

Edl, Michele

From: Ray Kimball [rayk@incnorthwest.com]
Sent: Monday, January 14, 2008 12:04 PM
To: Edl, Michele
Cc: Barlow@HAGADONE.COM
Subject: Water Right permit # 95-08961
Attachments: Use calcs.pdf

Hello Michele,

I've been asked by our client, Hagadone Hospitality Company, to review their water system and help provide proof of beneficial use. The water system consists of a well, a multi pod reservoir, and a distribution system. The distribution system feeds a restaurant, a 360 slip marina, and a floating gas station/store. The reservoir provides chlorine contact time and peak demand buffering. The well operates at 36 gpm.

In order to prove beneficial use at the requested flow, we calculated the total daily flow used by the facility at the peak of the season, converted that flow to an equivalent number of homes, and determined the maximum instantaneous demand from there.

The marina has 50 "live on" boats and 310 other slips which have access to the marina bathroom/shower facilities. The boat pump out facility uses 750 gallons per day and the restaurant has 250 patrons per day on an average summer weekend. Total daily flow on a peak day was calculated to be 10,200 gpd. Average domestic home use is 800 gpd, so the peak daily flow is equivalent to 12.75 homes. From the attached sizing guideline chart, the maximum instantaneous demand for 12.75 homes is 38 gpm. Attached are the corresponding calculations and support documents.

Please let me know if you have any questions.

Best regards,

Ray Kimball, PE

1/16/2008



ENGINEERS • SURVEYORS • PLANNERS

PROJECT: SILVER BEACH H₂O

PROJECT NO.: 07-268

DATE: 1-4-08

BY: RDK

SCALE: SHEET OF

SILVER BEACH MARINA / BEACH HOUSE

250 CUSTOMERS/DAY @ RESTAURANT

360 SLIP MARINA

50 LIVE ON BOATS

2 BATHROOMS

6 SHOWERS

750 GPD USED FOR PUMPOUT

1 FLOATING GAS STATION/STORE

H₂O USE : RESTAURANT : 8 GPD / PATRON. = 2000 GPD

MARINA LIVE ON UNITS : 25 GPD / SLIP = 1250 GPD

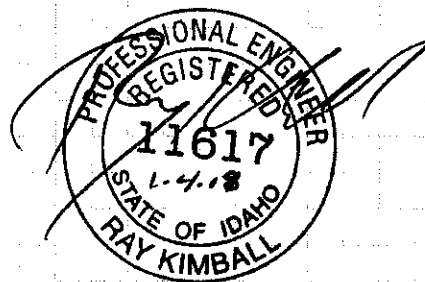
MARINA FACILITY W/ BATHROOM / SHOWER FACILITY : 20 GPD / SLIP = 6200 GPD

BOAT PUMP OUT : 750 GPD

TOTAL: 10,200 GPD

AVERAGE HOME USE: 800 GPD. ⇒ EQUIVALENT # HOMES = 12.75

MAXIMUM INSTANTANEOUS DEMAND FOR 12.75 HOMES = 38 GPM.



SOURCES: WATER SYSTEMS ENGINEERING MANUAL (GRUNDFOS)

