



0 0.1 0.2 0.4 0.6 0.8 Miles



Darrell DeBoer
Water Right Inspector
DANR-Water Rights Program



DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES
JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

JUL 02 2024

8426-3

Dakota Line Dairy
c/o David Lemstra
25971 456th Ave
Humboldt SD 57035

Dear Mr. Lemstra:

Enclosed is Water License No. 8426-3. This is the final water right document completing your process of obtaining a Water Right. Included with your license is a map prepared by the staff engineer who conducted the field investigation.

For your information SDCL 46-6-27 requires that if in the future, the owner of an existing well, constructs a replacement well and does not plan to use the old well, the old well is considered abandoned and must be plugged. Also, any well that is being used or is not considered abandoned must be valved and controlled, if flowing, or sealed and capped so that no leaking occurs either underground or at the surface.

So long as you use the water beneficially, as stated in the Water License, State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Sincerely,

Eric Gronlund, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

**STATE OF SOUTH DAKOTA
WATER LICENSE NO. 8426-3**

(1) Dakota Line Dairy, c/o David Lemstra, 25971 456th Ave, Humboldt SD 57035, made Application No. 8426-3, March 23, 2020, for a water permit to divert 0.67 cubic feet of water per second from groundwater, four wells (Sioux Quartzite Aquifer), Minnehaha County, South Dakota for commercial use in a dairy confinement operation. Permit No. 8426-3, with a priority date of March 23, 2020, was approved November 2, 2020, and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before November 2, 2025, and for the application to beneficial use of water on or before November 2, 2029.

The permit holder submitted a Notice of Completion of Works and Application of Water to Beneficial Use form on January 7, 2021. The Notice stated the diversion system was completed and the water was placed to beneficial use on December 15, 2020.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the construction of the water supply system and is entitled to divert 0.67 cubic feet of water per second for beneficial use. The locations of the diversion points are:

- Well #1: 110 ft N & 2,020 ft W of the SE corner Section 20, T102N, R52W (SW ¼ SE ¼)
(Latitude 43.61649 & Longitude -97.09721)
- Well #2: 260 ft N & 1,410 ft W of the SE corner Section 20, T102N, R52W (SW ¼ SE ¼)
(Latitude 43.61692 & Longitude -97.09467)
- Well #3: 365 ft N & 775 ft W of the SE corner Section 20, T102N, R52W (SE ¼ SE ¼)
(Latitude 43.61719 & Longitude -97.09224)
- Well #4: 370 ft N & 230 ft W of the SE corner Section 20, T102N, R52W (SE ¼ SE ¼)
(Latitude 43.61725 & Longitude -97.09025)

(3) The water is to be used during the following described annual period: January 1 – December 31.

(4) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use.

(5) Pursuant to South Dakota Water Law 46-5-30.1 Dakota Line Dairy, c/o David Lemstra, the holder and/or owner of Water Right No. 8426-3 is issued a license to appropriate water, the right to use 0.67 cubic feet of water per second from groundwater, four wells (Sioux Quartzite Aquifer), with a priority date of March 23, 2020, from the location specified in (2) of this license for commercial use in a dairy confinement facility.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 8426-3 and subject to the following qualifications:

1. The wells approved under Water Permit No. 8426-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this permit, shall control withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.

continued

2. Water Permit No. 8426-3 is subject to compliance with requirements of the Department's Water Pollution Control Permit issued pursuant to SDCL 34A-2-36 or 34A-2-36.2 or 34A-2-112 or 34A-2-124 for concentrated animal feeding operations.
3. Water Permit No. 8426-3 is subject to compliance with all existing and applicable Water Management Board Rules including but not limited to:
 - a) Chapter 74:54:01 Ground Water Quality Standards
 - b) Chapter 74:54:02 Ground Water Discharge Permit
 - c) Chapter 74:51:01 Surface Water Quality Standards
 - d) Chapter 74:51:02 Uses Assigned to Lakes
 - e) Chapter 74:51:03 Uses Assigned to Streams
 - f) Chapter 74:52:01 through 74:52:11 Surface Water Discharge Provisions
4. The permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Sioux Quartzite Aquifer.
5. Water Permit No. 8426-3 authorizes a total annual diversion of 300 acre-feet of water from the Sioux Quartzite Aquifer.


Eric Gronlund, Chief Engineer
Water Rights Program
Department of Agriculture and Natural Resources

JUL 02 2024
date

