

WATER PERMIT NO. 8745-3

Name of Applicant: **University of South Dakota**

Address: **414 E Clark Street, Vermillion SD 57069**

Phone: **605-231-2058**

Amount of Water Claimed: **0.78 cfs**

Total Acres:

Source of Water Supply: **Groundwater**

Water to be used for: **Geothermal well**

County: **Clay**

Type of Waste Disposal System: **Injection well or City of Vermillion Storm Sewer**

Location: **In Vermillion SD**

PRIORITY

Date Received: **3-28-2023**

Application/License Fee: **\$1,250.00**

Corrected Application Received:

Period of Annual Use: **Jan 1 – Dec 30**

Remarks: **Possibly 1 or 2 future injection wells**

Diversion Point: **SE1/4 SE1/4 Sec 13 -92N-52W**

Land to be Irrigated:

Depth of Well: **192**

Well Driller: **Heine Electric & Irrigation**

Remarks:

Type of Map: **aerial**

			13		
				x	

Reviewed and the Number Assigned on: **4-6-2023**

By: **Rachel Rodriguez**

Notice of Hearing - date to intervene: _____

**SOUTH DAKOTA
WATER PERMIT NO. 8745-3**

Date of first receipt of application March 28, 2023.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8745-3 to University of South Dakota, c/o Brian Limoges, 414 E Clark Street, Vermillion SD 57069 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. 8745-3 appropriates 0.78 cubic feet of water per second (cfs) from two existing wells in the Lower Vermillion Missouri Aquifer (192 feet deep) located in the SE1/4 SE1/4 Section 13 -T92N-R52W. There is currently one existing injection well and 1 or 2 future injection well(s) may also be installed all located in the SE 1/4 SE 1/4 Section 13-T92N-R52W. A volume up to 564 acre feet of water is to be appropriated for one-time use and then become non-consumptive by re-injecting water back into the same aquifer. This site is located in Vermillion SD.
2. The water appropriated shall be used for the purpose of geothermal 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. 8745-3 is June 26, 2023.
5. The date from which applicant may claim right is March 28, 2023.
6. One-fifth of the construction is to be completed on or before December 26, 2025.
7. All construction is to be completed on or before June 26, 2028.
8. Water is to be put to beneficial use on or before June 26, 2032.
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. 8745-3 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals shall be controlled so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The wells authorized by Permit No. 8745-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. Water Permit No. 8745-3 authorizes a one-time diversion of up to 564 acre-feet of water and then become nonconsumptive by reinjecting water used for geothermal purposes back into the Lower Vermillion Missouri aquifer.

WATER MANAGEMENT BOARD

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

JUN 23 2023
date



FORM 2: Application for uses other than irrigation
(type or print)

Mail to: SD DANR, Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>8745-3</u> Hydrologic Unit <u>10170102</u>
	Basin <u>Vermillion River</u>
	Newspaper <u>Plain Talk 624-2695</u>
	<u>Press & Dakotan</u> (office use only) <u>665-7811</u>

RECEIVED
MAR 28 2023
OFFICE OF
WATER

Application for Permit to Appropriate Water in 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.)

- Name to Appear on Water Permit University of South Dakota
Mailing Address 414 E Clark St. Vermillion SD 57069
(Address) (City) (State) (Zip Code)
Phone 605-658-6100 Mobile 605-231-2058 Email Brian.Limoges@USD.edu
- Amount of water claimed 0.78 *CFS or 350 **GPM and 564** ***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
2 existing production wells, 1 existing injection well, ~~1 future injection well~~
- Source of water supply All located in SESE sec 13-T92N-R52W Possibly 1 or 2 future injection wells.
- Location of point of diversion See provided well completion report and site plan County Clay
(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? _____
(example - NW1/4 section 12-T104N-R53W)
- County or counties where water will be used Clay
- Annual period during which water is to be used Year Round
- 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)

New building utilizing ground water for heat pump operation of the heating and cooling systems. The production wells consist of 2 wells for redundant operation. The ground water is pumped through filters and heat exchangers and re-injected back into the Aquifer. There is currently one injection well. A future injection well will likely be installed.

*564 Acre-feet volume is for one time use. Following years will be non-consumptive by re-injecting water back into the same Aquifer.

I, Brian Limoges AVP of Facilities Management, 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.

2021-08

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Also, attach map and any other technical information. (see instructions)

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 3-10 Have test holes been drilled? ☒ Yes ☐ No Drilled by Heine Irrigation
(if yes, please provide copies of logs)
- b) If existing wells, how many possibly 5 Provide copy of log(s), if available. Drilled by _____

For either existing or proposed wells:

- c) Well Depth (required) _____ Depth to Top of Water Bearing Material 105' Depth to Water from Surface 104'
- d) Distance to nearest domestic well on applicant's property None Property owned by others N/A

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) Injection well or City of Vermillion Storm Sewer
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of City of Vermillion Storm Sewer ~~Sanitary~~ System

3. Dugout Information

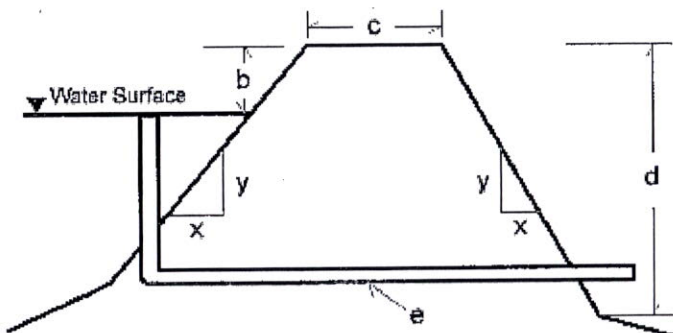
- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

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) Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres





Township: 92N 52W
Section: 13
QQ Sect: NESE

SITE LOCATION

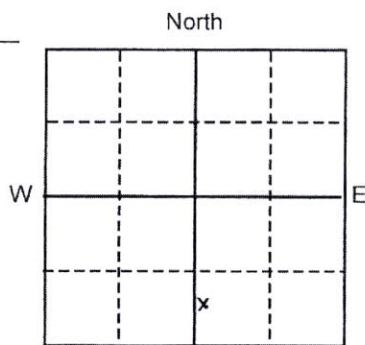
92N 52W
Section: 13

Township: 92N 52W
Section: 13
QQ Sect: SESE

Township: 92N 52W
Section: 24
QQ Sect: NENE

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE 1/4 SE 1/4 Sec 13 Twp 92N Rg 52WCounty CurryPlease mark well
location with an "X"

Well Completion Date

5-13-22

K — 1 Mile — D

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

1730 ft. from Abandoned well (identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

GeothermalDIRECT ROTARY

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>42</u> LB/FT	<u>8</u> IN	<u>7</u> FT	<u>150</u> FT	<u>13</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>Groutwell 17</u>		<u>17</u> Lb/gal	<u>0</u> Ft	<u>130</u> Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

TEMMIE

SCREEN:

☐ Perforated pipe ☒ ManufacturedDiameter 8 Inches Length 42 FeetMaterial SteelSlot Size .080 Set From 150 Feet to 192 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? HTH TABLETS☐ No, Why Not?Lab to which water
quality sample sent for analysis

Well Owner:

Business Name: University of South DakotaAddress: 414 E Clark StCity, State, Zip: Vermillion SD 57069

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Top Soil	0	2
Brown clay	2	32
"Grey/silty pebbly fill"	32	70
Gravel	70	73
" "	75	100
Broken Gravel	100	110
Sandy Grey clay	110	125
Sand & Gravel	125	172
med - coarse Gravel	172	192

STATIC WATER LEVEL ~102 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 Supply well #1 for Geothermal system42-781546
-96-929038This well was drilled under license # 810 and this report is true and accurate.Drilling firm: Heine electric & Irrigation

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

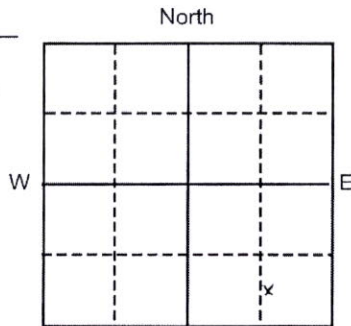
Date:

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE 1/4 SE 1/4 Sec 13 Twp 92N Rg 52WCounty CLAY

Please mark well location with an "X"



Well Completion Date

5/10/22

K 1 Mile K

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

~1790 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

↳ GEO THERMALDIRECT ROTARY

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>42</u> LB/FT	<u>8</u> IN	<u>6</u> FT	<u>150</u> FT	<u>13</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>GROUTWELL OF 20%</u>	<u>17 SACKS</u>	Lb/gal	<u>0</u> Ft	<u>130</u> Ft
<u>ARMOUR COAT</u>	<u>2 SACKS</u>	Lb/gal	<u>130</u> Ft	<u>192</u> Ft

Describe grouting procedure

IRREMOVABLE

SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 8 Inches Length 42 FeetMaterial STEELSlot Size .080 Set From 150 Feet to 192 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? HTH TABLETS
☐ No, Why Not?

Lab to which water quality sample sent for analysis

Well Owner:

Business Name: UNIVERSITY OF SOUTH DAKOTAAddress: 414 E CLARK STCity, State, Zip: VERMILION SD 57069

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	2
BROWN CLAY	2	32
GREY SILTY PEBBLEY TILL	32	70
GRAVEL	70	75
GREY SILTY PEBBLEY TILL	75	100
BROKEN GRAVEL	100	110
GREY SANDY CLAY	110	125
SAND & GRAVEL	125	172
MED-COARSE GRAVEL	172	192

STATIC WATER LEVEL

~102

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 SUPPLY WELL #2 FOR GEO THERMAL SYSTEM.
42.781643
-96.929048°
This well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

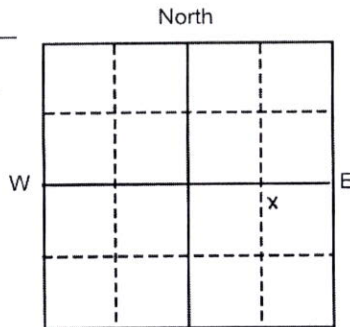
Date:

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE 1/4 SE 1/4 Sec 13 Twp 92N Rg 52WCounty CLAY

Please mark well location with an "X"



Well Completion Date

5/13/2022

1 Mile

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

21500 ft. from ABANDONED WELL (identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

GEOTHERMALDIRECT ROTARY

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>42</u> LB/FT	<u>8</u> IN	<u>6</u> FT	<u>128</u> FT	<u>13</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>NEAT CEMENT</u>	<u>2.35 yds</u>	Lb/gal	<u>0</u> Ft	<u>120</u> Ft
<u>GRAVEL</u>	<u>2 SUPER SACKS</u>	Lb/gal	<u>120</u> Ft	<u>192</u> Ft

Describe grouting procedure

TRIMMIE

SCREEN:

