

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 63-31481

Exam Date: 8/9/2012

1. Current Owner: CITY OF KUNA
PO BOX 13
KUNA ID 83634-0013
(208)922-5546
2. Accompanied by: Janice Yerton and Gordon Law
Phone No: (208) 922-5546
Address: PO Box 13
Relationship to Permit Holder: Operations Superintendent and City Engineer

3. **SOURCE** **TRIBUTARY**
GROUND WATER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 63-03266, 63-08215, 63-9668, 63-11970, 63-12394
2. Other water rights with the same point of diversion: None

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

GROUND WATER SW1/4NW1/4 Sec. 25, Twp 02N, Rge 01W, B.M. ADA County

Method of Determination: Field verified with a Garmin GPS unit.

2.

PLACE OF USE: Municipal
See attached map for place of use.

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
☐ Aerial Photo Attached (required for irrigation of 10+ acres).
☒ Photo of Diversion and System Attached

4.

<u>Well or Diversion ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
Well #6	Emerson	150	H0150V2SL6	UNK	546531
(Well ID D0025900)	Premium Efficient				

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

D. FLOW MEASUREMENTS

1.

Measurement

<u>Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No</u>	<u>Size</u>	<u>Calib. Date</u>
Flow Meter	Magnetic	Endress & Hauser	F10C8F16000			

2. Measurements: Direct readings were obtained from the visual display panel on the flow meter. Photographic documentation was used to capture the flow rate during the exam. Due to the accuracy of the flow meter installed, no additional measurements were conducted.

E. FLOW CALCULATIONS

___X___Additional Computation Sheets Attached

Measured Method: Theoretical Horsepower Calculator

See attached memo for further explanation.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: N/A

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

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

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

2. Volume Calculations for Other Uses: N/A

G. NARRATIVE/REMARKS/COMMENTS

The field exam for Water Right Permit 63-31481 was conducted on August 8, 2012 by myself, Dan Nelson, and Sean Vincent. Janice Yerton, the city superintendent of operations and Gordon Law, the city engineer, accompanied us during the field exam. This permit authorized the diversion of 4.5 cfs (cubic feet per second) of groundwater for municipal purposes. The POD (point of diversion) for this permit is a single groundwater well, with a drilling permit number of D0025900 (City of Kuna Well #6).

During the field exam, the well was pumping at a rate of approximately 1,150 gpm (gallons per minute). Theoretical calculations support the flow rate displayed during the field exam (see attached worksheet). The city engineer indicated that this was not the peak flow for this well, and additional information was later provided to indicate higher flows. An operator visited the well the following morning during the peak operation of the well and photographically documented flows ranging from 1,774 to 1,878 gpm. The driller's report for this well indicates it was tested at a rate of 2,817 gpm.

The well is equipped with a 150 horsepower vertical turbine pump and has a magnetic flow meter installed to document and record diversion rates. A digital readout on the meter was used to document the flow rate. The magnetic flow meter is an Endress & Hauser brand and appeared to be properly installed and is in good working condition. Considering the accuracy of the meter installed, an additional measurement was not conducted during the field exam. Photos were taken of the digital readout on the flow meter at the time of the exam and additional photos were submitted by the city to document the higher flows produced from this well.

Water is diverted from this well directly into the City of Kuna's distribution system. According to the city engineer, this well is one of the city's most productive wells and is heavily utilized in meeting the water demands of the city. The place of use for this permit is the service area of the City of Kuna municipal water supply system.

It appears the owner has met most of the conditions of the permit and has shown proof of the beneficial use of this diversion. I recommend that this permit be licensed for 4.0 cfs, the maximum diversion rate that was documented during the field exam process.

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

H. RECOMMENDATIONS

1. Recommended Amounts

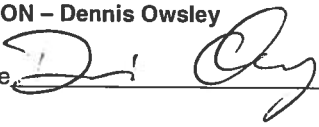
<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
MUNICIPAL	01/01 to 12/31	4.00 CFS	
<u>Totals:</u>		4.00 CFS	

