

WATER PERMIT NO. 8560-3

Name of Applicant: **TR Golf LLC**

Address: **150 S Oak Tree Lane, Dakota Dunes SD 57049**

Phone: **712 253-9124**

Amount of Water Claimed: **no add'l**

Total Acres: **65 add'l acres**

Source of Water Supply: **groundwater (one existing well)**

Water to be used for: **irrigation**

County: **Union**

Type of Waste Disposal System:

Location: **near Dakota Dunes**

PRIORITY

Date Received: **10-25-21**

Application/License Fee: **\$ 950**

Corrected Application Received: **11-8-21**

Period of Annual Use: **March 15 – November 15**

Remarks: **Add'l acres to Water Permit No. 8510-3**

Diversion Point: **NE 1/4 NW 1/4 (Gov't Lot 1) Sec 26-T89N-R48W**

Land to be Irrigated: **portions of the NW 1/4, Gov't Lot 1 & 2 Sec 26 and Gov't Lot 3, Section 23; all in T89N-R48W**

Depth of Well:

Well Driller:

Remarks:

Type of Map: **aerial**

Prepared by:

Reviewed and the Number Assigned on: **11-8-21**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

**SOUTH DAKOTA
WATER PERMIT NO. 8560-3**

Date of first receipt of application October 25, 2021.

Date of return to applicant for corrections, amendments or changes October 26, 2021.

Date of receipt of corrected application November 8, 2021.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8560-3 to TR Golf LLC, 150 S Oak Tree Lane, Dakota Dunes SD 57049 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. 8560-3 authorizes irrigation of an additional 65 acres and increases the permitted diversion rate authorized by Water Permit No. 8510-3 by 0.12 cubic feet of water per second (cfs). Water Permit No. 8354-3 and 8510-3 each appropriate 1.11 cfs. Water Permit No. 8354-3 authorizes one well completed into the Missouri:Elk Point Aquifer located in the NW 1/4 NW 1/4 Section 26 and No. 8510-3 authorizes one well completed into the Dakota Aquifer located in the NE 1/4 NW 1/4 (Gov't Lot 1) Section 26, both for irrigation of 30 acres located in the portions of the NW 1/4, Gov't Lot 1 & 2 Section 26 and Gov't Lot 3 Section 23; all in T89N-R48W. This permit corrects the location of the Dakota Aquifer well which was completed in the NW 1/4 NE 1/4 (Gov't Lot 1) Section 26-T89N-R48W and authorizes irrigation of an additional 65 acres located in the area described above from the wells authorized by Permit Nos. 8354-3 and 8510-3. Also, the diversion rate of 1.11 cfs from the Dakota Aquifer authorized by No. 8510-3 is being increased from 1.11 cfs to 1.23 cfs. This site is located on the east side of Dakota Dunes SD.
2. The amount of the appropriation may not exceed 2 acre feet annually for each acre of land to which water is actually and beneficially applied for irrigation. The water is to be used during the following described annual period: March 15 – November 15.
3. The date from which applicant may claim right is October 25, 2021.
4. The date of approval of Permit No. 8560-3 is January 24, 2022.
5. One-fifth of the construction is to be completed on or before July 24, 2024.
6. All construction is to be completed on or before January 24, 2027.
7. Water is to be put to beneficial use on or before January 24, 2031.
8. 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 Nos. 8354-3, 8510-3 and 8560-3 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals under this Permit 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. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

WATER MANAGEMENT BOARD

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

MAR 01 2022
date



FORM 2: Application for irrigation in South Dakota

(type or print)

Mail to: DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>8560-3</u> (office use only) Hydrologic Unit <u>10170101</u>
	Basin <u>Missouri River</u>
	Newspaper <u>Dakota Dunes N Sioux City Times</u> <u>Press & Dakotan</u>

RECEIVED

NOV - 8 2021

WATER RIGHTS
PROGRAMOriginally Received
10/25/21

Application For Permit To Appropriate Water For Irrigation

Type of Application: ☐ New ☐ Vested Right ☒ Amendment/Correction to Permit No. 8510-3
(Use predates Mar 2, 1955)

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

CHANGE ACRES TO 958510-3 authorizes irrigation of 30 Acres1. Name to Appear on Irrigation Permit TR Golf LLC

Note: The "Name to Appear on Irrigation Permit" must be the name in which the property to be irrigated is held in.

Mailing Address 150 S Oak Tree Lane Dakota Dunes SD 57049
(Address) (City) (State) (Zip Code)

Phone 605-232-3241 Mobile (no add'l) Email driversgc@gmail.com twoiversgc@bibleone.net

2. Amount of water claimed 1.11 *CFS or (no add'l) **GPM ***AF Total Acreage 65 add'l
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply ONE WELL INTO THE MISSOURI: ELK POINT AQUIFER

4. Location of point of diversion ONE WELL EST 320' DEEP LOCATED IN THE NE 1/4 NW 1/4
(example - 3 wells in SW 1/4 NE 1/4 section 12-T104N-R53W)

(Gout Lot 1) Section 26-789-R48W County UNION

5. County or counties where water will be used UNION, SD6. Annual period during which water is to be used MARCH 15 TO NOVEMBER 15

7. List below each forty acre division, or lot, or fraction thereof and show number of acres to be irrigated in each.
(Attach sheet if more space is needed)

Land Description	Acres	Land Description	Acres
Gout Lot 3 SW 23-89-48	10		
NW 1/4 NW 1/4 26-89-48	27		
SW 1/4 NW 1/4 26-89-48	5		
Gout Lot 1, 2 26-89-48	53		

8. Give a description of the project. (Attach sheet if more space is needed)

IRRIGATE UP TO 95 ACRES OF GOLF COURSE GROUND INCLUDING: TEES, GREENS,
FILLING ORNAMENTAL PONDS, 18 FAIRWAYS AND OTHER PLAYABLE AREAS.

I, Jay Layman Manager, 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 *NA* (check one or both as applicable) ☐ Drilling new well(s) ☐ Using existing well(s)

a) If new wells, how many _____ Have test holes been drilled ☐ Yes ☐ No Drilled by _____
(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) _____ Depth to Top of Water Bearing Material _____ Depth to Water from Surface _____

d) Distance to nearest domestic well on applicant's property _____ Property owned by others _____

2. Wastewater Disposal System Information *NA*

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 *NA*

a) Surface Dimensions _____ Depth _____

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

4. Water Storage Dams *NA*

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)

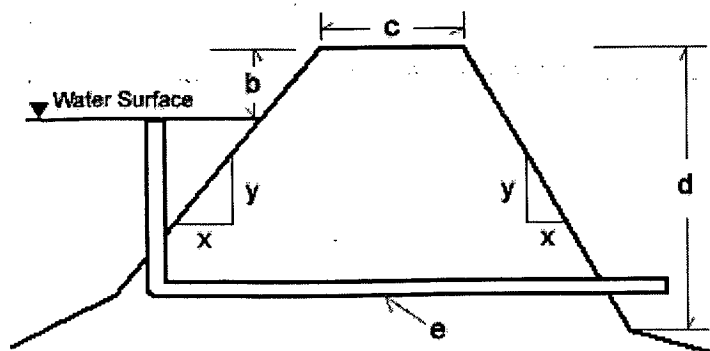
Upstream _____

Downstream _____

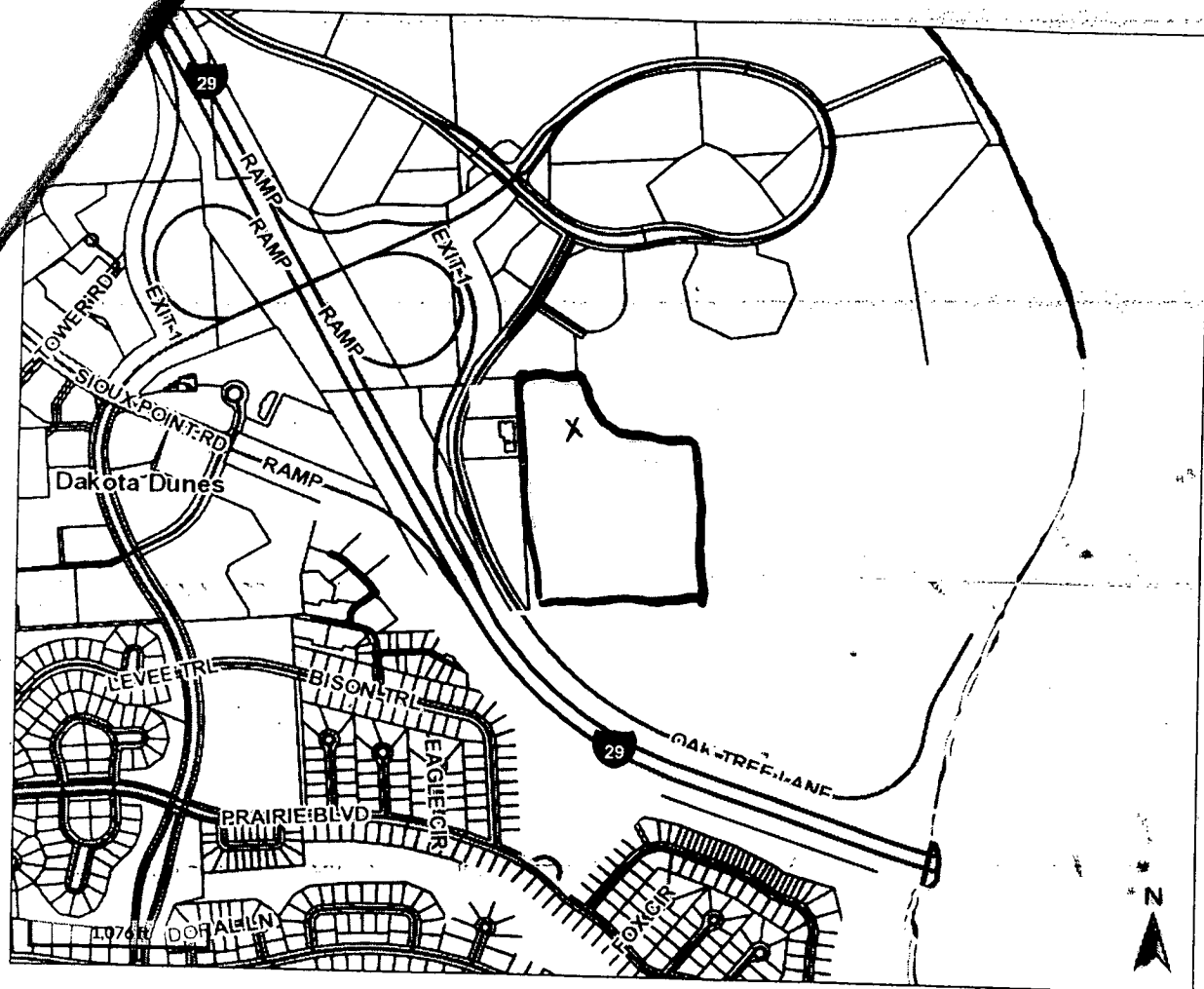
h) Surface Area of Impoundment _____

i) Storage _____ Acre Feet

j) Drainage Area Above Dam _____ Acres



acon™ Union County, SD



Overview

Legend

- ☐ Corporate Limits
- ☐ Political Township
- ☐ Parcels
- Roads**
 - Road
 - CORD
 - State Highway
 - Interstate

Parcel ID 23.DD.26.2000

Sec/Twp/Rng 26-89-48

Property Address

District 23618

Brief Tax Description

NW1/4NW1/4 LESS I-29 & LESS H-28 LESS TR1 & LOTS 2,3 & 4 TWO RIVERS 1ST ADD LESS PART OF LOT 1 TWO RIVERS 4TH ADD 23.96A

(Note: Not to be used on legal documents)

Alternate ID n/a

Class NACC

Acreage n/a

Owner Address TWO RIVERS INC

335 SIOUX POINT RD STE 100

DAKOTA DUNES SD 57049

Date created: 4/16/2018

Last Data Uploaded: 4/16/2018 1:17:39 AM



Developed by
The Schneider Corporation

Union County, SD



Overview

Legend

- ☐ Corporate Limits
- ☐ Political Township
- ☐ Parcels
- Roads**
 - Road
 - CO RD
 - State Highway
 - Interstate

Parcel ID 23.DD.26.2020

Sec/Twp/Rng 26-89-48

Property Address

District 23618

Brief Tax Description GOV'T LOT 2 DD PLAT LESS .068A FOR PART OF PR 11TH ADD (40.652A)

(Note: Not to be used on legal documents)

Alternate ID n/a

Class AGCC

Acreage 40.65

Owner Address TWO RIVERS INC

335 SIOUX POINT RD STE 100

DAKOTA DUNES SD 57049

Date created: 4/16/2018

Last Data Uploaded: 4/16/2018 1:17:39 AM



Developed by
The Schneider Corporation

Union County, SD



Overview

Legend

- ☒ Corporate Limits
- ☐ Political Township
- ☐ Parcels
- Roads**
 - Road
 - CO RD
 - State Highway
 - Interstate

Parcel ID	23.DD.23.3020	Alternate ID	n/a	Owner Address	TWO RIVERS INC
Sec/Twp/Rng	23-89-48	Class	AGCC		335 SIOUX POINT RD STE 100
Property Address		Acreage	19.88		DAKOTA DUNES SD 57049
District	23618				
Brief Tax Description	GOV'T LOT 3 DD PLAT LESS PRT LOT 1 & TR A & TR 1 TWO RIVERS BUSI CENTER 4TH ADD LESS 6.623A FOR PRT TR 1 & LOT 1 TR BUSI CENTER 8TH ADD				
	(Note: Not to be used on legal documents)				

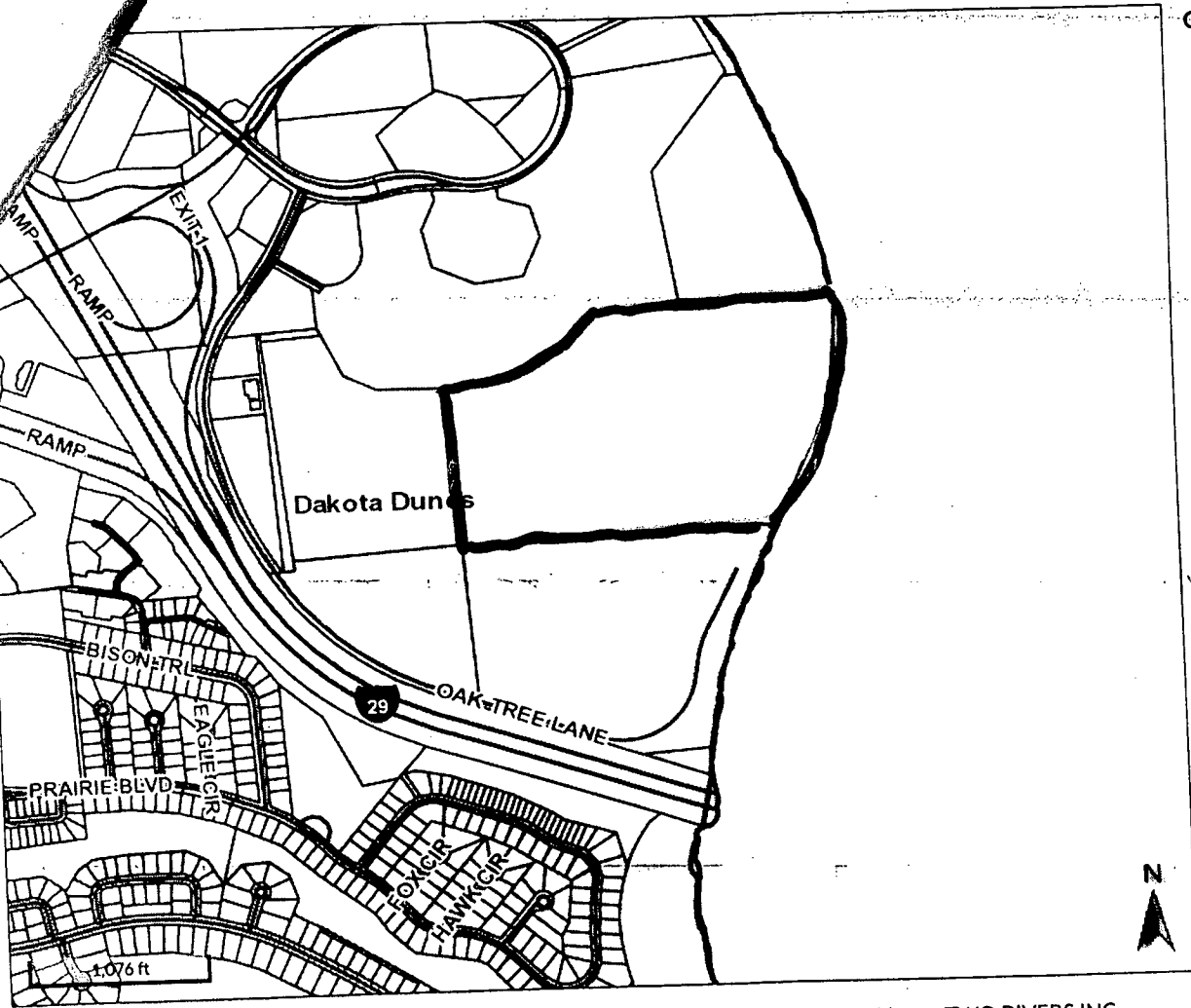
Date created: 4/16/2018
Last Data Uploaded: 4/16/2018 1:17:39 AM

 Developed by
The Schneider Corporation

Overview

Legend

- ☐ Corporate Limits
- ☐ Political Township
- ☐ Parcels
- Roads
 - Road
 - CORD
 - State Highway
 - Interstate

