

MEMORANDUM

TO: File 85-7642

FROM: Daniel Nelson – Staff Hydrologist

DATE: July 7, 2017

SUBJECT: Licensing Review for 85-7642

This is the licensing review of the partial field exam submitted by Sandy Hemenway formerly in our state office. The field exam was done in 2012. The system associated with this permit allowed water to be diverted from three wells and two springs to provide fish propagation storage and fish propagation for Sweetwater Aquaculture. The field exam was not completed, but I have included the incomplete field exam for reference purposes.

History:

This permit was filed for a fish rearing facility in 1997. The permit holder developed the facility, but after a couple of years found that the facility was infected with whirling fish disease. The facility had to shut down and follow a severe protocol to eliminate the disease from the facility. The facility was rented out for tropical fish rearing for a time, but the renter didn't take care of the facility and it ran into disrepair. The permit holder is now trying to restart the facility, but the cost of the re-certification and repairs has been cost prohibitive.

According to the owner, a female agent from our agency visited the site and performed measurements on the facility in the late 1990's. He couldn't remember the year or the name of the person doing the measurements. Northern Region staff and I searched the files, but could find no measurement date for this facility. The facility is less than a mile outside of the Lindsay Creek Ground Water Management Area (GWMA), so these measurements could have been done as part of the many studies that were done to create the Lindsay Creek GWMA.

In 2012, Sandy Hemenway visited the property. During my review, I was unable to confirm or determine how Ms. Hemenway came up with her flow rate recommendations, and there were some other questions that needed to be answered, so I visited the site on June 18, 2017 to complete the field examination.

Diversion Rate and Volume:

As stated above, I was unable to determine how the flow recommendation was determined in Ms. Hemenway's field report. During my visit, the permit holder gave measurement data he had collected over the years, and I performed a measurement using the Broad Crested Dam

formula found in the 1951 Mechanical Engineer's Handbook. A copy of this information is available if needed.

This type of measurement was not ideal, since I was not able to isolate the water from Well #4 and Well #1 and Well #2 were not connected into the system at the time of the measurement. However, I was able to perform theoretical calculations for Well #1 and Well #2, to find a total diversion rate from all of the water sources. My calculations were very close to the information supplied by the permit holder. Using the combination of the permit holder's information and the measurement that I performed, I was able to determine the capacity of the system without well #4. I am recommending that the diversion rate for this license be limited to 0.50 cfs. Please see my attached spreadsheet showing my calculations.

Diversion Volume and Storage Volume:

Ms. Hemenway did not provide calculations of the diversion volume or the storage volume. She had not completed this portion of the field exam report. The facility was designed to run all of the water through the ponds and then through the fish rearing facility. Therefore, the volume calculated should be considered the total volume.

Fish Propagation Storage:

The fish propagation storage is for the 7 ponds. I separated out the ponds into two sets based on the ponds average depth, and created pond spreadsheets for each set. The ponds were created in a similar fashion that allowed me to combining of the ponds for the spreadsheet. According to the spreadsheet, Ponds 1 and 2 have a capacity of 3.0 acre feet plus an evaporation and seepage rate of 1.9 af for a total of 4.9 af. Ponds 3 through 7 have a combined capacity of 3.9 af plus an evaporation and seepage rate of 3.5 af for a total volume requirement of 7.4 af. When all of the ponds are combined, the total capacity requirement is 6.9 af and an evaporation and seepage rate of 5.4 af for a total storage requirement of 12.3 af. The permit only allows a maximum storage capacity of 7.8 af, so there is approximately 4.5 af of evaporation and seepage volume that cannot be covered by this permit. Therefore, I can only recommend a storage volume of 7.8 af.

Fish Propagation Volume:

The fish propagation volume is based on the amount of water needed to properly operate the fish rearing facility. Please see my spreadsheet for my calculations. The amount of water diverted is well below what is needed to properly operate this facility. The permit holder told me that he had to inject oxygen into the water to make this facility work properly. The facility was actually operating on the bare minimum flow rate according to industry standards. Using the information available, I determined that the full 24 hour year round diversion volume would be needed to operate this business. The spreadsheet states that a volume of 463 af is allowable, however, the 463 is based on the total system capacity including Well #4. The maximum diversion rate we can allow is 0.50 cfs, so the total volume that can be produced at this rate is 362 af ($0.50 \text{ cfs} \times 1.9835 \times 365 \text{ days} = 362 \text{ af}$). The fish propagation storage component accounts for 7.8 af of that volume, the maximum annual volume of fish propagation that can be allocated under this permit is 354 af ($362 - 7.8 = 354.2 \text{ af}$).

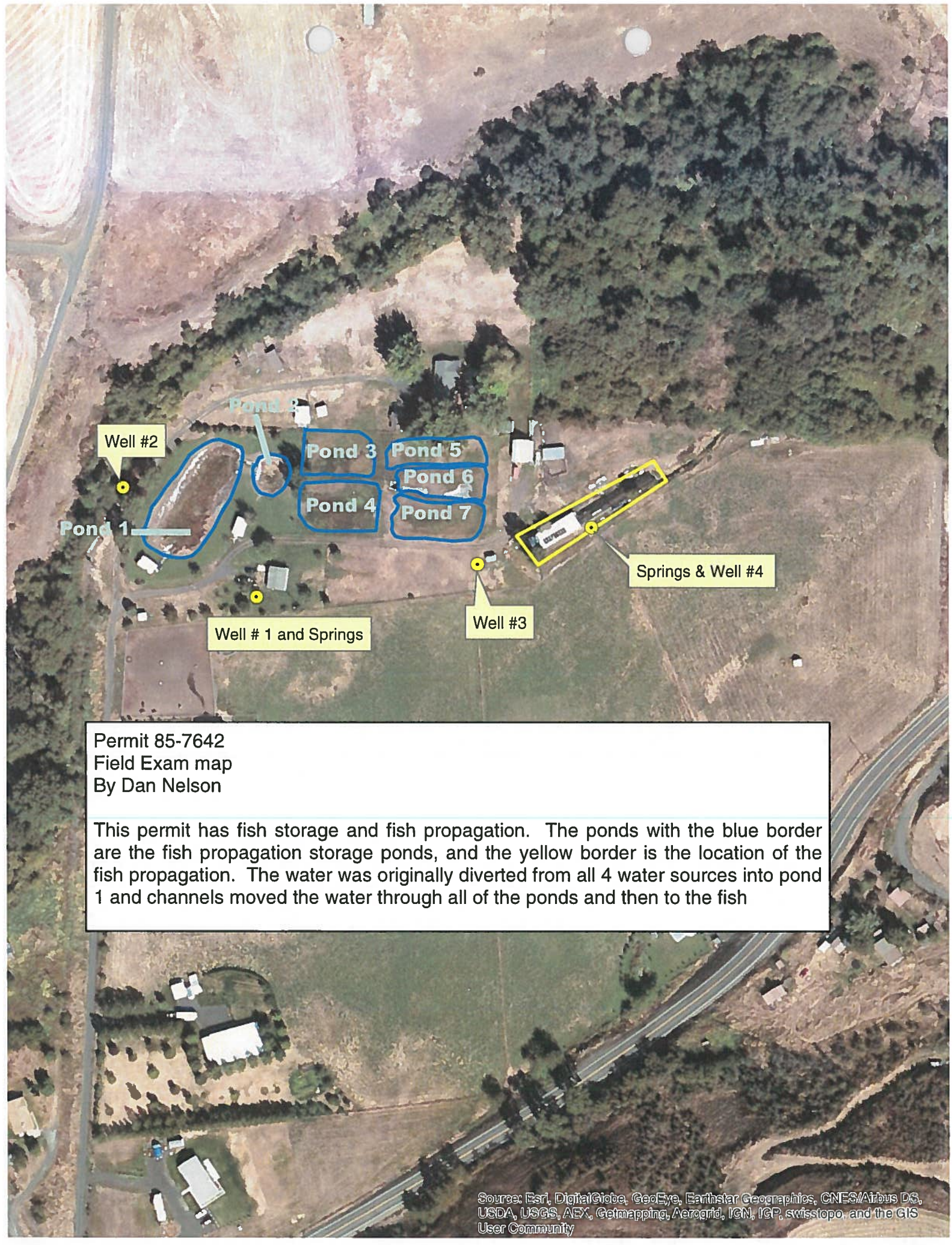
The maximum volume that can be diverted under this right is the 362 af, so the total volume should be limited to 362 af.

