STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 97-7500
Exam Date: 07/20/2020

1. Current Owner:
ROBERT F & KARLA H HATFIELD TRUST 1047 PENINSULA RD PRIEST RIVER ID 83856

2. Accompanied by: Robert Hatfield
Phone No: 208-448-4324
Address: Same as above
Relationship to permit Holder: Permit Holder

3. **SOURCE:** PRIEST RIVER

Tributary PEND OREILLE RIVER

Method of Determination: Arcmap and DRG.

B. OVERLAP REVIEW

1. Other water rights with the same place of use: NO Overlap

Water Right No.	Source	Purpose of Use	Basis

Comments: _____

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

Water Right No.	Source	Purpose of Use	Basis

Comments: _____

C. DIVERSION AND DELIVERY SYSTEM

1. **LOCATION OF POINT(S) OF DIVERSION:**
PRIEST RIVER L8 (NE¼ SE¼ SW¼), Sec. 31, Twp 57N, Rge 04W, B.M. BONNER County

Method of Determination: GPS. POD is located at -116°53.036, 48°14.455.

PLACE OF USE: IRRIGATION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
57N	04W	31											4.4 L4	3.0 L8					7.4

Total Acres: 7.4

PLACE OF USE: FIRE PROTECTION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
57N	04W	31											X L4	X L8					

Method of Determination: Field exam and Arcmap.

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.
__X__ 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
__X__ 1:24,000 or greater.

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

__X__ 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
WATER TRANSFER PUMP	**HONDA GX270**				

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
SPRINKLER NOZZLE PSI METHOD						

2. Measurements: Utilized PSI gage to determine average operating pressure for applicant's sprinkler system during active irrigation.

E. FLOW CALCULATIONS

__X__ Additional Computation Sheets Attached

Measured Method: Sprinkler Nozzle PSI Gage Method: Applicant irrigated with longest run of sprinkler pipe incorporating 11ea ¾ Full Circle, Brass Impact Sprinklers, 10ea with 7/32nd nozzles and 1ea with 5/32nd nozzles. The sprinkler line was set with two lines of 6ea and 5 each sprinklers off the main trunk line operating at one time.

- 4 sprinklers tested per line (1st, 3rd, 4th, and 5th / 1st, 3rd, 4th, and 6th)
- PSI readings = 26 psi No.1, 25 psi No.3, 25 psi No.4, and 24 psi No.'s 5 & 6.
  - (26 psi + 25 psi + 25 psi + 24 psi) / 4 = 25 psi average operating pressure.
- Rainbird sprinkler performance data for part No. 14070H ¾ inch full circle, brass impact sprinklers result in the following flow rates:
  - 10ea 7/32nd nozzle with 25 psi = 7.00 gpm x 10ea nozzles = 70 gpm.
  - 1ea 5/32nd nozzle at 25 psi = not valuated on performance chart = > 0 < 4.0 gpm
  - Total operating flow rate = 70.00 to 74.00 gpm = **0.17 cfs**

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$V_{I.R}$ = (Acres Irrigated) x (Irrigation Requirement) = 7.4 acres x 3.0 afa = 22.2 af

$V_{D.R}$ = [Diversion Rate (cfs)] x (Days in Irrigation season) x 1.9835 = 0.17 x 214 days x 1.9835 = 72.2 af

V = Smaller of $V_{I.R}$ and $V_{D.R}$ = 22.2 af

2. Volume Calculations for Other Uses:

This is a surface water right; there will be no annual or maximum diversion volumes applied to this water right license.

G. NARRATIVE/REMARKS/COMMENTS

Field exam conducted on 7/20/2020 with applicant, Robert Hatfield, showed water being diverted from the Priest River, for irrigation and fire protection purposes. At the POD, applicant had installed a screened intake pipe running to a 270 cc Honda water transfer pump. From the transfer pump, water was routed by main irrigation trunk line to the furthest point of his irrigation POU, an uphill situated meadow. Irrigation risers were installed to the main trunk at intervals to enable applicant to run two fire hose lines in the event of active fires, or to hook to irrigation sprinkler systems. A PSI method flow measurement was conducted resulting in the following diversion rate:

- Rainbird sprinkler performance data for part No. 14070H ¾ inch full circle, brass impact sprinklers result in the following flow rates:
  - 10ea 7/32nd nozzle with 25 psi = 7.00 gpm x 10ea nozzles = 70 gpm.
  - 1ea 5/32nd nozzle at 25 psi = not valuated on performance chart = > 0 < 4.0 gpm
  - Total operating flow rate = 70.00 to 74.00 gpm = **0.17 cfs**, which will be applied as the diversion rate for licensing purposes.

