

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 96-9437

Exam Date: 5/23/2013

1. Current Owner: JAMES FISHBACK

And/Or

ANNETTE FISHBACK
PO BOX 2163
SANDPOINT ID 83864
(208)263-9336

2. Accompanied by:
- Neal Edwards

Phone No: (208) 290-5327Address: 6157 Colburn culver Road, Sandpoint, ID 83864Relationship to Permit Holder: Property Manager

- 3.
- SOURCE**

LOST LAKE

TRIBUTARY

UNNAMED STREAM

B. OVERLAP REVIEW

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

C. DIVERSION AND DELIVERY SYSTEM1. **LOCATION OF POINT(S) OF DIVERSION:**

LOST LAKE NW1/4SW1/4 Sec. 25, Twp 58N, Rge 01W, B.M. BONNER County

Method of Determination: Visual Inspection and GPS

2.

PLACE OF USE: IRRIGATION AND IRRIGATION FROM STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
58N	01W	25																	5.0

Total Acres: 5

PLACE OF USE: IRRIGATION STORAGE, FIRE PROTECTION STORAGE, AND FIRE PROTECTION

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
58N	01W	25																	X

Method of Determination: Visual Inspection and GIS

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
Lake Diversion	NONE				8 inch standpipe
Irrigation Pump	Unknown	2 Hp	Unknown	Unknown	¾ inch line

*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: The pump wasn't operating at the time of our field visit. This exam was done early in the year, so irrigation wasn't needed.

E. FLOW CALCULATIONS

X Additional Computation Sheets Attached

Measured Method:

Theoretical Calculation = 0.13 cfs
 5 acres X 0.03 cfs/ac standard = 015 cfs
 Permit allowed on 5 acres = 0.15 cfs

I recommended 0.13 cfs for this permit. The system can't operate at the full 0.15 cfs permitted, but it is very close.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 5 \text{ acres irrigated} \times 3.0 \text{ af/ac} = 15$

$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.13 \text{ cfs} \times 214 \text{ days} \times 1.9835 = 55.2 \text{ af}$

$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 15 \text{ acre feet}$

2. Volume Calculations for Other Uses:

Pond Spreadsheet = 1.6 acre feet capacity and .5 acre feet for seepage and evaporation for a total of 2.1 acre feet for pond capacity plus seepage and evaporation.

The irrigation storage component allows multiple fills to supply the 15 acre feet required to irrigate this golf course.

The total storage volume = 2.1 af pond capacity, seepage, and evaporation + 15 acre feet worth of refills under the irrigation component = 17.1 acre feet of total volume for the storage component.

G. NARRATIVE/REMARKS/COMMENTS

The water for this permit goes through an 8 inch PVC intake pipe from Lost Lake to the new pond. The outflow of the intake pipe is below water level, so I couldn't get a measurement. Although there is an actual diversion structure, the new pond sits at the location where Lost Lake overflowed into an unnamed stream. The new pond is actually an on the old stream channel. The unnamed stream now discharges out of the new pond into another 8 inch intake pipe that flows through another pipe that delivers the water approximately 165 feet to the unnamed stream. The old channel of the unnamed stream is now a fairway for the golf course.

After speaking with administration, we have decided to remove the diversion to storage, since it cannot be measured or controlled. If we did try to control this diversion, the water in Lost Lake would overflow its banks and fill the new pond anyway.

There is a 2 Hp irrigation pump out of the new pond to a buried sprinkler system that irrigates approximately 5 acres. The sprinkler system is the only means of providing fire protection, and although it seems unlikely, in the case of forest fire, they could turn on the sprinkler system around buildings for protection. The main fire protection use is the new pond's storage that would allow fire fighters to divert directly out of the new pond without reducing the water in Lost Lake.

There are no other diversions out of Lost Lake, but water right 96-9331 does divert out of pond north of Lost Lake for irrigation use. Water right 96-9331 is a separate place of use and source on different owner's property. Water right 96-7084 is for a spring for a different property. Therefore, there is no significant overlapping water rights.

