

WATER PERMIT NO. 8475-3

Name of Applicant: **Mike Chicoine**

Address: **32926 482nd Ave, Jefferson SD 57038**

Phone: **712 898-9173**

Amount of Water Claimed: **2.22 cfs**

Total Acres: **80**

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

Water to be used for: **irrigation**

County: **Union**

Type of Waste Disposal System:

Location: **4 miles northwest of Elk Point**

PRIORITY

Date Received: **1-20-21**

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

Corrected Application Received:

Period of Annual Use: **April 1 – October 31**

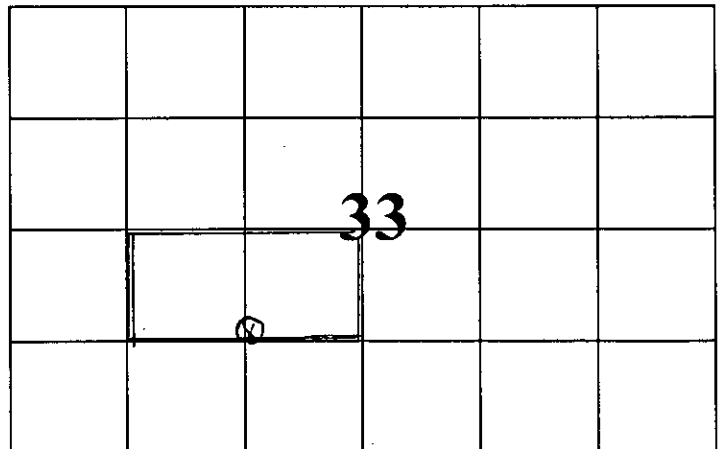
Remarks: **Requesting diversion rate greater than statutory limit**

Diversion Point: **NE 1/4 SW 1/4 Sec 33-T92N-**

R50W

Land to be Irrigated: **N 1/2 SW 1/4 Sec 33-T92N-**

R50W



Depth of Well: **100 feet deep**

Well Driller:

Remarks:

Type of Map: **aerial**

Prepared by:

Reviewed and the Number Assigned on: **1-20-21**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

**SOUTH DAKOTA
WATER PERMIT NO. 8475-3**

Date of first receipt of application January 20, 2021.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8475-3 to Mike Chicoine, 32926 482nd Ave, Jefferson D 57038 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. 8475-3 appropriate 2.22 cubic feet of water per second (cfs) from one well to be completed into the Missouri:Elk Point Aquifer (100 feet deep) located in the approximate center of the SW 1/4 Section 33 for irrigation of 80 acres located in the N 1/2 SW 1/4 Section 33; all in T92N-R50W. This site is located approximately 4 1/2 miles northwest of Elk Point 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 – October 31.
3. The date from which applicant may claim right is January 20, 2021.
4. The date of approval of Permit No. 8475-3 is April 5, 2021.
5. One-fifth of the construction is to be completed on or before October 5, 2023.
6. All construction is to be completed on or before April 5, 2026.
7. Water is to be put to beneficial use on or before April 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. 8475-3 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. 8475-3 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. 8475-3 authorizes a maximum diversion rate of 2.22 cfs for the irrigation of 80 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

APR 19 2021

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>8475-3</u>	(office use only) Hydrologic Unit <u>10176101</u>
	Basin <u>Vermillion River</u>	
	Newspaper <u>Leader-Courier, Elk Point</u>	
	<u>Press & Dakotan, Yankton</u>	

PAID
JAN 20 2021
Ck# 15370

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 MIKE CHICOINE

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

Mailing Address 32926 482ND AVE JEFFERSON ☒ SD ☒ 57038
(Address) (City) (State) (Zip Code)

Phone 712-898-9173 Mobile _____ Email _____

2. Amount of water claimed 2.22 *CFS or _____ **GPM _____ ***AF Total Acreage 80
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply MISSOURI- ELKPOINT BASIN GROUNDWATER

4. Location of point of diversion 1 WELL NE1/4 SW1/4 S33-T92N-R50W (approximate center)
(example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)

County UNION ☒

5. County or counties where water will be used UNION

6. Annual period during which water is to be used APRIL TO OCTOBER

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
NORTH 1/2 OF SW1/4 S33-T92N-R50W	80		

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

DRILLING A NEW WELL NEXT TO CENTERPOINT OF PIVOT FOR IRRIGATION.
REQUESTING DIVERSION RATE GREATER THAN STATUTORY LIMIT

RECEIVED

JAN 20 2021

WATER RIGHTS
PROGRAM

I, Michael J Chicoine Michael J Chicoine, 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 _____
(if yes, please provide copies of logs)b) If existing wells, how many 3 Provide copy of log(s), if available. Drilled by COPY OF LOGS ENCLOSED

For either Existing or Proposed Wells:

c) Well Depth (required) 100 Depth to Top of Water Bearing Material 50 Depth to Water from Surface 15d) Distance to nearest domestic well on applicant's property N/A Property owned by others 2358FT**2. Wastewater Disposal System Information**

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

b) System Capacity (gallons) _____ Year Constructed _____

c) Connected to the City of _____ Sanitary System

3. Dugout Information

a) Surface Dimensions _____ Depth _____

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

4. Water Storage Dams

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

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

b) Freeboard _____

c) Crest Width _____

Crest Length _____

d) Height _____

e) Primary Outlet Capacity _____

If pipe, diameter _____

f) Secondary Spillway Capacity _____

Spillway Width _____

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

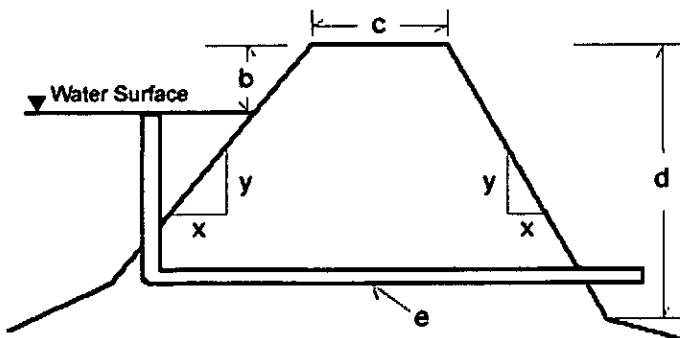
Upstream _____

Downstream _____

h) Surface Area of Impoundment _____

i) Storage _____ Acre Feet

j) Drainage Area Above Dam _____ Acres



Design Detail & Summary

ZIMMATIC™
BY LINDSAY

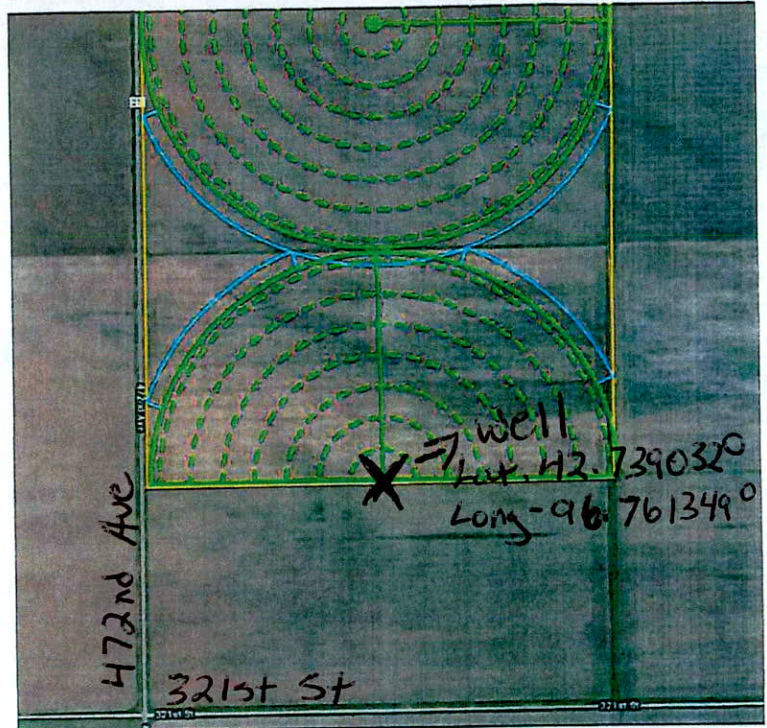
Prepared For:
Mike Chicoine
Mike Chicoine

KEISER
AG & IRRIGATION L.L.C.

System Name: Pivot 2

Span #	Diameter	Length	Cumulative Length
1	6 - 5/8"	180.17 ft	180.17 ft
2	6 - 5/8"	178.92 ft	359.08 ft
3	6 - 5/8"	178.92 ft	538.00 ft
4	6 - 5/8"	178.92 ft	716.92 ft
5	6 - 5/8"	178.92 ft	895.83 ft
6	6 - 5/8"	178.92 ft	1074.75 ft
7	6 - 5/8"	178.92 ft	1253.67 ft
Overhang:	5 - 9/16"	47.00 ft	1300.67 ft
End Gun:	-	0.00 ft	1303.67 ft

Total System Length: 1303.67 ft
 Number of Spans: 7
 Available Outlet Count: 182
 Degree of Sweep: 180 degrees
 Endgun Throw: 100.00 ft
 System Wetted Area: 61.03 acres
 Corner Wetted Area: NA
 End Gun Wetted Area: 5.19 acres
 Total Wetted Area: 66.22 acres



well location
↑

Latitude	Longitude
42.739032°	-96.761349°

Endgun Coverage Area									
Primary Endgun	Angle Degree From North		Angle Degree From Start		Start Position		Stop Position		Total Coverage Area
	Start	Stop	Start	Stop	Lat	Long	Lat	Long	
Area 1	287.8°	337.8°	19.6°	69.6°	42.740213°	-96.765918°	42.742371°	-96.763057°	2.71
Area 2	18.3°	64.2°	110.1°	156.0°	42.742388°	-96.759705°	42.740498°	-96.756935°	2.48

Second Endgun	Angle Degree From North		Angle Degree From Start		Start Position		Stop Position		Total Coverage Area
	Start	Stop	Start	Stop	Lat	Long	Lat	Long	

KEISER AG & IRRIGATION, LLC
 301 West South Street
 Hartington, 68739
 Office: 402-254-9557; (2): 605-661-6941
 juddkeiser@outlook.com
 www.lindsay.com

12/19/2020

Location Information

Legal Location:	NW NW NW NW SEC. 03, T. 091 N., R. 50 W.		
County:	UNION	Location:	091N50W03BBBB
		Latitude:	42.735360
Hydrologic Unit Code:	10170101	Longitude:	- 96.746270
Land Owner:		Ground Surface Elev. (ft.):	1125 T

