

D. FLOW MEASUREMENTS

1.

Measurement Equipment bucket and a stopwatch

2. Measurements:

Bucket and stopwatch

A measurement was taken from the overflow pipe at the top of the concrete spring box

This produced 5 gallons in 14 seconds for 0.05 cfs

$$\frac{5}{14} = \frac{x}{60} = 21.4 \quad 21.4/448.8 = 0.05 \text{ cfs}$$

The pipe that flows from the vault was tied into a second pipe that carried water to the channel below the pump house. A stick was inserted between the two pipes to hold them together. We removed the stick. This allowed water to flow freely from the vault. After several minutes, the flow of water slowed and we were able to take measurements with a 5 gallon bucket. At this point the water flowing out of the vault equaled the water flowing in.

	Seconds	gpm	cfs
	16.55	18.13	0.040
	16.62	18.05	0.040
	16.06	18.68	0.042
	16.55	18.13	0.040
	15.53	19.32	0.043
	16.62	18.05	0.040
average	16.32	18.38	0.041

E. FLOW CALCULATIONS X Additional Computation Sheets Attached

Measured Method:

$$5.0 \text{ acres} \times 0.03 = 0.15 \text{ cfs}$$

Permit allows 0.12 cfs

Measurements averaged 0.04 cfs

Recommended Rate: 0.04 cfs

Domestic water right 75-7653 also diverts from the spring. The back file for this right includes the dimensions of the spring tank (see attachment). According to this file the tank holds 7,540 gallons. The schematic included in the field exam for 75-7653 shows a 4 inch pvc pipe as the buried outlet. The pipe flows to the spring box downhill approximately 17 feet (determined using the National Elevation Data) and 135 feet (determined using GIS). Using these values and the Manning's equation we can determine the flow rate as 0.97 cfs. This is more than the amount needed to satisfy both the irrigation amount requested for this right and the domestic use under water right 75-7653.

Recommended diversion rate: 0.04 cfs**F. VOLUME CALCULATIONS**

1. Volume Calculations for Irrigation:

$$V_{I.R.} = 5 \text{ acres} \times 3.5 \text{ hgr} = 17.5$$

$$V_{D.R.} = 0.04 \text{ cfs} \times 214 \text{ days} \times 1.9835 \text{ (conversion)} = 16.98$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 16.98$$

2. Volume Calculations for Other Uses: n/a

*See memo for system capacity***G. NARRATIVE/REMARKS/COMMENTS:**

Two springs and Lake Creek flow through the Roylance property. The upper spring flows into a pond and from there into Lake Creek. This surface water also irrigates a small orchard to the south of the house, and the grass area around Lake Creek. In 2012 the Roylances built a house and drilled a new well to supply

water to the house. They intended to use this water for their heating system. In November 2012 the Department issued a license for domestic water right 75-14748 to divert from the upper spring.

The pond at the upper end of the system was originally constructed to provide water for the hydropower plant. Under right 75-7427, a 20 inch pipe flows underground to the hydropower building, near the Salmon River. Lake Creek flows through the pond.

Permit 75-7524 provides water from a second spring for 5 acres of irrigation. Two pipes flow south into a concrete 10,000 gallon spring box in T19N R21E Section 2 NESWNE. The spring box diverts water into a tank and a vault downhill, east of the spring, between the spring and the pump house. The vault supplies water to the pump house. The second tank holds water for culinary purposes and is pumped up to the out building, uphill from the house. This spring is the point of diversion for several domestic rights (see memo).

The vault sits downstream from the spring box and receives overflow water from the spring. A 1 ½ inch pipe flows from the pump house to supply irrigation on both sides of the road. The automated system includes 6 zones and supplies water to 14 sprinklers. All of the pipes, including the hydropower water supply pipe, are buried.

Decreed right 75-93D from Lake Creek overlaps the irrigation place of use for this right. There is evidence of irrigation at the place of use

It is worth noting that the Department issued the permit for this right on September 24, 1990. This was before the Wild and Scenic Rivers Stipulated Agreement. The right is not subject to the subordination database.

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>
IRRIGATION	4/01 to 10/31	0.04 CFS	NA
<u>Totals:</u>		0.04 CFS	

