

**WATER PERMIT NO. 8503-3**

Name of Applicant: Sorensen Family Farm LLC

Address: 2903 Sorensen Ave, Vermillion SD 57069 Phone: 605 670-7574

Amount of Water Claimed: 2.56 cfs Total Acres: 120

Source of Water Supply: groundwater (one well)

Water to be used for: irrigation County: Clay

Type of Waste Disposal System:

Location: 3 miles southwest of Vermillion

PRIORITY Date Received: 3-22-21 Application/License Fee: \$ 950

Corrected Application Received: Period of Annual Use: April 1 – Sept 30

Remarks: Permit Nos. 5579-3 and 7429-3 authorized irrigation of the same acreage from Missouri River

Diversion Point: NW 1/4 SE 1/4 Sec 1-T91N-R52E

Land to be Irrigated: portions of SE 1/4 NW 1/4, SW 1/4 NE 1/4, NE 1/4 SW 1/4, NW 1/4 SE 1/4, NE 1/4 SE 1/4 Sec 1-T91N-R52W and W 1/2 Sec 23-T32N-R4E (Nebraska Survey)

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Depth of Well: 130 feet deep

Well Driller:

Remarks:

Type of Map: topo

Prepared by:

Reviewed and the Number Assigned on: 3-22-21

By: **Karen Schlaak**

Notice of Hearing - date to intervene: \_\_\_\_\_

**SOUTH DAKOTA**  
**WATER PERMIT NO. 8503-3**

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Date of first receipt of application March 22, 2021.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8503-3 to Sorensen Family Farm LLC, c/o Grant Sorensen, 2903 Sorensen Ave, Vermillion SD 57069 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 8503-3 appropriates 2.56 cubic feet of water per second (cfs) from one well to be completed into the Missouri:Elk Point Aquifer (approximately 130 feet deep) located in the NW 1/4 SE 1/4 Section 1-T91N-R52W for irrigation of 120 acres located in the SE 1/4 NW 1/4, SW 1/4 NE 1/4, NE 1/4 SW 1/4, NW 1/4 SE 1/4, NE 1/4 SE 1/4 Section 1-T91N-R52W and portions of the W 1/2 Section 23-T32N-R4E (Nebraska Survey). Water Right No. 5579-3 and Water Permit No. 7429-3 authorize irrigation of the same acreage from the Missouri River. This site is located approximately 3 miles south of Vermillion 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: April 1 – September 30.
3. The date from which applicant may claim right is March 22, 2021.
4. The date of approval of Permit No. 8503-3 is July 5, 2021.
5. One-fifth of the construction is to be completed on or before January 5, 2024.
6. All construction is to be completed on or before July 5, 2026.
7. Water is to be put to beneficial use on or before July 5, 2030.
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 well approved under Water Permit No. 8503-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 8503-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. Pursuant to SDCL 46-5-6 which allows a greater diversion rate if the method of irrigation, time constraints, or type of soils so requires, Permit No. 8503-3 authorizes a maximum diversion rate of 2.56 cfs for the irrigation of 120 acres with an annual volume not to exceed 2 acre feet of water per acre per year.
4. 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

**JUL 13 2021**

date



MAR 22 2021

FORM 2: Application for irrigation in South Dakota  
(type or print)WATER RIGHTS  
PROGRAM

PAID

MAR 22 2021

Ck# 2797

|                                                                                                         |                             |                                                      |
|---------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------|
| Mail to:<br><br>DENR - Water Rights<br>523 E Capitol Ave<br>Pierre, SD 57501-3182<br>ph. (605) 773-3352 | No. <u>8503-3</u>           | (office use only)<br>Hydrologic Unit <u>10170101</u> |
|                                                                                                         | Basin <u>Missouri River</u> |                                                      |
|                                                                                                         | Newspaper <u>Plain Talk</u> |                                                      |
|                                                                                                         | <u>Press &amp; Dakotian</u> |                                                      |

## Application For Permit To Appropriate Water For Irrigation

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

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

1. Name to Appear on Irrigation Permit Sorensen Family Farm, LLC Grant Sorensen, Administrator

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

Mailing Address 2903 Sorensen Ave. Vermillion ☒ SD ☒ 57069  
(Address) (City) (State) (Zip Code)

Phone \_\_\_\_\_ Mobile 605-670-7574 Email \_\_\_\_\_

2. Amount of water claimed 2.56 \*CFS or 1150 \*\*GPM \_\_\_\_\_ \*\*\*AF Total Acreage 120  
(\*Cubic Feet per Second) (\*\*Gallons per Minute) (\*\*\*)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply 1 Well in the Elk Point:Missouri Aquifer4. Location of point of diversion Nw of SE of Section 1, T91nR52w

(example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)

County Clay ☒5. County or counties where water will be used Clay6. Annual period during which water is to be used April 1-Sept 30

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 |
|-----------------------------------------|-------|----------------------------------------|-------|
| se of nw of Sect. 1, T91nR52w (5579-3)  | 5     | ne of se of Sect. 1, T91nR52w (5579-3) | 2     |
| sw of ne of Sect. 1, T91nR52w, (5579-3) | 19    | portions W1/2Sec23T32nR4e (see 7429-3) | 41    |
| ne of sw of Sect. 1, T91nR52w (5579-3)  | 29    | (Nebraska Survey)                      |       |
| nw of se of Sect. 1, T91nR52w (5579-3)  | 25    |                                        |       |

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

Center pivot irrigation under 3 pivots (see attached photos) on the above listed properties. This application proposes to irrigate land now irrigated from the Missouri River under permits 5579-3 and 7429-3 from a new well to be drilled at the location indicated in Item 4 above and on the enclosed air photo. We are requesting a diversion rate greater than the statutory limit to accomodate windshield wiper methods on all 3 pivots as well as to better serve need of sandy silt soils which requires faster watering rates to sustain the crops.

I, Eric Sorensen (President), the applicant, certify under  
Name of Person Title (if applicable)

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

**Supplemental Information**

(type or print)

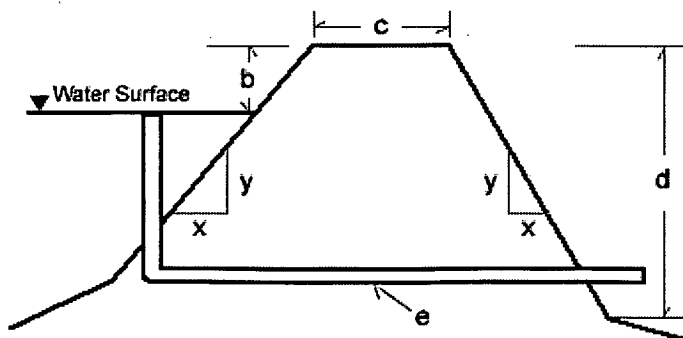
**1. Well Information** (check one or both as applicable) ☒ Drilling new well(s) ☐ Using existing well(s)a) If new wells, how many 1 Have test holes been drilled ☒ Yes ☐ No Drilled by Heine Electric & Irrigation, Inc.  
(if yes, please provide copies of logs)b) If existing wells, how many      Provide copy of log(s), if available. Drilled by     

For either Existing or Proposed Wells:

c) Well Depth (required) 130 Depth to Top of Water Bearing Material 69 Depth to Water from Surface 20d) Distance to nearest domestic well on applicant's property > 7000' Property owned by others > 8000'**2. Wastewater Disposal System Information**a) Type of System (i.e. septic tank, drain field)     b) System Capacity (gallons)      Year Constructed     c) Connected to the City of      Sanitary System     **3. Dugout Information**a) Surface Dimensions      Depth     b) Depth to water (ground surface to water level)     **4. Water Storage Dams**

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

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

b) Freeboard     c) Crest Width     Crest Length     d) Height     e) Primary Outlet Capacity     If pipe, diameter     f) Secondary Spillway Capacity     Spillway Width     

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

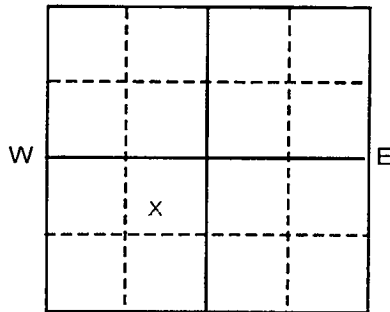
Upstream     Downstream     h) Surface Area of Impoundment     i) Storage      Acre Feetj) Drainage Area Above Dam      Acres

## SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE 1/4 SW 1/4 Sec 1 Twp 91 Rg 52WCounty CLAY

North

Please mark well  
location with an "X"

Well Completion Date

May 11, 2020

1 Mile

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

## PROPOSED USE:

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

## METHOD OF DRILLING:

MUD ROTARY

## CASING DATA:

☐ Steel ☐ Plastic ☐ Other

If other describe \_\_\_\_\_

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

## GROUTING DATA:

| Grout Type | No. of Sacks | Grout Weight | From   | To       |
|------------|--------------|--------------|--------|----------|
| ENTONITE   | 6            | 9.5 Lb/gal   | 0.0 Ft | 135.0 Ft |
|            |              | Lb/gal       | Ft     | Ft       |

Describe grouting procedure

REMIE METHOD

## SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter \_\_\_\_\_ Inches Length \_\_\_\_\_ Feet

Material \_\_\_\_\_

Slot Size \_\_\_\_\_ Set From \_\_\_\_\_ Feet to \_\_\_\_\_ Feet

Other information \_\_\_\_\_

## WAS A PACKER OR SEAL USED?

☐ Yes ☐ No

If so, what material? \_\_\_\_\_

Describe packer(s) and location \_\_\_\_\_

## DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? \_\_\_\_\_  
☐ No, Why Not? \_\_\_\_\_

 Lab to which water  
 quality sample sent for analysis
Well Owner: GRANT SORENSENBusiness Name: SORENSEN FAMILY FARMSAddress: 2903 SORENSEN AVECity, State, Zip: VERMILLION SD 57069

