

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 37-08220

Exam Date: 7/24/2012 (6/23/2016)

- Current Owner:
HEATHERLANDS HOMEOWNERS ASSN INC PO BOX 3901 KETCHUM ID 83340-3901 (208)726-3858
- Accompanied by: Mark Koffer of Walker Water Systems and Laura Gvozdas with Sun Country Management
Phone No: Mark (208)726-5145; Laura (208)726-3858
Address: Mark: 624 Pierce Street, Twin Falls ID 83301; Laura: PO Box 1672 Sun Valley, ID 83353
Relationship to Permit Holder: Mark maintains the water system for the subdivision. Laura is the property manager

3. SOURCE: GROUND WATER**B. OVERLAP REVIEW**

- Other water rights with the same place of use: 37-8220, 37-8686, 37-8831, 37-11238
- Other water rights with the same point-of-diversion: 37-159B, 37-8831 and 37-8686

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

GROUND WATER SE¼SW¼ Sec. 17, Twp 03N, Rge 18E, B.M. BLAINE County Well house #1 (south) 43.58348 -114.335582
GROUND WATER NW¼NE¼ Sec. 20, Twp 03N, Rge 18E, B.M. BLAINE County Well House #2 (north) 43.588684 -114.338635

Method of Determination: GPS

2.

PLACE OF USE: FIRE PROTECTION and DOMESTIC

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
03N	18E	17			X				X	X	X	X		X	X	X	X	X	
03N	18E	20	X	X			X												

PLACE OF USE: IRRIGATION

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
03N	18E	17								2.1	13.0	0.6		11.0		1.8	18.0	0.6	47.1
03N	18E	20		11.0			2.4												13.4

Method of Determination:

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	Mode number	Pump Make	Pump Serial No. or Discharge Size
Well #1 (South Well) A004254		20	6T20-275	Berkeley	4 inch discharge size
		20	6T20-275	Berkeley	4 inch discharge size

Well #2 (North Well) A004253		20	6T20-275	Berkeley	4 inch discharge size
		20	6T20-275	Berkeley	4 inch discharge size

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

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
Closed Conduit Flowmeter	Polysonic	Panametrics				3/29/2016
Closed Conduit Flowmeter	Polysonic	TymeFlyte				3/29/2016
Pressure Gage						

2. Measurements:

During the examination in 2012, the measurement equipment was not able to acquire a signal. Therefore, no measurement was secured. Finally, in 2016 another site visit occurred where measurements were conducted to determine the system capacity. There were several steps in reaching the system's capacity:

- Determine largest irrigation zone capacity (common area by the tennis courts).
- Observed Well #1 diverting 105 gpm under normal conditions (after 11am, 88 psi, 62 hertz)
- Calibrate McCrometer on Well #1
- Observed Well #2 diverting 65 gpm under normal conditions (after 11am, 99 psi, 60 hertz)
- Calibrate McCrometer on Well #2
- Open a fire hydrant that uses water from Well #2 only until pressure dropped to 12 psi. Viewed the McCrometer at Well #2 during the open discharge.
- Open a fire hydrant that uses water from Well #1 only until pressure dropped to 12 psi. Viewed the McCrometer at Well #1 during the open discharge.

E. FLOW

 x Additional Computation Sheets Attached

CALCULATIONS

a. Irrigation System for common area

- 22 sprinkler zone Rainbird 5000s and one 6504
- Using pitot tube, measure a pressure range of 29 PSI to 36 PSI at sprinklers
- On the 5000s they had .08 nozzles-rated at 3.3 GPM at 36 PSI and 2.8 GPM at 25 PSI (use 3.0 GPM average)
- 6504had nozzle 6- rated at 4.3 GPM at 30 PSI

21 sprinklers X 3.0 GPM = 63 GPM + 4.3 GPM = 67.3 GPM X 0.0023 = 0.15 cfs for irrigation.

b. Observe McCrometer at Well #1 under normal conditions--See photo 3 on page 4 of the photo narrative

c. Calibrating McCrometer at Well #1

- Connect Tymflyte equipment on open length of pipe
- Well # 1, beginning reading on the McCrometer was 756400 and ending reading was 757500

$$\begin{array}{r} 757500 \text{ gallons} \\ - 756400 \text{ gallons} \\ \hline 1,100 \text{ gallons/9 minutes} = 122.2 \text{ GPM} \end{array}$$
- The Tymeflyte showed a total of 131.1 GPM (1,180 gallons/9 minutes)
- $131.1/122.2 = 1.07$ efficiency factor for the McCrometer

d. Observe McCrometer at Well #2 under normal conditions--See photo 1 on page 6 of the photo narrative

e. Calibrating McCrometer at Well #2

- Connect Panametrics equipment on open length of pipe

- Well # 2, beginning reading on the McCrometer was 2871500 ending reading was 2872700

$$\begin{array}{r} 2872700 \\ - 2871500 \\ \hline 1,200 \text{ gallons/10} = 120 \text{ GPM} \end{array}$$
- The Panametrics showed a total of 137.0 GPM (1,370 gallons/10 minutes)
 $137/120 = 1.14$ efficiency factor for the McCrometer (see attached print out from the Panametric measurement)

f. Well #2; full capacity test

- 680 gpm as registered by the McCrometer- the system pressure dropped to 15 PSI
- 680 gpm X 1.14 efficiency factor = 775.2 GPM

g. Well #1; full capacity test

- 680 gpm as registered by the McCrometer- the system pressure dropped to 12 PSI
- 680 gpm X 1.07 efficiency = 727.6 GPM

Total capacity of the system:

$$\begin{array}{r} 775.2 \\ + 727.6 \\ \hline 1,502.8 \text{ GPM} / 448.83 = 3.35 \text{ cfs} \end{array}$$

37-8220 permit authorized domestic, irrigation, and fire protection uses.

Domestic -116 households per application for permit

Department Administrative Memorandum #22 includes a chart for in-house domestic water use. Per the chart, 120 households are allowed ~0.50 cfs for in-house domestic use.

$$(0.50/110) \times 116 = 0.53$$

The permit allowed 0.5 cfs for domestic

Rate for Domestic: 0.50 cfs

Irrigation The 2.5 acre common area receives irrigation from right 37-159B

Total irrigated acres based on an analysis of NAIP aerial imagery for years 2009, 2011, 2013 and 2015 is a total of 73.8 acres for all three rights.

Right 37-8220 allows 60.5 acres. Analysis of the imagery found irrigation of 62.5

Right 37-8686 allows 6.5 acres Analysis of the imagery found irrigation of 7.4

Right 37-8331 is for domestic only. Analysis of imagery found 3.9 irrigation of 3.9

$$62.5 + 7.4 + 3.9 = 73.8 \text{ total irrigated acres}$$

According to an email from James Speck, attorney for the Heatherlands subdivision, the homeowners association approved inclusion of a condition that restricts irrigation under 37-8220 to not more than ½ acres for each of the residential lots. (see attached)

Permit allowed 1.21 cfs for irrigation

$$60.5 \text{ acres} \times 0.02 = 1.21 \text{ cfs}$$

Recommended Rate for Irrigation 1.21 cfs

Fire Protection

System capacity of 3.35 cfs for fire protection

Permit allows 1.11 cfs

Recommended Rate for Fire Protection: 1.11 cfs

Total diversion rate from permit: 2.82 cfs

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: Irrigation Season of Use 4/15 to 10/31 for 200 days

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 60.5 \text{ irrigated acres} \times 3.5 = 211.8 \text{ AF}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 1.21 \text{ cfs} \times 200 \times 1.9835 = 480 \text{ AF}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \mathbf{211.8 \text{ AF}} \text{ for irrigation}$$

2. Volume Calculations for Other Uses: Domestic--0.6 AF for in-house use $\times$ 116 houses = **69.6 AF**

$$211.8 + 69.6 = 281.4 \text{ AF}$$

Total Recommended Volume: 281.4 AF

G. NARRATIVE/REMARKS/COMMENTS**History**

In May 1990, the Department of Water Resources issued water right permit 37-8220 for irrigation (1.21 cfs), domestic (0.5 cfs) and fire protection (1.114 cfs) to the Heatherlands Homeowners association with a 1986 priority date. According to the application, Heatherlands intended to develop 116 residential lots. The permit authorized irrigation of 60.5 acres only in connection with domestic use. Proof was submitted on September 12, 1994.

In September 1990, Heatherlands filed a second application for permit 37-8686 for the irrigation of 6.5 acres (0.13 cfs), domestic (0.17 cfs) and fire protection (0.56 cfs). The Department approved this application in 1995. This permit intended to cover 13 homes within the Sundance subdivision. Sundance is located to the northeast of Heatherlands. The permit specifically states that the irrigation use shall not exceed $\frac{1}{2}$ acres within each lot upon which a home has been constructed. The domestic portion of the right excludes irrigation. Proof was submitted on November 18, 1996.

Heatherlands submitted a third application in August 1994 for domestic use (0.17 cfs) and was approved a couple months later. This permit, 37-8831, identified 14 lots intended for the development of townhouses. Each of these lots fell within the Heatherlands subdivision; none were within Sundance. Heatherlands submitted proof of beneficial use for 14 townhouses in November 2003.

The Heatherlands Homeowners Association (HOA) also has water right 37-159B (0.6 cfs, 105.0 af) for irrigation purposes on 30 acres. The irrigated area is outside of the POU of rights 37-8220, 37-8686 and 37-8831 but all four rights share the same points of diversion (PDs). Right 37-159B was transferred to these PDs in 1995. Right 37-159B initially diverted from the East Fork of the Big Wood and the 1995 transfer (no. 4649) changed the PDs and the source.

A combined limit will apply for all the rights diverting out of the two wells. The limit is required because the combined total rate for the four rights have a diversion rate higher than what the system can provide.

On March 23, 2017, Chuck Brockway of Brockway engineering submitted *Technical Information in Support of Diversion Rates for Licensing of 37-8220, 37-8686 and 37-8831 (Heatherlands)* (see attachment). In that document Mr. Brockway provided a 1993 capacity estimation for three 20 horse power pumps and one 30 hp pump. The total estimated 1993 capacity was estimated to be 1,574 gpm or 3.51 cfs. A theoretical calculation found this estimation to be reasonable.

1993 System Capacity (Three 20 hp pumps / One 30 hp pump)

37-159B	0.60 cfs
37-8220	2.82 cfs
37-8686	0.86 cfs
37-8831	0.17 cfs
	4.45 cfs

(system capacity is 3.51 cfs)

In addition, water right 37-11238 overlaps the POU for the domestic and irrigation rights (POU is within Lot 116 of Heatherlands Subdivision).

System

Two wells supply water for the Heatherlands and Sundance subdivisions in Blaine County. The first well, A0004254 in T3N R18E Section 20 NWNE has two 20-horse power pumps. The second point of diversion in T3N R18E Section 17 SESW also has two 20 horsepower pumps. The wells are located approximately 2,060 feet apart. Pump 2 at the second well is the lead pump. The depth to water for these two well locations is approximately 100 feet deep.

Mark Koffer from Walker Water in Twin Falls manages the water system. According to Mark they rotate through both pumps at each well to prevent them from wearing out. There is currently no storage on the system. Storage is not necessary since the pumps are variable speeds. A 6-inch mainline, buried 6 inches deep, flows through the subdivision. Four-inch lines supply water to each of the houses.

In addition to the individual lots within the two subdivisions there is a 2.5 acre common area. This includes a clubhouse, swimming pool and tennis courts. The land that surrounds the activity area is irrigated. Right 37-159B diverts from the same two wells as the three permits. Right 37-159B is used to irrigate non-residential common areas only, including the area around the clubhouse, swimming pool and tennis courts. The irrigation around the clubhouse, pool and tennis courts was added to the POU for right 37-159B in a 2016 transfer.

IDWR Stub-in policy

According to licensing memo #1 Beneficial use shall be based on development with the service area during the authorized development period of the permit and shall include stubbed-in lots for domestic proposes.

A 6 inch main line supplies water to 4" pipes for all lots within the Heatherlands and Sundance subdivisions. In December 1999, Heatherlands submitted a request for extension of time to submit beneficial use for right 37-8831. In that document there is an explanation of the work that had been completed at that time. The description given is that the developer stubbed out the all water lines before the association incorporated in December 1979. The estimated cost was \$21,000.

Volume

See page # 2 of this report for actual volume readings and calculations. In 2012-2013 the subdivision recorded a maximum diversion from the two wells of 323 af. (see attachment: Heatherlands Flow Meter readings in gallons) The volume of water diverted includes the domestic and irrigation rights 37-8220, 37-8686 and 37-8331 and the 30 acres of irrigation allowed under right 37-159B.

Overlap of rights 37-8220 and 37-8831

The place of use for right 37-8220 includes the townhouses under domestic right 37-8831. Permit 37-8831 provides for domestic in-house use for 14 townhouse (see attached plat map). Five of the townhouse lots were subdivided at the time of the field exam. Of the 116 lots total, the 14 will be split into two each for a total of 130 houses. Right 37-8220 will cover one duplex per lot for in-house domestic use, and the irrigation and fire protection for all of the Heatherlands subdivision (see email dated January 19, 2017).

DEQ Sanitary Survey Findings

Idaho Department of Environmental Quality (DEQ) Source Water Assessment Summary Report: HEATHERLANDS SUBD (PWS# ID5070023):

This report evaluates HEATHERLANDS SUBD (PWS# ID5070023) WELL 2 A0004254 located in BLAINE county. The system serves approximately 225 people through 90 connections. The report was completed in September 2000.

This report evaluates HEATHERLANDS SUBD (PWS# ID5070023) WELL 1 A0004253 located in BLAINE county. The system serves approximately 225 people through 90 connections. The report was completed in November 2000.

A licensing amendment is required for 37-8220 to add a place of use.

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>
FIRE PROTECTION	01/01 to 12/31	1.11 CFS	
DOMESTIC	01/01 to 12/31	0.99 CFS	96.0 AF
IRRIGATION	04/15 to 10/31	0.72 CFS	126 AF
<u>Totals:</u>		2.820 CFS	