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

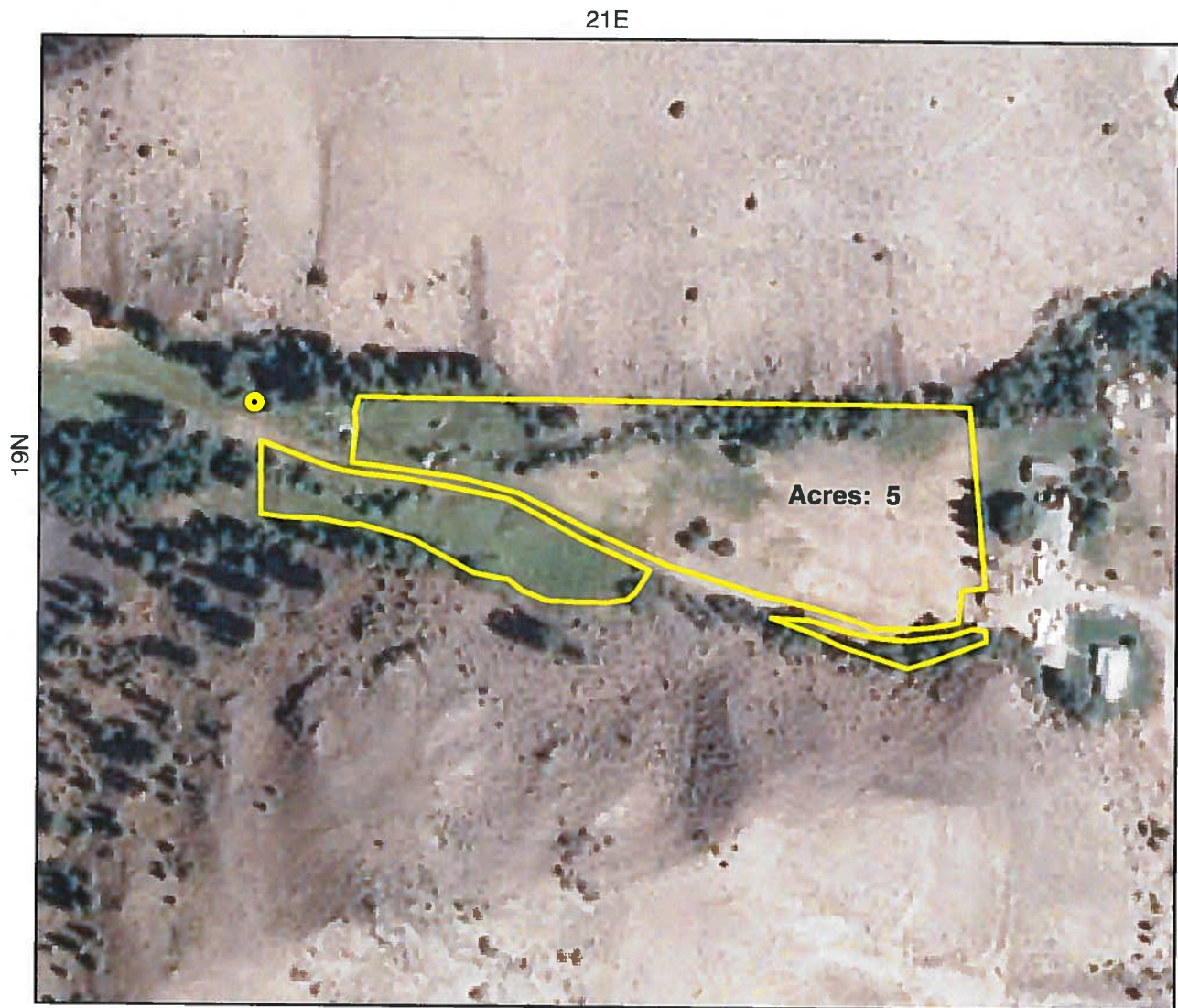
I. AUTHENTICATION

Field Examiner's Name Sandra Thiel Date 6/30/2017

Reviewer _____ Date _____

State of Idaho
Department of Water Resources
Water Right License
75-7524

This map depicts the IRRIGATION place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



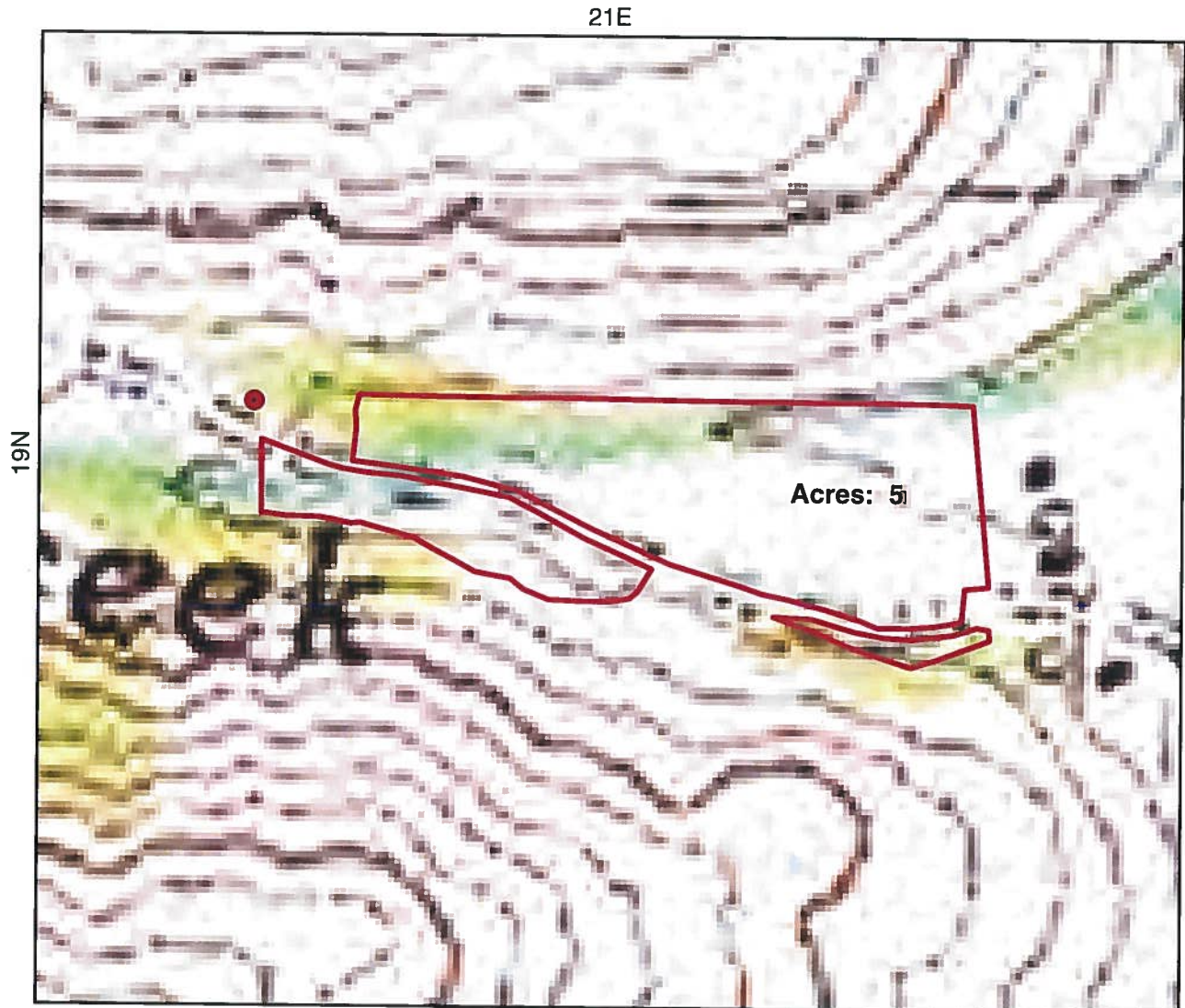
- Point of Diversion
- Place Of Use Boundary



