

WATER PERMIT NO. 7930-3

Name of Applicant: **James M Rand**

Address: **27871 452nd Ave, Parker SD 57053** Phone: **605 941-9873**

Amount of Water Claimed: **1.89 cfs** Total Acres: **162 acres**

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

Water to be used for: **irrigation** County: **Turner**

Type of Waste Disposal System:

Location: **3 miles southwest of Parker**

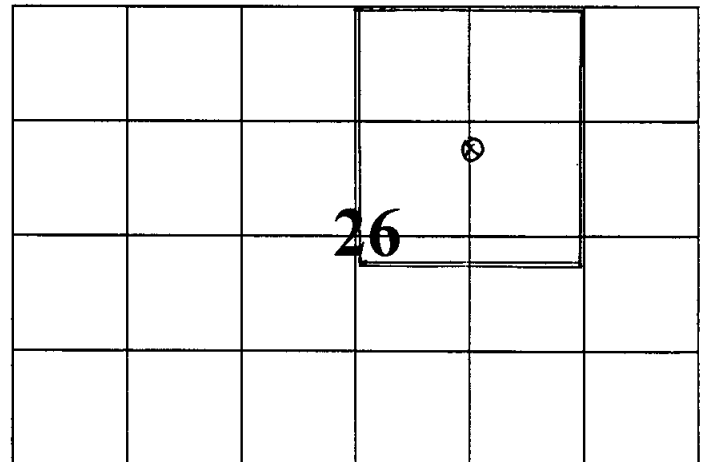
PRIORITY Date Received: **12-2-13** Application/License Fee: **\$ 1050**

Corrected Application Received: Period of Annual Use: **May 1 – Septemer 30**

Remarks:

Diversion Point: **S 1/2 NE 1/4 Sec 26-T99N-R54W**

Land to be Irrigated: **NE 1/4, N 1/2 SE 1/4 Sec 26-T99N-R54W**



Depth of Well: **168 feet deep**

Well Driller: **Steffl Drilling & Pump Inc.**

Remarks:

Type of Map: **aerial**

Prepared by:

Reviewed and the Number Assigned on: **12-2-13**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

Nov - 26

Mail to: PMB 2020 DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>7930-3</u> (office use only)	Hydrologic Unit <u>10170102</u>
	Basin <u>Vermillion River</u>	<u>605-297-4419</u>
	Newspaper <u>New Era, Box 579, Parker, SD 57053</u>	<u>605-331-2200</u>
	<u>Argus Leader, Box 5034, 57117</u>	

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Application For Permit To Appropriate Water For Irrigation

Type of Application: ☒ New ☐ Vested Right ☐ Amendment/Correction to Permit No. _____
(Use predates Mar 2, 1955)

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.) _____

1. Name to Appear on Irrigation Permit James M. Rand
(check one) ☒ Owner ☐ Tenant/lessee ☐ Owner's Legal Agent _____
(name and complete address if different than above name)
- Mailing Address 27871 452nd Ave Parker SD 57053-5603
(Address) (City) (State) (Zip Code)
- Home Phone 605 297-3683 Cell 605-941-9873 Email _____
2. Amount of water claimed 1.89 *CFS or 850 **GPM ***AF Total Acreage 162 A
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)
3. Source of water supply well
4. Location of point of diversion one well 200' from center in the SE 1/4 of the NE 1/4 Sec 26
(example - 3 wells in SW 1/4 NE 1/4 section 12-T104N-R53W) 43 22 02.0N 97 11 10.3 W E 1/4 1366 (SE 1/4 NE 1/4) County Turner T99N-R54 W
5. County or counties where water will be used Turner
6. Annual period during which water is to be used May 1 - Sept 30
7. List below each forty acre division, or lot, or fraction thereof and show number of acres to be irrigated in each.
(Attach sheet if more space is needed)

Land Description	Acres	Land Description	Acres
NE 1/4 of the NE 1/4 of Sec 26 99-54	38	NE 1/4 of the SE 1/4 sec 26 99-54	5
SE 1/4 of the NE 1/4 of Sec 26 99-54	38	NW 1/4 of the SE 1/4 Sec 26 99-54	5
NW 1/4 of the NE 1/4 of Sec 26 99-54	38		
SW 1/4 of the NE 1/4 of Sec 26 99-54	38		

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

I, James M. Rand James M Rand, the applicant, certify that I have read this application, have examined the attached map, and that the matters stated are true.

**SOUTH DAKOTA
WATER PERMIT NO. 7930-3**

Date of first receipt of application December 2, 2013.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 7930-3 to James M Rand, 27871 452nd Ave, Parker SD 57053 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. 7930-3 appropriates 1.89 cubic feet of water per second from one well to be completed into the Pleistocene Unknown Aquifer (168 feet deep) located in the S 1/2 NE 1/4 Section 26 for irrigation of 162 acres located in the NE 1/4, N 1/2 SE 1/4 Section 26; all in T99N-R54W.
2. The amount of the appropriation may not exceed 2 acre feet annually for each acre of land to which water is actually and beneficially applied for irrigation. The water is to be used during the following described annual period: May 1 – September 30.
3. The date from which applicant may claim right is December 2, 2013.
4. The date of approval of Permit No. 7930-3 is January 5, 2015.
5. One-fifth of the construction is to be completed on or before July 5, 2017.
6. All construction is to be completed on or before January 5, 2020.
7. Water is to be put to beneficial use on or before January 5, 2024.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. The well approved under Permit No. 7930-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 7930-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

WATER MANAGEMENT BOARD

By: Jeanne Goodman

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

FEB 17 2015

date



Supplemental Information

(type or print)

1. Well Information (check one or both as applicable) ☒ Drilling new well(s) ☐ Using existing well(s)

a) If new wells, how many 1 Have test holes been drilled ☒ Yes ☐ No Drilled by Ste ffl Drilling
(if yes, please provide copies of logs)

b) If existing wells, how many Provide copy of log(s), if available. Drilled by

c) Well Depth 168 Depth to Top of Water Bearing Material 145 Depth to Water from Surface 112 ft

d) Distance to nearest existing domestic well:

On applicant's property none On property owned by others 2600

2. Wastewater Disposal System Information

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

b) System Capacity (gallons) Year Constructed

c) Connected to the City of Sanitary System

3. Dugout Information

a) Surface Dimensions Depth

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

4. Water Storage Dams

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

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

b) Freeboard

c) Crest Width

Crest Length

d) Height

e) Primary Outlet Capacity

If pipe, diameter

f) Secondary Spillway Capacity

Spillway Width

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

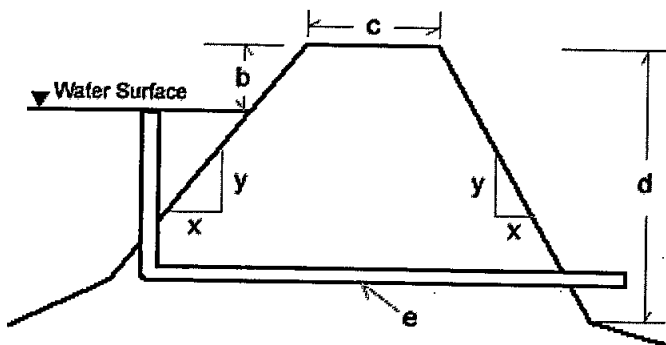
Upstream

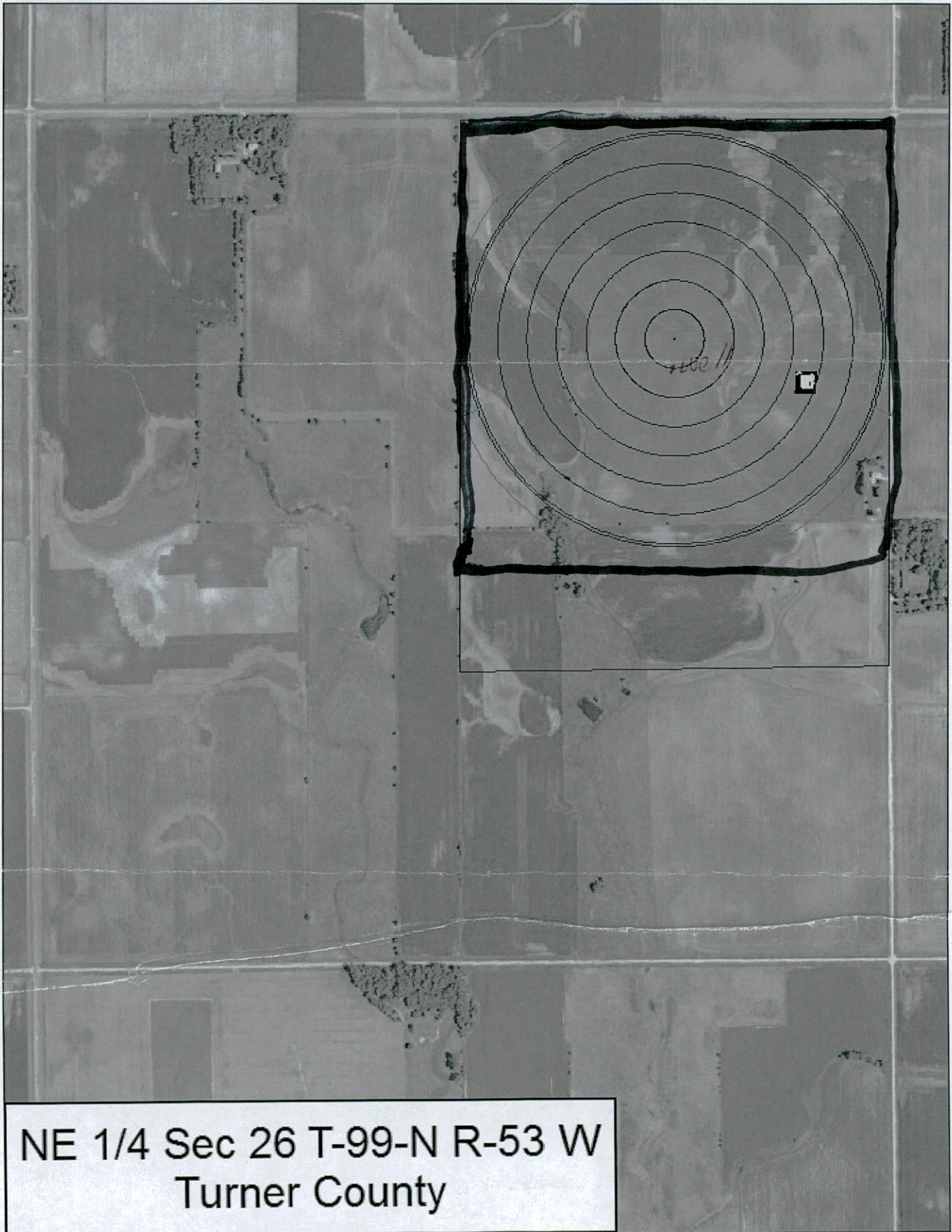
Downstream

h) Surface Area of Impoundment

i) Storage Acre Feet

j) Drainage Area Above Dam Acres





NE 1/4 Sec 26 T-99-N R-53 W
Turner County

Data use subject to license.

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Data Zoom 14-4



Sec 15
T099N
R54W

Sec 14
T099N
R54W

Sec 13
T099N
R54W

Sec 18
T099N
R53W

276 ST

450 AVE

Sec 22
T099N
R54W

Sec 23
T099N
R54W

Sec 24
T099N
R54W

Sec 19
T099N
R53W

452 AVE

277 ST

Turner

Sec 27
T099N
R54W

Sec 26
T099N
R54W

Sec 25
T099N
R54W

Sec 30
T099N
R53W

451 AVE

278 ST

Hurley Creek

Sec 34
T099N
R54W

Sec 35
T099N
R54W

Sec 36
T099N
R54W

Sec 2
T098N
R54W

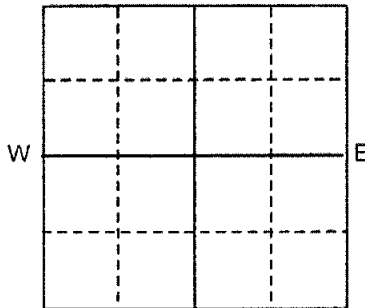
Sec 1
T098N
R54W

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW 1/4 NE 1/4 Sec 26 Twp 99 Rg 54County Turner

North

Please mark well
location with an "X"

Well Completion Date

November 18, 2013

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

PROPOSED USE:

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

METHOD OF DRILLING:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	147.0 FT	17.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Quick Grout	37	Lb/gal	0.0 Ft	137.0 Ft
Red Flint	30	Lb/gal	137.0 Ft	168.0 Ft

Describe grouting procedure
Tremmie

SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 12.00 Inches Length 21.0 FeetMaterial Stainless SteelSlot Size 90 Set From 147.0 Feet to 168.0 Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How? _____

☐ No, Why Not? _____
Lab to which water
quality sample sent for analysis _____Well Owner: Jim Rand

Business Name: _____

Address: 27871 452nd AveCity, State, Zip: Parker SD 57053

WELL LOG:

		DEPTH	
FORMATION		FROM	TO
Top Soil	Blk	0	1
Clay	Ylw	2	32
Clay	Blu	32	145
Sand	Blu	145	168

STATIC WATER LEVEL 112.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: _____☐ Bailed☐ Other

Pumping Level Below Land Surface

130.2 Ft. After 6.0 Hrs. pumped 930.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

Production Well # 2, Test Hole #4

43 22 02.0N

10 Hrs Air Development

97 11 10.3W

Elev 1366

This well was drilled under license # 463 and this
report is true and accurate.Drilling firm: Steffl Drilling & Pump Inc / Kris VanHueveln

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

Date: _____

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South Dakota Department of Environment and Natural Resources

Date 12/2, 20 13

RECEIVED OF Rand Farms 27871 452nd Ave Parker SD 57053

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

Fee for Application for Permit No. <u>7930-3</u> to Appropriate Water, to construct and to put water to beneficial use	850	00
Fee for Application for Permit No. _____ to Appropriate Water for Future use		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>7930-3</u>	200	00
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____		
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law) TOTAL	1050	00

No. **06499**

By

Jeanne Goodman
Chief Engineer

Water Rights Program - DENR
Conversation File Documentation

NAME OF PERSON OR FILE: Water Permit Application No. 7930-3, James Rand

ADDRESS: 27871 452nd Avenue, Parker SD 57053 COUNTY: Turner County

DATE: December 3, 2013 TELEPHONE: 605 941-9873

RE: Range designation on submitted map

I contacted Mr. Rand to clarify the Range designation on his application. The application states the Range as "R54W" but the map has it listed as "R53W". Based on the FSA aerial it appears that R54W is correct and the local FSA office erred in the legal on the map. Mr. Rand checked his plat book and confirmed the R54W is correct.

NAME: Eric Kunkel



**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

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



**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 7930-3, James M Rand**

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. 7930-3, James M Rand, 27871 452nd Avenue, Parker SD 57053.

The Chief Engineer is recommending DEFERRAL of Application No. 7930-3 for up to one year for the applicant to provide more information necessary to adequately determine if there is unappropriated water available and if the potential effect of pumping at the proposed well site will adversely impact existing water users which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued. This will entail further delineation of the aquifer and/or a 72-hour aquifer pump test including monitoring wells to aid in the evaluation of this aquifer.

See report on application for additional information.

Jeanne Goodman, Chief Engineer
February 4, 2014

NOTE: Failure to provide this additional information within one year will result in the application being brought before the Water Management Board for denial. For further explanation on what is necessary for DENR to evaluate this application, please contact Adam Mathiowetz or Ken Buhler at (605) 773-3352.

REPORT TO THE CHIEF ENGINEER
ON
WATER PERMIT APPLICATION NO. 7930-3
JAMES M. RAND
FEBRUARY 04, 2014

Water Permit Application No. 7930-3 proposes to appropriate water at a maximum diversion rate of 1.89 cubic feet of water per second (cfs) from one well to be completed into the Pleistocene Series: Unknown aquifer. The well is to be 168 feet deep and is located in the S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 26 for the irrigation of 162 acres located in the NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 26; all in T99N-R54W in Turner County.

AQUIFER: Pleistocene Series: Unknown (PS: U)

AREA HYDROGEOLOGY:

The test well log submitted with this application identified a glacial aquifer (sand and gravel) from 145 to 168 feet below grade. Hydrologic investigations (Lindgren and Hansen, 1990) did not identify an outwash deposit of sufficient size to map at the location and depth of this proposed application. The test well had a static water level of 112 feet below ground surface in November 2013. The test well log submitted with this application stated that it was pumped at 930 gallons per minute for six hours and had a water level decline from 112 feet to 130.2 feet below grade.

In the area of the proposed well site there are several known and mapped aquifers. The best information currently available indicates that the nearest portion of the Upper Vermillion Missouri and Parker-Centerville aquifers are approximately three miles southeast, and the Vermillion West Fork aquifer is approximately 1.5 miles northeast (Jarrett, 1986; Lindgren and Hansen, 1990; SDGS, 2014; Water Rights, 2014a; Water Rights, 2014c). The Niobrara aquifer likely underlies this outwash deposit (Lindgren and Hansen, 1990).

The Pleistocene Series: Unknown is a generic name for an aquifer of glacial origin that cannot be included in a previously mapped aquifer. Historically, the Water Management Board has approved water permit applications to appropriate water from these Pleistocene Series: Unknown aquifers. In interpreting 46-6-3.1, the First Judicial Circuit Court ruled in *Hanson County Dairy v. Bender* that evidence needs to show that water is available for proposed appropriations. In other words, data must be presented to show the average annual recharge exceeds the average annual discharge by at least the amount requested by the water permit application being considered (Memorandum Decision, April 11, 2012). This could be interpreted as necessitating the identification and quantification of recharge and discharge of an individual aquifer material deposit from which the applicant proposes to withdraw water.

To determine this information, the areal extent and altitude interval of the individual outwash deposit must be identified. This individual outwash deposit has not been previously mapped. To map the areal extent and determine the elevation of the outwash lithologic logs, DENR-Water Rights observation well logs, and water well completion reports filed with the DENR-Water Rights Program were considered (SDGS, 2014; Water Rights, 2014a; Water Rights, 2014c). The

top of the outwash deposit ranges from approximately 1,250 to 1,270 feet above mean sea level (msl) and ranges from 20 to 25 feet thick. That elevation range is approximately 135 feet to 170 feet below grade over the area of this outwash deposit. This deposit primarily lies in a channel incised into the bedrock (Niobrara Formation), as shown in Figure 1. At this time there is not sufficient information to delineate the aquifer. However, available information suggests the aquifer likely ranges from 1,800 to 2,400 acres in areal extent. Figure 1 shows a map of the area including all of the DENR-Geological Survey Lithologic Logs (SDGS, 2014) and all of the well completion reports on file with the DENR-Water Rights Program (Water Rights, 2014c).

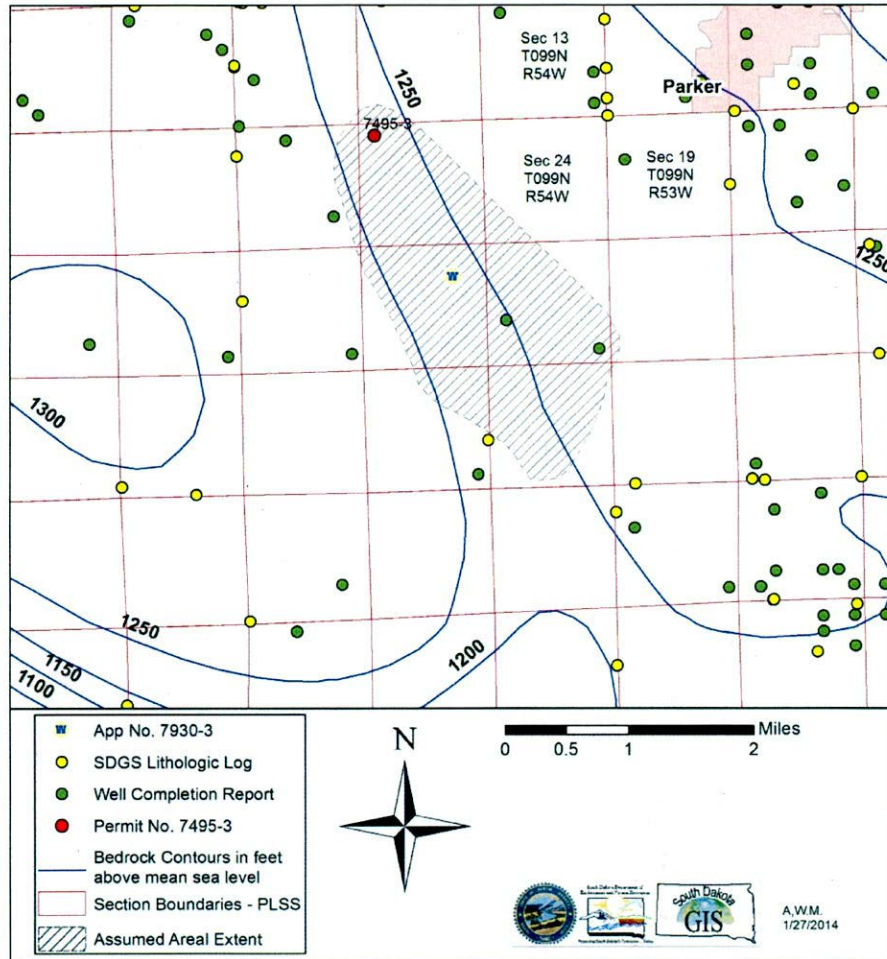


Figure 1- Map of the area around Application No. 7930-3

Although test hole logs submitted with Water Permit Application No. 7495-3 identified sand and gravel deposits, the information available at the time implied a Niobrara water source. The permit application was approved for diversion from the Niobrara.

It is probable that this outwash deposit is hydraulically connected to the Niobrara aquifer. It is also possible that this outwash deposit is connected to a large outwash body, formerly mapped as a portion of the Upper Vermillion Missouri aquifer, which is currently under study. The elevation of the static water level in the test well is approximately 15 feet lower than would be

top of the outwash deposit ranges from approximately 1,250 to 1,270 feet above mean sea level (msl) and ranges from 20 to 25 feet thick. That elevation range is approximately 135 feet to 170 feet below grade over the area of this outwash deposit. This deposit primarily lies in a channel incised into the bedrock (Niobrara Formation), as shown in Figure 1. At this time there is not sufficient information to delineate the aquifer. However, available information suggests the aquifer likely ranges from 1,800 to 2,400 acres in areal extent. Figure 1 shows a map of the area including all of the DENR-Geological Survey Lithologic Logs (SDGS, 2014) and all of the well completion reports on file with the DENR-Water Rights Program (Water Rights, 2014c).