Point of Diversion and Place of Use:

Ms. Hemenway did provide maps showing the accurate placement of the points of diversion and places of use. I did redo the fish propagation storage place of use, because I needed to determine an accurate surface area of the ponds. Well # 4 was not developed until after the proof of beneficial use was filed on this permit. The diversion rate and volume for this well cannot be included in this permit, but the permit holder isn't currently using Well #1 and Well #2, and is only using Well #3 and Well #4. Therefore, it is in the permit holder's best interests to include Well #4 as a point of diversion on this permit, so he can continue to operate the facility as he is currently doing.

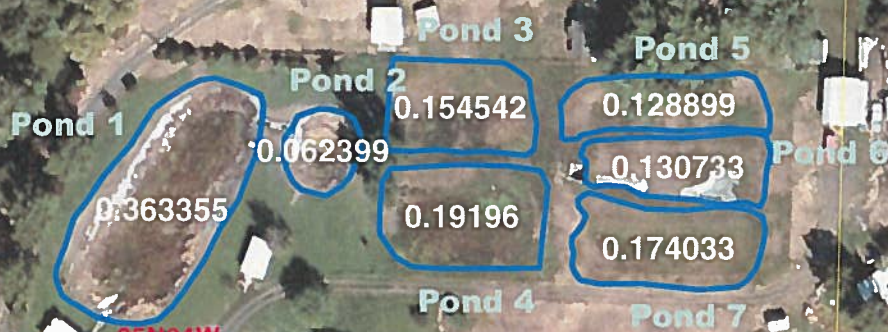
Conditions:

Conditions 1 (007), 2 (029), 4 (081), and 6 should be removed at licensing per Department standards. It should be noted that no fish screen was required for this permit, since none of the spring water open flowed into the fish hatchery. All of the springs capture water under ground and deliver the water via pipeline to the hatchery. Conditions 3 (01M) and 4 (004) should be carried forward to licensing. Condition 4 should be carried forward because the hatchery open discharges into a natural stream channel. Condition 7 (042) should be changed to condition 122 as is standard. Condition 259 should be added to license to address the fish propagation storage component.



Permit 85-7642
Field Exam map
By Dan Nelson

This permit has fish storage and fish propagation. The ponds with the blue border are the fish propagation storage ponds, and the yellow border is the location of the fish propagation. The water was originally diverted from all 4 water sources into pond 1 and channels moved the water through all of the ponds and then to the fish



Permit 85-7642
Fish Propagation Storage

The blue outlines show the storage ponds. The white numbers in the ponds are the surface area in acres. Ponds 1 and 2 have an average depth of 7 feet, and Ponds 3-7 have an average depth of 5 feet.



Raceway
151 ft X (4 ft X 2) X 3 ft

Building Fish Tanks
41 ft X 8 ft X 3 ft

Side Fish Tanks
41 ft X 8 ft X 3 ft

Permit 85-7642
Fish Propagation

This area is the fish rearing facility or the fish propagation. There were fish in the building, the raceways, and the tanks along side the raceways. At the time of my visit, there were only fish in the side tanks.

Permit 85-7642
 Measurement by Daniel A. Nelson
 Taken - 6/18/2017

ESTIMATED FLOW RATES FOR BROADCRESTED DAM USING CALCULATION $[(h) \wedge 1.5]$ (DAM WIDTH) 3.33 (please note used 2.64 under 0.2 feet.)		
HEAD IN FEET	FLOW RATE IN CFS	FLOW RATE IN GPM
0.01	0.01	2.55
0.02	0.02	7.21
0.03	0.03	13.24
0.04	0.05	20.38
0.05	0.06	28.48
0.10	0.18	80.56
0.11	0.21	92.94
0.12	0.24	105.89
0.13	0.27	119.40
0.14	0.30	133.44
0.15	0.33	147.99
0.16	0.36	163.03
0.17	0.40	178.55
0.18	0.43	194.54
0.19	0.47	210.97
0.20	0.51	227.85
0.21	0.55	245.15
0.22	0.59	262.86
0.23	0.63	280.99
0.24	0.67	299.51
0.25	0.71	318.42
0.26	0.75	337.72
0.27	0.80	357.39
0.28	0.84	377.43
0.29	0.89	397.83
0.30	0.93	418.58

Measurements Supplied By Owner		
Diversion	1998 Measurement in GPM	Unknown Date Measurement in GPM
Well # 3	69.12	66.70
Kress Spring	56.80	59.00
Well # 4		61.70
TOTAL	125.92	125.70

Well # 4 diverted 61.7
gpm during the
unknown date
measurement. The
total flow rate including
Well #4 would be 187
gpm

Please Note:

The owner expressed some concern that the artesian wells are not flowing at a rate that did at the time the proof of beneficial use was filed in 1998. The owner did supply some measurements that he took for this system in 1998 that can be seen from the following photos. During my measurements, Well #4 was operating, and it was not developed until after 1998, it cannot be included in the measurements. As you can see from the measurements that I performed and the measurements taken by the owner, the flow rates are reasonably close. I measured 163 gpm with Well #4 operating, and the permit holder measured 187 gpm with Well #4 operating. I am convinced that the artesian flow from Well # 3 and Kress Spring is flowing at approximately 126 gpm or 0.28 cfs. I performed theoretical calculations based on the information supplied by the permit holder. The permit holder informed me that the Well #1 has a 2/3 Hp pump or 0.67 Hp, and Well # 2 has a 3 Hp pump. The pump for well #1 is set at 60 feet, so the lift as estimated at 50 feet. Well # 2 has the pump set at 100 feet, so I estimated the lift at 90 feet. Both wells open discharge into a series of pond, so I estimated the pressure at 10 psi. The following are the flow rates that can be pumped from these two wells. The total amount of water that can be diverted through the system excluding well #4 is 0.50 cfs or 224 gpm.

P/D No.:

PUMP HORSEPOWER
 BOOSTER HORSEPOWER

PUMPING LEVEL

DISCHARGE PRESSURE

RATE OF FLOW (cfs)
 RATE OF FLOW (gpm)

Well # 1
0.67
0
50
10
0.06
25

Well # 2
3
0
90
10
0.16
73

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

Assumpti \$70 efficiency.
 No Friction

Water Sources

Cold well #1 ^{est.} (after K packer) free flow ~ 50 gpm
61.7

Well #2 62.4 (3 HP GRUNDFOS) (K packers?) 90 gpm

Kress Springs 52-59 free flowing 40 gpm

Well #4 61.7 free flowing 50 gpm

Well #3 (above 317) 61.7 (set @ 120') Pump (GRUNDFOS 60520-4) 60 gpm
Free flow 50 gpm

LAWYER SPRINGS 52-59 free flowing <??> 100 gpm
+ 40

without well #2 pump on - 350

300 gpm to one side RW

Re CIRC. to others (sets 2+3)
(2) KJ 11000CH pumps (150 gpm 4.5' lift)

1-4-98
← 50°

1°/100 normal

JOHN BOND
882-7499

CASINO
425

67°

TOUR KING

WATER TEMPS °F

	WELL #1	NATURAL	WELL #2	WELL #3	KRESS FIELD	5" MAIN
1-4-98	FLOODING	50.0			52.9	48.9
(NOV 97)	61.7			60.1	79.16 gpm	45.31 gpm
2-26-98			61.7	60.4	52.9	47.8

PUMP TEST
3-20-98 75pm - 61.2
120pm - 62.8 60pm 62.4
SWL - 53" - 27" SWL - 80"

6-25-98				61.3	56.8	50.7
7-8-98	SWL 19"↓ 72"	- 23" -	SWL 15"↓ 95"			
9-26-98	SWL 104" - 19" -	123"	8-23-98	62.4	57.6	58.1
10-28-98				63.1		
11-31-98				69.12 gpm	56.8 gpm	17.95 gpm
11-9-98	PUMP TEST WELL #1 150 gpm (19'3")			62.1	56.8	

11-19-98 BURNS
WELL DRILLING
DRAINED ~ 8'
STARTED DIPPING
WELL #3
EST 100 gpm
64.5°

1-29-99 SWL 134" SWL 154"
1-30-99 WELL #2
TURNED ON PUMP 200

LOWERCED WELL #2
DISCHARGE TO 36" BELOW GROUND

Fish Propagation Worksheet
Permit 85-7642

Determination of Density Index = Weight of Fish Produced in pounds/ (Fish length in inches X Facility Volume in ft³)		
Fish Weight	3,972.00	
Length	6.00	
Volume	6,408.00	
Density Index	0.10	
Under Ideal Conditions, Density Index should be between 0.4 and 1		

Determination of Flow Index = Weight in Pounds/ (Fish Length X Diversion Rate in gpm).		
Fish Weight	3,972.00	
Length	6.00	
Diversion Rate	286.00	
Flow Index	2.31	
Under Ideal Conditions, Flow Index should be between 0.83 and 2.7		

Determination of facility exchange = Diversion Rate in cfs X 3600/ Facility Volume in ft³		
Diversion Rate	0.64	
Facility Volume	6,408.00	
Exchanges per Hour	0.36	
Under Ideal Conditions, Exchanges per Day should be 2.5 for Trout.		

