

WATER PERMIT NO. 7927-3

Name of Applicant: Terry Britzman

Address: 16190 457th Ave, Watertown SD 57201

Phone: 605 880-9606

Amount of Water Claimed: 1.78 cfs

Total Acres: 135.3 acres

Source of Water Supply: groundwater (one well)

Water to be used for: irrigation

County: Codington

Type of Waste Disposal System:

Location: 9 miles north of Watertown

PRIORITY *Amended 3-5-14*
Date Received: 11-26-13

Application/License Fee: \$ 1050

Corrected Application Received:

Period of Annual Use: May 1 – October 31

Remarks:

Diversion Point: SE 1/4 SE 1/4 Sec 8-T118N-
R52W

Land to be Irrigated: SE 1/4 Sec 8-T118N-R52W

Depth of Well: 35 *170-250 feet deep*

Well Driller: Thein Well

Remarks:

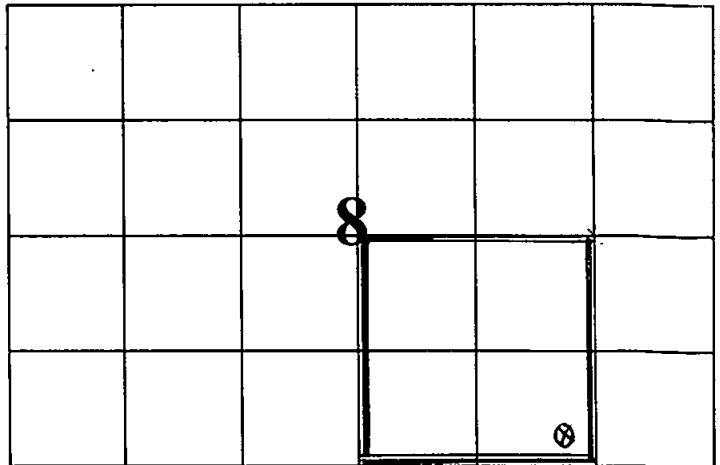
Type of Map: aerial

Prepared by:

Reviewed and the Number Assigned on: 11-26-13

By: Karen Schlaak

Notice of Hearing - date to intervene: _____



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

Erie

Amended application
3-5-14

Mail to: PMB 2020 DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>7927-3</u> (office use only)	Hydrologic Unit <u>10170202</u>
	Basin <u>Sioux River</u>	
	Newspaper <u>Public Opinion</u>	
	<u>Box 10 Watertown 57201</u> <u>605-886-6901</u>	

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NOV 26 2013

WATER RIGHTS
PROGRAM

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 Terry Britzman
(check one) ☒ Owner ☐ Tenant/lessee ☐ Owner's Legal Agent
(name and complete address if different than above name)

Mailing Address 14190 -451 AVE Watertown S.D. 57201
(Address) (City) (State) (Zip Code)

Home Phone 605-8866755 Cell 605-880-9604 Email _____

2. Amount of water claimed 1.28*CFS or 800**GPM ***AF Total Acreage 135.3
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable

3. Source of water supply Wells on ~~Acres~~ quarter (SE 1/4 SE 1/4)

4. Location of point of diversion _____
(example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
Wells SE 1/4 Sec 8-T118N-R52W County Codington

5. County or counties where water will be used Codington

6. Annual period during which water is to be used May 1 - Oct 31

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
<u>SE 1/4 Sec 8-118N-R52W</u>	<u>135.3</u>		

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

Put Center Pivot on quarter of land

I, Terry Britzman, the applicant, certify that I have read this application, have examined the attached map, and that the matters stated are true.

SOUTH DAKOTA
WATER PERMIT NO. 7927-3

Date of first receipt of application November 26, 2013.

Date of amended application March 5, 2014.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 7927-3 to Terry Britzman, 16190 457th Ave, Watertown SD 57201 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. 7927-3 appropriates 1.78 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (170-250 feet deep) located in the SE 1/4 SE 1/4 Section 8 for irrigation of 135.3 acres located in the SE 1/4 Section 8; all in T118N-R52W.
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: May 1 – October 31.
3. The date from which applicant may claim right is March 5, 2014.
4. The date of approval of Permit No. 7927-3 is June 2, 2014.
5. One-fifth of the construction is to be completed on or before December 2, 2016.
6. All construction is to be completed on or before June 2, 2018.
7. Water is to be put to beneficial use on or before June 2, 2023.
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 this Permit 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. 7927-3 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. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

WATER MANAGEMENT BOARD

By: 

Jeanne Goodman, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

JUN 18 2014

date



Supplemental Information

(type or print)

(see letter dated 3-5-14)

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 Thein Well
(if yes, please provide copies of logs)b) If existing wells, how many 170-250 Provide copy of log(s), if available. Drilled by _____c) Well Depth 35 Depth to Top of Water Bearing Material 1' Depth to Water from Surface 10'

d) Distance to nearest existing domestic well:

On applicant's property _____

On property owned by others 1/4 mile South**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)

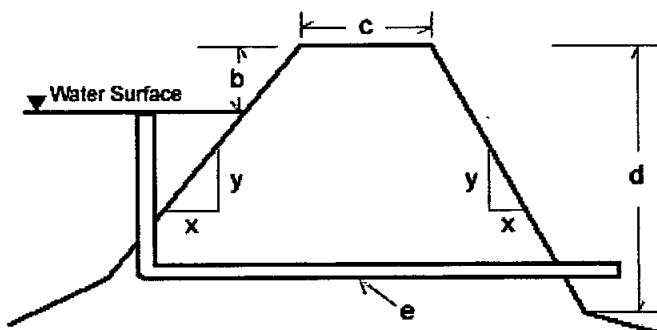
Upstream _____

Downstream _____

h) Surface Area of Impoundment _____

i) Storage _____ Acre Feet

j) Drainage Area Above Dam _____ Acres





United States Department of Agriculture
Farm Service Agency

February 04, 2011

PLSS: 8_118N_52W
Farm: 4910

Codington Co

1:8,502

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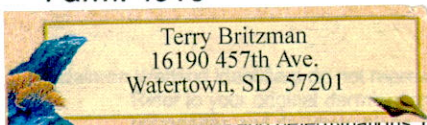
SB 154

Wetland Determination Identifiers

- Restricted Use
- ▽ Limited Restrictions
- Exempt from Conservation Compliance Provisions

Common Land Units

Non Cropland



ent the size, shape or specific determination of the area.
(CPA-026 and attached maps) for exact wetland
boundaries and determinations, or contact NRCS.

2010 Ortho-Photography - Not to Scale

THEIN WELL

**P.O. BOX 778, 11355 HWY. 71 NE (ACROSS FROM RINGO LAKE)
SPICER, MINNESOTA 56288 • (320) 796-2111
www.theinwell.com • E-mail: theinwell@tds.net**

WELLS ~ PUMPS
SALES ~ SERVICE

Since 1893

Sec 8

Well Log for Terry Breitman

Date: 10/10/13

Well Size: Test hole #2

Casing Length:

Screen Length:

Total Well Depth:

SWL:

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**WATER RIGHTS
PROGRAM**

[illegible]

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 11/26, 20 13

RECEIVED OF Terry Britzman 16190 457th Ave Watertown SD 57201

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

Fee for Application for Permit No. <u>7927-3</u> to Appropriate Water, to construct and to put water to beneficial use	850	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>7927-3</u>	200	00
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____		
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law)	TOTAL	1050 00

No. **06496**

By James Goodman
Chief Engineer



**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

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



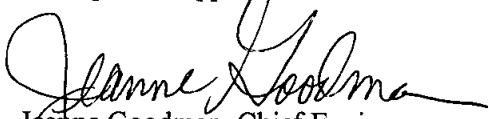
**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT APPLICATION
NO. 7927-3, Terry Britzman**

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. 7927-3, Terry Britzman, 16190 457th Avenue, Watertown SD 57201.

The Chief Engineer is recommending APPROVAL of Application No. 7927-3 as a TEMPORARY USE PERMIT pursuant to SDCL 46-5-39 because 1) water is available to be appropriated as a temporary use permit until Watertown Municipal Utilities develops water reserved from its future use permit, 2) the proposed diversion can be developed as a temporary use permit 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. Watertown Municipal Utilities has priority right to this water under future use withdrawal permits. This permit is issued as a temporary use permit pursuant to SDCL 46-5-39 and is subject to Watertown's prior rights if or when the city develops the reserve water supply. The permit may be subject to cancellation when the city puts to beneficial use water reserved by their future use permit. The Chief Engineer must provide the permit holder six months notice prior to cancellation of this temporary use permit.
2. The well approved under this Permit 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.
3. The well authorized by Permit No. 7927-3 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.
4. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.


Jeanne Goodman, Chief Engineer
January 24, 2014

REPORT TO THE CHIEF ENGINEER

WATER PERMIT APPLICATION NO. 7927-3

Terry Britzman

January 7, 2014

Water Permit Application No. 7927-3 proposes to withdraw groundwater at a maximum diversion rate of 1.78 cubic feet of water per second (cfs) from one well to be completed into the North management unit of the Big Sioux aquifer. The well is expected to be 35 feet deep, located in the SE¼ SE¼ of Section 8, T118N-R52W. Water will be used to irrigate 135.3 acres located in the SE¼ of Section 8, T118N-R52W, in Codington County.

AQUIFER: North management unit of the Big Sioux aquifer (BS:N)

HYDROGEOLOGY:

The North management unit of the Big Sioux aquifer is a surficial outwash, consisting of medium sands to medium gravels, located in the flood plain of the Big Sioux River and its tributaries. The aquifer is generally under water table conditions but can be confined locally. The Big Sioux: North aquifer is hydraulically connected to area surface waters, including the Big Sioux River and Lake Kampeska, and ground waters, including the Big Sioux: Brookings aquifer to the south. Water in the aquifer moves to the south and locally toward the Big Sioux River (Hansen, 1990; Kume, 1985).

