

STATE OF IDAHO  
DEPARTMENT OF WATER RESOURCES  
BENEFICIAL USE FIELD REPORT

**A. GENERAL INFORMATION**

Permit No: 67-15327

Exam Date: 10/26/20

## 1. Current Owner:

DONALD SHERRY 2335 MILL CREEK RD COUNCIL ID 83612-5220 AND/OR  
DEBI SHERRY 2335 MILL CREEK RD COUNCIL ID 83612-5220

3. **SOURCE:**

GROUND WATER

**Method of Determination:** Permit application, ArcMap, aerial imagery, and USGS topography. Pond was excavated and naturally filled with groundwater.

**B. OVERLAP REVIEW**

## 1. Other water rights with the same place of use:

NO Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A	N/A	N/A	N/A

Comments: No other aesthetic storage rights exist on property.

## 2. Other water rights with the same point-of-diversion:

NO Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A	N/A	N/A	N/A

Comments: None

**C. DIVERSION AND DELIVERY SYSTEM**1. **LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER SE¼ SW¼, Sec. 35, Twp 17N, Rge 01W, B.M. ADAMS County

Method of Determination: Permit application, ArcMap, aerial imagery, and USGS topography

**PLACE OF USE:** AESTHETIC STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
17N	01W	35												X					

Method of Determination: Permit application, ArcMap, aerial imagery, and USGS topography

## 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
85568	RPS SOLAR PUMP	1.07	N/A	RPS SOLAR PUMP	N/A

**D. FLOW MEASUREMENTS**

No flow measurements taken, in office exam.

**E. FLOW CALCULATIONS**

x

Additional Computation Sheets  
Attached

Theoretical Flow calculation:

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

Pump Horsepower	1.07 hp
Pumping Level	80 ft.
Discharge Pressure	30-50 psi
<b>Rate of Flow (cfs)</b>	<b>0.04 cfs</b>

**F. VOLUME CALCULATIONS**

## 1. Volume Calculations for irrigation:

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} =$$

## 2. Volume Calculations for Other Uses:

Using the Pond Loss Calculation Spreadsheet, GIS, and depth approximations the following theoretical calculations were determined:

Surface area (GIS): 0.04 acres

Average pond depth: 2.5 feet

Pond Evaporation and seepage: 1.1 af

**Pond Capacity (Spreadsheet): 2.1 af**

**G. NARRATIVE/REMARKS/COMMENTS**

On September 10, 2020 Don and Debbi Sherry submitted proof of beneficial use for water permit 67-15327. Based on the information provided in the water right file, this qualifies for an in office field exam. The ArcMap taxlot data from Adams County states that the land is owned by Donald and Debi Sherry.

The place of use had to be determined based on aerial photography. Aerial photos from 2019 (the year closest to when beneficial use was submitted) showed the pond as developed per the permit pond specifications. For the license, the POU will be drawn where the pond appears in the aerial photography.

While conducting the overlap analysis, there were several other water rights found in the same general QQ as the land described in this permit. The analysis found that all other water rights are pertinent to neighboring properties. Analysis can be viewed in attached spreadsheet.

The system diverts water using a solar pump using a 1.07 hp pump with a 0.04 cfs capacity and delivers 0.04 cfs of groundwater to the pond. Based on aerial photography, the pond appears to have a surface area of approximately 0.04 acres. Department standards suggest multiplying the maximum depth by 0.4 in order to get an average depth, in this case the pond has an average depth of 2.5 feet.

Based on the spreadsheet included with Administrative Memo 67, the pond would require 0.6 AF for evaporation and 0.5 AF for seepage each year. This means the total capacity of the pond will be 1.0 AF to be used for the initial filling or carryover storage of the pond and 1.1AF for the replacement of losses caused by seepage and evaporation.

Totaled, the pond would require and will be licensed for 2.1 AF and 0.04 CFS for diversion to storage.