2. Recommended Amendments

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

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION – Dennis Owsley

Field Examiner's Name  Date 10-1-2012

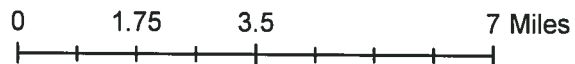
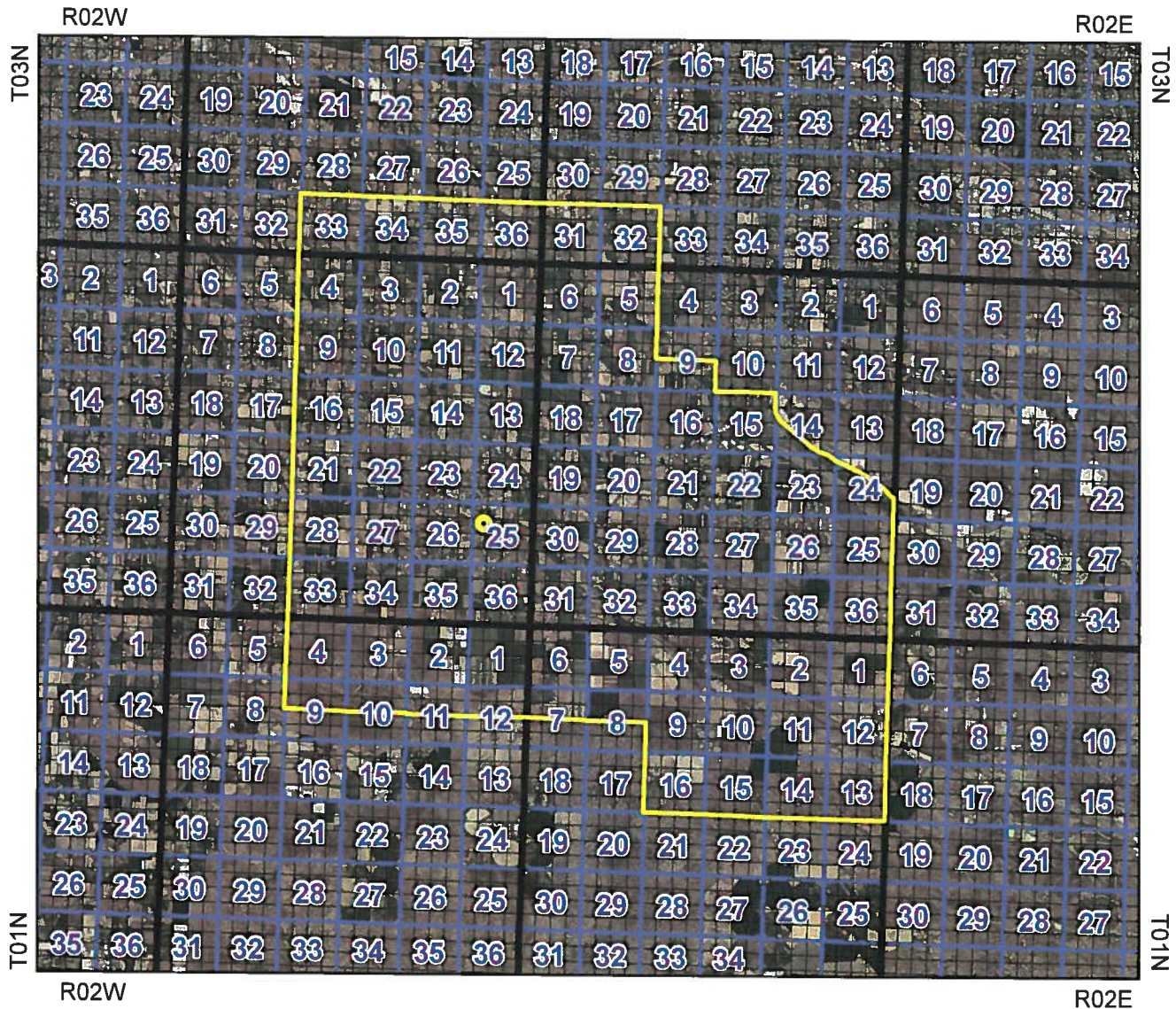
Reviewer _____ Date _____

State of Idaho
Department of Water Resources

Attachment To Water Right License

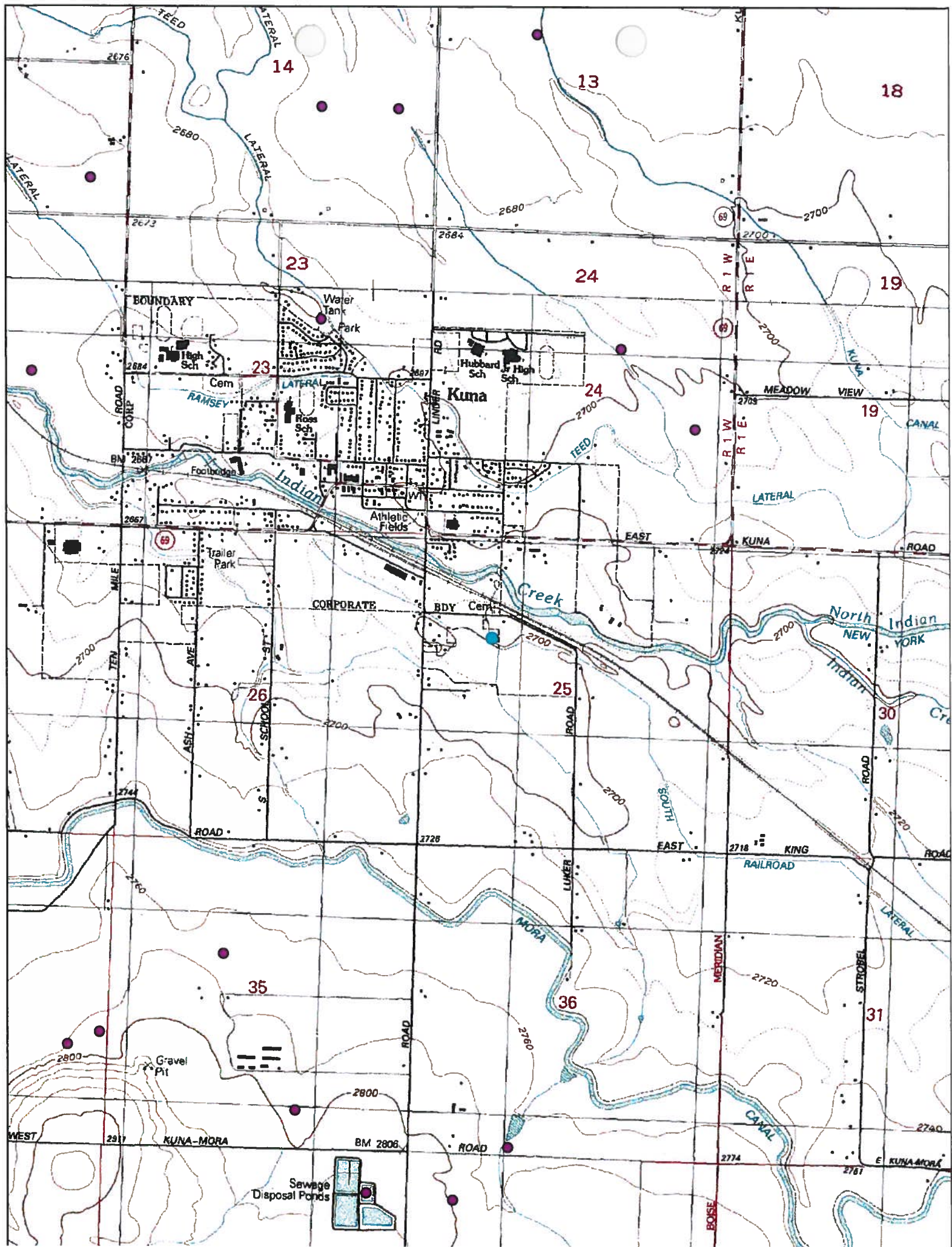
63-31481

This map depicts the MUNICIPAL place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



