

MEMORANDUM

TO: Water Right File 37-22870

FROM: Daniel Nelson – Analyst 3

DATE: February 13, 2020

SUBJECT: Licensing Review of Water Right 37-22870

The field exam for this right was performed by Certified Water Right Examiner Erick Powell of Brockway Engineering.

Diversion Rate:

Mr. Powell stated that the flow rate measured was 25.9 gpm or 0.0577 cfs rounded to 0.06 cfs. The evidence of the flow measurement was a picture of the flow meter's screen which shows a flow of 24.05 gpm or 0.053587 cfs rounded to 0.05 cfs. The difference between these two measurements is only about 1.8 gpm, which is well within standard measurement error. Therefore, I am going to go with the flow measurement recommended by Mr. Powell.

Diversion Volume:

Mr. Powell used an unconventional method for calculating the volume for this heating and cooling water right. After comparing Mr. Powell's calculations using the Department's current spreadsheet, I determined that Mr. Powell's calculations were only 1.4 af different than the calculations using the Department's spreadsheet. See attached spreadsheet. I ran Mr. Powell's volume calculations using the diversion rate that was shown on the flow meter of 0.053587 cfs. Using the photographed flow rate, there is only a 0.2 af of difference between Mr. Powell's method and the Department's spreadsheet. Therefore, the amount of error in the measurement and the calculations are close enough that I couldn't dispute the total volume for heating and cooling Mr. Powell provided. Whereas the Department doesn't have a peer reviewed tool or direction for heating and cooling uses, I have determined that we should go with the 15.7 af recommended by Mr. Powell.

Mr. Powell separated out the volume for each use, but I am going to recommend 15.7 af for heating, 15.7 af for cooling, and total volume of 15.7 af. When separated out, Mr. Powell's numbers and my calculations were significantly different for the both the heating and cooling uses. To avoid limiting either use, it will be best to have inclusive volumes for this permit to avoiding shorting one use of the other.

Conditions:

Conditions 027, R07, R05, 01R, and the descriptive condition describing the heating and cooling use will all be carried forward to licensing. Condition 051 will be changed to conditions 933 and 935. All of the other conditions will be removed.

Point of Diversion and Place of Use

The image below shows the place of use as the tax parcel border in yellow. The heating and cooling well is shown in blue, and the heating and cooling injection well is shown in purple. The green point is the domestic well that services home and yard irrigation.



Permit 37-22070 -- Heating, and Cooling Energy Estimator*

Heating Estimator

FloorArea 9078 ft²
 HeatLoss kBTu/h
 HeatSqFt 20 kBTu/h-ft²→
 HeatReqd 181.6 kBTu/h
 HeatHours 1500 Hours/year

Read Me

GPMPonH 3 Gal/min
 GPMPonC 3 Gal/min
 Heating 4085100 Gal/year
 Cooling 571914 Gal/year
 Total 4657014 Gal/year
 622595 Cu Ft./year
 14.293 AcreFt/year

Read Me

I used the standard of 3 GPMPon for closed looped systems

12.5	Heating AF
1.8	Cooling AF

HeatHours Estimates			
Region		Low	High
South	House	600	800
	School	200	400
	Office	200	700
Mid-USA	House	800	1000
	School	300	500
	Office	700	900
North	House	1000	1500
	School	500	600
	Office	900	1100

HeatSqFt Estimates (kBTu/h per 1000 ft ² of Floor Area)					
Region		Poor Quality	Std. Quality	Hi. Quality	Super Eff.
South	House	30	20	15	10
	School	30	22	15	10
	Office	22	18	14	11
Mid-USA	House	40	32	25	16
	School	35	27	20	13
	Office	25	22	15	12
North	House	50	40	30	20
	School	40	30	25	15
	Office	30	24	18	13

Cooling Estimator

HeatGain kBTu/h
 CoolSqFt 14 kBTu/h-ft²→
 CoolReqd 127.1 kBTu/h
 CoolHours 300 Hours/year

