

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

RECEIVED
DEC 27 2011
DEPT. OF WATER RESOURCES
SOUTHERN REGION

A Beneficial Use Field Report is prepared by a water right examiner as the result of an examination to clearly confirm and establish the extent of the beneficial use of water established in connection with a permit during the development period authorized by the permit and any extensions of time previously approved.

A. GENERAL INFORMATIONPermit No. 71-10934

1. Owner USA Acting through USDI Fish & Wildlife Service Phone No. 503-231-6145
Current address Division of Engineering, 911 NE 11th Ave, Portland OR 97232-4181
2. Examiner's name Terry Scanlan, P.E. (Examiner No. 11-129) EXAM DATE November 9, 2011
3. Accompanied by Brent Snider Email brent.snider@idfg.idaho.gov
Address HC 64, Box 9905, Stanley, ID 83278
Relationship to permit holder Hatchery Manager, Idaho Dept. Fish & Game Phone No. 208-774-3684
4. Source Ground Water tributary to _____

B. OVERLAP REVIEW

1. Other water rights with the same place of use 71-2088, 71-7079, 71-10936 , 71-10937
2. Other water rights with the same source and point of diversion 71-10936 , 71-10937

C. DIVERSION AND DELIVERY SYSTEM

1. Point(s) of Diversion: See Attachment A

Ident. No.	Gov't Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determination/Remarks

2. Place(s) of Use: _____ Method of determination Exam, 2009 Photo

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
10N	13E	36			L4											L5			
					X											X			

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☒ see attached.

Scale: 1" = _____

- ☒ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (**required**)
☒ Aerial photo attached (required for irrigation of 10+ acres)
☒ Photo of diversion and system attached

4. See Attachment A

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size

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

D. FLOW MEASUREMENTS See Attachment D

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
See Attachment D						

2. **Measurements:** _____

12.08 cfs (See Attachment D)

☒ Additional computation sheets attached

Flow was measured using installed flow meters. Total capacity for fish propagation use was measured at 12.08 cfs on November 9, 2011 (see Attachment D). Of this flow, 9.1 cfs is delivered under decreed water right 71-10937 and 2.5 cfs is delivered under this permit (71-10934), for a total authorized diversion of 11.6 cfs.

ATTACHMENT A

WELL DIVERSIONS AND DESCRIPTIONS

Part C. Diversion and Delivery System

1. Points of Diversion:

Ident. No.	Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determinations
Well 1	8	SW	SE	SE	36	10N	13E	Custer	Exam, 2009 Photo
Well 1A	8		SE	SE	36	10N	13E	Custer	Exam, 2009 Photo
Well 3			NE	NE	1	9N	13E	Custer	Exam, 2009 Photo
Well 5	5		NW	SE	36	10N	13E	Custer	Exam, 2009 Photo
Well 6	5	SE	NW	SE	36	10N	13E	Custer	Exam, 2009 Photo
Well 7	5	SE	NW	SE	36	10N	13E	Custer	Exam, 2009 Photo

4. Delivery System:

Well No.	Motor Make	Hp	Motor Ser. No.	Pump Make	Pump Ser. No. or Discharge Size
1	Franklin	10	Submersible	Berkeley	6-inch discharge 7T450
1A	Hitachi	20	Submersible	Robbco	8-inch; 12CME, 8.375" impeller
3	US Electric	25	9400800-853	Gould	10-inch discharge 12JHC
5	Hitachi	50	Submersible	Gould	10-inch discharge 14RJMC
6	Franklin	20	Submersible	Franklin	700ST8
7	Franklin	10	Submersible	Berkeley	7T450

ATTACHMENT B
REMARKS/NARRATIVE

Part E. Narrative/Remarks/Comments

Sawtooth Fish Hatchery is authorized to divert 5.8 cfs from May through September and 9.1 cfs from October through April from ground water for fish propagation under water right 71-10937. The hatchery is authorized to divert an additional 2.5 cfs on a year-round basis under this permit (71-10934).

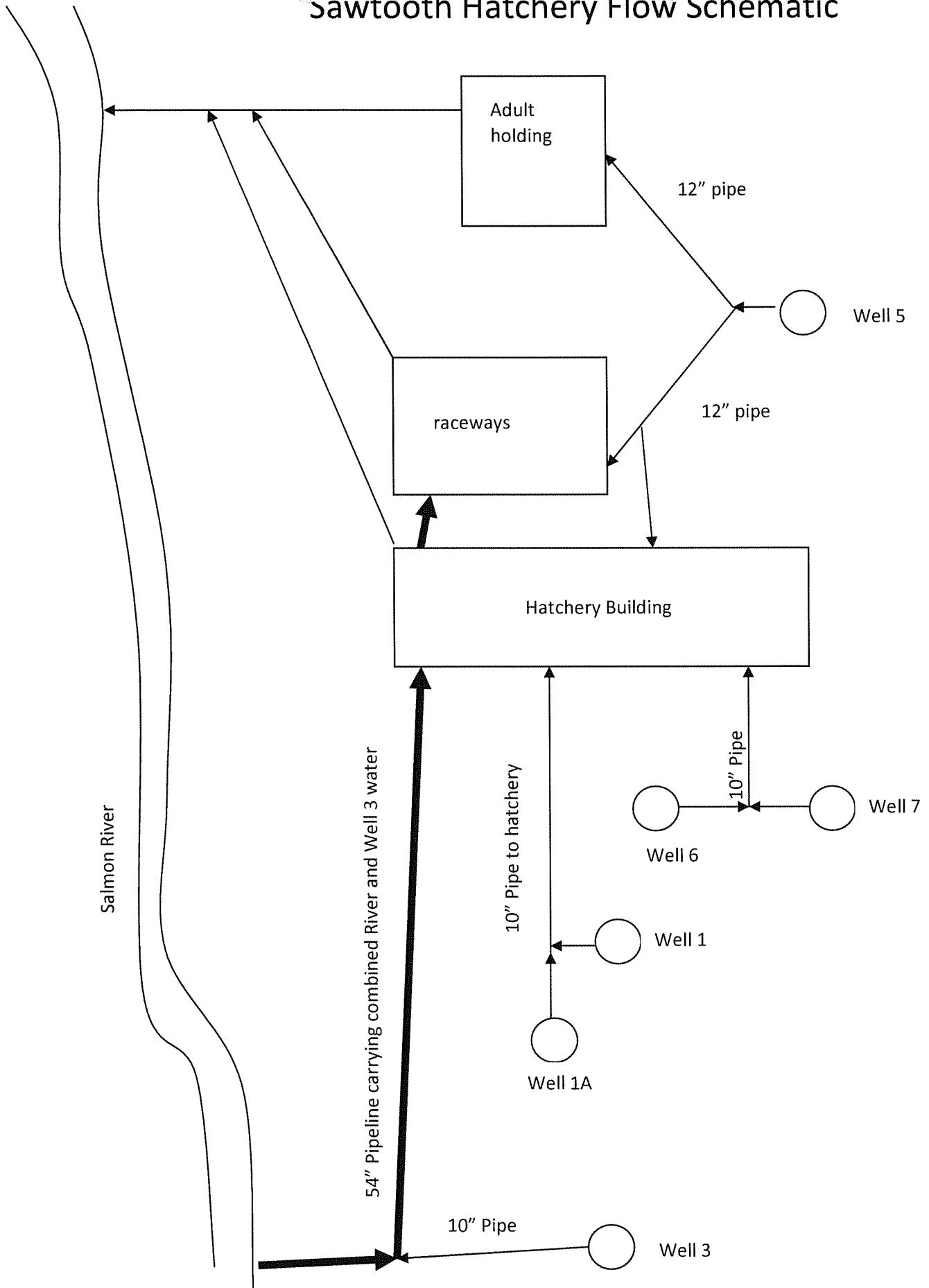
Per approved transfer 76669 and this permit, modifications have been made to existing wells and two new wells have been added to the system to help meet the hatchery's increased fish propagation needs.

The hatchery is supplied by six wells (Wells 1, 1A, 3, 5, 6, and 7) for fish propagation purposes under this permit and water right 71-10937, and a seventh well (Well 4) for domestic and irrigation purposes under water right 71-10936.

Water from the six wells is delivered to various locations within the hatchery facility, but ultimately all discharges back to the river at the same location. As such, the hatchery can be considered as a single system, but with limitations on various uses.

- Wells 1, 1A, 6, and 7 are all diverted for use inside the hatchery building. These flows pass through a de-gasification system prior to use. The capacity of the degasification system is a limiting factor in the combined use rate of these four wells. These wells are operated year-round. Wells 1 and 1A share a common pipe and well house. Wells 6 and 7 share a common pipe and well house. The well house for Wells 6 and 7 is the former Well 2 well house. Well 2 has been abandoned.
- Well 3 is diverted for ice control at the river intake. The flow from Well 3 mixes with the river flows for use in the outdoor raceways. It is used from October through April.
- Well 5 is diverted for use in the outdoor raceways and adult holding ponds. This well is operated year-round, with flow diverted to raceways in the fall, winter, spring, and flow to adult holding in summer.

