

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

RECEIVED

MAY 31 2017

DEPARTMENT OF
WATER RESOURCES

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

A. GENERAL INFORMATIONPermit No. 63-336761. Owner City of Boise, Department of Parks and RecreationPhone No. 208-608-7600Current address 1104 Royal Boulevard, Boise, ID 837062. Examiner's name Terry Scanlan, P.E., P.G.EXAM DATE 5/24/20173. Accompanied by Mike WoodwardEmail mwoodward@cityofboise.orgAddress 1104 Royal Boulevard, Boise, ID 83706Relationship to permit holder Horticulture Manager, BPRDPhone No. 608-71894. Source Ground Water

tributary to _____

B. OVERLAP REVIEW1. Other water rights with the same place of use 63-33579, New York Irrigation District water2. Other water rights with the same source and point of diversion 63-33579**C. DIVERSION AND DELIVERY SYSTEM**

1. Point(s) of Diversion:

Ident. No.	Gov't Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determination/Remarks
			SE	SW	15	3N	2E	Ada	Exam, Aerial Photo

2. Place(s) of Use:

Method of determination Exam, aerial photo

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
3N	2E	15												X					

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

Scale: 1" = _____

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

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
Well Pump	Franklin Electric	5	Submersible	FPS 4400	2 inch
				90FA5S4-PE	

*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
32 gal trash can, 5 gal bucket						
2-inch hose						

2. **Measurements:** _____

32 gallon trash can: 21 to 22 seconds fill times, 32 gallons x 60 seconds/minute / 21.5 seconds = 89 gpm = 0.20 cfs

5 gallon bucket: 3.0 to 3.5 seconds fill times, 5 gallons x 60 seconds/minute / 3.25 seconds = 92 gpm = 0.21 cfs

E. NARRATIVE/REMARKS/COMMENTS

A 6" well equipped with a 5 hp submersible pump provides water to a soil-lined pond at Terry Day Park for diversion to storage, municipal storage, and municipal from storage uses that include supplemental irrigation, wildlife, and recreation. Surface water from New York Irrigation District (NYID) is also diverted to the pond for irrigation purposes. The purpose of the well is to supplement NYID water when necessary and to keep the pond full during the non-irrigation season for aesthetic and wildlife purposes. There is not a direct diversion from the well to the pressurized irrigation system. Ground water is discharged into the pond, and a wet well equipped with submersible pumps is used to divert water from the pond into a pressurized irrigation system.

The well was completed with 6-inch diameter casing from +2 feet to 216 feet and 226 to 286 feet, and 6-inch diameter screen from 216 to 226 feet and 286 to 296 feet. Timed fill measurements at the time of the exam supported a well pump capacity of 90 gpm.

Development found at the time of the exam includes 5 acres of landscape area and 0.66 acre pond surface area with a maximum depth of 14 feet. Storage volume is approximately 5 acre feet. ET Idaho information included in Attachment C indicates the pond will have 1.5 ac-ft loss to evaporation per year. Seepage loss, based on the design maximum rate of 1/2 inch per day, is 10.0 acre feet over the 0.66 acre pond area. The permit allows 50 afa for storage (including evap) with multiple fills.

This permit is limited to 72 gpm or 0.16 cfs. Permit 63-33579 covers an additional 18 gpm or 0.04 cfs and the same volume amounts. This right, when combined with 63-33579 should be limited to 0.20 cfs and 38.6 ac-ft. See accompanying licensing exam for permit 63-33579.