- Point of Diversion
- Water Service Area Boundary
- Townships
- PLS Sections
- Quarter Quarters







Memo

Date: 9/28/12

To: Water Right File 63-31481

From: Dennis Owsley

Re: Well capacity and diversion rate for City of Kuna Well #6

This memo is a brief summary of how the diversion rate for water right 63-31481 was determined. A field exam was conducted on the City of Kuna's Well #6 (water right 63-31481 is assigned to this POD) on August 8, 2012. At the time of the exam, the well was producing approximately 1,150 gpm (gallons per minute). During the exam, the city engineer emphasized that the flow rate observed during the exam was not the maximum flow rate that the well can typically produce, given the current demand for the time of the day in which the exam was being conducted. In addition, the well was originally designed to produce higher flow rates to fill a storage reservoir that has not been constructed. Currently, the well diverts water directly to the distribution system. Therefore, it was recommended that the city provide additional information to document and support a higher flow rate under normal operating conditions.

Additional information was provided to the Department from the city in the form of additional photographs of the flow meter at higher flow rates than what was observed during the exam, pump test data from the well's original pump test, pump curves for the well, and flow charts for various pressures on the system. The photographs that were provided documented flows between 1,774 to 1,878 gpm. These photos were taken the day after the exam, in the early morning hours (approximately 4:00 a.m.) when the demand on the city system is greatest. The photos indicated a higher flow rate could be achieved by the well, but questions remained as to how long the well could sustain these flows rates and if they fall within typical operating conditions.

Pump test data from the well indicate the well is capable of sustaining a flow rate of over 2,800 gpm (with a larger horsepower pump). The documentation provided support the higher diversion rates suggested by the city, but the higher diversion rate with the current pump installation needed to be determined. Using the pump curves and flow charts provided by the city, it appears a flow rate of 1,750 gpm at a system pressure of 50 psi is a typical sustainable flow rate.

Given the two photographs submitted by the city to the Department indicated flow rates of 1,774 and 1,878 gpm, I would recommend averaging these two rates to estimate the maximum diversion rate from this well. These higher flows were documented during the peak demand for the city, and most likely were taken at a pressure just slightly less than 50 psi. An average of these two flows is 1,826 gpm, or a flow rate of approximately 4 cfs. Therefore I recommend a diversion rate of 4.0 cfs, based on the discussions with the city engineer and the documentation provided by the city.

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 63-31481
 Examiner: D. Owsley
 Date of Field Exam: 8/9/2012

	Option 1	Option 2	Option 3
P/D No.: D0025900			
PUMP HORSEPOWER	150	150	150
BOOSTER HORSEPOWER	0	0	0
PUMPING LEVEL	135	135	135
DISCHARGE PRESSURE	45	50	37.3
FRICTION	0	0	0
RATE OF FLOW (cfs)	3.87	3.69	4.18
(gpm)	1735.6	1655.6	1875.2

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.

Examiners Notes:

Confirmation calculations of the higher diversion rates documented by the city. A flow rate of 4 cfs can be maintained at a discharge pressure of approximately 40 psi. Option 3 represents reported pumping conditions of 1,875 gpm with a pumping water level of 135 feet. To achieve this flow from this depth, the pressure must be reduced to slightly less than 40 psi.

City of Kuna
Well No. 6
Check of Floway 14FKH, 9.250", 3 Stage Pump

Flow (gpm)	Pump (ft/stage)	Pump (ft)	50 psi Main	55 psi Main	60 psi Main	65 psi Main	70 psi Main	75 psi Main
0	118	354	210	222	233	245	257	268
250	114	342	216	227	238	250	262	274
500	109	327	222	234	245	257	269	280
750	104	312	228	241	252	264	275	287
1,000	100	300	236	247	259	270	282	293
1,250	95	285	243	255	266	278	289	301
1,500	89	267	250	262	273	285	296	308
1,750	83	249	258	270	281	293	304	316
2,000	79	237	266	277	289	301	312	324
2,250	75	225	275	286	298	309	321	332
2,500	68	204	283	295	306	318	330	341
2,750	60	180	291	302	314	325	337	348
3,000	51	153	303	314	326	337	349	360

City of Kuna
Well No. 6
50 PSI Main Pressure

Flow (gpm)	Draw Down (ft)	Minor Losses (ft)	Main Head (ft)	Total TDH (ft)	TDH Per Stage (ft)	Pump Efficiency (%)	Horsepower
0	95		115	210	70		
250	100	0.43	115	216	72	35%	39
500	106	1.03	115	222	74	44%	64
750	112	1.71	115	229	76	53%	82
1,000	117	3.14	115	236	79	64%	93
1,250	123	4.83	115	243	81	65%	118
1,500	128	6.76	115	250	83	71%	133
1,750	134	8.71	115	258	86	76%	150
2,000	139	11.54	115	266	89	80%	168
2,250	145	14.16	115	276	92	83%	188
2,500	151	17.02	115	283	94	84%	213
2,750	156	19.30	115	291	97	82%	246
3,000	162	25.25	115	303	101	80%	287

Main Pressure = 50 psi
 No of Stages = 3

Efficiency From Floway 14FKH Pump, 9.25" Impeller, 3 Stage
 Horsepower (HP) = $\text{gpm} \times \text{TDH} / 3960 \times \text{Efficiency}$