## WELL LOG:

| FORMATION                | DEPTH |     |
|--------------------------|-------|-----|
|                          | FROM  | TO  |
| GRAY FINE SAND           | 0     | 27  |
| TREE (WOOD)              | 27    | 28  |
| FINE GRAY SAND           | 28    | 58  |
| GRAY CLAY                | 58    | 59  |
| FINE GRAY SAND           | 59    | 69  |
| MEDIUM TO COARSE GRAVEL  | 69    | 95  |
| CORSE GRAVEL SMALL ROCKS | 95    | 120 |
| SMALL GRAVEL             | 120   | 132 |
| BROWN CLAY               | 132   | 135 |

## STATIC WATER LEVEL

If flowing: closed in pressure \_\_\_\_\_ FEET 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

LONGITUDE: 42.726481

LATITUDE: 96.931489

ELEVATION: 1129

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

Signature of License Representative: \_\_\_\_\_

Signature of Well Owner or Equitable Property Holder: \_\_\_\_\_

Date: 5-21-20

#copy# Mailed 5/21/20

# Sorensen Irrigation

## Legend

 Current pumping station

Sorensen 4 tower  NE Corner, Sec 1, T91nR52w

Sorensen Ave

Sorensen 2 tower 

proposed Dakota SS well  
Sorensen 9 tower  Current pumping station

Google Earth



4000 ft

# Proposed amendment Permit 5579-3

Write a description for your map.

hog confinements

Sorensen 4 tower

well/pivot point

Sorensen 2 tower

Proposed well

Sorensen 9 tower

Sorensen

7429-3

5579-3

# Sorensen Irrigation

## Legend

 Current pumping station

proposed Dakota SS well  
Sorensen 9 tower

 Current pumping station

Google Earth

© 2021 Google



900 ft

2016

## ANNUAL REPORT

FILE DATE 6/29/2016

RECEIPT NO 431298

Enter Filing Year

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

## DOMESTIC LLC

SDCL 47-34A-211; 59-11-24, 24.1

Please Type or Print Clearly In Ink

FILING FEE: \$50.00 Make check payable to SECRETARY OF STATE

## 1. LLC ID and Name:

DL004735

Enter LLC ID

SORENSEN FAMILY FARM, L.L.C.

Enter LLC Name

2. The jurisdiction under whose law it is formed SOUTH DAKOTA

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

15 MUIERFIELD CT

VERMILLION

SD

57069

Actual Street Address or Rural Route Box Number

City

State

ZIP+4

Mailing Address, if Different from Street Address

City

State

ZIP+4

## 4. The name of the South Dakota Registered Agent

Agent Name:

THOMAS J. JOHNSON

431 N PHILLIPS AVE STE 300

SIOUX FALLS

SD

57104-5933

Actual Street Address or Rural Route Box Number in This State

City

State

ZIP+4

PO BOX 2315

SIOUX FALLS

SD

57101-2315

Mailing Address in This State, if Different from Street Address

City

State

ZIP+4

## 5. The names and business addresses of its principal officers and directors (governors). If, pursuant to SDCL 59-11-24, the board of directors has been eliminated, list the names of the shareholders.

GRANT N SORENSEN

2903 SORENSEN AVE

VERMILLION

SD

57069

Manager

Actual Street Address

City

State

ZIP+4

No person may execute this report knowing it is false in any material aspect. Any violation is subject to a civil penalty (SDCL 47-1A-129).

Dated 06/29/2016

Signature Accepted Electronically

(Signature of an Authorized Person)

GRANT N SORENSEN

(Printed Name)

\*By signing this form you agree to have both the fee and the form processed electronically.  
A fee of up to \$40 will be assessed for returned payments.

6/29/2016 5:40:18 PM

# RECEIPT

## WATER RIGHTS PROGRAM South Dakota Department of Environment and Natural Resources

Date March 22, 2021

RECEIVED OF Sorensen Family Farm LLC 2903 Sorensen Ave Vermillion SD 57069

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

|                                                                                                                        |          |
|------------------------------------------------------------------------------------------------------------------------|----------|
| Fee for Application for Permit No. <u>8503-3</u> to Appropriate Water, to construct and to put water to beneficial use | \$750.00 |
| Fee for Application for Permit No. _____ to Appropriate Water for Future use                                           | \$       |
| Fee to retain Future Use Permit No. _____ after period of seven years.                                                 | \$       |
| Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>8503-3</u>            | \$200.00 |
| Fee for Filing Transfer Form _____                                                                                     | \$       |
| Fee for _____                                                                                                          | \$       |
| Fee for Issuing New Well Driller's License No. _____                                                                   | \$       |
| Fee for Renewal of Well Driller's License No. _____                                                                    | \$       |
| Fee for Issuing Well Pump Installer's License No. _____                                                                | \$       |
| Fee for Renewal of Well Pump Installer's License No. _____                                                             | \$       |
| (Any Other Work Provided by Law)                                                                                       |          |
| TOTAL                                                                                                                  | \$950.00 |

By *Eric Gronlund*  
Chief Engineer  
*vm*



**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. 8503-3, Sorensen Family Farm LLC.**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 8503-3, Sorensen Family Farm LLC, c/o Grant Sorensen, Administrator, 2903 Sorensen Avenue, Vermillion SD 57069.

The Chief Engineer is recommending APPROVAL of Application No. 8503-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. The well approved under Water Permit No. 8503-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 8503-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. Pursuant to SDCL 46-5-6 which allows a greater diversion rate if the method of irrigation, time constraints, or type of soils so requires, Permit No. 8503-3 authorizes a maximum diversion rate of 2.56 cfs for the irrigation of 120 acres with an annual volume not to exceed 2 acre feet of water per acre per year.
4. 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  
June 14, 2021

# **REPORT TO THE CHIEF ENGINEER**

**Water Permit Application No. 8503-3**

**Sorensen Family Farm, LLC**

**June 8th, 2021**

Water Permit Application No. 8503-3 proposes to appropriate water for irrigation of 120 acres at a maximum diversion rate of 2.56 cubic feet per second (cfs) from one well. The proposed well is to be completed into the Missouri: Elk Point aquifer with an approximate depth of 130 feet and located in NW  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 1 T91N-R52W. The acres to be irrigated are located in the SE  $\frac{1}{4}$  NW  $\frac{1}{4}$ , SW  $\frac{1}{4}$  NE  $\frac{1}{4}$ , NE  $\frac{1}{4}$  SW  $\frac{1}{4}$ , NW  $\frac{1}{4}$  SE  $\frac{1}{4}$ , NE  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 1 T91N-R52W and portions of the W  $\frac{1}{2}$  Section 23 T32N-R4E (Nebraska survey). These acres are also authorized for irrigation by Water Right No. 5579-3 and Water Permit No. 7429-3, both withdrawing from the Missouri River. This application is located approximately 3 miles south of Vermillion, SD in Clay County. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres.

**AQUIFER: Missouri: Elk Point (M:EP)**

## **HYDROGEOLOGY**

The Elk Point management unit of the Missouri aquifer consists of unconsolidated glacial outwash deposits composed of materials ranging from fine sand to very coarse gravel (Niehus, 1994; Stephens, 1967). The Missouri: Elk Point aquifer in South Dakota is located in Yankton, Clay, and Union Counties, underlying the flood plains of the Missouri and Big Sioux Rivers. Hedges et al. (1982) estimated the areal extent of the aquifer to be 219,100 acres, with 3,287,100 acre-feet of recoverable water in storage. The movement of groundwater within the aquifer is generally from the northwest to the southeast, and towards the Missouri River (Stephens, 1967). The Missouri: Elk Point aquifer is hydraulically connected to the Lower Vermillion Missouri and Lower James Missouri aquifers, and the Missouri, Vermillion, and Big Sioux Rivers (Niehus, 1994; Stephens, 1967).

Hydrologically, the Elk Point management unit can be found under both confined and unconfined conditions. Near the edge of the floodplain, the Missouri: Elk Point is overlain by relatively impermeable glacial till (Niehus, 1994; Stephens, 1967). A well completion report submitted with the application for a test hole at the proposed location shows that the aquifer at this location is comprised of gravel from approximately 69 to 132 feet below ground surface, overlain primarily with fine sand and a thin layer of gray clay (Water Rights, 2021b). The depth to water as indicated on the permit application form is 20 feet.

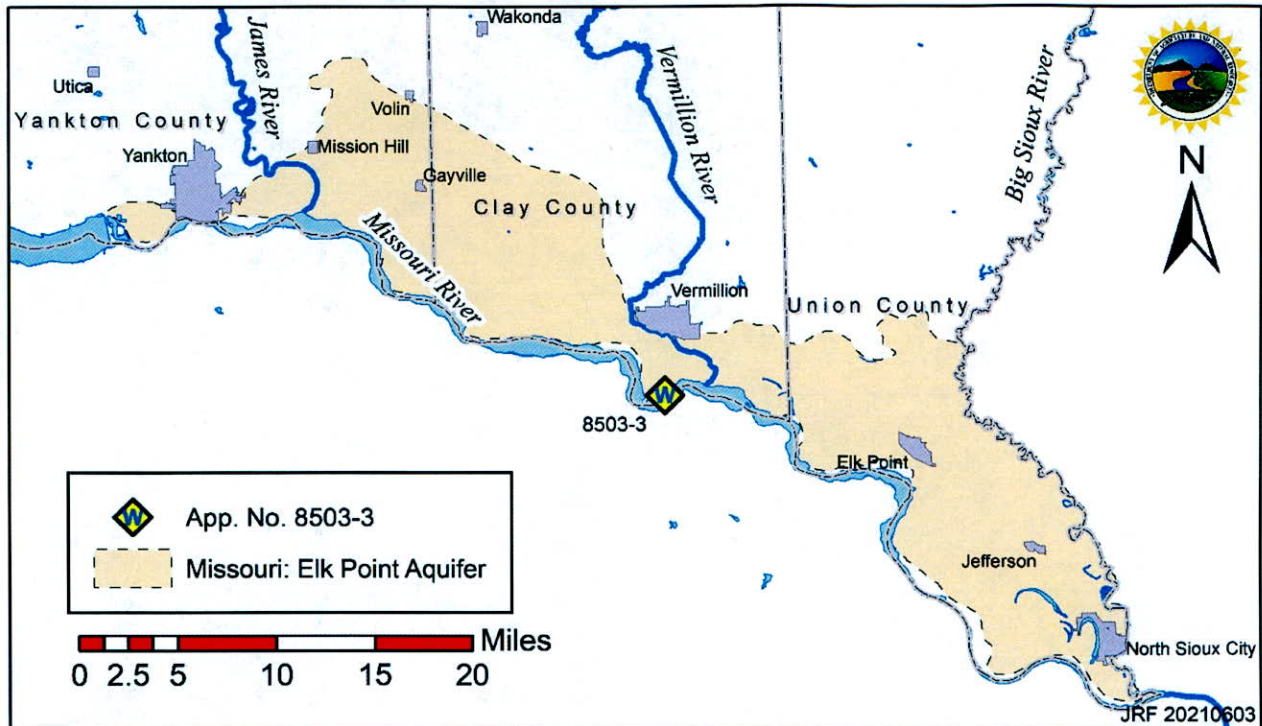


Figure 1. Map showing the location of the proposed diversion and Missouri: Elk Point aquifer boundaries as shown from Hedges et al. (1982).