☐ Perforated pipe ☒ ManufacturedDiameter 8 Inches Length 64 FeetMaterial STEELSlot Size .080 Set From 128 Feet to 192 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? HTH TABLETSLab to which water ☐ No, Why Not?
quality sample sent for analysis

Well Owner:

Business Name: UNIVERSITY OF SOUTH DAKOTAAddress: 414 E CLARK STCity, State, Zip: VERMILION SD 57069

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	2
BROWN CLAY	2	70
GREEN SILTY PEBBLEY TILL	70	75
GRAVEL	75	100
GREEN SILTY PEBBLEY TILL	100	110
BROKEN GRAVEL	125	172
GREEN SANDY CLAY	172	192
MED-COARSE SAND & GRAVEL		

STATIC WATER LEVEL ~ 104 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

INJECTION WELL FOR GEOTHERMAL SYSTEM42.782392°N-96.928319°WThis well was drilled under license # 810 and this report is true and accurate.Drilling firm: HEINE ELECTRIC & IRRIGATION

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:



UNIVERSITY OF
SOUTH DAKOTA

Document #

N153257587

Banner Document #

J0257587

0418 BAK

Application Area 62	Journal Voucher	Date March 29, 2023
------------------------	-----------------	------------------------

TO: DANR 523 E Capitol Pierre, SD 57501 Email to holly.briggs@state.sd.us	FROM: UNIVERSITY OF SOUTH DAKOTA 414 E Clark St Vermillion, SD 57069
---	---

Funding Information											
MSA Coding				Banner Coding							
Line	Company	Account	Center	Index	Fund	Organization	Account	Prg	Activity	Amount	DR/CR
1	9041	52040100	152001		262017	295615	744620	07		1,250.00	dr
2	3050	4299802	0370000	800						1250.00	cr
3											
4											
5											
6											
7											
8											
Total Debits & Credits										\$2,500.00	

Description of Service, Product, Transfer or Correction

Application Fee (\$1,050) and License Fee (\$200) for Geothermal Well Permit - Project 10514

Transaction Total

\$2,500.00

I declare and affirm under the penalties of perjury that this claim has been examined by me, and to the best of my knowledge and belief is in all things true and correct.

Approval

Heidi Bennett

Approval Signature

3/29/2023

Date

Approval

Lancy Kettel

Approval Signature

04/07/2023

Date

Katie Brown



25 Center Street • Vermillion, SD 57069

Ph: 605.677.7050 • Fax: 605.677.5461

Info@cityofvermillion.com

www.vermillion.us

June 13, 2023

Department of Agriculture and Natural Resources
Attn: Mr. Eric Gronlund
Joe Foss Building
523 E. Capitol Avenue
Pierre, SD 57501-3182

RE: APPLICATION FOR WATER PERMIT NO. 8745-3, USD

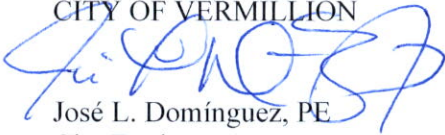
Mr. Gronlund:

Although we agree with the recommendations listed in your June 5, 2023 letter, it is important that you also consider the following observations and comments, regarding this permit. Following are our observations and comments:

- Currently USD has one injection well that has not functioned since the geothermal system was started in July 2022.
- Since July 2022 the City has allowed USD to temporarily discharge the water used into the City's storm sewer system.
- The City of Vermillion has not agreed to allow any permanent discharge into its storm sewer system.
- The application submitted states under "Supplemental Information", item 2.a), that the disposal system will be an "injection well or City of Vermillion Storm Sewer". This is incorrect since the City has not agreed to allow a permanent discharge into the City's storm sewer system. The only option available at this time is the injection well.
- Similarly, item 2.c) of the same section states that the geothermal system is already connected to the City's storm sewer system. The connection mentioned is temporary consisting of a fire hose strung along the ground until it reaches the City's stormwater inlet. Again, not a permanent connection since one has not been granted by the City.

Please contact me with any questions.

Sincerely,
CITY OF VERMILLION


José L. Domínguez, PE
City Engineer

RECEIVED

JUN 16 2023

OFFICE OF
WATER

Sister City to Ratingen, Germany
www.vermillion.us

Schlaak, Karen

From: Limoges, Brian M <Brian.Limoges@usd.edu>
Sent: Tuesday, March 28, 2023 9:00 AM
To: Duvall, Ron
Cc: Schlaak, Karen; Rodriguez, Rachel; Adair, Katie; Suarez, Pierre; Norstrom, Sara
Subject: RE: [EXT] Application for Geothermal Well at the University of South Dakota in Vermillion, SD
Attachments: PERMIT INFO.pdf; Well Completion Reports.pdf; WELL LOCATION MAP.pdf; SITE LOCATION.pdf
Importance: High

Ron,
See attached permit info, well completion reports, well location map, and site location information for our application. If all of this looks acceptable, We will mail this application along with our application fee of \$1,050.00 and license fee of \$200.00. Can you confirm the name for these non-cash vouchers?

Thanks,

Brian Limoges
Assistant Vice President of Facilities Management
University of South Dakota
Office: (605) 658-3308
Cell: (605) 231-2058
Brian.Limoges@usd.edu

**WE ARE
SOUTH DAKOTA**

www.WeAreSouthDakota.com

From: Duvall, Ron <Ron.Duvall@state.sd.us>
Sent: Tuesday, March 21, 2023 1:53 PM
To: Limoges, Brian M <Brian.Limoges@usd.edu>
Cc: Schlaak, Karen <karen.schlaak@state.sd.us>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>; Adair, Katie <katie.adair@state.sd.us>; Suarez, Pierre M <Pierre.Suarez@usd.edu>
Subject: RE: Application for Geothermal Well at the University of South Dakota in Vermillion, SD

Brian,

It would be the same application form as you used for your draft – attached is a blank application form with instruction sheet. On the application in Item No. 2 you can put the same numbers as your draft assuming they are still accurate – 350 gallons per minute and 564 AF*. The asterisk can then refer to an explanation you will add in Item No. 7 that the 564 acre-feet volume is for one-time use and then following years the use will be nonconsumptive by reinjecting water back into the same aquifer from which it is removed. In item No. 3 you can identify the source as two existing production wells, one existing injection well plus possibly another injection well. We have copies of the well logs here and you could modify your draft map as needed to show all the existing well sites including a possible location for another injection well. Assuming your injection wells work as planned, then you would NOT need to file another

application. The application you submit would address both the temporary volume to be discharged and then the on-going nonconsumptive use for geothermal use.

Please let me know if you have any further questions.

Thank you,

Ron

From: Limoges, Brian M <Brian.Limoges@usd.edu>

Sent: Tuesday, March 21, 2023 11:25 AM

To: Duvall, Ron <Ron.Duvall@state.sd.us>

Cc: Schlaak, Karen <Karen.Schlaak@state.sd.us>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>; Adair, Katie <Katie.Adair@state.sd.us>; Suarez, Pierre <Pierre.Suarez@usd.edu>

Subject: RE: [EXT] Application for Geothermal Well at the University of South Dakota in Vermillion, SD

Ron,
What do I need to do in order to apply for option #1 below? What permit do I need to fill out? I will include an application fee of \$1,050 plus license fee of \$200.00. Once we get the Geothermal rejection wells working properly do I need to reapply for a permit or will the permit you reference below in option 1 suffice?

Thanks,

Brian Limoges

Assistant Vice President of Facilities Management

University of South Dakota

Office: (605) 658-3308

Cell: (605) 231-2058

Brian.Limoges@usd.edu

**WE ARE
SOUTH DAKOTA**

www.WeAreSouthDakota.com

From: Duvall, Ron <Ron.Duvall@state.sd.us>

Sent: Tuesday, March 21, 2023 9:05 AM

To: Limoges, Brian M <Brian.Limoges@usd.edu>

Cc: Schlaak, Karen <karen.schlaak@state.sd.us>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>; Adair, Katie <katie.adair@state.sd.us>

Subject: RE: Application for Geothermal Well at the University of South Dakota in Vermillion, SD

Brian,

What I can't do is tell you it is OK to use water without having a water right permit for the use – see SDCL [46-1-15](#) and [46-5-9](#). When a situation occurs where water use is occurring without a water right permit, we ask the person to file an application to get into compliance as quickly as possible. Consequently, I think the University should pursue one of the following permitting options:

1. Apply for a permit for nonconsumptive geothermal purposes for 350 gallons per minute with a one-time volume of 564 acre-feet (acre-feet figure taken from the draft application you submitted) to cover your needs while getting the reinjection system working; or
2. Apply for a permit for 350 gallons per minute with an on-going annual volume of 564 acre-feet or whatever the correct acre-feet figure should be.

Given that the City of Vermillion has expressed concerns with the discharge of water, pursuing option 2 may make it more likely that your application will be contested by the city. If you pursue option No. 1 and it turns out that reinjection is not feasible and the University still plans to pursue geothermal use, then another application would need to be filed to make the one-time volume a permanent annual volume.

Under either option, for 564 acre-feet, the application fee is \$1,050.00 plus a license fee of \$200.00.

Please let me know if you have any questions.

Thank you,

Ron Duvall
Dept. of Agriculture & Natural Resources
Office of Water, Water Rights Program
605.773.3352
danr.sd.gov



DANR
SOUTH DAKOTA

From: Limoges, Brian M <Brian.Limoges@usd.edu>

Sent: Monday, March 20, 2023 1:07 PM

To: Duvall, Ron <Ron.Duvall@state.sd.us>

Cc: Schlaak, Karen <Karen.Schlaak@state.sd.us>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>

Subject: RE: [EXT] Application for Geothermal Well at the University of South Dakota in Vermillion, SD

Ron,

I have instructed the design firm that we need to have the geothermal wells in place and operational by the end of cooling season 2023 (September 1st, 2023). Our plan is to reject water into the City of Vermillion storm sewer this cooling season 2023 since we do not have an operational rejection well and no means to cool the building.

I have approval from City of Vermillion for this temp. discharge and requested extension of my temporary discharge permit (attached email) and received the attached from Katie Adair with the State. I assume I am approved to move forward utilizing my existing temp. discharge permit?

Brian Limoges
Assistant Vice President of Facilities Management
University of South Dakota
Office: (605) 658-3308
Cell: (605) 231-2058
Brian.Limoges@usd.edu

**WE ARE
SOUTH DAKOTA**

www.WeAreSouthDakota.com

From: Duvall, Ron <Ron.Duvall@state.sd.us>
Sent: Monday, March 20, 2023 1:02 PM
To: Limoges, Brian M <Brian.Limoges@usd.edu>
Cc: Schlaak, Karen <karen.schlaak@state.sd.us>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Subject: RE: Application for Geothermal Well at the University of South Dakota in Vermillion, SD

Do you have any kind of timeline, rough or otherwise?

