

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 63-33272

Exam Date: 8/27/2012

1. Current Owner: SAGE COLLINS and NICOLE COLLINS
1315 WILLIAMS LN
NAMPA ID 83686
(208)468-2228

2. Accompanied by: Sage and Nicole Collins

Phone No: Same

Address: Same

Relationship to Permit Holder: Same

3. **SOURCE**

GROUND WATER

TRIBUTARY

N/A

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 63-27781
2. Other water rights with the same point of diversion: 63-27781

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

GROUND WATER

SE1/4SE1/4

Sec. 10, Twp 02N, Rge 02W, B.M.

CANYON County

Method of Determination: GPS Location N43° 31.196' W116° 33.33' Garmin model GPSmap 76 Datum NAD 83

2. **PLACE OF USE:** HEATING

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	
02N	02W	10																X	

Method of Determination: Bing (2011) Aerial Photography w/ field verification.

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. **Well or Diversion****ID No.*****Motor Make****Hp****Motor Serial No.****Pump Make****Pump Serial No. or Discharge Size**

No Metal Tag -

WC Well ID #387225 unknown-submersible 1.5 unknown Baron unknown - 2" discharge

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

D. FLOW MEASUREMENTS1. **Measurement**

Equipment	Type	Make/Model No.	Serial No.	Size	Calib. Date
No physical measurement @ exam	N/A	N/A	N/A	N/A	N/A

See Flow Calculations Section below for Theoretical HP Equation & Pipe Diameter Flow Estimations.

2. Measurements: Piping from well not suitable (buried) for polysonic measurement.

E. FLOW CALCULATIONS

 X Additional Computation Sheets Attached

Measured Method: Theoretical HP Equation:

HP = 1.5

PSI = 40 (est. system used for domestic type use – heating a home)

Z = 24 ft [static level 14 ft – est. pumping level 10 ft below static level for small (<10 hp) system]

$Q = (8.8 \times 0.7 \times \text{HP}) / [Z + (2.31 \times \text{PSI})] = (8.8 \times 0.7 \times 1.5) / [24 + (2.31 \times 40)] = \mathbf{0.08 \text{ cfs}}$ est. capacity of pumping system

Measured Method: Pipe Diameter Flow Estimation:

Discharge Pipe Dia = 2 in => $Q = \mathbf{0.11 \text{ cfs}}$ (see attached “Expected Flows For Pipe Diameters”)

Theoretical HP Equation estimation = **0.08 cfs**

Pipe diameter flow estimation = **0.11 cfs**

Permitted Rate = **0.03 cfs**

Beneficial Use Limit = **0.03 cfs** (req. rate per heating excel worksheet attached)

Proof of Beneficial Use fee paid = \$0.00 = ground water use less **0.04 cfs or less**

Recommend Beneficial Use Limit/Permitted Rate = 0.03 cfs

Highest rate allowable based on beneficial use limit and permitted rate 0.03 cfs recommended. Overall system used for this permit (0.03 cfs) + 63-27781 domestic use (0.06 cfs) = 0.09 cfs. Theoretical HP Equation estimation within 75% of total rate (0.09 cfs) to be authorized for diversion from the well via both rights. No combined limit conditions needed considering system capable of diverting rate of both rights.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: **N/A**

2. Volume Calculations for Heating Use:

V_R => est. time system operating annually:

Owner stated thermostat set at ~73°F. Reasonable to assume system operating on days when avg. temp below ~70°F. The closer the temperature is 70°F, the less time the heating system would need to operate. Approximate system operates 0 hrs/day when avg. temp about 70°F (summer time Boise/Nampa area usually don't run heating systems at all), 12 hrs/day on days when avg. temp between 40°F and 70°F, and 24 hrs/day when avg. temp below 40°F: Based on NOAA avg. temp. data (attached):

Summer (avg. temp $\geq 70^\circ\text{F}$) = Jul, Aug, & Sept = 92 days $\times$ 0 hrs/day $\times$ 60 min/hr = 0 min annually

Fall & Spring (avg. temp 40°F - 70°F) = Oct, Mar, Apr, May, & Jun = 153 days/yr $\times$ 12 hrs/day $\times$ 60 min/hr = 110,160 min/yr

Winter (avg. temp $\leq 40^\circ\text{F}$) = Nov, Dec, Jan, & Feb = 120 days/yr $\times$ 24 hrs/day $\times$ 60 min/hr = 172,800 min/yr

$V_R = 0.03 \text{ cfs} \times 448.8 \text{ gpm/cfs} \times 282,960 \text{ min/yr} \times 1 \text{ af}/325,850 \text{ gal} = \mathbf{11.7 \text{ afa}}$ (this quantity corresponds with est. from “Residential Space Heating/Cooling Requirements For Cold Or Geothermal Sources” excel worksheet attached)

$V_D = 0.03 \text{ cfs} \times 365 \text{ days/yr} \times 1.9835 = \mathbf{21.7 \text{ afa}}$

$V = \text{Smaller of } V_R \text{ and } V_D = 11.7 \text{ afa} < 21.7 \text{ afa} = \mathbf{\text{Recommend } 11.7 \text{ afa}}$

Overall, system capable of producing at least 57.9 afa (0.08 cfs –all day for one year), which is enough water for both

the heating use (11.7 afa) and domestic use authorized via overlapping right 63-27781 (14.6 afa @ maximum allowable 13,000 gpd 365 days a year). No combined use limit condition(s) applicable considering system capable of diverting enough volume for all uses.

G. NARRATIVE/REMARKS/COMMENTS

SYSTEM DESCRIPTION:

System consists of a 6 in dia production well with a 2" discharge piped to pressure tank inside pump house then to two 1" lines for heating unit (internal use) and one 1" line for domestic uses. After use, heating water is injected through a separate injection well with WC metal tag D0030825. Production well motor and pump installed by Knie Pump & Drill Co. Owner did not recall hp of motor installed, but thought it was a ¾ hp. However, Mike Knie of Knie Pump & Drill Co. stated he doesn't often install ¾ hp pumps (motors) unless well is artesian. He said ~90% of the pumps (motors) in the area are at least 1.5 hp. In addition to Mr. Knie's comments, the 1992 claim record for overlapping right 63-27781 indicates the system utilizes a 1.5 hp motor. Therefore, assumed motor is 1.5 hp for exam purposes.

