

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 63-34206

Exam Date: 4/9/20

1. Current Owner:
HAWK STONE 3921 W CATALPA DR BOISE ID 83703

2. Accompanied by: Hawk Stone
Phone No: (208) 336-4084
Address: 3921 Catalpa Dr.
Boise, ID 83703

3. **SOURCE:**
WASTE WATER

Tributary
BOISE RIVER

Method of Determination: Permit application, ArcMap, aerial imagery, USGS topography, and field examination.

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	N/A	N/A	N/A

Comments: Overlap review found no overlapping place of use water rights.

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

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

Comments: Overlap review found no overlapping point of diversion water rights.

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

WASTE WATER NE¼ SE¼, Sec. 29, Twp 04N, Rge 02E, B.M. ADA County

Method of Determination: Field examination and ArcMap tools with aerial imagery.

PLACE OF USE: HEATING

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
04N	02E	29													X	X			

Method of Determination: Aerial Imagery, ArcMap Tools, and observation during field exam.

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.

X

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.

X

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
			Unknown		1.25"

D. FLOW MEASUREMENTS

2. Measurements: None Taken

E. FLOW CALCULATIONSTheoretical Method

Pump Horsepower= 0.25

Pumping Level= 5

Discharge Pressure= 20

$$Q = \frac{8.8 * (\text{Efficiency}) * \text{hp}}{\text{depth to water} + 2.31 * (\text{psi}) + \text{friction}}$$

See attached theoretical sheet

Theoretical Calculation = 0.03 cfs

Proof of Beneficial Use and statement from user suggests max rate of 9 gpm, or 0.02 cfs.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

2. Volume Calculations for Other Uses:

Rate= 9 gpm

Use= Continuous 24 hrs/day * 180 days/ year =7.2 AF

Heating spreadsheet (attached) recommends 6.6 AF

G. NARRATIVE/REMARKS/COMMENTS

A field exam was completed February 6, 2019 by agent Kate Hulse and was accompanied by Patrick Kelly of IDWR and current permit owner Hawk Stone. Current county tax lot information indicates that Hawk Stone is current property owner to 3921 W Catalpa Drive.

Mr. Stone proposes to collect geothermal wastewater from Johnson, Niznik, and Pursley systems. Geothermal wastewater is currently being diverted into the Boise Canal System, Mr. Hawk diverts wastewater to his shop by transporting it through an irrigation culvert underneath Catalpa Drive where he pumps out of the canal.

The system consists of a portable submersible pump. The diversion system is hydrologically separate from and have no direct connection to the Niznik geothermal well. As seen in the system diagram the blue line is the Boise City Canal and it flows north then west. The pink line is a two foot wide underground culvert that transports water to and from the Pursley, Niznik, and Johnson homes. Hawks system includes three points of diversion because diverts from each discharge point where water is relinquished from the control of Pursley, Niznik and Johnson. Mr. Stone has installed a plastic pipe to the ceiling of the culvert that connects to the discharge point of the three wells, water is transported to his agricultural outbuilding by a PVC pipe that extends between his property and the corner of the Boise City Canal.

The POU was determined using aerial photography, GIS, and field exam. The permit authorized the heating use for 1 home, one associated greenhouse, an agricultural outbuilding, and snow melting on driveway. The poof was submitted November 25, 2019 for only the heating of an agricultural outbuilding and the total diversion of 0.02 cfs. Review of aerial imagery shows the total square footage to be 300 square feet which agrees with the estimated square footage from the site visit. I am recommending 0.02 cfs for heating purposes since the system diverts at 9 gpm. Overlap review found no additional water rights for the POU and POD.

According to Hawk the system diverts at 9 gpm, we will allow him to heat his agricultural outbuilding for 6 months- 180 days. Hawk claims that he will be using the system continuously for heating for the permitted 6 months, this would give him a maximum volume of 7.2 AF, and a recommended amount of 6.6 AF (see attached spreadsheet).