Adjusted Density Index if the Facility was a Standard Facility is as follows: Adjusted Density Index = (Actual Density Index X Standard Exchange of 2.5 per Hour)/ Actual Exchanges per Hours=.		
Actual Density Index	0.10	
Actual Exchanges Per Hour	0.36	
Adjusted Density Index	0.72	
If the Adjusted Density Index is between 0.4 and 1 then the density Index was Lowered to handle a lower diversion rate, so the annual volume should equal diversion capacity.		

Diversion Capacity Calculation = Diversion Rate in cfs X 1.9835 X 356 days		
Diversion Rate	0.64	
Total Volume	463.3456	

<---- Use This Volume if Adjusted Density Index falls Within
Standards.

Facility Volume = Length X Width X Depth

Part of Facility	Length	Width	Depth	Volume in Cubic Ft
Raceways 2-				
4 ft raceways	151	8	3	3624
Building	60	10	3	1800
Side Tanks	41	8	3	984
				6408

Please Note: My understanding of how this facility operated is that the permit holder raised the fish in the raceways until they reached table size approximately 12 inches and then moved them to the ponds (Ponds 1-7 on the map). They were held in the ponds until they were sold. Therefore, I only used the raceway information to determine if the flow was adequate for the water use. The flow is actually on the low side, but the permit holder aeriated the raceways to attain the needed oxygen levels. I also used the flow rate from well #4, since it is needed to provide the needed flow for the facility. The flow rate From Well #4 cannot be included in this permit, but the permit holder was given an application for permit form to allow him the ability to include the flows from Well #4 and possibly additional development of a new well or placing pumps in the other existing wells.

The ponds shouldn't be included in this calculation, since they are deeper temporary ponds only used when the fish were large enough to sale as a temporary holding area for the fish. By removing the fish from the raceways, the permit holder could then restart a new batch of fish in the raceways. it takes 4 to 5 months to bring the fingerlings and smolts up to a size that can be sold, so the permit holder could have raised approximately 3 sets of fish at 2,000 to 4,000 fish per set.

University of Idaho
Aquaculture Research Institute
Fish Sale Data

Date: May 28, 2013

Buyer: Greg Dillon

Current Original

Tank #	Tank #	# fish	total mass (g)	g/fish	weight (lbs)	cost \$/lb	cost (\$)
F2	F2	200	26,800	134	59.0	\$ 2.50	\$ 147.58
F2	F1	90	13,500	150	29.7	\$ 2.50	\$ 74.34
		290					
A11	C1-C5	860	11,230	13	24.7	\$ 2.50	\$ 61.84
A11	D1	342	3,735	11	8.2	\$ 2.50	\$ 20.57
A11	D2	375	3,720	10	8.2	\$ 2.50	\$ 20.48
A11	D3	282	3,715	13	8.2	\$ 2.50	\$ 20.46
B11	B11	150	830	6	1.8	\$ 2.50	\$ 4.57
B12	B12	145	835	6	1.8	\$ 2.50	\$ 4.60
B29	B25-B27	165	1,225	7	2.7	\$ 2.50	\$ 6.75
B30	B28-B30	200	1,215	6	2.7	\$ 2.50	\$ 6.69
		2519			147.465		
							total \$ 367.87

33 marts little fish

Make check payable to U of I Bursar

0.06 LBS / Fish

CSI

26.4 LBS = 2138 Fish

239.4 LBS = 821 Fish

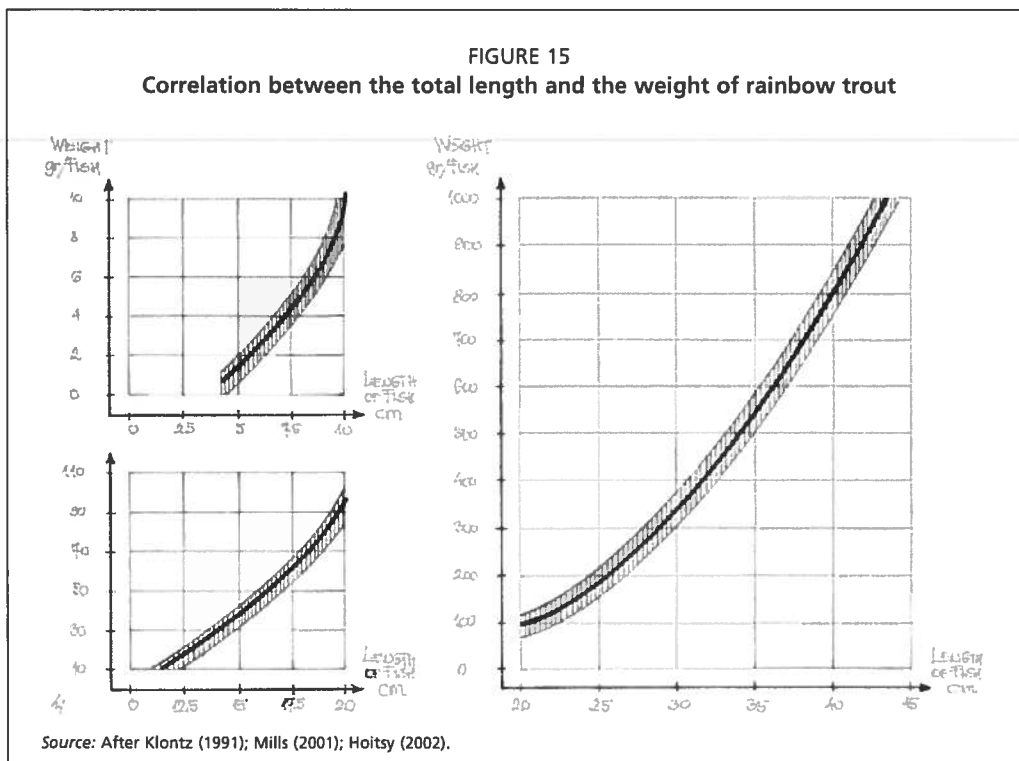
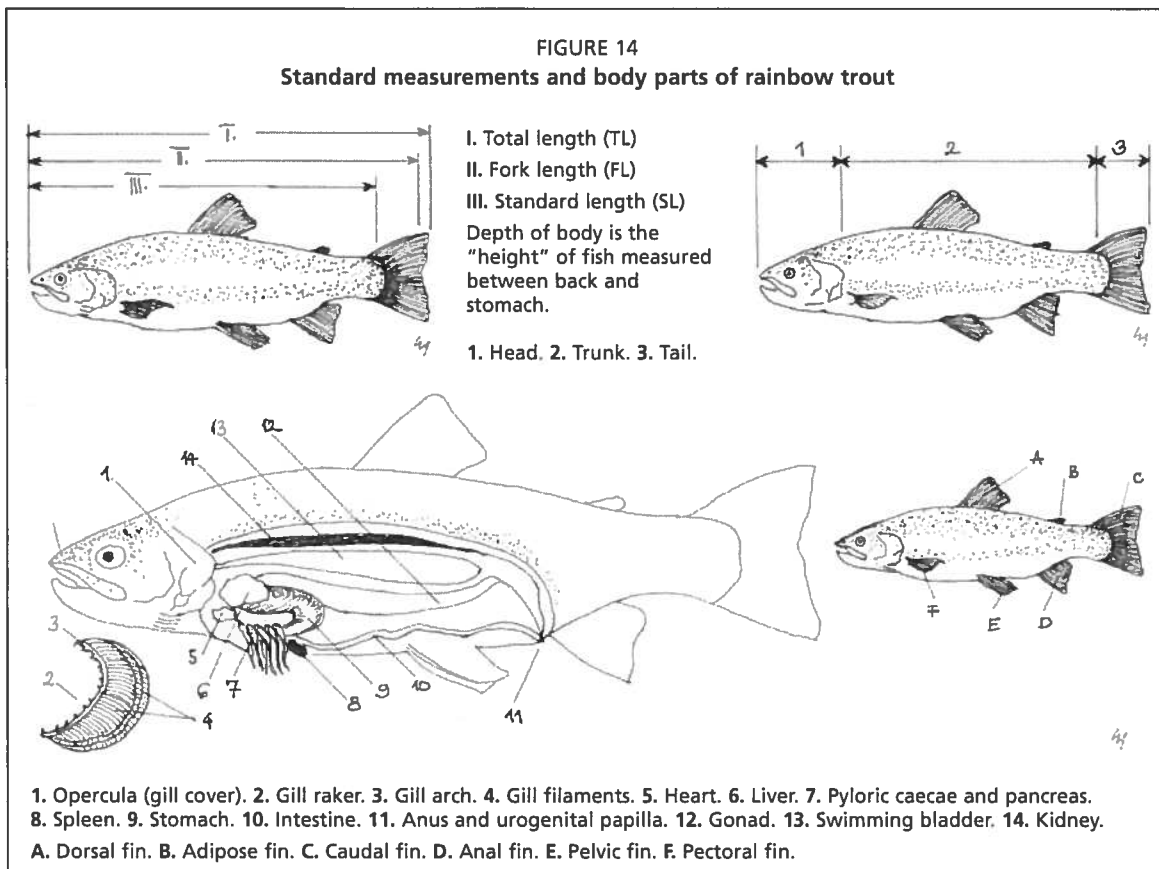
119.2 LBS = 1013 Fish