Sawtooth Hatchery Flow Schematic



ATTACHMENT C

PERMIT RECORD AND PROOF OF BENEFICIAL USE

State of Idaho
Department of Water Resources

Permit to Appropriate Water

NO. 71-10934

Priority: July 14, 2010

Maximum Diversion Rate: 2.50 CFS

This is to certify, that UNITED STATES OF AMERICA ACTING THROUGH
USDI FISH AND WILDLIFE SERVICE
DIVISION OF ENGINEERING
911 N E 11TH AVE
PORTLAND OR 97232-4181

has applied for a permit to appropriate water from:

Source: GROUND WATER

and a permit is APPROVED for development of water as follows:

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>RATE OF DIVERSION</u>
FISH PROPAGATION	01/01 to 12/31	2.50 CFS

LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER	SE1/4NE1/4NE1/4	Sec. 1, Twp 09N, Rge 13E, B.M.	
CUSTER County			
GROUND WATER	L5 (SE1/4NW1/4SE1/4)	Sec. 36, Twp 10N, Rge 13E, B.M.	4
CUSTER County			
GROUND WATER	L5 (SE1/4NW1/4SE1/4)	Sec. 36, Twp 10N, Rge 13E, B.M.	7
CUSTER County			
GROUND WATER	NE1/4NE1/4	Sec. 1, Twp 09N, Rge 13E, B.M.	3
CUSTER County			
GROUND WATER	L8 (SW1/4SE1/4SE1/4)	Sec. 36, Twp 10N, Rge 13E, B.M.	1
CUSTER County			
GROUND WATER	L5 (NW1/4SE1/4)	Sec. 36, Twp 10N, Rge 13E, B.M.	
CUSTER County			
GROUND WATER	L5 (NW1/4SE1/4)	Sec. 36, Twp 10N, Rge 13E, B.M.	5
CUSTER County			
GROUND WATER	L8 (SE1/4SE1/4)	Sec. 36, Twp 10N, Rge 13E, B.M.	10
CUSTER County			

PLACE OF USE: FISH PROPAGATION

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
10N	13E	36			X												X		
					L 4												L 5		

State of Idaho
Department of Water Resources
Permit to Appropriate Water
NO. 71-10934

CONDITIONS OF APPROVAL

1. Proof of application of water to beneficial use shall be submitted on or before **October 01, 2015**.
2. Subject to all prior water rights.
3. The right holder shall not divert water at a rate exceeding what is reasonably necessary for the beneficial use authorized by this right.
4. Use of water under this right shall be non-consumptive.
5. This right does not grant any right-of-way or easement across the land of another.
6. Right holder shall comply with the drilling permit requirements of Section 42-235, Idaho Code and applicable Well Construction Rules of the Department.
7. Prior to the diversion and use of water under this approval, the right holder shall comply with applicable water quality permitting requirements administered by the Department of Environmental Quality or the Department of Agriculture.
8. Use of water under this right will be regulated by a watermaster with responsibility for the distribution of water among appropriators within a water district. At the time of this approval, this water right is within State Water District No. 71.
9. When notified by the Department or by a watermaster with regulatory authority over this right, the right holder shall report the amount of water diverted in connection with this right. The report shall be submitted in the manner and frequency specified by the Department or the watermaster.
10. Prior to diversion of water under this right, the right holder shall install a lockable device, subject to the approval of the Department, in a manner that will provide the watermaster suitable control of the diversion.
11. Prior to the diversion and use of water under this right, the right holder shall install and maintain acceptable measuring device(s), including data logger(s), at the authorized point(s) of diversion and in accordance with Department specifications, or shall obtain an approved variance from the Department to employ an alternative method to determine and record the amount of water diverted.

This permit is issued pursuant to the provisions of Section 42-204, Idaho Code. Witness the signature of the Director, affixed at Boise, this 15th day of September, 2010.

FOR



GARY SPACKMAN, Interim Director

ATTACHMENT D
FLOW MEASUREMENTS

PART D. FLOW MEASUREMENTS

1. Measurement Equipment

Well	Type	Make	Model No.	Serial No.	Size	Calibration Date	Remarks
1	propeller flow meter	McCrometer		05-07613-06	6"		
1A	magnetic flow meter	McCrometer	Ultramag	um20100478	10"	new 10/2010	
3	propeller flow meter	McCrometer		84-10-1168	10"	Apr-08	
5	magnetic flow meter	McCrometer	Ultramag	um20110433	10"	new 10/2011	to adult holding
	magnetic flow meter	McCrometer	Ultramag	um20110434	10"	new 10/2011	to raceways
6&7	propeller flow meter	McCrometer		05-07595-06	6"	Jul-09	

2. Measurements

All measurements were made using the installed flow meters.

- Wells 1, 1A, 6, and 7 are all diverted for use inside the hatchery building. Wells 1 and 1A enter through one pipeline, and Wells 6 and 7 enter through a separate pipeline.
 - Flow from Wells 1 and 1A, in combination, were measured at 1380 gpm (3.07 cfs) on November 22, 2010. These flows consisted of 430 gpm from Well 1 and 950 gpm from Well 1A.
 - Flow from Wells 6 and 7, in combination, were measured at 1000 gpm (2.23 cfs) on August 18, 2010. Approximate flows were 650 gpm and 350 gpm from Wells 6 and 7, respectively.
 - The discharge from the four wells passes through a de-gasification system prior to fish propagation use. Although the combined capacity of the four wells is 5.3 cfs, the de-gas system capacity is the limiting factor on water use inside the hatchery building. Degas system capacity was measured at 2200 gpm (4.95 cfs) during the field examination on November 9, 2011. This flow consisted of 460 gpm from Well 1, 760 gpm from Well 1A, and 980 gpm from Wells 6 and 7. Well 1A was throttled to limit flow.
- Well 3 is diverted for ice control at the river intake. The flow from Well 3 mixes with the river flows for use in the outside raceways. Flow from Well 3 was measured at 1200 gpm (2.67 cfs) during the field examination on November 9, 2011.
- Well 5 is diverted for use at the outside raceways and adult holding ponds. Well 5 flow was measured at a rate of 2,000 (4.46 cfs) during the field examination on November 9, 2011 while pumping to the outside raceways.

In combination, the hatchery can utilize a groundwater supply of 12.08 cfs. The hatchery has an additional redundant supply of 0.35 cfs, for a total available hatchery groundwater supply of 12.43 cfs.