#### 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 proposed diversion can be developed without unlawful impairment of existing rights and that the proposed use is a beneficial use and in the public interest. This report will address the availability of unappropriated water and potential for unlawful impairment of existing water rights within the Missouri: Elk Point aquifer.

#### Water Availability

The probability of unappropriated water available from an aquifer can be evaluated by considering SDCL 46-6-3.1, which requires "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source." If the source of the water is older than or stratigraphically lower than the Greenhorn Formation and a water distribution system as defined by SDCL 46-1-6 (17) has applied for a permit, the Board need not take into consideration the balance of aquifer recharge and withdrawal. Here, the water source is not older or lower than the Greenhorn Formation and a water distribution system is not involved. Therefore, the balance of withdrawal and recharge must be considered.

## **Hydrologic Budget**

### *Recharge*

Recharge to the Missouri: Elk Point aquifer occurs through infiltration of precipitation, inflow from the Lower Vermillion-Missouri aquifer, leakage from the Dakota aquifer, and inflow from surface water (Bugliosi, 1986; Niehus, 1994; Stephens, 1967). From analysis of data from 20 observation wells, Hedges et al. (1985) estimated the recharge to the unconfined portions of the Missouri: Elk Point aquifer to be 3.8 inches per year. The analysis by Hedges et al. (1985) assumed a specific yield of 0.15, which is on the more conservative side of specific yield values for sand and gravel aquifers (Sterrett, 2007). The areal extent of the Missouri: Elk Point aquifer is 219,100 acres (Hedges et al., 1982), resulting in an estimated recharge to the aquifer of approximately 69,382 ac-ft/yr. By using observation well data, the data simultaneously represents both withdrawals from and recharge to the aquifer, as those processes occur concurrently. When the recharge is greater than discharge, this method produces a lower than actual recharge rate. The same holds true when discharge is greater than recharge, the calculated discharge rate is lower than the actual discharge rate.

The wells for the Lewis and Clark Rural Water System (RWS) induce recharge to the aquifer from the Missouri River, and Stonesifer (2013) estimated that this amount is at least 50% of their total pumpage. Assuming all of their wells are similar in location with regards to the Missouri River, and the Lewis and Clark RWS uses their full appropriation (current permits and reserved future uses), the Missouri: Elk Point aquifer would gain at least 22,582 ac-ft/yr through induced recharge. Other water rights/permits within the Missouri: Elk Point aquifer may also induce recharge from the Missouri, Vermillion, James, or Big Sioux Rivers, although this amount has not been quantified.

Combining the estimated recharge of Hedges et al. (1985), and the induced recharge for the current appropriations of the Lewis and Clark Rural Water System, the estimated average annual recharge to the Missouri: Elk Point aquifer is approximately 92,000 ac-ft/yr.

### *Discharge*

Discharge from the Missouri: Elk Point aquifer occurs through well withdrawals, evapotranspiration from areas where the aquifer is at or near the land surface, and outflow to the Missouri and Big Sioux Rivers (Bugliosi, 1986; Niehus, 1994; Stephens, 1967). Currently, there are 629 Water Rights/Permits appropriating water from the Missouri: Elk Point aquifer including future use permits and there are currently no other pending applications (Water Rights, 2021a). Table 1 shows a summary of non-irrigation Water Rights/Permits with their appropriation and estimated annual use. The amount of water that can be expected to be withdrawn can be estimated by assuming water rights/permits limited by an annual volume will pump the entire volume appropriated annually, water rights/permits limited only by diversion rate will pump at the maximum permitted diversion rate 60 percent of the time, and future use permits will be fully developed. In some cases, individual water rights are required to report their annual water usage to the Chief Engineer; their reported usage is included in Table 2.

Report on Water Permit Application No. 8503-3

**Table 1: Summary and estimated use of non-irrigation water rights/permits including future use permits (Water Rights, 2021a)**

| Water Right No. | Water Right Status | Type of Use | Water Right Holder                     | Appropriation – Annual Volume Limit (ac-ft) | Appropriation – Diversion Rate Limit (cfs) | Estimated Use (ac-ft) |
|-----------------|--------------------|-------------|----------------------------------------|---------------------------------------------|--------------------------------------------|-----------------------|
| 143-3           | LC                 | MUN         | CITY OF VERMILLION                     |                                             | 1.780                                      | 773.7                 |
| 147-3           | LC                 | MUN         | CITY OF VERMILLION                     |                                             | 2.660                                      | 1,156.2               |
| 1255-3          | LC                 | MUN         | CITY OF ELK POINT                      |                                             | 1.130                                      | 491.2                 |
| 1965-3          | LC                 | MUN         | TOWN OF GAYVILLE                       |                                             | 0.370                                      | 160.8                 |
| 4207-3          | LC                 | MUN         | TOWN OF JEFFERSON                      |                                             | 0.900                                      | 391.2                 |
| 4501-3          | LC                 | COM         | EDDIE WOHL                             |                                             | 0.050                                      | 21.7                  |
| 5021-3          | LC                 | IND         | VISHAY-DALE ELECTRONICS INC            |                                             | 0.100                                      | 43.5                  |
| 5118-3          | LC                 | MUN         | TOWN OF GAYVILLE                       |                                             | 0.330                                      | 143.4                 |
| 5388-3          | LC                 | IND         | L G EVERIST INC                        |                                             | 0.450                                      | 195.6                 |
| 5437-3          | LC                 | MUN         | DAKOTA DUNES COMM IMPROVEMENT DISTRICT |                                             | 3.330                                      | 1,447.5               |
| 5453-3          | LC                 | IND         | AALADIN INDUSTRIES INC                 |                                             | 0.050                                      | 21.7                  |
| 5490-3          | LC                 | FWP         | US GEOLOGICAL SURVEY                   |                                             | 0.090                                      | 39.1                  |
| 5581-3          | LC                 | SHD         | LARSON'S LANDING                       |                                             | 0.089                                      | 38.7                  |
| 5592-3          | LC                 | SHD         | EAST WINDS COURT INC                   |                                             | 0.110                                      | 47.8                  |
| 5593-3          | LC                 | IND         | VISHAY-DALE ELECTRONICS INC            |                                             | 0.056                                      | 24.3                  |
| 5616-3          | LC                 | COM         | CIMPLS INC                             |                                             | 0.440                                      | 191.3                 |
| 5782-3          | LC                 | MUN         | CITY OF NORTH SIOUX CITY               |                                             | 1.140                                      | 495.5                 |
| 5827-3          | LC                 | COM         | DON LANTIS                             |                                             | 0.022                                      | 9.6                   |
| 5832-3          | FU                 | RWS         | LEWIS & CLARK RWS                      | 0.00                                        |                                            | 0.0                   |
| 5907-3          | LC                 | FWP         | US FISH/WILDLIFE SERVICE               |                                             | 3.780                                      | 1,643.1               |
| 5953-3          | LC                 | COM         | H & K OIL CO                           |                                             | 0.037                                      | 16.1                  |
| 6151-3          | LC                 | COM         | VERNON & NORMA VAKOC                   |                                             | 0.670                                      | 291.2                 |
| 6170-3          | LC                 | IND         | CONCRETE MATERIALS                     |                                             | 0.222                                      | 96.5                  |
| 6236-3          | LC                 | MUN         | CITY OF VERMILLION                     | 1,161.00                                    | 2.600                                      | 1,161.0               |
| 6237-3          | FU                 | MUN         | CITY OF VERMILLION                     | 1,900.00                                    |                                            | 1,900.0               |
| 6354-3          | LC                 | MUN         | CITY OF VERMILLION                     |                                             | 0.022                                      | 9.6                   |
| 6580-3          | LC                 | COM         | WEST SHORE ACRES LLC                   |                                             | 0.100                                      | 43.5                  |
| 6733-3          | LC                 | FWP         | US FISH/WILDLIFE SERVICE               |                                             | 1.110                                      | 482.5                 |
| 6736-3          | PE                 | RWS         | LEWIS & CLARK RWS                      | 20,165.00                                   | 27.850                                     | 20,165.0              |
| 6744-3          | PE                 | DOM, COM    | JUDITH I GRANT                         |                                             | 0.780                                      | 339.0                 |