Based on previous mapping of the aquifer by Hansen (1990), Hedges and others (1982), Kume (1985), Putnam and Thompson (1996), and Thompson (2001), Stonesifer (2013) developed a composite map the Big Sioux: North aquifer, shown in Figure 1. The aquifer underlies approximately 111,700 acres of Codington, Grant, Hamlin, and Roberts Counties (Stonesifer, 2013).

Extending from the main trunk of the North management unit of the Big Sioux aquifer, a portion of the aquifer underlies the majority of Mud Creek. For the purposes of the Water Management Board and the Water Rights program, Goodman (1995) cleaved this subunit from the aquifer. For this report, this area will be referred to as the Mud Creek subunit. Buhler (2012) mapped the Mud Creek subunit based on the description by Goodman (1995) and mapping by Hedges and others (1982). Considering the updated mapping of the Big Sioux: North aquifer, the area of the subunit was adjusted. The Mud Creek subunit, shown in Figure 2, underlies approximately 11,600 acres. Assuming an average thickness of 20 feet and a specific yield of 0.15, the subunit contains an estimated 35,000 acre feet (ac-ft) of water in storage.

From the test hole log submitted with the application, aquifer materials were found from one to 35 feet below ground surface. This information agrees with other drilling in the area (SD Geological Survey, 2014; Water Rights, 2014c).

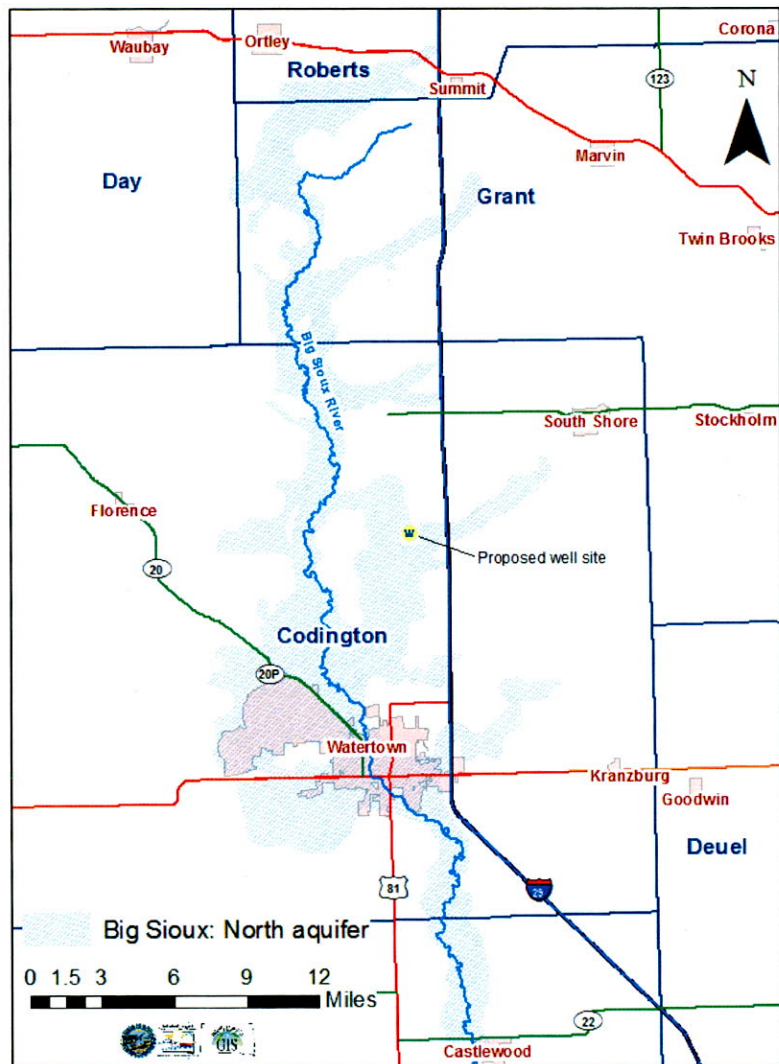


Figure 1: Big Sioux: North aquifer (Stonesifer, 2013)

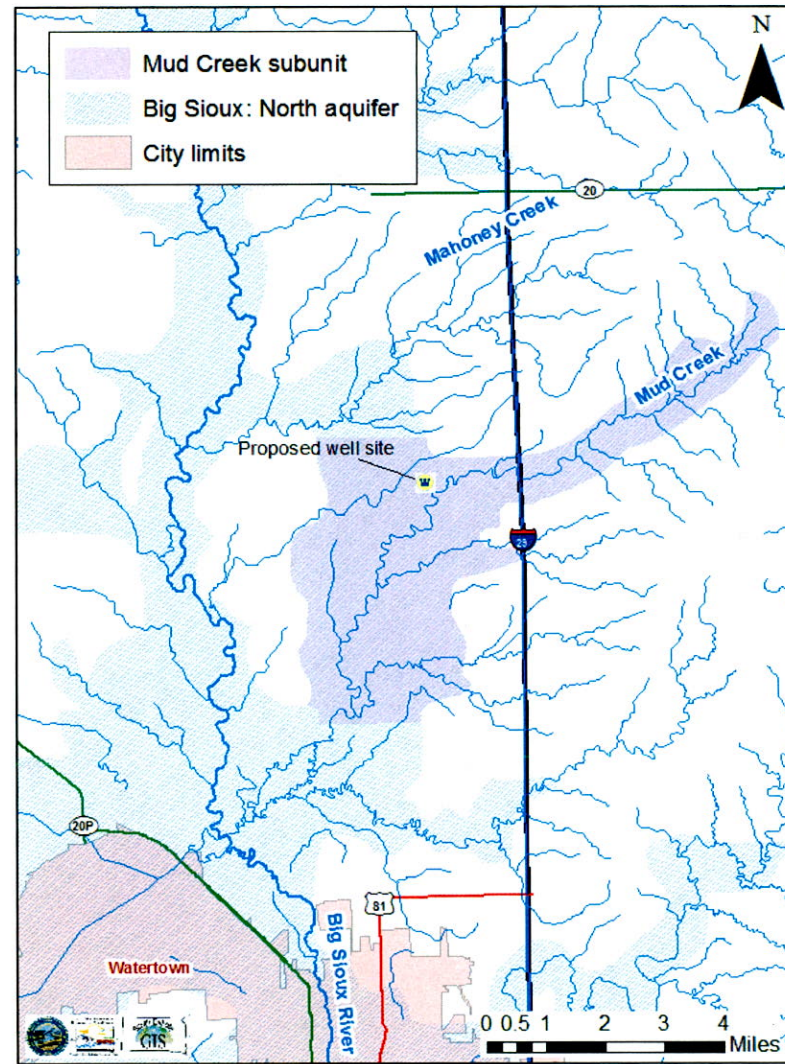


Figure 2: Mud Creek subunit (Buhler, 2009; Stonesifer, 2013)

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 existing rights from the aquifer that are pertinent to this application.

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 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 public water system has applied for a permit, the Board need not consider the recharge/withdrawal issue. Here, a public water system is not involved. Therefore, withdrawal/recharge issue must be considered.

Hydrologic Budget:

Discharge:

Discharge from the Big Sioux aquifer occurs through evapotranspiration, outflow out of the subunit, outflow to Mud Creek during low stage, and well withdrawals (Hansen, 1990).

In the area of the Big Sioux: North aquifer, evapotranspiration can occur at a rate of approximately 35 inches per year (in/yr) at ground surface, provided water is available (Putnam and Thompson, 1996). The amount of evapotranspiration is related to groundwater depth, and difficult to quantify.

The amount of water flowing through and out of an aquifer can be calculated by Darcy's equation, shown below. Total inflow is at least equal to outflow. Therefore, this outflow can be considered the absolute minimum recharge to the aquifer that is available for well withdrawal.

$$Q = T I L$$

Where: Q = flow through the aquifer

T = transmissivity of the aquifer

I = hydraulic gradient of the aquifer

L = cross sectional length of the aquifer

The amount of water discharging from groundwater to surface water can also be described by Darcy's equation. However, because the hydraulic gradient between groundwater and surface water continually changes, unlike the generally consistent hydraulic gradient of an aquifer, the annual volume of water discharging to streams from the subunit is difficult to determine.

There are currently nine water rights/permits appropriating water and one future use permit reserving water from the Mud Creek subunit, shown in Table 1 (Water Rights, 2014b). In

addition, there are numerous domestic wells on file that appear to be completed into the Mud Creek subunit (Water Rights, 2014c).

Table 1: Water rights/permits and future use permit withdrawing from the Mud Creek subunit (Water Rights, 2014b)

Permit No.	Name	Priority Date	Status	Type	Diversion (cfs)	Acres	Appropriation (ac-ft/yr)
2927-3	Roland Pester	08/26/1976	LC	IRR	1.86	130	260
4180A-3	Ina C Kahnke	12/15/1975	LC	IRR	2.88	392	784
5262-3	Rodney Zemlicka	01/05/1989	LC	IRR	2.22	165	330
5578-3	Rodney Zemlicka	09/11/1991	LC	IRR	2.22	244	488
4932-3	Northern Con-Agg Inc	10/27/1982	LC	IND	3.12		2259
5696-3	Rauville Café	08/03/1992	LC	COM	0.022		\$16
5862-3	City of Watertown	04/06/1995	FU	MUN			760
6362-3	Rodney Zemlicka	09/13/2002	PE-T	IRR		100	200
6540-3	Roger Mohr	09/14/2004	PE-T	IRR	2.23	160	320
7055-3	Watertown Municipal Utilities	04/06/1995	PE	MUN	8.00		4500
LC = Water Right, PE = Water Permit, FU = Future Use Permit, T = Temporary IRR = Irrigation, IND = Industrial, COM = Commercial, MUN = Municipal, RWS = Rural Water System							

While there are numerous domestic wells on file, many are no longer used as primary sources since rural water systems have been introduced in the area. Considering this, and the relatively small withdrawal ability and authorization of a domestic well, the annual quantity of water withdrawn due to domestic wells is not significant to the hydrologic budget of the subunit (Water Rights, 2014c).