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>Volume</u>
HEATING	01/01 to 12/31	0.02 CFS	6.6 AF
<u>Totals:</u>		0.02 CFS	6.6 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

Kate Huelse - Water Resource Agent

Field Examiner's Name Kate Huelse Date 4/10/20

Reviewer _____ Date _____



Point of diversion
out of Boise canal.

Looking South from
Catalpa Dr.



PVC line runs back
to Boise canal from
shop.



Pump used to divert water to place of use



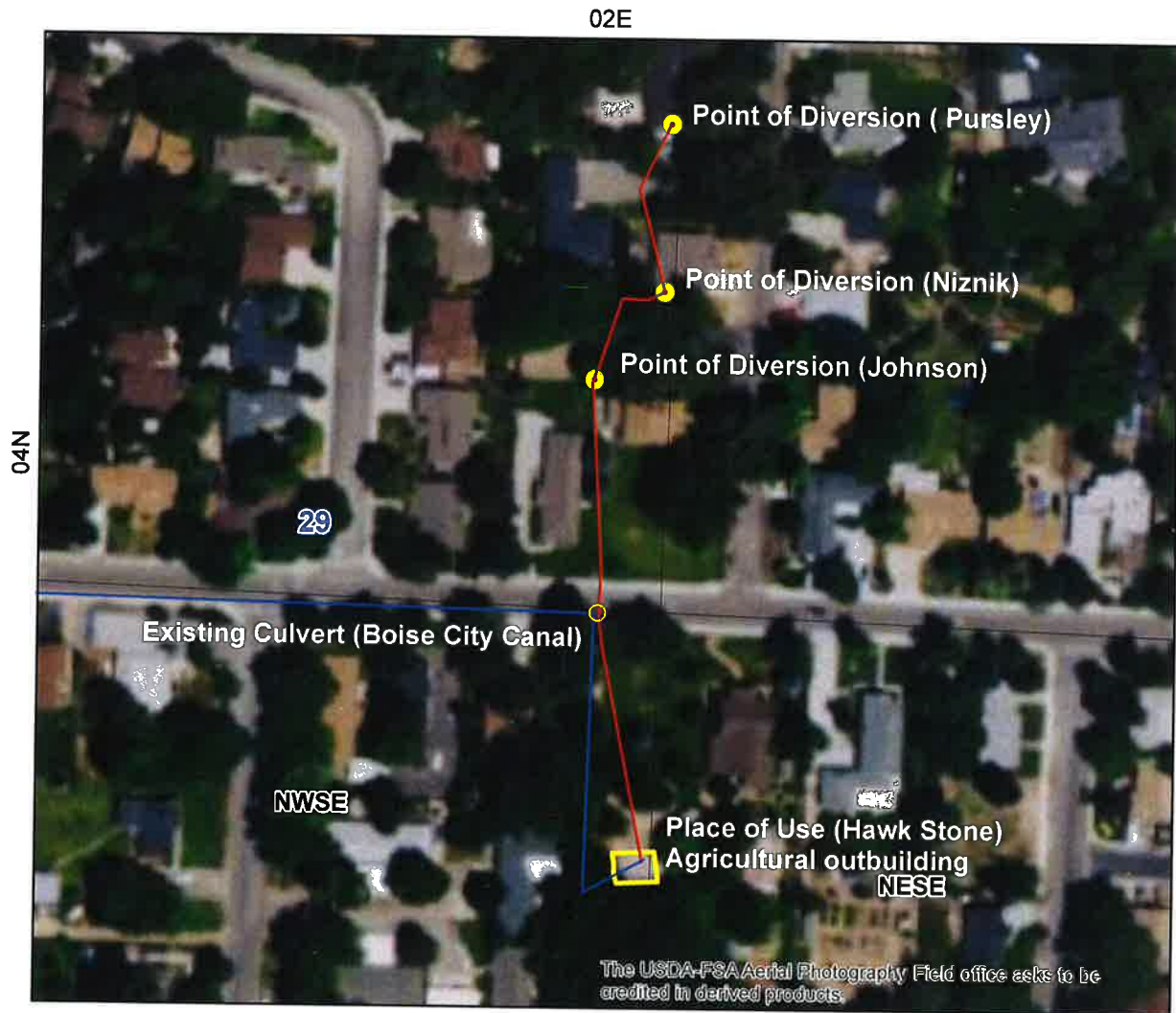
Snapshot of measurement during test.