Project Information

Project:	LINCOLN-UNION CO. STUDY		
Drill Date:	11/06/1984	Geologist:	R. HAMMOND
Company:	SDGS	Geologist's Log:	X
Drilling Method:	ROTARY	Driller:	T. MCCUE
Test Hole Number:	R1-84-104	Driller's Log:	
		Total Drill Hole Depth (ft.):	515.0

Geophysical Information

E-logs Available: YES

Lithologic Information

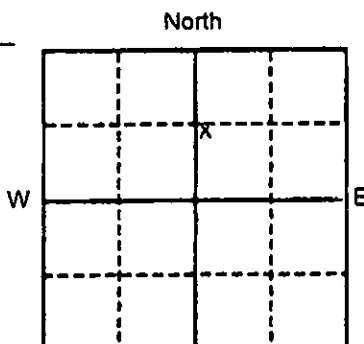
<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1125.0 - 1117.0	0.0 - 8.0	CLAY, YELLOW-BROWN
1117.0 - 1095.0	8.0 - 30.0	CLAY, LIGHT-BROWN, SLIGHTLY SILTY; FEW SAND LENSES
1095.0 - 1054.0	30.0 - 71.0	SILT, LIGHT-BROWN, CLAYEY, SANDY; SOME SAND LENSES
1054.0 - 1038.0	71.0 - 87.0	SAND, GRAY-BROWN, FINE, SILTY
1038.0 - 1004.0	87.0 - 121.0	GRAVEL, FINE TO MEDIUM, SANDY, FAIR SORTING, SUBROUND
1004.0 - 988.0	121.0 - 137.0	GRAVEL, MEDIUM TO COARSE, SUBROUND; SOME SHALE AND CHALK CLASTS
988.0 - 960.0	137.0 - 165.0	SILTSTONE, LIGHT-GRAY TO WHITE; NON-CALCAREOUS, VERY CLAYEY LENSES (DAKOTA FORMATION)
960.0 - 925.0	165.0 - 200.0	SILTSTONE, LIGHT-GRAY-BROWN, VERY SANDY; SEVERAL DARK GRAY-BROWN SHALE LAYERS (DAKOTA FORMATION)
925.0 - 845.0	200.0 - 280.0	SAND STONE, WHITE TO LIGHT-GRAY-BROWN, FINE
845.0 - 775.0	280.0 - 350.0	SANDSTONE, BROWN, MEDIUM; POORLY CEMENTED (DAKOTA FORMATION)
775.0 - 755.0	350.0 - 370.0	SANDSTONE, COARSE; SEVERAL SHALE STRINGERS
755.0 - 705.0	370.0 - 420.0	SANDSTONE, BROWN, MEDIUM; POORLY CEMENTED (DAKOTA FORMATION)
705.0 - 683.0	420.0 - 442.0	SANDSTONE, PINK, COARSE; POORLY CEMENTED (DAKOTA FORMATION)
683.0 - 667.0	442.0 - 458.0	SHALE, BROWN; GREASY, HARD
667.0 - 653.0	458.0 - 472.0	SANDSTONE, PINK, MEDIUM GRAINED; POORLY CEMENTED
653.0 - 629.0	472.0 - 496.0	SANDSTONE AND SHALE, PINK SANDSTONE, LIGHT-GRAY-BROWN SHALE; THIN BEDDED
629.0 - 610.0	496.0 - 515.0	SHALE, BRIGHT-GREEN; VERY GREASY, VERY HARD FROM 509 TO 515 FEET

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW ¼ NE ¼ Sec 32 Twp 92N Rg 50W

County Union

Please mark well
location with an "X"

Well Completion Date

August 9, 2013

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
3,500.0 ft. from Septic Tank (identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

Bucket method

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	16.00 IN	0.0 FT	49.0 FT	24.00 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	20	9.5 Lb/gal	0.0 Ft	40.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
Tremie Method

SCREEN:

☐ Perforated pipe ☒ Manufactured

Diameter 16.00 Inches Length 40.0 Feet

Material PVC

Slot Size .050 Set From 49.0 Feet to 89.0 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? Not Required
Lab to which water
quality sample sent for analysis

Well Owner: Melvin & Larry Donnelly

Business Name:

Address: POB 966

City, State, Zip: Elk Point SD 57025

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Top Soil	0	2
Silty Clay	2	36
Silty Sand	36	47
Sandy Gravel	47	81
Gravel	81	89

STATIC WATER LEVEL 14.05' FEET

If flowing: closed in pressure 5/27/14 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

RECEIVED

OCT - 4 2013

WATER RIGHTS
PROGRAMThis well was drilled under license # 666 and this
report is true and accurate.

Drilling firm: Hammond-Wetmore Drilling, LLC

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date: 9/20/13

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date January 20, 2021

RECEIVED OF Michael J. Chicoine 32926 482nd Ave Jefferson SD 57038

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

Fee for Application for Permit No. <u>8475-3</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>8475-3</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
dm



DENR
SOUTH DAKOTA

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

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 8475-3, Mike Chicoine**

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. 8475-3, Mike Chicoine, 32926 482nd Ave, Jefferson SD 57038.

The Chief Engineer is recommending APPROVAL of Application No. 8475-3 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. 8475-3 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. 8475-3 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. 8475-3 authorizes a maximum diversion rate of 2.22 cfs for the irrigation of 80 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
March 15, 2021

**REPORT TO THE CHIEF ENGINEER
WATER PERMIT APPLICATION NOS. 8474-3, 8475-3, AND 8476-3
MIKE CHICOINE
MARCH 15, 2021**

Water Permit Application Nos. 8474-3, 8475-3, and 8476-3 propose to appropriate water from the Missouri: Elk Point aquifer, to irrigate a combined total of 288.2 acres in Union County.

Application No. 8474-3 proposes to appropriate water at a maximum instantaneous diversion rate of 2.22 cubic feet per second (cfs) from a single, 100 feet-deep, well to be located in the approximate center of the NW ¼ Section 33 for irrigation of 160 acres located in the NW ¼ Section 33; all in T92N-R50W. The site is located approximately 5.7 miles northwest of Elk Point, SD.

Application No. 8475-3 proposes to appropriate water at a maximum instantaneous diversion rate of 2.22 cubic feet per second (cfs) from a single, 100 feet-deep, well to be located in the approximate center of the SW ¼ Section 33 for irrigation of 80 acres located in the N ½ SW ¼ Section 33; all in T92N-R50W. The site is located approximately 5.5 miles northwest of Elk Point, SD. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres.

Application No. 8476-3 proposes to appropriate water at a maximum instantaneous diversion rate of 2.22 cubic feet per second (cfs) from a single, 100 feet-deep, well to be located in the approximate center of the SW ¼ SE ¼ Section 18 for irrigation of 48.2 acres located in the W ½ SE ¼ Section 18; all in T90N-R48W. The site is located approximately 0.5 miles east of Jefferson, SD. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres.

AQUIFER: Missouri: Elk Point (M: EP)

Aquifer Characteristics

The Missouri: Elk Point aquifer is a deposit of as glacial outwash composed of fine sand to very coarse gravel (Niehus, 1994). It underlies approximately 219,100 acres of Yankton, Clay, and Union counties (Figure 1) with an estimated 3,287,100 million acre-feet of recoverable water in storage (Hedges et al., 1982). It 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). Both confined and unconfined groundwater conditions are present in the aquifer (Niehus, 1994; Stephens, 1967). The movement of groundwater within the aquifer is generally from the northwest to the southeast, and towards the Missouri River (Stephens, 1967). For Application Nos. 8474-3 and 8475-3, existing water well completion reports in the vicinity of the proposed applications show an average of 59 feet of silty, sandy clay overlying water bearing sand with gravel with an average depth to the groundwater surface of 18 feet. (Water Rights, 2021a). This indicates confined conditions with an average of 41 feet of artesian head pressure. For application No. 8476-3, nearby existing water well completion reports show an average of 65 feet of silty, sandy clay overlying water bearing sand with gravel with an average depth to the groundwater surface of 19 feet. (Water Rights, 2021a). This indicates confined conditions with an average of 46 feet of artesian head pressure.

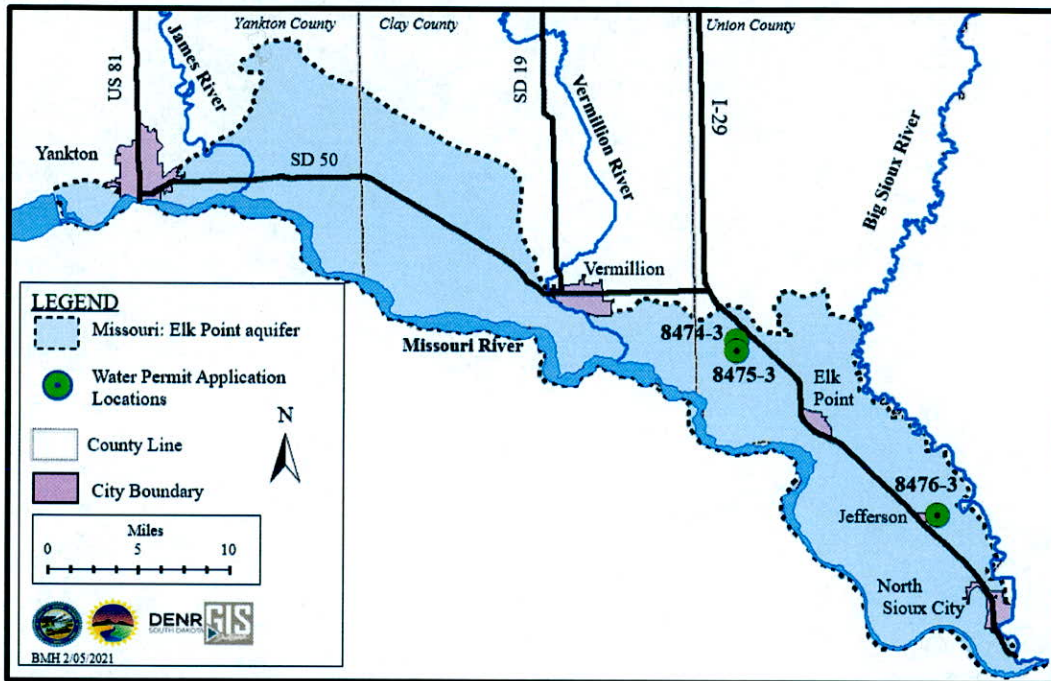


Figure 1. Water Permit Application Nos 8474-3, 8475-3, and 8476-3 shown within the Missouri: Elk Point aquifer boundary (modified from: Hedges et al., 1982).