# Report on Water Permit Application No. 8503-3

|         |    |           |                                 |           |        |          |
|---------|----|-----------|---------------------------------|-----------|--------|----------|
| 6869-3  | FU | RWS       | LEWIS & CLARK RWS               | 3,535.00  |        | 3,535.0  |
| 6869A-3 | FU | RWS       | LEWIS & CLARK RWS               | 0.00      |        | 0.0      |
| 7059-3  | PE | REC       | WE INVESTMENTS LLC              |           | 3.110  | 1,351.8  |
| 7094-3  | LC | FWP       | US FISH/WILDLIFE SERVICE        |           | 2.670  | 1,160.6  |
| 7207-3  | PE | RWS       | LEWIS & CLARK RWS               | 12,000.00 | 20.000 | 12,000.0 |
| 7208-3  | FU | RWS       | LEWIS & CLARK RWS               | 9,465.00  |        | 9,465.0  |
| 7388-3  | PE | DOM, IRR  | CLAY RURAL WATER SYSTEM INC     |           | 2.000  | 869.4    |
| 8031-3  | PE | COM       | DAKOTA PROTEIN CONVERSION INC   |           | 0.220  | 95.6     |
| 8040-3  | LC | IRR*, COM | HEINE ELECTRIC & IRRIGATION INC |           | 0.330  | 143.4    |
| 8147-3  | PE | COM, LCO  | DOUG LAFLEUR                    | 160.00    | 1.000  | 160.0    |
| 8212-3  | LC | MUN       | CITY OF YANKTON                 | 6,050.00  | 20.120 | 6,050.0  |
| 8381-3  | PE | COM       | R P CONSTRUCTORS                | 1.00      | 0.040  | 1.0      |
| 8403-3  | PE | COM       | STOCKMEN'S LIVESTOCK INC        | 40.00     | 2.000  | 40.0     |
| 8415-3  | PE | COM       | RC INVESTMENTS LLC              | 25.00     | 0.100  | 25.0     |
| 8435-3  | PE | COM       | SIOUX CITY INSULATION           | 1.00      | 0.330  | 1.0      |
|         |    |           |                                 |           | Total  | 66,738.3 |

FU = Reserved for Future Use, LC = Licensed, PE = Permitted

COM = Commercial, DOM = Domestic, FWP = Fish & Wildlife Propagation, IND = Industrial, IRR\*=Irrigation (not required to submit irrigation questionnaire),  
MUN =Municipal, REC = Recreation, RWS = Rural Water System, SHD = Suburban Housing Development,

Table 2: Reported annual water use in acre-feet from non-irrigation water rights/permits for the years 2006 to 2020 (Water Rights, 2021a)

|      | Clay<br>RWS        | Lewis &<br>Clark<br>RWS | City of<br>Vermillion | Dakota<br>Protein<br>Conversion<br>Inc | Doug<br>LaFleur | RP<br>Constructors | Stockmen's<br>Livestock<br>Inc | RC<br>Investments<br>LLC |
|------|--------------------|-------------------------|-----------------------|----------------------------------------|-----------------|--------------------|--------------------------------|--------------------------|
|      | 5998A-3,<br>7388-3 | 6736-3,<br>7207-3       | 147-3,<br>6236-3      | 8031-3                                 | 8147-3          | 8381-3             | 8403-3                         | 8415-3                   |
| 2006 | 170                |                         | 1,252                 |                                        |                 |                    |                                |                          |
| 2007 | 217                |                         | 1,344                 |                                        |                 |                    |                                |                          |
| 2008 | 213                |                         | 1,199                 |                                        |                 |                    |                                |                          |
| 2009 | 215                |                         | 1,140                 |                                        |                 |                    |                                |                          |
| 2010 | 183                |                         | 1,071                 |                                        |                 |                    |                                |                          |
| 2011 | 137                | 92                      | 1,127                 |                                        |                 |                    |                                |                          |
| 2012 | 525                | 3,836                   | 1,317                 |                                        |                 |                    |                                |                          |
| 2013 | 301                | 9,368                   | 1,183                 |                                        |                 |                    |                                |                          |
| 2014 | 307                | 11,532                  | 1,121                 |                                        |                 |                    |                                |                          |
| 2015 | 278                | 15,591                  | 1,161                 |                                        |                 |                    |                                |                          |
| 2016 | 231                | 17,091                  | 1,175                 |                                        |                 |                    |                                |                          |
| 2017 | 276                | 18,051                  | 1,215                 | 0                                      | 202             |                    |                                |                          |

Report on Water Permit Application No. 8503-3

|         |       |          |         |     |       |       |     |     |
|---------|-------|----------|---------|-----|-------|-------|-----|-----|
| 2018    | 305   | 18,143   | 1,168   | 0   | 98    |       |     |     |
| 2019    | 292   | 20,397   | 1,440   | 0   | 135   | 0.017 | 1   |     |
| 2020    | 461.1 | 21,039   | 1,373.1 | 0   | 121.3 | 0.022 | 4.2 | 0   |
| Max     | 525   | 21,039   | 1,440   | 0   | 202   | 0.022 | 4.2 | 0   |
| Min     | 137   | 92       | 1,071   | 0   | 98    | 0.017 | 1   | 0   |
| Average | 274.1 | 13,514.0 | 1,219.1 | 0.0 | 139.1 | 0.020 | 2.6 | 0.0 |

The reported usage for these non-irrigation permits shows that the usage for the City of Vermillion has remained steady over the years of record. Water Right No. 147-3 has a diversion rate of 2.66 cfs and Water Right No. 6236-3 is limited to an annual volume of 1,161 ac-ft. Combined, these two water rights are estimated to use 2,317.2 ac-ft/yr, however the average actual reported usage is 1,219.1 ac-ft/yr. The Clay RWS added Water Permit No. 7388-3 to their system in 2012, so the expected usage from their permits is greater than the average shown, additionally, their reported usage on Water Right No. 5998A-3 has already been included as part of the turf irrigation estimate. The Lewis & Clark RWS is still under development and the usage will continue to grow. The remaining non-irrigation water rights that are required to report their annual usage have too few years of reported withdrawals to reliably estimate their average annual use and were estimated using their diversion limits. Using the average actual reported use from the City of Vermillion instead of the appropriated amount, reduces the estimated use from non-irrigation water rights/permits by 1,098.1 ac-ft/yr to 65,640.2 ac-ft/yr.

In addition to the reduction in the total estimated use by using the average actual reported use, the estimated use for other water rights can be further reduced from their estimated use in Table 1. Water Permit No. 7059-3 for recreational use is for maintaining the water level in a small lake with a surface area of 17.6 acres; it is assumed that the only consumptive use of this water is due to evaporation. Annual evaporation of water from shallow lakes is estimated to be 42 inches per year at this location (NOAA, 1982) and average annual precipitation at the Sioux City, IA airport was determined to be 27.74 inches over the 30 year period of 1981 to 2010 (Arguez et al., 2010), resulting in an approximate estimated use of 20.9 ac-ft per year. This is a reduction of 1,330.9 ac-ft per year from the estimated use of 1351.8 ac-ft per year. Water Right Nos. 1965-3 and 5118-3 held by the Town of Gayville, SD, and Water Right No. 5592-3 held by East Winds Court, Inc. can all be estimated as withdrawing no water, as these systems are hooked up to rural water systems and maintain their water rights for standby use. These three water rights that are maintained for standby use reduces the estimated withdrawals by 352 ac-ft/yr. These additional reductions in estimated withdrawals total 1,682.9 ac-ft/yr, resulting in the total estimated use from non-irrigation water rights/permits being further reduced to 63,957.3 ac-ft/yr

There are a number of domestic wells on file that withdraw water from the Missouri: Elk Point aquifer, however the magnitude of their withdrawals is small, and since the introduction of rural water systems, many of these wells may no longer be in use (Water Rights, 2021b). The annual quantity of water withdrawn for domestic uses is considered to be negligible to the hydrologic budget of the aquifer.

Water Rights data from 2021 shows that there are 584 water rights/permits permitted for irrigation and required to submit an irrigation questionnaire (Water Rights, 2021a). Farmer (2018) analyzed the irrigation data from 1979 to 2016, and determined that from 1979 to 2005, the number of acres permitted for irrigation in the Missouri: Elk Point aquifer remained steady. Figure 2 shows the acres permitted for crop irrigation from 1979 to 2020 and the yearly total reported pumpage for the irrigation permits.

After 2006, for a number of reasons, there was an increase in the number of applications for permits, and that increase in permits also adjusted the long-term ratio of constructed to unbuilt irrigation systems. For estimating usage from irrigation water rights/permits, the reported withdrawals from 1979 to 2005 was used. Farmer (2018) calculated that the average application rate on all acres permitted for irrigation is 0.35 ft/yr (a little less than 4.2 inches/yr) from 1979 to 2005. Revising the analysis of Farmer (2018) by completely separating turf irrigation from crop irrigation, resulted in an average application rate for the years of 1979 through 2005 on permitted acres for crop irrigation of 0.343 ft/yr (or 4.11 inches/yr). The average application rate for the same years of 1979 through 2005 on permitted acres for turf irrigation was 0.97 ft/yr (or 11.63 inches/yr).

Currently, the total number of permitted acres for irrigation is 81,623.14 acres. Of these permitted acres, there are 13 water rights/permits shown in Table 3 that are irrigating a total of 737.6 acres of turf, and due to the water requirements of turf, the estimated usage should be determined separately from crop irrigation. For the purposes of estimation, it had previously been assumed that turf irrigation will use their full appropriation, which would result in an estimated average annual use of 1,877.7 ac-ft per year. However, if the acres of turf are irrigated with the reported average annual application rate of 0.97 ft/yr, the estimated average annual use falls to 715.5 ac-ft per year. Applying the average application rate of 0.343 ft/yr on the remaining 80,885.54 permitted acres results in an estimated average annual use for crop irrigation purposes of 27,744 ac-ft/yr. The total estimated average annual use for both types of irrigation is 28,459.5 ac-ft/yr. This application, if approved, is for the irrigation of 120 acres of crops, and using the average application rate, the estimated average annual use is 41.16 ac-ft/yr.

