

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 96-9144
Exam Date: 04/01/2021

1. Current Owner:
IRIS A DE MAURO PO BOX 433 CLARK FORK ID 83811-0433
2. Accompanied by: Brenda (last name unknown)
Phone No: 208-266-0409
Address: Same as Above
Relationship to permit Holder: Representative for permit holder

3. SOURCE:
GROUND WATER

Method of Determination: Arcmap and DRG

B. OVERLAP REVIEW

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

C. DIVERSION AND DELIVERY SYSTEM

1. LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER SW¼ NW¼, Sec. 23, Twp 56N, Rge 02E, B.M. BONNER County

Method of Determination: GPS; POD is well D0028026 located at -116°10.840, 48°11.362.

PLACE OF USE: HEATING, COOLING, and DOMESTIC

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
56N	02E	23							X										

Method of Determination: Field exam and Arcmap aerial imagery

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
D0028026	UNK	¾			

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
NONE						

2. Measurements: Unable to perform flow measurement due to inadequate piping requirements; main water pipe from well fed directly into vaulted storage tank with buried water conveyance system. ¼ HP well pump routes to a storage reservoir, and then a 5 HP distribution pump takes over prior to any frost free hydrant. Theoretic Pump Equation was used to derive a diversion rate equal to 13.9 gpm or **0.03 cfs**, considering department rounding standards with well pump at depth of 67 feet and operating pressure of 45 PSI.

E. FLOW CALCULATIONS

x Additional Computation Sheets Attached

Measured Method: Theoretic Pump Equation was used to derive a diversion rate equal to 13.9 gpm or **0.03 cfs**, considering department rounding standards with well pump at depth of 67 feet and operating pressure of 45 PSI.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

2. Volume Calculations for Other Uses:

- Domestic annual volume = external use only = **0.6 AF**
- Heating & Cooling annual volume = 1.5 GPM (exchanger flow capacity) x 60 min per hour x 24 hour per day x 365 day per year = 788,400 gallons annually / 325,850 gal per AF = **2.4 AF** considering department rounding standards, which are not additive between heating and cooling use(s).
- Maximum diversion volume = 0.6 AF (domestic) + 2.4 AF (heating & cooling) = **3.0 AF**

G. NARRATIVE/REMARKS/COMMENTS

Admin Notes: field exam(s) for 2ea permits 96-9145 & 96-9146 were completed in 2008 by Department staff. Following the exam(s), permit 96-9146 was licensed using the place of use (POU) associated with this permit 96-9144. Research of back-file information does not provide any reason why this occurred, and it is likely that it was human error during the licensing process at that time. As a result this permit, 96-9144, is being recommended for licensing under the POU originally designated for 96-9146. Review of each permit identifies the same beneficial uses and number of point(s) of diversion are present on each respective permit; additionally, there is no enlargement in beneficial use regarding which dome(s) are assigned to each permit. The legal description remains the same between each permit, so no amendment of permit is necessitated during the licensing process.

Field exam conducted on 4/15/2021 with the applicant's representative, Brenda, showed a groundwater well providing water for heating, cooling, and domestic uses. At the POD, well D0028026 uses a ¾ HP pump diverting water into a 10,000 gallon storage reservoir prior to distribution for beneficial uses. A Theoretic Pump Equation was used to derive a diversion rate equal to 13.9 gpm or **0.03 cfs**, considering department rounding standards which is recommended for licensing purposes, with well pump at depth of 67 feet and operating pressure of 45 PSI. While the applicant was permit approved for larger diversion rates for each of the three beneficial uses, the applicant is limited by the pump performance capacity of 0.03 cfs identified during the field exam. 0.03 cfs is recommended as the maximum diversion rate for licensing purposes.

From the storage reservoir, the water system incorporates a 5 HP distribution pump to pressure tanks prior to heating, cooling, and domestic uses. The heating & cooling POU consist of 3 domes, 1ea 30 ft diameter utility dome and 2ea 40 ft diameter greenhouse domes. The heat exchanger was installed approximately 20 years ago by Doc Holliday's Heating and Cooling, located in Spokane WA. The applicant did not have any documentation for the heat exchanger. Using photographs of the Water Furnace exchanger, model No. P056W10NCAASSB, and speaking directly with Mr. Holliday (who installed the system back in the early 2000s), I was able to collect pertinent performance capacity data.

