

WATER PERMIT NO. 2011-1

Name of Applicant: **Meadow Crest Sanitary District**

Address: **PO Box 627, Deadwood SD 57732** Phone: **57732**

Amount of Water Claimed: **0.089 cfs** Total Acres: **NA**

Source of Water Supply: **groundwater (2 wells)**

Water to be used for: **water distribution system** County: **Lawrence**

Type of Waste Disposal System:

Location: **3 miles east of Deadwood**

PRIORITY Date Received: **11-8-21** Application/License Fee: **\$ 300**

Corrected Application Received: **12-6-21** Period of Annual Use: **Jan1 – Dec 31**

Remarks: **one existing well and a proposed new well**

Diversion Point: **SW /14 NE 1/4 Section 17-T5N-
R4E**

Land to be Irrigated: **NA**

Depth of Well: **2000 feet deep**

Well Driller:

Remarks:

Type of Map: **topo**

Prepared by:

Reviewed and the Number Assigned on: **12-6-21**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

			17		

**SOUTH DAKOTA
WATER PERMIT NO. 2011-1**

Date of first receipt of application November 8, 2021.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 2011-1 to Meadow Crest Sanitary District, c/o John Keene, PO Box 627, Deadwood SD 57732-0627 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. 2011-1 appropriates 5.83 acre-feet of water annually at a maximum, combined, pump rate of 0.089 cubic feet of water per second from one existing well completed into the Deadwood aquifer (1,780 feet deep) and a new well to be completed into either the Deadwood or Madison aquifer (approximately 2,000 feet deep) both located in the NE 1/4 NW 1/4 Section 17-T5N-R4E for a water distribution system located in the NE 1/4, NE 1/4 NW 1/4, NW 1/4 SE 1/4, NE1/4 SW1/4 Section 17-T5N-R4E. This site is located approximately 3 miles east of Deadwood SD.
2. The water appropriated shall be used for the purpose of a water distribution system and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date from which applicant may claim right is November 8, 2021.
5. The date of approval of Permit No. 2011-1 is February 25, 2022.
6. One-fifth of the construction is to be completed on or before August 25, 2024.
7. All construction is to be completed on or before February 25, 2027.
8. Water is to be put to beneficial use on or before February 25, 2031.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. The existing well and proposed well approved under Water Permit No. 2011-1 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals under this Permit shall be controlled so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The proposed well authorized by Water Permit No. 2011-1 shall be constructed into a single aquifer, either the Deadwood aquifer or Madison aquifer, but not both. At the time of the licensing, the final water right be issued for the developed water source.
3. The proposed well authorized by Permit No. 2011-1 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.

(continued)

4. The permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Deadwood aquifer and also the Madison aquifer if the proposed well is completed into the Madison aquifer.
5. If the proposed well is completed into the Madison aquifer, the following qualification is effective:
 - In accordance with SDCL 46-1-14 and 46-2A-20, Permit No. 2011-1 is issued for a twenty year term. Pursuant to SDCL 46-2A-21, the twenty year term may be deleted at any time during the twenty year period or following its expiration. If the twenty year term is not deleted at the end of the term, the portion of the permit for the Madison aquifer may either be cancelled or amended with a new term limitation of up to twenty years.
6. Water Permit No. 2011-1 authorizes a total annual diversion of up to 5.83 acre-feet of water.

WATER MANAGEMENT BOARD

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

MAR 30 2022
date



RECEIVED

NOV - 8 2021

SD EForm - 1585LD V5

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

Mail to: DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	(office use only)	
	No. <u>2011-1</u>	Hydrologic Unit <u>10120202</u>
	Basin <u>Belle Fourche</u>	
	Newspaper <u>Black Hills Pioneer</u>	

PAID

NOV 8 2021

Ck# 1084

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use(s) of water:

☐ Municipal	☒ Water Distribution System	☐ Recreational	☐ Institutional
☐ Rural Water System	☐ Commercial	☐ Fish & Wildlife	☐ Geothermal
☒ Domestic (over 18 gpm)	☐ Industrial	☐ Other	

Type of Application:
(check one)

☒ New	☐ Vested Right (Use predates Mar 2, 1955)	☐ Future Use Reservation
☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____		
☐ Amendment/Correction to Permit No. _____		

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.)
_____1. Name to Appear on Water Permit Meadow Crest Sanitary District-John Keene

Mailing Address PO Box 627 (Address) Deadwood (City) ☒ SD ☒ 57732-0627 (State) (Zip Code)

Phone _____ Mobile 605-641-9118 Email johnkeene47@gmail.com

2. Amount of water claimed 0.089 *CFS or 15-40 **GPM and _____ ***AF or _____ Gallons

Flow rate and volume are both required. (*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use)

3. Source of water supply Deadwood Aquifer or Madison Aquifer

4. Location of point of diversion 1 Well in SW1/4 NE1/4 section 17 T5N-R4E County Lawrence ☒

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

If not a public water supply (e.g. municipal), will water be used outside of the area described above? ☐ Yes ☒ No

If "Yes," where will water be used? District location: NE1/4, NE1/4 NW1/4, NW1/4 SE1/4 Sec 17-

(example - NW1/4 section 12-T104N-R53W) T-5N-R-4E

5. County or counties where water will be used Lawrence6. Annual period during which water is to be used January 1-December 31

7. Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

A new well location constructed approximately 500 feet from the existing well and storage tank to supplement the existing system. This location is close to a fold and a normal fault. The proximity to these geologic structures means a possible increase in the potential water yield in both the Madison and Deadwood aquifers.

The actual pump rate of current well is 14 Gpm.

I, John Keene President Mr. John Keene, the applicant, certify under

Name of Person 605-641-9118 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 1 Provide copy of log(s), if available. Drilled by Weston Engineering, Inc.

For either Existing or Proposed Wells:

c) Well Depth (required) 2000 Depth to Top of Water Bearing Material 1200 Depth to Water from Surface 1150

d) Distance to nearest domestic well on applicant's property 500' Property owned by others _____

2. Wastewater Disposal System Information

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

b) System Capacity (gallons) N/A Year Constructed 2004

c) Connected to the City of N/A Sanitary System

3. Dugout Information

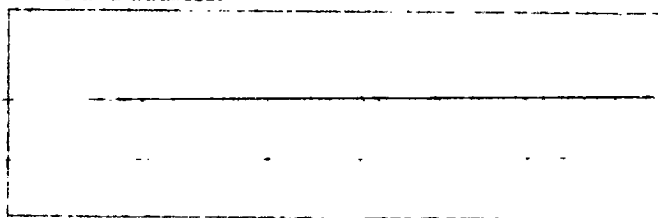
a) Surface Dimensions N/A Depth _____

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)

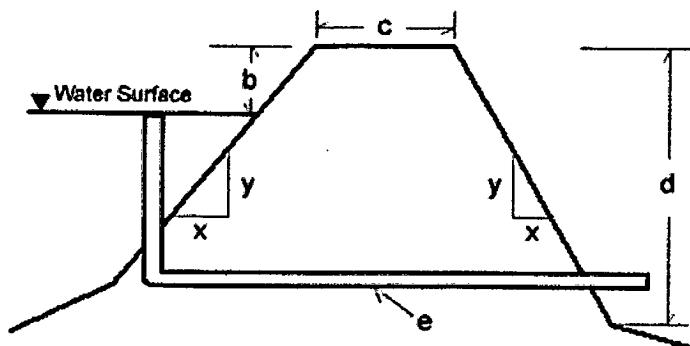
Upstream _____

Downstream _____

h) Surface Area of Impoundment _____

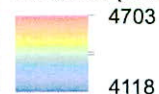
i) Storage _____ Acre Feet

j) Drainage Area Above Dam _____ Acres



- Approximate Subdivision Boundary
- ⊕ Existing Well
- ⊕ Potential New Well
- (4601') Deadwood Potentiometric Surface Elevation (ft amsl)
- Deadwood Potentiometric Surface Elevation Contour (ft amsl)
- Groundwater Flow Direction

Deadwood Potentiometric Surface Elevation (ft amsl)



0 2,000
Feet

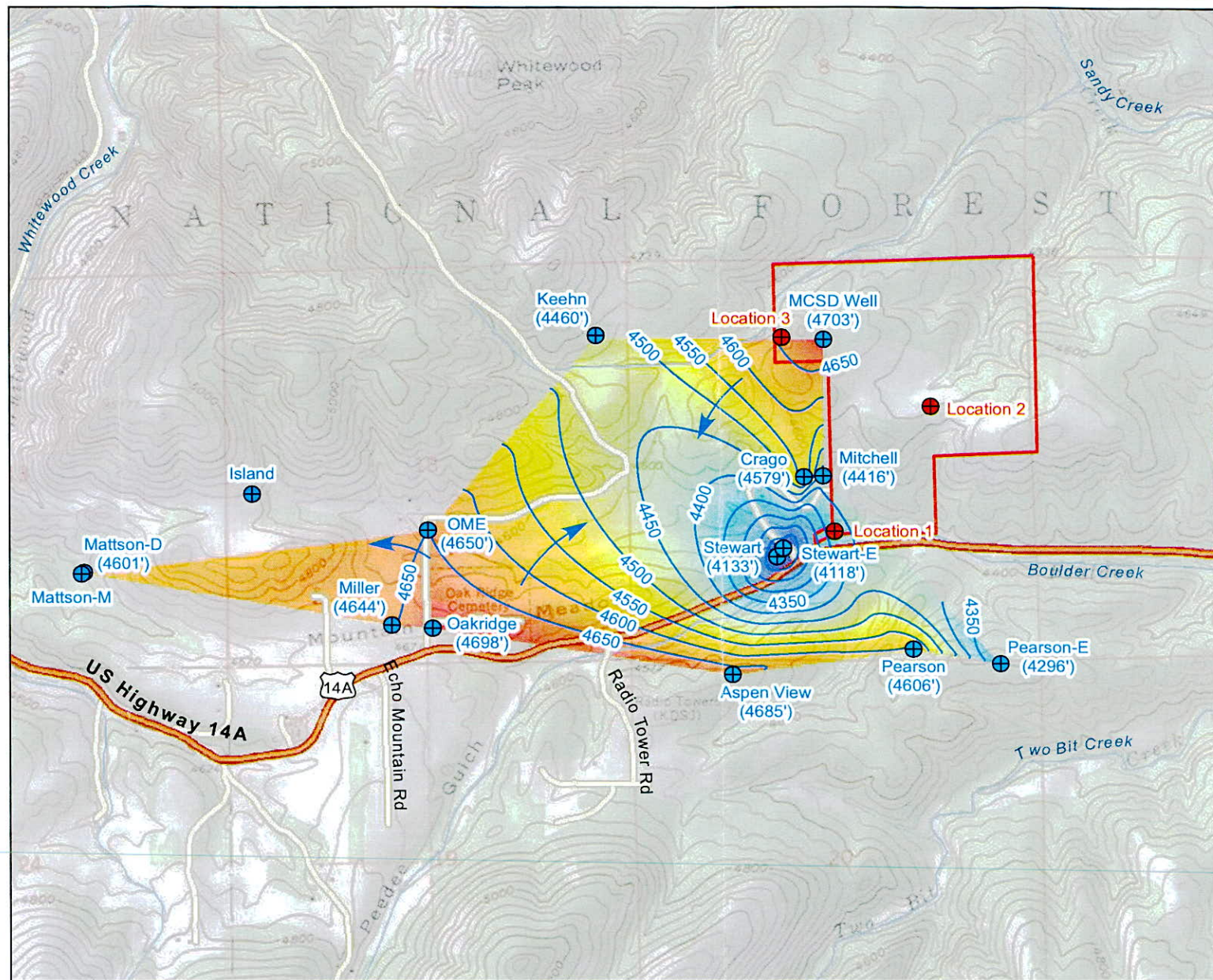
Notes:

ft amsl: feet above mean sea level

Sources:

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

Source: Geologic Map of the Deadwood North Quadrangle, South Dakota, Alvis L. Lisenbee1, Jack A. Redden1, and Mark D. Fahrenbach, 2015



LRE WATER
CONNECTING WATER TO LIFE

Prepared By:
LRE Water
Innovative Water Resource Solutions
South Dakota Office
Sioux Falls, South Dakota
(605) 310-1721