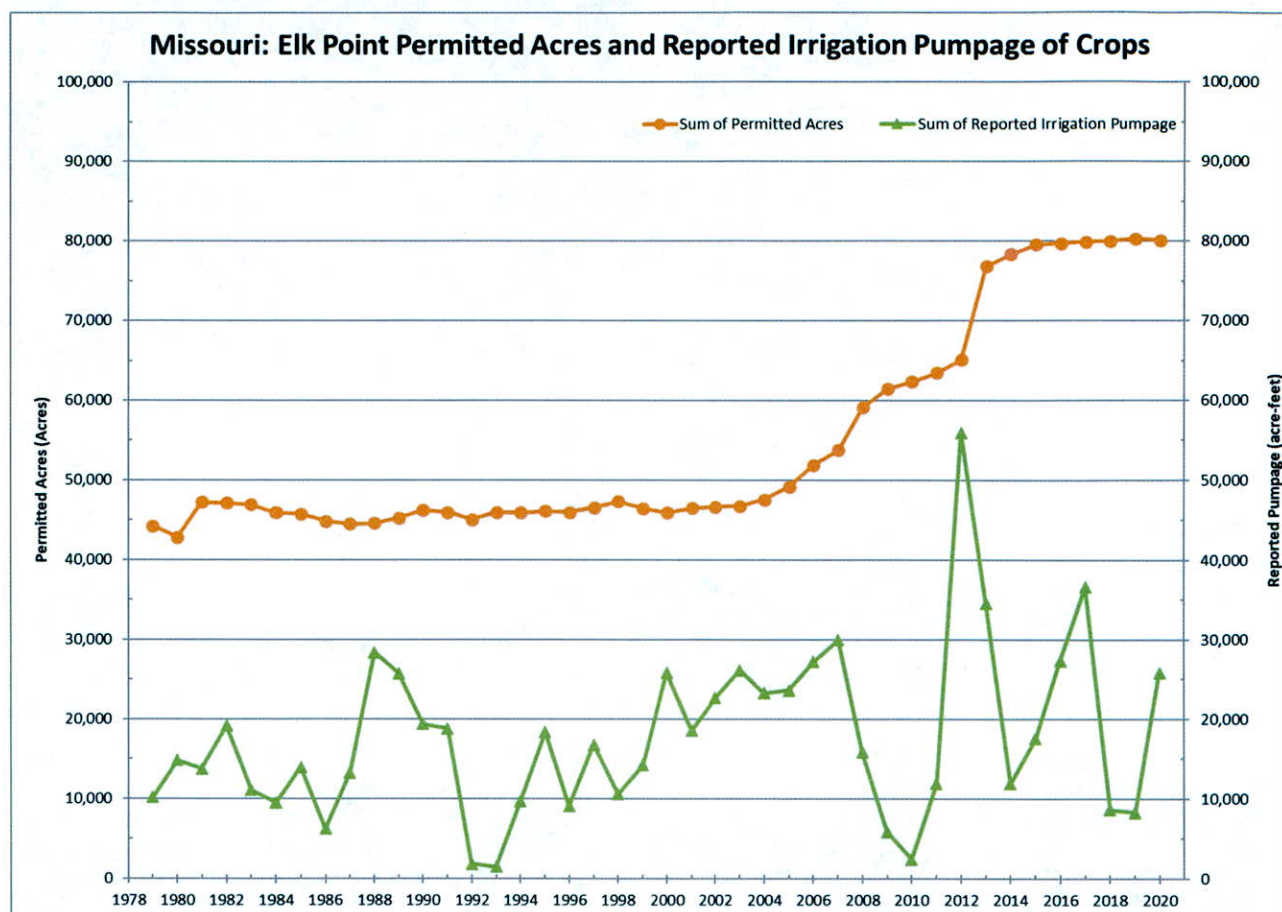


Figure 2: Acres permitted for irrigation of crops and reported crop irrigation pumpage (Water Rights, 2021a; Water Rights, 2021d)

Table 3: Water Permits/Rights for Irrigation of Turf (Water Rights, 2021a)

| Permit No.   | Name                                        | Acres        | Appropriation (ac-ft) |
|--------------|---------------------------------------------|--------------|-----------------------|
| 1294-3       | Recreation Dev Assn Inc                     | 102          | 306                   |
| 2011-3       | TR Golf LLC                                 | 95           | 285                   |
| 5786-3       | Dakota Dunes Golf Course                    | 173          | 519                   |
| 5935-3       | Ted Waitt                                   | 1            | 2                     |
| 5936-3       | Applied Engineering Inc                     | 1.8          | 3.6                   |
| 5998A-3      | Clay Rural Water System Inc                 | 300          | 600                   |
| 7225-3       | National Field Archery Assoc                | 2            | 4                     |
| 8010-3       | Ryan Rusher                                 | 2.5          | 7.5                   |
| 8029-3       | Dakota Dunes Community Improvement District | 17.8         | 35.6                  |
| 8040-3       | Heine Electric & Irrigation Inc             | 1            | 2                     |
| 8354-3       | TR Golf LLC                                 | 30           | 90                    |
| 8380-3       | National Field Archery Assoc                | 7            | 14                    |
| 8407-3       | Gayville-Volin School District 63-1         | 4.5          | 9                     |
| <b>Total</b> |                                             | <b>737.6</b> | <b>1,877.7</b>        |

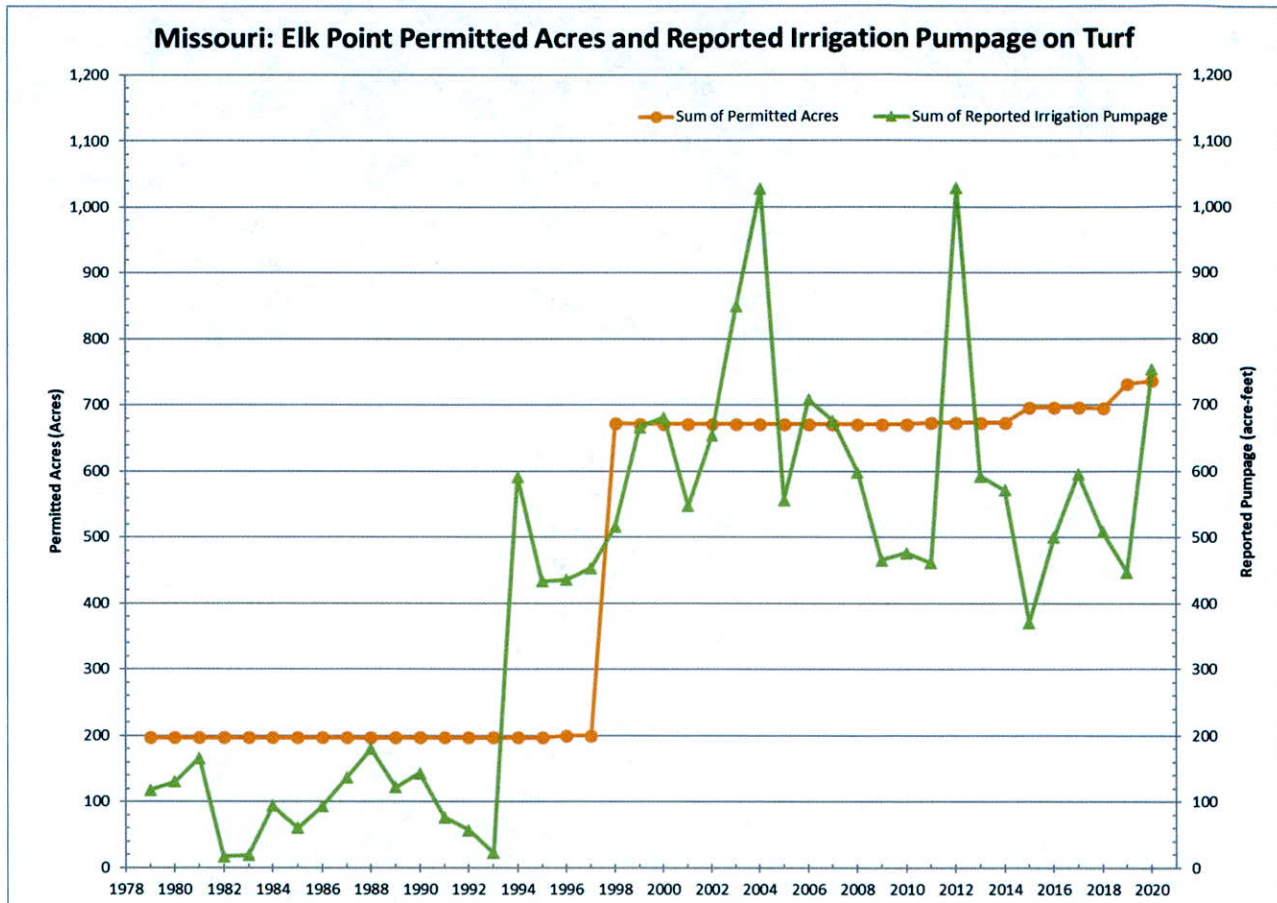


Figure 3: Acres permitted for irrigation of turf and reported turf irrigation withdrawals (Water Rights, 2021a; Water Rights, 2021d)

### *Hydrologic Budget*

The estimated withdrawals from the Missouri: Elk Point aquifer are 63,957.3 ac-ft/yr from nonirrigation users, and 28,459.5 ac-ft/yr from irrigation. Including an estimated 41.16 ac-ft/yr from this application, the estimated average annual withdrawal from the Missouri: Elk Point aquifer is 92,458 ac-ft/yr.

The estimated annual recharge to the Missouri: Elk Point aquifer is approximately 92,000 acft/yr. This estimated annual recharge does not include the recharge induced by well withdrawals aside from Lewis and Clark RWS; the actual recharge is likely to be greater than 92,000 ac-ft/yr. The estimated annual withdrawals equate to roughly three percent of the available water in storage. Due to the relatively small development of this large resource and the ability to induce recharge to the aquifer from nearby bodies of surface water, there is a reasonable probability there is unappropriated water available from the Missouri: Elk Point aquifer for the proposed appropriation.

### **Observation Well Data**

In determining the availability of unappropriated water for a permit application Administrative

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

The Water Rights Program currently maintains 36 observation wells completed in the Missouri: Elk Point aquifer (Water Rights, 2021c). The nearest observation well is CL-80C, located approximately 1.4 miles north of the proposed well location. As shown in Figure 4, the next nearest observation well is CL-80D, located approximately 3.9 miles northeast of the proposed well location. The hydrographs for these observation wells, as shown in Figure 5, can provide an idea of how the water table reacts to local pumping and regional climatic conditions.