Applicant had permitted for 2ea PODs, but at time of field exam had only developed a single POD. The second POD was removed from permit during licensing review. Applicant permitted for 0.50 cfs, but is limited to pump performance at time of field exam, resulting in irrigation and fire protection rates of diversion equal to 0.17 cfs. The 0.17 cfs irrigation diversion rate exceeds the department standard for applicant's total irrigated acres (7.4 acres) by 0.02 cfs, but the increase is warranted as applicant does not irrigate 24 hrs a day, and alternates irrigation across a large field, thus is not in jeopardy of exceeding annual volume requirements.

At time of permit, applicant was authorized 20.0 acres of irrigation. During field exam, irrigated acreage was identified and sketched out on map products. During licensing review, Arcmap aerial imagery was used to trace out irrigation area equaling 7.4 acres. The annual volume is equal to 7.4 acres x 3.0 afa = 22.2 af, but as this is a surface water source permit, there will be no annual volume nor maximum diversion volume applied to license. Applicant irrigated using hand moved sprinkler pipes, as well as fire hose to garden hose above ground portable sprinklers. Applicant was able to hook up to irrigation riser pipes at intervals to access irrigated areas along the long main trunk irrigation line, which ended at the highest point at his large irrigated field. Photographs were taken illustrating active irrigation at time of field exam.

Applicant permitted for fire protection, and based on the installed riser pipes with fire hose connections fire protection will be carried forward to licensing. There is no volume applied to the fire protection component, and a condition is applied to license that prohibit diversion of water for fire protection use under this right except to fight or repel an existing fire.

Condition 26A was removed from permit at time of licensing. Condition 227 was added describing minimum stream flow requirements for Priest River (97-7380). All other conditions from permit remain to license. There are no overlap concerns for this water right.

Have conditions of permit approval been met? __X__ Yes ____ No

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use	Rate of Diversion
IRRIGATION	04/01 to 10/31	0.17 CFS
FIRE PROTECTION	01/01 to 12/31	0.17 CFS