385.2 LBS = 3,972 Fish

0.097 LBS / Fish

3.4 MEASUREMENTS, BODY PARTS, ORGANS AND CORRELATIONS BETWEEN LENGTH AND WEIGHT

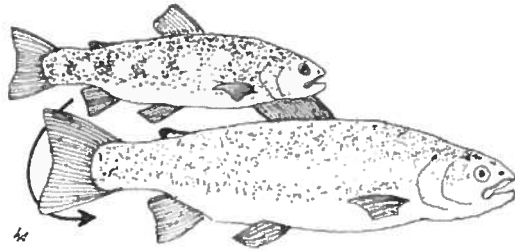
Figure 14 shows the standard measurements and body parts of a rainbow trout, while Figure 15 shows the correlation between its total length and weight.



Development of *table fish** from fingerling takes 4–6.5 months (Figure 19). For the sake of clear understanding and simple calculations, “table fish” in this technical paper refers to the desired minimum body weight of 250 g.

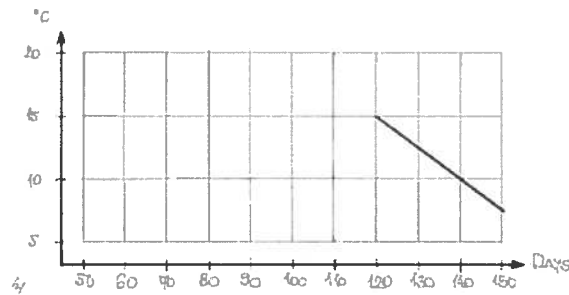
Growth of large table fish from 250 g to 500 g takes a further 2.5–4.5 months (75–135 days) when the water temperature is between 5 and 15 °C.

FIGURE 19
Development of table fish



Length of the development of table fish at water temperature between 5 and 15 °C.

Source: After Hoitsy (2002).



Total Storage Calculations

FILE NUMBER	85-7642 Pond 1 & 2
REVIEWER	Daniel Nelson
DATE	6/18/2017

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.)	0.428	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	7	"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)	2.996	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. 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.

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). 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 (AF)	1.1	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.8	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	4.9	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.

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	85-7642 Pond 1
REVIEWER	Daniel Nelson
DATE	6/18/2017

User Input
Calculated value
Formula Explanations

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

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: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	-0.65	31	0.00
Feb	-0.06	28	0.00
March	0.71	31	22.01
April	1.59	30	47.70
May	2.22	31	68.82
June	3.30	30	99.00
July	4.60	31	142.60
August	3.95	31	122.45
September	2.48	30	74.40
October	0.90	31	27.90
November	-0.47	30	0.00
December	-0.62	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 = 604.88

$$\left(\frac{604.88}{304.8} \right) \times 0.43 = 0.8 \text{ AFA}$$

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	85-7642 Pond 1 & 2
REVIEWER	Daniel Nelson
DATE	6/18/2017

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	0.428	AC.
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Pond Surface Area (SQ. FT.)	18644	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	SC	
Suggested Seepage Rate (FT./DAY)	0.0070	FT./DAY

Formula: (Surface Area X Seepage Rate) X 7.48 = Gallons Per Day Loss
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Convert to GPD	976	GPD
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Total Seepage Loss (AFA)	1.1	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.

Total Storage Calculations

FILE NUMBER	85-7642 Ponds 3-7
REVIEWER	Daniel Nelson
DATE	6/18/2017

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.)	0.78	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	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)	3.9	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. 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.
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). Note: You must have a " <u>From Storage</u> " component exceeding the initial fill on the permit to include a volume in this space.
Estimated Seepage Loss (AF)	2.0	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	1.5	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	7.4	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.

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	85-7642 Ponds
REVIEWER	Daniel Nelson
DATE	6/18/2017

User Input
Calculated value
Formula Explanations

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

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: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	-0.65	31	0.00
Feb	-0.06	28	0.00
March	0.71	31	22.01
April	1.59	30	47.70
May	2.22	31	68.82
June	3.30	30	99.00
July	4.60	31	142.60
August	3.95	31	122.45
September	2.48	30	74.40
October	0.90	31	27.90
November	-0.47	30	0.00
December	-0.62	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 = 604.88

$$\left(\frac{604.88}{304.8} \right) \times 0.78 = 1.5 \text{ AFA}$$

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	85-7642 Ponds 3-7
REVIEWER	Daniel Nelson
DATE	6/18/2017

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	0.78	AC.
-------------------------	------	-----

Pond Surface Area (SQ. FT.)	33977	SQ. FT.
-----------------------------	-------	---------

I used the following method to obtain my Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	SC	
Suggested Seepage Rate (FT./DAY)	0.0070	FT./DAY

Formula: (Surface Area X Seepage Rate) X 7.48 = Gallons Per Day Loss
--

Convert to GPD	1779	GPD
----------------	------	-----

Total Seepage Loss (AFA)	2.0	AFA
--------------------------	-----	-----

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.

Nelson, Dan

From: Nelson, Dan
Sent: Monday, June 26, 2017 3:51 PM
To: 'usminicattle@yahoo.com'
Subject: Water Measurements for Recent Field Examination.
Attachments: Sweetwater Aqua Meas..pdf

Dear Mr. Dillon;

During my field examination performed on June 18, 2017, you asked if I could provide you with some additional information and the results of my measurement analysis. I told you that I would email you this information, and this is my response to that request.

You asked if I could find the person that measured your facility in the late 1990's. I contacted our Northern Region office, and all of the staff at our State Office who might have done some field measurements for this system, and discovered that no one other than myself or Sandy Hemenway has visited your property to measure your system for the water right licensing process.

However, a study was performed in that area in the late 1990's for the Lindsey Creek Ground Water Management Area. I have not been able to find any documentation of measurements being performed as part of this study. I have reviewed the Lindsey Creek Ground Water Management Area files, to see if there were any reports or documentation provided for water measurements during this time period. From what I can determine, your property is just southeast of the Lindsey Creek Ground Water Management Area, so the staff doing the measurements for the study may not have kept any measurement data that was outside the borders of the Lindsey Creek Ground Water Management Area. The only information that I was able to find was information regarding the water levels in the wells in your area. I am still following up on one possible information source, but it could take some time for them to go through their archive records to see if there are any measurement records for your facility. As I stated while I was at your property, I do believe that someone measured your water use at one time, but those records were not included in the water right file, and don't appear to have been saved in any of archive data records. Without the actual written measurement records taken during that time period, it is impossible to recreate them. I can confirm that there were Department staff working in your area during this time period that may have measured your facility. Unfortunately, those records don't appear to have been archived in any of our database records.

I have attached a spreadsheet of my analysis of flow measurement I took, and the measurement information you supplied me. The two information sets were surprising similar for the spring and artesian well. I measured 163 gpm at the end of the raceways. This 163 gpm included flow from Well #3, Kress Spring, and Well #4. In the information you gave me, these three sources diverted 187 gpm. Both sets of information that you gave me provided approximately 126 gpm for Well # 3 and Kress Spring, which are the only two flow rates we can consider in the licensing of this permit. We can use your information for the artesian flowing wells and the springs, because they were counting on natural flow of the system.

The flow rates you documented for Well #1 (2/3 Hp Pump) and Well #2 (3 Hp Pump) didn't appear to have been taken during normal operating conditions. You told me that the pump in Well #1 was set at 60 feet, but the information you provided shows the pumping water level was over 100 feet during this test. You also stated that the pump in Well #2 was set at 100 feet, but the information you provided states the pumping level over 120 feet during the same test. This leads me to believe, that the information you provided for the two wells with pumps was based off a pumping tests, and not actual pump diversions using the wells used to divert the water. Unfortunately, the information you supplied on Well #1 and Well #2 is not reliable enough to use in the licensing of the permit.