HEATING USE:

Heating use for 2,900 sq. ft, two-story home. The thermometer is generally set at 73°F. The home also has a wood stove used during the winter time, which minimizes heating system use during winter months. Attachments "Residential Space Heating/Cooling Requirements For Cold Or Geothermal Sources" excel worksheet and "UIC Program Guidance For Calculating Total Domestic Water Use For Permitting a Ground-Source Heat Pump" provide additional information about the heating use and system.

OVERLAP:

Well serves as POD for 63-33272 and right 63-27781. Right 63-27781 is used for internal and external domestic uses for the same home (POU) as right 63-33272. System capable of producing enough rate and volume for all uses (see Flow Calculations and Volume Calculations above). Therefore, there should be no rate or volume limiting condition(s) placed on right during licensing. There are no other applicable overlapping rights associated with the POD and/or POU.

COMPLIANCE WITH PERMIT CONDITIONS:

Permit conditioned that return flow discharged to a subsurface must be authorized by a separate injection well permit. Injection well permit # 63W188001 issued for this system's injection well. This permit is in good standing (current permit valid thru 8/31/2019) with the injection well program. The heating system is being used for a single home within Lot 16 of Grays Farm Subdivision, in accordance with permit conditions. To the best of my knowledge, owner has complied with all permit conditions.

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	0.03 CFS	11.7
<u>Totals:</u>		0.03 CFS	11.7

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 Angela M. Quinn Date 12/19/2012
 Reviewer _____ Date _____

63-33272 Beneficial Use Field Report System Diagram & Map

R02W



● Point of Diversion (Production Well)

▼ Injection Well

Place Of Use Boundary

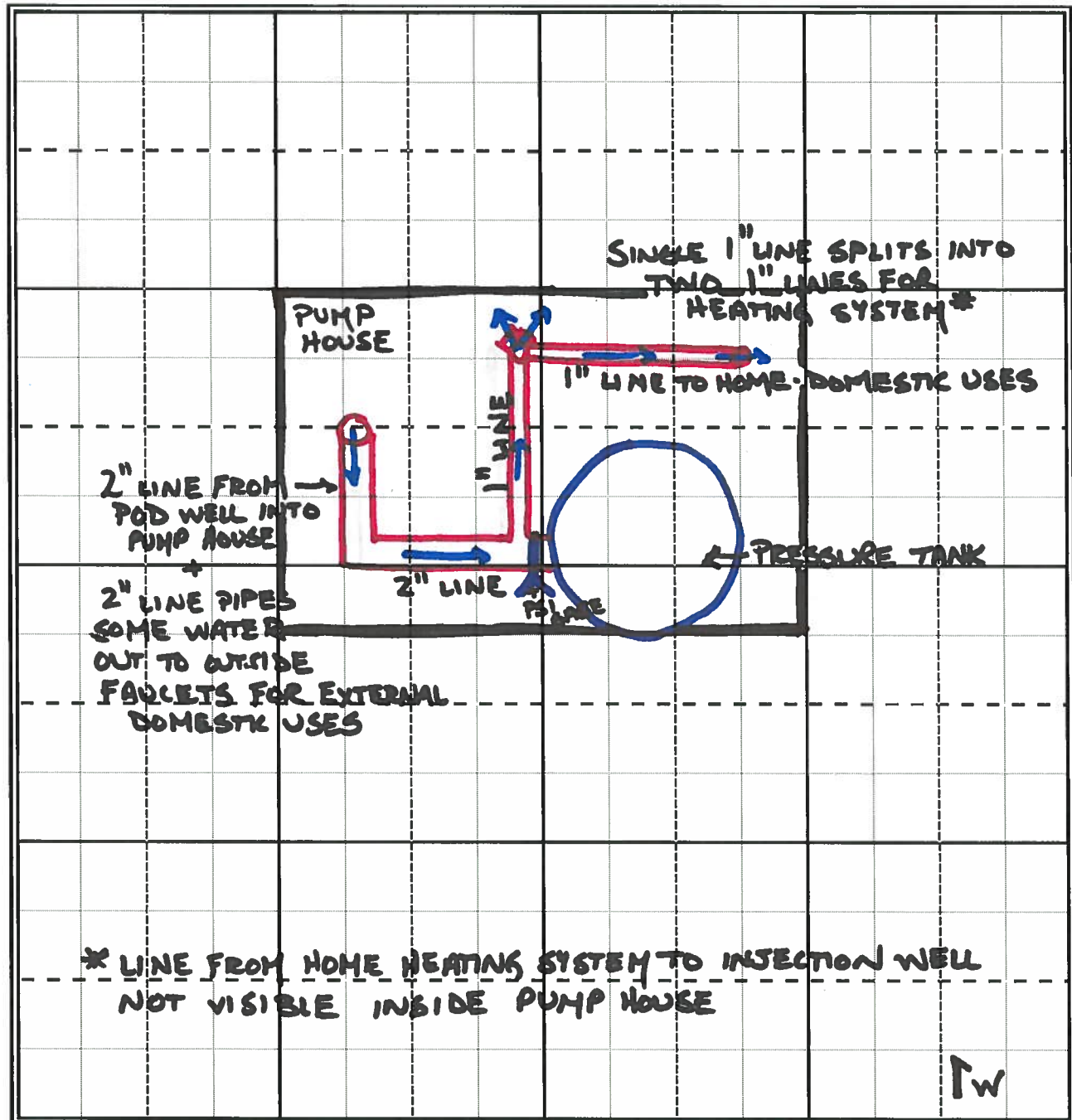
Townships

PLS Sections

Quarter Quarters



63-33272 Beneficial Use Field Report Diversion System Diagram



Not to Scale

EXPECTED FLOWS FOR PIPE DIAMETERS

This is for rough estimate for **pump & closed pipeline** system.