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ Change Beneficial Use

☐ Change P.U. as reflected above ☒ Add P.U. as reflected above ☐ None

I. AUTHENTICATION

Field Examiner's Name Samuel Hill Date 12/1/2011

Reviewer _____ Date _____

Heatherlands Subdivision

Irrigated Acres	Year Built	Lot	Address	Subdivision
0.70	1980	AM LOT 48A BLK 5	110 SWEETBRIER RD	HEATHERLANDS SUB
0.36	1981	LOT 19 BLK 3	210 SHAUN LN	HEATHERLANDS SUB
0.55	1981	LOT 18 BLK 3	217 SHAUN LN	HEATHERLANDS SUB
0.84	1981	LOT 4 BLK 2	101 CLOVER CIR	HEATHERLANDS SUB
0.78	1981	LOT 55 BLK 5	106 DOGWOOD RD	HEATHERLANDS SUB
0.71	1982	LOT 3 BLK 2	109 SWEETBRIER RD	HEATHERLANDS SUB
0.44	1982	LOT 89 BLK 7	209 SWEETBRIER RD	HEATHERLANDS SUB
0.59	1983	LOT 67 BLK 6	313 SWEETBRIER RD	HEATHERLANDS SUB
0.48	1984	LOT 84 BLK 7	106 COLUMBINE CIR	HEATHERLANDS SUB
0.66	1984	LOT 93 BLK 7	302 SWEETBRIER RD	HEATHERLANDS SUB
0.57	1985	LOT 68 BLK 6	206 SWEETBRIER RD	HEATHERLANDS SUB
0.57	1985	LOT 34 BLK 2	106 SHAUN LN	HEATHERLANDS SUB
0.44	1985	LOT 43 BLK 2	110 DOGWOOD RD	HEATHERLANDS SUB
0.75	1985	LOT 82 BLK 6	113 SNOWPLANT RD	HEATHERLANDS SUB
0.44	1985	LOT 13 BLK 2	105 COLUMBINE CIR	HEATHERLANDS SUB
0.40	1986	LOT 58 BLK 5	109 COLUMBINE CIR	HEATHERLANDS SUB
0.75	1986	LOT 107 BLK 8	405 SWEETBRIER RD	HEATHERLANDS SUB
0.68	1986	LOT 56 BLK 5	425 SWEETBRIER RD	HEATHERLANDS SUB
1.05	1986	LOT 14 BLK 2	310 SWEETBRIER RD	HEATHERLANDS SUB
0.71	1987	LOT 69 BLK 6	306 SWEETBRIER RD	HEATHERLANDS SUB
0.43	1987	LOT 74 BLK 6	209 SHAUN LN	PEACEFUL VISTA TOWNHOUSES
0.73	1987	LOT 92 BLK 7	109 DOGWOOD RD	HEATHERLANDS SUB
0.83	1987	LOT 31 BLK 4	140 DESPERADO DR	HEATHERLANDS SUB
0.73	1987	LOT 17 BLK 3	330 SWEETBRIER RD	HEATHERLANDS SUB
0.83	1987	LOT 28 BLK 4	238 MARIPOSA RD	HEATHERLANDS SUB
0.39	1987	LOT 24 BLK 3	226 MARIPOSA RD	HEATHERLANDS SUB
0.53	1988	LOT 6 BLK 2	222 SHAUN LN	HEATHERLANDS SUB
0.68	1988	LOT 91 BLK 7	122 SNOWPLANT RD	HEATHERLANDS SUB
0.65	1988	LOT 38 BLK 2	114 SNOWPLANT RD	HEATHERLANDS SUB
0.79	1989	LOT 51 BLK 5	201 SWEETBRIER RD	HEATHERLANDS SUB
0.46	1989	LOT 71 BLK 6	322 SWEETBRIER RD	HEATHERLANDS SUB
0.74	1989	LOT 35 BLK 2	214 SWEETBRIER RD	HEATHERLANDS SUB
0.87	1989	LOT 39 BLK 2	242 MARIPOSA RD	HEATHERLANDS SUB
0.66	1989	LOT 52 BLK 5	206 SHAUN LN	HEATHERLANDS SUB
0.74	1989	LOT 27 BLK 4	203 SHAUN LN	COBIA TOWNHOUSES
0.52	1990	LOT 103 BLK 6	314 SWEETBRIER RD	HEATHERLANDS SUB
0.85	1990	LOT 49 BLK 5	225 MARIPOSA RD	HEATHERLANDS SUB
0.71	1990	LOT 42 BLK 2	102 MARIPOSA RD	MARIPOSA TOWNHOUSES
0.45	1990	LOT 11 BLK 2	201 DOGWOOD RD	HEATHERLANDS SUB
0.74	1990	LOT 54 BLK 5	205 DOGWOOD RD	HEATHERLANDS SUB
0.52	1990	LOT 96 BLK 7	112 LARKSPUR RD	HEATHERLANDS SUB
0.84	1990	LOT 100 BLK 7	110 LARKSPUR RD	HEATHERLANDS SUB
0.58	1990	AM LOT 15A BLK 2	217 MARIPOSA RD	HEATHERLANDS SUB
0.99	1990	LOT 59A BLK 5	202 MARIPOSA RD	HEATHERLANDS SUB
0.41	1990	LOT 104 BLK 6	201 SHAUN LN	HEATHERLANDS SUB
0.50	1990	LOT 85 BLK 7	110 SNOWPLANT RD	HEATHERLANDS SUB
0.75	1991	LOT 50 BLK 5	302 SHAUN LN	HEATHERLANDS SUB
0.46	1991	LOT 75 BLK 6	305 SWEETBRIER RD	HEATHERLANDS SUB
0.42	1991	LOT 94 BLK 7	210 SWEETBRIER RD	HEATHERLANDS SUB
0.17	1991	SUBLOT 2 19,959SF	209 MARIPOSA RD	HEATHERLANDS SUB
0.73	1991	LOT 26 BLK 4	221 MARIPOSA RD	HEATHERLANDS SUB
0.43	1991	LOT 87 BLK 7	106 SWEETBRIER RD	HEATHERLANDS SUB
0.24	1991	SUBLOT 1 19,959SF	110 SHAUN LN	HEATHERLANDS SUB
0.44	1991	LOT 80 BLK 6	109 SHAUN LN	HEATHERLANDS SUB
0.55	1992	LOT 98 BLK 7	301 SHAUN LN	H.B.S. TOWNHOUSES
0.44	1992	LOT 8 BLK 2	113 SHAUN LN	MARIPOSA TOWNHOUSES
0.87	1992	LOT 109 BLK 8	213 DOGWOOD RD	HEATHERLANDS SUB

Heatherlands Subdivision

Irrigated Acres	Year Built	Lot	Address	Subdivision
0.47	1992	LOT 70 BLK 6	105 SNOWPLANT RD	HEATHERLANDS SUB
0.41	1992	LOT 72 BLK 6	109 SNOWPLANT RD	HEATHERLANDS SUB
0.73	1992	LOT 99 BLK 7Q	102 SNOWPLANT RD	HEATHERLANDS SUB
0.41	1992	LOT 76 BLK 6	409 SWEETBRIER RD	HEATHERLANDS SUB
0.66	1992	LOT 83 BLK 6	250 MARIPOSA RD	HEATHERLANDS SUB
0.38	1993	LOT 66 BLK 6	214 SHAUN LN	HEATHERLANDS SUB
0.58	1993	LOT 102 BLK 6	105 SHAUN LN	HEATHERLANDS SUB
0.65	1994	LOT 97 BLK 7	213 SHAUN LN	SHAUN (TOWNHOUSES)
0.27	1994	SUBLOT 1 16,200SF	113 DOGWOOD RD	HEATHERLANDS SUB
0.51	1994	LOT 106 BLK 8	118 SNOWPLANT RD	HEATHERLANDS SUB
0.44	1994	LOT 60 BLK 6	105 SWEETBRIER RD	HEATHERLANDS SUB
0.30	1994	SUBLOT 2	413 SWEETBRIER RD	HEATHERLANDS SUB
0.40	1994	SUBLOT 2 26,880SF	417 SWEETBRIER RD	HEATHERLANDS SUB
0.38	1994	SUBLOT 1	334 SWEETBRIER RD	HEATHERLANDS SUB
0.74	1994	LOT 77 BLK 6	233 MARIPOSA RD	HEATHERLANDS SUB
42.46		The Department received proof of beneficial use in September 1994		
0.59	average			
0.91	0	LOT 40 BLK 2	291 SHAUN LN	H.B.S. TOWNHOUSES
0.09	0	LOT 37 BLK 2	121 DOGWOOD RD	HEATHERLANDS SUB
0.34	1995	LOT 41 BLK 2	102 SYRINGA RD	FORT SILVERADO (TOWNHOUSES)
0.72	1995	LOT 78 BLK 6	211 SHAUN LN	PEACEFUL VISTA TOWNHOUSES
0.62	1995	LOT 79 BLK 6	215 SHAUN LN	SHAUN (TOWNHOUSES)
0.38	1996	SUBLOT 115B	106 SNOWPLANT RD	HEATHERLANDS SUB
0.35	1996	SUBLOT 115A	205 SWEETBRIER RD	HEATHERLANDS SUB
0.63	1996	LOT 23 BLK 3	401 SWEETBRIER RD	HEATHERLANDS SUB
0.63	1997	LOT 36 BLK 2	222 MARIPOSA RD	HEATHERLANDS SUB
0.40	1997	LOT 30 BLK 4	101 DOGWOOD RD	FORT SILVERADO (TOWNHOUSES)
0.43	1997	AM LOT 47A BLK 5	117 DOGWOOD RD	HEATHERLANDS SUB
0.51	1998	LOT 33 BLK 2	114 DOGWOOD RD	HEATHERLANDS SUB
0.47	1999	LOT 12 BLK 2	421 SWEETBRIER RD	HEATHERLANDS SUB
0.64	1999	LOT 9 BLK 2	218 MARIPOSA RD	HEATHERLANDS SUB
0.47	2000	LOT 44 BLK 2	202 SHAUN LN	HEATHERLANDS SUB
0.62	2000	LOT 45 BLK 5	106 CLOVER CIR	HEATHERLANDS SUB
0.84	2000	LOT 101 BLK 6	102 LARKSPUR RD	HEATHERLANDS SUB
0.80	2000	LOT 46 BLK 5	309 SWEETBRIER RD	HEATHERLANDS SUB
0.31	2000	SUBLOT 1 22,785SF .52	429 SWEETBRIER RD	HEATHERLANDS SUB
0.63	2000	LOT 90 BLK 7	214 MARIPOSA RD	HEATHERLANDS SUB
0.35	2000	SUBLOT 2 22,785SF .52	210 MARIPOSA RD	HEATHERLANDS SUB
0.61	2000	LOT 81 BLK 6	205 MARIPOSA RD	HEATHERLANDS SUB
0.58	2001	LOT 61 BLK 6	105 CLOVER CIR	HEATHERLANDS SUB
0.31	2001	LOT 63 BLK 6	106 LARKSPUR RD	HEATHERLANDS SUB
0.32	2002	SUBLOT 1	230 MARIPOSA RD	HEATHERLANDS SUB
0.24	2002	LOT 65 BLK 6	102 SHAUN LN	HEATHERLANDS SUB
0.39	2002	SUBLOT 2	205 SHAUN LN	COBIA TOWNHOUSES
0.69	2002	LOT 95 BLK 7	110 CLOVER CIR	HEATHERLANDS SUB
0.62	2003	LOT 53 BLK 5	105 LARKSPUR RD	HEATHERLANDS SUB
0.72	2004	LOT 86 BLK 7	109 LARKSPUR RD	HEATHERLANDS SUB
0.71	2004	LOT 5 BLK 2	234 MARIPOSA RD	HEATHERLANDS SUB
0.50	2005	LOT 57 BLK 5	206 MARIPOSA RD	HEATHERLANDS SUB
0.46	2008	LOT 32 BLK 4	213 MARIPOSA RD	HEATHERLANDS SUB
0.64	2011	LOT 113 BLK 8	229 MARIPOSA RD	HEATHERLANDS SUB
0.52	2013	LOT 25 BLK 4	102 SWEETBRIER RD	HEATHERLANDS SUB
0.42	2014	LOT 88 BLK 7	218 SHAUN LN	HEATHERLANDS SUB
61.89				

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right Nos. 37-8220, 37-8686, 37-8831 and 37-159B
 Reviewer: Dan Nelson and Sandy Thiel
 Date of Review: 3/24/2017

P/D No.:

PUMP HORSEPOWER
 BOOSTER HORSEPOWER

PUMPING LEVEL

DISCHARGE PRESSURE

RATE OF FLOW (cfs)

Well #1 pump #1	Well #1 pump #2	Well #2 pump #1	Well #2 pump #2	30 hp pump
20	20	20	20	30
0	0	0	0	0
80	80	80	80	80
12	12	12	12	12
0.84	0.84	0.84	0.84	1.26
377	377	377	377	565

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:

The efficiency was changed to 0.514 to attain the flow rate at the pumping level described by the owner. The pumping level has to be less than 100 feet, because the wells are only 100 feet deep. The two competing pumps in the same well causes the pump efficiency to drop due to the competition for water in the well.

	gpm	cfs	
all 20 Hp Pumps =	1508	3.36	
1-30Hp & 3 20HP =	1696	3.78	
Brockway =			
20Hp +30 Hp		792	
2 - 20hp pumps =		754	
Total =		1545.811	3.44
Just for Assumption=			
2 - 30hp pumps		1130.716	
2 - 20hp pumps =		754	
Total =		1884.527	4.20

Technical Information in Support of Diversion Rates for Licensing of 37-8220, 37-8686, and 37-8831 (Heatherlands)

C. G. Brockway, P.E.
March 23, 2017

1993 pump curves

IDWR measured the capacity of two well sources during a field exam in June 2016 for the above-referenced water rights. However, the installed well pumps as of the water right proof dates (1994, 1996, and 2003) were different than those in place when the 2016 field exam was made. The pumps in place as of 1993 were confirmed by Walker Water Systems, who was the system manager at the time and continues to function in that capacity today (see attached letter and pump curves provided by Walker). Two submersible pumps were installed in each well:

Well #1

Pump 1: Jacuzzi S6X3, 20HP

Pump 2: Jacuzzi S6X7, 30HP

Well #2

Pumps 1 and 2: Berkeley 6S2AH5, 20HP

As is the case today, the pumps were connected in parallel. In a parallel configuration, the composite pump curve is found by adding the flow from each pump for the range of total dynamic head.

System curve

The point at which the system would have operated in 1993 is the intersection of the composite pump curve and the system curve. The system curve describes the head required to push a given flow through the system, and takes the form

$$H = KQ^2$$

where H is the total head, Q is the flow rate, and K is a constant. Two concurrent head and flow values are needed to calculate K . Based on the IDWR 2016 field exam measurements, K may be calculated for each well pump system. The flow was measured by IDWR using an ultrasonic meter, and the head includes the following components:

Total head = Pumping lift + Pressure head at surface + Drop pipe losses +
Velocity head

Each component of head is described below.

Pumping lift

The pumping water level was not measured by IDWR staff during the full-capacity tests, but was measured and reported at the time of drilling (see attached well drilling records). Based on the specific capacity (gpm/ft) at the time of drilling, the pumping lift was calculated for the discharge delivered during the 2016 field exam.

	Well #1	Well #2
Static water level	39 feet	40 feet
Pumping test at time of drilling, flow and drawdown	515 gpm at 17.7 feet	530 gpm at 10 feet 968 gpm at 19.2 feet
Specific capacity	29.1 gpm/ft	51.7 gpm/ft (average from above two measured points)
Discharge during 2016 exam full-capacity test	728 gpm	775 gpm
Predicted drawdown during 2016 exam	$728 / 29.1 = 25.0$ feet	$775 / 51.9 = 15.0$ feet
Predicted pumping level (lift)	64.0 feet	55.0 feet

Pressure head at surface

This value was measured by IDWR during the full-capacity tests. Pressure was 12 psi or 27.7 feet at Well #1 and 15 psi or 34.6 feet at Well #2.

Drop pipe losses

Pump drop pipe losses during the full-capacity test were calculated using standard methods assuming Darcy-Weisbach friction, 4-inch galvanized pipe for each pump, and appropriate minor loss coefficients for the discharge piping and valving. The Well #1 and #2 depths are 97 feet and 100 feet, respectively. Pumps appear to be set at 80 feet.

	Well #1	Well #2
Drop pipe length	80 feet	80 feet
Pipe diameter & type	4" Sch 40 (3.99" I.D.)	4" Sch 40 (3.99" I.D.)
Full-capacity test flow rate	728 gpm	775 gpm
Flow rate per pump	364 gpm	387.5 gpm
Drop pipe velocity	9.34 ft/s	9.94 ft/s
Velocity head	1.36 feet	1.54 feet
Friction factor (calculated based on Re)	0.0180	0.0179
Minor loss coefficient	4.8	4.8
Check valve	2.1	
90-deg (2)	1.6	
Tee (side)	1.1	
Total drop pipe loss	12.4 feet	14.0 feet

Total head

The total head for each pumping system during the 2016 full-capacity test is as follows:

$$H (\text{Well \#1}) = 64.0 + 27.7 + 12.4 + 1.4 = 105.5 \text{ feet}$$

$$H (\text{Well \#2}) = 55.0 + 34.6 + 14.0 + 1.5 = 105.1 \text{ feet}$$

Calculated system curves

The head and flow points described above from the full-capacity tests may be used to find K and determine the system curves, as follows:

$$\text{Well \#1: } H_{\text{sys}} = 40.10Q^2$$

$$\text{Well \#2: } H_{\text{sys}} = 35.25Q^2$$

Where H_{sys} is in feet and Q is in cfs.

1993 capacity estimation

The composite pump curves and the calculated system curves are shown in the attached tables and graphs. The intersection of the curves represents the point at which the system would have operated had IDWR conducted its field exam in 1993 and followed same procedure used in 2016. For Well #1, the 1993 system capacity is estimated to be 792 gpm compared to the 2016 capacity of 728 gpm. For Well #2, the 1993 system capacity is estimated to be 782 gpm compared to the 2016 capacity of 775 gpm. The total capacity in 1993 is estimated to be 1,574 gpm or 3.51 cfs. It is recommended that the permits be licensed with this rate as the combined-use limit, as it better represents the true system capacity with the installed pumps at the time of the proof.





Walker

WATER SYSTEMS

Since 1947

Magic Valley
Wood River
FAX

208.733.4744
208.726.5145
208.736.0795

walkerwatersystems.com
walkerws@mindspring.com

624 Pierce Street Twin Falls, ID 83301 RCE-1335

Laura, c/o Sun Country Management

February 13, 2017

RE: HEATHERLANDS PUMPS

Dear Laura:

After some research into our records, we found that the following were the pumps that were installed at Heatherlands in 1993.

Pumphouse #1:

- Jacuzzi S6X3 20HP 200GPM
- Jacuzzi S6X7 30HP 300GPM

Pumphouse #2:

- Berkeley 6S2AH5 20HP 300GPM
- Berkeley 6S2AH5 20HP 300GPM

I hope this information is what you need. If you have any questions, please give me a call.

Sincerely,

Mark Koffer

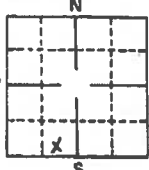
Walker Water Systems, Inc.