Exam Attachments

Attachment A: Field Exam Map

Attachment B: System Components and Diagrams

Attachment C: Flow Rate and Volume Calculations

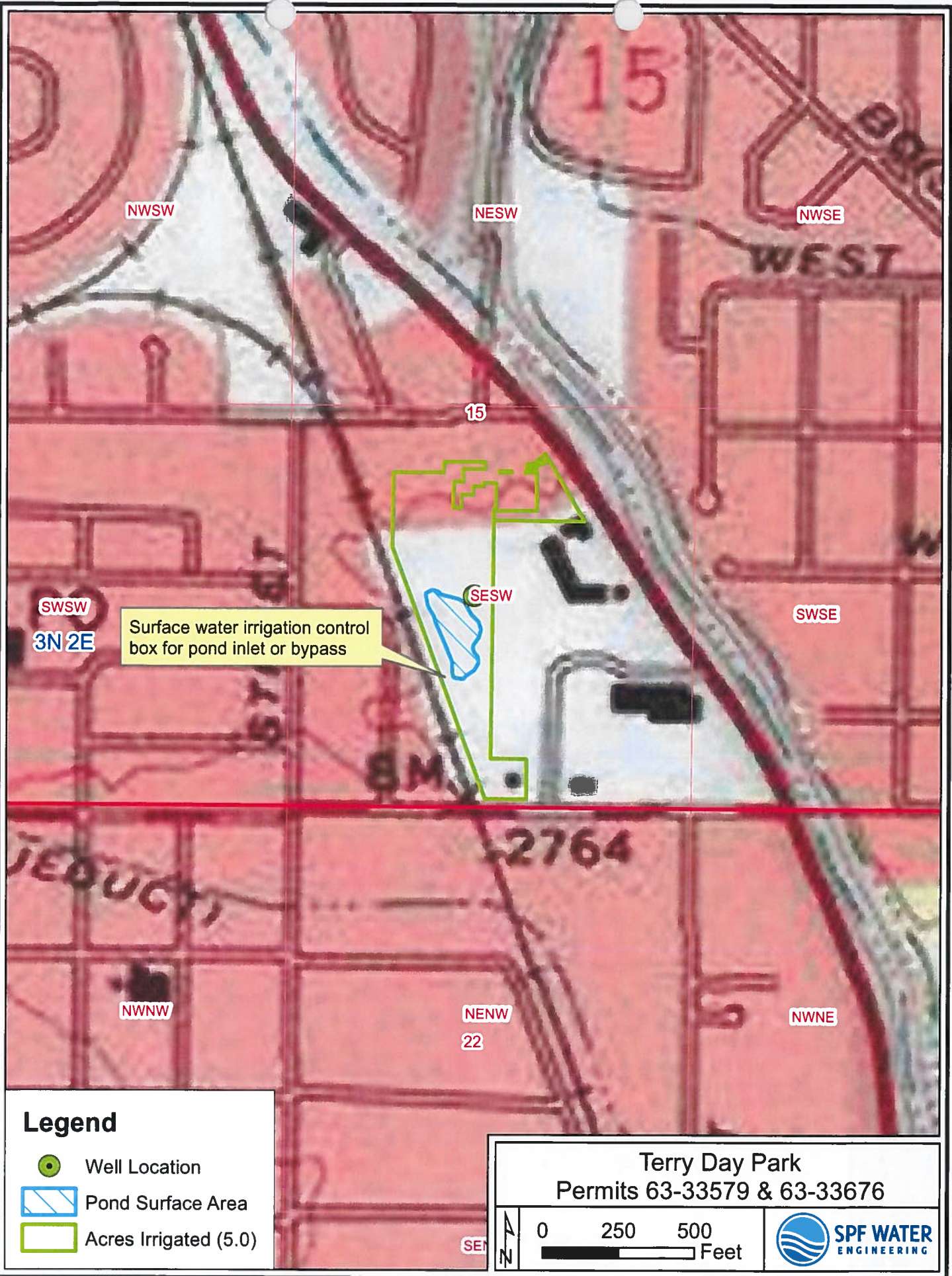
Attachment D: Exam Photos

Attachment E: Proof of Beneficial Use

Has the permit holder met all conditions of permit approval, including any mitigation requirements and/or measuring device installation requirements? ☒ Yes ☐ No If no, what must be done to meet the permit requirements?

