

MEMORANDUM

TO: File 85-7661

FROM: Daniel Nelson – Staff Hydrologist

DATE: June 16, 2014

SUBJECT: Review of System for Licensing

Sandy Hemenway performed the field exam on this permit and was unable to complete the field report due to retirement. Sandy properly located the point of diversion and place of use for this permit, but was unable to determine the flow rates needed to complete the report. I re-visited the site while working on other water rights in the area and retrieved enough information to complete the field exam.

This permit uses ground water and surface water to supply water to two 0.6 af fish ponds used to acclimate salmon before releasing them into the creek. This permit is for the ground water system, which I have determined can divert up to 1.90 cfs, but probably diverts closer to 1.45 cfs. I was unable to see the system while it was operating, but the system was designed to divert 750 gpm from the well, so limiting to the permitted amount is reasonable. The permit is limited to 1.40 cfs, so I am recommending a diversion rate from the ground water system of 1.40 cfs.

According to manage of the fish hatchery, these ponds are only used between mid-April and May 31. The actual days may change from year to year, but they facility is only used in the spring. The fish are kept in this facility for 43 days to allow them acclimate to the creek water. Sometimes the creek water gets too warm, and they need to release them early, but they try to keep them in the facility for the full 43 days if possible. The permit has a year round season, but the accompanying water right 85-7659 has distinct seasons. Therefore, I am recommending a season from April 1 to June 15 to allow some room for changes in the schedule for this facility.

This permit should be recommended as follows:

Fish propagation – 1.40 cfs and 119 af ($1.40 \text{ cfs} \times 1.9835 \times 43 \text{ days} - 0.6 \text{ storage} = 118.8 \text{ af}$)
Fish propagation storage – 0.6 af
Diversion to storage = 1.40 cfs.

Sandy Hemenway created all of the shape files for this permit, so the only real need was to determine the flow rates for this permit. I performed a fish facility analysis on this system, and discovered that they are actually diverting less water than would normally be diverted for a fish rearing facility. Therefore, I feel the diversion rates are reasonable.

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 85-7661
 Reviewer: Dan Nelson
 Date of Review: 5/28/2014

P/D No.:	Senerio 1	Senerio 2	Senerio 3
PUMP HORSEPOWER	60	60	60
BOOSTER HORSEPOWER	0	0	0
PUMPING LEVEL	140	200	260
DISCHARGE PRESSURE	23.8	23.8	23.8
RATE OF FLOW (cfs)	1.90 851	1.45 651	1.17 527 1.51 675.98

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:

There is one well pump for the ground water diversion. This is a 60 Hp pump . The only well log I could find stated this well was 103 feet deep, but the records for this well state that the bowls are set at 277 feet. It appears as though the well was deepened. The well log that we have shows a pumping water level of 100 feet with a 75 gpm yield, so it is reasonable to assume the well was deepened. It also appears as though the yield increases as the well deepens. The static water level in this area is approximately 6 feet. Therefore, if you use 1/2 of the well depth for the pumping water level, the pumping level would be approximately 140 feet, but if used 20 to 30 feet above where the bowls are set, the pumping level would be 260 feet. I used an average of the two standard pumping levels and came up with 200 feet. The pump is rated for 750 gpm according to the fish hatchery manager, which would put the pumping level at approximtely 165 feet. The permit is limited to 1.40 cfs, which pretty much matches the average between the two standards, s o I feel we can allow the full permitted amount of 1.40 cfs.

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D 0040067
DRILLING PERMIT NO. 831879
Water Right or Injection Well No. _____

2. OWNER:
Name Nez Perce Tribe
Address P.O. Box 365
City Lapwai State Id Zip 83540

3. LOCATION OF WELL by legal description:

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 36 North ☒ or South ☐
Rge. 4 East ☐ or West ☒
Sec. 22 1/4 1/4 1/4
Gov't Lot _____ County Nez Perce

Lat: _____ Long: _____
Address of Well Site 23975 Thunder Hill Rd
City Lapwai

(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:

☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other Fish Hatchery

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 Material	From	To	Weight / Volume	Seal Placement Method
<u>Bentonite</u>	<u>0</u>	<u>28</u>	<u>350 lbs</u>	<u>Dry</u>

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 28

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

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>8</u>	<u>+1</u>	<u>28</u>	<u>250</u>	<u>Steel</u>	☒	☐	☒	☐
<u>6</u>	<u>-8</u>	<u>103</u>	<u>100</u>	<u>PVC</u>	☐	☒	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

Packer ☐ Y ☒ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____

Screen Type & Method of Installation _____

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

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

6 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

36N 4W 22

Office Use Only			
Well ID No.			
Inspected by			
Twp	Rge	Sec	
1/4	1/4	1/4	
Lat:	:	Long:	:

12. WELL TESTS:

☐ Pump ☐ Bailor ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>approx 75+</u>		<u>100</u>	<u>1 Hr</u>

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter 36

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water	Y	N
<u>10</u>	<u>0</u>	<u>24</u>	<u>overburden</u>			☒
<u>10</u>	<u>24</u>	<u>28</u>	<u>basalt, soft</u>			☒
<u>8</u>	<u>28</u>	<u>36</u>	<u>basalt, firm</u>			☒
<u>8</u>	<u>36</u>	<u>37</u>	<u>Fract. basalt 2GPM</u>		☒	
<u>8</u>	<u>37</u>	<u>45</u>	<u>basalt, firm</u>			☒
<u>8</u>	<u>45</u>	<u>50</u>	<u>Fract. basalt 4GPM</u>		☒	
<u>8</u>	<u>50</u>	<u>87</u>	<u>basalt, firm</u>			☒
<u>8</u>	<u>87</u>	<u>92</u>	<u>Fract. basalt 20GPM</u>		☒	
<u>8</u>	<u>92</u>	<u>95</u>	<u>soft basalt</u>			☒
<u>8</u>	<u>95</u>	<u>103</u>	<u>basalt, firm</u>			☒

RECEIVED

JUN 01 2005

IDWR/North

Completed Depth 103 (Measurable)

Date: Started 3/10/05 Completed 3/13/05

14. DRILLER'S CERTIFICATION

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

Company Name Wittwell Drilling Firm No. 58

Principal Driller Roger Witt Date 3/28/05

and Driller or Operator II _____ Date _____

Operator I _____ Date _____

Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II.

Fish Propagation Worksheet

Determination of Density Index = Weight of Fish Produced in pounds/ (Fish length in inches X Facility Volume in ft³)		
Fish Weight	10,000.00	
Length	3.00	
Volume	26,136.00	
Density Index	0.13	
Under Ideal Conditions, Density Index should be between 0.4 and 1		

Determination of facility exchange = Diversion Rate in cfs X 3600/ Facility Volume in ft³		
Diversion Rate	6.50	
Facility Volume	26,136.00	
Exchanges per Hour	0.90	
Under Ideal Conditions, Exchanges per Day should be 2.5 for Trout.		

Diversion Capacity Calculation = Diversion Rate in cfs X 1.9835 X 43 days		
Diversion Rate	6.5	
Total Volume	554.4	

Determination of Flow Index = Weight in Pounds/ (Fish Length X Diversion Rate in gpm).		
Fish Weight	10,000.00	
Length	3.00	
Diversion Rate	2,917.20	
Flow Index	1.14	
Under Ideal Conditions, Flow Index should be between 0.83 and 2.7		

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	0.13	
Actual Exchanges Per Hour	0.90	
Adjusted Density Index	0.36	
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.		

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