Location Corrected by IDWR To:
T03N R18E Sec. 20 SWNWNE
By: mciscell 2012-12-21

By: mciscell 2012-12-21

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

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORTUSE TYPEWRITER OR
BALLPOINT PENState 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.RECEIVED
AUG 28 1985
Department of Water Resources

1. WELL OWNER Name <u>Heatherlands Subdivision</u> <u>% Chuck Ketterman</u> Address <u>Edwards, Howard & Martens' Box 186</u> <u>Ketchum, ID 83340</u> Owner's Permit No. <u>37-85-C-0004-000</u>		7. WATER LEVEL Static water level <u>40</u> feet below surface. Flowing? ☐ Yes ☒ No G.P.M. flow <u>968</u> p.s.i. Artesian closed-in pressure _____ p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug Temperature <u>46</u> °F. Quality _____ Describe artesian or temperature zones below _____																																																																															
2. NATURE OF WORK <u>W.R. 37-08220</u> ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)		8. WELL TEST DATA ☒ Pump ☐ Bailer ☐ Air ☐ Other _____ Discharge G.P.M. <u>530+</u> Pumping Level <u>50'</u> Hours Pumped <u>8</u> Pumped <u>968 GPM</u> from <u>59'2"</u> for <u>1/2 hour</u> .																																																																															
3. PROPOSED USE ☐ Domestic ☐ Irrigation ☐ Test ☒ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other _____ (specify type)		9. LITHOLOGIC LOG <u>70040</u> <table border="1"><thead><tr><th>Bore Diam.</th><th>Depth From</th><th>To</th><th>Material</th><th>Water Yes</th><th>No</th></tr></thead><tbody><tr><td>16</td><td>0</td><td>2</td><td>Surface</td><td></td><td></td></tr><tr><td></td><td>2</td><td>12</td><td>Boulders & Gravel & Clay</td><td></td><td></td></tr><tr><td></td><td>12</td><td>16</td><td>Gravel & clay</td><td></td><td></td></tr><tr><td></td><td>16</td><td>19</td><td>Bigger gravel & Clay</td><td></td><td></td></tr><tr><td>12</td><td>19</td><td>44</td><td>Clay & gravel</td><td></td><td></td></tr><tr><td></td><td>44</td><td>47</td><td>Gravel & sand</td><td>X</td><td></td></tr><tr><td></td><td>47</td><td>54</td><td>Clay & gravel</td><td></td><td>X</td></tr><tr><td></td><td>54</td><td>57</td><td>Sand</td><td></td><td></td></tr><tr><td></td><td>57</td><td>59</td><td>Clay & gravel</td><td></td><td></td></tr><tr><td></td><td>59</td><td>74</td><td>Gravel & clay</td><td>X</td><td></td></tr><tr><td></td><td>74</td><td>76</td><td>Clay & gravel</td><td>X</td><td></td></tr><tr><td></td><td>76</td><td>100</td><td>Gravel & clay</td><td>X</td><td></td></tr></tbody></table>		Bore Diam.	Depth From	To	Material	Water Yes	No	16	0	2	Surface				2	12	Boulders & Gravel & Clay				12	16	Gravel & clay				16	19	Bigger gravel & Clay			12	19	44	Clay & gravel				44	47	Gravel & sand	X			47	54	Clay & gravel		X		54	57	Sand				57	59	Clay & gravel				59	74	Gravel & clay	X			74	76	Clay & gravel	X			76	100	Gravel & clay	X	
Bore Diam.	Depth From	To	Material	Water Yes	No																																																																												
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	76	100	Gravel & clay	X																																																																													
4. METHOD DRILLED ☒ Rotary ☒ Air ☐ Hydraulic ☐ Reverse rotary ☐ Cable ☐ Dug ☐ Other _____																																																																																	
5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____ Thickness <u>375</u> inches Diameter <u>12 3/4</u> inches + <u>2</u> feet <u>100</u> 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 <u>1 1/2</u> inches by <u>1/2</u> inches Number <u>1868</u> perforations <u>61</u> feet <u>95</u> 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 <u>20</u> Material used in seal: ☒ Cement grout ☐ Bentonite ☐ Puddling clay ☐ _____ 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 <u>must</u> agree with written location.  Subdivision Name <u>Heatherlands</u> Lot No. <u>36 & 37</u> Block No. <u>2</u> County <u>Blaine</u> SE 1/4 SW 1/4 Sec. <u>17</u> , T. <u>3</u> N., R. <u>18</u> E., N.		10. Work started <u>7/26/85</u> finished <u>8/12/85</u>																																																																															
		11. DRILLERS CERTIFICATION <u>DR</u> I/We certify that all minimum well construction standards were complied with at the time the rig was removed. Firm Name <u>Water Water Systems, Inc.</u> Firm No. <u>15</u> <u>624 Pierce Street</u> Address <u>Twin Falls, Idaho 83301</u> Date <u>8/21/85</u> Signed by (Firm Official) <u>Ludwick B. Welch</u> and (Operator) <u>Ludwick B. Welch</u>																																																																															

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

W/11 # 1993



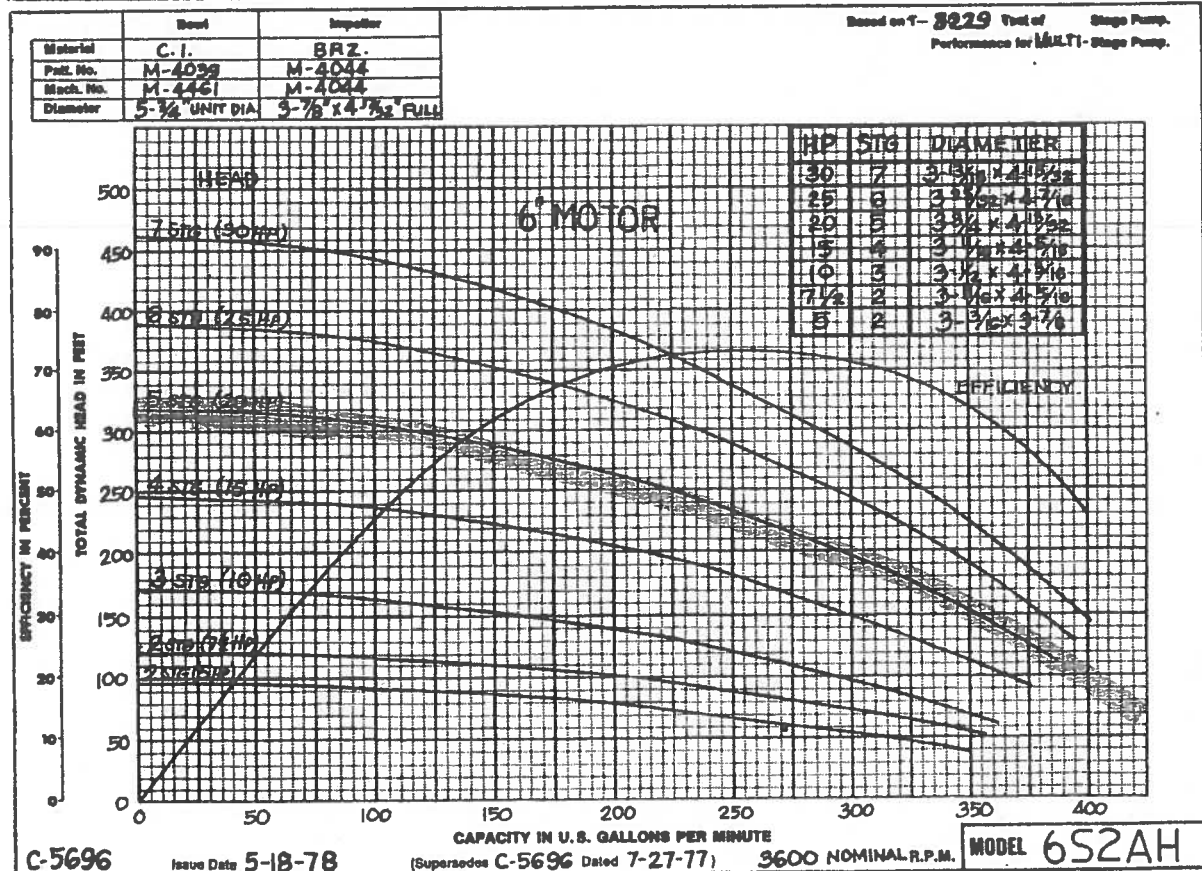
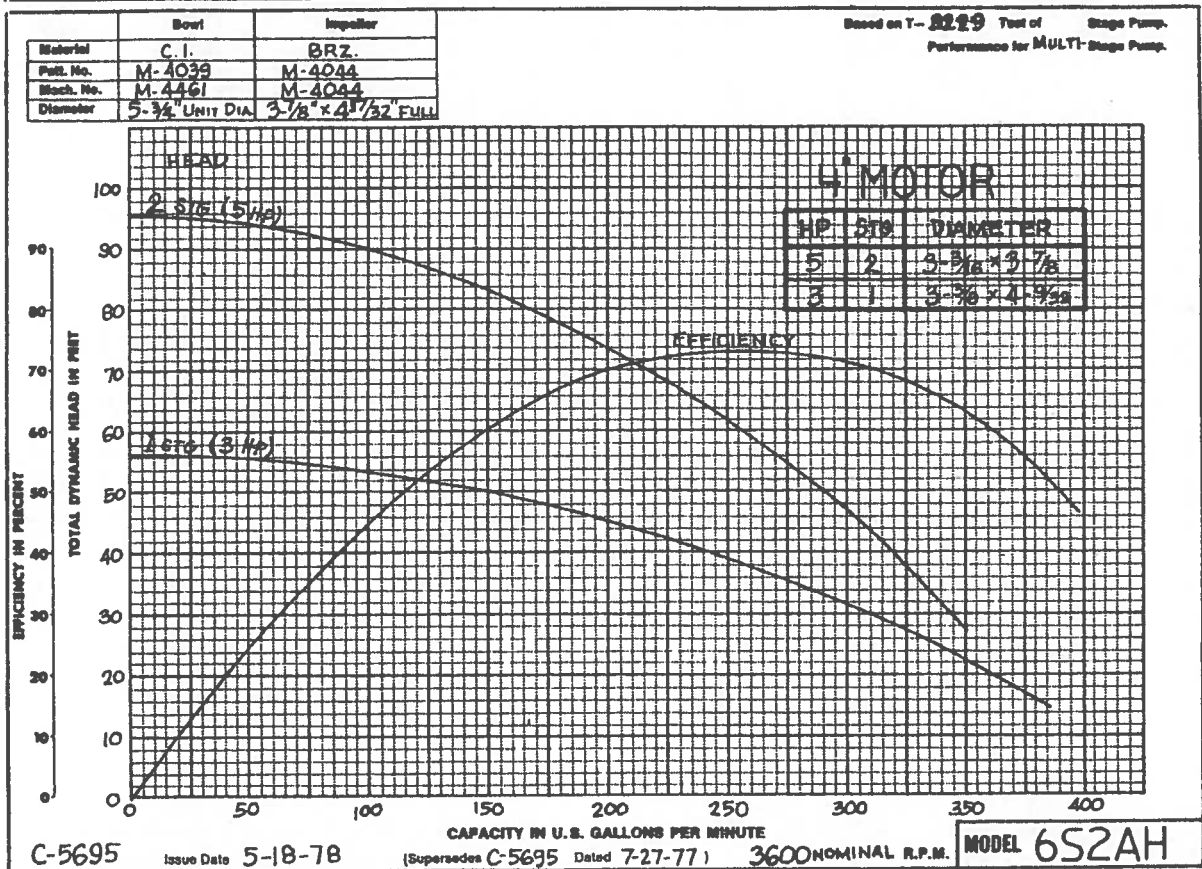
BERKELEY PUMP COMPANY

SUBMERSIBLE TURBINE PUMPS

6" AND 7" BOWLS

PERFORMANCE CURVES

CURVE	2500
DATE	6-5-78
PAGE	1.81
SUPERSEDES	
NEW	



Will #1 1993

**6" Submersible
Turbines**

3450 RPM — 60 CYCLE

PUMP MODEL NO.		Motor HP Rtg.	Max. Pump Dia. In. (1)	TOTAL DYNAMIC HEAD IN FEET																																				Shut- Off Head Feet	Tapping Disch. Tapping In. (2)
Single Phase	Three Phase			20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	325	350	375	400	450	500	550	600	650	700	800	900	1000								
CAPACITIES IN U.S. GALLONS PER MINUTE																																									
358L3-S	358L3-T	3	5 1/4"			124	119	113	108	103	97	91	75	63																					186	3					
558L4-S	558L4-T	5						129	125	122	118	115	108	97	86	73	57	32																		288	3				
758L5-S	758L5-T	7 1/2								126	123	120	114	107	101	93	86	77	67	56	39																394	3			
1058L8-S	1058L8-T	10										131	126	122	117	113	108	103	98	92	87	81	75	68												550	3				
	1658L11XP-T	16											136	133	130	126	123	120	116	113	110	106	103	99	92	84	75	65	53	33					805	3					
	2058L15XP-T	20	5 1/2"												134	132	129	127	125	123	120	118	116	111	106	101	95	90	83	68	48	17		1075	3						
	2558L17XP-T	25																																	1325	3					
558M2-S	558M2-T	5			233	222	211	200	188	176	164	150	99																							153	4				
755M3-S	755M3-T	7 1/2					234	226	218	210	203	195	175	152	118	60																				226	4				
1058M4-S	1058M4-T	10						235	228	222	216	210	195	180	164	146	120	74																		288	4				
	1558M6-T	15	5 1/4"							238	234	230	221	211	202	193	183	172	160	147	132	113	90	54												444	4				
	2058M8-T	20											230	223	216	210	203	195	188	181	173	165	156	134	103	56									600	4					
	2558M10XP-T	25																207	201	196	190	184	177	163	148	130	108	74							760	4					
	3058M12XP-T	30																																		910	4				
755H2-S	755H2-T	7 1/2	5 1/4"			274	264	252	240	226	210	194	140																							158	4				
1058H3-S	1058H3-T	10					284	257	250	242	234	212	188	148	94																					230	4				
	1558H4-T	15									274	262	247	230	210	186	158	118	84																	320	4				
	2058H5-T	20												250	236	222	205	186	163	128	78															410	4				
558X1-S	558X1-T	5	6 1/4"	405	385	312	252	170	82																											76	4				
755X2-S	755X2-T	7 1/2			387	365	340	315	287	255	217	176																								132	4				
1058X2-S	1058X2-T	10				425	405	385	362	337	312	280	172																							158	4				
	1558X3-T	15							410	400	385	370	335	285	220	148																				245	4				
	2058X4-T	20								427	417	407	382	353	321	282	240	183	134	87																328	4				
	2558X6-T	25													367	348	325	302	277	246	217	182	152	112											470	4					
	3058X7-T	30															355	335	316	283	273	248	223	193	130										545	4					

(1) Well inside diameter and straightness should be checked to insure adequate clearance exists before the pump is installed.

(2) Indicates recommended riser pipe size furnished as standard.

While the capacities quoted are based on tests of typical pumps and are given in good faith, they do NOT represent GUARANTEED PERFORMANCES. Please refer to factory if Certified Performance Curve is required. For High Capacity or Low Head conditions refer to N.P.S.H. curve. The maximum setting using Schedule 40 pipe is 600 feet. For settings deeper than 600 feet, use Schedule 40 pipe for the bottom 600 feet of riser pipe, and Schedule 80 for the remainder.

CHECK VALVES. If the pump setting exceeds 100 feet, install a check valve at the first joint in the riser pipe above the pump. Always use an additional check valve at the surface if the pump is part of a pressure system, or if the pressure head exceeds 500 feet. If the setting exceeds 500 feet, install a third check valve (non-slam type) in the riser pipe at two-thirds of the setting above the pump.

