

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 47-8271

Exam Date: 7/10/2014

1. Current Owner: J M MILLER ENTERPRISES INC
PO BOX 1
FILER ID 83328
(208)326-4729
2. Accompanied by: Jim Miller
Phone No: 208-308-1488, cell
Address: same as above
Relationship to Permit Holder: Permit holder

3. SOURCE

UNNAMED STREAM
WASTE WATER

TRIBUTARY

SNAKE RIVER
SNAKE RIVER

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

UNNAMED STREAM	SE1/4NE1/4	Sec. 13,	Twp 09S,	Rge 15E, B.M.
TWIN FALLS County				
WASTE WATER	SW1/4NW1/4	Sec. 13,	Twp 09S,	Rge 15E, B.M.
TWIN FALLS County				

Method of Determination: Aerial imagery and site visit

2.

PLACE OF USE: POWER

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
09S	15E	13	X																

PLACE OF USE: STOCKWATER

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
09S	15E	13	X			X													

Method of Determination: Aerial Imagery and site visit

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

4.

<u>Well or Diversion</u> <u>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</u> <u>Size</u>
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See maps and narrative

*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

<u>Measurement</u> <u>Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
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No direct measurement was made- power production records were used to determine flow rate and volume for the power portion. Stockwater rate was less than 0.24 cfs, so Table 2 from the Beneficial Use Exam Handbook was used to determine rate and volume.

2. Measurements: No direct measurements were made

E. FLOW CALCULATIONS☒ Additional Computation Sheets Attached

Measured Method:

The method of flow calculation for the power portion of the permit is shown on the attached sheet: **J. M. Miller Enterprises, Inc., 47-8271 Analysis of Production.**

Flow calculation for the stockwater portion was determined using the IDWR Beneficial Use Exam Handbook, Table 2, Water for Livestock In-stream Diversion.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: NA

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

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

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

2. Volume Calculations for Other Uses:

The method of volume calculation for the power portion of the permit is shown on the attached sheet: **J. M. Miller Enterprises, Inc., 47-8271 Analysis of Production.**

Volume calculation for the stockwater portion was determined using the IDWR Beneficial Use Exam Handbook, Table 2, Water for Livestock In-stream Diversion.

G. NARRATIVE/REMARKS/COMMENTS

The field exam for permit 47-8271 was conducted on July 10, 2014, accompanied by permit holder, Jim Miller. The original application, from May 24, 1991, listed one point of diversion (POD) in the SENE, Section 13, T09S, R15E, from an Unnamed Stream (sometimes referenced in the permit back file as Kastelu Drain), which is mainly comprised of waste water from nearby farm ground and some seepage tunnel water. An amendment on March 3, 1998, added another POD in the SWNW of Section 13, T09S, R15E, which was Waste Water near the end of Twin Falls Canal Company Lateral 39. Both PODS are on Mr. Millers property. The second POD, in the SWNW, has been placed just inside Mr. Millers property line and the QQ line to satisfy the permit legal description. On aerial imagery, the POD appears to be in the NWSW, but it seems likely that a shift in the imagery may be the problem. The water from the second POD is transported via ditch to the Unnamed Stream, then into a series of four water quality improvement ponds, which are maintained by the TFCC on Mr. Millers property. Water then enters a eight foot wide concrete penstock with a trash rack and is sent down gradient toward the Snake River in a 2 foot diameter steel pipe, over a distance of approximately 2000 feet. Excess water is directed back into the Unnamed Stream channel through a concrete overflow structure adjacent to the penstock.

The water enters the powerhouse and is directed into a Canyon Turbines Model 20264 Pelton-type 485 kW, four nozzle turbine. The turbine is connected to a water level sensor at the penstock which adjusts the flow through each nozzle every 30 seconds in response to the forebay water level. The turbine powers a Westinghouse 625 kva, three phase, 60 cycle, 720 RPM, 2300 volt generator with a power factor of 80 percent. Generated power is sent to a transformer and on to the Idaho Power system

The current contract with Idaho Power runs from 2010 through 2017. The FERC license (11060-001) was issued 12/12/1999 and is valid for 50 years.