The exchanger is a 5-ton unit @ 40 degree water temperature, with 50,000 BTU capacity, and a 1.5 GPM max flow through rate. A volume calculation was completed for each of the Domes in order to determine cubic feet, with data sheet attached to file during licensing review and are as follows:

- Utility dome: 30 ft diameter, 15 ft height, and no stem wall = 7,068.58 ft³
- 2ea Greenhouse domes: 40 ft diameter, 20 ft height, 4 ft stem wall = 21,781.71 ft³ x 2 domes = 43,563.4 ft³
- Total heat/cool footage = 7,68.58 ft³ + 21,781.71 ft³ = 50,632.0 ft³

Using the data above, the 50,000 BTU heat exchanger is capable of providing adequate heating and cooling for the three domes total area. The annual volume for heating and cooling is recommended using the heat exchanger flow through capacity versus well or distribution pump performance. The heating & cooling annual volume = 1.5 GPM (exchanger flow capacity) x 60 min per hour x 24 hour per day x 365 day per year = 788,400 gallons annually / 325,850 gal per AF = **2.4 AF** considering department rounding standards, which are not additive between heating and cooling use(s).

The domestic POU consists of up to ½ acre of irrigation associated with the two each greenhouse domes, and a small area of irrigation that occurs outside the domes by frost free hydrant and sprinklers. Domestic external use is befitting the beneficial use of water by the applicant, as the greenhouse is used by the applicant's outside the Department irrigation season of use. The applicant uses the greenhouses for personal use, and does not sell products grown within them. The heating and cooling enable hydroponic growing in addition to traditional earthen soil planting. I am recommending **0.6 AF** as the annual volume associated with domestic external use related to the application of water by the applicant's. The maximum diversion volume recommended for licensing equals 2.4 AF (heating/cooling) + 0.6 AF (domestic) = **3.0 AF**.

Conditions 046 and X01 were removed from the permit during licensing review. A text condition related to heating and cooling was updated to reflect 1 utility dome and 2 greenhouse domes versus the 1 home on permit. Condition 240 was added describing domestic use is for external use only, and condition 187 was added to describe the ½ acre of irrigation occurring under domestic use. Condition 004 was added to describe this right does not grant any right of way or easement across land of another. All other conditions on the permit shall remain on the license. There are no overlap concerns for this water right.

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>Annual Volume</u>
HEATING	01/01 to 12/31	0.03 CFS	2.4 AF
COOLING	01/01 to 12/31	0.03 CFS	2.4 AF
DOMESTIC	01/01 to 12/31	0.03 CFS	0.6 AF

