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MINUTES OF THE 237TH MEETING
OF THE WATER MANAGEMENT BOARD
FLOYD MATTHEW TRAINING CENTER
523 EAST CAPITOL AVENUE
PIERRE, SOUTH DAKOTA
JULY 6, 2022

CALL TO ORDER: Acting Chairman Rodney Freeman called the meeting to order at 9:30 a.m. Central Time. The roll was called, and a quorum was present.

Mr. Freeman stated that Chairman Bjork was unable to attend the meeting and Vice Chairman Larson was attending the meeting remotely, so with the concurrence of the board, he would be the acting chairman for today's meeting.

The meeting was streaming live on SD.net, a service of South Dakota Public Broadcasting.

The following attended the meeting:

Board Members: Rodney Freeman, Leo Holzbauer, and Jim Hutmacher attended in person. Peggy Dixon, Bill Larson, and Chad Comes attended remotely. Tim Bjork was absent.

Department of Agriculture and Natural Resources (DANR): Eric Gronlund, Chief Engineer, Ron Duvall, Mark Rath, Adam Mathiowetz, and Kim Drennon, Water Rights Program; Kelli Buscher, Shannon Minerich, and Sean Kruger, Surface Water Quality Program.

Attorney General's Office: David McVey, board counsel; Ann Mines Bailey, Water Rights Program counsel.

Legislative Oversight Committee: Senator Mary Duvall and Representative Mike Weisgram.

Court Reporter: Carla Bachand, Capital Reporting Services.

Water Permit Application No. 2833-2 and Water Permit Application 2834-2: Ryan Vogel, counsel for the Burnhams, Blake Burnham, Bryce Burnham, Brian Burnham, Amy Davis, Aaron Davis, Charles Davis, Laura Herrmann, Kevin Herrmann, Marie Condon, and Nate Hunke.

Water Permit Application No. 8620-3: Jason Erickson, counsel for Shannon Hutterian Brethren, Inc., Mark Wipf, Ben Wipf, Brian Friedrichsen.

ANNUAL ELECTION OF OFFICERS: Motion by Hutmacher, seconded by Holzbauer, to nominate Bill Larson as chairman, Jim Hutmacher as vice chairman, and Leo Holzbauer as secretary.

There were no other nominations.

A roll call vote was taken, and the motion carried unanimously.

Motion by Hutmacher, seconded by Holzbauer, to appoint Rodney Freeman as prehearing chairman for the next year and Bill Larson as alternate prehearing chairman. A roll call vote was taken, and the motion carried unanimously.

ROLL CALL: The roll was called, and a quorum was present.

ADOPT FINAL AGENDA: Motion by Hutmacher, seconded by Dixon to adopt the agenda as posted. A roll call vote was taken, and the motion carried unanimously.

CONFLICT DISCLOSURES AND REQUESTS FOR STATE BOARD WAIVERS: None.

ADOPT MAY 4, 2022, BOARD MEETING MINUTES: Motion by Holzbauer, seconded by Comes, to approve the minutes of the May 4, 2022, Water Management Board meeting. A roll call vote was taken, and the motion carried unanimously.

OCTOBER 5-6, 2022, MEETING LOCATION: The October 5-6 meeting will be in Pierre.

PUBLIC COMMENT PERIOD IN ACCORDANCE WITH SDCL 1-25-1: David McVey stated that on July 5, 2022, the Water Rights Program received a letter signed by Scott Herrmann, Rosebud Sioux Tribe President, taking a position on the granting of Water Permit Application No. 2834-2, Blake Burnham. Mr. McVey stated that the letter follows the form for a petition in opposition to the permit, but it was not timely so it should not be considered by the board. Mr. McVey noted that if Mr. Herrmann or someone on behalf of the tribe is present at the meeting, the proper time to address the board would be during this public comment period.

Marie Condon read the letter that Scott Herrmann sent to the Water Rights Program. She noted that a separate letter regarding Brian Burnham's application was emailed to the Water Rights Program.

There were no other public comments.

STATUS AND REVIEW OF WATER RIGHTS LITIGATION: Mr. McVey reported that the Powertech appeal regarding the board's order denying the motion to amend the procedural order to resume the evidentiary hearing is pending.

REQUEST TO ADVERTISE AMENDMENTS TO ARSD 74:51, SURFACE WATER QUALITY: Shannon Minerich, DANR Surface Water Quality Program, requested permission to advertise for a public hearing, to be held during the December 7-8, 2022, Water Management Board meeting, to consider amendments to 74:51, Surface Water Quality.

Ms. Minerich reported that the Clean Water Act requires that states develop surface water quality standards. States are required to review the water quality standards in a triennial review. The triennial reviews are open to the public and all of the water quality standards are open for public input. The Surface Water Quality Program is proposing more frequent public hearings to update a few select sections of the water quality standards each time rather than having one triennial review.

Ms. Minerich discussed the process for making rule changes. She provided a summary of proposed amendments to the rules which include adopting and updating Cadmium criteria, updating irrigation beneficial use to a seasonal use, deleting unused terms in the definitions, updates and corrections to Uses Assigned to Lakes, and updates and corrections to Uses Assigned to Streams. Ms. Minerich stated that in August 2022 the Surface Water Quality Program plans to issue a press release and hold a Teams meeting with interested parties regarding the updates.

Motion by Hutmacher, seconded by Larson, to authorize the DANR Surface Water Quality Program to advertise for a public hearing to consider amendments to ARSD 74:51-Surface Water Quality Standards. A roll call vote was taken, and the motion carried unanimously.

ADMINISTER OATH TO DANR STAFF: The court reporter administered the oath to DANR staff who were present and intended to testify during the meeting.

CANCELLATION CONSIDERATIONS: Prior to the meeting, the board members received the board packet, which included a table listing the proposed cancellations, the notices of cancellation, and the chief engineer’s recommendations.

Ten water rights and water permits were scheduled for cancellation. Mr. Duvall stated that the owners were notified of the hearing and the reasons for cancellation. The department received no comments or letters in response to the notices of cancellation.

The chief engineer recommended cancellation of the following water rights and water permits for the reasons listed.

Number	Original Owner	Present Owner(s) and Other Persons Notified	Reason
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DIVISION II WATER PERMITS & WATER RIGHTS

PE 2739-2	Platte Hutterian Brethren	Same (% Dale Stahl)	Non-Construction
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DIVISION III WATER PERMITS & WATER RIGHTS

RT 2762-3	Dennis Meyer	Same	Abandonment
RT 4505-3	Eltor Brenner	Joe Brenner	Abandonment
PE 6373-3	Ernest R Namminga	Same	Abandonment/Forfeiture
PE 6937A-3	Dean R Morman	Same	Non-Construction
PE 7265-3	Leesman Ranch	Leesman Ranch (% Leigh	Non-Construction
PE 7265A-3		Leesman)	
Permit No. 7265A-3 amended Permit No. 7265-3 by extending the construction period (no additional water or acreage)			
PE 7715-3	Allen Vannorsdel	Allen & Shawn Vannorsdel	Non-Construction
PE 7941-3	Joseph F Chicoine	Same	Non-Construction
PE 8263-3	Ohms Avon Farm	Same (% Stephen Ohms)	Non-Construction

Motion by Larson, seconded by Dixon, to accept the chief engineer’s recommendations for cancellation of the water rights and water permits for the reasons listed. A roll call vote was taken, and the motion carried unanimously.

FUTURE USE REVIEWS: A table listing the future use permits up for a seven-year review was included in the board packet the board members received prior to the meeting. Certain entities such as water distribution systems, municipalities and rural water systems can reserve water for future needs.

State law requires future use permits to be reviewed by the Water Management Board every seven years, and it requires the permit holder to demonstrate a reasonable need for the future use permit.

Mr. Duvall stated that the Water Rights Program contacted each of the entities regarding whether the entity wanted to retain the future use permit. The letters from the entities requesting that they be allowed to retain their future use permits, the Chief Engineer’s recommendations, and the Affidavits of Publication showing that the hearing was public noticed were included in the board packet. No letters in opposition were received in response to the public notice.

The chief engineer recommended that the board allow the following Future Use Permits to remain in effect as listed below.

No.	Name	Amount Remaining in Reserve	Source
551-2	City of Winner	1,568 AF	Ogallala Aquifer
1622-2	City of Gregory	269 AF	Ogallala Aquifer
1660-2	City of Burke	396 AF	Ogallala Aquifer
3429-3	WEB Water Development	15,000 AF	Missouri River
3984-3, 3984A-3, 3984B-3	Big Sioux Community Water System Inc.	589 AF	Big Sioux:Moody Aquifer
4456-3, 4456A-3	Aurora-Brule RWS Inc.	621 AF	Missouri River
6259-3	City of Volga	1,216 AF	Big Sioux:Brookings Aquifer

Motion by Comes, seconded by Holzbauer, that the future use permits shown in the table remain in effect for the amounts listed. A roll call vote was taken, and the motion carried unanimously.

