

# **Appendix I: Water Appropriation Permit and SDDENR Recommendation of Approval**



DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE SOUTH DAKOTA 57501-3182  
<http://denr.sd.gov>

DEC 15 2017

Otter Tail Power Company  
c/o Mark Thoma, Manager, Environmental Services  
PO Box 496  
Fergus Falls MN 56538-0496

Dear Mr. Thoma:

Enclosed is Water Permit No. 8309-3 authorizing construction of the water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

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

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

Sincerely,

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

enclosures

**SOUTH DAKOTA  
WATER PERMIT NO. 8309-3**

---

Date of first receipt of application September 18, 2017.


The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8309-3 to Otter Tail Power Company, c/o Mark Thoma, Manager, Environmental Services, PO Box 496, Fergus Falls MN 56538-0496 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. 8309-3 appropriates 12.3 acre-feet of water annually at a maximum pump rate of 0.22 cubic feet of water per second from one well completed into the Altamont Aquifer (679 feet deep) located in the SE 1/4 NE 1/4 Section 22-T113N-R48W. The site is located 1 1/2 miles northwest of Astoria and known as Astoria Station.
2. The water appropriated shall be used for the purpose of industrial and commercial use 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 of approval of Permit No. 8309-3 is December 11, 2017.
5. The date from which applicant may claim right is September 18, 2017.
6. One-fifth of the construction is to be completed on or before June 11, 2020.
7. All construction is to be completed on or before December 11, 2022.
8. Water is to be put to beneficial use on or before December 11, 2026.
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 well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 8309-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. The Permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Altamont aquifer.
4. Water Permit No. 8309-3 authorizes a total annual diversion of 12.3 acre feet of water.

**WATER MANAGEMENT BOARD**

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

DEC 15 2017  
date



**NOTICE OF COMPLETION OF WORKS AND  
APPLICATION OF WATER TO BENEFICIAL USE**

Date \_\_\_\_\_

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

FROM: \_\_\_\_\_  
(name)

\_\_\_\_\_  
(address)

\_\_\_\_\_  
(city, state, zip)

\_\_\_\_\_  
(phone)

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

Water Permit No. \_\_\_\_\_ states that the water use system is to be constructed by \_\_\_\_\_, and water is to be put to beneficial use by \_\_\_\_\_ (date) \_\_\_\_\_ (date)

The water use system was completed on \_\_\_\_\_ (date)

Applying the water to beneficial use was completed on \_\_\_\_\_ (date)

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

\_\_\_\_\_  
(signature)



# ? COMMON WATER RIGHT QUESTIONS?

## When do I need a Water Right?

- If you store more than 25 acre feet of water in a drydraw dam or any water in a dam on a navigable water course.
- If you use water at a rate greater than 25 gpm or more than 25,920 gal. per day for household or livestock water.
- If you use water for irrigation of more than one acre, or any use for commercial, municipal, institutional, or industrial.
- A new water permit is required to change permitted water sources, increase permitted diversion rate, or increase the irrigated acreage.

## As a water right holder what responsibilities do I have?

- If you are a new owner of property with existing water rights, you need to file a transfer of ownership.
- Adhere to all qualifications on water right.
- Irrigators must complete and return the annual irrigation questionnaire sent each fall.
- If chemicals or fertilizer are applied through system, you must have properly installed pollution prevention equipment and report your chemical use along with the irrigation questionnaire.

## Why are you here to look at my system, I thought I already had a Water Right?

- When the Water Management Board approves a water right permit application it becomes a water permit.
- The permit allows 5 years to construct the system.
- After the 5 year construction period, a permit investigation is conducted to determine the extent of the developed project.
- If the project is developed as permitted, a water license will then be issued and the water permit becomes a water right.
- Issuance of a water license is the final step in obtaining a water right to use water in South Dakota.

## Can I drill more wells or replacement wells under my Water Permit or Right?

To be approved, a replacement well or additional well(s) must:

- Be in the same water source and is not for more water than is authorized by the existing Water Permit.
- Be within a reasonable distance of the original well site.
- Not cause adverse interference with existing water rights and domestic wells.
- Contact the Water Rights Program prior to drilling a new well to confirm whether or not a new permit is needed.

## When can a Water Permit or Right be canceled?

- Project not constructed within the 5 year construction period.
- Abandonment - no intent to use water and use is abandoned.
- Forfeiture - no use of water for a three year period without legal excuse.
- For a third violation of a condition of a water permit/right such as failure to submit annual irrigation questionnaire.
- Water Management Board must take formal action to cancel a water permit, water right, or vested water right.

