

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 47-7721

Exam Date: 1/29/1999

1. Current Owner: WAYNE R MARSHALL
4813 River Rd
Buhl, ID 83316
(208)543-6999 cell (208)870-2638

2. Accompanied by:

The field exam was originally done by Georgia Satterlee on January 29, 1999. She was accompanied by the owner Wayne Marshall during the field exam. The following beneficial use report is based on the original beneficial use field report and the data collected during the field exam.

3. SOURCETRIBUTARY

GROUND WATER

B. OVERLAP REVIEW

1. Other water rights with the same place of use and point of diversion: 47-7792, it is proposed that permit 47-7792 be cancelled because it is repetitive to the uses covered by this permit 47-7721. The permit with the earliest priority date will be used.

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

GROUND WATER

NE1/4SE1/4

Sec. 32, Twp 08S, Rge 14E, B.M.

TWIN FALLS County

Method of Determination: Field exam, GPS tag A0001482.

2. PLACE OF USE: The place of use varies slightly from the original field exam due to better mapping ability.

<u>PLACE OF USE:</u>			DOMESTIC																
Twp	Rge	Sec	NE				NW				SW				SE				
			<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>	<u>Totals</u>
08S	14E	32													X	X			

Method of Determination:

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

Artesian low temperature geothermal well.

D. **FLOW MEASUREMENTS**

Method: Bucket and stopwatch

E. **FLOW CALCULATIONS**

☐ Additional Computation Sheets Attached

Measurements: Artesian low temperature geothermal well

#1 Measurement taken at wellhead 60 gal/min = **0.13 cfs**

#2 Measurement taken at fish ponds

SW point on property 18 gal/min = 0.04 cfs

NW point on property 56 gal/min = 0.12 cfs

The flow rate at the well head is the recommended at **0.13 cfs**

F. **VOLUME CALCULATIONS****Domestic:**

2 Homes (In-house use without irrigation)

1 home developed, 1 stub-out

Flow = 0.06 cfs Volume = 1.2 afa

Commercial:

Use is for two greenhouses; size of the greenhouses was stated by owner to actually be 30'x144' which is smaller than originally believed. See the attached calculation sheet for volume calculation.

Volume for one greenhouse = 11.5 afa x 2 greenhouses = 23 afa

Flow = 0.13 cfs Volume = 23 afa

Heating:

The heating use is for the 2 homes and a shop. Currently only one home is developed and the second is stubbed out, the volume calculated on the one home was doubled to account for the second home. See the attached calculation sheets for the volume calculations for the home and shop.

Volume for one home = 1.8 afa x 2 homes = 3.6 afa

Volume for shop = 7.5 afa

Flow = 0.13 cfs Volume = 11.1 afa

Fish Propagation:

The original field exam calculated a volume of 70.5 afa for fish propagation. It is recommended that that value be used based on the calculations in the field exam.

Flow = 0.13 cfs Volume = 70.5 afa

G. NARRATIVE/REMARKS/COMMENTS

The original field exam by Georgia Satterlee in January of 1999 was for the most part complete. It appears that during review of the beneficial use field report there was question as to how the volume for commercial and heating was determined. I have attempted to complete this exam with calculations that will reasonably allow for a recommendation of a volume for the uses. However there is a limiting factor to the total volume that can be recommended. During the field exam the flow rate was measured at 0.13 cfs, that flow rate running continuously throughout the year would only allow for a volume of 94.1 afa. The combined annual volume of all uses as calculated would actually total 105.8 afa, however because the flow would not provide that amount the total volume has been limited to 94.1 afa. I also spoke to the owner and found that at the well head the water is split out into separate lines that go to each of the uses. There is no secondary use of the water.

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>
DOMESTIC	01/01 to 12/31	0.060 CFS	1.20 AF
COMMERCIAL	01/01 to 12/31	0.130 CFS	23.00 AF
HEATING	01/01 to 12/31	0.130 CFS	11.10 AF
FISH PROPAGATION	01/01 to 12/31	0.130 CFS	70.50 AF
<u>Totals:</u>		0.130 CFS	94.10 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

Reviewer

Date

Georgia Satterlee
Chris Satterlee

3/21/12

4/10/12

Volume calculation WR 47-7721 Greenhouse (30'x144')

The annual volume requirement was calculated using a Memorandum from Rick Sterling to Terry Blau dated March 25, 1988 and Administrative Memorandum from Norm Young dated September 28, 1992 titled Rate of flow for heating use. The memorandums contain equations for calculating the annual water requirements for geothermal heating. The equations are listed below with an explanation of the variables; data was taken from the field exam and the National Oceanic and Atmospheric Administration (NOAA).

Explanation of values used in calculations:

Square footage of one greenhouse is 4320 sq/ft (30'x144'). The greenhouses are constructed with double polly and in the calculations the Peak Heating Load was taken from a graph related to double polly construction. The temperature of the geothermal source was measured at 118 °F. The temperature in the greenhouse is expected to be 60 °F. The annual heating degree days were taken from the Hagerman weather station because it is closest in elevation and proximity.