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	04/01 to 10/31	0.130 CFS	15.00 AF
IRRIGATION STORAGE	01/01 to 12/31		15.00 AF
IRRIGATION FROM STORAGE	04/01 to 10/31		15.00 AF
FIRE PROTECTION	01/01 to 12/31	0.130 CFS	
FIRE PROTECTION STORAGE	01/01 to 12/31		2.10 AF
<u>Totals:</u>		0.130 CFS	17.10 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 Daniel A. Nelson Date 11-21-2013

Reviewer _____ Date _____

State of Idaho
Department of Water Resources

Field Exam

96-9437

This map depicts the IRRIGATION STORAGE, FIRE PROTECTION, AND FIREPROTECTION 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.



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

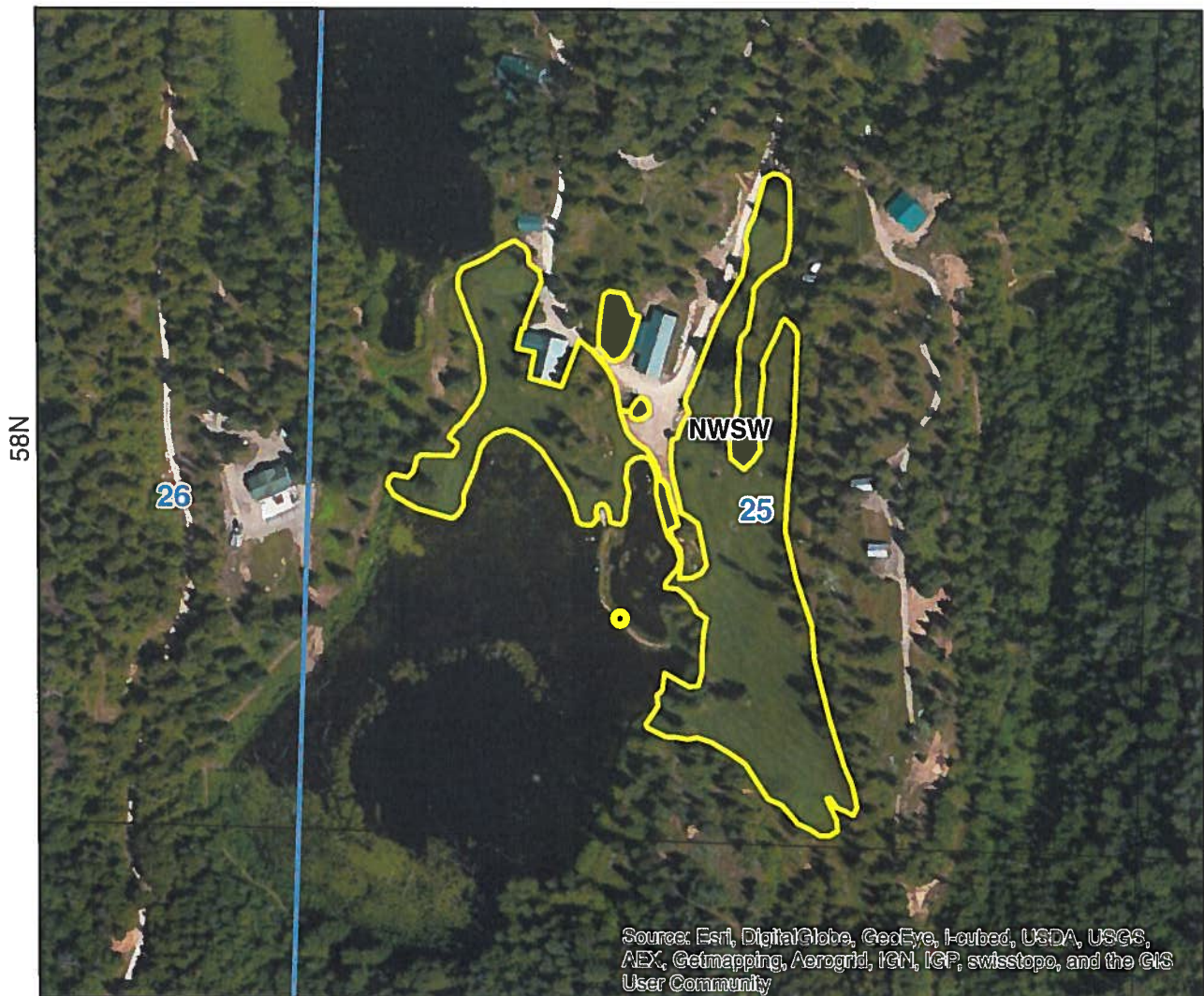
0 0.0075 0.015 0.03 Miles



State of Idaho
Department of Water Resources
Field Exam
96-9437

This map depicts the IRRIGATION AND IRRIGATION FROM 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.

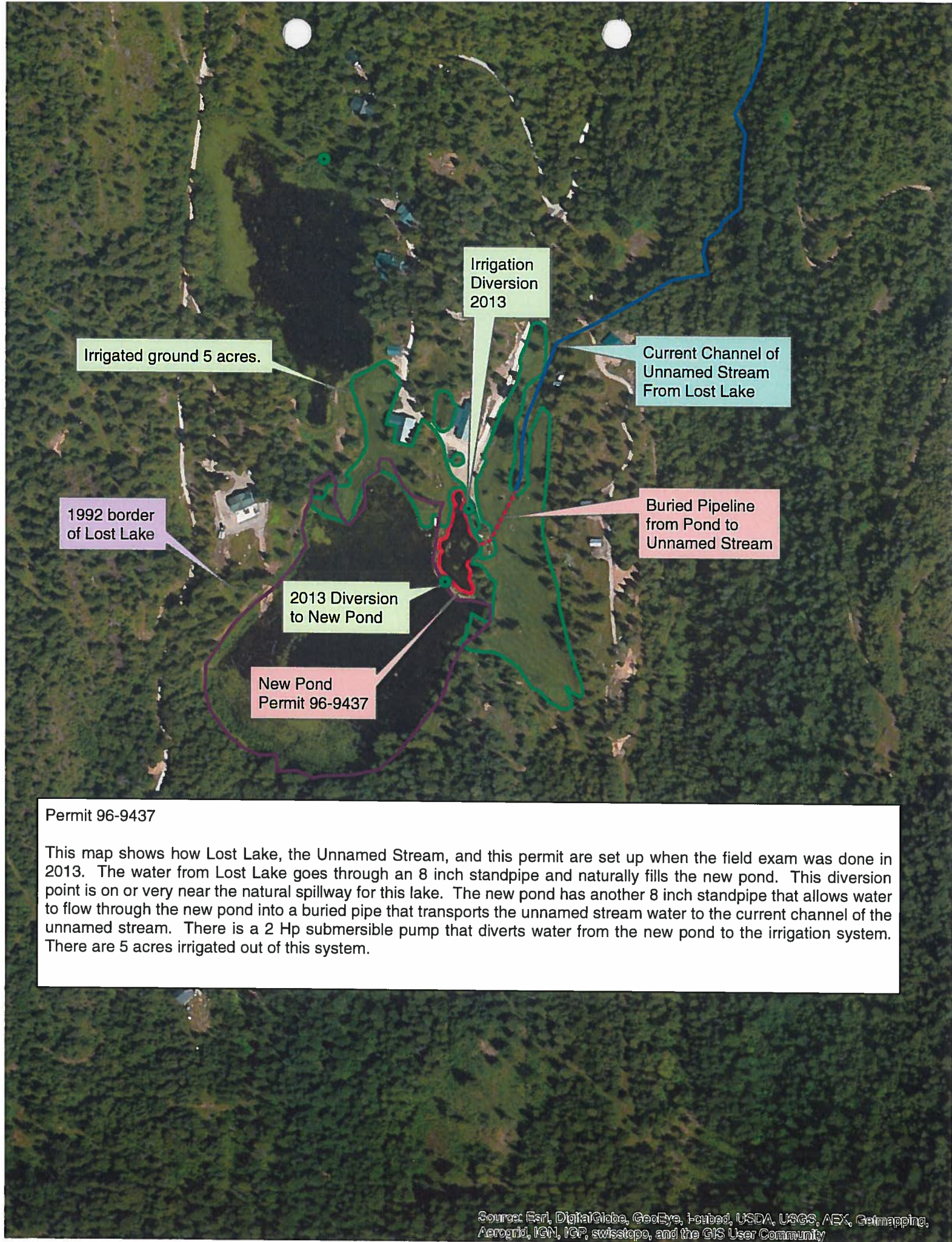
01W



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

0 0.035 0.07 0.14 Miles





Irrigation
Diversiion
2013

Irrigated ground 5 acres.