Totals: 0.17 CFS

2. Recommended Amendments

____ Change P.D. as reflected above ____ Add P.D. as reflected above __X__ None

Change P.U. as reflected above Add P.U. as reflected above X None

I. AUTHENTICATION

Luke Bates - Water Resource Agent

Field Examiner's Name _____ Date 8/21/2020

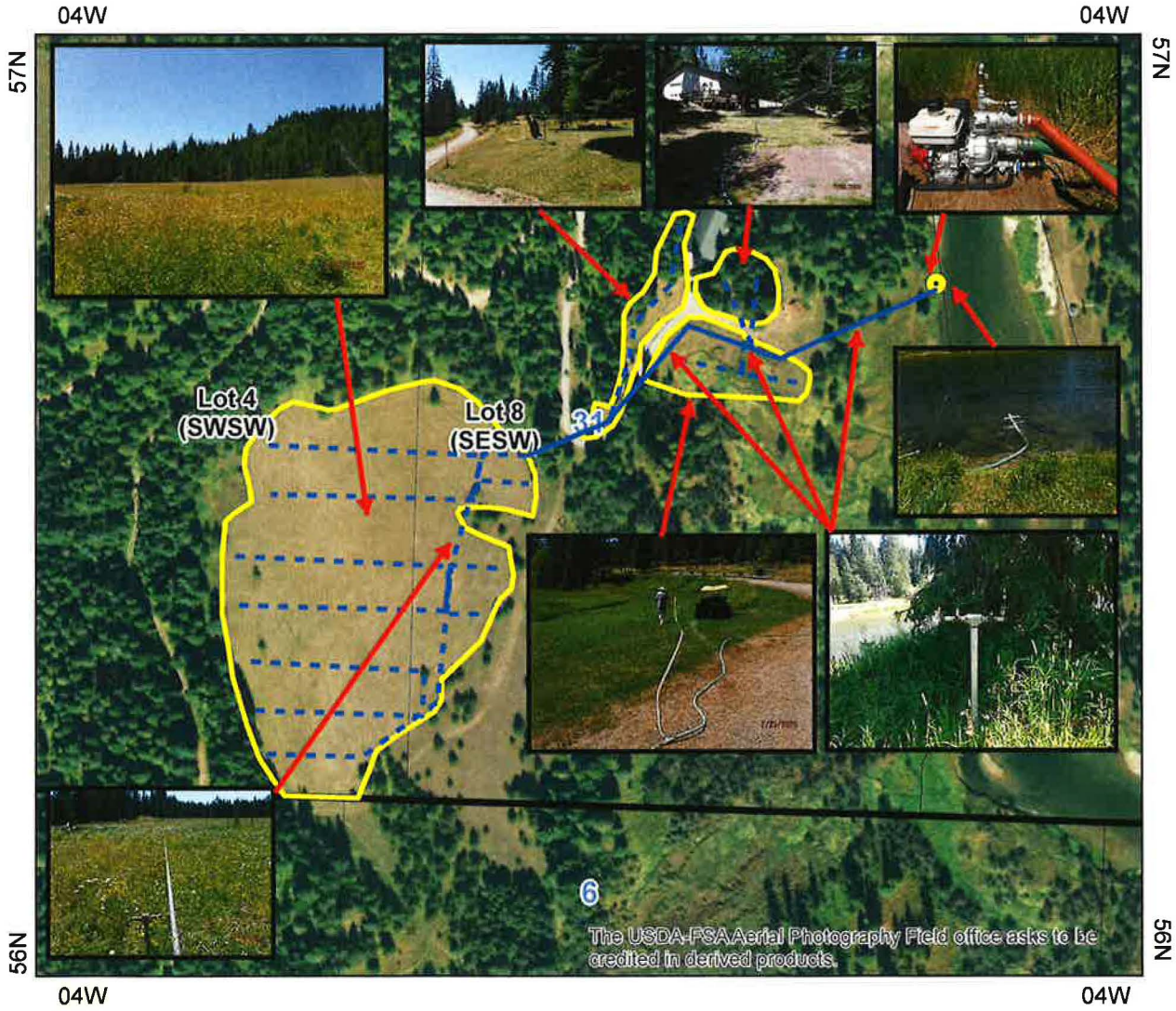
Reviewer _____ Date 8/21/2020

State of Idaho
Department of Water Resources

Attachment to Field Exam

97-7500

IRRIGATION system diagram.