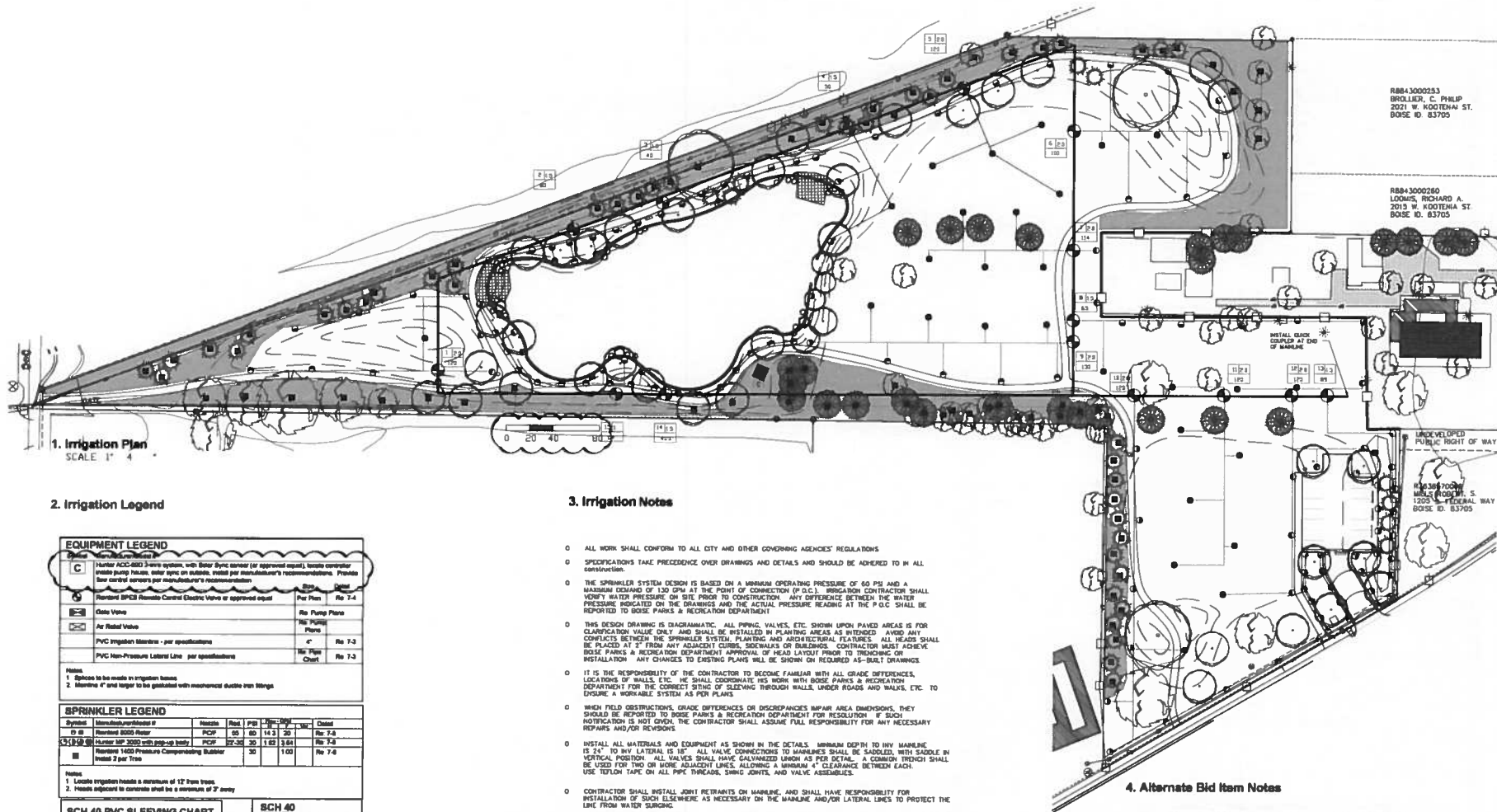
ATTACHMENT A
FIELD EXAM MAP





ATTACHMENT B

SYSTEM COMPONENTS AND DIAGRAMS



1. Irrigation Plan
SCALE: 1" = 4'

2. Irrigation Legend

EQUIPMENT LEGEND			
Symbol	Description	Qty	Notes
	1/2" ACP-600 3-way valve, with 1/2" O.D. outlet (if approved equal, 1/2" O.D. outlet)		Provide per manufacturer's recommendations. Provide flow control valves per manufacturer's recommendations.
	Standard BPCB Remote Control Electric Valve or approved equal	Per Plan	Re: 7-4
	Gate Valve	Re: Pump Plans	
	Air Relief Valve - per specifications	Re: Pump Plans	
	PVC Irrigation Mainline - per specifications	c'	Re: 7-3
	PVC Non-Pressure Lateral Line - per specifications	Re: Pipe Chart	Re: 7-3

SPRINKLER LEGEND			
Symbol	Description	Qty	Notes
	Standard 8000 Head	PCP 10	Re: 7-4
	Hunter MP 2000 with pop-up body	PCP 12-35	Re: 7-4
	Hunter 1400 Pressure Compensating Bubble Head	30	Re: 7-4

SCH 40 PVC SLEEVING CHART			
1" Sleeve	1-1/2" Sleeve	2" Sleeve	Notes
1" Sleeve	1-1/2" Sleeve	2" Sleeve	
1" Sleeve	1-1/2" Sleeve	2" Sleeve	
1" Sleeve	1-1/2" Sleeve	2" Sleeve	
1" Sleeve	1-1/2" Sleeve	2" Sleeve	
1" Sleeve	1-1/2" Sleeve	2" Sleeve	
1" Sleeve	1-1/2" Sleeve	2" Sleeve	
1" Sleeve	1-1/2" Sleeve	2" Sleeve	
1" Sleeve	1-1/2" Sleeve	2" Sleeve	
1" Sleeve	1-1/2" Sleeve	2" Sleeve	

Note: All valves and pipe below handings must be covered per this chart. Stamp a 2" x 6" on concrete with all the above.