Well #1: Current vs. 1993 capacity

CGB 3/23/2017

1993 pumps:

(1) Jacuzzi 20S6X3 (20HP)

(1) Jacuzzi 30S6X3 (30HP)

Pump curves:

(red = extrapolated using quadratic)

TDH (ft)	Q (gpm) 20S6X3	Q (gpm) 30S6X3
400		193
375		223
350		248
325		273
300	87	293
275	134	316
250	183	335
225	240	355
200	282	372
175	321	386
150	353	400
125	382	410
100	407	421

Pumps in parallel: add flows for a given head

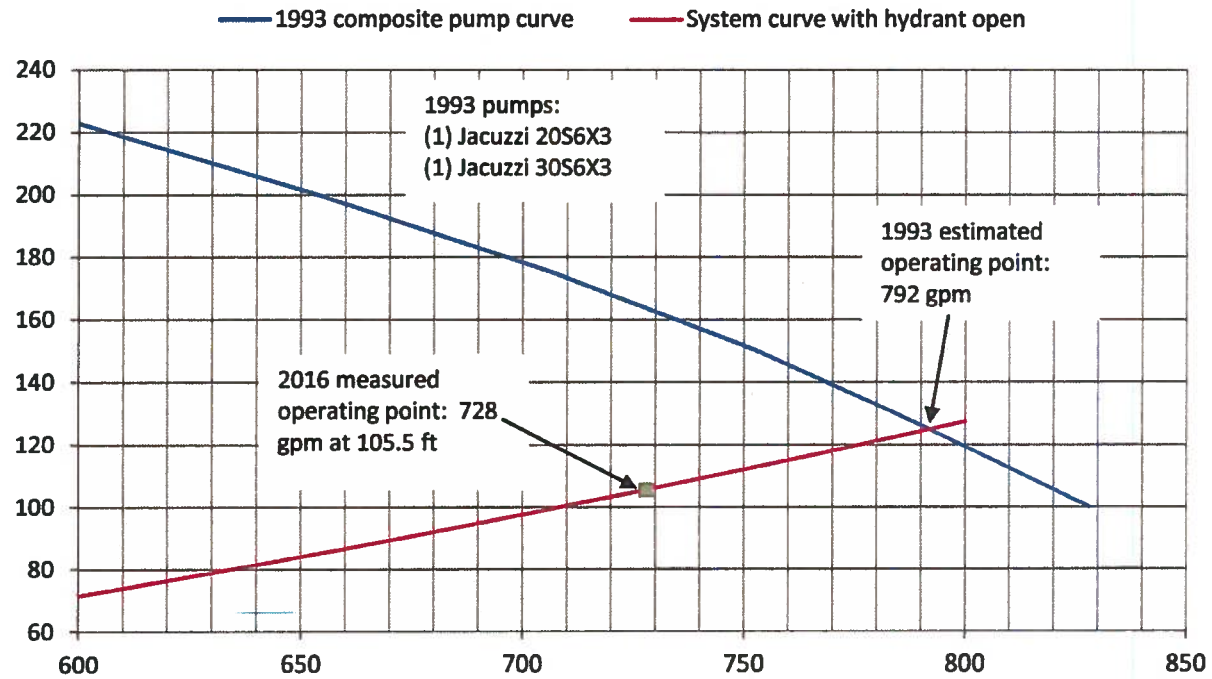
TDH (ft)	Q (gpm) 20S6X3	Q (gpm) 30S6X3	Composite Q (gpm)
300	87	293	380
275	134	316	450
250	183	335	518
225	240	355	595
200	282	372	654
175	321	386	707
150	353	400	753
125	382	410	792
100	407	421	828

System curve with hydrant
open (min. pressure condition)

IDWR 2016 measurement

Q (gpm)	Hsys (ft)
600	72
620	77
640	82
660	87
680	92
700	98
728	105.5
740	109
750	112
760	115
770	118
780	121
790	124
800	127

Heatherlands Well #1 Pump Capacity Comparison



Well #2: Current vs. 1993 capacity

CGB 3/23/2017

1993 pumps:

(2) Berkeley 6S2AH 5-stage 20HP

1993 pump

Manufacturer's curve:

TDH	
6S2AH	Q (gpm)
265	200
249	225
233	250
215	275
197	300
177	325
153	350
126	375
95	400

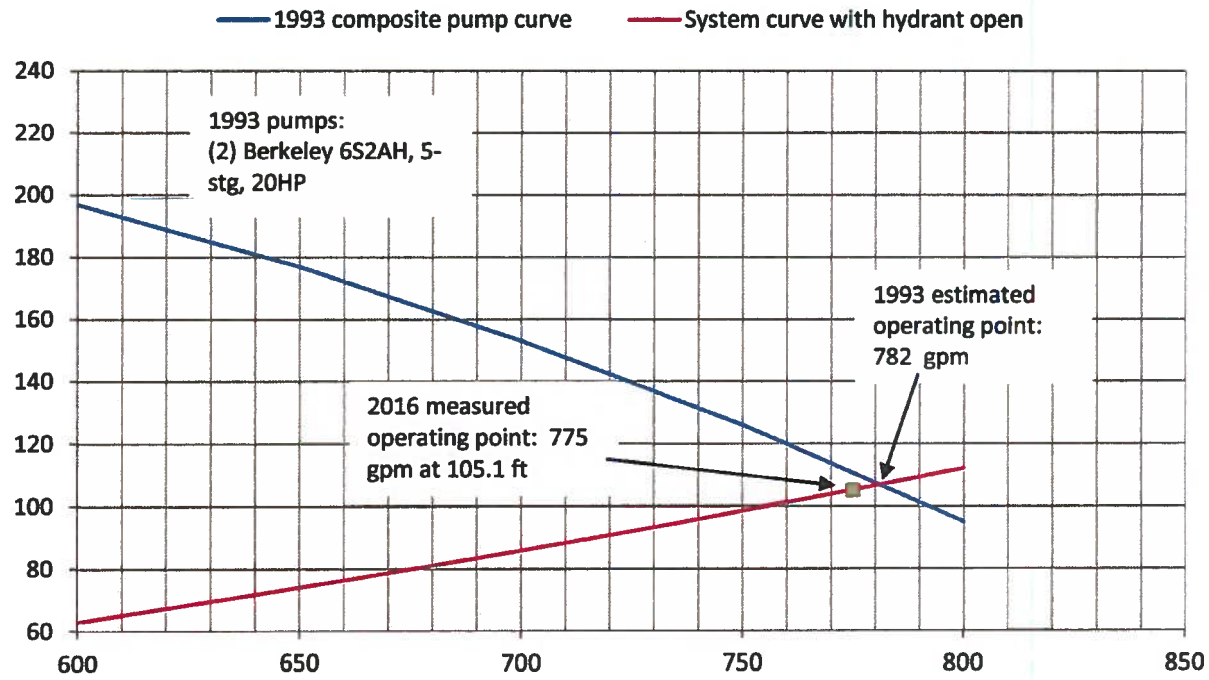
Pumps in parallel: add flows for
a given head

Composite	
TDH (ft)	Q (gpm)
265	400
249	450
233	500
215	550
197	600
177	650
153	700
126	750
95	800

System curve with hydrant
open (min. pressure condition)

IDWR 2016 measurement	
Q (gpm)	Hsys (ft)
600	63
620	67
640	72
660	76
680	81
700	86
720	91
740	96
760	101
775	105.1
780	106
790	109
800	112

Heatherlands Well #2 Pump Capacity Comparison



THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right Nos. 37-8220, 37-8686, 37-8831 and 37-159B
 Reviewer: Dan Nelson and Sandy Thiel
 Date of Review: 3/24/2017

P/D No.:

PUMP HORSEPOWER
 BOOSTER HORSEPOWER

PUMPING LEVEL

DISCHARGE PRESSURE

RATE OF FLOW (cfs)

Well #1	Well #2	Well #3	Well #3	Well #3
20	20	20	20	30
0	0	0	0	0
80	80	80	80	80
12	12	12	12	12
0.84	0.84	0.84	0.84	1.26
377	377	377	377	565

all 20 Hp Pumps = 1508 3.36
 1-30Hp & 3 20HP = 1696 3.78

Brockway = 20Hp +30 Hp 792
 2 - 20hp pumps = 754
Total = 1545.811 3.44

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:

The efficiency was changed to 0.514 to attain the flow rate at the pumping level described by the owner. The pumping level has to be less than 100 feet, because the wells are only 100 feet deep. The two competing pumps in the same well causes the pump efficiency to drop due to the competition for water in the well.

Just for Assumption= 2 - 30hp pumps 1130.716
 2 - 20hp pumps = 754
Total = 1884.527 4.20

Subdivision Name	Lot	Block	YEAR BUILT	Domestic Use Water Right	Irrigation Use Water Right
COBIA TOWNHOUSES	SUBLOT 1		2002	37-8220	37-8220
COBIA TOWNHOUSES	SUBLOT 2		2002	37-8831	37-8220
FORT SILVERADO (TOWNHOUSES)	SUBLOT 1		1994	37-8220	37-8220
FORT SILVERADO (TOWNHOUSES)	SUBLOT 2		1994	37-8831	37-8220
H.B.S. TOWNHOUSES	SUBLOT 115A		1996	37-8220	37-8220
H.B.S. TOWNHOUSES	SUBLOT 115B		1996	37-8831	37-8220
MARIPOSA TOWNHOUSES	SUBLOT 1		1991	37-8220	37-8220
MARIPOSA TOWNHOUSES	SUBLOT 2		1991	37-8831	37-8220
PEACEFUL VISTA TOWNHOUSES	SUBLOT 1		1994	37-8220	37-8220
PEACEFUL VISTA TOWNHOUSES	SUBLOT 2		1994	37-8831	37-8220
SHAUN (TOWNHOUSES)	SUBLOT 1		2000	37-8220	37-8220
SHAUN (TOWNHOUSES)	SUBLOT 2		2000	37-8831	37-8220
HEATHERLANDS SUB	2	2	0	37-8220	37-8220
HEATHERLANDS SUB	3	2	1982	37-8220	37-8220
HEATHERLANDS SUB	4	2	1981	37-8220	37-8220
HEATHERLANDS SUB	5	2	2004	37-8220	37-8220
HEATHERLANDS SUB	6	2	1988	37-8220	37-8220
HEATHERLANDS SUB	7	2	0	37-8220	37-8220
HEATHERLANDS SUB	8	2	1992	37-8220	37-8220
HEATHERLANDS SUB	9	2	1999	37-8220	37-8220
HEATHERLANDS SUB	10	2	0	37-8220	37-8220
HEATHERLANDS SUB	11	2	1990	37-8220	37-8220
HEATHERLANDS SUB	12	2	1999	37-8220	37-8220
HEATHERLANDS SUB	13	2	1985	37-8220	37-8220
HEATHERLANDS SUB	14	2	1986	37-8220	37-8220
HEATHERLANDS SUB	16	2	0	37-8220	37-8220
HEATHERLANDS SUB	33	2	1998	37-8220	37-8220
HEATHERLANDS SUB	34	2	1985	37-8220	37-8220
HEATHERLANDS SUB	35	2	1989	37-8220	37-8220
HEATHERLANDS SUB	36	2	1997	37-8220	37-8220
HEATHERLANDS SUB	37	2	0	37-8220	37-8220
HEATHERLANDS SUB	38	2	1988	37-8220	37-8220
HEATHERLANDS SUB	39	2	1989	37-8220	37-8220
HEATHERLANDS SUB	40	2	0	37-8220	37-8220
HEATHERLANDS SUB	41	2	1995	37-8220	37-8220
HEATHERLANDS SUB	42	2	1990	37-8220	37-8220
HEATHERLANDS SUB	43	2	1985	37-8220	37-8220
HEATHERLANDS SUB	44	2	2000	37-8220	37-8220
HEATHERLANDS SUB	AM 15A	2	1990	37-8220	37-8220
HEATHERLANDS SUB	17	3	1987	37-8220	37-8220
HEATHERLANDS SUB	18	3	1981	37-8220	37-8220
HEATHERLANDS SUB	19	3	1981	37-8220	37-8220
HEATHERLANDS SUB	20	3	0	37-8220	37-8220
HEATHERLANDS SUB	21	3	0	37-8220	37-8220
HEATHERLANDS SUB	22	3	0	37-8220	37-8220
HEATHERLANDS SUB	23	3	1996	37-8220	37-8220
HEATHERLANDS SUB	24	3	1987	37-8220	37-8220
HEATHERLANDS SUB	25	4	2013	37-8220	37-8220
HEATHERLANDS SUB	26	4	1991	37-8220	37-8220
HEATHERLANDS SUB	27	4	1989	37-8220	37-8220
HEATHERLANDS SUB	28	4	1987	37-8220	37-8220
HEATHERLANDS SUB	29	4	0	37-8220	37-8220
HEATHERLANDS SUB	30	4	1997	37-8220	37-8220
HEATHERLANDS SUB	31	4	1987	37-8220	37-8220
HEATHERLANDS SUB	32	4	2008	37-8220	37-8220
HEATHERLANDS SUB	45	5	2000	37-8220	37-8220
HEATHERLANDS SUB	46	5	2000	37-8220	37-8220
HEATHERLANDS SUB	49	5	1990	37-8220	37-8220
HEATHERLANDS SUB	50	5	1991	37-8220	37-8220
HEATHERLANDS SUB	51	5	1989	37-8220	37-8220
HEATHERLANDS SUB	52	5	1989	37-8220	37-8220
HEATHERLANDS SUB	53	5	2003	37-8220	37-8220

Subdivision Name	Lot	Block	YEAR BUILT	Domestic Use Water Right	Irrigation Use Water Right
HEATHERLANDS SUB	54	5	1990	37-8220	37-8220
HEATHERLANDS SUB	55	5	1981	37-8220	37-8220
HEATHERLANDS SUB	56	5	1986	37-8220	37-8220
HEATHERLANDS SUB	57	5	2005	37-8220	37-8220
HEATHERLANDS SUB	58	5	1986	37-8220	37-8220
HEATHERLANDS SUB	59A	5	1990	37-8220	37-8220
HEATHERLANDS SUB	AM 47A	5	1997	37-8220	37-8220
HEATHERLANDS SUB	AM 48A	5	1980	37-8220	37-8220
HEATHERLANDS SUB	60	6	1994	37-8220	37-8220
HEATHERLANDS SUB	61	6	2001	37-8220	37-8220
HEATHERLANDS SUB	62	6	0	37-8220	37-8220
HEATHERLANDS SUB	63	6	2001	37-8220	37-8220
HEATHERLANDS SUB	64	6	0	37-8220	37-8220
HEATHERLANDS SUB	65	6	2002	37-8220	37-8220
HEATHERLANDS SUB	66	6	1993	37-8220	37-8220
HEATHERLANDS SUB	67	6	1983	37-8220	37-8220
HEATHERLANDS SUB	68	6	1985	37-8220	37-8220
HEATHERLANDS SUB	69	6	1987	37-8220	37-8220
HEATHERLANDS SUB	70	6	1992	37-8220	37-8220
HEATHERLANDS SUB	71	6	1989	37-8220	37-8220
HEATHERLANDS SUB	72	6	1992	37-8220	37-8220
HEATHERLANDS SUB	73	6	0	37-8220	37-8220
HEATHERLANDS SUB	74	6	1987	37-8220	37-8220
HEATHERLANDS SUB	75	6	1991	37-8220	37-8220
HEATHERLANDS SUB	76	6	1992	37-8220	37-8220
HEATHERLANDS SUB	77	6	1994	37-8220	37-8220
HEATHERLANDS SUB	78	6	1995	37-8220	37-8220
HEATHERLANDS SUB	79	6	1995	37-8220	37-8220
HEATHERLANDS SUB	80	6	1991	37-8220	37-8220
HEATHERLANDS SUB	81	6	2000	37-8220	37-8220
HEATHERLANDS SUB	82	6	1985	37-8220	37-8220
HEATHERLANDS SUB	83	6	1992	37-8220	37-8220
HEATHERLANDS SUB	101	6	2000	37-8220	37-8220
HEATHERLANDS SUB	102	6	1993	37-8220	37-8220
HEATHERLANDS SUB	103	6	1990	37-8220	37-8220
HEATHERLANDS SUB	104	6	1990	37-8220	37-8220
HEATHERLANDS SUB	84	7	1984	37-8220	37-8220
HEATHERLANDS SUB	85	7	1990	37-8220	37-8220
HEATHERLANDS SUB	86	7	2004	37-8220	37-8220
HEATHERLANDS SUB	87	7	1991	37-8220	37-8220
HEATHERLANDS SUB	88	7	2014	37-8220	37-8220
HEATHERLANDS SUB	89	7	1982	37-8220	37-8220
HEATHERLANDS SUB	90	7	2000	37-8220	37-8220
HEATHERLANDS SUB	91	7	1988	37-8220	37-8220
HEATHERLANDS SUB	92	7	1987	37-8220	37-8220
HEATHERLANDS SUB	93	7	1984	37-8220	37-8220
HEATHERLANDS SUB	94	7	1991	37-8220	37-8220
HEATHERLANDS SUB	95	7	2002	37-8220	37-8220
HEATHERLANDS SUB	96	7	1990	37-8220	37-8220
HEATHERLANDS SUB	97	7	1994	37-8220	37-8220
HEATHERLANDS SUB	98	7	1992	37-8220	37-8220
HEATHERLANDS SUB	99	7	1992	37-8220	37-8220
HEATHERLANDS SUB	100	7	1990	37-8220	37-8220
HEATHERLANDS SUB	105	8	0	37-8220	37-8220
HEATHERLANDS SUB	106	8	1994	37-8220	37-8220
HEATHERLANDS SUB	107	8	1986	37-8220	37-8220
HEATHERLANDS SUB	109	8	1992	37-8220	37-8220
HEATHERLANDS SUB	113	8	2011	37-8220	37-8220
HEATHERLANDS SUB	114	8	0	37-8220	37-8220
HEATHERLANDS SUB	116	8	0	37-8220	37-8220