From: Limoges, Brian M <Brian.Limoges@usd.edu>
Sent: Monday, March 20, 2023 12:57 PM
To: Duvall, Ron <Ron.Duvall@state.sd.us>
Cc: Schlaak, Karen <Karen.Schlaak@state.sd.us>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Subject: RE: [EXT] Application for Geothermal Well at the University of South Dakota in Vermillion, SD

Ron,
USD is still working with the design firm on the issues concerning the non-working rejection well as part of our geothermal system. The plan is that we are going to have the existing rejection well redeveloped to determine flow capacity, viability, etc. Once we have that information then the design firm will need to determine if we need to add additional rejection wells. Once we know that information, the locations, etc. then I will reapply for a permit and include the required application fee. I will also make sure that the legal description is correct for the application and the well completion reports.

The goal of the system is that we will remove water from the aquifer and inject back into the same aquifer and not dump to the City of Vermillion storm sewer. This is why I haven't completed the application or submitted the application fee as there is too much yet to be determined before I can do this.

Let me know if this approach is acceptable and if you have any questions.

Thanks,

Brian Limoges
Assistant Vice President of Facilities Management
University of South Dakota
Office: (605) 658-3308
Cell: (605) 231-2058
Brian.Limoges@usd.edu

**WE ARE
SOUTH DAKOTA**

www.WeAreSouthDakota.com

From: Duvall, Ron <Ron.Duvall@state.sd.us>
Sent: Monday, March 20, 2023 10:04 AM
To: Limoges, Brian M <Brian.Limoges@usd.edu>
Cc: Schlaak, Karen <karen.schlaak@state.sd.us>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Subject: FW: Application for Geothermal Well at the University of South Dakota in Vermillion, SD

Brian,

We never received an application fee or confirmation concerning which legal descriptions of the wells were correct, either the legals on the well completion reports or on the map submitted with your draft application. Based on the map, it appears all the wells are in the SE1/4 SE1/4 section 13-92N-52W. Also, I see that the reference to "Abandoned Well" is in reference to the nearest pollution source and the not constructed well so ignore that comment.

I know you were having issues with the injection well which affected which fee was to be submitted with your application. Please let us know how you want to proceed.

Thank you,

Ron

From: Duvall, Ron

Sent: Wednesday, September 14, 2022 9:58 AM

To: Limoges, Brian M <Brian.Limoges@usd.edu>; DANR Mail <DANRMail@state.sd.us>

Cc: Suarez, Pierre <Pierre.Suarez@usd.edu>; Norstrom, Sara <Sara.Norstrom@state.sd.us>; Josed <Josed@cityofvermillion.com>; Schlaak, Karen <Karen.Schlaak@state.sd.us>; Gronlund, Eric <Eric.Gronlund@state.sd.us>

Subject: RE: [EXT] Application for Geothermal Well at the University of South Dakota in Vermillion, SD

Brian,

I looked over the application and made the following changes to the attached:

- Checked "Geothermal" as the type of use.
- Added to description in No. 3 – 2 production wells, 1 injection well all in SESE sec 13-T92N-R52W
- Included a map showing government section corner to confirm legal description of well locations as shown on your map. One of the well completion reports included with your application identifies the location of well as the NW1/4 SE1/4 section 13-T92N-R52W which is NOT in the locations identified on your map and the well completion report says "ABANDONED WELL." Is that the correct well completion report?

The application fee is based on the volume of water to be appropriated. For 564 acre-feet identified on the application, the fee is \$1,050.00 plus a license fee of \$200.00. If the application was for reinjection with minimal water losses, the application fee would be \$500.00 plus the \$200.00 license fee.

If you have any questions, please let me know.

Thank you,

Ron Duvall

Dept. of Agriculture & Natural Resources

Office of Water, Water Rights Program

605.773.3352

danr.sd.gov



DANR
SOUTH DAKOTA

From: Limoges, Brian M <Brian.Limoges@usd.edu>

Sent: Wednesday, September 14, 2022 7:55 AM

To: DANR Mail <DANRMail@state.sd.us>; Duvall, Ron <Ron.Duvall@state.sd.us>

Cc: Suarez, Pierre <Pierre.Suarez@usd.edu>; Norstrom, Sara <Sara.Norstrom@state.sd.us>; Josed

<Josed@cityofvermillion.com>

Subject: [EXT] Application for Geothermal Well at the University of South Dakota in Vermillion, SD

DANR and Ron,

Attached is the filled out application for our three (3) wells that were installed for the Geothermal loop system that provides heating and cooling for our new Health Science Building in Vermillion, SD on the campus of the University of South Dakota. Can you tell me if everything is filled out correctly and if I have all the required documentation needed for the permit. Finally, can you tell me what the fee is so that I can include that with this information to DANR.

Currently our rejection well is not operating correctly, which is located on the North side of the Lee Medical building. We are temporarily discharging the water into the City of Vermillion storm water system via fire hoses on the ground. The engineer is proposing to install underground piping to the City of Vermillion Storm Sewer as a permanent back up system to prevent this line from freezing before winter sets in. Ultimately, the University and City of Vermillion do not want this as a permanent solution, however USD is still waiting on the engineer and contractor to complete some additional tests/inspections of the existing rejection well in order to determine what the cause of the issue is and also what is the solution to reject this water back into the aquifer. Once that is determined, I can follow up with you on the proposed solution from the engineer.

Thanks,

Brian Limoges

Assistant Vice President of Facilities Management

University of South Dakota

Office: (605) 658-3308

Cell: (605) 231-2058

Brian.Limoges@usd.edu

**WE ARE
SOUTH DAKOTA**

www.WeAreSouthDakota.com



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 8745-3, University of South Dakota**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Agriculture and Natural Resources concerning Water Permit Application No. 8745-3, University of South Dakota, 414 East Clark Street, Vermillion SD 57069.

The Chief Engineer is recommending APPROVAL of Application No. 8745-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing domestic water uses and water rights, 3) the proposed use is a beneficial use and 4) it is in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board with the following qualifications:

1. The wells approved under Water Permit No. 8745-3 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals shall be controlled so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The wells authorized by Permit No. 8745-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. Water Permit No. 8745-3 authorizes a one-time diversion of up to 564 acre-feet of water and then become nonconsumptive by reinjecting water used for geothermal purposes back into the Lower Vermillion Missouri aquifer.

See report on application for additional information.

Eric Gronlund, Chief Engineer
June 5, 2023

Note: The Chief Engineer shall be notified when all of the water is being reinjected or when it is determined that alternative to reinjection are being considered. If all of the water cannot be reinjected, then another water right permit will be needed if water use for geothermal purposes is to continue. In addition, the volume of water discharged, other than water reinjected back to the Lower Vermillion Missouri aquifer, shall be reported to the Chief Engineer from the time of issuance of this permit to the end of each calendar year.

Report to the Chief Engineer
On Water Permit Application No. 8745-3

University of South Dakota

May 22nd, 2023

Water Permit Application No. 8745-3 proposes to appropriate 0.78 cubic feet of water per second (cfs) for a geothermal system from two existing wells completed into the Lower Vermillion Missouri aquifer (192 feet deep) located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 13-T92N-R52W. There is currently one existing injection well and 1 or 2 future injection well(s) may also be installed; all located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 13-T92N-R52W. A volume up to 564 acre-feet of water is to be appropriated for one-time use and the following years water use will be non-consumptive by re-injecting water back into the same aquifer. The site of interest is located in Vermillion, SD in Clay County.

AQUIFER: Lower Vermillion Missouri (LVM)

HYDROGEOLOGY:

The Lower Vermillion Missouri aquifer, referred to as the LVM aquifer for the remainder of this report, is a buried glacial outwash that was deposited by meltwater streams beyond the margin of active glacial ice (Stephens, 1967). The LVM aquifer materials range in size from a coarse sand to a coarse gravel (Niehus, 1994). The LVM aquifer is primarily confined but can be locally found under unconfined conditions such as in the flood plain of the Vermillion River (Niehus, 1994; Stephens, 1967). The LVM aquifer has an average thickness of approximately 100 feet in Clay County (Stephens, 1967). Table 1 shows the information related to the areal extent of the LVM aquifer, the area utilized for this report is approximately 106,000 acres (Mathiowetz, 2018).

The LVM aquifer is hydrologically connected to the Upper Vermillion Missouri: South (UVM:S) aquifer to the north, the Missouri: Elk Point aquifer to the south, the underlying Dakota aquifer, and the Vermillion River (Buhler, 2014; Mathiowetz, 2018; Niehus, 1994; Stephens, 1967). Hedges and others (1982) delineated a boundary between the Upper Vermillion Missouri aquifer and LVM aquifer with portions of each boundary being modified by Buhler (2014) and Mathiowetz (2018) in response to additional study of the Upper Vermillion Missouri aquifer, as shown on Figure 1.

Table 1. Estimated areal extent for the historic LVM aquifer boundary (Hedges and others, 1982), the portion of the UVM:S aquifer that overlies the historic LVM aquifer boundary (Buhler, 2014). The current LVM aquifer boundary (Mathiowetz, 2018), and the unconfined portion of the LVM aquifer along the Vermillion River (modified from Jensen, 2000; modified from Stonesifer, 2013).

Delineation	Estimated Areal Extent (acres)
Historic Lower Vermillion Missouri Aquifer (modified from Hedges and others, 1982)	124,000
Upper Vermillion Missouri: South Aquifer (UVM:S) (modified from Buhler, 2014) - Portion that overlies LVM aquifer boundary estimated by Hedges and others, 1982.	18,000
Current Lower Vermillion Missouri Aquifer* (Mathiowetz, 2018)	106,000
Unconfined Portion of Lower Vermillion Missouri Aquifer - not enclosed in UVM:S (Buhler, 2014) (modified from Jensen, 2000; modified from Stonesifer, 2013)	12,000
*Estimated by subtracting UVM:S aquifer boundary (Buhler, 2014) from historic boundary (Hedges and others, 1982)	

