

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 47-17636

Exam Date: 05/11/2021

1. Current Owner:
TWIN FALLS SCHOOL DISTRICT #411 201 MAIN AVE W TWIN FALLS ID 83301-6103
2. Accompanied by: Bill Southwick
Phone No: 208-212-6902
Address: 1130 Highland Ave, Twin Falls ID 83301
Relationship to permit Holder: Assistant Director of Maintenance, T.F.S.D. #411

3. SOURCE: GROUND WATER

Method of Determination: On-site Inspection

B. OVERLAP REVIEW

1. Other water rights with the same place of use: No Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A			

Comments: School utilizes water from Twin Falls municipal system for culinary water and pressurized irrigation utilizing Twin Falls Canal Co. shares.

2. Other water rights with the same point-of-diversion: NO Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A			

Comments: _____

C. DIVERSION AND DELIVERY SYSTEM

1. **LOCATION OF POINT(S) OF DIVERSION:**
GROUND WATER NW¼ NW¼ SW¼, Sec. 32, Twp 09S, Rge 17E, B.M. TWIN FALLS County

Method of Determination: On-site inspection

PLACE OF USE: HEATING

[illegible]

PLACE OF USE: COOLING

[illegible]

Method of Determination: On-site inspection

3.

X Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.

X Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.

X Aerial Photo Attached (required for irrigation of 10+ acres).

X Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
D0067043					

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
Flow Meter	Ultrasonic	GE Panametrics	PT878	09045		4/6/2021

2. Measurements: : Flow was measured simultaneously for 10 minutes using the Department's Panametrics flow meter and the installed in-line Siemens meter; I monitored the in-line meter while David Graybill operated the Panametrics:
 Siemens meter averaged 132 gpm $\approx$ 0.29 cfs
 Panametrics averaged 137.6 gpm $\approx$.031 cfs
 The difference between measurements was within 4%.
 Both measurements exceed the permitted flow rate of 0.27 cfs

E. FLOW CALCULATIONS N/A

_____ Additional Computation Sheets Attached

Measured Method:

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$$

2. Volume Calculations for Other Uses: Heating/Cooling

When filing Proof of Beneficial Use the school provided an average of water use based on the total meter reading taken in August of 2020 of 4,515,900 gallons. The school opened in August of 2016, so that is an average over 4 years:

$$4,515,000 \text{ gallons} / 325,850 \text{ gal/af} = 13.86 \text{ af/4 years} \approx 3.5 \text{ af}$$

Since the provided volumes were averaged over 4 years, I obtained additional volume readings and requested they report the volume monthly through the rest of 2021. I wasn't confident that an average of the total volume over four years would be representative of water use for any single year. During the field exam I was able to get additional readings recorded by the school custodian for 2020 & 2021 and they continued to report monthly volume to me throughout 2021. Note that the meter was set to read million gallons (mg) and was changed to 1000 gallons (kg) for improved accuracy just prior to our measurement. I have converted both to gallons for convenience. The results:

January 2021 volume = 5.2353 MG; January 5, 2022 = 7690.918 KG; 7,690,918 gl – 5,235,300 gl = 2,455,618 gallons;

$$2,455,618 \text{ gallons} / 325,850 \text{ gallons per acre foot} = 7.5 \text{ af}$$

Looking at the provided measurements, it became apparent that if I look at the 2020/2021 data from the beginning of the school year (September 2020) to the beginning of the next school year (September 2021) that there was slightly more water use than looking at the data based on calendar year only:

$$\text{Sep. 2020} = 4.5475 \text{ mg}; \text{ Sep 2021} = 7538.677 \text{ kg}; 7,538,677 - 4,547,500 - 2,991,177 / 325,850 = 9.17 \text{ af} \approx 9.2 \text{ af}$$

2021 was a rather warm year when compared to other years and since the data provided by the school district with the proof of beneficial use was averaged, I recommend assigning an annual volume of 9.2 af.

G. NARRATIVE/REMARKS/COMMENTS

David Graybill and I met with Bill Southwick and Robert Watkins, Head Custodian for Rock Creek Elementary School, on the morning of 5/11/2021 to calibrate their in-line meter, get a flow measurement and collect additional volume data if available.