Taking all this into account, I am going to make a recommendation for this permit of 224 gpm or 0.50 cfs for this system. This includes 126 gpm from Well #3 and the springs, and 108 gpm from Well #1 and Well #2 with the pumps. Since Well # 4 was added to the system after your development period for this permit, you will need to file a new permit for the water diverted from this well, and any additional water you would like to develop from the other two wells and the spring. You told me that you operated the system on approximately 300 gpm, and if you add Well #4's diversion rate of 62 gpm to the 224 gpm of the other sources, there would be close to 286 gpm diverted into the fish hatchery.

As we discussed, I would recommend that you include all of the points of diversion and water sources on your new application for permit. This will allow you to cover the additional diversion rate developed by Well #4, and allow to install pumps in the two artesian wells to ensure you have an adequate rate of diversion for your facility. We can amend your existing water right for \$100 fee to include Well #4 as a point of diversion, but we cannot include the 62 gpm diverted from this well for this license. This amendment will allow you to legally divert from Well #4. I will be sending you the paperwork. When you receive the amendment, you can contact me and I can discuss the different scenarios with you to ensure that you are staying within the limits of your water right.

I hope this answers all of your concerns. I am sorry, I could not find any information regarding the earlier measurement. Unfortunately, it appears as though the measurement was done for a specific study and was not shared with the water right file.

Respectfully,

Daniel Nelson
Water Right Analyst 3
Idaho Department of Water Resources
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)

Permit 85-7642
Measurement by Daniel A. Nelson
Taken - 6/18/2017

ESTIMATED FLOW RATES FOR BROADCRESTED DAM USING		
HEAD IN FEET	FLOW RATE IN CFS	FLOW RATE IN GPM
0.01	0.01	2.55
0.02	0.02	7.21
0.03	0.03	13.24
0.04	0.05	20.38
0.05	0.06	28.48
0.10	0.18	80.56
0.11	0.21	92.94
0.12	0.24	105.89
0.13	0.27	119.40
0.14	0.30	133.44
0.15	0.33	147.99
0.16	0.36	163.03
0.17	0.40	178.55
0.18	0.43	194.54
0.19	0.47	210.97
0.20	0.51	227.85
0.21	0.55	245.15
0.22	0.59	262.86
0.23	0.63	280.99
0.24	0.67	299.51
0.25	0.71	318.42
0.26	0.75	337.72
0.27	0.80	357.39
0.28	0.84	377.43
0.29	0.89	397.83
0.30	0.93	418.58

Measurements Supplied By Owner		
Diversion	1998 Measurement in GPM	Unknown Date Measurement in GPM
Well # 3	69.12	66.70
Kress Spring	56.80	59.00
Well # 4		61.70
TOTAL	125.92	125.70

Well # 4 diverted 61.7
gpm during the
unknown date
measurement. The
total flow rate including
Well #4 would be 187
gpm

Please Note:

The owner expressed some concern that the artesian wells are not flowing at a rate that did at the time the proof of beneficial use was filed in 1998. The owner did supply some measurements that he took for this system in 1998 that can be seen from the following photos. During my measurements, Well #4 was operating, and it was not developed until after 1998, it cannot be included in the measurements. As you can see from the measurements that I performed and the measurements taken by the owner, the flow rates are reasonably close. I measured 163 gpm with Well #4 operating, and the permit holder measured 187 gpm with Well #4 operating. I am convinced that the artesian flow from Well # 3 and Kress Spring is flowing at approximately 126 gpm or 0.28 cfs. I performed theoretical calculations based on the information supplied by the permit holder. The permit holder informed me that the Well #1 has a 2/3 Hp pump or 0.67 Hp, and Well # 2 has a 3 Hp pump. The pump for well #1 is set at 60 feet, so the lift as estimated at 50 feet. Well # 2 has the pump set at 100 feet, so I estimated the lift at 90 feet. Both wells open discharge into a series of pond, so I estimated the pressure at 10 psi. The following are the flow rates that can be pumped from these two wells. The total amount of water that can be diverted through the system excluding well #4 is 0.50 cfs or 224 gpm.

P/D No.:

PUMP HORSEPOWER
BOOSTER HORSEPOWER

PUMPING LEVEL

DISCHARGE PRESSURE

RATE OF FLOW (cfs)
RATE OF FLOW (gpm)

Well # 1
0.57
9
50
10
0.06
25

Well # 2
3
6
90
10
0.16
73

The above calculates the formula =

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

Assumpti 170 efficiency.
No Friction

Nelson, Dan

From: Nelson, Dan
Sent: Tuesday, May 30, 2017 1:09 PM
To: 'usminicattle@yahoo.com'
Subject: RE: water right permit 85-7642

Dear Mr. Dillon,

I sent the following message a few days ago, and I am still trying to set up a time I can come up and measure the water for your permit. If you could contact me by either email or telephone, I would appreciate it. I have also tried to call you several times, without being able to get through. I would like to help get this permit licensed as soon as possible.

Respectfully,

Daniel Nelson
Water Right Analyst 3
Idaho Department of Water Resources
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)

From: Nelson, Dan
Sent: Thursday, May 18, 2017 11:30 AM
To: 'usminicattle@yahoo.com' <usminicattle@yahoo.com>
Subject: water right permit 85-7642

Dear Mr. Dillon;

On May 16, 2012, Sandy Hemenway met with you perform a field examination on permit 85-7642 for a fish hatchery near Lapwai, Idaho. Ms. Hemenway retired, and I have been asked to complete the files she hadn't finished the licensing process. The reason that the licensing of this permit was delayed, was because there was some confusion over the amount of water being delivered to the fish facility from the springs and wells. I have several water rights that I need to do a field examination on in your area, and I was hoping that I could set up a time that I could visit the site and measure the wells and springs. I am more concerned about measuring the springs, but I would like to measure all of the water being used at the facility if possible.

I would like to meet with you on May 30th, June 5th, June 6th, or June 7th if possible. Please let me know if it is possible to meet with you on either of these dates. If you choose May 30th or June 5th, I won't be able to meet with you until after 12:00 pm. I can set my schedule to meet with you earlier in the day on June 6th or June 7th if you wish. If none of these dates work for you, please let me know a time that will be more suitable to your schedule.

Thank you so much for helping complete the processing of these files and getting this permit licensed. You can contact me by email or call me if that would be easier for you.

Daniel Nelson
Water Right Analyst 3
Idaho Department of Water Resources
Telephone (208) 287-4856

Nelson, Dan

From: Nelson, Dan
Sent: Thursday, May 18, 2017 11:30 AM
To: 'usminicattle@yahoo.com'
Subject: water right permit 85-7642

Dear Mr. Dillon;

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Thank you so much for helping complete the processing of these files and getting this permit licensed. You can contact me by email or call me if that would be easier for you.

Daniel Nelson
Water Right Analyst 3
Idaho Department of Water Resources
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

March 27, 2017

GREGORY J DILLON
29977 SWEETWATER LANE
LAPWAI ID 83540

RE: Water Right Permit 85-7642

Dear Mr. Dillon:

On May 16, 2012, Sandy Hemenway met with you perform a field examination on permit 85-7642 for a fish hatchery near Lapwai, Idaho. Ms. Hemenway retired, and I have been asked to complete the files she hadn't finished the licensing process. The reason that the licensing of this permit was delayed, was because there was some confusion over the amount of water being delivered to the fish facility from the springs and wells. I have several water rights that I need to do a field examination on in your area, and I was hoping that I could set up a time that I could visit the site and measure the wells and springs. I am more concerned about measuring the springs, but I would like to measure all of the water being used at the facility if possible. Springs tend to flow more in the spring, so I would like to come out and do the measurements as soon as possible to ensure we get peak flow from the springs.

I would like to meet with you as soon as possible to get finish up the licensing of this permit. I have decided to hold up the field visits for the other files until I hear from you, so we can finish up the licensing process for this permit.

Thank you so much for helping complete the processing of these files and getting this permit licensed. I would appreciate it if you could contact me by telephone or email by June 13, 2017 so we can measure the springs when they are at peak flow.

