

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 47-8144

Exam Date: 3/12/2012

1. Current Owner: TWIN FALLS WILDLIFE FEDERATION
PO BOX 785
TWIN FALLS ID 83303
(208)423-4044
2. Accompanied by: Greg Lowe College of Southern Idaho HVAC Specialist
Phone No: 208-732-6612
Address: 345 Falls Ave., Twin Falls, ID 83301
Relationship to Permit Holder: Employed by current facility owner (College of Southern Idaho).

3. **SOURCE**

GROUND WATER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 47-17169 and 47-4203 both for fish propagation from unnamed stream.
2. Other water rights with the same point of diversion: None

C. DIVERSION AND DELIVERY SYSTEM1. **LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER

NW1/4SE1/4NE1/4

Sec. 21, Twp 10S, Rge 17E, B.M.

TWIN FALLS County

Method of Determination: Waypoints were collected with a Garmin GPS map 76S receiver and downloaded into an ArcMap shapefile that corresponds with 2009 aerial photography and verified the point of diversion to be in Twp10S Rge17E S 21 NWSENE1/4. See attached map.

2.

PLACE OF USE: HEATING

Twp	Rge	Sec	NE				NW				SW				SE				Totals
10S	17E	21	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
						X													

COOLING same as HEATING

Method of Determination: Tracks were collected with a Garmin GPS map 76S receiver and downloaded into an ArcMap shapefile that corresponds with 2009 aerial photography and verified the place of use to be in Twp 10S Rge 17E S 21 SENE1/4. See attached map.

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☐ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☐ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☐ Photo of Diversion and System Attached

4.

<u>Well or Diversion</u> <u>ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge</u> <u>Size</u>
Well ID 389102		1.0 Hp			

D. FLOW MEASUREMENTS

1.

<u>Measurement</u> <u>Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
5 gallon bucket and stopwatch						

2. Measurements:

Time 1: 11.03 seconds;

Time 2: 11.59 seconds;

Time 3: 11.12 seconds;

Avg: 11.25 = 0.06 cfs**E. FLOW CALCULATIONS** Additional Computation Sheets Attached

Measured Method:

Theoretical yield:

$$Q = \frac{8.8 \times (\text{Hp}) \times (\text{Eff})}{H}$$

Where: Hp = 1.0 Hp

Eff = efficiency = 70% assumed

H = total head = pumping level + (2.31 x system pressure)
 assume pumping level of 10 feet (static water level per CSI records)
 system operates at 40 psi.

$$H = 10 + (40 \times 2.31) = 102.4$$

$$Q = \frac{8.8 \times 1.0 \times .70}{102.4} = 0.06 \text{ cfs}$$

F. VOLUME CALCULATIONS

1. Volume Calculations for Other Uses:

Heating/Cooling: System is runs 24/7 for

365 days a year with flow limiters that keep the flow at a constant 0.06 cfs (27 gpm):

$$0.06 \text{ cfs} \times 723.94 \text{ afa /1 cfs} = \underline{\underline{43.44 \text{ AFA}}}$$

Volume per type use:

Heating season 10/1 – 4/30 or 212 days:

Heating: $0.06 \text{ cfs} \times 212 \text{ days} \times 1.9835 = 25.3 \text{ AF}$

Cooling Season 5/1 – 9/30 or 153 days:

Cooling: $0.06 \text{ cfs} \times 153 \text{ days} \times 1.9835 = 18.2 \text{ AF}$ **G. NARRATIVE/REMARKS/COMMENTS**

Permit 47-8144 is for 0.06 cfs heating and cooling.

Application for permit 47-8144 was submitted by the Twin Falls Wildlife Federation on July 14, 1989, and proof of beneficial use was submitted September 28, 1989.

The point of diversion is a well with a 1.0 Hp pump that is located under the wet lab and classroom building which the system supplies ground water for the heating and cooling system (ground source heat pumps). Water is either delivered approximately 20' through a 2" polyethylene water line to 2 heat pumps and then is discharged into a 4' abs pipe or is pumped directly into a 4" overflow line when the heat pumps are off. Water is then carried approximately 120' to be discharged into the lower fish run and flows directly into Rock Creek. System runs at 0.06 cfs 24/7 regardless of whether the heating/cooling system is in use.