Totals: 0.03 CFS 3.0 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

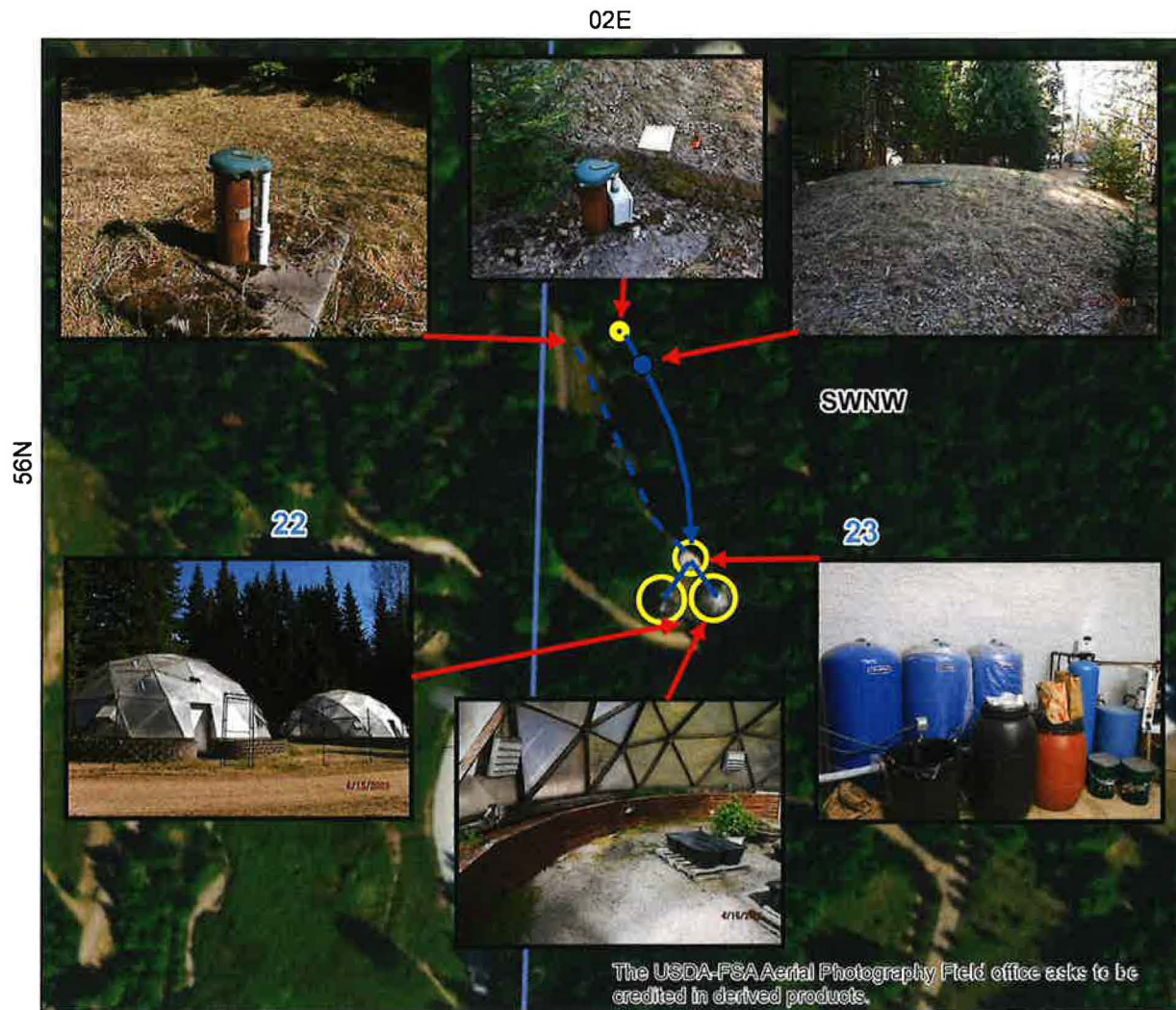
I. AUTHENTICATION Luke Bates - Water Resource Agent

Field Examiner's Name  Date 5/11/2021

Reviewer  Date 5/21/2021

State of Idaho
Department of Water Resources
Attachment to Field Exam
96-9144

HEATING and COOLING system diagram.



