

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
IN-OFFICE REVIEW/BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATIONExam Date: 04/26/2024

1. Does this qualify for an in-office field exam (IDAPA 37.03.02.035.01.r)? X Y N
- X Irrigation of 5 acres or less
 - Storage of up to 14.6 AF for stockwater purposes only
 - Any use other than irrigation or storage, if the combined diversion rate is 0.24 cfs or less.
 - Other < >

2. Current Owner: **MARKWARDT TRUST**Owner of Record Correct? NAddress of Record Correct? N

If No Explain:

3. Beneficial Use Fees have been paid: X Y N Receipt No: N044227

4. Source: Tributary:

LAKE PEND OREILLE**PEND OREILLE RIVER**Method of Determination: Bonner County Maps, GIS, and Tax Lot Data.Change in Source: Y X N**B. OVERLAP REVIEW**1. Other water rights with the same place of use: X No Overlap

Water Right No.	Source	Purpose of Use	Basis
96-8336	LAKE PEND OREILLE	IRRIGATION	LICENSE
96-7746	BIRCH CREEK	IRRIGATION	LICENSE
96-7760	GROUND WATER	DOMESTIC	LICENSE
96-7922	GROUND WATER	IRRIGATION	LICENSE
96-8337	GROUND WATER	IRRIGATION	LICENSE
96-8667	GROUND WATER	MUNICIPAL	LICENSE
96-8777	GROUND WATER	MUNICIPAL	LICENSE

Comments: Right 96-8336 for the irrigation of 3 acres overlaps the permit place of use (POU). However, Bonner County parcel data does not list any parcel within the NWNE of Government Lot 2 naming the right holder as owner. A review of the backfile indicates that there is likely to be a POU overlap, but the ownership was never updated. No claim has been filed for right 96-8336. The other rights listed above have apparent overlapping POU areas but the rights have different beneficial uses and/or different sources.

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

Water Right No.	Source	Purpose of Use	Basis
NONE	NA	NA	NA

Comments: There are no rights sharing the permit point of diversion (POD).**C. DIVERSION AND DELIVERY SYSTEM**

1. Location of Point(s) of Diversion:

Source	Govt. Lot	¼	¼	¼	Sec.	Twp.	Rge.		County
Lake Pend Oreille	2		NW	NE	2	56N	02W	B.M.	BONNER

Method of Determination: GIS and Tax lot data.Change in POD? Y X N Amendment Required? Y X N

2. Place of Use: IRRIGATION

TWP	RGE	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
56N	02W	2		1.2															1.2
		Lot #		2															
Total Acres =																			1.2

Method of Determination: Bonner County Maps, GIS, and Tax Lot Data.Change in POU? Y X N Amendment Required? Y X N

☐ 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

3. Diversion Id No.*	Motor Make	HP	Pump Model	Pump Make	Pump Serial No. or Discharge Size
Screened inlet in lake	PENTEK	2.0	DS3HG-01	STA-RITE	Unknown

*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
NONE	NA	NA	NA	NA	NA	NA

2. Measurement Comments: The permit holder submitted a photo of the STA-RITE 2.0 Hp pump used in the system. A maximum head of about 20 ft was estimated for the permit POU using the DRG map.

E. FLOW CALCULATIONS

☐ Additional Computation Sheets Attached

Measured Method:

A theoretical calculation and Administrative Memo #17 were used to determine a reasonable rate of diversion.

$$Q = (2.0 \text{ Hp})(8.8)(0.80 \text{ efficiency})/(20 \text{ ft lift}) + (2.31)(45 \text{ psi}) = 0.11 \text{ cfs}$$

Theoretical Calculation= 0.11cfs

Permit allowed = 0.05cfs

Recommendation= 0.04cfs

BU Limit= 0.04cfs

Comments:

Approximately 1.2-acre of irrigation was measured via ArcGIS and Bonner County imagery using the permit holder's map (figure 1) as a reference. A phone call with the permit holder Mary Markwardt, April 22, 2024, who confirmed the irrigated areas in a map submitted via email. The permit holder submitted additional photos of the 2 Hp pump, fish screened intake, and one of the Hunter sprinkler heads used throughout the irrigation POU (Photos 1-3). Mary noted that the system uses a variety of rotary sprinklers in open areas and umbrella sprinklers in other areas. The permit holder also stated that the parcel lines on imagery are not correct as the boundaries are actually further to the southeast and that the lawn is irrigated to the roadside in the southwest of the parcels.

The theoretical calculation determined approximately 0.11cfs is possible with a 2.0 Hp pump. However, according to Administrative Memo #17 up to 0.03cfs per acre is standard for the irrigation of up to 5 acres, and the irrigated POU is approximately 1.2 acres. I recommend a diversion rate of 0.04cfs for the license, as per Administrative Memo 17.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 1.2\text{-acre} \times 3.0 \text{ AF} = 3.6 \text{ AF}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.04\text{cfs} \times 214 \text{ days} \times 1.9835 = 17.0 \text{ AF}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 3.6 \text{ AF}$$

Comments:

The measured POU is approximately 1.2 acre. I recommend an annual volume 3.6 AF on the license for the irrigation of 1.2 acre, as per the headgate calculation above.