SIZING GUIDELINES FOR PUBLIC WATER SUPPLIES

MARINA USE WAS ASSUMED TO APPROXIMATE CAMPING/RV/PICNIC FACILITIES

Table 1-24 Public and Commercial Individual Water Usage Requirements

Type of Establishment	Usage Avg. gpd	Usage Range gpd (L/day)
Airport (per passenger)	4	3-5 (11-19)
Apartment, multiple family (per resident)	60	60 (227)
Bathhouse (per bather)	10	10 (38)
Camp:		
Construction, semipermanent (per worker)	50	50 (189)
Day, no meals served (per camper)	15	15 (57)
Luxury (per camper)	120	100-150 (379-568)
Resort, day and night, limited plumbing (per camper)	50	50 (189)
Tourist, central bath and toilet facilities (per person)	35	35 (132)
Tourist, central bath and toilet facilities (per person)	50	50 (189)
Cottage, seasonal occupancy (per resident)		
Club:		
Country (per resident member)	100	100 (379)
Country (per nonresident member present)	25	25 (95)
Dwelling:		
Boardinghouse (per boarder)	50	50 (189)
Additional kitchen requirements for nonresident boarders	-	10 (38)
Luxury (per person)	120	100-150 (379-568)
Multiple-family apartment (per resident)	40	40 (151)
Rooming house (per resident)	60	60 (227)
Single family (per resident)	60	50-75 (189-284)
Estate (per resident)	120	100-150 (379-568)
Factory (gallons per person per shift)	20	15-35 (57-132)
Highway rest area (per person)	5	5 (19)
Hotel:		
Private baths (2 persons per room)	60	60 (227)
No private baths (per person)	50	50 (189)
Hospital (per bed)	300	250-400 (946-1514)
Laundry, self-serviced (gallons per washing [per customer])	50	50 (189)
Motel:		
Bath, toilet, and kitchen facilities (per bed space)	50	50 (189)
Bed and toilet (per bed space)	40	40 (151)
Park:		
Overnight, flush toilets (per camper)	25	25 (95)
Trailer, individual bath units, no sewer connection (per trailer)	25	25 (95)
Trailer, individual baths, connected to sewer (per person)	50	50 (189)
Picnic:		
Bathhouses, showers, and flush toilets (per picnicker)	20	20 (76)
Toilet facilities only (gallons per picnicker)	10	10 (38)
Restaurant:		
Toilet facilities (per patron)	8	7-10 (26-38)
No toilet facilities (per patron)	2.5	2-1/2-3 (9-11)
Bar and cocktail lounge (additional quantity per person)		2 (8)
School:		
Boarding (per pupil)	80	75-100 (284-379)
Day, cafeteria, gymnasiums, and showers (per pupil)	-	25 (95)
Day, cafeteria, no gymnasiums or showers (per pupil)	-	20 (76)
Day, no cafeteria, gymnasiums, or showers (per pupil)	-	15 (57)
Day, no cafeteria, gymnasiums, or showers (per pupil)	10	10 (38)
Service station (per vehicle)	400	400 (1514)
Store (per toilet room)	10	10 (38)
Swimming pool (per swimmer)		
Theater:		
Drive-in (per car space)	5	5 (19)
Movie (per auditorium seat)	5	5 (19)
Worker:		
Construction (per person per shift)	50	50 (189)
School or office (per person per shift)	15	15 (57)

Table 1

TABULATED MAXIMUM INSTANTANEOUS FLOWS
Number of Connections vs. Maximum Instantaneous
Demand (MID) Flows for Residential Use

No.	Flow	No.	Flow	No.	Flow	No.	Flow
1	15	26	65	51	104	76	129
2	17	27	67	52	105	77	130
3	19	28	69	53	106	78	131
4	21	29	71	54	107	79	132
5	23	30	73	55	108	80	133
6	25	31	75	56	109	81	134
7	27	32	77	57	110	82	135
8	29	33	79	58	111	83	136
9	31	34	81	59	112	84	137
10	33	35	83	60	113	85	138
11	35	36	85	61	114	86	139
12	37	37	87	62	115	87	140
13	39	38	89	63	116	88	141
14	41	39	91	64	117	89	142
15	43	40	93	65	118	90	143
16	45	41	94	66	119	91	144
17	47	42	95	67	120	92	145
18	49	43	96	68	121	93	146
19	51	44	97	69	122	94	147
20	53	45	98	70	123	95	148
21	55	46	99	71	124	96	149
22	57	47	100	72	125	97	150
23	59	48	101	73	126	98	151
24	61	49	102	74	127	99	152
25	63	50	103	75	128	100	153

FOR EACH CONNECTION IN EXCESS OF 100, ADD AN ADDITIONAL 0.7 GPM.

IRRIGATION: Additional MID flows shall be required for those systems east of the Cascades which:

1. Do not have a separate irrigation system available to each lot; and,
2. Have lot sizes greater than 2.5 acres.

The additional flow shall be 10 gpm for each acre to be irrigated over the base value which is the product of 2.5 x the number of connections.

If irrigation will not be permitted on more than 2.5 acres per connection, or if additional management controls are instituted, then such information shall be noted on restrictive covenants, water user agreements, or some other legally enforceable agreement between the lot owner and the water system. This information must be submitted when requesting system approval in order to eliminate the additional flow requirements.

RECREATIONAL DEVELOPMENTS: Recreational developments shall use 60% of the values in Table 1. See page 28 regarding recreational developments.