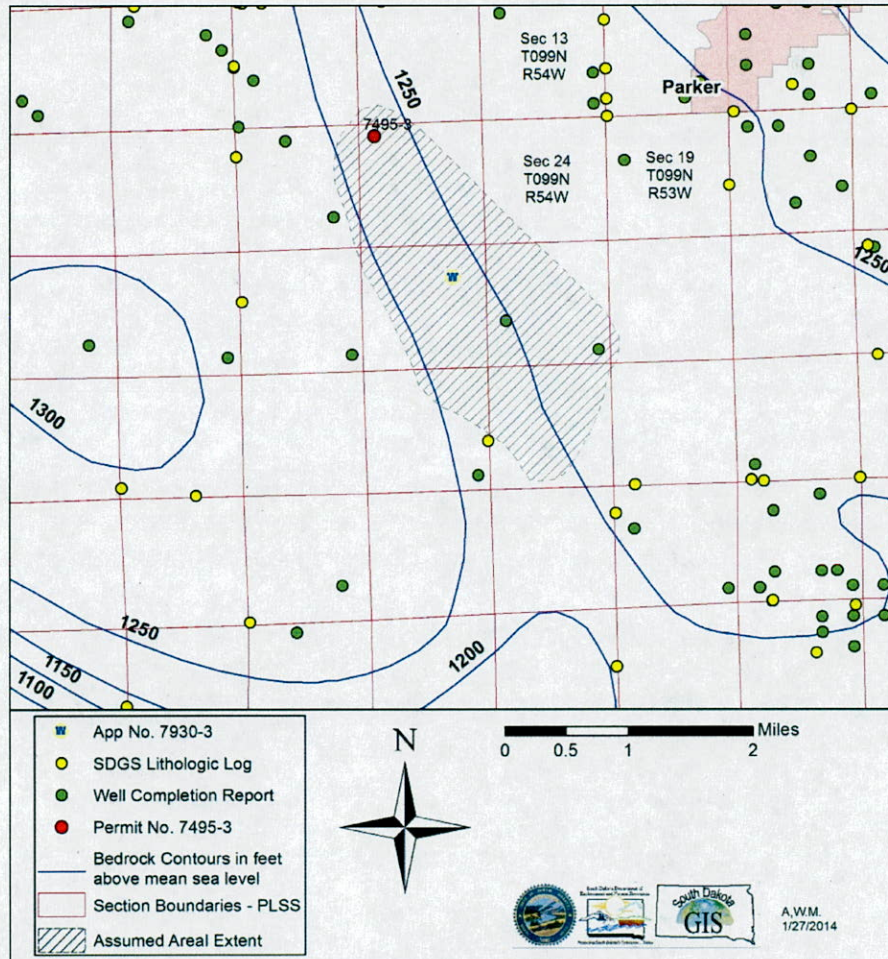


Figure 1- Map of the area around Application No. 7930-3

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It is probable that this outwash deposit is hydraulically connected to the Niobrara aquifer. It is also possible that this outwash deposit is connected to a large outwash body, formerly mapped as a portion of the Upper Vermillion Missouri aquifer, which is currently under study. The elevation of the static water level in the test well is approximately 15 feet lower than would be

expected of a well completed into the Niobrara aquifer in the same area. The aquifer is under confined conditions at the proposed well site.

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

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

WATER AVAILABILITY:

This application proposes to appropriate water from the Pleistocene Series: Unknown aquifer. Actual water use, if this application is approved, will likely be less than 324 acre-feet annually (ac-ft/yr). The probability of unappropriated water available from the aquifer can be evaluated by considering SDCL 46-6-3.1, which requires "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source." If the source of the water is older or lower than the Greenhorn Formation and a public water system has applied for a permit, the Board need not consider the recharge/withdrawal issue. In this case, the aquifer is not stratigraphically lower than the Greenhorn Formation and the applicant is not a public water system.

Hydrologic Budget:

Recharge:

Recharge to this outwash deposit is likely through infiltration of precipitation and inflow from the Niobrara aquifer. However, the recharge to this outwash deposit has not been quantified. The Upper Vermillion Missouri aquifer is characteristically and geographically similar to this outwash deposit. Hedges and others (1985) estimated recharge to the Upper Vermillion Missouri aquifer to be 0.25 inches per year (in/yr) using a regional flow net analysis. Buhler (2012b) performed another flow net analysis for the Upper Vermillion Missouri aquifer and calculated a recharge rate of 0.34 in/yr. That would be an annual recharge rate between 37.5 and 68 ac-ft/yr, although, due to the likely hydraulic connection to the Niobrara aquifer, any pumping from this outwash may induce recharge from the Niobrara aquifer.

Discharge:

Discharge from this outwash likely occurs through domestic well pumping and outflow to adjacent till. There are no appropriative rights authorizing the withdrawal of water from this outwash deposit (Water Rights, 2014b). There is one domestic well on file with the SD DENR-Water Rights Program that is likely completed into this outwash deposit (Water Rights, 2014c).

Hydrologic Budget:

The estimated annual recharge rate to this outwash deposit is between 37.5 to 113.3 ac-ft/yr. The application proposes to appropriate 324 ac-ft/yr to irrigate 162 acres. Assuming the maximum recharge and assuming that all of the recharge could be pumped under this application, this

would allow the application to apply approximately five inches of water per year per acre (in/yr/ac). A range of application rates for three different aquifers, the Floyd: Pearl Creek, the Tulare: East James, and the Tulare: Western Spink/Hitchcock, was determined to be 7.61 to 9.44 in/yr/ac (Buhler, 2012a; Buhler, 2013a; Buhler, 2013b). While the three aquifers range from approximately 80 to 100 miles northwest of this outwash deposit, the climate is not that different. More information, whether that is drilling more test holes to further delineate the aquifer or a 72-hour aquifer test being conducted, is required to determine if this outwash deposit can support the proposed appropriation.

The recharge rate and discharge due to withdrawals have not been quantified for this outwash deposit. From the best information reasonably available, the probability of annual withdrawals exceeding average annual recharge of this deposit of the Pleistocene Series: Unknown aquifer cannot be determined. Therefore, the probability of unappropriated water available from the Pleistocene Series: Unknown aquifer cannot be evaluated.

Observation Well Data:

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

The DENR-Water Rights Program does not monitor any observation wells completed into this outwash deposit. If a 72-hour aquifer test is conducted, one of the observation wells used for the aquifer test should be given to the DENR-Water Rights Program for future aquifer monitoring.

EXISTING WATER RIGHTS:

There are no appropriative water rights/permits authorized to withdraw water from the outwash deposit (Water Rights, 2014b). Water Permit No. 7495-3 is authorized to withdraw water from the Niobrara aquifer, not the proposed deposit of the Pleistocene Series: Unknown. Therefore, pumping at the proposed well site is not likely to have an adverse impact on the well authorized by Water Permit No. 7495-3. There is one domestic well on file with the SD DENR-Water Rights Program that is likely completed into this outwash deposit (Water Rights, 2014c). The domestic well is approximately 1.3 miles southeast of the proposed well site.

Since this outwash deposit is under confined conditions, drawdown may extend some distance from the pumped well. It may be possible that drawdown from this proposed diversion may be measurable in nearby domestic wells. Due to the limited areal extent of the aquifer, pumping at the proposed diversion rate may dewater a portion of the aquifer. If this were to occur, it would be considered an adverse impact. However, the impact of drawdown cannot be adequately defined without aquifer testing.

SDCL 46-6-6.1 does not protect artesian head pressure as a means of delivery and the Water Management Board has consistently recognized that to place water to maximum beneficial use a certain amount of drawdown may occur. To balance interests between irrigation use and delivery of water by artesian pressure, the Water Management Board defined an “adversely impacted domestic well” in ARSD 74:02:04:20(7) as:

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

Depending on the specific characteristics of this deposit of the Pleistocene Series: Unknown aquifer at the well site proposed by this application, some existing well owners may need to lower their pumps to accommodate for deeper water levels. The potential for adverse or unlawful impairment of existing users due to the development of the proposed diversion cannot be determined because sufficient information is not currently available to accurately appraise the characteristics of this outwash deposit at the proposed well site. An aquifer pump test, including monitoring wells, may need be conducted to aid in the evaluation of this aquifer to allow for the consideration of the availability of unappropriated water from the aquifer and the potential impacts to existing users as required by SDCL 46-2A-9.

CONCLUSIONS:

1. Water Permit Application No. 7930-3 proposes to appropriate water at a maximum diversion rate of 1.89 cfs from a deposit of the Pleistocene Series: Unknown aquifer for the irrigation of 162 acres.
2. From the best information reasonably available, the probability of unappropriated water being available from this deposit of the Pleistocene Series: Unknown aquifer for the proposed appropriation cannot be determined.
3. Because a record of observation well measurements is not available, the probability of unappropriated water available from this deposit of the Pleistocene Series: Unknown aquifer for the proposed appropriation cannot be evaluated.
4. Sufficient information on the aquifer characteristics is not currently available to determine the potential for adverse or unlawful impairment of existing users due to the development of the proposed diversion.
5. More information is required to adequately determine if there is unappropriated water available and if the potential effects of pumping at the proposed well site will adversely impact existing water users. Further delineation of the aquifer and/or 72-hour aquifer pump test including monitoring wells should be conducted to aid in the evaluation of this aquifer.


Adam Mathiowetz
SD DENR-Water Rights Program

Approved by:

Ken Buhler
SD DENR-Water Rights Program

REFERENCES:

- Buhler, K.A. 2013a. Report to the Chief Engineer on Water Permit Application No. 7373-3, Terry Wieting, Water Permit Application No. 7551-3, Wayne Binger, and Water Permit Application Nos. 7570-3, 7571-3, 7572-3, 7573-3, 7574-3, 7575-3, 7637-3, 7638-3, 7639-3 & 7640-3, Gary Marshall- Marshall Bros., Water Permit Application No. 7620-3, Oscar Inc.; January 30, 2013. SD DENR-Water Rights Program.
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- Buhler, K.A., 2012a. Report to the Chief Engineer on Water Permit Application No. 7295-3, William F. St. Clair; No. 7316-3, Van Buskirk Farms LLP; No. 7348-3, Michael Sentell; No. 7364-3, Wipf Acres LP; No. 7365-3, Huron Colony; No. 7366-3, Huron Colony; No. 7367-3, Huron Colony; No. 7368-3, Huron Colony; No. 7369-3, Huron Colony; and No. 7370-3, Huron Colony; August 23, 2012. SD DENR- Water Rights Program.
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- Water Rights. 2014a. Observation Well Files. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.
- Water Rights. 2014b. Water Right/Permit Files. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.
- Water Rights. 2014c. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.

Gronlund, Eric

From: Gronlund, Eric
Sent: Monday, March 31, 2014 1:17 PM
To: srand@amfam.com
Subject: pending water permit application

Mr. Rand:

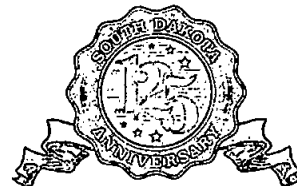
Water Permit Application No. 7930-3 in your name is pending for irrigation in Section 26, T99N, R54W of Turner County. As you are aware, the Chief Engineer recommended deferral of the application until more information necessary is provided to adequately determine if there is unappropriated water available and the potential effect of pumping on existing water users. This information is to include further delineation of the aquifer and/or a 72-hour aquifer pump test. DENR understands you have made contact with a consultant to perform the work and that the cost of having the necessary work done may be an issue. Please keep DENR informed of any progress? The recommendation which is dated February 4, 2014 provides one year for the information to be provided.

If you have any questions, please contact Adam Mathiowetz or myself

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



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



TEMPORARY PERMIT TO USE PUBLIC WATERS FOR TESTING PURPOSES

This temporary permit to use public waters is issued to Jim Rand, 27871 452nd Ave., Parker SD 57053 authorizing withdrawal of 3,672,000 gallons of water at a maximum rate of 850 gallons per minute from ground water (one well – 168 feet deep) located in the NE ¼ Section 26, T99N, R54W, Turner County.

The purpose of the project is to conduct a 72 hour pump test on an existing irrigation well. The water withdrawn from the well will be pumped through a center pivot.

This temporary permit becomes effective June 30, 2014 and expires on August 31, 2014. Once the test begins, pumping is authorized for 72 hours only.

This permit does not provide necessary right-of-way. Such arrangements should be made with the proper land owner.

Issuance of this temporary permit deals with the withdrawal of water only. It does not address other concerns or permitting issues from other State or Federal entities.

Issued: June 16, 2014

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



c: Brad Peschong, Leggette Brashears & Graham Inc (email)

McMath, Genny

From: Bradley J. Peschong <bradp@lbgsioux.com>
Sent: Monday, June 16, 2014 8:19 AM
To: McMath, Genny
Subject: Re: Jim Rand Temp Use Permit App

Genny - Yes, expanding is appropriate. I have not been able to contact the irrigator for confirmation of the dates yet. And since it's been raining like mad lately, it may take a while before they can start the center-pivot. Maybe give it through August 31?

Brad

On 6/16/2014 8:08 AM, McMath, Genny wrote:

I guess I do have a question on this – are you certain on the start and stop dates (June 3th – July 3rd) or do you need a bigger window. I know the test is only 72 hours but I can expand the date range if needed. My goal is NOT to have to redo the paperwork if they decide to start on the 28th of June or perhaps July 2nd.

Genny McMath
Water Rights Program
605.773.5455

From: Bradley J. Peschong [<mailto:bradp@lbgsioux.com>]
Sent: Friday, June 13, 2014 10:06 AM
To: McMath, Genny
Subject: Jim Rand Temp Use Permit App

Genny - On behalf of Jim Rand, attached is a temporary use application for your review. I believe you will also receive a hard copy of the application in the mail.

If I should have sent this to another DENR staff member, please forward or let me know.

If we can answer any questions, please contact me. Thanks!

Brad

--

Bradley J Peschong, CPG
Senior Hydrogeologist
Leggette, Brashears & Graham, Inc.
140 East Hinks Lane, Suite 126
Sioux Falls, South Dakota 57104
ph 605-334-6000
fx 605-334-1850



DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

NOTICE OF INTENT &
 CERTIFICATE OF APPLICANT FORM
 TO RECEIVE COVERAGE UNDER THE
 GENERAL PERMIT FOR TEMPORARY DISCHARGES
 AND A TEMPORARY WATER USE PERMIT

This form is provided by the Secretary of the South Dakota Department of Environment and Natural Resources in accordance with §74:52:02:09 of the Administrative Rules of South Dakota. No South Dakota Surface Water Discharge Permit will be issued except under completion and submittal of this form to the following addresses:

original to: South Dakota Department of Environment and Natural Resources
 Surface Water Quality Program
 Joe Foss Building
 523 East Capitol Avenue
 Pierre, South Dakota 57501-3181
 Telephone: (605) 773-3351 FAX: (605) 773-4068

PLEASE PRINT OR TYPE

I. Primary Contact Information

☒ Owner ☐ Operator ☐ Contractor

Name Jim Rand Phone (605) 297-9873
 Responsible Contact Person Jim Rand
 Street 27871 452nd Avenue
 City Parker State SD County Turner Zip Code 57053

II. Secondary Contact Information (If different from above)

☐ Owner ☐ Operator ☒ Contractor

Name Leggette Brashears & Graham, Inc Phone (605) 334-6000
 Responsible Contact Person B. Peschong
 Street 140 E. Hinks Lane, Suite 126
 City Sioux Falls State SD County Minnehaha Zip Code 57104

III. Facility/Site Location

Name Rand Production Well #2 Phone (605) 297-9873
 Responsible Contact Person Jim Rand
 Street 451st Avenue
 City Parker State SD County Turner Zip Code 57053

Is this facility located in Indian Country? ☐ Yes ☐ No

Section 26 Quarter NE Township 99N Range 54W
 Latitude 43.3672 Longitude -97.1862

IV. Standard Industrial Classification (SIC) Code of facility: 0115

FOR SDDENR USE ONLY

Permit Number: _____ Date Received: _____
 Date Permitted: _____ PCS: _____

- V. Please list all the activities which require the applicant to obtain a discharge permit. (Attach additional sheets if necessary.)

Conduct a 72-hour well pumping test. Discharge will be applied to the ground surface through a center-pivot irrigation system. Well is completed in an un-named glacial outwash.

VI. Discharge Information

- A. Estimate the following:

Date water withdrawal will commence: on or about June 30, 2014

Date for commencement of discharge: on or about June 30, 2014

Termination date of withdrawal: on or about July 3, 2014

Termination date of discharge: on or about July 3, 2014

Total volume of withdrawal: 3,672,000 gallons

Total volume of discharge: 3,672,000 gallons

Average flow rate of withdrawal: 850 gallons per minute

Average flow rate of discharge: 850 gallons per minute

- B. Source of water which is to be discharged: groundwater (unnamed glacial outwash)

- C. Name of Receiving Waters: none - water will be used for irrigation

- D. Brief description of water treatment processes employed, if any:

Water will be pumped from well to center-pivot irrigation system and discharged to the atmosphere/ground surface for crop irrigation. Water will not be treated.

- E. Describe the discharge and the type of wastewater from each outfall. Include all overflows, bypasses, or discharges from holding ponds, trenches, excavations, vessels, pipelines, etc.

Outfall 001 n/a

Outfall 002

Outfall 003

Attach additional sheets if necessary

NOTE: Please place points of withdrawal and discharge on a topographic map, or other map if a topographic map is unavailable. This map should extend to one (1) square mile beyond the property boundaries of the facility and each of its discharge facilities, and those wells, springs, and other surface water bodies, drinking water wells, and surface water intake structures listed in public records, or otherwise known to the applicant in the map area.

- F. Is there any reason to believe that the discharge may contain any pollutant other than those limited in the permit (i.e. TSS, pH, Chlorine, BTEX, Benzene, and TPH)? ☐ Yes ☒ No
If yes, list any pollutants that may be present:

NOTE: Attach any analytical data which indicate levels of pollutants present in water to be discharged.

VII. Pollution Prevention Plan

- A. Has the facility written a pollution prevention plan in lieu of sampling for TSS and pH?

☐ Yes ☒ No

- B. Brief description of best management practices being used in lieu of sampling:

Water will be used for crop irrigation through a center-pivot irrigation system.

VIII. Hydrostatic Testing

- A. Type of vessel being tested: n/a
- B. Material from which vessel is constructed: n/a
- C. Check appropriate box: ☐ Vessel has been previously used ☐ Vessel is virgin material
- D. Description of fluid material normally contained/transported through the vessel:

IX. List other information which you feel should be brought to the attention of the SDDENR regarding coverage under this general permit.

A well log showing the geology and construction details of the well is attached.

Attach additional sheets if necessary.

X. Certification – authorized representative should initial the check box.

☒

JMR

I certify under penalty of law that this document and all attachments were prepared under my direction (*initial*) or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including revocation of the permit and the possibility of fine and imprisonment for knowing violations.

NOTE: Application must be signed by the authorized chief elective or executive officer of the applicant, or by the applicant, if an individual.

I declare and affirm under the penalties of perjury that this claim (petition, application, information) has been examined by me, and to the best of my knowledge and belief, is in all things true and correct.

Name: Jim Rand Title: Owner

Date: 6-12-14

Signature: *JMR*

Surface Water Quality Program
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3181
Telephone: (605) 773-3351

STATE OF SOUTH DAKOTA
BEFORE THE SECRETARY OF
THE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

IN THE MATTER OF THE	)	CERTIFICATION OF
APPLICATION OF	)	
<u>Jim Rand Production Well #2 Pumping Test</u>	)	APPLICANT
(FACILITY NAME)	)	
STATE OF <u>SD</u>	)	
COUNTY OF <u>Turner</u>	)	SS

I, Jim Rand, the applicant in the above matter after being duly sworn upon oath hereby certify the following information in regard to this application:

South Dakota Codified Laws Section 1-40-27 provides:

"The secretary may reject an application for any permit filed pursuant to Titles 34A or 45, including any application by any concentrated swine feeding operation for authorization to operate under a general permit, upon making a specific finding that:

(1) The applicant is unsuited or unqualified to perform the obligations of a permit holder based upon a finding that the applicant, any officer, director, partner or resident general manager of the facility for which application has been made:

- (a) Has intentionally misrepresented a material fact in applying for a permit;*
- (b) Has been convicted of a felony or other crime involving moral turpitude;*
- (c) Has habitually and intentionally violated environmental laws of any state or the United States which have caused significant and material environmental damage;*
- (d) Has had any permit revoked under the environmental laws of any state or the United States; or*
- (e) Has otherwise demonstrated through clear and convincing evidence of previous actions that the applicant lacks the necessary good character and competency to reliably carry out the obligations imposed by law upon the permit holder; or*

(2) *The application substantially duplicates an application by the same applicant denied within the past five years which denial has not been reversed by a court of competent jurisdiction. Nothing in this subdivision may be construed to prohibit an applicant from submitting a new application for a permit previously denied, if the new application represents a good faith attempt by the applicant to correct the deficiencies that served as the basis for the denial in the original application.*

All applications filed pursuant to Titles 34A and 45 shall include a certification, sworn to under oath and signed by the applicant, that he is not disqualified by reason of this section from obtaining a permit. In the absence of evidence to the contrary, that certification shall constitute a prima facie showing of the suitability and qualification of the applicant. If at any point in the application review, recommendation or hearing process, the secretary finds the applicant has intentionally made any material misrepresentation of fact in regard to this certification, consideration of the application may be suspended and the application may be rejected as provided for under this section.

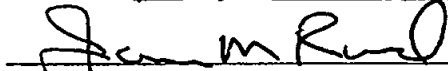
Applications rejected pursuant to this section constitute final agency action upon that application and may be appealed to circuit court as provided for under chapter 1-26."

Pursuant to SDCL 1-40-27, I certify that I have read the forgoing provision of state law, and that I am not disqualified by reason of that provision from obtaining the permit for which application has been made.

I declare and affirm under the penalties of perjury that this claim (petition, application, information) has been examined by me, and to the best of my knowledge and belief, is in all things true and correct.

NOTE: Notice of Intent/Certificate of Applicant form must be signed by the authorized chief elective or executive officer of the applicant, or by the applicant, if an individual.