Use to double check other measurements/estimates.

Assumes optimum design.

$$Q = VA \quad \text{where: } V = 5 \text{ ft/sec} \quad A = \pi r^2 \quad (\text{radius in ft.})$$

DIAMETER (INCHES)	RATE (CFS)
01	0.03
02	0.11
03	0.25
04	0.44
06	0.98
08	1.74
10	2.73
12	3.93
14	5.34
16	6.98
18	8.83
20	10.90
22	13.19
24	15.70
36	35.34
48	62.83

RESIDENTIAL SPACE HEATING/COOLING REQUIREMENTS FOR COLD OR GEOTHERMAL SOURCES

Worksheet created by Cindy Hodges, 11/93.

Data entered by: Angie Grimm
Exam Date: 08/27/12
File No: 63-33272
Computations for: Heating of Single Family Home

REQUIRED DATA:

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

2900 (reported by owner)
2 (reported by owner)
0.67 (avg residence)
73 (avg residence)
52 (NOAA Online Weather Data)
56 (Temp per Well Logs w/in 40 ac-tract)
273 (~ based on Boise area avg temp data)
18 (avg - system operation est. 12 to 24 hrs/day)

CALCULATED DATA:

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

E = 32,642 BTU/hour

TEMPERATURE DROP ACROSS SYSTEM
Formula: $T_s = 0.3 \times [S - T_i]$

Ts = 5.1 degrees F

* 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
4 deg F Boise
6 deg F Grand View
-8 deg F Cascade

SUMMER
80 deg F Boise
90 deg F Grand View
70 deg F Cascade

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

Q = 0.03 cfs

DIVERTED VOLUME OVER SEASON
Formula: $V_{div} = Q \times D \times H / 24 \times 1.9835$

Vdiv = 11.6 AFA

AVERAGE TEMPERATURE CALCULATION:

4 DEG MIN + 80 DEG HIGH / 2 =
42 DEG AVERAGE YEAR ROUND TEMP .

NOWData - NOAA Online Weather DataBoise Area ([ThreadEx Station](#))

Monthly Totals/Averages

Average Temperature (degrees F)

Year: 2011

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2011	31.7	35.5	44.1	46.2	55.5	64.3	75.6	78.4	71.4	54.6	40.0	31.3	52.4

This station's record may include data from more than one, possibly incompatible, locations. It reflects the longest available record for the Boise Area.

Official data and data for additional locations and years are available from the [Regional Climate Centers](#) and the [National Climatic Data Center](#).

UIC Program Guidance For Calculating the Average Weekly Injection Rate



The UIC Program does not dictate what method you use to calculate the Average Weekly Injection Rate for your injection well. The following are options you can use to make your calculation or for guidance to develop your own method. Document your calculation by using one of the options below or attaching your calculation. This information is required in Section I.D.

Example 1 – Heat Pump (Injection well class 5A7)

Pumping rate of heat pump in gallons per minute (gpm)	Hours per day heat pump will run on coldest day of year	Number of days per week heat pump will run during week coldest day occurs	Constant to convert to gallons per minute (gpm)	Average Weekly Injection Rate (gpm)
8 gal/min	x 18 hours/day	x 7 days/wk	x 0.00595 wks/hour	= 6.0 gpm
15 gpm	x 18	x 7	x 0.00595	= 11 gpm

Example 2 – Sprinkler Irrigation Return Flow (Injection well class 5F1)

Number of acres drained	Volume of water applied	% waste water	Constant to convert to gallons per minute (gpm)	Average Weekly Injection Rate
40 acres	9 gal/min/acre	x 0.05	x 0.000099 wk/min	= 18 gpm
	10080 min/wk	x	x	=
40 acres	0.02 ft ³ /sec/acre	x 0.05	x 0.0000017 wk/min	= 0.04 cfs
	604800 min/wk	x	x	=
		x	x	=

Example 3 – Theoretical Calculation of Flow Through a Pipe

The calculation used to generate this table assumes unrestricted flow through a well casing of the designated size. The calculation represents the maximum injection rate that is theoretically possible, which may be significantly larger than the subsurface will actually allow. Using this calculation will result in a relatively large radius of influence, which may cause your permit to include a monitoring requirement.

Well Diameter	Average Weekly Injection Rate
6"	2.5 cfs
8"	4.4 cfs
10"	6.8 cfs
12"	9.8 cfs
14"	13.4 cfs



GUIDE SPECIFICATIONS

GS Series

GENERAL

Units shall be performance certified to ISO standard 13256-1 for Water Loop Heat Pump, Ground Water Heat Pump and Ground Loop Heat Pump applications. Units shall be Underwriter Laboratories (UL and cUL) listed for safety on all models. Each unit shall be run tested at the factory. Each unit shall be pallet mounted and stretch wrapped. The units shall be manufactured in an ISO 9001:2000 certified facility.

The units shall be warranted by the manufacturer against defects in materials and workmanship for a period of one year on all parts, and 5 years on the compressor.

The units shall be designed to operate with entering fluid temperatures between 50°F (10°C) and 110°F (43.3°C) in cooling and temperatures between 25°F (-3.9°C) and 80°F (27°C) in heating.

CASING & CABINET

The cabinet shall be fabricated from heavy-gauge steel finished with Galvalume® plus, an aluminum-zinc alloy with a clear acrylic coating for additional corrosion protection. The interior shall be insulated with ½" (12.7mm) thick, multi density, coated, glass fiber. All units shall allow sufficient service access to replace the compressor without unit removal. One blower and two compressor compartment access panels shall be removable with supply and return ductwork in place. A duct collar shall be provided on the supply air opening. A filter rack with 1" (25.4mm) thick disposable filters and a 1" (25.4mm) return air duct collar shall be provided with each unit. The units shall have an insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise, and to permit service testing without air bypass. Units shall have a stainless steel condensate drain pan.