Current Channel of
Unnamed Stream
From Lost Lake

1992 border
of Lost Lake

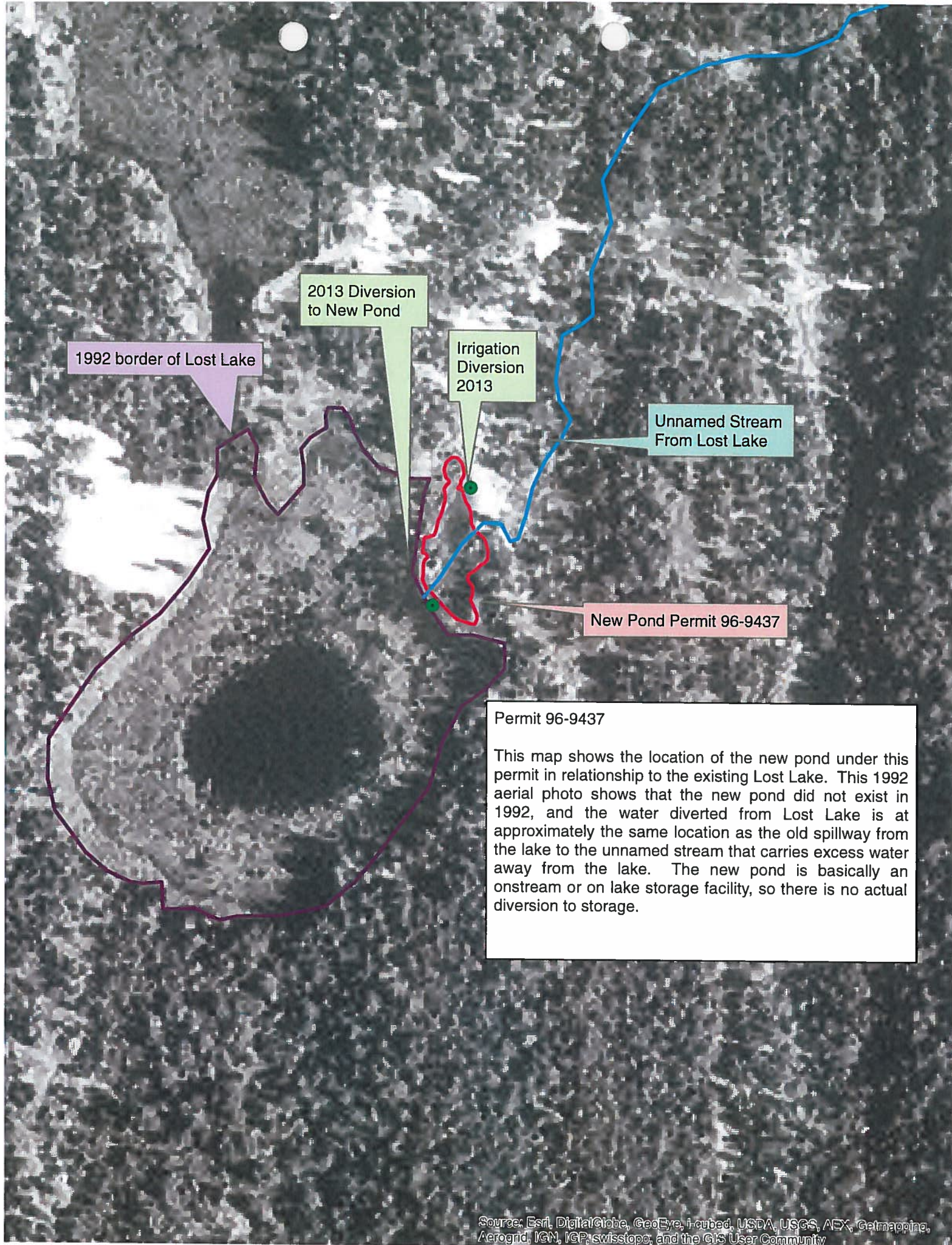
Buried Pipeline
from Pond to
Unnamed Stream