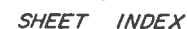


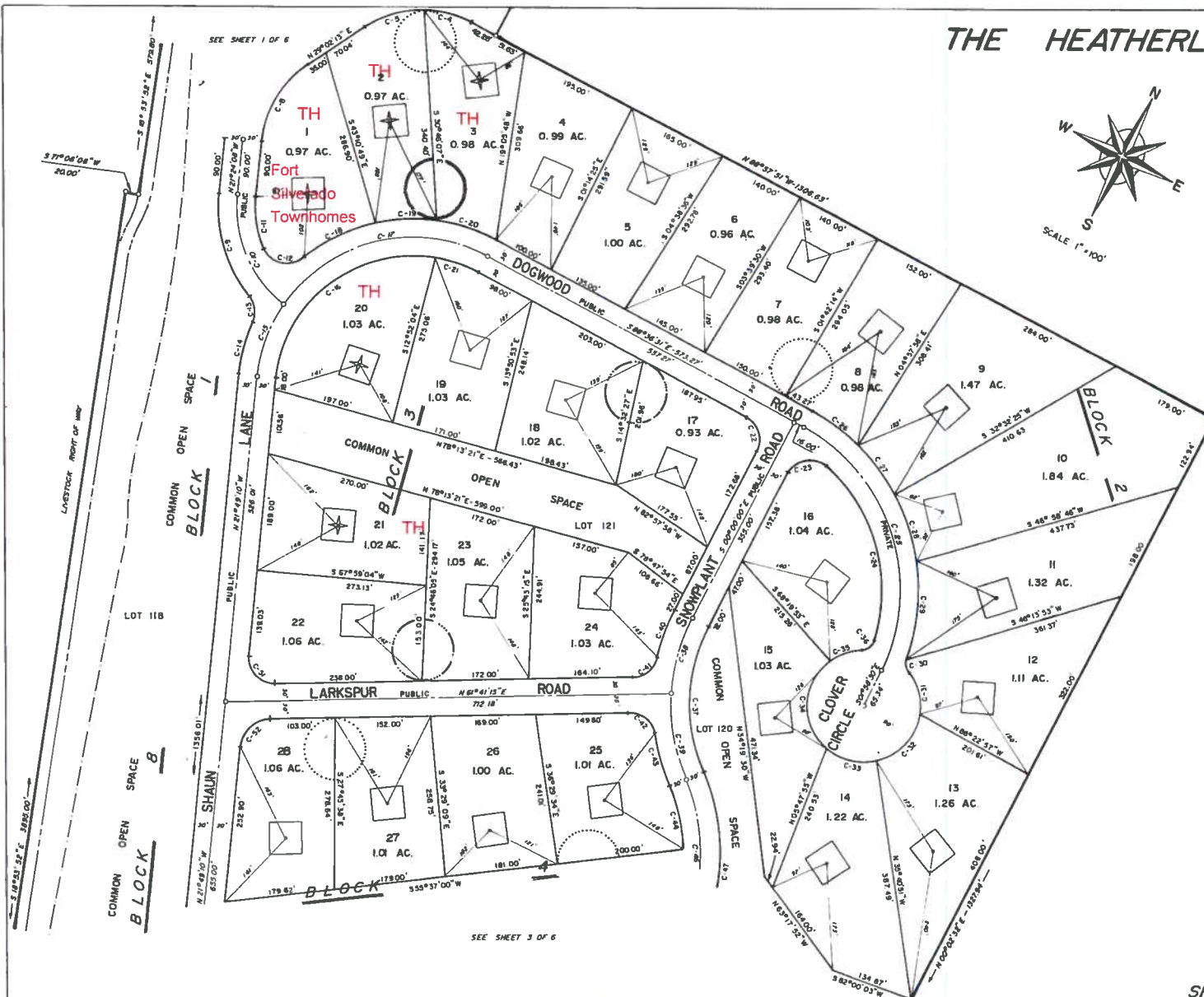
PREPARED BY
Edwards, Howard B Martens, Inc.
ENGINEERS / PLUMBERS / MECHANICS

1979

1. *Should The Livestock Right Of Way Be Deeded To The Heatherrlands Home Owners Association, It Shall Be Considered Common Open Space And Residential Density Shall Be Accrued.*
2. *There Will Be a 10' Utility Easement Centered On All Lot Lines*
3. *There Will Be a 5' Utility Easement Reserved Along All Road Right Of Ways.*
4. *All Water Rights Are to Remain in the Ownership of the Heatherrlands Home Owners Association.*
5. *Syringa Lane Will Not Be Maintained By Blaine County Until Extended Into The Adjacent Properties And Brought Up To County Standards.*

 Section Line
 Subdivision Boundary Line
 Lot Line
 Street Centerline
 Bicycle Path Easement
 30' Water Course Easement (Centerline)
 Powerline Easement / Fenced Livestock Driveway
 100' Diameter Well Easement - Well Flows to Comply with Wood River Fire District
 100' Diameter Domestic Well Easement (Alternate)
 100' Diameter Domestic Well Easement
 Building Envelope
 Building Envelope Designed for 1 Duplex Dwelling
 Found Brass Cap
 Found 5/8" Rebar w/ Cap
 INITIAL POINT - Set Concrete Monument
 Set 3/8"x 30" Rebar w/ Cap
 Set 1/2"x 24" Rebar w/ Cap - All Lot Corners
 Fenced Livestock Driveway





Scale 1" = 100'



SEE SHEET 3 OF 6



NOTE: Lot 17 is reserved for school or hospital site with no residential development allowed. If unused in 15 years ownership will revert to the Heatherlands Home Owners Association as common open space.

NOTE: Lot 17 is reserved for school or hospital site with no residential development allowed. If unused in 15 years ownership will revert to the Heatherlands Home Owners Association as common open space.

10' x 10' Intermountain
Gas Co. Utility Easement

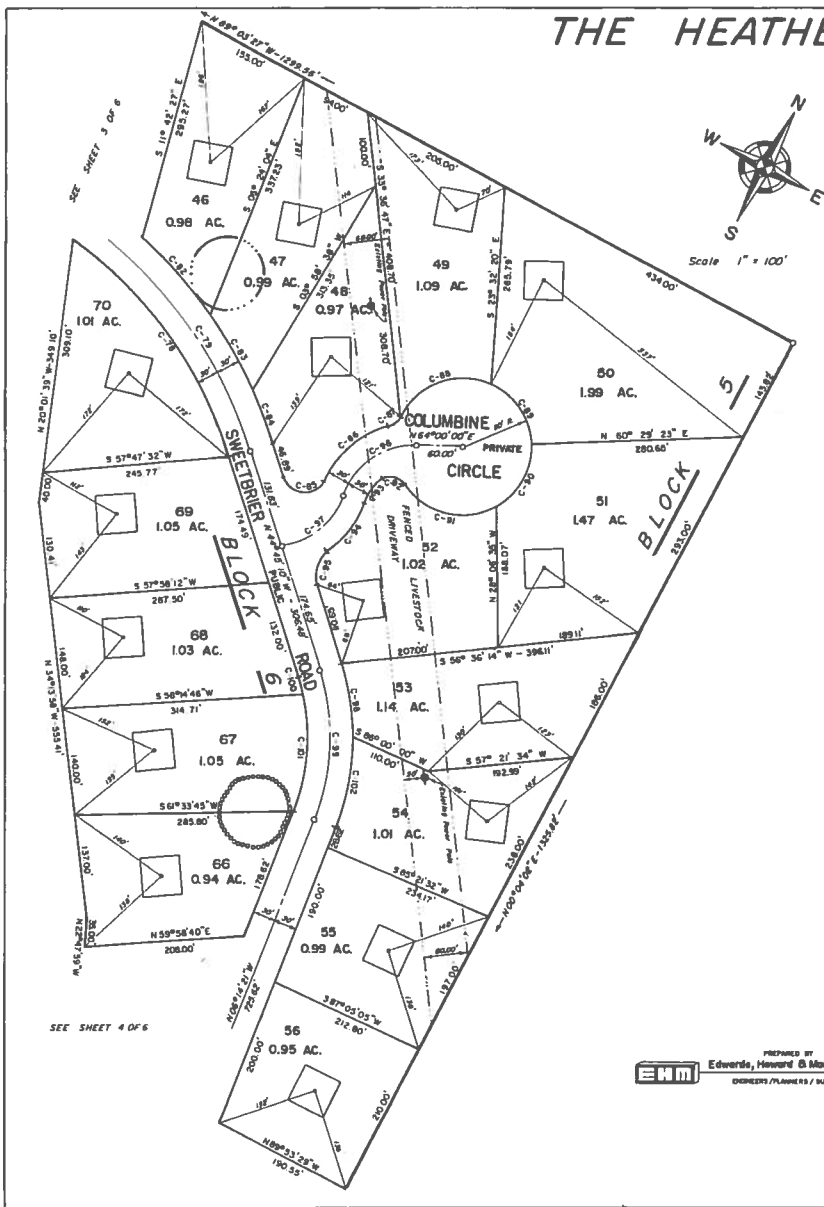
GULCH

N 65°05'44"E-1914.20'

SHEET 4 of 6

SEE SHEET 1

100



THE HEATHERLANDS



CURVE NO.	DELTA	RADIUS	ARC	CHORD	TANGENT	L.C.B.
C-1	02°08'49"	1640.00	435.02	435.00	217.54	S 19° 58' 16" E
C-2	81° 59' 58"	230.00	248.88	238.81	138.20	N 60° 02' 11" E
C-3	61° 59' 58"	200.00	216.42	208.01	120.17	N 80° 02' 11" E
C-4	27° 13' 05"	170.00	80.78	80.00	41.18	N 77° 22' 37" E
C-5	34° 45' 52"	170.00	103.20	101.82	53.24	N 48° 28' 39" E
C-6	50° 28' 21"	230.00	202.48	198.00	84.20	N 34° 49' 02" E
C-7	50° 28' 21"	200.00	176.07	170.44	84.20	N 34° 49' 02" E
C-8	50° 28' 21"	170.00	148.68	144.87	80.07	N 34° 49' 02" E
C-9	44° 59' 53"	230.00	178.97	174.48	84.28	S 43° 01' 40" E
C-10	57° 33' 42"	200.00	200.33	192.38	105.86	N 50° 10' 59" W
C-11	28° 44' 38"	170.00	85.29	84.39	43.58	N 33° 48' 28" W
C-12	108° 08' 81"	40.00	74.08	63.84	53.19	N 78° 47' 48" W
C-13	82° 45' 38"	40.00	43.82	41.88	24.40	S 34° 56' 22" E
C-14	18° 53' 36"	280.00	80.86	90.47	45.84	S 12° 51' 22" E
C-15	28° 14' 52"	280.00	127.82	128.24	65.23	N 71° 11' 53" W
C-16	94° 22' 28"	220.00	362.37	322.78	237.47	N 23° 22' 03" E
C-17	83° 57' 47"	210.00	386.38	334.44	224.98	N 43° 24' 36" E
C-18	28° 50' 48"	280.00	131.20	130.00	88.83	S 37° 09' 46" W
C-19	30° 09' 18"	280.00	89.51	88.00	49.77	S 60° 33' 33" W
C-20	20° 38' 54"	280.00	100.91	100.38	51.01	S 81° 04' 03" W
C-21	18° 50' 10"	220.00	72.33	72.00	38.49	N 80° 28' 46" W
C-22	88° 36' 51"	40.00	81.88	55.88	39.04	S 44° 48' 15" E
C-23	80° 27' 17"	40.00	73.82	63.88	52.58	S 55° 40' 50" E
C-24	85° 18' 58"	210.00	301.77	231.37	173.04	S 41° 53' 25" E
C-25	86° 38' 01"	300.00	453.61	411.62	282.87	S 48° 17' 50" E
C-26	18° 01' 32"	330.00	92.30	92.00	46.45	N 80° 28' 46" W
C-27	17° 35' 48"	330.00	100.39	100.00	50.38	N 83° 58' 09" W
C-28	18° 12' 35"	330.00	112.55	112.08	56.82	N 48° 07' 29" W
C-29	28° 09' 17"	330.00	182.18	180.53	82.72	N 81° 32' 08" W
C-30	58° 24' 49"	20.00	20.39	19.52	11.18	N 38° 39' 50" W
C-31	45° 24' 46"	80.00	71.33	69.48	37.88	N 43° 09' 56" W
C-32	85° 02' 10"	80.00	108.44	102.00	81.90	N 14° 03' 12" E
C-33	33° 28' 15"	90.00	84.02	81.00	48.50	N 78° 18' 10" E
C-34	104° 09' 49"	30.00	183.62	142.00	115.53	S 25° 51' 14" E
C-35	33° 54' 58"	90.00	82.78	82.00	47.16	S 43° 01' 10" W
C-36	89° 02' 47"	80.00	24.10	22.67	13.76	S 25° 17' 18" W
C-37	51° 10' 08"	210.00	241.12	233.19	129.27	S 23° 53' 07" E
C-38	26° 35' 47"	300.00	128.75	127.80	88.40	S 15° 17' 54" E
C-39	26° 34' 19"	300.00	139.13	137.89	70.84	S 37° 58' 56" E
C-40	14° 18' 24"	330.00	82.80	82.28	41.46	S 7° 08' 46" E
C-41	78° 00' 39"	40.00	53.07	49.26	31.24	S 23° 40' 58" W
C-42	82° 08' 48"	40.00	87.39	82.58	34.88	S 77° 14' 21" E
C-43	15° 00' 08"	330.00	88.41	88.18	43.48	S 43° 44' 01" E
C-44	21° 46' 33"	270.00	102.82	102.00	51.94	S 40° 18' 49" E
C-45	81° 08' 14"	270.00	382.19	351.07	231.03	S 11° 09' 35" W
C-46	72° 02' 47"	300.00	358.68	468.17	376.34	S 0° 16' 18" W
C-47	33° 15' 18"	330.00	192.49	189.77	99.07	S 34° 17' 28" E
C-48	37° 08' 22"	330.00	213.72	210.00	110.76	S 0° 48' 21" W
C-49	28° 16' 53"	330.00	181.32	180.00	77.02	N 38° 29' 43" E
C-50	8° 04' 47"	330.00	360.02	360.00	17.53	N 48° 40' 18" E
C-51	96° 25' 38"	40.00	87.37	86.88	44.81	N 70° 05' 57" W
C-52	83° 30' 24"	50.00	72.87	68.59	44.63	N 19° 58' 03" E

CURVE NO.	DELTA	RADIUS	ARC	CHORD	TANGENT	L.C.B.
C-71	38° 28' 03"	590.00	408.07	398.10	211.45	N 84° 48' 47" E
C-72	8° 23' 04"	620.00	101.53	101.44	50.89	S 84° 48' 17" W
C-73	15° 48' 35"	620.00	170.84	170.00	88.81	S 84° 19' 37" W
C-74	7° 11' 38"	620.00	79.85	77.80	38.97	S 73° 02' 24" W
C-75	54° 58' 48"	60.00	74.16	67.58	48.80	S 38° 43' 59" W
C-76	16° 00' 55"	590.00	188.85	188.00	93.79	S 74° 18' 18" W
C-77	10° 50' 04"	560.00	108.89	108.89	53.11	S 84° 48' 12" E
C-78	36° 36' 01"	560.00	368.05	361.98	185.38	S 83° 04' 10" E
C-79	48° 49' 02"	590.00	502.01	487.00	287.33	S 43° 07' 41" E
C-80	81° 17' 52"	50.00	70.95	62.14	42.33	N 44° 13' 41" W
C-81	11° 48' 04"	620.00	127.34	127.12	63.90	N 80° 09' 50" W
C-82	12° 36' 58"	620.00	136.27	136.00	68.41	N 84° 48' 44" W
C-83	10° 53' 00"	620.00	114.16	114.00	57.24	N 87° 14' 54" W
C-84	7° 12' 07"	620.00	78.00	78.00	39.08	N 84° 13' 53" W
C-85	13° 07' 40"	620.00	78.00	78.00	39.08	N 84° 13' 53" W
C-86	50° 42' 44"	130.00	118.05	111.34	61.81	S 27° 53' 18" W
C-87	50° 28' 45"	20.00	17.82	17.08	9.43	S 23° 05' 17" W
C-88	88° 58' 47"	90.00	139.80	126.14	88.41	S 41° 17' 50" W
C-89	33° 42' 39"	90.00	100.08	98.00	55.48	N 11° 51' 57" W
C-90	67° 13' 04"	90.00	97.73	93.00	54.31	N 13° 55' 52" E
C-91	87° 31' 55"	90.00	137.50	124.51	86.20	N 76° 28' 24" E
C-92	95° 12' 57"	20.00	33.24	29.84	21.81	N 72° 37' 53" E
C-93	35° 33' 54"	70.00	39.78	38.25	20.43	N 8° 44' 27" E
C-94	33° 22' 53"	130.00	80.18	78.52	41.41	N 10° 07' 42" E
C-95	72° 33' 03"	40.00	50.65	47.33	29.38	N 8° 28' 38" W
C-96	71° 32' 30"	100.00	124.86	116.91	72.05	N 28° 13' 43" E
C-97	83° 46' 40"	100.00	111.27	105.62	62.18	N 24° 20' 10" E
C-98	17° 12' 33"	330.00	98.12	98.73	49.83	N 34° 08' 53" W
C-99	33° 50' 49"	200.00	201.86	197.86	104.81	S 33° 29' 45" W
C-100	4° 27' 27"	270.00	21.01	21.00	10.81	S 47° 11' 58" E
C-101	34° 03' 22"	270.00	160.49	158.13	82.89	S 23° 16' 02" W
C-102	27° 11' 17"	330.00	122.71	122.00	62.07	N 6° 53' 29" W
C-103	34° 30' 11"	280.00	168.82	168.08	88.95	S 11° 00' 47" W
C-104	46° 46' 55"	280.00	204.12	198.50	106.4	S 17° 09' 07" W
C-105	46° 46' 55"	270.00	175.83	174.86	93.15	S 17° 09' 07" W
C-106	12° 18' 40"	280.00	80.00	79.89	30.12	S 34° 24' 14" W
C-107	33° 43' 59"	270.00	253.21	244.03	138.78	S 13° 04' 34" W
C-108	70° 39' 34"	300.00	369.97	346.97	212.65	S 3° 12' 47" W
C-109	4° 01' 41"	330.00	28.00	27.99	14.01	S 30° 06' 43" W
C-110	15° 29' 59"	330.00	89.27	89.00	44.51	S 27° 55' 53" W
C-111	18° 01' 32"	330.00	92.30	92.00	46.45	N 12° 10' 08" E
C-112	134° 48' 57"	330.00	75.18	79.00	39.79	N 2° 03' 07" W
C-113	8° 13' 37"	330.00	53.14	53.05	26.63	S 14° 17' 24" E
C-114	80° 34' 56"	40.00	86.49	81.21	34.11	S 21° 58' 18" W
C-115	104° 42' 51"	40.00	73.10	63.35	51.86	S 68° 32' 51" E
C-116	2° 00' 33"	380.00	18.24	18.24	8.12	N 33° 56' 00" W
C-117	18° 10' 10"	330.00	120.80	120.00	60.76	N 28° 26' 34" W
C-118	13° 38' 07"	380.00	80.2	80.00	43.32	N 17° 53' 15" W
C-119	20° 08' 26"	380.00	133.44	133.00	67.54	N 4° 17' 51" W
C-120	18° 19' 20"	380.00	121.47	121.00	61.28	N 23° 31' 54" E
C-121	16° 47' 47"	340.00	111.40	111.00	58.10	N 41° 25' 28" E
C-122	15° 53' 17"	340.00	82.16	82.00	41.24	N 50° 41' 00" E
C-123	102° 8' 10"	350.00	624.22	544.72	433.65	S 10° 47' 03" W
C-124	54° 53' 39"	320.00	306.88	284.49	166.21	S 12° 51' 42" E
C-125	38° 41' 22"	170.00	216.08	212.00	112.34	S 33° 05' 49" W
C-126	81° 30' 09"	370.00	48.04	48.00	24.07	S 57° 04' 54" W
C-127	38° 02' 18"	40.00	87.61	87.84	45.08	N 68° 42' 13" W
C-128	83° 09' 41"	40.00	58.06	53.05	35.49	N 20° 17' 48" E
C-129	58° 37' 15"	40.00	67.45	69.74	44.91	N 69° 35' 40" E
C-130	81° 32' 47"	40.00	58.21	53.71	35.83	S 22° 42' 21" W
C-131	95° 50' 19"	40.00	87.61	89.84	45.08	N 43° 48' 15" W
C-132	83° 09' 41"	40.00	58.06	53.05	35.49	S 20° 17' 42" W
C-133	18° 05' 55"	330.00	108.99	108.00	58.00	N 30° 44' 49" W
C-134	18° 55' 25"	300.00	98.08	98.64	50.00	S 30° 44' 48" E
C-135	14° 28' 07"	270.00	88.18	88.00	34.27	S 28° 31' 08" E
C-136	4° 57' 19"	270.00	21.00	20.99	10.50	S 37° 58' 43" E