Respectfully;

Daniel Nelson
Water Right Analyst 3
Idaho Department of Water Resources
Email: dan.nelson@idwr.idaho.gov
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)

Draft w/ stuff to attach to field exam

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 85-7642
Exam Date: 5/16/2012

1. Current Owner: SWEETWATER AQUACULTURE INC
GREGORY J DILLON PRES
29977 SWEETWATER LN
LAPWAI ID 83540-6135
(208)843-2929
2. Accompanied by: Gregory Dillon
Phone No: (208)843-2929
Address: 29977 Sweetwater Ln., Lapwai, ID 83540
Relationship to Permit Holder: current owner
Email: usminicattle@yahoo.com
Physical address for the POU is: 29979 Sweetwater Ln., Lapwai, ID 83540

Additional information: The Renter is Tony Bybee, and he did not know the entire system, so Gregory Dillon met me back out there on 5/29/2012, when I was back up in the area, to show and explain the run-ways and system located in the SESE quarter quarter.

3. SOURCE

GROUND WATER
SPRINGS

TRIBUTARY

SWEETWATER CREEK

B. OVERLAP REVIEW

1. Other water rights with the same place of use: None. 85-7085 Dillon, Sweetwater Creek irrigation for 30 acres located to the south. 85-1121 and 85-4189 are domestic or stockwater water rights for neighbors.
2. Other water rights with the same point of diversion: None. 85-7209 and 85-7085 are Sweetwater Springs Creek sources.

C. DIVERSION AND DELIVERY SYSTEM

1. LOCATION OF POINT(S) OF DIVERSION:

SPRINGS	L30 SW1/4SW1/4SE1/4	Sec. 22,	Twp 35N,	Rge 04W, B.M.	NEZ PERCE County*
GROUND WATER	L30 SW1/4SE1/4	Sec. 22,	Twp 35N,	Rge 04W, B.M.	NEZ PERCE County
GROUND WATER	L30 SW1/4SE1/4	Sec. 22,	Twp 35N,	Rge 04W, B.M.	NEZ PERCE County
SPRINGS	L31 SW1/4SE1/4SE1/4	Sec. 22,	Twp 35N,	Rge 04W, B.M.	NEZ PERCE County
GROUND WATER	L30 SW1/4SE1/4	Sec. 22,	Twp 35N,	Rge 04W, B.M.	NEZ PERCE County

*Requires an amendment.

Method of Determination: Garmin GPA Map 76S, ArcMap 2013 Imagery.

2.

PLACE OF USE:

Twp	Rge	Sec	FISH PROPAGATION STORAGE and FISH PROPAGATION																
			NE				NW				SW				SE				
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	Totals
35N	04W	22															X	X	
																	L 30	L 31	

DIVERSION TO STORAGE same as FISH PROPAGATION

Method of Determination: Garmin GPA Map 76S, ArcMap 2013 Imagery.

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. **Pictures taken at the time of the field examination have 2 separate dates, due the first time I was out there the owner could not make it, so the renter showed me the system, but he didn't know where everything was. So, the next time I was up in the area, the owner showed me the rest of the system.**

4.

<u>Well or Diversion ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
Well #1, ID Tag D003144,		2/3 Hp	unknown make/model	submersible pump.	2" discharge
Well #2, ID Tag D008480,		3 Hp	unknown make/model	submersible pump,	unknown size disch.
Well #3, ID Tag # D0010399,		artesian well			2" discharge

No permit for the following well, and it was drilled after proof of beneficial use was submitted:
 Well #4 D001785 artesian well 2" discharge

D. FLOW MEASUREMENTS

1.

<u>Measurement Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
None.						

2. Measurements:

Theoreticals for Wells #1 – 3 :

Well #1: $(8.8 \times 2/3 \text{ Hp} \times 0.7 \text{ eff}) / [2 + (30 \text{ psi} \times 2.31)] = 4.066 / 71.3 = 0.06 \text{ cfs}$
 Well #2: $(8.8 \times 3 \text{ Hp} \times 0.7 \text{ eff}) / [61 \text{ ft} + (30 \text{ psi} \times 2.31)] = 18.48 / 130.3 = 0.14 \text{ cfs}$
 Well #3: artesian

Measured at the time of the field examination:

Well 1: $5 \text{ gallon} / 7 \text{ sec} = 300 / 7 = 42 \text{ gpm} \times 0.00223 = 0.09 \text{ cfs}$
 Well #2: $90 \text{ gpm} \times 0.00223 = 0.20 \text{ cfs}$
 Well #3: artesian well measuring at $40 \text{ gpm} \times 0.00223 = 0.09 \text{ cfs}$
 Spring by well #1: full 3" pipe = 0.25 cfs
 Spring by well #4: $120 \text{ gpm} \times 0.00223 = 0.27 \text{ cfs}$
 Total Diversion Rate (running all at the same time): 0.9cfs

RECOMMEND:

Diversion to Storage 0.9 cfs

Make changes to AdHoc for diversion rate.

*****Well #4 measured 55 gpm (0.16 cfs, but cannot be used since it was drilled after proof of the beneficial use was submitted. #4 is artesian.***

E. FLOW CALCULATIONS

Measured Method:
 None.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: N/A
2. Volume Calculations for Other Uses: Fish Propagation;

Check out Invoice submitted with # of fish

Pond Sizes (determined using ArcMap):

Ponds 1 & 2: 0.4 acre X 7' average depth = 2.8 af

Ponds 3 – 7: 0.5 acres X 5' average depth = 2.5 af

Raceway Area: 0.1 acre X 3' average depth = 0.3 af

Total for Ponds: 5.6 af

INSERT: NEED TO DO E.T., seepage, etc. to add to ponds annual volume, then make recommendation and make changes on AdHoc

G. NARRATIVE/REMARKS/COMMENTS

At the time of the field examination, there were 7 interconnected fish propagation ponds, one raceway area, and a fish propagation building for tropical fish. There was no active flow in Ponds #1 - 7, since they had been shut down temporarily due to a case of Whirling Disease in 2005 (a parasite that affects juvenile fish and causes skeletal deformation and neurological damage; fish whirl instead of swim; the parasite is not transmissible to humans). Prior to this Dillon had 30,000 fish. He is currently being retested again, and has restarted the raceway raising sturgeon. Between Pond #1 and #2 is a concrete flow through with 42 inch X 2 ft high water level mark. At pond #2 there is a 4 inch overflow pipe that runs to Pond #4, and also an 8 inch buried line that runs east to the concrete control box for diverting water into ponds #3 - 7, and on to the raceway area. The overflow from the raceway area, gravity flows northeast down an existing channel, returning back to the Sweetwater Creek. At the time of the field examination, there were 4 groundwater sources (well #1 - 4, with well #4 being drilled after proof of beneficial use was submitted, so an application for permit will need to be submitted to cover that well). There are also 2 spring sources.

Well #1, ID Tag D003144, drilled 10/26/1996 by JRU Well Drilling and then modified to 200 ft deep on 11/13/1997 by Burns Well Drilling, 8 inch casing, 2/3 Hp unknown make/model submersible pump. Right by well #1 is a tiled collection tank for the spring source in the SWSEL30. Well #2, ID Tag D008480, is an 8 inch casing extending 15 inches above ground level, is 155 ft deep with 61 ft static, a 30 Hp unknown make/model submersible pump (located west of pond #1). Well #3, ID Tag # D0010399, is an artesian well that was drilled years ago, but the only well log found is when it was modified in 5/25/2000 by Ulson#179. It is a 6 inch casing, 463 ft deep, with a 2 inch discharge, located west of the fish raceway area. Well #4, ID Tag #D0017085, was drilled 3/21/01 after proof was already submitted to IDWR for this water right. It has an 8 inch casing, is 241 ft deep, and an artesian well that open discharges into a concrete tank prior to gravity flow discharging into the raceway area, along with the second springs source which is a tiled area right by well #4 to collect the water and then gravity flows into the same square concrete tank prior to discharging into the raceway area.

Ponds # 1 and #2 are 0.4 acre total size with an average depth of 7 ft. Ponds 3 - 7 are 0.5 acres total in size with the average depth of 5 ft. The raceway area is a total of 0.1 acre in size with an average depth of 3 ft.

When the entire system is running, well #1 - #3 discharge into Pond #1 with water gravity flowing throughout the ponds and on to the raceway area. Well #3 can also be added to Ponds # 5 - 7 if needed. Well #3 is a little warmer temperature water, so it is used solely in the building next to the raceway used for tropical fish propagation. Well #4 and the second spring are used for the tropical fish propagation done in the building next to the raceway area, and the raceway area itself. The overflow from the raceway is screened. Additional information was submitted showing the number of fish purchased 4/4/2012, and then another purchase on 5/28/2013 was for 2552 fish, from the U of I Aquaculture Research Institute. Beneficial use is for fish propagation of sturgeon, trout, bass, bluegill, and some tropical fish. At the time of the field examination, there were 2000 rainbow trout, 30 bass, 2 trout, and 12 sturgeons.