3. Irrigation Notes

- ALL WORK SHALL CONFORM TO ALL CITY AND OTHER GOVERNING AGENCIES' REGULATIONS.
- SPECIFICATIONS TAKE PRECEDENCE OVER DRAWINGS AND DETAILS AND SHOULD BE ADHERED TO IN ALL CONSTRUCTION.
- THE SPRINKLER SYSTEM DESIGN IS BASED ON A MINIMUM OPERATING PRESSURE OF 60 PSI AND A MAXIMUM HEAD OF 130 GPM AT THE POINT OF CONNECTION (P.O.C.). IRRIGATION CONTRACTOR SHALL VERIFY WATER PRESSURE ON SITE PRIOR TO CONSTRUCTION. ANY DIFFERENCE BETWEEN THE WATER PRESSURE INDICATED ON THE DRAWINGS AND THE ACTUAL PRESSURE READING AT THE P.O.C. SHALL BE REPORTED TO BOISE PARKS & RECREATION DEPARTMENT.
- THIS DESIGN DRAWING IS DIAGNOSTIC. ALL PIPING, VALVES, ETC. SHOWN UPON PAVED AREAS IS FOR CLARIFICATION VALUE ONLY AND SHALL BE INSTALLED IN PLANTING AREAS AS NOTED. AVOID ANY CONFLICTS BETWEEN THE SPRINKLER SYSTEM, PLANTING AND ARCHITECTURAL FEATURES. ALL HEADS SHALL BE PLACED AT 3" FROM ANY ADJACENT CURB, SIDEWALK OR BUILDING. CONTRACTOR MUST ADHERE TO BOISE PARKS & RECREATION DEPARTMENT APPROVAL OF HEAD LAYOUT PRIOR TO TRENCHING OR INSTALLATION. ANY CHANGES TO EXISTING PLANS WILL BE SHOWN ON REQUIRED AS-BUILT DRAWINGS.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BECOME FAMILIAR WITH ALL GRADE DIFFERENCES, LOCATIONS OF WALLS, ETC. HE SHALL COORDINATE HIS WORK WITH BOISE PARKS & RECREATION DEPARTMENT FOR THE CORRECT SIZING OF SLEEVING THROUGH WALLS, UNDER ROADS AND WALKS, ETC. TO ENSURE A WORKABLE SYSTEM AS PER PLANS.
- WHEN FIELD OBSTRUCTIONS, GRADE DIFFERENCES OR DISCREPANCIES IMPAIR AREA DIMENSIONS, THEY SHOULD BE REPORTED TO BOISE PARKS & RECREATION DEPARTMENT FOR RESOLUTION. IF SUCH NOTIFICATION IS NOT GIVEN, THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY NECESSARY REPAIRS AND/OR REVISIONS.
- INSTALL ALL MATERIALS AND EQUIPMENT AS SHOWN IN THE DETAILS. MINIMUM DEPTH TO INV. MAINLINE IS 24" TO INV. LATERAL IS 18". ALL VALVE CONNECTIONS TO MAINLINES SHALL BE SADDLED, WITH SADDLE IN VERTICAL POSITION. ALL VALVES SHALL HAVE GALVANIZED WASH AS PER DETAIL. A COMMON TRENCH SHALL BE USED FOR TWO OR MORE ADJACENT LINES, ALLOWING A MINIMUM 4" CLEARANCE BETWEEN EACH. USE TIGHT TAP ON ALL PIPE THREADS, DRUG JOINTS, AND VALVE ASSEMBLIES.
- CONTRACTOR SHALL INSTALL JOINT RESTRAINTS ON MAINLINE, AND SHALL HAVE RESPONSIBILITY FOR INSTALLATION OF SUCH ELSEWHERE AS NECESSARY ON THE MAINLINE AND/OR LATERAL LINES TO PROTECT THE LINE FROM WATER SURGING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL HIGH-UP OF ELECTRICAL OUTLET TO AUTOMATIC CONTROLLER AND UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL FLUSH AND ADJUST ALL SPRINKLER HEADS FOR OPTIMUM PERFORMANCE AND TO PREVENT OVER SPRAY ONTO WALKS, ROADS AND/OR BUILDINGS AS MUCH AS POSSIBLE. THIS SHALL INCLUDE THE SELECTION OF OPTIMUM ARC DEGREE TO FIT THE EXISTING SITE CONDITIONS AND TO THROTTLE THE FLOW CONTROL SYSTEM AT EACH VALVE TO OBTAIN OPTIMUM OPERATING PRESSURE FOR EACH SYSTEM, IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL TAKE RESPONSIBILITY FOR THE PROTECTION OF ALL PLANT MATERIALS DESIGNATED TO REMAIN ON SITE. HE SHALL TAKE NECESSARY PRECAUTIONS TO ENSURE PROTECTION FROM EQUIPMENT AND WORKER DAMAGE.
- CONTRACTOR SHALL BACKFILL, WATER SETTLE AS PER SPECIFICATIONS, AND REGRADE SITE TO FINISHED GRADE (FINISHED, GRASSY AND NOT FOR SETTING, OR ANYTHING).
- NO 4-WAY FITTINGS.
- AS-BUILTS SHALL BE PROVIDED PRIOR TO SUBSTANTIAL COMPLETION.

4. Alternate Bid Item Notes

- ALTERNATE 2 - PROVIDE AND INSTALL TREES AROUND POND, INCLUDING SPRAY HEAD IRRIGATION.
- ALTERNATE 5 - PROVIDE AND INSTALL HYDROSEEDED 'RTF' TURF AND IRRIGATION FOR AREA SOUTH OF POND.
- ALTERNATE 9 - PROVIDE AND INSTALL PERIMETER TREES (#4) INCLUDING 2 BUBBLERS PER TREE RE: 7-4.

