

MEMORANDUM

TO: File 85-~~7659~~ 7650 DAN 6-23-14
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 there were several issues that needed to be resolved prior to licensing of this permit. Due to the amount of information that was missing, I went back to the site and worked with the hatchery Manager, Aaron Penney.

Ms. Hemenway stated that this was a year round hatchery and that it raised 800,000 fish. Mr. Penney stated that the hatchery has two runs of fish. The first run is for the Fall Chinook, and runs for 10 weeks in the spring. The Fall Chinook run raises 400,000 fish at 100 fish to the pound. The second run is for the Spring Chinook, and runs for 12 weeks during the summer months. The Spring Chinook run raises 225,000 fish at 75 fish to the pound. I have completed a fish propagation analysis on this hatchery, and the numbers are reasonable for a hatchery this size.

Ms. Hemenway performed a pipe flow analysis to determine the flow rate for this system, but it didn't seem reasonable. I measured the system using the Thyme Flyte polysonic flow meter and discovered that her calculations were extremely low. The spring for this system supplies 1545 gpm or 3.44 cfs to the hatchery. Ms. Hemenway also stated that there was a backup pump for this system, and Mr. Penney stated that there has never been a well or backup pump from the creek for this system. The only water source for this system is the spring.

Ms. Hemenway calculated the volume for the ponds for the storage component for this system. An error was made when calculating the volumes for this facility. The correct volume is 0.2 acre feet of volume. Ms. Hemenway had the correct initial data, so I am confident that this is correct volume.

Ms. Hemenway also stated that water right 85-2123 did not overlap this permit because it came from a different spring for a single hatch house. I discussed this water right with Mr. Penney during my visit, and he informed me that the water for 85-2123 was actually diverted from the same spring from a 4 inch pipeline to hatch house on the same property. When the current facility was constructed, they replaced the 4 inch line with the current 8 inch line, and removed the hatch house for the large tanks shown on Ms. Hemenway's maps. Taking this into consideration, I feel that water right 85-2123 is a direct overlap with this permit.

I have added condition X35 to the license to ensure that these two water rights are not considered to be for different facilities, and that the rights have different seasons of use. The facility may be operating when the season of use for water right 85-20123 is not available, so they would need to count on water right 85-7656 to supply the entire diversion rate for the facility. The X35 condition should limit the diversion rate to 3.44 cfs and the total annual volume to 1051 acre feet.

This permit does supply some new information and limitations to the existing water right 85-2123, so I am recommending the full diversion rate for this permit, with X35 condition that limits the combined use. I feel the season for this permit remain year round, since the start and end dates for this facility is so dependent on spawning of the salmon. The following are my recommendations:

Diversion to storage = 3.44 cfs

Fish propagation storage = 0.2 af

Fish propagation =

3.44 cfs and 1050.6 af (1050.8 total allowable volume – 0.2 af storage volume = 1050.6 af)

I have included a measurement sheet, volume calculation sheet, fish propagation sheet, and volume calculation sheet for 85-2123 with this memo. I also changed the place of use for the storage component that Ms. Hemenway created to more accurately describe the location of the storage units. The remainder of the information supplied by Ms. Hemenway appears to be adequate.

POLYSONIC READINGS

PERMIT #: 85-7656

POINT OF DIVERSION

Spring Diversion

FIRST SET OF INFORMATION:

SET-UP IMPUTE DATA USED DURING
PREPARATION FOR FLOW MEASUREMENTS.

SECOND SET OF INFORMATION:

THESE ARE THE READINGS TAKEN FOR
THIS PUMP. THE TOTAL FLOW WAS
AVERAGED OVER A 10 MINUTE READING.

FLows IN GALLONS PER MINUTE (GPM)

1545 GPM FLOW RATE

FLows IN CUBIC FEET PER SECOND (CFS)

1545 GPM / 448.8 = 3.44 CFS FLOW RATE

Permit is limited to 4.00 cfs, so use
measured flow rate.