Future Use Permit No. 5862-3 reserves water from the Mud Creek subunit. Upon approval of this permit, the Water Management Board deemed this subunit fully appropriated. Initially, the future use permit application proposed reserving 6,275 ac-ft of water, but only 3,700 ac-ft was approved due to water availability estimates. The remaining 2,575 ac-ft were deferred until further study. In the review of this permit in 2006, this reservation amount was adjusted due to improved recharge estimates, resulting in 5,260 ac-ft approved for future use. The remaining 1,015 ac-ft were denied. In 2008, Water Permit No. 7055-3 applied to appropriate 4,500 ac-ft of water reserved by this future use permit, resulting in 760 ac-ft remaining reserved for future use (Water Rights, 2014b).

The amount of water that can be expected to be withdrawn by non-irrigation use water rights/permits at the current appropriation amount can be estimated by assuming those limited by an annual volume will pump the entire volume appropriated annually, and those limited only by diversion rate will pump at the maximum permitted diversion rate 60 percent of the time. Water Right No. 4932-3 is for non-consumptive use, indicating no actual net withdrawal from the aquifer. Therefore, the total annual withdrawal from the Mud Creek subunit by non-irrigation use is currently expected to be 4,510 ac-ft/yr (Water Rights, 2014b).

Figure 2 shows the historic irrigation data for the Mud Creek subunit. Pumpage from temporary use permits has been excluded because this use is accounted for in the future use reservation. The average annual irrigation pumpage is currently 187 ac-ft/yr and varies from a minimum of 22 ac-ft/yr to a maximum of 589 ac-ft/yr (Water Rights, 1980-2013). This data indicates a large variability in the data set, which can be seen in Figure 3. Aside from the relatively small population of users in this subunit, the variability in annual irrigation pumpage can be attributed

to two major factors: climatic and economic conditions. For example, during the drought and high commodity prices of 2012, the irrigation pumpage was much greater than the average. While there is relationship between these variables, they are difficult to predict.

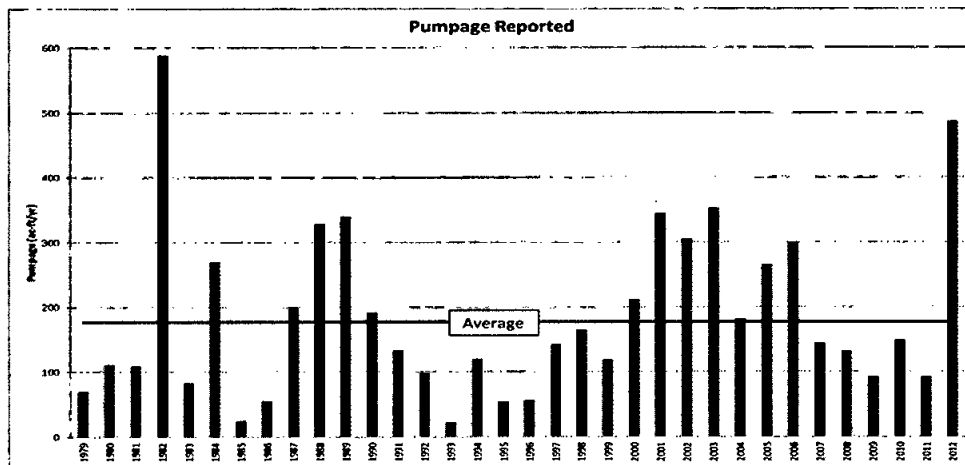


Figure 3: Historic irrigation water use from the Mud Creek subunit, excluding temporary use water permits (Water Rights, 1980-2013)

Recharge:

Recharge to the Big Sioux aquifer occurs through infiltration of precipitation and inflow from Mud Creek during high stage (Hansen, 1990).

The amount of annual recharge is related to the amount of annual precipitation. The annual precipitation in the Watertown area has been approximately 22 in/yr (Putnam and Thompson, 1996). The portion of precipitation that actually recharges the aquifer is dependent of several factors and is difficult to determine.

The amount of water discharging from surface water to groundwater can also be described by Darcy's equation. However, as previously discussed, because the hydraulic gradient between groundwater and surface water continually changes, the annual volume of water discharging to the subunit from streams is difficult to determine.

Hedges and others (1985) estimated recharge to be 6.5 in/yr for the entire Big Sioux aquifer system from a base flow recession analysis. This method is based on a strong relationship between groundwater and surface water, which is likely the case for the Big Sioux aquifer system. In this method recorded streamflow in a drainage basin is assumed to represent the groundwater recharge to the basin when the system is in equilibrium.

Hedges and others (1985) estimated recharge to the many aquifers in eastern South Dakota by observation well analysis. Methodology to calculate recharge includes:

1. Identifying all wells under unconfined conditions from the aquifer.
2. Totalling the recorded water level rises each year for each well.
3. Totalling the annual water level rise of all wells.
4. Dividing the total water level rise by the total number of years providing data.
5. Applying the specific yield to obtain the average annual recharge rate.

Big Sioux: North aquifer was determined to be recharged at a rate of 3.2 in/yr by this method using data from 25 observation wells over 290 total water years (Hedges and others, 1985). The specific yield of the aquifer, assumed to be 0.15 for aquifers by Hedges and others (1985), is a variable that greatly affects the resulting recharge estimation. Also, increases in water levels could be skewed by the effects of drawdown due to pumping and water levels in hydraulically connected surface waters. Because recharge and discharge occur simultaneously, measurements of any increase in water levels is a measure of both recharge and discharge. And so, this method likely yields a lower than actual recharge rate.

Putnam and Thompson (1996) also applied this method, or a similar one, to estimate recharge to the Big Sioux: North aquifer using data from nine wells from 1978 to 1985. Well locations were chosen to minimize the effects of drawdown and surface water levels. Applying a specific yield range of 0.10 to 0.20, the aquifer was determined to be recharged at a rate of 2.9 to 5.8 in/yr (Putnam and Thompson, 1996).

This same method was applied to water level data from the Water Rights Program observation well network. Data was available from eight observation wells totaling 288 water years from 1957 to 2013 (Water Rights, 2014b). Applying a specific yield range of 0.10 to 0.20, the aquifer is estimated to recharge at a rate of 2.72 to 5.43 in/yr. This estimation is the product of the most current data, the greatest amount of data, and the only data specifically from the Mud Creek subunit. Because the aquifer in this area is predominately under water table conditions, the entire area of the aquifer is applicable, resulting in a recharge range of approximately 2,630 to 5,250 ac-ft/yr.

Putnam and Thompson (1996) modeled the Big Sioux: North aquifer considering the areal extent, thickness, and depth of the aquifer, hydraulic properties of the aquifer and surface waters, components of recharge, and components of discharge. Essentially, the aquifer was divided into nodes, and these nodes were assigned aquifer properties. In total the nodes covered an area of 93,640 acres. The model was calibrated by assuming the aquifer was in dynamic equilibrium, where all the components of recharge become approximately equal to all the components of discharge. Recharge was estimated to average 5.53 in/yr under steady state conditions. Many more simplifying assumptions were also necessary. The model produced a simulated steady-state water budget of the aquifer, where the components of recharge had a total flow rate of 65.2 cfs. Applying this to the area of the aquifer in the study results in a recharge rate of 6.05 in/yr. Assuming the Mud Creek subunit is hydrogeologically the same as the Big Sioux: Northern aquifer, this recharge rate can be applied to the subunit. Applying the entire area of the aquifer, recharge is estimated to be 5,850 ac-ft/yr.

Observation Well Data:

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

The Water Rights Program monitors eight observation wells completed into the Mud Creek subunit. The nearest observation well, CD-57A, is located approximately one mile south of the

proposed well site. The hydrographs for these observation wells are shown in Figures 4 through 11 (Water Rights, 2014a).

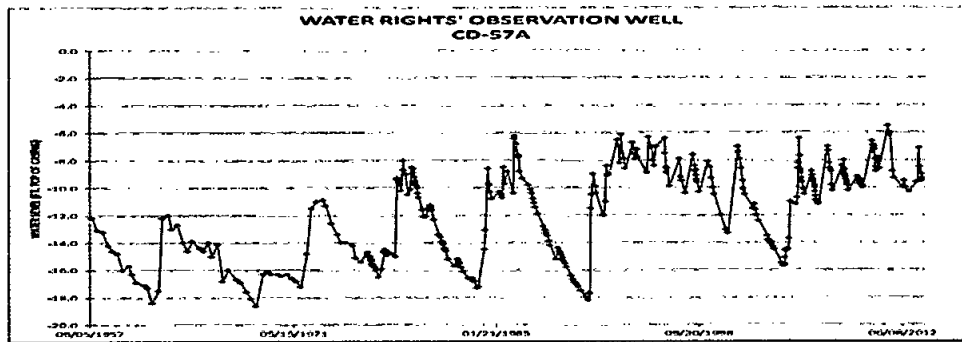


Figure 4: Hydrograph for observation well CD-57A (Water Rights, 2014a)

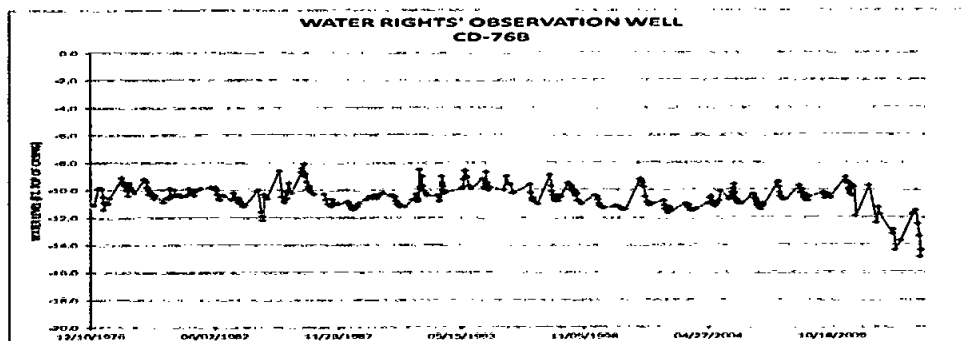


Figure 5: Hydrograph for observation well CD-76B (Water Rights, 2014a)