Pump data indicates that the pumps operate at approximately 40500 BTU/HR per pump for heating and 50500 BTU/HR per pump for cooling. If the design heat load is calculated utilizing the department's equation:

$$E = [e \times \Delta T] \times \text{Area}$$

e for building = 0.36 (midpoint between suggested value for Best energy efficiency (0.28) and better energy efficiency (0.44) as the building has 8" insulated walls, but the ceiling, doors and windows aren't as well insulated.)

$$\Delta T = (t_i - t_o) = (70^\circ - (-3^\circ)) = 73^\circ \text{ (-3}^\circ \text{ Suggested Outside Design Temperature for Twin Falls)}$$

$$E = [0.36 \times 73] \times 2700 \text{ ft}^2 = 70,956 \text{ BTU/HR}$$

With two pumps rated at 40500 BTU/HR, then the system design rated at 81000 BTU/HR for heating appears to be just slightly higher than the calculated design heat load BTU/HR rating.

Original application for permit was filed as heating/cooling, 1/01 – 12/31, but was data entered in our system as heating only. I have added the cooling back on as the original application was filed to license both uses and the hatchery grounds manager stated that the cooling use was as important as heating in the wet lab because the environment needs to be regulated at a steady temperature to ensure high survival rates for the smolts. Either way, the volume and flow of water passing through the system would still be the same regardless if it was licensed for heating year round or heating and cooling as this system runs at a steady 0.06 cfs, 24 hours a day, 365 days a year.

Recommend permitting 0.06 cfs for Heating/Cooling with an annual volume of 43.5 AF (25.3 AF Heating; 18.2 AF cooling).

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

H. RECOMMENDATIONS**1. Recommended Amounts**

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
HEATING	01/01 to 12/31	0.060 CFS	25.3 AF
COOLING	01/01 to 12/31	0.060 CFS	18.2 AF
<u>Totals:</u>		0.060 CFS	43.5 AF

2. Recommended Amendments

___ Change P.D. as reflected above ___ Add P.D. as reflected above ___x_None

___ Change P.U. as reflected above ___ Add P.U. as reflected above ___ Other

I. AUTHENTICATION

Field Examiner's Name

Date

3/23/2012

Reviewer

Date

4/6/12

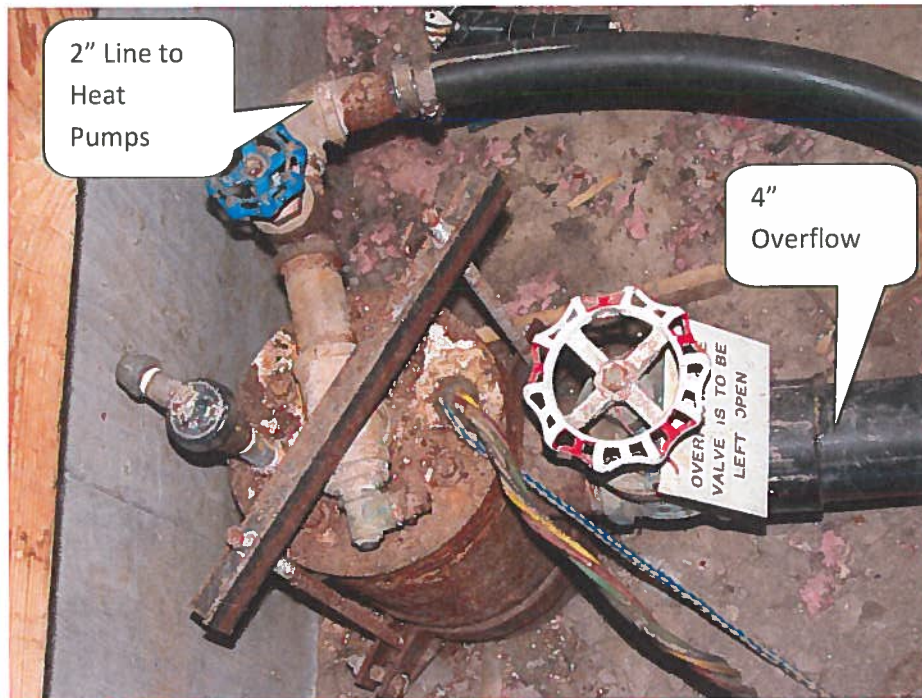


Figure 1: Well Head



Figure 2: Heat Pumps & Ducting



Figure 3: Hatchery and Classroom/Wet Lab Building

Delivery System Diagram



State of Idaho
Department of Water Resources
Water Right License

47-8144

Water Service Area Boundary for Twin Falls Wildlife Federation

R17E

T10S



0 0.03 0.06 0.12 Miles

-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters
-  Taxlots