This is not intended to answer all questions in regard to obtaining and keeping a water right and may in fact invite more questions. Please don't hesitate to contact the Water Rights Program at (605) 773-3352 or visit us at our web site: [denr.sd.gov](http://denr.sd.gov). We are here to assist you!



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

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

November 20, 2017

Otter Tail Power Company  
c/o Mark Thoma, Manager, Environmental Services  
PO Box 496  
Fergus Falls MN 56538

Dear Mr. Thoma:

Water Permit Application No. 8309-3 for industrial and commercial use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Clear Lake Courier printed at Clear Lake SD (Ph # 605-874-2499) and the Brookings Register printed at Brookings SD (Ph # 605-692-6271). You will need to contact the newspaper(s) and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

Eric Gronlund  
Natural Resources Engineer  
(605) 773-3352

enclosures

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

Instruction to Newspaper - Publish the Notice on November 29, 2017. The applicant is responsible for payment.

---

NOTICE OF APPLICATION NO. 8309-3 to Appropriate Water

Notice is given that Otter Tail Power Company, c/o Mark Thoma, Manager, Environmental Services, PO Box 496, Fergus Falls MN 56538 has filed an application for a water permit to appropriate 12.3 acre-feet of water annually at a maximum pump rate of 0.22 cubic feet of water per second from one well completed into the Altamont Aquifer (679 feet deep) located in the SE 1/4 NE 1/4 Section 22-T113N-R48W for industrial and commercial use. The site is located 1 1/2 miles northwest of Astoria and known as Astoria Station.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8309-3 with qualifications because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <http://denr.sd.gov/public> or contact Eric Gronlund for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by December 11, 2017.

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

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

Steven M. Pirner, Secretary, Department of Environment and Natural Resources. Published once at the total approximate cost of \_\_\_\_\_.



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE SOUTH DAKOTA 57501-3182  
<http://denr.sd.gov>

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT  
APPLICATION NO. 8309-3, Otter Tail Power Company**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 8309-3, Otter Tail Power Company, c/o Mark Thoma, Environmental Services Manager, PO Box 496, Fergus Falls MN 56538.

The Chief Engineer is recommending APPROVAL of Application No. 8309-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 8309-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. The Permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Altamont aquifer.
4. Water Permit No. 8309-3 authorizes a total annual diversion of 12.3 acre feet of water.

See report on application for additional information.

Jeanne Goodman, Chief Engineer  
November 16, 2017



Report to the Chief Engineer  
Water Permit Application No. 8309-3  
Otter Tail Power Company  
October 23, 2017

Water Permit Application No. 8309-3 for Otter Tail Power Company c/o Mark Thoma proposes to appropriate 12.3 acre-feet of water annually at a maximum diversion rate of 0.22 cubic feet per second (cfs) from the Altamont aquifer. The diversion point for this application is one well located in the SE ¼ NE ¼ Section 22 T113N-R48W in Deuel County. The water is for industrial and commercial use at the Astoria Station located in SE ¼ NE ¼ Section 22 T113N-R48W of Deuel County about 1.5 miles northwest of Astoria.

**Aquifer: Altamont aquifer (A)**

**Hydrogeology and Aquifer Characteristics**

The well for this application is screened at 612 to 672 feet below grade. The primary materials in this interval are “sandstone w/ sand layers” from 625 to 646 feet below grade and “sand medium fine” from 646 to 672 feet below grade. A review of the available geologic data for the area indicates the elevation at which this well is screened is too high for it to be bedrock sandstone (SDGS, 2017). The elevation of the screened aquifer materials correlates closest to the basal outwash in the area (SDGS, 2017). Basal aquifers are considered to be glacial outwash aquifers that are in contact with bedrock or are separated from the bedrock by only a thin layer of till. Hedges et al. (1982) applied the name Altamont aquifer to the previous unnamed basal outwash aquifers of the Prairie Coteau region of South Dakota. Identifying the aquifer for this well as Altamont aquifer is also consistent with the work done on the county scale by Kume (1985).

Hedges et al. (1982) estimated the Altamont aquifers collectively underlie in excess of about 1,672,800 acres of Beadle, Brookings, Brown, Clark, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Marshall, Roberts, and Spink Counties and contains in excess of about 7,197,360 acre-feet of recoverable water. In Deuel County, the Altamont aquifer is estimated to underlie about 305,900 acres with an estimated 1,605,900 acre-feet of water in storage (Hedges et al., 1982). Kume (1985) describes the Altamont aquifer throughout most of its extent in Deuel County as a sheet of basal outwash that appears to be continuous but notes that there could be areas where the outwash is not continuous and may not have a hydraulic connection with the rest of the basal outwash. Kume (1985) also maps areas where the basal outwash was not encountered.