Dated this 12 day of June, 2014



Applicant Signature

James M. Rand

Applicant Name (print)

**PLEASE ATTACH SHEET DISCLOSING ALL FACTS PERTAINING TO
SDCL 1-40-27 (1) (a) THROUGH (e).
ALL VIOLATIONS MUST BE DISCLOSED, BUT WILL NOT
AUTOMATICALLY RESULT IN THE REJECTION OF AN APPLICATION.**

FEB-20-2014 10:44

Received:
From:Feb 20 2014 09:13am
To: 16514901006

Page: 9/10

SD EForm - 1627LU v.1

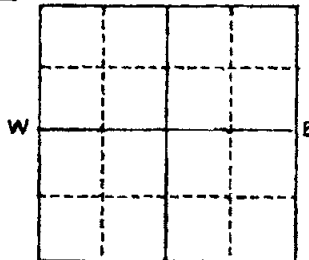
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW ¼ NE ¼ Sec 26 Twp 99 Rg 54

County Turner

North

Please mark well
location with an "X"

Well Completion Date

1 Mile

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

PROPOSED USE:

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

METHOD OF DRILLING:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	147.0 FT	17.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

GROUT Type	No. of Sacks	GROUT Weight	From	To
Quick Grout	37	Lb/gal	0.0 Ft	137.0 Ft
Red Flint	30	Lb/gal	137.0 Ft	168.0 Ft

Describe grouting procedure
Tremmie

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 12.00 Inches Length 21.0 Feet

Material Stainless Steel

Slot Size 90 Set From 147.0 Feet to 168.0 Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How?

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

Well Owner: Jim Rand

Business Name:

Address: 2787 1/2 452nd Ave

City, State, Zip: Parker SD 57053

WELL LOG:

		DEPTH	
FORMATION		FROM	TO
Top Soil	Blk	0	1
Clay	Ylw	2	32
Clay	Blu	32	145
Sand	Blu	145	168

STATIC WATER LEVEL 112.0 FEET

If flowing, closed in pressure PSI

GPM flow through inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:

☐ Baled

☐ Other

Pumping Level Below Land Surface

130.2 Ft. After 6.0 Hrs. pumped 930.0 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

Production Well # 2, Test Hole #4

43 22 02.0N 43.367 10 Hrs Air Development

97 11 10.3W 99.1862

Elev 1366

This well was drilled under license # 463 and this
report is true and accurate.

Drilling firm: Steffi Drilling & Pump Inc / Kris VanHueveln

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:

Legend

○ Production Well 2

□ Approx. Center Pivot Coverage

O:\Rand\gisdata\topo_loc.mxd, Created By: Rand, 6/12/2014, 3:16:29 PM, NAD 1983 UTM Zone 14N



Prepared By:
LEGGETTE, BRASHEARS & GRAHAM, INC.
 Professional Ground-Water and
 Environmental Engineering Services
 140 East Hinks Lane, Suite 126
 Sioux Falls, SD 57104
 (605) 334-6000

JIM RAND PARKER, SOUTH DAKOTA		
PRODUCTION WELL #2 WELL PUMPING TEST SECTION 26, T99N R54W		
Path: O:\Rand\gisdata\topo_loc.mxd	Date: 12 Jun 2014	FIGURE: 1

Legend

○ Production Well 2

□ Approx. Center Pivot Coverage

O:\Rand\gisdata\topo_loc.mxd Created By: Brad, 6/12/2014, 3:14:33 PM, NAD 1983 UTM Zone 14N



0 1,000 Feet

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Prepared By:
LEGGETTE, BRASHEARS & GRAHAM, INC.
 Professional Ground-Water and
 Environmental Engineering Services
 140 East Hinks Lane, Suite 126
 Sioux Falls, SD 57104
 (605) 334-6000

JIM RAND
 PARKER, SOUTH DAKOTA

PRODUCTION WELL #2 WELL PUMPING TEST
 SECTION 26, T99N R54W

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Date: 12 Jun 2014

FIGURE: 2

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To: 16514901006

Page: 9/10

SD EForm - 1021LU v1

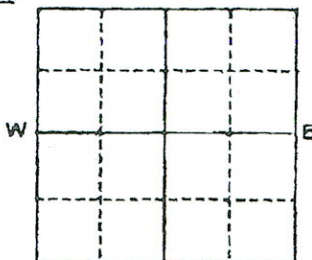
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW ¼ NE ¼ Sec 26 Twp 99 Rg 54

County Turner

North

Please mark well
location with an "X"

Well Completion Date

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

PROPOSED USE:

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

METHOD OF DRILLING:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	147.0 FT	17.50 IN
LB/FT	IN	FT	FT	IN
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☐ Perforated pipe ☒ Manufactured

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Material Stainless Steel

Slot Size 90 Set From 147.0 Feet to 168.0 Feet

Other information

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☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How?

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

Well Owner: Jim Rand

Business Name:

Address: 2787 1/2 452nd Ave

City, State, Zip: Parker SD 57053

WELL LOG:

		DEPTH	
FORMATION		FROM	TO
Top Soil	Blk	0	1
Clay	Ylw	2	32
Clay	Blu	32	145
Sand	Blu	145	168

STATIC WATER LEVEL 112.0 FEET

If flowing: closed in pressure PSI

GPM flow through Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:

☐ Bailed

☐ Other

Pumping Level Below Land Surface

130.2 Ft. After 6.0 Hrs. pumped 930.0 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

Production Well # 2, Test Hole #4

43 22 02.0N 43.367 10 Hrs Air Development

97 11 10.3W 99.1862

Elev 1366

This well was drilled under license # 463 and this report is true and accurate.

Drilling firm: Steffi Drilling & Pump Inc / Kris VanHueveln

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:



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



**AMENDED
TEMPORARY PERMIT TO USE PUBLIC WATERS
FOR TESTING PURPOSES**

This amended temporary permit to use public waters is issued to Jim Rand, 27871 452nd Ave., Parker SD 57053 authorizing withdrawal of 3,672,000 gallons of water at a maximum rate of 850 gallons per minute from ground water (one well – 168 feet deep) located in the NE ¼ Section 26, T99N, R54W, Turner County.

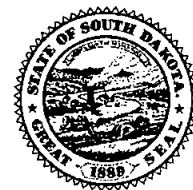
The purpose of the project is to conduct a 72 hour pump test on an existing irrigation well. The water withdrawn from the well will be pumped through a center pivot.

The original temporary permit issued on June 16, 2014 for this project specified a June 30th start date for the project. This amended temporary permit becomes effective June 20, 2014 and expires on August 31, 2014. **Once the test begins, pumping is authorized for 72 hours only.**

This permit does not provide necessary right-of-way. Such arrangements should be made with the proper land owner. Issuance of this temporary permit deals with the withdrawal of water only. It does not address other concerns or permitting issues from other State or Federal entities.

Issued: June 17, 2014


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



c: Brad Peschong, Leggette Brashears & Graham Inc (email)

Note: This amended temporary permit supersedes the permit issued on June 16, 2014.

RECEIVED

AUG 11 2014

WATER RIGHTS
PROGRAM

**LEGGETTE, BRASHEARS
& GRAHAM, INC.**

140 E. Hinks Lane, Suite 126
Sioux Falls, SD 57104
(605) 334-6000
(605) 334-1850 (FAX)

LETTER OF TRANSMITTAL

DATE:	8-Aug-14	JOB NO.:	0614.RAND01.AT
ATTENTION:	Ken Buhler		
RE:	Proposed Irrigation Well		
	Water Permit Application 7930-3		
	Parker, South Dakota		

TO: DENR
523 East Capitol
Pierre, SD 57501-3181

WE ARE SENDING YOU: ☒ Attached ☐ Under separate cover via _____ the following items:

- ☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1	8/7/2014		Aquifer Pumping Test & Analysis Report

THESE ARE TRANSMITTED as checked below:

- ☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☒ For your use ☐ Approved as noted ☐ Resubmit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS: _____

COPY TO: _____

SIGNED: _____ Brad Peschong

**AQUIFER PUMPING TEST & ANALYSIS
PROPOSED IRRIGATION WELL
WATER PERMIT APPLICATION 7930-3
SECTION 26 T99N, R54W
PARKER, SOUTH DAKOTA**

Prepared For

Mr. Jim Rand
27871 452nd Ave.
Parker, SD 57053

August 7, 2014

LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Groundwater and Environmental Engineering Services
140 East Hinks Lane, Suite 126
Sioux Falls, SD 57104
(605) 334-6000

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- B Field Data Records and Transducer Data
- C Quantitative Analysis Plots

**AQUIFER PUMPING TEST & ANALYSIS
PROPOSED IRRIGATION WELL
WATER PERMIT APPLICATION 7930-3
SECTION 26 T99N, R54W
PARKER, SOUTH DAKOTA**

1.0 INTRODUCTION

Leggette, Brashears & Graham, Inc. (LBG) is pleased to provide this report with the results of an aquifer pumping test and analysis recently completed for Mr. James Rand of Parker, SD. LBG's proposal for this work, dated May 13, 2014, was authorized on June 5, 2014.

1.1 Project Purpose

The purpose of LBG's work on this project was to conduct an aquifer pumping test to provide information regarding the aquifer characteristics at the location of Production Well 2 (PW-2) and to provide estimates of aquifer characteristics at that location. PW-2 is located in the SW¼ NE¼ Section 26, T99N, R54W at approximately 43.3672°N, 99.1862°W.

1.2 Background Information

PW-2 was constructed by others in November 2013. The location of PW-2 is shown in Figures 1 and 2. PW-2 was drilled to a depth of 168 feet below ground surface (ft bgs), and is constructed with a 12-inch diameter screen set in a 17½-inch diameter borehole. The well is screened from 168 to 147 ft bgs, with gravel pack extending from 168 to 137 ft bgs. The upper 147 feet of PW-2 is cased with 12-inch diameter plastic casing. The static water level reported by the driller at the time of installation was approximately 112 ft bgs.

PW-2 is completed in an unnamed glacial outwash present between approximately 145 to 168 ft bgs. Overlying sediments consist of glacial till: oxidized (weathered) till from approximately ground surface to 32 ft bgs; and unoxidized (unweathered) till from approximately 32 ft bgs to the top of the sand and gravel at 145 ft bgs. A well log illustrating the geology and construction details of PW-2 is provided in Appendix A.

One observation well (OW-1) is located 430 feet north of PW-2. The OW-1 is a 4-inch diameter PVC well completed at 153 to 193 ft bgs. The static water level in OW-1 is

approximately 112 ft bgs. A well log illustrating the geology and construction details of OW-1 is provided in Appendix A.

Information contained in the Report to the Chief Engineer on Water Permit Application No. 7930-3 (Mathiowetz, 2014) recognizes the unknown characteristics of the outwash aquifer and suggest an areal extent of the aquifer in the range of 1,800 to 2,400 acres. One domestic well (Finn, SE¼ Section 25 T99N R54W) is reportedly completed in this aquifer, located approximately 1.25 miles (6,650 feet) southeast. An irrigation well (Herlyn, NW¼ Section 23 T99N R54W) is reportedly also completed in this aquifer. The Herlyn well is located approximately 1.2 miles (6,500 feet) northwest (Figure 1).

2.0 PW-2 AQUIFER PUMPING TEST

A constant-rate aquifer pumping test was conducted during the period of July 9 to July 11, 2014. Mr. Rand and his representatives were present during portions of the test and performed daily observations and measurements in the pumping well and observation well.

Prior to the aquifer test, LBG installed transducers in PW-2 and in OW-1 on July 1, 2014 to gather pre-test aquifer water-level information. The pre-pumping test data was collected beginning July 1, 2014 and continued for a period of approximately 1 week following the test. The transducers were recovered on July 18, 2014.

2.1 Aquifer Pumping Test Equipment and Permits

Mr. Rand contracted with Steffl Well Drilling Company of Willmar, MN to furnish and install a 75 horse-power submersible pump and production well sounding tube in PW-2. The pump intake was set at approximately 147 feet below the top of the casing; which had a stickup of approximately 3 feet above grade. Mr. Rand installed a calibrated totalizing flow meter, wellhead connections, discharge throttling (gate) valve and pressure gauge for the test.

The discharge piping from PW-2 was connected to an adjacent center-pivot irrigation system. The irrigation system was capable of utilizing water within the approximately 700-800 gallons per minute (gpm) rates expected during the test. Flow rate through the irrigation system varied slightly depending on the location of the end of the center-pivot, where an end gun was installed to increase the effective distance of the system at varying points along the

circumference of the irrigated circle. As operated by the client during the test, the end gun was utilized in all areas except: 1) near a house located east-southeast of PW-2; 2) in the areas bordering the east-adjacent and north-adjacent township roads (depending on wind direction); and 3) across adjacent landowner property in a west-southwest direction. In general, the flow rate decreased approximately 100 gpm when the end gun was not operating. The decrease in flow rate corresponds to a decrease in the pumping test drawdown as illustrated on Figure 3.

LBG installed a transducer in the sounding tube in PW-2 at a depth of approximately 147 ft bgs (approximately 35 feet submergence). Groundwater levels were recorded in PW-2 with an In-Situ Level TROLL® 700, 30 pounds per square inch gauged (psig) transducer with integrated data logger. Manual water-level measurements were also collected from PW-2 to confirm the accuracy and proper operation of the transducer (Figure 3).

Groundwater levels were recorded in OW-1 with a similar In-Situ Level TROLL® 700, 30 psig, pressure transducer with integrated data logger. The transducer was installed in the 4-inch diameter casing of OW-1 at a depth of approximately 149 ft below top of casing (approximately 35 feet submergence). Manual water-level measurements were also collected to confirm the accuracy of the transducer data. The OW-1 transducer appeared to successfully record pre-pumping test water levels; but malfunctioned during the 72-hour pumping test. Consequently, water-level data were collected from OW-1 solely by manual measurement during the pumping test and did not affect subsequent data analysis.

A request for a Temporary Water Use Permit for a 72-hour pumping test was submitted by the client to the SD Department of Environment and Natural Resources (DENR). The DENR *General Permit for Temporary Discharges and a Temporary Water Use Permit Activities (1941v1)* was approved by the DENR and valid over the interval of June 20, 2014 until August 31, 2014.

2.2 Constant-Rate Pumping Test

Pumping was initiated for the constant-rate test on Wednesday July 9, 2014 at 10:24 am, after the background period of water-level data collection. The depth to water in PW-2 prior to, during, and subsequent to the test is shown on Figure 3. The initial flow meter rates recorded from the sweep dial indicated an initial discharge rate of approximately 800 gpm. Pumping rates

during the test decreased to 700 gpm during times when the end gun was not operating (Figure 4). Field data records for the pumping test are included in Appendix B.

Potentially complicating factors were present during the test including; operation of a nearby irrigation well (Herlyn), cyclical operation of the irrigation end gun, and general operation of the center pivot irrigator. The Herlyn irrigation well, located approximately 6,500 feet northwest is reportedly completed in the same aquifer, and reportedly operated during the test timeframe. Figure 3 includes information on the approximate times that the Herlyn irrigation well was operated. There is no obvious evidence of interference from the Herlyn well operation in the data from the PW-2 test. In particular, the Herlyn well pumped during the background monitoring period prior to the PW-2 test and did not appear to influence water levels in PW-2.

The operation of the end gun is evident as a change in pumping rates and drawdown in PW-2 throughout the test (Figure 4). As discussed earlier, end gun usage is discontinued at certain locations around the irrigation circle. When the end gun was not being used, the pumping rates decreased approximately 100 gpm and drawdown in PW-2 also decreased. Although the pumping differences and resulting drawdown variability is obvious in the data, analysis of the pumping data was not adversely affected by the end gun operation as it could be disregarded in the dataset during test analysis.

Lastly, the general operation of the center-pivot irrigator may have affected the pumping rate due to terrain changes. As the irrigator traversed higher elevations, the total dynamic head pressure on the pump would have increased, resulting in a gradually decreasing pumping rate and decreased drawdown. Conversely, as the irrigator traversed to lower elevations, the total dynamic head would have decreased, pumping rate would gradually increase, and drawdown would gradually increase.

The pumping test ended on Saturday July 12, 2014 at 11:37 am which corresponds to a total pumping duration of 73.2 hours. During the test, a total of 1.0 inch (13.5 ac-ft) of water was discharged to the ground surface.

2.3 Constant-Rate Test – Analysis

The elapsed time versus drawdown/depth to water data for PW-2 are presented in Figures 3 through 5. The time versus drawdown/depth to water data for OW-1 is presented in Figures 6

and 7. The response to pumping PW-2 was consistent with the response expected from a confined aquifer, with drawdown occurring almost immediately in OW-1 subsequent to the initiation of pumping in PW-2.

The drawdown and recovery data measured in PW-2 versus elapsed time is shown in Figure 4. The drawdown measured in PW-2 after 24 hours of pumping was approximately 17.3 feet, with a corresponding pumping water level of 127.3 ft bgs (Figure 3). This corresponds to a specific capacity of 46.2 gpm/ft. $\left[\frac{800 \text{ gpm}}{17.3 \text{ feet drawdown}}\right]$. The maximum drawdown measured in PW-2 at the conclusion of the test (73 hours) was approximately 18.5 feet with a corresponding water level of approximately 128.5 ft bgs and resulting specific capacity of 43.2 gpm/ft. The maximum drawdown measured in OW-1 at the conclusion of the test was 8.06 feet, with a corresponding water level in OW-1 of 120.3 ft bgs.

After pumping stopped in PW-2, recovery data were recorded for approximately 147 hours. After 77 hours, PW-2 had recovered to approximately 95% of the initial static water elevation. OW-1 had recovered to within approximately two feet of initial conditions (approximately 75%). However, data indicate that background water levels were decreasing before and after the test, and prohibited the observed recovery from reaching the pre-pumping static levels. This is evident by the water level decreases observed starting approximately 42 hours prior to test start and in the recovery reversal observed at approximately 8,500 minutes where the recorded data transitions from test recovery to the background decreasing water trend.

Aquifer parameters of transmissivity (T) and storativity (S) were determined by analyzing the drawdown versus elapsed time data using Aqtesolv for Windows Pro (Aqtesolv) (ver. 4.50). Based on the qualitative analyses and supposing the required assumptions were met, the Theis (1935), Theis w/ Boundary (1935), Cooper-Jacob (1946), and Theis Recovery (1935) solutions for a confined aquifer were applied to the drawdown versus elapsed time data collected from PW-2 and OW-1. The results of the quantitative analysis are summarized in Table 1. Output for the Aqtesolv solutions are included in Appendix C.

The T for the aquifer as determined from the drawdown versus elapsed time analyses of PW-2 and OW-1 ranges from 7,756 to 12,020 feet squared per day (ft²/day), with a geometric mean of 9,871 ft²/day. The values for S range from 0.00116 to 0.00135 with a geometric mean of 0.0012.

A potential aquifer boundary was observed at approximately 1,680 minutes into the pumping portion of the test. At this time in the test, drawdown rates increased, suggesting the radius of influence had reached a negative (impermeable) boundary. Comparison of the slope of the line before and after the inflection indicates the slope doubled from ~2.4 to ~4.8, corroborating the boundary presence. Calculation of the distance to this boundary using the time-distance relationship (Driscoll, 1989. Equation 9.12) and the geometric mean of calculated T and S:

$$r_o = \sqrt{\frac{0.3 \cdot T \cdot t}{S}}$$

Where:

r_o = radius of influence (feet)
 T - Transmissivity (9,871 ft²/day = 73,835 gpd/ft)
 t = time in days (1682 minutes = 1.16 days)
 S - coefficient of storage = 0.0001

yields an estimated 5,100 feet to the boundary. For comparison, using the minimum and maximum estimates for T (7,756 and 12,020 ft²/day) and S (0.001) data, yields distances of approximately 4,500 feet and 5,600 feet, respectively. Several boundaries were input into the Aqtesolv solution (Theis w/ boundaries) and the best data match occurred with boundaries located 3,500 feet from PW-2. Therefore, the data indicate that boundaries are located between approximately 3,500 and 5,600 feet from PW-2. These distances are similar to those presented by the DENR in Mathiowetz (2014). Lastly, as illustrated in Table 1, the S/S' value for the Theis Recovery solution in PW-2 is less than 1, indicating a negative boundary condition.

Long-term drawdown projections were estimated by extending a trendline for the late-time data from PW-2 and OW-1 (Figures 5 and 6). These projections are based on the Cooper-Jacob straight-line assumptions and give a qualitative estimate as to how long it would take to draw the water down to the top of the aquifer. Time estimates for an 800 gpm pumping rate to lower the aquifer water level below the top of the aquifer are greater than 70 years for the PW-2 location and greater than seven years for OW-1. It is important to note, however, that this assumes continuous pumping which is not the case with the proposed irrigation well, PW-2.

Estimates of the lateral extent of the radius of influence for the 72-hour pumping test at 800 gpm are shown on Figure 8. The distance-drawdown estimates indicate that the radius of influence is approximately 6,500 feet from PW-2. This coincidentally is the approximate distance

of the only wells known or suspected to also be completed in the aquifer: Finn and Herlyn. For comparison, given the measured T , S determined by this test ($T=73,835$, $S=0.001$), estimated drawdown at the Finn and Herlyn wells after 3 days of pumping using the Theis solution yields a similar result of approximately 1 ft of drawdown at 6,500 feet. Consequently, it is concluded that the Herlyn and Finn wells were at the edge of the cone of depression for the test, and likely did not experience significant decrease in elevations at the conclusion of the test.

3.0 DISCUSSION AND CONCLUSIONS

The pumping test was performed at an approximate rate of 800 gpm for a period of 72-hours, with recovery monitored for approximately six days after cessation of groundwater withdrawal. The geometric mean of the calculated transmissivity determined for the aquifer at PW-2 is 9,871 ft²/day (ranging from 7,756 to 12,020 ft²/day), and the storativity is approximately 0.001. The pumping test applied 1-inch of water for the irrigated area (~162 acres), which is the equivalent of approximately 13.5 ac-ft of water. This test period and amount discharged realistically approximated the actual proposed usage of the well for irrigation purposes.

PW-2 recovery data indicated that groundwater levels rapidly recovered, and returned to at least 95% of static conditions within approximately 3 days following the completion of pumping. It is assumed that this is a worst-case recovery percentage as the data suggests a downward trend in the aquifer elevations present at times greater than approximately 8,500 minutes. Thus it is suspected that the recovery is actually marginally greater. Thus, it can be reasonably concluded that full recovery was achieved at PW-2 within the six days of recovery monitoring following the cessation of pumping.

The test conducted is a practical approximation of the typical, expected usage of the irrigation well during a typical irrigation event (13.5 ac-ft). The requested appropriation amount of 324 ac-ft/yr is actually much greater than a typical annual utilization for PW-2, which will be likely on the order of 81 ac-ft/year (6 inches/acre/year +/-). The actual irrigated amount will vary depending on annual precipitation, but will likely range between 4- to 8-inches (54 ac-ft/yr to 108 ac-ft/yr) of irrigation per year. Review of the time-drawdown data for this test indicates that the aquifer recovers quickly from pumping conditions and does not lower the water level to below the top of the aquifer. Estimates presented herein suggest the pumping duration required

to lower the water level to below the top of the aquifer would need to be on the order of 'years,' not 'days,' which is the expected pumping duration for this irrigation well. Estimates of the extent of drawdown for a typical irrigation event at PW-2 indicates that the Finn and Herlyn wells (both located approximately 6,500 feet distant) will not be adversely affected by pumping at PW-2 at the expected 800 gpm for 72-hours. If groundwater elevation decreases are observed in nearby wells, the test data suggests the decreases will be small (less than several feet), temporary (days), and only in artesian pressure. The data suggests that there will be no impacts requiring the Finn or Herlyn wells to lower pumps to accommodate the usage at PW-2. As a consequence, it appears that compliance with SDCL 46-6-6.1 is clearly met.