2013 Diversiion
to New Pond

New Pond
Permit 96-9437

Permit 96-9437

This map shows how Lost Lake, the Unnamed Stream, and this permit are set up when the field exam was done in 2013. The water from Lost Lake goes through an 8 inch standpipe and naturally fills the new pond. This diversion point is on or very near the natural spillway for this lake. The new pond has another 8 inch standpipe that allows water to flow through the new pond into a buried pipe that transports the unnamed stream water to the current channel of the unnamed stream. There is a 2 Hp submersible pump that diverts water from the new pond to the irrigation system. There are 5 acres irrigated out of this system.



1992 border of Lost Lake

2013 Diversion
to New Pond

Irrigation
Diversion
2013

Unnamed Stream
From Lost Lake

New Pond Permit 96-9437

Permit 96-9437

This map shows the location of the new pond under this permit in relationship to the existing Lost Lake. This 1992 aerial photo shows that the new pond did not exist in 1992, and the water diverted from Lost Lake is at approximately the same location as the old spillway from the lake to the unnamed stream that carries excess water away from the lake. The new pond is basically an onstream or on lake storage facility, so there is no actual diversion to storage.

TOTAL STORAGE

FILE NUMBER	96-9437
REVIEWER	Dan Nelson
DATE	5/23/2013

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)	0.4	"Surface Area" is automatically carried over from the "Seepage Loss Sheet"
Average Pond Depth (In feet)	4	"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
Pond Capacity (In acre feet)	1.6	you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above.

Volume Needed Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (In acre feet)	15	The "Volume Needed Above Initial Fill" is the acre-feet of water required to meet <i>afrom 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)	0.04	The "Estimated Seepage Loss" is automatically carried over from the Seepage Loss Sheet
Estimated Evaporation Loss (In acre feet)	0.44	The "Estimated Evaporation Loss" is automatically carried over from the Evaporation Loss Sheet
Total Volume Required (In acre feet)	17.1	"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 (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)	3.34	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	1	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	45	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

FILE NUMBER	96-9437
REVIEWER	Dan Nelson
DATE	5/23/2013

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

User Input
Calculated value
Formula Explanations

USING THIS SPREADSHEET

To ascertain the evaporation from a pond, you will need to go to the Kimberly 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.

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	0.56	30	16.80
May	0.91	31	28.21
June	1.69	30	50.70
July	3.34	31	103.54
August	2.91	31	90.21
September	1.65	30	49.50
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 = 338.96

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

(338.96 ÷ 304.8) × 0.40 = 0.4 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.

FILE NUMBER	96-9437
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DATE	5/23/2013

User Input
Calculated value
Formula Explanations

INPUTS

SQ. FT. Calculator
Pond Surface area in acres
0.4

POND SURFACE AREA (SQ. FT.)	17424
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SUGGESTED SEEPAGE RATE (FT/DAY)	0.0003
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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	39	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 at kimberly dot uidaho dot edu Copyright 2012, University of Idaho.

Sandpoint KSPT (NWS -- 108137)