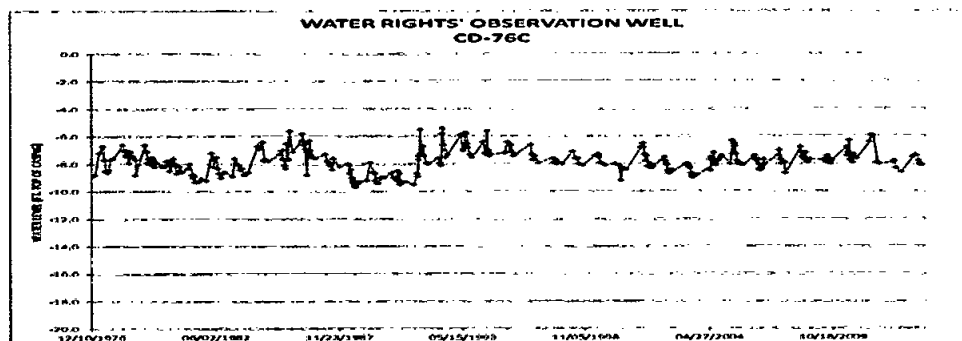


Figure 6: Hydrograph for observation well CD-76C (Water Rights, 2014a)

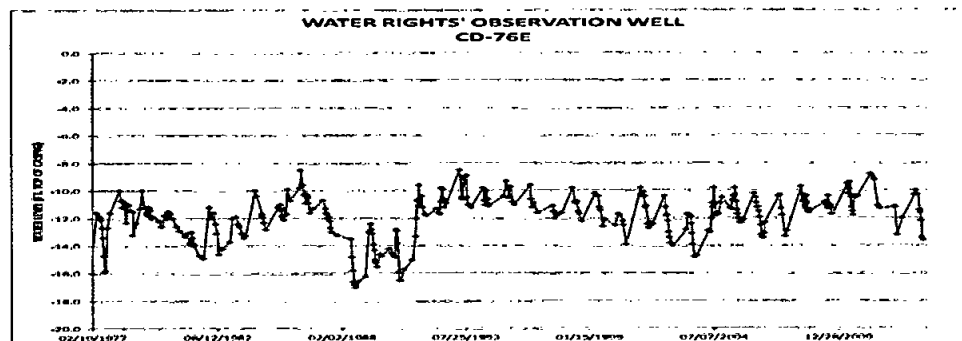


Figure 7: Hydrograph for observation well CD-76E (Water Rights, 2014a)

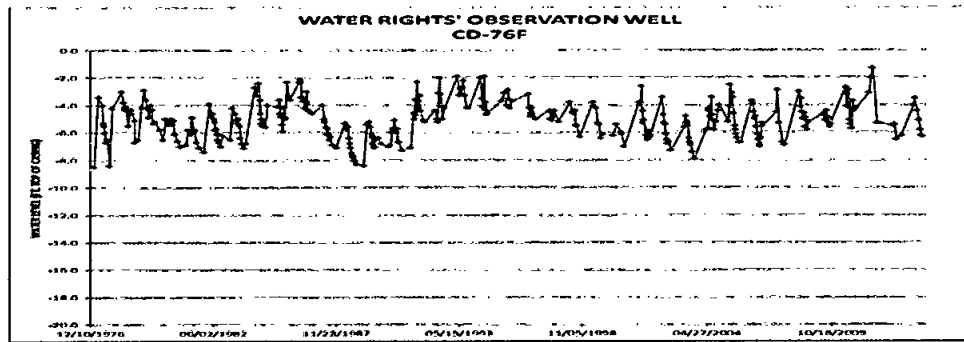


Figure 8: Hydrograph for observation well CD-76F (Water Rights, 2014a)

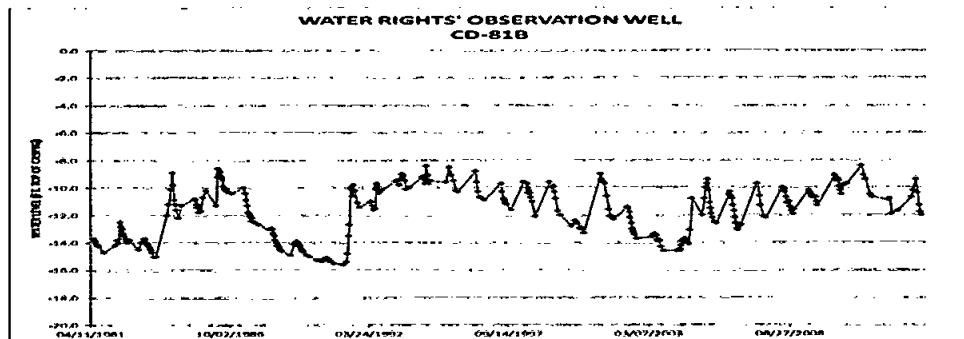


Figure 9: Hydrograph for observation well CD-81B (Water Rights, 2014a)

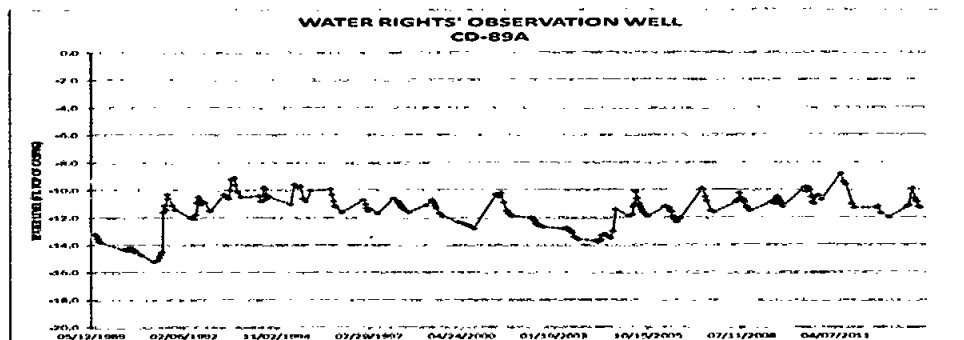


Figure 10: Hydrograph for observation well CD-89A (Water Rights, 2014a)

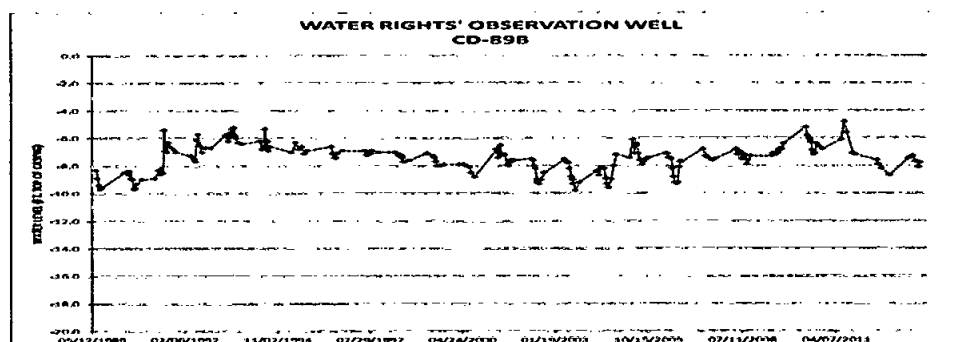


Figure 11: Hydrograph for observation well CD-89B (Water Rights, 2014a)

The observation well data documents cyclic conditions of water levels, recharging during wet years and declining during dry years. Temporal well withdrawal is masked by climatic

conditions, indicating that recharge to and natural discharge from the subunit exceeds well withdrawal. Nearly all observation wells in the subunit record steady or increasing water levels over the period of record, indicating that recharge has equaled or exceeded withdrawals. Observation well CD-76B has recorded recent decreases in water levels. This is likely due to the development of a nearby water right, and so, this is localized drawdown due to pumping (Water Rights, 2014a).

Using observation wells, the annual change in water levels can be measured in an attempt to quantify annual change in storage in the subunit and determine the difference between annual recharge and annual discharge. However, simply observing the trends in the hydrographs can adequately provide a description in a change in storage. Linear trend lines can contribute to determining water level trends but cannot provide quantitative data.

In this subunit, many observation wells have recorded steady water levels over the period of record. Often for a shallow aquifer with a strong hydraulic connection to surface waters, the aquifer system will naturally reach dynamic equilibrium. Therefore, actual annual recharge cannot be accurately quantified by this method for the subunit.

Because water levels have remained steady over the period of record, recharge is at least as much as the average well withdrawal, 4,697 ac-ft/yr. Applying this over the area of the subunit results in an actual recharge rate of at least 4.86 in/yr. If recharge exceeds this, which has been indicated by modeling to be 6.05 in/yr, the remainder is discharged by other means.

Conclusion:

Tables 2 and 3 show in summary the expected annual use and the estimated annual withdrawal of the Mud Creek subunit. Total expected average annual use is estimated to be 5,457 ac-ft/yr. Recharge was estimated considering the method used and is likely in the vicinity of 4,700 to 5,300 ac-ft/yr. Therefore, unappropriated water is not available from the subunit according to this hydrologic budget.

Tables 2 and 3: Expected annual use versus estimated annual recharge of the Mud Creek subunit

Withdrawals				Recharge	
Permit No.	Status	Type	Expected Use (ac-ft/yr)	Method	Estimate (ac-ft/yr)
2927-3	LC	IRR	187	Modeling	5850
4180A-3	LC	IRR		Water Level Increases	2,630 to 5250
5262-3	LC	IRR		Change in Water in Storage	4697
5578-3	LC	IRR		Estimated Range	4700 to 5300
4932-3	LC	IND	0		
5696-3	LC	COM	10		
5862-3	FU	MUN	760		
7055-3	PE	MUN	4500		
Total			5457		

SDCL 46-5-39 & SDCL 46-5-40

Pursuant to SDCL 46-5-39, the Water Management Board may authorize a temporary appropriation of water from an unused portion of a future use permit; however, pursuant to SDCL 46-5-40, the temporary use permit would be effective only until the future use permit holder desires to use the water reserved by the future use permit and appropriated by the temporary use permit. The temporary use permit holder would then be given six months notice of

permit cancellation. Temporary use permits are issued to place water reserved by future use permits to beneficial use until the future use permit is developed.