UNOPPOSED NEW WATER PERMITS ISSUED BY THE CHIEF ENGINEER WITHOUT A HEARING BEFORE THE BOARD: Prior to the meeting the board received a copy of the table listing the unopposed new water permits issued by the Chief Engineer. (See attachment.)

NEW WATER PERMIT APPLICATIONS: The pertinent qualifications attached to approved water permit applications throughout the hearings are listed below:

Well Interference Qualification

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

Well Construction Rule Qualification No. 1

The well(s) authorized by Permit No. ___ shall be constructed by a licensed well driller and construction shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) from the producing formation to the surface pursuant to Section 74:02:04:28.

Well Construction Rule Qualification No. 2

The well(s) authorized by Permit No. ___ shall be constructed by a licensed well driller and construction 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.

Irrigation Water Use Questionnaire Qualification

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

Low Flow Qualification

Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

CONSIDER WATER PERMIT APPLICATION NO. 2833-2, BRIAN BURNHAM AND WATER PERMIT APPLICATION NO. 2834-2, BLAKE BURNHAM: Ann Mines Bailey requested that Application No. 2833-2 and Application No. 2834-2 be addressed in one hearing. She noted that both applications relate to a project owned by the same family.

Ryan Vogel, attorney for the applicants, had no objection to considering both applications in one hearing. The intervenors also had no objection.

Acting Chairman Freeman stated that the board would proceed with hearing both applications in one hearing.

Ms. Mines Bailey appeared on behalf of the chief engineer and the Water Rights Program, Ryan Vogel appeared on behalf of Brian and Blake Burnham, and intervenors Kevin Herrmann, Aaron Davis, and Marie Condon appeared pro se.

David McVey, board attorney, asked if all of the opponents properly submitted petitions in opposition. Ms. Mines Bailey stated that she believes that all of the petitions would be considered timely.

The parties waived opening statements.

Ms. Mines Bailey offered Exhibit 1A, the administrative file for Water Permit Application No.

2833-2, Brian Burnham, and Exhibit 1B, the administrative file for Water Permit Application No. 2834-2, Blake Burnham. The administrative files contain the applications, the reports and recommendations of the chief engineer, the petitions in opposition, and the notices of publication.

Exhibits 1A and Exhibit 1B were admitted into the record.

Ms. Mines Bailey called Adam Mathiowetz, staff engineer with the Water Rights Program, who had previously been administered the oath by the court reporter.

Mr. Mathiowetz testified that Exhibit 2 is his Curriculum Vitae.

Ms. Mines Bailey offered Exhibit 2. The exhibit was admitted into the record.

Mr. Mathiowetz testified that he is a senior groundwater engineer, and his primary responsibilities include reviewing water permit applications for technical aspects as required by South Dakota water law, distribution of those applications to other staff members for review, and peer review of their reports. Mr. Mathiowetz is also responsible for reviewing well completion reports and licensing well drillers and pump installers. He provides technical assistance to the Water Management Board and members of the public regarding ground water and wells. Mr. Mathiowetz is also responsible for the management of the observation well network, including two full-time staff technicians and the seasonal members of the Water Rights Program that measure the observation well network.

Mr. Mathiowetz stated that he prepared one report regarding both Water Permit Application Nos. 2833-2 and 2834-2. The joint review was based on his initial review in determining aquifers and realizing that both of the aquifers the applicants were proposing to use were acting as extensions of the Ogallala aquifer and that this is essentially one farm operation owned by the family.

Water Permit Application No. 2833-2, Brian Burnham, proposes to irrigate 130 acres at a maximum instantaneous diversion rate of 1.85 cubic feet of water per second (cfs) from two existing wells, authorized under Water Rights No. 1260-2, and seven proposed wells approximately 100 feet deep to be completed into the Quaternary Eolian aquifer functioning as an extension of the Ogallala aquifer in this location. The proposed wells and the land to be irrigated are located in Tripp County approximately 24 miles southwest of Winner, SD.

Water Permit Application No. 2834-2, Blake Burnham, proposes to irrigate 130 acres at a maximum instantaneous diversion rate of 1.85 cfs from up to four wells approximately 100 feet deep to be completed into the Quaternary Terrace aquifer functioning as an extension of the Ogallala aquifer in this area. The land to be irrigated and the proposed well locations are located in Tripp County approximately 23 miles southwest of Winner, SD.

Pursuant to SDCL 46-2A-9, Mr. Mathiowetz's report addresses the availability of unappropriated water and the potential for unlawful impairment of existing domestic water uses and water rights within the localized portions of the Quaternary Eolian and Quaternary Terrace aquifers as well as water availability from the Ogallala aquifer.

Mr. Mathiowetz noted that in the opening paragraph regarding Water Permit Application No. 2833-2,

the report that was made available to the public did not include the location of the wells being within the western half of Section 15; however, within the report the maps do indicate the locations. The analysis does include the correct location for the wells, which is also how it was public noticed.

Mr. Mathiowetz testified that Exhibit 3 is a map of the project area including geologic formations, surface water sources, and other information. The map is included on page 4 in the report and is labeled as Figure 1. Mr. Mathiowetz created the map using the ESRI ArcMap software, data sources from the South Dakota Geological Survey for the geologic map, and other databases maintained by the State of South Dakota and the Water Rights Programs.

Ms. Mines Bailey offered Exhibit 3. The exhibit was admitted into the record.

Mr. Mathiowetz pointed out on Exhibit 3 the locations of Application No. 2833-2, Brian Burnham, Application No. 2834-2, Blake Burnham, the five ground water observation wells completed into the Ogallala aquifer, the diversion points for existing Ogallala aquifer water rights, the Keya Paha River, other streams and rivers, sections, and township boundaries. The map also shows the various geologic formations that are encountered when excavating, drilling, or digging.

Based on the geologic map, the aquifer materials in the location of the diversion point for Application No. 2833-2, Brian Burnham, are Quaternary aged Eolian deposits. The Eolian deposits are wind-blown silts to finer sands and locally derived from the Valentine Formations sandhills formations.

Based on the geologic map, the aquifer materials in the location of the diversion point for Application No. 2834-2, Blake Burnham, are Quaternary aged Terrace deposits. Terrace deposits are clay to boulder sized clasts, which could include fine sand up to very coarse gravel. These are deposited as pediments, paleochannels, and terrace fills of former flood plains.

The primary difference between Eolian deposits and Terrace deposits is how they were deposited, which also leads to their physical structure distinction. Eolian were deposited by wind and, therefore, have to be, in general, average sized, smaller particles than Terrace deposits which are deposited generally by water or gravity. The Terrace deposits tend to have, on average, a larger size particle than Eolian deposits.

Mr. Mathiowetz stated that review of data and available sources showed that the High Plains aquifer, which is a country regional scale aquifer ranging from South Dakota to Texas, includes several different formations and deposits, the Arikaree, which is underlying the Ogallala, and the overlying Quaternary aged materials, which includes alluvium, terrace, and eolian deposits. Work done by Filipovic with the S.D. Geological Survey in 2004 indicated the High Plains aquifer was present at this location and that water movement was from the southwest toward the northeast to the Keya Paha River. Further review was conducted of the available lithologic logs, test hole logs, and geologic information and a discussion with Tony Beck, who is a licensed driller from Nebraska working at the site for Burnhams. Based on the driller's information the first material encountered when drilling was not Ogallala aquifer formation material. Mr. Beck then drilled into the Arikaree, which is commonly called red rock. The Arikaree, where he was working, was not acting as an aquifer. Information indicates that water moves through this area, and it is part of the High Plains aquifer, which the Water Rights Program manages as two separate components, the overlying Ogallala

aquifer and the underlying Arikaree aquifer. Information provided by the driller indicated the Arikaree aquifer was not acting as an aquifer at the applicant's location. Looking at these three sources independently, then combining that information, it was determined that these particular portions of the Quaternary Terrace aquifer and Quaternary Eolian aquifer are acting as an extension of the Ogallala aquifer in this area.

The Ogallala aquifer specifically and in the formation in and of itself that makes up the bulk of aquifer is comprised of sand, silt, silty clay, sandstone, siltstone, and surficial gravel deposits. It is broken up into two bodies in South Dakota, the main body where the applicants propose to withdraw water and the erosional remnants. The main body is south and west of Ponca Creek and the erosional remnant is north and east of Ponca Creek. The main body in South Dakota underlies approximately 1,000,000 acres. Mr. Mathiowetz stated that for his analysis he relied on just the main body.

Determination of the availability of unappropriated water is done by creating a hydrologic budget comparing estimate average annual recharge with estimated average annual withdrawals and reviewing observation well data.

The Ogallala receives recharge through the infiltration of precipitation. The Ogallala, as well as the Quaternary Terrace and Quaternary Eolian deposits that the applicants intend to use, is unconfined in this area. Several studies have been done calculating the recharge to the Ogallala aquifer. None of the studies were specific to the Quaternary Terrace and Quaternary Eolian deposits functioning as an extension of the aquifer, but some of the studies appear to include those deposits as portions of the Ogallala aquifer.

