

PLACE OF USE: COOLING

Method of Determination: ArcMap aerial imagery and site visit

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 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 Size</u>
D0062142		3		Extraction well	
D0062356				Injection Well	

*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

<u>Measurement Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
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No flow measurement necessary under Beneficial Use Exam Rules

2. Measurements No measurement made per Beneficial Use Exam Rules

E. FLOW CALCULATIONS

____ Additional Computation Sheets Attached

Measured Method:

Ground water theoretical calculation

Theoretical Rate of Flow Calculation: $Q = 8.8 \times \text{HP} \times \text{Eff.} / \text{TDH}$, where 8.8 is a constant, HP is pump horsepower, Eff is the estimated efficiency of the system, TDH is the total dynamic head calculated by PSI (system pressure in pounds per square inch) multiplied by 2.31, added to the pumping water level.

$$Q = 8.8 \times 3 \text{ (HP)} \times 0.7 \text{ (EFF)} / 7 \text{ (feet of lift)} + (40 \text{ (PSI)} \times 2.31) = 0.19 \text{ cfs}$$

F. VOLUME CALCULATIONS**1. Volume Calculations for Irrigation: NA**

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

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

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

2. Volume Calculations for Other Uses:

Heating: $183 \text{ days} \times 36000 \text{ gal/day} / 325850 = 20.2 \text{ AF} \times 0.4 \text{ (average run time factor)} = \mathbf{8.1 \text{ AF}}$

Cooling: $182 \text{ days} \times 18000 \text{ gal/day} / 325850 = 10.0 \text{ AF} \times 0.4 \text{ (average run time factor)} = \mathbf{4.0 \text{ AF}}$

Total volume: **12.1 AF**

G. NARRATIVE/REMARKS/COMMENTS

The Beneficial Use Field Exam for permit 37-22814 was completed on June 26, 2015, with Carol Ward, property caretaker, present. Matt Thornton, with Thornton Heating and Sheet Metal, was contacted by phone to obtain information on the heating and cooling system, as his firm did most of the work on the system which is the focus of this exam. Water for the permit is diverted from a well via a 3 HP pump and is then run through the Bosch TW071 heat pump units (one each for heating and cooling). After use for heating or cooling, the water is injected back into the aquifer through a 6 inch well. The system is an open loop system, as it pumps water continuously from the aquifer during use, and then dumps it back into the aquifer at about the same depth. The heated/cooled area of the home is 7652 square feet.

According to Mr. Thornton, the cooling portion and the heating portion each operate for 6 months of the year, with the heating portion running at 36000 gallons per day and the cooling using 18000 gallons per day. Mr. Thornton believed that a 40% average run time for the units would be appropriate. That would yield a heating volume of 8.1 AF and a cooling volume of 4.0 AF for a total volume of 12.1 AFA.

No flow measurement was required, per Beneficial Use Exam Rules, but the ground water theoretical measurement calculation yields a flow rate of 0.19 cfs, which is more than adequate for the permitted 0.13 cfs.

The property also has a domestic well, tag D0062359, which supplies water for the house, lawn, and landscaping. Recommend licensing permit at a volume of 8.1 AF for heating, 4.0 AF for cooling, for a total volume of 12.1 AFA, and a flow rate of 0.13 cfs.

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	0.130 CFS	8.10 AF
COOLING	01/01 to 12/31	0.130 CFS	4.00 AF
	<u>Totals:</u>	0.130 CFS	12.10 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 ☐ Other

I. AUTHENTICATION

Field Examiner's Name

Date 06/26/2015

Reviewer

Date

Reviewer's Note: Injection authorized by UIC
permit #37W094001 at time of licensing.
Jones 9/28/15