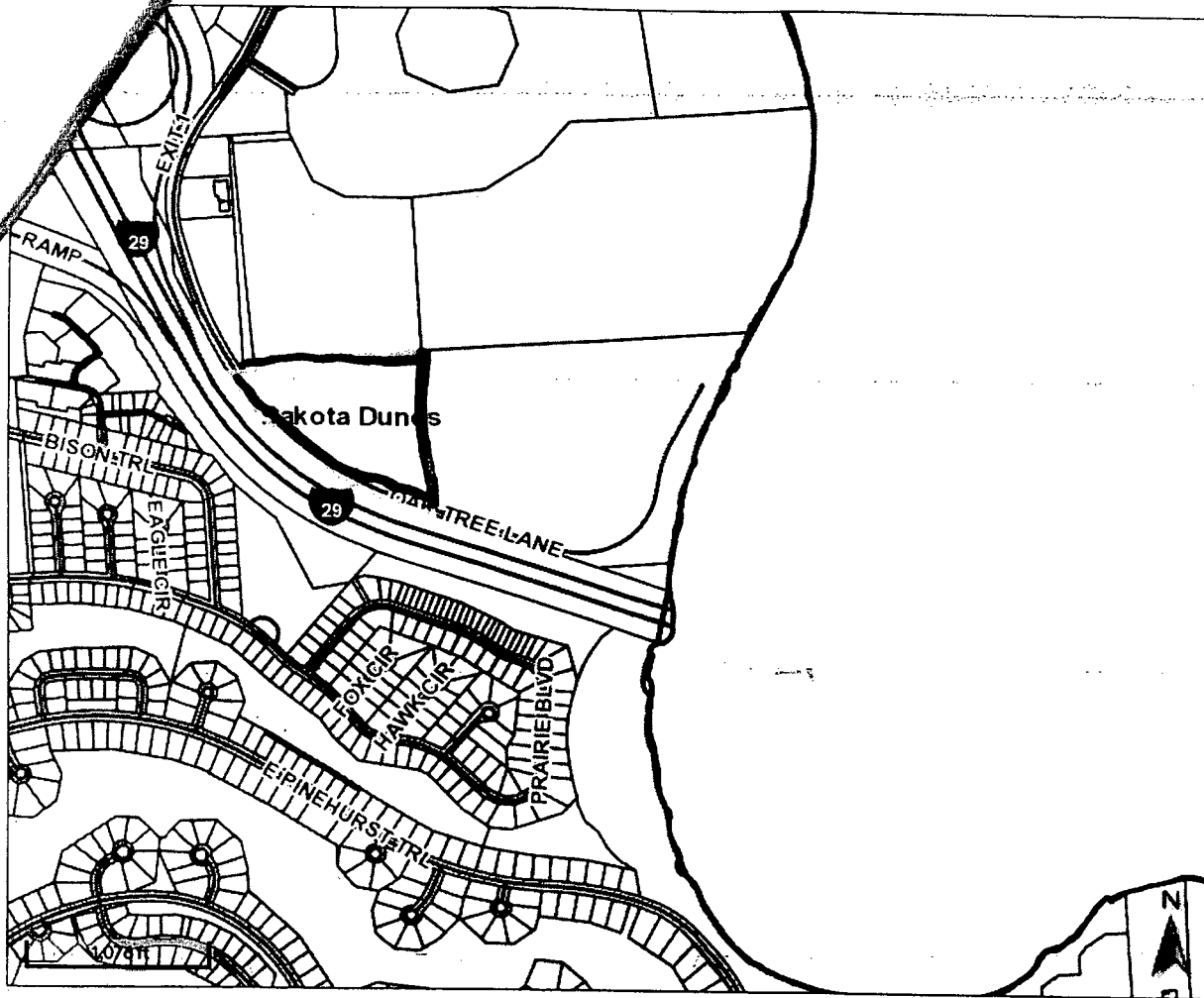


Parcel ID	23.DD.26.2015	Alternate ID	n/a	Owner Address	TWO RIVERS INC
Sec/Twp/Rng	26-89-48	Class	NACC		335 SIOUX POINT RD STE 100
Property Address		Acreage	n/a		DAKOTA DUNES SD 57049
District	23618				
Brief Tax Description	GOV'T LOT 1 DD PLAT LESS PART OF LOT 1 TWO RIVERS BUSINESS CENTER 4TH ADD 56.25A				
	(Note: Not to be used on legal documents)				

Date created: 4/16/2018
 Last Data Uploaded: 4/16/2018 1:17:39 AM

 Developed by
 The Schneider Corporation

acon™ Union County, SD



Overview

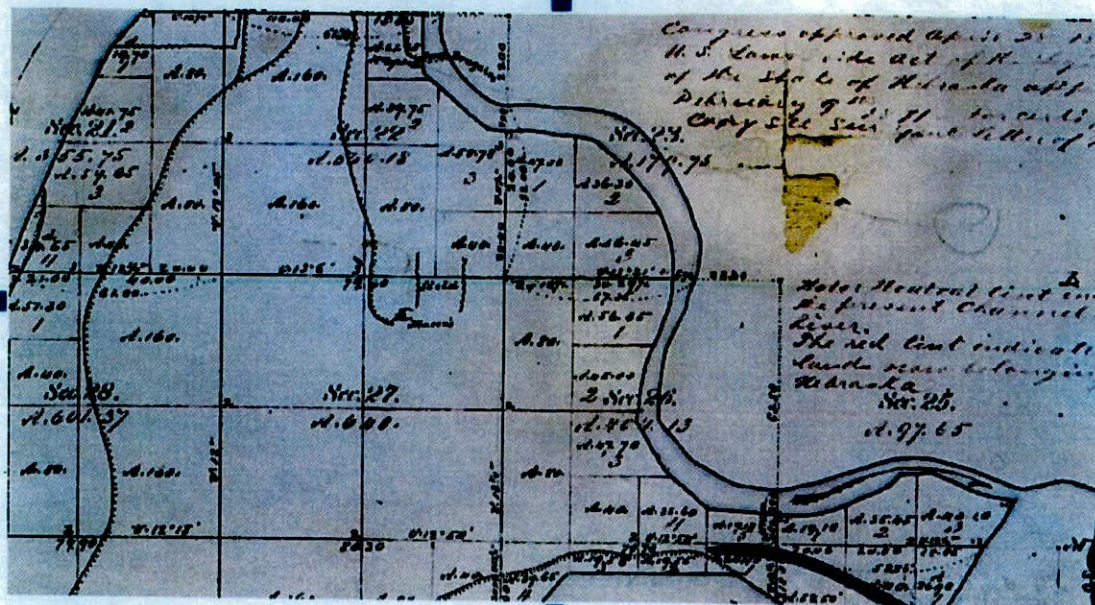
Legend

- ☐ Corporate Limits
- ☐ Political Township
- ☐ Parcels
- Roads
 - Road
 - CORD
 - State Highway
 - Interstate

Parcel ID	23.DD.26.2010	Alternate ID	n/a	Owner Address	DAKOTA DUNES DEVEL CO
Sec/Twp/Rng	26-89-48	Class	AGCC		335 SIOUX POINT RD #100
Property Address		Acreage	15.11		DAKOTA DUNES SD 57049
District	23618				
Brief Tax Description	SW1/4NW1/4 LESS I-29 LESS TR 1 & LOTS 3 & 4 TWO RIVERS 1ST ADD LESS 3.994A FOR PRAIRIE 3RD ADD LESS .061A FOR PRAIRIE 4TH ADD TR 1 LESS				
	(Note: Not to be used on legal documents)				

Date created: 4/16/2018
Last Data Uploaded: 4/16/2018 1:17:39 AM

 Developed by
The Schneider Corporation



 Hold down the Ctrl key to select a region with the mouse.

8510-3

SOUTH DAKOTA WATER WELL COMPLETION REPORT

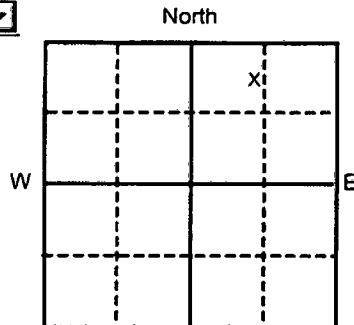
11-02

Location NE--1/4--NW--1/4 Sec 26 Twp 89N Rg 48W

NW 1/4 NE 1/4

County UNION ☒

Please mark well location with an "X"



Well Completion Date

04/09/2021

1 Mile

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

130 ft. from SEPTIC (identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

DIRECT ROTARY

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	8 IN	0 FT	180 FT	12.75 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	21	9.4 Lb/gal	0 Ft	120 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

TREMMIE METHOD

Called Heine per WK 1/10/2021

SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 8 Inches Length 100 FeetMaterial PVCSlot Size .032 Set From 120 Feet to 180 FeetOther information .032 FROM 240' TO 280'

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: TWO RIVERS GOLF CLUBAddress: 150 OAK TREE LANECity, State, Zip: DAKOTA DUNES ☒ SD ☒ 57049

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	3
GREY CLAY	3	17
MEDIUM TO COARSE SAND	17	106
SILTSTONE	106	135
SANDSTONE	135	194
CLAYSTONE/SILTSTONE LAYERS	194	254
SANDSTONE	254	280
CLAYSTONE	280	290

STATIC WATER LEVEL 8 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

42.500762*

-96.476616*

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

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder

RECEIVED

MAY 21 2021

Date: 4-21-21

WATER RIGHTS PROGRAM



531114784

ANNUAL REPORT

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

Domestic Limited Liability Company
SDCL 47-34A-211; 59-11-24, 24.1

2021
FILING YEAR

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

Filing Fee: \$50

Total Fee: \$50

1. Business ID and Name:

DL175321
BUSINESS ID

TR GOLF, LLC
BUSINESS NAME

2. The jurisdiction under whose law it is formed South Dakota

3. The address of the principal executive office (business address):

Actual Street Address

**300 CENTENNIAL DRIVE, SUITE 200
NORTH SIOUX CITY, SD 57049**

Mailing Address

**300 CENTENNIAL DRIVE, SUITE 200
NORTH SIOUX CITY, SD 57049**

4. 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 **Nikki K Nobbe**

Actual Street Address in this State

**639 STREETER DRIVE
APT 201
NORTH SIOUX CITY, SD 57049**

Mailing Address in this State

**639 STREETER DRIVE
APT 201
NORTH SIOUX CITY, SD 57049**

5. If the LLC is manager-managed, list the names and addresses of its Managers. SDCL 59-11-24. If the LLC is member-managed, this section may be left blank.

Name	Address
------	---------

Bart J Connelly	300 Centennial Drive, Suite 200, North Sioux City, SD 57049
------------------------	--

Jay D Layman	300 Centennial Drive, Suite 200, North Sioux City, SD 57049
---------------------	--

Jan Vontobel	300 Centennial Drive, Suite 200, North Sioux City, SD 57049
---------------------	--

6. 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.

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).

B0157-9347 11/09/2020 10:06AM Rec'd by SD SOS



11/09/2020

Dated

Email (Optional)

Dan A. Moore

Signature of an Authorized Person

Dan A. Moore

Printed Name

B0157-9348 11/09/2020 10:06AM Rec'd by SD SOS



RECEIPT

WATER RIGHTS PROGRAM South Dakota Department of Agriculture and Natural Resources

Date October 25, 2021

RECEIVED OF Connelly Tiehen & Sons/TR Golf LLC PO Box 1268 Dakota Dunes SD 57049

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

Fee for Application for Permit No. <u>8560-3</u> to Appropriate Water, to construct and to put water to beneficial use	\$ <u>750.00</u>
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>8560-3</u>	\$ <u>200.00</u>
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	\$ <u>950.00</u>

By Eric Gronlund
Chief Engineer

me



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

October 26, 2021

TR Golf LLC
Roll Slater, Mgr
150 S Oak Tree Lane
Dakota Dunes SD 57049

Dear Sir:

Thank you for submitting the two *Applications for a Permit to Appropriate Water* located in Union County. In order to complete the applications, the following is required.

- Regarding the application from the Big Sioux River, what is the proposed pump rate from the river to the borrow pits?
- Regarding your signature on the application, a review of the Secretary of State's corporation website finds TR Golf LLC listed. Your name is not listed as one of its partners. DANR will need the application to be signed by a listed partner or a statement of authority that the person signing the application has the authority to act on behalf of TR Golf LLC on all matters involving the water permit application. The applications are enclosed.

If you have any questions, please contact me.

Sincerely,

Karen Schlaak

Karen Schlaak
Water Rights Program
605 773-3352
karen.schlaak@state.sd.us

enclosures



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

File No. 8560-3

WATER RIGHTS PROGRAM -- FILE DOCUMENTATION

NAME: TR Golf LLC

DATE: November 10, 2021

RE: Water Permit Application No. 8560-3

COMMENTS:

I sent an email at the address provided (2riversgc@gmail.com) on the application to determine whether references to the two wells on the application referred to existing, permitted, wells or whether new wells were intended to irrigate the existing and additional acres. A response from the email address by Rodd indicated that no additional wells were being drilled. In the response, Rodd also mentioned that the well driller, Dick Hammond, informed Rodd the actual pump in the well is capable of 1.23 cubic feet of water per second which is 0.12 cfs above the permitted amount. Rodd asked whether the increase was significant. My response was Application No. 8560-3 can be modified to request an increase in the permitted pump rate from 1.11 cfs to 1.23 cfs. When asked to clarify which well has the increased pump rate, Rodd indicated it is the well covered by Water Permit No. 8510-3 from the Dakota aquifer.

Based on this email conversation, the application is being modified to indicate the permitted diversion rate under Water Permit No. 8510-3 is being increased by 0.12 cfs from the current 1.11 cfs to 1.23 cfs from the Dakota aquifer.

Ron Duvall
Water Rights Permitting Administrator
Water Rights Program

Duvall, Ron

From: Two Rivers Club <2riversgc@gmail.com>
Sent: Thursday, December 23, 2021 10:26 AM
To: Duvall, Ron
Subject: Re: [EXT] Dakota Well Location

That location is correct.

Rodd Slater

On Thu, Dec 23, 2021 at 10:13 AM Duvall, Ron <Ron.Duvall@state.sd.us> wrote:

The following screen snip shows the location of the Dakota well based on the well completion report which can be viewed here: <https://danr.sd.gov/wrimage/WellCompletionReports/images75k/00076122.pdf>

Please confirm that the location is in the NW1/4 NE1/4 and then we will correct the location using your pending Application No. 8560-3. I circled the well location (green dot) and club house with a blue pen.

nal Degrees)



Lat: 42.500762

W
22

Towns hip: 89N 48W
Section: 22
QQ Sect: SESE

89N 48W
Section: 23

Towns hip: 89N 48W
Section: 23
QQ Sect: NWSW

Towns hip: 89N 48W
Section: 23
QQ Sect: SWSW

Towns hip: 89N 48W
Section: 23
QQ Sect: SESW

Towns hip: 89N 48W
Section: 23
QQ Sect: SWSE

89N 48W

Towns hip: 89N 48W
Section: 27
QQ Sect: NENE

Towns hip: 89N 48W
Section: 26
QQ Sect: NWNW

Towns hip: 89N 48W
Section: 26
QQ Sect: NENW

Towns hip: 89N 48W
Section: 26
QQ Sect: NWNE

89 48W 16 42 500762

89N 48W
Section: 27

89N 48W
Section: 26

Towns hip: 89N 48W
Section: 26
QQ Sect: SWNE

Towns hip: 89N 48W
Section: 27
QQ Sect: SENE

Towns hip: 89N 48W
Section: 26
QQ Sect: SWNW

Towns hip: 89N 48W
Section: 26
QQ Sect: SENW



**, 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. 8560-3, TR Golf LLC**

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. 8560-3, TR Golf LLC, 150 S Oak Tree Lane, Dakota Dunes SD 57049.

The Chief Engineer is recommending APPROVAL of Application No. 8560-3 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 Nos. 8354-3, 8510-3 and 8560-3 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals under this Permit 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. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Eric Gronlund, Chief Engineer
December 29, 2021

Report to the Chief Engineer
On Water Permit Application No. 8560-3

TR Golf LLC

c/o Bart Connelly

January 5, 2022

Water Permit Application No. 8560-3 proposes to irrigate 65 acres located in the W $\frac{1}{2}$ NW $\frac{1}{4}$ Gov't Lot 1 and 2 Section 26 and Gov't Lot 3 Section 23 from one well completed into the Missouri: Elk Point aquifer (authorized by Permit No. 8354-3) and one well completed into the Dakota aquifer (authorized by Permit No. 8510-3). Additionally, Water Permit Application No. 8560-3 proposes to increase the permitted diversion rate authority authorized by Water Permit No. 8510-3 by 0.12 cubic feet of water per second (cfs) from one well completed into the Dakota aquifer. The site is located in Union County on the east side of Dakota Dunes, South Dakota.

Water Permit No. 8354-3 authorizes a maximum instantaneous diversion rate of 1.11 cfs from one well completed into Missouri: Elk Point aquifer (105 feet deep) in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 26 for the irrigation of 30 acres of a golf course located in the W $\frac{1}{2}$ NW $\frac{1}{4}$ Gov't Lot 1 and 2 of Section 26 and Gov't Lot 3 of Section 23; all in T89N-R48W.

Water Permit No. 8510-3 authorizes a maximum instantaneous diversion rate of 1.11 cfs from one well that was to be completed into the Dakota aquifer (290 feet deep) in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ (Gov't Lot 1) of Section 26-T89N-R48W to supplement the irrigation of the 30 acres of the golf course authorized under Permit No. 8354-3 with no increase in irrigated acres.

If approved, Water Permit Application No. 8560-3 and Water Permit No. 8510-3 will collectively authorize a maximum instantaneous diversion rate of 1.23 cfs from one well completed into the Dakota aquifer (290 feet deep) in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ Gov't Lot 1 of Section 26-T89N-R48W.

If approved, Water Permit Application No. 8560-3 will also authorize the use of one well completed into the Missouri: Elk Point aquifer (authorized by Permit No. 8354-3) and one well completed into the Dakota aquifer (authorized by Permit No. 8510-3) to irrigate an additional 65 acres located in the W $\frac{1}{2}$ NW $\frac{1}{4}$ Gov't Lot 1 and 2 Section 26 and Gov't Lot 3 Section 23; all in T89N-R48W, for a collective total of 95 acres of a golf course.

AQUIFERS: Dakota (DKOT) and Missouri: Elk Point (M: EP)

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

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

WATER AVAILABILITY:

Water Permit Application No. 8560-3 proposes to appropriate water from the Dakota and Missouri: Elk Point aquifers. The probability of unappropriated water being available from either 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 Missouri: Elk Point aquifer is not older than or stratigraphically lower than the Greenhorn Formation; though, the Dakota aquifer is older than and stratigraphically lower than the Greenhorn Formation. Additionally, 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 Dakota and Missouri: Elk Point aquifers must be considered.

DAKOTA AQUIFER

DAKOTA AQUIFER - HYDROGEOLOGY:

The Cretaceous-aged, Dakota Formation is defined as the first relatively continuous sandstone below the Greenhorn Limestone, and it extends downward to the top of the Skull Creek Shale in western and central South Dakota (Schoon, 1971). In eastern South Dakota, the Skull Creek Shale is not continuous and when absent, the Dakota Formation directly overlies Precambrian bedrock or the Inyan Kara Group (Schoon, 1971). In western South Dakota, a stratigraphically equivalent formation to the Dakota Formation is the Newcastle Formation, which has outcrops in the Black Hills (Bredehoeft, et al., 1983). In South Dakota, the Dakota Formation has been subdivided into three units (Schoon, 1971). The upper unit consists of light brown to reddish-brown, fine to medium grained, friable sandstone, interbedded with gray to dark gray shale. Thin, discontinuous beds of lignite are present in the lower part of the upper unit. The middle unit consists of a gray silty clay with small siderite pellets disseminated throughout. The lower unit consists of medium to coarse grained sandstone (Schoon, 1971).