PVC wrapped in coil
used to heat shop.

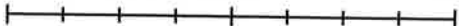
Water does not leave
system.

State of Idaho
Department of Water Resources
System Diagram
63-34206



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

0 0.0175 0.035 0.07 Miles



RESIDENTIAL SPACE HEATING/COOLING REQUIREMENTS FOR COLD OR GEOTHERMAL SOURCES

Worksheet created by Cindy Hodges, 11/93.

Data entered by: Kate Hulse
Exam Date: 02/10/20
File No: 63-34206
Computations for: Heating of 1 home

REQUIRED DATA:

Area of livable floor space, ft2 (A) 300
2 story? (N=1, Y=2) 1
House efficiency factor (e) * 1.11
Inside design temperature (Ti) 72
Average outside temperature (To) ** 22
Source temperature, degrees F (S) 90
Heating/cooling days per season (D) 243
Hours/day system operates (H) 24

CALCULATED DATA:

DESIGN HEAT LOAD (BTU/hr required)
Formula: $E = [e \times (Ti - To)] A$
Applies factor of 0.8 for two-story dwelling

E = 16,650 BTU/hour

TEMPERATURE DROP ACROSS SYSTEM
Formula: $Ts = 0.3 \times [S - Ti]$

Ts = 5.4 degrees F

FLOW RATE REQUIRED (at given source temperature)
Formula: $Q = E / (500 \times Ts) \times 448.8$

Q = 0.01374 cfs

DIVERTED VOLUME OVER SEASON
Formula: $Vdiv = Q \times D \times H / 24 \times 1.9835$

Vdiv = 6.6 AFA

AVERAGE TEMPERATURE CALCULATION:

4 DEG MIN + 80 DEG HIGH / 2 =

42 DEG AVERAGE YEAR ROUND TEMP.

* e values are as follows:

0.28 Best energy efficiency - extra insulation, caulked and

weatherstripped, with storm windows and doors

0.44 Better energy efficiency - standard insulation, caulked and

weatherstripped, with storm windows and/or doors

0.67 Average residence - standard insulation, no weatherproofing

but with storm windows or double panes

1.11 Poor energy efficiency - minimal insulation, no weatherproofing

or storm windows (older homes, shops or greenhouses)

** Suggested average outside temperatures:

WINTER

30 deg F Boise

20 deg F Cascade

SUMMER

75 deg F Boise

63 deg F Cascade

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 63-34206
Reviewer: Kate Huelse
Date of Review: 2/11/2020

P/D No.: Scenario 1

PUMP HORSEPOWER	0.25
BOOSTER HORSEPOWER	0
PUMPING LEVEL	5
DISCHARGE PRESSURE	20
RATE OF FLOW (cfs)	0.03

The above calculates the formula =
$$Q = \frac{8.8 * (\text{Efficiency}) * \text{hp}}{\text{depth to water} + 2.31 * (\text{psi}) + \text{friction}}$$

Assumptions: %70 efficiency.
No Friction

Examiners Notes:

A range of small hp pumps were assumed given this is for domestic use and the requested diversion rate is relatively small. Lift was measured using the DRG map. Topography from the home to shore waters measure close to 25 feet. A range of discharge pressures were used under what we would expect to see from in home domestic tanks (40-60 psi). Theoretical average flow rate is 0.05 cfs.