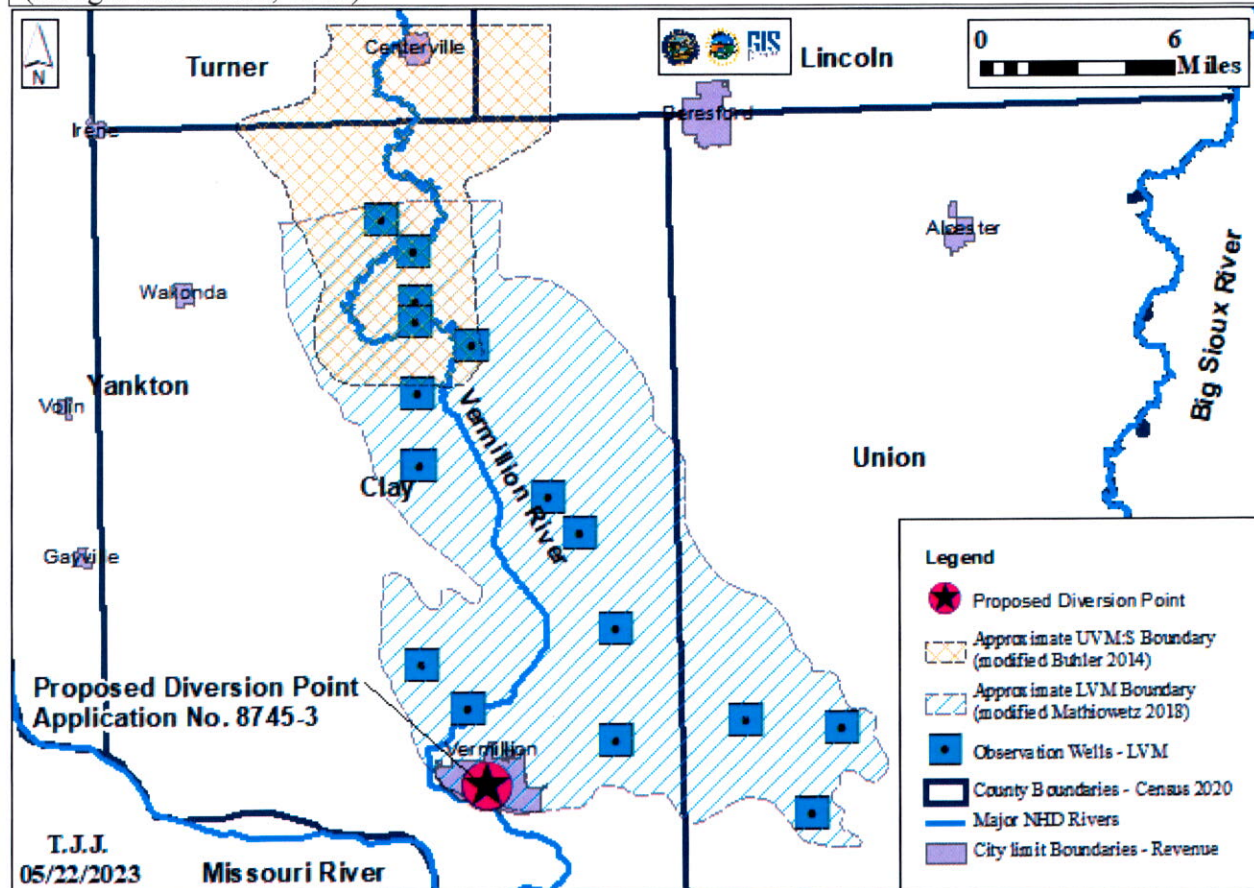


Figure 1. Map of the approximate LVM aquifer boundary delineated by Hedges and others (1982) with a portion of the UVM:S and LVM aquifer boundary estimated by Buhler (2014) and Mathiowetz (2018) respectively, and the location of proposed diversion point for Water Permit Application No. 8745-3, and LVM aquifer observation wells (Water Rights, 2023b and 2023c).

There are three water well completion reports submitted with this application listed on Table 2. The reports on Table 2 are all located in the SE ¼ SE ¼ Section 13 -T92N-R52W (Water Rights, 2023b). Based on water well completion reports near the proposed diversion points and these water well completion reports, the LVM aquifer is expected to be unconfined at the diversion points (SDGS, 2023; Water Rights, 2023b and 2023d).

Table 2. The date, static water level, and geology of three Water Well Completion Reports for Application No. 8745-3.

Water Well Completion Reports			
Date	05/10/2022	05/13/2022	05/13/2022
Static Water Level (ft)	102	104	102
Geology (ft)			
Topsoil	0-2	0-2	0-2
Brown Clay	2-32	2-70	2-32
Grey Silty Pebbly Till	32-70	70-75	32-70
Gravel	70-75	75-100	70-75
Grey Silty Pebbly Till	75-100	100-110	75-100
Broken Gravel	100-110	125-172	100-110
Grey Sandy Clay	110-125	172-192	110-125
Sand & Gravel	125-172		125-172
Med-Coarse Gravel	172-192		172-192

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

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

WATER AVAILABILITY:

Water Permit Application No. 8745-3 proposes to appropriate water from the LVM aquifer. The probability of unappropriated water being available from the aquifer can be evaluated by considering SDCL 46-6-3.1, which requires “No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source. An application may be approved, however, for withdrawals of groundwater from any groundwater formation older than or stratigraphically lower than the Greenhorn Formation in excess of the average estimated annual recharge for use by water distribution systems.” The LVM aquifer is not older than or

stratigraphically lower than the Greenhorn Formation, and the applicant's proposed use is not for use in a water distribution system as defined by SDCL 46-1-6(17). Therefore, the average annual recharge and average annual withdrawal rates to and from the LVM aquifer must be considered.

HYDROLOGIC BUDGET:

Recharge

Recharge to the LVM aquifer is received primarily through infiltration of precipitation where the aquifer is at or near land surface, groundwater inflow from the Upper Vermillion Missouri: South aquifer, seepage from Vermillion River, and leakage from the underlying Dakota aquifer (Niehus, 1994; Stephens, 1967). Using observation well analysis, Hedges and others (1985) estimated a recharge rate of 3.8 inches per year for the unconfined portion of the LVM aquifer. However, Stonesifer (2013) recalculated the recharge rate to be an estimated 4.58 inches per year using the same method but with additional observation well data. The unconfined area for this primarily confined aquifer is approximately 12,000 acres (Table 1; modified from Jensen, 2000; modified from Stonesifer, 2013). Therefore, the estimated average annual recharge rate for the unconfined portion of the LVM aquifer is approximately 4,580 acre-feet/year (based on Stonesifer, 2013 and modified from Jensen, 2000).

It is assumed that the confined portion of the LVM aquifer recharges at a similar rate and is hydrologically similar to the confined portion of the Upper Vermillion Missouri aquifer. Using regional flow-net analysis, Hedges and others (1985) estimated the recharge rate of the, primarily confined, Upper Vermillion Missouri aquifer to be approximately 0.25 inches per year. The confined portion of the LVM aquifer is approximately 94,000 acres, this was found by subtracting the unconfined area from the current total area on Table 1. Using the Hedges and others (1985) confined recharge rate multiplied by the confined portion areal extent, the average annual recharge rate for the confined portion of the LVM aquifer is approximately 1,960 acre-feet per year. Combining average annual recharge rate for both the confined and unconfined portions of the LVM aquifer (within the LVM aquifer within Hedges and others (1982) historical aquifer boundary minus Buhler (2014) delineation of the UVM:S aquifer boundary), the average annual recharge rate is approximately 6,540 acre-feet per year.

Discharge

Discharge from the LVM aquifer in South Dakota primarily occurs through well withdrawals, seepage to surface water features, and evapotranspiration in areas where the aquifer is at or near land surface. There are 97 water rights/permits authorized to appropriate water from the LVM aquifer within the historical aquifer boundary delineated by Hedges and others (1982) (Water Rights, 2023c). However, 61 water rights/permits are in both the LVM aquifer boundary delineated by Hedges and others (1982) and the Upper Vermillion Missouri: South aquifer boundary delineated by Buhler (2014). Of the 61 water rights/permits, 29 are currently withdrawing water from the Upper Vermillion Missouri: South aquifer and are still labeled as withdrawing water from the LVM aquifer. Therefore, by excluding the 29 water rights/permits

that are withdrawing from the Upper Vermillion Missouri: South aquifer from the 97 water rights/permits, there are 68 water rights/permits authorized to appropriate water from the LVM aquifer within the current aquifer boundary delineated by Mathiowetz (2018). There is one pending application (Application No. 8731-3) for the LVM aquifer with a priority date senior to this application. There are no future use permits reserving water from the LVM aquifer (Water Rights, 2023c).

Table 3 summarizes the 7 non-irrigation water rights/permits authorized to appropriate water from the LVM aquifer with the estimated annual use for each water right/permit as determined by their limiting diversion rate or annual volume. The data on Table 3 is broken up into two sets of water rights/permits: 1) those that are located in the historic aquifer boundary by Hedges and others (1982) but not in the Upper Vermillion Missouri: South aquifer boundary delineated by Buhler (2014) and 2) water rights/permits that are located within both boundaries. The amount of water withdrawn was estimated by assuming the non-irrigation water rights/permits limited by an annual volume will withdraw their entire appropriated volume every year. It is estimated that the non-irrigation water rights/permits limited only by a diversion rate will pump at their maximum permitted diversion rate for 60 percent of the time. This is a standard method developed by the DANR-Water Rights Program for estimating average annual withdrawals by non-irrigation appropriations limited solely by diversion rate. It is likely an overestimate of water withdrawn by water rights/permits only limited by diversion rate. Overall, the estimated average annual withdrawal rate for the LVM aquifer non-irrigation water rights/permits within the historic aquifer boundary (Hedges and others, 1982) is approximately 1,224.4 acre-feet/year, and approximately 48.6 acre-feet/year excluding water rights/permits that are in the Upper Vermillion Missouri: South delineation by Buhler (2014) (Table 3) (Water Rights, 2023c).

Table 3. Estimated average annual use for non-irrigation water rights/permits authorized to appropriate water from the LVM aquifer within the historic aquifer boundary by Hedges and others (1982) but not the UVM:S aquifer delineation by Buhler (2014), and non-irrigation water rights within aquifer boundary delineated by Hedges and others (1982) and Buhler's (2014) UVM:S boundary (Water Rights, 2023c).

Permit No.	Name	Uses	Status	Authorized Diversion Rate (cfs)	Authorized Annual Volume (acre-feet)	Estimated Use (acre-feet/year)
1870-3	USD FACILITIES MGMT	INS	LC	0.03	NA	13.0
6397-3	SD DEPT OF TRANSPORTATION	INS	LC	0.033	NA	14.3
8222-3	SOUTHEAST FARMERS COOP	COM	PE	0.167	18.4	18.4
8257-3	THEIN WELL CO INC	COM	PE	0.089	1	1
8479-3	KNIFE RIVER	IND	PE	0.133	1.84	1.84
					Total:	48.6
3905-3*	CLAY RURAL WATER SYSTEM INC	RWS	LC	2	NA	868.8
5979-3*	CLAY RURAL WATER SYSTEM INC	RWS	LC	2	307	307
					Total:	1175.8
*Within aquifer boundary delineated by Hedges and others (1982) and Buhler's (2014) UVM:S boundary LC Licensed Water Right, PE Water Permit, INS Institutional, COM Commercial, RWS Rural Water System						

There are 90 irrigation water rights/permits appropriating water from the LVM aquifer within Hedges and others (1982) historical aquifer boundary (Water Rights, 2023c). Irrigation water rights/permits have been typically required to report their annual usage on an irrigation questionnaire since 1979. However, due to changes in farming practices, new equipment, and an increase in the number of permits from 43 in 2006 to 71 in 2013, the average over the entire period of record may not be an accurate reflection of average annual irrigation withdrawal at the present time. The average annual withdrawal rate for the LVM aquifer within Hedges and others (1982) historical boundary for irrigation water rights/permits that have reported over the past ten years of record (2012 to 2021) is approximately 3,015 acre-feet per year (Table 4) (Water Rights, 2023a).