The Dakota aquifer is comprised of the saturated and permeable portions of the Dakota Formation and is primarily a confined bedrock aquifer throughout most of South Dakota (Schoon, 1971; Water Rights 2021b and 2021d). Schoon (1971) estimated the Dakota Formation underlies 66,500 square miles of South Dakota and has an average thickness of 150 feet. A conservative estimate of the amount of water stored in the Dakota aquifer can be estimated by assuming 15% porosity for the Dakota Formation (Schoon, 1971), multiplied by the average thickness (150 feet) and the areal extent (66,500 square miles or 42.5 million acres) of the aquifer to calculate approximately 960 million acre-feet of stored water in South Dakota.

In Lincoln and Union Counties, the average saturated thickness of the Dakota aquifer is approximately 216 feet, with a documented maximum aquifer thickness of approximately 423 feet (Niehus, 1997). The depth to Dakota aquifer materials ranges from approximately 53 to 558 feet below the ground surface, with an average depth to the top of aquifer approximately 281 feet below the ground surface (Niehus, 1997). The static water level in wells completed into the Dakota aquifer varies from approximately 12 to 372 feet below the ground surface, with an average static water level of approximately 155 feet below the ground surface (Niehus, 1997). In Union County, Hedges and others (1982) estimated the areal extent of the Dakota aquifer to be approximately 452 square miles, or 289,280 acres, and the aquifer contains approximately 7,810,600 acre-feet of recoverable water in storage. The Dakota aquifer is generally under confined conditions and the direction of groundwater movement in the aquifer is generally to the south (Niehus, 1997).

No water well or test hole completion report was submitted with Water Permit Application No. 8560-3. There is a well completion report on file for the well completed into the Dakota aquifer well authorized by Water Permit No. 8510-3 that the applicant proposes to use (Water Rights, 2021d). The report lists "Top Soil" from 0 to 3 feet below the ground surface, "Grey Clay" from 3 to 17 feet, "Medium to Coarse Sand" from 17 to 106 feet, "Siltstone" from 106 to 135 feet, "Sandstone" from 135 to 194 feet, "Claystone/Siltstone Layers" from 194 to 254 feet, "Sandstone" from 254 to 280 feet, and "Claystone" from 280 to 290 feet below the ground surface (Water Rights, 2021d). The well was screened in siltstone and sandstone from 120 to 180 feet below the ground surface, and again in claystone, siltstone and sandstone from 240 feet to 280 feet below the ground surface (Water Rights, 2021d). The static water level was approximately 8 feet below the ground surface at the time of well completion (April 9, 2021). Based on the well completion report, the Dakota aquifer is confined at the existing well site (Water Rights, 2021d).

DAKOTA AQUIFER - OBSERVATION WELL DATA:

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

Observation wells provide data on how the aquifer reacts to regional climatic conditions and local pumping. The DANR-Water Rights Program monitors 46 observation wells completed into the Dakota aquifer (Water Rights, 2021b). The two closest observation wells to the well the applicant proposes to use are UN-98A (approximately 4 miles northwest) and UN-77E (approximately 28 miles northwest (as shown in Figure 3) (Water Rights, 2021b). The hydrographs for these observation wells are displayed in Figures 1 and 2 (Water Rights, 2021b). The data points utilized to construct the hydrographs are measurements of the static water level in the observation wells from the top of the well casing.

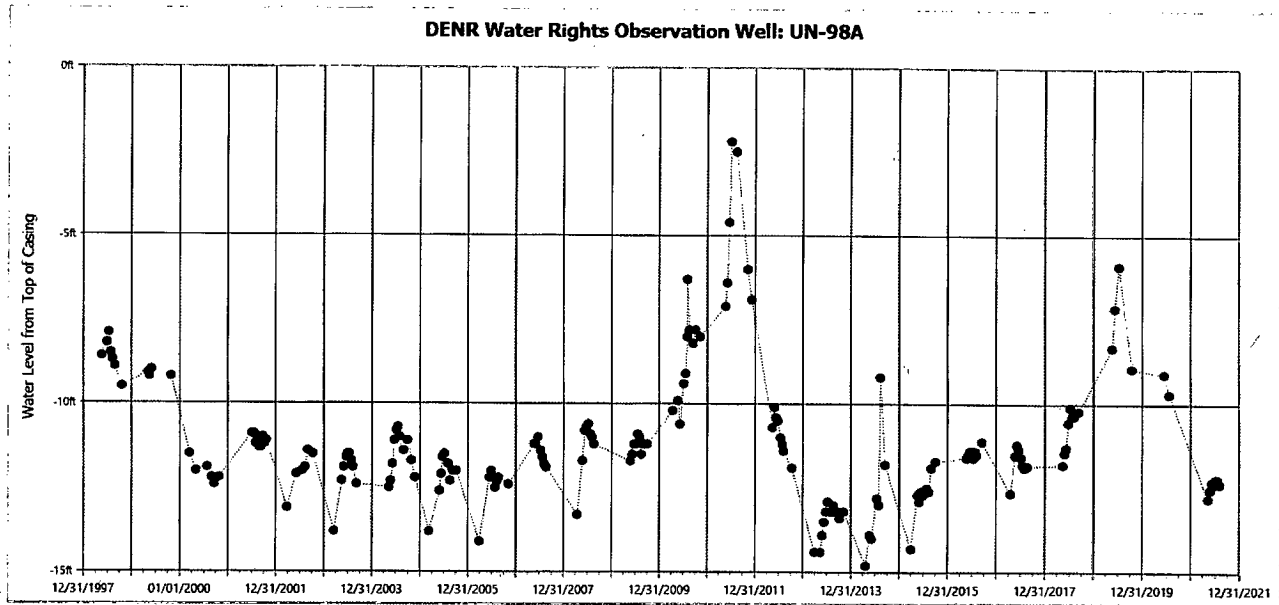


Figure 1. Hydrograph for observation well UN-98A (Water Rights, 2021b)

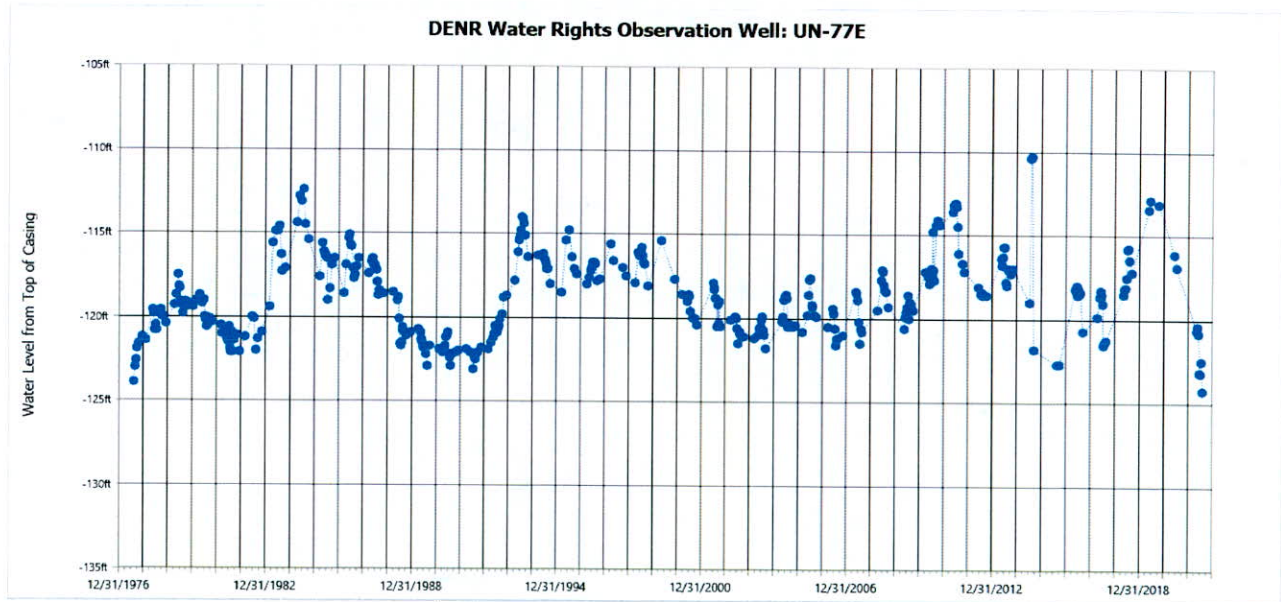


Figure 2. Hydrograph for observation well UN-77E (Water Rights, 2021b)

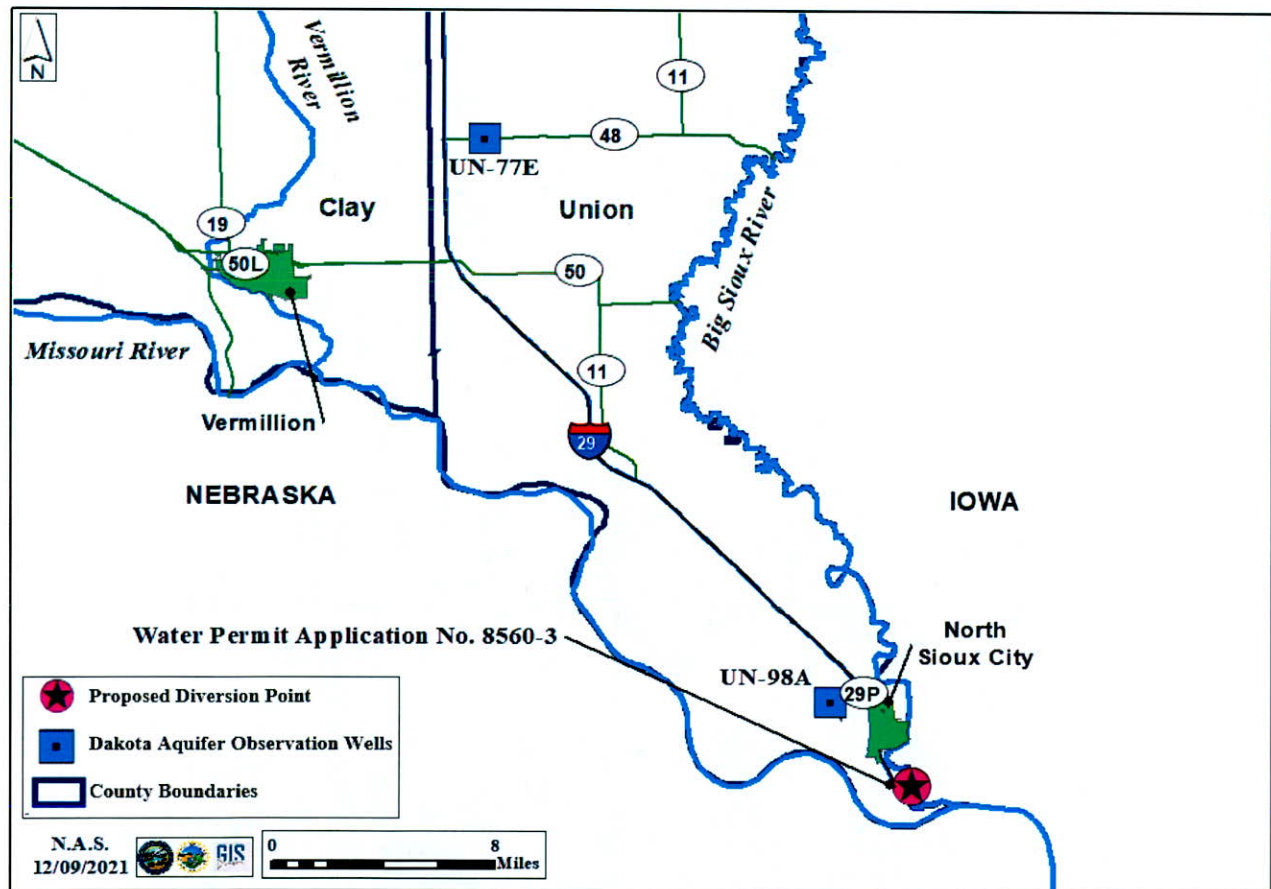


Figure 3. Location of the existing well completed into the Dakota aquifer proposed to be used by Water Permit Application No. 8560-3 with the Dakota aquifer observation wells within approximately 30 miles (Water Rights, 2021b and 2021c)

While the overall trend in these historical measurements is slightly downward, observation well ED-85A (approximately 231 miles northwest of the existing well) completed into the Dakota aquifer has recorded a trend that has been stable to slightly increasing from 1991 to 2017 (Figure 4) (Water Rights, 2021b). An aquifer pumping test at the well was the cause for the drawdown in hydraulic head that occurred in 2018 (Figure 4) (Water Rights, 2021b).

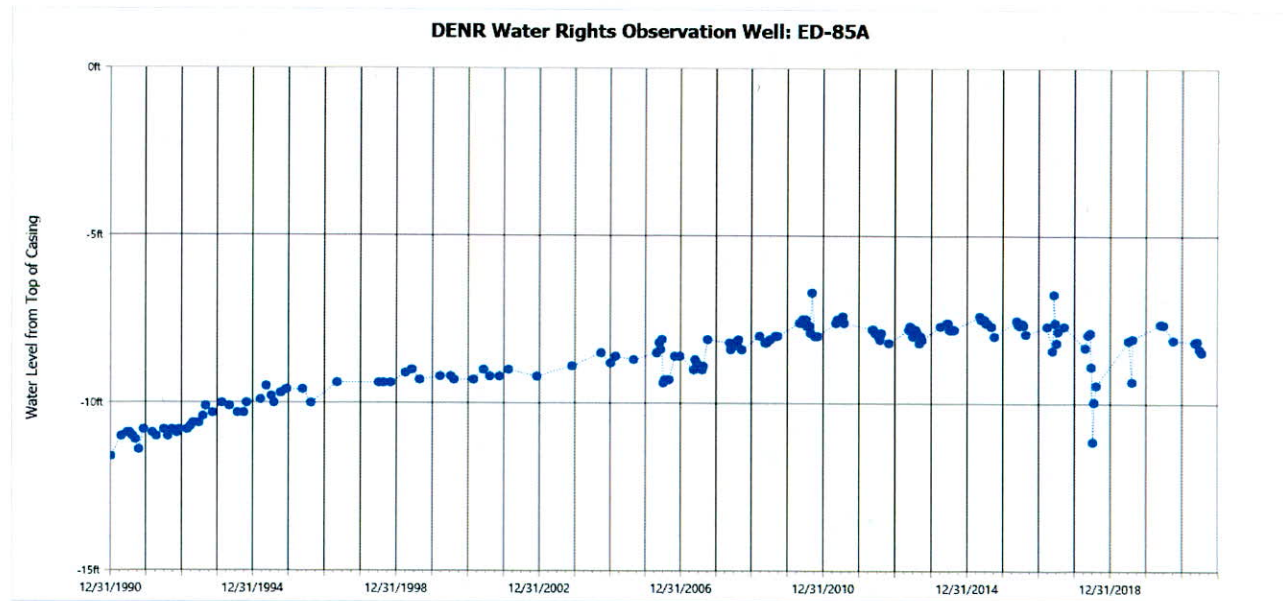


Figure 4. Hydrograph for observation well ED-85A (Water Rights, 2021b)

In addition to the observation well hydrographs, a record of the potentiometric surface is shown through historical accounts. Schoon (1971) developed maps of the potentiometric surface of the Dakota aquifer using data modified from Darton (1909), from the State Engineer's office for the period 1914 to 1915, and from a compilation of many reports over the period of 1936 to 1953. Wells that have been completed into the Dakota aquifer in the past ten years and within approximately one mile of the existing well were used to approximate the current potentiometric surface conditions (Table 1) (Water Rights, 2021d). The contour lines on the maps utilized in Schoon (1971) do not extend to the South Dakota state line boundary. As a result of the existing well proposed to be used being within close proximity to the state line, the use of "approximate" is stressed due to the interpretation needed to estimate the potentiometric surface in the vicinity of the well for this application.

Table 1. Historic and current approximate water level elevations near the existing well the applicant proposes to use (Schoon, 1971; Water Rights, 2021d)

Data Source	Year(s)	<i>Approximate</i> potentiometric surface in the vicinity of the existing well (feet)
Schoon (1971), after Darton	1909	1,000 to 1,100
Schoon (1971), State Engineer's Office	1914-1915	900 to 1,000
Schoon (1971)	1936-1953	1,000 to 1,100
Well Logs Database	2011-Present	1,000 to 1,100

Throughout South Dakota, most of the hydrographs for observation wells completed into the Dakota aquifer, and the potentiometric surface measurements of the Dakota aquifer show a decreasing trend in hydraulic head (Water Rights, 2021b). A decline in water levels (as shown on the hydrographs in Figures 1 and 2) in a confined aquifer does not necessarily indicate a significant decrease in water stored in the aquifer, as water levels above the top of the aquifer materials are representative of the hydraulic head (water pressure) inside the aquifer. Additionally, there are uncontrolled, flowing wells discharging water from the Dakota aquifer at ground surface, and it is expected water from the aquifer is also being discharged to other aquifers if wells completed into the Dakota aquifer have experienced casing failure.

Concerns have developed over time about the decline in artesian head pressure of the Dakota aquifer. Schoon (1971) stated, "The fact that withdrawal from the artesian system exceeds recharge is clearly demonstrated by declining pressures." However, the Water Management Board has found that past declines of the potentiometric surface (as shown on Table 1) do not automatically constitute that withdrawals have exceeded recharge (Water Rights, 1987). The Board has concluded that withdrawals exceeding the average annual recharge cannot be determined based solely upon a decline in head pressure, and in theory the Dakota aquifer head pressure is stabilizing relative to withdrawals and discharges (Water Rights, 1987). Since discharge from uncontrolled flowing wells is likely to continue until water levels in the aquifer decline to being at or below the ground surface and continuing to allow beneficial pumping to occur reduces the amount of water being discharged to waste, the Water Management Board's decision to optimize development of the Dakota aquifer is favorable. Therefore, there is a reasonable probability unappropriated water from the Dakota aquifer is available for the proposed appropriation.

DAKOTA AQUIFER - HYDROLOGIC BUDGET:

Recharge

Recharge to the Dakota aquifer in South Dakota occurs through upward leakage from underlying aquifers with higher artesian pressure than the Dakota aquifer, downward seepage from overlying confining layers, and through the infiltration of precipitation on the Newcastle Formation outcrops in the Black Hills (Bredehoeft, et al., 1983; Niehus, 1997). Using computer modeling, Bredehoeft, et al. (1983) attempted to match Darton's (1909) potentiometric surface map of the Dakota aquifer to develop a recharge estimate of approximately 79.4 cfs (57,500 acre-feet per year) before well development began. However, many assumptions used in Bredehoeft, et al.'s (1983) recharge estimate were incorrect and outdated. For example, assuming steady-state flow conditions between aquifers is unrealistic of real-world conditions and the recharge estimates used for the Madison and Inyan Kara aquifers in Bredehoeft, et al.'s (1983) analysis are much lower than estimates measured by more recent research (Carter, et al., 2002). While Bredehoeft, et al.'s (1983) estimate can provide a scale of the Dakota aquifer's recharge rate, it cannot be used as an exact value for water management purposes. As the physical properties of aquifers and the locations where adjacent aquifers are in contact with each other are relatively undefined among many other factors, it is unknown whether the true recharge rate of the Dakota aquifer is higher or lower than Bredehoeft et al.'s (1983) estimate.