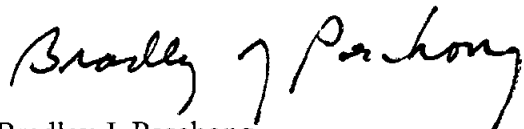
Utilizing data from the Report to the Chief Engineer (Mathiowetz, 2014), annual recharge to the aquifer is estimated to be in the range of 0.25 to 0.34 in/yr. Utilizing the given 1,800 to 2,400 acre estimated size of the aquifer, the Mathiowetz report estimates that the expected annual recharge to the aquifer is on the order of 37.5 to 68 ac-ft/year. However, test recovery data indicates there is sufficient water to support the operation of the irrigation well.

The data from PW-2, as indicated by the ratio of aquifer storage during pumping to aquifer storage during recovery, indicates the presence of a negative (impermeable) boundary condition. The negative boundary condition is not unexpected and is likely due to the finite limits of the saturated sands within the clay till. The presence of a boundary, while indicative of a finite aquifer, does not necessarily infer that the aquifer is not sufficiently extensive in other directions to support the likely water appropriation requested in the Permit. The rapid recovery rate of the test indicated the boundary is not significant in the proposed use of the well as an intermittent-use irrigation well, and adverse impacts on water elevations are not anticipated.

In conclusion, the test data suggests that the usage of PW-2 for intermittent irrigation purposes as requested in Water Permit Application 7930-3 will not result in adverse impairment of existing users.

LEGGETTE, BRASHEARS & GRAHAM, INC.

This report was prepared by:



Bradley J. Peschong
Project Manager

This report was reviewed by:



Tim Kenyon
Senior Vice President

L:\Hydro\Rand\June 2014 Aquifer Test _final.docx

4.0 REFERENCES CITED

Mathiowetz, A, 2014. Report to the Chief Engineer on Water Permit Application No. 7930-3, James M. Rand, February 04, 2014. SD Department of Environment and Natural Resources. Pierre, SD.

Driscoll, F.G., 1989. Groundwater and Wells. Johnson Filtration Systems, Inc. St. Paul, MN.

TABLE

TABLE 1

**JIM RAND
27871 425ND AVENUE
PARKER, SOUTH DAKOTA**

Summary of Aquifer Parameters

Observation Location	Euclidean Distance from Pumping Well (feet)	Well Diameter (inches)	Static Water Level (feet bTOC)	Maximum Measured Drawdown at End of Pumping (feet)	Measurement Method	T (ft ² /day)	S/S'	S	Method of Analysis
Pumping Well (PW-2)	0	12	112.3	16.97	Manual & Transducer	10380	NA	NV	Confined Theis (1935)
						12020	NA	NV	Confined Theis (1935) w/ Boundary
						11200	NA	NV	Confined Cooper Jacob (1946)
						10610	0.8326	NV	Confined Theis Recovery (1935)
Observation Well (OW-1)	430	4	114.04	8.06	Manual	7756	NA	0.001347	Confined Theis (1935)
						8046	NA	0.001159	Confined Cooper Jacob (1946)
						min	7756	0.833	1.16E-03
						max	12020	0.833	1.35E-03
					geo mean	9871	0.833	0.0012	

NOTES:

T: Transmissivity

M: Manual

bTOC: Below Top of Casing

S: Storativity

S/S': Ratio of storage (S) during pumping and storage (S') during recovery. Values >1.0 indicate recharge boundary, and values <1.0 indicate negative boundary

NA: Not analyzed or not applicable

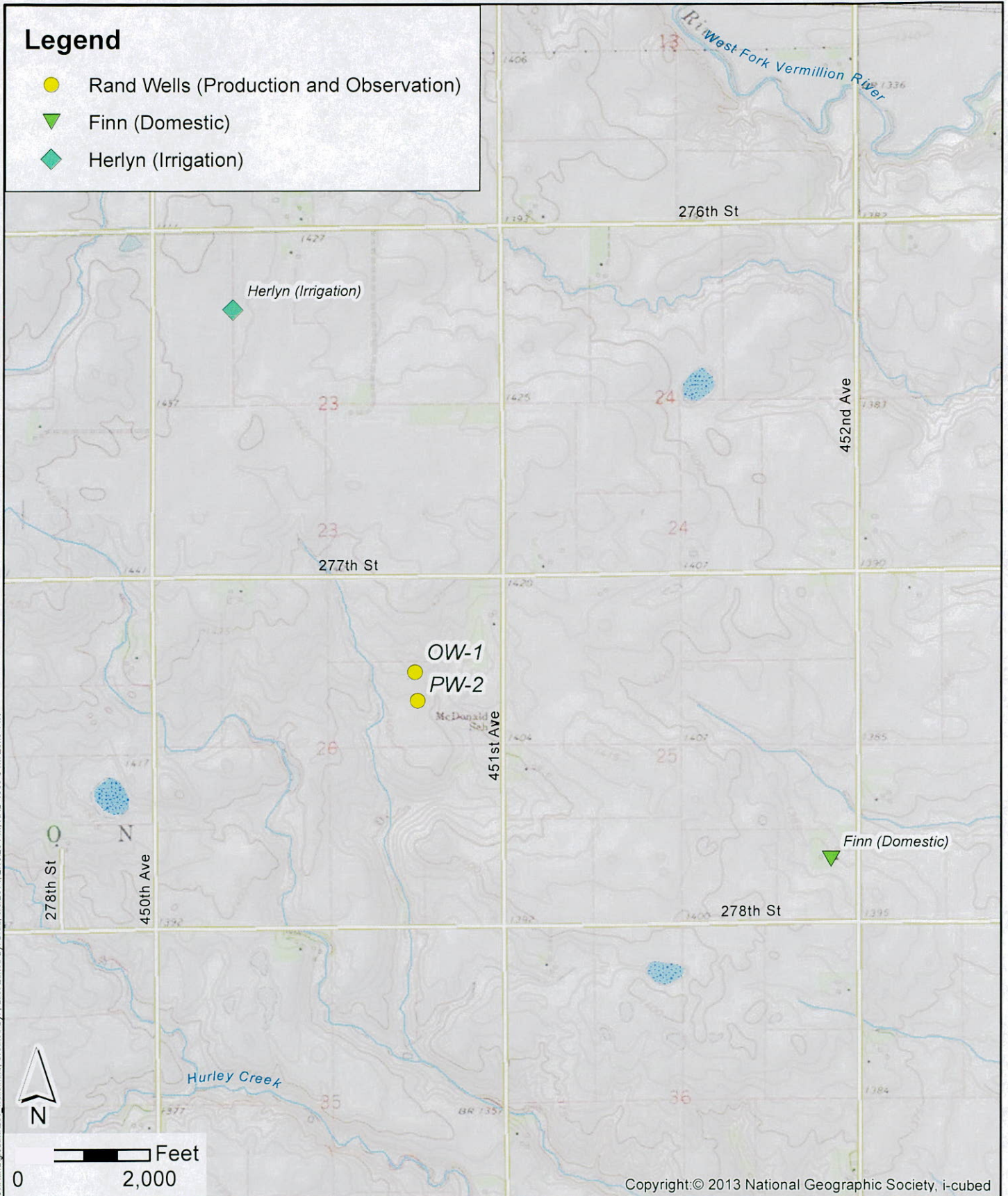
NV: Not Valid for the pumping well

(ft²/day) = square feet per day

FIGURES

Legend

- Rand Wells (Production and Observation)
- ▼ Finn (Domestic)
- ◆ Herlyn (Irrigation)



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JIM RAND
 PARKER, SOUTH DAKOTA

PRODUCTION WELL #2 WELL PUMPING TEST
 SECTION 26, T99N R54W

Path: O:\Rand\gisdata\Loc_wells.mxd

Date: 06 Aug 2014

FIGURE: 1

Legend

- PW-2 and OW-1 Locations

277th St

OW-1

PW-2

278th St

451st Ave



0 800 Feet

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid,



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JIM RAND
PARKER, SOUTH DAKOTA