0 Miles 0.125

State of Idaho
Department of Water Resources
Water Right License
75-7524

This map depicts the IRRIGATION place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



- Point of Diversion
- Place Of Use Boundary



0 Miles 0.125

75-7524 Place of use

*See Photo Narrative

Domestic System

Irrigation System

Hillside
Infiltration
Gallery

overflow pipe
(Measurement 1)*

Water Tank

Pump house
and
Water Storage

Domestic
Water
Rights

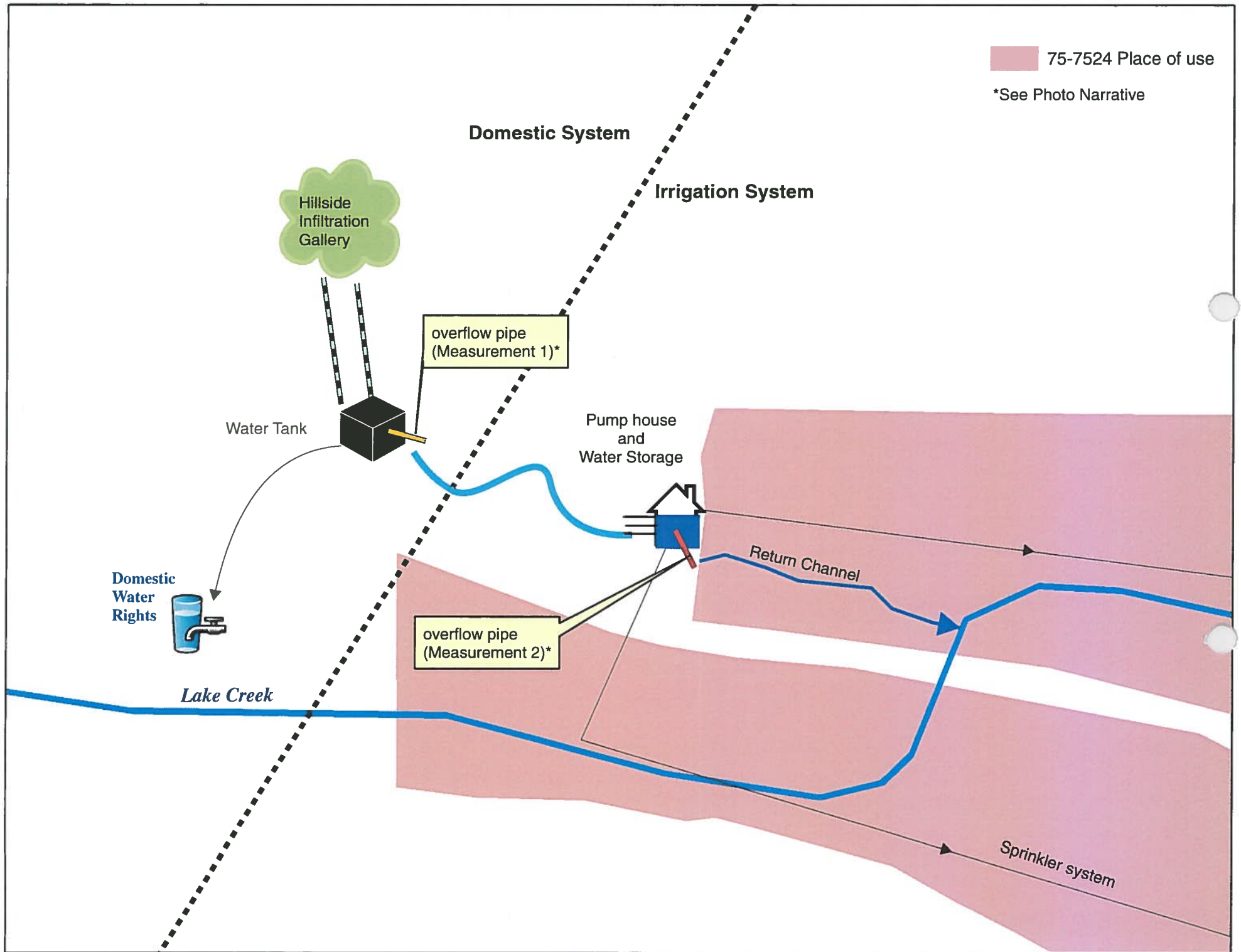


Lake Creek

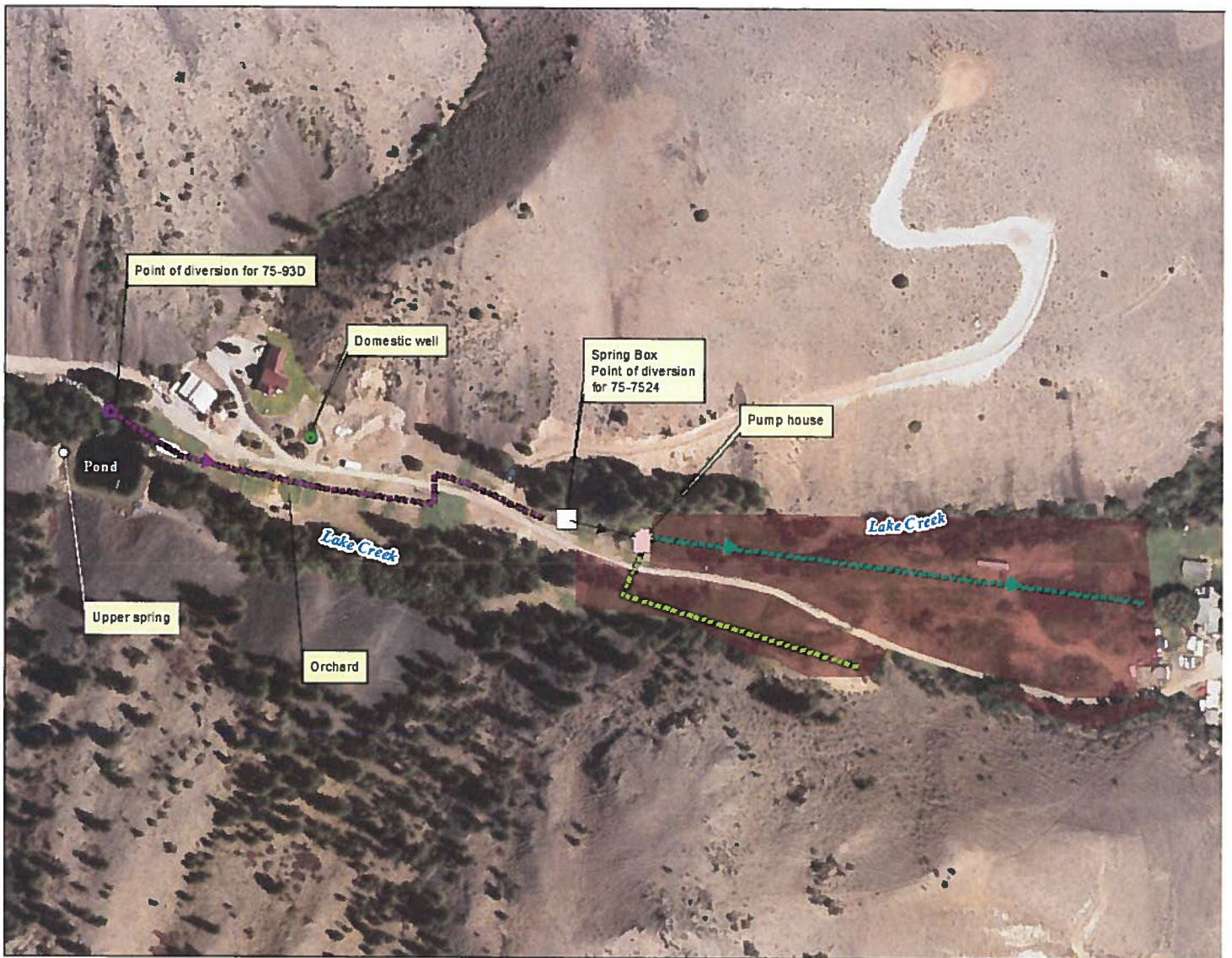
overflow pipe
(Measurement 2)*

Return Channel

Sprinkler system



System Diagram for Water Right 75-7524



Two springs and Lake Creek flow through the Roylance property. The upper spring flows into a pond and from there into Lake Creek. Water is re-diverted from Lake Creek, under right 75-93D, for sprinklers shown above as a dashed purple line. This surface water also irrigates a small orchard to the south of the house, and the grass area around Lake Creek. Before building the house the family lived in the building shown above with a white roof. In 2012 they built a house (brown roof above) and drilled a new well to supply water to the house. They intended to use this water for their heating system. In November 2012 the Department a license for domestic water right 75-14748 to divert from the upper spring.

The pond at the upper end of the system was originally constructed to provide water for the hydropower plant. A 20 inch pipe flows underground to the hydropower building, near the Salmon River. Lake Creek flows through the pond. As of this writing permit 75-7427 for hydropower has not been licensed because Department's hold on licensing hydropower water rights. This permit belongs to Jerry McMillan and Christine Smith.

Permit 75-7524 provides water from a second spring, identified above as the spring box, for 5 acres of irrigation (red shaded area shown above). A concrete spring box in T19N R21E Section 2 NESWNE surrounds the spring (white square). The spring box diverts water into two tanks downhill, east of the spring, between the spring and the pump house (orange house). One tank supplies water to the pump house. A second tank holds water for culinary purposes and is pumped up to the out building. This spring is also the point of diversion for domestic right 75-7653 and others (see attached memo).

A 1 ½ inch pipe flows from the pump house to supply irrigation on both sides of the road. The automated system includes 6 zones and supplies water to 14 sprinklers. All of the pipes, including the hydropower water supply pipe, are buried.