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 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 water availability and potential for unlawful impairment of existing water rights within the Missouri: Elk Point aquifer.

WATER AVAILABILITY

Water Permit Application Nos. 8474-3, 8475-3, and 8476-3 propose to appropriate water from the Missouri: Elk Point aquifer. The probability of unappropriated water being available from an aquifer can be evaluated by considering SDCL 46-6-3.1 which requires "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source..." If the source of the water is older or lower than the Greenhorn Formation and a water distribution system has applied for a permit, the Board need not consider the balance of recharge to and withdrawal from the aquifer. For this application, a water distribution system is not involved and the aquifer is not older or lower than the Greenhorn Formation, therefore, the balance of recharge and withdrawal must be considered.

Hydrologic Budget

Recharge:

The Missouri: Elk Point aquifer is recharged by infiltration of precipitation where the aquifer is at or near the land surface, inflow from the Lower Vermillion-Missouri and Dakota aquifers, and seepage from the Missouri, Vermillion, James, and Big Sioux Rivers (Bugliosi, 1983; Niehus,

1994). Recharge to the aquifer was estimated by Hedges et al. (1985) to be approximately 3.8 inches per year. With the aforementioned areal extent of the aquifer estimated at 219,100 acres, the annual recharge rate can be estimated at 69,382 acre-feet/year (ac-ft/yr). Stephens (1967) noted that pumping of the aquifer will induce recharge from the Missouri River. Stonesifer (2013) estimated that the Missouri River contributed 22,582 ac-ft/yr of recharge due to the pumping operation of the Lewis and Clark Rural Water System (RWS). This estimate is based off inducing at least 50% recharge of the water pumped currently and at full development of the existing and future use permits held by Lewis & Clark RWS. Depending on location and diversion rate, this percentage of induced recharge is likely to be much greater than 50% (Mathiowetz, 2020). This results in a total estimated annual recharge of approximately 92,000 ac-ft/yr for the Missouri: Elk Point aquifer with the recognition that as Lewis & Clark RWS further develops, they will likely induce more recharge. There are other wells, both domestic and appropriative, in close vicinity of the Missouri River that can induce recharge from the river, but that amount of induced recharge has not been estimated.

Discharge:

Discharge from the Missouri: Elk Point aquifer occurs through evapotranspiration in areas where the aquifer is near land surface, well withdrawals, leakage to the underlying Dakota aquifer and outflow to the Missouri and Big Sioux Rivers (Bugliosi, 1983; Niehus, 1994). Currently, there are a total of 621 water rights/permits (39 non-irrigation, 577 irrigation, and 5 future use) appropriating water from the Missouri: Elk point aquifer (Water Rights, 2021a). A summary of the non-irrigation water rights/permits are listed in Table 1. The total estimated volume of water to be withdrawn can be determined by assuming that water rights/permits limited by an annual volume will pump the entire volume appropriated annually or that water rights/permits limited by diversion rate will pump at the maximum permitted diversion rate 60 percent of the time.

Table 1. Non-irrigation water rights/permits from the Missouri: Elk Point aquifer with permitted appropriation and estimated volume water use (Water Rights, 2021a).

Use ^a	Number of Water Rights/Permits	Appropriation limited by Annual Volume (ac-ft/yr)	Appropriation limited by Diversion Rate (cfs)	Total Estimated Volume (ac-ft/yr)
COM	12	227.0	1.540	896.40
DOM	2		2.780	1,208.40
FWP	4		7.650	3,325.27
IND	5		0.878	381.65
MUN	11	10,686.0	8.330	14,307.72
REC	1	393.3		393.30
RWS	2	32,165.0		32,165.00
SHD	2		0.199	86.50
Total	39	43,471.3	21.377	52,764.24
a - COM: Commercial; DOM: Domestic; FWP: Fish and Wildlife Propagation; IND: Industrial; MUN: Municipal; REC: Recreational; SHD: Suburban Housing Development				

The total estimated volume of 52,764 ac-ft/yr can be modified after consideration of the thirteen non-irrigation permits that are required to report their annual usage from the Missouri: Elk Point aquifer. The estimated annual volume for nine of these permits are accounted for in Table 1. Five commercial use permits (8031-3, 8381-3, 8403-3, 8415-3, and 8435-3) are currently under development and are authorized a combined (2.69 cfs) 1,169 ac-ft/yr, assuming a 60 percent

pumping rate. Permit No. 8147-3, a commercial use permit, limited by an annual volume of 160 ac-ft/yr. Lewis and Clark RWS appropriates 32,165 ac-ft/yr from permits 6736-3 (20,165 ac-ft/yr) and 7207-3 (12,000 ac-ft/yr). Even though the average reported pumping rate is 12,678 ac-ft/yr, this system is continually undergoing development, as a result, their full authorized appropriation is included in Table 1. The City of Yankton is limited by an annual volume of 6,050 ac-ft/yr of water under municipal use Permit No. 8212-3. The Clay RWS maintains Permit No. 5998A-3 which is also required to report its total annual use and does so as a non-irrigation permit due to its irrigation system uniqueness, serving several homes in a housing development (Water Rights, 2021a). The annual appropriation for this permit is accounted for with the turf permits in Table 4.

Table 2 contains the non-irrigation permits required to report annual pumpage and the applicable adjustment to the total estimated volume. Permit No. 7388-3 (2.0 cfs) is a domestic use permit held by the Clay RWS authorized to withdraw an estimated total of 870 ac-ft/yr, assuming a 60 percent pumping rate. However, an average value of 314 ac-ft/yr, reported pumping between 2012-2019, is considered most reflective of the infrastructure currently in place. Therefore, the difference of 556 ac-ft/yr will adjust the total estimated volume for domestic use. The City of Vermillion has 2 permits (Permit No. 147-3 appropriating 1,156 ac-ft/yr, assuming a 60 percent pumping rate, and Permit No. 6236-3 limited annually to 1,161 ac-ft/yr) authorized to appropriate a combined 2,317 ac-ft/yr. However, with an average value of 1,192 ac-ft/yr reported from 2006-2019, the difference 1,125 ac-ft/yr will adjust the total estimated volume for municipal permits. An adjusted total estimated volume of 51,083 ac-ft/yr will be included in the water balance for non-irrigation permits.

Table 2. Adjustment to Total Estimated Volume based on Non-irrigation pumpage reports for the Missouri: Elk Point aquifer (Water Rights, 1979-2019a, 2021a).

Use ^a	Non-Irrigation required to report annual usage	Permit Nos.	Reported Annual Estimated Volume (ac-ft/yr)	Change to Table 1	Total Estimated Volume (ac-ft/yr)
COM	currently under development	8031-3, 8381-3, 8403-3, 8415-3, 8435-3	1,169	none	896.40
	Doug Lafleur	8147-3	160		
DOM	Clay RWS ^b	7388-3	314	556	652.40
FWP	N/A				3,325.27
IND					381.65
MUN	City of Vermillion	147-3, 6236-3	1,192	1,125	13,182.72
	City of Yankton	8212-3	6050	none	
REC	N/A				393.30
RWS	Lewis & Clark RWS	6736-3, 7207-3	32,165	none	32,165.00
SHD	N/A				86.50
Total					51,083.20
a - COM: Commercial; DOM: Domestic; FWP: Fish and Wildlife Propagation; IND: Industrial; MUN: Municipal; REC: Recreational; SHD: Suburban Housing Development					
b – Clay RWS maintains Permit No. 5998A-3 which is also required to report annual use as a non-irrigation permit. The annual appropriation for this permit is accounted for with the turf permits in Table 4.					

Well withdrawals from the Missouri: Elk Point aquifer are primarily for irrigation use. Table 3 shows the historic irrigation water use from the aquifer as reported to the DENR-Water Rights Program through annual irrigation questionnaires. The average annual reported pumping is 18,857.75 ac-ft/yr (Water Rights, 1979-2019b). However, this is not reflective of the increased pumpage from recent development. Stonesifer (2013) and Farmer (2018a) developed a method to estimate the average annual use from irrigation that accounts for an increasing issuance of water rights/permits and applies the correct allowance for appropriation per permitted acre when it was reduced, in 1978, from 3 ac-ft to 2 ac-ft. Farmer (2018a) determined that an average application rate of 0.35 feet per permitted acre can be utilized to estimate annual use for irrigation.

Currently, there are 577 water rights/permits for irrigation with 75,520.5 total permitted acres for irrigation (Water Rights, 2021a). Farmer (2018b) further refined estimating average annual use by considering the different application rates between turf and crop irrigation. Turf irrigation should be determined separately because they tend to utilize their full authorized allowance for appropriation. Table 4 shows the permits that are considered turf irrigation with the appropriation amount determined from the permitted acres, multiplied by either 2 or 3 ac-ft as specifically allowed for each permit. A value of 1,877.7 ac-ft/yr will be included in the total volume estimate for turf irrigation. Subsequently, the calculation for estimated annual use requires adjustment because the acres for turf irrigation need to be removed from the total permitted acres. Subtracting the turf irrigation acres (Table 4) from the total permitted acres yields a value of 74,782.9 acres for crop irrigation. Applying the 0.35 application rate to the acres for crop irrigation yields approximately 26,174 ac-ft/yr. Summing turf and crop irrigation estimates yields a value of 28,051 ac-ft/yr to be included in the water balance section for irrigation permits.

There are five Future Use permits appropriating water from the Missouri: Elk Point aquifer. The full permitted volume authorized from the permits is utilized when estimating the annual volume usage. The future use areas are all in Clay County and composed of 13,000 ac-ft reserved by Lewis and Clark Rural Water System and 1,900 ac-ft reserved by the City of Vermillion. This is a total of 14,900 ac-ft/yr of water reserved for these permits and will be included in the water balance section for future use.

There are numerous domestic wells on file with the Water Rights Program within the Missouri: Elk Point aquifer (Water Rights 2021b). Domestic users are not required to report their annual water usage and their low diversion rates are not considered a significant portion of the hydrologic budget. Additionally, some domestic well may no longer be in use after the development of rural water systems in the area.

There is one pending application for the Missouri: Elk Point aquifer, Water Permit Application No. 8463-3, proposing to appropriate water at a maximum instantaneous diversion rate of 1.78 cfs to irrigate of 114 acres. Utilizing the average application rate of 0.35 feet per permitted acre (Farmer, 2018a), approximately 40 ac-ft/yr will be included in the water balance for the pending application.

Table 3. Historic irrigation pumpage from the Missouri: Elk Point aquifer (Water Rights, 1979-2019b).

