

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 93-7213

Exam Date: 5/22/2013

1. Current Owner: PHILIP SERGENT

And/Or

MARIA SERGENT
3676 FOUR CORNERS RD
TENSED ID 83870
(208)274-2804

2. Accompanied by:
- Philip Sergent

Phone No: Same as AboveAddress: Same as AboveRelationship to Permit Holder: Owner

- 3.
- SOURCE

SPRING

TRIBUTARY

SINKS

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 93-7427
2. Other water rights with the same point of diversion: None

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

SPRING NW1/4SW1/4SE1/4 Sec. 9, Twp 44N, Rge 04W, B.M. BENEWAH County

Method of Determination: GPS and Visual Inspection

2.

PLACE OF USE: STOCKWATER STORAGE

Twp Rge Sec	NE				NW				SW				SE				Totals
44N 04W 9	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
															X		

Method of Determination: GIS, Goggle Maps, and Visual Inspection

- 3.
- YES
- Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.

YES Aerial Photo Attached (required for irrigation of 10+ acres).YES 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
N/A					

*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						

2. Measurements: This is pond developed over the top of spring, so no measurement was possible.**E. FLOW CALCULATIONS**X Additional Computation Sheets Attached

Measured Method:

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = \underline{1 \text{ acres} \times 3 \text{ af} = 3 \text{ af.}}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = \underline{0.03 \text{ cfs} \times 214 \times 1.9835 = 12.7 \text{ af}}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \underline{3 \text{ af}}$$

2. Volume Calculations for Other Uses:

The pond capacity was calculated at 0.32 acre feet of volume with 0.08 acre feet for evaporation for a total of 0.4 acre feet of storage. There is no seepage, since this is an on-stream pond. The owner stated this pond was 20 feet in the middle of the pond. Using the field examiner's handbook, I multiplied the deepest portion of the pond by 0.4 to attain the average depth of 8 feet ($0.4 \times 20 = 8 \text{ ft}$). The owner stated that approximately 24 head of cattle and horses use this pond for stockwater. Range cattle and horses both consume 12 gpd per the Field Examiner's handbook. The volume need for stockwater is equal to the capacity of the pond, so no additional water is needed beyond the 0.4 af for capacity and evaporation.

$$12 \text{ gpd stock} \times 24 \text{ head} \times 365 \text{ days} / 325850 = 0.3 \text{ total annual acre feet of use per year.}$$

G. NARRATIVE/REMARKS/COMMENTS

This is a small pond that has been excavated over a spring. There is some runoff water that is captured early in the year, but it was not present at the time of my field exam in May, so I am assuming that there isn't much runoff water available.

The application for this permit was filed and advertised with stockwater and stockwater from storage uses. The stockwater from storage was removed by Department staff at the time the permit was issued. The permit stated it was for stockwater purposes only. During the field exam, I discovered that the owner developed the spring by constructing a small pond with no pumps or other means to divert the water from the pond. I discussed this permit with administration, and it was determined that there was enough confusion during the permitting of this field exam, that it would be acceptable to change the use from stockwater to stockwater storage to better define the water use without seeking a licensing amendment. There was no enlargement of the permit, since the stockwater use sought is greater than the capacity of the pond. The stockwater use is for 0.3 af and the pond capacity of the pond is 0.3 and it has minimal evaporation of 0.1 af, so the 0.4 af shouldn't be considered an enlargement of the original permit.

Water right 93-7427 is a ground water North Idaho Adjudication (NIA) claim that was filed for the home and stockwater purposes. This water right is limited to 13,000 gallons per day per the NIA recommendation. The stockwater portion of 93-7427 is for the same 24 head of stock described in this water right. Since water right 93-7427 has not been decreed yet in the NIA and it is a Beneficial Use Claim, I did not include any combined limitation conditions, because this claim could be denied in the NIA court.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS**1. Recommended Amounts**

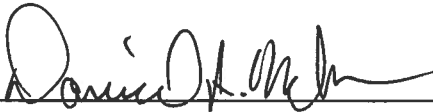
<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
STOCKWATER STORAGE	01/01 to 12/31		0.40 AF
<u>Totals:</u>			0.40 AF

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 Daniel A. Nelson – Staff Hydrologist

Field Examiner's Name  Date 10-17-2013

Reviewer _____ Date _____

State of Idaho
Department of Water Resources

Field Exam

93-7213

This map depicts the STOCKWATER STORAGE 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.