PRODUCTION WELL & OBSERVATION WELL MAP

Path: O:\Rand\gisdata\fig2_aerial.mxd

Date: 06 Aug 2014

FIGURE: 2

FIGURE 3

JIM RAND
27871 452ND AVENUE
PARKER, SOUTH DAKOTA

PW-2 Water Levels vs Elapsed Time

◆ Series3 ■ Series2

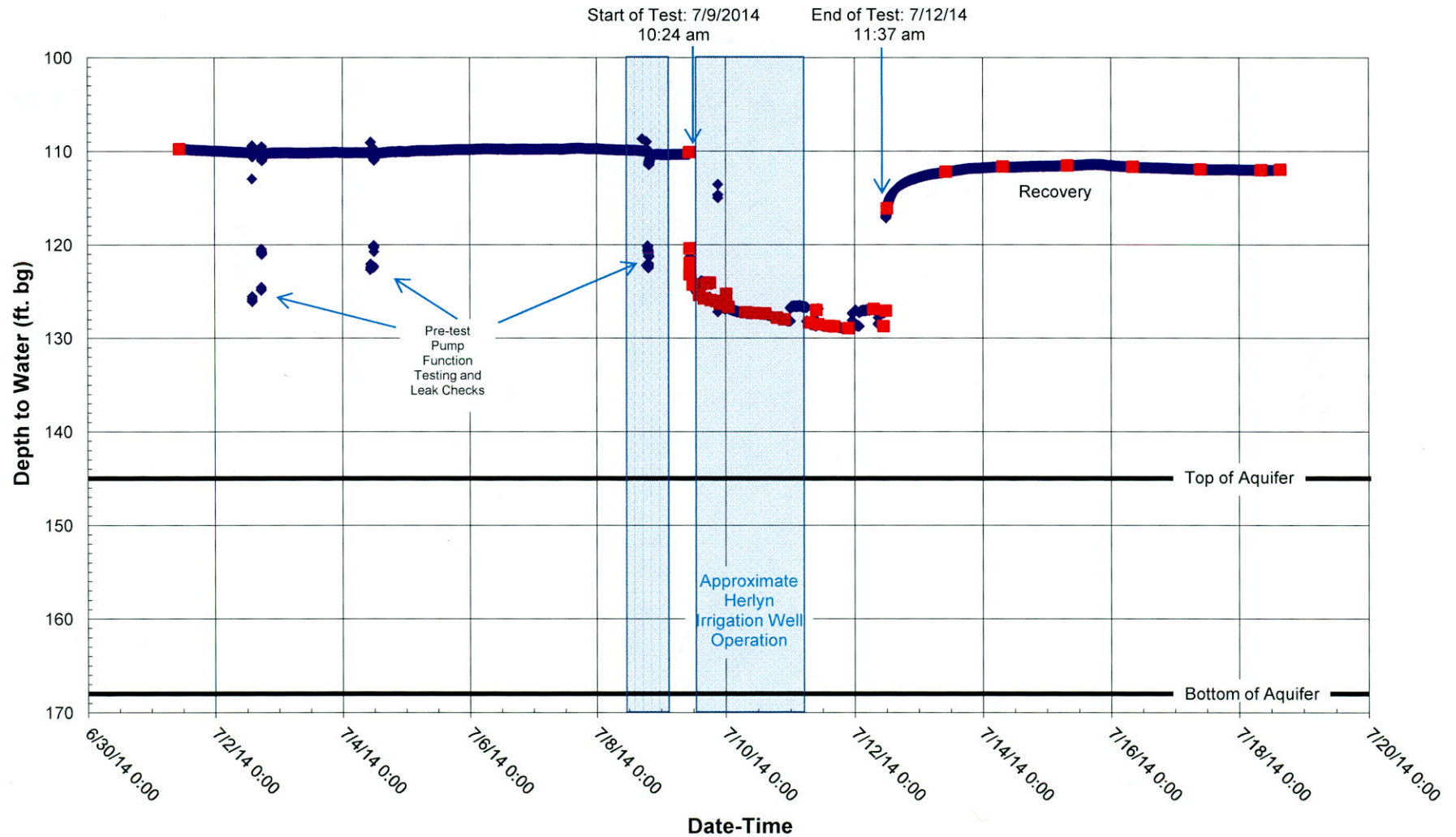


FIGURE 4

JIM RAND
27871 452ND AVENUE
PARKER, SOUTH DAKOTA

PW-2 Drawdown & Pumping Rate vs Elapsed Time

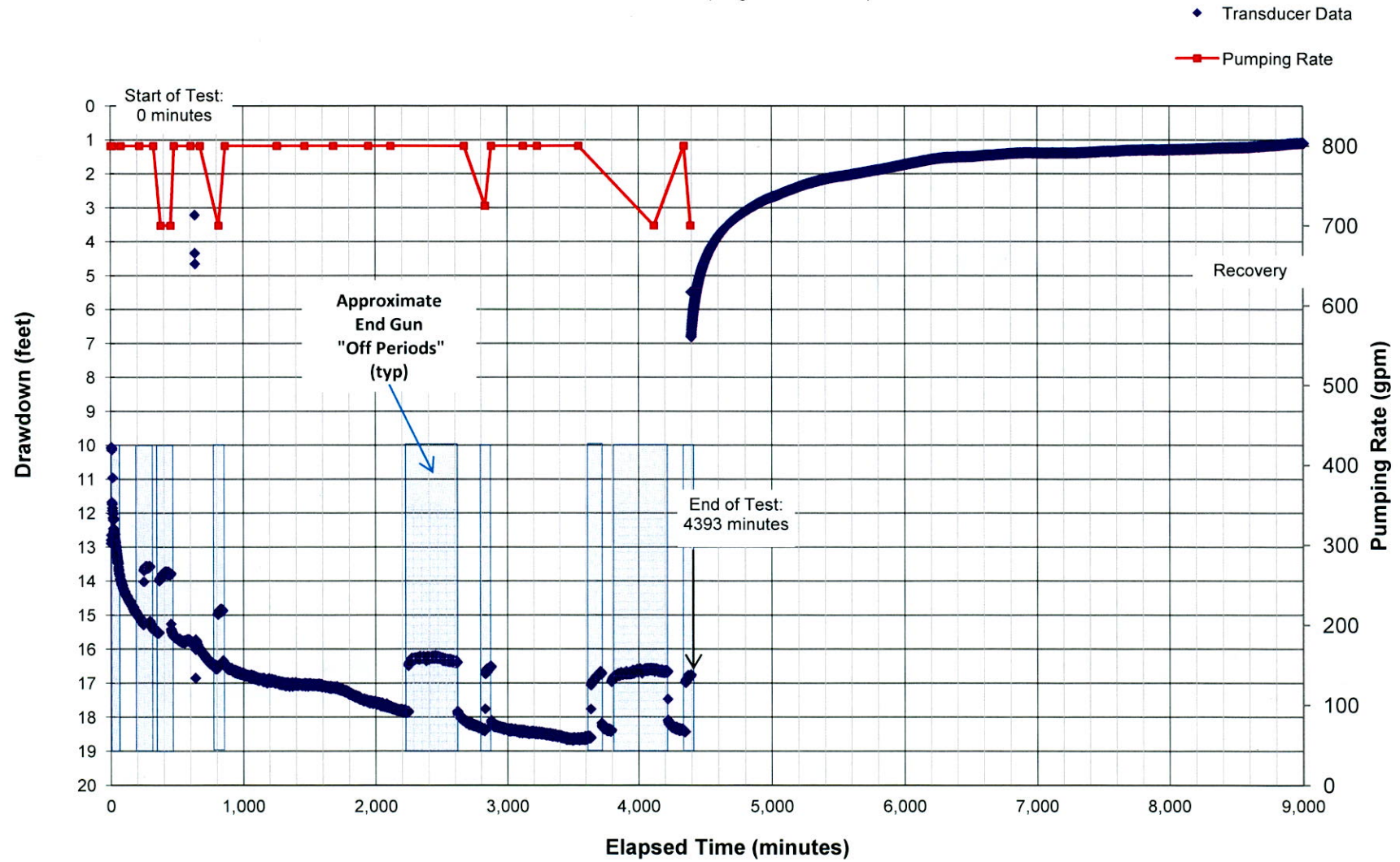


FIGURE 5

JIM RAND
27871 452ND AVENUE
PARKER, SOUTH DAKOTA

PW-2 Water Levels vs Elapsed Time and Long-Term Projection

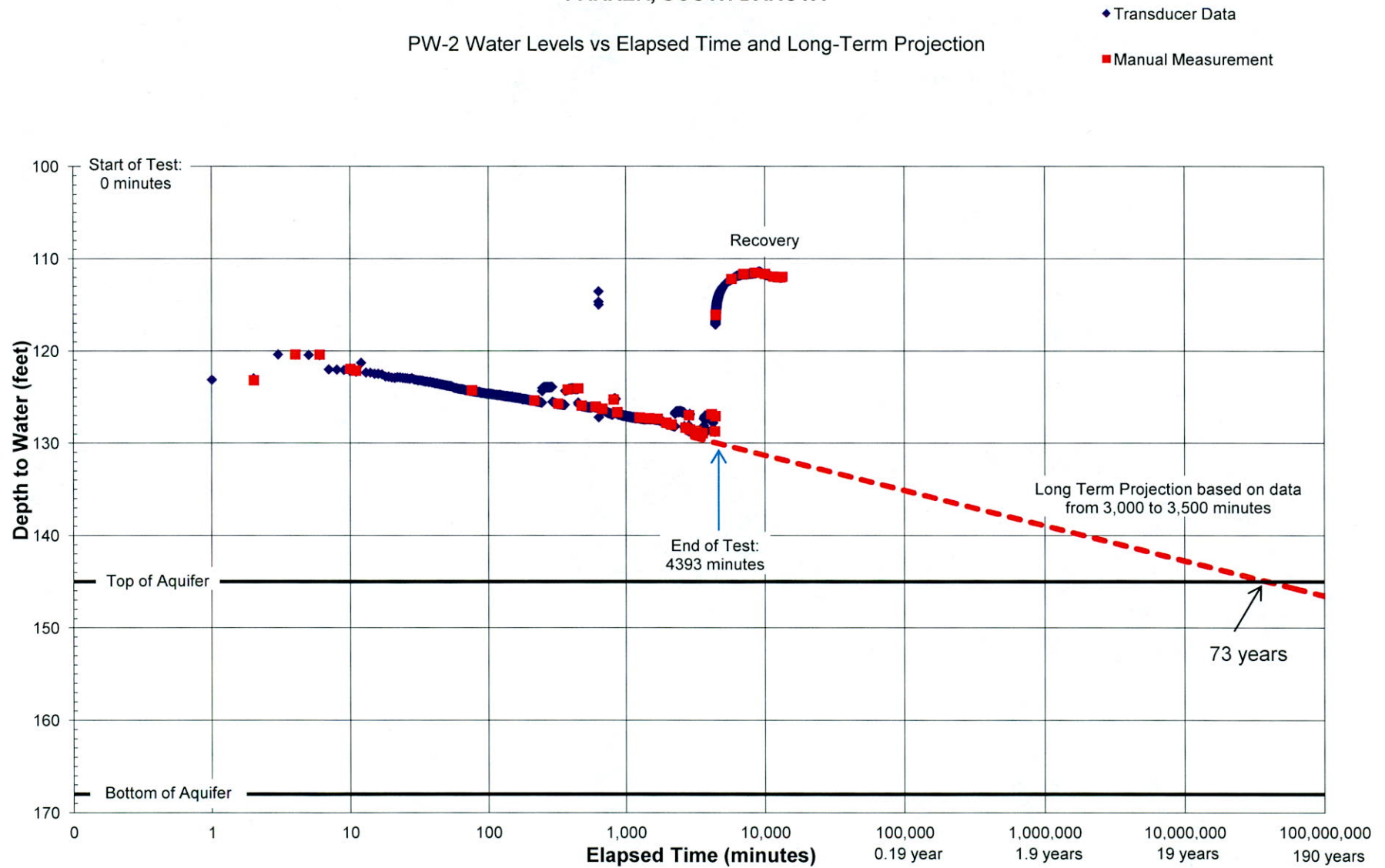


FIGURE 6

JIM RAND
27871 452ND AVENUE
PARKER, SOUTH DAKOTA

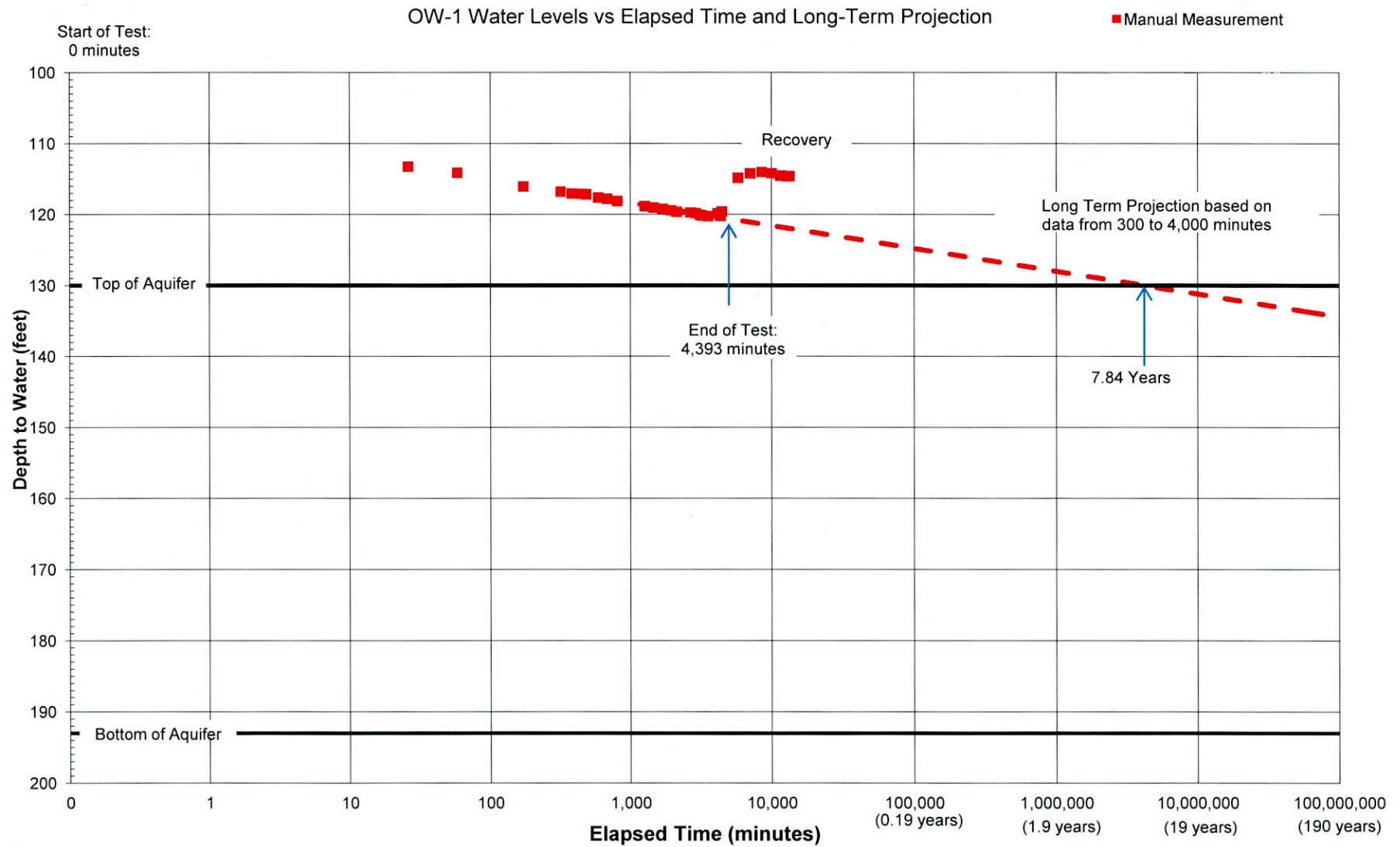


FIGURE 7

JIM RAND
27281 452ND AVENUE
PARKER, SOUTH DAKOTA

OW-1 Drawdown vs Elapsed Time
(430 feet from PW-2) June 2014 Test

■ Manual Measurement

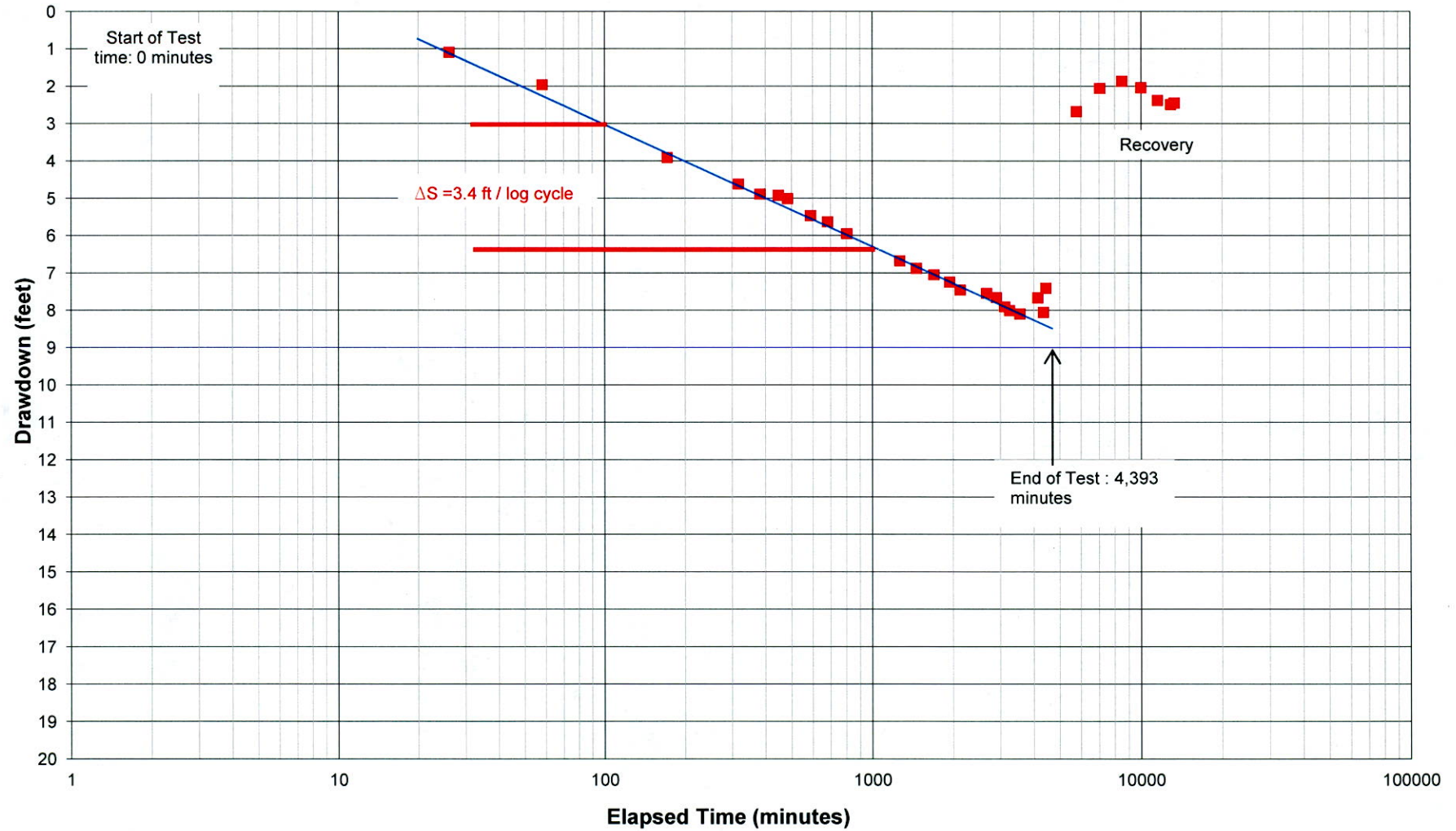
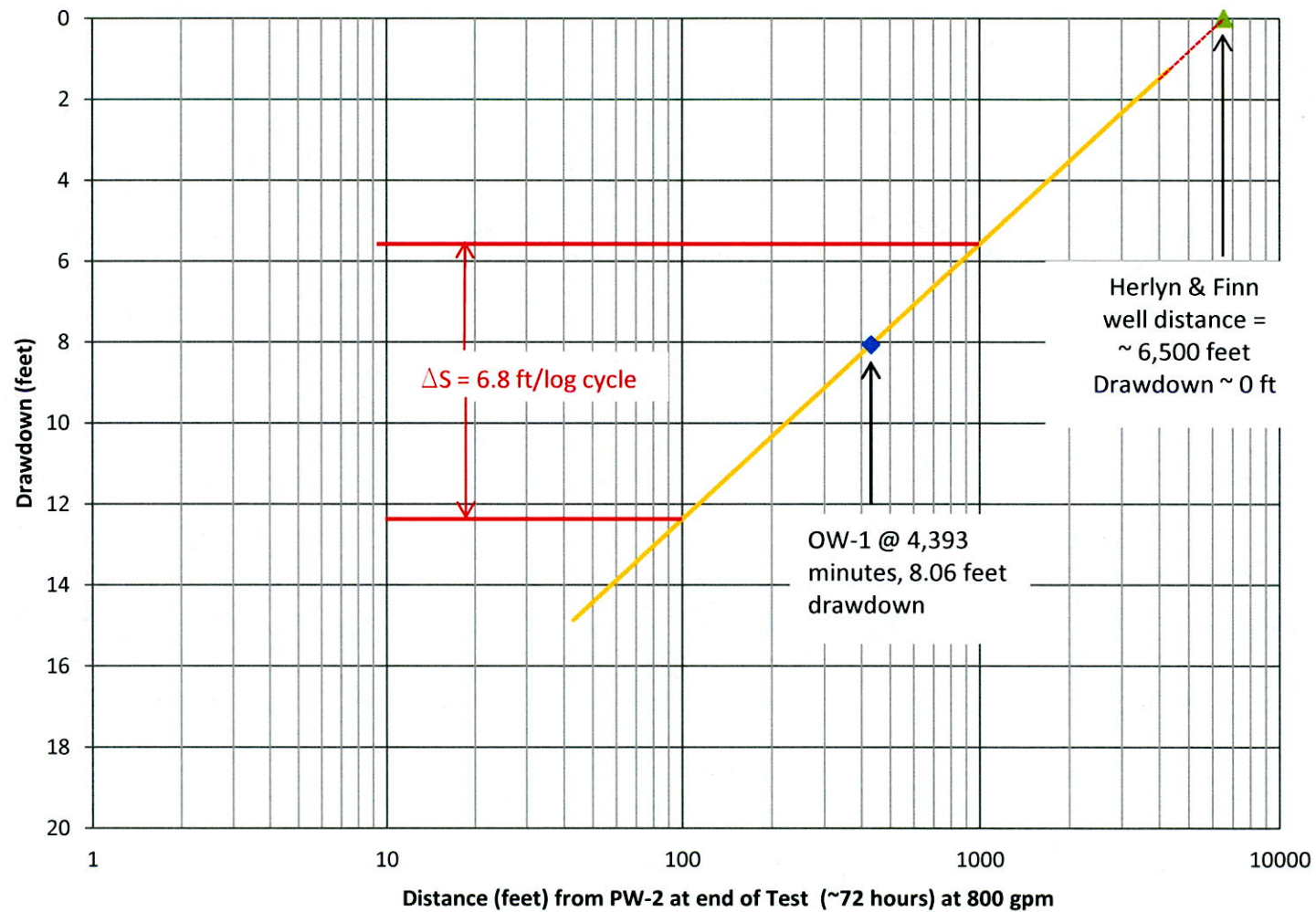


FIGURE 8

JIM RAND
27871 452ND AVENUE
PARKER, SOUTH DAKOTA

Distance - Drawdown Curve for 72-hour Pumping at 800 gpm



APPENDIX A

Rand PW-2 and OW-1 Geologist Logs

PW-2

SD EForm - 1621LU V1

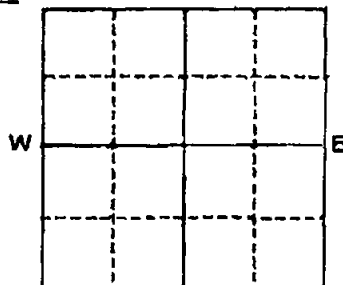
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW ¼ NE ¼ Sec 26 Twp 99 Rg 54

County Turner

North

Please mark well
location with an "X"

Well Completion Date

1 Mile

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

PROPOSED USE:

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

METHOD OF DRILLING:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	MOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	147.0 FT	17.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Quick Grout	37	Lb/gal	0.0 Ft	137.0 Ft
Red Flint	30	Lb/gal	137.0 Ft	168.0 Ft

Describe grouting procedure
Tremmie

SCREEN:

☐ Perforated pipe ☒ Manufactured

Diameter 12.00 inches Length 21.0 Feet

Material Stainless Steel

Slot Size 90 Set From 147.0 Feet to 168.0 Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How?

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

Well Owner: Jim Rand

Business Name:

Address: 27871 452nd Ave

City, State, Zip: Parker SD 57053

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Top Soil BIK	0	1
Clay Ylw	2	32
Clay Blu	32	145
Sand Blu	145	168

STATIC WATER LEVEL 112.0 FEET

If flowing: closed in pressure PSI

GPM flow through inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:

☐ Bailed

☐ Other

Pumping Level Below Land Surface

130.2 Ft. After 6.0 Hrs. pumped 930.0 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

Production Well # 2, Test Hole #4

43 22 02.0N 43.367 10 Hrs Air Development

97 11 10.3W 99.1862

Elev 1366

This well was drilled under license # 463 and this report is true and accurate.

Drilling firm: Steffl Drilling & Pump Inc / Kris VanHueveln

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:

SOUTH DAKOTA WATER WELL COMPLETION REPORT

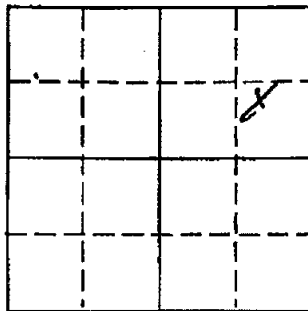
11-02

Location SE 1/4 NE 1/4 Sec 26 Twp 99N Rg 54W Well Owner: JIM RAND

County TURNER

North OW-1

Please mark well location with an "X"



Well completion Date 5-3-14

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.) 1/4 mile Septic Tank (Identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

ROTARY

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>220 LB/FT</u>	<u>4 IN</u>	<u>0 FT</u>	<u>193 FT</u>	<u>8 3/4 IN</u>
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>NP</u>	<u>12</u>	<u>Lb/gal</u>	<u>0 Ft</u>	<u>125 Ft</u>
		Lb/gal	Ft	Ft

Describe grouting procedure PRESSURE PUMPED
DROOT THROUGH TREMIE LENS

SCREEN:

☐ Perforated pipe ☒ Manufactured

Diameter 4 Inches Length 40 Feet

Material _____

Slot Size 25 Set From 153 Feet to 193 Feet

Other information _____

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How?

CHLORINE

Lab sample sent to for water quality analysis ☐ No, Why Not? _____

Business Name: _____

Address: 278 71 452 AVE

City, State, Zip: PARKER S.D. 57050

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>TOP SOIL</u>		
<u>YELLOW CLAY</u>		
<u>BLUE CLAY w/ GRAY STRIPS</u>		
<u>BLUE CLAY</u>	<u>62</u>	<u>130</u>
<u>FINE SAND</u>	<u>130</u>	<u>150</u>
<u>SAND & GRAVEL</u>	<u>150</u>	<u>193</u>
<u>SHALE</u>	<u>193</u>	<u>203</u>

STATIC WATER LEVEL

112 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in? _____

WELL TEST DATA:

☒ Pumped Describe: PUMPED w/ AIR

☐ Bailed

☐ Other _____

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

RECEIVED

MAY 19 2014

WATER RIGHTS PROGRAM

This well was drilled under license # 515

And this report is true and accurate.

Drilling firm: MARION WYLL DRILLING

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

Date: 5/13/14

Please return **WHITE COPY** to: DENR Water Rights

523 E Capitol Ave. Pierre SD 57501

APPENDIX B

Field Data Records and Transducer Data

Pumping Test Record (Pumping Well)

Client/Project: Jim Rand, Parker SD		Site: NE 26 T99N R54W	Pumping Well: Rand Well 2
Well	Pump		
Pumping Well:	Make:		
Screen Setting (ft bg):	Intake (ft bg):		
Stickup (ft):	Column Diameter (in):		
Measuring/Reference Point:	Power (ie. 3 ph, 480 V):		
	Horsepower:		
Water Level Meter:	Type: ☐ Submersible ☐ Vert. Turbine		
Sand Meter Type: ☐ Rossum ☐ Imhoff	☐ Other		
☐ Other			

Notes: Please obtain readings every 8 hours, at any changes in pumping rates, restarts, etc.

Date	Time (24-hr)	Depth H ₂ O (feet)	GALLONS PER MINUTE	ACRE FEET X .001			Comments
7-1-14	1030	112.30	0	0			PUMPING WELL
7-1-14	1100	114.04	-	-			4" WELL
7-9-14	12:00	Irrigation started 1 mile N West - Hartlyn					
7-9-14	6-8 pm	Re-start well off & on to check for leaks & tie up hoses					
7-9-14				000143.5	- Pump Start		
7-9-14	11:40	126.82				M. Keell Measurement	Pumping Well
7-9-14	1:15 PM	117.95	800	597	Endgun on	JR Measurement	4" Well
7-9-14	2:00 PM	127.93	800	686	"	JR Meas	Irrig Well
7-9-14	3:40 PM	118.66	800	925	"	JR	4" Observ Well
7-9-14	3:46 PM	128.28	800	944	"	JR	Irrig well
7-9-14	4:42 PM	126.73	700	1079	Endgun off	JR	Irrig well
7-9-14	4:45	118.93	700	1086	"	JR	4" Obs Well
7-9-14	5:50	118.96	700-725	1229	"	JR	4" OBS Well
7-9-14	5:56	126.62	700	1243	"	JR	Irr. Well
7-9-14	6:21	125.49	800	1309	Endgun On	JR	Irr. Well
7-9-14	6:26	119.05	800	1317	"	JR	4" Obs Well
7-9-14	8:12 PM	119.51	800	1580	"	JR	4" Obs Well
7-9-14	8:27 PM	125.60	800	1616	"	JR	Irrig Well

Pumping Test Record (Pumping Well)

Client/Project: Jim Rand, Parker SD		Site: NE 26 T99N R54W	Pumping Well: Rand Well 2
Well	Pump		
Pumping Well:	Make:		
Screen Setting (ft bg):	Intake (ft bg):		
Stickup (ft):	Column Diameter (in):		
Measuring/Reference Point:	Power (ie. 3 ph, 480 V):		
	Horsepower:		
Water Level Meter:	Type: ☐ Submersible, ☐ Vert. Turbine		
Sand Meter Type: ☐ Rossum, ☐ Imhoff	☐ Other		
☐ Other			

Notes: Please obtain readings every 8 hours, at any changes in pumping rates, restarts, etc.

Date	Time (24-hr)	Depth H ₂ O (feet)	GALLONS PER MINUTE	ACRE FEET X .001	Endgun		Comments
7-9-14	9:38PM	128.83	800	1787	on	JR	Irrig well
7-9-14	9:44PM	119.67	800	1801	on	JR	4" obs well
7-9-14	11:45PM	119.99	800	2101	on	JR	4" obs well
7-9-14	11:58PM	127.82	708	2133	off	JR	Irrig well
7-10-14	12:09AM	Start Reverse - 82% vis of water - Systemat 82% - 76%					
7-10-14	12:30AM	Endgun back on - 82%					78" water - 23%
7-10-14	12:48AM	129.20	800	2251	on	JR	Irrig well
7-10-14	7:19AM	129.78	800	3231	on	JR	Irrig well
7-10-14	7:23AM	120.72	800	3240	on	JR	4" obs well
7-10-14	10:32AM	126.82	800	3719	on	JR	4" obs well
7-10-14	10:49AM	129.87	800	3747	on	JR	Irrig well
7-10-14	2:26PM	129.91	800	4290	on	DR	Irrig well
7-10-14	2:33PM	121.09	800	4305	on	DR	4" OBS well
7-10-14	6:38PM	121.29	800	4905	on	JR	4" obs well
7-10-14	6:50PM	130.35	800	4933	on	JR	Irrig well
7-10-14	9:37PM	130.56	800	5349	on	AR	Irrig well
7-10-14	9:41PM	121.50	800	5359	on	AR	4" OBS well
7-11-14	6:41AM	121.59	800	6609	on	JR	4" obs well
7-11-14	6:54AM	130.88	800	6645	on	JR	Irrig well
7-11-14	9:34AM	129.53	700-725	7052	off	DR	Irrig well

PAGE 1 OF 1

LEGGETTE, BRASHEARS & GRAHAM, INC.

Pumping Test Record (Pumping Well)

Client/Project: Jim Rand, Parker SD Site: NE 26 T99N R54W

Pumping Well: Rand Well 2

Well	Pump
Pumping Well:	Make:
Screen Setting (ft bg):	Intake (ft bg):
Stickup (ft):	Column Diameter (in):
Measuring/Reference Point:	Power (ie. 3 ph, 480 V):
	Horsepower:
Water Level Meter:	Type: ☐ Submersible, ☐ Vert. Turbine
Sand Meter Type: ☐ Rossum, ☐ Imhoff	☐ Other
☐ Other	

Notes: Please obtain readings every 8 hours, at any changes in pumping rates, restarts, etc.

Date	Time (24-hr)	Depth H ₂ O (feet)	GALLONS PER MINUTE	ACRE FEET X .001	Endgun		Comments
7-11-14	10:20am	131.09	800	7153	ON	DR	Irrigation well
7-11-14	10:34am	126.70	800	7186	ON	DR	OBS well
7-11-14	2:06PM	126.95	800	7723	on	JR	OBS well
7-11-14	2:23PM	131.25	800	7767	on	JR	Irrig well
7-11-14	4:11PM	131.29	800	8040	on	JR	Irrig well
7-11-14	4:18PM	122.05	800	8056	on	JR	4th obs well
7-11-14	9:16pm	122.14	800	8813	on	JR	OBS well
7-11-14	9:29pm	131.45	800	8846	on	JR	Irrigation well
7-12-14	6:59am	129.41	700	10164	off	JR	Irrig well
7-12-14	7:05am	126.71	700	10176	off	JR	OBS well
7-12-14	10:35am	122.10	800	10678	on	JR	OBS well
7-12-14	10:43am	131.28	800	10697	on	JR	Irrig well
7-12-14	11:32am	129.62	700	10809	off	JR	Irrig well
7-12-14	11:37am		700	10818	off	JR	Ended test pumping
7-12-14	12:00pm	118.66	-	-	-	JR	Irrig well
7-12-14	12:02pm	121.45	-	-	-	JR	OBS well
7-13-14	10:00am	114.76	-	-	-	JR	Irrig well
7-13-14	10:10am	116.72	-	-	-	JR	OBS well
7-14-14	7:15am	114.21	-	-	-	JR	Irrig well
7-14-14	7:20	116.10	-	-	-	JR	OBS well

PAGE 1 OF 1
7-15-14 7:20AM 115.91

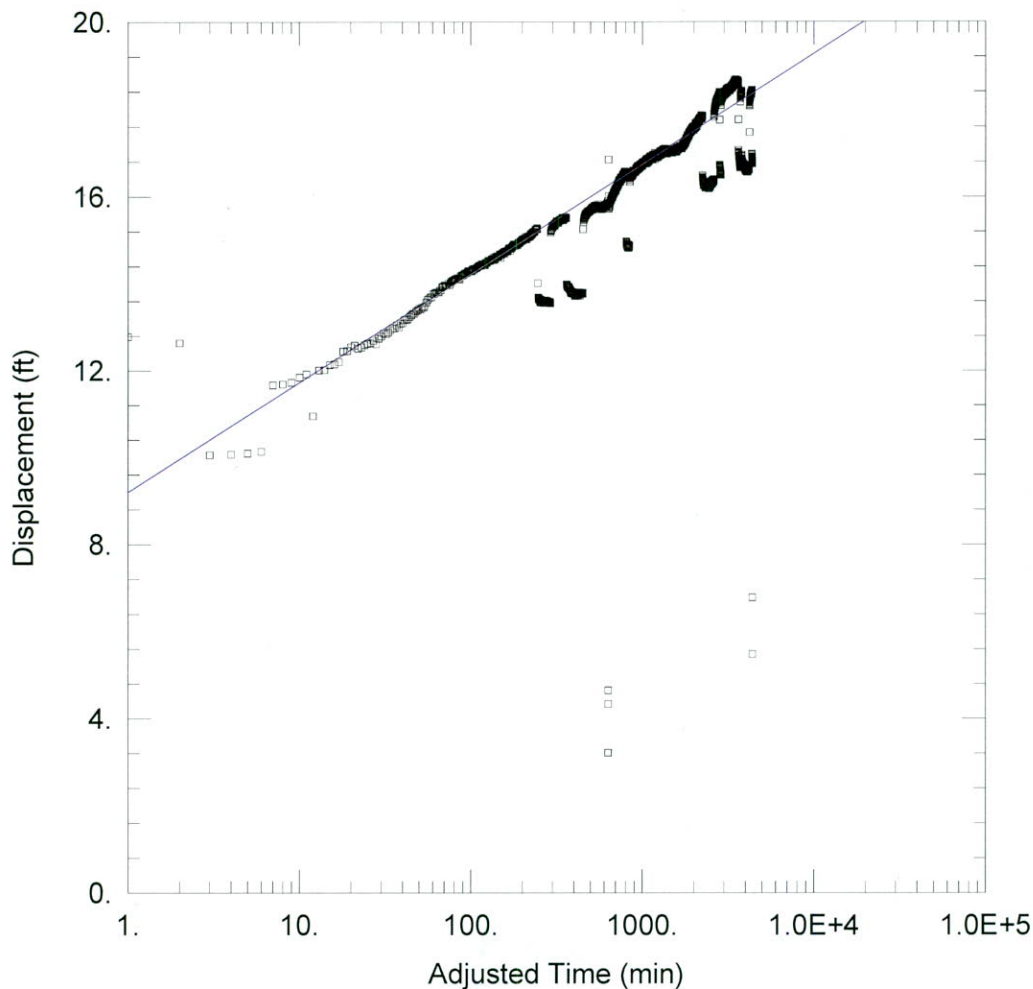
-JR OBS well

7-15-14 7:25AM 114.02

JR Irrig well

APPENDIX C

Quantitative Analysis Plots



WELL TEST ANALYSIS

Data Set: C:\Program Files (x86)\HydroSOLVE\AQTESOLV Pro 4.0\data\PW coopjacob MCP-revised.aqt
 Date: 08/06/14 Time: 15:39:58