Mr. Mathiowetz stated that he approached his review of the recharge by using an area of the Ogallala that did not necessarily include the Eolian and Terrace deposits for calculating a recharge estimate, he used the published available recharge rates. The recharge rates, which range from 1.3 inches per year to 3.4 inches per year, were multiplied by the area of the main body of the aquifer, which is approximately 1,000,000 acres, to reach totals for the main body of the Ogallala aquifer of 108,914 acre-feet per year to 284,852 acre-feet per year.

Withdrawals from the Ogallala aquifer occur through well withdrawals for reasonable domestic use and appropriate domestic use, municipal, rural water systems, irrigation, fish and wildlife propagation, institutional, and commercial for use in a livestock feeding operation.

Mr. Mathiowetz stated that at the time of completion of his report, there were 171 active water rights and permits authorized to withdraw water and four future use permits. The estimated total of withdrawals from the main body of the Ogallala aquifer is approximately 31,128.3 acre-feet per year. Mr. Mathiowetz came to that number by adding two categories of use. One is the annual irrigation using an average of the reported irrigation use for the period of 1982 to 2020. After further review of the data, Mr. Mathiowetz decided to use the average from 2012 through 2020, as shown in Table 3 on page 7 of his report. This time period is more representative of current irrigation methods and technologies in terms of how much water is being applied.

Future use permits were included in the other broad category of non-irrigation use. Future use permits are assumed to be fully developable because an entity with a future use permit could request

a volume and if they did not develop that total volume, the portion undeveloped rolls back into the future use permit and, therefore, over time would be fully developable.

For other non-irrigation permits, there were two methods of estimation. For those permits limited by an annual volume, Mr. Mathiowetz assumed that the entire annual volume would be pumped and for those permits limited by a diversion rate, he assumed pumping at the licensed or permitted diversion rate for 60 percent of the time. Based on experiences with staff members in the Water Rights Program and working with licensees in the past to establish annual volumes, it was determined that 60 percent was reasonable for most entities that would not be pumping continuously.

Mr. Mathiowetz stated DANR maintains 69 observation wells completed into the main body of the Ogallala aquifer, and he reviewed data from all 69 observation wells. Hydrographs for six of the observation wells are included in Mr. Mathiowetz's report. These six observation wells are within approximately five miles of the applicants' various proposed well locations. In general, the observation wells show a stable to slightly rising water levels over the period of record, with the exception of one area in Bennett County where there has been a recent proliferation of new applications. Also, in that area some of the observation wells are confined, and the water appears to be equilibrating to withdrawals by the new permits, but these Bennett County observation wells are an outlier compared to the bulk of the geographic area represented by the observation wells. The oldest of the six observation wells has data from 1959 through the end of 2021.

The observation well data shows that the natural conditions, not pumping, is dominating the changes in water levels and that there is not only recharge but also natural discharge from the aquifer. Mr. Mathiowetz concluded that there is a reasonable probability that unappropriated water is available for both of these applications.

Mr. Mathiowetz stated that Exhibit 4 is an aerial map of the project area that includes property as shown in a plat book for the various petitioners as well as the Keya Paha River and two major local streams that are flanking the area where the applicants' proposed wells will be located. Mr. Mathiowetz created the map using the ESRI ArcMap software, various databases maintained by the state and the Water Rights Program, and information from the 2020 Tripp County plat book for the various properties.

Ms. Mines Bailey offered Exhibit 4. The exhibit was admitted into the record.

Mr. Mathiowetz pointed out on the map the location of the proposed well locations for Application No. 2833-2 and Application No. 2834-2, the DANR Ogallala aquifer observation wells, the Ogallala aquifer water rights and permits proposed diversion points, the Keya Paha River, Lost Creek, and Cottonwood Creek, petitioners' properties as taken from the 2020 Tripp County plat book, and the section lines.

The closest water right to the proposed points of diversion for Application No. 2833-2 is Water Right No. 1260-2, which is held by the applicant. The next closest is Water Right No. 2167-2 located to the southeast. With the exception of Water Right No. 1260-2, the closest existing water right to Application No. 2834-2 is also Water Right No. 2167-2.

The nearest observation well to Application No. 2833-2 is TR-59A, which is approximately one mile south of the most southern proposed well locations. The nearest observation well to Application No. 2834-2 is also TR-59A, which is approximately two and a half miles away.

There are domestic wells in the area. The presence of domestic wells is determined by reviewing the Water Rights Program well completion report database. Not all domestic wells are included in the database. Some wells predate the requirement for well completion reports to be submitted to the Water Rights Program, and sometimes wells are drilled by the landowner, who may be unaware that they need to submit a well completion report.

The nearest domestic well on record to Application Nos. 2833-2 and 2834-2 not held by the applicants is approximately 1.8 miles east of Application No. 2833-2 and approximately one-half mile southwest of Application No. 2834-2.

In order to receive protection under the law, an existing right or domestic well must meet the definition of an adequate well as set forth in South Dakota Well Construction Standards. An adequate well is defined as a well that is constructed such that at the time of construction the inlet to the pump can be placed at least 20 feet into the saturated aquifer or if the aquifer is less than 20 feet thick, as near to the bottom of the saturated aquifer as possible. The thickness of the aquifer in this particular area is frequently 20 to 40 feet, however, several wells do show that it could be up to 50 feet.

Mr. Mathiowetz stated that based on the information available, there is a reasonable probability that development of Application Nos. 2833-2 and 2834-2 will not unlawfully impair existing appropriations using adequate wells or adequate domestic wells. This is based upon the relatively limited natural variance of the water level, as shown in the hydrographs included in the report, especially those that are in close proximity to multiple permits pumping, such as Observation Well TR-78N shown in the bottom right corner of Exhibit 4, and the fact that the aquifer is unconfined. In general, in an unconfined aquifer, significant drawdown does not extend far from the pumping well. This is also based on the lack of history of substantiated complaints regarding well interference from the Ogallala aquifer, and the distance between the various appropriative, high-capacity, pumping water rights.

Mr. Mathiowetz stated that his understanding of the petitioners' concerns include:

- Development of these applications would lower ground water levels and prevent and damage use of personal and private wells;
- Development of these applications would reduce availability of water in various surface water bodies, particularly cited was Lost Creek;
- Development of these applications would affect future land values for adjacent properties; and
- Development of these applications would not be in the public interest, but only in the interest of the applicants.

Mr. Mathiowetz stated that public interest is not part of his review and land values are not considered when determining whether to recommend granting a water right. In terms of water availability, by review of the hydrologic budget, the Ogallala aquifer has a significant amount water available. The

minimum estimated recharge is more than 108,000 acre-feet per year with the estimated average use being slightly more than 30,000 acre-feet per year. In terms of potential for unlawful impairment, the unconfined nature of the aquifer will help prevent some of that spread of drawdown because that is the physics of how it works. The number of wells proposed would mean that, at least from an outside view, the potential that the sediments the wells are completed into are finer, therefore, they are going to have more drawdown locally, and potentially impact themselves before there is time to have sufficient pumping to have drawdown significantly further away. Mr. Mathiowetz made general assumptions that the applicants are likely going to have to run multiple wells at the same time to operate the system.

Regarding the petitioners' concerns about the reduction of surface water, particularly Lost Creek, Mr. Mathiowetz stated that since he does not know whether the creek is a losing stream (water flows from the creek horizontally into the aquifer) or a gaining stream (water flows from the aquifer into the creek) he cannot be certain of the exact type of potential effects. However, at the distances from the applicants' proposed wells to Lost Creek, it would be difficult to discern, over a standard pumping season and methodology of how most irrigators run, whether it was natural effects or specifically pumping from the applicants' wells that would cause any changes in that creek.

This concluded questioning by Ms. Mines Bailey.

In response to questions from Mr. Vogel, Mr. Mathiowetz stated that there have been no well interference complaints from any aquifer in Tripp County. Mr. Mathiowetz stated that he does not have the well construction reports for the observation wells in front of him, so he is not aware of whether they are adequate wells. The information regarding water levels in the observation wells is collected by seasonal or full-time DANR Water Rights Program staff.

Mr. Herrmann asked if Mr. Mathiowetz can assure the petitioners that the observation well data will show there won't be a problem in the future with the nine wells. Mr. Mathiowetz stated there are areas to the north and particularly in Bennett County where there has been recent proliferation of wells for irrigation completed and there has not been significant drawdown causing unlawful impairment. There are observation wells near these two applications that do support usage. The number of wells is not necessarily fully relevant. The applicants are requesting a diversion rate of 1.85 cfs. That could come from one well or it could a combination of the wells requested. The maximum permitted diversion rate is 1.85 whether it all comes from one well or several wells, the total pump rate is the same. As part of the licensing process, after five years or if the applicant submits a completion of works form, the Water Rights Program staff will perform an on-site visit, look at the system, collect information from the pumps and the well log information. The permit holder is required to submit annual irrigation questionnaires stating how much was pumped, when it was pumped, what rate they were pumping at, and how many acres were irrigated. The observation wells are measured throughout the summer into early fall. The effects of pumping will be seen at the closer observation wells, but observation wells that are farther away will show the general aquifer characteristics and what's happening in static conditions. By being able to compare the two you would be able to determine whether what is happening is more a natural condition or more specific to pumping at a site. The hydrographs, which are included in Mr. Mathiowetz's report, show the information that is directly obtained from the observation wells. The hydrographs document the water level in the aquifer rises during wetter periods and slowly declines during drier periods. The

effects of local pumping on the water level in the observation wells is temporary as water levels recover to pre-pumping season levels. The recovery and following of the climatic wet/dry cycle means that natural conditions, recharge to and natural discharge from the aquifer, govern the long term changes in water level of the aquifer.