CURVE NO.	DELTA	RADIUS	ARC	CHORD	TANGENT	L.C.B.
C-61	108° 28' 08"	40.00	74.33	64.09	53.94	N 79° 03' 14" W
C-62	73° 31' 52"	80.00	102.87	95.77	59.77	N 14° 58' 48" E
C-63	18° 23' 19"	270.00	86.65	86.28	43.70	N 31° 00' 49" E
C-64	18° 23' 19"	300.00	96.28	95.87	48.56	N 31° 00' 49" E
C-65	18° 23' 19"	330.00	105.91	105.48	53.41	N 31° 00' 49" E
C-66	82° 43' 47"	40.00	84.74	75.70	41.93	N 88° 54' 23" W
C-67	87° 16' 13"	50.00	76.18	69.01	47.67	S 3° 25' 59" W
C-68	92° 37' 44"	40.00	84.67	77.85	41.88	S 86° 37' 23" E
C-69	90° 58' 28"	40.00	83.48	87.02	40.65	S 5° 08' 11" W
C-70	18° 08' 57"	560.00	177.39	176.65	89.44	S 59° 41' 23" W

PREPARED BY
ENM Edwards, Howard & Mortens Inc.
ENGINEERS / PLANNERS / SURVEYORS

CERTIFICATE OF OWNERS

This is to certify that the undersigned are the owners or representatives of the owners in fee simple of the following described property located in Sections 17 and 20, Township 3 North, Range 18 East, Base Meridian, Blaine County, Idaho, said property being more specifically described as follows: Commencing at the Southeast corner of said Section 17. Said point lies Due North, 2650.67' from the East quarter corner of Section 20. Thence, N 89° 09' 03" W, 1298.96', to the Southeast corner of SW 4 SE 4 Section 17, which is the INITIAL POINT.

Thence, N 00° 04' 02" E, 1325.82', to the Northeast corner of SW 4 SE 4, Section 17
Thence, N 89° 03' 27" W, 1298.96', to the Northwest corner of SW 4 SE 4, Section 17
Thence, N 00° 02' 32" E, 1327.94', to the center of Section 17
Thence, N 88° 57' 51" W, 1306.63', to the Southeast corner of SW 4 NW 4, Section 17
Thence, N 00° 11' 09" E, 1000.16', along the East boundary of SW 4 NW 4, Section 17
Thence, N 88° 48' 39" W, 943.63', parallel to the North boundary of SW 4 NW 4, Section 17 to the East boundary of the shack driveway right of way.
Thence, S 21° 02' 41" E, 591.86', along said right of way.
Thence, along a curve, C=1, along said right of way.
Thence, S 18° 53' 52" E, 379.80', along said right of way.
Thence, S 71° 06' 08" W, 20.00', along said right of way.
Thence, S 18° 53' 52" E, 3895.00', along said right of way.
Thence, N 71° 06' 08" E, 40.00', along said right of way.
Thence, S 18° 53' 52" E, 68.45', along said right of way to the centerline of Ohio Gulch Road.
Thence, N 62° 05' 44" E, 1914.20', along the centerline of Ohio Gulch Road to the east boundary of NW 4 NE 4 Section 20.
Thence, N 00° 01' 48" E, 638.77', to the INITIAL POINT. The gross area in this platted land as described is 197.66 acres.

It is the intention of the undersigned to and they do hereby include said land in this plat. The easements indicated in this plat are not dedicated to the public but the rights to use said easements are hereby perpetually reserved for public utilities and no structure other than for such utility purposes are to be erected within the lines of said easements. The undersigned do by these presents grant, bargain, sell, convey, confirm and dedicate to the public for public use forever, all streets and thoroughfares designated public on this plat.

The purchaser and/or owner of this lot or parcel understands and agrees that private road construction, maintenance, and snow removal shall be the obligation of the owner, his successors in interest, or homeowner's association, and that Blaine County is in no way obligated to accept, maintain or improve these roads until the roads are brought up to county standards, dedicated, and accepted by the county, and that each owner shall notify in writing any successor in interest of these facts.

[Signature]
BUXKORN INVESTMENT CO PARTNERS
ROY B. TINKER
JERRELL D. MONKARSH
EUGENE M. MONKARSH
CASEY R. FAMILIAN
GAIL P. WILLENS
BERRY SMOCK

[Signature]
CLAUDE E. BLECHMANN
FREDERICK H. BLECHMANN FOR:
WILLIAM H. LANG
THEODORE H. LANG
HOWARD P. BLECHMANN - TRUSTEE

COUNTY RECORDER'S CERTIFICATE

Instrument No. 198153
STATE OF IDAHO)
COUNTY OF BLAINE)

This is to certify that the foregoing plat was filed for record in the office of the Recorder of Blaine County, Idaho on the 30 day of October, 1979, at 4 P.M., and duly recorded in plat book _____ at page _____.

Deputy

MAINE MEYER
Ex-Officio Recorder
[Signature]

ACKNOWLEDGEMENT

STATE OF IDAHO)
COUNTY OF BLAINE)

On this 24th day of September, 1979, before me the undersigned a Notary Public in and for said State, appeared the person whose name is subscribed to the above Certificate of Owners and acknowledged to me that he executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal the day and year in this Certificate first above written.

[Signature]
Notary Public in and for the State of Idaho

CERTIFICATE OF SURVEYOR

This is to certify that I, Charles D. Howard, a Registered Land Surveyor in the State of Idaho, made the survey of land as described in the Certificate Of Owners and designated hereon as The Heatherlands, and that this plat is a true and correct representation of said survey as made and stated by me on said land.



ACKNOWLEDGEMENT

STATE OF IDAHO)
COUNTY OF BLAINE)

On this 24th day of September, 1979, before me, a Notary Public in and for the State of Idaho, personally appeared Charles D. Howard known to me to be the person whose name is subscribed to the above Certificate of Surveyor and acknowledged to me that he executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

[Signature]
Notary Public in the State of Idaho

COUNTY SURVEYOR CERTIFICATE

This is to certify that the undersigned has checked the foregoing plat and computations for making the same and has determined that they comply with the laws of the State of Idaho and County of Blaine related thereto. Dated this 24th day of September, 1979.

[Signature]
County Surveyor

COUNTY COMMISSIONER'S ACCEPTANCE

The foregoing plat has been accepted and approved by the Board of County Commissioners of Blaine County Idaho this 24th day of September, 1979.

[Signature]
Attest Clerk

[Signature]
Chairman

ZONING & PLANNING COMMISSION ACCEPTANCE

The foregoing plat was duly accepted and approved by the Blaine County Zoning and Planning Commission Blaine County, Idaho on this 11th day of September, 1979.

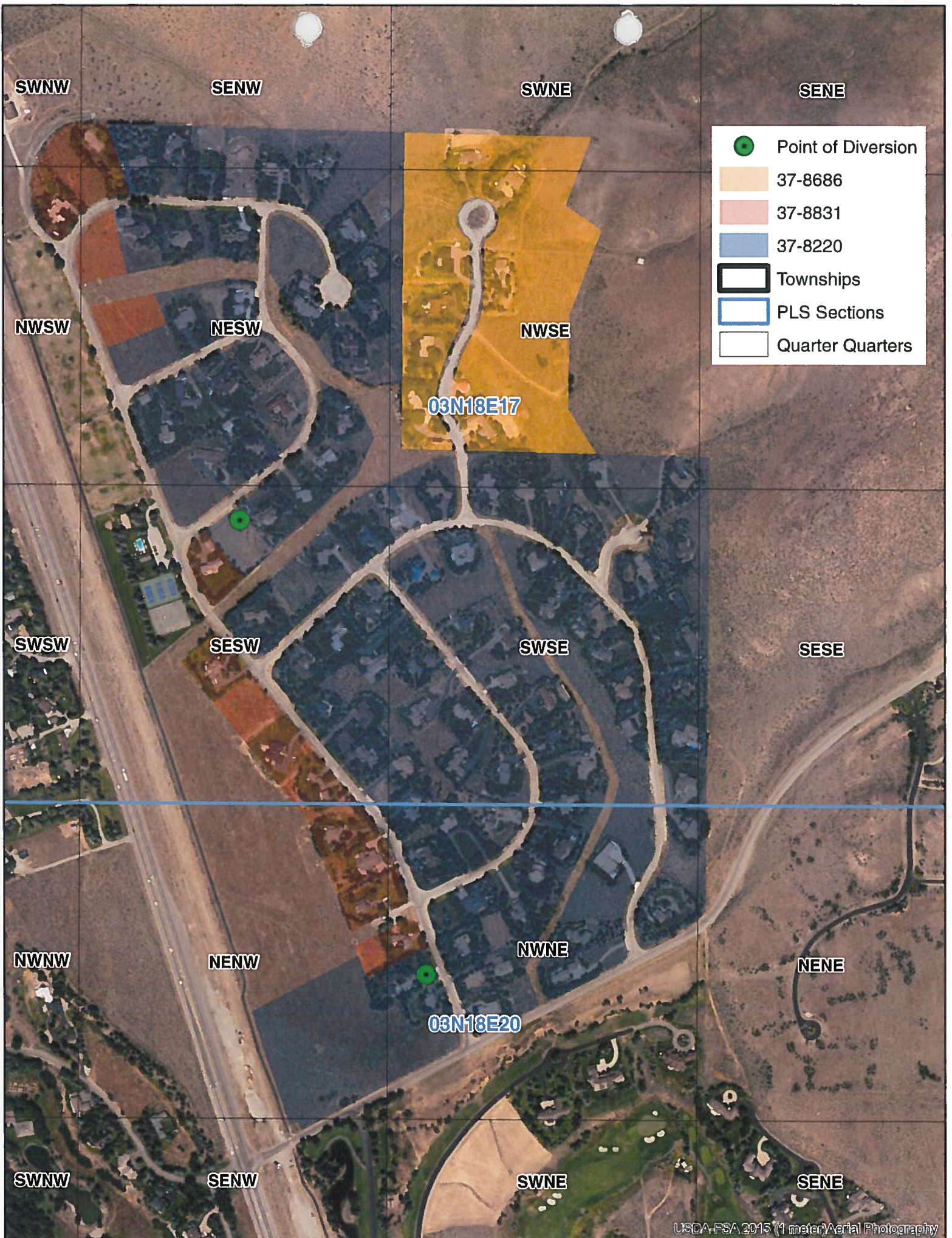
[Signature]
Chairman

COUNTY TREASURER'S CERTIFICATE

The foregoing plat has been accepted and approved by the County Treasure of Blaine County, Idaho this 24th day of September, 1979.

[Signature]
Blaine County Treasure

SANITARY RESTRICTION



THICKNESS
? NO LING.

INNER LINING
? NO LING.

KIND OF FLUID
? WATER

SENSOR MOUNTING
? U

TYPE OF SENSOR
? SMALL

DATA CHANGE
? NO

SPACING
4.175 IN U

05-23 11:0600
+000.00 % AI2

PRT PERIOD Thickness
61 MIN 0.17

11:27+123.368E 00PM 00R
+00000 *10 G 00R
-00000 *10 G 00R

11:28+126.462E 00PM 00R
+00011 *10 G 00R
-00000 *10 G 00R

11:29+124.953E 00PM 00R
+00023 *10 G 00H
-00000 *10 G 00H

11:30+118.084E 00PM 00R
+00034 *10 G 00R
-00000 *10 G 00R

11:31+110.423E 00PM 00R
+00047 *10 G 00H
-00000 *10 G 00H

11:32+146.615E 00PM 00H
+00059 *10 G 00R
-00000 *10 G 00R

11:33+152.955E 00PM 00R
+00074 *10 G 00R
-00000 *10 G 00R

11:34+149.521E 00PM 00R
+00089 *10 G 00R
-00000 *10 G 00R

11:35+145.558E 00PM 00R
+00104 *10 G 00H
-00000 *10 G 00H

11:36+140.803E 00PM 00R
+00118 *10 G 00R
-00000 *10 G 00R

10000 IN

PIPE MATERIAL
? CS-88

INNER LINING
? NO LING.

INNER LINING
? NO LING.

KIND OF FLUID
? WATER

SENSOR MOUNTING
? U

TYPE OF SENSOR
? SMALL

DATA CHANGE
? NO

SPACING
4.176 IN U

06-23 11:0600
+000.00 % AI2

PRT PERIOD Thickness
61 MIN 0.17

11:27+123.368E 00PM 00R
+00000 *10 G 00R
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11:28+126.462E 00PM 00R
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11:33+152.955E 00PM 00R
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11:34+149.521E 00PM 00R
+00089 *10 G 00R
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11:35+145.558E 00PM 00R
+00104 *10 G 00H
-00000 *10 G 00H