PROJECT INFORMATION

Company: Rand Hydro Eval
 Client: Jim Rand
 Project: 0614.RANDAT
 Location: Parker SD
 Test Well: PW
 Test Date: July 2014

AQUIFER DATA

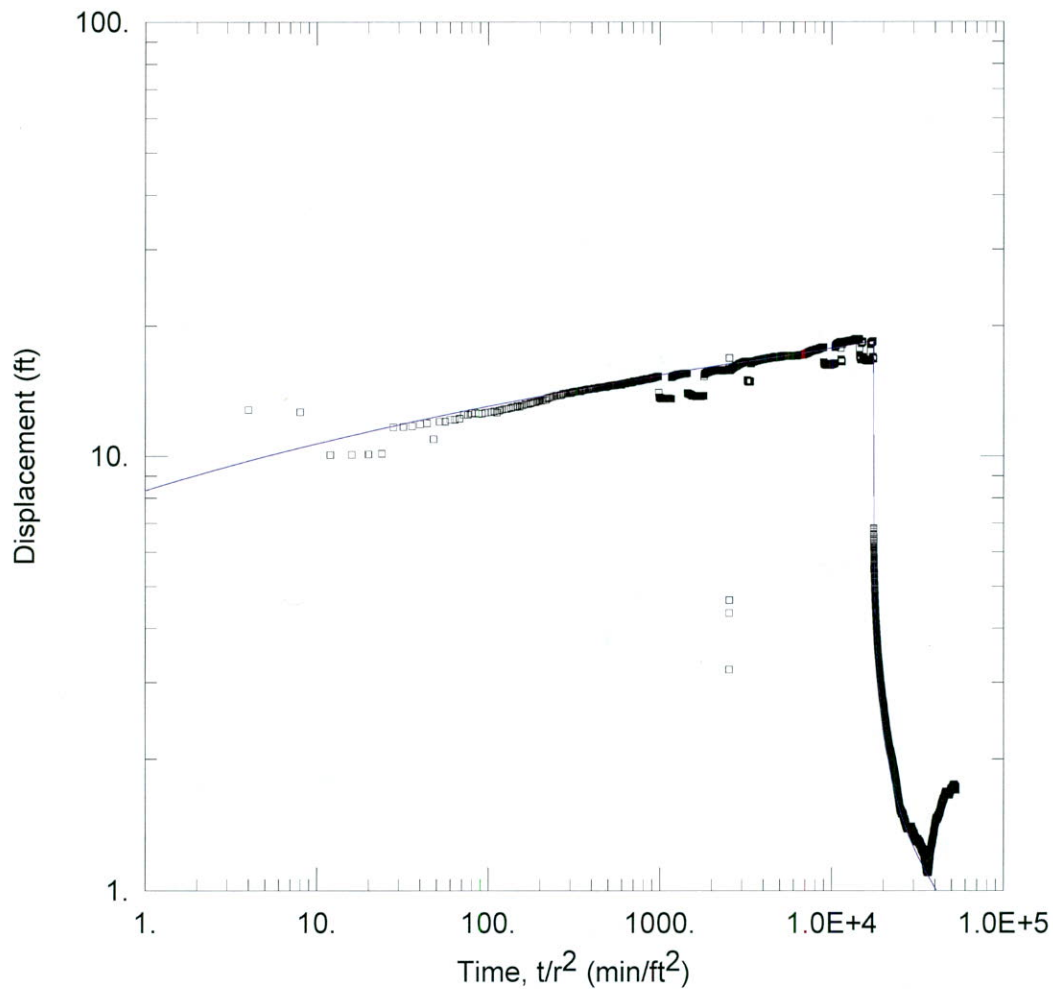
Saturated Thickness: 23. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
PW	0	0	□ PW	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob
 T = 1.12E+4 ft²/day S = 0.01581



WELL TEST ANALYSIS

Data Set: C:\...\PW Theis MCP-revised with boundaries.aqt

Date: 08/06/14

Time: 15:46:45

PROJECT INFORMATION

Company: Rand Hydro Eval

Client: Jim Rand

Project: 0614.RANDAT

Location: Parker SD

Test Well: PW

Test Date: July 2014

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
PW	0	0

SOLUTION

Aquifer Model: Confined

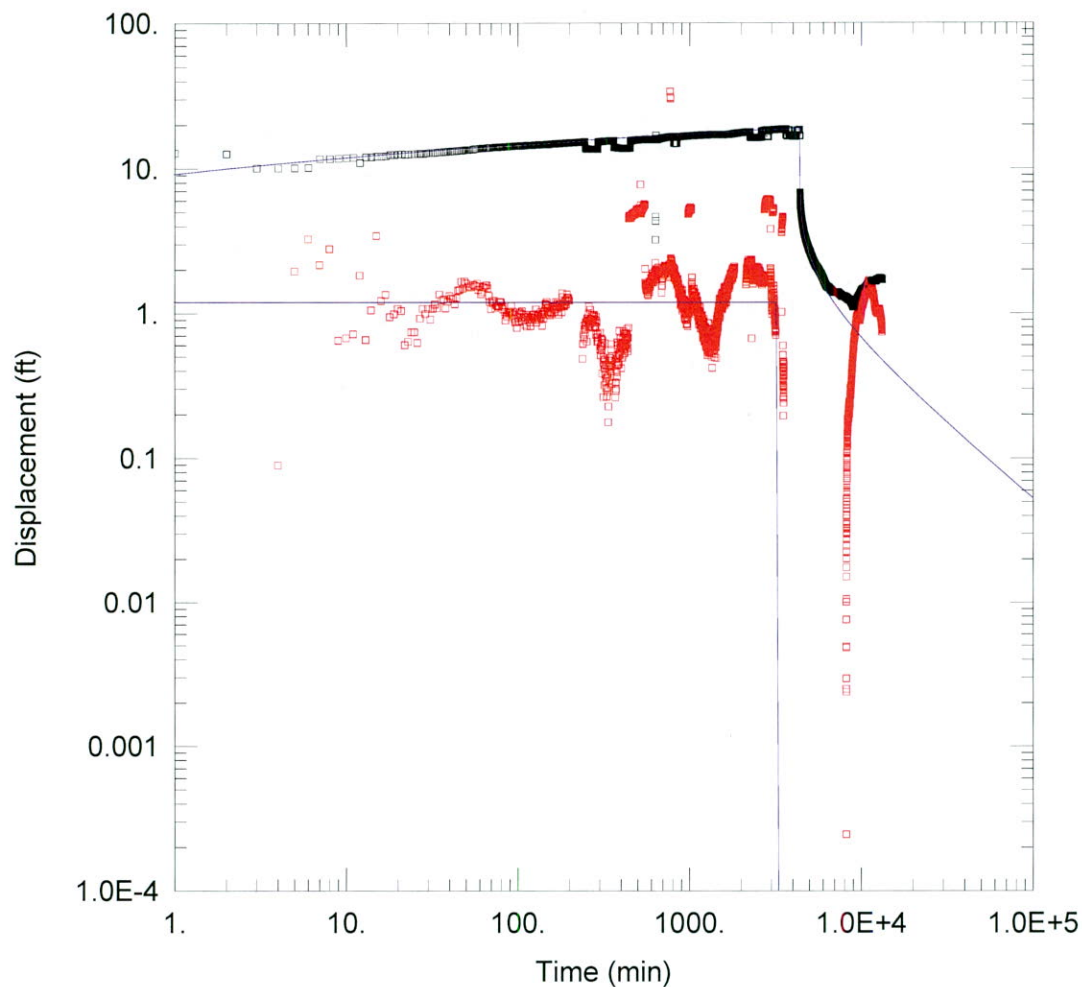
Solution Method: Theis/Hantush

$T = 1.202E+4 \text{ ft}^2/\text{day}$

$S = 0.005453$

$Kz/Kr = 1.$

$b = 23. \text{ ft}$



WELL TEST ANALYSIS

Data Set: C:\Program Files (x86)\HydroSOLVE\AQTESOLV Pro 4.0\data\PW Theis MCP-revised.aqt
 Date: 08/06/14 Time: 15:45:31

PROJECT INFORMATION

Company: Rand Hydro Eval
 Client: Jim Rand
 Project: 0614.RANDAT
 Location: Parker SD
 Test Well: PW
 Test Date: July 2014

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
PW	0	0	PW	0	0

SOLUTION

Aquifer Model: Confined

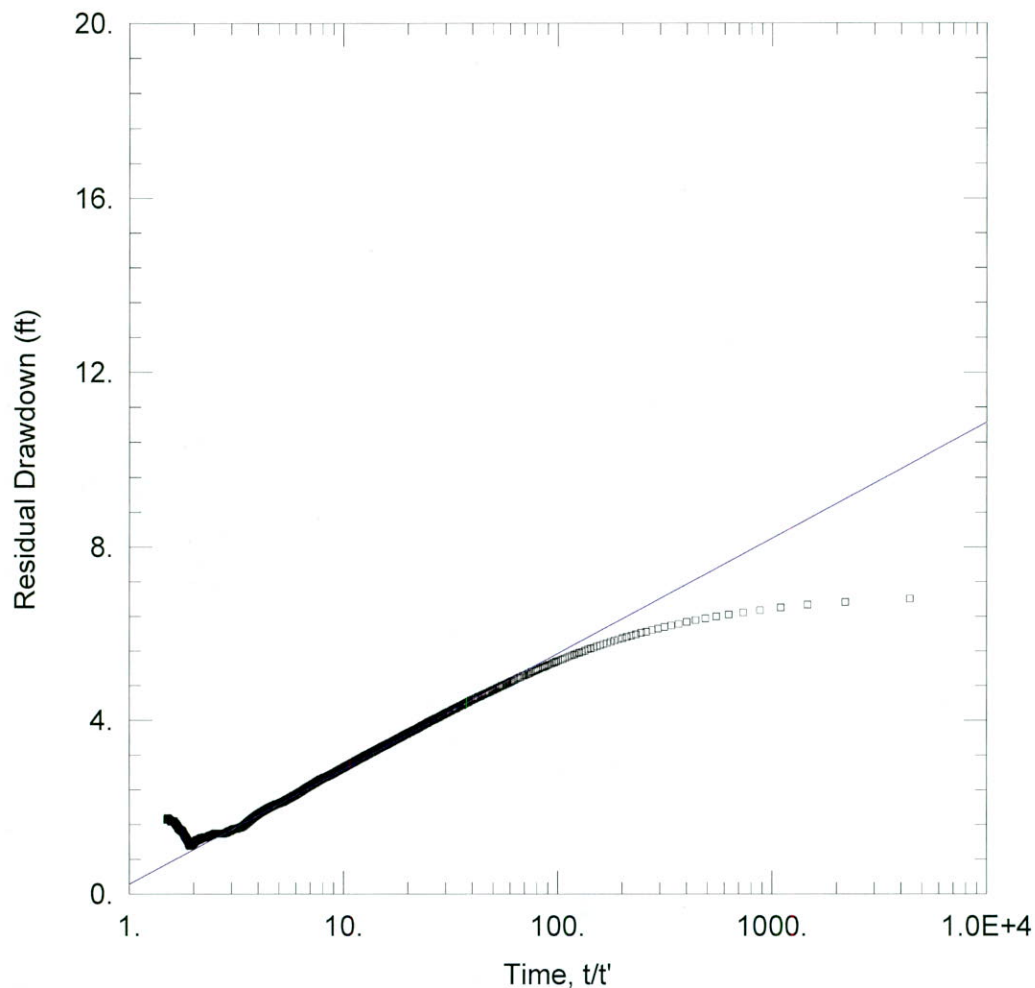
Solution Method: Theis/Hantush

T = 1.038E+4 ft²/day

S = 0.03201

Kz/Kr = 1.

b = 23. ft



WELL TEST ANALYSIS

Data Set: C:\...\PW Theis recovery MCP-revised.aqt

Date: 08/06/14

Time: 15:44:45

PROJECT INFORMATION

Company: Rand Hydro Eval

Client: Jim Rand

Project: 0614.RANDAT

Location: Parker SD

Test Well: PW

Test Date: July 2014

AQUIFER DATA

Saturated Thickness: 23. ft

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
□ PW	0	0

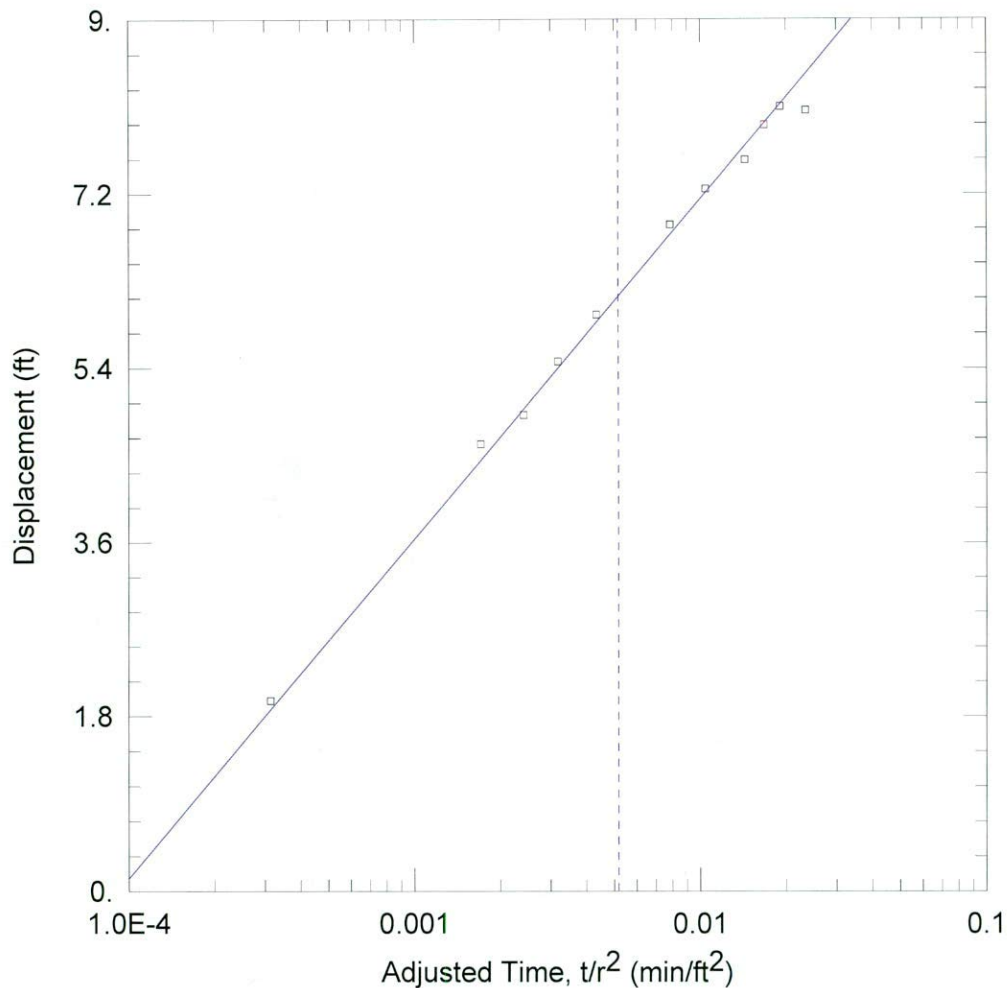
SOLUTION

Aquifer Model: Confined

Solution Method: Theis (Recovery)

$T = 1.061E+4 \text{ ft}^2/\text{day}$

$S/S' = 0.8326$



WELL TEST ANALYSIS

Data Set: C:\Program Files (x86)\HydroSOLVE\AQTESOLV Pro 4.0\data\obs cooper jacob MCP-revised.aqt
 Date: 08/06/14 Time: 15:44:01

PROJECT INFORMATION

Company: Rand Hydro Eval
 Client: Jim Rand
 Project: 0614.RANDAT
 Location: Parker SD
 Test Well: PW
 Test Date: July 2014

AQUIFER DATA

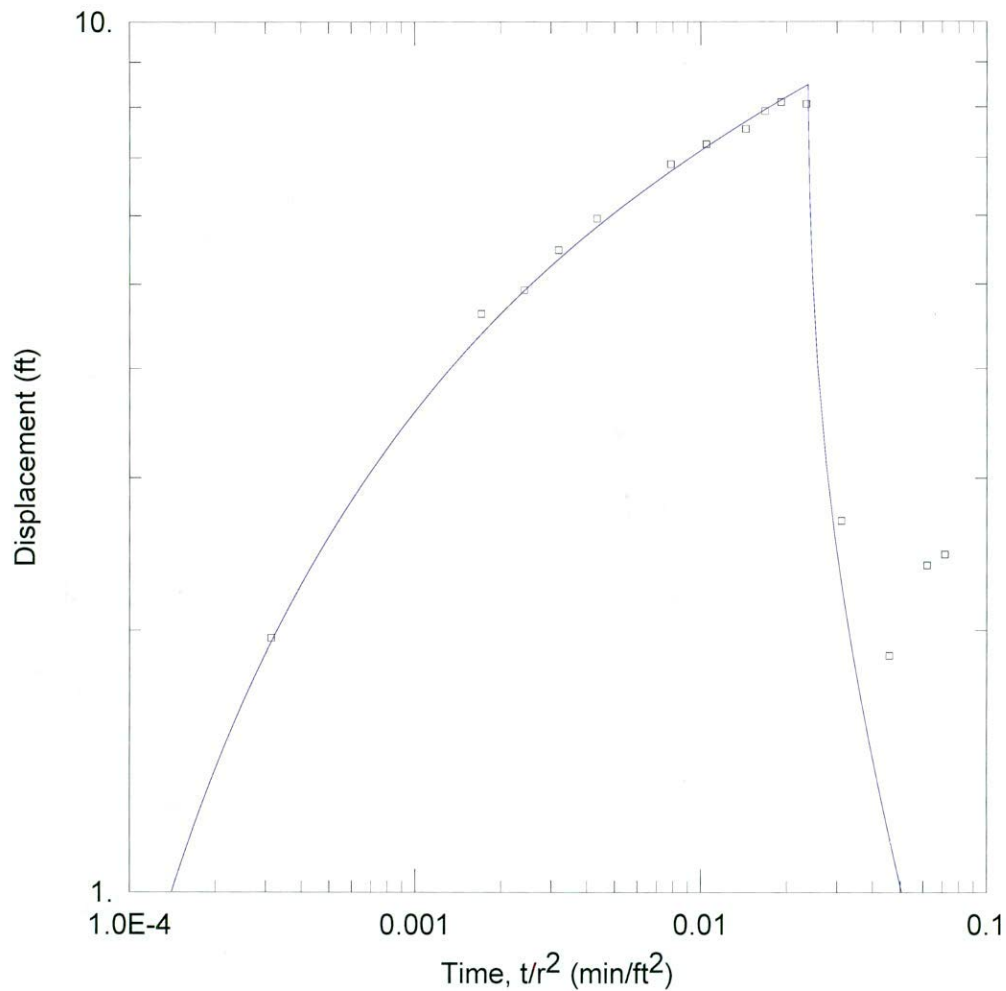
Saturated Thickness: 63. ft Anisotropy Ratio (K_z/K_r): 1.

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
PW	0	0	Observation Well	430	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob
 $T = 8046.3 \text{ ft}^2/\text{day}$ $S = 0.001159$



WELL TEST ANALYSIS

Data Set: C:\Program Files (x86)\HydroSOLVE\AQTESOLV Pro 4.0\data\obs theis MCP-revised.aqt
 Date: 08/06/14 Time: 15:47:51

PROJECT INFORMATION

Company: Rand Hydro Eval
 Client: Jim Rand
 Project: 0614.RANDAT
 Location: Parker SD
 Test Well: PW
 Test Date: July 2014

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
PW	0	0	Observation Well	430	0

SOLUTION

Aquifer Model: Confined

Solution Method: Theis/Hantush

T = 7756.4 ft²/day

S = 0.001347

Kz/Kr = 1.

b = 63. ft



**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

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

denr.sd.gov



**REVISED RECOMMENDATION OF CHIEF ENGINEER FOR WATER
PERMIT APPLICATION NO. 7930-3, James M Rand**

Pursuant to SDCL 46-2A-2, the following is the revised recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 7930-3, James M Rand, 27871 452nd Avenue, Parker SD 57053.

The Chief Engineer is recommending APPROVAL of Application No. 7930-3 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 Permit No. 7930-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 7930-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Jeanne Goodman, Chief Engineer
December 4, 2014

NOTE: Through follow-up to the study of the Upper Vermillion Missouri aquifer, DENR intends for the South Dakota Geological Survey to drill an observation well in the area of your proposed well. This observation well will become part of DENR's aquifer monitoring network with routine water level measurements recorded and maintained.

