

Nelson, Dan

From: Nelson, Dan
Sent: Monday, November 06, 2017 11:20 AM
To: 'Erick Powell'
Subject: RE: Permit 37-22783 Field report

Erick,

Thank you for this information. However, I still need the square footage of the home to see if these numbers seem reasonable. As I said earlier, most systems don't run 24 hours a day all year long. Most systems run approximately 1800 hours in Idaho. This is a very basic number. There are seasons of the year when no heating or no cooling is required. We have to take that into account.

We have several spreadsheets that we use for heating and cooling based on the size of the space being heated and the accuracy needed. The spreadsheet I used was a basic spreadsheet that just looks to see if the numbers are within reasonable parameters based on the number of heating and cooling days for the state as a whole. If the volume for a system doesn't fit in this spreadsheet, then we do a calculation based on the square feet being heated, heating degree days, cooling degree days, water temperature, and system being used to determine if the amount of water that is needed to properly heat the home. The law is very clear that we cannot issue a license for more water than can be beneficially used or that is reasonably needed to heat the home.

Thank you for the explanation of the flow rate. I was under the impression from your narrative that both units ran at full flow rate during the heating season. I will make those adjustments.

There appears to be some confusion on what is needed, so I will be sending out a formal letter requesting the information needed. This letter will go into detail what is needed, so there isn't any further confusion. I am sorry my earlier email wasn't clear. We need to know the designed system flow and operating requirements based on the number of heating degree days and cooling degree days for the size of the heated area. It will take me a day or two to put the letter together, but I will try to get it to you as soon as I possibly can.

If you have any questions, please don't hesitate to contact me.

Respectfully,

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

From: Erick Powell [mailto:erick.powell@brockwayeng.com]
Sent: Monday, November 06, 2017 10:30 AM
To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Subject: RE: Permit 37-22783 Field report

MR. Powell called
11/6 and asked
for additional
time to supply
the information
He has until
11/20/17
DAN 11/6/17

Hi Dan,

Here are my comments regarding your questions. I hope that this helps clarify any question that you might have.

1. The total flow rate measured was 48 gpm. That flow was measured with both heat pumps running at 100%. The heating to the house is made up by 100% of the 6 ton unit (22 gpm) and 15% of the 10 ton unit ($26 \text{ gpm} \times 0.15 = 4 \text{ gpm}$) for a measured flow rate of 26 gpm. The recommendation that we made for heating was for 26 gpm or 0.06 cfs.
2. Geothermal heat pumps are extremely efficient. The system is designed to operate year round in either heating or cooling mode. That being said, there may be times, based on the historical weather that the water right holder may wish to heat their house during months that are traditionally warm. And they could wish to cool their residence during months that are traditionally heating months. It is my recommendation that the license be issued with heating (0.06 cfs) and cooling (0.06 cfs) use from 1/1 to 12/31. If your concern is that they would potentially use both (0.12 cfs), that was not my intent or recommendation. You could add a condition to restrict flow rate for both heating and cooling to 0.06 cfs.
3. I'm not sure what spreadsheet you are using, so I cannot comment directly on your spreadsheet. The system was designed and installed by a licensed HVAC firm. The size of the units and water use necessary to provide heat to the residence was calculated by the HVAC firm, so I'm not commenting on if the system is appropriate for the residence size. What I can confirm is that the license holder has put in a system that can beneficially use the measured water flow rate. The heating/cooling flow rate of 0.06 cfs is less than the authorized permit flow rate of 0.10 cfs. The owner can use the system year round for heating or cooling, and the recommended volume is 0.06 cfs for the entire year.

If you want to visit about this further, please give me a call and we can discuss.

Thanks,

Erick

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All information, calculations, maps, drawings, or other documents transmitted via email are preliminary unless explicitly stated in the email text or in the documents themselves.

From: Nelson, Dan [<mailto:Dan.Nelson@idwr.idaho.gov>]

Sent: Tuesday, October 31, 2017 4:09 PM

To: erick.powell@brockwayeng.com

Subject: Permit 37-22783 Field report

Hello Erick,

The field report you submitted for permit 37-22783 seems to be acceptable, but I do need some information to clarify the heating system. We were able to match reasonably closely the volume you calculated for permit 71-10953 that you submitted earlier, but I am struggling following your calculations for this permit. The following are the areas that I am having trouble with.

- 1.) In your photos, the flow rate on the flow meter when the 10 ton and the 6 ton was operating looked to be 48 gpm. That would make sense with 22 gpm going to the 6 ton unit and 26 gpm going to the 10 ton unit. What is