AE2S
MEADOW CREST SANITARY DISTRICT
DEADWOOD, SOUTH DAKOTA

POTENTIOMETRIC SURFACE OF DEADWOOD AQUIFER

FILE: 5502AEN01_01g.MXD

DATE: 2/3/2021

FIGURE: 3

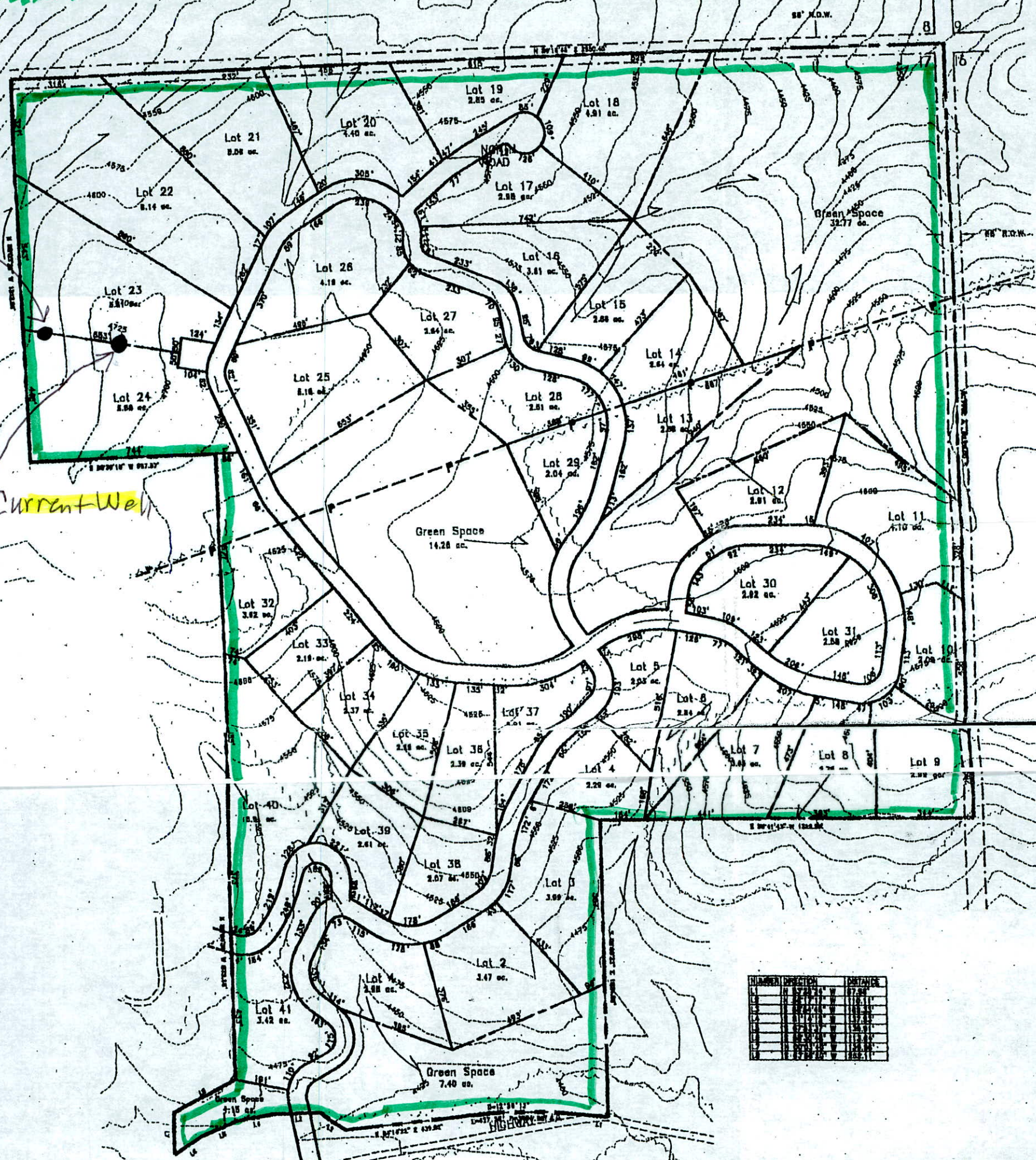
MEADOW CREST

NE1/4, E1/2 NE1/4 NW1/4, NW1/4 SE1/4 LYING NORTH OF HIGHWAY EXCEPT LOT H-1,
AND APPROXIMATELY 300 SQUARE FEET IN THE NE1/4 SW1/4 ALL LOCATED
IN SECTION 17, T5N, R4E, B.H.M., LAWRENCE COUNTY, SOUTH DAKOTA

outline of area covered by distribution system

*Proposed
new
well*

Current Well



LINE	DIRECTION	DISTANCE
1	N 1/4	1.00
2	N 1/4	1.00
3	N 1/4	1.00
4	N 1/4	1.00
5	N 1/4	1.00
6	N 1/4	1.00
7	N 1/4	1.00
8	N 1/4	1.00
9	N 1/4	1.00
10	N 1/4	1.00
11	N 1/4	1.00
12	N 1/4	1.00
13	N 1/4	1.00
14	N 1/4	1.00
15	N 1/4	1.00
16	N 1/4	1.00
17	N 1/4	1.00
18	N 1/4	1.00
19	N 1/4	1.00
20	N 1/4	1.00
21	N 1/4	1.00
22	N 1/4	1.00
23	N 1/4	1.00
24	N 1/4	1.00
25	N 1/4	1.00
26	N 1/4	1.00
27	N 1/4	1.00
28	N 1/4	1.00
29	N 1/4	1.00
30	N 1/4	1.00
31	N 1/4	1.00
32	N 1/4	1.00
33	N 1/4	1.00
34	N 1/4	1.00
35	N 1/4	1.00
36	N 1/4	1.00
37	N 1/4	1.00
38	N 1/4	1.00
39	N 1/4	1.00
40	N 1/4	1.00
41	N 1/4	1.00



Scale: 1" = 400'

5N 4E
Section: 07

5N 4E
Section: 08

5N 4E
Section: 09

5N 4E
Section: 18

5N 4E
Section: 17

5N 4E
Section: 16

5N 4E
Section: 19

5N 4E
Section: 20

5N 4E
Section: 21

Log of Well
Meadowcrest Well

Depth		
From	To	Description of Formation
0	30	Sandstone & red shale
30	90	Red shale & yellow sandstone
90	120	Yellow sandstone, red shale stringers
120	150	Yellow sandstone
150	180	Yellow sand, shale stringers
180	210	Yellow sandstone, red shale stringers
210	240	Red shale & sandstone
240	270	Red shale & gravel
270	300	Red shale & white limestone stringers
300	320	Red shale & pink rock
320	350	White limestone stringers – red & brown shale, purple shale
350	380	Gray limestone stringers – red, brown, yellow sand
380	410	White-gray limestone stringers – yellow & red sand
410	440	White-gray limestone stringers – red sandstone
440	470	White-gray limestone stringers – yellowish, orange sand
470	500	White-gray limestone, yellowish orange sand
500	530	White-gray limestone, yellow and orange sand
530	560	Sandstone – little cement, red & orange stringers
560	590	Whitish brown limestone
590	620	Cream limestone
620	650	Cream limestone
650	680	Cream & gray limestone
680	710	Yellow limestone & gray dolomite
710	750	Yellow limestone
750	780	Yellow limestone & dolomite
780	810	Brown & gray limestone, red stringers
810	840	Limestone, dolomite
840	870	Dolomite, white limestone stringers
870	900	Yellow – brown dolomite
900	930	Orange limestone, red, white & gray dolomite stringers
930	960	Orange limestone, red, white & gray dolomite stringers
960	990	Brown dolomite, orange stringers
990	1020	Burgandy to black shale
1020	1040	Black shale, brown sand stringers
1040	1080	Brown dolomite – black shale stringers
1080	1110	Brown dolomite – black shale stringers
1110	1140	Brown dolomite
1140	1170	Black shale
1170	1200	Green shale
1200	1230	Green shale, red stringers

1230	1260	Greenish-black shale, red stringers
1260	1290	Black shale, green stringers
1290	1320	Green shale, black stringers
1320	1350	Green shale, red & black stringers
1350	1380	Brown shale, green shale stringers
1380	1410	Green shale, colored limestone stringers
1410	1440	Green shale
1440	1470	Green shale, cream limestone stringers
1470	1500	Green shale, cream limestone stringers
1500	1530	Green shale, brown sandstone stringers
1530	1560	Green shale, brown sandstone stringers
1560	1590	Black shale, white limestone stringers
1590	1620	Black shale, brown sandstone, white limestone
1620	1650	Black shale, brownish red shale
1650	1680	Brown sand, green shale
1680	1710	Brown sand
1710	1740	Brown sand, black & green shale
1740	1770	Brown sand, black & green shale
1770	1806	Brown sand, black & green shale
1806	1842	No sample



DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES

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

November 9, 2021

Meadow Crest Sanitary District
c/o John Keene
PO Box 627
Deadwood SD 57732-0627

Karen,
Resubmitted for your
consideration. See enclosures
John.

Dear Mr. Keene:

Thank you for submitting the *Application for a Permit to Appropriate Water* in Lawrence County. We have reviewed our files and cannot find an existing permit for Meadow Crest Sanitary District. Therefore, this application should include both the existing well and the proposed new well. There are a few items that will need to be clarified and submitted.

The application requests an appropriation of 15-40 gallons per minute (gpm). We need a specific number. If you are unsure of the pump rate, our suggestion is to apply for the larger amount. Also, the maximum pump rate of the existing well will be required.

In addition to the pump rates, the application needs to include the annual volume in either gallons per year or acre feet per year. In calculating the annual volume, be reasonable but also plan for the maximum annual volume of use from the wells at full development. It is unrealistic that the wells will be pumped at capacity continuously during an entire year. Therefore, DANR requests identification of an annual volume to be used by the water distribution system.

A map needs to be submitted that references a government section corner or quarter corner including section, township and range. The map submitted does not have these designations. On the map, please mark the location of the existing well, the proposed new well, and outline the area covered by the water distribution system.

If you have any questions, please contact me.

Sincerely,

Karen Schlaak

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

enclosure

RECEIPT

WATER RIGHTS PROGRAM South Dakota Department of Agriculture and Natural Resources

Date November 8, 2021

RECEIVED OF Meadow Crest Sanitary District/John Keene PO Box 627 Deadwood SD 57732-0627

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

Fee for Application for Permit No. <u>2011-2</u> to Appropriate Water, to construct and to put water to beneficial use	\$ <u>100.00</u>
Fee for Application for Permit No. _____ to Appropriate Water for Future use	\$ _____
Fee to retain Future Use Permit No. _____ after period of seven years.	\$ _____
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>2011-2</u>	\$ <u>200.00</u>
Fee for Filing Transfer Form _____	\$ _____
Fee for _____	\$ _____
Fee for Issuing New Well Driller's License No. _____	\$ _____
Fee for Renewal of Well Driller's License No. _____	\$ _____
Fee for Issuing Well Pump Installer's License No. _____	\$ _____
Fee for Renewal of Well Pump Installer's License No. _____	\$ _____
(Any Other Work Provided by Law)	
TOTAL	\$ <u>300.00</u>

By Eric Gronlund
Chief Engineer

vm

Mathiowetz, Adam (DENR)

From: John Keene <johnkeene47@gmail.com>
Sent: Wednesday, December 29, 2021 6:55 PM
To: Mathiowetz, Adam (DENR)
Subject: RE: [EXT] Meadow Crest Sanitary District

Yes that would make sense to us. Thank you

Living the Good Life,

John

John Keene
REMAX In The Hills
605-641-9118 (cell)
605-642-2500 (Office)
Johnkeene47@gmail.com

From: Mathiowetz, Adam (DENR) <Adam.Mathiowetz@state.sd.us>
Sent: Monday, December 27, 2021 8:02 AM
To: John Keene <johnkeene47@gmail.com>
Cc: Gronlund, Eric <Eric.Gronlund@state.sd.us>; Drennon, Kim <Kim.Drennon@state.sd.us>
Subject: RE: Meadow Crest Sanitary District

John,

Thank you for sending the report on Meadow Crest Sanitary District's future water needs.

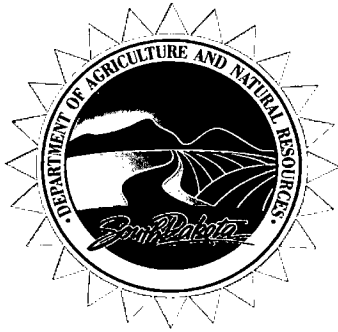
I would like to verify what we discussed last Thursday, December 23 regarding the desired water source for any future well. Your current application specifies the Deadwood aquifer as the source. However, you stated the desire of Meadow Crest Sanitary District is to obtain a Madison aquifer well if possible, but be prepared to have a Deadwood aquifer well. Is that still correct?

Since there is no well in the ground yet, it would be prudent to process your application for both the Deadwood and the Madison aquifer. If the application were approved, at the time of licensing the permit we would evaluate which aquifer the well is withdrawing water from and then remove the non-used aquifer. If this is agreeable to Meadow Crest, please let us know.

If you have any questions, feel free to contact us.



Adam Mathiowetz, PE
Engineer, Water Rights Program
Department of Agriculture and Natural Resources
523 E. Capitol Ave. Pierre SD, 57501
605.773.3352
danr.sd.gov



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 2011-1, Meadow Crest Sanitary District**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Agriculture and Natural Resources concerning Water Permit Application No. 2011-1, Meadow Crest Sanitary District, PO Box 627, Deadwood SD 57732.

The Chief Engineer is recommending APPROVAL of Application No. 2011-1 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing domestic water uses and water rights, 3) the proposed use is a beneficial use and 4) it is in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board with the following qualifications:

1. The existing well and proposed well approved under Water Permit No. 2011-1 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals under this Permit shall be controlled so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The proposed well authorized by Water Permit No. 2011-1 shall be constructed into a single aquifer, either the Deadwood aquifer or Madison aquifer, but not both. At the time of the licensing, the final water right be issued for the developed water source.
3. The proposed well authorized by Permit No. 2011-1 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. The permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Deadwood aquifer and also the Madison aquifer if the proposed well is completed into the Madison aquifer.

continued

5. If the proposed well is completed into the Madison aquifer, the following qualification is effective:
 - In accordance with SDCL 46-1-14 and 46-2A-20, Permit No. 2011-1 is issued for a twenty year term. Pursuant to SDCL 46-2A-21, the twenty year term may be deleted at any time during the twenty year period or following its expiration. If the twenty year term is not deleted at the end of the term, the portion of the permit for the Madison aquifer may either be cancelled or amended with a new term limitation of up to twenty years.
6. Water Permit No. 2011-1 authorizes a total annual diversion of up to 5.83 acre-feet of water.

See report on application for additional information.



Eric Gronlund, Chief Engineer
February 6, 2022

**Report to the Chief Engineer on
Water Permit Application No. 2011-1**

Meadow Crest Sanitary District
12 January 2022

Meadow Crest Sanitary District proposes to appropriate 5.83 acre-feet of water annually (ac-ft/yr) at a maximum instantaneous withdrawal rate of 0.089 cubic feet of water per second (cfs) from one existing well completed into the Deadwood Aquifer (1,780 feet deep) and a new well to be completed into the Deadwood or Madison Aquifer (approximately 2,000 feet deep), both located in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17 T5N-R4E for a water distribution system located in the NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, and NE $\frac{1}{4}$ SW $\frac{1}{4}$ in Section 17 T5N-R4E, Black Hills Meridian. This site is located approximately 3 miles east of Deadwood, South Dakota. The applicant indicated that they would prefer to withdraw from the Madison aquifer, but their existing well withdraws from the Deadwood aquifer and they would add another well into the Deadwood aquifer if it is necessary to meet their requested diversion rate. Therefore, this technical review will analyze as if the applicant is withdrawing from either of the aquifers.

Applicable South Dakota Codified Law

Pursuant to SDCL 46-2A-9, a permit to appropriate water may be issued 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 domestic water uses and water rights, and that the proposed use is a beneficial use and in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board. This report will only assess the availability of water and possibility of developing this application without unlawful impairment of existing domestic water uses and water rights.

Pursuant to SDCL 46-6-3.1, 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 the water to the groundwater source. An exception allows water distribution systems to withdraw from groundwater sources older or stratigraphically lower than the Greenhorn Formation regardless of the results of a hydrologic budget. The applicant is a water distribution system as defined in SDCL 46-1-6(17). The Deadwood aquifer and the Madison aquifer are both older and stratigraphically lower than the Greenhorn Formation. Therefore, it is not necessary to find that recharge exceeds withdrawals to approve this application. However, a statewide and local hydrologic budget for both aquifers will be included for the information of the Chief Engineer and the Water Management Board.