Temperature Drop Across System Calculation: $\Delta T_s = 0.3(S - T)$

Where:

ΔT_s = Temperature drop across system

S = Geothermal source temperature

T = Temperature required by system

Values used:

$S = 118$ °F

$T = 60$ °F

$$\Delta T_s = 0.3(S - T) = \boxed{17.4}^{\circ}\text{F}$$

Volume Calculation:

$$V = \frac{HL \times DD \times 24 \times C_D}{\Delta t_1 \times k \times C \times \Delta t_2}$$

Where:

V = Annual volume of geothermal water required

HL = Peak heating load in BTU/hr (taken from graph)

DD = Annual heating degree-days

24 = 24 hrs/day

C_D = Empirical correction factor for heating effect vs. 65 °F degree-days

Δt_1 = Design temperature difference

k = Correction factor to account for losses, use 0.90

C = Constant to correct for desired units, 2.72×10^6 BTU/AF-°F

$\Delta t_2 = \Delta T_s$ = Temperature drop across system (calculated above)

Values used:

$HL = 300,101$ BTU/hr

$DD = 5,832$ °F

$24 = 24$ hrs/day

$C_D = 0.85$

$\Delta t_1 = 73$ °F

$k = 0.9$

$C = 2,720,000$ BTU/AF-°F

$\Delta t_2 = 17.4$ °F

$$V = \frac{HL \times DD \times 24 \times C_D}{\Delta t_1 \times k \times C \times \Delta t_2} = \boxed{11.5} \text{ afa}$$

Volume calculation WR 47-7721 Home

The annual volume requirement was calculated using a Memorandum from Rick Sterling to Terry Blau dated March 25, 1988 and Administrative Memorandum from Norm Young dated September 28, 1992 titled Rate of flow for heating use. The memorandums contain equations for calculating the annual water requirements for geothermal heating. The equations are listed below with an explanation of the variables; data was taken from the field exam and the National Oceanic and Atmospheric Administration (NOAA).

Explanation of values used in calculations:

The home was built in 1995, the house efficiency factor was assumed to have a *better energy efficiency* or 0.44 BTU/hr ft² °F. The home is also a two story home so a adjustment factor was applied, the home was 2132 ft². The Design temperature difference for the area is 73 °F. The temperature of the geothermal source was measured at 118 °F. The temperature in the home is expected to be 70 °F. The annual heating degree days were taken from the Hagerman weather station because it is closest in elevation and proximity.

Design Heat Load Calculation: $E = [e \times \Delta t_1] 0.8 \times A$

Where:

E = BTU/hr required

e = House efficiency factor

Δt_1 = Design temperature difference

0.8 = Adjustment factor for two story homes

A = Area of heated space

Values used:

$$\begin{aligned} e &= 0.44 \text{ BTU/hr ft}^2 \text{ °F} \\ \Delta t_1 &= 73 \text{ °F} \\ A &= 2,132 \text{ ft}^2 \end{aligned}$$

$$E = [e \times \Delta t_1] 0.8 \times A = \boxed{54,784} \text{ BTU/hr}$$

*If calculation is not for a two story home the 0.8 factor in the equation is not used.

Temperature Drop Across System Calculation: $\Delta T_s = 0.3(S - T)$

Where:

ΔT_s = Temperature drop across system

S = Geothermal source temperature

T = Temperature required by system

Values used:

$$\begin{aligned} S &= 118 \text{ °F} \\ T &= 70 \text{ °F} \end{aligned}$$

$$\Delta T_s = 0.3(S - T) = \boxed{14.4} \text{ °F}$$

Volume Calculation:

$$V = \frac{HL \times DD \times 24 \times C_D}{\Delta t_1 \times k \times C \times \Delta t_2}$$

Where:

V = Annual volume of geothermal water required

HL = Peak heating load in BTU/hr

DD = Annual heating degree-days

24 = 24 hrs/day

C_D = Empirical correction factor for heating effect vs. 65 °F degree-days

Δt_1 = Design temperature difference

k = Correction factor to account for losses, use 0.90

C = Constant to correct for desired units, 2.72×10^6 BTU/AF-°F

$\Delta t_2 = \Delta T_s$ = Temperature drop across system (calculated above)

Values used:

$HL = 54,784$ BTU/hr

$DD = 5,832$ °F

$24 = 24$ hrs/day

$C_D = 0.61$

$\Delta t_1 = 73$ °F

$k = 0.9$

$C = 2,720,000$ BTU/AF-°F

$\Delta t_2 = 14.4$ °F

$$V = \frac{HL \times DD \times 24 \times C_D}{\Delta t_1 \times k \times C \times \Delta t_2} = \boxed{1.8} \text{ afa}$$

1

RP08S14E327220A

MARSHALL, WAYNE R
PARCEL DATA SHEET

Property Address:
4813 RIVER RD BUHL 83316

Owner(s): LRSN: 2346

MARSHALL, WAYNE R

Neighborhood: 33001 Melon Valley River Chart T
Property Class: 101- Irrigated Crop Land
Review Year: 2007

Memos:
1007 In Office - 2007
RY07 Review Year - 2007

4813 RIVER RD
BUHL, ID 83316-5104

Pricing Message:

Sale / Transfer History:

Legal Description:
SEC 32 T 8 R 14
NE SE, EXC NE 17.87A; E 5.03A
OF NW SE; NE .92A TAX #996 SW
SE; N 14.78A SE SE

Category Allocation / Values:

Value Change:

Ext	Value	Cat	Category Description	ID	Method	Pct	Updated
L00	\$ 38,737	01	01 Irr Ag			100%	02/26/2007
	\$ 494	05	05 Dry grazing			100%	02/26/2007
	\$ 31,220	10H	10H-AGHomesite HO			100%	02/26/2007
	\$ 0	19	19 Public ROW			100%	02/26/2007
	\$ 70,451 L00 Total Value						
R01	\$ 45,940	48H	48H-MFH Real on Own Land HO	M		100%	02/26/2007
	\$ 14,000	47H	47H-Imp to Mobile HO	01		100%	02/26/2007
	\$ 1,680	47H	47H-Imp to Mobile HO	02		100%	02/26/2007
	\$ 61,620 R01 Total Value						
R02	\$ 0	32	32 Non-res imp on 1-12,15	01		100%	02/26/2007
	\$ 0	32	32 Non-res imp on 1-12,15	02		100%	02/26/2007
	\$ 0 R02 Total Value						
	\$ 132,071 Parcel Total Value						

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FEB 24 2012
DEPT. OF WATER RESOURCES
SOUTHERN REGION

Land Base:

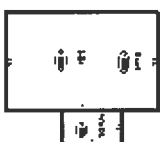
Parcel Size		Topography		Public Utilities		Street or Road	Neighborhood	Data Collection:		
Legal Acres:	0.550	High	Level	Swampy	Water	All Gas	Sidewalk	Initials	Date	
Square Feet:	1,747,191.600	Low	Rolling		Sewer	Electricity	Alley	MF	02/16/2007	
								MF	02/16/2007	
								No One Home		
Legal Acres:	1.000	High	Level	Swampy	Water	All Gas	Sidewalk			
Square Feet:	1,747,191.600	Low	Rolling		Sewer	Electricity	Alley			
Legal Acres:	29.060	High	Level	Swampy	Water	All Gas	Sidewalk			
Square Feet:	1,747,191.600	Low	Rolling		Sewer	Electricity	Alley			
Legal Acres:	9.500	High	Level	Swampy	Water	All Gas	Sidewalk			
Square Feet:	1,747,191.600	Low	Rolling		Sewer	Electricity	Alley			

Land Detail:

Land Type	Acres	Actual FF	Eff Depth	Site Rating	Base Value	Description	Influences	Assessed Value
Land Method	Sq Ft	Eff FF		Soil ID				
57 Rural Invest T F Canal 001	29.060	0.00	0.00	Oil				
15 Per Acre (by soil type)	0.00	0.00						
57 Rural Invest T F Canal 001	9.500	0.00	0.00	DGA				
15 Per Acre (by soil type)	0.00	0.00						
95 Residential Land Table 12	1.000	0.00	0.00					
30 Per Acre (breakpoint / rate with interpolation)	0.00	0.00						
57 Rural Invest T F Canal 001	0.550	0.00	0.00	Waste				
15 Per Acre (by soil type)	0.00	0.00						

Image:

Sketch Date: 02/16/2007



Data Collection:

Improvement Summary:

Type	Yr Bt	Eff Yr	Grade	Cond	Size	Width x Length	Height	Capacity	Quantity	Rate/SF	RCN	Depr %	RCNLD	% Comp	RD/FLoc %	Market Value	Price Msg
MHOME	1995	1995	Good	Good	1,066 SF	26 x 41				\$ 40.76	\$ 45,480		\$ 45,940	100%	100%	\$ 45,940	
BSMT	1995	1995	Fair	Avg	1,066 SF	26 x 41			1	\$ 13.13	\$ 14,000		\$ 14,000	100%	100%	\$ 14,000	
WDDK	1995	1995	Fair	Avg	160				1	\$	\$ 1,680		\$ 1,680	100%	100%	\$ 1,680	
Total Improvements: 3																Total Market Value	\$ 61,620

MANUFACTURED HOME

Size: 26 x 41
Sq Ft: 1,066

Bathrooms	Fixture Count
ZF 2	3F 4F 5F Extra 8

Make: NASHUA

Model:

Serial #:

Park Name:

House Type:

Occupancy:

Primary Heat

Primary Cooling:

Single Family - Tenant

Forced hot air-elec

None

Roof/Cover: Comp sh to 235#

Roof Type: Gable

Ext Cover: Wood siding

Access: Unsurfaced driveway

Market/RDF Reason

(None)

(None)

(None)