04W



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

0 0.01 0.02 0.04 Miles



NESW

NWSE

System Diagram - 93-7213
By Dan Nelson

This is a small pond that has been excavated over a spring. There is some runoff water that is captured early in the year, but it was not present at the time of my field exam in May, so I am assuming that there isn't much runoff water available.

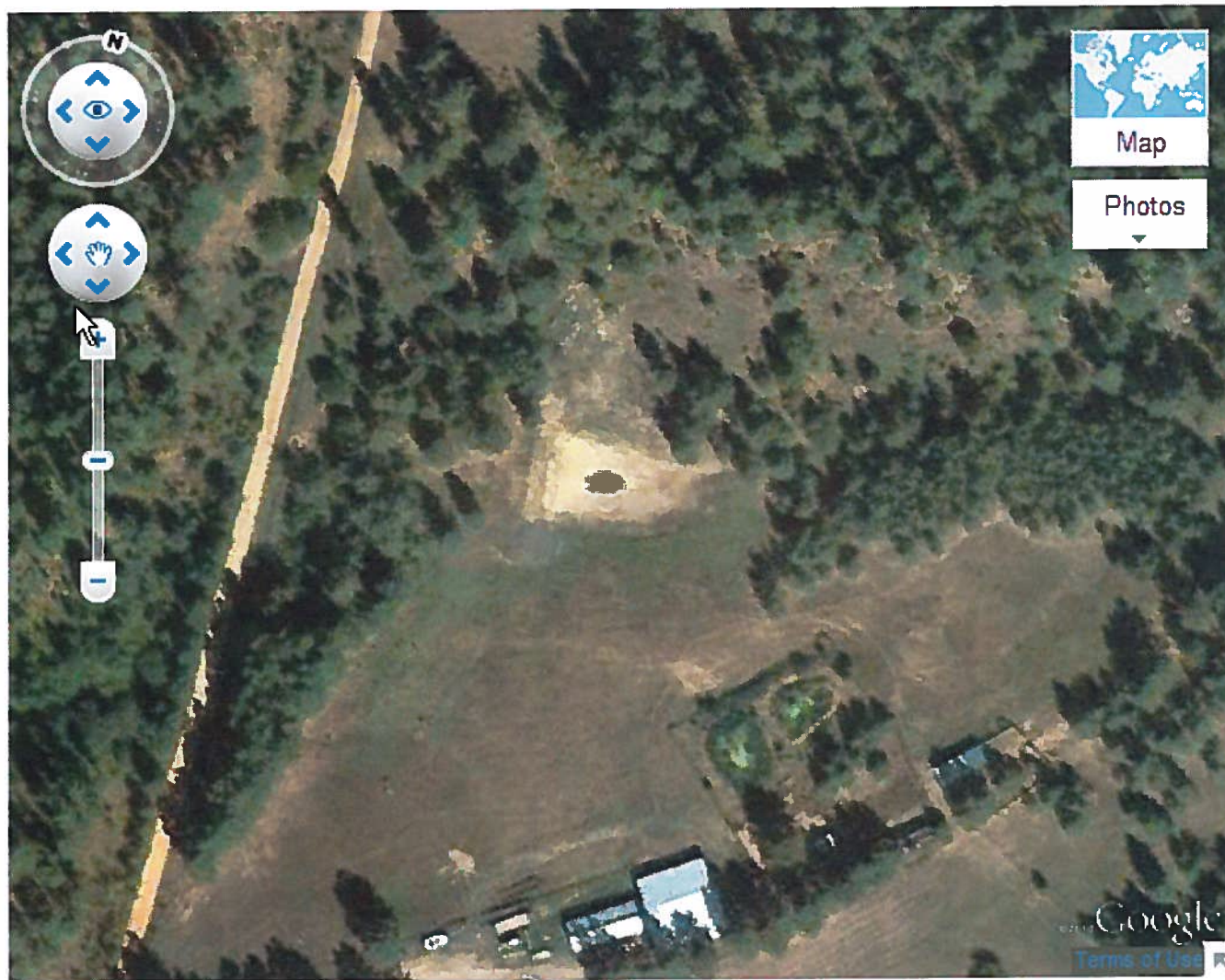
9

44N04W

0.04 acre Surface area of Pond.