REFRIGERATION CIRCUITS

All units shall contain a sealed refrigerant circuit including a hermetic compressor, bi-directional thermal expansion valve metering device, finned tube air-to-refrigerant heat exchanger, refrigerant reversing valve and service ports. Compressor shall be high efficiency rotary or scroll type, designed for heat pump duty, quiet operation and mounted on rubber vibration isolators. Compressor motors shall be equipped with overload protection. Refrigerant reversing valves shall be pilot operated sliding piston type with replaceable encapsulated magnetic coils energized only during the cooling cycle. The finned tube coil shall be constructed of lanced aluminum fins not exceeding fourteen fins per inch bonded to rifled copper tubes in a staggered pattern not less than three rows deep and have a 450 PSIG (3100 kPa) working pressure. Coils shall have a baked polyester enamel coating for protection against most airborne chemicals. Coil end plates shall be aluminum. The coaxial water-to-refrigerant heat exchanger shall be constructed of a convoluted copper (optional cupronickel) inner tube and steel outer tube with a designed refrigerant working pressure of 450 PSIG (3100 kPa) and a designed water side working pressure of no less than 400 PSIG (2750 kPa). The water-to-refrigerant heat exchanger shall be insulated to prevent condensation at low fluid temperatures.

FAN MOTOR & ASSEMBLY

The fan shall be direct drive centrifugal forward curved type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet low velocity operation. The fan housing shall be removable from the unit without disconnecting the supply air ductwork for servicing of the fan motor. The fan motor shall be an ECM-2 microprocessor controlled DC type motor with internal programming factory set for the specific unit and featuring soft start/stop and a delay off feature for maximum efficiency and quiet operation. There will further be provisions for adjusting the air delivery of the motor and blower by +/- 15% from rated air flow (GS070 +/-0.15%).

ELECTRICAL

Controls and safety devices will be factory wired and mounted within the unit. Controls shall include compressor contactor, 24V transformer, revers-

ing valve coil and solid state lock-out controller (UPM). The UPM controller shall include the following features: Anti-short cycle time delay, random start, brown out/surge/power interruption protection, 90 second low pressure switch bypass timer, shutdown on high or low refrigerant pressure safety switch inputs, shutdown for the optional freestat or high level condensate sensors, 24 VAC alarm output for remote fault indication, unit reset at thermostat or disconnect, ability to defeat time delays for servicing and automatic intelligent reset. The UPM shall automatically reset after a safety shut down and restart the unit, if the cause of the shut down no longer exists, after the anti-short cycle and random start timers expire. Should a fault re-occur within 10 minutes after reset, then a permanent lockout will occur. A light emitting diode (LED) shall announce the following alarms: high refrigerant pressure, low refrigerant pressure, low water temperature and a high level of condensate in the drain pan (when equipped with the optional low water temperature and high level condensate sensors). The LED will display each fault condition as soon as the fault occurs. If a permanent lockout occurs, then the fault LED will display the type of fault until the unit is reset.

Safety devices include a low pressure cutout set at 20 PSIG (140 kPa) for loss of charge protection (freestat and/or high discharge gas temperature sensor is not acceptable) and a high pressure cutout control set at 380 PSIG (2600 kPa).

True ECM motor interface board shall provide a screw type terminal block for thermostat connection, LED's to indicate thermostat status and air delivery. Direct wiring of the motor control harness to the thermostat is not acceptable.

An optional energy management relay to allow unit control by an external source shall be factory installed.

PIPING

Supply, return water and condensate drain connections shall be brass female pipe thread fittings and mounted flush to cabinet exterior.

INTERNAL ELECTRIC HEAT

208/230-1-60 volt units shall be equipped with optional factory installed internal electric resistance heat for auxiliary and emergency heat. Electric heater must be Underwriter's Laboratories (UL and ULc) approved for safety when installed in the unit. External heater packages or heater packages not specifically listed for use with the unit are unacceptable. Electric heater packages shall include a heater collar mounted to the blower outlet, individual thermal overload protected heater elements no greater than 5kW each and magnetic contactors. Heater packages shall have a separate power supply connection from the compressor and this power supply shall also power the unit blower motor and control transformer for safe operation.

HEAT RECOVERY PACKAGE

208/230 volt units shall be equipped with a optional factory installed internal heat recovery kit for domestic hot water production. This kit shall include an internally protected pump, double walled coaxial water-to-refrigerant heat exchanger, 140°F (60°C) hot water temperature limit switch and an on/off switch/circuit breaker.

LOOP PUMP PACKAGE - CONSULT FACTORY

208/230-1-60 volt units shall be equipped with an optional factory installed ground loop pump kit. This kit shall include a 1/6 HP loop pump, isolation valves and a set of purge connections for purging and pressurizing the ground loop with the unit in place. The pump, all piping and valves shall be internal to the unit.



PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

GS062

GEO-SAVER

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Blower		Loop Pump		Min. Circuit Amps	Max. Fuse/Breaker
		RLA	LRA	FLA	HP	FLA	HP		
208/230-1-60	-1	25.6	169.0	6.8	3/4	-	-	40.6	60
208/230-3-60	-3	17.7	123.0	6.8	3/4	-	-	29.0	45

MECHANICAL SPECIFICATIONS

Refrigerant: R-22			
Air Coil			
Square Feet	Rows Deep	Tube O.D.	Fins/Inch
4.5	3	3/8	14
Water Coil			
Type		Work Press	
Coaxial		450 psig	
Blower Size		Compr Type	
11 x 9 DD		Scroll	
Net Weight		Ship Weight	
376 lbs		402 lbs	

BLOWER PERFORMANCE

Available External Static Pressure (Inches of Water, Gauge, Wet Coil and Filter Included)

Blower Speed	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20
+						2300						
Norm						2000						
-						1700						



FLUID PRESSURE DROP

Fluid Flow (GPM)	Pressure Drop (FOH) (PSIG)	
8	3.48	1.51
10	5.21	2.25
15	10.80	4.68
18	15.00	6.49
22	21.52	9.32

ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 2000 CFM and 15.0 GPM

Water Loop				Ground Water				Ground Loop			
Cooling		Heating		Cooling		Heating		Cooling		Heating	
Capacity	EER	Capacity	COP	Capacity	EER	Capacity	COP	Capacity	EER	Capacity	COP
60,000	13.2	77,000	4.6	65,000	18.3	60,000	4.1	60,500	14.6	48,000	3.3

CAPACITY DATA All performance at 2000 CFM and 15.0 GPM

COOLING

EFT Range (Standard)
50°F to 100°F

Entering Fluid Temp. (°F)	Entering Air Temp. (°F)	Total Capacity (MBtuH)	Sensible Capacity (MBtuH)	Sensible to Total Ratio	Power Input (kW)	Heat of Reject (MBtuH)	EER
50°	70°db 61°wb	56.86	37.71	0.66	3.19	67.74	17.8
60°		55.27	36.97	0.67	3.54	67.37	15.6
70°		53.68	36.35	0.68	3.90	67.00	13.
85°		51.30	35.66	0.70	4.44	66.45	11.6
100°		48.92	35.18	0.72	4.97	65.90	9.8
50°	75°db 63°wb	60.89	45.00	0.74	3.20	71.83	19.0
60°		59.19	44.11	0.75	3.56	71.36	16.6
70°		57.49	43.38	0.75	3.92	70.89	14.7
85°		54.95	42.55	0.77	4.46	70.18	12.3
100°		52.40	41.99	0.80	5.00	69.47	10.5
50°	80°db 67°wb	66.79	49.64	0.74	3.23	77.82	20.7
60°		64.93	48.66	0.75	3.59	77.19	18.1
70°		63.07	47.85	0.76	3.96	76.57	15.9
85°		60.27	46.94	0.78	4.50	75.63	13.4
100°		57.48	46.32	0.81	5.04	74.69	11.4
50°	85°db 71°wb	72.69	54.32	0.75	3.26	83.81	22.3
60°		70.67	53.25	0.75	3.62	83.03	19.5
70°		68.64	52.37	0.76	3.99	82.25	17.2
85°		65.60	51.37	0.78	4.54	81.08	14.5
100°		62.56	50.69	0.81	5.08	79.91	12.3

Units are complete packages containing compressor, reversing valve, expansion valve, metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in install on actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
gs062p6 mod2 Rev: 10-06

HEATING

EFT Range (Standard)
25°F to 80°F

Entering Fluid Temp. (°F)	Entering Air Temp. (°F)	Total Capacity (MBtuH)	Power Input (kW)	Heat of Abs. (MBtuH)	COP
50°	60°	65.21	4.44	50.06	4.3
60°		73.35	4.61	57.61	4.7
70°		81.50	4.79	65.15	5.0
80°		89.64	4.97	72.69	5.3
50°	70°	61.63	4.52	46.20	4.0
60°		69.32	4.70	53.28	4.3
70°		77.02	4.88	60.36	4.6
80°		84.71	5.06	67.44	4.9
50°	80°	57.43	4.62	41.65	3.6
60°		64.59	4.81	48.18	3.9
70°		71.76	4.99	54.72	4.2
80°		78.92	5.17	61.26	4.5

LOW TEMP HEATING

Antifreeze Required

25°	60°	43.98	4.00	30.33	3.2
30°		47.97	4.09	34.02	3.4
40°		55.95	4.26	41.40	3.8
25°	70°	41.57	4.07	27.67	3.0
30°		45.34	4.16	31.13	3.2
40°		52.88	4.34	38.06	3.6
25°	80°	38.74	4.17	24.53	2.7
30°		42.25	4.26	27.72	2.9
40°		49.28	4.44	34.12	3.3

FHP MANUFACTURING COMPANY

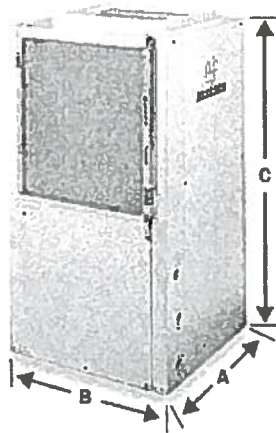
601 N.W. 65th Court - Fort Lauderdale, FL 33309

Phone: (954) 776-5471 - Fax: (800) 776-5529

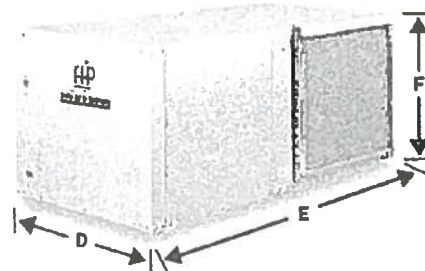
<http://www.fhp-mfg.com>

GS SERIES

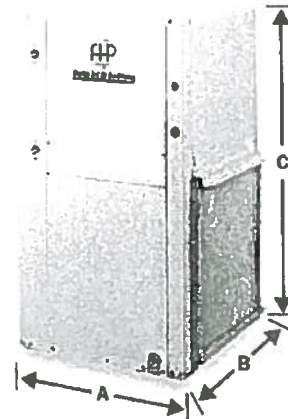
VERTICAL



HORIZONTAL



COUNTERFLOW



DIMENSIONS						
MODEL	VERTICAL/C. FLOW			HORIZONTAL		
	WIDTH	DEPTH	HEIGHT	WIDTH	LENGTH	HEIGHT
	A	B	C	D	E	F
GS018	21.50	21.50	40.25	25.50	45.00	21.75
GS024	21.50	21.50	40.25	25.50	43.00	21.75
GS030, 036	21.50	26.00	47.25	26.00	54.50	21.75
GS042, 048	24.00	32.75	47.25	30.00	68.00	21.75
GS054, 062	26.00	33.25	51.25	30.00	68.00	21.75
GS070	26.00	33.25	58.25	30.00	78.00	21.75

All ratings & specifications are subject to change without notice.