The Altamont aquifer has not been subdivided into management units by the Water Rights Program and the Water Management Board. Historically water availability has been reviewed for the entire Altamont aquifer when considering a new application (Water Rights, 2017b). However, more recent reviews have additionally examined water availability in the

aquifer on a more localized scale where information is available and hydrogeologic conditions warrant a more localized review (Water Rights, 2017b). One such example is Hamilton's (1986) Altamont aquifer no. 2 in Clark County. Information is not available to delineate a localized hydrogeologic unit for this application. For the review of this application, water availability will be examined aquifer wide in South Dakota and to offer a localized perspective on water availability for the portion of the Altamont aquifer in Deuel County.

### **South Dakota Codified Law (SDCL) 46-2A-9**

Pursuant to SDCL 46-2A-9, a permit to appropriate water may be issued only if there is a reasonable probability there is unappropriated water available for the applicant's proposed use, the proposed diversion can be developed without unlawful impairment of existing rights, and the proposed use is a beneficial use and in the public interest. This report will address the availability of unappropriated water and potential effects on existing rights from the aquifer that are pertinent to this application.

### **Water Availability**

Water Permit Application No. 8309-3 proposes to appropriate water from the Altamont aquifer for industrial and commercial use. The probability of unappropriated water available from an aquifer can be evaluated by considering SDCL 46-6-3.1 which requires "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source." If the source of the water is older or lower than the Greenhorn Formation and a water distribution system has applied for a permit, the Board need not consider the recharge/withdrawal issue. Here, a water distribution system is not involved and the Altamont aquifer is not older or lower than the Greenhorn Formation, therefore the withdrawal/recharge issue must be considered.

### **Observation Wells**

In determining the availability of unappropriated water for a permit application Administrative Rule 74:02:05:07 requires the Water Management Board to rely on the record of observation well measurements, in addition to other data, to determine that the quantity of water withdrawn annually from the aquifer does not exceed the estimated annual recharge.

The Water Rights Program monitors 31 observation wells completed into the Altamont aquifer (Water Rights, 2017a). Of these, two are located in Deuel County with the remainder in Clark, Spink, and Day Counties. Observation wells in Day, Clark, and Spink Counties primarily show increased to relatively stable water levels when comparing current data to the start of the period of record with fluctuations in response to climatic conditions. Some wells also document seasonal pumping of nearby irrigation wells. Water levels in the observation wells monitoring the aquifer generally increase during wet periods and gradually decrease during dry periods or

remain relatively stable. This indicates that natural conditions dominate the aquifer, and recharge to and natural discharge from the aquifer exceeds pumping. Since recharge to and natural discharge from an aquifer can be captured for pumping, there is a reasonable probability that unappropriated water is available from the Altamont aquifer in South Dakota.

The hydrographs for the Deuel County wells are shown in Figure 1 and 2. These observation wells are under confined conditions. Observation Well R2-96-02 is in close proximity to a well field for a rural water system (Lincoln-Pipestone Rural Water) located in Minnesota with several wells that are likely completed into aquifer materials of a similar elevation to those monitored by observation well R2-96-02 and are identified as Altamont aquifer wells (MNDNR, 2017 and Healy, 2000). R2-96-02 is likely documenting the localized impacts of the rural water system's pumping rather than the overall condition of the aquifer in Deuel County. However, in comparing the early and later portions of the hydrograph for R2-96-02, it appears that the water level in the observation well is in the process of stabilizing.

The hydrograph for observation well DU-73A is expected to be more representative of conditions at the well site for this application. DU-73A has about 300 feet of artesian head pressure. Over the period of record for DU-73A the water level has fluctuated over a range of about 15.52 feet. Water levels in DU-73A declined during a period of time from 1997 to 2003, but have been relatively stable since 2003. If water levels in an aquifer decline over an extended period of time, it may be suggestive of withdrawal exceeding recharge. However, the water levels of DU-73A stabilized rather than continuing to decrease, and water levels in R2-96-02 appear to be in the process of stabilizing indicating that natural conditions dominate the aquifer in the area. This indicates withdrawals from the aquifer have not exceeded recharge. Since recharge to and groundwater outflow from an aquifer can be captured for well withdrawals, this further supports unappropriated water being available in the aquifer.