SESW

SWSE



This is a photo from Google Maps that show the pond. I transposed this map onto the ESRI map we have in our files.

TOTAL STORAGE

FILE NUMBER	93-7213
REVIEWER	Dan Nelson
DATE	5/22/2013

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

Surface Area (in Acres)	0.04	"Surface Area" is automatically carried over from the "Seepage Loss Sheet"
Average Pond Depth (in feet)	8	"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 suggest multiplying the maximum depth by 0.4 to get the average depth, or you can use any method that
Pond Capacity (in acre feet)	0.32	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

Volume Needed Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (in acre feet)	0	The "Volume Needed 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). PLEASE NOTE: You must have a "From Storage" component exceeding the Initial fill on the permit to include a volume in this space.
Estimated Seepage Loss (in acre feet)	0.0	The "Estimated Seepage Loss" is automatically carried over from the Seepage Loss Sheet
Estimated Evaporation Loss (in acre feet)	0.0	The "Estimated Evaporation Loss" is automatically carried over from the Evaporation Loss Sheet
Total Volume Required (in acre feet)	0.4	"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 (in cfs)	1.00	The "Flow Rate" into the Pond depicts the actual flow either measured or estimated into the pond.
Highest Daily Evaporation Rate From Evaporation Tab. (in mm/day)	3.24	This number is automatically selected by picking the highest recorded number in the "Precipitation Deficit Table".
Maximum Required Daily Maintenance Volume (in acre feet per day)	0.00	"Maximum Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year, and 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 (in cfs)	0.00	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determine 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	0	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. This number should be between 1 and 365 days for a project to be successful.
Days Required to Fill the Pond at 13,000 gallons per day	8	The "Days Required to Fill the Pond at 13,000 gallons per day" is calculated converting the "Pond Capacity" and the "Maximum Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Maximum Daily Maintenance Volume" in gallons to determine the number of days to fill pond. This number should be between 1 and 365 if this pond is to described as a domestic use.

User Input
Calculated value
Formula Explanations

Evaporation Loss Calculation

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

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

P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

USING THIS SPREADSHEET

To ascertain the evaporation from a pond, you will need to go to the Kimberley Research Center website. The link is found below. This web site provides the Precipitation Deficit for the area where the pond is located. The Precipitation Deficit is the total amount of free pan 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, and the entire state is pretty much covered. 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.

User Input

Calculated value

Formula Explanations

Found at: <http://www.kimberly.uidaho.edu/ETIdaho/online.php>

Precipitation Deficit

Station: Twin Falls 2 NNE (NWS - 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	0.00	31	0.00
Feb	0.00	28	0.00
March	0.00	31	0.00
April	0.33	30	9.90
May	0.78	31	24.18
June	2.20	30	66.00
July	3.24	31	100.44
August	3.14	31	97.34
September	1.61	30	48.30
October	0.00	31	0.00
November	0.00	30	0.00
December	0.00	31	0.00

PLEASE NOTE: We cannot use the season average, because there are several areas in Northern Idaho with a negative Precipitation Deficit. Therefore, we must enter each monthly deficit, and enter in a zero (0) for each negative month. The reason for this is that precipitation can only offset evaporation to the extent of the evaporation.

Please enter the daily average Precipitation Deficit as shown in the example below.

Although it has sometimes been useful to consider wintertime evaporation to be zero, Allen and Robison (2007, p. 169) noted, "Evaporation during nongrowing (wintertime) periods varies widely"

¹Negative monthly mean values should be entered in the above table as "0".