Mr. Herrmann asked what Mr. Mathiowetz does if he sees a problem in one of the hydrographs. Mr. Mathiowetz stated that he would keep watching the hydrograph, but if there is a drawdown or a well going dry, the Water Rights Program needs to be made aware of it. Mr. Herrmann asked Mr. Mathiowetz if he needs to file a complaint if there is a problem with one of his wells.

Mr. Vogel objected to the question. Mr. Freeman sustained the objection.

Mr. Herrmann asked Mr. Mathiowetz to point out on Exhibit 4 a well that is not an irrigation well. Mr. Mathiowetz stated that he cannot do that because all of the permitted wells on that exhibit are for irrigation uses. Mr. Herrmann asked if he has a well that is being used for cattle only in this area and it goes dry, and then the owner of the well complains that there is an issue if this is the first time Mr. Mathiowetz will find out about it? Mr. Herrmann said he is trying to understand. He said Mr. Mathiowetz mentioned that the observation well itself doesn't necessarily tell us that there is a problem with someone's non-irrigation well.

Mr. Vogel objected stating that he is not sure what the question was. Mr. Freeman did not rule on the objection.

Mr. Herrmann asked if the observation wells will show whether there is a problem with someone else's well in the area? Mr. Mathiowetz said the observation well data will not indicate that there is a problem with someone else's well because it doesn't measure that person's well specifically.

In response to questions from Mr. Davis, Mr. Mathiowetz stated that drawdown moves out radially from a pumping well. If the groundwater movement is from left to right, the left side of the drawdown cone will be a little squashed and the right side becomes elongated. The location of the observation wells is not going to be as site-specific but will still be relatively reflective because the groundwater movement is a very slow movement. The cone still goes out radially and, while it gets a little elongated in the direction of movement, the squashing isn't that much, so being upgradient you would need to be closer than comparatively downstream to measure the same amount of drawdown downgradient, but it still allows you to measure it. All of the observation wells in the area that are measured are in the Ogallala aquifer.

There were no questions of Mr. Mathiowetz from the board members.

Mr. Vogel called Blake Burnham who was administered the oath by the court reporter.

Mr. Burnham testified regarding Application No. 2833-2 and 2834-2. Mr. Burnham's grandfather starting the farming operation in 1949. Mr. Burnham pointed out on Exhibit 4 the location the home place, which is near Application No. 2833-2. On the home place are the shop, a hay shed, the old dairy parlor, the feedlot pens, the calving area, the calving kickout pens, equipment storage, a house, and nine houses for employees. There are two domestic wells at the home base. The wells are used

for domestic use and for cattle and are the closest wells to Application No. 2833-2.

Mr. Burnham stated that Application No. 2833-2 is in conjunction with Water Right No. 1260-2. This was an old pivot that will be replaced so there are two pivots going in. This application is for the irrigation of 130 acres. The Burnhams intends to run the two pivots alternately so only one will run at a time at 835 gpm, which is 1.85 cfs. Mr. Burnham stated that this application is for up to 7 wells, but 7 wells is the worst-case scenario. He will only install enough wells needed to get to the approved pumping rate. Corn and alfalfa are grown, and the crop is fed to the livestock. Mr. Burnham stated that Tony Beck is the well driller, and he recommended that the wells be 600 feet apart. If significant drawdown occurs in his domestic wells, Mr. Burnham would shut off the irrigation wells.

Mr. Burnham stated that Application No. 2834-2 is to irrigate 130 acres with up to four proposed wells. There will be one center irrigation pivot. Corn and alfalfa are also grown in this area. Mr. Beck will also be the well driller for these wells. The wells will be used all at once at the approved pumping rate.

The timeline for completion of both projects is two months for well completion and two weeks to install the center pivots.

Mr. Burnham stated that he does not have any concerns about his domestic wells being affected by these two water permit applications.

There were no questions from the parties or the board members.

Mr. Herrmann was administered the oath by the court reporter. He offered a report from a geologist.

Mr. Vogel and Ms. Mines Bailey objected because the report was not prepared by Mr. Herrmann and there is no foundation to admit the exhibit. Ms. Mines Bailey stated that the exhibit needs to come in through the author of the report.

Mr. Freeman sustained the objection.

Mr. McVey asked Mr. Herrmann if the report is a government-created public record. Mr. Herrmann stated that the report is not a government-created public record. He contracted with Prairie Consulting to prepare the report. Nate Hunke prepared the report and was available to testify regarding the report.

Mr. Herrmann stated that land in the area of the applications was gifted to him from his parents. He is concerned that the wells on his land will be affected by the number of wells the Burnhams intend to install and the amount of water they intend to pump out of the aquifer. This is the reason he hired an expert to determine if his wells will be affected.

There were no questions from the parties or the board members.

Mr. Herrmann called Nate Hunke who was administered the oath by the court reporter.

Mr. Herrmann offered Exhibit A, Mr. Hunke's curriculum vitae.

The exhibit was admitted into the record.

Mr. Hunke stated that he has a bachelor's degree in geology and master's degree in hydrogeology. He discussed his publications and work history as well as other information included on his curriculum vitae.

Mr. Hunke testified regarding his report. He said the purpose of his analysis was to look at the permit applications and, based on the diversion rates, what kind of an impact pumping would have on the Ogallala aquifer.

Mr. Vogel offered Exhibit B, a groundwater modeling assessment report prepared by Mr. Hunke, Prairie Consulting.

Responding to questions from Ms. Mines Bailey, Mr. Hunke stated that he prepared Exhibit B, the report. The sources of information he used in preparing the report are the South Dakota Geological Survey, Filipovic 2004 - Hydrogeologic Assessment of the High Plains Aquifer in Tripp and Gregory Counties, South Dakota, and Filipovic 2011 - Hydrogeologic Assessment of the High Plains Aquifer in Bennett County, South Dakota, U.S. Geological Survey 2022 - Modflow 6, which is the model used to generate the report, and miscellaneous reports that are relevant to the study area.

Ms. Mines Bailey had no objection to admitting the exhibit.

Mr. Vogel asked Mr. Hunke if, through his work history, he has any experience conducting an analysis like the one he did in this report. Mr. Hunke stated that most of his work history is related to petroleum cleanup and petroleum assessment. Most of the groundwater cleanup work he does involves the saturated zone, which is beneath the water table and the petroleum contaminants absorb into the underlying aquifers or aquitards. Monitoring wells need to be installed to establish groundwater contours, flow directions, contamination concentrations, slug testing analysis to determine hydraulic conductivity, which basically determines how quickly water moves through an aquifer.

Mr. Hunke stated that in the early 1990's he took a five-day course, 40 hours of training, in which he did groundwater modeling. Since then, this is the only time he has used this particular type of analysis. He stated that his consulting firm does do a lot of modeling in the form of slug testing, groundwater contour, groundwater movement, etc.

Mr. Vogel asked if contamination cleanup analysis is the same as determining impact on other wells in the area? Mr. Hunke said that one part of the petroleum contamination cleanup criteria is to determine what wells may be impacted by the petroleum contamination, and that is based on the hydraulic conductivity, the groundwater elevation contours, to make an assessment on what private wells are in the area and make a determination if there are potential impacts. Mr. Vogel asked if that has anything to do with water. Mr. Hunke said he does not use Modflow 6 specifically to model that, but Modflow 6 does basically the same.

Mr. Vogel asked if it has anything to do with the water levels in those wells. Mr. Hunke answered that it definitely does. Mr. Hunke cited as an example in which petroleum contamination at Watertown had migrated underneath Highway 212 onto the next property, so wells were installed to the south. By measuring the groundwater level in the wells, then surveying the top of casing elevation of the wells, flow direction was determined and potential impacts to the Big Sioux River. Mr. Vogel asked if Mr. Hunke was determining drawdown in the wells. Mr. Hunke stated that a pumping wells were originally involved in that project, then they changed to soil vapor extraction.

Mr. Vogel objected to Exhibit B, stating that Mr. Hunke is not qualified to testify as an expert, based on his work history.

The other parties had no objection.

Mr. Freeman admitted Exhibit B into the record. He said the experience issue goes to the weight that the board gives it as opposed to the qualifications.

Mr. Vogel said Mr. Hunke's title on the report is senior hydrologist. He asked what the definition of hydrologist is. Mr. Hunke stated that his title is actually hydrogeologist, which is what his background is in. He has seven years of experience in geology and in hydrogeology. His focus in graduate school was on hydrogeology.