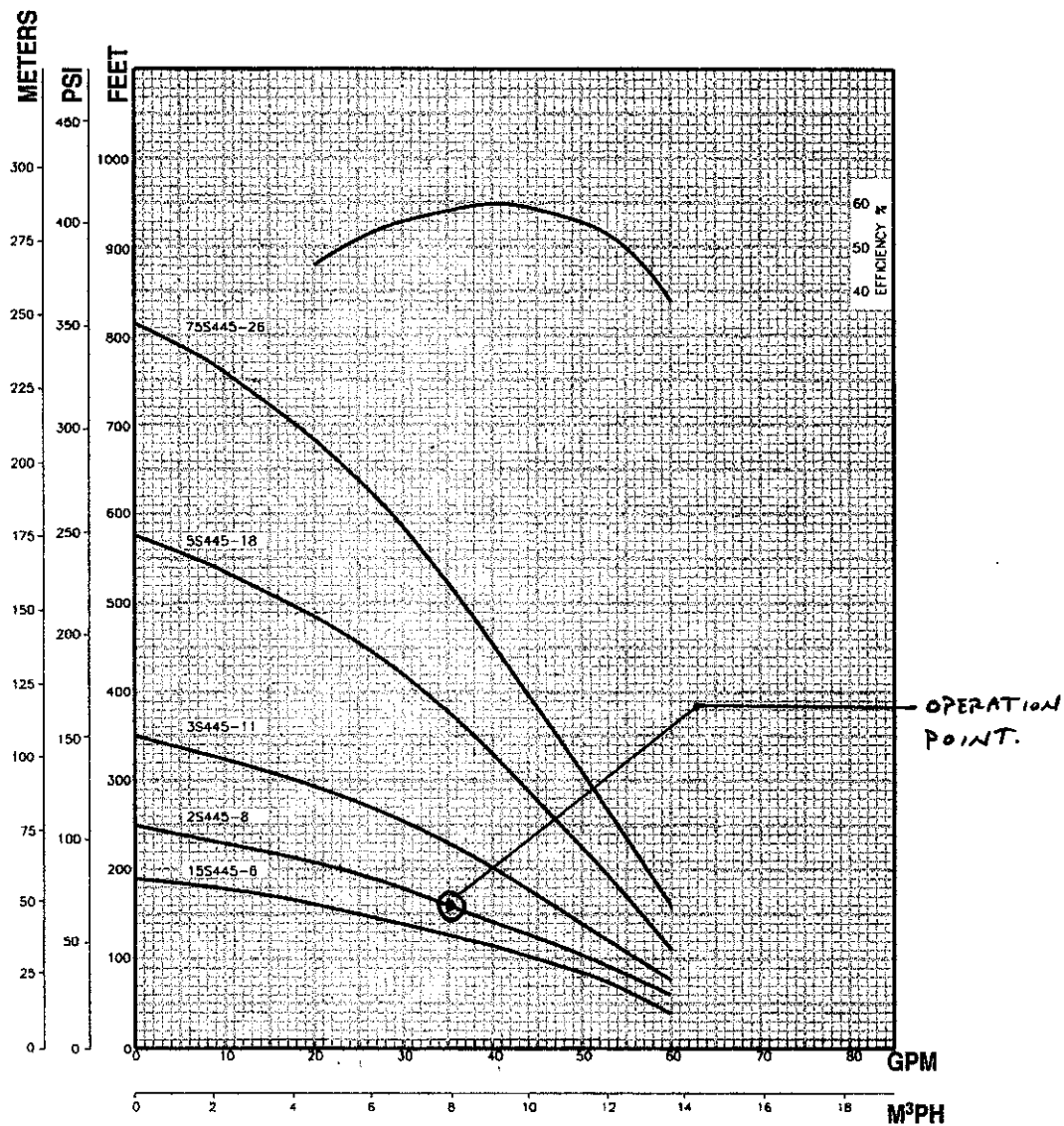
CLASS IV WATER SYSTEMS: Class IV water systems may be designed based on the above table or based on the Class 4 Water System Design book.

765 2115



SandHandler™ High Capacity 45 GPM

Performance Curves



- Notes:
- 1) Performance shown does not include friction loss in the drop pipe.
 - 2) All performance data is based on rated motor name plate voltage.
 - 3) Performance for former XP models are the same as 45 GPM models.