Future Use Permit No. 5862-3 reserves 760 ac-ft of water. In the time since the Mud Creek subunit has been considered fully appropriated by Water Management Board action, Temporary Water Permit Nos. 6362-3 and 6540-3 have been issued (Water Rights, 2014b). Over the period of record, 2003 to 2012, these permits reported a total average pumpage of 94 ac-ft/yr, with a maximum and minimum pumpage of 224 and 33 ac-ft/yr, respectively (Water Rights, 1980-2013). Therefore, there is currently 666 ac-ft/yr available for temporary appropriation from the Mud Creek subunit.

EXISTING WATER RIGHTS:

If approved, the proposed well will be located near other wells that obtain water from the same groundwater source. The nearest domestic wells on file that appear to be completed into this subunit are located approximately 1,000 feet southeast and south of the proposed well site (Water Rights, 2014c). The nearest diversion point for a water right, No. 4932-3 Northern Con-Agg Inc, is located approximately 2,000 feet southeast. There are no other water rights/permits or future use areas within one mile of the proposed well site (Water Rights, 2014b).

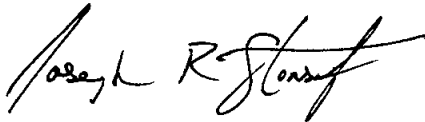
From modeling, Putnam and Thompson (1996) indicated that the Big Sioux: North aquifer is probably unable to support extensive irrigation during dry periods. Because the Mud Creek subunit is relatively thin, the amount of water in storage is limited. Average annual recharge is estimated to be approximately 15 percent of the water in storage. While the expected average annual withdrawal has been determined to be approximately equal to the average annual recharge for this subunit, conditions could occur where withdrawal exceeds the average annual recharge. When this occurs, the amount of water in storage will be reduced, which will reduce the saturated thickness of the already thin aquifer. The predominant water table conditions of this aquifer in this area dictate that drawdown due to pumping would probably not be significant far from the proposed well site. Drawdown effects due to pumping in the area could be reduced considering the close proximity to Mud Creek. Precise drawdown cannot be quantified without aquifer testing.

The Water Management Board has consistently recognized that to place water to maximum beneficial use a certain amount of drawdown may occur. Therefore, nearby adequate wells are not expected to be adversely impacted by the proposed diversion. However, for a thin aquifer with limited storage, if the saturated thickness is reduced to the extent that water rights/permits can no longer pump at their developed or “historically established” diversion rates, this may be considered an adverse impact.

CONCLUSIONS:

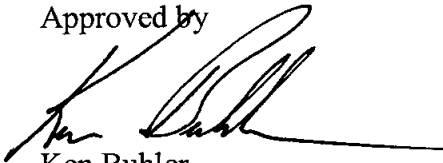
1. The water permit application proposes to withdraw groundwater at a maximum diversion rate of 1.78 cfs from one well to be completed into the Mud Creek subunit of the North management unit of the Big Sioux aquifer for the irrigation of 135.3 acres in Codington County.
2. The Mud Creek subunit has been deemed fully appropriated based on Water Management Board action.

3. The water availability analysis concluded the Mud Creek subunit of the Big Sioux: North aquifer is fully appropriated and there is NOT a reasonable probability that unappropriated water is available to supply the proposed appropriation.
4. Pursuant to SDCL 46-5-39 and SDCL 46-5-40, a temporary use water permit allows water reserved by future use water permits to be put to beneficial use only until the future use permit holder desires to use the water reserved.
5. While two temporary use water permits have since been approved, there is a reasonable probability that reserved water is temporarily available from the Mud Creek subunit to supply the proposed appropriation.
6. There is a reasonable probability that these proposed wells will not adversely or unlawfully impair existing nearby wells.
7. If the saturated thickness is reduced in this thin aquifer with limited storage to the extent that water rights/permits can no longer pump at their developed or "historically established" diversion rates, this may be considered an adverse impact.



Joseph R Stonesifer
SD DENR-Water Rights Program

Approved by



Ken Buhler
SD DENR-Water Rights Program

REFERENCES:

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- Water Rights. 2014b. Water Right/Permit Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2014c. Water Well Completion Reports, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.



**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

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



January 27, 2014

Terry Britzman
16190 457th Avenue
Watertown SD 57201

Dear Mr. Britzman:

As per our telephone conversation, please find enclosed the staff report and Chief Engineer's recommendation for a water permit application to irrigate in Codington County. The recommendation is for the application to be approved as a temporary use permit which is subject to cancellation when the city of Watertown fully develops water held in reservation by a future use permit from this aquifer.

After reviewing, please feel free to contact DENR with any questions you may have and let us know whether you want to proceed to public notice.

Sincerely,

Eric Gronlund

Water Rights Program, DENR
605 773-3352
Eric.gronlund@state.sd.us

enclosure

Department of Environment and Natural Resources

Please amend Water Permit Application No 7927-3 from the 35 ft. well to 170-250 ft. well, to withdraw ground water at a rate of 1.78 cubic ft. of water per second in the SE1/4 of Section 8, Township 118 North, Range 52 West. Well is to be used to irrigate 135.3 acres located in the SE1/4 of Section 8-T118- R52 W in Codington County.

RECEIVED

MAR 05 2014

WATER RIGHTS
PROGRAM



Terry Britzman
16190 - 457 AVE
Wtn. S.D. 57201

cell 605.880-9606



**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
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**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 7927-3, Terry Britzman**

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. 7927-3, Terry Britzman, 16190 457th Avenue, Watertown SD 57201.

The Chief Engineer is recommending APPROVAL of Application No. 7927-3 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 this Permit 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. 7927-3 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. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Jeanne Goodman, Chief Engineer
May 14, 2014

REPORT TO THE CHIEF ENGINEER
ON
WATER PERMIT APPLICATION NO. 7927-3
TERRY BRITZMAN
MAY 16, 2014

Water Permit Application No. 7927-3 proposes to appropriate groundwater at a maximum diversion rate of 1.78 cubic feet of water per second (cfs) from one well to be completed into the Prairie Coteau aquifer. The well is expected to be between 170 and 250 feet deep and is to be located in the SE ¼ SE ¼ Section 8 for the irrigation of 135.3 acres located in the SE ¼ Section 8; all in T118N-R52W in Codington County.

AQUIFER: Prairie Coteau (PCO)

AQUIFER CHARACTERISTICS:

A well completion report was not submitted with application for this depth. However, there is sufficient information available from SD DENR-Geologic Survey lithologic logs, observation well files, water right/permit files, and water well completion reports to evaluate this aquifer (SDGS, 2014; Water Rights, 2014a, 2014b, and 2014c). The Prairie Coteau aquifer is an intermediate (i.e. neither basal nor surficial) aquifer composed of brown to gray, coarse to very coarse sand and fine gravel (Hansen, 1990). Hansen (1990) delineated the Prairie Coteau aquifer in Grant and Codington Counties, and Thompson (2001) studied the aquifer in Roberts County and the Lake Traverse Reservation. Thompson (2001) concluded the Prairie Coteau aquifer in these areas is not a continuous aquifer, but is instead a group of discontinuous outwash deposits generally found in the 1,550 to 1,750 feet above mean sea level elevation (fmsl) interval. The depth and thickness of these deposits can vary widely. These outwash deposits have been collectively known as an aquifer due to their similarities.

In the area of the proposed well site, the North management unit of the Big Sioux aquifer is generally located above the Prairie Coteau aquifer, and the Lonesome Lake and Altamont aquifers are generally located below the Prairie Coteau aquifer (Hansen, 1990). Other small outwash deposits lie above, below, and adjacent to this deposit of the Prairie Coteau aquifer (Hansen, 1990). The Prairie Coteau is probably in hydraulic connection with these aquifers and outwashes, among others.

Historically, the Water Management Board has approved water permit applications to appropriate water from the Prairie Coteau aquifer system. However, in interpreting 46-6-3.1, the First Judicial Circuit Court ruled in *Hanson County Dairy v. Bender* that evidence needs to show that water is available for the proposed appropriation. In other words, data must be presented to show that the average annual recharge exceeds the average annual discharge by at least the amount requested by the water permit application being considered (Memorandum Decision April 11, 2012). This could be interpreted as necessitating the identification and quantification of recharge and discharge of an individual outwash deposit of the Prairie Coteau aquifer from which the applicant proposes to withdraw water.

The areal extent and thickness of this individual outwash deposit of the Prairie Coteau aquifer was identified by examining SD DENR-Geological Survey test hole logs, water levels in domestic and observation wells, water quality from area observation wells, water right/permit files, and water well completion reports (SDGS, 2014; Water Rights, 2014a, 2014b, and 2014c). This portion of the aquifer is generally found in the 1,640 to 1,580 fmsl and is generally 5 to 15 feet thick. This portion of the Prairie Coteau aquifer underlies approximately 31,785 acres in Codington County. This portion of the aquifer is under artesian conditions, and the potentiometric surface generally ranges from flowing to 50 feet below grade (approximately 1,800 fmsl) (Water Rights, 2014a and 2014c). Figure 1 is a map of the areal extent of the portion of the Prairie Coteau aquifer with water rights/permits, observation wells, and lithologic logs.