Year	Number of Permits Reporting	Appropriation (acre-feet/year)	Pumpage (acre-feet/year)
1979	265	124,828.0	10,377.00
1980	267	126,362.0	15,205.00
1981	302	136,318.0	14,233.00
1982	272	123,559.3	18,822.35
1983	274	121,895.7	10,834.04
1984	283	126,743.4	9,194.30
1985	284	125,068.5	13,983.50
1986	288	125,842.5	6,451.60
1987	282	124,104.3	13,439.70
1988	283	124,014.1	28,756.35
1989	294	126,847.3	25,941.90
1990	297	127,965.7	19,425.00
1991	300	126,471.7	18,798.60
1992	295	125,265.7	1,881.95
1993	298	125,576.3	1,475.20
1994	295	122,975.1	10,221.43
1995	292	121,644.3	18,320.24
1996	296	124,606.2	9,412.78
1997	305	126,518.2	17,182.00
1998	313	127,862.6	11,127.24
1999	308	125,225.6	14,748.02
2000	309	124,852.2	26,640.12
2001	313	125,537.4	19,071.88
2002	315	125,555.8	23,547.22
2003	314	125,379.8	26,734.67
2004	322	126,955.8	23,862.25
2005	335	130,046.6	23,964.50
2006	353	136,491.6	27,974.54
2007	366	139,826.6	30,482.84
2008	445	161,640.0	56,538.19
2009	410	155,245.4	6,120.97
2010	419	155,905.4	2,723.87
2011	431	159,700.8	12,107.55
2012	445	161,640.0	56,538.19
2013	543	185,637.7	34,838.46
2014	557	189,492.7	12,084.23
2015	563	191,387.7	17,751.93
2016	564	190,428.8	27,638.64
2017	567	191,366.2	37,013.46
2018	570	191,113.7	8,855.66
2019	575	191,797.2	8,847.29
Maximum:	575	191,797.2	56,528.19
Minimum:	265	121,644.3	1,475.20
Average:	361.2	141,456.0	18,857.75

Table 4. Water rights/permits for irrigation on turf (Water Rights, 2021a).

Permit Number	Name	Acres	Appropriation (ac-ft)
1294-3	Recreation Development Association, Inc.	102.0	306.0
2011-3	Two Rivers Golf Club	95.0	285.0
5786-3	Dakota Dunes Golf Course	173.0	519.0
5935-3	Ted Waitt	1.0	2.0
5936-3	Applied Engineering, Inc.	1.8	3.6
5998A-3	Clay Rural Water System, Inc.	300.0	600.0
7225-3	National Field Archery Association	2.0	4.0
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.	1.0	2.0
8354-3	Two Rivers, Inc.	30.0	90.0
8380-3	National Field Archery Association	7.0	14.0
8407-3	Gayville-Volin School District 63-1	4.5	9.0
Total:		737.6	1,877.7

Water Balance:

The Missouri: Elk Point aquifer estimated average annual withdrawal rate is 94,074 ac-ft/yr (non-irrigation: 51,083; irrigation: 28,051; future use; 14,900; pending: 40). Estimated average annual recharge is 92,000 ac-ft/yr. The expected use of 101 ac-ft/yr (irrigating 288.2 acres at the 0.35 in/ac application rate) by these applications results in an exceedance of 2,175 ac-ft/yr in average annual withdrawal compared to recharge for this aquifer. However, the amount of induced recharge is likely much greater than currently estimated because the amount of recharge induced by non-Lewis & Clark RWS wells has not been estimated (Mathiowetz, 2020). Moreover, the wells for the Lewis and Clark RWS induce at least 50% of their recharge from the Missouri River and any additional induced recharge by other users has not been estimated. Therefore, there is a reasonable probability additional induced recharge potential exists in this aquifer to meet the estimated exceedance shown in the hydrologic budget plus the withdrawal proposed by this application.

Observation Well Data

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

The DENR-Water Rights Program monitors 33 observation wells completed into the Missouri: Elk Point aquifer (Water Rights, 2021c). The hydrographs for observation wells within four miles of Water Permit Application Nos. 8474-3 and 8475-3 are shown in Figures 2 through 4. The hydrographs for observation wells within three miles of Water Permit Application No. 8476-3 are shown in Figures 5 through 7.

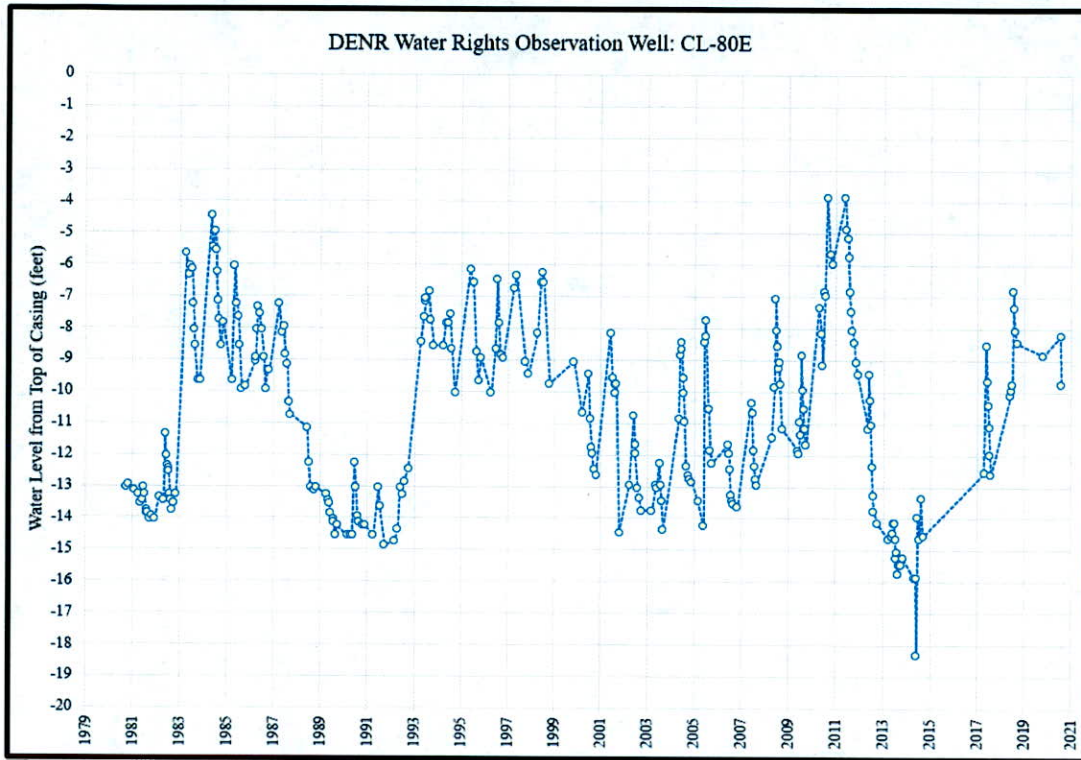


Figure 2. Hydrograph for observation well CL-80E. It is approximately 2.9 miles northwest of the proposed well locations for Water Permit Application Nos. 8474-3 and 8475-3 (Water Rights, 2021c).

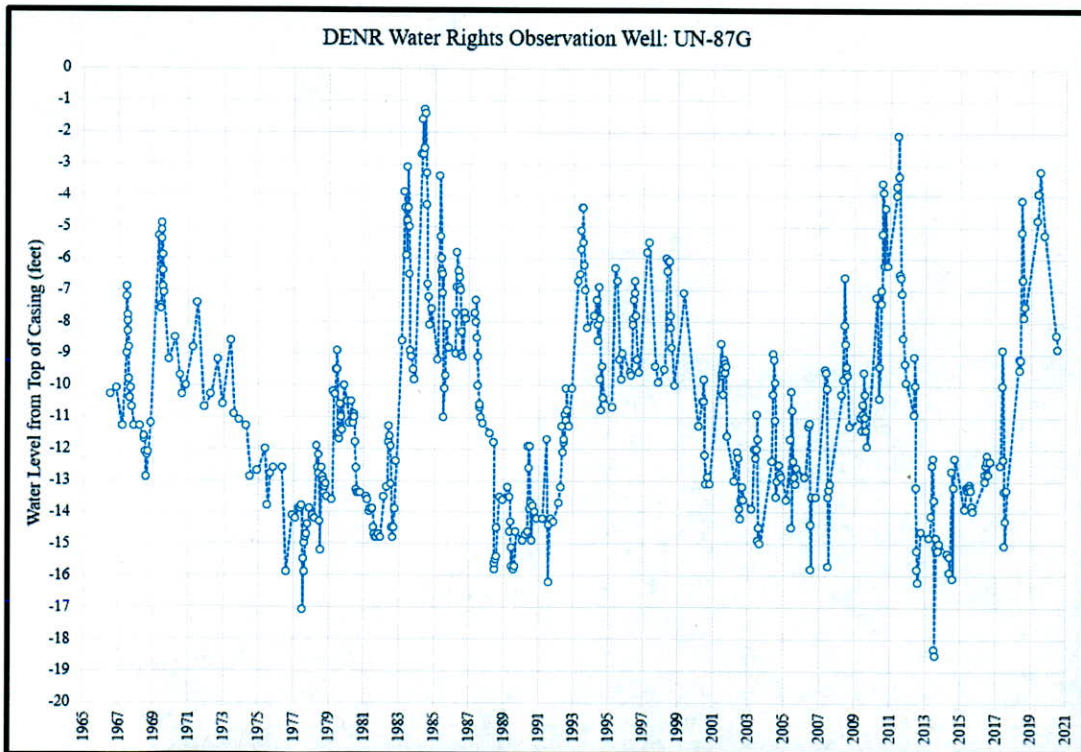


Figure 3. Hydrograph for observation well UN-87G. It is approximately 4.0 miles southeast of the proposed well locations for Water Permit Application Nos. 8474-3 and 8475-3 (Water Rights, 2021c).