Statistics based on thirty year normal spans 1973 to 2007 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	-3.32	-2.24	-0.87	0.56	0.91	1.69	3.34	2.91	1.65	-0.51	-3.98	-3.73	-106	0	-106
15-Day Moving Average ^d	-3.40	-2.54	-0.92	0.53	0.96	1.56	3.28	2.89	1.51	-0.47	-3.99	-3.63			
7-Day Moving Average ^e	-3.35	-2.35	-0.93	0.51	0.94	1.58	3.32	2.90	1.58	-0.46	-4.07	-3.61			
3-Day Moving Average ^f	-3.31	-2.24	-0.88	0.53	0.92	1.62	3.33	2.91	1.63	-0.49	-4.00	-3.70			
Standard Deviation ^k	mm/day												mm		
Monthly ^c	2.53	1.87	1.59	1.01	1.78	1.23	2.17	2.02	1.19	2.04	1.93	2.28	157	0	157
15-Day Moving Average ^d	2.57	2.51	1.67	1.47	1.97	1.90	2.04	1.90	1.72	1.90	2.52	2.35			
7-Day Moving Average ^e	3.49	3.39	2.26	2.30	2.69	2.71	2.33	2.52	2.24	2.52	3.75	3.40			
3-Day Moving Average ^f	4.68	4.38	3.22	3.16	3.73	3.72	2.91	3.25	2.91	3.34	5.43	4.92			
20% Exceedance ^l	mm/day												mm		
Monthly ^c	-2.25	-0.58	-0.02	1.42	1.87	2.62	4.29	4.15	2.89	0.48	-2.46	-2.40	17	0	17
15-Day Moving Average ^d	0.03	0.08	1.31	2.55	3.62	4.21	5.05	4.72	3.55	1.77	0.00	0.00			
7-Day Moving Average ^e	0.30	0.88	1.98	3.29	4.76	4.94	5.38	5.17	3.94	2.40	0.66	0.16			
3-Day Moving Average ^f	0.46	1.23	2.48	3.85	5.11	5.63	5.70	5.48	4.40	2.64	0.96	0.31			
80%	mm/day												mm		

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 96-9437
 Reviewer: Dan Nelson
 Date of Review: 5/23/2013

P/D No.:	Senerio 1	Senerio 2	Senerio 3	
PUMP HORSEPOWER	2	2	2	
BOOSTER HORSEPOWER	0	0	0	
PUMPING LEVEL	0	0	0	
DISCHARGE PRESSURE	40	40	40	
RATE OF FLOW (cfs)	0.13	0.13	0.13	AVE
	60	60	60	60

The above calculates the formula =

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

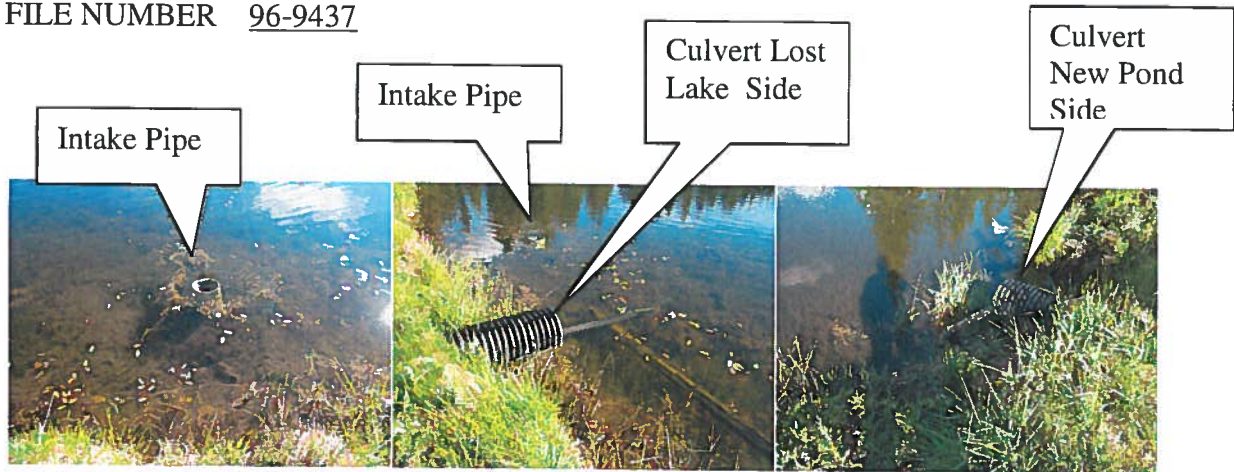
Assumptions: %70 efficiency.
 No Friction

Examiners Notes:

This is a 2 Hp submersible pump. The operating pressure was given to use from the property manager. The pump box where the pressure gauge sat as at pond level or slightly below the pond level, so there is no actual lift on this pumping plant. The system pressure is the only work against this pump.