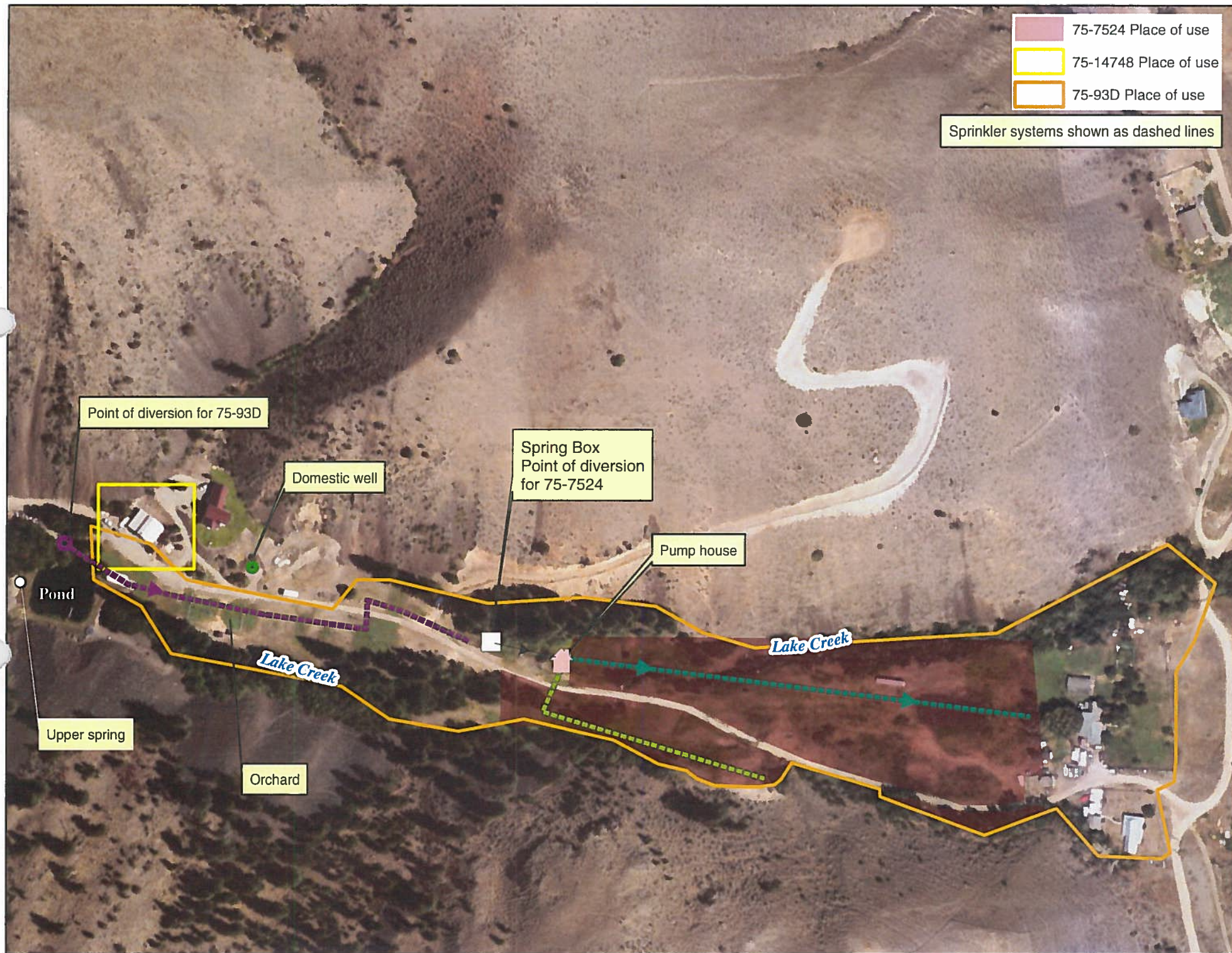
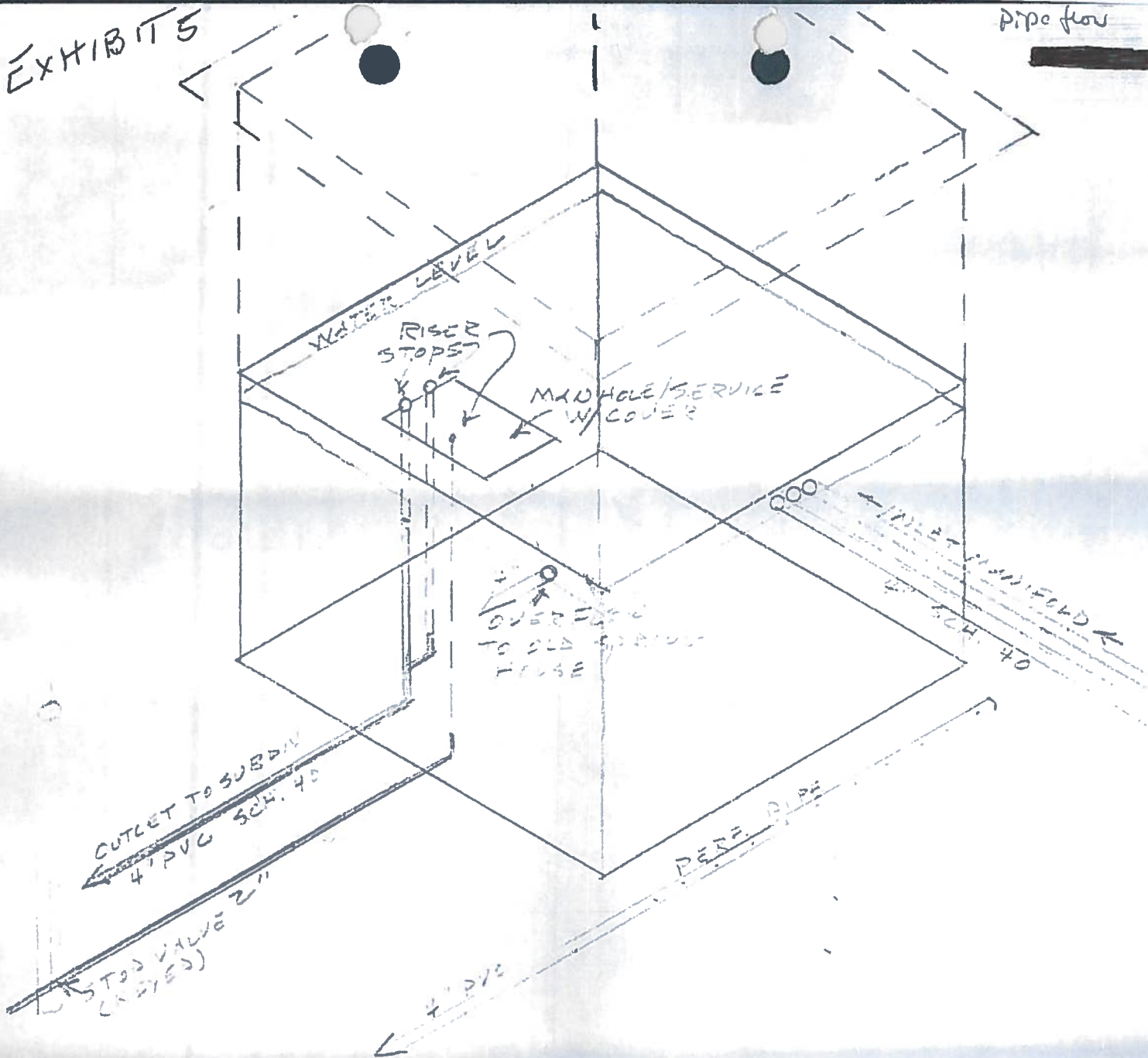