Franklin Pump Systems

SandHandler™ High Capacity 45 GPM

Performance Charts

Submersibles

CAPACITIES IN U.S. GALLONS PER MINUTE

CAPACITIES IN G.P. GALLONS PER MINUTE																					
PUMP MODEL	HP	PSI	DEPTH TO PUMPING WATER LEVEL, OR LIFT, IN FEET																		
			SHADED AREAS INDICATE MOST EFFICIENT PERFORMANCE																		
			20	40	60	80	100	120	140	160	180	200	240	260	280	300	320	340	360	380	400
15S445-6	1-1/2	0	68	62	57	52	46	39	31												
		10	62	56	51	45	38	29	19												
		20	55	50	44	36	28	17	5												
		30	49	42	35	26	16	3													
		40	41	34	25	14															
		50	33	23	12																
60	22	10																			
Shut-off (ft.)	190	PSI	74	65	56	48	39	30	22	13	4										
2S445-8	2	0	71	65	60	56	52	48	44	40	35	29									
		10	64	59	55	51	48	44	40	34	28	20									
		20	58	54	51	47	43	39	33	27	19	9									
		30	54	50	47	43	38	32	26	17	7										
		40	50	46	42	37	32	24	16	5											
		50	45	41	36	31	23	14	3												
60	41	36	29	22	13	1.5															
Shut-off (ft.)	250	PSI	104	95	87	78	69	61	52	43	35	26	9								
3S445-11	3	0	72	68	65	62	59	56	53	50	47	43	36	31	26	20					
		10	68	64	61	58	55	52	49	46	43	39	30	25	19	12					
		20	64	61	58	55	52	49	46	42	38	34	24								
		30	60	57	54	52	48	45	42	38	34	29	17								
		40	57	54	51	48	45	41	37	33	28	22	16								
		50	54	51	47	44	41	37	32	27	21	15									
		60	50	47	44	40	36	31	26	20	14										
		70	46	43	39	35	31	25	19	13											
		80	43	39	35	30	24	18	12												
		90	38	34	29	24	18	11													
100	33	28	23	16	9																
Shut-off (ft.)	350	PSI	143	134	126	117	108	100	91	82	74	65	48	39	30	22	13	4			
5S445-18	5	0			69	66	63	61	59	57	55	53	50	48	46	44	42	40	38	36	33
		20	68	65	63	60	57	56	54	52	51	49	46	44	42	40	38	35	32	29	26
		40	62	60	57	56	54	52	50	48	46	44	41	39	37	34	32	28	25	21	
		60	57	55	51	51	50	48	46	44	43	41	36	33	31	27	24	20	16		
		80	53	51	49	47	46	44	42	40	38	35	30	26	23	19					
		100	49	47	45	43	41	39	37	34	32	29	25	18							
		120	45	43	41	39	36	34	31	28	24	20	16								
		140	40	38	35	33	30	27	23	19											
		160	35	32	29	26	22	18													
170	31	28	25	21	17																
Shut-off (ft.)	575	PSI	236	227	219	210	201	193	184	175	167	158	141	132	123	115	106	97	89	80	71
PUMP MODEL	HP	PSI	DEPTH TO PUMPING WATER LEVEL, OR LIFT, IN FEET																		
			SHADED AREAS INDICATE MOST EFFICIENT PERFORMANCE																		
			50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	
75S445-26	7-1/2	0	-	-	-	-	57	54	50	47	44	40	36	32	28	24	18	11	3		
		20		-	-	57	54	50	47	44	40	36	32	28	24	18	11	3			
		40		-	58	54	51	48	45	41	37	33	29	24	18	12	5				
		60		58	55	52	48	45	41	37	33	29	25	19	12	5					
		80		55	52	48	45	41	37	33	29	25	19	12	5						
		100		52	48	45	42	38	34	30	25	20	14	6							
		120		49	45	42	38	34	30	25	21	14	7								
		140		45	42	38	35	30	26	21	15	7									
		160		42	39	35	31	26	21	15	8										
		180		39	35	31	27	22	16	8											
200		35	31	27	22	16	9														
220		32	27	22	17	10															
Shut-off (ft.)	815	PSI	331	310	288	266	245	223	201	180	158	136	115	93	71	50	28	6			