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

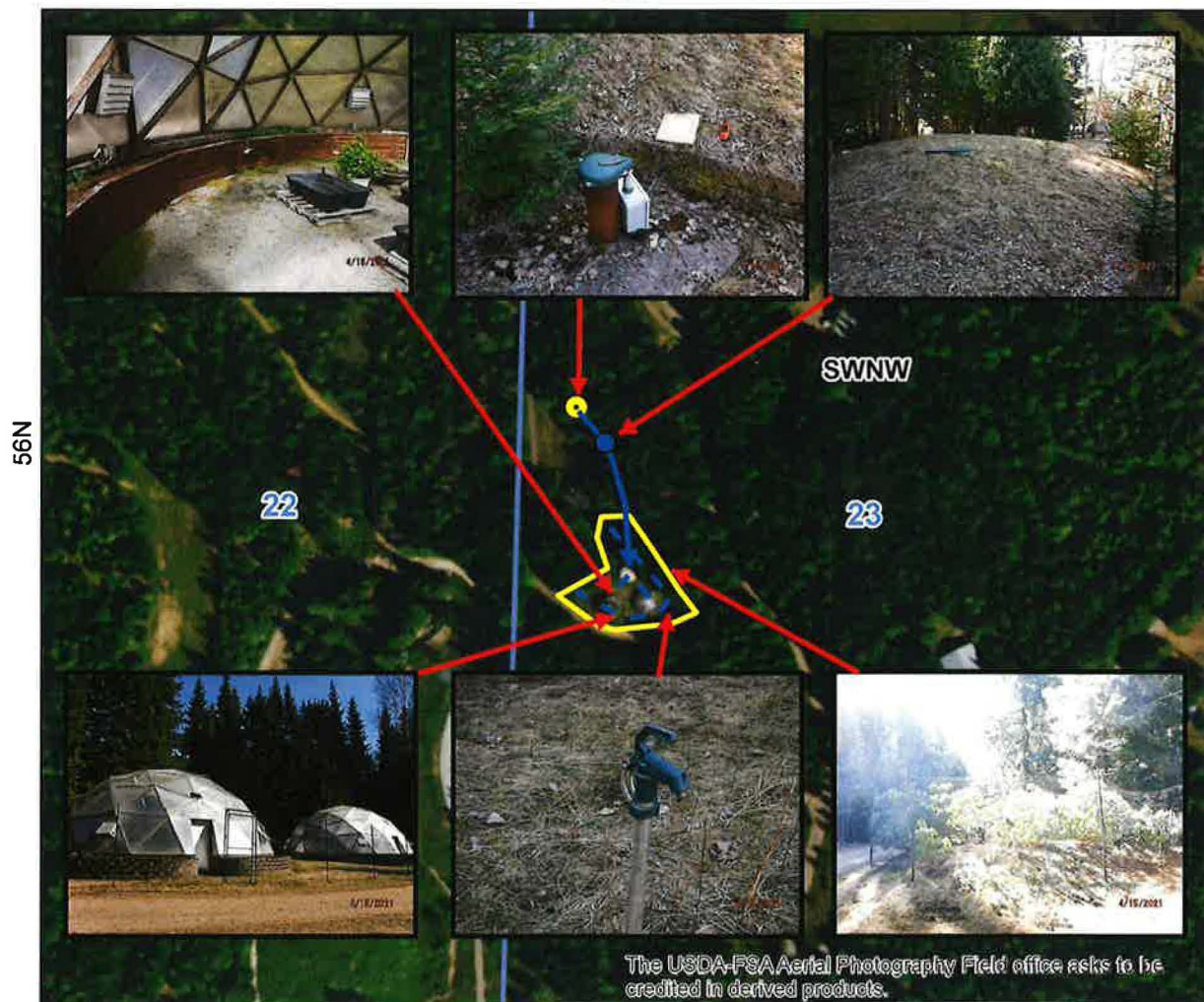
0 0.025 0.05 0.1 Miles



State of Idaho
Department of Water Resources
Attachment to Field Exam
96-9144

DOMESTIC system diagram.

02E



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

0 0.035 0.07 0.14 Miles



7/98

Starships Consulting and
Management Services

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

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

1. WELL TAG NO. D0028026Drilling Permit No: 789369

Other IDWR No. _____

2. OWNER

Name DEMAURO, IRIS #1Well Number: 520Address 100 VUELTA SUSANACity SANTA FE State NM Zip 87501

3. LOCATION OF WELL by legal description

sketch map location must agree with written location

N			
X			
S			

Twp. 56 ☒ North or ☐ South
 Rge. 2 ☒ East or ☐ West
 Sec. 23 1/4 NW 1/4 NW 1/4

Gov't Lot _____ County BONNER

Lat: _____ Long: _____

Address of Well Site SPRING CREEK RD.City CLARK FORK

(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 (Replacement, etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD

☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT	METHOD
Material	From	To	Sacks or Pounds	
DRY GRANULE				
BENTONITE	0	18	5 BAGS	OVERBORE

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 37'Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6	+2	37	<u>.250</u>	STEEL	☒	☐	☒	☐

Length of Headpipe 5' Length of Tailpipe _____

9. PERFORATIONS/SCREENS

☐ Perforations Method _____☒ Screens Screen Type TELESCOPING

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
38	42	20	1	5	SS	☐	☐

Screen

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

18 ft. below ground Artesian pressure _____ lb.Depth flow encountered 42 ft. Describe access port or control devices: _____