Because of the system configuration, a direct measurement was not possible, so upon request, Mr. Miller provided power production records for all of the years that he has data available. To calculate the flow rate and volume for the facility, the common theoretical kilowatt formula: $kW = \text{Head (feet)} \times \text{Flow (cfs)} \times \text{Efficiency} / 11.8$ (constant) was used to first calculate flow, then volume. The highest production year, 2011 was used to calculate volume, and the month of September, 2010, the highest single month of production was used to determine the license flow rate (see attached spreadsheet). These calculations yielded a recommended flow rate of 17.6 cfs and a volume of 5245.9 AFA. This method of calculating flow rate should satisfy the measuring device requirement; if not, there is a slot in the concrete tailrace, which could accommodate a weir (see photos). The impoundment for the hydropower facility was not constructed as large as was originally planned, so it does not appear to warrant IDWR oversight.

Mr. Miller informed me that about 90 cattle and horses use the unnamed stream, the water quality improvement ponds, the forebay, as well as the stream below the hydropower inlet as a drinking source. Using Table 2, Water for Livestock In-stream Diversion, from the Beneficial Use Exam Handbook, a diversion rate of 0.01 cfs and a volume of 1.2 AFA is recommended for the stockwater portion of the permit.

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>
POWER	01/01 to 12/31	17.600 CFS	5,245.90 AF
STOCKWATER	01/01 to 12/31	0.010 CFS	1.20 AF
<u>Totals:</u>		17.600 CFS	5,245.90 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