Total mm/year = **346.16**

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

(**346.16** $\div$ **304.8**) $\times$ **0.04** = **0.0 AFA**

Surface Area of Pond is automatically Carried over from the Seepage Loss Sheet.

SEEPAGE CALCULATIONS

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

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User Input
Calculated value
Formula Explanations

INPUTS

SQ. FT. Calculator
Pond Surface area in acres
0.04

POND SURFACE AREA (SQ. FT.)	1742
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SUGGESTED SEEPAGE RATE (FT/DAY)	0.0000
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Use the table below to find the "SUGGESTED SEEPAGE RATES".

FORMULA: (Surface Area X Seepage Rate) / 7.48 = Gallons Per Day loss

CONVERT TO GPD	0	GPD
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TOTAL SEEPAGE LOSS (AFA)	0.0	AFA
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SUGGESTED SEEPAGE RATES FOR DIFFERENT SOIL TYPES:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.20 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.016 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 with shallow 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 X:\Spatial\Soils\USCS\PondSoils.lyr. Use "0" if the ponds intersect the water table.

ET_{Idaho} 2012 -- Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho

Please send suggestions for improving this site to robison@kimberly.uidaho.edu Copyright 2012, University of Idaho.

Potlatch 3 NNE (NWS -- 107301)

Statistics based on thirty year normal spans 1969 to 2001 years

For a different land cover or crop click on the above link.

You can highlight this table and copy via the clipboard to a Microsoft Excel or OpenOffice spreadsheet to plot or otherwise work with this data.

Open water - shallow systems (ponds, streams)															
Precipitation Deficit (Click here for a graph)															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Growing Season ^a	Non Growing Season ^b	Annual
Mean ^j	mm/day												mm		
Monthly ^c	-2.20	-1.57	-0.74	0.33	0.78	2.20	3.24	3.14	1.61	0.09	-2.26	-2.17	73	0	73
15-Day Moving Average ^d	-2.31	-1.83	-0.81	0.32	0.86	2.20	3.19	3.05	1.44	0.01	-2.29	-2.07			
7-Day Moving Average ^e	-2.26	-1.64	-0.74	0.29	0.84	2.18	3.22	3.09	1.49	0.06	-2.30	-2.18			
3-Day Moving Average ^f	-2.22	-1.54	-0.74	0.29	0.79	2.17	3.24	3.14	1.57	0.08	-2.27	-2.19			
Standard Deviation ^k	mm/day												mm		
Monthly ^c	1.96	1.16	1.42	1.07	1.92	0.90	1.42	1.62	1.16	1.77	1.31	2.04	136	0	136
15-Day Moving Average ^d	1.98	1.56	1.52	1.45	2.06	1.30	1.45	1.68	1.60	1.62	1.65	1.90			
7-Day Moving Average ^e	2.50	2.24	2.02	2.10	2.77	1.95	1.92	2.29	2.05	2.24	2.35	2.63			
3-Day Moving Average ^f	3.35	3.08	2.75	2.95	3.84	2.81	2.68	3.04	2.69	3.06	3.30	3.48			
20 % Exceedance ^l	mm/day												mm		
Monthly ^c	-1.26	-0.51	-0.06	1.39	1.45	2.69	3.97	4.08	2.92	1.05	-1.20	-0.98	158	0	158
15-Day Moving Average ^d	0.05	0.20	1.06	2.37	3.56	4.02	4.94	4.58	3.39	1.99	0.00	0.04			
7-Day Moving Average ^e	0.47	0.99	2.04	3.16	4.28	4.75	5.32	5.04	3.78	2.51	0.72	0.38			
3-Day Moving Average ^f	0.61	1.26	2.60	3.77	4.77	5.18	5.54	5.51	4.03	2.87	1.01	0.61			

PHOTOGRAPHER AND DATE OF PHOTOS DANIEL A NELSON 5/22/2013

FILE NUMBER 93-7213



The above photo is of the pond. As you can see, the area excavated is actually larger than the actual pond. The actual pond is relatively small. Runoff can enter the pond from the west, but there was nothing running into the pond during our visit in May.