Mr. McVey told Mr. Herrmann that at some point when he is qualifying a witness as an expert, it is prudent to request that he be treated as an expert witness. Non-qualified witnesses cannot give expert testimony, so Mr. Herrmann should ask the board for permission to treat Mr. Hunke as an expert witness.

Mr. Herrmann moved for the board to treat Mr. Hunke as an expert witness.

Ms. Mines Bailey had no objection.

Mr. Vogel objected.

The other parties had no objection.

Mr. Freeman stated that Mr. Hunke would be treated as an expert witness.

Mr. Herrmann asked Mr. Hunke is there is anything in the report that he would not be able to stand by, based on the objections that were presented and based on his qualifications. Mr. Hunke stated that he stands by all of the information provided in his report.

In his report, Mr. Hunke recommends that, based on the fact that the wells in both applications request using 1.85 cfs, in order to not damage surrounding wells, that number should be decreased from 1.85 cfs for both applications. He said when he put the numbers into the model he included both permit application rates as pumping wells to represent the amount of water diversion that was applied for; 835 gallons per minute, for each permit. Figure 3 in Mr. Hunke's report is a layout of the

grid he used in the model. It is nine miles from east to west and four miles from north to south; it is broken up into sections to get more specific about locations. He inserted the private well locations, based on the locations given to him as represented in Appendix 3, and the locations were plotted onto the grid. In addition, pumping wells 1, 2, and 3 were plotted. Mr., Hunke said his understanding is that pumping wells 1 and 2 are both representing the 9 wells. Pumping well 1 is in part of Section 16 on the left and in the western half of Section 16 is represented by pumping well 2. The Blake Burnham permit application represents pumping well 3, and that is in the southeast corner of Section 11.

Figure 4 is a map representing the groundwater elevation. These valleys were inputted into the model, and he used Observation Well TR-59A, which is about one mile south of pumping wells 1 and 2. Observation well TR-59B is located a mile and a half south and a mile and a half from the pumping wells. The groundwater elevation is included for that observation well. Approximately one mile south of Observation Well TR-59A and two and a half miles east is Observation Well TR-78M, which also has a water table elevation associated with it. The water table elevations are based on the July 22, 2003, readings from those wells. Mr. Hunke said he used July 22, 2003, in this case because that is approximately date that the 2004 paper was written. That study provided him with some aquifer elevations, shown in Figure 2 of his report. This is a study done between July 22, 2003, and August 7, 2003. It shows the aquifer elevation based on those observation wells. There was 2,250 feet of head on the upper part and, towards the Keya Paha River it was 2,150 feet, there is a 100-foot elevation drop.

Figure 5 represents when the pumping wells are turned on, so basically stress is being applied to the Ogallala aquifer with 1.85 cfs or 835 gpm. The contours that are shown are a representation of the water table elevations. Surrounding the pumping wells there is a drawdown going from 670 to 660 to 650 feet mean sea level where, if you go back to Figure 4, it shows that there is about 680 to 670 feet mean sea level in that area, so there is a substantial water table drawdown. These aren't metered so in that area 10 to 15 meters of drawdown is roughly to 33-49 feet of drawdown on the water table. That is based on the hydraulic conductivity of the Ogallala aquifer as measured by studies that have been conducted in that area. Around Pumping well 3 there is a water table elevation that is approximately 630 meters above feet mean sea level as opposed to the static conditions shown in Figure 4. Based on that, Mr. Hunke formulated results from the pumping in those two areas. He projected a drawdown amounts of up to 66 feet for Private Well 1, 33 to 39 feet for Private Well 2, and 0 to 16 feet for Private Well 3. There is a little bit of drawdown in Well 5, but basically Wells 5, 6, 7, 8, and 9 are relatively unaffected.

Mr. Hunke ran the model for current conditions. The most recent conditions he could get from the observation wells were from August 9, 2021, and he got basically the same results. Based on the model results, the private wells would see the water level decline upwards of 66 feet in the closest well and 33 to 39 feet in the next closest well, and 0 to 16 feet in Private Well 3. This is estimated based on static conditions, no pumping versus stress to the aquifer with the pumping and the drawdown that would occur. Depending on saturated thickness and depth of the water, the private wells could potentially dry up. Mr. Hunke recommended that observation wells be placed to the south to monitor the wells when actual pumping is occurring. At this time, the closest observation well is one mile south, which is upgradient of the pumping wells. In the upgradient direction, there is less of an effect than in the downgradient direction, so that observation well would not give a good

depiction of the drawdown occurring from the pumping wells.

Mr. Hunke stated that in his expert opinion, of the six observation wells that have been discussed (Exhibit 4), none of the observation wells would be sufficient to determine the effect of the drawdown from the pumping wells. He recommended that observation wells be placed to the south and the east of Pumping Wells 1 and 2, and also downgradient less than a mile from Pumping Well 3.

Mr. Hunke recommended that the flow rates be reduced from 1.85 cfs; however, he would have to model different varied rates of pumping in order to recommend a safe pumping rate for the wells. Mr. Hunke stated that when he was generating the water table elevations for the model, he used the Keya Paha River gaging stations, Figure 6. There is a gaging station to the northwest of and one to the southeast. He measured the distance between the two, and the difference in stream elevation between the two, which generates a slope. In this case the elevation is declining as you go to the southeast, so the drop in elevation divided by the distance, which is about 28,000 meters, gives you a slope. Using that information, Mr. Hunke estimated what the elevation of the stream is at the site boundaries in the northeast portion of the study area. The river represents a window to the water table. There is no resistance to the groundwater flow to the surface water flow. That information went into the groundwater contour map.

Responding to questions from Ms. Mines Bailey, Mr. Hunke stated that in the report he reviewed the water source broadly as the High Plains aquifer. He understands that the Water Rights Program manages the two aquifers separately. He said the only way he could assess the aquifer appropriately was to treat it as one aquifer because it is hydraulically connected. There might be some variations in hydraulic conductivity but, based on the literature from the South Dakota Geological Survey that he had access to, they had indicated that the High Plains aquifer in that area hydraulic conductivity of about 14.4 feet per second, which includes the aquifer itself. Mr. Hunke said he does not fundamentally disagree with how the Water Rights Program administers the Ogallala and Arikaree aquifers. He said the Arikaree in this area would be irrelevant because it is not part of the High Plains aquifer. This model also includes the Pierre Shale, which is directly beneath the Ogallala formation, and that forms the base of the aquifer for the study in this area. Mr. Hunke said he agrees with Mr. Mathiowetz's report that the Quaternary Eolian and Quaternary Terrace deposits are functioning as the Ogallala aquifer, or part of the High Plains aquifer for purposes of reviewing these two applications. He also agrees that the water in the Ogallala aquifer flows to the northeast toward the Keya Paha River. Groundwater flow will generally mimic the elevation of the ground surface elevation.

Mr. Hunke stated that when he puts a model together the model assumes a homogeneous aquifer material, so there would be a variation that would not be reflective of the actual aquifer materials.

Mr. Hunke said on page 7 of his report the 9 private wells are referenced. The information for these wells was provided by Kevin Herrmann and the petitioners. The information did not include well logs. Mr. Hunke said the only information he received was location of the wells and that the wells are drilled to approximately 100 feet below grade. The private well locations consisted of the section, township, and range, and quarter section information. Mr. Hunke did not receive information as to what water source each of the private wells is completed into, whether the wells are considered adequate wells, or how the private wells are used. He said meters per second pumpage from those

wells is included in the model. It based on 300 gallons per day, which is an average for domestic use. He assumed the wells were used for domestic use, but he also understands that some of the wells are used for livestock watering purposes. Mr. Hunke said he does not have any information that indicates that those households actually use those 9 wells. Based on what he has been told about the average depth of the wells, most of the wells completed in the area are in the Ogallala aquifer because it does provide an adequate water supply to the wells, so it qualifies as an aquifer. It would be of no use to complete a well in an aquitard, like the Pierre Shale, because you would never get enough water out of that well to provide an economic source of water. Mr. Hunke said he does not have well logs for the wells, so he doesn't know what water source the wells are completed into.

Regarding page 13 of his report, Mr. Hunke stated that the model assumes both wells are pumping at the same time at the same rate. He said he assumed that if the Burnhams were given approval for the water permits, the wells could both operate at the same time at the maximum rate for a 24-hour period. Mr. Hunke said since he assumed that both wells would be pumping at the same time when he developed the model results, he does not know if pumping the wells one at a time would make a difference in the model. He said for the model, he assumed that both wells were each pumping 835 gpm at the same time, as laid out in the permit. Mr. Hunke said he took the maximum amount of proposed pumping, and based on the proposed appropriation, he applied that to each well.

In the model, Mr. Hunke assumed that a homogeneous aquifer material and a saturated thickness of 50 feet. Three wells are represented in the report, Appendix 2, and Mr. Hunke did an evaluation of saturated thicknesses. He utilized the 50 feet using the well log from Section 11, which is Pumping Well 3 in the report. The 50-foot thickness roughly coincides with the other two wells he used to evaluate the aquifer thickness. The well log for the Burnham's well in Section 11 shows a saturated thickness of approximately 49 feet.