City of Kuna
Well No. 6
60 PSI Main Pressure

Flow (gpm)	Draw Down (ft)	Minor Losses (ft)	Main Head (ft)	Total TDH (ft)	TDH Per Stage (ft)	Pump Efficiency (%)	Horsepower
0	95		138	233	78		
250	100	0.43	138	239	80	35%	43
500	108	1.03	138	245	82	44%	70
750	112	1.71	138	252	84	53%	90
1,000	117	3.14	138	259	86	64%	102
1,250	123	4.83	138	266	89	65%	129
1,500	128	6.76	138	273	91	71%	146
1,750	134	8.71	138	281	94	76%	163
2,000	139	11.54	138	289	96	80%	182
2,250	145	14.16	138	298	99	83%	204
2,500	151	17.02	138	306	102	84%	230
2,750	156	19.30	138	314	105	82%	266
3,000	162	25.26	138	326	109	80%	308

Main Pressure = 60 psi
 No of Stages = 3

Efficiency From Floway 14FKH Pump, 9.25" Impeller, 3 Stage
 Horsepower (HP) = $\text{gpm} \times \text{TDH} / 3960 \times \text{Efficiency}$

**City of Meridian
Well No. 6
65 PSI Main Pressure**

Flow (gpm)	Draw Down (ft)	Minor Losses (ft)	Main Head (ft)	Total TDH (ft)	TDH Per Stage (ft)	Pump Efficiency (%)	Horsepower
0	96		150	246	82		
250	100	0.43	150	260	83	36%	46
500	106	1.03	150	257	86	44%	74
750	112	1.71	150	264	88	53%	94
1,000	117	3.14	150	270	90	64%	107
1,250	123	4.83	150	278	93	65%	135
1,500	128	6.76	150	285	95	71%	152
1,750	134	8.71	150	293	98	76%	170
2,000	139	11.54	150	301	100	80%	190
2,250	145	14.16	150	309	103	83%	212
2,500	151	17.02	150	318	106	84%	239
2,750	158	19.30	150	325	108	82%	276
3,000	162	25.25	150	337	112	80%	319

Main Pressure = 65 psi
No of Stages = 3

Efficiency From Floway 14FKH Pump, 9.25" Impeller, 3 Stage
Horsepower (HP) = $\text{gpm} \times \text{TDH} / 3960 \times \text{Efficiency}$

**City of Kuna
Well No. 6
70 PSI Main Pressure**

Flow (gpm)	Draw Down (ft)	Minor Losses (ft)	Main Head (ft)	Total TDH (ft)	TDH Per Stage (ft)	Pump Efficiency (%)	Horsepower
0	95		162	257	86		
250	100	0.43	162	262	87	35%	47
500	106	1.03	162	269	90	44%	77
750	112	1.71	162	275	92	53%	98
1,000	117	3.14	162	282	94	64%	111
1,250	123	4.83	162	289	96	65%	141
1,500	128	6.76	162	296	99	71%	168
1,750	134	8.71	162	304	101	76%	177
2,000	139	11.54	162	312	104	80%	197
2,250	145	14.16	162	321	107	83%	220
2,500	151	17.02	162	330	110	84%	248
2,750	156	19.30	162	337	112	82%	285
3,000	162	25.25	162	349	116	80%	330

Main Pressure = 70 psi
No of Stages = 3

Efficiency From Floway 14FKH Pump, 9.25" Impeller, 3 Stage
Horsepower (HP) = $\text{gpm} \times \text{TDH} / 3960 \times \text{Efficiency}$

City of Kuna
Well No. 6
75 PSI Main Pressure

Flow (gpm)	Draw Down (ft)	Minor Losses (ft)	Main Head (ft)	Total TDH (ft)	TDH Per Stage (ft)	Pump Efficiency (%)	Horsepower
0	95		173	268	89		
250	100	0.43	173	274	91	35%	49
500	106	1.03	173	280	93	44%	80
750	112	1.71	173	287	96	53%	102
1,000	117	3.14	173	293	98	64%	116
1,250	123	4.83	173	301	100	65%	146
1,500	128	6.76	173	308	103	71%	164
1,750	134	8.71	173	316	106	76%	184
2,000	139	11.54	173	324	108	80%	204
2,250	145	14.16	173	332	111	83%	227
2,500	151	17.02	173	341	114	84%	256
2,750	156	19.30	173	348	116	82%	295
3,000	162	25.25	173	360	120	80%	341

Main Pressure = 75 psi
 No of Stages = 3

Efficiency From Floway 14FKH Pump, 9.25" Impeller, 3 Stage
 Horsepower (HP) = $\text{gpm} \times \text{TDH} / 3960 \times \text{Efficiency}$

Gordon

City of Kuna
Municipal Well No. 6
Constant Discharge Pumping Test
Performed March 3, 2003

Time	Water Level	Pumping Rate	Comments
8:00 AM	94.98	0	Starting Constant Speed Test
8:06			Ramping up Pump to 1800 RPM
8:09	143.20	2817	1800 RPM on Pump
8:10	146.42		
8:11	146.41		
8:12	146.69		
8:13	146.86		
8:14	146.96		
8:15	147.08		
8:20	147.47		
8:25	148.96		
8:30	149.81		
8:35	150.00		
8:40	160.31		
8:45	150.61		
8:50	150.69		
8:55	150.83		
9:00	151.02		
9:10	151.34		
9:20	161.63		
9:30	151.80		
9:40	152.10		
9:50	162.28		
10:00	152.41		
10:10	162.60		
10:20	152.79		
10:30	162.91		
10:40	163.03		
10:50	163.31		
11:00	153.38		
11:10	163.50		
11:20	153.70		
11:30	163.70		
11:40	163.80		
11:50	163.91		
12:00 PM	154.00		
12:10	164.10		
12:20	154.32		
12:30	164.35		
12:40	164.45		
12:50	154.64		
1:00	154.66		