SUPPLEMENTAL REPORT TO THE CHIEF ENGINEER
ON
WATER PERMIT APPLICATION NO. 7930-3
JAMES M. RAND
DECEMBER 8, 2014

BACKGROUND:

Water Permit Application No. 7930-3 was submitted in December 2013. The application proposed to divert water at a maximum diversion rate of 1.89 cubic feet of water per second (cfs) from one well to be completed into the Pleistocene Series: Unknown aquifer. The well is 168 feet deep and is located in the S ½ NE ¼ Section 26 for the irrigation of 162 acres located in the NE ¼ and N ½ SE ¼ Section 26; all in T99N-R54W in Turner County. The applicant conducted an aquifer test based on the Chief Engineer's recommendation to defer the application up to one year to allow the applicant to provide more information necessary to adequately determine if there is unappropriated water available and if the potential effect of pumping at the proposed well site will adversely impact existing water users.

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

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

SDCL 46-6-3.1

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

In applying SDCL 46-6-3.1, the Sixth Judicial Circuit Court ruled in 2005 that if the Water Management Board uses average annual recharge, then it should also use average annual withdrawals to determine if unappropriated water is available from the aquifer (*Hines v. South Dakota Dept. of Environ. and Nat'l Resources, Hughes County 04-37*) (Memorandum Decision, April 29, 2005).

A 2012 First Judicial Circuit Court's rulings ultimately stated that data must be present to show it is probable the average annual recharge exceeds the average annual discharge by at least the amount requested by the water permit application being considered (*Hanson County Dairy v. Robert Bender and Stace Nelson*) (Memorandum Decision, April 11, 2012).

Later in 2012, the First Judicial Circuit Court stated that in deciding whether or not it is probable that the quantity of water withdrawn will exceed the quantity of the average estimated annual recharge is to be based according to the best information reasonably available, and that nothing in South Dakota law requires a recharge study (*Longview Farms, LLP v. South Dakota Dept. of Environ. and Nat'l Resources*) (Memorandum Decision, May 17, 2012).

AREA HYDROGEOLOGY:

The Pleistocene Series: Unknown is a generic name for an aquifer of glacial origin that cannot be included in a previously mapped aquifer. Prior to the completion of Hedges and others (1982) "Corps Report" and the Lindgren and Hansen (1990) Hutchinson and Turner Counties report there were two deep (greater than 100 feet) SD DENR-Geological Survey lithologic test holes within approximately three miles of the well site. By the time of the Lindgren and Hansen (1990) report there were seven test holes within approximately three miles of the well site, but none within approximately two miles (SDGS, 2014). That is to say, at the time the Hedges and others (1982) report and the Lindgren and Hansen (1990) report were published there were very few test holes in the area to detect the existence of this aquifer.

The test well log submitted with this application identified a glacial aquifer (sand and gravel) from 145 to 168 feet below grade. Hydrologic investigations (Lindgren and Hansen, 1990) lacked the geologic data to assess the presence of this outwash deposit. A test well was constructed at this site in 2013. The test well had a static water level of 112 feet below ground surface in November 2013. The test well log submitted with this application stated that it was pumped at 930 gallons per minute (gpm) for six hours and had a water level decline from 112 feet to 130.2 feet below grade. That is a specific capacity of 51.1 gpm/ft of drawdown.

The best information currently available indicates that the nearest portions of the Upper Vermillion Missouri and Parker-Centerville aquifers are approximately three miles southeast, and the Vermillion West Fork aquifer is approximately 1.5 miles northeast (Jarrett, 1986; Lindgren and Hansen, 1990; SDGS, 2014; Water Rights, 2014a; Water Rights, 2014c). The Niobrara aquifer underlies this outwash deposit (Lindgren and Hansen, 1990). However, the aquifer this application proposes to use is not a part of any of those aquifers.

A temporary permit was issued to perform an aquifer test at this well site. The pump test was performed and analyzed by Leggette, Brashears & Graham, Inc. on behalf of the applicant to obtain information about the proposed aquifer and the hydrogeologic characteristics of the project area. Numerical aquifer characteristics such as transmissivity and storativity were determined.

AQUIFER PUMP TEST EVALUATION:

A pumping well, referred to as PW-2 in the Leggette, Brashears & Graham, Inc. aquifer pump test report, and an observation well, referred to as OW-1 in the report, were drilled in the S $\frac{1}{2}$ NE $\frac{1}{4}$ and the SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 26 T99N-R54W, respectively (Peschong, 2014). A map of the project area is shown in Figure 1. The observation well is 430 feet north of the pumping well.

The aquifer pump test was to be a 72-hour constant-rate pump test followed by at least 72-hours of recovery monitoring. The actual times were 73.2 hours of pumping and approximately 144 hours of recovery measurements. The water levels in the pumping well, PW-2, were measured

manually and by a pressure transducer attached to a data logger (Peschong, 2014). The water level in the observation well, OW-1, were only taken manually (Peschong, 2014). The response of the aquifer to pumping was consistent with an aquifer under confined conditions (Peschong, 2014).

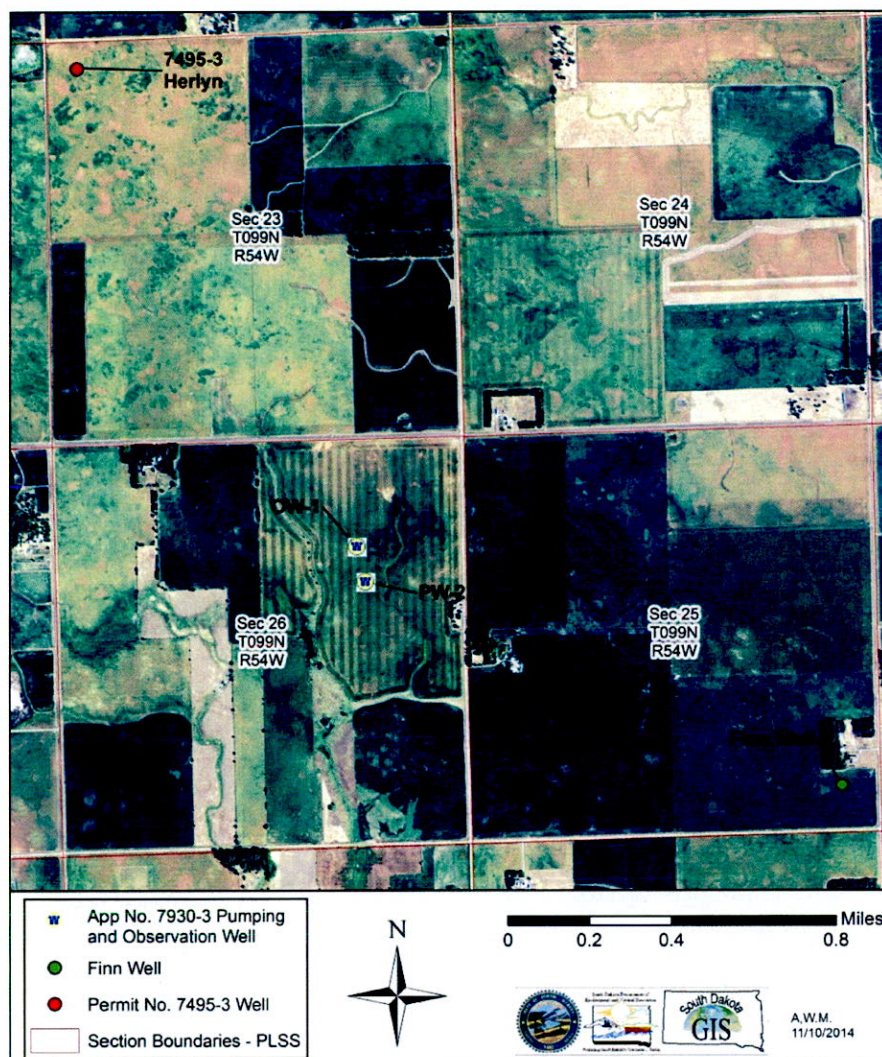


Figure 1- Map of the area of Application No. 7930-3 (Peschong, 2014; Water Rights, 2014b and 2014c)

The pump test water was discharged through a center pivot irrigation system. A calibrated flow meter was installed between the well and the center pivot. The well was pumped at approximately 800 gpm when the end gun of the center pivot was on and approximately 700 gpm when it was off. Based on the time pumping during the test, 73.2 hours, and the volume applied according to the flow-meter, 10.67 acre-feet (ac-ft), the average pump rate during the aquifer test was 791.7 gpm. The area irrigated by the center pivot used to move the water away from the pumping well was 135.9 acres (Rand, Personal Communication, November 10, 2014). That would be an application rate of 0.94 inches per acre, which is slightly less than the intended one inch per acre stated in Peschong's (2014) report.

The transmissivity of the aquifer calculated from the pump test data ranged from 58,014.9 gallons per day per foot (gpd/ft) to 89,909.6 gpd/ft, depending on the method of calculation, with a geometric mean of 73,835.1 gpd/ft (Peschong, 2014). The storativity of the aquifer was calculated to range from 0.00116 to 0.00135 with a geometric mean of 0.0012. The methods for calculating transmissivity and storativity included: confined Theis, confined Theis with boundary, confined Cooper-Jacob, and the confined Theis recovery (Peschong, 2014).

The maximum drawdown in the pumping well, PW-2, was 18.5 feet after 73.2 hours of continuous pumping. The maximum drawdown in the observation well, OW-1, was 8.06 feet at the conclusion of the pumping portion of the test (73.2 hours). After 77 hours of recovery time, the water level in PW-2 recovered to approximately 95 percent of the initial static water level (approximately 0.6 feet from initial static water level). The water level in OW-1 recovered to within approximately two feet of initial static water level (approximately 75 percent). Peschong (2014) went on to state:

“However, data indicate that background water levels were decreasing before and after the test, and prohibited the observed recovery from reaching the pre-pumping static levels. This is evident by the water level decreases observed starting approximately 42 hours prior to test start and in the recovery reversal observed at approximately 8,500 minutes where the recorded data transitions from test recovery to the background decreasing water trend.”

During the aquifer test a potential boundary condition was observed. At 1,680 minutes (28 hours) into the pumping portion of the test, drawdown rates increased. This increase in drawdown rates suggested the drawdown cone had reached a negative (impermeable) boundary. The line on a time-drawdown graph indicated the slope doubled from approximately 2.4 to 4.8 when the boundary was encountered. Using the time-drawdown relationship from Driscoll (1989), shown in equation 1, and the geometric mean of calculated T and S, Peschong (2014) estimated the boundary at approximately 5,100 feet from PW-2 (see Equation 1).

$$r_o = \sqrt{\frac{0.3 \cdot T \cdot t}{S}} \quad \text{Eq. 1}$$

Where:

r_o = radius of influence (ft)
 T = Transmissivity (73,835 gpd/ft)
 t = time in days (1,680 minutes = 1.16 days)
 S = coefficient of storage (0.001)

Using high and low values of T and S the distance to the boundary from PW-2 ranged from approximately 4,500 to 5,600 feet (Peschong, 2014). Peschong (2014) using Aqtesolv, a computer program, and the Theis with boundaries method determined the best matched location for the potential boundary was approximately 3,500 feet from PW-2.

Using 73,835.08 gpd/ft for T, 0.0012 for S, and 1.167 days for t, the distance to the boundary is approximately 4,640 feet from PW-2. This value will be used for the distance to an aquifer boundary for analysis presented later in this report.

The boundary condition that was encountered 1,680 minutes into the pumping portion of the test indicates the drawdown cone extended to a boundary condition. However, no other indications of boundary conditions were detected during the aquifer test. Figure 2 shows the boundary condition encountered at 1,680 minutes as the right boundary. On the left, note that the radius of influence is greater than 6,500 feet away.

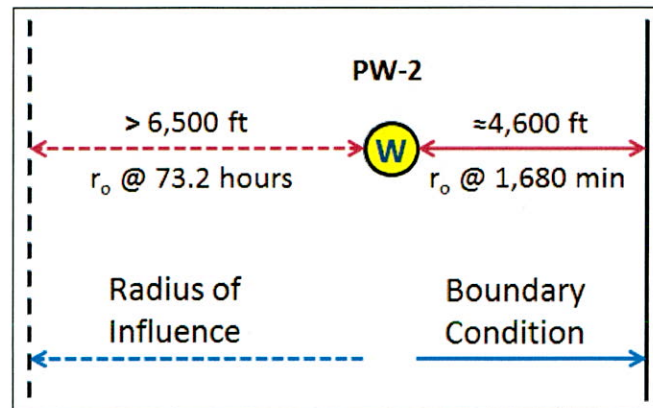


Figure 2- Distance to a boundary condition and radius of influence, r_o , from the pumped well, PW-2

Using a Cooper-Jacobs Distance Drawdown Curve (see Figure 3), Peschong (2014) estimated the radius of influence at the end of the pumping portion of the test to be approximately 6,500 feet. Calculating the distance from the drawdown data, the radius of influence is 6,593 feet.

Calculating the radius of influence, r_o , using Equation 1 instead of the Distance-Drawdown Curve (Figure 3) with a transmissivity (T) of 73,835 gpd/ft, a time (t) of 3.05 days (73.2 hours), and coefficient of storage (S) of 0.0012, the radius of influence is approximately 7,503 feet.

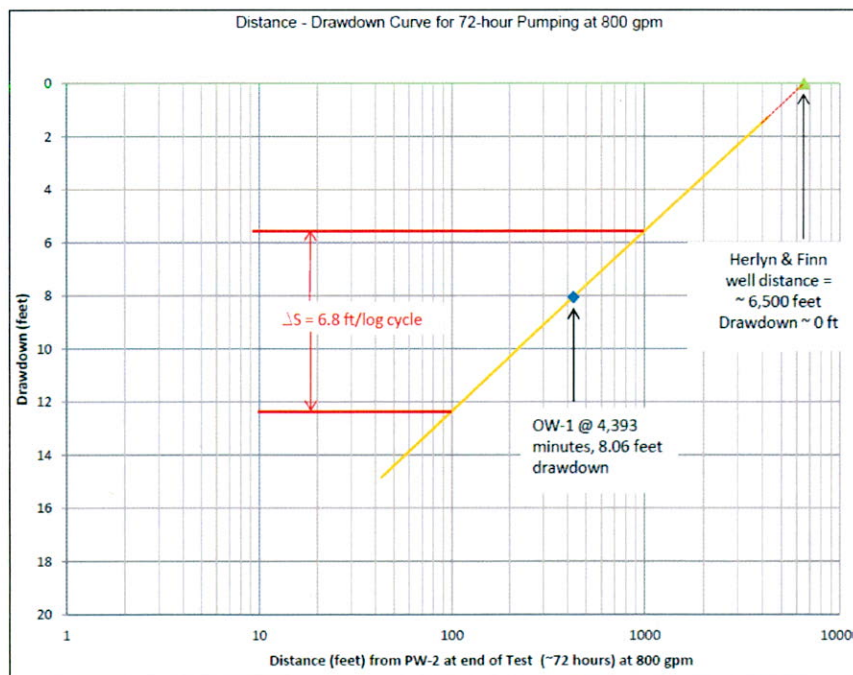


Figure 3- Distance-Drawdown Curve for 72-hour Pumping at 800 gpm (Peschong, 2014)

Long-term drawdown was estimated by Peschong (2014) by extending a trendline for the late-time data from PW-2 and OW-1 water levels over elapsed time charts (see Figures 4 and 5). Peschong (2014) calculated it would take 73 years of continuous pumping of PW-2 at 800 gpm to lower the water level below the top of the aquifer at PW-2 and 7.84 years to do the same at OW-1.

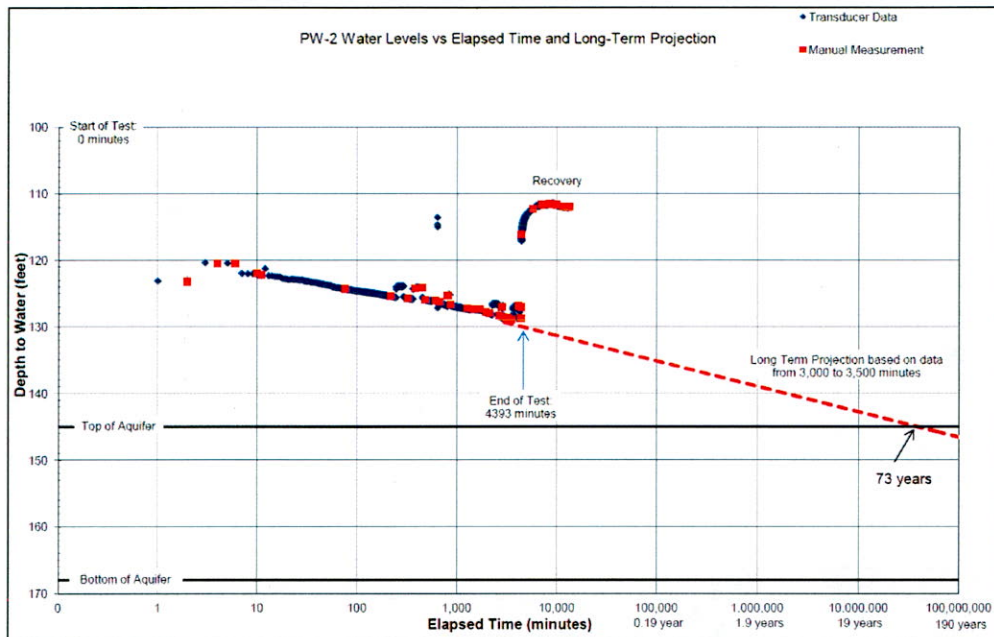


Figure 4- PW-2 (pumping well) Water Levels vs. Elapsed Time and Long-Term Projection (Peschong, 2014)

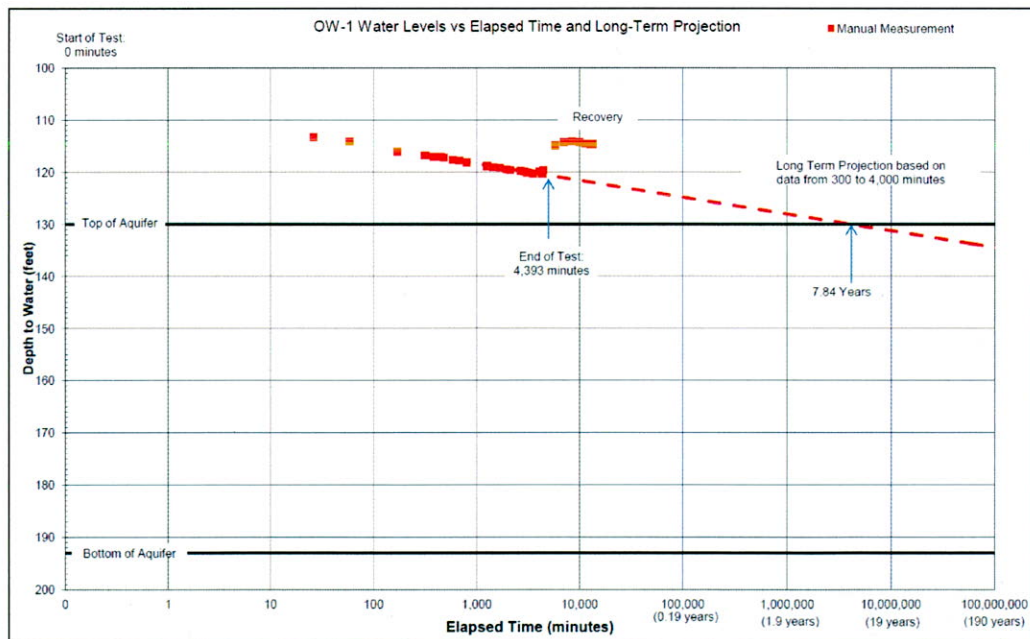


Figure 5- OW-1 (observation well) Water Levels vs. Elapsed Time and Long-Term Projection (Peschong, 2014)

Peschong (2014) stated after cessation of pumping, the water level recovered to 95 percent of static conditions in PW-2 within approximately three days. This was believed to be a “worst-case recovery percentage” because the data suggested a downward trend in the aquifer water levels after an elapsed time of approximately 8,500 minutes (approximately six days). Based on that data, it was suspected that recovery was marginally greater than measured. Thus, it was surmised that full recovery was achieved in PW-2 within the six days of recovery monitoring following the cessation of pumping (Peschong, 2014). Peschong (2014) went on to state that typically the applicant will apply between four and eight inches of irrigation water per year (45.3 to 90.3 ac-ft/yr).

Peschong (2014) concluded that there is sufficient water to support the operation of the proposed irrigation well, there will be no impacts requiring the lowering of pumps in existing wells, and adverse impacts on water elevations are not anticipated. The conclusion there is sufficient water available is based on the fact it would take years of continuous pumping to lower the water level below the top of the aquifer, the well is capable of being pumped at 800 gpm, and that the water level recovered after cessation of the pumping portion of the aquifer test. Neither of those reasons addresses the requirements in SDCL 46-6-3.1. The conclusions that no impacts will require the lowering of pumps and adverse impacts on water elevations are not anticipated are based on the limited drawdown expected to be created from pumping the well and the rapid recovery rate of the aquifer observed during the test. Both of the reasons are acceptable and valid in determining whether a proposed diversion will adversely impact existing appropriative and domestic users.

The test did not determine if unappropriated water is available for this proposed appropriation. However, it was determined that pumping this proposed diversion would not likely cause adverse impacts to existing appropriative and domestic users.

EXISTING WATER RIGHTS:

There is one domestic well on file that may be completed into the same outwash deposit as the well this application proposes to use, known as the “Finn” well in Peschong’s (2014) report. The well is likely between 6,500 and 7,000 feet southwest of the well this application proposes to use. The drawdown at that range of distances calculated from the Theis equation is shown in Table 1. The drawdown shown in Table 1 is under the worst case scenario of pumping constantly for 185 days (the entire irrigation season) at the maximum diversion rate requested by the application (850 gpm).

Transmissivity	Storativity	Pump Rate	Time	Distance	Drawdown
GPD/ft		GPM	Days	ft	ft
73835 ^a	0.0012 ^a	850 ^b	185 ^c	6500	5.8
				7000	5.6
				7900	5.3
^a = Geometric means from: Peschong, 2014; ^b = Maximum diversion rate requested; ^c = pumping entire irrigation season					

Table 1 - Potential drawdown at nearby wells on file with the DENR-Water Rights Program (icalcul8, 2014; Water Rights, 2014b and 2014c)

At the time of drilling in November 1981, the “Finn” well had a static water level of 90 feet below grade. That water level is very similar to the expected water level if the water level was

measured today. The top of the aquifer is also approximately 90 feet below grade. There is approximately 18 feet and 33 feet of artesian head pressure at the observation well (OW-1) and the pumped well (PW-2) sites, respectively. Thus, pumping at 850 gpm for 185 days continuously would start to dewater the aquifer at the “Finn” well but not necessarily at the observation well and pumped well. However, the estimated maximum drawdown in the “Finn” well would leave at least 20 feet of saturated thickness at the “Finn” well. The well completion report indicates the “Finn” well is an adequate well.