MODEL		CFM	ARI / ISO 13256-1 PERFORMANCE DATA											
			ENTERING WATER TEMPERATURES											
			Water Loop				Ground Water				Ground Loop			
			86°F		68°F		59°F		50°F		77°F		32°F	
			CAPACITY AND EFFICIENCY DATA											
		COOLING CAPACITY (WLHP)	EER (WLHP)	HEATING CAPACITY (WLHP)	COP (WLHP)	COOLING CAPACITY (GWHP)	EER (GWHP)	HEATING CAPACITY (GWHP)	COP (GWHP)	COOLING CAPACITY (GLHP)	EER (GLHP)	HEATING CAPACITY (GLHP)	COP (GLHP)	
GS018	600	15,500	16.8	16,300	5.2	17,200	25.9	13,200	4.5	16,000	19.4	10,600	3.8	
GS024	800	23,500	14.9	28,500	4.8	26,400	22.6	23,200	4.2	24,500	16.7	18,200	3.6	
GS030	1000	28,000	17.6	33,200	5.9	30,000	25.9	26,000	4.9	29,000	20.7	19,000	4.1	
GS036	1200	34,000	15.5	40,500	5.3	37,800	22.8	32,400	4.6	35,000	18.7	24,500	3.6	
GS042	1400	39,600	15.7	48,500	5.5	44,000	22.8	39,000	4.6	41,000	17.9	30,000	3.8	
GS048	1600	47,000	14.5	58,000	5.1	52,000	21.1	47,000	4.3	49,000	16.6	36,500	3.6	
GS054	1800	51,000	14.0	62,000	4.5	57,000	19.8	52,000	4.1	52,000	15.4	41,000	3.5	
GS062	2000	60,000	13.2	77,000	4.6	65,000	18.3	60,000	4.1	60,500	14.6	48,000	3.3	
GS070	2200	68,000	13.0	82,000	4.7	76,000	19.2	66,000	3.9	69,000	14.3	53,000	3.5	

Tabulated performance data is at noted entering water temperatures and entering air conditions of 80.6°F DB/66.2°F WB at ARI/ISO 13256-1 rated CFM and copper heat exchangers.



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<http://www.fhp-mfg.com>

heat pumps

970-204 Rev. 4/06

PERFORMANCE DATA

Operating Temperatures & Pressures, GS054-070

			OPERATING DATA							
MODEL	ENTERING WATER TEMP, °F	WATER FLOW GPM	COOLING				HEATING			
			SUCTION PRESSURE PSIG	DISCHARGE PRESSURE PSIG	WATER TEMP RISE, °F	AIR TEMP DROP, °F	SUCTION PRESSURE PSIG	DISCH PRESS., PSIG	WATER TEMP DROP, °F	AIR TEMP RISE, °F
GS054	30°	8.0					33-41	167-204	3-4	18-22
		18.0					37-45	173-212	2-3	19-24
	40°	8.0	66-80	117-143	13-16	21-26	42-52	184-225	5-6	22-27
		18.0	66-80	107-131	7-9	22-27	47-57	191-233	3-4	24-29
	50°	8.0	68-83	137-167	13-16	20-25	51-63	201-246	7-9	27-32
		18.0	68-83	125-152	7-9	21-25	57-69	209-255	4-5	28-35
	60°	8.0	69-84	161-197	13-16	20-24	60-74	214-262	8-10	31-38
		18.0	69-84	147-180	7-9	20-24	67-82	222-271	5-6	33-40
	70°	8.0	70-86	178-218	13-16	20-24	72-88	229-280	10-12	34-42
		18.0	70-86	162-198	7-9	20-24	79-97	238-290	6-7	37-45
	80°	8.0	71-87	206-252	12-15	19-23	83-101	247-302	11-14	39-47
		18.0	71-87	188-230	7-8	19-23	91-111	256-313	7-8	42-51
	90°	8.0	73-89	235-287	12-15	18-22	94-115	263-321	12-15	43-53
		18.0	73-89	214-261	7-8	18-23	104-127	272-333	7-9	46-56
	100°	8.0	73-89	263-321	12-15	18-22				
		18.0	73-89	239-292	7-8	19-23				
GS062	30°	10.0					31-38	169-206	3-4	19-23
		20.0					34-41	174-213	2-3	20-25
	40°	10.0	61-74	115-141	13-16	22-27	39-48	186-227	6-7	23-28
		20.0	61-74	106-129	8-9	22-27	43-52	192-235	3-4	25-30
	50°	10.0	62-76	134-164	14-17	21-25	47-58	203-248	8-10	28-34
		20.0	62-76	123-150	8-10	21-26	52-64	210-257	5-6	29-36
	60°	10.0	63-77	158-193	13-16	20-24	56-68	216-264	9-11	32-39
		20.0	63-77	145-177	8-9	20-25	61-75	224-273	6-7	34-42
	70°	10.0	63-77	177-217	14-17	19-24	66-81	228-278	11-13	35-43
		20.0	63-77	163-199	8-10	20-24	73-89	235-287	6-8	37-46
	80°	10.0	64-78	206-251	13-16	18-23	76-93	245-300	12-15	40-49
		20.0	64-78	188-230	8-9	19-23	84-102	254-310	7-9	42-52
	90°	10.0	65-80	234-285	13-16	18-22	87-106	261-319	14-17	44-54
		20.0	65-80	214-262	7-9	18-22	95-117	270-329	8-10	47-57
	100°	10.0	66-80	262-320	13-16	18-22				
		20.0	66-80	240-293	7-9	18-22				
GS070	30°	12.0					31-38	169-206	3-4	19-23
		22.0					34-41	174-213	2-3	20-25
	40°	12.0	61-74	115-141	13-16	22-27	39-48	186-227	6-7	23-28
		22.0	61-74	106-129	8-9	22-27	43-52	192-235	3-4	25-30
	50°	12.0	62-76	134-164	14-17	21-25	47-58	203-248	8-10	28-34
		22.0	62-76	123-150	8-10	21-26	52-64	210-257	5-6	29-36
	60°	12.0	63-77	158-193	13-16	20-24	56-68	216-264	9-11	32-39
		22.0	63-77	145-177	8-9	20-25	61-75	224-273	6-7	34-42
	70°	12.0	63-77	177-217	14-17	19-24	66-81	228-278	11-13	35-43
		22.0	64-78	163-199	8-10	20-24	73-89	235-287	6-8	37-46
	80°	12.0	64-78	206-251	13-16	18-23	76-93	245-300	12-15	40-49
		22.0	64-80	188-230	8-9	19-23	84-102	254-310	7-9	42-52
	90°	12.0	65-80	234-285	13-16	18-22	87-106	261-319	14-17	44-54
		22.0	65-80	214-262	7-9	18-22	95-117	270-329	8-10	47-57
	100°	12.0	66-80	262-320	13-16	18-22				
		22.0	66-80	240-293	7-9	18-22				

