

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 96-9206
Exam Date: 06/17/2015

1. Current Owner:
HANSEN INVESTMENTS LLC 899 E BOTTLE BAY RD SAGLE ID 83860
2. Accompanied by: Bob Hansen
Phone No: 208-661-0085
Address: 67 Wild Horse Trail, Sandpoint ID 83864-8701
Relationship to permit Holder: President, Hansen Investment, LLC.

3. **SOURCE:**
GROUND WATER

Method of Determination: Arcmap and DRG.

B. OVERLAP REVIEW

1. Other water rights with the same place of use: YES Overlap

Water Right No.	Source	Purpose of Use	Basis
96-2309	PEND OREILLE RIVER	IRRIGATION	LCENSE

Comments: WR 96-2309 uses water from Pend Oreille River for irrigation purposes for 23 acres that overlaps the POU of this water right, but from a different source.

2. Other water rights with the same point-of-diversion: NO Overlap

Water Right No.	Source	Purpose of Use	Basis

Comments: _____

C. DIVERSION AND DELIVERY SYSTEM

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

GROUND WATER SW¼ NE¼, Sec. 1, Twp 55N, Rge 04W, B.M. BONNER County
GROUND WATER SW¼ NE¼, Sec. 1, Twp 55N, Rge 04W, B.M. BONNER County

Method of Determination: GPS. PODs are two wells located at -116° 46.345, 48° 08.764 (D0039736, E0009226) and -116° 46.325, 48° 08.765 (D0035405, E0009227).

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.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
D0039736 (E0009226)		40			
D0035405 (E0009227)		20			

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
NONE						

2. Measurements: Unable to perform flow measurement due to piping from wells going directly into storage tank and three 86 gal pressure tanks.

E. FLOW CALCULATIONS

 X Additional Computation Sheets Attached

Measured Method:

Applicant provided engineer developed pump performance values for two pumps as follows:

- 20hp pump (well D0035402) diversion rate = 528 gpm.
- 40hp pump (well D0039736) diversion rate = 676 gpm.
- Total diversion rate = 1,204 gpm / 448.48 gpm = **2.68 cfs**. See attached Dufort Water System Evaluation Pg. 1.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = \text{N/A}$$

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

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} =$$

2. Volume Calculations for Other Uses:

Annual Volume / Maximum Diversion Volume = (82 parcel connections x 1.2 af) + (3 ERU for Restaurant x 1.2 af) + (2 ERU for Clubhouse x 1.2 af) = 98.4 af + 3.6 af + 2.4 af = **104.4 af**

G. NARRATIVE/REMARKS/COMMENTS

Admin note: this water right has been amended, as applicant was permitted for 1 well, and at time of field exam 2 wells were in use for this municipal development.

Field exam conducted on 6/17/2015 with the applicant's representative, Bob Hansen, showed two wells providing groundwater for the Dufort Water Association at The Crossing Subdivision. The water conveyance system incorporated 2 wells with 20hp and 40hp pumps diverting water to a 60,000 gallon storage tank and three 86 gallon pressure tanks. Due to pipes from wells going directly to storage tank and pressure tanks, I was unable to perform flow measurements. Applicant provided engineer developed pump performance values for two pumps as follows:

- 20hp pump (well D0035402) diversion rate = 528 gpm.
- 40hp pump (well D0039736) diversion rate = 676 gpm.
- Total diversion rate = 1,204 gpm / 448.48 gpm = 2.68 cfs.

The maximum diversion rate that will be applied to license equals **2.68 cfs**.

During field exam, it was identified that the Dufort Water System provides services to 82 parcel connections, 5 equivalent residential units (ERUs) that account for the dock side restaurant and club house, and the irrigation of associated acreage within the municipals designated POU. The municipal development includes residential lots, one restaurant, a marina, and boat docks. The annual volume equals the sum of 82 parcel service connections + 5 ERUs = (82 lot connections x 1.2 af) + (5 ERUs x 1.2 af) = **104.4 af**, which will also be applied as the maximum diversion volume for licensing purposes.