There are 61 irrigation water rights/permits appropriating water from the LVM aquifer within Hedges and others (1982) historical aquifer boundary excluding rights/permits within delineation UVM:S aquifer by Buhler (2014) (Water Rights, 2023c). However, due to changes in farming practices and an increase in the number of permits from 27 in 2006 to 45 in 2013, the average over the entire period of record may not be an accurate reflection of actual average annual withdrawal at the present time. The average annual withdrawal rate for the LVM aquifer irrigation water rights/permits that have reported over the past ten years of record (2012 to 2021) is approximately 1,866 acre-feet per year (Table 4) (Water Rights, 2023a).

There are ten water permits approved in 2022 and early 2023 (Nos. 8632-3, 8589-3, 8641-3, 8672-3, 8680-3, 8692-3, 8693-3, 8711-3, 8725-3, and 8726-3) and one other pending application in 2023 (No. 8731-3) that were not included in the irrigation questionnaire compilation and need to be accounted for. The new permits are authorized to irrigate 1,093 acres, while the pending application (No. 8731-3), proposes to irrigate 162 acres. All together a total of 1,255 acres are planned to be irrigated (Water Rights, 2023c). Assuming one foot of water per acre per year, the withdrawal rate for these water permits/applications is approximately 1,255 acre-feet per year. The average annual withdrawal rate for irrigation appropriations from 2012 to 2021 combined with 2022 and 2023 permits and new applications within Hedges and others (1982) historical aquifer boundary, is approximately 4,270 acre-feet per year (Table 4) (Water Rights, 2023a). The average annual withdrawal rate for irrigation appropriations from 2012 to 2021 combined with 2022 and 2023 permits and new applications within Hedges and others (1982) historical aquifer boundary excluding water rights/permits within delineation UVM:S aquifer by Buhler (2014), is approximately 3,121 acre-feet per year (Table 4) (Water Rights, 2023a).

Application No. 8745-3 (this application) is requesting 564 acre-feet of water to be appropriated for a one-time use with the following years of water use being non-consumptive by re-injecting the pumped water back into the aquifer (Water Rights, 2023c). Therefore, the average annual use for this application that will be accounted for in the hydrologic budget for the LVM aquifer will be 0 ac-ft/yr.

Table 4. Reported irrigation uses from the LVM aquifer for water right/permits within the historical boundary of LVM aquifer excluding delineation UVM:S aquifer (Buhler, 2014) (Water Rights, 2023a)

Historical Boundary of LVM aquifer (Hedges and others, 1982)			Historical Boundary of LVM aquifer (Hedges and others, 1982), Excluding UVM:S Aquifer Boundary (Buhler, 2014)		
Year	Number of Permit/License	Annual Pumpage (ac-ft/yr)	Year	Number of Permit/License	Annual Pumpage (ac-ft/yr)
1979	49	1163.0	1979	40	810.5
1980	47	2417.0	1980	38	1995.0
1981	49	1543.0	1981	39	1205.4
1982	37	870.0	1982	27	758.3
1983	38	716.3	1983	28	644.7
1984	47	691.0	1984	37	549.0
1985	46	1328.2	1985	36	927.2
1986	45	1047.5	1986	35	807.5
1987	37	1115.4	1987	27	794.4
1988	38	2083.8	1988	28	1442.4
1989	38	2301.2	1989	28	1522.2
1990	38	2113.2	1990	28	1288.2
1991	39	1670.1	1991	29	1044.1
1992	39	168.8	1992	29	116.7
1993	39	0.0	1993	29	0.0
1994	39	517.3	1994	29	308.7
1995	37	506.6	1995	28	368.2
1996	36	997.6	1996	27	572.9
1997	36	1085.0	1997	27	645.0
1998	36	1032.9	1998	26	736.6
1999	38	900.6	1999	27	698.9
2000	38	2041.7	2000	27	1574.9
2001	38	2037.0	2001	27	1781.8
2002	40	1762.3	2002	29	1123.2
2003	40	1800.6	2003	29	1470.6
2004	39	1747.5	2004	28	1167.6
2005	45	1410.2	2005	28	1071.1
2006	43	2674.5	2006	27	1734.3
2007	50	2909.1	2007	26	1327.0
2008	55	4301.3	2008	28	911.9
2009	58	482.6	2009	30	460.8
2010	59	144.6	2010	30	134.0
2011	62	2195.1	2011	33	1219.4
2012	61	7759.5	2012	33	3355.3
2013	71	4109.1	2013	45	2856.5
2014	75	1576.3	2014	48	1006.4
2015	78	1925.8	2015	50	1473.5
2016	79	2187.5	2016	51	1779.0
2017	79	3156.6	2017	52	2439.3
2018	79	427.7	2018	52	419.4
2019	79	339.6	2019	52	333.0
2020	78	3353.2	2020	51	1972.5
2021	80	5316.2	2021	54	3026.7
Average 1979-2021		1812.2	Average 1979-2021		1159.9
Average 2012-2021		3015.2	Average 2012-2021		1866.2

There are domestic wells completed into the LVM aquifer that do not require a water right/permit, so the withdrawal amount from those wells is unknown (Water Rights, 2023d). Due to their relatively low diversion rates, withdrawals from domestic wells are not considered to be a significant portion of the hydrologic budget. Additionally, with the development of rural water systems in areas where the LVM aquifer is the uppermost aquifer available; it is likely some domestic users may have transitioned to rural water. Therefore, the quantity of water withdrawn by domestic wells is estimated to be negligible to the hydrologic budget for the LVM aquifer.

Hydrologic Budget Summary

The average annual recharge rate for the unconfined portion of the LVM aquifer not enclosed in the UVM:S aquifer (Buhler, 2014) is approximately 4,580 acre-feet/year. The average annual recharge rate for the current confined portion LVM aquifer (Mathiowetz, 2018) is approximately 1,960 acre-feet/year. Combining average annual recharge rate for both the current confined and unconfined portions of the LVM aquifer not enclosed in the UVM:S aquifer, the average annual recharge rate is approximately 6,540 acre-feet per year.

The average annual withdrawal rate from the LVM aquifer within Hedges and others (1982) historical aquifer boundary (the non-irrigation appropriations (1,224 acre-feet/year); the average annual withdrawal rate for irrigation appropriations from 2012 to 2021, 2022-2023 water permits, and new applications, including this one, (4,270 acre-feet/year)) is approximately 5,494 acre-feet per year, also shown on Table 5 (Water Rights, 2023a).

The average annual withdrawal rate from the LVM aquifer within Hedges and others (1982) historical aquifer boundary excluding rights/permits within delineation UVM:S aquifer by Buhler (2014) (the non-irrigation appropriations (49 acre-feet/year); the average annual withdrawal rate for irrigation appropriations from 2012 to 2021, 2022-2023 water permits, and new applications, including this one, (3,121 acre-feet/year)) is approximately 3,170 acre-feet per year, also shown on Table 5 (Water Rights, 2023a).

This application proposes a one-time use of 564 acre-feet/year with an ongoing non-consumptive use of water due to reinjection of pumped water into the aquifer. Therefore, the one-time use is not included in the average annual use because the annual use will be 0 acre-feet/year.

Collectively, the average annual recharge rate for both the confined and unconfined portions of the LVM aquifer is greater than the average annual withdrawal rate from both the LVM aquifer within Hedges and others (1982) historical aquifer boundary and the LVM aquifer within Buhler (2014) and Mathiowetz (2018) boundary delineated portions of the UVM:S and LVM aquifers. Furthermore, the average annual recharge to the aquifer exceeds the average annual withdrawals plus the one-time use for this application. Based on the hydrologic budget, there is a reasonable probability unappropriated water is available from the LVM aquifer for the proposed appropriation.

Table 5. List of water rights/permits withdrawals, new applications (if approved), and one-time use for application withdrawals from both the historic boundary of the LVM and current boundary of the LVM excluding the UVM:S delineated areas made by Buhler (2014) (Water Rights, 2023a)

	Historical Boundary of the LVM Aquifer (Hedges and others, 1982) Pumpage (ac-ft/yr)	Historic Boundary of the LVM Aquifer (Hedges and others, 1982), Excluding UVM:S Aquifer Boundary (Buhler 2014) Pumpage (ac-ft/yr)
Non-Irrigation Appropriation	1,224	49
Irrigation Appropriation (2012-2022)	3,015	1,866
New Permits (2022-2023)	1,093	1,093
Pending Application	162	162
Total	5,494	3,170
Application No. 8745-3 one-time use (2023)	564	564

OBSERVATION WELL DATA:

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

The DANR-Water Rights Program monitors ten observation wells completed into the LVM aquifer with two additional observation wells (CL-80J and CL-66AR) that are within both the historic aquifer boundary delineated by Hedges and others (1982) and Upper Vermillion Missouri: South aquifer boundary as defined by Buhler (2014), with observation wells in the area of this application shown on Figure 5 (Water Rights, 2023b). These observation wells provide data on how the aquifer reacts to regional climatic conditions and local pumping. The three closest observation wells to the diversion points are CL-57A (approximately 2.5 miles northwest), CL-66BR (approximately 4.3 miles northwest), and CL-80G (approximately 4.3 miles northeast) (Water Rights, 2023b). The hydrographs for these observation wells are displayed in Figures 2, 3, and 4 respectively (Water Rights, 2023b). The data points utilized to construct the hydrographs are measurements of the static water level in the observation wells from the top of the well casing. It is worth noting the hydrograph titles display DENR Water Rights Observation Well on the hydrographs when the titles should display DANR Water Rights Observation Well on the hydrographs.