Percent

100%

100%

100%

Floor Base Value	\$	48,820	Adjustments & Features			Fireplaces & Other Features			Garages & Carports			Exterior Features		
Crawl/Slab Adjustment	\$	0	Frame/Siding/Roof	\$	0	Item	Quan	Base Value	Item	Size	Base Value	Item	Quan (sf)	Base Value
Total Base Value	\$	48,820	Loft/Cathedral	\$	0	Built-in dishwasher	1	\$ 695						
Row Type Adj.	\$	48,820	Interior Finish	\$	0	Exhaust fan and hood	1	\$ 265						
Subtotal Adj & Features	\$	2,280	Basement Finish	\$	0	Built-in Range	1	\$ 750						
Subtotal, 1 Unit	\$	51,100	Heating	\$	0									
Subtotal, All 0 Units	\$	51,100	Cooling	\$	0									
Subtotal Garages & Porch	\$	0	Plumbing	\$	570									
Total Base Value	\$	51,100	Fireplaces	\$	0									
Grade Adjustment Factor	\$	0.89	Other Features	\$	1,710									
Grade Adjustment Amount	\$	-5,620	Extra Living Units	\$	0									
Grade Adjusted Value	\$	45,480												
Grade Adjusted \$ / Sq Ft	\$	0.00	Garages & Porches											
Total Depr.	\$	0	Attached/Int. Garage	\$	0									
RCN Less Depreciation	\$	45,480	Carport	\$	0									
RDF	\$	0	Basement Garage	\$	0									
Location Adj.	\$	0	Porch/Deck/etc.	\$	0									
% Complete	\$	0	Depreciation											
Total Adjustments	\$	0	Physical	0%	\$	0								
FINAL VALUE (rounded)	\$	45,940	Functional	0%	\$	0								
Final Value \$ / Sq Ft	\$	0.00	External	0%	\$	0								

Image:

Sketch Date: 02/16/2007



Data Collection:

Improvement Summary:

Type	Yr Bld	Eff Yr	Grade	Cond	Size	Width x Length	Height	Capacity	Quantity	Rate/Sf	RCN	Depr %	RCNLD	% Comp RDI/Floc %	Market Value	Price Msg
GRNHSEFS	1950	1950	Fair	Fair	1,000 SF	20 x 50			1					100%	\$	0 No Value
SHEDGP	1950	1950	Fair	Poor	300 SF	15 x 20	6		1					100%	\$	0 No Value
Total Improvements: 2															Total Market Value	\$ 0

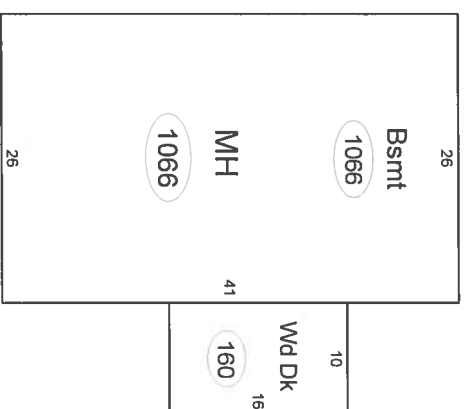
ProVal Sketch Worksheet MARSHALL, WAYNE R

Parcel ID: RP08S14E327220A

Calculated Areas

<u>Label</u>	<u>Area</u>
MH	1066
Wd Dk	160

Total finished living area: 0 SF



Volume calculation WR 47-7721 Shop (40' x 84')

The annual volume requirement was calculated using a Memorandum from Rick Sterling to Terry Blau dated March 25, 1988 and Administrative Memorandum from Norm Young dated September 28, 1992 titled Rate of flow for heating use. The memorandums contain equations for calculating the annual water requirements for geothermal heating. The equations are listed below with an explanation of the variables; data was taken from the field exam and the National Oceanic and Atmospheric Administration (NOAA).

Explanation of values used in calculations:

The shop is 40' x 84' or 5832 ft², the efficiency factor was assumed to have a *poor energy efficiency* or 1.11 BTU/hr ft² °F. The Design temperature difference for the area is 73 °F. The temperature of the geothermal source was measured at 118 °F. The temperature in the shop is expected to be 60 °F. The annual heating degree days were taken from the Hagerman weather station because it is closest in elevation and proximity.

Design Heat Load Calculation: $E = [e \times \Delta t_1] 0.8 \times A$

Where:

E = BTU/hr required

e = House efficiency factor

Δt_1 = Design temperature difference

0.8 = Adjustment factor for two story homes

A = Area of heated space

Values used:

$$\begin{aligned} e &= 1.11 \text{ BTU/hr ft}^2 \text{ °F} \\ \Delta t_1 &= 73 \text{ °F} \\ A &= 3,360 \text{ ft}^2 \end{aligned}$$

$$E = [e \times \Delta t_1] 0.8 \times A = \boxed{272,261} \text{ BTU/hr}$$

*If calculation is not for a two story home the 0.8 factor in the equation is not used.