Condition 26A and 046 were removed from license. Condition X35 was added to describe overlap condition of rights 96-2309 and 96-9206 when combined shall not exceed a total diversion rate of 3.13 cfs. Condition 004 was added to describe right-of-way requirements and limitations. All other conditions remain on license from permit. WR 96-2309 overlaps this WR's POU, but uses water from Pend Oreille River for irrigation purposes for 23 acres; condition X35 listed above was added to mitigate overlap concerns for this water right. There are no other overlap concerns for this WR.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use	Rate of Diversion	Annual Volume
MUNICIPAL	01/01 to 12/31	2.68 CFS	104.4 AF

Totals: 2.68 CFS 104.4 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 ☒ None

I. AUTHENTICATION

Luke Bates - Water Resource Agent

Field Examiner's Name  Date 9/14/2020
 Reviewer  Date 9/21/2020

Dufort Water System Evaluation

October 26, 2010

This report was prepared in accordance with obtained information from the Idaho Department of Environmental Quality (IDEQ), Water Systems Management, Inc. and Bob Hansen, and in accordance with the Sizing Guidelines for Public Water Supplies, as prepared by the Washington Department of Social and Health Services, Division of Health. Some information included in this report include data from the reservoir record drawings, as provided by IDEQ, online IDWR well log reports, and the operations and maintenance manual information, as provided by IDEQ. Assumptions made in this report are consistent with the design engineer. The information provided, and the calculated data within on this report indicate that this existing water system has the available capacity to serve the proposed 21 additional water service connections, for a total of 103 connections on this water system.

Known Information

Existing Reservoir Data:

Reservoir Water Depth:	9.00	feet	* Record Drawings dated 7/27/07 and Reservoir recorded data dated 1/30/2006 as submitted to DEQ. Capacity depth of 9-feet confirmed by Bob Hansen of Water Systems Management, Inc (WSMI) on October 26, 2010. 1 cubic feet = 7.481 gallons
Reservoir Inside Length:	78.67	feet	
Reservoir Inside Width:	14.67	feet	
Reservoir Capacity:	10,387	cubic feet	
Reservoir Capacity:	77,704	gallons	

Miscellaneous Data:

Reservoir water elevation:	2,149	feet	* The Crossings Record Drawings - NGVD 29
Highest connection elevation:	2,180	feet	* The Crossings Record Drawings - NGVD 29
Lowest connection elevation:	2,074	feet	* Willow Bay View Lots Water Plans - NGVD29
System controlling elevation:	-31	feet	* Reservoir Elevation - Highest connection elevation
Static Head Pressure:	-13	psi	* At Highest service elevation (2.31 ft = 1 psi)
Minimum Operating Pressure:	40	psi	* As recommended by Idaho rules for Public Drinking Water Systems
Minimum Operating Head:	53	psi	* System operates at 60 psi per WSMI

Well data:

Well #1:	528	gpm	* IDWR Tag #: 0035405 - 20 hp American Marsh N58MC-1
Well #2:	676	gpm	* IDWR Tag #: 0039736 - 40hp American Marsh N57MC-3
Total Well production (Q _w):	1,204	gpm	* Sum of well flows

Booster Pump data:

Pump #1:	60	gpm	* Per DEQ Filed O&M - 5hp - AY McDonald 23500W3Y
Pump #2:	400	gpm	* Per DEQ Filed O&M - 20hp - American Marsh N58KC
Pump #3:	400	gpm	* Per DEQ Filed O&M - 20hp - American Marsh N58KC
Pump #4:	400	gpm	* Per DEQ Filed O&M - 20hp - American Marsh N58KC
Total Reservoir production (Q _r):	1,260	gpm	* Sum of pump flows

Maximum Instantaneous Demand (MID):

Residential:

The Crossings Development:	82	
Willow Bay Holdings Property:	15	
Willow Bay View Lots:	6	
Total # of Residential Connections:	103	
MID:	155	gpm

* Number of services per the plat of the Crossings, and agreements to supply water to Willow Bay Holdings and Willow Bay View Lots. See attached sizing guidelines for Public Water Supplies, Division of Health, Olympia, Washington - Table 1 - Tabulated Maximum Instantaneous Flows

Irrigation:

The Crossings Dev. (Par.>2.5 acres):	8	
The Crossings Dev. (Irr. acres):	84	
Willow Bay Holdings property:	4	*assumed
Willow Bay View Lots:	4	*assumed
MID:	875	gpm
Total MID:	1,030	gpm

* Number of services per INC's evaluation of The Crossings. Assumed maximum number of lots over 2.5-acres for Willow Bay Holdings property and Willow Bay View Lots based on existing acreages. See attached sizing guidelines for Public Water Supplies, Division of Health, Olympia, Washington - Table 1 - Tabulated Maximum Instantaneous Flows

Daily Supply Requirement:

Total number of connections	103	
Usage requirement per connection:	1,500	gpd
Total Daily Supply Requirement:	154,500	gpd/conn