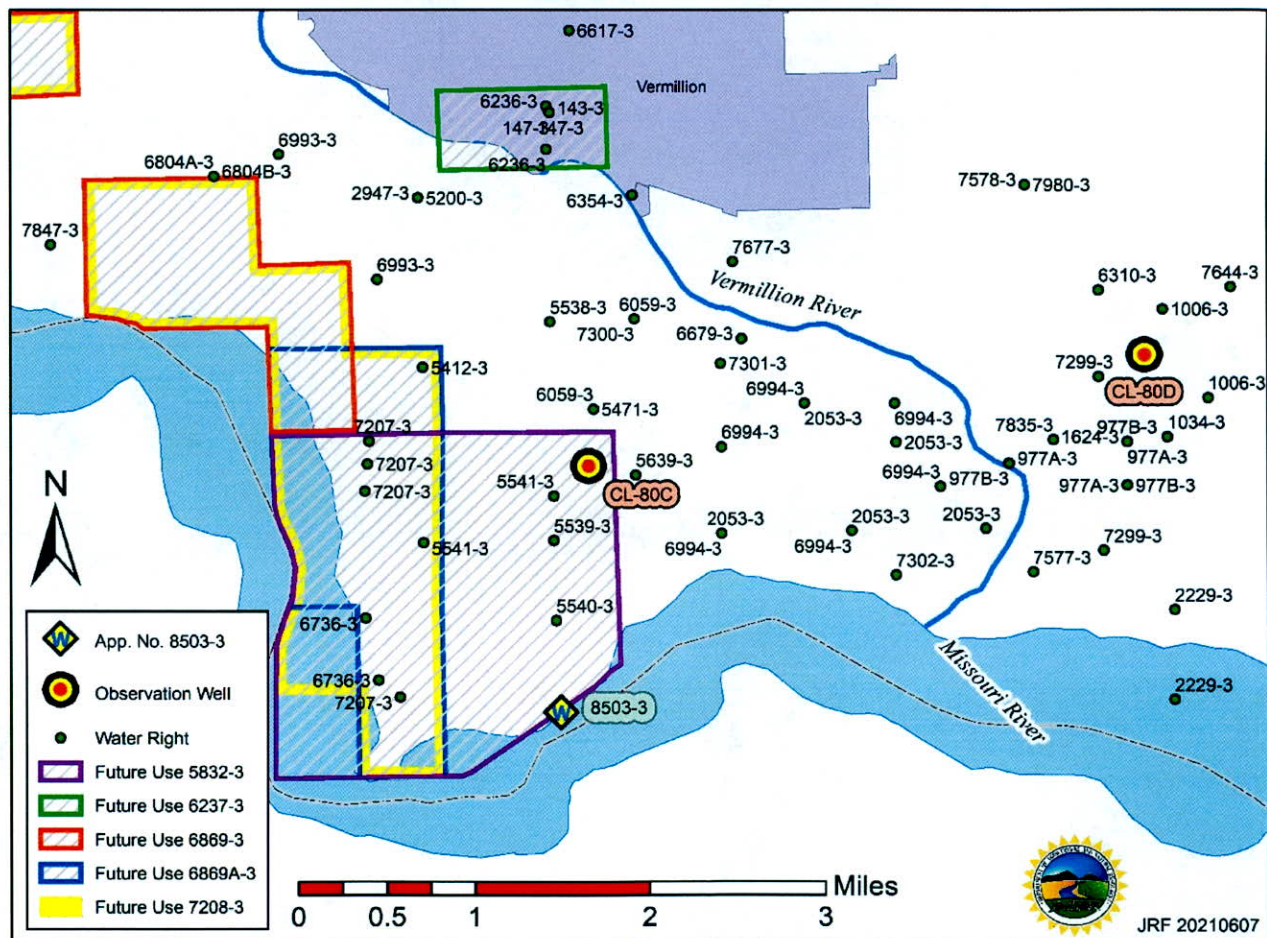


Figure 4. Map showing the location of nearby observation wells and water rights in the Missouri: Elk Point aquifer (Water Rights, 2021a; Water Rights, 2021c)

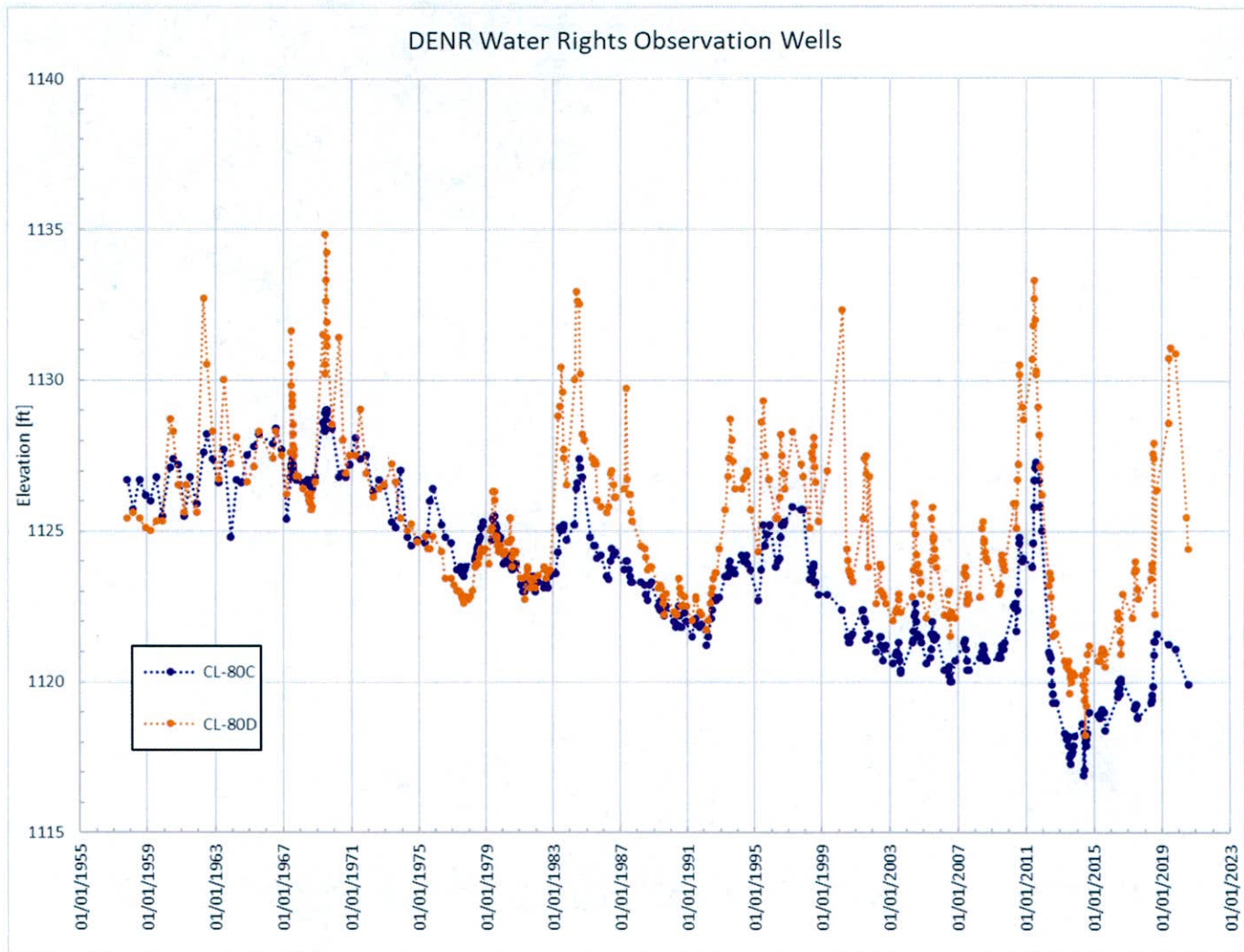


Figure 5: Hydrographs for Observation Wells CL-80C and CL-80D (Water Rights, 2021c)

The two observation well hydrographs are representative of the Missouri: Elk Point aquifer. The hydrographs show that the aquifer responds well to hydrologic conditions, recharging during wetter periods and declining during drier periods. The hydrographs of the Missouri River (Figure 6 and 7) generally show the same peaks, rising periods, and declining periods as the hydrographs of the Missouri: Elk Point aquifer, indicating that the aquifer is hydraulically connected to the Missouri River. Observation wells CL-80C and CL-80D are under water table conditions. Figure 6 is the hydrograph of the Missouri River at Sioux City, Iowa, approximately 40 miles downstream from the USGS stream gage Missouri River near Maskell, Nebraska (Figure 7), located across the Missouri River from Vermillion, SD. There are slight differences between these hydrographs as the confluences of the Vermillion and Big Sioux Rivers are located between these gages. Due to the availability of information, Figure 6 shows discharge, whereas Figure 7 shows gage height. The peaks on these hydrographs generally do not correspond with local precipitation events, as in the case of the peak in 2011, which was generated from the effects of snowmelt and rainfall far upstream and the controlled release of water from upstream dams. The observation well measurements show that the effects from

pumping are temporal, and that the aquifer generally returns to pre-pumping conditions. There is a downward trend in these observation wells due to the construction of the Gavins Point Dam in Yankton, SD; the Missouri River is entrenching below the dam, lowering the water surface elevation of the river (Goodman, 2007; Iles, 1979; USACE, 2017). Entrenchment of the Missouri River does not reflect the availability of unappropriated water, and the downward trend is not indicative of the Missouri: Elk Point aquifer being over appropriated. The observation well data indicates that there is a reasonable probability that there is unappropriated water available from the Missouri: Elk Point aquifer.