Time	Water Level	Pumping Rate	Comments
1:10	154.70		
1:20	154.80		
1:30	154.91		
1:40	154.93		
1:50	154.98		
2:00	155.12		
2:10	155.15		
2:20	155.17		
2:30	155.32		
2:40	155.40		
2:50	155.60		
3:00	155.52		
3:10	155.68		
3:20	155.61		
3:30	155.69		
3:40	155.67		
3:50	155.69		
4:00	155.72	2817	1800 RPM on Test Pump
4:01	107.30	0	Pump Off
4:02	105.32		
4:03	104.35		
4:04	103.82		
4:05	103.38		
4:06	103.05		
4:07	102.85		
4:08	102.64		
4:09	102.47		
4:10	102.32		

City of Kuna
Municipal Well No. 6
Step Pumping Test
Performed February 28, 2003

Time	Water Level	Pumping Rate	Comments
10:00 AM	94.93	0	Starting Step Test
10:01	115.73	1317	1050 RPM on Test Pump
10:02	116.80		
10:03	117.37		
10:04			
10:05	117.65		
10:06	117.85		
10:07	117.98		
10:08	118.11		
10:09	118.22		
10:10	118.28		
10:11	118.37		
10:12	118.47		
10:13	118.57		
10:14	118.67		
10:15	118.72		
10:16	118.75		
10:17	118.80		
10:18	118.80		
10:19	118.84		
10:20	118.87		
10:25	119.02		
10:30	119.13		
10:35	119.25		
10:40	119.40		
10:45	119.38		
10:50			
10:55	119.54		
11:00	119.60		
11:01	125.46	1689	1200 RPM on Test Pump
11:02	125.85		
11:13	125.98		
11:04	126.02		
11:05	126.10		
11:06	126.17		
11:07	126.21		
11:08	126.24		
11:09	126.27		
11:10	126.30		
11:15	126.39		
11:20	126.49		

Time	Water Level	Pumping Rate	Comments
11:25	126.59		
11:30	126.66		
11:40	126.80		
11:50	126.90		
12:00 PM	127.02		
12:01	132.88	1992	1350 RPM on Test Pump
12:02	133.20		
12:03	133.35		
12:04	133.43		
12:05	133.48		
12:06	133.52		
12:07	133.66		
12:08	133.60		
12:09	133.65		
12:10	133.69		
12:15	133.81		
12:20	133.90		
12:25	133.97		
12:30	134.08		
12:40	134.19		
12:50	134.32		
1:00	134.44		
1:01	139.06	2282	1500 RPM on Test Pump
1:02	139.39		
1:03	139.52		
1:04	139.58		
1:05	139.63		
1:06	139.67		
1:07	139.72		
1:08	139.76		
1:09	139.80		
1:10	139.82		
1:20	139.98		
1:30	140.14		
1:40	140.25		
1:50	140.32		
2:00	140.40		
2:01	145.45	2514	1650 RPM on Test Pump
2:02	146.69		
2:03	146.80		
2:04	146.89		
2:05	146.93		
2:06	146.97		
2:07	146.00		
2:08	146.03		
2:09	146.06		
2:10	146.10		
2:15	146.21		
2:20	146.32		

Time	Water Level	Pumping Rate	Comments
2:25	146.32		
2:30	146.37		
2:40	146.56		
2:50	146.61		
3:00	146.61		
3:01	152.05	2817	1800 RPM on Test Pump
3:02	152.41		
3:03	152.54		
3:04	152.63		
3:06	152.72		
3:06	152.78		
3:07	152.83		
3:08	152.89		
3:09	152.92		
3:10	152.97		
3:15	153.18		
3:20	153.33		
3:25	153.45		
3:30	153.52		
3:40	153.57		
3:50	153.91		
4:00	153.91		
4:01		0	Stopped Pump
4:02	104.00		
4:03	102.88		
4:04	101.96		
4:05	101.47		
4:06	101.31		
4:07	101.00		
4:08	100.83		
4:09	100.65		
4:10			

City Of Kuna

Municipal Well No. 6 Pumping Facilities

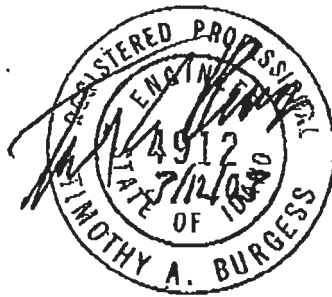
Final Pump Selection

March 12, 2003

Note: Well No. 6 was completed on March 5, 2003. The well was pump tested at 2817 gallons per minute for eight hours with a specific yield of 46 gpm per foot of drawdown. The well recovered to within seven feet of the static water level within 10 minutes of ending the test. Well No. 6 is the most productive well in Kuna's potable water system.

This design selects a pump for the final condition where it will pump directly into a ground storage reservoir. The well will pump directly into the distribution system on an interim basis at a rate lower than the design capacity.

As currently designed, with a 150 horsepower Floway 14FKH, 9.250", 3-Stage pump, the well will deliver approximately 1350 gallons per minute to the distribution system under a main pressure of 70-75 psi. The well will deliver approximately 2600 gpm to a future ground storage reservoir.