Discharge

Discharge from the Dakota aquifer in South Dakota occurs through well withdrawals, uncontrolled flowing wells and corroded well casings, and outflow to overlying adjacent aquifers because of higher artesian pressure in the Dakota aquifer, such as the Lower Vermillion-Missouri and Missouri aquifers in Lincoln and Union Counties (Bredehoeft, et al., 1983; Kume; 1977; Niehus, 1997; Water Rights, 2021b and 2021c). In Lincoln and Union Counties, the aquifer may also discharge to fractures in the underlying Sioux Quartzite (Niehus, 1997).

Currently, there are 253 water rights/permits appropriating water from the Dakota aquifer within South Dakota (Water Rights, 2021c). Additionally, there are seven future use permits reserving water from the Dakota aquifer (Water Rights, 2021c). For the purpose of estimating average annual withdrawals, the seven future use permits are assumed to be fully developable for a total of 4,237 acre-feet per year (Table 2).

Table 2. Future use permits reserving water from the Dakota aquifer

Future Use Permit Holder	Amount of Reserved Water (acre-ft)
City of Canton (1262C-3, 5219-3)	1,849
City of Lennox (5101-3, 5101A-3)	0*
South Lincoln RWS (4817-3)	1,448
Lincoln RWS (5155-3)	440
City of Harrisburg (8400-3)	500
Total:	4,237
RWS: Rural Water System, *The City of Lennox has allocated the water they had reserved	

Of the 253 Dakota aquifer water rights/permits, 19 are for irrigation use and 234 are for non-irrigation use. Table 3 summarizes the 234 non-irrigation water rights/permits authorized to appropriate water from the Dakota aquifer with the estimated annual use for each water right/permit as determined by their limiting diversion rate or annual volume. The use type determined for each water right/permit was based on the primary use categorized for each water right/permit as some permits have additional uses (Water Rights, 2021c). Historically, average water use by non-irrigation appropriations limited by an instantaneous diversion rate have been assumed to be pumping 60% of full time at the respective permitted diversion rate. Water rights/permits limited by an annual volume are assumed to withdraw their entire respective annual volume limitation. This is a standard method used by the DANR-Water Rights Program for estimating annual withdrawals by non-irrigation appropriations from an aquifer (Water Rights, 2021c).

Twelve non-irrigation water rights/permits on Table 3 are authorized to withdraw from one or more aquifers, in addition to the Dakota aquifer. Two of these non-irrigation water permits (Permit Nos. 2804-3 and 8464-3) have a specified volume out of their entire appropriated volume that was authorized only for their Dakota aquifer well. For the purpose of estimated average annual withdrawals, these water permits are assumed to withdraw their full specified volume permitted only for their Dakota aquifer well. The remaining ten water rights/permits do not have a certain diversion rate or volume designated for what each well from each aquifer is authorized to divert. For the purpose of estimating average annual withdrawals, these water rights/permits are assumed to be withdrawing their full amount from the Dakota aquifer.

Additionally, the municipal water rights/permits that are authorized to appropriate water from the Dakota aquifer, that are identified as being connected to a rural water system (RWS) likely maintain their wells for standby purposes (Drinking Water Program, 2021; Water Rights, 2021c); as such, the average annual water use for these water rights has been estimated to be zero acre-feet per year on Table 3. Overall, the average annual withdrawal rate for the Dakota aquifer non-irrigation water rights/permits is approximately 22,774 acre-feet per year (Table 3) (Water Rights, 2021c).

Table 3. Summary of the non-irrigation water rights/permits authorized to appropriate from the Dakota aquifer with estimated annual use determined by their respective diversion rate or annual volume (Drinking Water Program, 2021; Water Rights, 2021c)

Use Type	No. of Water Rights/Permits	Appropriation for Water Rights/Permits limited by Volume (acre-feet/year)	Appropriation for Water Rights/Permits limited by Diversion Rate (cfs)	Total Estimated Use (acre-feet/year)
RWS	6	2,005	2.2	2,961
SHD	7		3.33	1,447
REC	3	3.1	0.45	199
COM	104	1,205	11.74	6,304
DOM	11		1.753	762
FWP	4		2.73	1,186
GEO	2		2.33	1,012
INS	2		1.34	582
IND	6	160	0.84	525
MUN	89	3,274	10.41	7,798
TOTAL:	234	6,647	37.1	22,774
RWS: Rural Water System, SHD: Suburban Housing Development, REC: Recreation,				
COM: Commercial, DOM: Domestic, FWP: Fish & Wildlife Propagation, GEO: Geothermal,				
INS: Institutional, IND: Industrial, MUN: Municipal				

As development of the Dakota aquifer has increased over time, some of the appropriations have been made by rural water systems that are required to report their annual withdrawal rate (Water Rights, 2021c). The withdrawals that are annually reported from the Dakota aquifer by some appropriative users (South Lincoln RWS, Clay RWS, and Lincoln County RWS) are shown in Table 4 (Water Rights, 2021c and 2021f). The reported withdrawals by the RWS users listed on Table 4 are for comparison purposes only to show historically the average annual use has been less than the volume that is estimated on Table 3 (Water Rights, 2021c and 2021f). The estimated use for RWS users calculated on Table 3 will be used in the analysis.

Table 4. Non-irrigation rural water system water rights/permits required to report their respective annual use from the Dakota aquifer (Water Rights, 2021c and 2021f)

	South Lincoln RWS	Clay RWS	Lincoln County RWS
	5647-3, 6300-3, 6490-3, 6778A-3	5997B-3	5156-3
2003	725		
2004	904		
2005	769		
2006	863	72	
2007	860	126	
2008	863	124	0
2009	773	119	0
2010	775	122	0
2011	785	116	0
2012	865	186	0
2013	765	155	0
2014	739	148	0
2015	711.5	141	0
2016	640	163	0
2017	643	201	0
2018	503	170	0
2019	562	162	0
2020	530	197	0
Max	904	201	0
Min	503	72	0
Avg	738	147	0
RWS: Rural Water System			

Currently, there are 19 irrigation water rights/permits authorized to appropriate water from the Dakota aquifer (Water Rights, 2021c). Irrigation water rights/permits have been typically required to report their annual usage on an irrigation questionnaire since 1979. Table 5 lists only 16 water rights/permits appropriating water from the Dakota aquifer as Water Right Nos. 394-3 and 762-3 are not required to submit an irrigation questionnaire. Collectively, Water Right Nos. 394-3 and 762-3 are authorized to irrigate 31.2 acres (Water Rights, 2021c). Generally, irrigators in eastern South Dakota apply less than one foot of water per acre per year. However, to account for the fluctuation in wet and dry cycles from year to year, the one foot of water per acre per year application rate will be used to liberally estimate the annual withdrawal rate for these irrigation water rights. Therefore, Water Right Nos. 394-3 and 762-3 are estimated to collectively withdraw approximately 31.2 acre-feet per year (Water Rights, 2021c). Additionally, Water Permit Application No. 8510-3 (approved in 2021) authorizes 30 acres of golf course to be irrigated and is limited to an annual appropriation that may not exceed two-acre feet annually for each acre of land authorized to be irrigated (Water Rights, 2021c). Therefore, the average annual withdrawal rate for Water Permit Application No. 8510-3 is approximately 60 acre-feet per year. Overall, the average annual withdrawal rate for the three water rights/permits not accounted for on Table 5 is approximately 91.2 acre-feet per year.

To give a better representation of the current development of the Dakota aquifer, the average annual withdrawal rate for the irrigation water rights/permits that have reported over the last ten years was estimated. On average, the last ten years of Dakota aquifer irrigation water rights/permits pumped 206.3 acre-feet annually (Table 5) (Water Rights, 2021a).

By combining the calculated withdrawal rate for the three irrigation water rights/permits that are not accounted for on Table 5 with the average annual withdrawal rate based on the development of the Dakota aquifer over the last ten years, the average annual withdrawal rate for the 19 Dakota aquifer irrigation water rights/permits is approximately 297.5 acre-feet per year (Water Rights, 2021a and 2021c).

Table 5. Reported historic irrigation use from Dakota aquifer (Water Rights, 2021a)

Year	No. of Permits Reporting	Reported Pumpage (acre-feet)
1979	2	38
1980	2	110
1981	4	45
1982	5	33.2
1983	5	64.4
1984	4	0
1985	5	8.1
1986	5	238.9
1987	5	1.3
1988	4	452.8
1989	4	265.4
1990	4	234
1991	5	165.4
1992	5	40.4
1993	7	112.4
1994	7	51.9
1995	8	30.8
1996	8	34.4
1997	9	48
1998	9	175.8
1999	10	101.6
2000	10	172.8
2001	11	160.9
2002	10	178.9
2003	10	205
2004	10	154
2005	12	146.5
2006	13	232.3
2007	14	200
2008	14	196.4
2009	15	130.8
2010	17	171.7
2011	18	174.6
2012	18	298.3
2013	18	256.5
2014	17	162.9
2015	17	236.1
2016	16	196
2017	16	229.1
2018	16	156.7
2019	15	107.5
2020	16	245.6
Min	2	0
Max	18	453
Avg (1979 to 2020)	10	149
Avg (2011 to 2020)	17	206

There are domestic wells completed into the Dakota aquifer that do not require a water right/permit, so the withdrawal amount for domestic use is unknown (Water Rights, 2021d). Since the introduction of rural water systems, many domestic wells are likely no longer in use or are not being used as primary water sources. Due to their relatively low diversion rates and the availability of rural water, withdrawals from domestic wells are not considered to be a significant portion of the hydrologic budget for the Dakota aquifer. It is currently unknown how much water is being discharged from the Dakota aquifer through uncontrolled flowing wells. The Water Management Board has previously determined water being discharged through uncontrolled flowing wells is not a beneficial use and does not constitute appropriation pursuant to SDCL 46-6-3.1 (Water Rights, 1987).

Hydrologic Budget Summary

The estimated average annual recharge to the Dakota aquifer has not been accurately quantified. Bredehoeft et al. (1983) estimated a recharge rate of approximately 57,500 acre-feet per year but several factors make it uncertain if that is a high or low estimate. The average annual withdrawal rate for the water rights/permits authorized to appropriate water from the Dakota aquifer totals approximately 27,439 acre-feet per year (listed in Table 6). Based on the hydrologic budget, there is a reasonable probability unappropriated water is available from the Dakota aquifer for the proposed appropriation.

Table 6. Estimated use from Dakota aquifer (Water Rights, 2021a and 2021c)

Type of Water Right/Permit	Estimated Use (acre-feet/year)
Future Use Reservations	4,237
Non-Irrigation	22,774
Irrigation (average reported from 2011 to 2020, plus three permits that do not have to report/have not reported)	297.5
Application No. 8560-3 (if approved, assuming 2 acre-feet, per acre, annually)	130
TOTAL:	27,439

DAKOTA AQUIFER - POTENTIAL FOR UNLAWFUL IMPAIRMENT OF EXISTING WATER RIGHTS:

Currently, there are 253 water rights/permits authorized to appropriate water from the Dakota aquifer and an additional seven future use permits reserving water in the Dakota aquifer (Water Rights, 2021c). The closest water right/permit (not held by the applicant) to the existing well is Water Right No. 6110-3 held by Dakota Dunes Community Improvement District. The diversion point for Water Right No. 6110-3 is located approximately 0.3 miles northwest of the well the applicant proposes to use for this application (Figure 5) (Table 7) (Water Rights, 2021c).

There are domestic wells on file with the DANR-Water Rights Program that are completed into the Dakota aquifer, with the closest domestic well on file (not held by the applicant) approximately 0.9 miles northwest of the existing well (Water Rights, 2021d). There could potentially be other domestic wells completed into the Dakota aquifer near the well the applicant proposes to use that are not on file with the DANR-Water Rights Program.

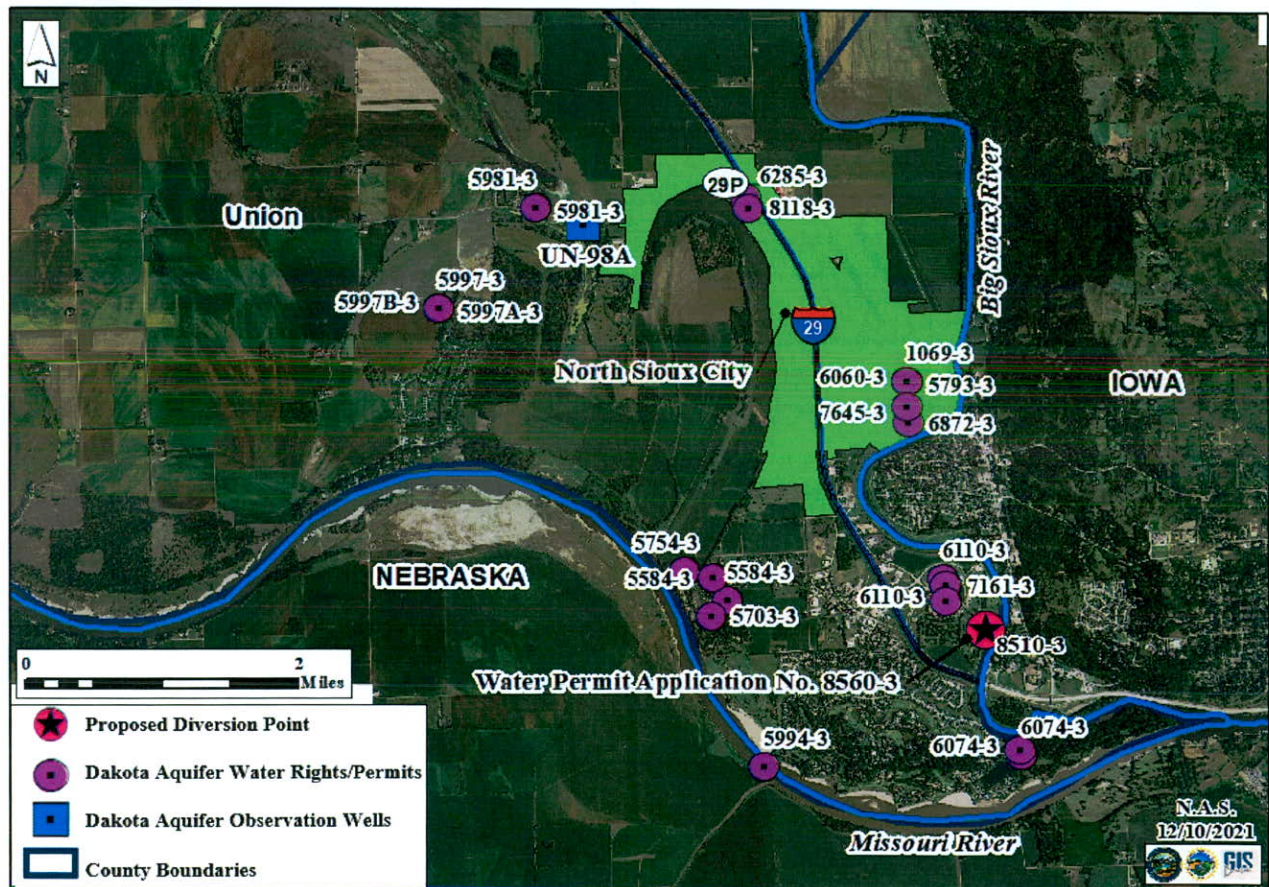


Figure 5. Location of the existing well completed into the Dakota aquifer proposed to be used by Water Permit Application No. 8560-3, with the Dakota aquifer water rights/permits and observation well within approximately five miles (Water Rights, 2021b and 2021c)

Table 7. Water rights/permits authorized to withdraw water from the Dakota aquifer within approximately five miles of the existing well, as shown in Figure 5 (Water Rights, 2021)

Permit No.	Name	Status	Use	Diversion Rate (cfs)	Authorized Annual Volume (acre-feet)
1069-3	City of North Sioux City	LC	MUN	0.55	
5584-3	Sandy Mead Homeowners	LC	SHD	0.37	
5703-3	Charles A Long	LC	IRR	0.06	
5754-3	Riv-R-Land Estates Inc	LC	SHD	0.4	
5793-3	City of North Sioux City	LC	MUN	1.22	
5981-3	Deer Run Homeowners Association	LC	SHD	1.22	
5994-3	Robert L Peterson	LC	IRR	0.053	
5997-3	Clay Rural Water System Inc	PE	SHD	1.11	
5997A-3	Clay Rural Water System Inc	PE	SHD		
5997B-3	Clay Rural Water System Inc	PE	SHD		
6060-3	City of North Sioux City	LC	MUN	2.22	1,500
6074-3	Dakota Dunes Community Improvement District	LC	MUN	3.34	2,419
6110-3	Dakota Dunes Community Improvement District	LC	IRR	0.12	
6285-3	City of North Sioux City	LC	MUN	0.89	386
6872-3	City of North Sioux City	LC	MUN	0.89	
7161-3	BPI Technology	PE	COM	0.01	
7645-3	City of North Sioux City	PE	MUN	1.33	483
8118-3	City of North Sioux City	PE	MUN	1.34	905
8510-3	TR Golf LLC	PE	IRR	1.11	
LC: Licensed Water Right; PE: Water Permit, COM: Commercial, IRR: Irrigation					
MUN: Municipal, SHD: Suburban Housing Development					

Observation well UN-98A (approximately 4 miles northwest of the existing well) has ten high-yield wells (assumed to be a well with an authorized diversion rate greater than 0.2 cfs) within approximately three miles of it (as shown on Figure 5) (Water Rights, 2021b and 2021c). The lithologic log on file for UN-98A noted the well was drilled 312 feet deep below the ground surface, with the top of aquifer is expected to be approximately 165 feet below the ground surface (SDGS, 2021). The lowest recorded static water level on the hydrograph (displayed in Figure 1) is approximately 15 feet below the ground surface, which indicates there was still approximately 150 feet of artesian head pressure in UN-98A even during drier periods when high-yield wells are expected to be pumping more water (Water Rights, 2021b).

The Dakota aquifer is under confined conditions at the existing well site based on the well completion report on file with the DANR-Water Rights Program (Water Rights, 2021d). Since the Dakota aquifer is confined at the well site, drawdown can extend some distance but the exact drawdown behavior of a well cannot be known without an aquifer performance test. At the existing well site, the Dakota aquifer has a saturated aquifer thickness of approximately 184 feet with the depth to the top of aquifer materials around 106 feet below the ground surface (Water Rights, 2021d). This would allow for enough thickness for a pump inlet to be placed 20 feet below the top of the aquifer, which is required for the well to be considered adequate under ARSD 74:02:04:20(6). Any drawdown as a result of the proposed diversion is not expected to

unlawfully impair nearby adequate wells. In Union County, there are no substantiated complaints on file with the DNR-Water Rights Program regarding well interference for adequate wells completed into the Dakota aquifer (Water Rights, 2021e).