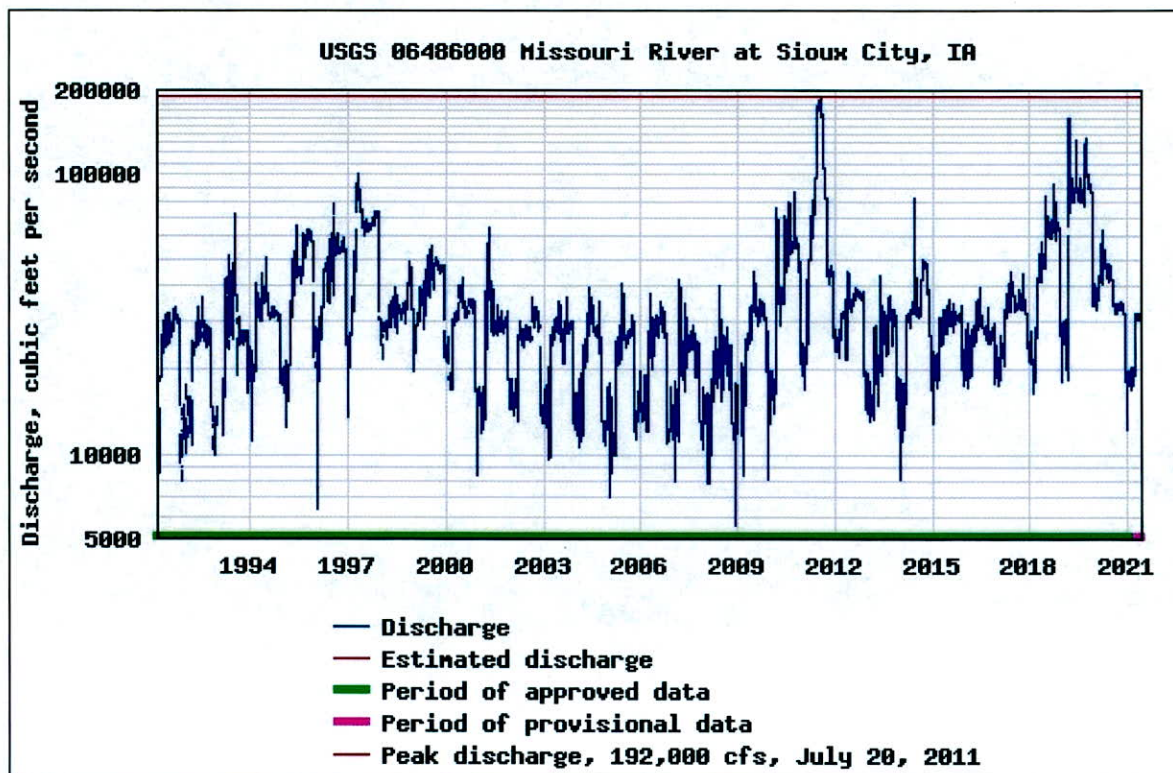


Figure 6: Hydrograph for USGS Stream Gage 06486000 Missouri River at Sioux City, IA (USGS, 2021)

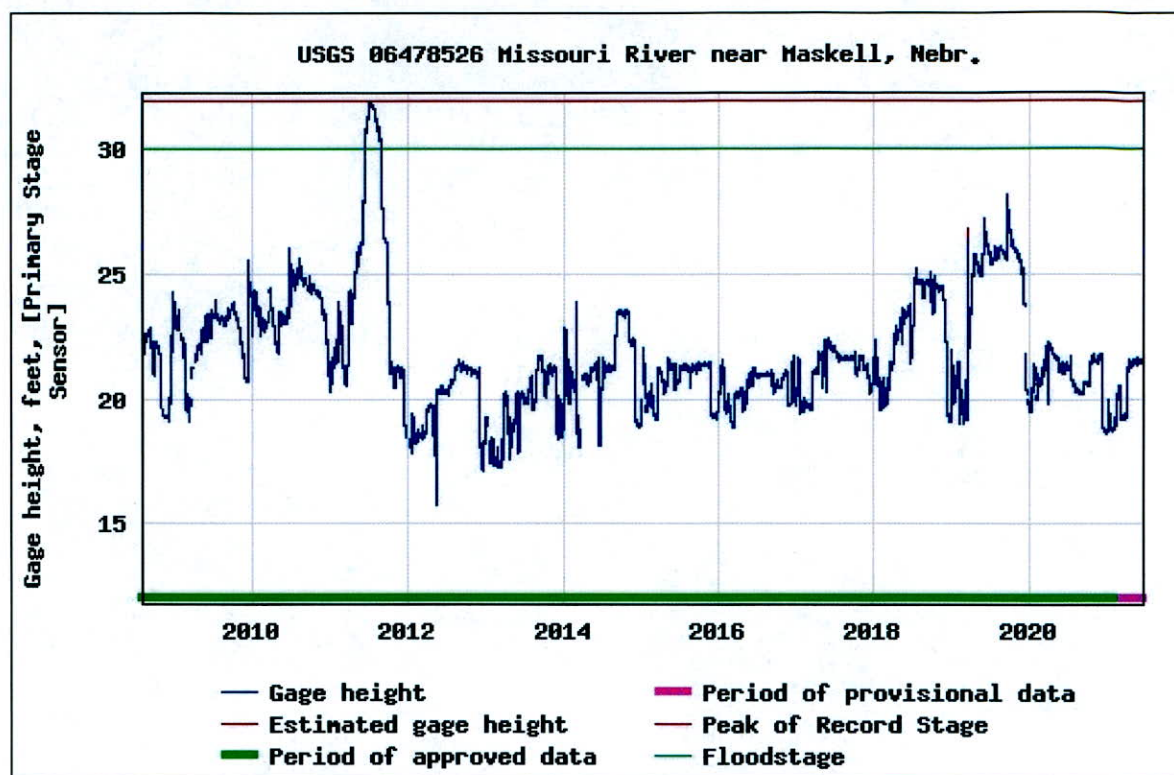


Figure 7: Hydrograph for USGS Stream Gage 06478526 Missouri River near Maskell, NE (USGS, 2021)

## EXISTING WATER RIGHTS

There are 629 water rights/permits appropriating water including the 5 future use permits that have reserved water from the Missouri: Elk Point aquifer (Water Rights, 2021a). The location of the diversion points for water rights/permits authorized to withdraw water from the Missouri: Elk Point aquifer in the vicinity of this application are shown in Figure 4. The areas reserved for the future use permits within the map boundaries are also shown.

Drawdown from well withdrawals within the Missouri: Elk Point aquifer is generally not significant at distances far from the pumping well. Examination of the hydrographs of 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 irrigation wells. Even though there are a large number of high capacity wells in the Missouri: Elk Point aquifer, there has not been a history of well interference. This application, if approved, is not expected to unlawfully impair nearby adequate wells.

An adequate well has been defined in Administrative Rule of South Dakota (ARSD) 74:02:04:20(6) as:

“a well constructed or rehabilitated to allow various withdrawal methods to be used, to allow the inlet to the pump to be placed not less than 20 feet into the saturated aquifer or formation material when the well is constructed, or to allow

the pump to be placed as near to the bottom of the aquifer as is practical if the aquifer thickness is less than 20 feet”.

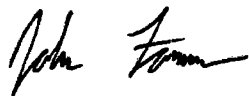
In the past, the Water Management Board has recognized that to place water to the maximum beneficial use, a certain amount of drawdown may occur. With no history of well interference complaints from users in the Missouri: Elk Point aquifer, adequate wells are not expected to be unlawfully impaired if this proposed appropriation is approved.

**SDCL 46-5-6:**

Pursuant to SDCL 46-5-6, the diversion rate for an irrigation appropriation cannot be in excess of one cfs for every 70 acres, or “the equivalent thereof.” The statute does provide that: “The Water Management Board may allow a greater diversion, in volume or rate or both, if the method of irrigation, any time constraints on diversion of water, or the type of soil so requires. However, no annual volume may be greater than three acre-feet per acre delivered to the land.” Water Permit Application No. 8503-3 proposes to divert water at a maximum rate of 2.56 cfs for the irrigation of 120 acres or at a rate of 1.493 cfs per 70 acres. The proposed irrigation system of this application involves 3 center pivots that are planned to operate in a windshield wiper pattern on sandy silt soils. Due to the operational requirements of the 3 center pivots irrigation system, and the type of soil, a certain amount of diversion rate is required to properly operate the system and effectively irrigate. The reason for this request is reasonable and has been accepted by the Water Management Board in the past.

**CONCLUSIONS**

1. Water Right Permit Application No. 8503-3 proposes to irrigate 120 acres with a maximum diversion rate of 2.56 cfs from one well to be completed into the Missouri: Elk Point aquifer in Clay County.
2. The acres proposed to be irrigated by this application are already irrigated under Water Right License No. 5579-3 (70 acres) and Water Right Permit No. 7429-3 (40.66 acres), both appropriating water from the Missouri River.
3. This application is seeking a diversion rate that exceeds the statutory limit of 1 cfs for every 70 acres. This application is seeking an equivalent rate of 1.493 cfs per 70 acres due to irrigation system requirements and sandy silt soils. It is a reasonable request and similar requests have been accepted by the Water Management Board in the past.
4. Based on observation well data and the hydrologic budget, there is a reasonable probability that unappropriated water is available from the Missouri: Elk Point aquifer.
5. There is a reasonable probability that the diversion proposed by this application will not unlawfully impair adequate wells for existing water rights and domestic uses.



John Farmer  
SD DANR – Water Rights Program

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# AFFIDAVIT OF PUBLICATION

PLAIN TALK

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WATER RIGHTS  
PROGRAM

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SORENSEN FAMILY FARM LLC  
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VERMILLION SD 57069

STATE OF SOUTH DAKOTA  
COUNTY OF CLAY

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

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE  
NEWSPAPER ON THE 25th DAY OF June, 2021  
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION  
OF SAID NOTICE TO WIT \$26.77 ENSURES TO THE  
BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO  
AGREEMENT AND UNDERSTANDING FOR THE DIVISION THEREOF HAS  
BEEN MADE WITH ANY OTHER PERSON, AND THAT NO PART THEREOF  
HAS BEEN AGREED TO BE PAID TO ANY PERSON WHOMSOEVER.