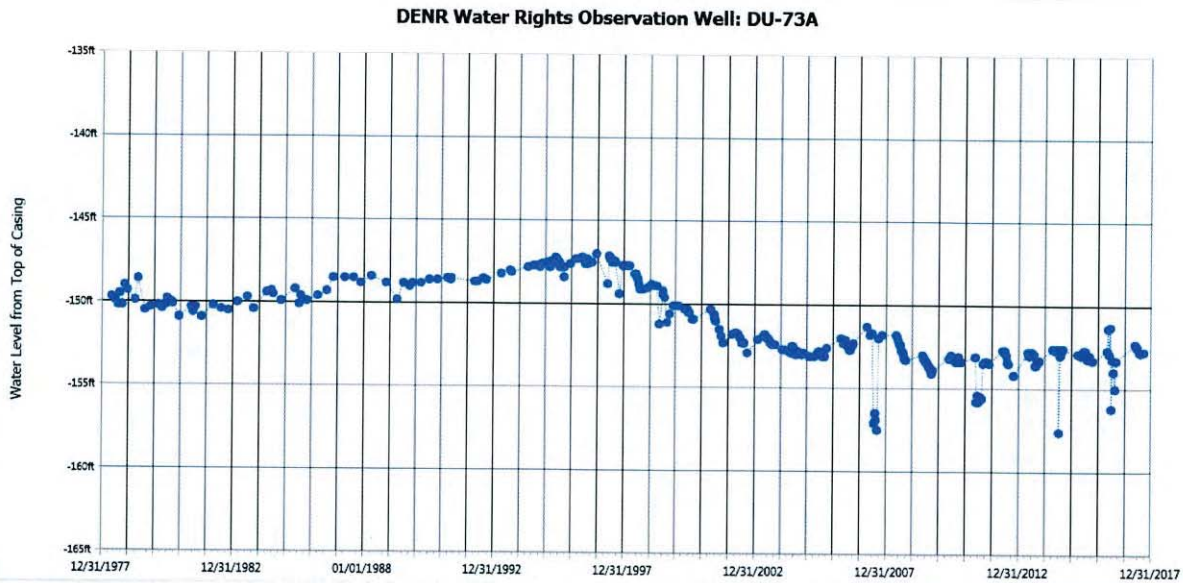


Figure 1: Hydrograph of Observation Well DU-73A located about 6.1 miles northeast (Water Rights, 2017a)

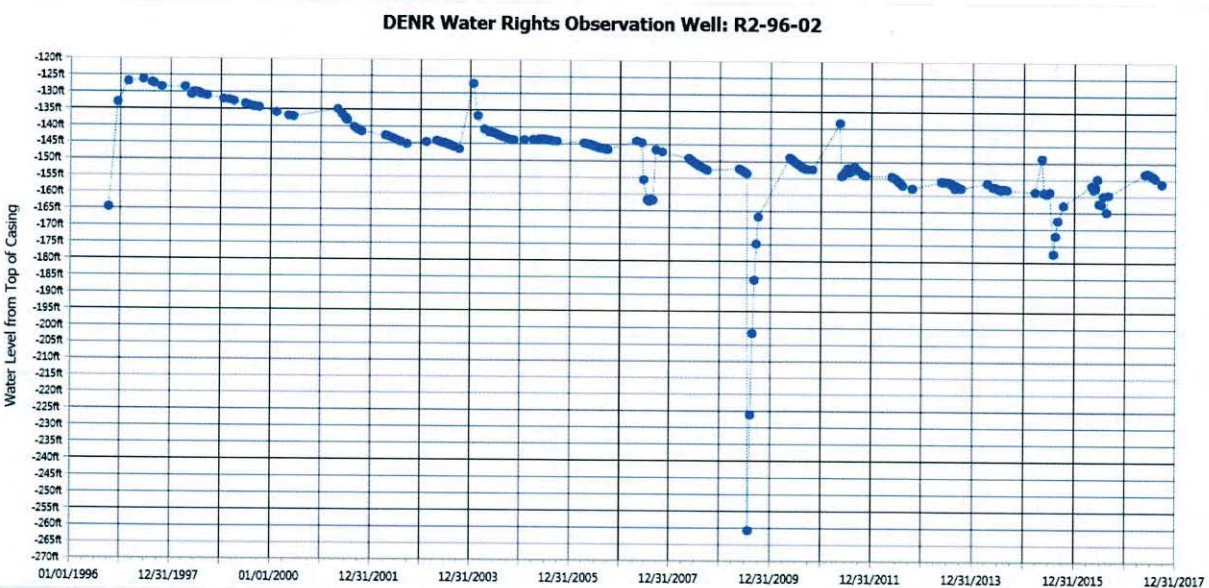


Figure 2: Hydrograph of Observation Well R2-69-02 located about 10.1 miles northeast (Water Rights, 2017a)