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.”

The Water Management Board considered the delivery of water by artesian head pressure versus maximum beneficial use during the issuance of Water Right No. 2313-2 for Coca-Cola Bottling Company of the Black Hills. The Board adopted the Findings of Facts and Conclusions of Law that noted the reservation of artesian head pressure for delivery of water would be inconsistent with SDCL 46-1-4 which states, “general welfare requires that the water resources of the state be put to beneficial use to the fullest extent of which they are capable...” (Water Rights, 1995). Furthermore, the Water Management Board found if increased cost or decreased production as a result of impacts on artesian head pressure by legitimate users is to be considered as an unlawful impairment, it would also conflict with SDCL 46-1-4 (Water Rights, 1995). With that in mind, some existing well owners may need to install or lower pumps depending on the specific characteristics of the Dakota aquifer at their location. However, when considering the statutes (SDCL 46-1-4 and 46-6-6.1), rules (ARSD 74:02:04:20(6) and (7)), the saturated thickness of the Dakota aquifer in Union and Lincoln Counties, the artesian head pressure in observation wells and appropriative user’s wells completed into the Dakota aquifer near the existing well, and the lack of well interference complaints from the Dakota aquifer in the area, any drawdown created from the proposed diversion is not expected to cause an unlawful impairment on existing water right/permit holders or domestic users with adequate wells. Therefore, there is a reasonable probability that any interference from the proposed appropriation will not impose unlawful impairments on existing users with adequate wells.

Special Consideration: Well Construction

The well completion report submitted for the well the applicant proposes to use meets adequate well construction standards as defined in ARSD 74:02:04:20.

An adequate well has been defined in ARSD 74:02:04:20(6) as:

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

The alternative well construction requirements for certain Dakota aquifer wells (74:02:04:35) are not permitted for irrigation uses. Additionally, the alternative well construction requirements for certain Dakota aquifer wells (74:02:04:35) are not met for this area as the Greenhorn Limestone does not appear to be present. Any future replacement wells shall meet the adequate well construction standard as defined in ARSD 74:02:04:20. Replacement wells may not be constructed using the alternative construction requirements that are allowed for domestic use wells outlined in ARSD 74:02:04:35.

MISSOURI: ELK POINT AQUIFER

MISSOURI: ELK POINT AQUIFER - HYDROGEOLOGY:

The Missouri: Elk Point aquifer is a deposit of glacial outwash consisting of fine sand to very coarse gravel (Niehus, 1997). The Missouri: Elk Point aquifer underlies approximately 219,100 acres in Clay, Union, and Yankton Counties, and the aquifer contains approximately 3,287,100 acre-feet of recoverable water in storage (Hedges et al., 1982). The Missouri: Elk Point aquifer is hydraulically connected to the Lower Vermillion Missouri and Lower James Missouri aquifers, and the Big Sioux, James, Missouri, and Vermillion Rivers (Niehus, 1994; Stephens, 1967). The Missouri: Elk Point aquifer underlies the floodplains of the Big Sioux and Missouri Rivers (Niehus, 1997). Near the edge of the floodplains, the aquifer is overlain by a relatively impermeable glacial till (Niehus, 1994; Stephens, 1967).

In Lincoln and Union Counties, the average saturated thickness of the Missouri: Elk Point aquifer is approximately 84 feet, with a documented maximum aquifer thickness of approximately 146 feet (Niehus, 1997). The depth to Missouri: Elk Point aquifer materials ranges from approximately 0 to 105 feet below the ground surface, with an average depth to the top of aquifer approximately 22 feet below the ground surface (Niehus, 1997). The static water level in wells completed into the Missouri: Elk Point aquifer varies from approximately 0 to 130 feet below the ground surface, with an average static water level of approximately 18 feet below the ground surface (Niehus, 1997). The Missouri: Elk Point aquifer is generally under confined conditions in the northwestern part of the aquifer, and generally under unconfined conditions in the southern part of the aquifer, and the direction of groundwater movement in the aquifer is generally from the northwest to the southeast (Niehus, 1994 and 1997).

No water well or test hole completion report was submitted with Water Permit Application No. 8560-3. There is a well completion report on file for the well completed into the Missouri: Elk Point aquifer well authorized by Water Permit No. 8354-3 that the applicant proposes to use (Water Rights, 2021d). The report lists “Top Soil” from 0 to 3 feet below the ground surface, “Gray Clay” from 3 to 17 feet, “Fine Gray Sand” from 17 to 47 feet, “Fine Brown Sand” from 47 to 62 feet, and “Small-Medium Gravel Sand” from 62 to 105 feet below the ground surface (Water Rights, 2021d). The well was screened in “Small-Medium Gravel Sand” from 85 to 105 feet and had a static water level of approximately 24 feet below the ground surface at the time of completion (November 11, 2020) (Water Rights, 2021d). Based on the well completion report, the Missouri: Elk Point aquifer is locally confined at the existing well site. The glacial outwash deposits in this area are variable, so while the existing well is overlain by a layer of clay making the aquifer confined at the existing well site, the clay deposit may not be laterally extensive (Water Rights, 2021d).

Figure 6 displays a map of the approximate areal extent of the Missouri: Elk Point aquifer delineated from Hedges and others (1982) and the location of the existing well proposed to be used by Water Permit Application No. 8560-3 (Water Rights, 2021c).

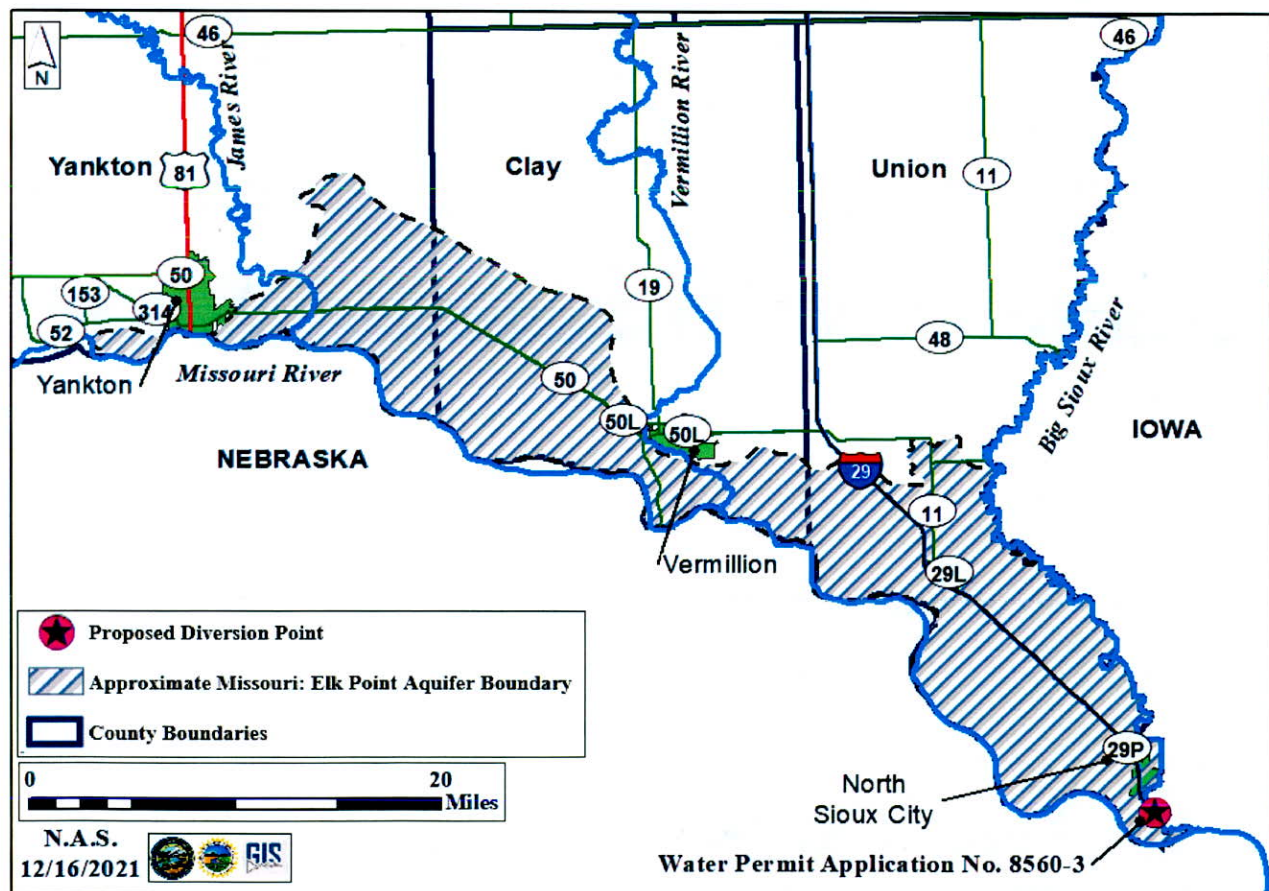


Figure 6. Map of the approximate Missouri: Elk Point aquifer boundary delineated from Hedges and others (1982) with the location of the existing well proposed to be used by Water Permit Application No. 8560-3 (Water Rights, 2021c)

MISSOURI: ELK POINT AQUIFER - HYDROLOGIC BUDGET:

Recharge

Recharge to the Missouri: Elk Point aquifer is primarily through the infiltration of precipitation where the aquifer is at or near the ground surface, seepage from the Big Sioux, James, Missouri, and Vermillion Rivers, inflow from the Lower Vermillion-Missouri aquifer at the northern boundary of the Missouri aquifer and inflow from the Big Sioux aquifer at the extreme northeastern boundary of the Missouri aquifer, and from the underlying Dakota aquifer in Union and Lincoln Counties (Niehus, 1994 and 1997).

Using observation well analysis, Hedges and others (1985) estimated a recharge rate to the Missouri: Elk Point aquifer of approximately 3.8 inches per year. The Elk Point management unit is estimated to underly approximately 219,100 acres (Hedges et al, 1982); therefore, the average annual recharge rate of the Missouri: Elk Point aquifer is approximately 69,382 acre-feet per year.

Stephens (1967) noted that pumping of the Missouri: Elk Point aquifer will induce recharge from the Missouri River. Stonesifer (2013) estimated that the Missouri River contributed 22,582 acre-feet per year of recharge induced from the pumping operation at Lewis and Clark RWS. This estimate is based off inducing at least 50% recharge of the water pumped at full development of the existing and future use permits held by Lewis and Clark RWS. Depending on location and diversion rate, this percentage of induced recharge is likely to much greater than 50% (Mathiowetz, 2021). This results in a total estimated recharge rate of approximately 92,000 acre-feet per year to the Missouri: Elk Point aquifer. There are other wells, both domestic and appropriative, in close vicinity to the Missouri River that can induce recharge from the river, but that amount of induced recharge has not been quantified.

Discharge

Discharge from the Missouri: Elk Point aquifer is primarily through well withdrawals, evapotranspiration where the aquifer is at or near the ground surface, outflow to the Big Sioux and Missouri Rivers during periods of low flow and stage, and leakage to the underlying Dakota aquifer (Niehus, 1994 and 1997; Water Rights, 2021c).

Currently, there are 622 water rights/permits appropriating water from the Missouri: Elk Point aquifer within South Dakota (Water Rights, 2021c). Additionally, there are five future use permits reserving water from the Missouri: Elk Point aquifer (Water Rights, 2021c). For the purpose of estimating average annual withdrawals, the five future use permits are assumed to be fully developable for a total of 14,900 acre-feet per year (Table 8).

Table 8. Future use permits reserving water from the Missouri: Elk Point aquifer (Water Rights, 2021c)

Future Use Permit Holder	Amount of Reserved Water (acre-ft)
Lewis and Clark RWS (5832-3)	0
City of Vermillion (6237-3)	1,900
Lewis and Clark RWS (6869-3)	3,535
Lewis and Clark RWS (6869A-3)	0
Lewis and Clark RWS (7208-3)	9,465
Total:	14,900
RWS: Rural Water System	

Table 9 summarizes the 39 non-irrigation water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer with the estimated annual use for each water right/permit as determined by their limiting diversion rate or annual volume. Historically, average water use by non-irrigation appropriations limited by an instantaneous diversion rate have been assumed to be pumping 60% of full time at the respective permitted diversion rate. Water rights/permits limited by an annual volume are assumed to withdraw their entire respective annual volume limitation. This is a standard method used by the DANR-Water Rights Program for estimating annual withdrawals by non-irrigation appropriations from an aquifer (Water Rights, 2021c).

Water Permit No. 5998-3 is permitted for turf irrigation and Water Permit No. 5998A-3 extends the amount of time allowed for water to be put to beneficial use as authorized by Water Permit No. 5998-3 (Water Rights, 2021c). These two irrigation permits are included with the non-irrigation water rights/permits listed on Table 9, as the permit holder is not required to submit an annual irrigation questionnaire; however, the permit holder is required to report annual water use as listed on Table 10 (Water Rights, 2021c).

Three water rights were identified as being connected to a rural water system and maintain their wells for standby purposes (Drinking Water Program, 2021; Water Rights, 2021c); as such, the average annual water use for these water rights has been estimated to be zero acre-feet per year on Table 9.

Water Permit No. 7059-3 is permitted for recreational use for maintaining the water level of a small lake with a surface area of 17.6 acres (Water Rights, 2021c). It is assumed that the only consumptive use of this water is due to evaporation (Water Rights, 2021c). Annual evaporation of water from shallow lakes is estimated to be approximately 42 inches per year at the location of the authorized diversion point for Water Permit No. 7059-3 (NOAA, 1982), and average annual total precipitation at the Sioux City, Iowa airport was determined to be approximately 29.27 inches over the 30-year period of record (1981 to 2010) (Arguez et al., 2020), which results in the lake to fluctuate approximately 12.73 inches per year. To maintain the water level of the small lake, the estimated use of Water Permit No. 7059-3 is approximately 18.7 acre-feet per year.

Overall, the average annual withdrawal rate for the 39 non-irrigation water rights/permits (plus the two irrigation permits not required to submit an annual irrigation questionnaire) authorized to appropriate water from the Missouri: Elk Point aquifer is approximately 48,317 acre-feet per year (Table 9) (Water Rights, 2021c).

There are 14 non-irrigation water rights/permits required to report their annual usage from the Missouri: Elk Point aquifer. Three of these water rights/permits (Nos. 8031-3, 8415-3, and 8435-3) are currently under development and have not reported any withdrawals from the Missouri: Elk Point aquifer to the DANR-Water Rights Program (Water Rights, 2021c). Furthermore, the reported usage (as shown on Table 10) for Permit Nos. 8381-3 and 8403-3 (approved in 2018 and 2019) is not necessarily reflective of the future usage of these permits based on information within their respective water permit files (Water Rights, 2021c), and only two years of reported withdrawals (Water Rights, 2021f). Therefore, the estimated use for Permit Nos. 8031-3, 8415-3, 8435-3, 8381-3, and 8403-3 will be based on the method used above: water rights/permits limited by an instantaneous diversion rate have been assumed to be pumping 60% of full time at the respective permitted diversion rate; water rights/permits limited by an annual volume are assumed to withdraw their entire respective annual volume limitation. Their estimated average annual withdrawal rate is listed on Table 9.

Additionally, the reported use for the City of Yankton (8212-3) and Lewis and Clark RWS (6736-3 and 7207-3) (as shown on Table 10) is steadily increasing (Water Rights, 2021f), as these water users are continually undergoing development (Water Rights, 2021c). It is likely these water users will use up to their entire respective annual volume limitation in the future; therefore, the average annual withdrawal rate for these water rights/permits is assumed to be their entire respective annual volume listed on Table 9 (Water Rights, 2021c).

Table 9. Summary of the non-irrigation water rights/permits (plus two irrigation water permits) authorized to appropriate water from the Missouri: Elk Point aquifer with estimated annual use determined by their respective diversion rate or annual volume (Drinking Water Program, 2021; Water Rights, 2021c)

Permit No.	Name	Status	Priority Date	Use	Appropriation for Water Rights/Permits limited by Diversion Rate (cfs)	Appropriation for Water Rights/Permits limited by Volume (acre-feet/year)	Total Estimated Use (acre-feet/year)
4501-3	Eddie Wohl	LC	03/27/1980	COM	0.05		21.7
5616-3	Cimpls Inc	LC	01/31/1992	COM	0.44		191.1
5827-3	Don Lantis	LC	06/08/1994	COM	0.022		9.6
5953-3	H & K Oil Co	LC	08/19/1996	COM	0.037		16.1
6151-3	Vernon & Norma Vakoc	LC	10/04/1999	COM	0.67		291
6580-3	West Shores Acres LLC	LC	01/28/2005	COM	0.10		43.4
8031-3	Dakota Protein Conversion Inc	PE	06/18/2014	COM	0.22		95.6
8147-3	Doug Lafleur	PE	04/06/2015	COM, LCO	1.0	160	160
8381-3	RP Constructors	PE	11/19/2018	COM	0.04	1	1
8403-3	Stockmen's Livestock Inc	PE	06/27/2019	COM	2.0	40	40
8415-3	RC Investments Inc	PE	11/14/2019	COM	0.10	25	25
8435-3	Sioux City Insulation	PE	07/30/2012	COM	0.33	1	1
6744-3	Judith I Grant	PE	07/24/2006	DOM, COM	0.78		338.8
7388-3	Clay RWS Inc	PE	07/30/2012	DOM, IRR	2.0		270
5998-3	Clay RWS Inc	PE	04/21/1997	IRR, DOM	2.2		
5998A-3	Clay RWS Inc	PE	04/21/1997	IRR, DOM	0.0		
5490-3	USGS CERC Field Research Station	LC	11/15/1990	FWP	0.09		39.1
5907-3	US Fish and Wildlife Service	LC	01/26/1996	FWP	3.78		1,642
6733-3	US Fish and Wildlife Service	LC	06/07/2006	FWP	1.11		482.2
7094-3	US Fish and Wildlife Service	LC	12/01/2008	FWP	2.67		1,159.8
5021-3	Vishay-Dale Electronics Inc	LC	05/04/1984	IND	0.10		43.4
5388-3	LG Everist Inc	LC	01/30/1990	IND	0.45		195.5
5453-3	AaLadin Industries Inc	LC	05/24/1990	IND	0.05		21.7
5593-3	Vishay-Dale Electronics Inc	LC	10/31/1991	IND	0.056		24.3
6170-3	Concrete Materials	LC	01/03/2000	IND	0.222		96.4
1255-3	City of Elk Point	LC	01/01/1914	MUN	1.13		490.9
143-3	City of Vermillion	LC	01/21/1956	MUN	1.78		773.2
147-3	City of Vermillion	LC	01/01/1935	MUN	2.66		1,229
6236-3	City of Vermillion	LC	11/06/2000	MUN	2.6	1,161	
6354-3	City of Vermillion	LC	08/12/2002	MUN	0.022		10
1965-3	Town of Gayville	LC	01/01/1914	MUN	0.37		0*
4207-3	Town of Jefferson	LC	01/01/1916	MUN	0.90		391
5118-3	Town of Gayville	LC	01/28/1987	MUN	0.33		0*
5437-3	Dakota Dunes Community Improvement District	LC	04/12/1990	MUN	3.33		1,446.6
5782-3	City of North Sioux City	LC	08/12/1993	MUN	1.14		495.2
8212-3	City of Yankton	LC	03/25/2016	MUN	20.12	6,050	6,050
7059-3	WE Investments LLC	PE	08/28/2008	REC	3.11		18.7
6736-3	Lewis and Clark RWS	PE	07/08/1994	RWS	27.85	20,165	20,165
7207-3	Lewis and Clark RWS	PE	07/08/1994	RWS	20.0	12,000	12,000
5581-3	Larson's Landing	LC	07/30/1991	SHD	0.089		38.7
5592-3	East Winds Court Inc	LC	10/09/1991	SHD	0.11		0*
						TOTAL:	48,317
*Identified as being connected to a RWS							
COM: Commercial; DOM: Domestic; FWP: Fish and Wildlife Propagation; IND: Industrial; IRR: Irrigation; LCO: Livestock Confinement Operation;							
MUN: Municipal; REC: Recreation; RWS: Rural Water System; SHD: Suburban Housing Development							

The annual withdrawal rate for Clay RWS Inc (Permit Nos. 5998-3, 5998A-3 and 7388-3), Doug Lafleur (8147-3), and City of Vermillion (147-3, 6236-3) on Table 10 are relatively steady over a period of record (Water Rights, 2021c and 2021f); therefore, the average annual withdrawal rate based on the reported values from each of these water users (as shown on Table 10) is reasonably reflective of the future withdrawals to be made by these appropriative users. The average annual withdrawal rate based off the reported annual withdrawal rates averaged on Table 10 for these water rights/permits will be used in this analysis.