Point of Diversion

Place Of Use Boundary

Townships

PLS Sections

Quarter Quarters

0 0.035 0.07 0.14 Miles

N

State of Idaho
Department of Water Resources

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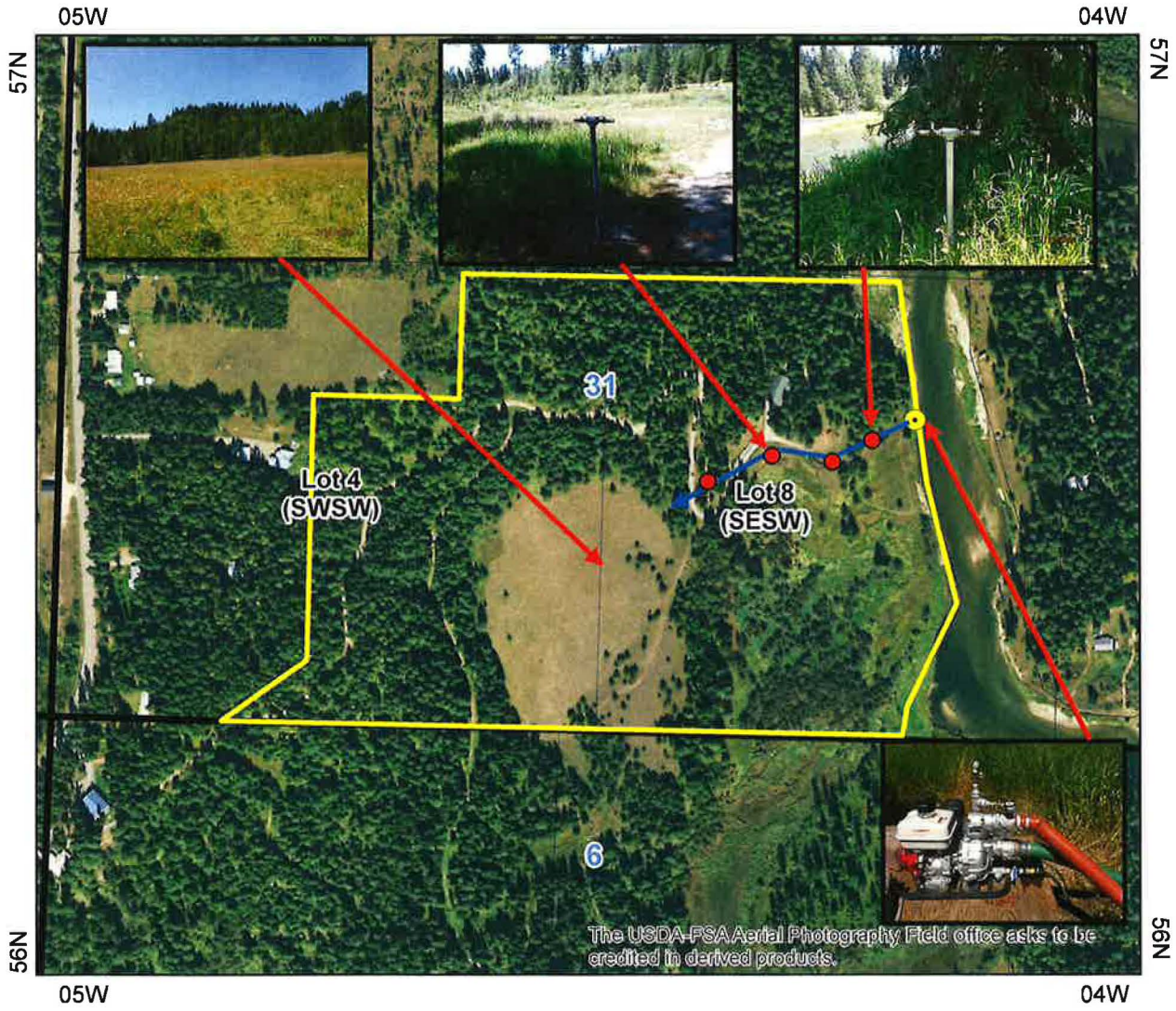
FIRE PROTECTION system diagram.



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

0 0.05 0.1 0.2 Miles

N

97-7500

14070H

3/4" Full Circle, Brass Impact Sprinkler

Bearing: 3/4" Male NPT, Brass
Trajectory Angle: 27°
Operating Range: 25-80 psi
Flow Rate: 4.2-23 GPM
Radius: 44-71 ft.

FEATURES

- Heavy duty brass construction
- Extra large body and barrel
- Stainless steel springs and fulcrum pin
- Chemically resistant washers
- Dual nozzle ports
- Two-year warranty

BENEFITS

- Extra large body accommodates wide range of flow rates and nozzles
- Long nozzle barrel increases distance of throw
- Corrosion and grit resistant
- Built to last

PERFORMANCE DATA

Straight Bore Nozzle (SBN-3) with Spreader (LAN-1-20) (Stream Height: 10 ft.)