Temperature Drop Across System Calculation: $\Delta T_s = 0.3(S - T)$

Where:

ΔT_s = Temperature drop across system

S = Geothermal source temperature

T = Temperature required by system

Values used:

$$\begin{aligned} S &= 118 \text{ °F} \\ T &= 60 \text{ °F} \end{aligned}$$

$$\Delta T_s = 0.3(S - T) = \boxed{17.4} \text{ °F}$$

Volume Calculation:

$$V = \frac{HL \times DD \times 24 \times C_D}{\Delta t_1 \times k \times C \times \Delta t_2}$$

Where:

V = Annual volume of geothermal water required

HL = Peak heating load in BTU/hr

DD = Annual heating degree-days

24 = 24 hrs/day

C_D = Empirical correction factor for heating effect vs. 65 °F degree-days

Δt_1 = Design temperature difference

k = Correction factor to account for losses, use 0.90

C = Constant to correct for desired units, 2.72×10^6 BTU/AF-°F

$\Delta t_2 = \Delta T_s$ = Temperature drop across system (calculated above)

Values used:

HL = 272,261 BTU/hr

DD = 5,832 °F

24 = 24 hrs/day

C_D = 0.61

Δt_1 = 73 °F

k = 0.9

C = 2,720,000 BTU/AF-°F

Δt_2 = 17.4 °F

$$V = \frac{HL \times DD \times 24 \times C_D}{\Delta t_1 \times k \times C \times \Delta t_2} = \boxed{7.5} \text{ afa}$$

State of Idaho
Department of Water Resources
Water Right License
47-7721

Water Service Area Boundary for Wayne R Marshall

R14E

T08S



0 0.025 0.05 0.1 Miles

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



State of Idaho
Department of Water Resources
Water Right License
47-7721

Water Service Area Boundary for Wayne R Marshall



0 0.03 0.06 0.12 Miles

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



State of Idaho
Department of Water Resources
Water Right License
47-7721

Water Service Area Boundary for Wayne R Marshall

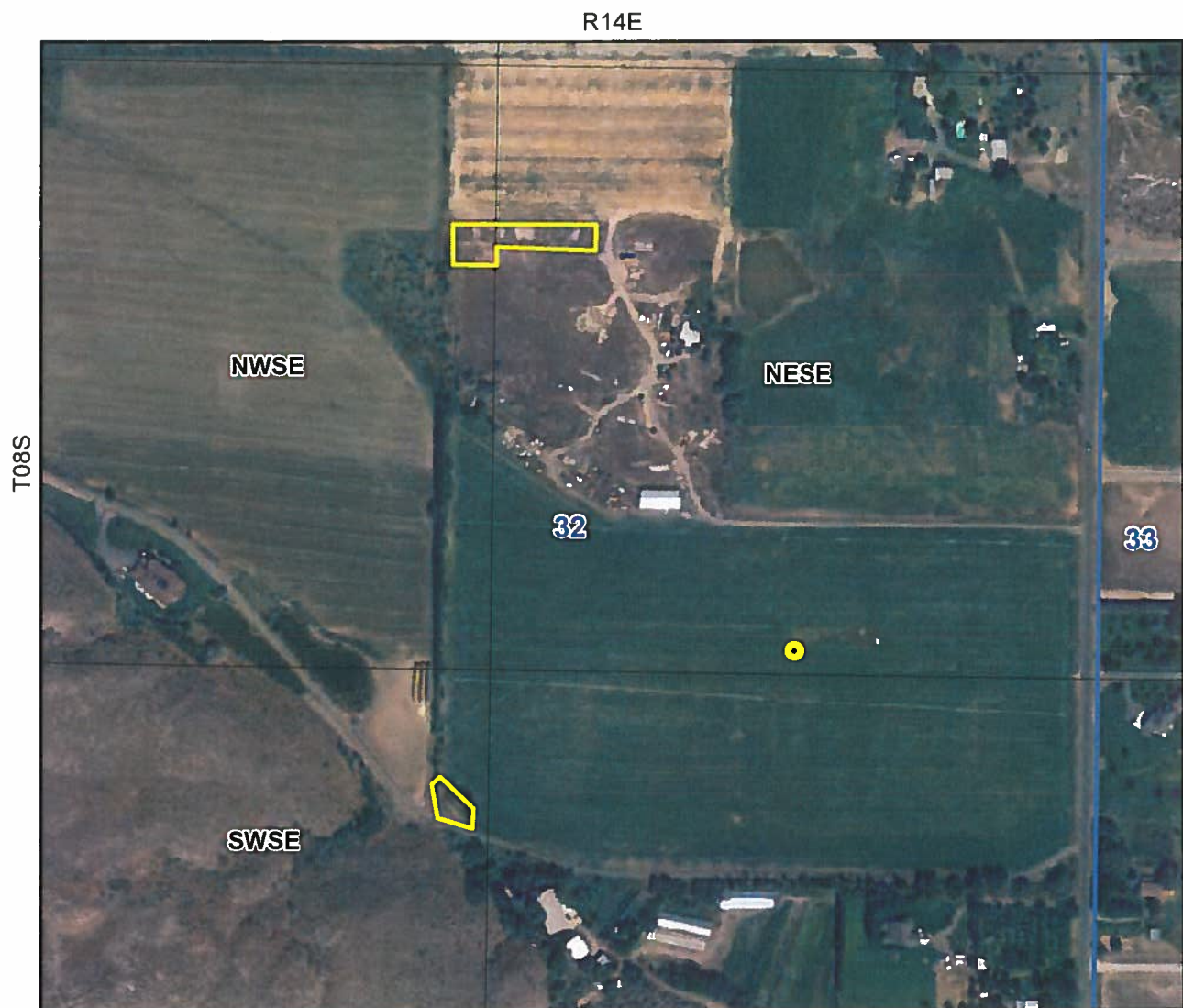


0 0.03 0.06 0.12 Miles

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



State of Idaho
Department of Water Resources
Water Right License
47-7721
Water Service Area Boundary for Wayne R Marshall