Pursuant to SDCL 46-2A-20:

Notwithstanding §§ 46-1-14 and 46-2A-7, no water permit for construction of works to withdraw water from the Madison formation in Butte, Fall River, Custer, Lawrence, Meade and Pennington counties may be issued for a term of more than twenty years, unless the Water Management Board determines, based upon the evidence presented at a hearing that:

(1) Sufficient information is available to determine whether any significant adverse hydrologic effects on the supply of water in the Madison formation would result if the proposed withdrawal were approved; and

(2) The information, whether provided by the applicant or by other means, shows that there is a reasonable probability that issuance of the proposed permit would not have a significant adverse effect on nearby Madison formation wells and springs.

This application proposes to possibly withdraw water from the Madison aquifer in one of the counties listed above. Therefore, for the component of this application that withdraws from the Madison aquifer, in addition to the other requirements, the Water Management Board must consider the effect this application may have on nearby Madison aquifer wells and springs and this application is subject to a 20-year term limit.

Aquifer: Deadwood (DDWD)

Hydrogeologic Characteristics of the Deadwood Aquifer

The Deadwood aquifer is composed of the saturated and permeable portions of the Deadwood Formation. The Deadwood Formation is a “Variegated, yellow to red, brown, gray, and green glauconitic conglomerate, sandstone, shale, dolomitic limestone, and dolomite” which was deposited during the Lower Ordovician and Middle Cambrian geologic periods and can be up to 400 feet thick [1]. The Deadwood Formation extends across much of the northern Great Plains region, and is an aquifer in Wyoming, South Dakota, Nebraska, Montana, North Dakota in the United States and Manitoba and Saskatchewan in Canada [2]. The Deadwood Formation overlies various metamorphic and igneous Pre-Cambrian rocks and underlies the Winnipeg Formation, which is a “tan calcareous siltstone and sandy shale with limestone lenses overlying gray and light green fissile shale” [1]. Regional groundwater flow is generally from southwest to northeast [2]. Locally, groundwater in the Deadwood aquifer flows radially outward from its outcrop in the Black Hills [3]. The Deadwood aquifer underlies approximately 19 million acres and stores approximately 280 million acre-feet of recoverable water in South Dakota west of the Missouri River [4] and extends east of the Missouri River in northern South Dakota [2]. The Deadwood aquifer has numerous isolated remnants within the crystalline core area of the Black Hills which are either not connected to the main body of the Deadwood aquifer or are only slightly connected to it. Figure 1 shows the outcrop of the Deadwood and Madison aquifers in the northern Black Hills [5], the location of Water Rights Program observation wells completed into those aquifers [6], and the boundaries of the local hydrologic budgets for the Deadwood and Madison aquifers for this application [7].

The applicant submitted a well completion report for a well completed into the Deadwood aquifer on February 4, 2004. The driller reported encountering brown sand and green shale from 1,650 to 1,680 feet below grade, brown sand from 1,680 to 1,710 feet, brown sand and black and green shale from 1,710 feet to 1,806 feet and did not get a sample of the cuttings from 1,806 to 1,842 feet below grade. The driller placed a 5 ½ inch diameter screen from 1,651 to 1,781 feet below grade and left the well as an open hole below the screen. The driller reported that the well was flowing at the time the well was completed, with a closed-in pressure of 11 pounds per square inch (psi), which is equivalent to 25 feet of hydraulic head above the top of the casing.

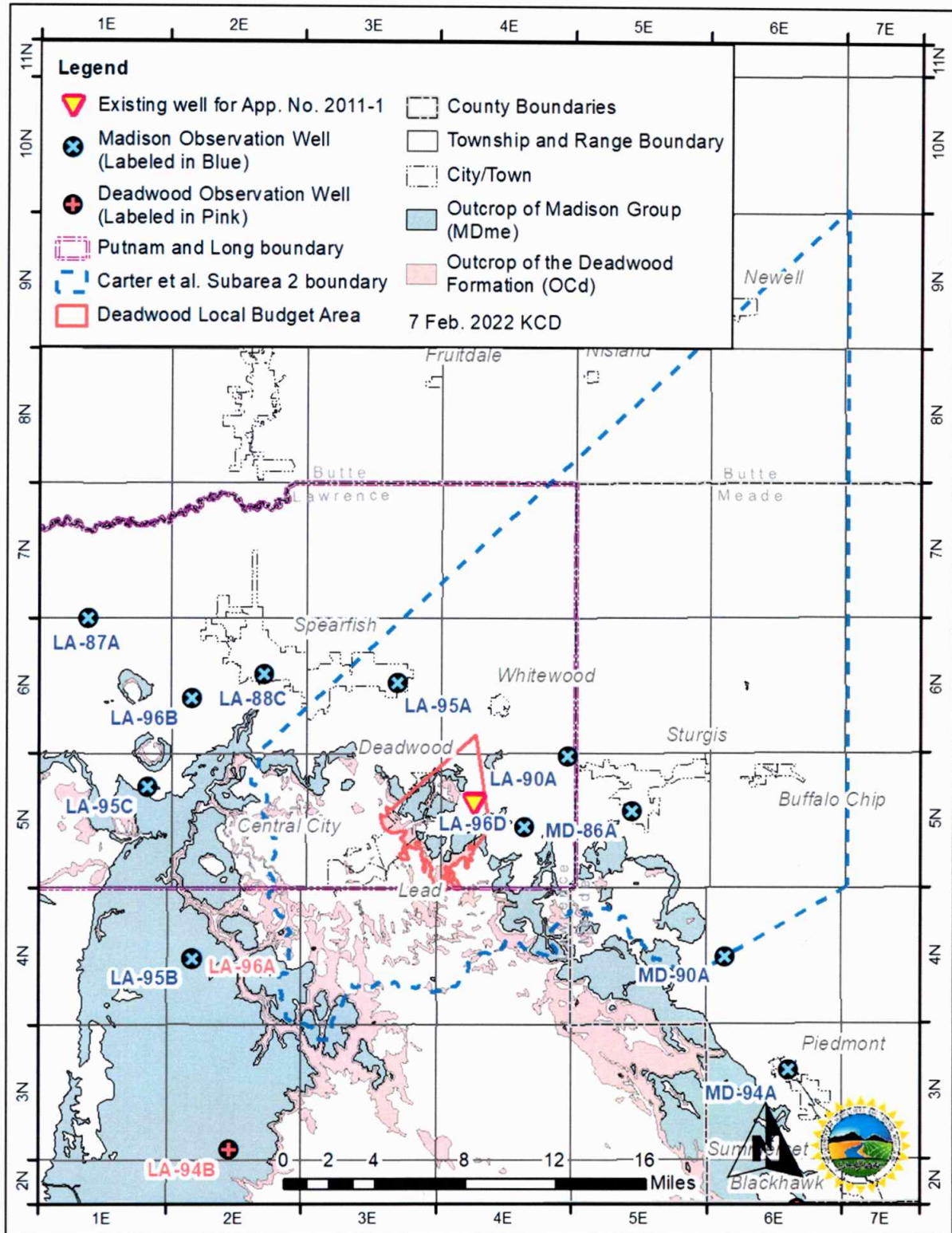


Figure 1: The existing well for this application, the area of the local hydrologic budgets for both the Madison and Deadwood aquifers [8] [9], the outcrops of those aquifers [5], and the location of DANR Observation Wells completed into those aquifers [6].

Availability of Water in the Deadwood Aquifer

Statewide Hydrologic Budget

Statewide Recharge

Recharge to the Deadwood aquifer in South Dakota is mainly by infiltration of precipitation on the outcrop of the Deadwood Formation [10]. Driscoll and Carter [10] estimated that the recharge to the area of outcrop of the Deadwood aquifer that is connected to the main body of the aquifer is approximately 14,500 ac-ft/yr.

Statewide Discharge

Discharge from the Deadwood aquifer in South Dakota is by spring flow to seeps and streams [11], evapotranspiration, groundwater outflow to aquifers in contact with the Deadwood aquifer and/or parts of the Deadwood aquifer in other states, and by domestic and appropriative well withdrawals [10]. Due to the prevalence of stratigraphically higher/easier to access aquifers in most areas and the low withdrawal rate per domestic well, domestic well withdrawals are estimated to be negligible. There are 33 water rights/permits authorized to withdraw from the Deadwood aquifer in South Dakota [12]. Of those, 18 are various types of water distribution system (municipal, rural water system, etc.), 11 are for commercial use, 2 are for irrigation, one is for domestic use, and one is for industrial use [12]. Irrigation reports are available for the Deadwood aquifer for the period of record from 1989 through 2020 [13]. Figure 2 shows irrigation withdrawals over the entire period of record available [13]. From 1989 through 2016, one irrigation water right/permit reported withdrawals. From 2017 through 2020, two irrigation water rights/permits reported withdrawals [13]. The average irrigation reported over the entire period of record is approximately 34 ac-ft/yr. The average irrigation reported from 2017 through 2020 is 91 ac-ft/yr [13]. Since the average from 2017 through 2020 includes both irrigation water rights/permits reporting, it will be used in this report as the average annual irrigation withdrawal.

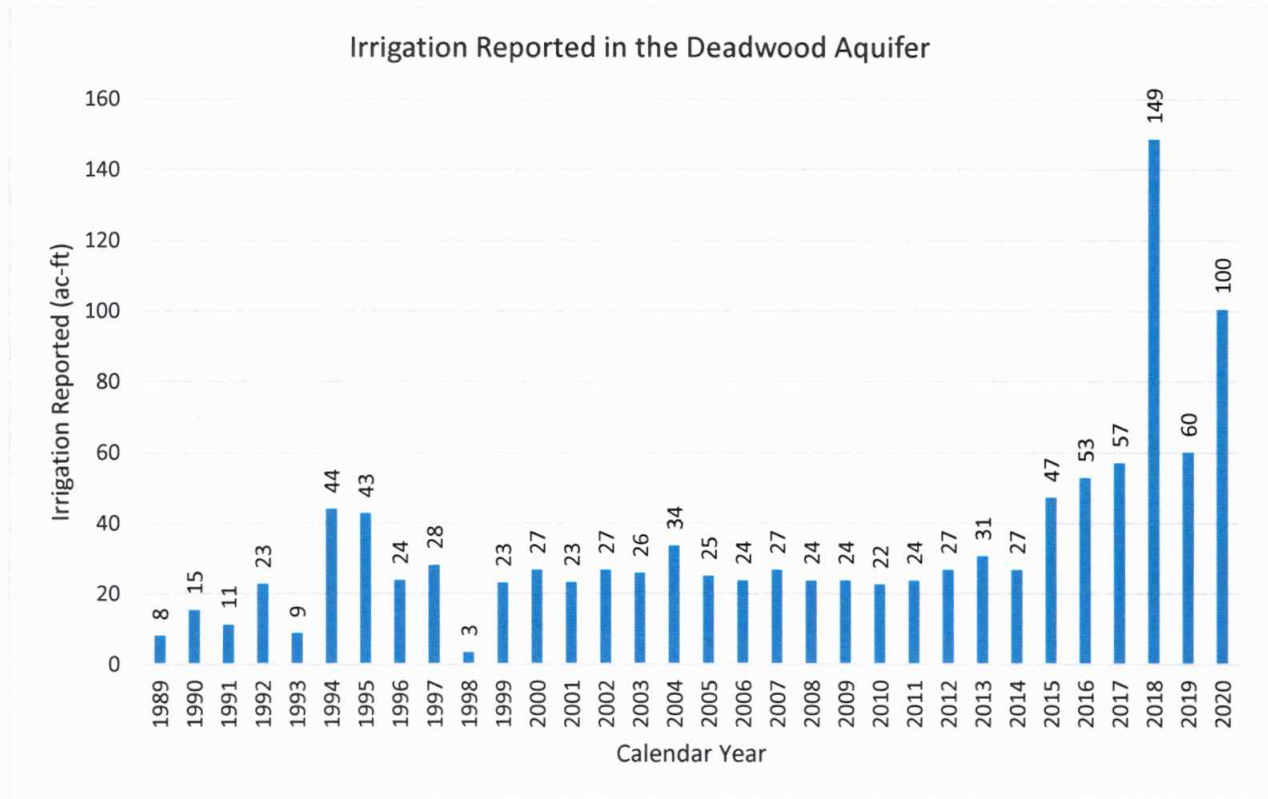


Figure 2: Irrigation reported in the Deadwood aquifer over the period of record from 1989 through 2020 [13].

Of the non-irrigation water rights/permits, five are required to report their average withdrawals, shown in Table 1. Most of those water rights are new enough that they may still be developing their permits, so their full developed use is not necessarily reflected by their average reported use. Water rights/permits older than 9 years or that are reporting an average withdrawal that is greater than the volume limit specified on their permit are estimated by using the average annual withdrawal reported. The remaining water rights/permits required to report are estimated to use the annual volume limit specified in their permits. The total estimated withdrawal for the 5 water rights/permits required to report their withdrawals is approximately 65 ac-ft/yr. This estimate includes the withdrawals from Water Permit No. 2008-1, which withdraws from an isolated remnant of the Deadwood aquifer.

Table 1: Water rights/permits required to report their withdrawals from the Deadwood aquifer

Permit No.	Status	Use Type	Name/Business	Max. CFS	Vol. Limit (ac-ft/yr)	Priority	Years Reported	Avg. Reported Use (ac-ft/yr)	Est. Use (ac-ft/yr)
1900-1	License	MUN	City of Deadwood	0.100	N/A	10/30/2008	12	4.2	4.2
1969-1	Permit	WDS	Terry Trojan Well No 2	0.220	46.0	07/14/2017	4	58.0	58.0
2008-1	Permit	IND	City of Lead	0.022	1.0	06/30/2021	0	0.0	1.0
2782-2	License	COM	Big Game Storage LLC	0.027	1.0	02/09/2018	3	0.8	1.0
2791-2	License	WDS	Twisted Oak Trail Road District	0.067	1.0	09/24/2018	2	0.1	1.0
Total				0.436	49.0	N/A	N/A	63.1	65.2
COM – Commercial, IND – Industrial, MUN – Municipal, WDS – Water Distribution System									

For all non-irrigation water rights/permits not required to report their withdrawals, their annual withdrawal was estimated by assuming they pump at their maximum instantaneous withdrawal rate 60% of the time [12]. The total estimated withdrawal for non-irrigation water rights/permits not required to report their withdrawals is 1,732 ac-ft/yr. This is likely to be an overestimate, based on Water Rights Staff experience. Additionally, this estimate may include other water rights/permits located in isolated remnants of the Deadwood aquifer.