Ms. Mines Bailey asked if Pumping Well 3 would pump itself dry before it would drawdown Private Well 1, 33 to 49 feet, if the saturated thickness at the pumping well is only 50 feet. Mr. Hunke answered that the High Plains aquifer has high transmissivity for time activity so it can be pumped at a high rate and provide water. He did not look at the drawdown effect in the actual well, he just looked at the drawdown effect in surrounding wells. Theoretically, it could be pumped dry. Mr. Hunke said once it is pumped dry, the pump would shut off so it would not be able to pull another 49 feet a half mile away. The model just assumes that the given pumping rate and the associated drawdowns in water table elevation, which appeared to be 10 to 20 meters in the vicinity of the pumping well.

Ms. Mines Bailey pointed out that on page 13 of Mr. Hunke's report, he states that it would probably result in a 10 to 15 meter drawdown at Private Well 1; but in the summary on page 16, he wrote that there would be approximately 66 feet of drawdown in Private Well 1. Figures 4 and 5 in the report, show a drop of 20 meters, which is about 65.5 feet difference. Ms. Mines Bailey asked why there is a discrepancy? Mr. Hunke said that is because he does not know the exact depth of the private well. He assumed the private well is 100 feet deep, but it could be deeper, and the aquifer could be a greater depth as well because the maximum depth reported for the aquifer is 210 feet. Ms. Mines Bailey asked if Mr. Hunke is asserting the 33 to 49 feet of drawdown or is he asserting the 66-foot drawdown. Mr. Hunke stated that based on the pre-pumping conditions or static conditions versus pumping conditions, it will be in the neighborhood at Private Well 1, assuming everything is

homogeneous, and about a 33 to 39-foot drop in Private Well 2, but they are within a quarter mile of the pumping well. Mr. Hunke said he took the quarter section, township, range information and put them on a topo map, which shows the farms in the area. Then he assumed that the private well would be in the location of the farm. He stated drawdown would be 66 feet at Private Well 1 and 33 to 39 feet at Private Well 2, and 16 feet at Private Well 3.

Ms. Mines Bailey asked what changed between page 13 of the report and the summary and conclusion. Mr. Hunke answered that he believes he re-ran the model, and it came up with a different result. One of the wells was in the wrong location, so that caused the discrepancy. He stated that the information on page 13 of the report is accurate.

Mr. Hunke's recommendation is for a decrease in the rate of diversion for these applications. Ms. Mines Bailey asked what rate Mr. Hunke would recommend. Mr. Hunke stated that he would not know what that rate is without running the model for different varying pumping rates.

Mr. Hunke also recommended installing more observation wells, and as he was testifying to Mr. Herrmann's questions he stated that it would be best to install the observation wells to the south. Mr. Hunke stated that he meant to testify that the observation wells should be installed to the north, which would be downgradient of the pumping wells, because the effect of pumping will be greater in the downgradient direction, which is toward the river. He stated that the present observations are all upgradient and won't show an accurate depiction of the actual effects of pumping.

Mr. Vogel and the other parties had no questions of Mr. Hunke.

Responding to a question from Mr. Hutmacher regarding the cone of depression diameter, Mr. Hunke stated that Figure 5 in his report illustrates the cone of depression every 10 meters, so it would be a quarter mile wide right at pumping well. However, the cone of depression extends out from that because it lowers the aquifer at Private Well 2 and it lowers the aquifer at Private Well 3. That is a combined cone of depression, so the diameter will be greater than a quarter section because it is affecting wells a mile or so out from there. Mr. Hunke said the cone of depression could be up to a mile from the well.

No other board members had questions of Mr. Hunke.

Aaron Davis was administered the oath by the court reporter. Mr. Davis testified that he is a neighbor of the Burnhams. He is concerned about the usage amount in the proposed irrigation wells and the possible consequences. Mr. Davis stated his needs are for livestock and home. He is concerned about how long it will take to replenish the wells if there is a problem, and he is concerned that the cost associated with having to drill new wells to keep water available if there is an issue. Mr. Davis said there are several wells in the area that he knows of that would be affected if there is a drawdown issue. These are not physically good wells, even without a drawdown on them. Mr. Davis said he realizes that the Burnhams need water for their feedlot operation, but so do all the other families in the surrounding area. Mr. Davis asked the board to take into consideration the needs of all the other families in the neighborhood.

In response to a question from Mr. Holzbauer, Mr. Davis stated that he believes his wells are

classified as adequate wells.

Marie Condon was administered the oath by the court reporter. She testified that her well was drilled in the early 1980's. The well driller told her at that she could run three hydrants 24 hours a day, seven days a week and never run out of water. Ms. Condon stated that she is concerned that the proposed new wells will use too much water and deplete water for livestock and domestic use. She said SDCL 46-1-1, SDCL 46-1-3, and SDCL 46-5-5, states that domestic use of water takes precedence over appropriative rights. Ms. Condon said she would like to be sure that her concerns of water available for livestock and domestic use are considered; they should have first priority. She is also concerned about Lost Creek, which runs through her property. There is another small creek that runs through some Indian land she rents. These creeks are the only way she waters livestock, and without water in those creeks, there is no pasture use.

In response to a question from Mr. Holzbauer, Ms. Condon said the water in Lost Creek originates in Nebraska. She is not sure where the water originates in the other small creek on Indian land.

Ms. Mines Bailey called Eric Gronlund, Chief Engineer, as a rebuttal witness. Mr. Gronlund was previously administered the oath.

Mr. Gronlund recommended approval of Water Permit Application No. 2833-2, Brian Burnham with the following qualifications:

1. The wells approved under Water Permit No. 2833-2 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals 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 wells authorized by Permit No. 2833-2 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

Mr. Gronlund recommended approval of Water Permit Application No. 2834-2, Blake Burnham with the following qualifications:

1. The wells approved under Water Permit No. 2834-2 are located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals 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 wells authorized by Permit No. 2834-2 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management

Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.

3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

Mr. Gronlund stated that, although it was permitted for much more, Water Permit No. 1260-2 was licensed for 1.85 cfs for irrigation of 130 acres. Mr. Burnham testified that he is planning to alternate use, so Mr. Gronlund recommends attaching an additional qualification to the permit that the diversion of water under Water Right No. 1260-2 and Water Permit No. 2833-2, combined, be limited to 1.85 cfs.

Mr. Gronlund testified that he briefly reviewed Mr. Hunke's report. Mr. Hunke recommended the installation of additional observation wells in the proposed diversion point areas. Mr. Gronlund stated that observation wells are always a good to have, so he is not opposed to that, but Blake Burnham testified that they have two domestic wells for their home place. Mr. Gronlund said it is likely the Burnham's domestic wells would be the first to be impacted and therefore would be the "Canary in the Mine" if a problem does occur.

Ms. Mines Bailey asked if Mr. Gronlund has a request as to DANR's role in the location of observation wells if the board imposes such a qualification. Mr. Gronlund stated that, although rare, the board has on occasion required the installation of observation wells as part of approval of a permit that would become part of the South Dakota Observation Well Network. He asked that the locations of the observation wells be approved by DANR, with the assistance of the South Dakota Geological Survey.

Mr. Gronlund stated that he believes the two applications constitute a beneficial use. He believes the applications are in the public interest as it pertains to the jurisdiction of the Water Management Board.

Ms. Mines Bailey asked when Mr. Gronlund looks at administering water rights, does he look at any one specific year. Mr. Gronlund answered that the Water Rights Program does not administer water rights in South Dakota based on a specific year, whether it's a dry year or a flooding year. The history of record is used to administer water rights.

Regarding the concerns expressed by the petitions regarding impact to their private domestic wells, Mr. Gronlund stated that his recommendation includes the Well Interference Qualification. South Dakota statute states that domestic use takes precedence over appropriative rights. Domestic use includes household uses and livestock watering.

Ms. Mines Bailey asked, if petitioners run into issues with their domestic wells should these applications be granted, what information would the Water Rights Program need from them to commence an investigation. Mr. Gronlund said it is advisable for the petitioners to know as much as possible about their wells. Testimony today indicated that there are no well completion reports of file for the petitioners' wells. If a domestic well was drilled after the 1980's there should be a well completion report for the well. He said the petitioners need to know the well depth, what pump is in

the well and where the pump is sitting. This is information the Water Rights Program would need for deciding whether the well is adequate and whether it is being adversely impacted by these appropriative rights.

Ms. Condon asked how she can get an observation well installed on her property. Mr. Freeman stated that is irrelevant for this hearing, but Ms. Condon can take it up with the Water Rights Program after the hearing.

There were no other questions of Mr. Gronlund.

Mr. Larson left the meeting at this time.

The parties offered closing statements.

Mr. Freeman requested board action.

Motion by Hutmacher, seconded by Holzbauer, to approve 2833-2, Brian Burnham, subject to the three qualifications set forth by the Chief Engineer and the following new qualification: Water Permit No. 2833-2 and existing Water Right No. 1260-2 may not be utilized at the same time. Further, the maximum usage for Water Permit No. 2833-2 and Water Right No. 1260-2 is capped at 1.85 cfs.