ATTACHMENT E

TOPO MAP & 2009 AERIAL PHOTO

2009 Photo

T10N R13E

T9N R13E

Well 5

Well 7

Well 6

Well 1

Well 1A

Well 3

Legend



New Wells



Existing Wells



Hatchery POU

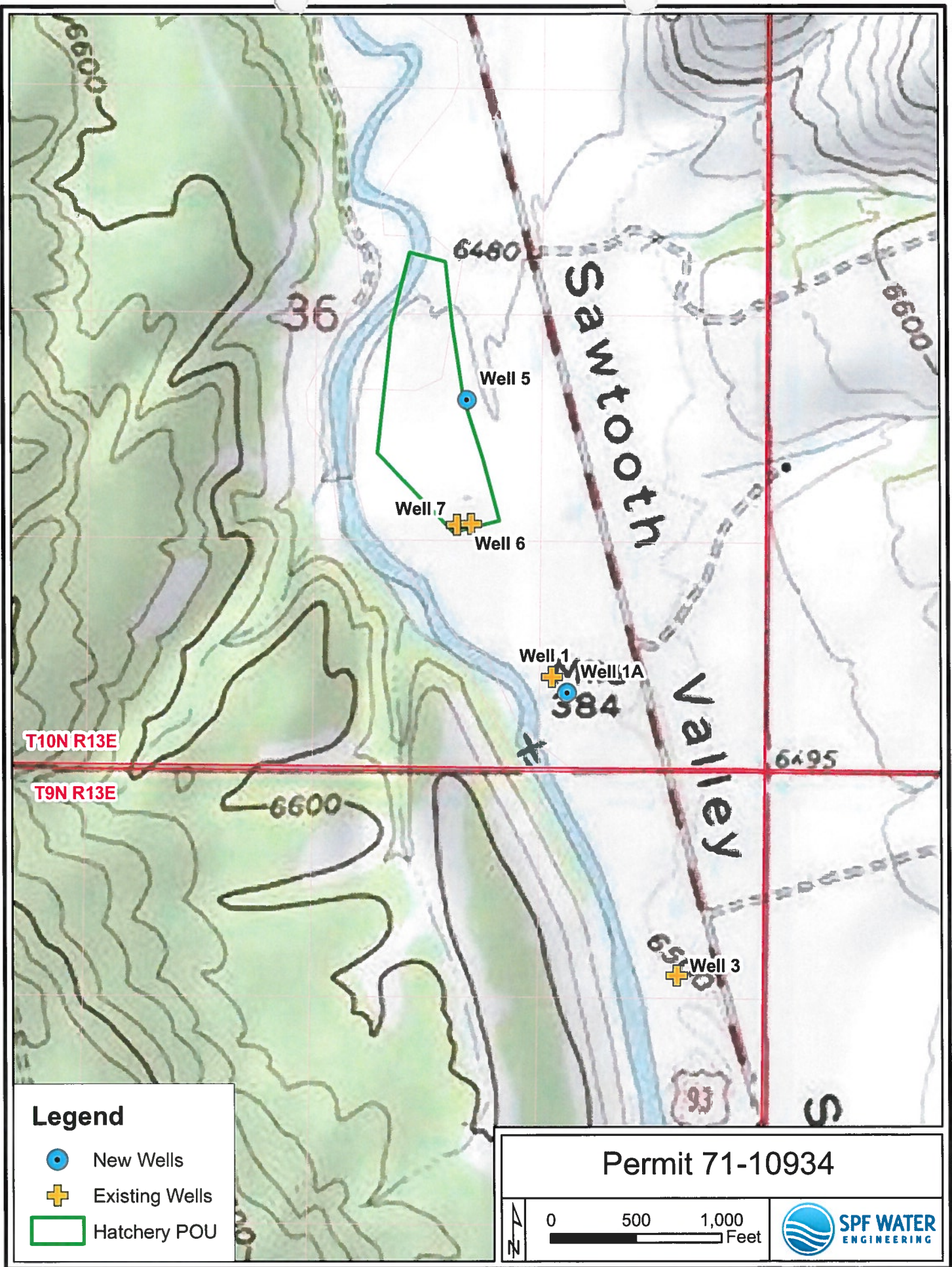
Permit 71-10934



0 500 1,000 Feet



SPF WATER
ENGINEERING



T10N R13E

T9N R13E

Sawtooth Valley

Well 5

Well 7

Well 6

Well 1

Well 1A

Well 3

384

6495

6600

6500

93

S

Legend

-  New Wells
-  Existing Wells
-  Hatchery POU

Permit 71-10934

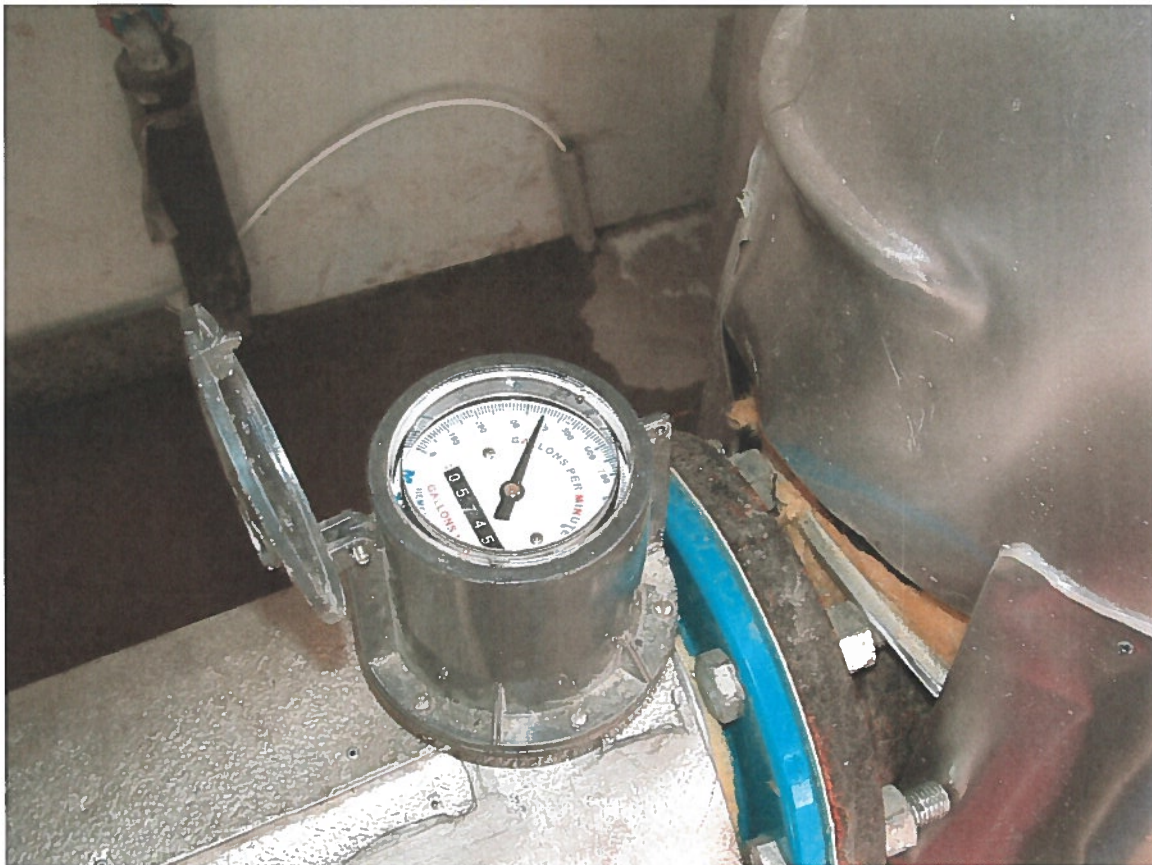


ATTACHMENT F

PHOTOS



Well 1 - well head and discharge piping (Well 1 well house)



Well 1 flow meter



Well 1 well house



Well 1A



Well 1A flow meter display (at Well 1 well house)



Well 1A discharge piping (at Well 1 well house)



Well 3 well head (in Well 3 well house)



Well 3 well house



Well 3 Flow meter



Well 5 (foreground) with generator, panel, and transformer



Well 5 Flow meter Display (at raceway degas building)



Well 5 Discharge to adult holding degas facility; flow meter is blue-green spool



Well 5 Panel (VFD, autotransfer switch, disconnect)



Well 6 (foreground) with hatchery building in background



Well 7 (foreground) with Well 6 & 7 well house in background



Well 6 and 7 flow meter in Well 6 & 7 well house (former Well 2 well house)



Well 6 and 7 discharge piping in Well 6 & 7 well house (former Well 2 well house)

ATTACHMENT G
WELL DRILLERS' REPORTS AND PUMP CURVES

DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

Well #1

1. WELL OWNER

Name ARMY CORP. OF ENGINEERS
Address STANLEY, IDAHO 83278
Owner's Permit No. _____

7. WATER LEVEL

Static water level 3 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature 44 °F. Quality good

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning) _____

8. WELL TEST DATA

☐ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
<u>UNKNOWN</u>		

3. PROPOSED USE

☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other FISH HATCHERY (specify type)

9. LITHOLOGIC LOG

Hole Diam.	Depth		Material	Water	
	From	To		Yes	No
12	0	3	TOP SOIL		☒
	3	7	CEMENTED CONCRETE GRAVEL		☒
	7	12	COARSE GRAVEL		☒
	12	20	PEA GRAVEL		☒
	20	26	COARSE SAND GRAVEL		☒
	26	40	WHITE SAND & PEA GRAVEL		☒
	40	63	COARSE GRAVEL		☒
	63	68	SAND & PEA GRAVEL		☒

4. METHOD DRILLED

☐ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☒ Cable ☐ Dug ☐ Other _____

6. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____
Thickness 3/22 inches Diameter 12 inches + 1 feet 68 feet
Inches _____ inches _____ feet _____ feet
Inches _____ inches _____ feet _____ feet
Inches _____ inches _____ feet _____ feet
Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☐ No
Perforated? ☒ Yes ☐ No
How perforated? ☒ Factory ☐ Knife ☐ Torch
Size of perforation 4 inches by 3 inches
Number 86 perforations From 23 feet To 63 feet
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 18 Material used in seal: ☒ Cement grout
☐ Pudding clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☒ Temp. surface casing
☐ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent
Weld
☐ Cemented between strata
Describe access port _____

6. LOCATION OF WELL

Sketch map location must agree with written location.
Subdivision Name _____
APPROX. 5 MI. SOUTH
OF STANLEY, IDAHO
Lot No. _____ Block No. _____
County C. ADAMS
SW 1/4 SE 1/4 Sec. 36, T. 10, N. 13, E. 14.

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Firm Name GUTHRIE Well Drilling Firm No. 226
Address ARCO, IDAHO 83213 Date 1/7/80
Signed by (Firm Official) H. T. Guthrie
and
(Operator) James H. Guthrie

USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT



SUBMERSIBLE TURBINE

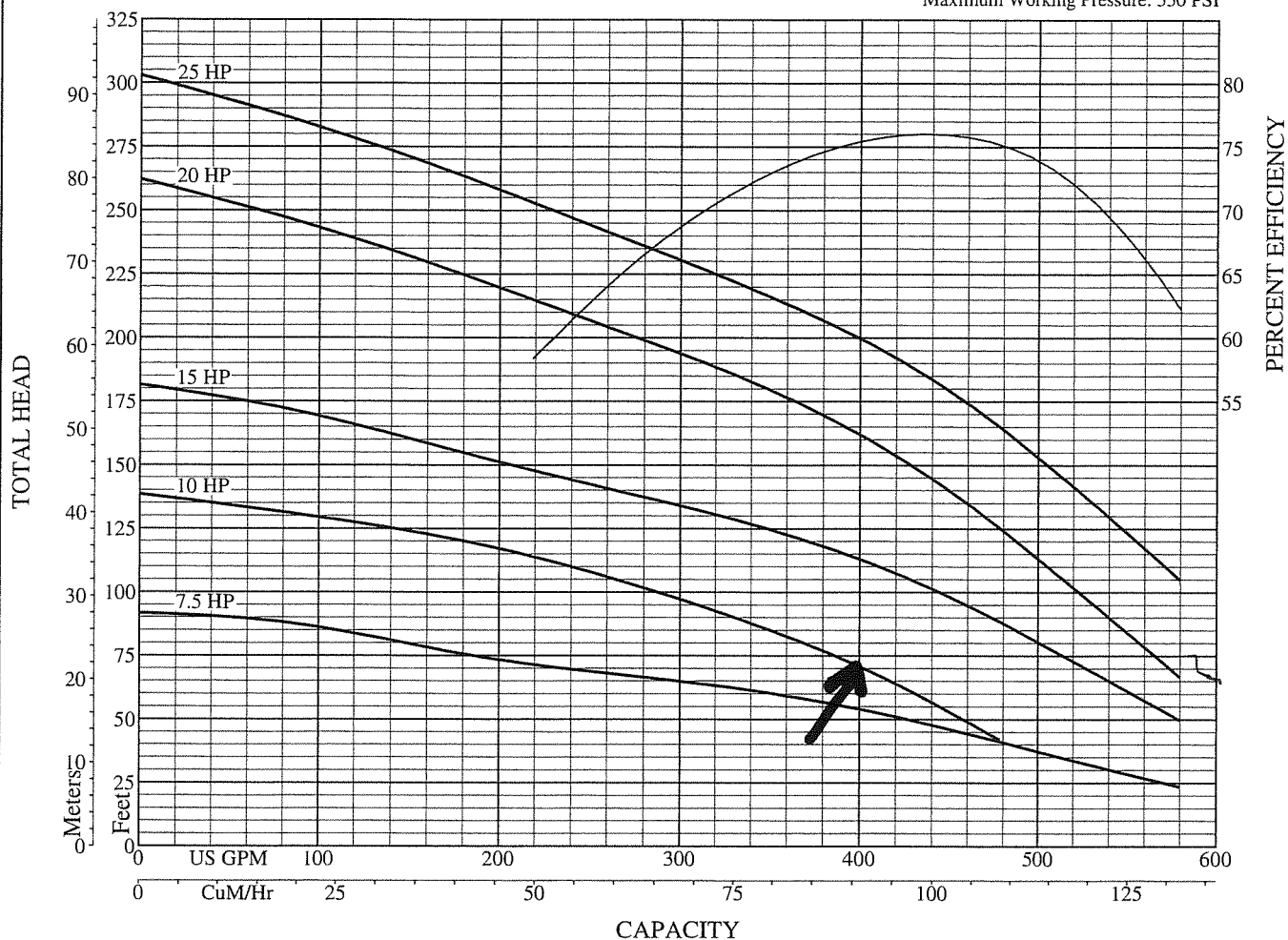
Well #1

7T-450

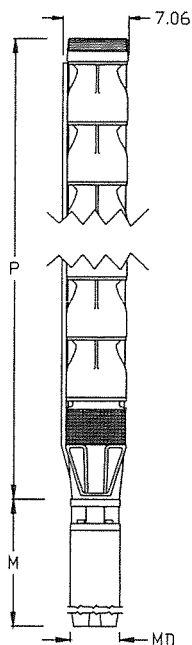
Nominal RPM: 3450

Based on Fresh Water @ 68° F.

Maximum Working Pressure: 550 PSI



OUTLINE DIMENSIONS / WEIGHTS



HP	stages	Motor size	P length	M* length	MD* dia.	Mtr. wt.	Pump wt.
7.5	1	6"	19.94	28.00	5.38	120	59
10	2	6"	26.44	30.56	5.38	135	85
15	2	6"	26.44	33.13	5.38	146	85
20	3	6"	32.94	30.56	5.38	135	110
25	3	6"	32.94	33.13	5.38	148	110

Note: dimensions = inches; weight = U.S. lbs.

M* Maximum length (Franklin Electric Motor)

MD* Motor diameter (Franklin Electric Motor)

SPECIFICATIONS

Minimum Well I.D.	8.0 Inches
Minimum Submergence @ BEP (above inlet)	10.0 Feet
Capacity Range	100 – 580 GPM
Discharge	5" F x 6" M NPT
See manufacturer's data for motor cooling requirements	

SUPERSEDES

All Previous

Date **04/15/96**

Section **ST**

Page **20.01**

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

1. WELL TAG NO. D 0051186
Drilling Permit No. 859620
Water right or injection well # _____

2. OWNER: US Fish & Wildlife Service
Name Division of Engineering
Address 911 NE 11th Av
City Portland State OR Zip 97232-4181

3. WELL LOCATION:
Twp. 10 North ☒ or South ☐ Rge. 13 East ☒ or West ☐
Sec. 36  1/4 S/E 1/4 S/E 1/4

Gov't Lot _____ County _____ Custer _____
 Lat. _____ ° _____ (Deg. and Decimal minutes)
 Long. _____ ° _____ (Deg. and Decimal minutes)

Address of Well Site Sawtooth Fish Hatchery 1200'
City Stanley ID

Lot. _____ Blk. _____ Sub. Name _____

4. USE: ☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation ☐ Thermal ☐ Injection
☒ Other fish propagation

5. TYPE OF WORK:

☒ New well ☐ Replacement well ☐ Modify existing well

☐ Abandonment ☐ Other

6. DRILL METHOD:
☐ Air Rotary ☐ Mud Rotary ☒ Cable ☐ Other

7. SEALING PROCEDURES:

Seal material	From (ft)	To (ft)	Quantity (lbs or ft³)	Placement method/procedure
bentonite chip 0	8	650#	poured	
bentonite grout 8	19	650#	pumped	

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/ Schedule	Material	Casing	Liner	Threaded	Welded
16"	+2	29	.375	steel	☒	☒	☐	☒
16"	64	67'6"	.375	steel	☒	☒	☐	☒
					☐	☐	☐	☐
					☐	☐	☐	☐

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

9. PERFORATIONS/SCREENS:

Perforations ☐ Y ☒ N Method _____

Manufactured screen ☒ Y ☐ N Type Johnson v wire

Method of installation pull back 20" casing

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
29'	64'	50		16	stainless	

Length of Headpipe 31' Length of Tailpipe 2'6"

Packer ☐ Y ☒ N Type _____

10.FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method

11. FLOWING ARTESIAN:

Flowing Artesian? ☐ Y ☒ N Artesian Pressure (PSIG) _____

Describe control device

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) 8 Static water level (ft) 8

Water temp. (°F) _____ Bottom hole temp. (°F) _____

Describe access port _____

Well test:			Test method:			
Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Pump	Bailer	Air	Flowing artesian
see attached			☒	☐	☐	☐

Water quality test or comments:

13. LITHOLOGIC LOG and/or repairs or abandonment:

[illegible]

Completed Depth (Measurable): 67' 6"

Date Started: 8/17/10 Date Completed: 9/14/10

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 Stevens & Sons Co. No. 153

*Principal Driller. [Signature] Date 9/22/10

*Driller [Signature] Date 9/22/10

*Operator II _____ Date _____

Operator 1 _____ Date _____

* Signature of Principal Driller and rig operator are required.

Company: riverside inc

Name:

Date: 10/15/2010



Pump:

Size: 12CME (1 stage)
 Type: SUBMERSIBLE
 Synch speed: 1800 rpm
 Curve:
 Specific Speeds:
 Dimensions:
 Vertical Turbine:
 Speed: 1770 rpm
 Dia: 8.375 in
 Impeller:
 Ns: 2240
 Nss: ---
 Suction: 8 in
 Discharge: --- in
 Bowl size: 11.75 in
 Max lateral: 1 in
 Thrust K factor: 7.5 lb/ft

Search Criteria:

Flow: 1100 US gpm Head: 50 ft

Fluid:

Water
 SG: 1.002
 Viscosity: 1.105 cP
 NPSHa: --- ft
 Temperature: 60 °F
 Vapor pressure: 0.2563 psi a
 Atm pressure: 14.7 psi a

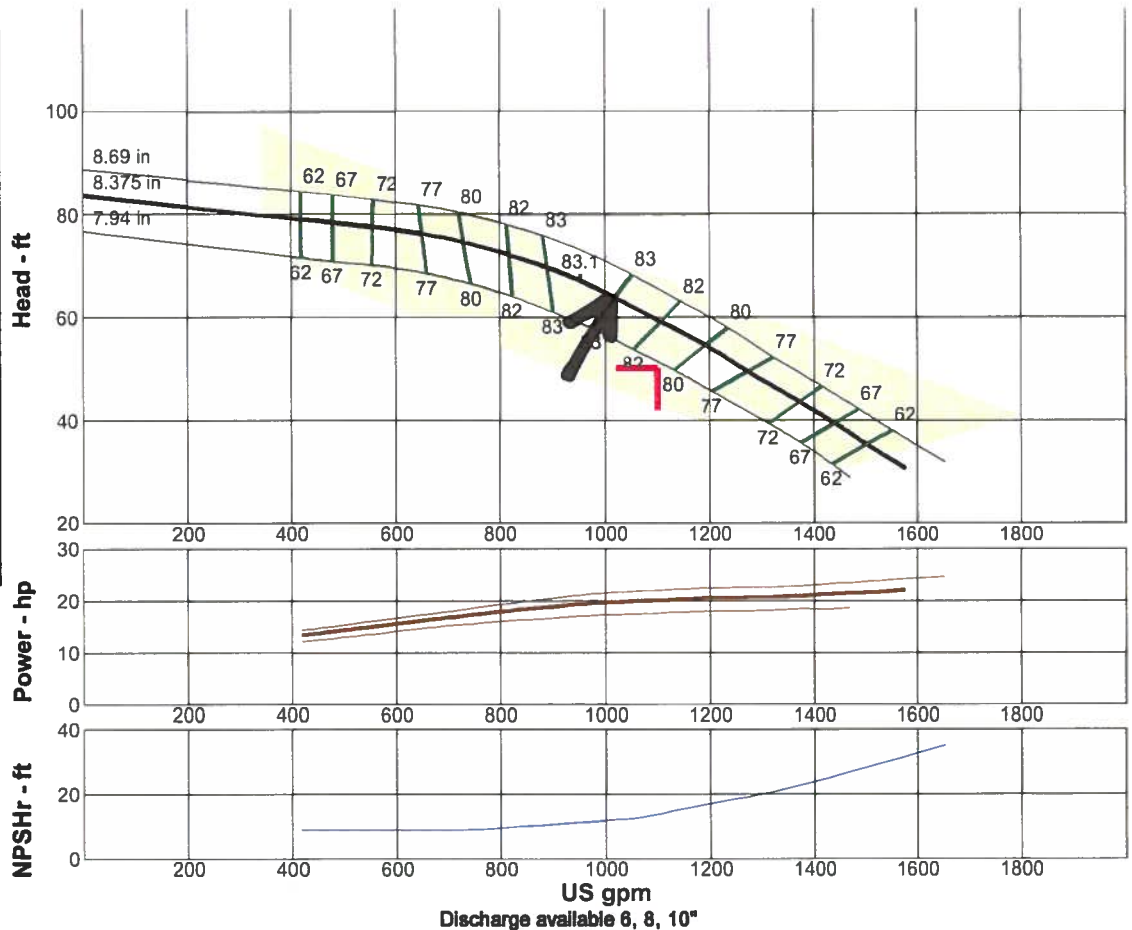
Motor:

Standard: NEMA
 Enclosure: SUB
 Sizing criteria: Max Power on Design Curve
 Size: 25 hp
 Speed: 1800
 Frame: 8"

Pump Limits:

Temperature: 120 °F
 Pressure: 340 psi g
 Sphere size: 0.73 in
 Power: --- hp
 Eye area: --- in²

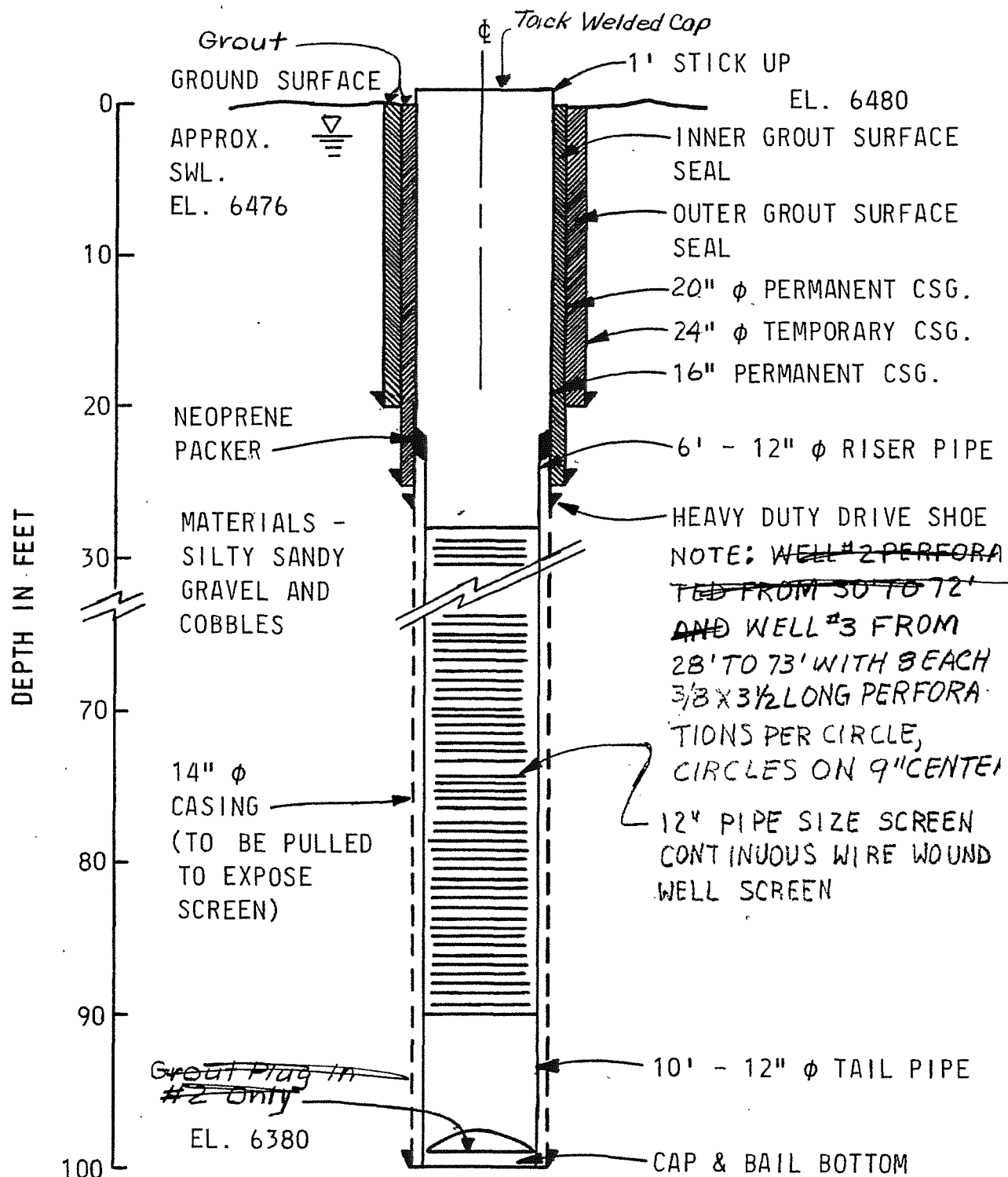
--- Data Point ---	
Flow:	1100 US gpm
Head:	59.5 ft
Eff:	82.1%
Power:	20.2 hp
NPSHr:	14.1 ft
--- Design Curve ---	
Shutoff head:	83.7 ft
Shutoff dP:	36.2 psi
Min flow:	--- US gpm
BEP:	83.1% @ 954 US gpm
NOL power:	22.1 hp @ 1575 US gpm
--- Max Curve ---	
Max power:	24.7 hp @ 1652 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
1320	1770	46.6	74.6	20.8	20.9
1100	1770	59.5	82.1	20.2	14.1
880	1770	70	82.9	18.8	10.6
660	1770	76	77.4	16.4	9.12
440	1770	78.8	63.8	13.7	9.15

Well 3



SAWTOOTH NATIONAL FISH HATCHERY, IDAHO
HATCHERY WATER WELLS NO. 2 & 3

NOTE: Rev. 82 July 2

SCHEMATIC

Des. By: K.C.H.

Mar. 1982

57-144-4-22

154-1-3-20-100

3 150' 16" 1982 09N 13E 01A

SUMMARY BOREHOLE RECORD

(OFFICE USE ONLY)

DEPTH OF HOLE	150	OF O.B.	150	DIAMETER OF HOLE	16"
ROCK DRILLED		% REC		DATE STARTED	9-13-82
AZIMUTH HOLE		MADE	0°	DATE COMPLETED	10-8-82
INITIALS	KCH DRS			CONTRACT NO.	DACW68-82-C-0144
SURFACE EL		6494		HOLE NO WELL #3	
				N 242,010 E 931,508	

ELEVATIONS	GRAPHIC LOG	CORE %	DESCRIPTION OF MATERIALS	REMARKS
10		0	SILTY SANDY GRAVEL WITH COBBLES - ROUNDED 3/8 TO 7 INCH MATERIAL, LOOSE COMPACTION.	SWL (10-8-82)
20		0		BOTTOM OF 24 INCH CASING
30		0	SANDY GRAVEL - ROUNDED GRAVELS TO 3/8 INCHES IN DIAMETER, LOOSE COMPACTION.	BOTTOM OF 20 INCH CASING
40		0		16 INCH CASING MILL SLOTTED 3/8 x 3" SLOTS, 8 PER ROW, ROWS ON 9 INCH CENTERS SLOTTED FROM 33 TO 73 FEET
50		0		
60		0		
70		0		
80		0	SCATTERED SILT SEAMS FROM 75 TO 150 FEET.	BOTTOM OF 16 INCH CASING WITH 2-FOOT CONCRETE PLUG
90		0	Driller Marcum F-158 #299	NE 1/4 Sec 1 T 9 N R 13 E
100		0	Pg 1 of 6	

09N 13E 01A

OFFICE USE ONLY)

ELEVATIONS		DEPTH OF HOLE	OF O.B.	DIAMETER OF HOLE	DATE STARTED	DATE COMPLETED	CONTRACT NO.
GRA PHIC LOG		% CORE	% REC	MADE			
SURFACE EL. 6494		HOLE NO. WELL #3		N 242,010		E 931,508	
6394		GRAVELLY SAND - ROUNDED MATERIAL TO 3/8 INCHES IN DIAMETER, SCATTERED SILT SEAMS, LOOSE TO MED. COMPACTION				HOLE BACKFILLED 75 TO 150 FEET	
6344		BO' OM OF HOLE EL. 6344				NE 1/4 Sec 1 T 9N R 13E	
		P, 2. f. l				MF #299	

62

SAWTOOTH NAT. FISH HATCHERY
SITE AND PROJECT

WELL #3
HOLE NO.

#3

DRILLING LOG		DIV	INSTALLATION	SHEET
1. PROJECT		NPD	NPD	1
2. LOCATION (County, State or Station)		931, 308	SEE AND TYPE OF BIT	OF 2 SHEETS
3. DRILLING AGENCY		Rocky Mtn Well Drilling	11. SAMPLER ELEVATION (FOOTER)	14-11-82
4. HOLE NO. (As shown on drawing title and file number)		No 3	12. MANUFACTURER'S DESIGNATION OF DRILL	
5. NAME OF DRILLER		Martin Farnsworth	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	18
6. DIP (SECTION OF HOLE)		VERTICAL ☒ INCLINED ☐ DEG. FROM VERT.	14. TOTAL NUMBER CORE BOXES	
7. THICKNESS OF OVERBURDEN		150'	15. ELEVATION GROUND WATER	9.5'
8. DEPTH DRILLED INTO ROCK		0	16. DATE MOLE	STARTED 9-13-82 COMPLETED 10-8-82
9. TOTAL DEPTH OF HOLE		150'	17. ELEVATION TOP OF MOLE	6494
			18. TOTAL CORE RECOVERY FOR BORING	
			19. SIGNATURE OF INSPECTOR	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0	0					
10			Silty Sandy Gravel with Cobbles			
20						
27'						
30						material 3/8" minus Gravel
40						Bailing test @ 40' no fine gravel
50						Bailing twice, water dropped from 14' to 32'
60						(Bailer dia. 12" I.D. X 15")
70						
80						Bailing test @ 62' on 9-23-82 Bailing 8 times got 3 1/2 bags full of sand.
90						(0.075 min. to 1/8" dia) material
100						
110						
120						
130						
140						
150						