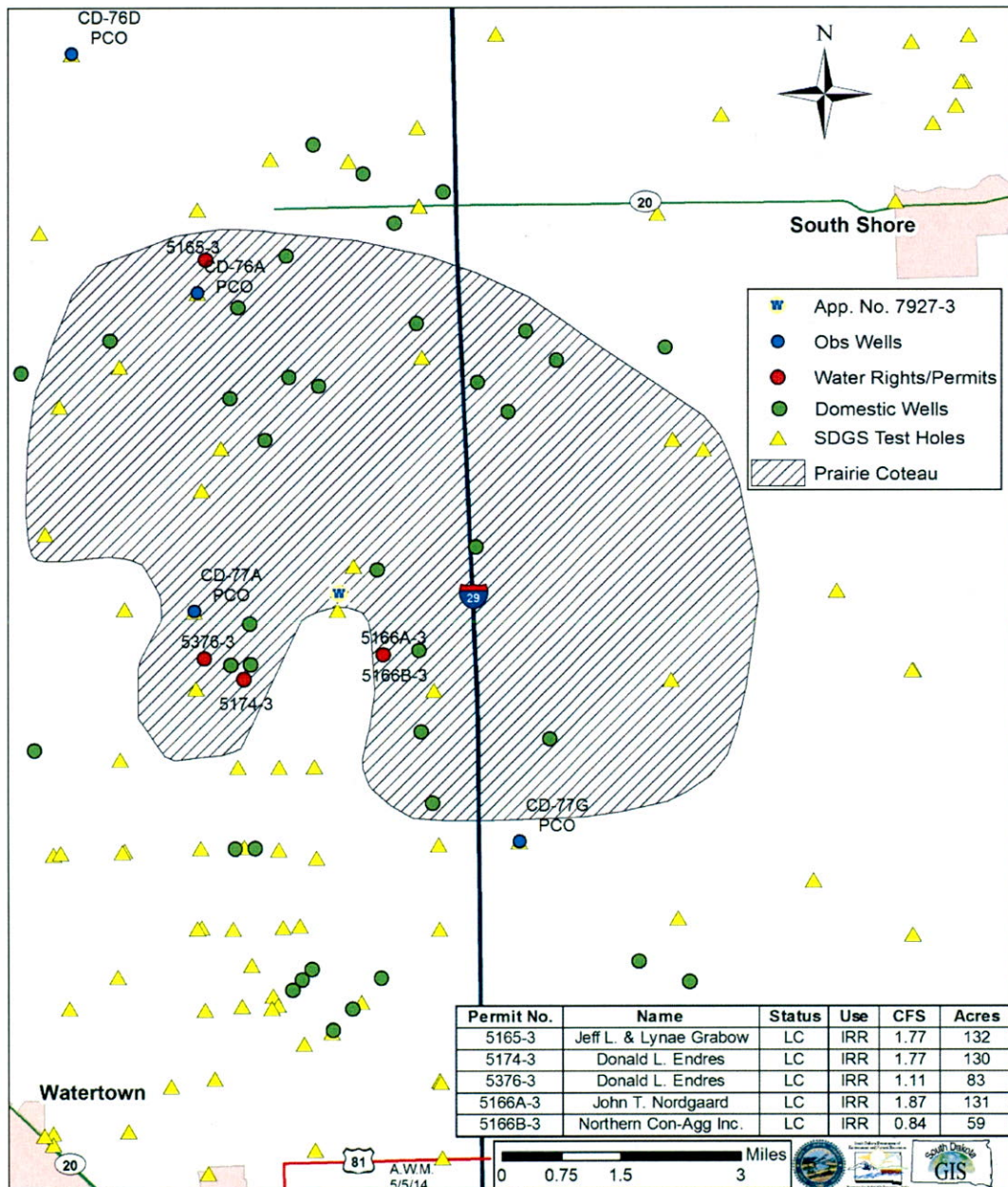


Figure 1- Areal extent the Prairie Coteau aquifer with water rights/permits, observation wells, domestic wells, and SDGS Test holes

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 this 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 effects on existing rights from the aquifer that are pertinent to this application.

WATER AVAILABILITY:

This application proposes to appropriate water from the Prairie Coteau aquifer. Actual water use, if this application is approved, will likely be less than 270.6 acre-feet annually (ac-ft/yr). The probability of unappropriated water available from the aquifer can be evaluated by considering SDCL 46-6-3.1, which requires "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source." If the source of the water is older or lower than the Greenhorn Formation and a public water system has applied for a permit, the Board need not consider the recharge/withdrawal issue. In this case, the aquifer is not stratigraphically lower than the Greenhorn Formation and the applicant is not a public water system.

Hydrologic Budget:

Recharge:

Recharge to this portion of the Prairie Coteau aquifer occurs through leakage from till, the overlying Big Sioux aquifer (Hansen, 1990), and potentially the underlying Lonesome Lake and Altamont aquifers. Recharge to this portion of the aquifer has not been quantified. However, for management and development programs, Hedges and others (1985) estimated a recharge rate range of 0.15 to 0.60 inches per year (in/yr). For the determined area of the aquifer, this recharge rate range equates to an approximate annual recharge rate of 397 to 1,590 ac-ft/yr. That is not to say that all of the recharge or water in storage is available everywhere in the aquifer.

Discharge:

Discharge from this portion of the Prairie Coteau aquifer occurs primarily by well withdrawals (Hansen, 1990). There are currently five water rights/permits withdrawing from this portion of the aquifer, which are described in the table shown in Figure 1 (Water Rights, 2014b). In addition to the appropriative rights, there are a number of well completion reports on file with the SD DENR-Water Rights Program for domestic wells that appear to be completed into this portion of the Prairie Coteau aquifer (Water Rights, 2014c). The annual withdrawal due to domestic use is not a significant component of the hydrologic budget of the aquifer.

The irrigation development of this portion of the Prairie Coteau started in 1988 and has only slightly increased since then. The annual withdrawal from the aquifer fluctuates, which is probably mostly dependent on annual growing season climatic conditions. Table 1 shows the total annual pumpage reported from this portion of the aquifer over the period of record, 1988 to 2013 (Water Rights, 1989-2014). The annual average pumpage was 313 ac-ft/yr.

Year	Permits Reporting	Appropriation (ac-ft)	Pumpage (ac-ft)
1988	3	1400	702.3
1989	3	1400	666
1990	4	1712	680
1991	4	1712	126.6
1992	4	1652	175
1993	4	1652	96
1994	4	1276	180
1995	4	1276	122
1996	4	1276	287
1997	4	1130	303
1998	4	1130	109
1999	4	1130	285
2000	4	1130	352.5
2001	4	1130	311
2002	4	1130	314
2003	4	1130	519
2004	4	1130	332
2005	4	1130	248
2006	4	1130	512
2007	5	1070	469
2008	5	1070	192
2009	5	1070	105
2010	5	1070	152
2011	5	1070	161
2012	5	1070	484
2013	5	1070	263
Min	3	1070	96
Max	5	1712	702.3
Avg	4.2	1236.4	313.3

Figure 2- Historic irrigation water use from this portion of the Prairie Coteau aquifer (Water Rights, 1989-2014)

Hydrologic Budget:

Assuming this appropriation, if approved, uses an application rate of one foot per year per acre (135.3 ac-ft/yr total), the estimated average annual withdrawal from this portion of the Prairie Coteau aquifer and this application is estimated to be 448.6 ac-ft/yr. Thus, assuming the estimated average annual pumpage, recharge to this aquifer must equal 0.17 in/yr. This required recharge rate is on the lower end of the range of recharge rates suggested by Hedges and others (1985). Therefore, there is a reasonable probability that unappropriated water is available from this portion of the Prairie Coteau aquifer for this proposed appropriation.

Observation Well Data:

Administrative Rule of South Dakota Section 74:02:05:07 requires that the Water Management Board shall rely upon the record of observation well measurements 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 56 observation wells completed into the Prairie Coteau aquifer with only two of these completed into this portion of the aquifer (Water Rights, 2014a). The locations of these observation wells are shown in Figure 1. Observation wells CD-77A and CD-76A are located approximately 1.8 miles west and 4.2 miles northwest of the proposed well site, respectively. The hydrographs for the observation wells are shown in Figures 2 and 3, respectively

The observation well data documents cyclic conditions of water levels, that is to say rising (recharging) during wet years and declining during dry years. The effects of pumping in the aquifer are obvious, which is expected in an observation well near high capacity wells in an aquifer under artesian conditions. However, the water level in the observation wells always recovers after the end of the irrigation season. The temporal impacts of well withdrawal from the aquifer are masked by climatic conditions. This indicates that recharge to and natural discharge from the aquifer greatly exceeds well withdrawal. Over the period of record, non-irrigation season water levels in this portion of the aquifer have remained fairly steady. Therefore, unappropriated water is available from this portion of the Prairie Coteau aquifer to support the proposed appropriation.