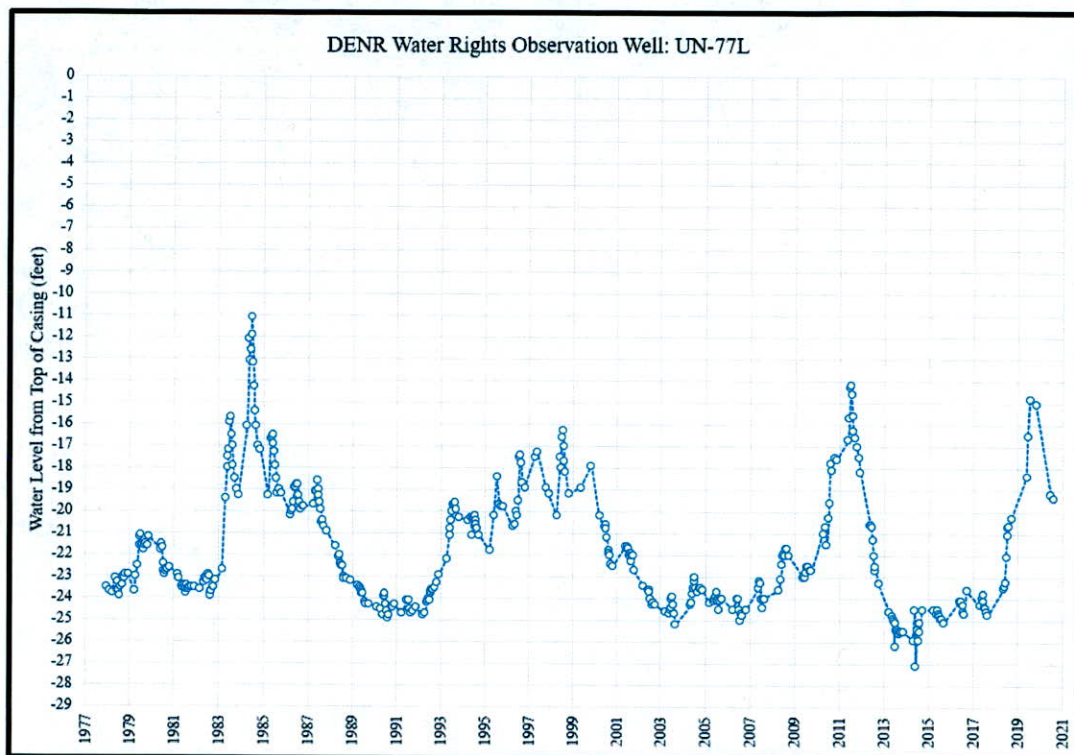


Figure 4. Hydrograph for observation well UN-77L. It is approximately 3.3 miles south of the proposed well locations for Water Permit Application Nos. 8474-3 and 8475-3 (Water Rights, 2021c).

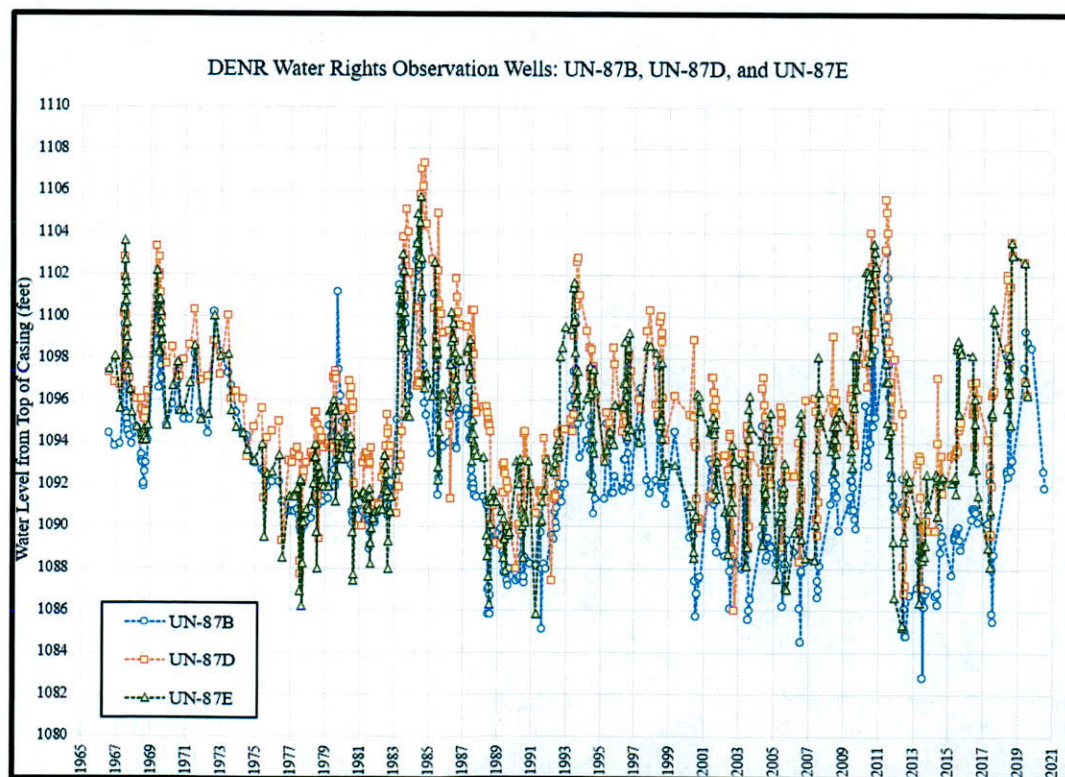


Figure 5. Hydrographs for observation wells UN-87B, UN-87D, and UN-87E. UN-87B is located approximately 0.4 miles east, UN-87D is located approximately 1.0 mile northwest, and UN-87E is located approximately 2.0 miles northwest of the proposed well location for Water Permit Application No. 8476-3 (Water Rights, 2021c).

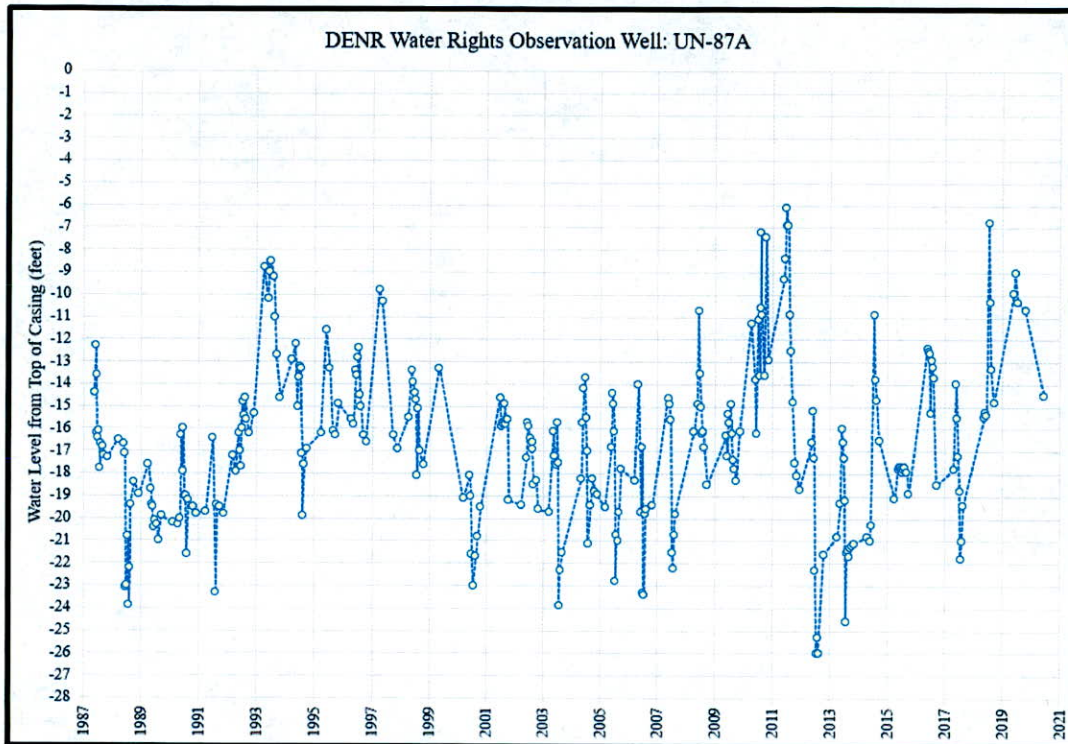


Figure 6. Hydrograph for observation well UN-87A. It is approximately 2.2 miles northeast of the proposed well location for Water Permit Application No. 8476-3 (Water Rights, 2021c).

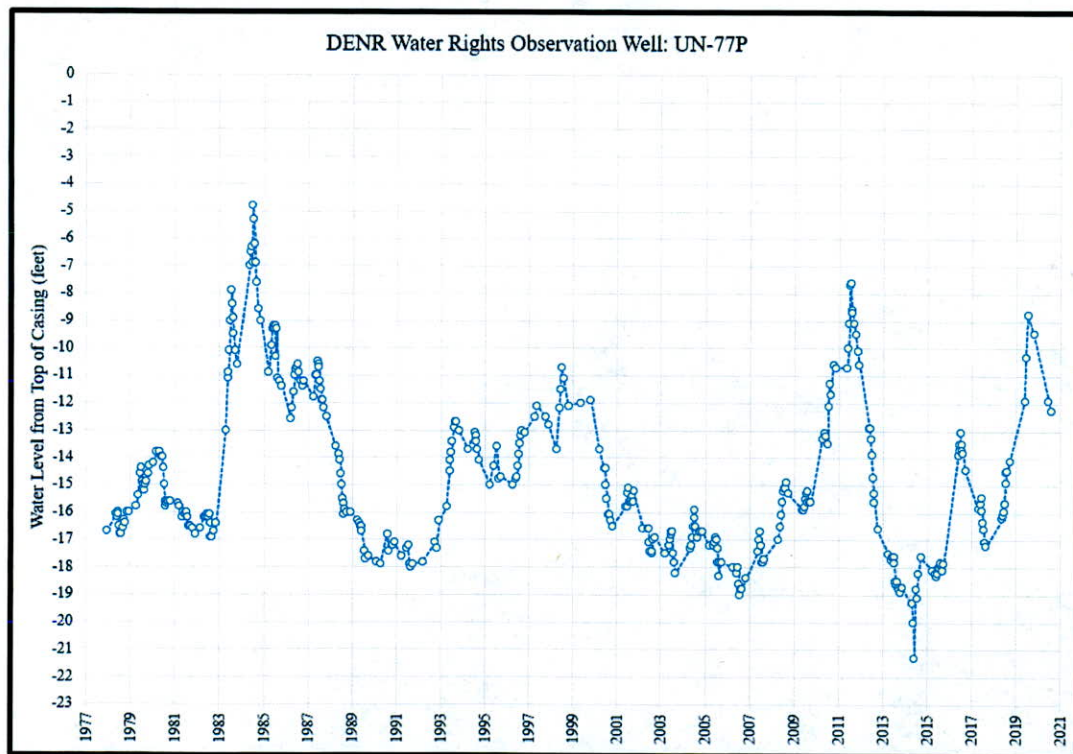


Figure 7. Hydrograph for observation well UN-77P. It is approximately 2.1 miles southwest of the proposed well location for Water Permit Application No. 8476-3 (Water Rights, 2021c).