11:36+140.803E 00PM 00R
+00118 *10 G 00R
-00000 *10 G 00R

06-23 11:3600 *R

Outer Diameter 6.0

Panametric measurement

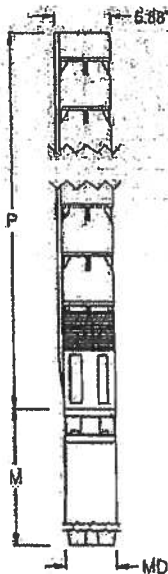
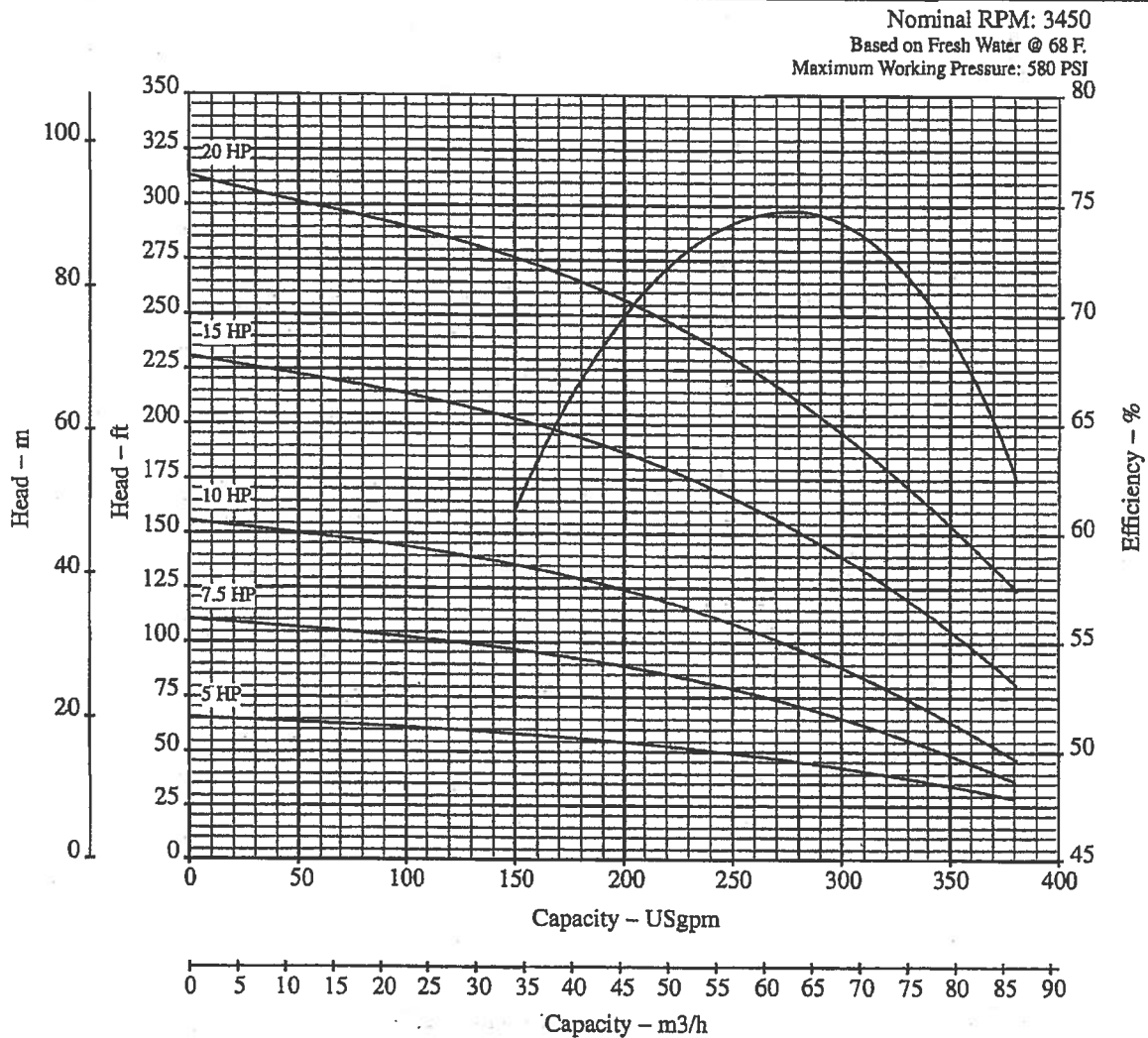
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File Name: C:\Users\sthiel\Desktop\LOG15.LOG
Start Time: 6/23/2016 12:41
End Time: 6/23/2016 12:51
Interval: 60
Records: 10
Cyclic Flags: 2
Error Flags: 8208

Date/Time	Velocity (ft/s)	Volume (gal/m)	(+)Total (Ac-Ft)	Error #
6/23/2016 12:41	1.178510612	107.3503873	0.05714409	0
6/23/2016 12:42	1.247374278	113.6231703	0.05747981	0
6/23/2016 12:43	1.330467568	121.1921279	0.057831	0
6/23/2016 12:44	1.31133365	119.4492216	0.05819636	0
6/23/2016 12:45	1.634844639	148.917798	0.05858645	0
6/23/2016 12:46	1.392510644	126.8436241	0.05899801	0
6/23/2016 12:47	1.347896071	122.7796881	0.05938212	0
6/23/2016 12:48	1.346294003	122.6337559	0.05975698	0
6/23/2016 12:49	1.343348254	122.365428	0.06012892	0
6/23/2016 12:50	1.405213709	128.0007447	0.06051379	0
	Average gpm	123.3155946		
	cfs	0.274767368		



SUBMERSIBLE TURBINE

6T-275



OUTLINE DIMENSIONS / WEIGHTS

HP	stages	Motor size	P length	M* length	MD* dia.	Mtr. wt.	Pump wt.
5	1	6"	18.98	27.00	5.51	95	56
7.5	2	6"	23.98	27.60	5.51	114	75
10	3	6"	28.98	29.80	5.51	127	95
15	4	6"	33.98	30.40	5.51	130	114
20	5	6"	38.98	35.50	5.51	160	133

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

M* Maximum length (Pentair Motor)

MD* Motor diameter (Pentair Motor)

SPECIFICATIONS

Minimum Well I.D.	6.0 Inches
Minimum Submergence @ BEP (above inlet)	10.0 Feet
Capacity Range	125 - 380 GPM
Discharge	4" F NPT
See manufacturer's data for motor cooling requirements	

SUPERSEDES

All Previous

Date 04/01/05

Section **6T**

Page 7.01

Heatherlands Flow meter readings

Heatherlands I

7/19/12	49454500
8/28	60756300
9/13	64665200
10/25	68446800
11/27	68469100
1/23/13	68518100
2/20	68545000
3/20	68584800
8/30	08694600

Heatherlands II

7/19/12	45294500
8/28	63674700
9/13	70454600
10/25	79959700
11/27	80142800
12/26	80493900
1/23/13	80494000
2/20	80494500
3/20	80494500
5/22	82569900
6/26	90313200
7/30	99798400
8/27	06596900

Heatherlands Flow Meter Readings in Gallons

Well 1		Difference	Days	Volume per day	
7/19/2012	49454500				
8/28/2012	60756300	11301800	41	275654	
9/13/2012	64665200	3908900	17	229935	
10/25/2012	68446800	3781600	43	87944	
11/27/2012	68469100	22300	34	656	
1/23/2013	68518100	49000	62	790	
2/20/2013	68545000	26900	29	928	
3/20/2013	68584800	39800	29	1372	
8/30/2013	108694600	40109800	164	244572	
Total		59240100	419		
Well 2				51605338	gallons per year
7/19/2012	45294500				
8/28/2012	63674700	18380200	41	448298	
9/13/2012	70454600	6779900	17	398818	
10/25/2012	79959700	9505100	43	221049	
11/27/2012	80142800	183100	34	5385	
12/26/2012	80493900	351100	30	11703	
1/23/2013	80494000	100	29	3	
2/20/2013	80494500	500	29	17	
3/20/2013	80494500	0	29	0	
5/22/2013	82569900	2075400	64	32428	
6/26/2013	90313200	7743300	36	215092	
7/30/2013	99798400	9485200	35	271006	
8/27/2013	106596900	6798500	29	234431	
Total		61302400	416		
				53786962	gallons per year
Total from both wells				105392299	gallons per year
				323	afa

INNER LING
? NO LING.

INNER LING
? NO LING.

INNER LING
? NO LING.

SENSOR MOUNTING
? SMALL

TYPE OF SENSOR
? SMALL

DATA CHANGE
? NO

SPACING
4.176 IN U

06-23 11:0600
+003.00 % AI2

PRT PERIOD
01 MIN

Thickness
0.17

11:27+123.368E 00PM 00R
+00000 *10 G 00R
-00000 *10 G 00R

11:28+120.462E 00PM 00R
+00011 *10 G 00R
-00000 *10 G 00R

11:29+124.953E 00PM 00R
+00023 *10 G 00H
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11:30+118.084E 00PM 00R
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11:35+145.558E 00PM 00R
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-00000 *10 G 00H

11:36+140.803E 00PM 00R
+00118 *10 G 00R
-00000 *10 G 00R

06-23 11:3600 *R
+003.00 % AI2

6.0000 IN

PIPE MATERIAL
? CS,SS

INNER LING
? NO LING.

INNER LING
? NO LING.

KIND OF FLUID
? WATER

SENSOR MOUNTING
? U

TYPE OF SENSOR
? SMALL

DATA CHANGE
? NO

SPACING
4.176 IN U

06-23 11:0600
+003.00 % AI2

PRT PERIOD
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Thickness
0.17

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11:36+140.803E 00PM 00R
+00118 *10 G 00R
-00000 *10 G 00R

06-23 11:3600 *R
+003.00 % AI2

1 min.
110 gallons

2 min.
230 gallons

3 min.
340 gallons

4 min.
470 gallons

5 min.
590 gallons

6 min.
740 gallons

7 min.
890 gallons

8 min.
1040 gallons

9 min.
1,180 gallons

6/24/2016

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT
State law requires that this report be filed with the Director, Department of Water
within 30 days after the completion or abandonment of the well.Location Corrected by _____ To: _____
T03N R18E Sec. 20 SWNWNE
By: mciscell 2012-12-21

Pump house #1

1. WELL OWNER Name <u>Kirkman Development Inc</u> Address <u>Box 1328 Huchem IDA 83228</u> Owner's Permit No. _____		7. WATER LEVEL Static water level <u>39</u> feet below land surface. Flowing? ☐ Yes ☒ No G.P.M. flow _____ Artesian closed-in pressure _____ p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug Temperature _____ °F. Clarity _____	
2. NATURE OF WORK ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe method of abandoning) _____		8. WELL TEST DATA ☒ Pump ☐ Boiler ☐ Air ☐ Other _____ Discharge G.P.M. <u>515</u> Pumping Level <u>54' R</u> Hours Pumped <u>6</u>	
3. PROPOSED USE ☐ Domestic ☐ Irrigation ☐ Test ☒ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other _____ (specify type)		9. LITHOLOGIC LOG 09938.1 Hole No. _____ Depth From To Material Water Yes No 16 0 3 TOP SOIL & GRAVEL X 16 3 20 GRAVEL & CLAY X 12 20 45 " " " " X 12 45 56 CLAY AND GRAVEL X 12 56 65 COARSE SAND & GRAVEL X 12 65 77 COARSE SAND X 12 77 80 LARGE GRAVEL X 12 80 89 GRAVEL & CLAY X 12 89 92 LARGE GRAVEL X 12 92 97 GRAVEL & CLAY X	
4. METHOD DRILLED ☐ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary ☒ Cable ☐ Dug ☐ Other _____		10. Work started <u>APRIL 12, 1980</u> finished <u>MAY 16, 1980</u>	
5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____ Thickness _____ Diameter _____ From _____ To _____ Inches _____ feet _____ Inches _____ feet _____ Inches _____ feet _____ Inches _____ feet _____ Was casing drive shoe used? ☒ Yes ☐ No Was a packer or seal used? ☐ Yes ☒ No Perforated? ☒ Yes ☐ No How perforated? ☐ Factory ☒ Kelleys ☐ Torch Size of perforation <u>3/8"</u> inches by <u>1.5</u> inches Number _____ From _____ To _____ Inches _____ feet _____ Inches _____ feet _____ Inches _____ 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 _____ feet Placed from _____ feet to _____ feet Surface seal depth <u>20'</u> Material used in seal: ☒ Cement grout ☐ Pudding clay ☐ Well cuttings Sealing procedure used: ☐ Shurry pit ☒ Temp. surface casing ☐ Overbore to seal depth Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld _____ Describe access port <u>2" GALV PIPE WITH CAP</u> ☐ Compensated between screens		11. DRILLER'S CERTIFICATION I/We certify that all minimum well construction standards were compiled with at the time the rig was removed. Firm Name <u>Karl Smith Well Drilling</u> License No. <u>2165</u> Address <u>Box 1165 Huchem IDA 83228</u> Signed by (Firm Official) <u>Karl Smith</u> and (Operator) <u>Ray Jones</u>	
6. LOCATION OF WELL Search map location must agree with written location. N <u>void</u> W <u>void</u> E <u>void</u> Subdivision Name _____ Lot No. _____ Block No. _____ Country <u>Blaine</u> <u>NE 1/4 Sec 20, T. 3 N, R. 18 E, W. 1/4</u>			

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

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORTUSE TYPE OR
BALLPOINT PENPump
House #2State 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.RECEIVED
AUG 26 1985

1. WELL OWNER Name <u>Heatherlands Subdivision</u> <u>7 Chuck Ketterman</u> Address <u>Edwards, Howard & Martens Box 186</u> <u>Ketchum, ID 83340</u> Owner's Permit No. <u>37-85-C-0004-000</u>		7. WATER LEVEL Static water level <u>40</u> feet below land surface. Flowing? ☐ Yes ☒ No G.P.M. flow <u>968</u> Water Meter <u>None</u> Artesian closed-in pressure _____ p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug Temperature <u>46</u> °F. Quality _____ Describe artesian or temperature zones below.																																																																																			
2. NATURE OF WORK <u>W.R. 37-08220</u> ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)		8. WELL TEST DATA ☒ Pump ☐ Bailer ☐ Air ☐ Other _____ Discharge G.P.M. <u>530+</u> Pumping Level <u>50'</u> Hours Pumped <u>8</u> <u>Pumped 968 GPM from 59' 2" for 1/2 hour.</u>																																																																																			
3. PROPOSED USE ☐ Domestic ☐ Irrigation ☐ Test ☒ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other _____ (specify type)		9. LITHOLOGIC LOG <u>70040</u> <table border="1"><thead><tr><th rowspan="2">Bore Diam.</th><th colspan="2">Depth</th><th rowspan="2">Material</th><th colspan="2">Water</th></tr><tr><th>From</th><th>To</th><th>Yes</th><th>No</th></tr></thead><tbody><tr><td>16</td><td>0</td><td>2</td><td>Surface</td><td></td><td></td></tr><tr><td></td><td>2</td><td>12</td><td>Boulders & Gravel & Clay</td><td></td><td></td></tr><tr><td></td><td>12</td><td>16</td><td>Gravel & clay</td><td></td><td></td></tr><tr><td></td><td>16</td><td>19</td><td>Bigger gravel & Clay</td><td></td><td></td></tr><tr><td>12</td><td>19</td><td>44</td><td>Clay & gravel</td><td></td><td></td></tr><tr><td></td><td>44</td><td>47</td><td>Gravel & sand</td><td>X</td><td></td></tr><tr><td></td><td>47</td><td>54</td><td>Clay & gravel</td><td></td><td>X</td></tr><tr><td></td><td>54</td><td>57</td><td>Sand</td><td></td><td></td></tr><tr><td></td><td>57</td><td>59</td><td>Clay & gravel</td><td></td><td></td></tr><tr><td></td><td>59</td><td>74</td><td>Gravel & clay</td><td>X</td><td></td></tr><tr><td></td><td>74</td><td>76</td><td>Clay & gravel</td><td>X</td><td></td></tr><tr><td></td><td>76</td><td>100</td><td>Gravel & clay</td><td>X</td><td></td></tr></tbody></table>		Bore Diam.	Depth		Material	Water		From	To	Yes	No	16	0	2	Surface				2	12	Boulders & Gravel & Clay				12	16	Gravel & clay				16	19	Bigger gravel & Clay			12	19	44	Clay & gravel				44	47	Gravel & sand	X			47	54	Clay & gravel		X		54	57	Sand				57	59	Clay & gravel				59	74	Gravel & clay	X			74	76	Clay & gravel	X			76	100	Gravel & clay	X	
Bore Diam.	Depth		Material		Water																																																																																
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	76	100	Gravel & clay	X																																																																																	
4. METHOD DRILLED ☒ Rotary ☒ Air ☐ Hydraulic ☐ Reverse rotary ☐ Cable ☐ Dug ☐ Other _____																																																																																					
5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____ Thickness _____ Diameter _____ From _____ To _____ <u>37.5</u> inches <u>12 3/4</u> inches + <u>2</u> feet <u>100</u> 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 <u>1 1/2</u> inches by <u>1/2</u> inches Number _____ From _____ To _____ <u>1868</u> perforations <u>61</u> feet <u>95</u> 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 <u>20</u> Material used in seal: ☒ Cement grout ☐ Bentonite ☐ Puddling clay ☐ _____ 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 <u>Heatherlands</u> Lot No. <u>36 & 37</u> Block No. <u>2</u> County <u>Blaine</u> SE 1/4 SW 1/4 Sec. <u>17</u> , T. <u>3</u> N/R. <u>18</u> E/W.		11. DRILLERS CERTIFICATION <u>82</u> I/We certify that all minimum well construction standards were complied with at the time the rig was removed. Firm Name <u>Walter Water Systems, Inc.</u> Firm No. <u>15</u> <u>624 Pierce Street</u> Address <u>Twin Falls, Idaho 83301</u> Date <u>8/21/85</u> Signed by (Firm Official) <u>Frederick B. Welch</u> and (Operator) <u>Frederick B. Welch</u>																																																																																			

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

PHOTOGRAPHER AND DATE OF PHOTOS: Clay Webster, Cherie Palmer, Sandy Thiel, June 23, 2016
FILE NUMBERS 37-8220, 37-8686 and 37-8831