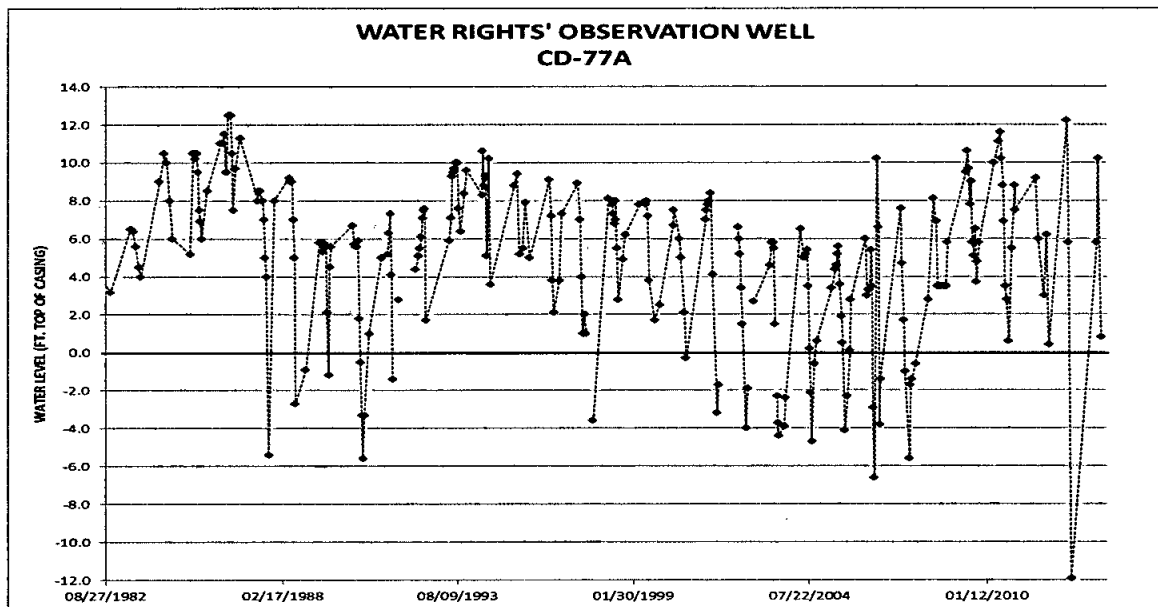


Figure 2- Hydrograph of observation well CD-77A (Water Rights, 2014a)

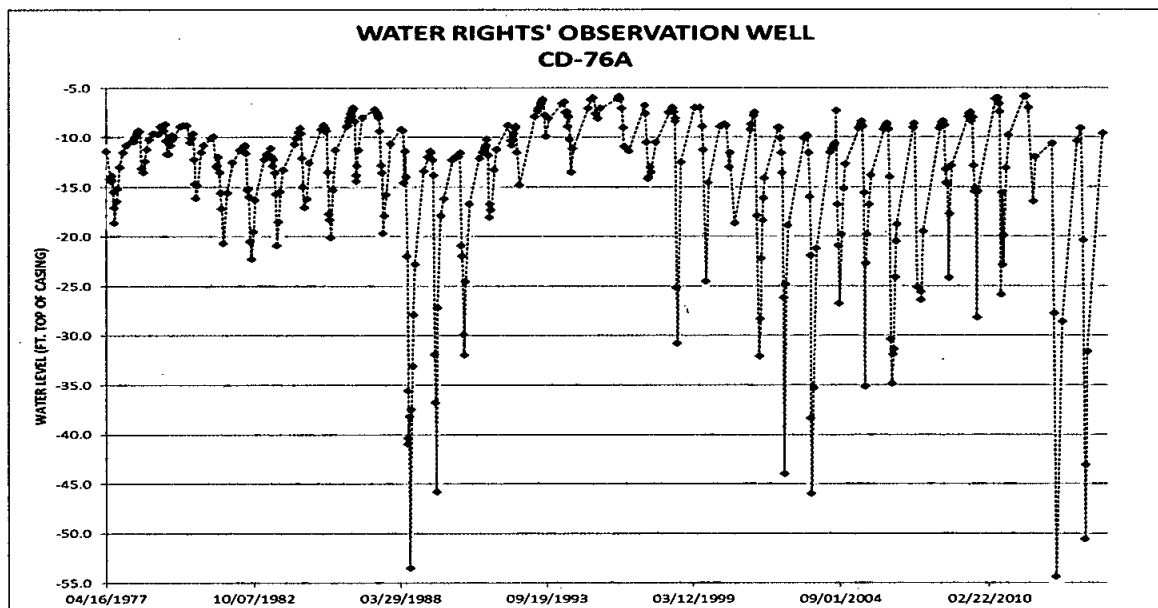


Figure 3- Hydrograph of observation well CD-76A (Water Rights, 2014a)

EXISTING WATER RIGHTS:

There are five water rights/permits authorizing wells within this portion of the Prairie Coteau aquifer with four of the water rights/permits within two miles of the proposed well (Water Rights, 2014b). The nearest well authorized by a water right/permit is approximately 0.9 miles southeast of the proposed well. There are a number of domestic wells on file with the SD DENR-Water Rights Program that appear to be completed into the Prairie Coteau aquifer within approximately two miles of the well used by this application (Water Rights, 2014c). The nearest domestic well on file is approximately 0.4 miles northeast of the proposed well.

Early development of the Prairie Coteau aquifer just north of the proposed well site was accompanied with controversy. Domestic wells completed into the Prairie Coteau were affected by irrigation pumping with the most noticeable affect that flowing wells ceased flowing or had diminished flow during the irrigation season (Goodman, 1988). Goodman (1988) stated that the availability of water for adequately constructed domestic wells had not been affected. The portion of the Prairie Coteau aquifer where the complaints are located is not the same portion as this application is proposing to use. No complaints regarding the loss of artesian head have been filed with the DENR-Water Rights Program since the late 1980's (Water Rights, 2014d).

Since the Prairie Coteau aquifer is under artesian conditions at the well site, drawdown may extend some distance from the pumped well. It may be possible that drawdown from this proposed appropriation may be measurable in the nearby domestic and appropriative right wells. However, the impact of drawdown is not expected to be significant due to the distance between wells and the height of artesian head is often in excess of 100 feet.

SDCL 46-6-6.1 does not necessarily protect artesian head pressure as a means of delivery and the Water Management Board has consistently recognized that to place water to maximum beneficial use a certain amount of drawdown may occur. To balance interests between irrigation use and delivery of water by artesian pressure, 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"

Depending on the specific characteristics of the Prairie Coteau aquifer at the well site, some existing well owners may need to lower their pumps to accommodate deeper water levels. However, when considering the statute (SDCL 46-6-6.1) and rule (ARSD 74:02:04:20(7)), well interference from the proposed appropriation is not likely to cause a significant impact.

In general, the hydrographs document the obvious effects of pumping; however, these effects have been relatively minimal over the period of record, and water levels have always recovered once irrigation has ceased (Water Rights, 2014a). Therefore, at the distances involved and the large amount of artesian head, there is a reasonable probability that any well interference from this proposed appropriation will not adversely or unlawfully impair existing appropriative or

domestic users. However, if approved, the water permit should include the qualification that the well owner should 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.

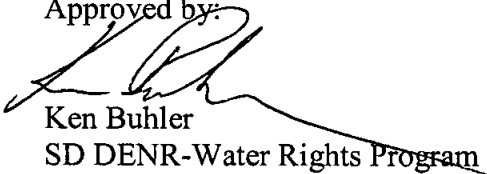
CONCLUSIONS:

1. This application proposes to appropriate water from the Prairie Coteau aquifer for the irrigation of 135.3 acres at a maximum diversion rate of 1.78 cfs.
2. There is a reasonable probability that unappropriated water is available from this portion of the Prairie Coteau aquifer for this proposed appropriation.
3. The Prairie Coteau aquifer is under confined conditions, and there are flowing or near flowing domestic wells completed into this portion of the aquifer.
4. Early development of irrigation from the Prairie Coteau aquifer in this area involved contested case hearings, but in general, development has not produced many well interference complaints.
5. Significant drawdown occurs in the Prairie Coteau aquifer due to pumping. Well interference with nearby existing irrigation and domestic wells is possible. However, the interference is not expected to adversely impair an adequate well.



Adam W. Mathiowetz
SD DENR-Water Rights Program

Approved by:



Ken Buhler
SD DENR-Water Rights Program

REFERENCES:

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- In the Matter of Water Permit Application No. 7239-3, by Hanson County Dairy v. Robert Bender and Stace Nelson, South Dakota First Judicial Court Civ. No. 11-54 (Memorandum Decision, April 11, 2012)
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- Water Rights. 2014c. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2014d. Codington County File. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

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MAY 29 2014

Form 8

WATER RIGHTS
PROGRAM

DENR

NOTICE OF APPLICATION
NO. 7927-3 to Appropriate
Water

Notice is given that Terry Britzman, 16190 457th Ave, Watertown SD 57201 has filed an application for a water permit to appropriate 1.78 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (170-250 feet deep) located in the SE 1/4 SE 1/4 Section 8 for irrigation of 135.3 acres located in the SE 1/4 Section 8; all in T118N-R52W.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7927-3 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. 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.

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 June 2, 2014.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pinner, Secretary, Department of Environment and Natural Resources.

Published once at the total approximate cost of \$50.83.

(May 23, 2014) 5583

All legal notices in the Public Opinion and other South Dakota newspapers can be found at www.sdpublicnotices.com

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County of Codington) SS

I, Monica K. Saathoff

certify that the attached printed Notice was taken

from the Watertown Public Opinion

printed and published in Watertown

County of Codington and

state of South Dakota. The notice was published

in the newspaper on the following date:

May 23rd, 2014

Cost of Printing \$55.83

Monica K Saathoff
(Signature)

Bookkeeper

(Title)

May 23rd, 2014

(Date Signed)



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

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



May 16, 2014

Public Opinion
PO Box 10
Watertown SD 57201

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7927-3 to Appropriate Water. Please publish the notice once on May 23, 2014. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

The applicant must verify to you that the notice is to be published and arrange for payment. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Terry Britzman, 16190 457th Ave, Watertown SD 57201 (Ph # 605-886-6755).

Please send the Water Rights Program an affidavit or the enclosed Proof of Publication form immediately.

The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

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



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

May 16, 2014

Terry Britzman
16190 457th Ave
Watertown SD 57201

Dear Mr. Britzman:

Water Permit Application No. 7927-3 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 Public Opinion printed at Watertown SD (Ph # 605-886-6901). You will need to contact the newspaper(s) and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
(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.

Instruction to Newspaper - Publish the Notice on May 23, 2014. The applicant is responsible for payment. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352 or email: Karen.schlaak@state.sd.us.

NOTICE OF APPLICATION NO. 7927-3 to Appropriate Water

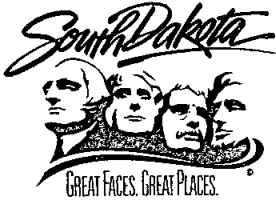
Notice is given that Terry Britzman, 16190 457th Ave, Watertown SD 57201 has filed an application for a water permit to appropriate 1.78 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (170-250 feet deep) located in the SE 1/4 SE 1/4 Section 8 for irrigation of 135.3 acres located in the SE 1/4 Section 8; all in T118N-R52W.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7927-3 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. 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.