The hydrographs shown in Figures 2 through 7 are representative of the hydrographs for other observation wells completed in the Missouri: Elk Point aquifer. The hydrographs show the water level of the aquifer is relatively stable over the period of record. They indicate that the aquifer responds well to climatic conditions with rising water levels during wet periods and declining water levels during drier periods. They also demonstrate that any drawdowns from pumping are temporary because the water levels typically recover to pre-pumping levels after the irrigation season.

A few Missouri: Elk Point aquifer observation well hydrographs show a gradual downward trend. These wells are located next to the Missouri River and the downward trend is due to entrenchment of the Missouri River, below Gavins Point Dam in Yankton, SD, lowering the water surface elevation of the river (Goodman, 2007). This results in a lowering of water levels in the hydraulically connected aquifer as the water level in the aquifer equilibrates to the lower average water surface elevation of the river. Therefore, downward trends are likely caused by the entrenchment of the Missouri River and not from over-appropriation of the Missouri: Elk Point aquifer (Mathiowetz, 2020).

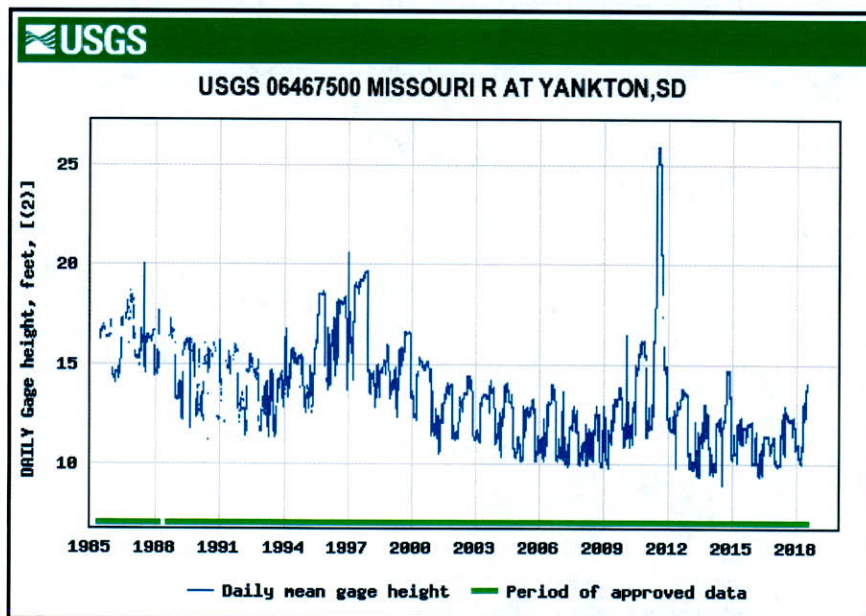


Figure 8. Hydrograph for USGS Stream Gage 06467500 Missouri River at Yankton, SD (USGS, 2021).

The U.S. Geological Survey (USGS) operates stream flow gaging station No. 06467500, on the Missouri River at Yankton, SD. Comparing the hydrograph for this gage (Figure 8) to the observation well hydrographs of the Missouri: Elk Point aquifer (Figures 2 - 7), show both the river and the aquifer react to climatic conditions by rising and falling in a similar fashion. Furthermore, during flood events, as particularly shown in 2011, the water level in the aquifer, especially closer to the Missouri River, rises very quickly beyond what is typically seen for glacial outwash aquifers. This indicates there is hydraulic connection between the aquifer and the river. This means that when the elevation of the water in the river is greater than the aquifer, the river recharges the aquifer. Conversely, when the elevation of the water is higher in the aquifer, the aquifer naturally discharges to the river. As-a-result, as long as there is water in the river, there will be water in the aquifer and there is a reasonable probability unappropriated water is available for this proposed appropriation.

POTENTIAL FOR UNLAWFUL IMPAIRMENT OF EXISTING WATER RIGHTS

Currently, there are a total of 621 water rights/permits appropriating or reserving water from the Missouri: Elk Point aquifer (Water Rights, 2021a). Table 5 lists the water rights/permits shown in Figure 9 within 3 miles of the proposed well locations for Application Nos. 8474-3 and 8475-3. Table 6 lists the water rights/permits shown in Figure 10 within two miles of the proposed well location for Application No. 8476-3.

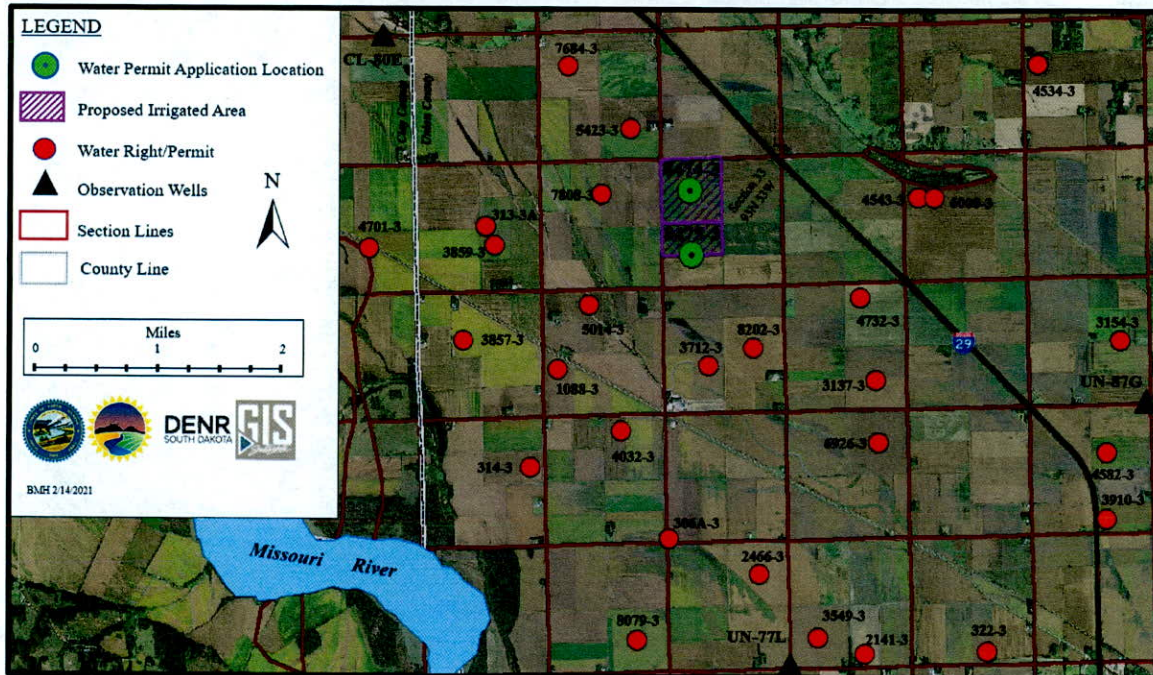


Figure 9. Existing Missouri: Elk Point aquifer water rights/permits and observation wells in the vicinity of Water Permit Application Nos. 8474-3 and 8475-3 (modified from Hedges, et al., 1982; Water Rights 2021a & 2021c).

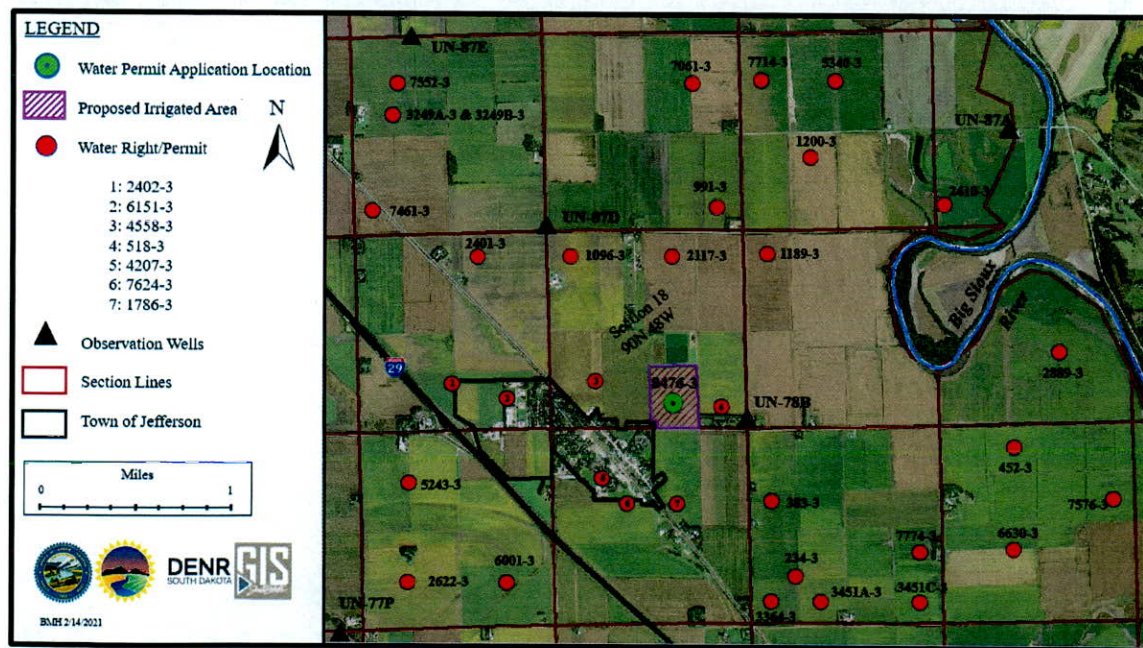


Figure 10. Existing Missouri: Elk Point aquifer water rights/permits and observation wells in the vicinity of Water Permit Application No. 8476-3 (modified from Hedges, et al., 1982; Water Rights 2021a & 2021c).

Table 5. Water rights/permits shown in Figure 9 (Water Rights, 2021a).