MODE SELECT
INPUT
OUTER DIAMETER
8.6399 IN
PIPE MATERIAL
? PVC
WALL THICKNESS
0.3529 IN
INNER LINING
? NO LING.
KIND OF FLUID
? WATER
SENSOR MOUNTING
? U
TYPE OF SENSOR
? SMALL
DATA CHANGE
? NO
SPACING
8.262 IN U
05-28 11:5730 *R
+007.00 % R12
ZERO MODE
CLEAR
ZERO MODE
AUT ZERO
0304.9 MMSEC
102.97 % T0

12:03+ 1.522E 3GPM 00R
+00000 *10 G 00R
-00000 *10 G 00R
12:04+ 1.545E 3GPM 00R
+00154 *10 G 00R
-00000 *10 G 00R
12:05+ 1.531E 3GPM 00R
+00300 *10 G 00R
-00000 *10 G 00R
12:06+ 1.552E 3GPM 00R
+00460 *10 G 00R
-00000 *10 G 00R
12:07+ 1.551E 3GPM 00R
+00611 *10 G 00R
-00000 *10 G 00R
12:08+ 1.541E 3GPM 00R
+00769 *10 G 00R
-00000 *10 G 00R
12:09+ 1.542E 3GPM 00R
+00927 *10 G 00R
-00000 *10 G 00R
12:10+ 1.539E 3GPM 00R
+01082 *10 G 00R
-00000 *10 G 00R
12:11+ 1.574E 3GPM 00R
+01234 *10 G 00R
-00000 *10 G 00R
12:12+ 1.547E 3GPM 00R
+01389 *10 G 00R
-00000 *10 G 00R
12:13+ 1.544E 3GPM 00R
+01545 *10 G 00R
-00000 *10 G 00R

METER SET UP



measurement

Permit 85-7656

Volume Calculation By Dan Nelson

16-Jun-14

Number of Circular Tanks	Tank Diameter in feet	Tank Depth in feet	Volume per tank in cubic feet.	Total Volume in Cubic Feet
4	16	4	803.84	3215.36
3	20	4	1256	3768

Number of Square tanks	Width in Feet	Length in Feet	Depth in Feet	Volume per tank in Cubic Feet	Total Volume in Cubic Feet
14	6	6	2.5	90	1260

Total Volume of Circular Tanks in cubic feet	Total Volume of Square Tanks in cubic feet	Total Volume in Cubic Feet	Total Volume in Acre Feet.
6983.36	1260	8243.36	0.189242

Fish Propagation Worksheet

Determination of Density Index = Weight of Fish Produced in pounds/ (Fish length in inches X Facility Volume in ft³)		
Fish Weight	7,000.00	
Length	3.00	
Volume	8,243.00	
Density Index	0.28	
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	3.44	
Facility Volume	8,243.00	
Exchanges per Hour	1.50	
Under Ideal Conditions, Exchanges per Day should be 2.5 for Trout.		

Diversion Capacity Calculation = Diversion Rate in cfs X 1.9835 X 154 days		
Diversion Rate	3.44	
Total Volume	1050.779	

Determination of Flow Index = Weight in Pounds/ (Fish Length X Diversion Rate in gpm).		
Fish Weight	7,000.00	
Length	3.00	
Diversion Rate	1,545.00	
Flow Index	1.51	
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	0.28	
Actual Exchanges Per Hour	1.50	
Adjusted Density Index	0.47	
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.

Calculator - Read Me

Step 1 - Calculate No. of Days

Is It a Leap Year?

☐ YES

☒ NO

Enter Starting Date:

March

1

March - 1

Enter Ending Date:

September

30

September - 30

Total Number of Days (Starting and Ending Dates Inclusive)

214

Step 2 - Input Flow Rate Value

Select Units

Cubic Feet per Second

Input Flow Rate

0.24 CFS

Step 3 - Select Units of Output Volume

Select Units

Ac-Ft

Output Volume

101.9 Ac-Ft

A 102 Ac-Ft is the maximum amount of volume with a flow rate of 0.24 cfs under the existing water right 85-2123. The current system can provide a maximum of 1051 Ac-Ft (see fish propagation sheet). The 102 Ac-Ft is inclusive with the 1051 Ac-Ft.