Pg 30 F6
 MF #2 99
 Sec 1
 T 9N R 13E

MAR 71 1836 PREVIOUS
 MOLETS
 PROJECT
 HOLE NO. 3

#3

Hole No. Wc/11 #3

DRILLING LOG		INSTALLATION		SHEET 2 OF 2 SHEETS		
1. PROJECT		10. SIZE AND TYPE OF BIT		11. DAY FOR ELEVATION SHOWN (T.M. or M.M.)		
2. LOCATION (Coordinates or Section)		12. MANUFACTURER'S DESIGNATION OF DRILL		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		
3. DRILLING AGENCY		14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER		
4. HOLE NO. (As shown on drawing title and file number)		16. DATE HOLE		17. ELEVATION TOP OF HOLE		
5. NAME OF DRILLER		18. TOTAL CORE RECOVERY FOR BORING		19. SIGNATURE OF INSPECTOR		
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		19. SIGNATURE OF INSPECTOR				
7. THICKNESS OF OVERBURDEN						
8. DEPTH DRILLED INTO ROCK						
9. TOTAL DEPTH OF HOLE						
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX ON SAMPLE NO.	REMARKS (Drilling time, water loss, depth of overburden, etc., if significant)
1000						
110						
120			Sand			0.07 in. to 1/4" dia. bailed 9 times from 27' to 96' water level dropped from 81' to 18'
130						
140						
150						
160						
150	150'		Bottom of hole			Note: Bailing test @ 150' on 10-1-BZ for 8 min. Bailed 9 times, 30 8 1/2 bails full. water level dropped from 81' to 18'. Bailer on this test is 10 1/8 ID, x 12' 9"
			P, 4 of 6			
			MF #299			
			Sec 1			
			T 7N			
			R 13E			

MAR 71 1836 PREVIOUS

COMPLETE

PROJECT

Hole No. Wc/11 #3

DRILLING LOG			DIVISION		INSTALLATION		SHEET	
PROJECT			DATE		HOLE NO.		OF 2 SHEETS	
1. PROJECT			2. LOCATION		3. DRILLING AGENCY		4. HOLE NO. (As shown on drawing title and file number)	
5. NAME OF DRILLER			6. DIRECTION OF HOLE		7. THICKNESS OF OVERBURDEN		8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE			10. SIZE AND TYPE OF BIT		11. DAYUM FOR ELEVATION THROUGH (See 10)		12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN			14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER		16. DATE HOLE	
17. ELEVATION TOP OF HOLE			18. TOTAL CORE RECOVERY FOR BORING		19. SIGNATURE OF INSPECTOR		20. REMARKS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	1. CORE NO.	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of penetration, etc., if significant)		
5			large gravel	24"	-	4 PM - 8 PM 4 hrs. 9-13-82		
10			large gravel	24"		8 PM - 9 PM 1 hr. 9-13-82		
15			gravel & sand	24"		9 AM - 11 AM 2 hrs. 9-14-82		
20			gravel & sand	24"		11 AM - 4 PM 5 hrs. 9-14-82		
25			gravel	20"		4 PM - 7 PM, 8 AM - 6 PM 13 hrs. 9-15-82		
30			gravel	20"		6 PM - 5:30 PM 25 hrs. 9-15-82		
35			gravel	16"		11 AM - 1 PM 2 hrs. 9-17-82		
40			gravel	16"		1 PM - 3 PM 2 hrs. 9-17-82		
45			gravel	16"		3 PM - 7 PM 4 hrs. 9-17-82		
50			gravel	16"		9 AM - 11 AM 2 hrs. 9-18-82		
55			gravel	16"		11 AM - 1 PM 2 hrs. 9-18-82		
60			pea gravel	16"		3 PM - 7 PM, 8 AM - 10 AM 8 hrs. 9-18-82		
65			pea gravel	16"		1 PM - 8:00 PM 7 hrs. 9-22-82		
70			pea gravel	16"		9 AM - 1 PM 3 hrs. 9-23-82		
75			pea gravel & sand	16"		1 PM - 9 AM 9-23-82 9-24-82		
80			pea gravel & sand	16"		9 AM - 2 PM 9-24-82		
85			pea gravel & sand	14"		2 PM - 6 PM 9-24-82		
90			pea gravel & sand	14"		1 PM - 5 PM 9-24-82		
95			pea gravel & sand	14"		5 PM - 9 PM 9-24-82		
100			pea gravel & sand	14"		9 AM - 3 PM 10-1-82		

Pg 5086
MF #299
Sec 1
T 9 N
R 13 E

Hole No. 3

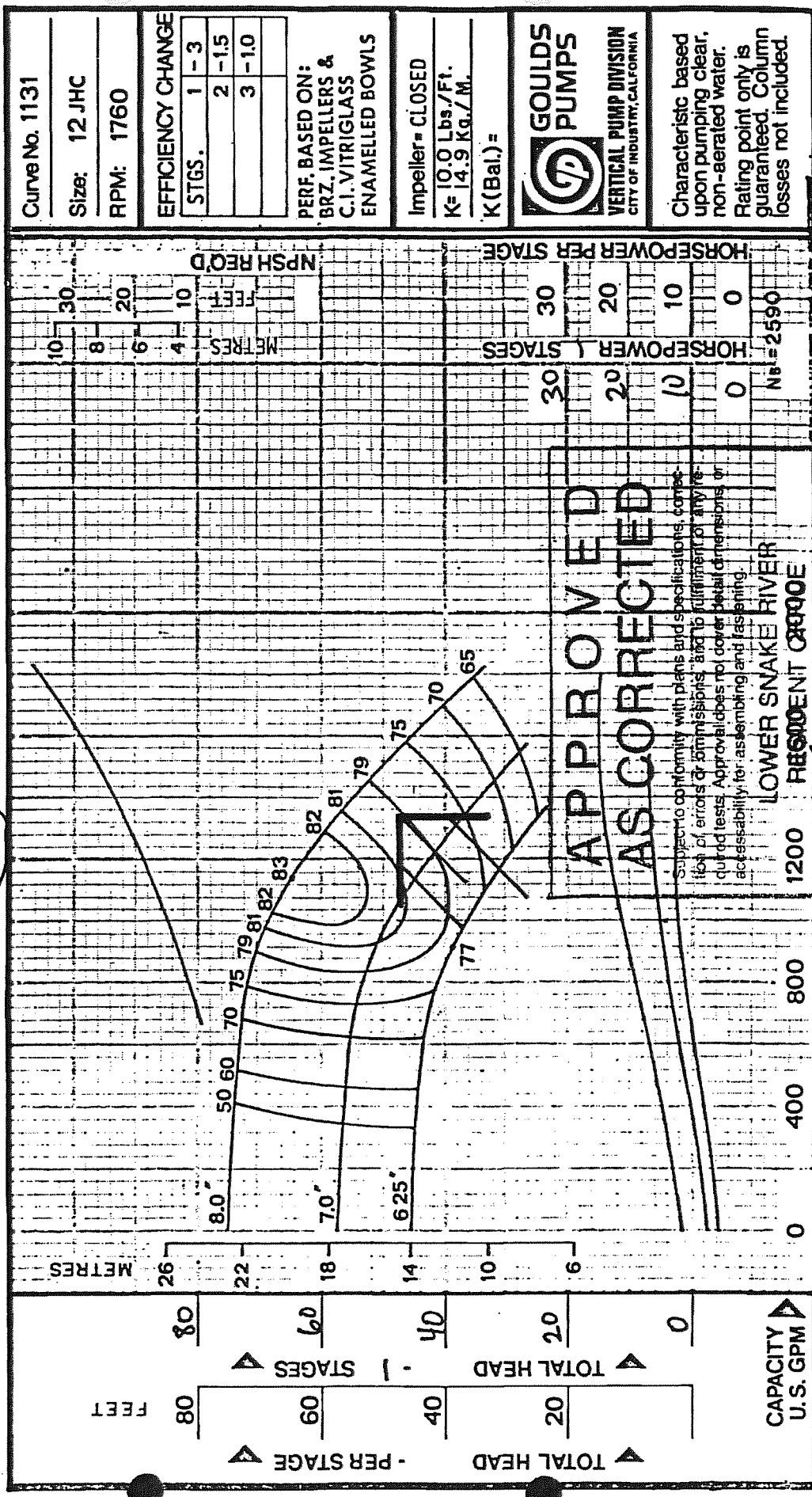
DRILLING LOG		DIVISION	INSTALLATION	SHEET	
PROJECT				OF 2 SHEETS	
OAKLANDS-82-C-0144		Walla Walla District	10. SIZE AND TYPE OF BIT		14" 7/8" 11" 14" 1 1/2"
1. LOCATION (Coordinates or Station)		Ground Surface	11. DATUM FOR ELEVATION SHOWN (TBM or B.M.)		
2. DRILLING AGENCY		Rocky Mtn Well Drilling	12. MANUFACTURER'S DESIGNATION OF DRILL		Walsh 5-46-4
3. HOLE NO. (As shown on drawing title and file number)		15.3	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN		DISTURBED C UNDISTURBED C
4. NAME OF DRILLER		M. J. Evans	14. TOTAL NUMBER CORE BOXES		22
5. DIRECTION OF HOLE		☒ VERTICAL ☐ INCLINED DEG. FROM VERT.	15. ELEVATION GROUND WATER		3 ft.
6. THICKNESS OF OVERBURDEN		0.5	16. DATE HOLE		STARTED 3-13-1982 COMPLETED 3-15-1982
7. DEPTH DRILLED INTO ROCK		150'	17. ELEVATION TOP OF HOLE		Ground Surface
8. TOTAL DEPTH OF HOLE		150 ft.	18. TOTAL CORE RECOVERY FOR BORING		
9. SIGNATURE OF INSPECTOR			19. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
100			coarse sand	14"		8 AM - 11 AM 10-4-82
105			coarse sand	14"		11 AM - 3 PM 10-4-82
110			coarse sand	14"		3 PM - 8 PM 10-4-82
115			coarse sand	14"		8 AM - 11 AM 10-5-82
120			coarse sand	14"		11 AM - 2 PM 10-5-82
125			coarse sand	14"		2 PM - 6 PM 10-5-82
130			coarse sand	14"		8 AM - 1 PM 10-6-82
135			coarse sand	14"		1 PM - 7 PM 10-6-82
140			coarse sand	14"		8 AM - 1 PM 10-7-82
145			coarse sand	14"		1 PM - 7 PM 10-7-82
150			coarse sand	14"		8 AM - 12 Noon 10-8-82

done bailer tests
each time we pulled all the water out of the hole in 5-15 min.
bailer test depths were: 40', 60', 80', 100', 120', 140', 150'