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>
DIVERSION TO STORAGE	01/01 to 12/31	0.02 CFS	
AESTHETIC STORAGE	01/01 to 12/31		2.1 AF
<u>Totals:</u>		0.02 CFS	2.1 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 Kate Huelse - Water Resource Agent

Field Examiner's Name Kate Huelse Date 10/27/20

Reviewer \_\_\_\_\_ Date \_\_\_\_\_

**FIELD EXAM CHECKLIST**
 PERMIT # 67-15227 STAFF K Hulse DATE 10/26/20
**PREPARE LICENSING FILE (Left side)**

- ☒ Copy of permit approval & proof report (place on top)  
☒ Copy of original application for permit  
☒ Copy of Proof of Beneficial Use Exam fee required \$\_\_\_\_\_ Exam fee paid \$\_\_\_\_\_  
 \_\_\_\_\_ Copies of any Amendments/Assignments/Ownership Docs

**EXAM PREPERATION (Right side)**

- \_\_\_\_\_ Blank Beneficial Use Field Report form  
 \_\_\_\_\_ Aerial photo (system diagram map to be completed with permit owner)  
☒ Well log (attach to field exam)  
 Conditions: Measuring device requirements? NO Installed? \_\_\_\_\_  
 Other (supplemental conditions, limits, etc.)? \_\_\_\_\_  
 Overlap: POD? NO  
 POU? NO

Ownership

Taxlot / ID SOS match?

If new owner, collect Assignment of Permit form / Ownership Change form in field.

**EXAM APPOINTMENT**

owner or rep phone #? \_\_\_\_\_

Owner or rep will be present at exam (someone familiar with system)<sup>1</sup>?

Exam date/time/place?

If cannot get from web or other references: directions to site? approx driving time from office?

System on/operating normally during exam (not always required)?

**SYSTEM INFO**Pump Diversion

Approx HP?

Owner can provide pump curve?

Pump set or lift?

Approx operating psi?

Approx mainline pipe diameter?

Approx # sprinklers? Nozzle size?

Gravity Flow

Ditch capacity?

Weirs or Flumes installed?

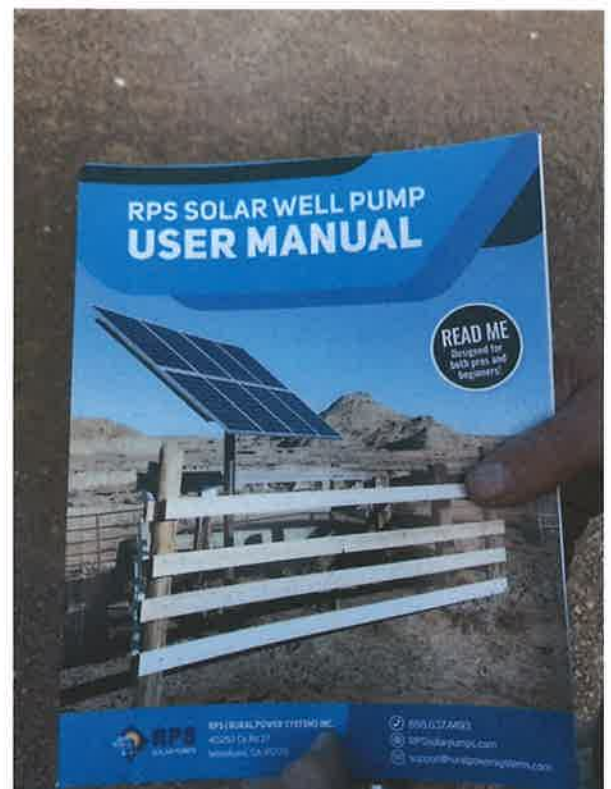
Special Remarks:**POST FIELD EXAM**

- ☒ Exam date data entered  
☒ Ad Hoc data entry & license shapes  
☒ Exam file prepared – see N:\WR Field Exams\LicenseFileOrganization  
☒ Licensing amendments required \_\_\_\_\_ If so, received?  
☒ Draft license & WR Layout maps **OR** \_\_\_\_\_ Void permit

<sup>1</sup> OK to do exam w/o anyone present if owner agrees in advance, provides info so you can find p/d, how system works, how recognize p/u etc. Usually limited to small systems – spring/creek/well for cabins, few acres irrigation, minor stockwater/wildlife/recreation etc.



RPS Solar Well Pump, 800 Watt  
1.07 hp. Diverts groundwater  
to aesthetic storage.



THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 67-15327  
 Reviewer: Kate Huelse  
 Date of Review: 10/26/2020

P/D No.:	Scenario 1	Scenario 2	Scenario 3
PUMP HORSEPOWER	1.07	1.07	1.07
BOOSTER HORSEPOWER	0	0	0
PUMPING LEVEL	80	80	80
DISCHARGE PRESSURE	30	40	50
RATE OF FLOW (cfs)	0.04	0.04	0.03 0.04

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,  
 No Friction

**Examiners Notes:**

A pump horsepower of 1.07 was used based on the information given by Debi Sherry. Lift was measured using the well drillers report, static water level is 45 feet and the screen was installed from 100 feet to 121 feet, assuming the pump sits about 20 feet above the screen lift is 75 feet. A range of discharge pressures were used from 30-50 psi. Theoretical average flow rate is 0.04 cfs.



## Seepage Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total annual seepage losses from a pond.

FILE NUMBER	67-15327
REVIEWER	Kate Huelse
DATE	10/19/2020

User Input
Calculated value
Formula Explanations

### INPUTS

Pond Surface Area (AC.)	0.4	AC.
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Pond Surface Area (SQ. FT.)	17424	SQ. FT.
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I used the following method to obtain my Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	CL	
Suggested Seepage Rate (FT./DAY)	0.0030	FT./DAY

Formula: (Surface Area X Seepage Rate) X 7.48 = Gallons Per Day Loss
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Convert to GPD	391	GPD
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Total Seepage Loss (AFA)	0.4	AFA
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Though sand and gravel seepage rates may actually be higher, the maximum allowable rate is 0.2 ft/day, pursuant to Administrative Memo "Seepage Loss Standards for Ponds and Reservoirs."

Suggested Seepage Rates for Different Soil Types:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.2 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.02 ft per day
SC (clayey sands, sand clay mixtures) = 0.007 ft per day
CL (Low to medium plasticity clays) = 0.003 ft per day
MH, OH, PT and CH (high plasticity clays) = 0.0003 ft per day
LINED PONDS (liners can be chemical, fabric, or bentonite) = 0 ft per day
Ponds Intercepting Groundwater (excavated ponds filled by ground water) = 0 ft per day

**PLEASE NOTE:** The initial basis for the Suggested Seepage Rates in the table above is found on Page 16 of Seepage from Fish Ponds, Bulletin 599, August 1989 Alabama Agricultural experiment Station, Auburn University, Auburn University Alabama. If you don't know the soil type, please refer to the map provided at the NRCS Web Soil Survey (Tab #1), an ArcMap Soil Classification Map (Tab #1.1), or published NRCS Soil Survey (Tab #1.2). Use "0" if the pond fill relies on the water table.

## Evaporation Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	67-15327
REVIEWER	Kate Huelse
DATE	10/19/20

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:

P = Precipitation
ET= Evapotranspiration
P <sub>d</sub> = Precipitation deficit
P <sub>d</sub> =ET-P

### USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation Deficit for a station most representative of the pond under examination. The Precipitation Deficit is the total amount of free water surface evaporation minus the precipitation for a given area, which gives the total amount of evaporative losses incurred by the pond. There are several weather sites that are used throughout the state. IDWR staff can find the nearest site using Arc Map. The shape file containing the sites can be found at X:/Spatial/Climate/ETIdahostations.shp.

### Instructions:

1. Use the link below to navigate to ET Idaho 2012.
2. Select the station which is most representative to your pond location.
3. Click Submit Query.
4. Under "Land Covers with Evapotranspiration Estimates," select "Open Water - Shallow Systems (ponds, streams)" or "Open Water - small stock ponds" depending on the pond size.
5. Click the link to "Precipitation Deficit."
6. Reference and copy (ctrl + C) the first subheading "Mean" values.
7. Click the "Paste Values from ET Idaho" button. The table will automatically enter a zero (0) for any negative precipitation deficit values.

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

### Precipitation Deficit

Station: Council (NWS -- USC00102187)

Month	mm/day <sup>1</sup>	Days per month	mm/Month
Jan	-2.32	31	0.00
Feb	-1.38	28	0.00
March	-0.31	31	0.00
April	1.23	30	36.90
May	1.94	31	60.14
June	2.87	30	86.10
July	3.92	31	121.52
August	3.45	31	106.95
September	2.02	30	60.60
October	0.34	31	10.54
November	-2.06	30	0.00
December	-2.73	31	0.00

**PLEASE NOTE:** The seasonal average for precipitation deficit should not be used for calculations because precipitation often exceeds evaporation during wetter months of the year. If the pond is kept full, excess precipitation during wetter months does not serve to refill the pond during drier months.