0 0.05 0.1 0.2 Miles

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



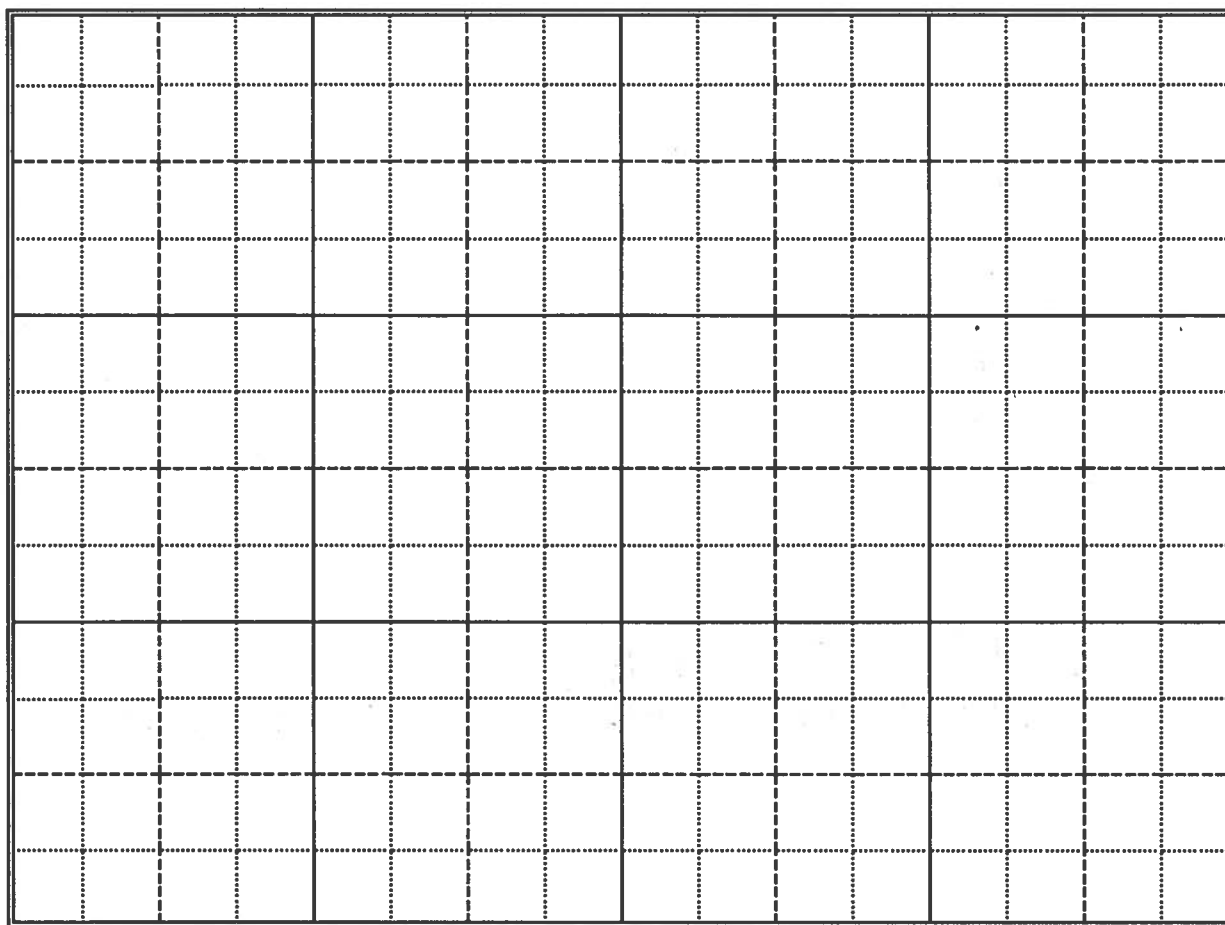
1999

FIELD

EXAM

[illegible]

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe I.D. as applicable.



Scale: 1" = _____.

☒ Copy of USGS Quadrangle Attached Showing location(s) of point(s) of diversion and place(s) of use (required).

☒ Aerial Photo Attached (required for irrigation of 10+ acres)

☒ Photo of Diversion and System Attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
GPSA0001482		2			

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

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
BUCKET / STOPWATCH						

2. Measurements:

ARTESIAN GEOTHERMAL WELL

@ WELL 60 gal/min = 0.134 cfs → recommend rate @ well

@ FISH PONDS

SW ptn property 18 gal/min = 0.04 cfs

NW ptn property 56 gal/min = 0.125 cfs

HEATING

- a. 40'x84' shop, small pipes divert hot water for heat
- b. upstairs portion of the home is heated by a coil heating system
- c. downstairs portion of the home heated by small pipes running through the floor
- d. greenhouse ~~50'x150'~~ ^{30'x144'}, hot water coil, regulate temperature for germinating seeds and growing plants plus a "pad" of underground piping, ~~50'x150'~~ ^{30'x144'} for second greenhouse
- e. stub-out for domestic use and small coil for heat

approximate area where heating occurs
0.50 acre (4) = 2.00 ac ft

COMMERCIAL

greenhouse ~~50'x150'~~ ^{30'x144'}
existing underground "pad" piping ~~50'x150'~~ ^{30'x144'}

approximate area of greenhouse(s)
0.34 acre (4) = 1.38 ac ft

47-07792

All uses will be recommended in 47-07721.