Heating and cooling extraction well – Point of Diversion

Heating and cooling injection well



37-22814

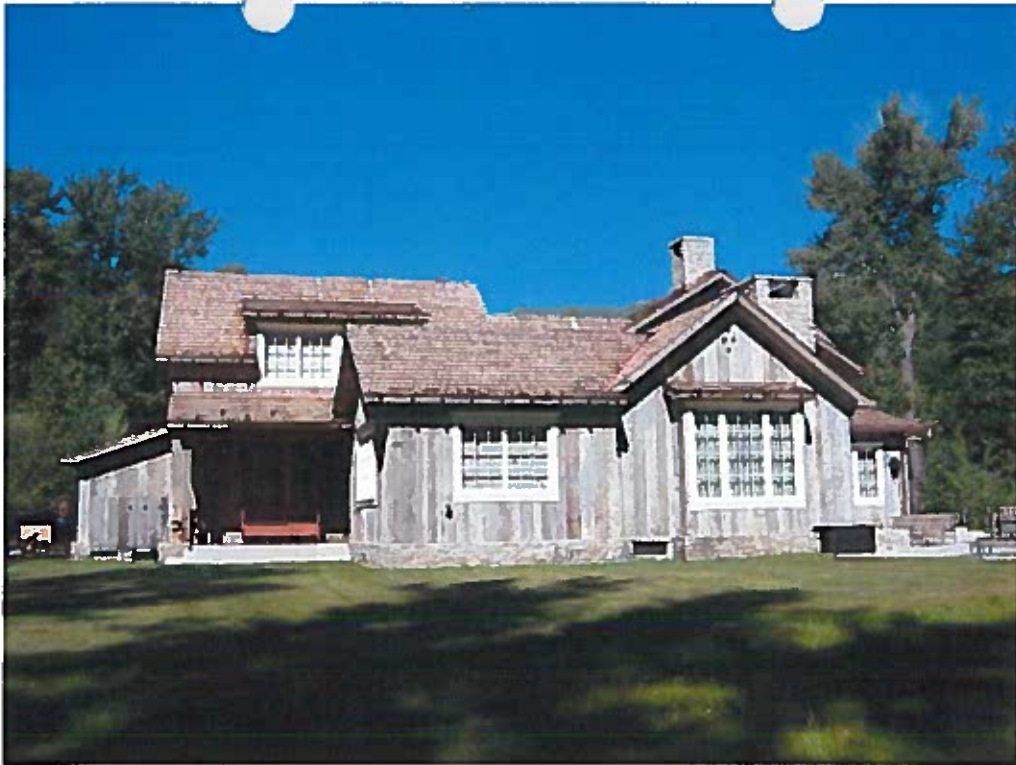


Heating and cooling plumbing inside utility room in home

Heat pump units inside utility room in home



37-22814



Views of Cooper Home - Place of Use



37-22814

Idaho Department of Water Resources

System Diagram



Cooper Family Gift Trust
37-22814

Legend

- Township/Range
- Sections
- QQ



0 0.005 0.01 0.02 Miles

0 D0050012

SENE

SWNW

30

04N 8E

29

0 D0062359

H/C
Pump

0 D0062142

0 D0062356

Dam

LIC=37W094001

NESE

NWSW

0 D0043072

37-22814

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

AD

1. WELL TAG NO. D 00 62359

Drilling Permit No. _____

Water right or injection well # _____

2. OWNER: Lee / Gilman

Name Lee / Gilman

Address P.O. Box 5348

City Ketchum State Id Zip 83340

3. WELL LOCATION:

Twp. 4 North ☒ or South ☐ Rge. 18 East ☒ or West ☐

Sec. 29 1/4 SW 1/4 NW 1/4

Gov't Lot A County Blaine

Lat. 43 39.340 (Deg. and Decimal minutes)

Long. 114 20.748 (Deg. and Decimal minutes)

Address of Well Site 97 Rivers Edge Lane

City Ketchum

Lot A Blk. Sub. Name River Lane

4. USE:

☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation ☐ Thermal ☐ Injection

☐ Other _____

5. TYPE OF WORK:

☒ New well ☐ Replacement well ☐ Modify existing well

☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☒ Air Rotary ☐ Mud Rotary ☐ Cable ☐ Other _____

7. SEALING PROCEDURES:

Seal material	From (ft)	To (ft)	Quantity (lbs or ft)	Placement method/procedure
Bentonite Grout	-10	20	300 lbs	Pumped - Tremmie
Bentonite Chips	0	-10	550 lbs	Dry Pour

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
6"	+2	43	250	Steel	☒	☐	☐	☒

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) _____

9. PERFORATIONS/SCREENS:

Perforations ☐ Y ☐ N Method _____

Manufactured screen ☐ Y ☒ N Type _____

Method of installation _____

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule

Length of Headpipe _____ Length of Tailpipe _____

Packer ☐ Y ☒ N Type _____

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft)	Placement method

11. FLOWING ARTESIAN:

Flowing Artesian? ☐ Y ☒ N Artesian Pressure (PSIG) _____

Describe control device _____

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) 10 ft Static water level (ft) 8 ft

Water temp. (°F) cold Bottom hole temp. (°F) cold

Describe access port Well Cap

Well test:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Test method:
30 ft	60	60	Pump ☐ Bailer ☐ Air ☒ Flowing artesian ☐

Water quality test or comments: Good

13. LITHOLOGIC LOG and/or repairs or abandonment:

Bore Dia. (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water
10	0	5	Fill Dirt	Y X
10	5	10	Top Soil	X
10	10	20	Gravel & Boulders	X
8	20	43	Gravel & Boulders	X

Completed Depth (Measurable): 43 Ft

Date Started: 6/07/2013 Date Completed: 6/07/2013

14. DRILLER'S CERTIFICATION:

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Dirt Works Co. No. 652

*Principal Driller Bill McNamee Date 6/11/2013

*Driller _____ Date _____

*Operator II _____ Date _____

Operator I _____ Date _____

* Signature of Principal Driller and rig operator are required.

RECEIVED

JUN 12 2013

DEPT. OF WATER RESOURCES
SOUTHERN REGION

568655