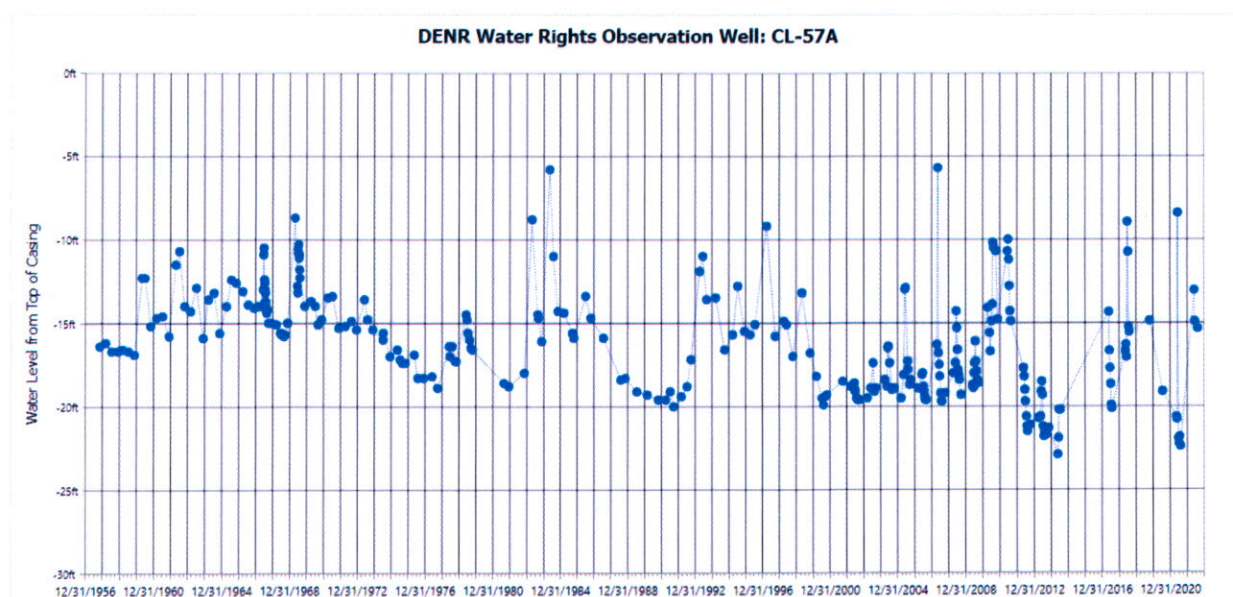


Figure 2. Hydrograph for observation well CL-57A (Water Rights, 2023b)

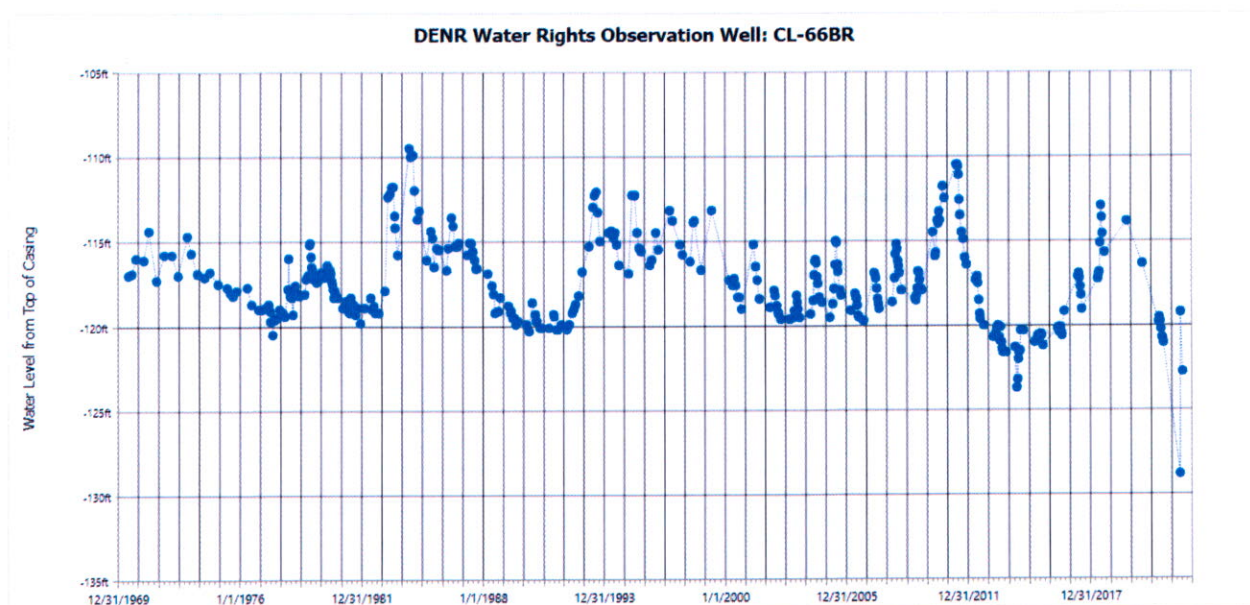


Figure 3. Hydrograph for observation well CL-66BR (Water Rights, 2023b)

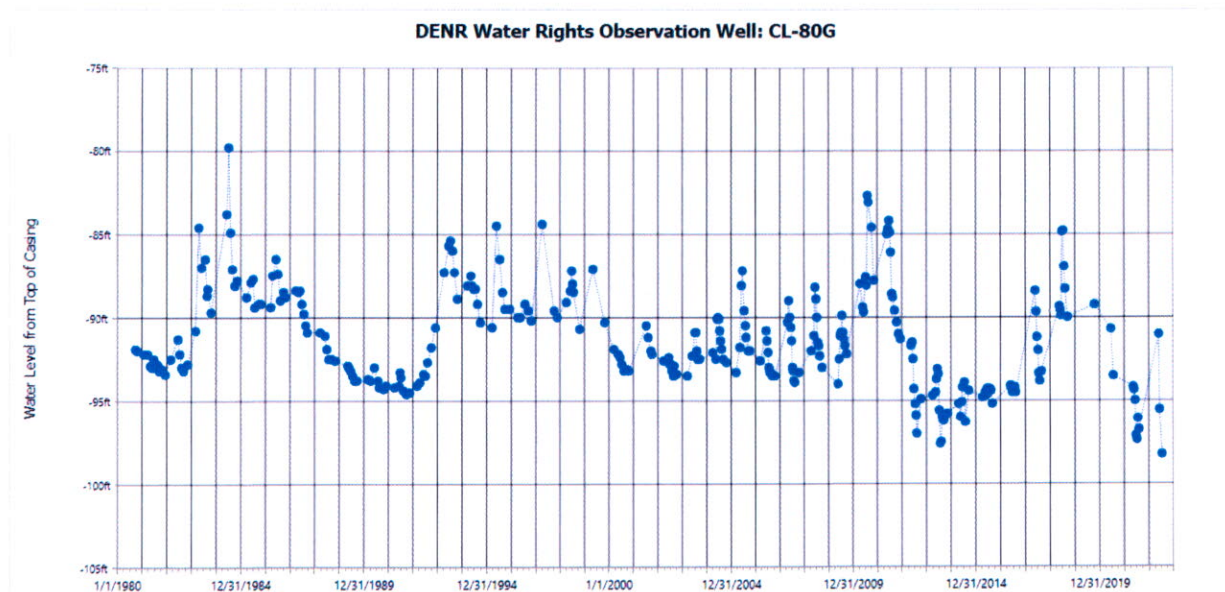


Figure 4. Hydrograph for observation well CL-80G (Water Rights, 2023b)

A majority of the observation wells in the LVM aquifer have a stable trend in the water level. Figure 2 has a lot of unusually high data points, this is likely due to the wells close proximity to the Vermillion River drastically changing the water level. The data shown on Figure 4 shows a slight declining trend in recent years. This may be due to recent development nearby development of the aquifer or the hydrologic connection to the Missouri: Elk Point aquifer and how the water levels of the Missouri River affect the Missouri: Elk Point aquifer and subsequently the LVM aquifer (Mathiowetz, 2023). The hydrographs for the LVM aquifer observation wells indicate that the aquifer responds well to climatic conditions because water levels are rising during wetter periods (early spring snowmelt and precipitation) and declining to a stable water level during drier periods. Additionally, the water levels in the observation wells display that the amount of recharge to and natural discharge from the aquifer greatly exceeds pumping with the aquifer with water levels returning to pre-pumping conditions between irrigation seasons. Aquifer recovery indicates that climatic conditions and therefore, the effects of recharge to and natural discharges from the aquifer govern the long-term fluctuations of waters levels in the aquifer rather than the impacts of pumping from the LVM aquifer. By recognizing that both recharge to and natural discharge from an aquifer can be captured for pumping, the observation well hydrographs demonstrate unappropriated water is available for the proposed appropriation.

POTENTIAL FOR UNLAWFUL IMPAIRMENT OF EXISTING WATER RIGHTS:

Water rights/permits in the general vicinity of the proposed well site for this application are shown in Figure 5 and summarized in Table 5. The closest water right/permit to the diversion point for this application, not held by the applicant, is Water Right No. 7647-3 which is held by Heikes Family Farm LLC. The diversion point for Water Right No. 7647-3 is located approximately 1.5 miles northeast of the proposed diversion point for this application (Water Rights, 2023c). There are domestic wells on file with the DANR-Water Rights Program that are

completed into the LVM aquifer, with the closest domestic well on file (not held by the applicant) approximately 0.1 miles northwest of the diversion point based on the legal description provided by the well driller on the well completion report (Water Rights, 2023d). There could potentially be other domestic wells completed into the LVM aquifer near the diversion points that are not on file with the DANR-Water Rights Program.

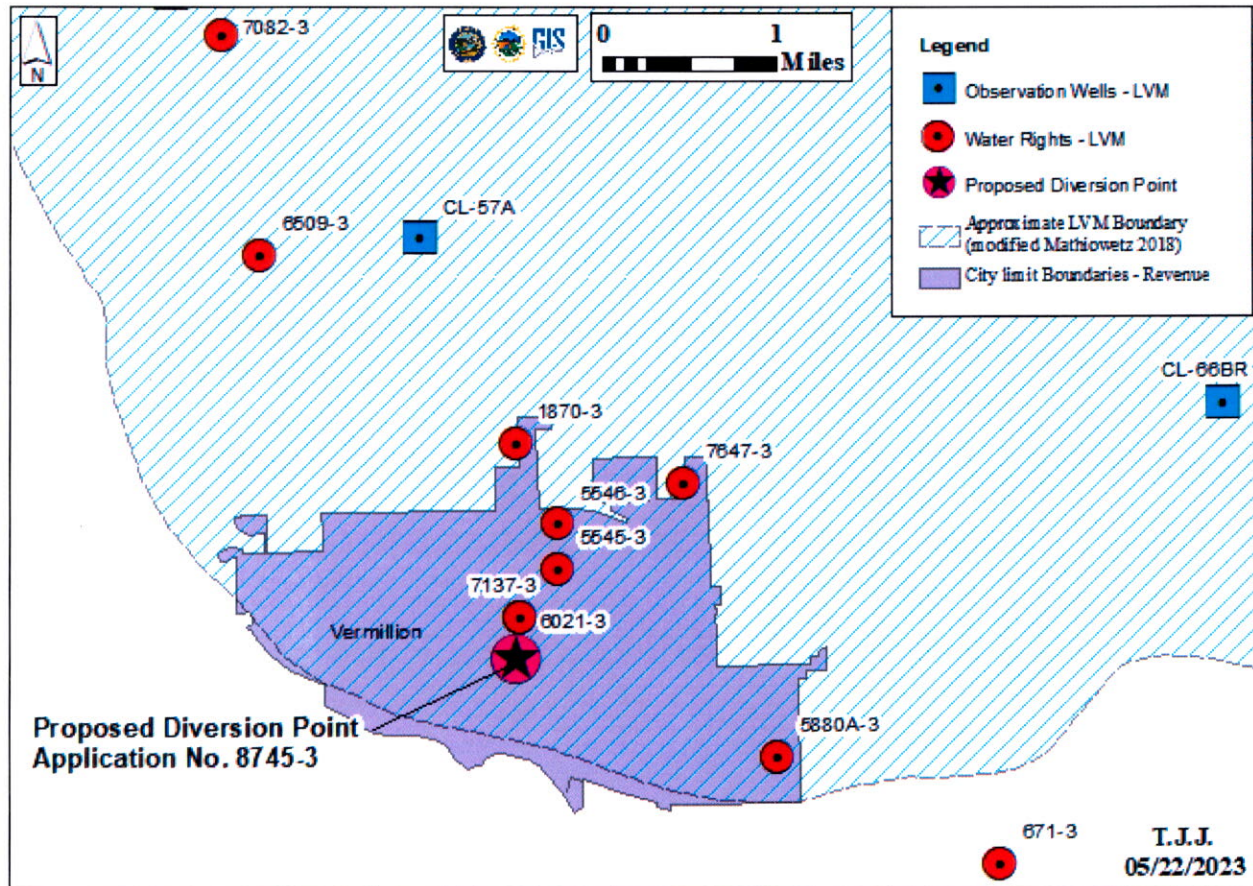


Figure 5. Map of the proposed diversion points for Water Permit Application No. 8745-3 and nearby LVM aquifer water rights/permits and observation wells within 4 miles of the proposed diversion points (Water Rights, 2023b and 2023c).