PSI @ Nozzle	NOZZLE SIZE													
	3/16" x 1/8-20˚		13/64" x 1/8-20˚		7/32" x 1/8-20˚		15/64" x 1/8-20˚		1/4" x 1/8-20˚		17/64" x 1/8-20˚		9/32" x 1/8-20˚	
	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM
25	44	7.40	45	8.30	46	9.20	46	10.30	47	11.40	47	12.50	48	13.80
30	47	8.10	48	9.10	49	10.10	50	11.20	51	12.40	51	13.70	52	15.10
35	49	8.70	50	9.80	51	10.90	52	12.10	52	13.40	53	14.80	54	16.30
40	50	9.30	51	10.50	52	11.70	53	13.00	54	14.40	55	15.80	56	17.40
45	51	9.90	52	11.10	54	12.40	55	13.80	56	15.20	57	16.80	58	18.50
50	52	10.40	53	11.70	55	13.10	56	14.50	57	16.10	58	17.70	59	19.50
55	53	10.90	54	12.30	56	13.70	57	15.20	59	16.90	59	18.60	61	20.40
60	53	11.40	55	12.80	57	14.30	58	15.90	60	17.60	61	19.40	62	21.30
65	54	11.90	56	13.30	58	14.90	59	16.50	61	18.30	62	20.20	63	22.20
70	55	12.40	57	13.80	59	15.40	60	17.20	62	19.00	63	21.00	65	23.00
75	55	12.80	58	14.30	60	16.00	61	17.80	63	19.70	-	-	-	-
80	56	13.20	58	14.80	61	16.50	62	18.40	64	20.30	-	-	-	-

Straight Bore Nozzle (SBN-3V) with Plug (Stream Height: 10 ft.)

PSI @ Nozzle	NOZZLE SIZE															
	5/32"		11/64"		3/16"		13/64"		7/32"		15/64"		1/4"		17/64"		9/32"	
	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM
25	-	-	-	-	44	5.10	45	6.00	46	7.00	46	8.00	47	9.10	48	10.30	48	11.50
30	-	-	-	-	47	5.60	48	6.60	49	7.60	50	8.80	51	10.00	51	11.20	52	12.60
35	46	4.20	47	5.10	49	6.10	50	7.10	51	8.20	52	9.50	52	10.80	53	12.10	54	13.60
40	46	4.50	48	5.40	50	6.50	51	7.60	52	8.80	53	10.10	54	11.50	55	13.00	56	14.60
45	47	4.80	49	5.80	51	6.90	52	8.10	54	9.30	55	10.70	56	12.20	57	13.80	58	15.40
50	48	5.00	50	6.10	52	7.20	53	8.50	55	9.80	56	11.30	57	12.90	58	14.50	59	16.30
55	48	5.30	50	6.40	53	7.60	54	8.90	56	10.30	54	11.80	59	13.50	59	15.20	61	17.10
60	49	5.50	51	6.70	53	7.90	55	9.30	57	10.80	58	12.40	60	14.10	61	15.90	62	17.80
65	49	5.70	52	6.90	54	8.30	56	9.70	58	11.20	59	12.90	61	14.70	62	16.50	63	18.50
70	50	5.90	52	7.20	55	8.60	57	10.00	59	11.60	60	13.40	62	15.20	63	17.20	65	19.20
75	50	6.20	53	7.40	55	8.90	58	10.40	60	12.10	61	13.80	63	15.70	-	-	-	-
80	50	6.40	53	7.70	56	9.10	58	10.70	61	12.40	62	14.30	64	16.30	-	-	-	-

Applicant has

10ea 7/32" nozzle sprinklers → avg operating PSI = 25 psi

1ea 5/32" nozzle sprinkler → " " 25psi

Rain Bird Agri-Products Co. / 633 W. Foothill Blvd. / Glendora, CA 91741-2469 / Phone: (800) 435-5624 / Fax: (626) 852-7310

POD – RIVER DIVERSION BY PIPE AND PUMP

POD – HONDA GX270 WATER TRANSFER PUMP

FLEX PIPE FROM POD TO IRRIGATION MAIN TRUNK LINE

IRRIGATION RISERS OFF MAIN TRUNK PIPE LINE

IRRIGATION PIPE FROM MAIN TRUNK LINE TO SPRINKLER SYSTEM

IRRIGATION POU & FIRE PROTECTION POU

IRRIGATION SPRINKLERS – 10EA 7/32ND AND 1EA 5/32ND NOZZLES

IRRIGATION PSI AT TIME OF OPERATION = AVG 25 PSI

IRRIGATION POU & FIRE PROTECTION POU

IRRIGATION AND FIRE PROTECTION POU

IRRIGATION AND FIRE PROTECTION POU