Balance of Statewide Hydrologic Budget

The recharge to the Deadwood aquifer in South Dakota is estimated to be 14,500 ac-ft/yr [10]. Estimated withdrawals from the Deadwood aquifer in South Dakota are summarized in Table 2. The total estimated withdrawals from the Deadwood aquifer are 1,888 ac-ft/yr, including at least one withdrawal that is not connected to the main body of the aquifer. This application seeks to withdraw up to 5.83 ac-ft/yr. Therefore, based on the statewide hydrologic budget, there is reasonable probability unappropriated water is available for this application.

Table 2: Estimated withdrawals from the Deadwood aquifer in South Dakota

Type of Use	Number of Permits	Est. Use (ac-ft/yr)
Irrigation (2017 through 2020)	2	91
Non-Irrigation, Reporting	5	65
Non-Irrigation, Not Reporting	26	1,732
Total	33	1,888

Local Hydrologic Budget

The local hydrologic budget boundaries were drawn to minimize groundwater flows across the boundaries [3]. Where the potentiometric (hydraulic head) surface is unknown, boundaries were drawn radially outward from the Black Hills because in general, groundwater flow around the Black Hills goes radially outward from the crystalline core. The area of exposed outcrop within the local hydrologic budget boundaries is approximately 2,550 acres. Driscoll and Carter [10] estimated recharge to the aquifer using a yield-efficiency algorithm which estimated the amount of recharge based on rainfall on the aquifer outcrop. The average annual precipitation from water years 1950 to 1998 on the outcrop area in the local hydrologic budget ranged between 27.5 and 28.5 inches per year [8]. Using their yield efficiency algorithm, Driscoll and Carter [10] estimated, given the average annual precipitation over the entire outcrop was 19.96 inches per year, the precipitation recharge was 2.63 inches per year. Assuming precipitation recharge is proportional to average annual rainfall, the precipitation recharge for the area of local hydrologic budget ranges from 3.62 to 3.76 inches per year, or, applied over the area of the outcrop, 768 to 797 ac-ft/yr. There are 4 water rights/permits authorized to withdraw from the Deadwood aquifer in the local hydrologic budget area [12]. Three water rights are for suburban housing development use and one is for municipal use. Using the same methods as in the statewide hydrologic budget section, the estimated annual withdrawal is 67 ac-ft/yr. Since this application may withdraw up to 5.83 ac-ft/yr if it is approved, there is reasonable probability unappropriated water is available in the local hydrologic budget for this application.

Observation Wells

Administrative Rule of South Dakota (ARSD) 74:02:05:07 requires the Water Management Board to rely upon the record of observation wells, in addition to other information, to determine

that recharge to an aquifer exceeds withdrawals. The Water Rights Program maintains 5 observation wells completed into the Deadwood aquifer [6]. The nearest Deadwood aquifer observation well to this application is Observation Well LA-96A (shown in Figure 3), located approximately 14 miles southwest of this application. Given the distance between this application and Observation Well LA-96A, it is unlikely that the observation well levels represent the water levels in the Deadwood aquifer near this application, but it still indicates the behavior of the aquifer as a whole, and is representative of trends in the other observation wells. In general, water levels in the aquifer rise when annual precipitation is higher than average and decline when annual precipitation is lower than average. Occasional declines also occur due to seasonal withdrawals near the observation well. The rise and decline of water levels in the observation wells corresponding to increases and decreases of annual precipitation indicates water is naturally discharging from the Deadwood aquifer. Therefore, recharge to and natural discharge from the Deadwood aquifer greatly exceeds withdrawals, and there is reasonable probability unappropriated water is available for this application.

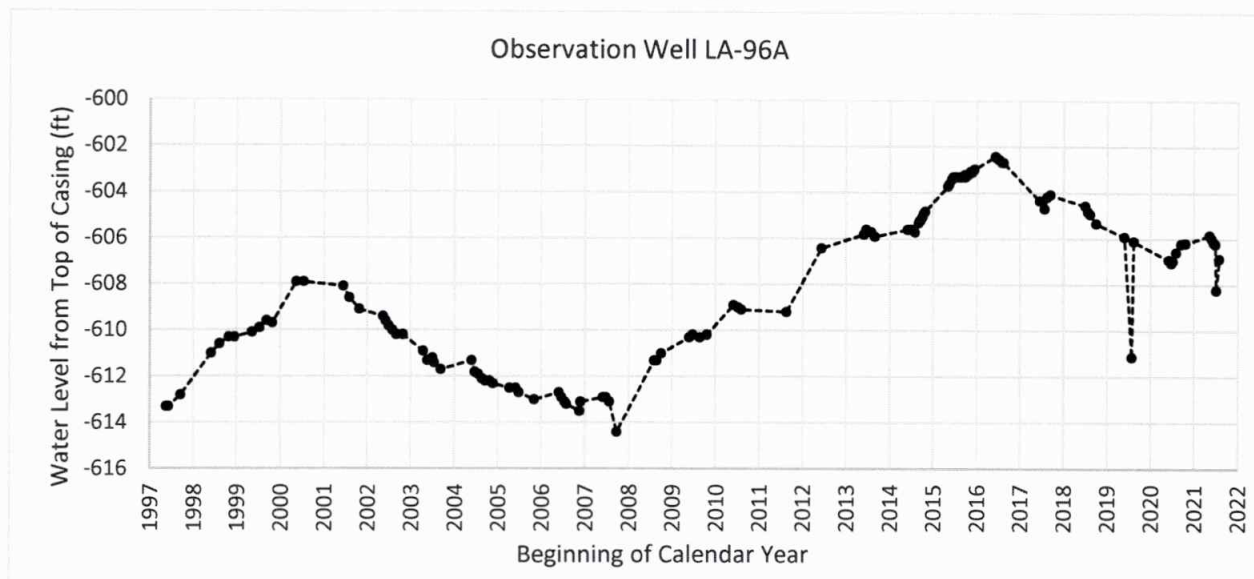


Figure 3: Observation Well LA-96A [6]

Potential for Unlawful Impairment of Existing Water Rights in the Deadwood Aquifer

The nearest water right/permit completed into the Deadwood aquifer to this application is located approximately 0.5 miles south of the southern-most proposed well site for this application and approximately 0.9 miles from the other two proposed well sites and existing well for this application [12]. There are four well completion reports for domestic wells completed into the Deadwood aquifer on file with the Water Rights Program that are within the same section as this application, excluding the well completion report submitted with this application [14]. The Water Rights Program has historically interpreted an unlawful impairment of existing water rights to occur if a junior water right/permit causes a nearby adequate well with a senior water right/permit to become unable to withdraw at the rate it is entitled to or, if a domestic well is impacted, a water right/permit causes an adequate domestic well to be unable to withdraw at the rate needed to supply reasonable domestic use of water. Administrative Rule of South Dakota (ARSD) 74:02:04:20(6) defines an adequate well as:

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

Since the Deadwood aquifer is under confined conditions, the drawdown in the aquifer may extend across more distance than a well in an unconfined aquifer would. In the hearing for Water Permit Application No. 2313-2 for Coca-Cola Bottling Company, the Water Management Board determined that to put the waters of the state to maximum beneficial use, hydraulic head would not be protected as a means of water delivery [15]. Some drawdown due to this application is likely to occur and nearby well owners may need to lower their pumps. There are no complaints on file regarding well interference in Lawrence County [16]. This application seeks to withdraw at 0.089 cfs, or approximately 40 gallons per minute, which is a relatively low withdrawal rate compared to many appropriative water users. Based on the lack of complaints and relatively low withdrawal rate of this application, there is reasonable probability this application can be developed without unlawful impairment of existing water rights.

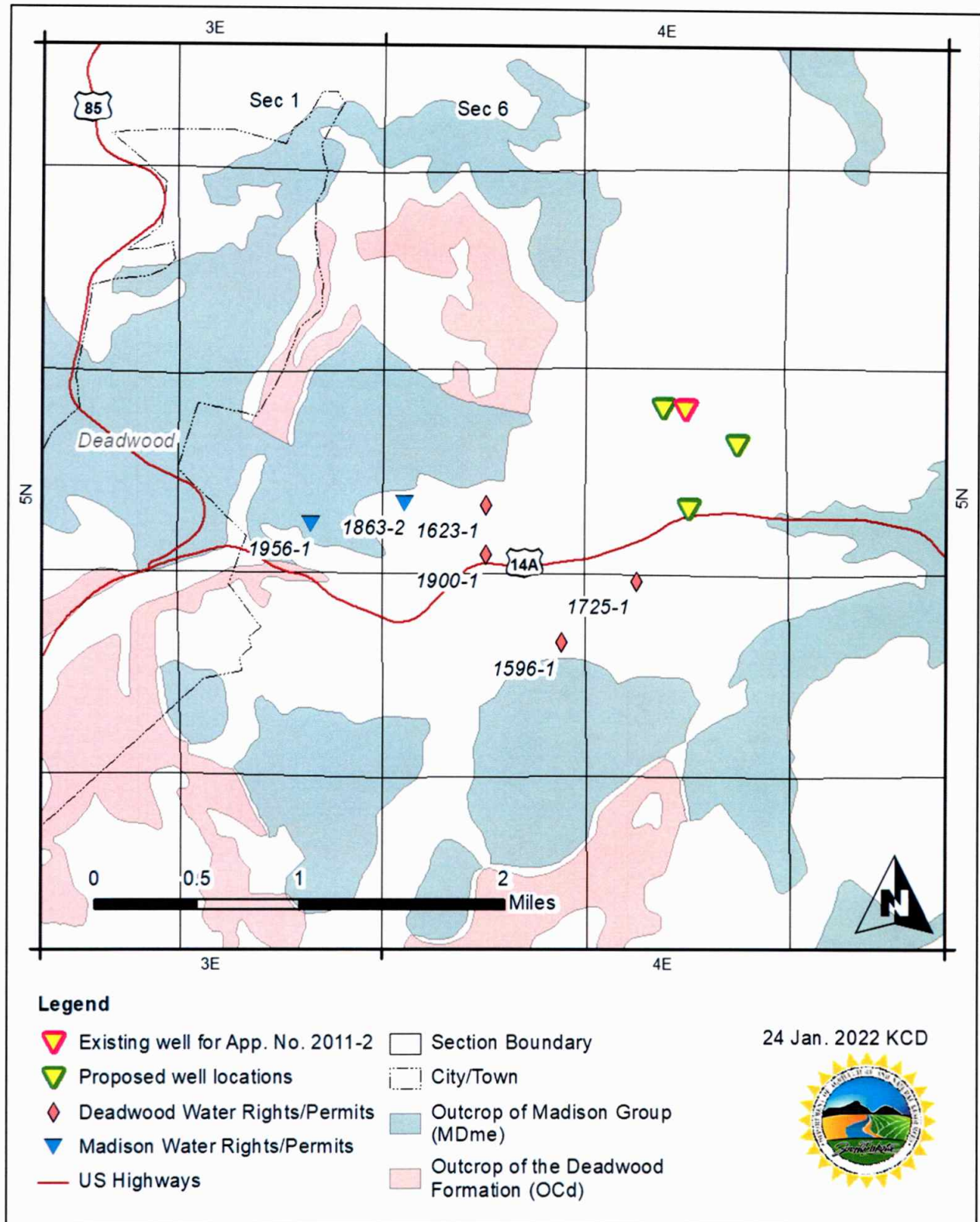


Figure 4: Nearby Deadwood and Madison aquifer water rights/permits [12], the outcrops of those aquifers [5], and the locations of existing and proposed wells for this application.

Aquifer: Madison (MDSN)

Hydrogeologic Characteristics of the Madison Aquifer

The Madison Group in South Dakota is a Lower Mississippian and Upper Devonian group of formations consisting of the Englewood and Pahasapa Limestone formations in the Black Hills [17]. The Pahasapa Limestone is a “white, light-gray to tan, fine- to medium-grained limestone and dolomite containing brown to gray chert [1].” The Englewood Limestone is a “pink to lavender to light-gray, thin- to medium-bedded, fine- to medium-grained, argillaceous, dolomitic limestone [1].” The Madison aquifer consists of the permeable and porous portions of the Madison Group that are sufficiently saturated to deliver useful quantities of water. The Madison aquifer extends over more than 210,000 square miles in Montana, Wyoming, North Dakota, South Dakota, and Nebraska [18], although it may not be suitable as a source of water in all of those areas due to extreme depth to the aquifer and low water quality far from the outcrops [19]. The Madison aquifer may be hydrologically connected to the Deadwood aquifer underlying it in some locations and is connected to the Minnelusa aquifer above it [8]. There are other bedrock aquifers that receive natural discharge from the Madison aquifer further away from the Black Hills where confining layers between the Madison aquifer and those aquifers are absent. The hydraulic head of the Madison aquifer is higher than land surface in many places around the Black Hills, causing some wells completed into the aquifer to flow without a pump [14]. Numerous springs and seeps in the Black Hills flow with water that has been determined to come from the Madison aquifer [20].

This application is within a mile of the outcrop of the Madison aquifer. There is one well completion reports on file with the Water Rights Program within a mile of this application that is likely to be completed into the Madison aquifer [14]. That well was completed in the SE ¼ SW ¼ Section 17 T5N-R4E on December 19, 2001. The driller reported encountering yellow limestone from 30 to 60 feet, dull yellow limestone from 60 to 160 feet, lost returns from 160 to 660 feet, hard green shale with greenish white sand from 660 to 800 feet. The driller cased the well from ground level to 627 feet below grade and left an open hole below that. The static water level at the time the well was completed was 360 feet below grade, or based on land surface data, approximately 4,200 feet above NGVD29 [21]. McKaskey [22] indicates that near the area of this application, the Madison aquifer’s hydraulic head (a.k.a. potentiometric surface) is approximately 4,200 feet above NGVD29. A green layer of shale is often used as a marker bed and an indicator of the presence of the Winnipeg Formation in the Black Hills [23]. Based on the water level elevation in the well, formations described above the loss in returns, and the presence of a green shale at the bottom of the well, it is likely that well withdraws from the Madison aquifer. Since the water level at the time of drilling did not rise above any contiguous limestone indicated in the well completion report, it is likely the Madison aquifer is under unconfined conditions near this application, even though the formation is buried below a layer of clay and other confining lithology.