The school has a closed loop heat pump that utilizes a heat exchanger to extract heat from either the ground water or the fluid in the closed loop system. Once the heating/cooling potential is utilized, the water is delivered to an injection well and returned to the aquifer. The heating/cooling system is a completely non-consumptive use of water. The school also has a natural gas boiler system with a closed loop refrigerant system that is utilized as the primary heat source during the winter months according to Emory Warren, Manager of Maintenance Operations for the school district. Emory also stated that no water is utilized in the boiler system and that the heat pump is used primarily for cooling but may also be used for heating throughout the year and serves as a back up to the boiler system in the winter. Based on that information, I will be recommending both heating/cooling for year round use to allow the school the flexibility to utilize the system as a primary heating/cooling system in the spring/summer/fall, or as a backup when needed in the wintertime.

David and I ran a 10 minute measurement utilizing both the in-line meter and the Department's portable ultrasonic meter to calibrate the school's meter and obtain a measurement of the flow rate. The results indicate the accuracy of the school's in-line Siemens Mag 5000 magnetic meter was within an acceptable 4.0% variance from the Department's meter. We measured a flow rate of 0.29 cfs for the system on the installed meter and 0.31 cfs on the Department's meter. Both measurements exceed the permitted rate of 0.27 cfs (see Figure 1 & Summary of Measurement Readings).

The volume data collected utilizes the average water use reported after four years that was filed with the proof of beneficial use, available monthly volumes recorded by the head custodian and monthly volumes reported monthly from June to December of 2021 via email by Bill Southwick. All are included with this field report.

Volume was calculated based on reported volumes from the beginning of the school year, September 2020 to the beginning of the school year in September of 2021. This resulted in a volume that was close to the volume that has been recommended to 47-17635 for Pillar Falls Elementary of 10.5 af. Both schools were constructed at the same time and are virtually identical in design, square footage, and heating/cooling systems.

Recommend licensing a flow rate of 0.27 cfs and a volume of 9.2 af.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS**1. Recommended Amounts**

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
HEATING	01/01 to 12/31	0.27 CFS	9.2 af
COOLING	01/01 to 12/31	0.27 CFS	9.2 af