## Hydraulic Budget

### Recharge

Recharge to the Altamont aquifer in Deuel County is primarily from lateral groundwater inflow from other counties where the aquifer is closer to ground surface where infiltration of precipitation can more readily occur. A very small amount of recharge may also occur from infiltration of precipitation though the overlaying aquifers and till (Hamilton, 1989). Hedges et al. (1985) estimates average annual recharge to the unconfined portion of the Altamont aquifer at

2.2 inches per year. However for confined aquifers, Hedges et al. (1985) recommended recharge rates of 0.15 to 0.60 inches per year for use by management and development programs. Since the Altamont aquifer is primarily a confined aquifer the recommended recharge range for confined aquifers will be used to examine the hydraulic budget of the Altamont aquifer. There is no estimate of recharge to the Altamont aquifer specifically for Deuel County. Estimated range of average annual recharge to the Altamont aquifer based on the area of Hedges et al. (1982) and the recommended recharge rate for confined aquifers is 20,910 to 83,640 acre-feet per year for the entire Altamont aquifer and for Deuel County the estimated average annual recharge range is 3,824 to 15,295 acre-feet per year.

### *Withdrawals*

Discharge from the Altamont aquifer in Deuel is primarily through groundwater outflow to other counties and well withdrawals (Hamilton, 1989). Hamilton's (1989) map of the potentiometric contours of the Altamont aquifer in Brookings County indicates lateral groundwater inflow from Deuel County into Brookings County. There are currently 74 water rights/permit authorized to appropriate water for the Altamont aquifer and two future use permits (Water Rights, 2017b). Of these, 55 are located in Clark County, 10 in Day County, five in Codington County, three in Spink County, one in Deuel County, one in Grant County, and one in Kingsbury County. Due to their relatively low diversion rates, withdrawals from domestic wells are not considered to be a significant portion of the hydrologic budget. Additionally with the development of rural water in areas where the Altamont aquifer is the uppermost aquifer available, domestic users may have transitioned to rural water since in general rural water provides better water quality than direct use domestic use of the Altamont aquifer.

There are 53 irrigation water rights/permits currently authorized to appropriate water from the Altamont aquifer. Irrigation water rights/permits from the Altamont aquifer are all located in Clark, Day, or Spink Counties. Reported irrigation usage from the Altamont aquifer is shown in Figure 3. Average yearly reported irrigation pumpage for the data in Figure 3 is 2,346 acre-feet per year. Eleven of the water permits for irrigation have been issued relatively recently (since the start of 2012). These recent water permits have authorized the irrigation of 2,158 acres (Water Rights, 2017b). Although these recent irrigation appropriations can be used at rates of up to two feet per acre per year, aquifers in the eastern portion of the state for which the application rate per irrigated acre has been quantified have yielded application rates of less than ten inches per acre per year. Utilizing the historical average combined with an estimated usage of less than ten inches per acre for recent appropriations and assuming that all recently permitted acres will be irrigated results in estimation for irrigation use of less than 4,145 acre-feet per year. It should also be noted that this method is expected to overestimate irrigation use since actual use by the noted recently issued water permits was not excluded from the average of the reported water use.