*See attached sizing guidelines for Public Water Supplies, Division of Health, Olympia, Washington, for minimum production capabilities

Standby Storage (SS) Requirement:

800 Gallons/Connection:	82,400	gallons
Minimal Pump Production:	528	gpm
Minimal Pump Production (gal/conn/day):	7,382	gallons
Total SS:	75,018	gallons

*See attached sizing guidelines for Public Water Supplies, Division of Health, Olympia, Washington - 100 or More Connections, Single Source

Equalization Storage (ES) Requirement:

$$ES = (MID - Q_w) \times (150) \sim ES = 0 \text{ if } MID < Q_w$$

MID:	1,030	gpm
Source Production (Q_w):	1,204	gpm
Total ES:	0	gallons

*See attached sizing guidelines for Public Water Supplies, Division of Health, Olympia, Washington - Equalizing Storage
** Source (Q_w) per INC evaluation of system design

Fire Flow Requirement:

Required flow:	1,250	gpm
Required pressure:	20	(psi)
Equivalent Storage Volume:	150,000	gallons
Source Production Rate (Q_w):	1,204	gpm
Source Equivalent:	144,480	gallons
Required Storage Volume:	5,520	gallons

* 2hr minimum

* 1250gpm @ 2 hrs

* Sum of well flows

* 1204gpm @ 2 hrs

* Storage Eq - Source Eq

* All homes larger than 3600 SF in the Crossings Development are required to NFPA sprinkler system installed.

Provided Storage:

Storage Required:	80,538	gallons	* Total SS + ES + Fire Flow
	10,766	cubic feet	
Storage Provided:	77,704	gallons	* Reservoir
	10,387	cubic feet	
Difference:	-2,835	gallons	

Provided Storage < Required Storage (SEE "STORAGE NOTE" BELOW)

STORAGE NOTE: Regulations now require that required storage be the summation of the standby storage, the equalization storage and the fire flow storage. Though the system is approximately 2,835 gallons short of the required storage for the proposed 103 connections, the 135kW standby generator appears to have been adequately sized to operate the well pumps, and the booster pumps under most situations, such as a power outage or a pump failure. A load test on the existing generator was not observed by the system operator or h2. It is recommended that if a full load test of the generator has not recently been completed, that one be scheduled, observed and well documented by the Dufort Water System for future reference.

System Pressures:

Record Drawings indicate three (3), 86-gallon pressure tanks were installed. According to the Operations and Maintenance Manual, and the Control Panel Construction documents, the booster pumps, and well pump #2, were installed with a Variable Frequency Drive's (VFD); thus eliminating the need for all but one (1) pressure tanks (to eliminate the potential for water hammer) when the system usage increases. According to Water Systems Management, Inc., the system operating pressure is currently set at 60 psi.

Chlorination:

Residential MID:	1,030	gpm	* See MID Calculations above
Minimum Chlorine Contact Time:	30	minutes	* Assumed contact time by design engineer as precautionary measure only
Contact Area (ex. dpth x ex. width):	132	square feet	* water depth * reservoir inside width
Minimum Inside length (contact time):	28.60	feet	* ((MID * Contact Time) / (7.481 gal/cf)) / Contact Area
Existing inside length:	78.67	feet	* per Record Drawings
Estimated Contact Time:	75	minutes	* (Reservoir CF * 7.481 gal/cf) / (MID)