P. C. F. 6
MF #299
Sec 1
T 9N
R 13E

GOULDS PROPOSAL NO. 83-K-021	GOULDS SO. NO.	INQUIRY NO.	CUSTOMER P.O. NO.	P.O. DATE	ITEM NO.	CUSTOMER
PROJECT SAWTOOTH FISH HATCHERY			832501	1/100	P-1-1, P-1-3	DCO CONTRACTORS
SERVICE:			WELLS #1 & #3			
			GPM CAPACITY:	FT. TDH:	%EFFICIENCY: RPM	
			1344	48	-	



CERTIFY: DRAWING		229
SIGNED AND APPROVED		
GOULDS PUMPS, INC.		DATE: 5/27/83
CITY OF INDUSTRY, CALIFORNIA		
SIGNED AND APPROVED		DATE: 5/27/83
CITY OF INDUSTRY, CALIFORNIA		

Fig. 300 *Imperial* 500
 Date: 1 SEP 1983

83-31-11B-3

12011 #3

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

* Signature of Principal Driller and rig operator are required.

well 5

Model: VIS-BAT

Size: 14RJMC

60Hz

RPM: 1770

Stages: 1

Job/Inq.No. :

Purchaser : UNDEFINED

End User :

Issued by : Chad Draper

Rev. : 0

Item/Equip.No. : ITEM 001

Quotation No. : CD11-07-19 01

Date : 07/19/2011

Service :

Order No. :

Certified By :

Operating Conditions

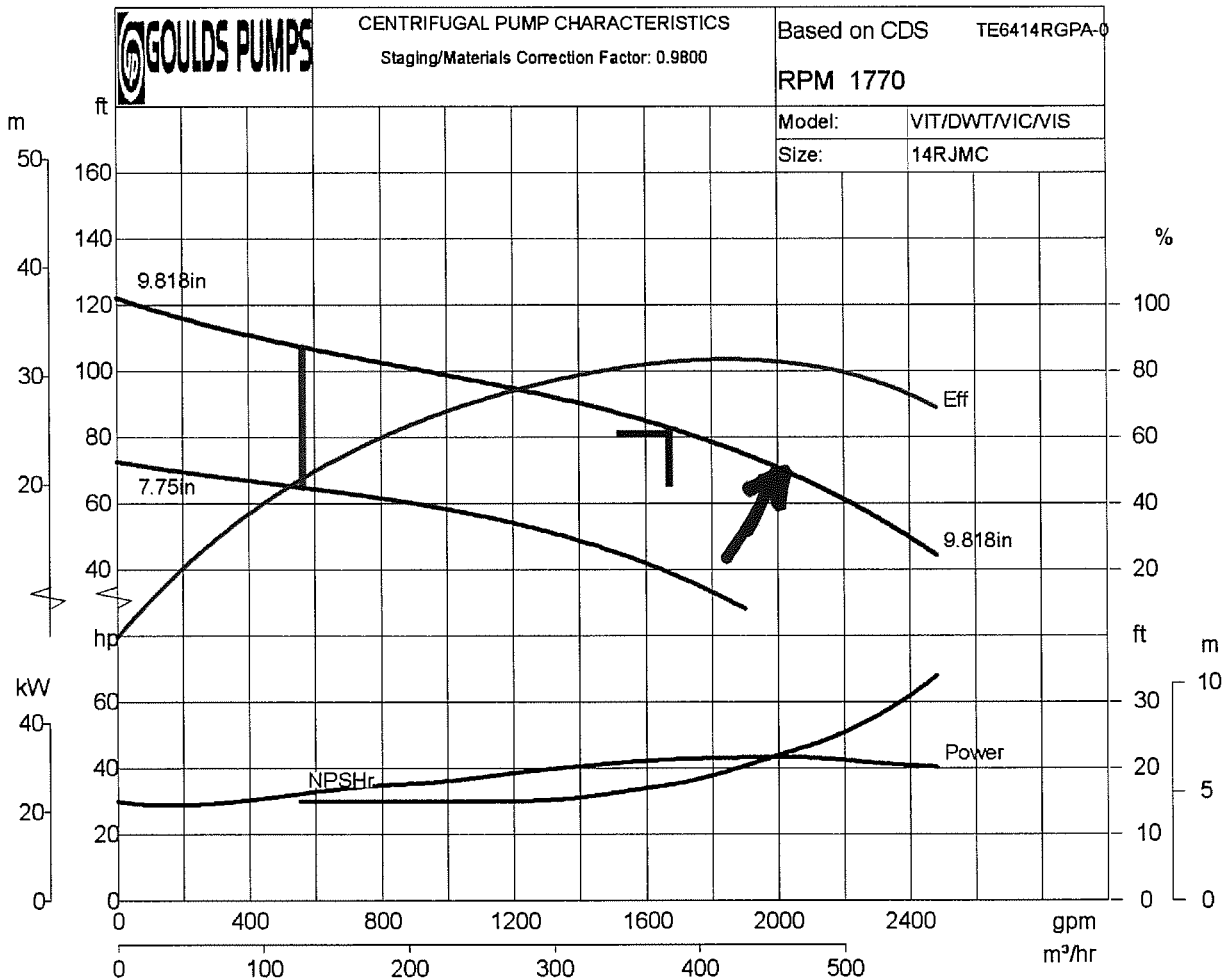
Liquid:
Temp.: 70.0 deg F
S.G./Visc.: 1.000/1.000 cp
Flow: 1,683.0 gpm
TDH: 82.0 ft
NPSHa:
Solid size:
Vapor Press:

Pump Performance

Published Efficiency: 84.4 %
Rated Pump Efficiency: 82.1 %
Rated Total Power: 42.40 hp
Non-Overloading Power: 43.4 hp
Shut off Head: 122.1 ft
NPSHr: 17.6 ft
Bowl Material: Cast iron with glass enamel
Impeller Material: Bronze
Suction Specific Speed: 8,107 gpm(US) ft
Min. Hydraulic Flow: 564.0 gpm
Min. Thermal Flow: N/A
Imp. Dia. First 1 Stg(s): 9.8175 in
Max. Solids Size: 0.9800 in

Notes: 1. Bowl Performance Curve based on Pumping Clear, non-Aerated Water. Rated Point only is guaranteed.

caused by Off-BEP selection (60% - 80%)



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. DRILLING PERMIT NO 848865
Other IDWR No. **D0052209**
2. OWNER: Appl. 901866
Name Sawtooth Fish Hatchery
Address HC 64 Box 9905

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location

W  E

Twp. 10 North ☒ or South ☐
Rge. 13 East ☒ or West ☐
Sec. 36 $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$
10 acres 40 acres 60 acres

S Gov't lot _____ County **Custer**

Lat: : : Long: : :
Address of Well Site **T75-Sawtooth Fish Hatchery**

City Stanley

(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 propagation

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

- ☐
- New Well
- ☐
- Modify
- ☐
- Abandonment
- ☒
- Other replacement

6. DRILL METHOD

- ☒
- Air Rotary
- ☐
- Cable
- ☐
- Mud Rotary
- ☐
- Other

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT	METHOD
Material	From	To	Sacks or Pounds	
Grannular	0			
Bentonite		18	2500lbs	overbore

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
16"	+3	52	.375	steel	☒	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

- ☐ Perforations Method _____
- ☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
86	81	blank		14"	steel	☐	☒
81	61	.80		16" tele	stainless	☐	☒
61	51	blank		16" tele	stainless	☐	☒

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

12 ft. below ground Artesian Pressure lb
Depth flow encountered ft. Describe access port or control
devices:

11. WELL TESTS:

- ☐
- Pump
- ☐
- Bailer
- ☒
- Air
- ☐
- Flowing Artesian

Yield gal/min.	Drawdown	Pumping Level	Time
400+			8hrs

Water Temp. Bottom hole temp.