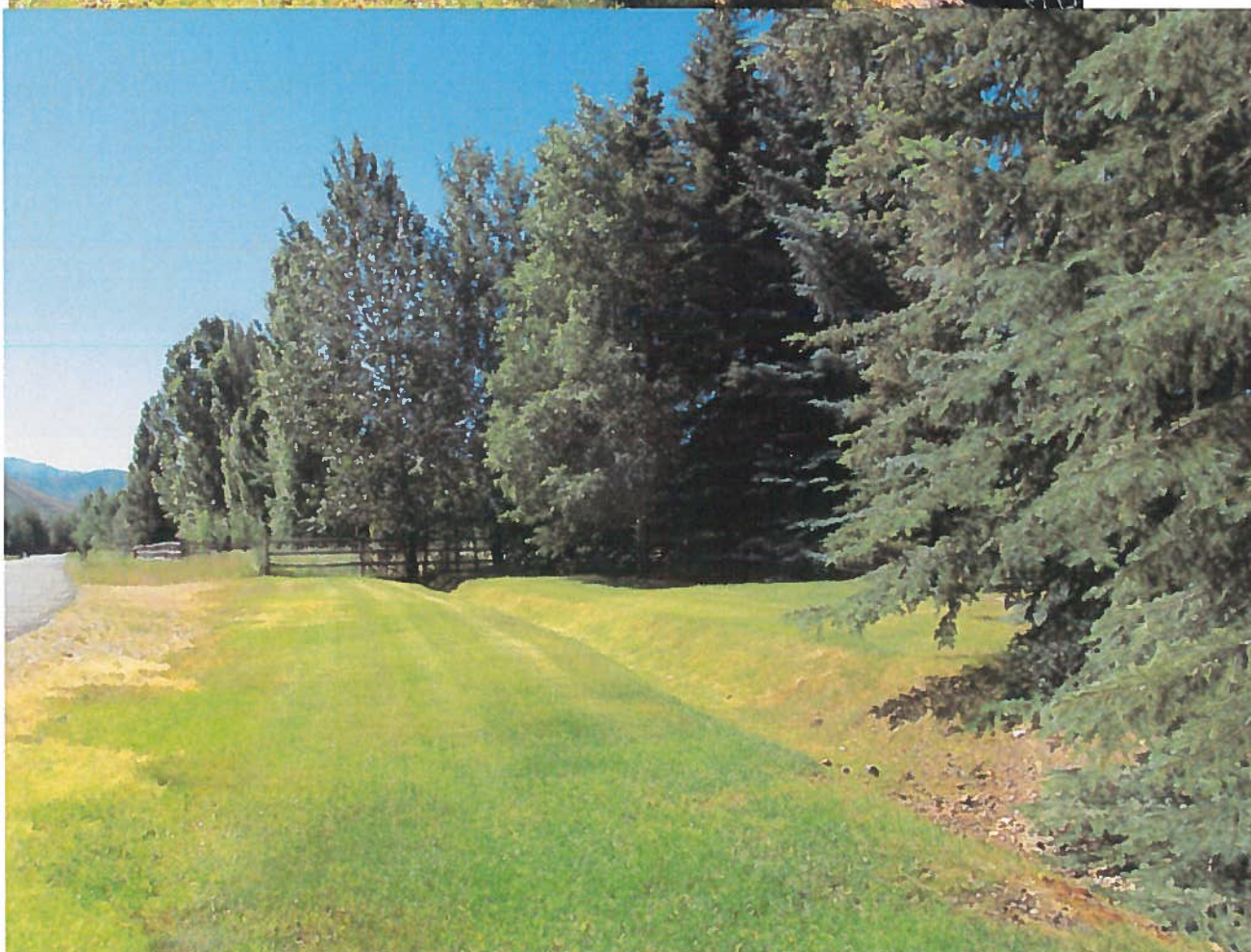
Well House 1



Well House 2



Irrigation Large
station
(22 sprinkler zone)
around
tennis courts





Well house # 1 Testing



Well house 1 at max capacity pressure dropped to 12 PSI



Control Panel at Well house #1 Pump 1 running as lead



Control Panel at Well house #1 Pump 2 running as lead



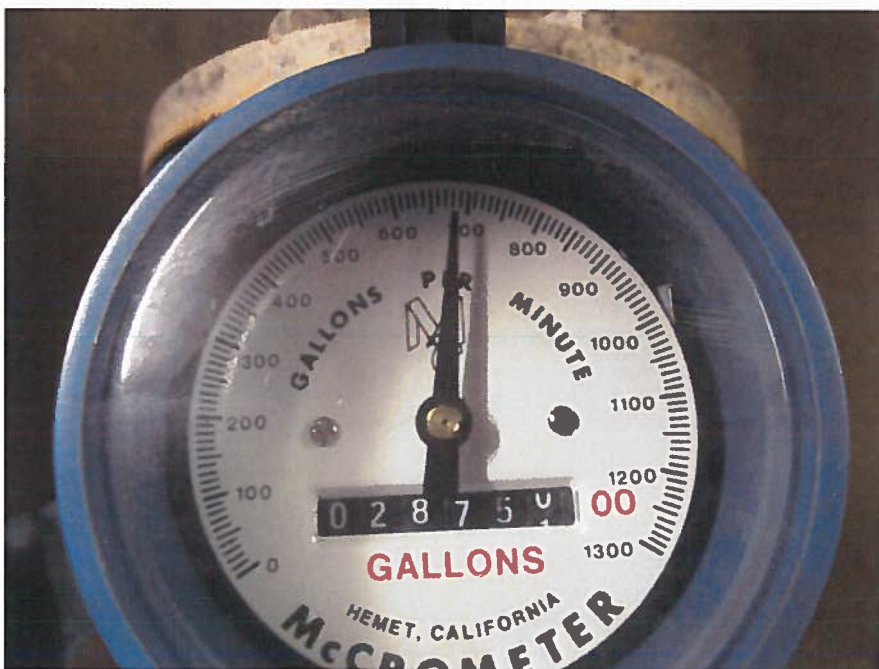
Inline pressure gage at Well house #1



Beginning of Macrometer test at Well house #1 Tested at 93% accurate



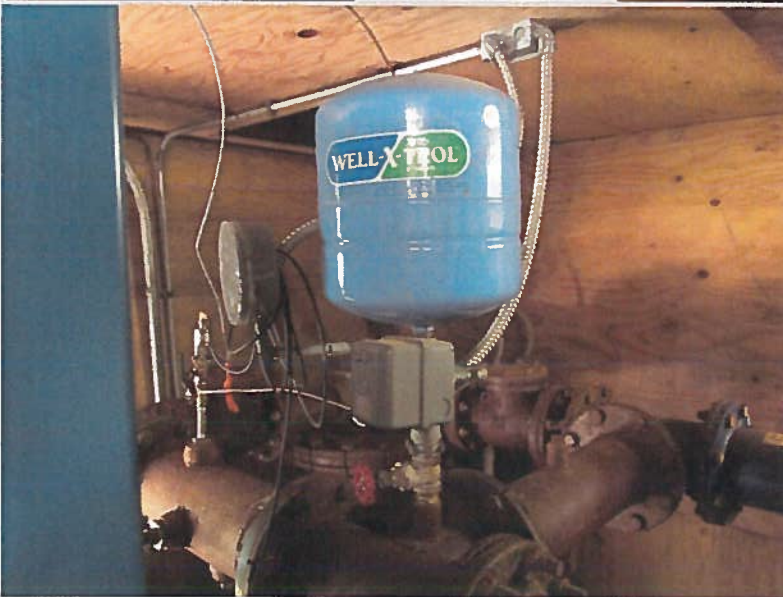
Beginning of
Macrometer test in
Well house #2



Well 1 Panel both
pumps maxed out
pressure 31.3 PSI then
15 PSI



Beginning of
Macrometer test in
Well house #2



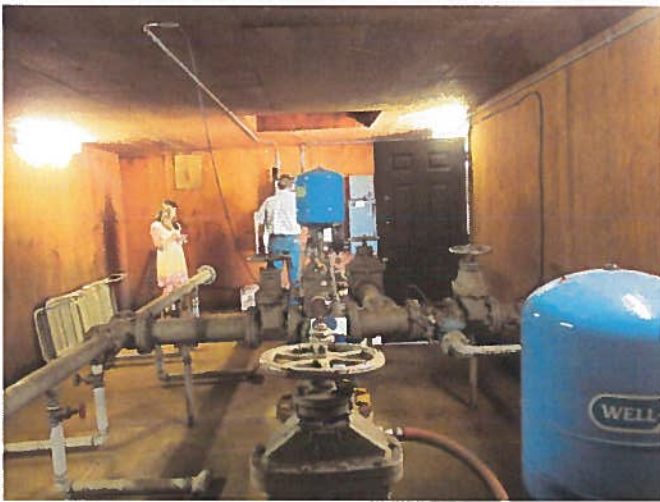
Pressure tank at Well
house #2



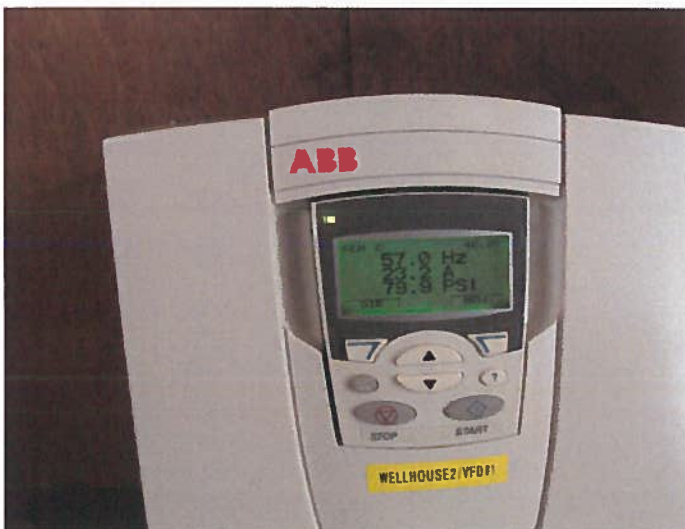
Setting up panametrics
at well house # 2



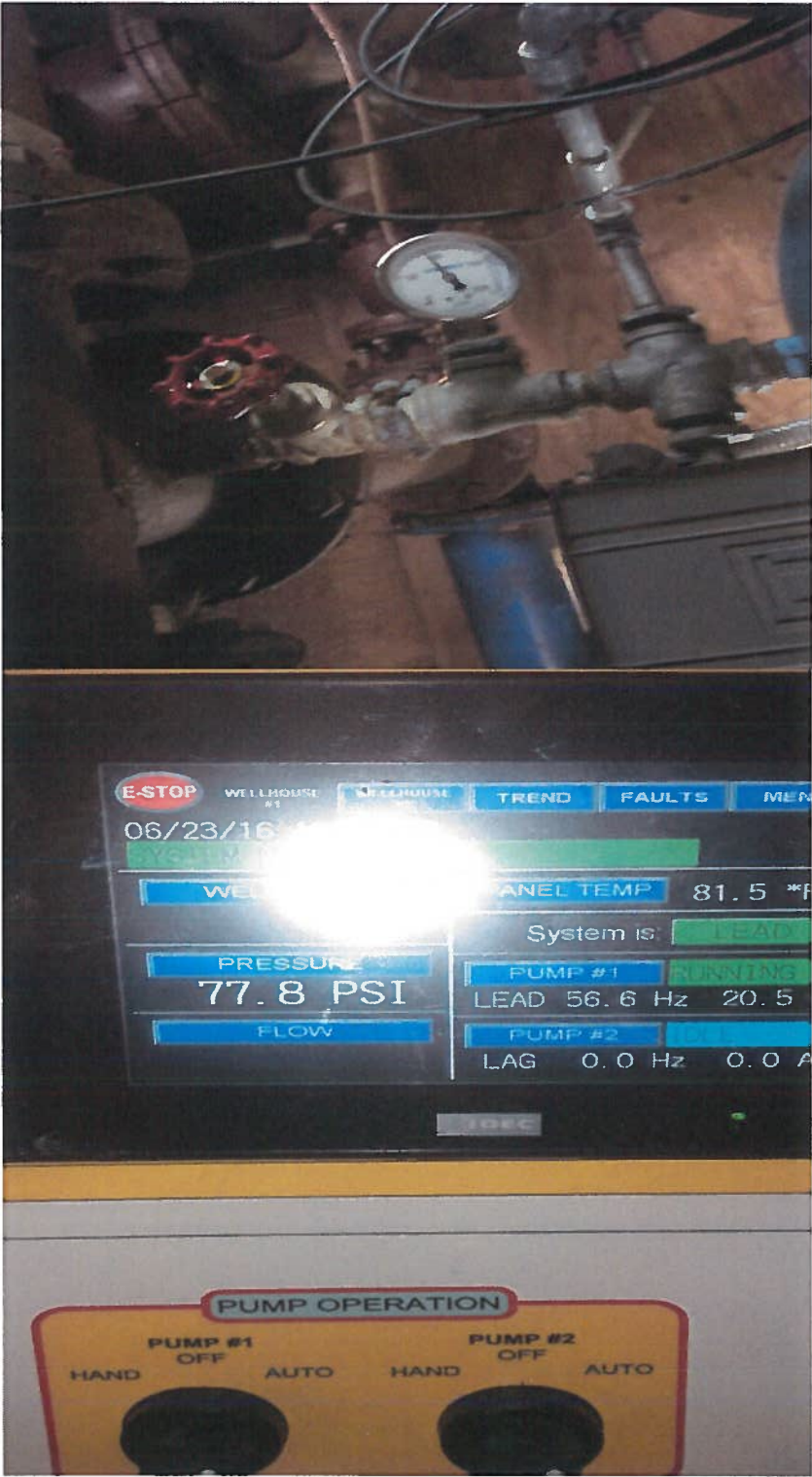
Wellhouse # 2 Line on
left is discharge line
right is service line



Well house #2



Variable Flow Drive
Well house #2



Pressure gage at Well house #2

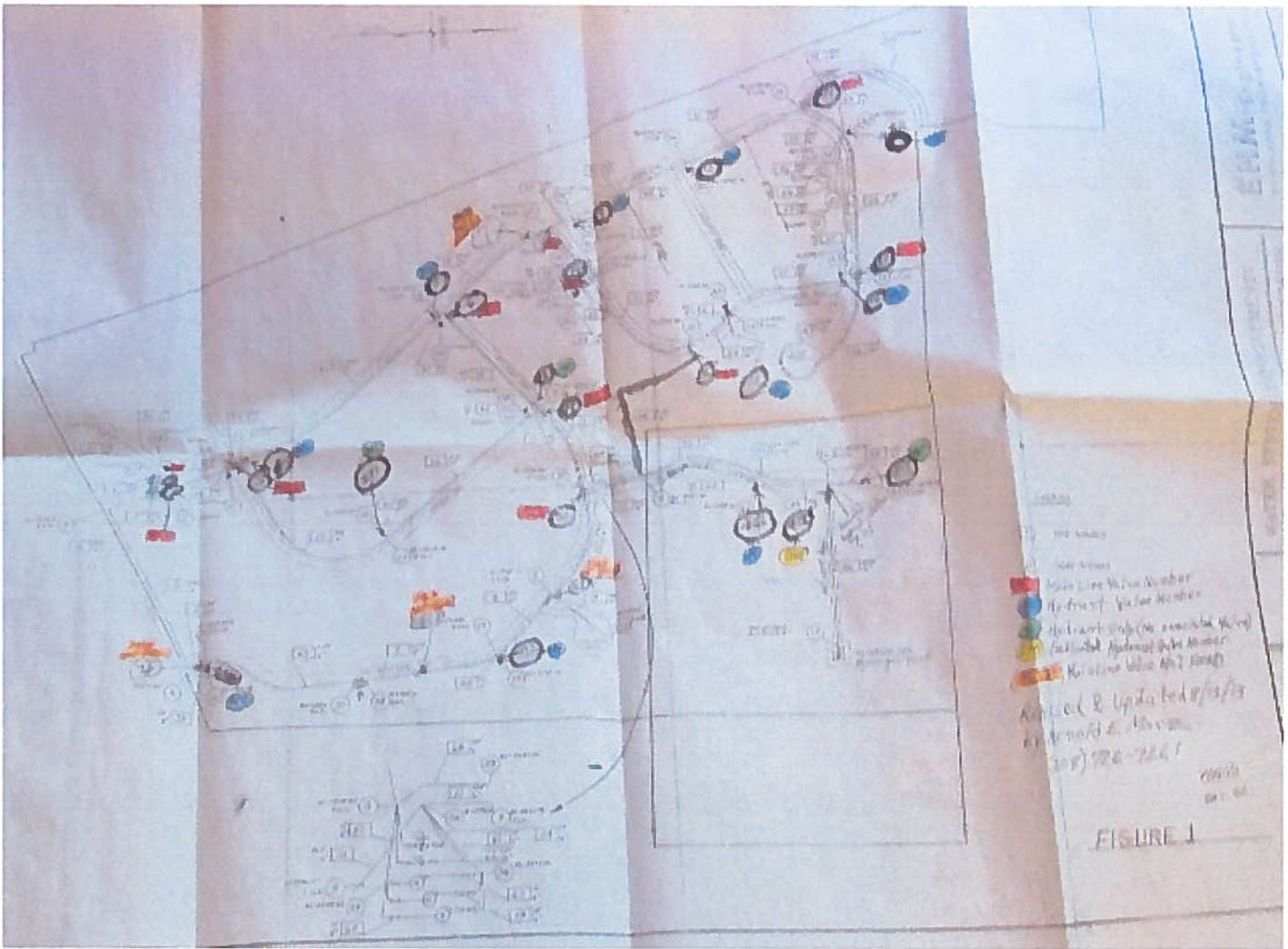
Well house # 2 Pump 1
lead pump 77.8 PSI



Well house # 2 both
pumps maxed out
Pressure dropped to 12
PSI



Variable Flow Drive at
Well house # 2 with
Wellhouse #1 as lead



As-built for improvements with fire hydrants shown as green and blue dots