Mr. Hutmacher stated that one of the qualifications attached to the water permit is the well interference qualification. The Burnhams will be the first ones to know that there is a problem. If there is a problem, it will affect their domestic wells and irrigation wells before it affects anyone else's wells. Mr. Hutmacher said he has reason to believe that the aquifer will produce better than the Burnhams are anticipating. He also believes no one else's wells will be affected. If there is a problem with other wells, it needs to be reported so the department can investigate. The petitioners need to get the information for their wells, as suggested by Mr. Gronlund.

Mr. Holzbauer stated that by combining Water Permit No. 2833-2 with Water Right No. 1260-2, the Burnhams will be authorized to use less water. Water Right No. 1260-2 is currently authorized for 2.1 cfs, but when combined with No. 2833-2 will now be authorized for 1.85 cfs.

Ms. Dixon asked if there is a need to amend Water Right No. 1260-2, or is that covered by adding it to Water Permit No. 2833-2?

Mr. Freeman said he does not believe it is necessary to amend No. 1260-2 because it is covered by No. 2833-2.

Mr. Gronlund stated that No. 1260-2 is authorized at 1.87 cfs, not 2.1 cfs, for 131 acres. Mr. Gronlund believes the Burnhams cannot operate under No. 2833-2, unless they abide by the new qualification. He believes that Water Right No. 1260-2 does not need to be amended. The qualification being on No. 2833-2 is going to rule the day.

Ms. Dixon asked if both wells could run at the same time at half of the 1.85 cfs?

Mr. Vogel said the intention is that both pivots on No. 1260-2 and No. 2833-2 are using the same wells, so both could not run at the same time; the wells are intended to run alternatively.

A roll call vote on the motion to approve Water Permit No. 2833-2 with the four qualifications was taken, and the motion carried unanimously.

Motion by Hutmacher, seconded by Holzbauer, to approve Water Permit No. 2834-2, Blake Burnham, subject to the three qualifications set forth by the Chief Engineer. A roll call vote was taken, and the motion carried unanimously.

Ms. Mines Bailey will prepare one set of proposed Findings of Fact, Conclusions of Law, and Final Decision pertaining to both water permits. The draft is due by August 31, 2022, and objections are to be submitted by September 15, 2022.

CONSIDER WATER PERMIT APPLICATION NO. 8620-3, SHANNON HUTTERIAN BRETHREN, INC.: Ann Mines Bailey stated that the petitioners in this matter were not in attendance at the hearing.

Ms. Mines Bailey represented the Water Rights Program.

Jason Erickson represented Shannon Hutterian Brethren, Inc.

Ms. Mines Bailey offered Exhibit 1, the administrative file for Water Permit Application No. 8620-3. The administrative file contains the application, the report and recommendation of the chief engineer, the petition in opposition, and the notices of publication.

The exhibit was admitted into the record.

Ms. Mines Bailey called Kim Drennon, engineer with the Water Rights Program, who had previously been administered the oath by the court reporter.

Ms. Drennon stated that Exhibit 2 is her Curriculum Vitae. Ms. Mines Bailey offered Exhibit 2.

The exhibit was admitted into the record.

Ms. Drennon testified that she received a Bachelor of Science in engineering with a civil emphasis from Dordt University in May 2015. The same month she passed the Fundamentals of Engineering exam, which designates her as an engineer intern or engineer in training, depending on the state. She received a master's degree in civil and environmental engineering from South Dakota School of Mines and Technology in December 2018.

Ms. Drennon has been employed with the Department of Agriculture and Natural Resources since January 2019. She performs the technical review of applications, installs data loggers for special projects, inspects dams, and answers constituent complaints.

Ms. Drennon testified regarding her report on Water Permit Application 8620-3. She stated that she reviewed whether unappropriated water is available and whether this application can be developed without unlawful impairment to the existing water rights. Ms. Drennon pointed out that the header on pages 2 through 7 of the report shows Water Permit Application No. 8592-3; that should be changed to Water Permit Application No. 8620-3. This change does not affect Ms. Drennon's analysis.

Water Permit Application No. 8620-3 seeks to appropriate 61.6 acre-feet of water annually at a maximum instantaneous diversion rate of 0.111 cfs (50 gpm) from two existing wells completed into the Codell aquifer. This site is located approximately three miles southwest of Winfred, South Dakota in Miner County. The water will be for commercial use in a dairy and swine facility.

The Codell aquifer is a Cretaceous-age sandstone, which is a member of the Carlile Shale. The Codell aquifer underlies approximately 4,960,000 acres in South Dakota east of the Missouri River and stores approximately 9,900,000 acre-feet of water. The aquifer is confined.

Near this application there were about 270 feet of hydraulic head lifting water above the top of the aquifer. The aquifer materials are about 82 feet thick in this location.

Ms. Drennon determined the availability of unappropriated water by doing a hydrologic budget analysis and reviewing observation well water levels. A hydrologic budget is used to determine recharge and withdrawals to the aquifer.

The Codell aquifer receives recharge mainly by infiltration from glacial aquifers and other aquifers that are in contact with the Codell aquifer. No studies have been done to calculate recharge to the Codell aquifer. For recharge, Ms. Drennon estimated withdrawals from the aquifer using data available to the Water Rights Program, then she divided that withdrawal over the area of the aquifer to find an amount of recharge that would have to happen for recharge to exceed withdrawals. Withdrawal is an intentional taking of water from the aquifer.

There are 48 water rights/permits authorized to appropriate water from the Codell aquifer. Six of the 48 water rights/permits are for irrigation. The total estimated withdrawal for the aquifer is 1,994 acre-feet per year. This application proposes to appropriate up to 61.6 acre-feet per year. The recharge to the aquifer would have to be at least 0.005 inches per year to support current appropriations. Ms. Drennon stated that the Codell aquifer receives recharge of more than 0.005 inches per year.

The Water Rights Program maintains 22 observation wells completed into the Codell aquifer. In preparing her report, Ms. Drennon reviewed all 22 observation wells.

Ms. Drennon stated that Exhibit 3 is a hydrograph for Observation Well MR-86A, which is the nearest observation well to this application. The hydrograph is included as Figure 2 in the report. Ms. Drennon used information in the Water Rights Program observation well database to create the hydrograph.

Ms. Mines Bailey offered Exhibit 3. The exhibit was admitted into the record.

Ms. Drennon stated that hydrograph shows that, in general, water levels rise during periods of higher than average precipitation and decline when there is less than average precipitation, which indicated that water is flowing out of the aquifer naturally. It indicates that there is natural discharge occurring, which the Water Management Board has traditionally considered available for appropriation.

Based on her review, Ms. Drennon concluded that there is reasonable probability unappropriated water is available for this application.

Ms. Drennon stated that Exhibit 4 is an aerial imagery map of the application and other information pertaining to this application. She created the map using ArcMap. Most of the data points on the map were obtained from information maintained by the Water Rights Program, and the petitioner's property boundary was from the 2020 plat book.

Ms. Mines Bailey offered Exhibit 4. The exhibit was admitted into the record.

The applicant's proposed wells are indicated by the yellow triangle with the pink outline in the lower left quadrant of the map. The nearest domestic well on file with the Water Rights Program is indicated by the pink triangle located approximate a mile and a half southwest of the application. The nearest observation well is indicated with an orange plus over top of a black circle located approximately six miles southwest of the application. The nearest water right to this application in the Codell aquifer is indicated by an orange triangle located in the upper right quadrant of the map. The nearest water right is approximately 23 miles away from the application. The nearest domestic well on file with the Water Rights Program is a mile and a half from the application. Not all domestic wells are on file because some of the of them may have been installed before all well completion reports were required to be submitted to the Water Rights Program, and some could be drilled by the landowner themselves, and they have not submitted a well completion report.

Ms. Drennon stated that there is reasonable probability this application can be developed without unlawful impairment of existing water rights/permits or adequate domestic wells. This is based on the fact that there are 270 feet of hydraulic head above the top of the aquifer, the fact that the nearest domestic well on file is about a mile and a half away, and the fact that the aquifer is 82 feet thick. Ms. Drennon also looked at the record of complaints on file in Miner County, and there no complaints in Miner County.

Ms. Drennon reviewed the petition in opposition for this matter. Her understanding of the petitioner's concern is that their well is unable to get water at this time, and they are hauling water. The petitioners are also concerned about the effect that drain tiling has on water availability. Drain tiling was not included in Ms. Drennon's review of the application. Ms. Drennon stated that there is no well completion report on file for the petitioner's well, so she cannot determine if the well is adequate or if it is completed into the same aquifer. Based on her technical analysis, Ms. Drennon does not believe that this application will impair a well located in the vicinity of the petitioner's property.

There were no questions of Ms. Drennon.

Mr. Erickson called Mark Wipf, who was administered affirmation by the court reporter. Mr. Wipf stated that he is the president of Shannon Hutterian Brethren, Inc., and he oversees the communal life the colony is living. Mr. Wipf requested that the board consider approval of the water permit application. The water will be used for a swine and dairy operation.