E. NARRATIVE/REMARKS/COMMENTS

FROM: Georgia Satterlee
DATE: 29 January 1999
RE: 47-07721

On 20 January 1999 at 0930 hrs., I met with Wayne Marshall to perform a field examination on the permit. The permit is for domestic, commercial, heating, and fish propagation from an artesian geothermal well located in the Banbury Management Area. According to Mr. Marshall, the water temperature is 118 degrees at the diversion point and at the south-west pond the temperature is 82 degrees.

The point of diversion is located on the south-west corner of the existing green house, which is in the SENESE $\frac{1}{4}$ of Section 32, T08S, R14E. The well had a tag #A0001482. The diversion rate was measured with a bucket and stopwatch. Mr. Marshall measured pressure of system as 36 psi.

Wayne Marshall has two permits:

<u>Permit #</u>	<u>Rate</u>	<u>Priority Date</u>	<u>Uses</u>
47-07721	3.0 cfs	03/25/1981	D,P,H,F,C,I
47-07792	8.0 cfs	02/12/1982	D,P,H,F,C

The well in Section 30, the 27 acres of irrigation in Section 36, and the power use were never developed.

Because the two permits are repetitive, I will recommend all uses on the permit with the earliest priority date.

DOMESTIC

2 homes (In-house use without lawns)
1 home developed, 1 stub-out

0.06 cfs 1.2 afa

FISH PROPAGATION

The fish are raised in a temperature controlled setting (SW pond has a constant temperature of 82 degrees), Mr. Marshall says water is continually diverted to the ponds. However, ambient temperature in the warmer months allows only 50% of groundwater use.

November-June=182 days (0.13 cfs) 1.9835 = 46.9

July-October =183 days (0.13 cfs) 1.9835(50%) = 23.6

70.5 afa

9 ponds surface area total: 0.17 acres
" " volume ac ft total: 0.52 acres

There is one pond in the south-west corner of property and the rest of the ponds are located in the north-west corner. Marshall raises ornamental fish and snails, all used for decorative uses; He breeds, raises and sell the items locally.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

F. FLOW CALCULATIONS

Additional Computation Sheets Attached

Measured Method:

BUCKET/STOPWATCH (PHOTO PG. 1/4) 60 gpm = 0.13 cfs

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

 $V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$ _____ $V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 =$ _____ $V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$ _____

2. Volume Calculations for Other Uses:

see 'E'

Applicant submitted
proof w/ 1.00 rate only

Exam Fee Limit = 1.00
 Permit Rate = 3.00
 Measured = 0.13
 Recommend = 0.13

H. RECOMMENDATIONS

1. Recommended Amounts

System Max. Diversion Rate = 0.13 cfs

Beneficial Use	Period of Use		Rate of Diversion	Annual Volume
	From	To	Q (cfs)	V (afa)
② Domestic - In-House	1/1	12/31	0.06	1.2
~~Domestic No Lawn~~	1/1	12/31	0.13	70.5
~~Fish Propagation~~	1/1	12/31	" "	1.4
~~Commercial~~	1/1	12/31	0.13	2.0
~~Heating~~				
Totals:			0.13	75 ac ft