POD - WELL E0009227



POD – WELL E0009227 – 20 HP PUMP



POD – WELL E0009226



POD – WELL E0009227 – 40 HP PUMP





WATER CONVEYANCE SYSTEM



SYSTEM OPERATING AT 60 PSI

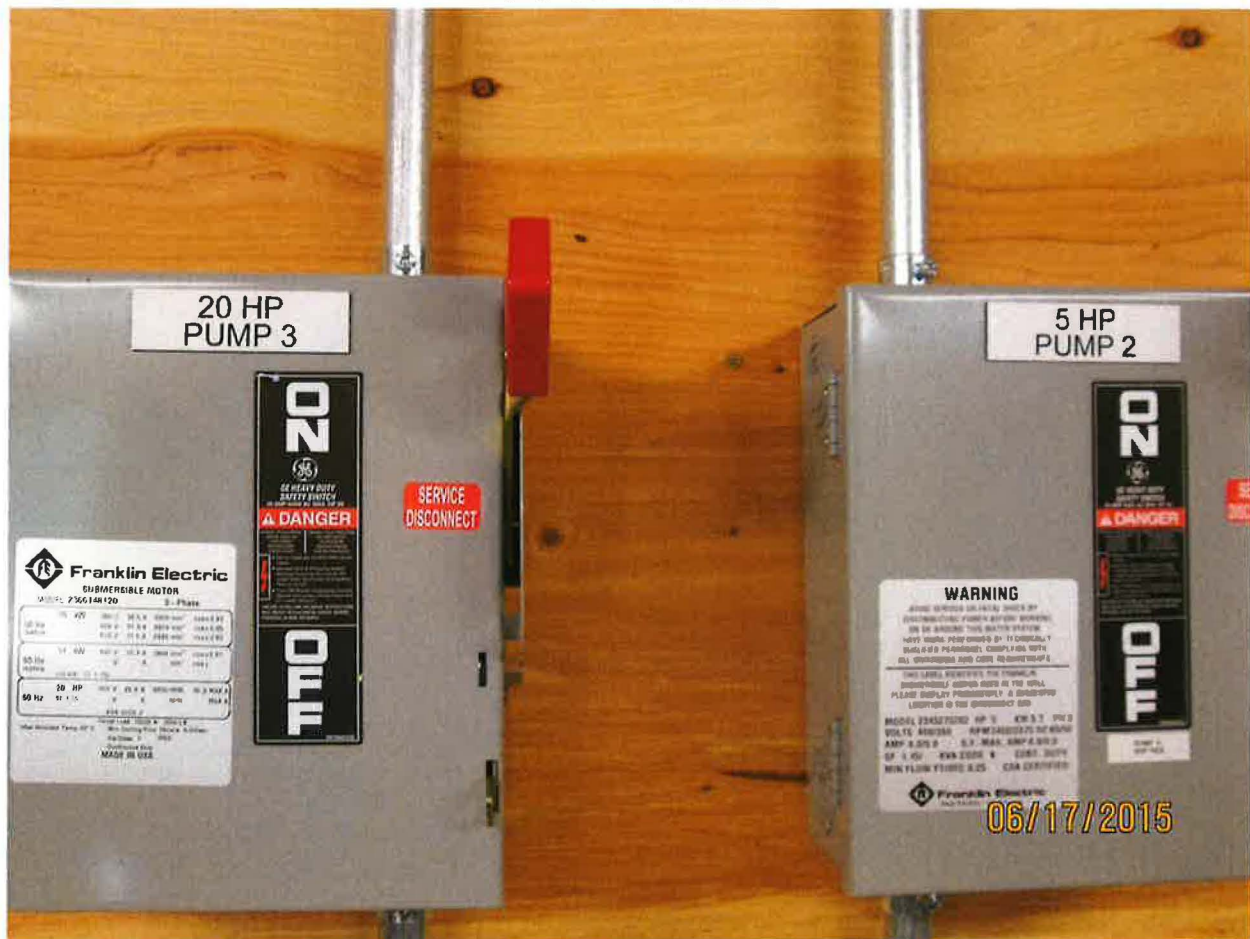


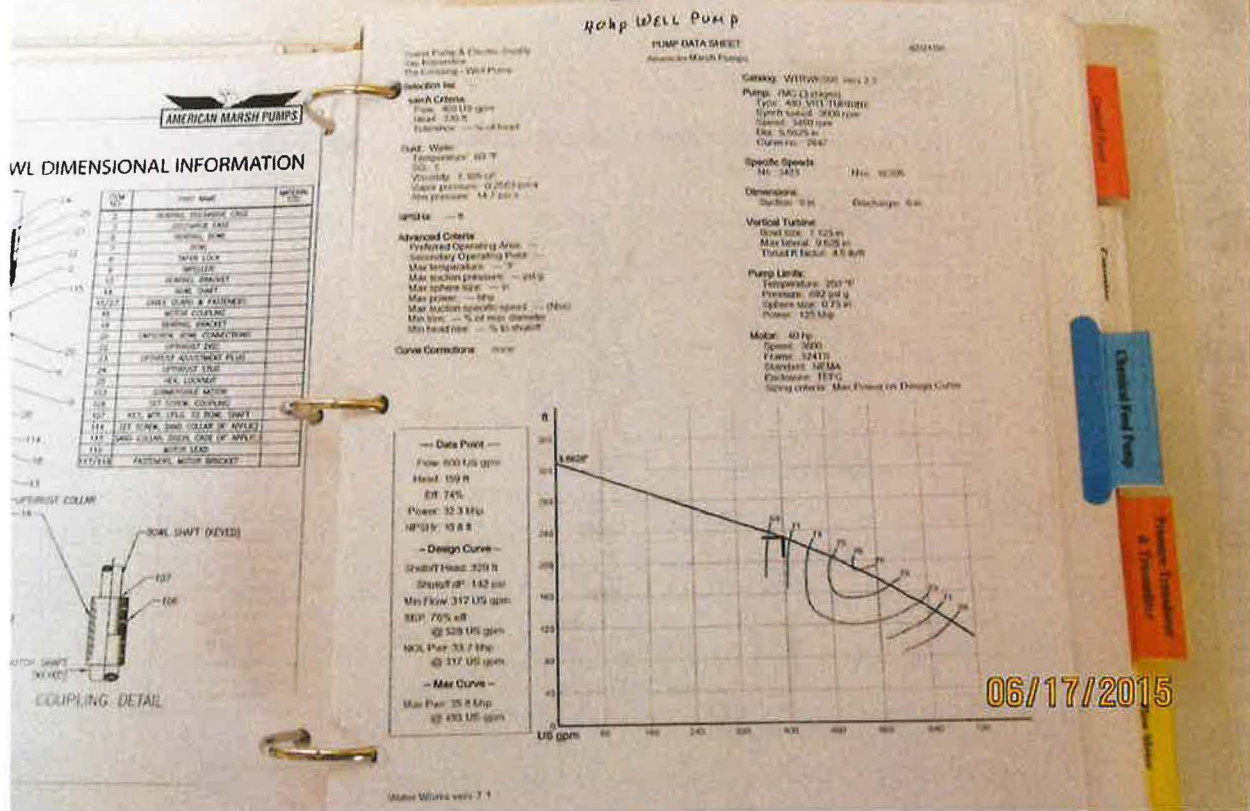
PUMP CONTROL PANEL



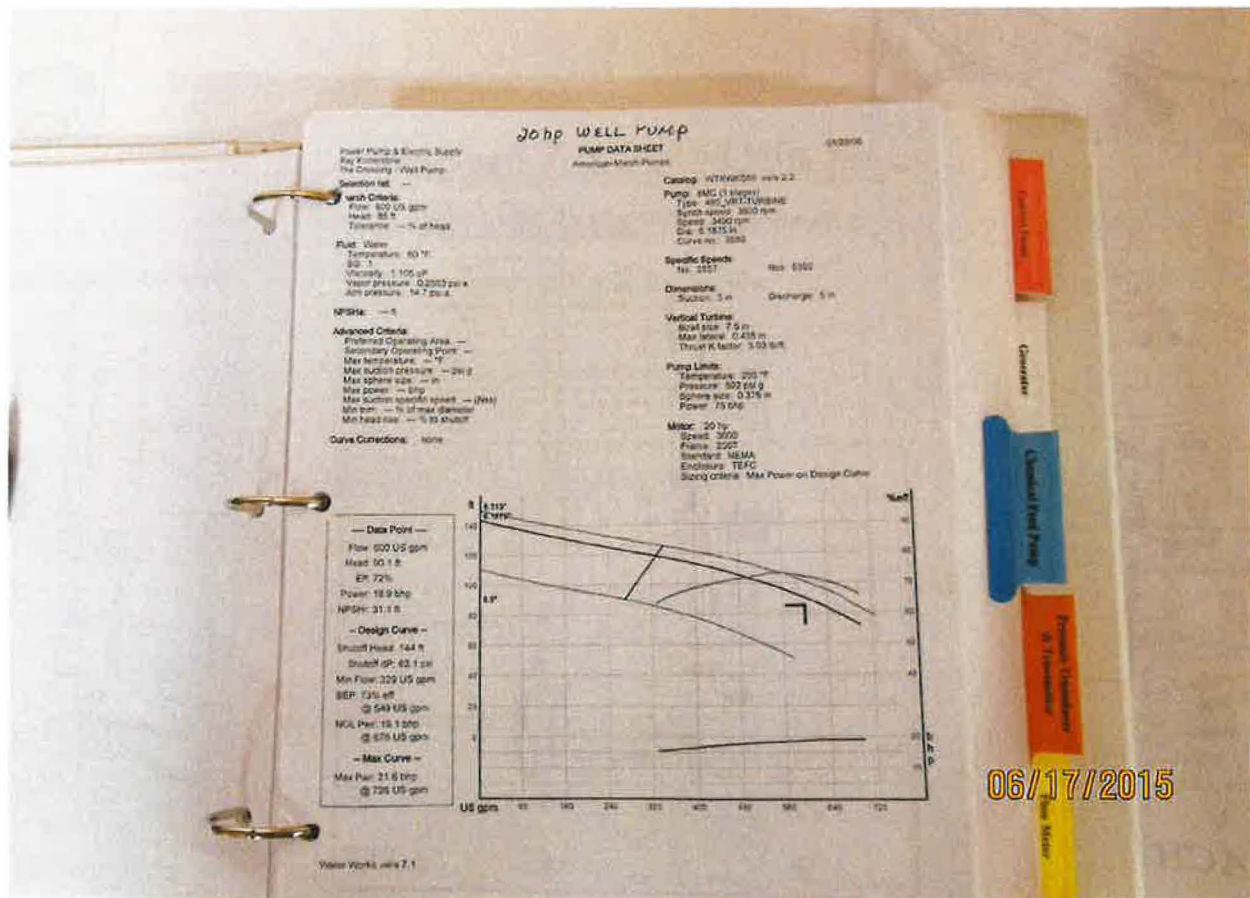