Table 6. List of water rights/permits shown in Figure 5 (Water Rights, 2023c).

Permit	Name/Business	Priority	Status	Use Type	CFS	Acres
671-3	Todd Heine	11/06/1959	License	Irrigation	3.4	243.8
1870-3	USD Facilities MGMT	01/28/1971	License	Institutional	0.03	0
5545-3	USD Facilities MGMT	04/22/1991	License	Irrigation	0.06	5
5546-3	USD Facilities MGMT	04/10/1991	License	Irrigation	0.443	31
5880A-3	City of Vermillion	08/25/1995	License	Irrigation	0.86	73.4
6021-3	USD Facilities MGMT	01/01/1910	License	Irrigation	0.11	7.75
6509-3	Patti Bancroft	05/17/2004	License	Irrigation	0.22	23
7082-3	Bottolfson Brothers	10/29/2008	License	Irrigation	1.56	138
7137-3	USD Facilities MGMT	05/21/2009	Permit	Irrigation	0.56	30.75
7647-3	Heikes Family Farm LLC	01/17/2013	Permit	Irrigation	0.18	30

The LVM aquifer is primarily under confined conditions, but it can be found to be locally unconfined near the Vermillion River. Based on the well completion reports submitted with the application and near the proposed diversion points for this application, the LVM aquifer is expected to be under unconfined conditions. In an unconfined aquifer, drawdown created by pumping does not extend far from the pumped well. However, in a confined aquifer, drawdown from a pumping well can extend some distance from the well. The Water Management Board recognizes that putting water to beneficial use requires a certain amount of drawdown to occur. The Board has developed rules to allow water to be placed to maximum beneficial use without the necessity of maintaining artesian head pressure for domestic use. The Water Management Board defined an “adversely impacted domestic well” in ARSD 74:02:04:20(7) as:

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

When considering the statutes (SDCL 46-1-4 and 46-6-6.1), rules (ARSD 74:02:04:20(6) and (7)), history of irrigation in the area without any recent complaints of well interference (Water Rights, 2023e), the lack of well interference complaints, the saturated aquifer thickness near the diversion point, any drawdown created from the diversion is not expected to cause an unlawful impairment on existing water right/permit holders or domestic users with adequate wells. Additionally, the water used for geothermal purposes will be reinjected back into the same aquifer. Therefore, there is a reasonable probability that any interference from the proposed appropriation will not impose unlawful impairments on existing users with adequate wells.

CONCLUSIONS:

1. Water Permit Application No. 8745-3 proposes to appropriate 0.78 cfs of water for a geothermal system from two existing wells completed into the LVM aquifer, located in the approximate center of SE ¼ SE ¼ Section 13-T92N-R52W. The site of interest is located in Vermillion, SD.
2. There is currently one existing injection well and 1 or 2 future injection well(s) may also be installed; all located in the SE ¼ SE ¼ Section 13-T92N-R52W. A 564 acre-feet of water volume is to be appropriated for one-time use and the following years water use will be non-consumptive by re-injecting water back into the same aquifer.
3. Based on observation well data and the hydrologic budget, there is a reasonable probability that unappropriated water is available from the LVM aquifer to supply the proposed appropriation.
4. There is a reasonable probability that the diversion by Water Permit Application No. 8745-3 will not unlawfully impair adequate wells for existing water rights/permits and domestic uses.



Tyler Jensen
Natural Resources Engineer I
SD DANR - Water Rights Program

Reviewed by:



Adam Mathiowetz, PE
Natural Resources Engineer IV
SD DANR -Water Rights Program

References

- Buhler, K. A. 2014. Report to the Chief Engineer on 21 Water Permit Applications from the Upper Vermillion Missouri Aquifer. SD DANR – Water Rights Program, Joe Foss Bldg. Pierre, SD.
- Hedges, L.S., Allen, J., Holly, D.E., 1985. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa, Task 7: Ground Water Recharge; United States Army Corps of Engineers Contract DACW 45-80-C-0185.
- Hedges, L.S., Burch, S.L., Iles, D.L., Barari, R.A., and Schoon, R.A. 1982. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa, Task 1: Bed rock Topography and Distribution, Task 2: Extent of Aquifers, Task 3 Ground-Water Storage, Task 4: Computerized Data Base. United States Army Corps of Engineers Contract DACW 45-80-C-0185.
- Jensen, A.R., 2000. First Occurrence of Aquifer Materials in Clay County, South Dakota. SD DANR-Geological Survey Aquifer Materials Map 1. Vermillion, SD.
- Mathiowetz, A. 2023. Report to the Chief Engineer on Water Permit Application No. 8754-3 Lewis & Clark Regional Water System c/o Troy Larson, Executive Director. Natural Resources Engineer IV, SD DANR – Water Rights Program, Joe Foss Bldg. Pierre, SD.
- Mathiowetz, A. 2018. Report to the Chief Engineer on Water Permit Application 8335-3. Natural Resource Engineer IV, SD DANR – Water Rights Program, Joe Foss Bldg. Pierre, SD.
- Niehus, C.A., 1994. Water Resources of Lincoln and Union Counties, South Dakota. U.S. Geological Survey Water-Resources Investigations Report 93-4195. U.S. Geological Survey. Rapid City, SD.

- SDGS, 2023. South Dakota Geological Survey Lithologic Logs Database. Accessed May 22, 2023. <http://cf.sddanr.net/lithdb/>.
- Stephens, J.C., 1967. Geology and Water Resources of Clay Counties, South Dakota Part II: Water Resources. Bulletin 19. SD DANR-Geological Survey, Vermillion, SD.
- Stonesifer, J. R. 2013. Report to the Chief Engineer on Water Permit Application 7918-3. SD DANR – Water Rights Program, Joe Foss Bldg. Pierre, SD.
- Water Rights, 1995. Findings of Fact, Conclusions of Law, and Final Decision in the Matter of Water Permit Application No. 2313-2, Coca-Cola Bottling Company of the Black Hills. DANR-Water Rights Program file for Water Right No. 2313-2. Pierre, SD.
- Water Rights, 2023a. "1979-2021 Irrigation Summaries by Aquifer", SD DANR-Water Rights Program, Joe Foss Building, Pierre, SD.
- Water Rights, 2023b. Observation Well Data, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.
- Water Rights, 2023c. Water Right/Permit Files, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.
- Water Rights, 2023d. Well Completion Reports, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.
- Water Rights, 2023e. County Files, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

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

June 9, 2023

University of South Dakota
c/o Brian Limoges
414 E Clark Street
Vermillion SD 57069

Dear Mr. Limoges:

Water Permit Application No. 8745-3 for geothermal use have been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Plain Talk printed at Vermillion SD (Ph # 605 624-2695) and the Daily Press & Dakotan printed at Yankton SD (Ph # 605 665-7811). You will need to contact the newspapers 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 newspapers to authorize publication of your Notice and to arrange for payment. Early contact with the papers can eliminate delays. Upon receiving authorization from you, the publishers have been instructed to publish your notice. The newspapers have 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,

Rachel Rodriguez

Rachel Rodriguez
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. 8745-3 to Appropriate Water

Notice is given that the University of South Dakota, c/o Brian Limoges, 414 E Clark Street, Vermillion SD 57069 has filed an application for a water permit for a geothermal system to appropriate 0.78 cubic feet of water per second (cfs) from two existing wells in the Lower Vermillion Missouri Aquifer (192 feet deep) located in the SE1/4 SE1/4 Section 13 -T92N-R52W. There is currently one existing injection well and 1 or 2 future injection well(s) may also be installed all located in the SE 1/4 SE 1/4 Section 13-T92N-R52W. A volume up to 564 acre feet of water is to be appropriated for one-time use and then become non-consumptive by re-injecting water back into the same aquifer. This site is located in Vermillion SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8745-3 with qualifications because 1) unappropriated water is available, 2) existing domestic water uses and water rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest as it pertains to matters within the regulatory authority of the Water Management Board. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.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 this application or recommendation shall allege that the application, upon approval, will cause injury to the person that is unique from any injury suffered by the public in general. The injury must concern a matter either within the regulatory authority found in SDCL 46-2A-9 for approval or denial of the application, or other matter concerning the application within the regulatory authority of the board to act upon as defined by SDCL 46-2-9 and 46-2-11, or both. Any person meeting the petitioner requirements and wishing to be a party of record in a contested case hearing shall file a written petition to oppose the application with BOTH the applicant and Chief Engineer. A petition opposing the application shall be filed on a form provided by the Chief Engineer. The petition form is available online at <https://danr.sd.gov/public> or by contacting the Chief Engineer. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501" or call (605) 773-3352. The applicant's mailing address is given above. If contesting the Chief Engineer's recommendation, the applicant shall also file a petition. A petition filed by either an interested person or the applicant must be filed by June 26, 2023.

The petition shall include a statement describing the unique injury upon approval of the application on the petitioner, the petitioner's reasons for opposing the application, and the name and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

Any interested person may file a comment on the application with the Chief Engineer. The comment shall be filed on a form provided by the Chief Engineer and is available online at <https://danr.sd.gov/public> or by calling (605) 773-3352 or writing the Chief Engineer at the address provided above. Filing a comment does not make the commenter a party of record or a participant in any hearing that may be held. Any comment must be filed by June 26, 2023.

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_

From: Rodriguez, Rachel
Sent: Thursday, June 8, 2023 3:58 PM
To: Kelly Kronaizl
Subject: 8745-3 University of South Dakota - Public Notice
Attachments: 8745-3 public.short_final.docx; FORM8.FRM.doc

Attached is a notice to be published on June 16, 2023.