CoolHours Estimates			
Region		Low	High
South	House	1100	1600
	School	600	1000
	Office	1200	1800
Mid-USA	House	800	1000
	School	400	550
	Office	700	1100
North	House	200	300
	School	200	300
	Office	300	600

CoolSqFt Estimates (kBTu/h per 1000 ft ² of Floor Area)					
Region		Poor Quality	Std. Quality	Hi. Quality	Super Eff.
South	House	32	25	17	10
	School	65	53	36	31
	Office	35	28	20	15
Mid-USA	House	30	22	15	9
	School	60	48	38	28
	Office	30	25	17	14
North	House	28	20	14	8
	School	50	42	30	26
	Office	28	22	16	12

* adapted from HeatCoolWater.xlsx with permission from the spreadsheet author, Dr. Steve Kavanaugh

Recalculation using Erick Powell's method for volumes using the flow rate shown in the photos of the flow meter.

24.05 gpm photo of meter / 448.8 = 0.053587	0.053587	250	0.3	1.9835	7.971736088
24.05 448.8 0.053587344	0.053587	115	0.5	1.9835	6.111664334
					14.08340042

Please call the Assessor's Office at 208-788-5535 for any information not available here.

Characteristic Information for Parcel Number:RP00455002002A

Residential Characteristic Records:1

Manufactured Characteristic Records:0

Parcel Number	RP00455002002A
Owner	DANIELS TERRENCE D DANIELS COURTNEY S
Address	248 EAST FORK RD
Legal Description	PIONEER SUB #2 AM LOT 2A
Mailing Address	259 YELLOW MOUNTAIN RD GREENWOOD VA 22943-1614
Residential Record	1
Fireplace	3
Heat Method	Yes
Air Conditioning	No
Bathrooms	10.00
Kitchens	1
Bedrooms	10
Car Storage 1 sq. ft.	498
Car Storage 1 type	Attached
Car Storage 2 sq. ft.	0
Car Storage 2 type	None
General Purpose sq. ft.	0
Year Built	2004
Last Year Remodeled	2013
Ground Floor sq. ft.	6976
Upper Floor sq. ft.	2102
Lower Floor sq. ft. Unfinished	0
Lower Floor sq. ft. Finished	0
Basement Floor sq. ft. Unfinished	0
Basement Floor sq. ft. Finished	0
Attic sq. ft. Unfinished	0
Attic sq. ft. Finished	0

Nelson, Dan

From: Nelson, Dan
Sent: Thursday, February 13, 2020 10:54 AM
To: 'Erick Powell'
Subject: RE: Permit 37-22870

Thank You Erick. I figured you just forgot to include it and had it on hand.

Dan Nelson

From: Erick Powell [mailto:erick.powell@brockwayeng.com]
Sent: Thursday, February 13, 2020 10:53 AM
To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Subject: RE: Permit 37-22870

Hi Dan,

Thanks for the email and letting me know about the omission. I have attached an updated map with the 2019 aerial photograph.

Regards,
Erick

From: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Sent: Thursday, February 13, 2020 8:51 AM
To: Erick Powell <erick.powell@brockwayeng.com>
Subject: Permit 37-22870

Hello Erick,

We are reviewing the field examination for permit 37-22870. You neglected to include the map that is required with the field report. If you could email me this map, we can move forward with the processing of this field report. I am writing up my report at this time, so the sooner you can get it to me, the sooner I can turn the permit in for licensing signature.

Daniel Nelson
Water Right Analyst 3
Idaho Department of Water Resources
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)



0 45 90 180 Feet

WATER RIGHT PERMIT NO. 37-22870

**BENEFICIAL USE EXAM MAP
T3N R18E SECTION 3 SWSW**

BROCKWAY ENGINEERING, PLLC.
ICB - Date: 2/13/2020

NAIP 2019 AERIAL

DANIELS_PARCEL N
● Domestic Well
● Production Well
● Injection Well