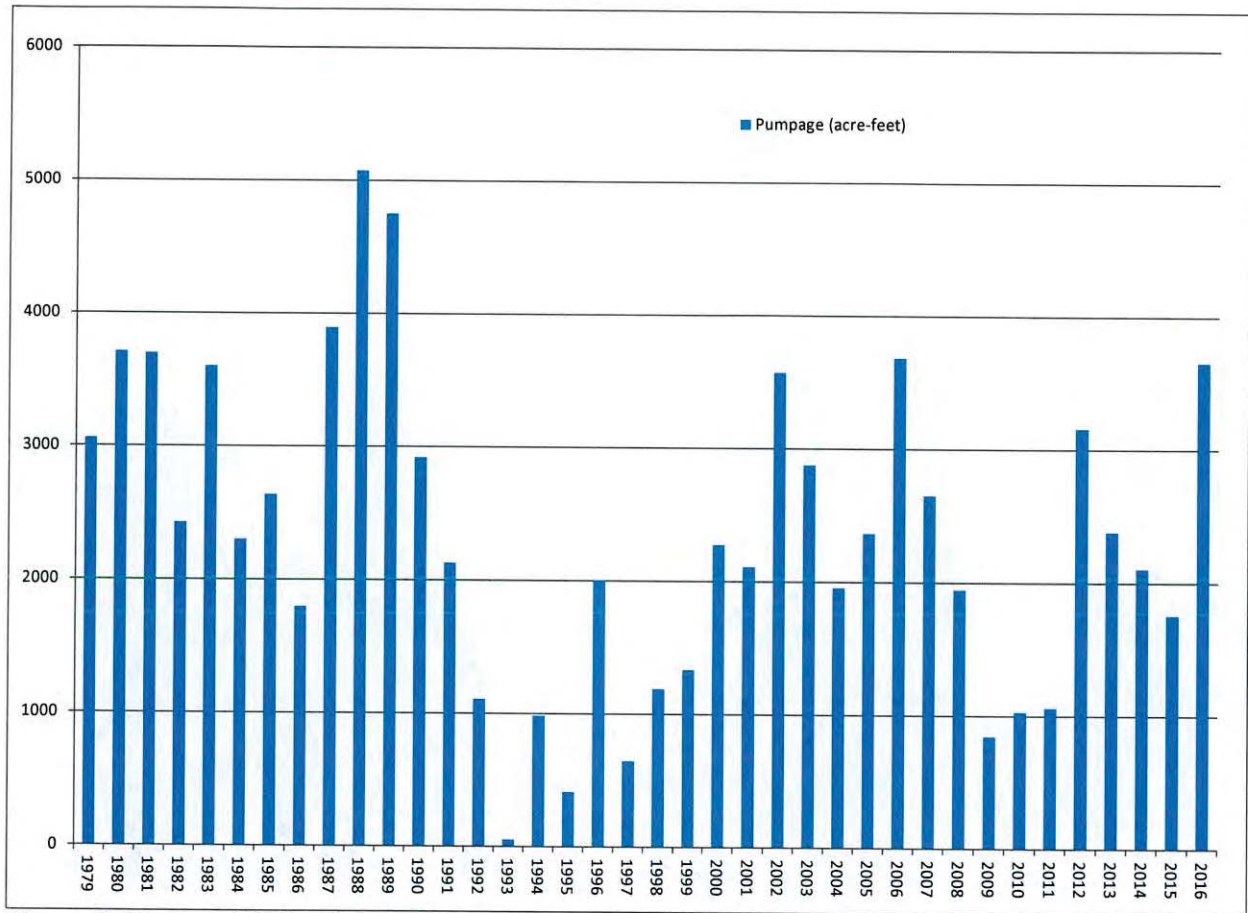


Figure 3: Reported irrigation pumpage by year from the Altamont aquifer (Water Rights, 1980-2017)

There are two future use permits reserving water from the Altamont aquifer for the Towns of Henry (Permit No. 4052-2) and Wallace (Permit No. 4054B-3); however both communities are on rural water so full development of these permits is unlikely (Drinking Water, 2016). However for estimating water use for future use permits it is assumed that future use permits will be fully developed, therefore estimated water use for these permits is 881 acre-feet per year. Historically, average water use by non-irrigation appropriations limited by instantaneous diversion rate has been less than 60% of full time pumping at the permitted diversion rate. The Cities of Arlington, Roslyn, Bristol, and Clark all obtain their water from rural water systems (Drinking Water, 2016). Therefore, water use under these water rights is expected to be minimal with the water right maintained primarily for emergency purposes (i.e. backup or fire protection). Estimated average annual water use for the remaining non-irrigation water rights/permits is estimated to be less than 2,364 acre-feet per year. Therefore, average non-irrigation annual appropriative withdrawals from the aquifer are estimated to be less than 3,245 acre-feet per year.

### *Balance*

Total average annual appropriative water use from the Altamont aquifer is estimated to be less than 7,390 acre-feet per year. Estimated average annual recharge to the aquifer is 20,910 to 83,640 acre-feet per year. Therefore, there is a reasonable probability that unappropriated water is available in the Altamont aquifer for the appropriation proposed by this application.