PERMIT NO.	NAME	PRIORITY DATE	CFS	ACRES	STATUS ^a	USE ^a
1088-3	MARIMAC INC	05/27/1965	1.80	125.3	LC	IRR
2141-3	CALVIN L CHAUSSEE	11/26/1974	2.28	160.0		
2466-3	CAROL A DONNELLY	10/22/1975	3.88	272.0		
306A-3	THOMAS W CURRY	09/24/1956	1.71	120.0		
313-3A	DAWN GLOVER	10/08/1956	2.43	170.4		
3137-3	BANKERS TRUST CO	10/28/1976	1.94	136.0		
314-3	JAMES DONNELLY	10/08/1956	2.67	280.0		
3154-3	WINIFRED E NABB	10/29/1976	2.00	140.0		
322-3	FRED JORGENSEN & SON	10/18/1956	1.98	138.6		
3549-3	MARCELLA FLANNERY ESTATE	01/11/1977	1.89	132.0		
3712-3	GEORGE DONNELLY	03/04/1977	2.00	144.0		
3857-3	DAWN GLOVER	03/07/1977	2.22	163.6		
3859-3	MARGARET ANN PETERSON	03/07/1977	1.02	72.0		
3910-3	HUGH MORRIS	03/24/1977	1.87	130.0		
4032-3	DAWN & GARY GLOVER	06/24/1977	0.57	40.0		
4534-3	WAYNE HECKATHORN	03/10/1980	1.11	105.0		
4543-3	LYLE WAGNER	07/25/1980	2.88	289.0		
4582-3	ED MCINERNEY	10/28/1980	1.88	132.0		
4701-3	MARY EBY TRUST	03/30/1981	1.85	131.0		
4732-3	GERALD BENJAMIN	03/27/1981	2.22	189.0		
5014-3	CRAIG MCINERNEY	02/23/1984	1.44	101.0		
5423-3	MELVIN DONNELLY	03/06/1990	1.78	126.0		
6000-3	BURDETTE HANSON	05/02/1997	0.00	33.0		
7684-3	JOHN STEVEN DONNELLY	02/06/2013	1.78	131.0		
7808-3	MELVIN DONNELLY	03/25/2013	1.78	134.0		
8079-3	MELVIN DONNELLY	01/20/2015	1.78	135.0		
6926-3	CHUCK DONNELLY	12/20/2007	1.89	160.0	PE	
8202-3	GERALD BENJAMIN	02/10/2016	1.89	132.0		

a - LC: License; PE: Permit; IRR: Irrigation

There are numerous domestic wells on file with the Water Rights Program within the vicinity of the proposed well sites (Water Rights 2021b). Users in the vicinity of the proposed applications are likely using water provided by a rural water system. Nevertheless, when considering the large amount of artesian head pressure (40 feet) and saturated thickness of the aquifer in this area, domestic users with adequate wells are not anticipated to be adversely impacted by the pumping proposed for these applications. Even though there are high capacity wells in the Missouri: Elk Point aquifer, there has not been a history of well interference complaints due to pumping (Water Rights, 2021d).

To protect domestic well users, the Water Management Board defined an “adversely impacted domestic well” in ARSD 74:02:04:20(7) as:

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

Table 6. Water rights/permits shown in Figure 10 (Water Rights, 2021a).

PERMIT NO.	NAME	PRIORITY DATE	CFS	ACRES	USE ^a	STATUS ^a
1096-3	MIKE CHICOINE	01/27/1964	1.1	78.0	IRR	LC
1189-3	AUTHIER - UNION	03/31/1965	2.2	152.4		
1200-3	MIKE CHICOINE	04/29/1965	2.3	158.0		
1786-3	ROBERT/THERESA GEARY	01/01/1949	2.0	140.0		
2117-3	DEAN BOSSE	09/23/1974	1.3	90.0		
234-3	LYNN R MOLLET	08/07/1956	2.3	160.0		
2401-3	PAUL VONDRAK	10/15/1975	2.0	145.0		
2402-3	PAUL VONDRAK	10/15/1975	1.1	75.0		
2410-3	DENNIS J CHICOINE	10/02/1975	2.0	180.0		
2622-3	JOHN TRUDEAU	03/15/1976	1.7	116.0		
2889-3	DALE CHICOINE	08/19/1976	2.7	250.0		
3249A-3	DEAN BOSSE	12/03/1976	1.2	82.0		
3249B-3	GLENN BOSSE	12/03/1976	0.7	48.0		
3364-3	DEAN BOSSE	12/03/1976	0.9	67.0		
3451A-3	MIKE CHICOINE	01/07/1977	0.6	40.0		
383-3	VIRGIL L MOLLET	01/04/1957	2.2	150.0		
452-3	KEITH D & JANICE L HOWARD	12/21/1957	4.4	320.0		
4558-3	MIKE CHICOINE	09/17/1980	1.4	95.0		
518-3	DALE BOSSE	02/01/1958	2.1	150.0		
5243-3	GEORGE NORTON	11/18/1988	1.1	76.7		
5340-3	PATTY BRIENZO	07/18/1989	2.2	160.0		
6001-3	JOSEPH & JOHN TRUDEAU	05/05/1997	1.8	136.0		
991-3	AUTHIER - UNION	05/24/1962	2.9	191.4		
4207-3	TOWN OF JEFFERSON	01/01/1916	0.9	n/a	MUN	
6151-3	VERNON & NORMA VAKOC	10/04/1999	0.7	n/a	COM	
3451C-3	IVAN MOLLET	08/07/1956	0.6	40.0	IRR	PE
6630-3	LYNN R MOLLET	06/02/2005	0.9	60.0		
7061-3	BRAD CHICOINE	09/04/2008	1.8	152.0		
7461-3	GLENN BOSSE	09/26/2012	1.1	32.0		
7552-3	DEAN BOSSE	10/31/2012	0.6	49.0		
7576-3	KEITH D & JANICE L HOWARD	12/21/2012	3.3	400.0		
7624-3	DAVE FORNIA	12/26/2012	2.0	120.0		
7714-3	BRAD CHICOINE	02/04/2013	1.7	59.3		
7774-3	ROBERT J & THERESA GEARY	02/14/2013	1.8	35.0		

a - LC: License; PE - Permit; IRR: Irrigation; MUN: Municipal; COM: Commercial

a - LC: License; PE - Permit; IRR: Irrigation; MUN: Municipal; COM: Commercial

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 Findings of Facts and Conclusions of Law that noted the reservation of artesian head pressure for delivery of water is 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 considered as an unlawful impairment, it conflicts with SDCL 46-1-4 (Water Rights, 1995). Consequently, some existing well owners may need to lower their pumps due to deeper water levels depending on the specific characteristics of the Missouri: Elk Point aquifer at their location; particularly since the aquifer is under confined conditions near the proposed diversion point for this application. Nearby adequate wells are not

expected to be adversely impacted as defined in ARSD 74:02:04:20(7). Furthermore, the majority of the Missouri: Elk Point aquifer is under unconfined conditions. In an unconfined aquifer, drawdown from pumping is generally not significant far from the well. Therefore, unconfined conditions near the proposed well site would minimize potential well interference from drawdown. Nevertheless, if this application is approved, the water permit should include a qualification that the well owner should control their withdrawals so there is not a reduction of water for adequate domestic wells or for adequate wells having prior water rights.

When considering the large amount of artesian head pressure (41 – 46 feet), saturated thickness of the aquifer in this area, the hydrographs of nearby observation wells not showing detrimental impact of pumping, and the lack of well interference complaints due to pumping, there is reasonable probability that the proposed diversion can be developed without unlawfully impairing existing appropriative or domestic water users with adequate wells.

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. 8475-3 proposes to divert water at a maximum instantaneous diversion rate of 2.22 cfs for the irrigation of 80 acres or at a rate of 1.94 cfs per 70 acres. Application No. 8476-3 proposes to divert water at a maximum instantaneous diversion rate of 2.22 cfs for the irrigation of 48.2 acres or at a rate of 3.22 cfs per 70 acres. The applicant stated, for Application No. 8476-3, that he wanted to use a smaller system to avoid spraying his neighbor’s area to the east. A smaller pivot to control irrigation is likely the case for Application No. 8475-3. A smaller pivot may require the same flow rate to operate as a typical sized pivot, but cover a smaller area resulting in the exceedance for the 1 cfs per 70 acres. This type of reason has been accepted by the Water Management Board in past.

CONCLUSIONS:

1. Application No. 8474-3 proposes to appropriate water at a maximum instantaneous diversion rate of 2.22 cubic feet per second (cfs) from one well completed into Missouri: Elk Point aquifer. The well is expected to be 100 feet deep and located in the approximate center of the NW ¼ Section 33 for irrigation of 160 acres located in the NW ¼ Section 33; all in T92N-R50W, in Union County. The site is located approximately 5.7 miles northwest of Elk Point, SD.
2. Application No. 8475-3 proposes to appropriate water at a maximum instantaneous diversion rate of 2.22 cubic feet per second (cfs) from one well completed into Missouri: Elk Point aquifer. The well is expected to be 100 feet deep and located in the approximate center of the SW ¼ Section 33 for irrigation of 80 acres located in the N ½ SW ¼ Section 33; all in T92N-R50W, in Union County. The site is located approximately 5.5 miles northwest of Elk Point, SD. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres.

3. Application No. 8476-3 proposes to appropriate water at a maximum instantaneous diversion rate of 2.22 cubic feet per second (cfs) from one well completed into Missouri: Elk Point aquifer. The well is expected to be located in the approximate center of the SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 18 for irrigation of 48.2 acres located in the W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 18; all in T90N-R48W, in Union County. The site is located approximately 0.5 miles east of Jefferson, SD. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres.
4. Based on the hydrologic budget and the potential to further induce recharge from the Missouri River, there is a reasonable probability unappropriated water is available for these proposed applications.
5. There is a reasonable probability the diversions proposed by these applications can be made without unlawfully impairing existing appropriative or domestic users with adequate wells.
6. Application Nos. 8475-3 and 8476-3 have requested a diversion rate in excess of the statutory limit of one cfs per 70 acres. The applicant indicated that he wants to avoid overspraying adjacent areas. This will require a smaller pivot which in turn will require an increased diversion rate to achieve the irrigation requirements. This reason has been accepted by the Water Management Board in the past.



Blaise Hansen
SD DENR – Water Rights Program

Reviewed By:



Adam Mathiowetz, PE
SD DENR-Water Rights Program

REFERENCES:

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Water Rights. 2021c. *Observation Well Files*. SD DENR-Water Rights Program, Joe Foss Building, Pierre, SD.

Water Rights. 2021d. *Clay County Files*. SD DENR-Water Rights Program, Joe Foss Building, Pierre, SD.

AFFIDAVIT OF PUBLICATION

MAR 29 2021 State of South Dakota)
:ss
WATER RIGHTS County of Union)
PROGRAM

Bruce L. Odson,
the publisher of the Leader-Courier, deposes and says that

The Leader-Courier

is a legal weekly newspaper of a general circulation, printed and published in Elk Point, County of Union, State of South Dakota, and has been such legal newspaper during the time hereinafter mentioned, and that affiant 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

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 Elk Point, the said place of publication; that the first publication of said notice in said newspaper was

on Thursday, the 25 day of March, 2021

and that the succeeding publications were

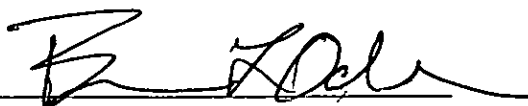
on Thursday, the _____ day of _____,

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

\$ 35.95, 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.