Availability of Water in the Madison Aquifer

Statewide Hydrologic Budget

Statewide Recharge

The Madison aquifer receives recharge from infiltration of precipitation and streamflow on the outcrop area and may also receive inflow from the underlying Deadwood aquifer [8]. There are several reports available estimating recharge to the Madison aquifer.

Woodward-Clyde Consultants [24] estimated recharge to the outcrop of the Madison aquifer in the Black Hills as part of an environmental impact statement for the ETSI Coal Slurry Pipeline Project. The upper-bound estimate of recharge in the Woodward-Clyde Consultants report is approximately 400,000 ac-ft/yr, assuming almost all of the precipitation that falls on the outcrop infiltrates into the aquifer [24]. Woodward-Clyde Consultants produced a lower-bound recharge estimate of 140,000 ac-ft/yr based on the Rahn and Gries [20] report [24]. However, the Rahn and Gries report estimated recharge for all Paleozoic limestone in the Black Hills, which includes the Madison Group, the Minnelusa Formation, and the Minnekahta Formation [20]. Rahn and Gries [20, p. 15] reported that 146.14 cfs was their minimum estimated recharge rate for the Paleozoic limestone from infiltration of precipitation, which converts to approximately 106,000 ac-ft/yr for all Paleozoic formations. The Woodward-Clyde Consultants report did not acknowledge the fact that the Rahn and Gries [20] report estimated minimum recharge for a larger group of formations than the Woodward-Clyde Consultants report covers [24].

Carter, Driscoll, and Hamade [8] analyzed streamflow and precipitation data from water years 1931 to 1998 in the Black Hills area in South Dakota and Wyoming to determine the average annual recharge to the Madison and Minnelusa aquifers. They estimated a combined average annual recharge to both aquifers to be 344 cfs, or approximately 249,000 ac-ft/yr, not including possible flow from the Deadwood aquifer [8]. Carter, Driscoll, and Hamade [8] estimate that approximately 55% of the recharge goes to the Madison aquifer, so the total estimated average recharge to the Madison aquifer from the outcrop in the Black Hills is 137,000 ac-ft/yr, not including possible inflow from adjacent aquifers. The Carter, Driscoll, and Hamade [8] report uses more years of data, more recent data, and better assumptions than the Woodward-Clyde Consultants [24] and Rahn and Gries [20] reports. Therefore, the best estimate of recharge to the Madison aquifer is based on the Carter, Driscoll, and Hamade [8] report.

Statewide Discharge

Discharge from the Madison aquifer in South Dakota is mainly by outflow to other aquifers when the hydraulic head in the Madison aquifer is higher than those aquifers, outflow to springs and seeps, and by withdrawals by domestic and appropriative wells [7]. Due to the presence of overlying aquifers and water distribution systems, domestic well withdrawals are a negligible portion of the hydrologic budget of the Madison aquifer. There are 157 water rights/permits currently authorized to withdraw from the Madison aquifer and 10 future use water rights/permits reserving water from the Madison aquifer. Table 3 shows the future use permits reserving water from the Madison aquifer [12].

Of the 157 active water rights/permits, 93 are primarily for some kind of water distribution system (rural water system, municipal, etc), 30 primarily for irrigation, 14 for commercial use, 11 for industrial use, 4 for domestic use, 2 for geothermal use, 2 for institutional use, and one for

recreation. Estimated withdrawals for irrigation use are shown below in Table 4 (page 13). When there were more than 10 years of irrigation reports available, the average reported irrigation was used to estimate irrigation withdrawals. When there were less than 10 years of irrigation reports available, withdrawals are assumed to equal 2 acre-feet per acre although actual usage is likely less for non-turf irrigation. Non-irrigation withdrawals from permit holders with irrigation as a permitted use are assumed to withdraw at their maximum instantaneous diversion rate 60% of the time. In the case of Water Right No. 1885-1, that would have caused the total estimated withdrawal to exceed the rate they were physically capable of withdrawing, so their total estimated withdrawal is 100% of their maximum instantaneous diversion rate.

Table 3: Future Use Permits from the Madison aquifer [12]

Permit No.	Name/Business	County	Use	Priority Date	Amount Reserved (ac-ft/yr)
369-1	City of Belle Fourche	LA	MUN	12/10/1958	620
2086-2	City of Rapid City	PE	MUN	05/18/1989	4,075
439-2	City of Rapid City	PE	MUN	09/22/1956	3,367
1872-1	City of Spearfish	LA	MUN	11/13/2006	2,704
2560-2	Fall River Water Users District	FR	RWS	05/16/2005	358
2560A-2	Fall River Water Users District	FR	RWS	05/16/2005	0
2560B-2	Fall River Water Users District	FR	RWS	05/16/2005	0
2580-2	Southern Black Hills Water System	FR	RWS	03/02/2006	1,474
1833-2	Weston Heights Home Owners	MD	RWS	02/18/1983	211
1995-1	Black Hawk Water User District	MD	RWS	04/15/2020	1,300
Total					14,109
FR – Fall River, LA – Lawrence, MD – Meade, PE – Pennington					
MUN – Municipal, RWS – Rural Water System					

Water Right/Permit Nos. 1096-1, 1096A-1, 1496-1, and 1670-1 are all authorized to withdraw from one well and one dam. Water Right Nos. 1096-1, 1096A-1, 1670-1 authorize diversion of water for irrigation use and Water Right No. 1096A-1 and Water Permit No. 1496-1 authorize diversion of water for rural water system use. Documentation in the administrative file for Water Right No. 1670-1 indicates that the well is not valved such that it can be shut off when not in use for the beneficial uses listed on the permits. A letter dated September 9, 1998 indicates that when the water for that well is not being used for the beneficial uses described in the permits, it is used for fish and wildlife propagation. The person writing the letter indicated they would prefer the Water Management Board not to order the well to be shut off when not used for irrigation or rural water system withdrawals. It is likely the well continues to flow uncontrolled, so at the flow rate listed in Water Right No. 1096A-1 of 1.33 cfs, that well withdraws approximately 964 ac-ft/yr from the Madison aquifer.

Water Right No. 1650-1 does not require the water right holder to report annual withdrawals and allocates no acreage. It provides supplemental water supply from a flowing well for Water Right No. 1231-1. Water Right No. 1231-1 permits a 110 acre-ft dam to provide water for a commercial livestock operation and irrigation of 134 acres. Water Right No. 1650-1 allows for direct irrigation from a Madison aquifer well of up to 2 acre-ft per acre for the land permitted by Water Right No. 1231-1. Kilts estimated that Water Right No. 1650-1 withdraws 55.9 ac-ft/yr [25].

Report on Water Permit App. No. 2011-1

There are 35 water rights/permits that have a volume limit listed in their permit or have had their total withdrawal limited by a subsequent water right/permit held by the same person/entity. While many of those water rights/permits are required to report their withdrawals, they may develop their permits further to withdraw up to the limit on their permit. The total volume listed by such permits is 20,886 ac-ft/yr.

There are 89 non-irrigation water rights/permits that do not have a volume limit listed in their permit and are not discussed above. They are estimated to withdraw up to their maximum instantaneous diversion rate 60% of the time, for a total estimated withdrawal of 16,897 ac-ft/yr. Based on Water Rights Staff experience, this estimate is likely to be higher than the actual withdrawals by those water rights/permits.

Table 4: Permits with irrigation listed as one beneficial use, or are connected to an irrigation permit [12] [26]

Permit No.	Name/Business	Diversion rate (cfs)	Acres Licensed/ Permitted	Average Report (ac-ft/yr)	Years of Irrigation Reports	Estimated average irrigation (ac-ft/yr)	Est. Non-irr. Use (ac-ft/yr)	Total Est. Withdrawal (ac-ft/yr)
2773-2	Arrowhead Country Club	1.110	100.00	0	3	200.0	0.0	200.0
1096-1	Bar Bar V Livestock LLC	1.880	216.00	65.5	30	*	*	*963.5
1670-1		3.610	253.00	49.6	23	*	*	*
1635-1	Black Hills National Cemetery	0.820	54.50	95.6	25	95.6	356.4	452.0
1452-1	Black Hills State College	3.330	25.44	18.5	32	18.5	1,447.5	1,465.9
1096A-1	Butte Meade Sanitary Dist	1.330	0.00	N/A	0	*	*	
2458-2	City of Rapid City	0.800	107.00	101.6	20	101.6	0.0	101.6
2002-1	City of Spearfish	1.330	40.00	N/A	0	80.0	0.0	80.0
2313-2	Coca-Cola Bottling	0.330	3.00	7.3	26	7.3	143.4	150.8
1899-1	Davis Ranches Inc	1.430	100.00	0.0	12	0.0	0.0	0.0
2673-2	Diocese of Rapid City	0.120	7.00	8.3	8	14.0	0.0	14.0
1009-1	Donald F/Ann J Brady	0.780	53.73	31.1	39	31.1	0.0	31.1
1185-1		0.380	22.52	109.1	39	109.1	***	109.1
2286-2	Donald Konechne	0.100	38.50	10.6	27	10.6	0.0	10.6
1707A-1	Elkhorn Ridge @ Frawley Ranches LLC	3.705	100.00	N/A	0	200.0	1,610.5	1,810.5
1707E-1		0.000	0.00	38.3	2	**	**	
1931-1		0.170	3.30	3.0	8	6.6	73.9	80.5
1650-1	Foothill Land & Cattle LLC	0.890	0.00	N/A	0	*	*	*55.9
1945-1	Frawley Ranches LLC	1.110	265.00	46.9	7	530.0	0.0	530.0
1858-1	Glencoe Camp Resort II LLC	0.860	34.00	0.0	15	0.0	373.8	373.8
2593-2	Hart Ranch Development	0.490	72.50	15.2	14	15.2	213.0	228.2
1911-2	Hart Ranch Development Co	0.880	124.00	121.1	27	121.1	382.5	503.6
1725-2	Janice R Crowser	1.070	75.10	2.8	22	2.8	0.0	2.8
1923-1	Jim Montieth	0.110	3.00	1.0	9	6.0	47.8	53.8
858-2	John & Heidi McBride	9.360	655.75	7.1	35	7.1	0.0	7.1
1885-1	John T & Veronica Widdoss	0.110	22.00	14.9	4	44.0	35.7	79.7
1223-1	Montana Dakota Land LLC	0.670	263.00	200.4	39	200.4	0.0	200.4
1960-1	One Diamond Inc	1.280	150.00	137.0	5	300.0	556.4	856.4
1363-1	Spearfish Canyon Cntry Cl	0.900	80.10	61.3	34	61.3	0.0	61.3
2106-2	Stuart Rice	0.080	2.80	0.9	26	0.9	34.8	35.7
1842-1	Tom C Davis	0.440	330.00	0.0	16	0.0	0.0	0.0
2741-2	Tubbs Land & Cattle LLC	3.340	567.00	0.0	2	1,134.0	0.0	1,134.0
419-2	Wind Cave National Park	0.150	6.00	N/A	0	12.0	65.2	77.2
Total		42.965	3,774.24			3,309.1	5,340.8	9,669.4

* Discussed in text. **gives additional time to develop 1707A-1. *** Reports all use types in irrigation report

In addition to the potential withdrawals by future use permits described above, two other applications are deferred or held in abeyance. Water Permit Application No. 2585-2 for Southern Black Hills Water System seeks to appropriate 1,600 ac-ft/yr but is deferred for further study.

Water Permit Application No. 2685-2 for Powertech, Inc is held in abeyance pending federal permitting and seeks to appropriate 889 ac-ft/yr.

Summary of Statewide Hydrologic Budget

The best available estimate of recharge to the Madison aquifer in South Dakota is approximately 137,000 ac-ft/yr. The estimated withdrawals as described in the Statewide Discharge section are summarized in Table 5. The total estimated withdrawal, including withdrawals reserved for future use and held, or deferred applications is approximately 64,050 ac-ft/yr. This application seeks to withdraw up to 5.83 ac-ft/yr. Therefore, based on the statewide hydrologic budget, there is reasonable probability unappropriated water is available for this application.

Table 5: Summary of withdrawals from Madison aquifer

Type	Count	Est. Rate (ac-ft/yr)
Irrigation (Table 4)	33	9,669
Volume limit	35	20,886
Diversion Rate limit	89	16,897
<i>Subtotal (authorized to withdraw)</i>	<i>157</i>	<i>47,452</i>
Future use (Table 3)	10	14,109
Pending/deferred/held	2	2,489
Grand total	169	64,050

Local Hydrologic Budgets

Since this application is near the outcrop of the Madison aquifer, it is appropriate to analyze local hydrologic budgets. Two local hydrologic budgets are available, based on recharge estimates from different studies of similar quality of analysis but with different study area boundaries [7] [9]. Figure 1 shows the study area boundaries relative to this application [7] [9]. Both studies estimate hydrologic budgets for the Madison and Minnelusa aquifers together [7] [9].

Carter, et al.

Carter, et al. [7] divided the area around the Black Hills into 9 Subareas and used streamflow, precipitation, spring flow, estimated ground water flow, and well withdrawal data from 1987 to 1996 for the hydrologic budgets. This application is in Subarea 2 of their report. The boundaries of the Carter et al. [7] subareas were designed to minimize flow across subarea boundaries, although at the time of the study, there was some net flow from Subarea 1 to Subarea 2 and across other subarea boundaries. Carter et al. [7] estimated the total recharge to the Madison and Minnelusa aquifers from streamflow and precipitation infiltration was 130.7 cfs. Assuming 55% of the recharge goes to the Madison aquifer, the estimated recharge in Subarea 2 is 20.8 cfs, or approximately 15,101 ac-ft/yr [8] [7]. Carter, et al. [7] do not provide values for the recharge area of the Madison and Minnelusa formations for each subarea in their report, so it is possible the proportion of recharge area to those aquifers is different within the subarea. Following the same methods as the Statewide Discharge section, withdrawals from Carter et al. [7] Subarea 2 within South Dakota are shown in Table 6. The total estimated withdrawals including water reserved for future use is approximately 10,592 ac-ft/yr [12] [26]. This application seeks to

withdraw up to 5.83 ac-ft/yr. Therefore, based on this hydrologic budget, there is reasonable probability unappropriated water is available for this application.