Both need 175 HP
AMB

Ground Storage System Curve
3/12/03

Tank Full 2650 gpm @ 192' TDH

CAPACITY (USGPM)

BO'

1770 RPM

ENCLOSED TYPE IMPELLER

14FKH

NO. OF STAGES	EFF. CHANGE (NO. OF POINTS)
1	-3
2	-2
3	-0

HORSEPOWER WILL BE EFFECTED BY CHANGE IN EFFICIENCY

PERFORMANCE FOR:

Bowl Pattern No.: 545284-A-R0

Imp. Pattern No.: 545285-A-R1

PUMP DATA

Shaft Dia. (IN.)	1 15/16
Maximum Sphere (IN.)	1 5/8
Maximum Head (FT.)*	654
Min. Submergence (IN.)**	30
Impeller Wt. (LBS.)	27.5
Thrust Constant (K)	16.0
Bowl O.D. (IN.)	14

NOTES

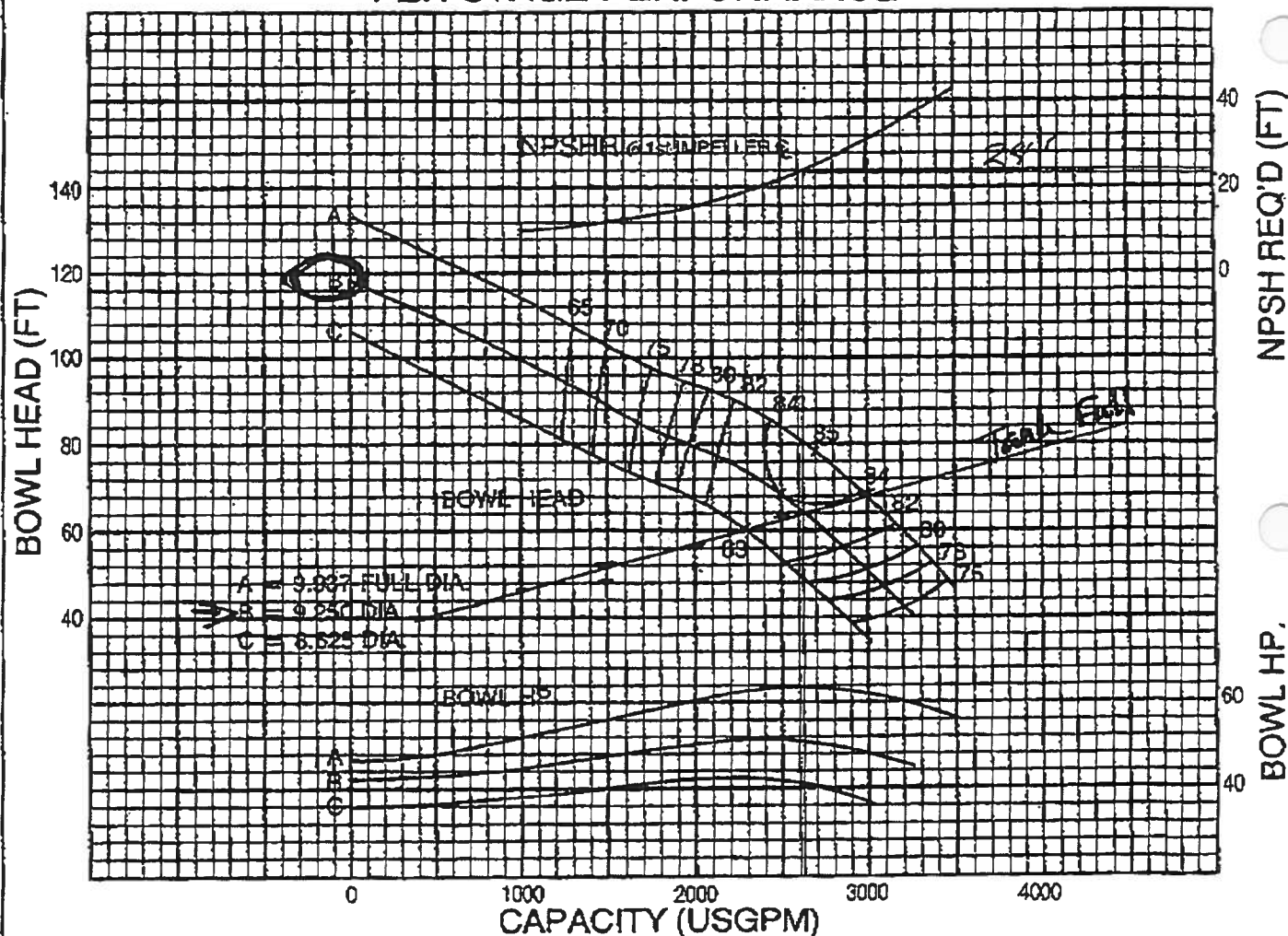
Performance indicated based on cold water with a specific gravity of 1.0.

* Standard construction.