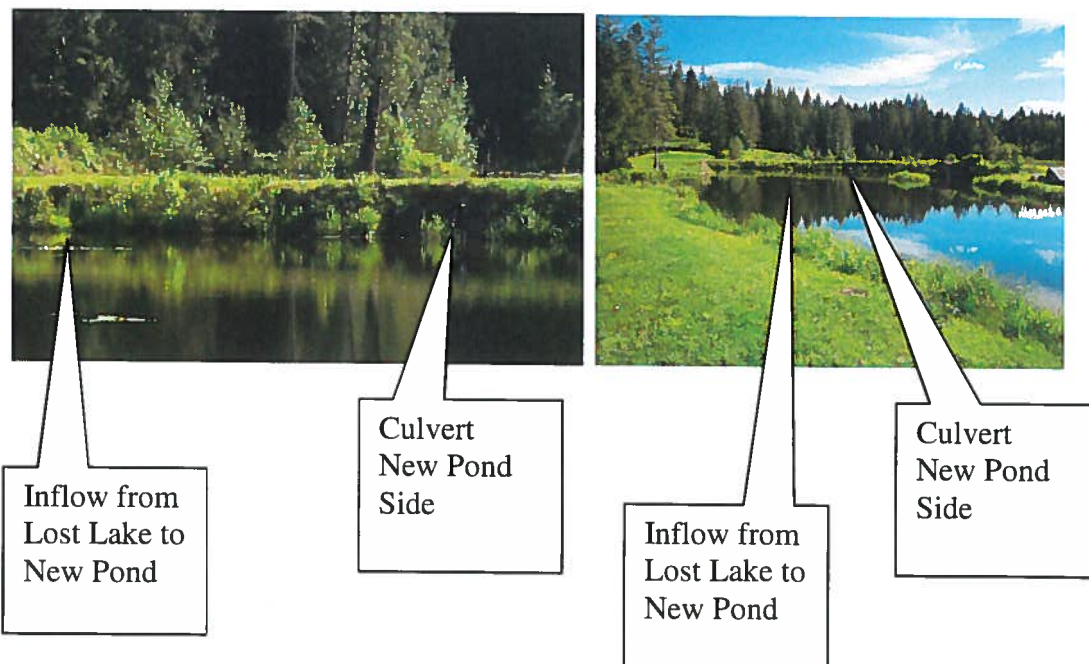
PHOTOGRAPHER AND DATE OF PHOTOS DANIEL A NELSON 5/23/2013

FILE NUMBER 96-9437



The photo in the upper left shows the intake pipe from Lost Lake into the new pond. The middle picture above shows the same intake structure in relationship to a culvert carrying an irrigation line that travels through the new pond and through Lost Lake to irrigate the ground on the west side of Lost Lake. The picture above left shows the same culvert on the new pond side. These pictures show that both the lake and the pond are almost at the same water level.

The photos below show the location of the culvert and the outflow of the diversion from the lake into the pond on the pond side. The picture to the right is a close up of the culvert and the outflow. Note the tree between the two points. The picture to the right shows the lake from the irrigation pump shed and the point of discharge and the culvert on a larger scale.



PHOTOGRAPHER AND DATE OF PHOTOS DANIEL A NELSON 5/23/2013

FILE NUMBER 96-9437



The photos above show the submersible pump with the bucket over the top of it, and the power panel that shows that this is a 2 Hp pump.

The photos below show the outflow from the new pond into the unnamed stream. The outflow is very similar to the diversion from the pond, but it doesn't have a wire screen on it. The outflow comes out of the pipe from the pond briefly and then flows into another pipe that delivers it to the unnamed stream



PHOTOGRAPHER AND DATE OF PHOTOS DANIEL A NELSON 5/23/2013

FILE NUMBER 96-9437

The photos below show the new pond. The diversion from the lake is near the small island in the photo below right.



The photos below show the irrigation in relationship to the new pond. There is also some irrigation on the other side of Lost Lake, but this is the major area irrigated from the system.