Table 6: Madison withdrawals estimated within Carter et al. [7] Subarea 2 in South Dakota [12] [26]

Type	Count	Est. Rate (ac-ft/yr)
Irrigation	8	3,381
Volume limit	8	2,073
Diversion rate limit	19	2,434
<i>Subtotal (authorized to withdraw)</i>	<i>35</i>	<i>7,888</i>
Future use	1	2,704
Pending/deferred/held	0	0
Grand total	36	10,592

Putnam and Long

Putnam and Long [9] estimated precipitation recharge to the Madison formation to be approximately 8.0 cfs. They estimated streamflow recharge to the Madison and Minnelusa formations along Bear Gulch, Beaver Creek, Spearfish Creek, and False Bottom Creek was 17.5 cfs [9]. There are also other streams and stream channels that flow over the Madison Formation in the Putnam and Long [9] study area [19]. Putnam and Long [9] estimated that on average, natural discharge from the Madison and Minnelusa aquifers by spring flow was 51 cfs, which is more than the recharge rate estimated. This means that there is likely some groundwater inflow from other aquifers than the Madison and Minnelusa aquifer or from the Madison and Minnelusa aquifers outside of the study area. There is probably also additional streamflow recharge from the streams not included in the Putnam and Long [9] study. Some natural discharge is available for capture, and the Putnam and Long [9] study does not include well withdrawals in its estimates of recharge and discharge. The Putnam and Long [9] study also does not account for groundwater inflow from the west that is likely to occur [7]. Assuming 55% of the streamflow recharge goes to the Madison aquifer [8], then approximately 9.6 cfs goes to the Madison aquifer from streamflow from the four streams specified above, the total estimated recharge in the study area is 17.6 cfs (approx. 13,000 ac-ft/yr). Assuming 55% of the spring flow discharge comes from the Madison aquifer [8], then approximately 28.1 cfs (approx. 20,000 ac-ft/yr) flows out of the Madison aquifer as spring flow. The actual natural discharge from the Madison aquifer from springs is likely to be a much higher proportion of all spring flow, because Naus, Driscoll, and Carter [27] used chemical and dye analysis to find that three of the four major springs in the study area are supplied 70% or more from the Madison aquifer. Since the Putnam and Long [9] study was published in 2007, it is reasonable to assume new discharges starting January 1, 2007, withdraw from the natural discharge described in the study. Following the same methods as the Statewide Discharge section, the total estimated appropriative withdrawal from the Putnam and Long [9] study area is approximately 13,172 ac-ft/yr (Table 7, see page 16) [12] [26]. The total estimated appropriative withdrawal from water rights/permits with a priority date after the publishing date of the Putnam and Long study is approximately 1,987 ac-ft/yr (Table 7) [12] [26]. This application proposes to withdraw 5.83 ac-ft/yr. Therefore, based on a hydrologic budget within the Putnam and Long [9] study area boundaries, there is reasonable probability unappropriated water is available for this application.

Table 7: Madison withdrawals estimated inside the Putnam and Long [9] study area [12] [26]

Type	All time		After Jan. 1, 2007	
	Count	Est. Rate (ac-ft/yr)	Count	Est. Rate (ac-ft/yr)
Irrigation	10	5,018	6	1,680
Volume limit	9	4,742	5	128
Diversion rate limit	18	3,412	2	178
<i>Subtotal (authorized to withdraw)</i>	<i>37</i>	<i>13,172</i>	<i>13</i>	<i>1,987</i>
Future use	0	0	0	0
Pending/deferred/held	0	0	0	0
Grand total	37	13,172	13	1,987

Observation Wells

Administrative Rule of South Dakota (ARSD) 74:02:05:07 requires that the Water Management Board relies upon the record of observation well data, in addition to other information, in order to determine that recharge to the aquifer exceeds withdrawals. The Water Rights Program maintains 25 observation wells completed into the Madison aquifer. The nearest Madison observation well to this application is LA-96D, located approximately 2.3 miles southeast of this application. This observation well is representative of water level fluctuations in the aquifer near this application. In general, water levels rise in the Madison aquifer and in Observation Well LA-96D during periods of higher than average annual precipitation and decline during periods of lower than average annual precipitation. This means that recharge and natural discharge are the dominant effects in the aquifer and natural discharge is available for capture. Therefore, based on observation well analysis, there is reasonable probability unappropriated water is available for this application.

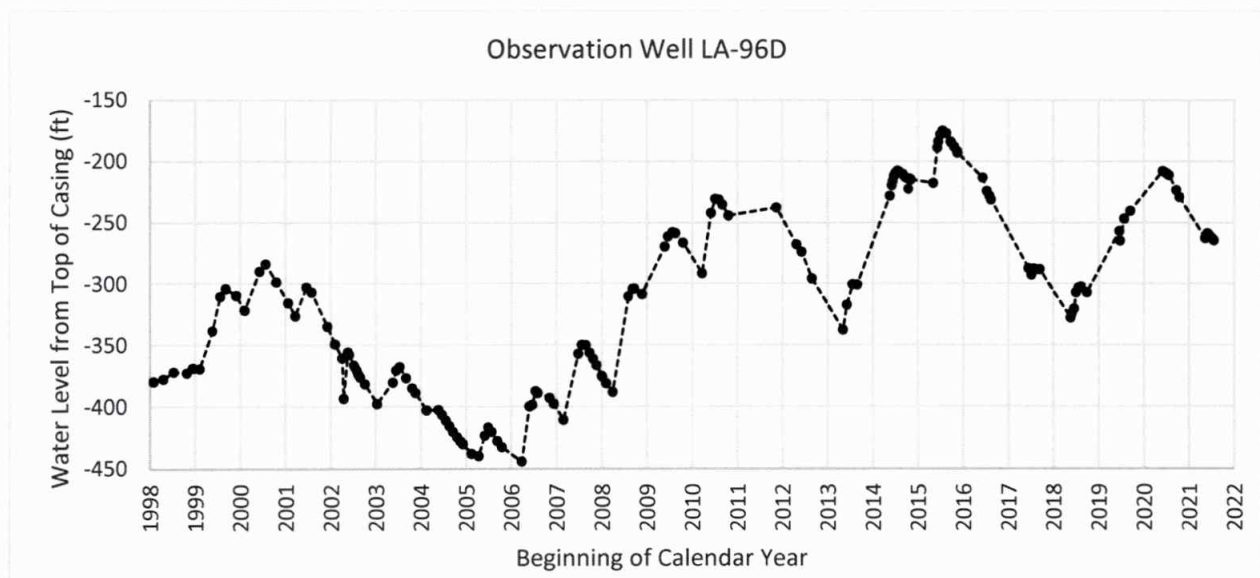


Figure 5: Observation Well LA-96D [6]

Potential for Unlawful Impairment of Existing Water Rights in the Madison Aquifer

The nearest water right/permit authorized to withdraw from the Madison aquifer is located approximately 1.4 miles southwest of this application. The nearest well completion report to this

application that is likely to be completed into the Madison aquifer is the one mentioned in the section on hydrogeologic characteristics of the Madison aquifer, located within the same mile section as this application. The Water Rights Program has historically interpreted an unlawful impairment of existing water rights to occur if a junior water right/permit causes a nearby adequate well with a senior water right/permit to become unable to withdraw at the rate it is entitled to or, if a domestic well is impacted, the water right/permit causes the adequate domestic well to be unable to withdraw at the rate needed to supply reasonable domestic use of water. Administrative Rule of South Dakota (ARSD) 74:02:04:20(6) defines an adequate well as:

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

In the hearing for Water Permit Application No. 2313-2 for Coca-Cola Bottling Company, the Water Management Board determined that to put the waters of the state to maximum beneficial use, hydraulic head would not be protected as a means of water delivery [15]. Some drawdown from this application is likely to occur and nearby well owners may be required to lower their pumps. There is no record of well interference in Lawrence County [16]. Given the lack of well interference complaints in this aquifer in Lawrence County, there is reasonable probability this application can be developed without unlawful impairment of existing water rights.

Springs

The nearest large springs to this application are Higgins Gulch and Old Spearfish Hatchery springs, located approximately 15 miles northwest of this application, and Elk Creek Spring, located approximately 15 miles southeast of this application [27]. Upon considering the deferral of Water Permit Application No. 2585-2 for Southern Black Hills Water System, the Water Management Board adopted a conclusion of law stating in part, "... The only protection South Dakota law provides when considering an application for an underground water permit for flow from an artesian spring is under the public interest criteria" [28]. Given the distance between the proposed well site and the nearest springs, there is reasonable probability this application can be developed without noticeably impacting flow from the springs.

Conclusions

1. Water Permit Application No. 2011-1 seeks to appropriate up to 5.83 ac-ft/yr at a maximum total withdrawal rate of 0.089 cfs from one existing well completed into the Deadwood Aquifer and a new well to be completed into either the Deadwood or Madison Aquifer, both located in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17 T5N-R4E for a water distribution system located in the NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, and NE $\frac{1}{4}$ SW $\frac{1}{4}$ in Section 17 T5N-R4E, Black Hills Meridian.
2. Based on the record of observation wells and the hydrologic budgets, there is reasonable probability unappropriated water is available from the Madison aquifer and the Deadwood aquifer.
3. There is reasonable probability this application can be developed without unlawful impairment of existing water rights/permits.



Kimberly Drennon, E.I.

Natural Resources Engineer II – DANR Water Rights Program

References

- [1] J. E. Martin, J. F. Sawyer, M. D. Fahrenbach, D. W. Tomhave and L. D. Schulz, "Geologic Map of South Dakota," SD DANR Geological Survey Program, Vermillion, South Dakota, 2004. General Map 10.
- [2] J. S. Downey, "Geohydrology of bedrock aquifers in the Northern Great Plains in parts of Montana, North Dakota, South Dakota, and Wyoming," United States Geological Survey, Denver, Colorado, 1986. Professional Paper 1402-E.
- [3] M. L. Strobel, J. M. Galloway, G. R. Hamade and G. J. Jarrell, "Potentiometric surface of the Deadwood aquifer in the Black Hills Area, South Dakota," United States Geological Survey, Denver, Colorado, 2000. Hydrologic Investigations Atlas 745-E.
- [4] J. C. Allen, D. L. Iles and A. K. Petres, "Analysis of groundwater and streamflow data Western Dakotas region of South Dakota: Tasks 3A.B.C. and 4A.B.: Groundwater resource inventory," U.S. Army Corps of Engineers, Omaha, Nebraska, 1985.
- [5] M. L. Strobel, G. J. Jarrell, J. F. Sawyer, J. R. Schleicher and M. D. Fahrenbach, "Distribution of hydrogeologic units in the Black Hills Area, South Dakota," United States Geological Survey, Rapid City, South Dakota, 1999. Hydrologic Investigations Atlas 743.
- [6] SD DANR Water Rights Program, "Observation wells," Pierre, South Dakota, 2022.
- [7] J. M. Carter, D. G. Driscoll, G. R. Hamade and G. J. Jarrell, "Hydrologic budgets for the Madison and Minnelusa aquifers, Black Hills of South Dakota and Wyoming, Water Years 1987-96," United States Geological Survey, Rapid City, South Dakota, 2001. Water-Resources Investigations Report 01-4119
- [8] J. M. Carter, D. G. Driscoll and G. R. Hamade, "Estimated recharge to the Madison and Minnelusa aquifers in the Black Hills Area, South Dakota and Wyoming, Water Years 1931-98," United States Geological Survey, Rapid City, South Dakota, 2001. Water-Resources Investigations Report 00-4278.
- [9] L. D. Putnam and A. J. Long, "Characterization of ground-water flow and water quality for the Madison and Minnelusa aquifers in northern Lawrence County, South Dakota," United States Geological Survey, Rapid City, South Dakota, 2007. Scientific Investigations Report 2007-5001.

- [10] D. G. Driscoll and J. M. Carter, "Hydrologic Conditions and Budgets for the Black Hills of South Dakota, through Water Year 1998," United States Geological Survey, Rapid City, South Dakota, 2001. Water-Resources Investigation 01-4226.
- [11] P. H. Rahn, "Ground water resources of western South Dakota," U.S. Army Corps of Engineers, Omaha, Nebraska, 1979.
- [12] SD DANR Water Rights Program, "Water right permit file database," SD DANR Water Rights Program, Pierre, South Dakota, 2022.
- [13] SD DANR Water Rights Program, "Irrigation questionnaire summaries," SD DANR Water Rights Program, Joe Foss Bldg., Pierre, SD, 2021.
- [14] SD DANR Water Rights Program, "Well-completion report database," SD DANR Water Rights Program, Joe Foss Bldg., Pierre, 2022.
- [15] South Dakota Water Management Board. *On the Matter of Water Permit Application No. 2313-2 for Coca Cola Bottling Company*, 1995.
- [16] SD DANR Water Rights Program, "County Files," SD DANR Water Rights Program, Joe Foss Bldg., Pierre, South Dakota, 2022.
- [17] M. D. Fahrenbach, F. V. Steece, J. F. Sawyer, K. A. McCormick, G. L. McGillivray, L. D. Schulz and J. A. Redden, "South Dakota Stratigraphic Correlation Chart," SD DANR Geological Survey Program, Vermillion, South Dakota, 2010. Oil and Gas Investigation 3.
- [18] J. S. Downey, "Geohydrology of the Madison and associated aquifers in Parts of Montana, North Dakota, South Dakota, and Wyoming," United States Geological Survey, Alexandria, Virginia, 1984. Professional Paper 1273-G.
- [19] J. M. Carter, D. G. Driscoll, J. E. Williamson and V. A. Lindquist, "Atlas of water resources in the Black Hills area, South Dakota," United States Geological Survey, 2002. Hydrologic Atlas 747.
- [20] P. H. Rahn and J. P. Gries, "Large springs in the Black Hills, South Dakota and Wyoming," SD DENR Geological Survey Program, Vermillion, South Dakota, 1973. Report of Investigations 107.
- [21] Intermap, "IFSAR 5-meter Digital Elevation Model," Not published, Pierre, South Dakota, 2008.
- [22] J. D. R. G. McKaskey, "Hydrogeologic framework for the Madison and Minnelusa aquifers in the Black Hills Area," Master's Thesis, South Dakota School of Mines and Tech, Rapid City, South Dakota, 2013.