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

George Satterlee

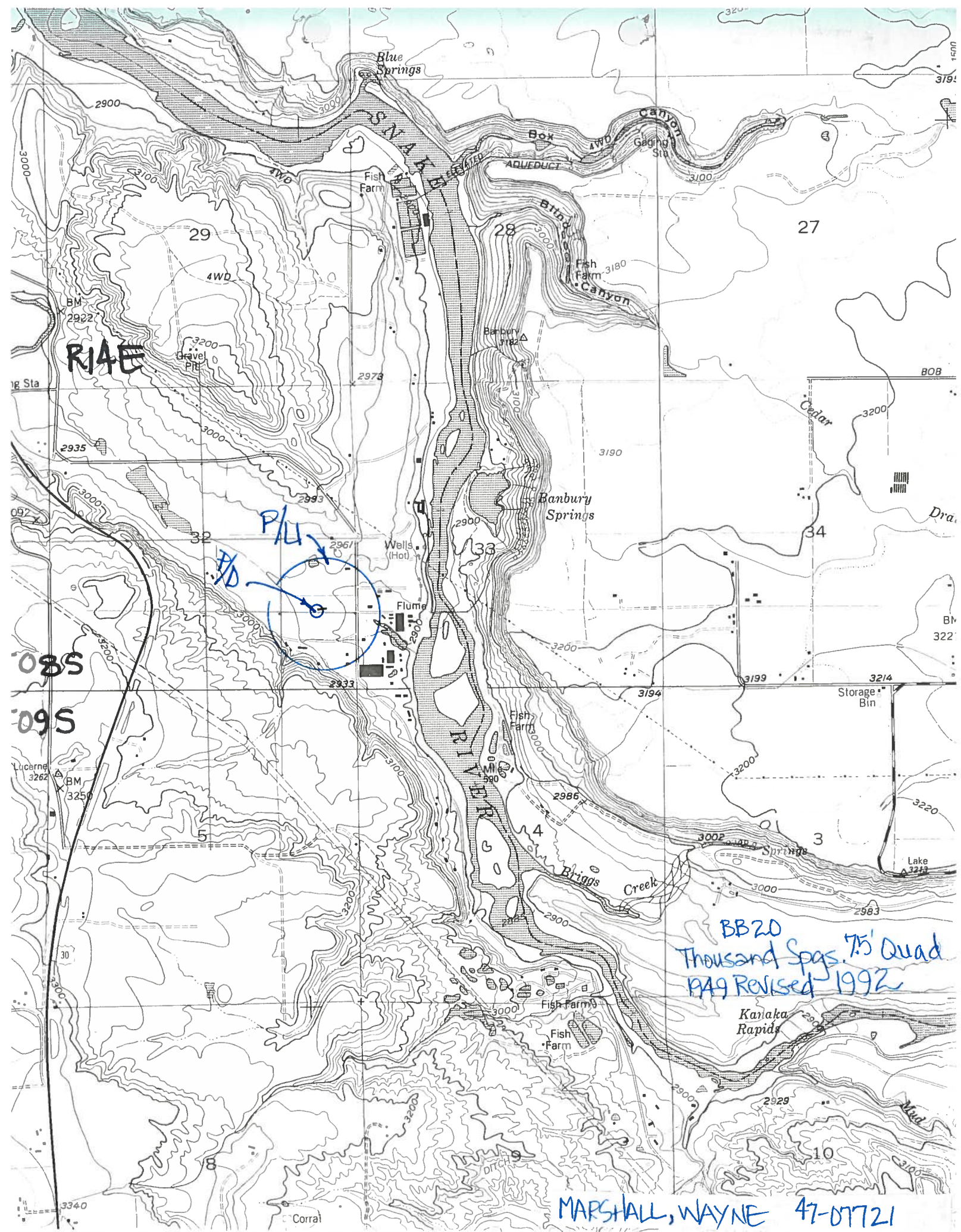
Date

29 January 1999

Reviewer

Date

SEAL



BB20
Thousand Spgs. 75' Quad
P49 Revised 1992

MARSHALL, WAYNE 47-07721

T37
3650
IP

R14E

IP

IP

T36 HEL
3372

T39 HEL
3373

4.7
6000000

Domestic

Home

21.9

Shop

2
4.9

P/D

3
17.4

POND 20' x 90' x 3'

T08S

T09S

T41 HEL
27

32 33
5 4

IP

IP

RIVER RD.

R14E

IP

T37

3650

IP

T40 HEL
3372

T39 HEL
3373

14.7

FISH
POND

HOME

SHOP

21.9

STUB
IN

P/D

2

4.9

FISH POND
3

17.4

Greenhouse

T08S

T09S

IP

T41 HEL
27

32

33

5

4

IP

RIVER RD.

Marshall, Wayne
1992 ASCS Flight

47-07721

1/4



photo looking W'ly

greenhouse back-ground



photo looking NE'ly



measurement with bucket stopwatch, outflow was the only pipe that had been valved on.

photo looking S'ly

Measurement 60 gpm = 0.13 cfs

Marshall, Wayne 20 Jan 1999

1100 hrs. Examiner: Satterlee
47-07721

photo looking
due west

green house



shop

home behind trees

area where 2nd green-
would go "pipe pad"
existing underground



heating paraphanelia

photo looking in greenhouse from west

Marshall, Wayne 20 Jan 1999
Examiner:Satterlee 1100 hrs.



domestic
Stub-out
piping for
heat

photo looking W'ly



photos looking SW'ly



pond in the SW Corner of property 82° WATER TEMP.

$$\begin{aligned} \text{Pond} &= 20' \times 90' \times \frac{1}{2}' = \\ &\frac{1800 \text{ ft}^2}{2} = 900 \text{ ft}^2 \\ &= 0.041 \text{ ac.} \end{aligned}$$

$$\begin{aligned} &\frac{5400 \text{ ft}^3}{2} = \\ &= 0.124 \text{ ac.} \end{aligned}$$

Marshall, Wayne
20 Jan 1999 1100 hrs.
Examiner: Satterlee



photos looking W'ly



NORTH SIDE PROPERTY

7 ponds

$$15' \times 40' \times 3' =$$

$$4200 \text{ ft}^2 = 0.096 \text{ ac.}$$

$$12600 \text{ ft}^3 = 0.289 \text{ ac.}$$

$$1 \text{ pond } 30' \times 50' \times 3'$$

$$1500 \text{ ft}^2 = 0.034 \text{ ac.}$$

$$4500 \text{ ft}^3 = 0.103 \text{ ac.}$$

Marshall, Wayne 20Jan1999
Examiner: Satterlee 1100 hrs