PUMP CONTROL PANELS

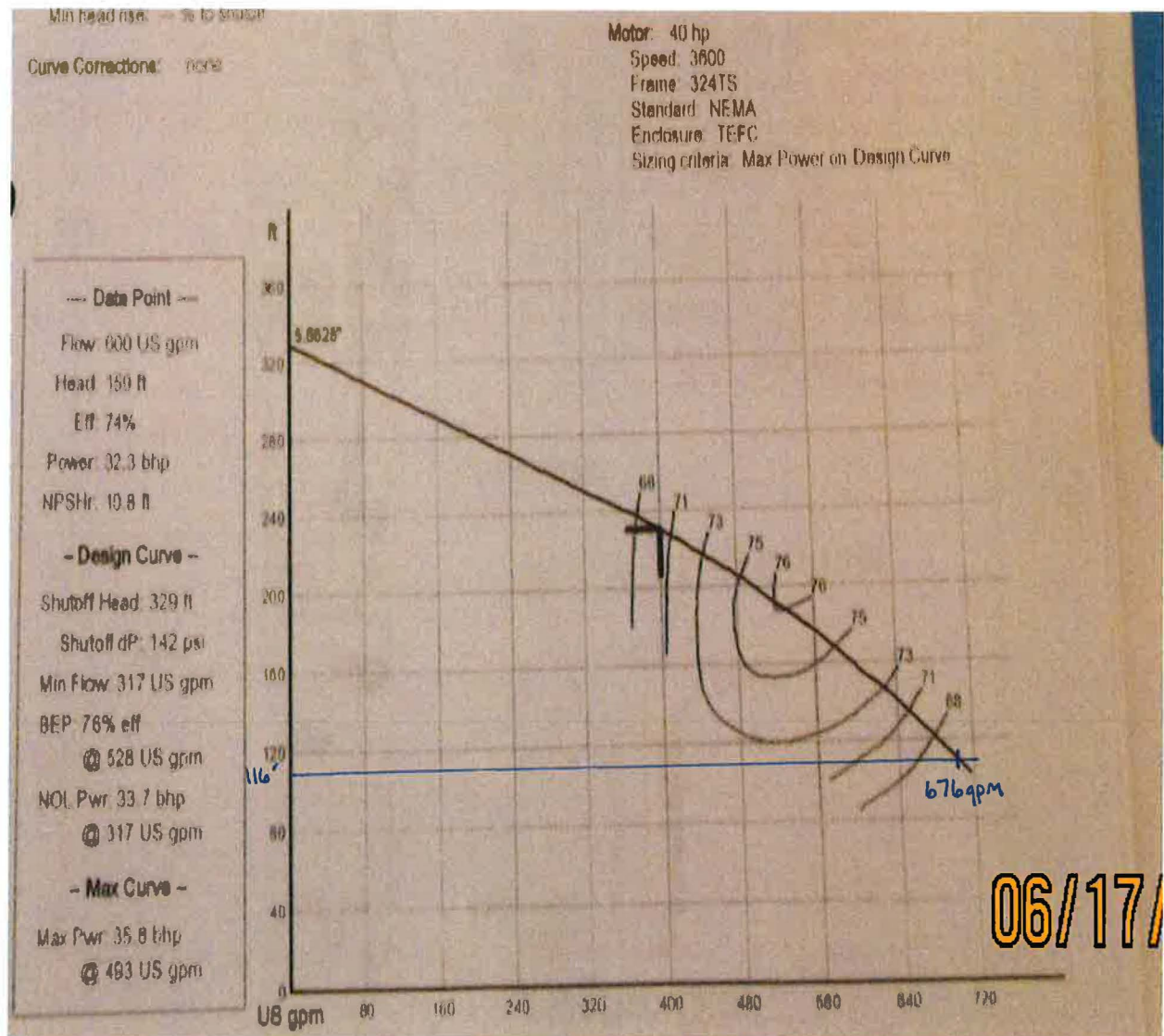




PUMP CURVE 40 HP WELL PUMP



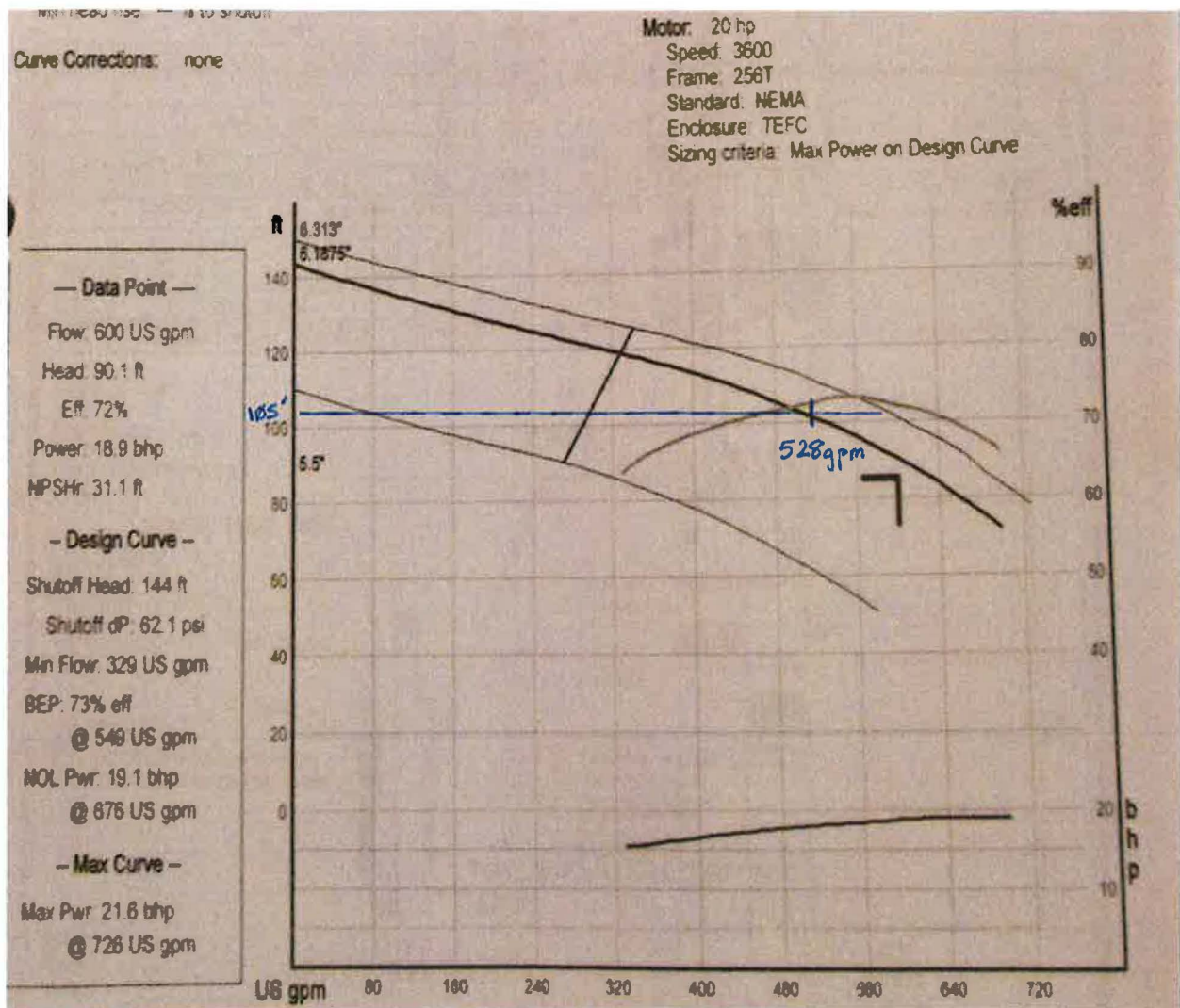
PUMP CURVE 20 HP WELL PUMP



POD – WELL D0039736

PUMP ASSOCIATED WITH WELL IS AND ABOVE GROUND 40 HP PUMP SYSTEM,

WITH PUMPING LEVEL EQUAL TO 116'