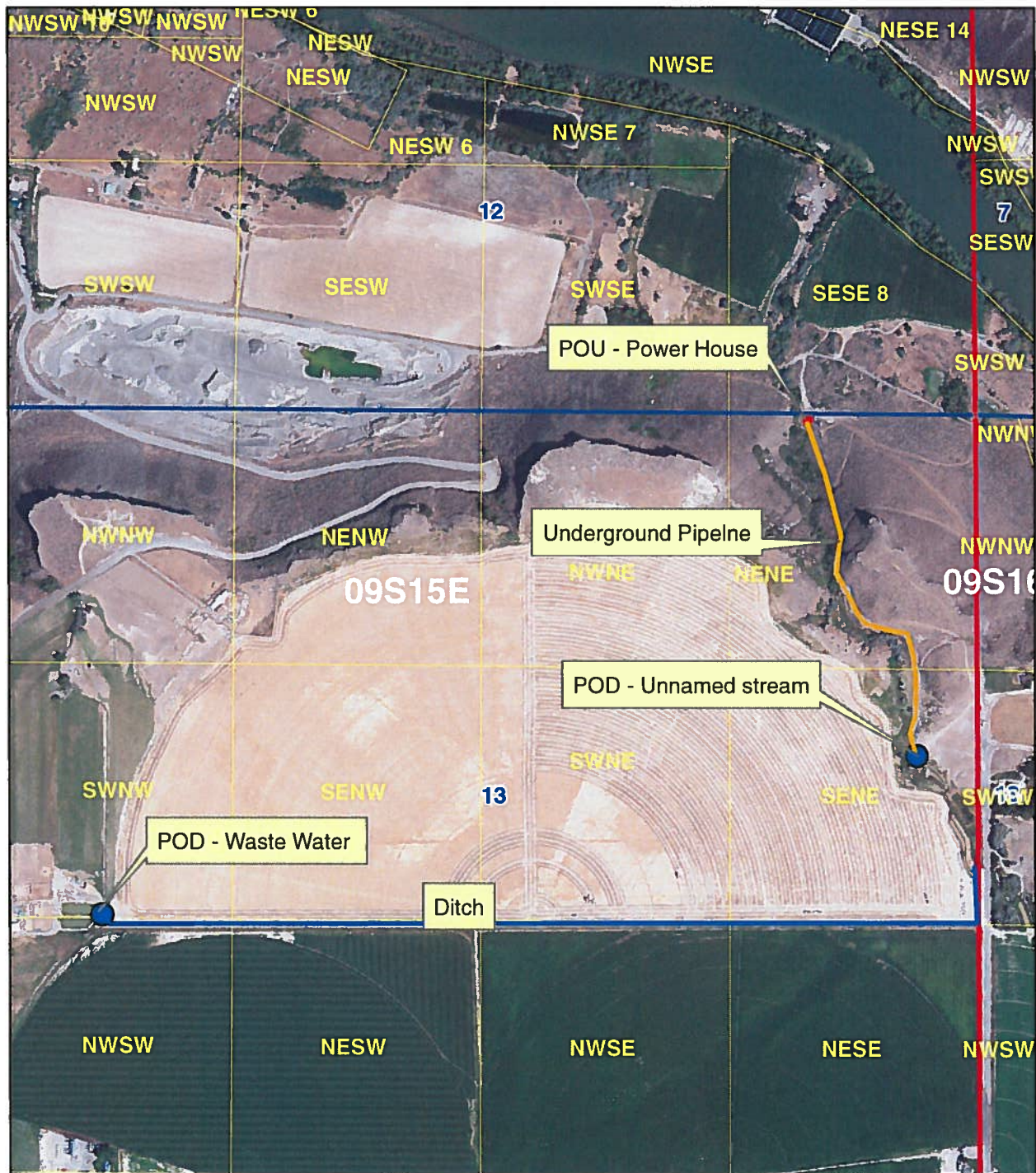
I. AUTHENTICATION

Field Examiner's Name Jim B. Boring Date 7/10/2014

Reviewer _____ Date _____

Idaho Department of Water Resources

System Diagram



47-8271 Miller

Legend

-  Township/Range
-  Sections
-  QQ



0 0.05 0.1 0.2 Miles



POD location for the Waste Water source

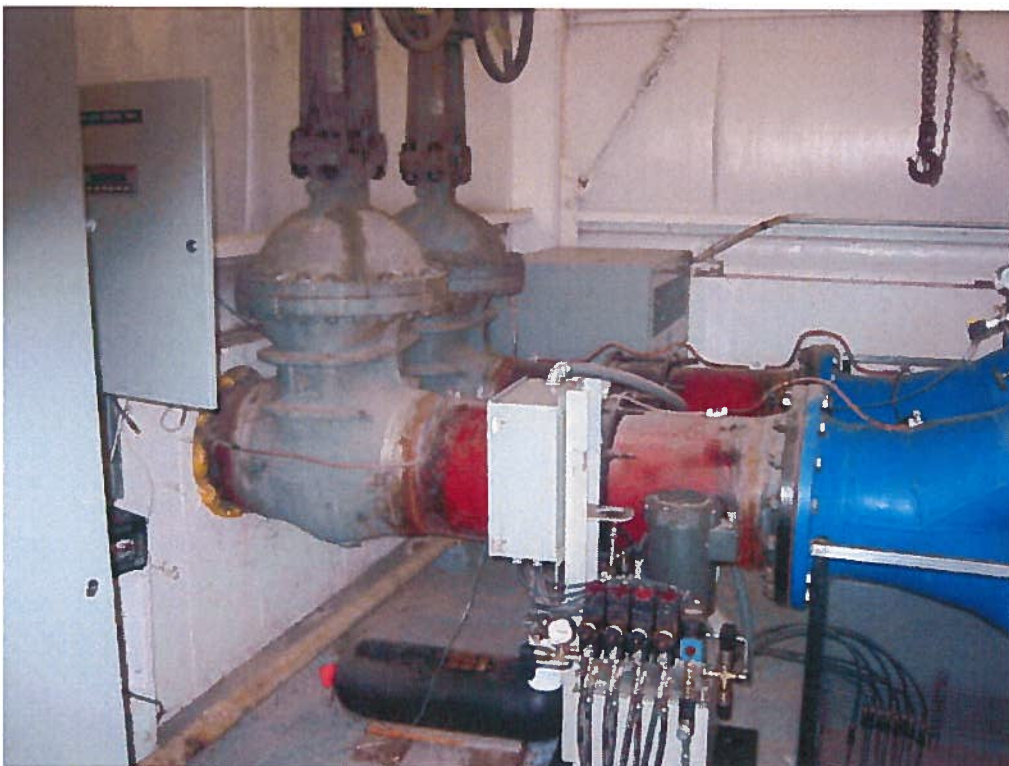
POD location for Unnamed Stream source





Power house in Snake River Canyon

Water enters power house and is split into two service lines



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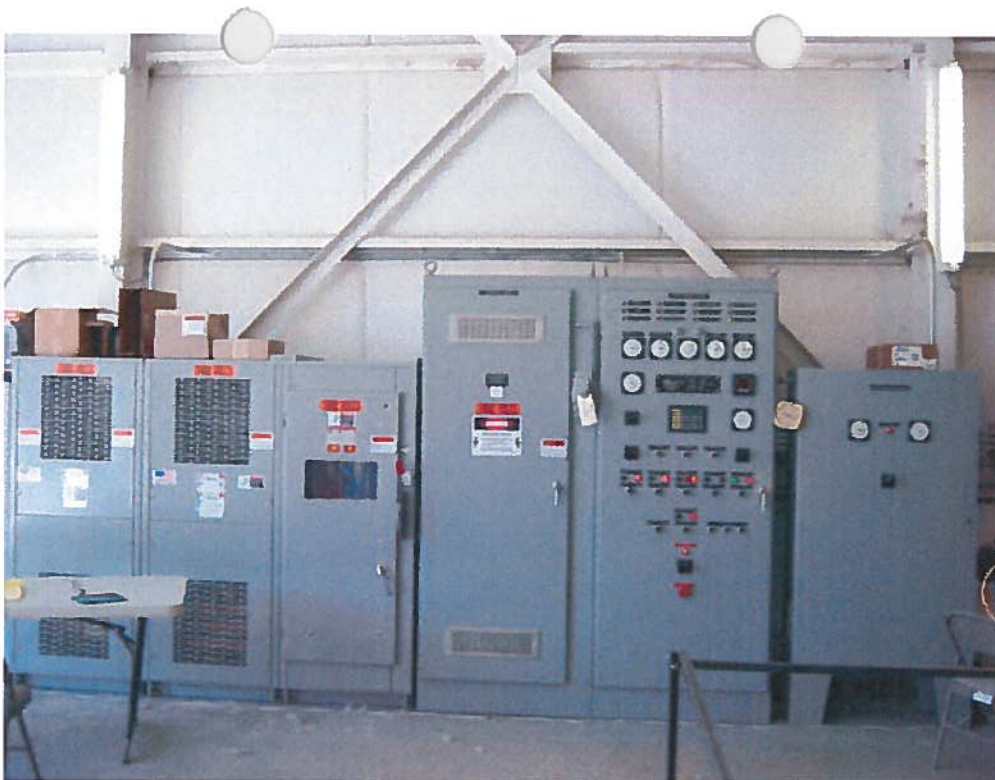


Each service line splits into two pipes which supply nozzles that power the turbines. Each of the four nozzles is adjusted every 30 seconds in response to changing levels in the pool above the penstock

The Westinghouse generator inside the power house



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Extensive control panels inside power house

Permit holder Jim Miller observing water as it exits the power house



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J. M. Miller Enterprises, Inc. 47-8271 Analysis of Production

2011- highest year of production on record- to calculate volume