On a county scale the only water right currently authorized to appropriate water from the Altamont aquifer in Deuel County is Water Right No. 451-3 for the City of Brandt. The City of Brandt appears to be primarily served by individual connections to Brookings-Deuel Rural Water (Friedeman, 2017). Sixty percent usage of the maximum instantaneous diversion rate authorized by this water right would be about 56 acre-feet per year. However, in reviewing the file for Water Right No. 451-3 a well depth of 60 feet is documented (Water Rights, 2017b); given the available geologic information a well completed into the basal outwash (Altamont aquifer) in that area would be expected to be closer to 550 to 650 feet in depth (SDGS, 2017; Kume, 1985; Kume, 1976; Tomhave and Schulz, 2004). Since Water Right No. 451-3 is an older water right, information on the well for the water right is fairly limited; however assuming the well depth of 60 feet is correct this well is likely completed into an Unknown management unit of the Pleistocene series or an aquifer of the Prairie Coteau and not the Altamont aquifer (Water Rights, 2017b; SDGS, 2017; Kume, 1985; Kume, 1976; Tomhave and Schulz, 2004). For Deuel County, the estimated average annual recharge range is 3,824 to 15,295 acre-feet per year. This application is proposing an annual appropriation of 12.3 acre-feet. Therefore, there is a reasonable probability that unappropriated water is available in the Altamont aquifer in Deuel County for the appropriation proposed by this application.

### **Existing Users**

The approximate well location for this application and the nearest water right are shown in Figure 4. The diversion point for Water Right No. 451-3 held by the City of Brandt is located about seven miles to the northwest of the well this application propose to utilize. As previously discussed, the well may not be completed into the Altamont aquifer. The next closest South Dakota Water Right authorized to withdraw from the Altamont aquifer is Water Right No. 1490-3 for the Town of Revillo located about 30 miles to the north. A review of area well completion reports on file with the Water Rights Program within five miles of the well location for this application indicates wells completed into shallower glacial aquifers rather than the Altamont aquifer (Water Rights, 2017c). There are farm sites within one mile that could potentially have wells completed into the Altamont aquifer. However, the depth and poor water quality of the Altamont aquifer would make either shallower aquifers, if available, or rural water systems more appealing as a water supply.



Figure 4: Map of area including water rights/permits in South Dakota currently authorized to appropriate water from the Altamont aquifer and Water Rights observation wells currently monitoring the Altamont aquifer (Water Rights, 2017b and Water Rights, 2017a)

The exact amount of drawdown as the result of pumping due to this proposed diversion cannot be quantified without more extensive aquifer testing. Since the aquifer is under confined conditions in the area of the well, some amount of drawn down from pumping is expected. However, given the amount of artesian head pressure in the Altamont aquifer at this well location (approximately 340 feet) the diversions under this permit, if approved, would not be expected to adversely impact adequate wells or existing water rights in the area.

The Water Management Board has promulgated rules that allow water to be placed to maximum beneficial use without the necessity of maintaining artesian head pressure for domestic use. Administrative Rule of South Dakota (ARSD) 74:02:04:20(7) defines an adversely impacted domestic well as “a well in which the pump intake was set at least 20 feet below the top of the aquifer at the time of construction or, if the aquifer is less than 20 feet thick, is as near to the bottom of the aquifer as is practical and the water level of the aquifer has declined to a level that the pump will no longer deliver sufficient water for the well owner's needs.” In the case of Water Permit Application No. 2313-2 for the Coca-Cola Bottling Company of the Black Hills, the Water Management Board adopted findings that noted that if the increased costs or decreased production as a result of the impacts of legitimate users on artesian head pressure could be considered an adverse impact it would conflict with SDCL 46-1-4 (Water Rights, 1995). SDCL



46-1-4 requires the water resources of the state be put to beneficial use to the maximum extent of which they are capable (Water Rights, 1995).

### **Historical Notes**

Several of the past applications for Otter Tail Power Company have been contested. The most recent was now cancelled Water Permit No. 6846-3 for the Veblen aquifer in Grant County (Water Rights, 2017b). Previously contested applications have been for large annual withdrawals, in the case of now cancelled Water Permit No. 6846-3 “a maximum annual withdrawal from ground water of 10,000 acre-feet of water with a total volume beneficial use not to exceed 4,700 acre-feet of water annually averaged on a rolling 20 period” (Water Rights, 2017b). In the case of this application Otter Tail Power Company is requesting to appropriate 12.3 acre-feet of water annually from the Altamont aquifer.

There is also a history of concern involved with the noted Burr wellfield of the Lincoln-Pipestone Rural Water System in Minnesota. The concern centered on the possibility that pumping by the rural water system may impact the water levels of Lake Cochrane. Water level monitoring and management planning over this concern are focused primarily on the shallower Prairie Coteau aquifer in the area (Healy, 2000 and USDA, 1999). The aquifer that this application is proposing to appropriate water from is the Altamont aquifer.