Mr. Wipf stated that the colony has a CAFO permit, and DANR notified the colony that the permit needed to be upgraded. The colony started studying its water usage because DANR wanted to know how much water was being used for the swine and dairy operations. That is how the colony found out they needed a water permit. Mr. Wipf said the dairy and swine operations are of benefit to the Shannon Hutterian Brethren, and providing clean drinking water for the dairy and swine operations is a beneficial use of the water.

In response to a question from Ms. Mines Bailey, Mr. Wipf said the colony is connected to a rural water system. The purpose for the water appropriation is for livestock drinking, wash down, and finishing.

In response to a question from Mr. Hutmacher, Mr. Wipf stated that the colony is in the process of adding 120 dairy cows to the operation. This is the reason for a second well.

There were no other questions of Mr. Wipf.

The Chief Engineer recommended approval of the application with the following qualifications:

1. The wells approved under Water Permit No. 8620-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under these Permits shall control withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. Water Permit No. 8620-3 is subject to compliance with requirements of the Department's Water Pollution Control Permit issued pursuant to SDCL 34A-2-36 or 34A-2-36.2 or 34A-2-112 or 34A-2-124 for concentrated animal feeding operations.
3. Water Permit No. 8620-3 is subject to compliance with all existing and applicable Water Management Board Rules including but not limited to:
 - a) Chapter 74:54:01 Ground Water Quality Standards,
 - b) Chapter 74:54:02 Ground Water Discharge Permit,
 - c) Chapter 74:51:01 Surface Water Quality Standards,
 - d) Chapter 74:51:02 Uses Assigned to Lakes,
 - e) Chapter 74:51:03 Uses Assigned to Streams, and
 - f) Chapter 74:52:01 through 74:52:11 Surface Water Discharge Provisions
4. The Permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Codell aquifer.

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5. Water Permit No. 8620-3 authorizes a total annual diversion of 61.6 acre-feet of water from the Codell aquifer.

Motion by Hutmacher, seconded by Holzbauer, to approve Water Permit Application No. 8620-3, Shannon Hutterian Brethren, Inc. subject to the qualifications set forth by the Chief Engineer. A roll call vote was taken, and the motion carried unanimously.

The parties waived Findings of Fact and Conclusions of Law.

ADJOURN: Motion by Hutmacher, seconded by Holzbauer, to adjourn the meeting. Motion carried unanimously.

A court reporter was present for the hearings and a transcript of the proceedings may be obtained by contacting Carla Bachand, PO Box 903, Pierre, SD 57501, phone number (605) 224-7611, or email pcbachand@pie.midco.net.

Approved October 5, 2022.

Water Management Board

WATER MANAGEMENT BOARD MEETING

July 6, 2022

Qualifications:
 wi - well interference
 wcr - well construction rules
 iq - irrigation questionnaire
 lf - low flow

Unopposed New Water Permit Applications Issued Based on the Chief Engineer Recommendations

No.	Name	Address	County	Amount	Use	Source	Qualifications
1988A-1	Western Construction Inc	Rapid City	MD	2.67 cfs	industrial	Belle Fourche River	lf, 5 special
2017-1	Broken Bridge Ranch LLC	Sturgis	MD	3.00 cfs	221 acres	Belle Fourche River	lf, iq
2018-1	Monarch Ridge Devel Inc	Black Hawk	MD	1.11 cfs	wds	1 well-Madison Aquifer	wi, wcr, 3 special
2841-2	HWY 79 LLC	Rapid City	PE	0.89 cfs	wds	2 wells-Inyan Kara Aquifer	wi, 2 special
2842-2	H & H Land Co #2 LLC	Rapid City	PE	0.09 cfs	wds	2 wells-Quaternary Alluvium	wi, wcr, 2 special
2845-2	USDA, Forest Service	Lakewood CO	JN	100 AF	rec, fwp, dom	runoff-trib of N Fork Medicine Cr	lf, 1 special
2846-2	Clay Kaiser	Millboro	TR	1.11 cfs	60 acres	runoff-existing storage dam	lf, iq, 2 special
2847-2	Donovan Farms LLC	Tuthill	BT	2.11 cfs	160 acres	1 well-Ogallala Aquifer	wi, wcr, iq
8572-3	Ray Martinmaas	Orient	HD	43.5 AF	rec, livestock	runoff-Matter Creek	lf, 1 special
8597-3	CHS Farmer Alliance	Freeman	HT	0.1 cfs	commercial	1 well-Niobrara Aquifer	wi, 2 special
8605-3	Lenny Peterson	Hitchcock	SP	2.29 cfs	160 acres	James River	iq, 3 special
8607-3	Spring Creek Htnn Brethren	Forbes ND	MP	0.22 cfs	commercial	3 wells-Inyan Kara Aquifer	wi, wcr, 4 special
8608-3	Dennis & Wayne Fischer	Piedmont	CA	1.89 cfs	135 acres	1 well-Grand Aquifer	wi, iq
8609-3	Clover Leaf Farms Inc	Elk Point	UN	2.0 cfs	60 acres	1 well-Missouri:Elk Point	wi, wcr, iq, 1 special
8610-3	Five Star Cottages LLC	Vermillion	CL	no add'l	65 acres	1 well-Missouri:Elk Point	wi, iq
8611-3	Chase L Jensen	Aurora	BG	1.14 cfs	80 acres	1 well-Rutland Aquifer	wi, wcr, iq
8612-3	Drumgoon Digester	Lake Norden	HM	0.10 cfs	commercial	1 well-Prairie Coteau Aquifer	wi, wcr, 2 special
8613-3	Renewable Energy LLC	Tea	CL	29.76 cfs	wds	well field-Missouri:Elk Point	wi, 2 special
8615-3	Lewis & Clark RWS	Yankton	CL	2.0 cfs	160 acres	1 well-Missouri Elk Point	wi, wcr, iq
8617-3	Ralph & Lucille Marquardt	Milbank	GT	0.34 cfs	commercial	1 well-Revillo Aquifer	wi, 4 special
8618-3	MoDak Dairy Inc	Goodwin	DU	1.12 cfs	commercial	2 wells-Pleistocene Series	wi, 4 special
8619-3	Tim or Kari Ostrem	Centerville	CL	1.78 cfs	260 acres	Unknown	wi, wcr, iq
8621-3	Todd Maeschen	Ethan	DN	1.34 cfs	160 acres	Missouri South Aquifer	wi, wcr, iq
8622-3	Cory Amdahl	Summit	GT	1.78 cfs	108 acres	1 well-Niobrara Aquifer	wi, wcr, iq, 1 special
8623-3	Anden VanBeek	Hudson	UN	1.56 cfs	246.45 acres	3 wells-Big Sioux:North	wi, wcr, iq
8624-3	Mark Johnson	Avon	BH	1.56 cfs	136 acres	2 wells-Brule Creek Aquifer	wi, wcr, iq
8625-3	Marty or Teresa Gilbertson	Vermillion	CL	1.78 cfs	100 acres	1 well-Niobrara Aquifer	wi, wcr, iq, 1 special
8626-3	Tri-Cross Renewable Energy	Viborg	TU	0.10 cfs	commercial	1 well-Missouri:Elk Point	wi, wcr, 2 special
8627-3	Richard L Logue	Colorado Springs, CO	CL	no add'l	60 acres	1 well-Niobrara Aquifer	wi, wcr, iq
8628-3	David E Hoops	Huron	CA	1.44 cfs	110 acres	3 wells-Herreid Management	wi, wcr, iq
						Unit of Spring Creek Aquifer	

8631-3	Tamera A Norton (Schrempp)	Yankton	UN	1.11 cfs	40 acres	1 well-Missouri:Elk Point	wi, wcr, iq,1 special
8632-3	Bottolfson Brothers	Vermillion	CL	1.78 cfs	122.04 acres	1 well-Lower Vermillion Missouri Aquifer	wi, wcr, iq,1 special
8633-3	Jackrabbit Family Farms	Pipestone MN	DN	0.115 cfs	commercial	1 well-Codell Aquifer	wi, 4 special
8634-3	Daniel M Ulmer	Yankton	HT	1.78 cfs	80 acres	1 well-Lower James Missouri	wi, wcr, iq,1 special

Future Use Reviews

No.	Name	Address	County	Amount Remaining in Reserve	Use	Source	Qualifications
551-2	City of Winner	Winner	TR	1,568 AF	municipal	Ogallala Aquifer	none
1622-2	City of Gregory	Gregory	GY	269 AF	municipal	Ogallala Aquifer	none
1660-2	City of Burke	Burke	GY	396 AF	municipal	Ogallala Aquifer	none
3429-3	WEB Water Development	Aberdeen	BN	15,000 AF	RWS	Missouri River	none
3984-3,	Big Sioux Community	Egan	MY	589 AF	RWS	Big Sioux:Moody Aquifer	none
3984A-3,	Water System Inc						
3984B-3							
4456-3,	Aurora-Brule RWS Inc	Kimball	BL	621 AF	RWS	Missouri River	none
4456A-3							
6259-3	City of Volga	Volga	BG	1,216 AF	municipal	Big Sioux:Brookings Aquifer	none