POD – WELL D0035405

PUMP ASSOCIATED WITH WELL IS AND ABOVE GROUND 20 HP PUMP SYSTEM,
WITH PUMPING LEVEL EQUAL TO 105'



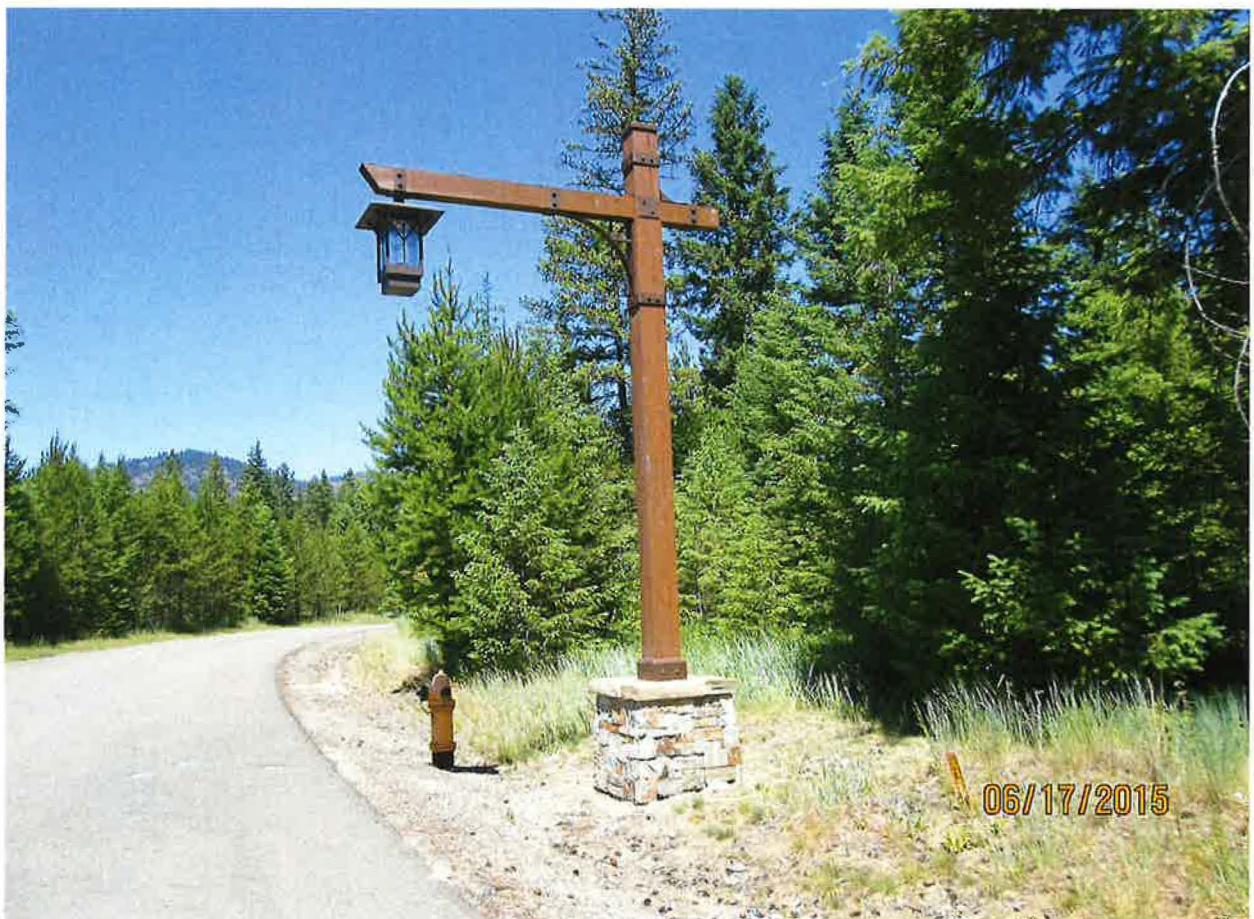
PUMP HOUSE CO-LOCATED WITH 2EA WELLS



FIRE HYDRANT



STUB-IN AT POU



FIRE HYDRANT



SPORT CENTER AT POU



POU – LOT IN CROSSING SUBDIVISION



POU – CROSSING SUBDIVISION





POU – MARINA IN SUBDIVISION



POU – DOCKS IN SUBDIVISION



POU – LOT IN SUBDIVISION





POU – LOT IN SUBDIVISION





POU



GATED ENTRANCE / EXIT CROSSING SUBDIVISION