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>
FISH PROPAGATION STORAGE	01/01 to 12/31		0.00 AF
DIVERSION TO STORAGE	01/01 to 12/31	0.00 CFS	
FISH PROPAGATION	01/01 to 12/31	0.00 CFS	
	<u>Totals:</u>	0.00 CFS	

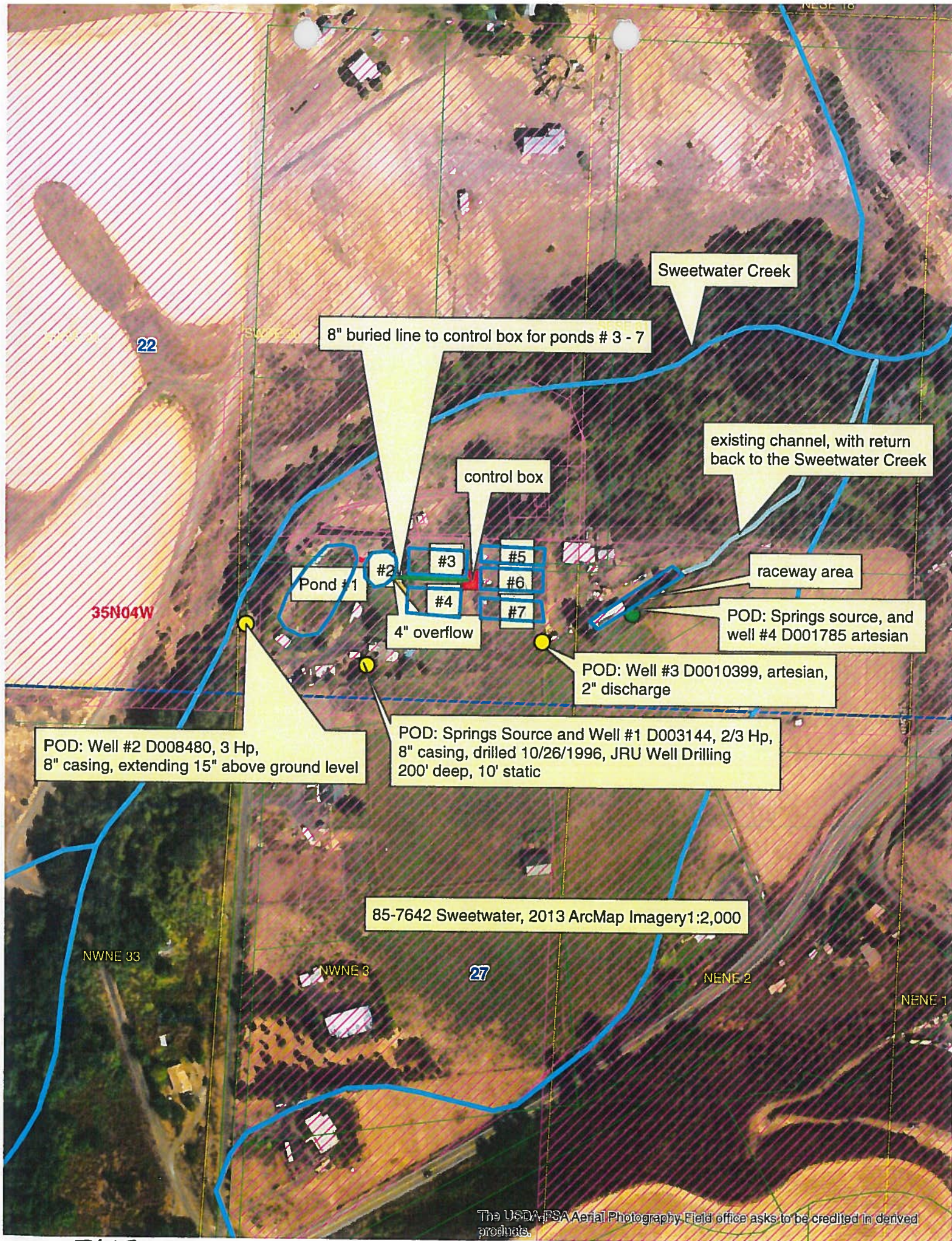
2. Recommended Amendments

☒ 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

Field Examiner's Name _____ Date _____





Well
#4
D001785
artesian
well by
run-
way
6" casing
2" discharge

05/29/2012



From
Spring
(by well
#4)
From
well
#3

05/29/2012

85-7642



S. Hemmings

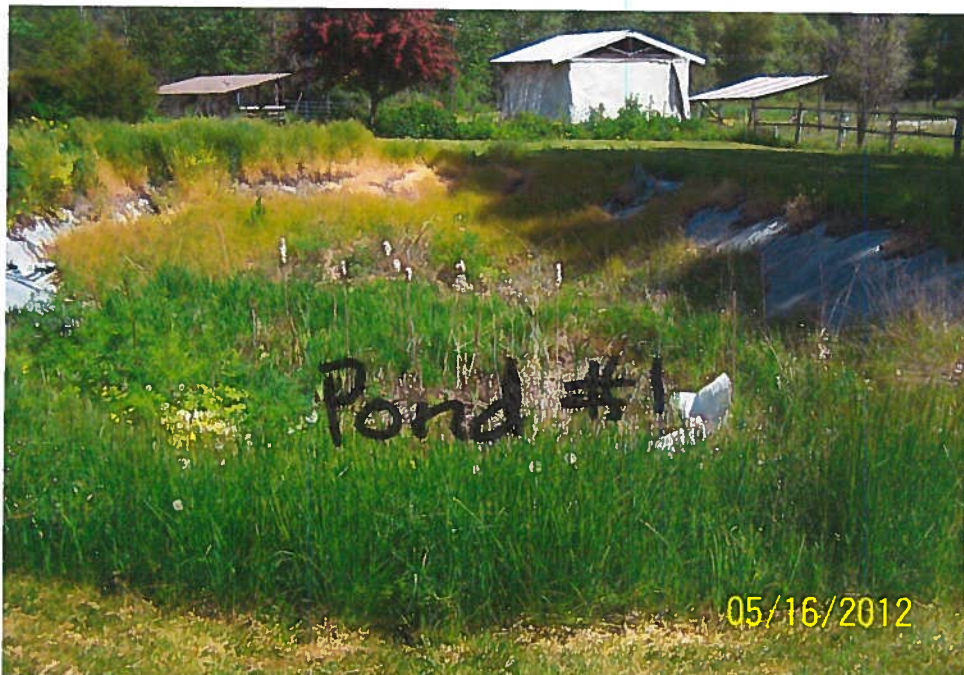


power box by well #2

85-7642

S. Hemmings

85-7642



42" wide with 2" high water mark

Spring source
by well #1

S. Hemmery

85-7642



concrete control box
for ponds # 3-7



Well # 3 Artesian
D0010399, 2" discharge

some
notes
#1 of

S. Hemerway



run
way
(flow
thru
system)



existing
channel,
from
race way
over-
flow,
flowing
back
to
Sweetwater
creek

85-7642

S. Hernerway



race
way
+
tanks



the
race-
way
area

85-7647

S. Hernerway



Over
flow
from
raceway



Tropical
fish
building

S. Hemerway

855-7647

well #1

RECEIVED

Form 238-7
11/97

JUN 09 2000

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

Office Use Only		
Inspected by		
Twp	Rge	Sec
1/4	1/4	1/4
Lat:	:	Long:
:	:	:

1. WELL TAG NO. D 0010399

DRILLING PERMIT NO. 85-97-7-0076-101

Other IDWR No. 745595

2. OWNER:

Name Greg Dillion
Address Rt 1 Box 184 A
City Sapre State ID Zip 83540

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N		Twp. <u>35N</u>		North ☒ or South ☐	
W		Rge. <u>4W</u>		East ☐ or West ☒	
E		Sec. <u>22</u>		SWSE 1/4 1/4 1/4	
S		Gov't Lot		County <u>Nez Perce</u>	
		Lat:		Long:	
		Address of Well Site <u>1/4 mile N of Rd</u>		City <u>Sapre</u>	
		<u>95 E from state 2-1 mile Sapre</u>		(Give at least name of road - Distance to Road or Landmark)	
		Lt. <u>1/4</u> Bk. <u>1/4</u> Sub. <u>1/4</u>		Name <u>NE - 1/4 Sec 22</u>	

4. USE:

☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other Fish Farm

5. TYPE OF WORK check all that apply (Replacement etc.)

☐ New Well ☒ Modify ☐ Abandonment ☐ Other

6. DRILL METHOD

☐ Air Rotary ☒ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES

SEAL/FILTER PACK	AMOUNT	METHOD
Material	From To Sacks or Pounds	

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s) _____

Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

Perforations _____ Method _____

Screens _____ Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

_____ ft. below ground Artesian pressure _____ lb.

Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: good

Depth first Water Encounter _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
6	363	408	drilled 6" to 406-408		
			no cutting came up		
6	408	465	hard basalt rock		
6	465	468	medium black basalt		
6	468		heavy black fine material		
6	468		back to 463 ft		
			material fine black		
			basalt		

Completed _____ Depth 463 (Measurable)
Date: Started 4/6/2000 Completed 5/25/2000

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Phil Olson Firm No. 179

Firm Official _____ Date _____

and Driller or Operator Phil Olson Date 5/25/2000

(Sign once if Firm Official & Operator)

35N 4W 22

FORWARD WHITE COPY TO WATER RESOURCES

Well #3
OK, since it was modified in 2000, but originally drilled earlier

RECEIVED

Form 238-11/97 MAR 28 2001

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

IDWR/North

1. WELL TAG NO. D 00 17085

DRILLING PERMIT NO.