11. WELL TESTS:

☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
20		42'	1 HR

Water Temp. COLD Bottom Hole Temp COLDWater Quality test or comments: GOODDepth first Water encountered 42

12. LITHOLOGIC LOG:(Describe repairs or abandonment)

Bore Diam	From	To	Remarks: Lithology, Water Quality, Temperature	Water	
				Y	N
8"	0	3	Top Soil	☐	☐
8	3	42	Sand & Gravel w/ Soil	☒	☐
8	42	50	Cemented Gravel	☐	☐
8	50	58	Blue Silty Clay	☐	☐
8	58	82	Broken Brown Shale Pea Gravel 42-8	☐	☐

RECEIVED

DEC 23 2002

IDWR/North

Completed Depth 42 (Measurable)Date: Started 12/4/02 Completed 12/5/02

13. DRILLER'S CERTIFICATION

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

Firm Name H2O WellService, Inc. Firm No. 448Firm Official [Signature] Date 12-19-02and Supervisor or Operator [Signature] Date 12-19-02

(Sign Once if Firm Official and Operator)

(Louie Hanner)

56N 2E 23

THEORETICAL PUMPING EQUATION FOR WR# 96-9144

Theoretical Pumping Equation is required because system did not allow for a proper measurement. Pump is estimated to be at 67 ft, and running at 45 psi.

PUMP EQUATIONS

WATER RIGHT No. 96-9144

D0028026	HP	H in feet	Efficiency as a decimal	Pumping lift in feet	System pressure in PSI
Q = $HP \cdot 8.8 \cdot \text{Eff} / H$	0.75	171.0816	0.8	67	45
Q = 0.031 cfs 13.9 gpm					

VOLUME CALCULATIONS FOR 3EA DOMES USED WITH HEATING/COOLING SYSTEM

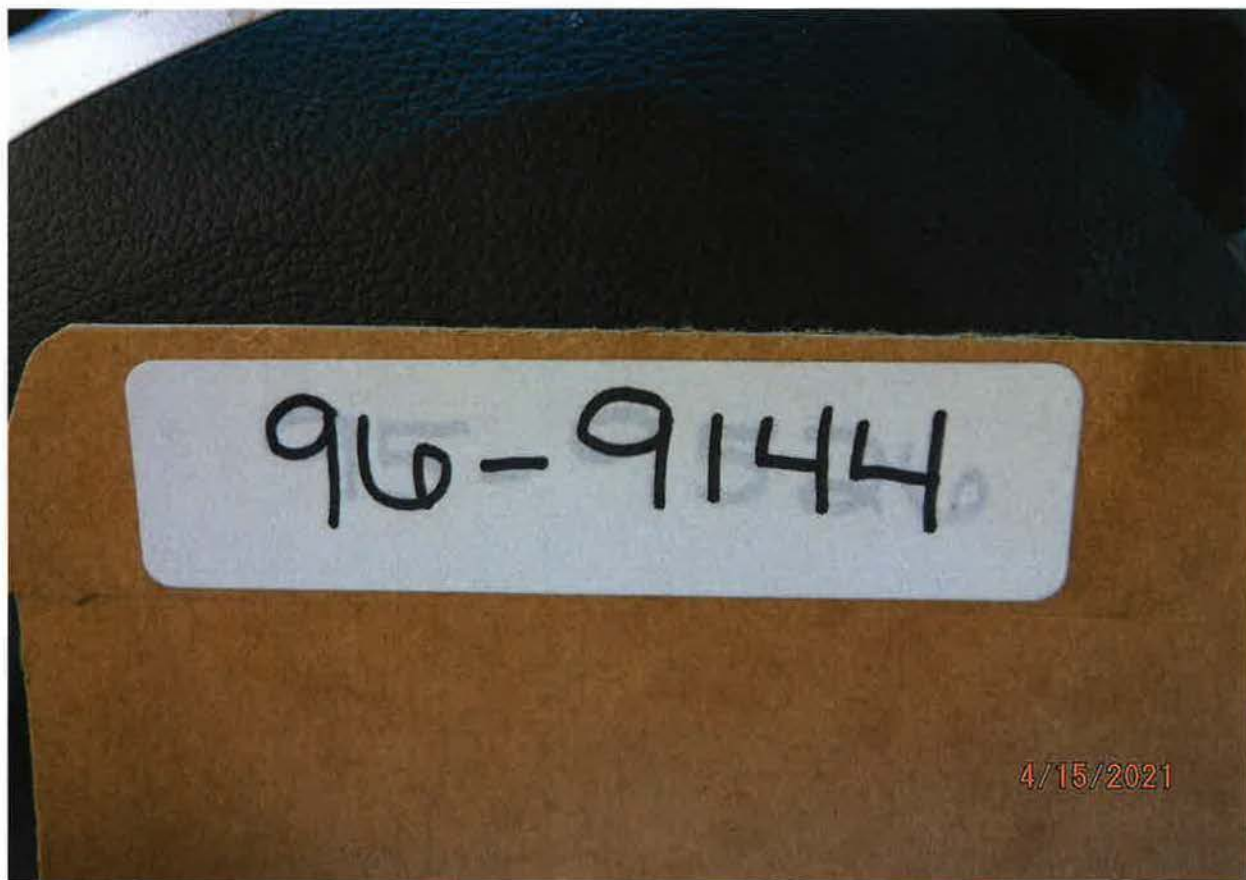
SMALL 30' DIAMETER UTILITY DOME = PUMP STATION AND WATER CONVEYANCE SYSTEM CONTROLS**Sphere Calcs**