Table 10. Non-irrigation water rights/permits required to report their respective annual use from the Missouri: Elk Point aquifer (Water Rights, 2021c and 2021f)

	RP Constructors	Stockmen's Livestock Inc	Clay RWS Inc	Doug Lafleur	City of Vermillion	City of Yankton	Lewis and Clark RWS
	8381-3	8403-3	5998-3, 5998A-3, 7388-3	8147-3	147-3, 6236-3	8212-3	6736-3, 7207-3
2003			238		1,363		
2004			483		1,226		
2005			21		1,247		
2006			170		1,252		
2007			217		1,344		0
2008			213		1,199		0
2009			215		1,140		0
2010			183		1,071		0
2011			137		1,127		92
2012			525		1,317		3,836
2013			301		1,183		9,368
2014			307		1,121		11,532
2015			278	202	1,161		15,591
2016			231	202	1,175	66	17,091
2017			276	202	1,215	531	18,051
2018			305	98	1,168	504	18,143
2019	0.0171	1	292	135	1,440	1,370	20,397
2020	0.0224	4.2	461	121	1,373	2,923	21,039
Max	0.022	4.2	525	202	1,440	2,923	21,039
Min	0.017	1.0	21	98	1,071	66	0
Avg	0.0198	2.6	270	160	1,229	1,079	9,653
RWS: Rural Water System							

Currently, there are 583 irrigation water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer (Water Rights, 2021c). Irrigation water rights/permits have been typically required to report their annual usage on an irrigation questionnaire since 1979. Table 11 lists only 570 water rights/permits appropriating water from the Missouri: Elk Point aquifer, resulting in the estimated use for thirteen irrigation permits unaccounted for. The usage for two irrigation water permits (Nos. 5998-3 and 5998A-3) was accounted for on Table 9 with the non-irrigation water rights/permits, as the permit holder is not required to submit an annual irrigation questionnaire (Water Rights, 2021c). Additionally, there are eleven water permits that were approved in December of 2020, or 2021, and have not submitted an annual irrigation questionnaire to date (Water Rights, 2021a and 2021c). These eleven water permits are authorized to irrigate 1,269.2 acres (Water Rights, 2021c). By utilizing the one foot of water per acre per year application rate to liberally estimate the annual withdrawal rate for these irrigation water permits, the average annual withdrawal rate for the eleven water permits (approved in Dec 2020, or 2021) is approximately 1,269.2 acre-feet per year.

The average annual withdrawal rate for the Missouri: Elk Point aquifer irrigation water rights/permits that have reported over the period of record is approximately 17,991 acre-feet per year (Table 11) (Water Rights, 2021a). To reflect the current development of irrigation water rights/permits more accurately, the average annual withdrawal rate for irrigation appropriations that have reported from 2011 to 2020 is approximately 24,182 acre-feet per year (Table 11) (Water Rights, 2021a).

By combining the calculated withdrawal rate for the irrigation water permits that are not accounted for on Table 9 or Table 11, with the average annual withdrawal rate based on the development of the Missouri: Elk Point aquifer over the last ten years, the average annual withdrawal rate for the Missouri: Elk Point aquifer irrigation water rights/permits is approximately 25,451 acre-feet per year (Water Rights, 2021a and 2021c).

Table 11. Reported historic irrigation use from Missouri: Elk Point aquifer (Water Rights, 2021a)

Year	No. of Permits Reporting	Reported Pumpage (acre-feet)
1979	259	9,859
1980	263	15,045
1981	297	13,096
1982	269	18,822.4
1983	273	10,834
1984	281	9,194.3
1985	282	13,718.5
1986	286	6,252.1
1987	281	13,163.7
1988	282	28,184.6
1989	292	25,651.9
1990	297	19,425
1991	300	18,798.6
1992	295	1,882
1993	298	1,475.2
1994	295	10,221.4
1995	292	18,320.2
1996	296	9,412.8
1997	305	17,182
1998	313	11,127.2
1999	308	14,748
2000	309	26,640.1
2001	313	19,071.9
2002	315	23,547.2
2003	314	26,734.7
2004	322	23,862.3
2005	335	23,964.5
2006	353	27,974.5
2007	366	30,482.8
2008	396	16,261.9
2009	410	6,121
2010	419	2,723.9
2011	431	12,107.6
2012	445	56,538.2
2013	543	34,838.5
2014	557	12,084.2
2015	563	17,751.9
2016	564	27,638.6
2017	567	37,013.5
2018	570	8,855.7
2019	575	8,847.3
2020	570	26,140
Min	259	1,475
Max	575	56,538
Avg (1979 to 2020)	364.3	17,991
Avg (2011 to 2020)	538.5	24,182

There are domestic wells completed into the Missouri: Elk Point aquifer that do not require a water right/permit, so the withdrawal amount from those wells is unknown (Water Rights, 2021d). 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 Missouri: Elk Point 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 Missouri: Elk Point aquifer.

Hydrologic Budget Summary

The average annual recharge rate to the Missouri: Elk Point aquifer is estimated to be approximately 92,000 acre-feet per year. The average annual withdrawal rate for the water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer totals approximately 88,798 acre-feet per year (listed in Table 12). There is likely more induced recharge than what has been calculated. Based on the hydrologic budget, there is a reasonable probability unappropriated water is available for the proposed appropriation.

Table 12. Estimated use from Missouri: Elk Point aquifer (Water Rights, 2021a and 2021c)

Type of Water Right/Permit	Estimated Use (acre-feet/year)
Future Use Reservations	14,900
Non-Irrigation	48,317
Irrigation (average reported from 2011 to 2020, plus eleven permits that have not reported)	25,451
Application No. 8560-3 (if approved, assuming 2 acre-feet, per acre, annually)	130
TOTAL:	88,798

MISSOURI: ELK POINT AQUIFER - OBSERVATION WELL DATA:

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

Observation wells provide data on how the aquifer reacts to regional climatic conditions and local pumping. The DNR-Water Rights Program monitors 36 observation wells completed into the Missouri: Elk Point aquifer (Water Rights, 2021b). The five closest observation wells to the well the applicant proposes to use are UN-78C (approximately 1.5 miles northwest), UN-77U (approximately 3 miles northwest), UN-77V (approximately 3 miles northwest), UN-78D (approximately 3.2 miles northwest), and UN-77Q (approximately 5.5 miles northwest) (as shown in Figure 13). The hydrographs for these observation wells are displayed in Figures 7 to 11 (Water Rights, 2021b). 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.

The hydrographs for the observation wells display stable water levels over their respective periods of record. The hydrographs for the Missouri: Elk Point aquifer 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 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 water levels in the aquifer rather than the impacts of pumping from the Missouri: Elk Point 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.

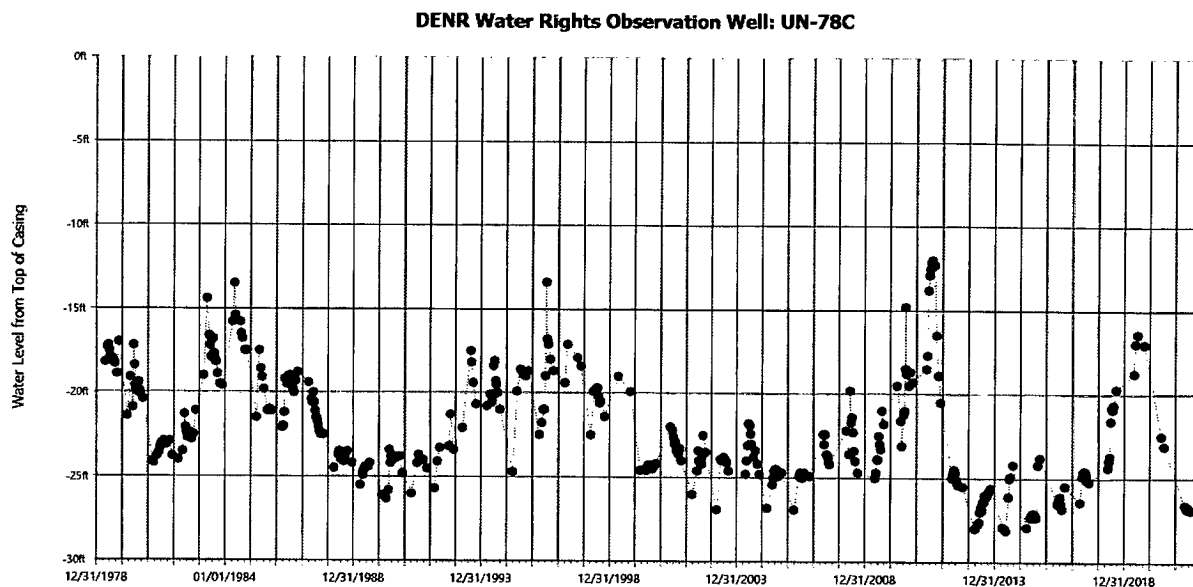


Figure 7. Hydrograph for observation well UN-78C (Water Rights, 2021b)

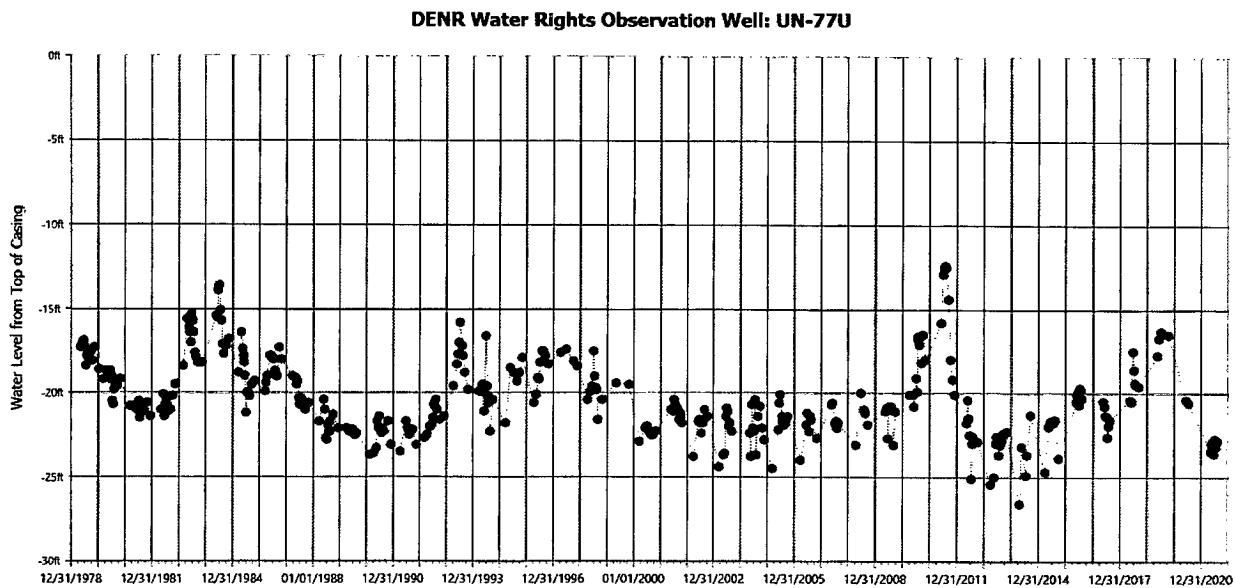


Figure 8. Hydrograph for observation well UN-77U (Water Rights, 2021b)

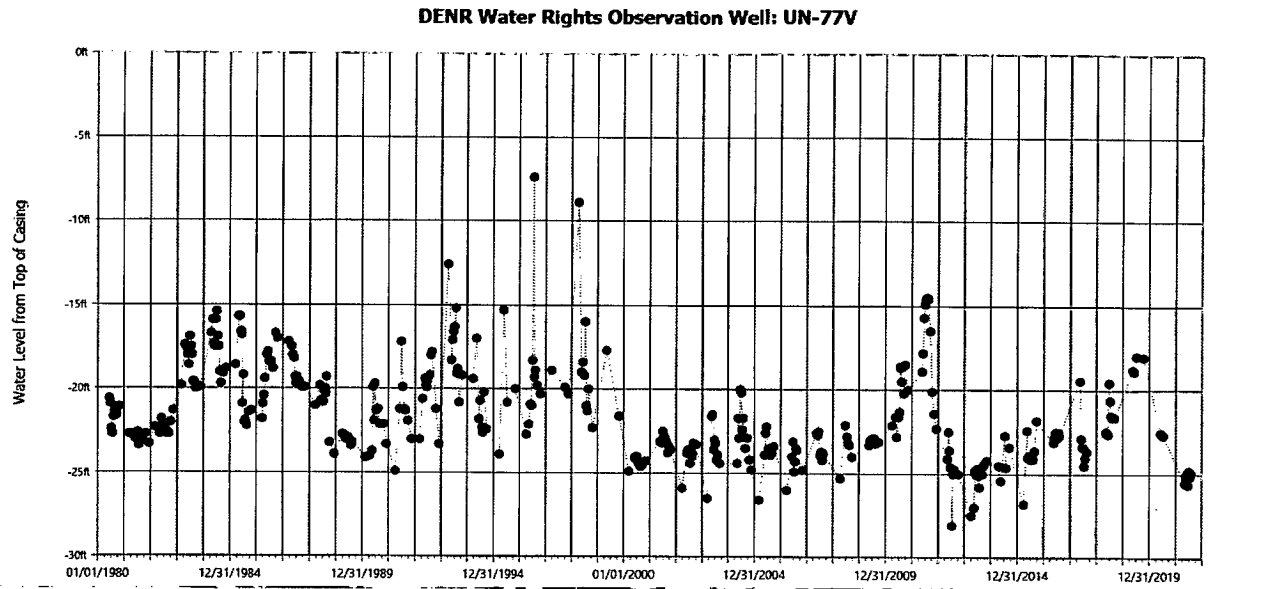


Figure 9. Hydrograph for observation well UN-77V (Water Rights, 2021b)

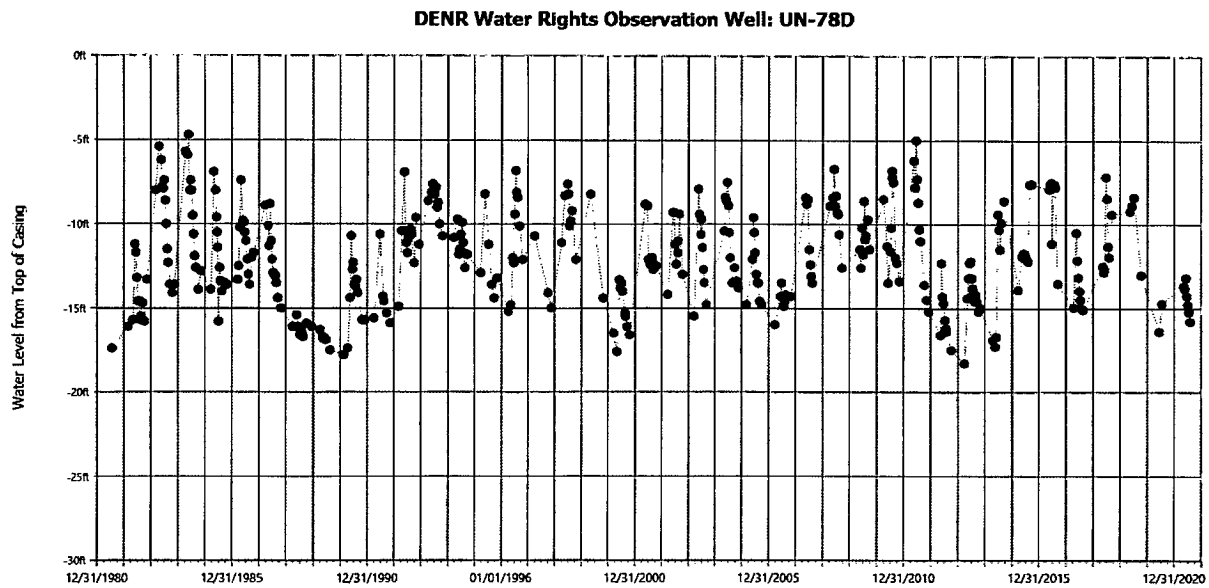


Figure 10. Hydrograph for observation well UN-78D (Water Rights, 2021b)

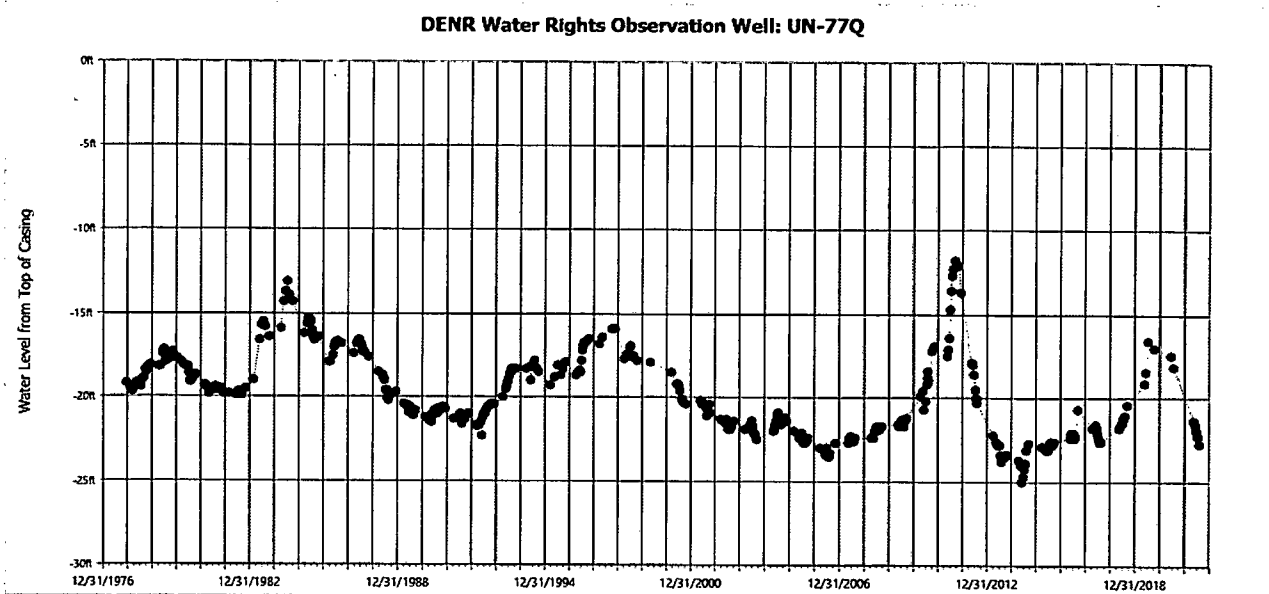


Figure 11. Hydrograph for observation well UN-77Q (Water Rights, 2021b)

It is worth noting, several Missouri: Elk Point aquifer observation well hydrographs show a gradual downward trend. These observation wells are located near the Missouri River, and the downward trend seen on the hydrographs is due to the entrenchment of the river channel, below Gavins Point Dam (Yankton, SD), that has lowered the water surface elevation of the river (Goodman, 2007). The entrenchment has resulted in a lowering of water levels in the hydraulically connected, Missouri: Elk Point aquifer, as the water level in the aquifer equilibrates to the lower average water surface elevation of the river. Therefore, the downward trends seen on some observation well hydrographs are likely caused by the entrenchment of the Missouri River change, and not from over-appropriation of the Missouri: Elk Point aquifer.