This chart shows approximate temperatures and pressures for a unit in good repair. The values shown are meant as a guide only and should not be used to estimate system charge. This chart assumes rated air flow and 80° d.b./67° w.b. entering air temperature in cooling, 70° d.b. entering air temperature in heating. Heating data at entering fluid temperatures below 50° assumes the use of antifreeze.

As a result of continuing research and development, specifications are subject to change without notice.

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Administration within 30 days after the completion or abandonment of the well.

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AUG 8 1973

1. WELL OWNER Name <u>Jack Johni</u> Address <u>1013 Benner Nampa, Ida 83415</u> Owner's Permit No. _____		7. WATER LEVEL Static water level <u>14' 4"</u> feet below land surface Flowing? ☐ Yes ☒ No G.P.M. flow _____ Temperature _____ ° F. Quality <u>F.I.R.</u> Artesian closed-in pressure _____ p.s.i. Controlled by ☐ Valve ☐ Cap ☐ Plug																																																																																																																							
2. NATURE OF WORK ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe method of abandoning) _____		8. WELL TEST DATA ☐ Pump ☐ Bailer ☒ Other <u>F.I.R.</u> Discharge G.P.M. <u>50</u> Draw Down <u>10</u> Hours Pumped <u>1</u>																																																																																																																							
3. PROPOSED USE ☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal ☐ Industrial ☐ Stock		9. LITHOLOGIC LOG 041835																																																																																																																							
4. METHOD DRILLED ☒ Cable ☐ Rotary ☐ Dug ☐ Other		<table border="1"><thead><tr><th rowspan="2">Hole Diam.</th><th colspan="2">Depth</th><th rowspan="2">Material</th><th colspan="2">Water</th></tr><tr><th>From</th><th>To</th><th>Yes</th><th>No</th></tr></thead><tbody><tr><td>8</td><td>0</td><td>1</td><td>top Soil</td><td></td><td>X</td></tr><tr><td>8</td><td>1</td><td>3</td><td>Brn Clay</td><td></td><td>X</td></tr><tr><td>8</td><td>3</td><td>5</td><td>Hard Red</td><td></td><td>X</td></tr><tr><td>8</td><td>5</td><td>7</td><td>Sandy Brn Clay</td><td></td><td>X</td></tr><tr><td>8</td><td>7</td><td>8.4</td><td>Broken Basalt</td><td></td><td>X</td></tr><tr><td>8</td><td>8.4</td><td>16</td><td>Basalt</td><td></td><td>X</td></tr><tr><td>8</td><td>16</td><td>17</td><td>Broken Basalt (Some Cinders)</td><td>X</td><td></td></tr><tr><td>8</td><td>17</td><td>25</td><td>Hard Gray Basalt</td><td>X</td><td></td></tr><tr><td>8</td><td>25</td><td>30</td><td>Basalt</td><td>X</td><td></td></tr><tr><td>8</td><td>30</td><td>40</td><td>Brn Clay (Some Cinders)</td><td>X</td><td></td></tr><tr><td>8</td><td>40</td><td>48</td><td>Brn Clay (Some Cinders)</td><td>X</td><td></td></tr><tr><td>8</td><td>48</td><td>53.4</td><td>Basalt</td><td>X</td><td></td></tr><tr><td>6</td><td>53.4</td><td>58</td><td>Hard Gray Basalt</td><td>X</td><td></td></tr><tr><td>6</td><td>58</td><td>68</td><td>Basalt</td><td>X</td><td></td></tr><tr><td>6</td><td>68</td><td>75</td><td>Basalt</td><td>X</td><td></td></tr><tr><td>6</td><td>75</td><td>80</td><td>Basalt</td><td>X</td><td></td></tr><tr><td>6</td><td>80</td><td>85</td><td>Basalt & Red Cinders</td><td>X</td><td></td></tr><tr><td>6</td><td>85</td><td>90</td><td>Basalt & Red Cinders</td><td>X</td><td></td></tr></tbody></table>		Hole Diam.	Depth		Material	Water		From	To	Yes	No	8	0	1	top Soil		X	8	1	3	Brn Clay		X	8	3	5	Hard Red		X	8	5	7	Sandy Brn Clay		X	8	7	8.4	Broken Basalt		X	8	8.4	16	Basalt		X	8	16	17	Broken Basalt (Some Cinders)	X		8	17	25	Hard Gray Basalt	X		8	25	30	Basalt	X		8	30	40	Brn Clay (Some Cinders)	X		8	40	48	Brn Clay (Some Cinders)	X		8	48	53.4	Basalt	X		6	53.4	58	Hard Gray Basalt	X		6	58	68	Basalt	X		6	68	75	Basalt	X		6	75	80	Basalt	X		6	80	85	Basalt & Red Cinders	X		6	85	90	Basalt & Red Cinders	X	
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5. WELL CONSTRUCTION Diameter of hole <u>6</u> inches Total depth <u>90</u> feet Casing schedule: ☒ Steel ☐ Concrete Thickness <u>2.50</u> inches Diameter <u>6</u> inches From <u>1-6"</u> feet To <u>52.4"</u> feet _____ inches _____ inches _____ feet _____ feet _____ inches _____ inches _____ feet _____ feet _____ inches _____ inches _____ feet _____ feet _____ inches _____ inches _____ feet _____ feet Was a packer or seal used? ☐ Yes ☒ No Perforated? ☐ Yes ☒ No How perforated? ☐ Factory ☐ Knife ☐ Torch Size of perforation _____ inches by _____ inches Number _____ From _____ To _____ _____ perforations _____ feet _____ feet _____ perforations _____ feet _____ feet _____ perforations _____ feet _____ feet Well screen installed? ☐ Yes ☒ No Manufacturer's name _____ Type _____ Model No. _____ Diameter _____ Slot size _____ Set from _____ feet to _____ feet Diameter _____ Slot size _____ Set from _____ feet to _____ feet Gravel packed? ☐ Yes ☒ No Size of gravel _____ Placed from _____ feet to _____ feet Surface seal? ☒ Yes ☐ No To what depth <u>52</u> feet Material used in seal ☐ Cement grout ☒ Puddling clay																																																																																																																									
6. LOCATION OF WELL Sketch map location must agree with written location. County <u>Canyon</u> <u>SE 1/4 SE 1/4 Sec. 10, T. 2 N. R. 2 W</u>		10. Work started <u>7/9/73</u> finished <u>7/16/73</u>																																																																																																																							
		11. DRILLER'S CERTIFICATION This well was drilled under my supervision and this report is true to the best of my knowledge. <u>Jesse Hill</u> 216 Driller's or Firm's Name Number <u>449 High St Nampa, Ida 83401</u> Address <u>Jesse Hill</u> 7/17/73 Signed By Date																																																																																																																							