Diameter:	30
Height:	15
Stemwall:	0
Calculate...	
Radius of Curvature:	15
Circumference:	94.25
Floor Area:	706.86
Dome Surface Area:	1413.72
Dome Volume:	7068.58
Stemwall Surface Area:	0
Stemwall Volume:	0
Total Surface Area:	1413.72
Total Volume:	7068.58
Level:	9
Radius @ Level:	12
Area @ Level:	452.39

7,068.58 FT³**2EA - 40' DIAMETER DOMES** = DOMESTIC EXTERNAL USE UP TO ½ ACRE IRRIGATION (GREENHOUSE)**Sphere Calcs**

Diameter:	40
Height:	20
Stemwall:	4
Calculate...	
Radius of Curvature:	20
Circumference:	125.66
Floor Area:	1256.64
Dome Surface Area:	2513.27
Dome Volume:	16755.16
Stemwall Surface Area:	502.65
Stemwall Volume:	5026.55
Total Surface Area:	3015.93
Total Volume:	21781.71
Level:	9
Radius @ Level:	17.86
Area @ Level:	1002.17

21,781.71 FT³ X 2EA DOMES = 43,563.4 FT³**TOTAL HEATING/COOLING AREA (CUBIC FEET)** = 7,068.58 FT³ + 43,563.4 FT³ = **50,632.0 FT³**