- [23] A. Mathiowetz, Interviewee, *Natural Resources Engineer IV - DANR Water Rights Program*. [Interview]. 2 February 2022.
- [24] Woodward-Clyde Consultants, "Well-field hydrology technical report for the ETSI coal slurry pipeline project," United States Department of Interior Bureau of Land Management, 1981.
- [25] W. K. Kilts, "Report to the Chief Engineer on Water Permit Application No. 1987-1," DANR Water Rights Program, Joe Foss Bldg., Pierre, South Dakota, 2019.
- [26] SD Water Rights, "Irrigation reports," SD DANR Water Rights Program, Joe Foss Bldg., Pierre, South Dakota, 2021.
- [27] C. A. Naus, D. G. Driscoll and J. M. Carter, "Geochemistry of the Madison and Minnelusa aquifers in the Black Hills area, South Dakota," United States Geological Survey, Rapid City, South Dakota, 2001. Water-Resources Investigations Report 01-4129.
- [28] South Dakota Water Management Board. *Finding of Facts, Conclusions of Law, and Final Decision on the Matter of Water Permit Application No. 2585-2*, 1997.

RECEIVED

FEB 22 2022

WATER RIGHTS
PROG. M

Affidavit of Publication

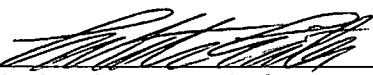
STATE OF SOUTH DAKOTA:

COUNTY OF LAWRENCE:

Letitia Lister of said County and State being first duly sworn, on her oath says: That the BLACK HILLS PIONEER is a legal daily newspaper of general circulation, printed and published in the City of Spearfish, in said County and State by Letitia Lister, and has been such a newspaper during the times hereinafter mentioned; and that said newspaper has a bonafide circulation of at least 200 copies weekly, and has been published within said County in the English language for at least one year prior to the first publication of the notice herein mentioned, and is printed in whole or in part in an office maintained at the place of publication; and that I, Letitia Lister, the undersigned, am the Publisher of said newspaper and have personal knowledge of all the facts stated in this affidavit; and that the advertisement headed:

Notice Of Application
No. 2011-1

a printed copy of which is hereto attached, was printed and published in said newspaper for 1 successive and consecutive weeks, the first publication being made on the 15th day of Feb, 2022, and the last publication on the _____ day of _____, that the full amount of fees charged for publishing same, to-wit: The sum of \$ 40.28 insures solely to the benefit of the publisher of the BLACK HILLS PIONEER, that no agreement or understanding for a division thereof has been made with any person and that no part thereof has been agreed to be paid to any other person whomsoever.


Subscribed and sworn to before me this 17th day of Feb, 2022



Notary Public, Lawrence County, South Dakota

My commission expires: 7-18-2025

NOTICE OF APPLICATION NO.

2011-1 to

Appropriate Water

Notice is given that Meadow Crest Sanitary District, c/o John Keene, PO Box 627, Deadwood SD 57732 has filed an application for a water permit to appropriate 5.83 acre-feet of water annually at a maximum, combined, pump rate of 0.089 cubic feet of water per second from one existing well completed into the Deadwood aquifer (1,780 feet deep) and a new well to be completed into either the Deadwood or Madison aquifer (approximately 2,000 feet deep) both located in the NE 1/4 NW 1/4 Section 17-T5N-R4E for a water distribution system located in the NE 1/4, NE 1/4 NW 1/4, NW 1/4 SE 1/4, NE1/4 SW1/4 Section 17-T5N-R4E. This site is located approximately 3 miles east of Deadwood SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2011-1 with qualifications because 1) unappropriated water is available, 2) existing domestic water uses and water rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest as it pertains to matters within the regulatory authority of the Water Management Board. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

Schlaak, Karen

From: Duvall, Ron
Sent: Monday, February 7, 2022 3:53 PM
To: legals@bhpioneer.com
Cc: Schlaak, Karen
Subject: Legal Public Notice
Attachments: FORM8.FRM.doc; 2011-1public.short_final.docx

Attached is a notice to be published on February 15, 2022.

Meadow Crest Sanitary District, c/o John Keene, PO Box 627, Deadwood SD 57732 has been asked to contact you to authorize publication and arrange for payment.

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

Please acknowledge receipt of this email and let me know if you have any questions.

Thank you,

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



DANR
SOUTH DAKOTA

Schlaak, Karen

From: Duvall, Ron
Sent: Monday, February 7, 2022 4:01 PM
To: johnkeene47@gmail.com
Cc: Schlaak, Karen
Subject: Water Permit Application No. 2011-1
Attachments: 2011-1APPL.pdf

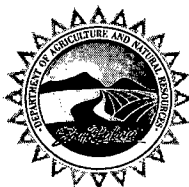
Mr. Keene,

Attached is a copy of the report, chief engineer recommendation and information regarding the public notice for your water permit application. As stated in the letter, please contact the paper(s) as soon as possible to authorize publication and arrange for payment. This information is being mailed to you tomorrow along with a receipt for the fee you submitted with your application.

Please let me know if you have any questions.

Thank you,

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



DANR
SOUTH DAKOTA



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

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

February 8, 2022

Meadow Crest Sanitary District
c/o John Keene
PO Box 627
Deadwood SD 57732

Dear Mr. Keene:

Water Permit Application No. 2011-1 has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Spearfish Black Hills Pioneer (Ph # 605 642-2761). You will need to contact the newspaper 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 is 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 to authorize publication of your Notice and to arrange for payment. Early contact with the paper 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, _____

Karen Schlaak

Karen Schlaak
Water Rights Program
(605) 773-3352

enclosures

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

NOTICE OF APPLICATION NO. 2011-1 to Appropriate Water

Notice is given that Meadow Crest Sanitary District, c/o John Keene, PO Box 627, Deadwood SD 57732 has filed an application for a water permit to appropriate 5.83 acre-feet of water annually at a maximum, combined, pump rate of 0.089 cubic feet of water per second from one existing well completed into the Deadwood aquifer (1,780 feet deep) and a new well to be completed into either the Deadwood or Madison aquifer (approximately 2,000 feet deep) both located in the NE 1/4 NW 1/4 Section 17-T5N-R4E for a water distribution system located in the NE 1/4, NE 1/4 NW 1/4, NW 1/4 SE 1/4, NE1/4 SW1/4 Section 17-T5N-R4E. This site is located approximately 3 miles east of Deadwood SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2011-1 with qualifications because 1) unappropriated water is available, 2) existing domestic water uses and water rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest as it pertains to matters within the regulatory authority of the Water Management Board. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing this application or recommendation shall allege that the application, upon approval, will cause injury to the person that is unique from any injury suffered by the public in general. The injury must concern a matter either within the regulatory authority found in SDCL 46-2A-9 for approval or denial of the application, or other matter concerning the application within the regulatory authority of the board to act upon as defined by SDCL 46-2-9 and 46-2-11, or both. Any person meeting the petitioner requirements and wishing to be a party of record in a contested case hearing shall file a written petition to oppose the application with BOTH the applicant and Chief Engineer. A petition opposing the application shall be filed on a form provided by the Chief Engineer. The petition form is available online at <https://danr.sd.gov/public> or by contacting the Chief Engineer. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501" or call (605) 773-3352. The applicant's mailing address is given above. If contesting the Chief Engineer's recommendation, the applicant shall also file a petition. A petition filed by either an interested person or the applicant must be filed by February 25, 2022.

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

Any interested person may file a comment on the application with the Chief Engineer. The comment shall be filed on a form provided by the Chief Engineer and is available online at <https://danr.sd.gov/public> or by calling (605) 773-3352 or writing the Chief Engineer at the address provided above. Filing a comment does not make the commenter a party of record or a participant in any hearing that may be held. Any comment must be filed by February 25, 2022.

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

Published once at the total approximate cost of_



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

MAR 30 2012

Meadow Crest Sanitary District
c/o John Keene
PO Box 627
Deadwood SD 57732-0627

Dear Mr. Keene:

Enclosed is Water Permit No. 2011-1 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

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

Sincerely,

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

enclosures



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

October 2, 2023

John Keene
Meadow Crest Sanitary District
PO Box 627
Deadwood, SD 57732

Dear Mr. Keene:

I am writing in regard to the request submitted by Meadow Crest Sanitary District to revise the location of the well to be completed into the Deadwood or Madison aquifer authorized under Water Permit No. 2011-1.

Water Permit No. 2011-1 authorizes 5.83 acre-feet of water annually at a maximum instantaneous diversion rate of 0.089 cubic feet of water per second (cfs) from one existing well completed into the Deadwood aquifer (1,780 feet deep) and one new well to be completed into the Deadwood or Madison aquifer (approximately 2,000 feet deep), both located in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 17-T5N-R4E for a water distribution system.

For the new well to be completed into the Deadwood or Madison aquifer, it was indicated the permitted location was unfavorable due to the topography and the revised location is requested to be in the S $\frac{1}{2}$ NE $\frac{1}{4}$ of Section 17-T5N-R4E.

Upon review of the request and pursuant to SDCL 46-5-13.1, the well to be located in the S $\frac{1}{2}$ NE $\frac{1}{4}$ of Section 17-T5N-R4E and completed into the Deadwood or Madison aquifer, is authorized without application or publication of a notice of hearing pursuant to SDCL 46-2A-4. No increase in the authorized diversion rate of 0.089 cfs from the two wells is authorized. If the total diversion rate increases, a new water right permit will need to be obtained.

Under Water Permit No. 2011-1, the construction of works deadline is on or before February 25, 2027.

If you have any questions, please contact me at (605) 773-3352.

Sincerely,

Eric Gronlund, Chief Engineer
Water Rights Program

Approval of Location Change

NAME: Meadow Crest Sanitary District c/o John Keene

ADDRESS: PO Box 627, Deadwood, SD 57732

DATE: October 2, 2023

COUNTY: Lawrence

TELEPHONE: 605-641-9118

BACKGROUND:

Water Permit No. 2011-1 authorizes 5.83 acre-feet of water annually at a maximum instantaneous diversion rate of 0.089 cubic feet of water per second (cfs) from one existing well completed into the Deadwood aquifer (1,780 feet deep) and one new well to be completed into the Deadwood or Madison aquifer (approximately 2,000 feet deep), both located in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 17-T5N-R4E for a water distribution system.

Mr. John Keene submitted an email requesting to revise the location of the well to be completed into the Deadwood or Madison aquifer from the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 17 to the S $\frac{1}{2}$ NE $\frac{1}{4}$ of Section 17; all in T5N-R4E, 1,800 feet southeast from original diversion point. Mr. Keene indicated no other conditions or parameters of the original permit will be changed other than the well location.

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 water source remains either the Deadwood or Madison aquifer for the new well.
- **If irrigation, no new land is irrigated**
Water Permit No. 2011-1 is authorized for water distribution system use.

- **Review of Existing Diversions**

The nearest water right/permit from the original and revised location for the new well to be completed into the Deadwood or Madison aquifer is Water Right No. 1725-1, held by Aspen View Subdivision for use from the Deadwood aquifer. The location change makes the well authorized under Water Permit No. 2011-1 approximately 0.82 miles northeast of the well authorized by Water Right No. 1725-1. Given the distance, drawdown from pumping should not increase the potential for unlawful impairment of neighboring wells.

RECOMENNDED ACTION:

Based on the above criteria, it is recommended that construction of the diversion point be allowed at the proposed location in the S $\frac{1}{2}$ NE $\frac{1}{4}$ of Section 17-T5N-R4E.



Nakaila Steen, Natural Resources Engineer II
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 of the diversion point does not increase the potential for adverse effects to existing diversions.



Eric Gronlund, Chief Engineer
Water Rights Program

Rodriguez, Rachel

From: John Keene <johnkeene47@gmail.com>
Sent: Thursday, September 21, 2023 11:59 AM
To: Rodriguez, Rachel
Subject: Re: [EXT] Emailing: MCSD Location Maps Sent to Rachel Rodriguez SD State Water Rights

Yes I confirm that

John Keene
REMAX In The Hills
Fit 4 Life!

On Thu, Sep 21, 2023, 10:51 AM Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us> wrote:
I spoke with the chief engineer, and he said as long as the new designated location is from the same aquifer and no additional water is appropriated per 46-5-13.1 (Change of location of diversion point). Can you confirm that you meet the two requirements?

Thank you,

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

-----Original Message-----

From: John Keene <johnkeene47@gmail.com>
Sent: Thursday, September 21, 2023 11:11 AM
To: Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Cc: 'Lysann Zeller' <lzeller@wrbsc.com>; Dustin Dale <Dustin.Dale@ae2s.com>
Subject: [EXT] Emailing: MCSD Location Maps Sent to Rachel Rodriguez SD State Water Rights

Rachel, I just spoke with you about the process to change the site for our new well (permit 2011-1) due to the unfavorable topography. The attached maps show the well site we had received the permit for marked with large "X". The new well site will be southeast of that site designated at "Location 2" with a dot. Let me know if this does not identify the new location to your satisfaction. Thank you

John

John Keene
President
Meadow Crest Sanitary District
605-641-9118 (cell)
605-642-2500 (Office)
Johnkeene47@gmail.com

Your message is ready to be sent with the following file or link attachments:

**SOUTH DAKOTA
WATER PERMIT NO. 2011-1**

Date of first receipt of application November 8, 2021.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 2011-1 to Meadow Crest Sanitary District, c/o John Keene, PO Box 627, Deadwood SD 57732-0627 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. 2011-1 appropriates 5.83 acre-feet of water annually at a maximum, combined, pump rate of 0.089 cubic feet of water per second from one existing well completed into the Deadwood aquifer (1,780 feet deep) and a new well to be completed into either the Deadwood or Madison aquifer (approximately 2,000 feet deep) both located in the NE 1/4 NW 1/4 Section 17-T5N-R4E for a water distribution system located in the NE 1/4, NE 1/4 NW 1/4, NW 1/4 SE 1/4, NE1/4 SW1/4 Section 17-T5N-R4E. This site is located approximately 3 miles east of Deadwood SD.
2. The water appropriated shall be used for the purpose of a water distribution system and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date from which applicant may claim right is November 8, 2021.
5. The date of approval of Permit No. 2011-1 is February 25, 2022.
6. One-fifth of the construction is to be completed on or before August 25, 2024.
7. All construction is to be completed on or before February 25, 2027.
8. Water is to be put to beneficial use on or before February 25, 2031.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. The existing well and proposed well approved under Water Permit No. 2011-1 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals under this Permit shall be controlled so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The proposed well authorized by Water Permit No. 2011-1 shall be constructed into a single aquifer, either the Deadwood aquifer or Madison aquifer, but not both. At the time of the licensing, the final water right be issued for the developed water source.
3. The proposed well authorized by Permit No. 2011-1 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.