EXHIBIT 5

pipe flow



CONCRETE - 6 BAG-RE-IMP.

8" TOP	96 cu'
6" BOTTOM	72 cu'
6" WALLS	184 cu'

352 cu' = 13 cu.yds

12' x 12' x 8'
12' x 12' x 7'

LAKE CREEK
SPRING P
STORAGE TANK
8617 GAL TOTAL
7540 GAL. FLUID
1-10-98
SCALE = 1/4" G.F.

MICROFILMED

NOV 18 2002

Manning's Equation Calculator for Flow Rate in a Circular Conduit Flowing Full

$S = 0.1259$ ft/ft
 $n = 0.009$ manning's coefficient
 $d = 4.0$ pipe diameter (inches)
 $D = 0.33$ pipe diameter (feet)
 $r = 0.17$ pipe radius (feet)
 $A = 0.09$ area (ft²)
 $WP = 1.05$ wetted perimeter (ft)
 $R = 0.08$ hydraulic radius (ft)

$Q = 0.97$ flow rate (CFS)

READ ME

Manning's Equation for velocity (v) in a circular conduit is equation (2) where the computation of the flow.

In equations (1) and (2), n is the Roughness and R is the hydraulic radius for different channel types. For a circular conduit, R is equal to the area divided by the wetted perimeter, $R = A / WP$. n is often assumed to be 0.009 for concrete.

Because Manning's Equation for velocity (v) is reported in ft²/s, Q must be reported in ft³/s or unitless constant.

Channel Slope

Slope Options

☐ Manual Entry
 ☒ Slope Calculator

Slope Calculator

Rise = feet

Run = feet

Slope, $S = 0.1259$ ft/ft

Pipe Material, (n):

plastic (pvc, abs)

Pipe Diameter (inches)

4.0 inches

$$(1) \quad v = 1.49$$

$$(2) \quad Q = v \times A$$

$$(3) \quad Q = 1.49$$

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 75-7524
 Examiner: Sandra Thiel
 Date of Field Exam: 11/14/2013

P/D No.:	Option 1	OPTION 2	OPTION 3	
PUMP HORSEPOWER	10	10	10	
BOOSTER HORSEPOWER	0	0	0	
PUMPING LEVEL	0	0	0	
DISCHARGE PRESSURE	15	10	5	
FRICTION	40	50	60	
RATE OF FLOW (cfs)	0.83	0.84	0.86	AVE
(gpm)	370.4	378.2	386.4	0.84

The above calculates the formula =

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

Assumptions: %70 efficiency.

Examiners Notes:

Place of use comparison

Process	Basin Sequence	Draft	Owner	Source	POD/ POU	SENE	Total Acres
Water Right	75-10054	N	PARRISH, GRANT	LAKE CREEK	POU	X	0
Water Right	75-10435	N	MC MILLAN, JERRY L; SMITH, CHRISTINE G	SPRING	POU	X	0
Water Right	75-10945	N	JOHNSON, HARVEY	SPRING	POU	X	0
Water Right	75-13315	N	SALO, WILLIAM MARTIN; SHUMATE, LESLIE MAY	SPRING	POU	X	0
Water Right	75-13714	N	CULLEN, PATRICIA; CULLEN, PATRICK	SPRINGS	POU	X	0
Water Permit	75-7524	N	MC MILLAN, JERRY L; SMITH, CHRISTINE G	SPRING	POU	3.0	6
Water Right	75-7524	Y	ROYLANCE, JASON	SPRING	POU	5.0	5
Water Right	75-7654	N	SHUMATE, LESLIE MAY	GROUND WATER	POU	0.7	0.7
Water Right	75-93D	N	ROYLANCE, JASON	LAKE CREEK	POU	7.5	11.8

MEMORANDUM

TO: Water Rights File 75-7524
FROM: Sandra Thiel
DATE: August 30, 2016
SUBJECT: Point of diversion overlap

On October 3, 2012 I conducted a field exam for water right permit 75-7524 for irrigation. The spring is located on Jason Roylance's property, adjacent to Lake Creek in T19N R21E Section 2 NE ¼ SW ¼ NE ¼, Lemhi County. The spring box appears to straddle the QQ line with SENWNE lot 2. In June 2013 I met with Gary and Linda Hawkins to determine the location of the point of diversion for water right permit 75-7653. Mrs. Hawkins took me to the spring located on Jason Roylance's property. It was the same spring I had identified in September of 2012 as the point of diversion for 75-7524. Ultimately the IDWR issued a license for 75-7653 for domestic use. The point of diversion was identified as the same spring as 75-7524.

On July 19, 2016, I made a second visit to the permit place of use. At that time I talked to Linda Hawkins again. She gave me the names of the people who divert from the spring. I have attempted to match the names with existing water right. She counted nine diversions from the spring. She said she has an easement recorded with the county for use of the road and a 100 foot access around the spring. Based on the names she provided I was able to find five water rights, including hers in our database. According to Linda, there are four other domestic users that do not have a water right. I believe that there is an additional diversion on the (then) Roylance property from the domestic spring, for the property at the point of diversion. The rights are as follows: 75-7653 75-10435, 75-13315, 75-13715 and 75-10945.