University of South Dakota, c/o Brian Limoges, 414 E Clark Street, Vermillion SD 57069, (605-231-2058 or 605-658-6100) 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.

Thank you,

Rachel Rodriguez
DANR | Program Assistant
Rachel.Rodriguez@state.sd.us



From: Rodriguez, Rachel
Sent: Thursday, June 8, 2023 4:01 PM
To: Michael Pietz
Subject: FW: 8745-3 University of South Dakota - Public Notice
Attachments: 8745-3 public.short_final.docx; FORM8.FRM.doc

Attached is a notice to be published on June 16, 2023.

University of South Dakota, c/o Brian Limoges, 414 E Clark Street, Vermillion SD 57069, (605-231-2058 or 605-658-6100) 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.

Thank you,

Rachel Rodriguez
DANR | Program Assistant
Rachel.Rodriguez@state.sd.us



AFFIDAVIT OF PUBLICATION

RECEIVED

JUN 20 2023

OFFICE OF
WATER

PLAIN TALK

USD FACILITIES MANAGEMENT
414 E CLARK
VERMILLION SD 57069

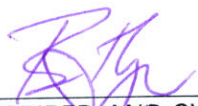
STATE OF SOUTH DAKOTA
COUNTY OF CLAY

BETH RYE, BEING FIRST DULY SWORN ON OATH DEPOSES
AND SAYS THAT (S)HE IS THE ADVERTISING DIRECTOR OF YANKTON
MEDIA INC, A CORPORATION, THE PRINTER AND THE PUBLISHER OF THE
PLAIN TALK, A LEGAL WEEKLY NEWSPAPER PUBLISHED AND CIRCULATED
IN THE CITY OF VERMILLION, SAID COUNTY AND STATE, AND ONE OF
THE OFFICIAL NEWSPAPERS OF THE SAID COUNTY OF FACTS STATED IN
THIS AFFIDAVIT; THAT THE ANNEXED
NOTICE OF APPLICATION NO.

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE
NEWSPAPER ON THE 16th DAY OF June, 2023
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION
OF SAID NOTICE TO WIT \$41.92 ENSURES TO THE
BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO
AGREEMENT AND UNDERSTANDING FOR THE DIVISION THEREOF HAS
BEEN MADE WITH ANY OTHER PERSON, AND THAT NO PART THEREOF
HAS BEEN AGREED TO BE PAID TO ANY PERSON WHOMSOEVER.

PUBLISHED ON: 06/16/2023

FILED ON: 06/16/2023


SUBSCRIBED AND SWORN TO BEFORE ME THIS 16th DAY OF June, 2023

NOTARY PUBLIC, SOUTH DAKOTA
MY COMMISSION EXPIRES

7/15/28

Notice is given that the University of South Dakota, c/o Brian Limoges, 414 E Clark Street, Vermillion SD 57069 has filed an application for a water permit for a geothermal system to appropriate 0.78 cubic feet of water per second (cfs) from two existing wells in the Lower Vermillion Missouri Aquifer (192 feet deep) located in the SE1/4 SE1/4 Section 13 -T92N-R52W. There is currently one existing injection well and 1 or 2 future injection well(s) may also be installed all located in the SE 1/4 SE 1/4 Section 13-T92N-R52W. A volume up to 564 acre feet of water is to be appropriated for one-time use and then become non-consumptive by re-injecting water back into the same aquifer. This site is located in Vermillion SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8745-3 with qualifications because 1) unappropriated water is available, 2) existing domestic water uses and water rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest as it pertains to matters within the regulatory authority of the Water Management Board. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.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 this application or recommendation shall allege that the application, upon approval, will cause injury to the person that is unique from any injury suffered by the public in general. The injury must concern a matter either within the regulatory authority found in SDCL 46-2A-9 for approval or denial of the application, or other matter concerning the application within the regulatory authority of the board to act upon as defined by SDCL 46-2-9 and 46-2-11, or both. Any person meeting the petitioner requirements and wishing to be a party of record in a contested case hearing shall file a written petition to oppose the application with BOTH the applicant and Chief Engineer. A petition opposing the application shall be filed on a form provided by the Chief Engineer. The petition form is available online at <https://danr.sd.gov/public> or by contacting the Chief Engineer. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501" or call (605) 773-3352. The applicant's mailing address is given above. If contesting the Chief Engineer's recommendation, the applicant shall also file a petition. A petition filed by either an interested person or the applicant must be filed by June 26, 2023.

The petition shall include a statement describing the unique injury upon approval of the application on the petitioner, the petitioner's reasons for opposing the application, and the name and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

Any interested person may file a comment on the application with the Chief Engineer. The comment shall be filed on a form provided by the Chief Engineer and is available online at <https://danr.sd.gov/public> or by calling (605) 773-3352 or writing the Chief Engineer at the address provided above. Filing a comment does not make the commenter a party of record or a participant in any hearing that may be held. Any comment must be filed by June 26, 2023.

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 \$41.92 and can be viewed free of charge at www.sdpublicnotices.com

Published June 16, 2023.

AFFIDAVIT OF PUBLICATION

RECEIVED

JUN 20 2023

OFFICE OF
WATER

YANKTON DAILY PRESS AND DAKOTAN

USD FACILITIES MANAGEMENT
414 E CLARK ST
VERMILLION SD 57069

STATE OF SOUTH DAKOTA
COUNTY OF YANKTON

KELLY HERTZ, BEING FIRST DULY SWORN ON OATH DEPOSES
AND SAYS THAT (S)HE IS THE MANAGING EDITOR OF YANKTON
MEDIA INC, A CORPORATION, THE PRINTER AND THE PUBLISHER OF THE
YANKTON DAILY PRESS AND DAKOTAN, A LEGAL DAILY NEWSPAPER
PUBLISHED AND CIRCULATED IN THE CITY OF YANKTON, SAID COUNTY
AND STATE, AND ONE OF THE OFFICIAL NEWSPAPERS OF THE SAID
COUNTY OF FACTS STATED IN THIS AFFIDAVIT; THAT THE ANNEXED
NOTICE OF APPLICATION NO.

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE
NEWSPAPER ON THE 16th DAY OF June, 2023
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION
OF SAID NOTICE TO WIT \$41.92 ENSURES TO THE
BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO
AGREEMENT AND UNDERSTANDING FOR THE DIVISION THEREOF HAS
BEEN MADE WITH ANY OTHER PERSON, AND THAT NO PART THEREOF
HAS BEEN AGREED TO BE PAID TO ANY PERSON WHOMSOEVER.

PUBLISHED ON: 06/16/2023

FILED ON: 06/16/2023


SUBSCRIBED AND SWORN TO BEFORE ME THIS 16th DAY OF June, 2023

NOTARY PUBLIC, SOUTH DAKOTA
MY COMMISSION EXPIRES

7115128

Notice is given that the University of South Dakota, c/o Brian Limoges, 414 E Clark Street, Vermillion SD 57069 has filed an application for a water permit for a geothermal system to appropriate 0.78 cubic feet of water per second (cfs) from two existing wells in the Lower Vermillion Missouri Aquifer (192 feet deep) located in the SE1/4 SE1/4 Section 13 -T92N-R52W. There is currently one existing injection well and 1 or 2 future injection well(s) may also be installed all located in the SE 1/4 SE 1/4 Section 13-T92N-R52W. A volume up to 564 acre feet of water is to be appropriated for one-time use and then become non-consumptive by re-injecting water back into the same aquifer. This site is located in Vermillion SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8745-3 with qualifications because 1) unappropriated water is available, 2) existing domestic water uses and water rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest as it pertains to matters within the regulatory authority of the Water Management Board. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.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 this application or recommendation shall allege that the application, upon approval, will cause injury to the person that is unique from any injury suffered by the public in general. The injury must concern a matter either within the regulatory authority found in SDCL 46-2A-9 for approval or denial of the application, or other matter concerning the application within the regulatory authority of the board to act upon as defined by SDCL 46-2-9 and 46-2-11, or both. Any person meeting the petitioner requirements and wishing to be a party of record in a contested case hearing shall file a written petition to oppose the application with BOTH the applicant and Chief Engineer. A petition opposing the application shall be filed on a form provided by the Chief Engineer. The petition form is available online at <https://danr.sd.gov/public> or by contacting the Chief Engineer. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501" or call (605) 773-3352. The applicant's mailing address is given above. If contesting the Chief Engineer's recommendation, the applicant shall also file a petition. A petition filed by either an interested person or the applicant must be filed by June 26, 2023.

The petition shall include a statement describing the unique injury upon approval of the application on the petitioner, the petitioner's reasons for opposing the application, and the name and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

Any interested person may file a comment on the application with the Chief Engineer. The comment shall be filed on a form provided by the Chief Engineer and is available online at <https://danr.sd.gov/public> or by calling (605) 773-3352 or writing the Chief Engineer at the address provided above. Filing a comment does not make the commenter a party of record or a participant in any hearing that may be held. Any comment must be filed by June 26, 2023.

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 \$41.92 and can be viewed free of charge at www.sdpublicnotices.com

Published June 16, 2023.

Rodriguez, Rachel

From: Rodriguez, Rachel
Sent: Thursday, June 8, 2023 4:14 PM
To: Limoges, Brian
Subject: 8745-3 University of South Dakota - Public Notice
Attachments: 8745-3_rec.pdf; Ltr_Notice.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 paper(s) as soon as possible to authorize publication and arrange for payment**. This information is being mailed to you today.

Thank you,

Rachel Rodriguez
DANR | Program Assistant
Rachel.Rodriguez@state.sd.us





**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

JUN 23 2023

University of South Dakota
c/o Brian Limoges
414 E Clark Street
Vermillion SD 57069

Dear Mr. Limoges:

Enclosed is Water Permit No. 8745-3 authorizing construction of the water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

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



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

**Affidavit of Public Notice
on DANR Website**

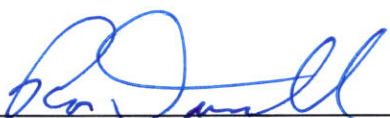
Pursuant to SDCL § 46-2A-4, public notice of the following application was posted on the DANR web site at <https://danr.sd.gov/public>. The posted public notice is the same notice as published in the pertinent newspaper(s) and a copy of the public notice is maintained in the application file. If the application is contested, the posting is moved to the DANR contested case website at <https://danr.sd.gov/public/ContestedCase.aspx> until final action is taken on the application pursuant to SDCL § 46-2A-4.

Application No.: 8745-3

Name of Applicant: University of South Dakota, Brian Limoges

Date of Posting: 6/12/2023

Date of Removal: 6/23/2023



Ron Duvall, Water Rights Permitting Administrator

6/23/23

Date

Subscribed and sworn to before me, a notary public, this 23rd day of June, 2023.



Notary Public - South Dakota
My commission expires: 5/16/2029



(SEAL)