For example, see Sandpoint KSPT (NWS -- 108137), the annual precipitation deficit is -106 mm. However, April through September have positive precipitation deficit values. To properly estimate the annual volume of water necessary to refill a pond due to evaporation losses, the table will automatically enter a zero (0) for each month that the precipitation value is reported as a negative value.

As described above, precipitation offsets evaporation in winter months, so the net effect is that wintertime precipitation deficit is usually zero.

Total mm/year = 482.75

$$[(482.75 \text{ mm/yr}) \div (\text{convert to feet})] \times (\text{Surface area of pond, in acres}) = \text{Evaporation Loss in Acre Feet}$$

$$(482.75 \div 304.8) \times 0.40 = 0.6 \text{ AFA}$$



## Total Storage Calculations

FILE NUMBER	67-15327
REVIEWER	Kate Huelse
DATE	10/19/2020

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.

User Input
Calculated value
Formula Explanations

Surface Area (AC.)	0.4	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	2.5	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you know the maximum depth and not the average depth, the Field Examiner's Handbook suggests multiplying the maximum depth by 0.4 to get the average depth, or you can use any method that seems reasonable to attain average depth.
Pond Capacity (AF)	1	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. <b>Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.</b>
Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	0	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 acre feet from the initial fill = 5 acre feet of additional storage needed). <b>Note: You must have a "From Storage" component exceeding the initial fill on the permit to include a volume in this space.</b>
Estimated Seepage Loss (AF)	0.4	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.6	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	2.1	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Loss, and Evaporation Loss amounts to determine the total amount of storage required.

Flow Rate into Pond (CFS)	0.02	The "Flow Rate into Pond" depicts the actual flow, either measured or estimated, into the pond. For offstream facilities, this will be equivalent to "diversion to storage" rate.
Highest Daily Evaporation Rate From Evaporation Tab. (mm/Day)	3.92	This number is carried over from the "Evaporation Loss" sheet. It is the highest recorded number in the "Precipitation Deficit Table".
Required Daily Maintenance Volume (AF/Day)	0.01	"Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year to maintain pond volume. It is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (CFS)	0.00	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determined by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	30	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i>
Days Required to Fill the Pond at 13,000 Gallons per Day	30	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i> Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.

# Soil Classification with Published Soil Surveys

Alternative to Soil Classification with the NRCS Web Soil Survey

This spreadsheet has been designed by Idaho Department of Water Resources to determine the soil type and classification at the pond site.

FILE NUMBER	67-15327
REVIEWER	Kate Huelse
DATE	10/19/2020

User Input
Calculated value
Formula Explanations

County: Adams, Idaho

## 1. Navigate to the NRCS Soil Survey Website

NRCS Published Soil Surveys for Idaho found at:

<https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=ID>

Reviewer used the Survey entitled:

Adams County Area

## 2. Use GIS and the Soil Survey to determine Soil Type

Utilize ArcGIS to Obtain the Soil Symbol (may be a number or abbreviated name)

The shapefile SSURGOOnePlan is found at X:\Spatial\Soils\SSURGOOnePlan\soils.shp

Soil Symbol (GIS field MUSYM):

7

What if my Soil Symbol is 999?\* (see box)

Find the name of the soil in the Soil Legend.

The Soil Legend is typically the last bookmark in the Soil Survey report.

The Full Name of This Soil is:

Appledellia Loam, 4 to 8 percent slopes

## 3. Use the Soil Survey to determine the USCS Classification

Within the county NRCS Soil Survey report, click the bookmarked link to "Tables."

Scroll down until you reach a table called "Engineering Properties and Classifications" or "Engineering Index Properties." The table is ordered by soil symbol and the soil name.

Scroll down until you reach the soil which matches your soil symbol and name.

The table lists the USCS Classification for each depth in the soil profile.

Be sure to use the predominant soil classification for the pond depth where seepage occurs.

If the pond has a greater depth than the soil survey, use data from the lowest depth reported.

Pond Depth: 5 feet = 60 inches

The Soil Survey states the soil USCS Classification at 60 inches is CL

Signature of Principal Driver and my operator are required.