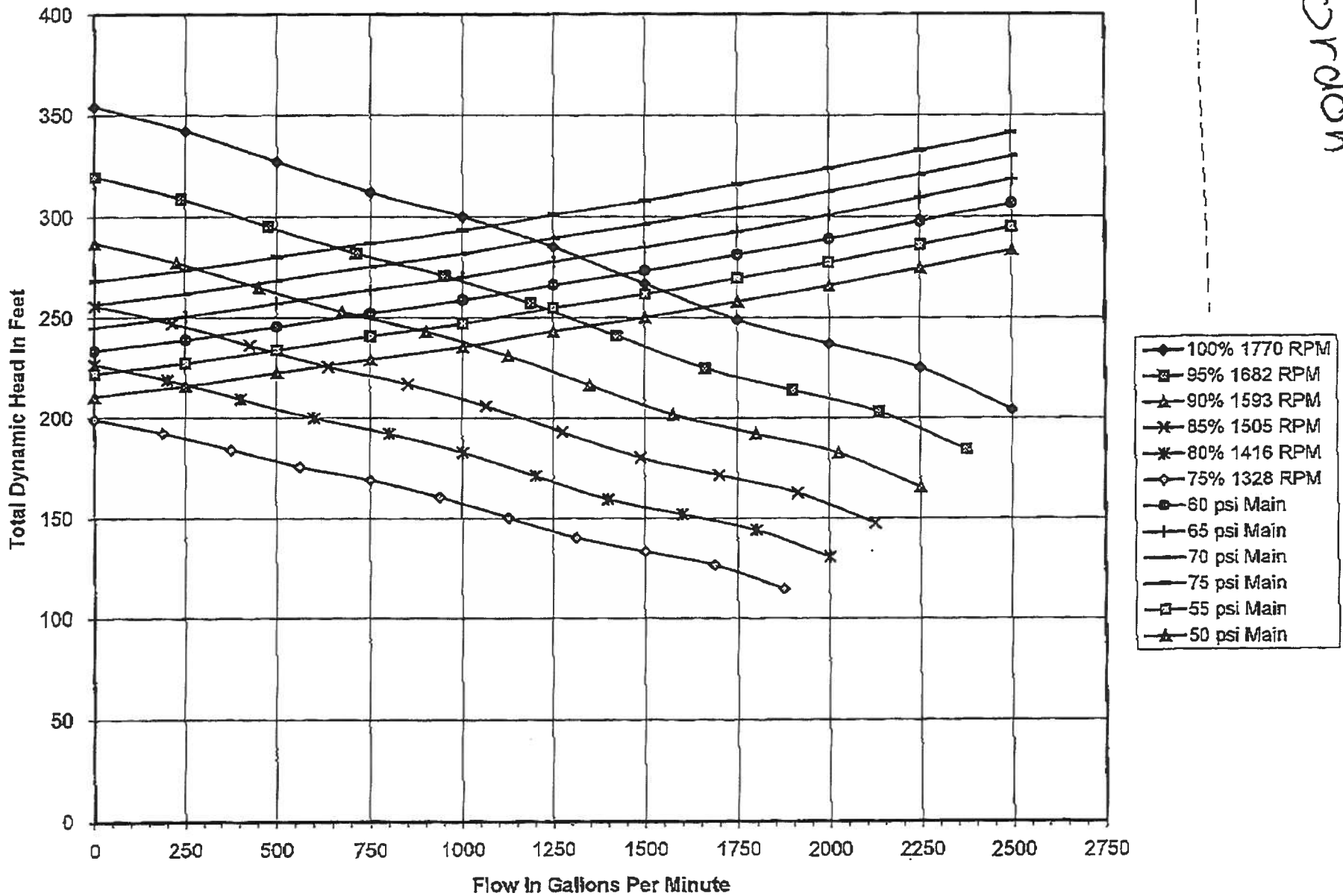
** Minimum submergence over lip of bell to prevent vortexing.

Efficiency improvements are available in certain instances. Please contact the factory.

PER STAGE PERFORMANCE



City Of Kuna Well 6 Floway 14 FKH, 9.250" Impeller, 3 Stage Variable Speed System Curves