The United States Geological Survey (USGS) maintains Stream Gage #06467500, located on the Missouri River at Yankton, SD, and the hydrograph for this gage is shown in Figure 12 (USGS, 2021). By comparing the hydrograph for Stream Gage #06467500 to the observation well hydrographs of the Missouri: Elk Point aquifer (Figures 7 to 11), both show the river and aquifer react to climatic conditions by rising and falling over similar trends (USGS, 2021; Water Rights, 2021b). Additionally, during flood events (such as, the year 2011), the water level in the Missouri: Elk Point aquifer, especially where in closer proximity to the Missouri River, rises very quickly beyond what is typically seen for glacial outwash aquifers (Water Rights, 2021b). This indicates there is a hydraulic connection between the Missouri: Elk Point aquifer and the Missouri River. Therefore, when the elevation of the water in the Missouri River is higher than the elevation of water in the aquifer, the river will recharge the aquifer. In contrast, when the elevation of water is higher in the Missouri: Elk Point aquifer, the aquifer naturally discharges to the Missouri River. As a result, there is a reasonable probability unappropriated water is available for the proposed appropriation.

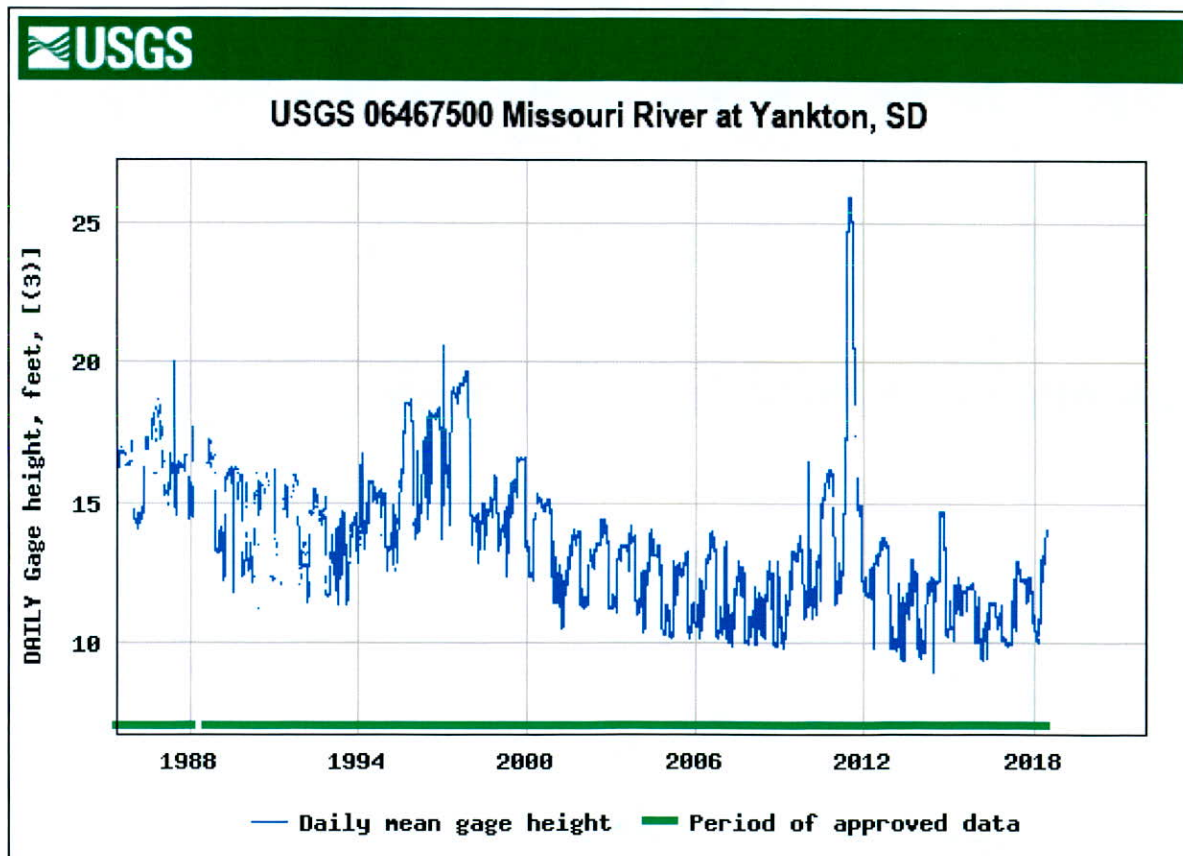


Figure 12. Hydrograph for USGS Stream Gage #06467500 Missouri River at Yankton, SD (USGS,2021)

MISSOURI: ELK POINT AQUIFER - POTENTIAL FOR UNLAWFUL IMPAIRMENT OF EXISTING WATER RIGHTS:

Currently, there are 622 water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer, plus five future use permits reserving water from the Missouri: Elk Point aquifer (Water Rights, 2021c). The diversion points authorized by Water Right No. 5786-3 and Water Permit Nos. 8029-3, 8381-3, and 8435-3, are all within approximately one mile of the existing well proposed to be used for this application (Table 13) (Figure 13) (Water Rights, 2021c).

There are domestic wells on file with the DANDR-Water Rights Program that are completed into the Missouri: Elk Point aquifer, with the closest domestic well on file (not held by the applicant) approximately 0.3 miles southwest of the existing well (Water Rights, 2021d). There could potentially be other domestic wells completed into the Missouri: Elk Point aquifer near the well the applicant proposes to use that are not on file with the DANDR-Water Rights Program.

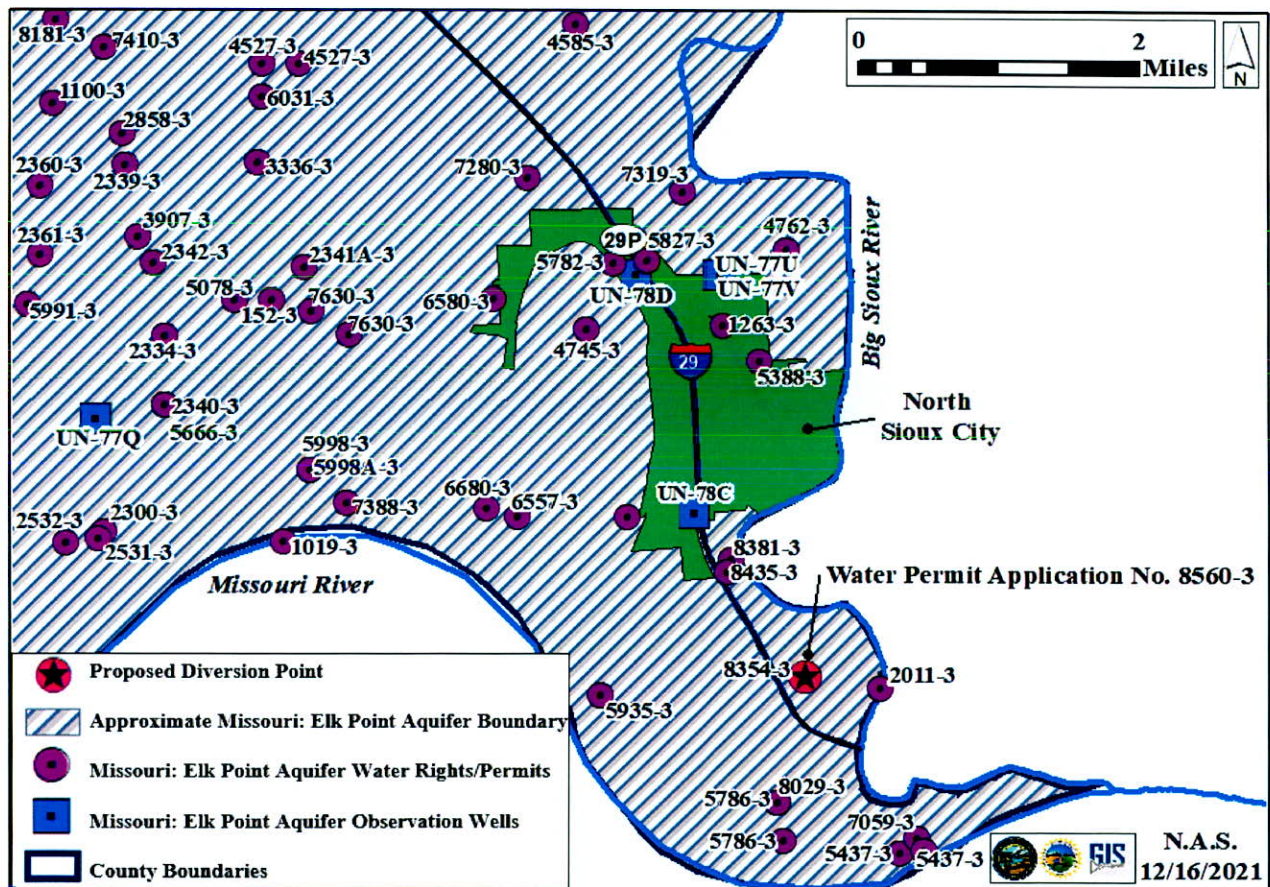


Figure 13. Location of the existing well completed into the Missouri: Elk Point aquifer proposed to be used by Water Permit Application No. 8560-3, with the Missouri: Elk Point aquifer water rights/permits and observation wells within approximately five miles (Water Rights, 2021b and 2021c)

Table 13. Water rights/permits authorized to withdraw water from the Missouri: Elk Point aquifer within approximately five miles of the existing well, as shown in Figure 13 (Water Rights, 2021)

Permit No.	Name	Status	Use	Authorized Acres if IRR	Authorized Diversion Rate (cfs)	Authorized Annual Volume (acre-feet)
152-3	Stephen F Jones	LC	IRR	39	0.56	
1019-3	Leonard, James, & Richard Dailey	LC	IRR	230	3.27	
1100-3	Vincent Trudeau	LC	IRR	64.5	0.92	
1263-3	Eugene Flynn	LC	IRR	152	2.16	
2011-3	TR Golf LLC	LC	IRR	95	1.31	
2300-3	Michael A Dailey	LC	IRR	125	1.78	
2334-3	Bradley J & Constance J Beavers	LC	IRR	190	2.68	
2339-3	Derochie Farms LLC	LC	IRR	120	1.71	
2340-3	Steve Heitman	LC	IRR	216	2.7	
2341A-3	Alvin J Howe	LC	IRR	216	1.94	
2342-3	Russell Lafleur	LC	IRR	100	1.43	
2360-3	Meryln Karpen	LC	IRR	132	1.9	
2361-3	Meryln Karpen	LC	IRR	132	1.9	
2531-3	Paul E Dailey	LC	IRR	255	2.7	
2532-3	Paul E Dailey	LC	IRR	200	2.7	
2858-3	Alvin J Howe	LC	IRR	136	1.94	
3336-3	LaFleur Farms	LC	IRR	197	2.22	
3907-3	Russell Lafleur	LC	IRR	73	1.04	
4527-3	Booge Properties Limited Partnership	LC	IRR	238	3.4	
4585-3	JFR-INV-LTD, LLC	LC	IRR	167	2.38	
4745-3	McCook Lake Izaak Walton League	LC	IRR	211	3	
4762-3	Mike or Matt Schmitz	LC	IRR	136	1.89	
5078-3	Bradley & Constance Beavers	LC	IRR	40	0.57	
5388-3	L G Everist Inc	LC	IND		0.45	
5437-3	Dakota Dunes Community Improvement District	LC	MUN		3.33	
5666-3	Joe & John Trudeau	LC	IRR	203	1.56	
5782-3	City of North Sioux City	LC	MUN		1.14	
5786-3	Dakota Dunes Golf Course	LC	IRR	173	4.5	
5827-3	Don Lantis	LC	COM		0.022	
5935-3	Ted Waitt	LC	IRR	1	0.044	
5991-3	Donald G Jorgensen	LC	IRR	95	1.36	
5998-3	Clay Rural Water System Inc	PE	IRR	300	2.22	
5998A-3	Clay Rural Water System Inc	PE	IRR		0	
6031-3	LaFleur Farms	LC	IRR	95	1.77	
6557-3	Mike Chicoine	PE	IRR	60	1.55	
6580-3	West Shore Acres LLC	LC	COM		0.1	
6680-3	Parks & Wildlife Foundation	LC	IRR	310	2.44	
7059-3	WE Investments	PE	REC		3.11	
7280-3	Tami Norton-Schrempp	PE	IRR	136	1.78	
7319-3	Matt Schmitz	PE	IRR	120	1.45	
7388-3	Clay Rural Water System Inc	PE	DOM, IRR		2	
7410-3	Eugene Mollet	PE	IRR	67	1.33	
7630-3	Mark A Nylen	PE	IRR	160	3.34	
8029-3	Dakota Dunes Community Improvement District	PE	IRR	17.8	0.78	
8181-3	Marc T Bernard	PE	IRR	40	0.89	
8354-3	TR Golf LLC	PE	IRR	30	1.11	
8381-3	R P Constructors	PE	COM		0.04	1
8435-3	Sioux City Insulation	PE	COM		0.33	1

The Missouri: Elk Point aquifer ranges from confined to unconfined aquifer conditions, but is primarily under unconfined conditions (Niehus, 1994 and 1997). The aquifer is expected to be locally confined at the existing well site based on well completion report on file for the existing well; however, the lithologic log on file for observation well UN-78C indicates the aquifer varies to unconfined conditions nearby (SDGS, 2021; Water Rights, 2021b and 2021d). However, the confined conditions locally encountered in the Missouri: Elk Point aquifer often react to pumping in a manner more similar to unconfined conditions than confined conditions (Mathiowetz, 2021). Drawdown created by pumping a well generally does not extend far from the pumped well in an unconfined aquifer; however, in a confined aquifer, drawdown from pumping could extend a distance from the diversion point. The exact drawdown behavior of a well cannot be known without an aquifer performance test. Examination of the hydrographs for observation wells completed into the Missouri: Elk Point aquifer show no signs of being significantly impacted by drawdown caused by pumping, despite usually being located within a mile of several high-yield wells (assumed to be a well with an authorized diversion rate greater than 0.2 cfs) (Water Rights, 2021b and 2021c).

At the existing well site, the Missouri: Elk Point aquifer has a saturated aquifer thickness of approximately 81 feet with the depth to the top of aquifer materials around 17 feet below the ground surface (Water Rights, 2021d). This would allow for enough thickness for a pump to be placed 20 feet below the top of the aquifer, which is required for the well to be considered adequate under ARSD 74:02:04:20(6). Any drawdown as a result of the proposed diversion for this application is not expected to unlawfully impair nearby adequate wells. In Union County, there are no substantiated complaints on file with the DANR-Water Rights Program regarding well interference for adequate wells completed into the Missouri: Elk Point aquifer (Water Rights, 2021e).

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.”

The Water Management Board considered the delivery of water by artesian head pressure versus maximum beneficial use during the issuance of Water Right No. 2313-2 for Coca-Cola Bottling Company of the Black Hills. The Board adopted the Findings of Facts and Conclusions of Law that noted the reservation of artesian head pressure for delivery of water would be inconsistent with SDCL 46-1-4 which states, “general welfare requires that the water resources of the state be put to beneficial use to the fullest extent of which they are capable...” (Water Rights, 1995). Furthermore, the Water Management Board found if increased cost or decreased production as a

result of impacts on artesian head pressure by legitimate users is to be considered as an unlawful impairment, it would also conflict with SDCL 46-1-4 (Water Rights, 1995). With that in mind, some existing well owners may need to install or lower pumps depending on the specific characteristics of the Missouri: Elk Point aquifer at their location. However, when considering the statutes (SDCL 46-1-4 and 46-6-6.1), rules (ARSD 74:02:04:20(6) and (7)), the saturated thickness of the Missouri: Elk Point aquifer in Union and Lincoln Counties, and the lack of well interference complaints from the Missouri: Elk Point aquifer in the area, any drawdown created from the proposed diversion is not expected to cause an unlawful impairment on existing water right/permit holders or domestic users with adequate wells. Additionally, the well proposed to be used is an existing well that has been in place and is presumed to have been in use for some time without any reported well interference complaints on file with the DANR-Water Rights Program (Water Rights, 2021c, 2021d and 2021e). Therefore, there is a reasonable probability that any interference from the proposed appropriation will not impose unlawful impairments on existing users with adequate wells.