POD - WELL D0028026



WELL D-TAG D0028026



10,000 GAL STORAGE RESERVOIR



WATER MAIN LINE FROM STORAGE RESERVOIR TO PUMP STATION UTILITY DOME



INJECTION WELL -D0028065



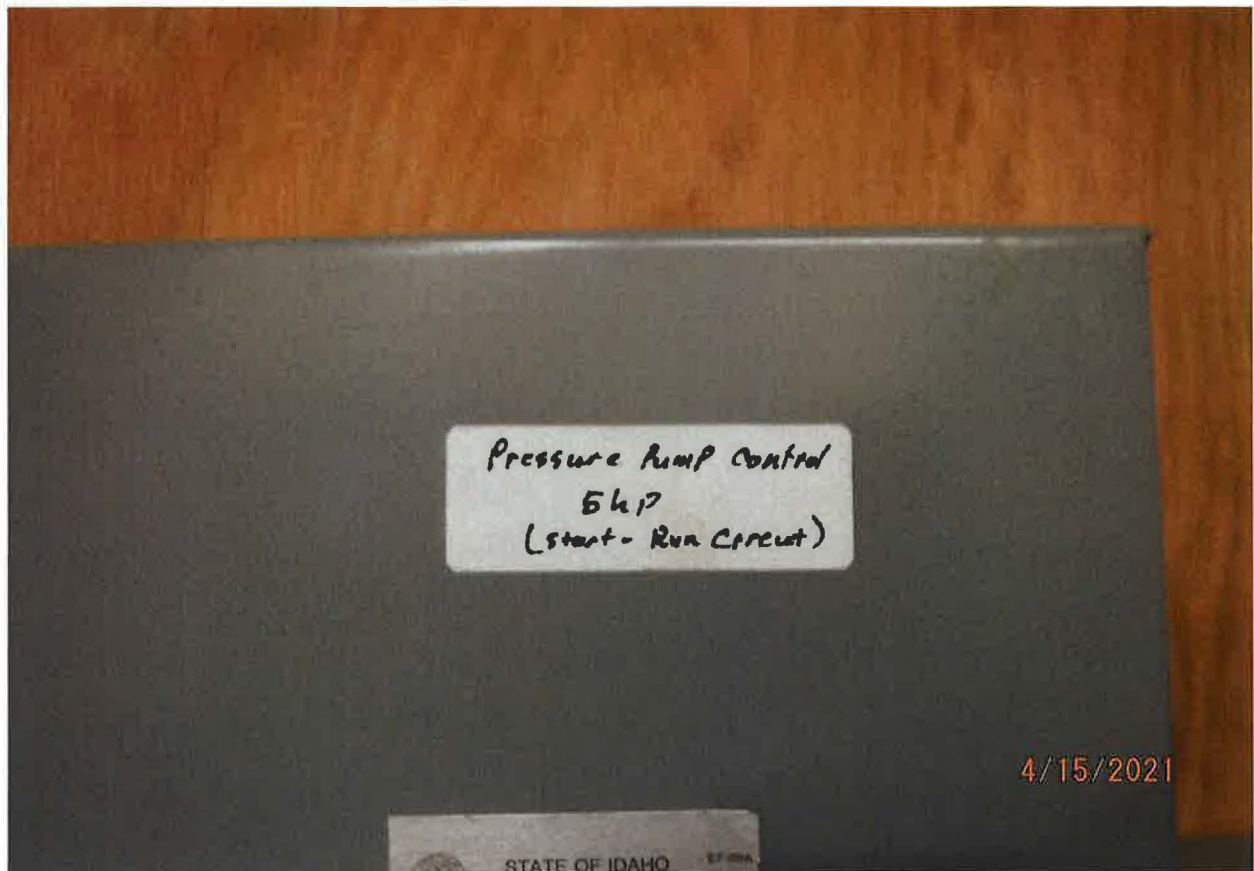
WELL D0028026 3/4 HP PUMP INSTALLED



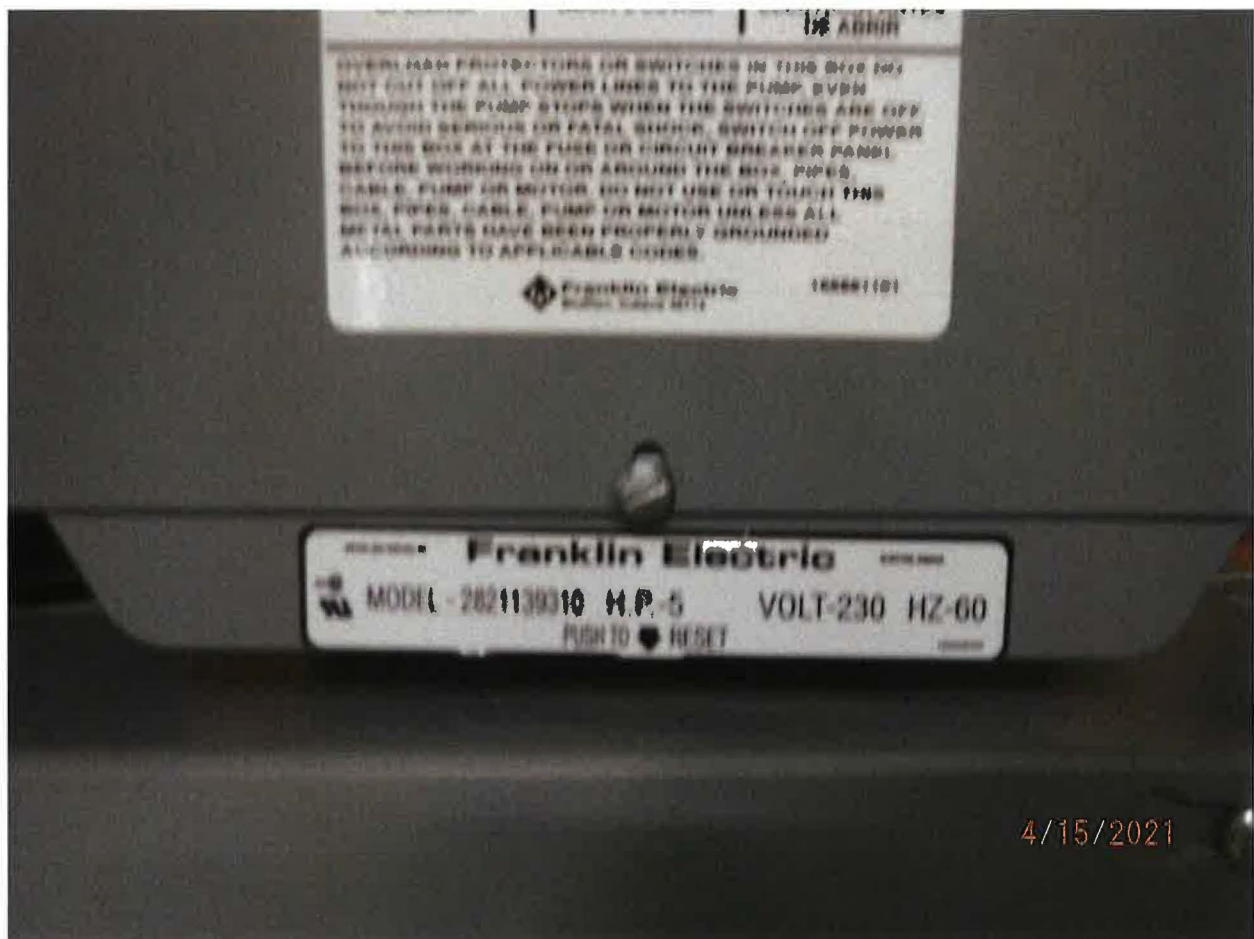


INJECTION WELL D0028065 ¾ HP PUMP INSTALLED





5 HP TRANSFER PUMP INSTALLED FROM STORAGE RESERVOIR TO DISTRIBUTION SYSTEM

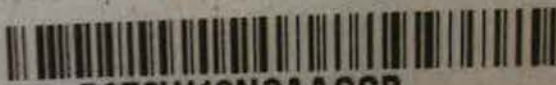




40 PSI OPERATING PRESSURE



PRESSURE TANK(S)

MODEL: 
P056W10NCAASSB

S/N : 
TG0385

W.O.#: **138763**

UNIT VOLTAGE	HZ	PH	FLA
208/230	60	1	25.3

MINIMUM CIRCUIT AMP	MAX FUSE TIME DELAY	MAX HACR BRKR (USA)	MAX BRKR CANADA
30.2	50	50	50

COMPRESSOR	MOTOR	Vac	PH	FLA	HP
Vac 208/230	EXT.PUMP	208/230	1	5.4	1/2
PH 1					
RLA 18.9					
LRA 137					
QTY 1					

4/15/2021

HEAT EXCHANGER

Model: P056W10NCAASSB

Serial: TG0385

Work Order: 138763

Sales Order
 95096

4/15/2021



POU – DOMESTIC, HEATING & COOLING – 2EA DOMES



INTERIOR OF DOME - USES WATER FOR DOMESTIC USE IRRIGATION UP TO ½ ACRE & HEATING/COOLING



POU – DOMESTIC, HEATING & COOLING





HEATING AND COOLING USED TO REGULATE INDOOR TEMPERATURE



DOMESTIC EXTERNAL USE FOR UP TO ½ ACRE IRRIGATION



POU - DOMESTIC EXTERNAL USE FOR UP TO ½ ACRE IRRIGATION