Considering that the potential drawdown shown in Table 1 is based on pumping continually for 185 days straight at the maximum permitted diversion rate, which is unlikely, the drawdown created from pumping the irrigation well will likely be less than what is shown in Table 1. Therefore, there is a reasonable probability that pumping from this proposed diversion will not adversely impact adequate domestic wells withdrawing water from the same aquifer.

Upon review of the test hole and well logs for this application and the performance of the aquifer pump test, it was determined that the well authorized for Water Permit No. 7495-3 (the Herlyn well in Peschong’s report) is likely completed into the same aquifer as this application proposes to use.

The well authorized by Permit No. 7495-3 is approximately 7,900 feet northwest from the well site. The estimated maximum drawdown in the well authorized by Permit No. 7495-3 created by pumping PW-2 is approximately 5.3 feet. That would leave approximately 25 feet of artesian head pressure. Considering that the potential drawdown shown in Table 1 is based on pumping continually for 185 days straight at the maximum permitted diversion rate, the drawdown created from pumping the irrigation well will likely be less than shown. Therefore, there is a reasonable probability that pumping from this proposed diversion will not adversely impact adequate wells completed into the same aquifer with prior appropriative rights.

SDCL 46-6-6.1 does not protect artesian head pressure as a means of delivery and the Water Management Board has consistently recognized that to place water to maximum beneficial use a certain amount of drawdown may occur. To balance interests between irrigation use and delivery of water by artesian pressure, the Water Management Board defined an “adversely impacted domestic well” in ARSD 74:02:04:20(7) as:

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

Assuming adequate construction, there is a reasonable probability that pumping by this proposed diversion will not adversely impair adequate domestic or appropriative wells having prior appropriative rights.

WATER AVAILABILITY:

The aquifer pump test did not compare recharge with withdrawal from this portion of the Pleistocene Series: Unknown aquifer. However, analysis of the aquifer test data did allow for

determination of an area of influence as well as how the pumped well (PW-2) interacts with area wells.

The distance from the pumped well to the permeability boundary that was indicated by the drawdown data was approximately 4,640 feet. The radius of influence at the end of the pumping portion of the aquifer test ranged from approximately 6,500 to 7,503 feet. Approximately three days after the cessation of pumping, the water level in the aquifer started to slightly decline. Approximately six days after the cessation of pumping, the water level of the aquifer as measured in the pumping well (PW-2) and the observation well (OW-1) was approximately 0.5 feet lower than the highest water level recorded during the recovery period. During the test pumping period and during at least the early portion of the recovery period, the well supplying Water Permit No. 7495-3 (Herlyn) was pumping water at a rate of 500 gpm. While there are no exact recordings when and how long the well authorized by Permit No. 7495-3 was pumped, estimates are available from Peschong's (2014) report and from a conversation with Dennis Herlyn (Personal Communication, September 18, 2014), owner of Water Permit No. 7495-3. The best information available indicates Mr. Herlyn pumped his well for at least three days before the water level started declining during the recovery period of the aquifer test. The well authorized by Permit No. 7495-3 is approximately 7,500 feet away from the observation well (OW-1) and 7,900 feet from the pumping well (PW-2).

At 500 gpm pumping for three days continuously with a T (transmissivity) of 73,835 gpd/ft and an S (coefficient of storage) of 0.0012, the well authorized by Permit No. 7495-3 is expected to create a drawdown of approximately 0.4 feet at OW-1 (icalcul8, 2014). The manually measured decline from maximum water level during the recovery period is 0.5 feet. Assuming the well authorized by Permit No. 7495-3 was pumped for the three days used in the calculation and the fact only one inflection indicating a permeability boundary was seen in both the pumping and recovery data, it is reasonable to assume that the aquifer extends at least 7,500 feet around the well authorized by Permit No. 7495-3.

Considering the distances of the radiuses of influence of the well authorized by Water Permit No. 7495-3, the well pumped for the aquifer test, and the distance to the permeability boundary, the area of the aquifer likely ranges from at least approximately 6,377 to 7,060 acres. Hedges and others (1985) suggested that for management and development programs the recharge rate to confined aquifers should range from 0.15 to 0.6 inches per year (in/yr); recharge to this aquifer is estimated at approximately 80 to 353 ac-ft/yr.

The average application rate for irrigation appropriations from 1979 through 2013 was calculated for all irrigation permits/rights within approximately five miles of the well site (Water Rights, 1979-2014). The rate is 8.77 inches per acre (in/ac). There are 34 water rights/permits including permits that have been cancelled or incorporated into other water rights/permits within the five mile radius. A range of application rates for three different aquifers, the Floyd: Pearl Creek, the Tulare: East James, and the Tulare: Western Spink/Hitchcock, was determined to be 7.61 to 9.44 in/yr/ac (Buhler, 2012a; Buhler, 2013a, Buhler, 2013b). Considering, the other application rates, it is reasonable to assume 8.77 in/ac is a representative value for irrigation application rate in the area of this application.

Considering the applicant used a 135.9 acre pivot and that he intends to keep using this pivot if the application is approved (Rand, Personal Communication, November 10, 2014), on average the applicant will apply no more than 99.3 ac-ft/yr if water is applied at a rate of 8.77 in/yr. The pivot authorized under Permit No. 7495-3 irrigates approximately 133 acres (Dennis Herlyn, Personal Communication, November 18, 2014). Therefore, Permit No. 7495-3 will pump approximately 97.2 ac-ft/yr on average. That is a total of 196.5 ac-ft/yr.

That amount of water is slightly more than the middle of the estimated range of average annual recharge to the portion of the Pleistocene Series: Unknown aquifer that was within the radiuses of influence of the well authorized by Water Permit No. 7495-3 and the pumping well used for the aquifer test. Therefore, there is a reasonable probability that there is unappropriated water available for this proposed appropriation.

OBSERVATION WELL

There are no DENR-Water Rights Program observation wells completed into the aquifer this application proposes to use (Water Rights, 2014a). Administrative Rule of South Dakota Section 74:02:05:07 requires the Water Management Board to rely upon the record of observation well measurements to determine the quantity of water withdrawn annually from the aquifer does not exceed the estimated average annual recharge. Three previous applications have been deferred for aquifer testing: Permit No. 7541-3, Permit No. 7921-3, and Permit No. 7988-3. Each has been required to construct an observation well and provide the well to DENR-Water Rights Program for monitoring.

The observation well used for the aquifer test, OW-1, is not suitable as an observation well due to its close proximity to the production well (PW-2) and difficulty to access. In similar situations, the Chief engineer has recommended the applicant provide an observation well to the State that is in a public right of way or readily accessible area on property owned by the permit holder with a perpetual easement for maintaining the observation well.

CONCLUSIONS:

1. Deferred Permit Application No. 7930-3 proposes to appropriate water at a maximum diversion rate of 1.89 cfs from a deposit of the Pleistocene Series: Unknown aquifer for the irrigation of 162 acres.
2. An aquifer pump test was conducted and analyzed by Leggette, Brashears & Graham, Inc. A report was prepared by B.J. Peschong.
3. The aquifer pump test determined the transmissivity and the storativity of the aquifer to be 73,835 gpd/ft and 0.0012, respectively.
4. Upon review of test hole logs and the aquifer pump test data provided with this application, it is likely Water Permit No. 7495-3 is withdrawing water from the same aquifer as this application proposes to use.
5. There is a reasonable probability that pumping the proposed diversion will not adversely impact existing domestic and appropriative users.
6. Interpretation of the pumping and recovery data indicates the aquifer underlies an area of at least approximately 6,377 to 7,060 acres. That equates to an approximate average annual recharge range of 80 to 353 ac-ft/yr.

7. It is reasonable to assume the applicant and Water Permit No. 7495-3 will on average apply 8.77 in/yr, which is 196.5 ac-ft/yr based on the area irrigated by their respective center pivots.
8. There is a reasonable probability that unappropriated water is available for this proposed appropriation.
9. The DENR-Water Rights Program does not currently have any observation wells completed into this portion of the aquifer. In similar situations, the Chief Engineer has recommended the applicant provide an observation well to the State for aquifer monitoring.



Adam Mathiowetz
SD DENR-Water Rights Program

Approved by:



Ken Buhler
SD DENR-Water Rights Program

REFERENCES:

Circuit Court of South Dakota, First Judicial Circuit, 2012, May 17, 2012 Memorandum Decision
re: Longview Farms, LLP v. South Dakota Dept. of Environ. and Nat'l. Resources.

Circuit Court of South Dakota, First Judicial Circuit, 2012, April 12, 2012 Memorandum Decision
re: Hanson County Dairy v. Robert Bender and Stace Nelson.

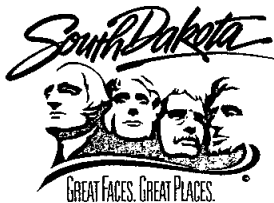
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DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

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



December 5, 2014

Argus Leader
PO Box 5034
Sioux Falls SD 57117

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7930-3 to Appropriate Water. Please publish the notice once on December 18, 2014. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

The applicant must verify to you that the notice is to be published and arrange for payment. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is James M Rand, 27871 452nd Ave, Parker SD 57053 (Ph # 605-297-3683).

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

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
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December 5, 2014

New Era
PO Box 579
Parker SD 57053

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DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

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

December 5, 2014

James M Rand
27871 452nd Ave
Parker SD 57053

Dear Mr. Rand:

Water Permit Application No. 7930-3 for irrigation use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the New Era printed at Parker SD (Ph # 605-297-4419) and the Argus Leader printed at Sioux Falls SD (Ph # 605-331-2200). 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 December 18, 2014. The applicant is responsible for payment. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352 or email: Karen.schlaak@state.sd.us.

NOTICE OF APPLICATION NO. 7930-3 to Appropriate Water

Notice is given that James M Rand, 27871 452nd Ave, Parker SD 57053 has filed an application for a water permit to appropriate 1.89 cubic feet of water per second from one well completed to be completed into the Pleistocene Unknown Aquifer (168 feet deep) located in the S 1/2 NW 1/4 Section 26 for irrigation of 162 acres located in the NE 1/4, N 1/2 SE 1/4 Section 26; all in T99N-R54W.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7930-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by December 29, 2014.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Information concerning this application is available at <http://denr.sd.gov/public>. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

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James Rand
27871 452nd Ave
Parker, SD 57053

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Linda Schulte being duly sworn, says: That The Argus Leader is, and during all the times hereinafter mentioned was, a daily legal newspaper as defined by SDCL 17-2-21, as amended published at Sioux Falls, Minnehaha County, South Dakota; that affiant is and during all of said times, was an employee of the publisher of such newspaper and has personal knowledge of the facts stated in this affidavit; that the notice, order or advertisement, a printed copy of which is hereto attached, was published in said newspaper upon

NOTICE OF APPLICATION
NO. 7930-3 to Appropriate Water

Notice is given that James M Rand, 27871 452nd Ave, Parker SD 57053 has filed an application for a water permit to appropriate 1.89 cubic feet of water per second from one well completed to be completed into the Pleistocene Unknown Aquifer (168 feet deep) located in the S 1/2 NW 1/4 Section 26 for irrigation of 162 acres located in the NE 1/4, N 1/2 SE 1/4 Section 26; all in T99N-R54W.

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4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition. Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by December 29, 2014. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Information concerning this application is available at <http://danr.sd.gov/public>. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources. Published once at the total approximate cost of \$63.67.

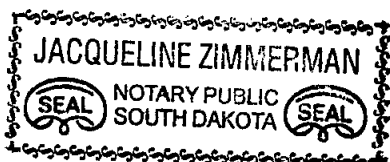
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Linda Schulte
Subscribed and sworn to before me 12/18/2014

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Notary Public, South Dakota

My Commission expires December 22, 2015



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STATE OF SOUTH DAKOTA

COUNTY OF MINNEHAHA } ss

Linda Schulte being duly sworn, says: That The Argus Leader is, and during all the times hereinafter mentioned was, a daily legal newspaper as defined by SDCL 17-2-21, as amended published at Sioux Falls, Minnehaha County, South Dakota; that affiant is and during all of said times, was an employee of the publisher of such newspaper and has personal knowledge of the facts stated in this affidavit; that the notice, order or advertisement, a printed copy of which is hereto attached, was published in said newspaper upon

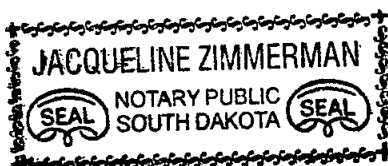
Tuesday, the 23 day of December 2014,
_____, the _____ day of _____ 2015,
_____, the _____ day of _____ 2015,
_____, the _____ day of _____ 2015,
_____, the _____ day of _____ 2015,
_____, the _____ day of _____ 2015,
_____, the _____ day of _____ 2015,

and that \$64.32 was charged for publishing the same

Linda Schulte
Subscribed and sworn to before me 12/30/2014

J. Zimmerman
Notary Public, South Dakota

My Commission expires December 22, 2015



NOTICE OF APPLICATION
NO. 7930-3 to Appropriate Water

Notice is given that James M Rand, 27871 452nd Ave, Parker SD 57053 has filed an application for a water permit to appropriate 1.89 cubic feet of water per second from one well completed to be completed in to the Pleistocene Unknown Aquifer (168 feet deep) located in the S 1/2 NE 1/4 Section 26 for irrigation of 162 acres located in the NE 1/4, N 1/2 SE 1/4 Section 26; all in T99N-R54W.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7930-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by January 5, 2015.

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. Information concerning this application is available at <http://denr.sd.gov/public>. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published once at the total approximate cost of \$64.32.
1454763 Dec. 23, 2014

RECEIVED

JAN 15 2015

WATER RIGHTS
PROGRAM

Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF TURNER

I, Robin Schneider of the City of Parker, County of Turner, State of South Dakota being first duly sworn on oath, deposes and says: The New Era is a weekly legal newspaper of general circulation, printed and published in the City of Parker, in said County of Turner, by The New Era, New Century Press, publishers, and has been such legal newspaper during the times hereinafter mentioned; that the said newspaper has been in existence as such legal newspaper for more than one year prior to the publication of the notice hereunto attached, and has during all of said publication of the notice hereunto attached, and has during all of said time had, and now has, more than 200 bona fide subscribers; that the undersigned, The affiant, is the Office Manager of the said newspaper, in charge of the advertisement department thereof and has personal knowledge of all the facts stated in this affidavit and the advertisement headed:

#5956 Notice of Application No. 7930-3 To Appropriate Water

_____ printed copy of hereto attached, is printed and published in the said newspaper for one successive weeks, one each week and on the same day of the week, on the following dates, to wit:

On Thursday, the 25th day of Dec. , 2014

That \$23.17 being the full amount of the fees for publication of the attached notices insures solely for the benefits of the publishers of the said newspaper, that no arrangement or understanding for a division thereof has been made with any other person and that no part thereof has been agreed to be paid to any other person whomsoever.

Robin Schneider

Subscribed and sworn to before me this _____

Day of _____

January 2015

Paul R. Harms

Notary Public, Turner County, South Dakota

My Commission Expires: March 20, 2018

**NOTICE OF APPLICATION NO.
7930-3**

To Appropriation Water

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Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7930-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief

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The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Information concerning this application is available at <http://denr.sd.gov/public>. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published once at the total approximate cost of \$23.17.

(#5956, 12/25/14, The New Era)

Publication Fee \$
Notary Fees \$
Total \$23.17



NOTICE OF APPLICATION NO. 7930-3 to Appropriate Water

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The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Information concerning this application is available at <http://denr.sd.gov/public>. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published once at the total approximate cost of _____.

Schlaak, Karen

From: Schlaak, Karen
Sent: Friday, December 19, 2014 9:37 AM
To: Robin Schneider (rschneider@ncppub.com)
Subject: Notice for James Rand
Attachments: 7930-3public.short.docx

Robin,

Attached is the Notice of Application No. 7930-3, James Rand to be published next week. As stated in our phone conversation, James Rand is responsible for payment of the first publication. Please bill the Water Rights Program for the second publication.

Also, send us affidavits for both publications.

Thanks,

Karen Schlaak

Water Rights Program
523 E Capitol Ave
Pierre SD 57501
Phone: 605 773-3352

Schlaak, Karen

From: Schlaak, Karen
Sent: Friday, January 02, 2015 9:38 AM
To: Robin Schneider (rschneider@ncppub.com)
Subject: FW: Notice for James Rand

We received the bill for the December 25 publication. We need an affidavit for our records. Please send.

Thanks, Karen

From: Robin Schneider [<mailto:rschneider@ncppub.com>]
Sent: Friday, December 19, 2014 10:43 AM
To: Schlaak, Karen
Subject: Re: Notice for James Rand

Received and will get that published.
Have a Merry Christmas.

Robin

On 12/19/14 9:37 AM, "Schlaak, Karen" <Karen.Schlaak@state.sd.us> wrote:

Robin,
Attached is the Notice of Application No. 7930-3, James Rand to be published next week. As stated in our phone conversation, James Rand is responsible for payment of the first publication. Please bill the Water Rights Program for the second publication.

Also, send us affidavits for both publications.

Thanks,

Karen Schlaak
Water Rights Program
523 E Capitol Ave
Pierre SD 57501
Phone: 605 773-3352

Invoice / Statement

New Century Press

Box 28
Rock Rapids, IA 51246

Phone: 712-472-2525

Fax: 712-472-3414

URL: <http://www.ncppub.com>

1/1

RECEIVED

JAN 02 2015

WATER RIGHTS
PROGRAM

WATER RIGHTS PROGRAM
523 E CAPITOL
PIERRE, SD 57501

Acct #: 00008154
Phone: (605)773-3352
Date: 12/31/2014
Due Date: 01/10/2015

Date	Trans #	Type	Description	Inches	Amount	Balance
12/25/2014	300030138	INV	00013661 5956 - Application No 7930-3			23.17
12/25/2014		INS	D The New Era	7.000	23.17	

Remarks

Thank you for your business.

Total Due \$ 23.17

0 - 0	1 - 30	31 - 60	61 - 90	91 - 120	Over 120
\$ 23.17	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00

January 15, 2015

PAYMENT REQUEST FORM

PAYEE: New Century Press
PO Box 28
Rock Rapids IA 51246

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

DESCRIPTION OF SERVICE, PRODUCE OR TRANSFER

Pub. Notice reprint for 7930-3 - (J Rand) in New Era -Parker SD

AMOUNT: \$23.17

FUNDING SOURCE:

GENERAL: X

FEDERAL:

OTHER:

COMMENTS:

AUTHORIZATION:

 1-15-15

I declare and affirm under the penalties of perjury that this claim is in all things, true and correct. I further agree to comply with the provisions of the Civil Rights Act of 1964 and regulations issued thereunder relating to nondiscrimination in federal assisted programs.

January 5, 2015

PAYMENT REQUEST FORM

PAYEE: Argus Leader
PO Box 5034
Sioux Falls SD 57117

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

DESCRIPTION OF SERVICE, PRODUCE OR TRANSFER

reprint of Permit No. 7930-3

AMOUNT: \$64.32

FUNDING SOURCE:

GENERAL: X

FEDERAL:

OTHER:

COMMENTS:

AUTHORIZATION:

Janne Goodman

1-5-15

I declare and affirm under the penalties of perjury that this claim is in all things, true and correct. I further agree to comply with the provisions of the Civil Rights Act of 1964 and regulations issued thereunder relating to nondiscrimination in federal assisted programs.

Schlaak, Karen

From: Schlaak, Karen
Sent: Friday, December 19, 2014 9:43 AM
To: AL Legals (allegals@gannett.com)
Subject: Notice for Application No. 7930-3, James Rand
Attachments: 7930-3public.short.docx

Sara,
We received the affidavit for this notice which was published on December 18th. There was an error in the publication (our error).

Please publish the attached notice on December 23 or 24. Please send the bill and affidavit the Water Rights Program.

If you have questions, let me know.

Thanks,

Karen Schlaak

Water Rights Program
523 E Capitol Ave
Pierre SD 57501
Phone: 605 773-3352

From: AL Legals [<mailto:allegals@gannett.com>]
Sent: Monday, December 08, 2014 10:57 AM
To: Schlaak, Karen
Subject: email text please

Hi Karen,

Can you please email me the text for Application No. 7930-3 (James Rand).

Thank you!

Sara Kruse

ARGUS LEADER MEDIA | LEGAL DESK
200 S. MINNESOTA AVE.
SIOUX FALLS, SD 57104
605-331-2207
LEGALS@ARGUSLEADER.COM



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

FEB 17 2015

James M Rand
27871 452nd Ave
Parker SD 57053

Dear Mr. Rand:

Enclosed is Water Permit No. 7930-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

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

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

Sincerely,

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

enclosures

7930-3
RECEIVED

MAR 09 2015

WATER RIGHTS
PROGRAMNOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USEDate 2-28-15TO: Water Rights Program, DENR
523 E. Capitol
Pierre, SD 57501-3181

FROM:

Jim Rand

(name)

22821 452nd Ave

(address)

Parker, SD 57053

(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. 7930-3 states that the water use system is to be constructed by1-5-2020

(date)

, and water is to be put to beneficial use by

1-5-2024

(date)

The water use system was completed on 7-1-14

(date)

Applying the water to beneficial use was completed on

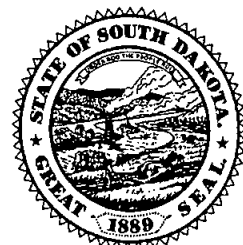
2-28-15

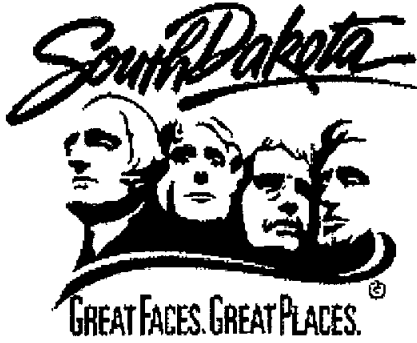
(date)

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

Jim Rand

(signature)





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
PMB 2020
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
<http://denr.sd.gov>

March 10, 2015

7930-3

Jim Rand
27871 452nd Ave
Parker SD 57053

Dear Mr. Randi:

I am writing to acknowledge receipt of the "Notice of Completion of Works" form that you sent in to let us know that you are completed with your irrigation system.

The system is now ready for inspection. Inspections are done on a county-by-county basis as staff time permits. You have done everything you need to do and the intervening time between the completion of your project and the staff inspection has no bearing on your water permit.

Someone from our office will contact you prior to the inspection to set up a time that is convenient for you. If you have any questions, please contact me.

Sincerely,

A handwritten signature in black ink that reads "Genny McMath". The signature is written in a cursive, flowing style.

Genny McMath
Water Rights Program
(605) 773-3352
email: genny.mcmath@state.sd.us