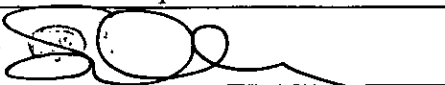


Subscribed and sworn to before me

this 25 day of March, 2021

My commission expires 7-12-23

SUSAN ODSON
NOTARY PUBLIC
SOUTH DAKOTA



Notary Public

NOTICE OF APPLICATION NOS. 8474-3, 8475-3 AND 8476-3 TO APPROPRIATE WATER

Notice is given that Mike Chicoine, 32926 482nd Ave, Jefferson, SD 57038 has filed the following applications for a water permit. Application No. 8474-3 proposes to appropriate 2.22 cubic feet of water per second (cfs) from one well to be completed into the Missouri:Elk Point Aquifer (100 feet deep) located in the approximate center of the NW 1/4 Section 33 for irrigation of 160 acres located in the NW 1/4 Section 33; all in T92N-R50W. This site is located approximately 5 miles northwest of Elk Point, SD.

Application No. 8475-3 proposes to appropriate 2.22 cfs from one well to be completed into the Missouri:Elk Point Aquifer (100 feet deep) located in the approximate center of the SW 1/4 Section 33 for irrigation of 80 acres located in the N 1/2 SW 1/4 Section 33; all in T92N-R50W. This applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres. This site is located approximately 4 1/2 miles northwest of Elk Point, SD.

Application No. 8476-3 proposes to appropriate 2.22 cfs from one well to be completed into the Missouri:Elk Point Aquifer (100 feet deep) located in the SW 1/4 SE 1/4 Section 18 for irrigation of 48.2 acres located in portions of the W 1/2 SE 1/4 Section 18; all in T90N-R48W. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres. This site is located approximately 1/4 mile east of Jefferson, SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 8474-3, 8475-3 and 8476-3 with qualifications because 1) unappropriated water is

available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineer's recommendations with qualifications, the applications, 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 the applications, or recommendations must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendations. 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 April 5, 2021.

The petition may be informal but must include a statement describing the petitioner's interest in the applications, the petitioner's reasons for opposing or supporting the applications, 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 recommendations of the Chief Engineer and no petition to oppose the applications are 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 applications. Notice of the hearing will be given to the applicant and any person filing a petition.

Publish March 25, 2021
Published once at the total approximate cost of \$35.95
12-3-117

AFFIDAVIT OF PUBLICATION

YANKTON DAILY PRESS AND DAKOTAN

RECEIVED

MAR 29 2021

WATER RIGHTS
PROGRAM

MIKE CHICOINE
32926 482ND AVE
JEFFERSON SD 57038

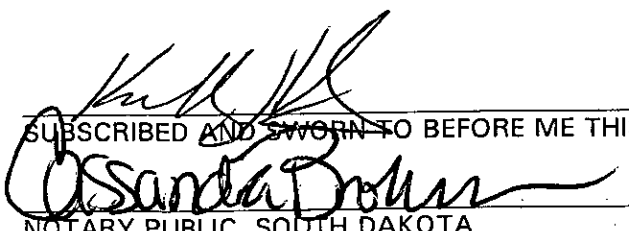
STATE OF SOUTH DAKOTA
COUNTY OF YANKTON

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
3+ 25 NOTICE OF APPLICATIO

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE
NEWSPAPER ON THE 25th DAY OF March, 2021
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION
OF SAID NOTICE TO WIT \$33.17 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: 03/25/2021

FILED ON: 03/25/2021


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

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

Ad text : 3 + 25

NOTICE OF APPLICATION NOS. 8474-3, 8475-3 and 8476-3 to
Appropriate Water

Notice is given that Mike Chicoine, 32926 482nd Ave, Jefferson SD 57038 has filed the following applications for a water permit. Application No. 8474-3 proposes to appropriate 2.22 cubic feet of water per second (cfs) from one well to be completed into the Missouri:Elk Point Aquifer (100 feet deep) located in the approximate center of the NW 1/4 Section 33 for irrigation of 160 acres located in the NW 1/4 Section 33; all in T92N-R50W. This site is located approximately 5 miles northwest of Elk Point SD.

Application No. 8475-3 proposes to appropriate 2.22 cfs from one well to be completed into the Missouri: Elk Point Aquifer (100 feet deep) located in the approximate center of the SW 1/4 Section 33 for irrigation of 80 acres located in the N 1/2 SW 1/4 Section 33; all in T92N-R50W. This applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres. This site is located approximately 4 1/2 miles northwest of Elk Point SD.

Application No. 8476-3 proposes to appropriate 2.22 cfs from one well to be completed into the Missouri:Elk Point Aquifer (100 feet deep) located in the SW 1/4 SE 1 /4 Section 18 for irrigation of 48.2 acres located in portions of the W 1/2 SE 1/4 Section 18; all in T90N-R48W. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres. This site is located approximately 1/4 mile east of Jefferson SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 8474-3, 8475-3 and 8476-3 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 recommendations with qualifications, the applications, 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 the applications or recommendations must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendations. 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 April 5, 2021.

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Published once at the total approximate cost of \$33.17



DENR
SOUTH DAKOTA

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

March 17, 2021

Mike Chicoine
32926 382nd Ave
Jefferson SD 57038

Dear Mr. Chicoine:

Water Permit Application Nos. 8474-3, 8475-3 and 8476-3 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 Leader-Courier printed at Elk Point SD (Ph # 605 356-2632) 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 recommendations of the Chief Engineer and report 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 publisher 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 applications.

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 NOS. 8474-3, 8475-3 and 8476-3 to Appropriate Water

Notice is given that Mike Chicoine, 32926 482nd Ave, Jefferson SD 57038 has filed the following applications for a water permit. Application No. 8474-3 proposes to appropriate 2.22 cubic feet of water per second (cfs) from one well to be completed into the Missouri:Elk Point Aquifer (100 feet deep) located in the approximate center of the NW 1/4 Section 33 for irrigation of 160 acres located in the NW 1/4 Section 33; all in T92N-R50W. This site is located approximately 5 miles northwest of Elk Point SD.

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Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 8474-3, 8475-3 and 8476-3 with qualifications because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineer's recommendations with qualifications, the applications, 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.

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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

APR 19 2021

Mike Chicoine
32926 482nd Ave
Jefferson SD 57038

Dear Mr. Chicoine:

Enclosed are Water Permit Nos. 8474-3, 8475-3 and 8476-3 authorizing construction of the water diversion systems and beneficial use of the water, not exceeding the limits as specified in the Water Permits.

An application/license filing fee of \$950.00 was submitted with the application for Water Permit No. 8476-3. The fee for this permit should be \$700.00. \$250.00 will be refunded to you. The refund check should be received within the next couple of weeks.

Form 10's, *Notice of Completion of Works and Application of Water to Beneficial Use*, are enclosed. Please return the completed forms after you have finished the systems and have put the water to beneficial use. An investigation can then be scheduled so the water licenses 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

8475-3

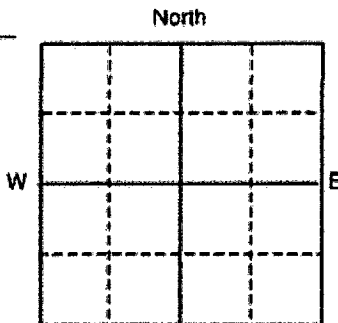
SD EForm - 1621LD V1

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE 1/4 SW 1/4 Sec 33 Twp 92N Rg 50WCounty Union

Please mark well location with an "X"



Well Completion Date

5-21-2021

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
2400 ft. from Septic (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>12</u> IN	<u>0</u> FT	<u>60</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
<u>Bentonite Grout</u>	<u>10</u>	Lb/gal	<u>0</u> Ft	<u>24</u> Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

Tremie Pipe

SCREEN:

☒ Perforated pipe ☐ Manufactured
Diameter 12 Inches Length 20 FeetMaterial PVCSlot Size 50 Set From 60 Feet to 80 FeetOther information 80-100 ft 12" Johnson
Stainless Steel 85 slotWAS A PACKER OR SEAL USED? ☐ Yes ☐ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? Chlorine Tablets
☐ No, Why Not?

Lab to which water quality sample sent for analysis

Well Owner: Michael Chicoine

Business Name:

Address: 32926 482nd AveCity, State, Zip: Jefferson, SD 57038

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>TOP SOIL</u>	<u>0</u>	<u>3</u>
<u>Brown Clay</u>	<u>3</u>	<u>37</u>
<u>Gray Clay</u>	<u>37</u>	<u>51</u>
<u>medium Sand</u>	<u>51</u>	<u>60</u>
<u>Gravel</u>	<u>60</u>	<u>105</u>

STATIC WATER LEVEL 18 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: Turbine and
☐ Bailed Desil Engine
☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

This well was drilled under license # 805 and this report is true and accurate.Drilling firm: Sam Heine Well COSignature of License Representative: [Signature]Signature of Well Owner or Equitable Property Holder: [Signature]

RECEIVED

JUL 08 2021

Date: 6-12-2021

WATER RIGHTS PROGRAM



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

October 20, 2025

*8474-3,*8475-3,*8476-3,*1096-3
*2620-3,*2621-3,*3451A-3,*4558-3
*6557-3,*7218-3,*7221-3,*7222-3
*7223-3,*7711-3,*7713-3

Michael Chicoine
32427 472nd Ave
Elk Point SD 57025

Dear Mr. Chicoine:

Enclosed is a "Notice" dated October 8, 2025, concerning the 2025 Irrigation Questionnaires.

The notice was originally mailed to you at 32926 482nd Ave, Jefferson SD 570383. The post office notified our office that your address has changed, and your records have been updated accordingly.

This is a time sensitive matter. Please complete and return the enclosed questionnaire or submit your report online at <https://danr.sd.gov/iq/> using this password **GSPMVA**.

If this change of address is in-correct, please contact our office immediately to update your contact information.

Sincerely,

Amanda Dewell
Permitting Administrator
Water Rights Program
605 773-3352
Amanda.Dewell@state.sd.us

enclosures

CHIC926 570382006-1425
RETURN TO SENDER
CHICOINE, MICHAEL JAMES
32427 472ND AVE
ELK POINT SD 57025-6712

10/14/25

RETURN TO SENDER