Totals: 0.27 CFS 9.2 af

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☒ None

I. AUTHENTICATION

Bill Mills -

Field Examiner's Name

Date

Reviewer

Date

1-27-2022

1-28-2022



Figure 1: Readout on installed meter during measurement



Figure 2: Production well



Figure 3: Injection well



Figure 4: Heat exchanger



Figure 5: Data plate on heat exchanger

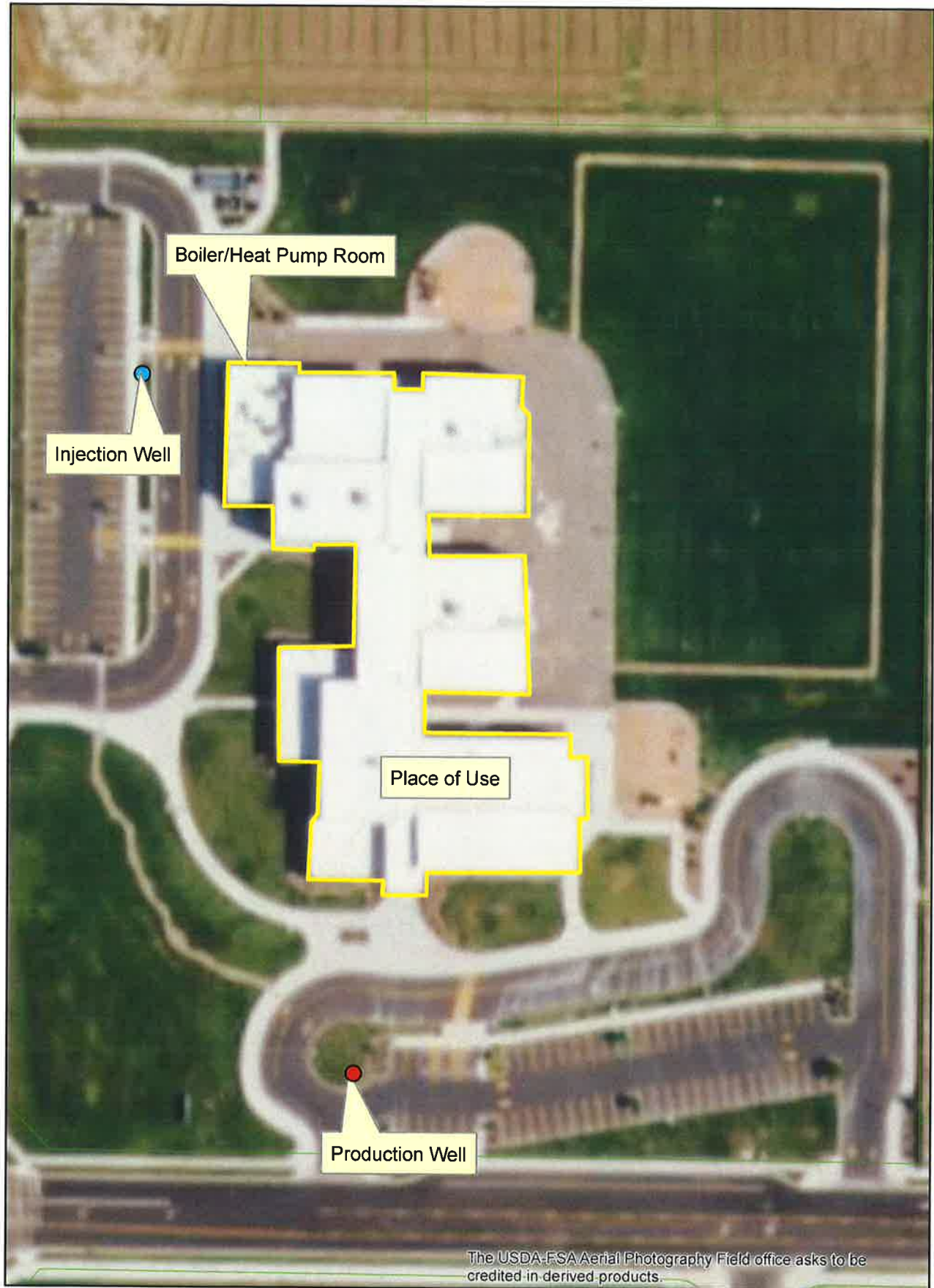


Figure 6: Installed meter



Figure 7: Department's meter during set up

System Diagram 47-17636



Summary of Measurement Readings Rock Creek Elementary School on 5/11/2021

Head Custodian: Robert Watkins 208-539-8702

Seimens meter:

Initial Reading 5294.2143 US KG

10 Min. Timed (converted to gallons):

5297155.7 Start

5298477.4 Stop

1321.7 gallons = 132.2 gpm $\approx$ 0.29 cfs

Panametrics:

52125.3 Start

53501.5 Stop

1376.2 gallons = 137.6 gpm $\approx$ 0.31 cfs

Within 4% accuracy.

Measurements exceed permitted flow rate of 0.27 cfs

Field Notes
5/11/2021 →

Pillar Falls

0.27 $\approx$ 121.2 gpm

5/11 14051621 USC

14502613 start

14503756 -

1,143 114.3 gpm

0.25

Soshua Allen

208 539 8870

4731

~~5071~~

92.3

start

14502613

14505654

91.87

2849

Barber M-scores-

Field Notes
pg 2

~~EMPTY~~

208-212-6903

9 - Tues - Rock Creek

5294, 2143 us KG

Rock Creek →
Elementary

121.2 gpm ≈ 0.27

5294, 6493

5294, 4039

52943999

Robert Watkins

208 539 8702

5296, 3210 us KG

5294, 3999

192.26 gpm

1, 922

5296321

5294, 399

Pg 3

Rock Creek
Elementary

Start

5297155.7

5298477.4

1321.7

1.32 gpm

Pana

S

~~52263.9~~

S

52125.3

53501.5

1.376.2

3.7%

1st week day of month

Mid August - May 20

Rock Creek Elementary School

Year	January	February	March	April	May	June	July	August	September	October	November	
2015										0	0	0
2016		0	0	0	0	19.2	19.2	0	19.2	19.2	19.2	0
2017		0	0	0	0	19.2	19.2	0	19.2	19.2	19.2	0
2018		0	0	0	0	19.2	19.2	0	19.2	19.2	19.2	0
2019		0	0	0	0	19.2	19.2	0	19.2	19.2	19.2	0
2020		0	0	0	0	19.2	19.2	0	19.2			0

$4,515,900 \text{ Gallons} / 98 \text{ days per year (avg.)} = 46,080.61 \text{ gallons per day per year (reflecting a yearly average over 4 yrs. of operation)}$

$46,080.61 \text{ gallons per year} / 4 \text{ years} = 11520.16 \text{ gallons per day}$

$11520.16 \text{ gallons per day} / 10 \text{ hours of operation per day} = 1152.02 \text{ gallons per hour}$

$1152.02 \text{ gallons per hour} / 60 \text{ minutes per hour} = 19.2 \text{ gallons per minute (average)}$

The reading was not done on a consistent basis thus we took the average usage over the time span of the operation.