The documentation for 75-7653 (Hawkins) provides photography on a photo documentation sheet showing the construction of the spring box. The page labeled as Exhibit 3 lists the name as the Lake Creek Subdivision Water System. The explanation that accompanies the first picture mentions Bill Salo as the operator of the backhoe. Bill Salo is listed as the owner on water right 75-13315 along with his daughter Leslie Shumate. Leslie Shumate currently lives at the place of use for the domestic right 75-13315.

Decreed right 75-10435, for domestic use, lists Christine Mc Millian as the owner. Ms McMillian was the previous owner of the water right that is the subject of this memo. There is no documentation regarding this right other than the proof report. The proof report for 75-10435 lists the place of use as parcel 00068005001C. Roland Miller currently owns this property and, at the time of this memo, the house appears to be vacant.

Harvey Johnson is owner of decreed right 75-10945. However, the property belongs to Kyle Faulkner. There were no documents with this right. The place of use for this right is in the Lake Creek Subdivision. Decreed right 75-13715 belongs to Sadie Barrett; the place of use for this right is also in the Lake Creek Subdivision.

Linda Hawkins said that in 2010 Jason Roylance tapped into the spring. If he irrigated from the spring they would not get any water. At the time of our discussion his irrigation system does not divert directly from the spring. The water in the vault is all overflow from the spring box. The domestic users are satisfied before water flows to the vault and made available to pump for irrigation.

PHOTOGRAPHER AND DATE OF PHOTOS: Sandy Thiel, September , 2012
FILE NUMBER 75-7525



Lake Creek flowing
into pond

Pond outlet



Out building

New house

Pond outlet

Lake Creek



New Well

New House



Spring box

Channel to pump house

Water flowing from spring box (Measurement 1)

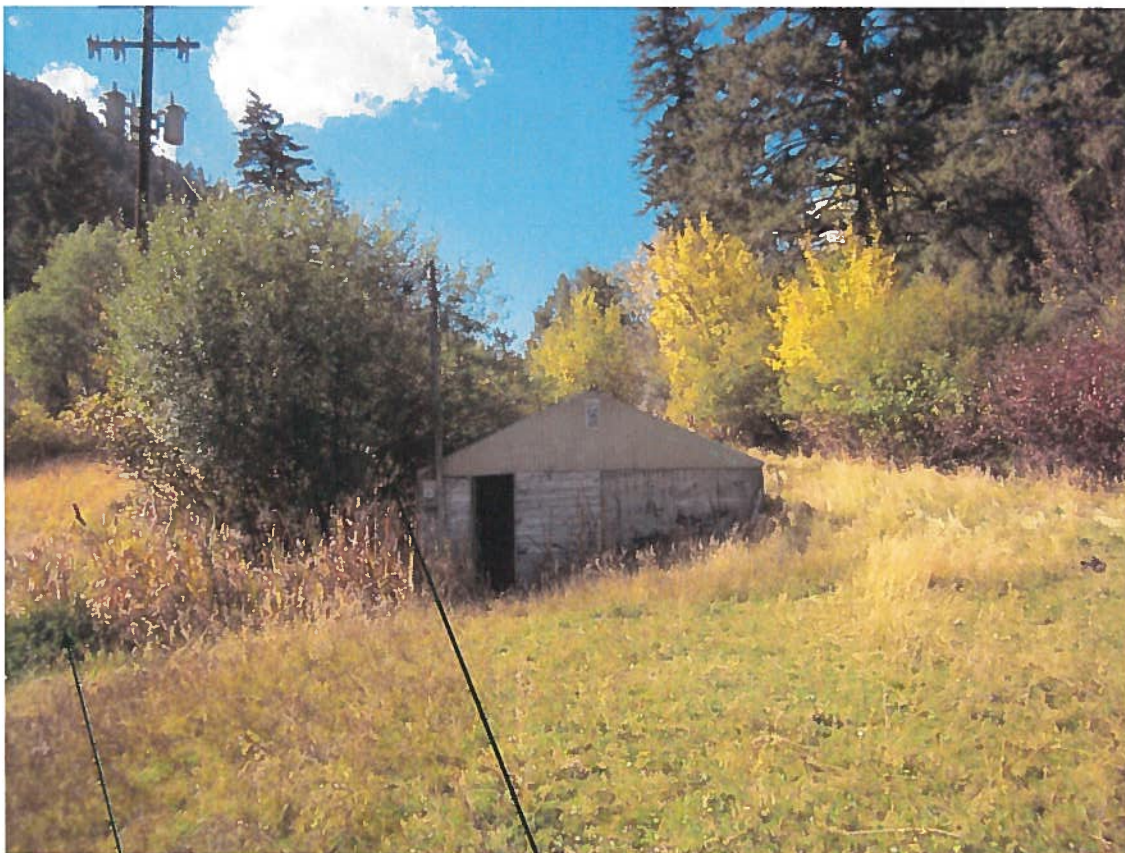


Spring water collection

Located between the spring box and the pump house

(Measurement 2)