(continued)

D:\GIS\GIS\AE2S Meadow_Crest\maps\5502AEN01_01.mxd 2/4/2021 9:52:43 AM NAD 1983 UTM Zone 13N

- Approximate Subdivision Boundary
- Existing Well
- Potential New Well
- (4372') Top of Madison Formation Elevation (ft amsl)
- Top of Madison Formation Elevation Contour (ft amsl)
- Top of Madison Formation Elevation (ft amsl)
 - 4605
 - 4138



0 2,000 Feet

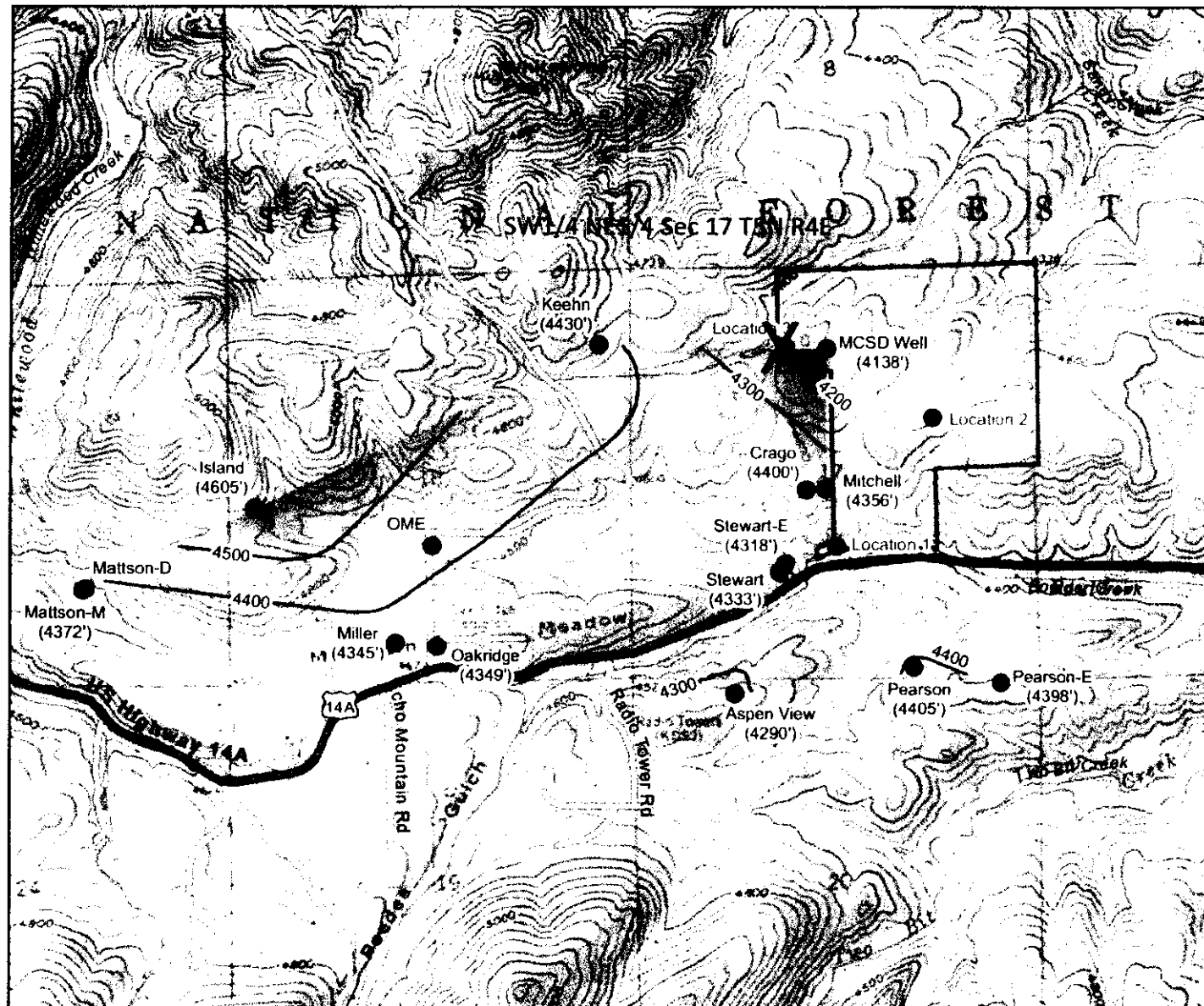
Notes:

ft amsl: feet above mean sea level

Sources:

Service Layer Credits: Copyright © 2013 National Geographic Society, i-cubed

Source



Prepared By:
LRE Water
Innovative Water Resource Solutions
South Dakota Office
Sioux Falls, South Dakota
(605) 310-1721

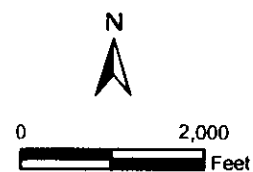
AE2S
MEADOW CREST SANITARY DISTRICT
DEADWOOD, SOUTH DAKOTA

TOP OF MADISON FORMATION

FILE: 5502AEN01_01j.MXD

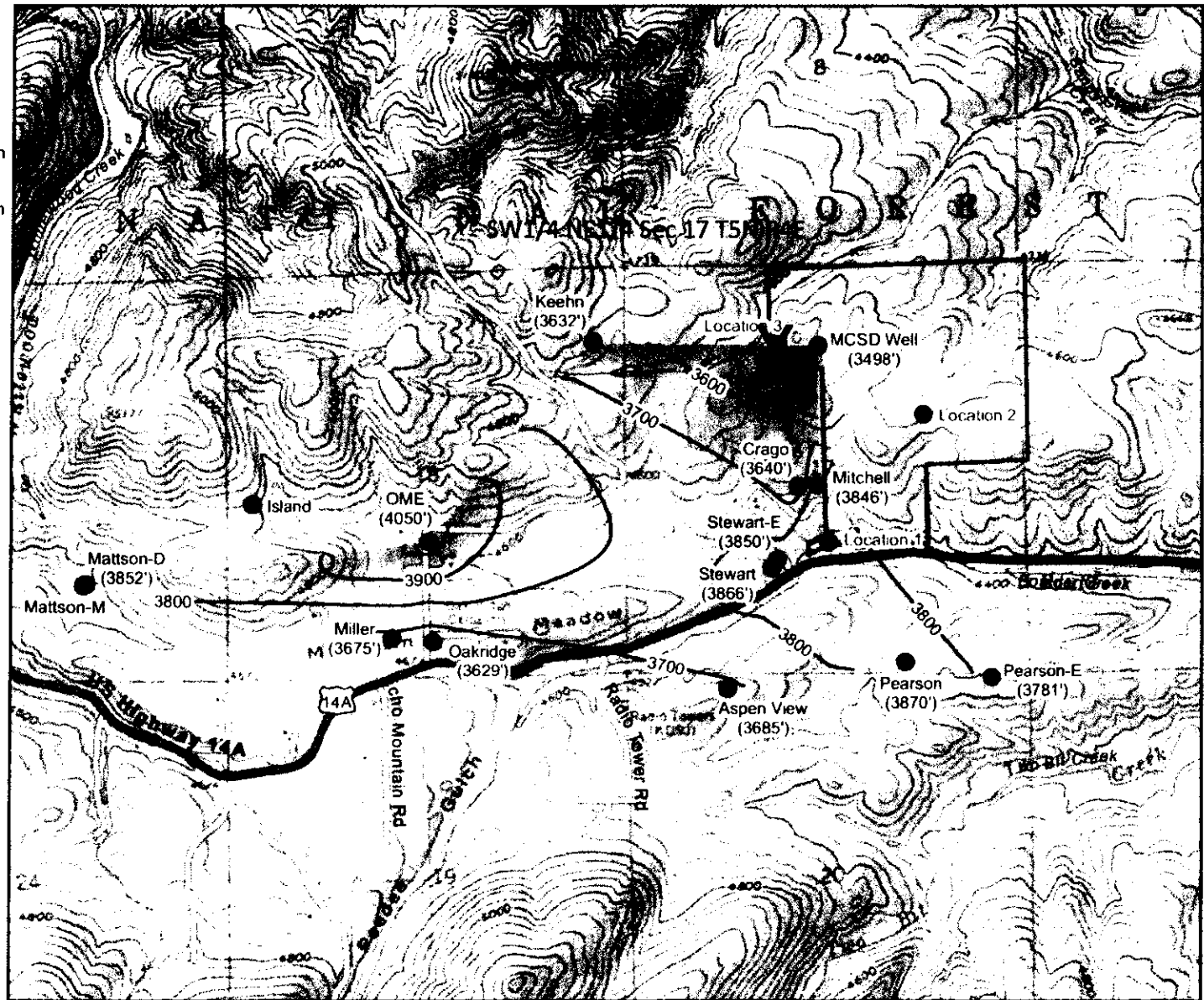
DATE: 2/4/2021 FIGURE: 5

- Approximate Subdivision Boundary
- Existing Well
- Potential New Well
- (3852') Top of Deadwood Formation Elevation (ft amsl)
- Top of Deadwood Formation Elevation Contour (ft amsl)
- Top of Deadwood Formation Elevation (ft amsl)
- 4050
- 3498



Notes:
ft amsl, feet above mean sea level

Sources:
Service Layer Credits: Copyright © 2013 National Geographic Society, i-cubed
Source:



Prepared By:
LRE Water
Innovative Water Resource Solutions
South Dakota Office
Sioux Falls, South Dakota
(605) 310-1721

AE2S
MEADOW CREST SANITARY DISTRICT
DEADWOOD, SOUTH DAKOTA
TOP OF DEADWOOD FORMATION

FILE: 5502AEN01_011.MXD

DATE: 2/3/2021

FIGURE: 4

- Approximate Subdivision Boundary
- Existing Well
- Potential New Well
- (4601') Deadwood Potentiometric Surface Elevation (ft amsl)
- Deadwood Potentiometric Surface Elevation Contour (ft amsl)
- Groundwater Flow Direction

Deadwood Potentiometric Surface Elevation (ft amsl)

- 4703
- 4118



0 2,000 Feet

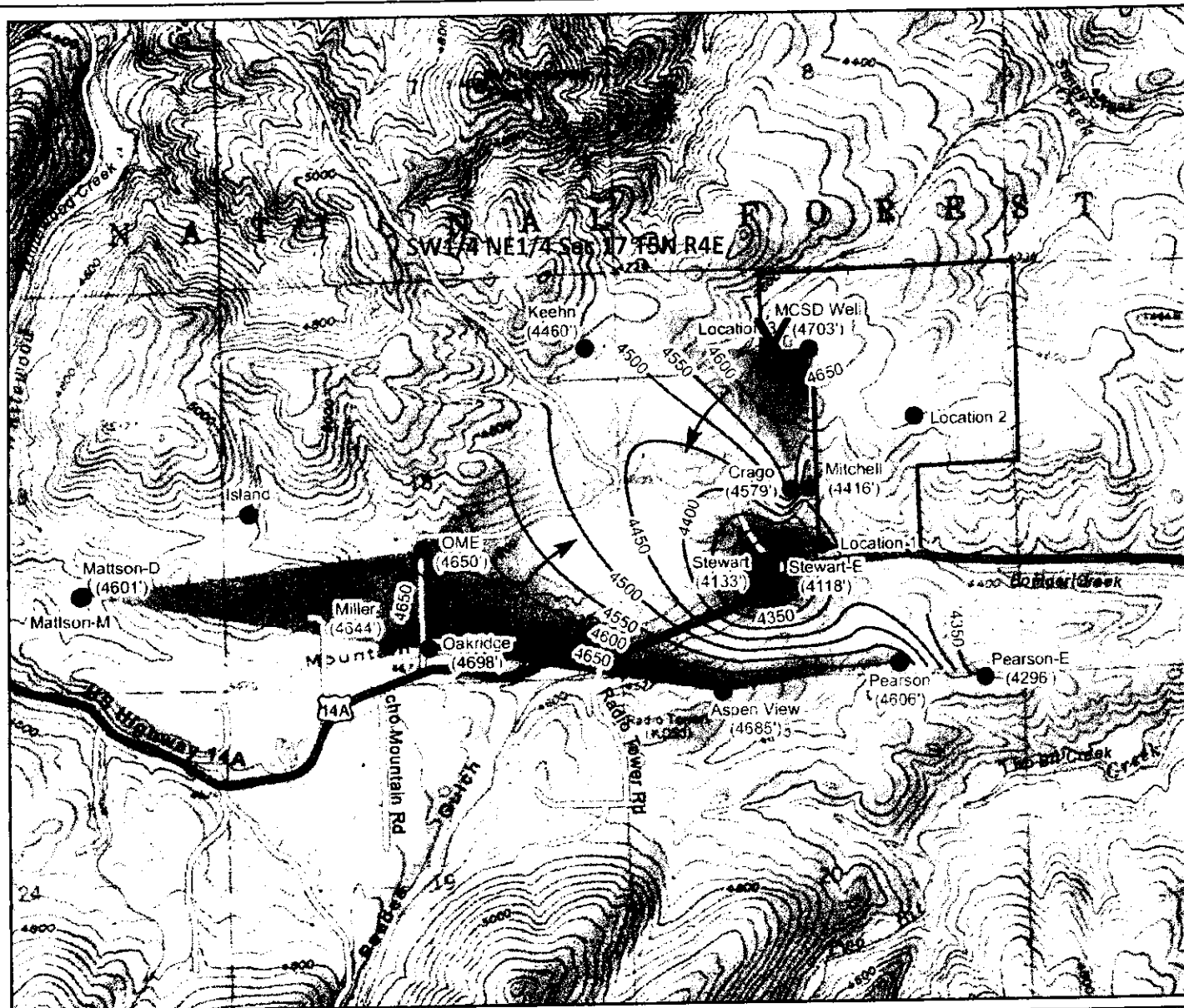
Notes:

ft amsl: feet above mean sea level

Sources:

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

Source: Geologic Map of the Deadwood North Quadrangle, South Dakota, Alvis L. Lisenbee, Jack A. Redden and Mark D. Fahrenbach, 2015



Prepared By:
LRE Water
Innovative Water Resource Solutions
South Dakota Office
Sioux Falls, South Dakota
(605) 310-1721

AE2S
MEADOW CREST SANITARY DISTRICT
DEADWOOD, SOUTH DAKOTA

POTENTIOMETRIC SURFACE OF DEADWOOD AQUIFER

FILE: 5502AEN01_01g.MXD

DATE: 2/3/2021 FIGURE: 3