PUBLISHED ON: 06/25/2021

FILED ON: 06/25/2021

*Jackie Lammers*

SUBSCRIBED AND SWORN TO BEFORE ME THIS 25th DAY OF June, 2021

*Chandra Bour*

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

NOTARY PUBLIC, SOUTH DAKOTA  
MY COMMISSION EXPIRES 07/04/2026  
TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE  
NEWSPAPER ON THE 25th DAY OF June, 2021



Ad text : NOTICE OF APPLICATION  
NO. 8503-3 to Appropriate Water

Notice is given that Sorensen Family Farm LLC, c/o Grant Sorensen, 2903 Sorensen Ave, Vermillion SD 57069 has filed an application for a water permit to appropriate 2.56 cubic feet of water per second (cfs) from one well to be completed into the Missouri:Elk Point Aquifer (approximately 130 feet deep) located in the NW 1/4 SE 1/4 Section 1-T91N-R52W for irrigation of 120 acres located in the SE 1/4 NW 1/4, SW 1/4 NE 1/4, NE 1/4 SW 1/4, NW 1/4 SE 1/4, NE 1/4 SE 1/4 Section 1-T91N-R52W and portions of the W 1/2 Section 23-T32N-R4E (Nebraska Survey). The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres. Water Right No. 5579-3 and Water Permit No. 7429-3 authorize irrigation of the same acreage from the Missouri River. This site is located approximately 3 miles south of Vermillion SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8503-3 with qualifications because 1) unappropriated water is available, 2 ) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineers recommendation with qualifications, the application, and staff report are available at <http://denr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352) and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by July 5, 2021.

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

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

Published: June 25th, 2021

Published once at the total approximate cost of \$26.77

**WATER RIGHTS  
PROGRAM**

YANKTON DAILY PRESS AND DAKOTAN

GRANT SORENSEN  
SORENSEN FAMILY FARM LLC  
2903 SORENSEN AVE  
VERMILLION SD 57069

STATE OF SOUTH DAKOTA  
COUNTY OF YANKTON

KELLY HERTZ, BEING FIRST DULY SWORN ON OATH DEPOSES AND SAYS THAT (S)HE IS THE MANAGING EDITOR OF YANKTON MEDIA INC, A CORPORATION, THE PRINTER AND THE PUBLISHER OF THE YANKTON DAILY PRESS AND DAKOTAN, A LEGAL DAILY NEWSPAPER PUBLISHED AND CIRCULATED IN THE CITY OF YANKTON, SAID COUNTY AND STATE, AND ONE OF THE OFFICIAL NEWSPAPERS OF THE SAID COUNTY OF FACTS STATED IN THIS AFFIDAVIT; THAT THE ANNEXED 6+25 NOTICE OF APPLICATIO

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE  
NEWSPAPER ON THE 25th DAY OF June, 2021  
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION  
OF SAID NOTICE TO WIT \$27.21 ENSURES TO THE  
BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO  
AGREEMENT AND UNDERSTANDING FOR THE DIVISION THEREOF HAS  
BEEN MADE WITH ANY OTHER PERSON, AND THAT NO PART THEREOF  
HAS BEEN AGREED TO BE PAID TO ANY PERSON WHOMSOEVER.

PUBLISHED ON: 06/25/2021

FILED ON: 06/25/2021

SUBSCRIBED AND SWORN TO BEFORE ME THIS 25th DAY OF June, 2021

NOTARY PUBLIC, SOUTH DAKOTA

MY COMMISSION EXPIRES 07/04/2026

STUDY OF THE EFFECTS OF A 10% SALT DEFICIENCY ON THE

THE FOLLOWING INFORMATION IS BEING CHYSED FOR THE INFORMATION

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

NEW YORK, JULY 10 (AP) - A large crowd gathered in New York City today to witness the funeral of a young man who was killed in a riot during the 1968 presidential campaign.

0-2500

Ad text : 6+25

NOTICE OF APPLICATION

NO. 8503-3 to Appropriate Water

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Published once at the total approximate cost of \$27.21

## Schlaak, Karen

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**From:** Schlaak, Karen  
**Sent:** Monday, June 14, 2021 12:45 PM  
**To:** Jackie Lammers (jackie.lammers@yankton.net)  
**Subject:** 8503-3, Sorensen Family Farm LLC  
**Attachments:** 8503-3public.short.docx; FORM8.FRM.doc

Attached is a notice to be published on June 25, 2021.

Sorensen Family Farm LLC c/o Grant Sorensen, 2903 Sorensen Ave, Vermillion SD 57069 (605 670-7574) has been notified to contact you to authorize publication and arrange for payment.

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

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

*Karen Schlaak*

DANR - Water Rights Program  
(605) 773-3352  
Website: <https://danr.sd.gov>



## Schlaak, Karen

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**From:** Schlaak, Karen  
**Sent:** Monday, June 14, 2021 12:44 PM  
**To:** 'classifieds@plaintalk.net'  
**Subject:** 8503-3, Sorensen Family Farm LLC  
**Attachments:** 8503-3public.short.docx; FORM8.FRM.doc

Attached is a notice to be published on June 25, 2021.

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

*Karen Schlaak*

DANR - Water Rights Program

(605) 773-3352

Website: <https://danr.sd.gov>





**DEPARTMENT of AGRICULTURE  
and NATURAL RESOURCES**

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

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

June 14, 2021

Sorensen Family Farm LLC  
c/o Grant Sorensen  
2903 Sorensen Ave  
Vermillion SD 57069

Dear Mr. Sorensen

Water Permit Application No. 8503-3 for irrigation use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Plain Talk printed at Vermillion SD (Ph # 605 624-2695) and the Press & Dakotan printed at Yankton SD (Ph # 605 665-7811). You will need to contact the newspapers and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

*Karen Schlaak*

Karen Schlaak  
Water Rights Program  
(605) 773-3352

enclosures

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

NOTICE OF APPLICATION NO. 8503-3 to Appropriate Water

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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

**JUL 13 2021**

Sorensen Family Farm LLC  
c/o Grant Sorensen  
2903 Sorensen Ave  
Vermillion SD 57069

Dear Mr. Sorensen:

Enclosed is Water Permit No. 8503-3 authorizing construction of the water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

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

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

Sincerely,

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

enclosures

RECEIVED

MAR 14 2022

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

Date

03/10/2022

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

FROM:

Sorensen Family Farm LLC c/o Grant Sorensen  
(name)2903 Sorensen Av  
(address)Vermillion SD 57069  
(city, state, zip)605-670-7574  
(phone)

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

Water Permit No. 8503-3 states that the water use system is to be constructed by

Aug 10, 2021, and water is to be put to beneficial use by Sept 10, 2022.  
(date) (date)

The water use system was completed on

Nov 10, 2021  
(date)

Applying the water to beneficial use was completed on

Nov 10, 2021  
(date)

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

Grant Sorensen  
(signature)





**DEPARTMENT of AGRICULTURE  
and NATURAL RESOURCES**

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

March 14, 2022

8503-3

Grant Sorensen  
Sorensen Family Farm LLC  
2903 Sorensen Ave  
Vermillion SD 57069

Dear Mr. Sorensen:

I am writing to acknowledge receipt of the "Notice of Completion of Works" form that you sent in to let us know that you are completed with your irrigation system.

The system is 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 your project and the staff inspection has no bearing on your water permit.

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.

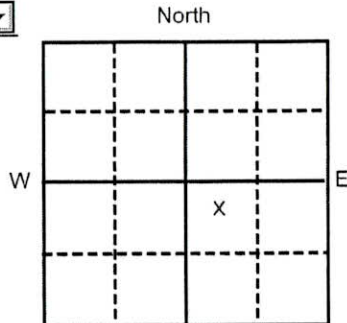
Sincerely,

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

8503-3

## SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE 1/4 SE 1/4 Sec 1 Twp 91N Rg 52WCounty CLAY ☒Please mark well  
location with an "X"

Well Completion Date

4/22/2021

1 Mile

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

## PROPOSED USE:

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

## METHOD OF DRILLING:

REVERSE ROTARY

## CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

| PIPEWEIGHT | DIAMETER     | FROM        | TO           | HOLE DIAMETER |
|------------|--------------|-------------|--------------|---------------|
| LB/FT      | <u>16</u> IN | <u>0</u> FT | <u>80</u> FT | <u>22</u> IN  |
| LB/FT      | IN           | FT          | FT           | IN            |
| LB/FT      | IN           | FT          | FT           | IN            |

## GROUTING DATA:

| Grout Type | No. of Sacks | Grout Weight      | From        | To           |
|------------|--------------|-------------------|-------------|--------------|
| GROUT WEL  | <u>19</u>    | <u>9.4</u> Lb/gal | <u>0</u> Ft | <u>59</u> Ft |
|            |              | Lb/gal            | Ft          | Ft           |

Describe grouting procedure

TREMIE METHOD

## SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 16 Inches Length 20 FeetMaterial PVCSlot Size .085 Set From 80 Feet to 100 FeetOther information .050 SLOT - FROM 100' - 112'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 analysisWell Owner: GRANT SORENSENBusiness Name: SORENSEN FAMILY FARM LLCAddress: 2903 SORENSEN AVECity, State, Zip: VERMILLION ☒ SD ☒ 57069

## WELL LOG:

| FORMATION          | DEPTH |     |
|--------------------|-------|-----|
|                    | FROM  | TO  |
| TOP SOIL/FINE SAND | 0     | 3   |
| FINE SAND          | 3     | 27  |
| TREE               | 27    | 28  |
| FINE GRAY SAND     | 28    | 58  |
| GRAY CLAY          | 58    | 59  |
| GRAY FINE SAND     | 59    | 69  |
| COARSE GRAVEL      | 69    | 95  |
| GRAVEL AND ROCKS   | 95    | 112 |

## STATIC WATER LEVEL

8.6' FEET

If flowing: closed in pressure

PSI

GPM flow through

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate

GPM

## WELL TEST DATA:

☒ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

12.84 Ft. After 2 Hrs. pumped 900 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: 800 GPM

## REMARKS

ELEVATION 1732'

LAT 42.726413°

LONG -96.932082°

WATER PERMIT #8503-3

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

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:

RECEIVED

JAN 30 2023

OFFICE OF  
WATER