Water Quality test or comments:

Depth first Water Encountered 18'

12. LITHOLOGIC LOG: (Describe repair or abandonment)

Water

[illegible]Completed Depth: **81** (Measurable)

Date: Started 9/6/07 Completed 9/22/07

13. DRILLER'S CERTIFICATION

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

Firm Name **Hiddleston & Son, Inc.**

Firm No. 35

Firm Official Doris Sullivan

Date 1-15-08

Supervisor or Operator [Signature]
(Sign once if Firm Official & Operator)

Date _____

Well 6

Submersible Turbine Pumps

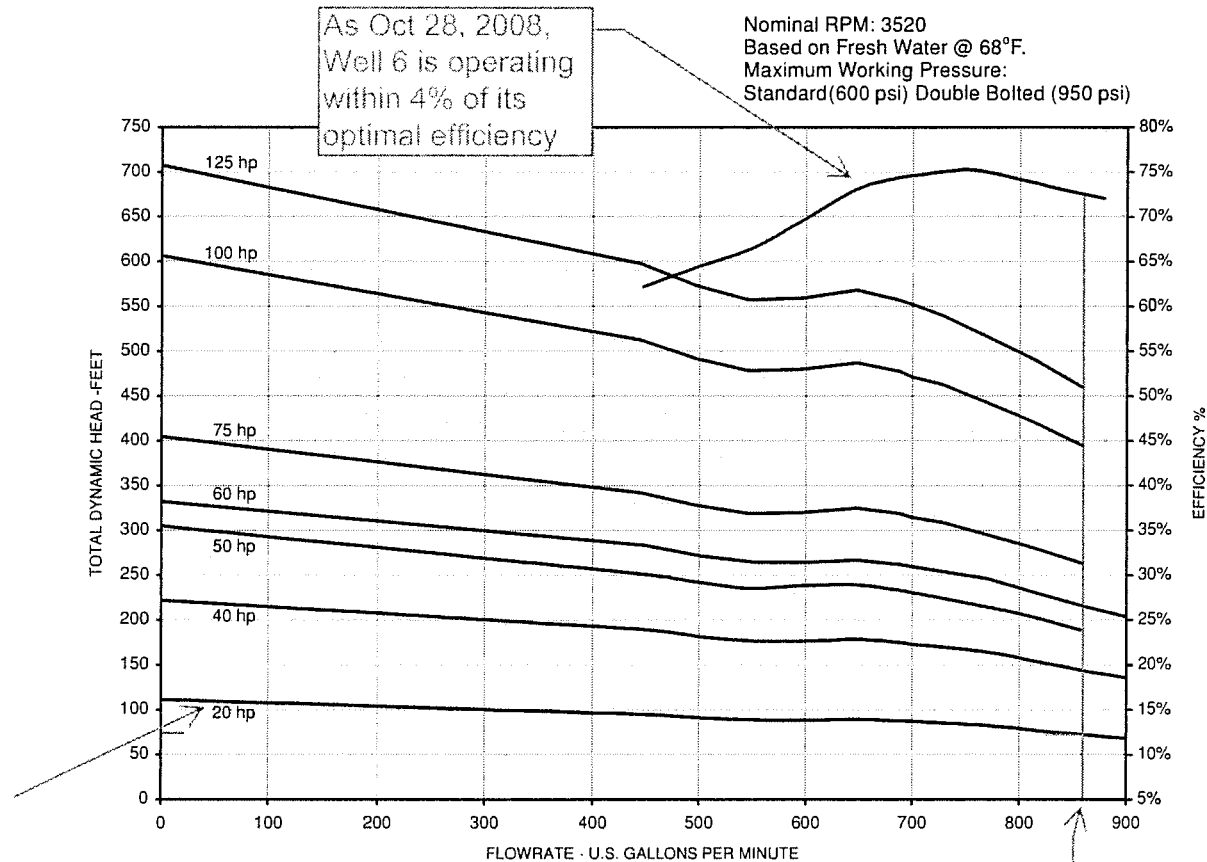
Franklin

Sawtooth Well 6 located behind the hatchery building southwest of the generator room.

PAGE: SP-310

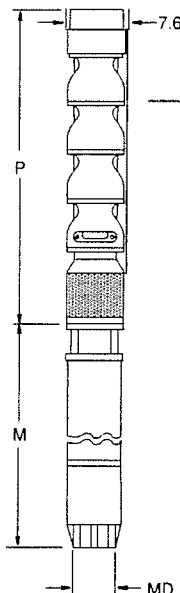
DATE: Sept 1, 2007

Model 700ST8 Performance



Dimension Information

Well 6 alone 860 GPM = 72' TDH



HP	Stages	Trim	Motor Size	Disch. Size	P Inches	M* Inches	MD* Inches	Motor Wt Lbs.	Pump Wt Lbs.
20	1	A	6"	4"	27	31	5.38	147	137
				6"	27	31	5.38	147	146
40	2	A	6"	4"	34	41	5.38	206	172
				6"	34	41	5.38	206	181
50	3	B	6"	4"	41	55	5.38	176	208
				6"	41	55	5.38	176	217
60	3	A	6"	4"	41	61	5.38	334	208
				6"	41	61	5.38	334	217
75	4	B	8"	4"	50	47	7.70	430	266
				6"	50	47	7.70	430	274
100	6	B	8"	4"	64	55	7.70	530	337
				6"	64	55	7.70	530	345
125	7	B	8"	4"	71	69	7.70	700	372
				6"	71	69	7.70	700	381

Note: *MD diameter = Franklin Electric Motor, M = Maximum Length of Franklin Electric Motor

Specifications

Minimum Well I.D.	8"
Minimum Submergence @ BEP (above inlet)	10 Feet
Discharge	4" or 6" NPT

Note: Refer to Franklin Electric AIM data for motor cooling requirements.

BERKELEY

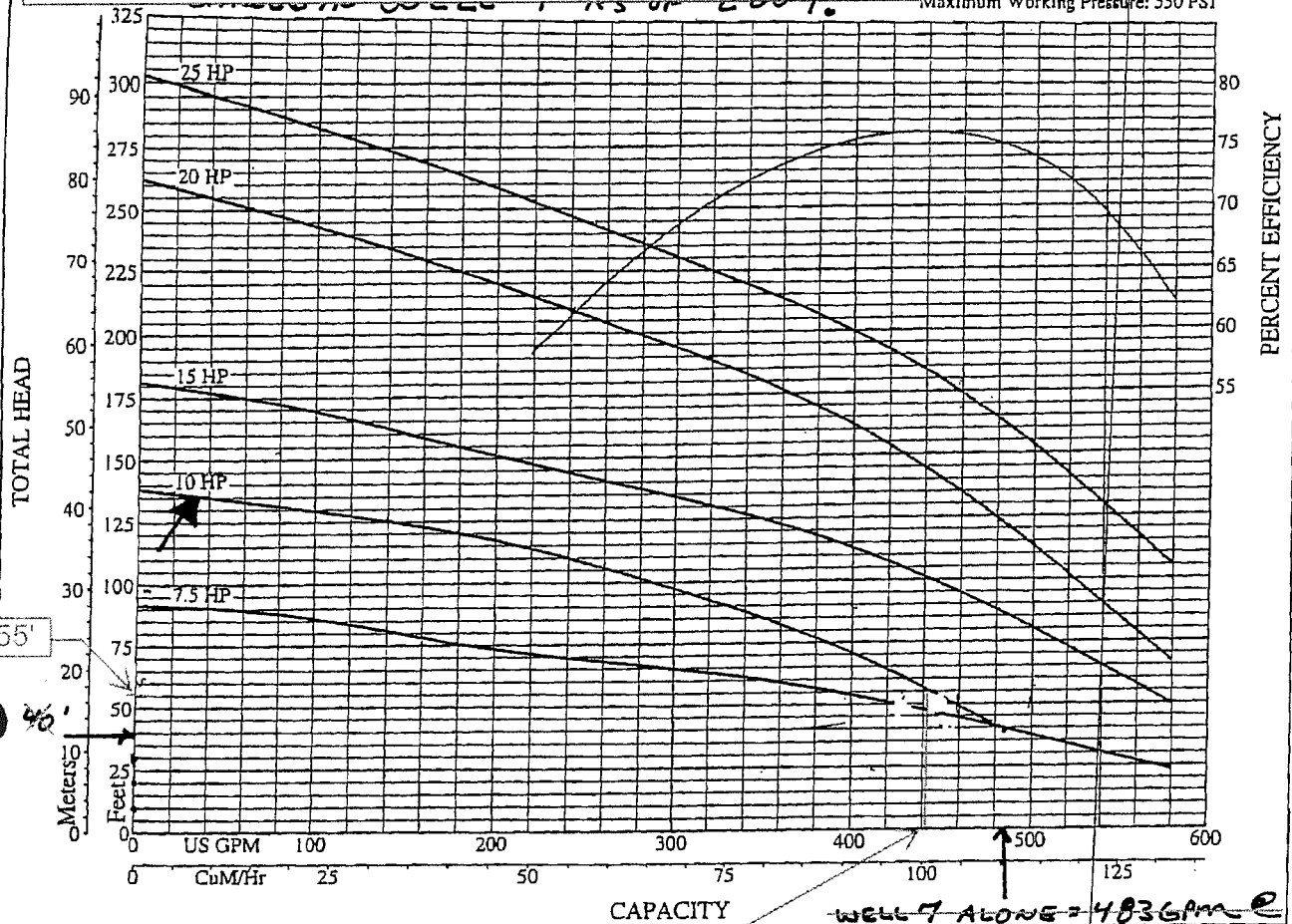
Well 7 is located behind the hatchery building 10 feet east of the pump house that is opposite the generator room.

SUBMERSIBLE TURBINE

7T-450

Well 2 rehabed & new pump installed in 2005. Well 2 failed & closed in 2007. The pump was installed in the new Well 7 in 2008.

Nominal RPM: 3450
Based on Fresh Water @ 68° F.
Maximum Working Pressure: 550 PSI



Well 7 alone Oct 28, 2008 measured at weir 443 GPM

OUTLINE DIMENSIONS / WEIGHTS

HP	stages	Motor size	P length	M* length	MD* dia.	Mtr. wt.	Pump wt.
7.5	1	6"	19.94	28.00	5.38	120	59
10	2	6"	26.44	30.56	5.38	135	85
15	2	6"	26.44	33.13	5.38	146	85
20	3	6"	32.94	30.56	5.38	135	110
25	3	6"	32.94	33.13	5.38	148	110

Note: dimensions = inches; weight = U.S. lbs.

M* Maximum length (Franklin Electric Motor)

MD* Motor diameter (Franklin Electric Motor)

SPECIFICATIONS

Minimum Well I.D.	8.0 Inches
Minimum Submergence @ BEP (above inlet)	10.0 Feet
Capacity Range	100 - 580 GPM
Discharge	5" F x 6" M NPT

See manufacturer's data for motor cooling requirements

SUPERSEDES

All Previous

Date 04/15/96

Section **ST**

Page 20.01