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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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published once at the total approximate cost of _____.



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

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



JUN 18 2014

Terry Britzman
16190 457th Ave
Watertown SD 57201

Dear Mr. Britzman:

Enclosed is Water Permit No. 7927-3 authorizing construction of your 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,

Jeanne Goodman, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

7927-3



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

JUN 05 2023

Terry Britzman
16190 457th Ave
Watertown, SD 57201

7927-3

Dear Mr. Britzman:

Enclosed is Water License No. 7927-3. This is the final water right document completing your process of obtaining a Water Right. Included with your license is a map prepared by the staff engineer who conducted the field investigation.

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

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

Sincerely,

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

enclosures

STATE OF SOUTH DAKOTA
WATER LICENSE NO. 7927-3

(1) Terry Britzman; 16190 457th Ave, Watertown, SD 57201 made Application No. 7927-3, November 26, 2013 for a water permit to divert 1.78 cubic feet of water per second from groundwater, one well, (Prairie Coteau Aquifer), Codington County, South Dakota for irrigation purposes. Permit No. 7927-3, with a priority date of March 5, 2014 was approved June 2, 2014 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before June 2, 2018 and for the application to beneficial use of water on or before June 2, 2023.

An investigation conducted for licensing purposes found the diversion point developed outside of the permitted area. Pursuant to SDCL 46-5-13.1 and ARSD 74:02:01:14.01, the Chief Engineer made a finding that the change in the diversion point location did not increase the potential for adverse effects to existing diversions.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the construction of the water supply system and is entitled to divert 1.78 cubic feet of water per second for beneficial use. The location of the diversion point is:

1,335 ft N and 1,330 ft W of the SE corner of Section 8, T118N, R52W (NW ¼ SE ¼)
Latitude 45.03893 Longitude -97.09119

(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use to irrigate the following land:

Section 8, T118N, R52W	NW ¼ SE ¼	33.2 acres
	NE ¼ SE ¼	33.3 acres
	SE ¼ SE ¼	33.2 acres
	SW ¼ SE ¼	35.0 acres
	TOTAL	134.7 acres

(4) Pursuant to South Dakota Water Law 46-5-30.1 Terry Britzman; 16190 457th Ave, Watertown, SD 57201 the holder and/or owner of Water Right No. 7927-3 is issued a license to appropriate water, the right to use 1.78 cubic feet of water per second from groundwater, one well, (Prairie Coteau Aquifer) with a priority date of March 5, 2014 from the location specified in (2) of this license for irrigation purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 7927-3 and subject to the following qualifications:

The well approved under this permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well under this Permit shall control their withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.

continued

The well authorized by Permit No. 7927-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with the 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. *(The well was drilled by Thein Well Company Inc. A copy of the well completion report is on file with the Water Rights Program.)*

This Water Right is approved subject to the irrigation water use questionnaire being submitted each year.

Eric Gronlund

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

JUN 05 2023
date



Approval of Location Change and/or Additional Diversion Point(s)

NAME: Terry Britzman

ADDRESS: 16190 457th Ave, Watertown SD 57201

DATE: May 25, 2023

COUNTY: Codington

GENERAL DESCRIPTION OF AUTHORIZED PROJECT:

The permit holder is authorized to construct a well 170 to 250 feet deep well into the Prairie Coteau Aquifer in the SE1/4 SE1/4 of Section 8 for irrigation of 135.3 acres in the SE1/4 of Section 8; all in T118N-R52W.

AUTHORITY:

Pursuant to SDCL 46-5-13.1, the location of a diversion point may be changed or additional diversion points may be licensed provided the following conditions are met and the potential for interference with other existing diversions is not increased:

- **Developed water source same as permitted source and no additional water appropriated**

The permit holder constructed a 265 feet deep well into the Prairie Coteau Aquifer in the NW1/4 SE1/4 of Section 8 T118N-R52W

- **If irrigation, no new land is irrigated**

The permit holder is developed irrigation of 134.7 acres in the SE1/4 of Section 8 T118N-R52W

- **Review of Existing Diversions**

There is one existing water permits/rights within a mile and half of where the this well was developed. This water permit was existing permit when this permit was issued, it was determined that there was reasonable probability any well interference due to pumping of this well would not adversely or unlawfully impair existing rights. The same would be expected for the well constructed in the new location.

RECOMMENDED ACTION

Based on the above criteria, it is recommended that the diversion point(s) be licensed as developed.


Mark D. Rath, Natural Resources Engineer
Water Rights Program

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

This change in location and/or additional diversion point(s) does not increase the potential for adverse effects to existing diversions.


Eric Gronlund, Chief Engineer
Water Rights Program

Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 7927-3

I have this day, May 2, 2023, made a thorough examination of the water use system constructed by Terry Britzman; 16190 457th Ave, Watertown, SD 57201 of Permit No. 7927-3, bearing the priority of March 5, 2014 authorizing the diversion of 1.78 cu. ft. per second of the waters of Prairie Coteau Aquifer for irrigation purposes, in Codington County.

A. Works used to divert the water:

Well Information:

- 1) Well Drilling Firm: Thein Well Drilling
- 2) No. of Wells 1
- 3) Depth(s) 257.00 feet
- 4) Well log is available Y

Casing:

- 1) Diameter 12.00 inches
- 2) Length Unknown feet
- 3) Type Steel

Screen:

- 1) Type SS
- 2) Length 20.00 feet
- 3) Static water level 4.00 feet

Pump:

- 1) Make Turbine
- 2) Model Unknown
- 3) Size Unknown
- 4) Capacity 800 GPM

Motor:

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

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

- 1) Type Above ground Aluminum 2) Size 8 inches 3) Length 15 feet

Comments: Well at the pivot

C. Works used to apply water to beneficial use:

Center pivot:

- 1) Make Valley
2) Overall length 1300 feet
3) Number of towers 7
4) End gun Y
5) Capacity 800 GPM

Chemigation Equipment:

- 1) Does chemigate N

D. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Y

2) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period Y

3) Exceptions to compliance are: None

E. Condition and Location:

1. The system is in good condition with the point(s) of diversion located as follows: WELL LOCATION
2. From the SE corner Sec 8 T118N R52W, 1,335 ft N & 1,330 ft W, Lat 45.03893 Long -97.09119 (NW ¼ SE 1/4).

3. The works are capable of diverting and conveying to the place of use 1.78 cu. ft. per second of water which is to be used for irrigation. Water has been put to beneficial use to the maximum extent as follows:

legal description/acreage

NW ¼ SE ¼ – 33.2 acres Section 8, T118N, R52W
NE ¼ SE ¼ – 33.3 acres
SE ¼ SE ¼ - 33.2 acres
SW ¼ SE ¼ – 35.0 acres

comprising a total of 134.7 acres of land and the license should be issued for 1.78 cfs

4. All structures, wells and lands on map Y

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

The irrigated acreage was determined with the aid of FSA imagery and ArcMAPS software.

The pump rate reported in a recent Irrigation Questionnaire was used to establish the system flow capacity.

The mailing address and the telephone number in the permit materials need to be updated to 16235 455th Ave, Watertown, SD 57201 and the contact phone number is 605/880-9606 (cell).

I talked to Terry's son during a May 10, 2023 visit.

A handwritten signature in black ink, appearing to read "Darrell W DeBoer". The signature is fluid and cursive, with the first name "Darrell" and last name "DeBoer" clearly distinguishable.

Darrell W DeBoer
Water Rights Inspector
DANR, Water Rights Program

Date report completed: May 11, 2023

**Diversion Point
Location**

From the SE corner of
Sec 8 T118N-R52W
** Well**
1335 ft N & 1330 ft W
Lat 45.03894 Long -97.09114

Irrigated Land

Sec 8 T118N-R52W
NW1/4 SE 1/4 - 33.2 ac
NE 1/4 SE1/4 - 33.3 ac
SE1/4 SE1/4 - 33.2 ac
SW1/4 SE1/4 - 35.0 ac

Well

Section 8
T118N-R52WReference
Corner

0 625 1,250 2,500 3,750 5,000 Feet

7927-3

SD EForm - 1621LD V1

SOUTH DAKOTA WATER WELL COMPLETION REPORT

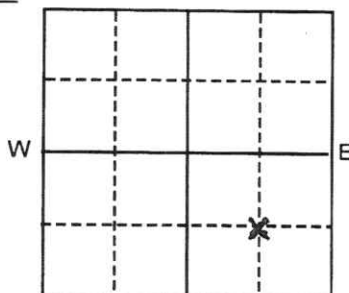
11-02

Location NW ¼ SE ¼ Sec 8 Twp 118N Rg 51W

County Codington

North

Please mark well location with an "X"



Well Completion Date

August 20, 2014

1 Mile

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

PROPOSED USE:

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

METHOD OF DRILLING:

Rotary

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	237.0 FT	17.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Bentonite	57	Lb/gal	0.0 Ft	232.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
tremie piped

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 12.00 Inches Length 20.0 Feet

Material Stainless steel

Slot Size .080 Set From 237.0 Feet to 257.0 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? chlorinated

☐ No, Why Not?
Lab to which water quality sample sent for analysis
owner to obtain

Well Owner: Terry Breitzman

Business Name:

Address: 16190 457th Ave

City, State, Zip: Watertown SD 57201

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Top soil	0	1
Sand & gravel	1	12
Blue clay	12	168
Soft blue clay	168	235
Medium to coarse sand	235	257
Blue clay	257	260

STATIC WATER LEVEL

4.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:

☐ Bailed

☐ Other

Pumping Level Below Land Surface

45.0 Ft. After 8.0 Hrs. pumped 610.0 GPM

Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

GPS: N 45 2.333
W 97 5.468GPS N 45 2.333
W 97 5.468

GPS correction

This well was drilled under license # 475 and this report is true and accurate.

Drilling firm: Thein Well Co., Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Terry Breitzman

Date: 5/24/15

7927-3