In Clark County, there have been multiple concerns regarding water rights appropriating water from the Altamont aquifer. These are primarily tied to impacts of a well or wells impacting other wells, surface waters, or springs (Buhler, 2014). None of these resulted in a determination of adverse impact as a result of pumping (Buhler, 2014). Springs with the Altamont aquifer as a water source are typically the result of downward sloping terrain along the edge of the Coteau Des Prairies incising area aquifers. The well location for this application is not in close proximity to a downward sloping edge of the Coteau Des Prairies, and the static water level for this well is not above ground surface.

### **Conclusions**

1. Water Permit Application No. 8309-3 for Otter Tail Power Company proposes to appropriate 12.3 acre-feet of water annually at a maximum diversion rate of 0.22 cfs from the Altamont aquifer for industrial and commercial use at the Astoria Station. The diversion point for this application is one well located in the SE  $\frac{1}{4}$  NE  $\frac{1}{4}$  Section 22 T113N-R48W.
2. There is a reasonable probability that unappropriated water is available in the Altamont aquifer for this application.
3. There is a reasonable probability that this application, if approved, will not adversely impact adequate domestic wells or existing water rights/permits.



Whitney Kilts

SD DENR-Water Rights Program

## References

- Buhler, K. 2014. Report to the Chief Engineer on Water Permit Application No. 8026-3. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.
- Drinking Water Program. 2016. Drinking Water System Information. SD DENR-Drinking Water Program Online Database. Accessed November 11, 2017.  
<http://denr.sd.gov/des/dw/sysinfomap.aspx>.
- Friedeman, B. 2017. Environmental Scientist. SDDENR-Drinking Water Program, Pierre, SD. Personal Communication. October 30, 2017.
- Kume, J. 1976. Major Aquifers on Deuel and Hamlin Counties, South Dakota. Information Pamphlet No. 11. South Dakota Geological Survey. Vermillion, SD.
- Kume, J. 1985. Water Resources of Deuel and Hamlin Counties, South Dakota. Water-Resources Investigations Report 84-4069. USGS. Huron, SD.
- Hamilton, L.J. 1986. Geology and Water Resources of Clark County, South Dakota; Part II: Water Resources. South Dakota Geologic Survey Bulletin 29. Vermillion, SD.
- Hamilton, L.J. 1989. Water Resources of Brookings and Kingsbury Counties, South Dakota. Water-Resources Investigations Report 88-4185. USGS. Huron, SD.
- Healy, D. B. 2000. Burr Water Source: 2000 Water Resource Management Plan. Lincoln Pipestone Rural Water. Lake Benton, MN.
- Hedges, L.S., Burch, S. L., Iles, D. L., Barari, R. A., and Schoon, R. A. 1982. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota, and Iowa. Task 3: Ground-Water Storage. U.S. Army Corps of Engineers Contract DACW 45-80-C-0185.
- Hedges, L.S., Allen, J. and Holly, D.E. 1985. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota, and Iowa. Task 7: Ground-Water Recharge. U.S. Army Corps of Engineers Contract DACW 45-80-C-0185.

- MNDNR. 2017. Minnesota Water Use Data-ArcGIS Layer. Minnesota Department of Natural Resources-Water Appropriations Permit Program. Accessed October 2017. <[http://www.dnr.state.mn.us/waters/watermgmt\\_section/appropriations/wateruse.html](http://www.dnr.state.mn.us/waters/watermgmt_section/appropriations/wateruse.html)>.
- SDGS. 2017. South Dakota Geological Survey Lithologic Logs Database. Accessed October 2017. <<http://cf.sddenr.net/lithdb/>>.
- Tomhave, D. W. and Schulz, L. D. 2004. Bedrock Geologic Map Showing Configuration of the Bedrock Surface in South Dakota East of the Missouri River.
- USDA. 1999. Environmental Impact Statement Lincoln-Pipestone Rural Water Existing System North/Lyon County Phase Northeast Phase Expansion. United States Department of Agriculture Rural Utilities Service and Environmental Protection Agency.
- Water Rights. 1980-2017. 1979-2016 Irrigation Questionnaire Data: SD DENR-Water Rights Program, Joe Foss Building, Pierre, South Dakota.
- Water Rights. 1995. Water Rights File No. 2313-2 Coca-Cola Bottling Company of the Black Hills. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2017a. Observation Well Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.
- Water Rights. 2017b. Water Right/Permit Files. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2017c. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.