Other IDWR No. IDENT# 768 232

2. OWNER:

Name Gregg Dillon

Address Rt. 1 Box 84B

City Lapwai State ID Zip 83540

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

POSTED

N			
W			
S			

Twp. 34 North ☒ or South ☐
Rge. 4 East ☐ or West ☒
Sec. 22 1/4 SW 1/4 SE 1/4
Gov't Lot County Nezperce
Lat. Long.

Address of Well Site 3 mile from Hwy

95 on WEB Rd City Lapwai

Lt. Blk. Sub. Name

4. USE:

- ☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other Aquaculture

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other

6. DRILL METHOD

- ☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT		METHOD
Material	From	To	Sacks or Pounds		
Bentonite	0	17	350	Top	Pour

Was drive shoe used? ☒ N Shoe Depth(s) 30'

Was drive shoe seal tested? ☒ Y ☐ N How? Air Pressure

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	-30	30	Steel	☒	☒	☐	☐
6"	+2	-125	100	PVC	☐	☒	☐	☐

Length of Headpipe Length of Tailpipe

9. PERFORATIONS/SCREENS

Perforations Method

Screens Screen Type

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

ft. below ground Artesian pressure 12 lb.

Depth flow encountered 210 ft. Describe access port or control devices: Top of casing

34N 4W 22

FORWARD WHITE COPY TO WATER RESOURCES

Office Use Only
Inspected by
Twp Rge Sec
1/4 1/4 1/4
Lat. : : Long. : :

11. WELL TESTS:

- ☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
250			1.56

Water Temp. 61.7 Bottom hole temp.

Water Quality test or comments: Good

Depth first Water Encounter 115

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
14	12	16	Clay to same Rock		
14	16	29	Wthd BSLT		
8	29	34	" "		
8	34	69	Hard Gray BSLT		
8	69	94	HT Black BSLT		
8	94	115	Red Wthd BSLT	90	
8	115	129	Gray BSLT		
8	129	219	HT BTK BSLT		
6	219	241	Red Brown Wthd BSLT	100	

Completed Depth 241 (Measurable)

Date: Started 3-19-01 Completed 3-21-01

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name UHIENKOTT DRILLING Firm No. 125

Firm Official Date 3-23-01

and

Driller or Operator Date 3-23-01

(Sign once if Firm Official & Operator)

well #4 drilled after proof submitted

Hemenway, Sandy

From: Greg Dillon [usminicattle@yahoo.com]
Sent: Thursday, April 17, 2014 2:31 PM
To: Hemenway, Sandy
Subject: Re: Water Right 85-7642 Sweetwater distribution system

Hi Sandy,
Everything looks fine and is labeled correctly on the map you attached.
Best wishes on your retirement!

Greg Dillon

www.minicattlecountry.com

On Wednesday, April 16, 2014 2:12 PM, "Hemenway, Sandy" <Sandy.Hemenway@idwr.idaho.gov> wrote:
Gregory,

I am in the final stages of getting your water right licensed. Please look over the attached map to make sure that I have the distribution system diagramed properly. If there is something incorrect, please get back with me immediately since I am retiring tomorrow, and I was wanting to complete all my files prior retiring.

Thanks so much,

Sandy Hemenway
Sr. Water Resource Agent
IDWR State Office, Boise
(208)287-4920
Cell: (208)761-0280
Sandy.hemenway@idwr.idaho.gov

University of Idaho
Aquaculture Research Institute
Fish Sale Data

Date: May 28, 2013

Buyer: Greg Dillon

Current Original

Tank #	Tank #	# fish	total mass (g)	g/fish	weight (lbs)	cost \$/lb	cost (\$)
F2	F2	200	26,800	134	59.0	\$ 2.50	\$ 147.58
F2	F1	90	13,500	150	29.7	\$ 2.50	\$ 74.34
		290					
A11	C1-C5	860	11,230	13	24.7	\$ 2.50	\$ 61.84
A11	D1	342	3,735	11	8.2	\$ 2.50	\$ 20.57
A11	D2	375	3,720	10	8.2	\$ 2.50	\$ 20.48
A11	D3	282	3,715	13	8.2	\$ 2.50	\$ 20.46
B11	B11	150	830	6	1.8	\$ 2.50	\$ 4.57
B12	B12	145	835	6	1.8	\$ 2.50	\$ 4.60
B29	B25-B27	165	1,225	7	2.7	\$ 2.50	\$ 6.75
B30	B28-B30	200	1,215	6	2.7	\$ 2.50	\$ 6.69
		2519					
33 marts little fish							total \$ 367.87

Make check payable to U of I Bursar



DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service

FISH HEALTH INSPECTION REPORT

This report is NOT evidence of future disease status. To determine current status, contact inspecting biologist below.

Name of Fish Source Sweetwater Aquaculture Case # 10-076		Address or Location of Fish Source Rt 1 Box 184A Lapwai, ID 83540 208 843-2929		Name of Owner or Manager ☒ ☐ Greg Dillon		Inspection Dates This 2/18/2010 Prior 4/14/05 4/03/03 1/18/02		Classification No pathogens SW No Pathogens No Pathogens							
FISH EXAMINED					Pathogens Inspected for and Results ³					No Previous Inspections					
Species ¹	Lot Number	Age ²	Number/lot	Obtained as Eggs(E) or Fish(F) FROM:	BF	BR	BK	SW	VE	VH	VP	VC	A	B	Type of Fish Examined
RBT	1	10 mo	400	(F) College of Southern Idaho	60	60	60	60	60	60	60				☒ Hatchery ☐ Feral
															☒ Salmonid ☐ Non-salmonid
															Types of Water Supply
															☒ Spring ☐ Well
															Stream ☐ Impoundment
															☐ Enclosed ☒ Free of fish
															Inspecting Biologist Signature
															Kathy Clemens
															Title 50 Inspector
															Concurred (signature & title)
															Inspecting Biologist Address
															Idaho Fish Health Center
															PO Box 272
															Orofino, ID 83544
															208 476-9500

Remarks: All fish were sampled on 2/18/10. Virology results by inoculation of 5-pool tissues homogenates onto virus-sensitive CHSE-214 and EPC cell cultures; plaque assays were monitored for at least 21 days. BF and BR results by BHIA culture and/or appropriate biochemicals. BK results by FAT. SW - 5-pool whole heads by pepsin-trypsin digest. Confirmation by PCR.

- 1- Use standard FWS abbreviations (see back of page)
2- For hatchery fish give age in months; for feral fish use symbols: e=eggs or fry; f=fingerlings; y=yearlings; b=older fish
3- See list of pathogen abbreviations on back of page; findings reported as $\frac{\text{number examined}}{\text{results}}$ where - = negative and + = positive; other pathogens listed in remarks.

Form 3-226(8/82)

SWEETWATER05.DOT

COLLEGE OF SOUTHERN IDAHO**FISH HATCHERY**

P.O. Box 1238

Twin Falls, Idaho 83303-1238

208-733-9554

DATE

April 4

20

12

Greg Dillon
Lapwai, ID

Description	Amount
26.4 lbs RBT @ 81 ^F / _{lb}	
2138 Fish \$4.00/ _{lb}	\$105.60
239.4 lbs 82 ^F / _{lb}	
3.43 ^F / _{lb}	
	353.60
	1017.20
119.2 lbs @ 8.50 ^F / _{lb}	
1013 Fish	\$1002.00

Please make checks payable to: College of Southern Idaho

Remit to: CSI Business Office, P.O. Box 1238, Twin Falls, ID 83303-1238

Return 1 copy of statement with remittance.