POD-
PRODUCTION
WELL

INJECTION WELL

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

809554

Office Use Only
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 1/4 1/4
Lat: _____ Long: _____

1. WELL TAG NO. **D0030825**

DRILLING PERMIT NO. _____

Other IDWR No. _____

2. OWNER:

Name **RICK WILLIAMS**

Address **1315 WILLIAMS LANE**

City **NAMPA**

State **ID** Zip **83686**

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N
W E S
Twp **2** North ☒ or South ☐
Rge **2** East ☐ or West ☒
Sec **10** 1/4 SE 1/4 SE 1/4
Gov't Lot _____ County **CANYON** Long _____
Address of Well Site **SAME** City _____

(Give at least name of road + Distance to Road or Landmark)
Lt. _____ Blk. _____ Sub Name _____

4. USE:

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

5. TYPE OF WORK: check all that apply

☒ New Well ☐ Modify ☐ Abandonment ☐ Other (Replacement etc.)

6. DRILL METHOD:

☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES:

Seal/Filter Pack			AMOUNT	METHOD
Material	From	To	Sacks or Pounds	
BENTONITE	0	18	200#	POUR

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

Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6	+2	18		250 STEEL	☒	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS:

☐ Perforations Method _____
☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

25 ft. below ground

Artesian pressure _____ lb.

Depth flow encountered _____ ft. Describe access port or control devices _____

11. WELL TESTS:

☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian
Yield gal./min. Drawdown Pumping Level Time
Water Temp _____ Bottom hole temp _____
Water Quality test or comments: _____
Depth first Water Encounter _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water
				Y N
10	0	15	TOP SOIL/ HARD PAN	
	15	18	LAVA	
6	18	25	LAVA	
	25	32	LAVA W/ CREVICES	X
	32	42	BROWN CLAY/ SHALE	X

Completed Depth **42** (Measurable)
Date: Started **12/11/2003** Completed **12/11/2003**

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FEB 09 2004

WATER RESOURCES
WESTERN REGION

13. DRILLER'S CERTIFICATION:

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

Company Name **DAVIS WELL & PUMP**

Firm No **101**

Firm Official

and

Driller or Operator

Chris Hlain
(Sign once if Firm Official & Operator)

Date **12/12/2003**

Date **12/12/2003**

FORWARD WHITE COPY TO WATER RESOURCES

63-33272 Beneficial Use Field Report Photos



63-33272 Exam 8/27/2012: POD-production well facing south. Portion of POU (home) in left side of photo background.



63-33272 Exam 8/27/2012: Injection well facing south. Injection well usually covered by/underneath the adjacent orange construction barrel.

63-33272 Beneficial Use Field Report Photos Continued



63-33272 Exam 8/27/2012: Diversion works inside pump house/shed. 2" line from production well on left side of photo. 1" line to heating system and domestic uses adjacent to pressure tank to right of 2" line from well.



State of Idaho

DEPARTMENT OF WATER RESOURCES

Western Region, 2735 Airport Way • Boise, Idaho 83705-5082

Phone: (208) 334-2190 • Fax: (208) 334-2348 • Web Site: www.idwr.idaho.gov

C. L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Interim Director

August 17, 2012

Sage and/or Nicole Collins
1315 Williams Ln.
Nampa, ID 83686

RE: Scheduling Field Exam for Water Right Permit No. 63-33272

Dear Mr. and/or Mrs. Collins:

We are planning to **conduct water right examinations** in the vicinity of the above-referenced permit **during the weeks of August 20 and August 27, 2012**. An examination is needed to verify your water use in order to issue a water right license.

Please be advised that you will need to operate your system under normal conditions during the examination. The permit authorizes diversion of ground water for heating use.

In order to conduct your exam as efficiently as possible, we ask that you call this office to schedule a day and time convenient for you. **Please call me at 208-334-2190 by August 24, 2012**. If there is a problem with scheduling or conducting the examination at this time, please call and other arrangements can be made. I appreciate your attention in this matter and I look forward to hearing from you.

Sincerely,

A handwritten signature in black ink, appearing to read 'Angela M. Grimm', is written over a horizontal line.

Angela M. Grimm, P.G.
Water Resource Agent, Sr.