DAKOTA AND MISSOURI: ELK POINT AQUIFER - CONCLUSIONS:

1. Water Permit Application No. 8560-3 proposes to irrigate 65 acres from one well completed into the Missouri: Elk Point aquifer (authorized by Permit No. 8354-3) and one well completed into the Dakota aquifer (authorized by Permit No. 8510-3). Additionally, Water Permit Application No. 8560-3 proposes to increase the permitted diversion rate authority authorized by Water Permit No. 8510-3 by 0.12 cfs from one well completed into the Dakota aquifer, and correct the legal description of the well completed into the Dakota aquifer. The site is located in Union County on the east side of Dakota Dunes, South Dakota.
2. Water Permit No. 8354-3 authorizes a maximum instantaneous diversion rate of 1.11 cfs from one well completed into Missouri: Elk Point aquifer (105 feet deep) for the irrigation of 30 acres of a golf course.
3. Water Permit No. 8510-3 authorizes a maximum instantaneous diversion rate of 1.11 cfs from one well completed into the Dakota aquifer (290 feet deep) to supplement the irrigation of the 30 acres of the golf course authorized under Permit No. 8354-3 with no increase in irrigated acres.
4. If approved, Water Permit Application No. 8560-3 and Water Permit No. 8510-3 will collectively authorize a maximum instantaneous diversion rate of 1.23 cfs from one well completed into the Dakota aquifer (290 feet deep).
5. If approved, Water Permit Application No. 8560-3 will authorize the use of one well completed into the Missouri: Elk Point aquifer (authorized by Permit No. 8354-3) and one well completed into the Dakota aquifer (authorized by Permit No. 8510-3) for the irrigation of 65 acres, for a collective total of 95 acres of a golf course.

6. Based on observation well data and the hydrologic budget, there is a reasonable probability that unappropriated water is available from the Dakota and Missouri: Elk Point aquifers to supply the proposed appropriation.
7. There is a reasonable probability that the proposed diversion by Water Permit Application No. 8560-3 will not unlawfully impair adequate wells for existing water rights/permits and domestic users.

Nakaila Steen

Nakaila Steen
Natural Resources Engineer I
SD DANR - Water Rights Program

Reviewed by:

Adam Mathiowetz

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

References

- Arguez, A., I. Durre, S. Applequist, R. Vose, M. Squires, X. Yin, R. Heim, and T. Owen, 2020. NOAA's U.S. Climate Normals (1991-2020). Annual Precipitation Normals for Station USW00014943 Sioux City Airport, Iowa. NOAA National Center's for Environmental Information. Accessed December 16, 2021.
- Bredehoeft, J.D., Neuzil, C.E., and Milly, P.C., 1983. Regional Flow in the Dakota Aquifer: A Study of the Role of Confining Layers. Alexandria, Virginia: U.S. Geological Survey, 1983. Water-Supply Paper 2237.
- Carter, J.M., Driscoll, D.G., Williamson, J.E., and Lindquist, V.A., 2002. Atlas of Water Resources in the Black Hills area, South Dakota. Rapid City South Dakota: U.S. Geological Survey, 2002. Hydrologic Investigations Atlas HA-747.
- Darton, N.H., 1909. Geology and Underground Waters of South Dakota. Water Supply Paper 227. U.S. Geological Survey, Washington D.C.
- Drinking Water Program. 2021. Drinking Water System Information. SD DANR – Drinking Water Program Online Database. Accessed December 15, 2021.
<<http://danr.sd.gov/des/dw/sysinfomap.aspx>>
- Fahrenbach, M.D., Steece, F.V., Sawyer, J.F., McCormick, K.A., McGillivray, G.L., Schulz, L.D., and Redden, J.A. 2010. South Dakota Stratigraphic Correlation Chart. Oil and Gas Investigations 3. SD DANR-Geological Survey, Vermillion, SD.
- Goodman, J.A., 2007. Report on Water Permit Application No. 6869-3, Lewis and Clark RWS. SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.
- Hedges, L.S., Burch, S.L., Iles, D.L., Barari, R.A., and Schoon, R.A., 1982. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa. Task 1:

- Bedrock Topography and Distribution, Task 2: Extent of Aquifers, Task 3: Ground-Water Storage, Task 4: Computerized Data Base, Final Report. U.S. Army Corps of Engineers Contract DACW 45-80-C-0185.
- 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.
- Kume, J., 1977. Geology and Water Resources of Charles Mix and Douglas Counties, South Dakota, Part II – Water Resources. South Dakota Geological Survey. Bulletin 22. Vermillion, SD.
- Mathiowetz, A.W., 2021. Personal Communication. 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. Vermillion, SD.
- Niehus, C.A., 1997. Major Aquifers in Lincoln and Union Counties, South Dakota. U.S. Geological Survey - Information Pamphlet 49. U.S. Geological Survey. Vermillion, SD.
- NOAA, 1982. Evaporation Atlas for the Contiguous 48 United State. NOAA Technical Report NWS 33.
- Schoon, R.A., 1971. Geology and Hydrogeology of the Dakota Formation in South Dakota. South Dakota Geological Survey Report of Investigations No. 104. Vermillion, SD.
- SDGS, 2021. South Dakota Geological Survey Lithologic Logs Database. Accessed December 13, 2021. <http://cf.sddanr.net/lithdb/>.
- Stephens, J.C., 1967. Geology and Water Resources of Clay County, South Dakota, Part II. Water Resources. South Dakota DANR-Geological Survey Bulletin 19, Vermillion, SD.
- Stonesifer, J.R., 2013. Water Availability of the Missouri: Elk Point Aquifer. SD DANR-Water Rights Program, Joe Foss Building, Pierre, SD.
- USGS, 2021. USGS Surface-Water Daily Statistics for the Nation, Stream Gage #06467500, Missouri River at Yankton, SD. Accessed December 16, 2021.
- Water Rights, 1987. Findings of Fact, Conclusions of Law, and Final Decision in the Matter of Water Permit Application No. 5136-3, Farmland Industries Inc of Huron, SD. DANR-Water Rights Program file for Water Right No. 2313-2. 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, 2021a. "1979-2020 Irrigation Summaries by Aquifer", SD DANR-Water Rights Program, Joe Foss Building, Pierre, SD.
- Water Rights, 2021b. Observation Well Data, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.
- Water Rights, 2021c. Water Right/Permit Files, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.
- Water Rights, 2021d. Well Completion Reports, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.
- Water Rights, 2021e. County Files, SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.
- Water Rights, 2021f. "1994-2020 Non-Irrigation Yearly Reports", SD DANR-Water Rights Program, Joe Foss Bldg, Pierre, SD.

AFFIDAVIT OF PUBLICATION

YANKTON DAILY PRESS AND DAKOTAN

RECEIVED

JAN 20 2022

WATER RIGHTS
PROGRAM

TR GOLF LLC
150 S OAK TREE LANE
DAKOTA DUNES SD 57049

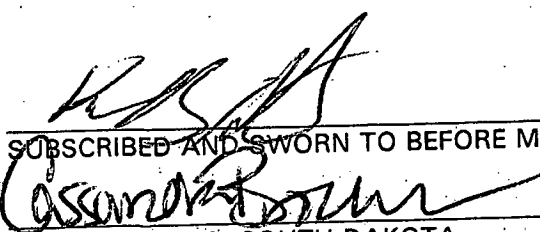
STATE OF SOUTH DAKOTA
COUNTY OF YANKTON

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
1 + 13 NOTICE OF APPLICATIO

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE
NEWSPAPER ON THE 13th DAY OF January, 2022
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION
OF SAID NOTICE TO WIT \$50.56 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: 01/13/2022

FILED ON: 01/13/2022


SUBSCRIBED AND SWORN TO BEFORE ME THIS 13th DAY OF January, 2022

NOTARY PUBLIC, SOUTH DAKOTA
MY COMMISSION EXPIRES 07/04/2026

NOTICE OF APPLICATION NOS. 8559-3 and 8560-3 to
Appropriate Water

Notice is given that TR Golf, LLC c/o Jay Layman, Mgr, 150 S Oak Tree Lane, Dakota Dunes SD 57049 has filed the following applications for a water permit. Application No. 8559-3 proposes to appropriate 3 acre-feet of water annually at a maximum pump rate of 3.11 cubic feet of water per second (cfs) from the Big Sioux River located in Govt Lot 3 Section 23 to fill two borrow pits (ponds) located in Govt Lot 3 Section 23 and Govt Lot 1 Section 26; all in T89N-R48W for recreational use on the golf course.

Application No. 8560-3 proposes to irrigate an additional 65 acres and increase the permitted diversion rate authorized by Water Permit No. 8510-3 by 0.12 cfs. Water Permit No. 8354-3 and 8510-3 each appropriate 1.11 cfs. Water Permit No 8354-3 authorizes one well completed into the Missouri:Elk Point Aquifer located in the NW1/4 NW 1/4 Section 26 and No. 8510-3 authorizes one well completed into the Dakota Aquifer located in the NE 1/4 NW 1/4 (Govt Lot 1) Section 26, both for irrigation of 30 acres located in the portions of the NW 1/4, Govt Lot 1 & 2 Section 26 and Govt Lot 3 Section 23; all in T89N-R48W. This application corrects the location of the Dakota Aquifer well which was completed in the NW 1/4 NE 1/4 (Govt Lot 1) Section 26-T89N-R48W and requests to irrigate an additional 65 acres located in the area described above from the wells authorized by Permit Nos. 8354-3 and 8510-3. Also, the diversion rate of 1.11 cfs from the Dakota Aquifer authorized by No. 8510-3 is being increased from 1.11 cfs to 1.23 cfs. This site is located on the east side of Dakota Dunes SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 8559-3 and 8560-3 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 Engineers recommendations with qualifications, the applications, and staff reports 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 the applications or recommendations 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 applications, or other matter concerning the applications 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 January 24, 2022.

The petition shall include a statement describing the unique injury upon approval of the applications on the petitioner, the petitioner's reasons for opposing the applications, 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 applications 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 January 24, 2022.

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

the applications or contesting the recommendations is filed, then a hearing will be scheduled, and the Water Management Board will consider the 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 \$50.56.

AFFIDAVIT OF PUBLICATION

RECEIVED

JAN 18 2022
State of South Dakota)
:SS
County of Union)
Bruce Odson,
the publisher of the Dakota Dunes / North Sioux City Times,
deposes and says that

The Dakota Dunes / North Sioux City Times
is a legal weekly newspaper of a general circulation, printed and published in North Sioux City, County of Union, State of South Dakota, and has been such legal newspaper during the time hereinafter mentioned, and that affidavit is and was during all the time hereinafter mentioned in charge of the advertising department thereof, and has personal knowledge of all the facts stated in this affidavit; and that the notice and advertisement headed:

Notice of Application Nos. 8559-3 and 8560-3

a printed copy of which is hereunto attached and made a part hereof, was printed and published in the said newspaper at least once in

each week for 1 successive weeks; that said newspaper at the time of the first publication of said notice hereinafter stated, had, and still has, a bona fide circulation of over two hundred paid copies weekly, and had been published in the said County of Union for more than one year immediately prior to the date of the said publication of said notice, and that said newspaper during said times, was, and is, printed in part in an office maintained at said city of North Sioux City, the said place of publication; that the first publication of said notice in said newspaper was

on Thursday, the 13 day of January, 2022

and that the succeeding publications were

on Thursday, the _____ day of _____

on Thursday, the _____ day of _____

on Thursday, the _____ day of _____

that the fees for the printing and publishing of said notice and advertisement in said newspaper as aforesaid were

\$ 52.54, that the full amount of the fee charged insures to the benefit of the publisher of the said newspaper, that no agreement or 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 other person whomsoever.

Subscribed and sworn to before me

this 13 day of January, 2022

My commission expires 7-12-23

SUSAN J. JOHNSON
NOTARY PUBLIC
SOUTH DAKOTA
Notary Public

NOTICE OF APPLICATION NOS. 8559-3 AND 8560-3 TO APPROPRIATE WATER

Notice is given that TR Golf, LLC c/o Jay Layman, Mgr, 150 S Oak Tree Lane, Dakota Dunes SD 57049 has filed the following applications for a water permit. Application No. 8559-3 proposes to appropriate 3 acre-feet of water annually at a maximum pump rate of 3.11 cubic feet of water per second (cfs) from the Big Sioux River located in Gov't Lot 3 Section 23 to fill two borrow pits (pools) located in Gov't Lot 3 Section 23 and Gov't Lot 1 Section 26; all in T89N-R48W for recreational use on the golf course.

Application No. 8560-3 proposes to irrigate an additional 65 acres and increase the permitted diversion rate authorized by Water Permit No. 8510-3 by 0.12 cfs. Water Permit No. 8354-3 and 8510-3 each appropriate 1.11 cfs. Water Permit No. 8354-3 authorizes one well completed into the Missouri:Elk Point Aquifer located in the NW 1/4 NW 1/4 Section 26 and No. 8510-3 authorizes one well completed into the Dakota Aquifer located in the NE 1/4 NW 1/4 (Gov't Lot 1) Section 26, both for irrigation of 30 acres located in the portions of the NW 1/4, Gov't Lot 1 & 2 Section 26 and Gov't Lot 3 Section 23; all in T89N-R48W. This application corrects the location of the Dakota Aquifer well which was completed in the NW 1/4 NE 1/4 (Gov't Lot 1) Section 26-T89N-R48W and requests to irrigate an additional 65 acres located in the area described above from the wells authorized by Permit Nos. 8354-3 and 8510-3. Also, the diversion rate of 1.11 cfs from the Dakota Aquifer authorized by No. 8510-3 is being increased from 1.11 cfs to 1.23 cfs. This site is located on the east side of Dakota Dunes SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 8559-3 and 8560-3 with qualifications because 1) inappropriate 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 recommendations with qualifications, the applications, and staff reports are available at <https://danr.sd.gov/public> or contact Ron Duval for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing the applications

or recommendations 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 applications, 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 January 24, 2022.

The petition shall include a statement describing the unique injury upon approval of the applications on the petitioner, the petitioner's reasons for opposing the applications, 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 applications 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 January 24, 2022.

If the applicant does not contest the recommendations of the Chief Engineer and no petition to oppose the applications is received, the Chief Engineer shall act on the applications pursuant to the recommendations with no hearing held before the Water Management Board. If a petition opposing the applications or contesting the recommendations is filed, then a hearing will be scheduled, and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition. Publish Jan. 13, 2022

Published once at the total approximate cost of \$52.54
T2-A-176



**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.**

January 6, 2022

TR Golf LLC
c/o Jay Layman
150 S Oak Tree Lane
Dakota Dunes SD 57049

Dear Mr. Layman:

Water Permit Application Nos. 8559-3 and 8560-3 for irrigation and recreation use have been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Dakota Dunes North Sioux City Times printed at North Sioux City (Ph # 605 232-3539) and the Press & Dakotan printed at Yankton (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 recommendations of the Chief Engineer and reports on the applications 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,

Karen Schlaak

Karen Schlaak
Water Rights Program
(605) 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendations, 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 applications.

NOTICE OF APPLICATION NOS. 8559-3 and 8560-3 to Appropriate Water

Notice is given that TR Golf, LLC c/o Jay Layman, Mgr, 150 S Oak Tree Lane, Dakota Dunes SD 57049 has filed the following applications for a water permit. Application No. 8559-3 proposes to appropriate 3 acre-feet of water annually at a maximum pump rate of 3.11 cubic feet of water per second (cfs) from the Big Sioux River located in Gov't Lot 3 Section 23 to fill two borrow pits (ponds) located in Gov't Lot 3 Section 23 and Gov't Lot 1 Section 26; all in T89N-R48W for recreational use on the golf course.

Application No. 8560-3 proposes to irrigate an additional 65 acres and increase the permitted diversion rate authorized by Water Permit No. 8510-3 by 0.12 cfs. Water Permit No. 8354-3 and 8510-3 each appropriate 1.11 cfs. Water Permit No 8354-3 authorizes one well completed into the Missouri:Elk Point Aquifer located in the NW1/4 NW 1/4 Section 26 and No. 8510-3 authorizes one well completed into the Dakota Aquifer located in the NE 1/4 NW 1/4 (Gov't Lot 1) Section 26, both for irrigation of 30 acres located in the portions of the NW 1/4, Gov't Lot 1 & 2 Section 26 and Gov't Lot 3 Section 23; all in T89N-R48W. This application corrects the location of the Dakota Aquifer well which was completed in the NW 1/4 NE 1/4 (Gov't Lot 1) Section 26-T89N-R48W and requests to irrigate an additional 65 acres located in the area described above from the wells authorized by Permit Nos. 8354-3 and 8510-3. Also, the diversion rate of 1.11 cfs from the Dakota Aquifer authorized by No. 8510-3 is being increased from 1.11 cfs to 1.23 cfs. This site is located on the east side of Dakota Dunes SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 8559-3 and 8560-3 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 recommendations with qualifications, the applications, and staff reports 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 the applications or recommendations 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 applications, or other matter concerning the applications 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's 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 January 24, 2022.

The petition shall include a statement describing the unique injury upon approval of the applications on the petitioner, the petitioner's reasons for opposing the applications, 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 applications 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 January 24, 2022.

If the applicant does not contest the recommendations of the Chief Engineer and no petition to oppose the applications is received, the Chief Engineer shall act on the applications pursuant to the recommendations with no hearing held before the Water Management Board. If a petition opposing the applications or contesting the recommendations is filed, then a hearing will be scheduled, and the Water Management Board will consider the 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_



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

MAR 01 2022

TR Golf LLC
c/o Jay Layman, Manger
150 S Oak Tree Lane
Dakota Dunes SD 57049

Dear Mr. Layman:

Enclosed are Water Permit Nos. 8559-3 and 8560-3 authorizing construction of the water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permist.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, are enclosed. Please return the 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

RECEIVED

APR 14 2022

WATER RIGHTS
PROGRAM

**NOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USE**

Date Apr 11, 2022

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

FROM: TR Golf LLC c/o Rodd Slater
(name)
150 S Oak Tree Ln
(address)
Dakota Dunes, SD 57049
(city, state, zip)

712 253-9124 cell
(phone)
605 232-3241

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. 8560-3 states that the water use system is to be constructed by 1/24/27, and water is to be put to beneficial use by 1/24/31.
(date) (date)

The water use system was completed on Apr. 2021.
(date)

Applying the water to beneficial use was completed on Apr Mar 16, 2022.
(date)

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

Rod Slater
(signature)





8560-3

**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

April 20, 2022

8559-3
8560-3

Rodd Slater
TR Golf LLC
150 S Oak Tree Ln
Dakota Dunes SD 57049

Dear Mr. Slater:

I am writing to acknowledge receipt of the "Notice of Completion of Works" forms that you sent in to let us know that you are completed with the water use systems authorized under Water Permit Nos. 8559-3 and 8560-3.

The systems are now ready for inspection. Inspections are done on a county-by-county basis as staff time permits. You have done everything you need to do and the intervening time between the completion of the projects and the staff inspection has no bearing on your water permits.

Someone from our office will contact you prior to the inspection to set up a time that is convenient for you. If you have any questions, please contact me.

Sincerely,

Genny McMath
Water Rights Program
(605) 773-3352
email: genny.mcmath@state.sd.us