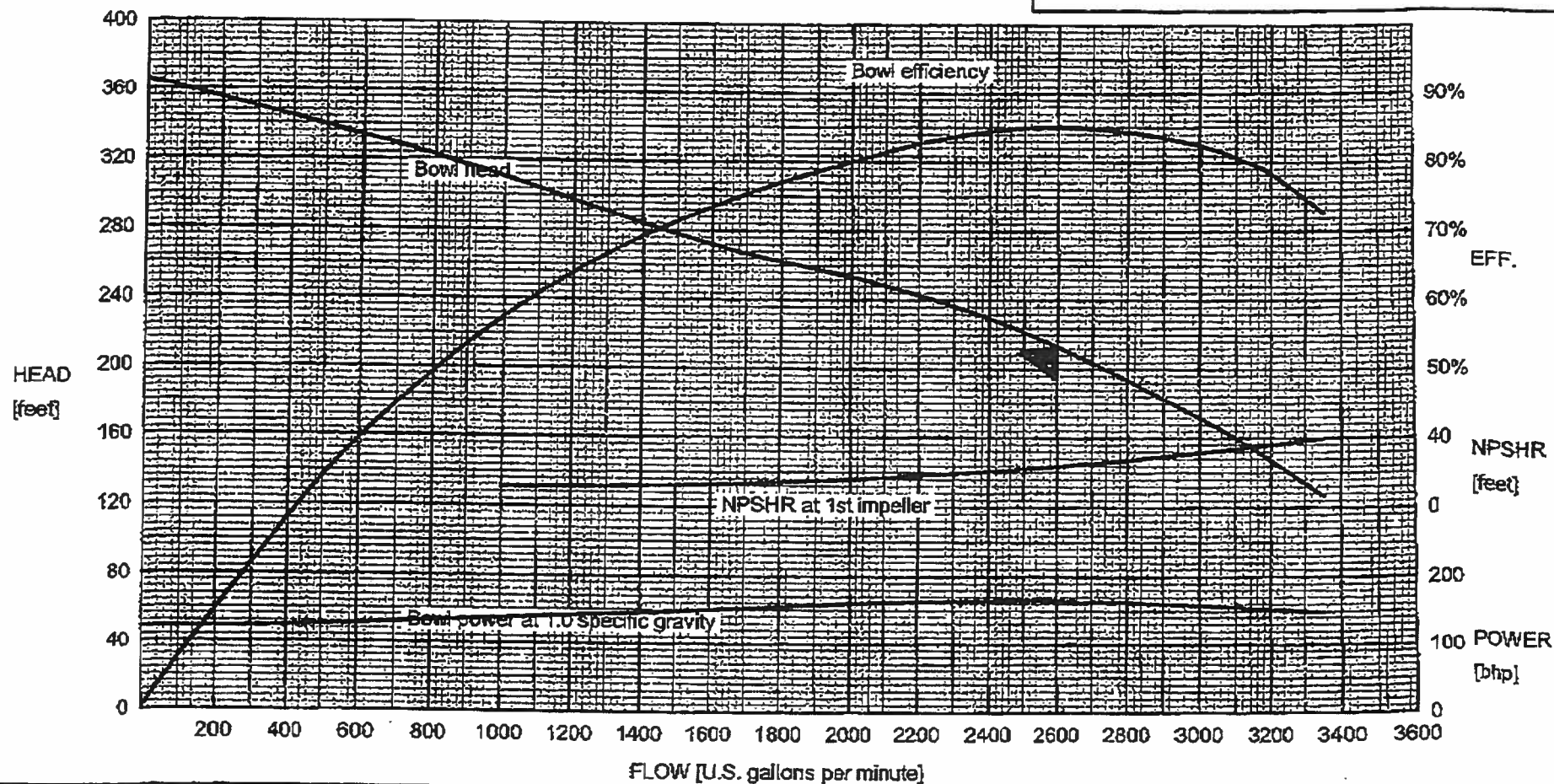
Gordon

The head and power may be different than shown in accordance with Hydraulic Institute standards.

CERTIFIED PERFORMANCE BASED ON TESTS OF SIMILAR PUMPS

PUMPTech CO., INC.

(1) 3 stage 14FKH



PUMPTech CO., INC.
 444 So. Yellowstone Hwy.
 Idaho Falls, Idaho 83405

Floway Pumps
 FRESNO, CALIFORNIA

TYPE: 14FKH
 NO. OF STAGES: 3
 R.P.M.: 1770
 PUMP SERIAL NO.:

DWG. NO.

Archimedes Professional 1.1.9 (printed: 7/2/2003 1:34:39 PM)

A **WEBA** COMPANY

Copyright © 2002 Floway Pumps All Rights Reserved

DWN. BY: genuser

DATE: 07/02/2003

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

775892

Office Use Only			
Inspected by			
Twp	Rge	Sec	
1/4		1/4	
Lat	:	Long	:

1. WELL TAG NO. D 25900
 DRILLING PERMIT NO. _____
 Other IDWR No. _____

2. OWNER: City of Kuna
 Name PO Box 13
 Address Kuna ID 83634
 City _____ State _____ Zip _____

3. LOCATION OF WELL by legal description:
 Sketch map location must agree with written location.

N		Twp. <u>2</u>		North ☒ or South ☐	
E		Rge: <u>1</u>		East ☐ or West ☒	
S		Sec. <u>25</u>		N/E ☐ S/W ☐ N/W ☐	
		Gov't Lot _____		County <u>Ada</u>	
		Lat: <u>43</u> : <u>29</u> : <u>45</u>		Long: <u>116</u> : <u>26</u> : <u>15</u>	

Address of Well Site South of Stagecoach,
East of Swan Falls Rds City Kuna
 (Give at least name of road + Distance to Road or Landmark)

11. WELL TESTS:

☒ Pump	☐ Bailer	☐ Air	☐ Flowing Artesian
Yield gal./min.	Drawdown	Pumping Level	Time
<u>2817</u>	<u>60'</u>	<u>155'</u>	<u>8 hr</u>

Water Temp. 75 Bottom hole temp. _____
 Water Quality test or comments: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
30	0	19	clay & basalt		X
	19	23	broken basalt		X
	23	140	basalt	X	
	40	145	sticky red-brown clay		X
	145	155	cemented gravel		X
	155	195	coarse sand & gravel	X	
	195	201	brown clay		X
	201	231	sand & gravel	X	
	231	245	sticky clay		X
	245	256	cemented sand		X
	256	395	clay & fine sand streaks	X	
	395	402	greenish clay		X
	402	445	greenish medium sand	X	
	445	452	green clay		X
	452	465	green medium sand	X	
	465	485	brown clay		X
	485	566	brown medium sand	X	
	566	571	green clay		X
#7. #8-12 sand 376 to 571 poured					
packer 5' long, 12" pipe					
RECEIVED MAR 18 2003 WATER RESOURCES WESTERN REGION					
Completed	Depth	(Measurable)			
Date: Started	<u>10/4/02</u>	Completed	<u>3/3/03</u>		

13. DRILLER'S CERTIFICATION

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

Company Name Stevens & Sons Firm No. 153
 Firm Official Ron Stevens Date 3/10/03
 and _____
 Driller or Operator _____ Date _____
 (Sign once if Firm Official & Operator)

4. USE:

☐ Domestic ☒ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

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

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD

☐ Air Rotary ☒ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK		AMOUNT		METHOD
Material	From To	Sacks or Pounds		
bentonite chips	0 155	22 yd		poured
bentonite grout	155 380	12 yd		pumped
cement grout	380 402	12 sk		pumped

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

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
18"	+3	402	375	steel	☒	☐	☐	☐
10	375	485	365	steel	☐	☒	☐	☐
10	566	571	365	steel	☐	☒	☐	☐

Length of Headpipe 5' Length of Tailpipe 110'

9. PERFORATIONS/SCREENS

Perforations _____ Method _____

Screens Johnson Screen Type stnls Y wire

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
485	566	30		10	stnls	☐	☒
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

95 ft. below ground Artesian pressure _____ lb.
 Depth flow encountered _____ ft. Describe access port or control devices: _____



Photo 1. View of the pressure gauge on Well #6. Photo taken by D. Owsley on 8/9/2012.



Photo 2. View of the water level gauge on Well #6. Photo taken by D. Owsley on 8/9/2012.



Photo 3. View of Well #6. Photo taken by D. Owsley on 8/9/2012.



Photo 4. View of motor and pump for Well #6. Photo taken by D. Owsley on 8/9/2012.



Photo 5. View of Well #6 discharge during the field exam. Photo taken by D. Owsley on 8/9/2012.



Photo 6. View of Well #6 discharge. Photo taken by the City of Kuna on 8/10/2012.



Photo 7. View of Well #6 discharge. Photo taken by the City of Kuna on 8/10/2012.