The system was designed to accommodate 120gpm flows.

RECEIVED

SEP 01 2020

DEPT OF WATER RESOURCES
SOUTHERN REGION

Meter Readings
47-17636 Rock Creek Elementary
2020

Jan		
Mar		
April		
May		
June		
July		
Aug		
Sep	4.5475	mg
Oct	5.0256	
Nov	5.2251	
Dec	5.2353	
2021 Jan	5.2353	
Feb	5.2353	
Mar	5.2353	
April	5.2353	
May	5.2614	
June	5610.331	kg
July	6247.562	
Aug	6947.439	
Sep	7538.677	
Oct	7675.349	
Nov	7688.486	
Dec	7690.918	

Mills, Bill

From: Bill Southwick <southwickbi@tfsd.org>
Sent: Wednesday, January 5, 2022 6:46 AM
To: Mills, Bill
Subject: well readings

Pillar Falls 17278512

Rock Creek 7690.9175

Mills, Bill

From: Bill Southwick <southwickbi@tfsd.org>
Sent: Thursday, December 2, 2021 8:01 AM
To: Mills, Bill
Subject: water readings

Pillar Falls Elementary 17271190

Rock Creek Elementary 7688.4859

Mills, Bill

From: Bill Southwick <southwickbi@tfsd.org>
Sent: Monday, November 1, 2021 8:35 AM
To: Mills, Bill
Subject: WELL READINGS

BILL HERE IS THE WELL READINGS FOR NOVEMBER

ROCK CREEK 7675.3492

PILLAR FALLS 17247492

Mills, Bill

From: Bill Southwick <southwickbi@tfsd.org>
Sent: Friday, October 1, 2021 7:47 AM
To: Mills, Bill
Subject: RE: Thanks Bill

Here are the water readings for October Rock Creek 7538.6774 and Pillar Falls 17144490

From: Mills, Bill <Bill.Mills@idwr.idaho.gov>
Sent: Wednesday, September 1, 2021 12:43 PM
To: Bill Southwick <southwickbi@tfsd.org>
Subject: Thanks Bill

Thanks Bill!

From: Bill Southwick [<mailto:southwickbi@tfsd.org>]
Sent: Wednesday, September 1, 2021 8:58 AM
To: Mills, Bill <Bill.Mills@idwr.idaho.gov>
Subject: Re: My email at IDWR

The water reading for Pillar Falls is 16536693. The water reading for Rock creek is 6947.4392. Thanks Bill

Sent from my iPhone

On Aug 17, 2021, at 1:35 PM, Mills, Bill <Bill.Mills@idwr.idaho.gov> wrote:

Hey Bill,
You now have my email and it would be great if you could send the meter readings for Pillar Falls & Rock Creek elementary schools each month,
Thanks!
Bill

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Rock Creek Elementary
Monthly Flow Meter Readings

Date	Beginning Reading US.MG	Ending Reading US.MG	Signature
July/01/20			
Aug/03/20			
Sept/01/20	4.5475	5.0256	RW
Oct/01/20	5.0256	5.2251	RW
Nov/02/20	5.2251	5.2353	
Dec/01/20	5.2353	5.2353	
Jan/04/21	5.2353	5.2353	
Feb/01/21	5.2353	5.2353	
Mar/01/21	5.2353	5.2353	
Apr/01/21	5.2353	5.2614	
May/03/21	5.2614		
June/01/21			

4781
4995
102

TFSD

Monthly Flow Meter Reading

Year 20 21

School: Rock Creek

Date	Beginning Reading	Amount Used	Initial
July ' 2021	5610.3312	194.1808	
Aug , 2021	6247.5615		
Sep			
Oct			
Nov			
Dec			
Jan			
Feb			
Mar			
Apr			
May			
June			