MONTH	KWH	KWH Ave/day	KWH Ave/hr	CFS	Volume
January	0	0	0	0	0
February	0	0	0	0	0
March	0	0	0	0	0
April	64800	2160	90	4.010574	238.6492
May	200400	6464.516129	269.3548387	12.00297	738.0448
June	223200	7440	310	13.8142	822.0139
July	217200	7006.451613	291.9354839	13.00921	799.9168
August	210000	6774.193548	282.2580645	12.57797	773.4002
September	223200	7440	310	13.8142	822.0139
October	262800	8477.419355	353.2258065	15.74042	967.8551
November	22800	760	31.66666667	1.411128	83.96917
December	0	0	0	0	0

5245.863

September 2010- highest month of production on record- to calculate diversion rate

KWH	KWH Ave/day	KWH Ave/hr	CFS
284400	9480	395	17.60196

Volume = 5245.9 AFA, Flow Rate = 17.60 cfs

Formula to calculate cfs from KWH is: $KW = Q \times h \times e / 11.8$

11.8 = constant

Q = flow rate in cfs

h = head

e = unit efficiency

Head of this plant is 331', efficiency of Pelton turbine and Westinghouse generator is 0.8

Formula to calculate volume is: $AF = cfs \times 1.9835 \text{ AF/day} \times \text{days in month}$

$$KW = \frac{Q \times h \times e}{11.8}$$

$$\frac{KWH}{hrs} = \frac{(\text{?}Q)(331)(0.8)}{11.8}$$

$$\downarrow$$

$$395 \frac{KWH}{hr}$$

$$KWH = KW \times hr$$

$$KW = \frac{KWH}{hrs}$$