The second measurement was taken just to the right of this photo



Pump house

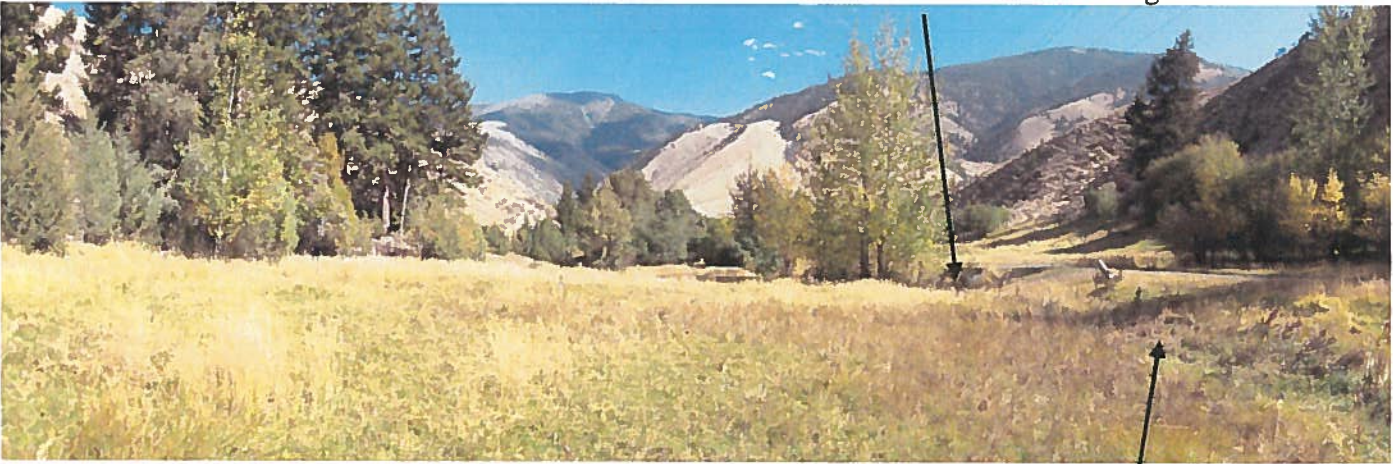
The spring box is approximately 110 feet uphill behind the building

Channel flowing to Lake Creek

Second measurement taken just behind the bush



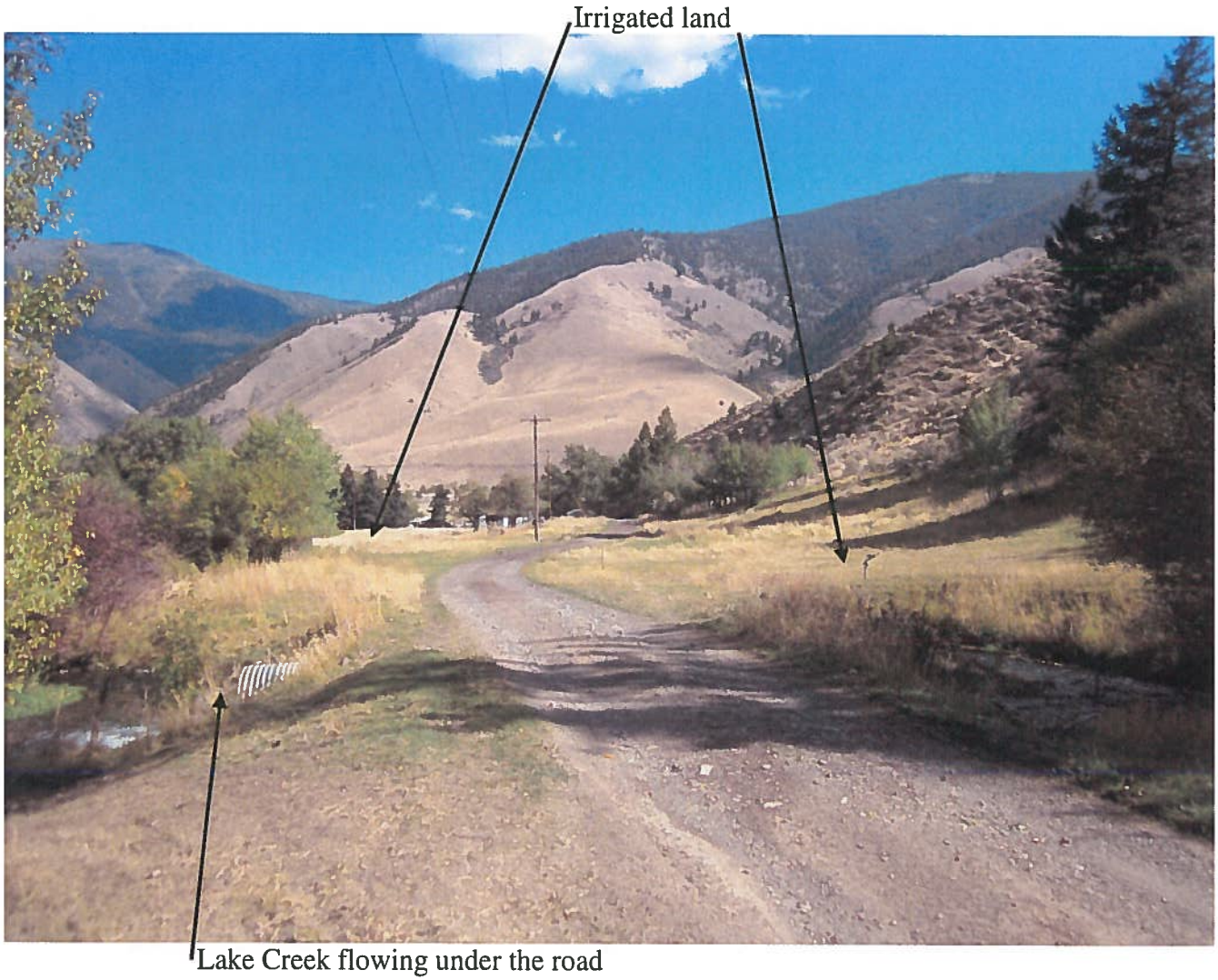
Pump
Tag
A0019123



Lake Creek flowing under road

Channel from overflow
returning water to Lake
Creek

Irrigated area, north of the road, looking east toward the Salmon River



Irrigated land

Lake Creek flowing under the road