G. PURPOSE OF USE

Irrigation ☒ Y ☐ N # Stock ☐ NA Domestic # of Homes ☐ NA

Change in Purpose of Use? ☐ Y ☒ N

Method of Determination: Bonner County Maps, GIS, and Tax lot Data

H. NARRATIVE/REMARKS/COMMENTS

This permit for the irrigation of 1.5-acre qualifies for an in-office examination for license. The permit holder submitted the Proof of Beneficial Use, received by IDWR on November 28, 2023, stating in section #3 that the beneficial use was developed for 1.5 acre of irrigation. After correspondence I was able to confirm approximately 1.2-acre of irrigation was developed using aerial imagery (Figures 2 - 4) and the map submitted by the permit holder outlining the irrigation POU and POD (Figure 1). The permit holder confirmed that property imagery and parcel layers are misaligned in the local GIS data. The parcel irrigation POU is adjacent to the road in the southwest and the actual property boundaries are further southeast than apparent in current imagery.

A theoretical calculation confirmed that the pump could deliver the rate on the permit. The irrigation place of use confirmed for the license is 1.2 acre. I recommend the license be issued for a rate of 0.04cfs, as per Administrative Memo #17. I recommend the license be issued for an annual volume of 3.6 AF for the irrigation of 1.2-acre, based on the field headgate calculation in section F of this report.

I recommend the license be issued with conditions X59, X60, R66, & 004. Condition 029 should be removed from the license as the permit holder confirmed that there is a screen installed at the intake.

Have conditions of permit approval been met? X Yes No

I. RECOMMENDATIONS

1. Recommended Amounts:

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
IRRIGATION	04/01 TO 10/31	0.04 CFS	3.6 AF
	<u>Totals:</u>	0.04 CFS	3.6 AF

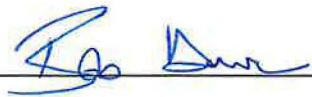
2. Recommended Amendments:

 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

Other: < >

J. AUTHENTICATION- Bob Howe- Water Resource Agent

Field Examiner's  Date 7-29-2024

Reviewer  Date 8/1/24



Figure 1- Image submitted by the permit holder of the irrigation POU (outlined in black) and the POD (point in the NE corner of the POU).



Figure 2- Bonner County GIS- imagery of the parcels appurtenant to the permit POU (centered) and neighboring parcels. Note, several boundaries run through homes, the imagery is offset to the parcel lines.



Figure 3- Bonner County GIS imagery- Both Irrigated POU measurements areas are stacked and shaded in highlighted boundary is the top layer. Approximately 1.2 acres of irrigated area determined using an ArcGIS measurement and measurements made with the Bonner County imagery using a map submitted by the permit holder as a reference.



Figure 4- GIS 2023 Imagery- Confirmed POU (outlined in blue) and POU (blue point in the northeast of the parcel).



Photo 1 (left)- Hunter popup sprinkler head variations of which are used throughout the POU.
Photo 2 (right)- Fish screen on the intake below the highwater mark of the lake.

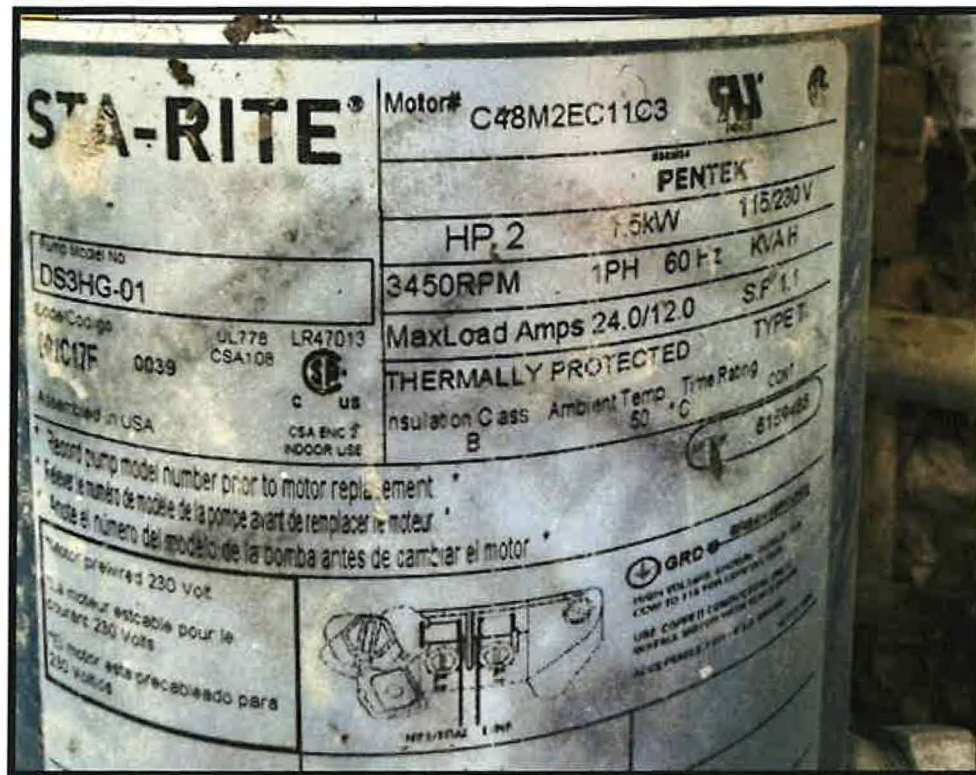


Photo 3- The Sta-Rite 2 Hp pump used for the irrigation system.