RBB43000253
BROOKER, C. PHILIP
2021 W. KOOTENAI ST.
BOISE ID. 83705

RBB43000260
LOOMIS, RICHARD A.
2013 W. KOOTENAI ST.
BOISE ID. 83705

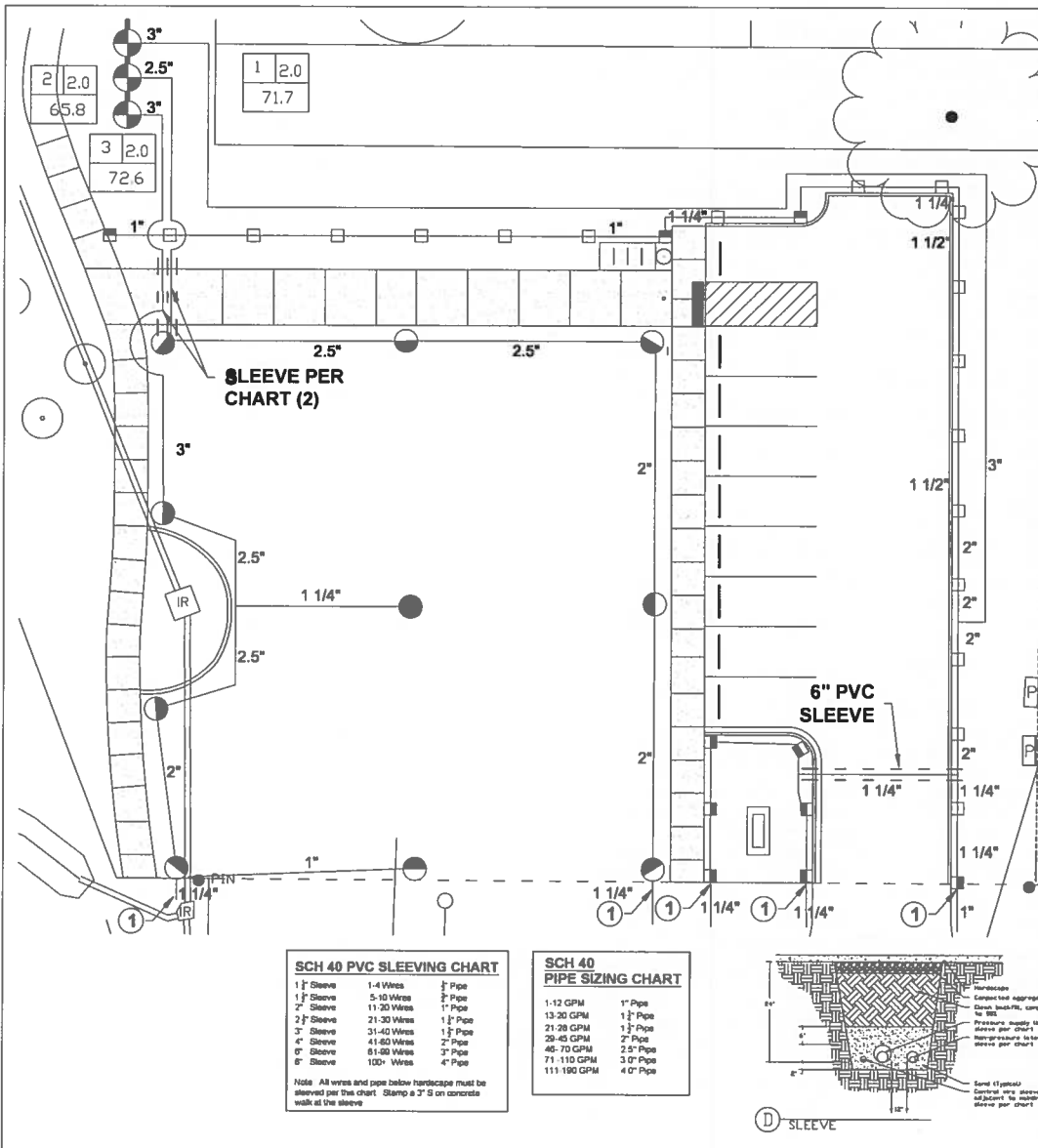
Date	Review
2.7.12	addendum 2

DAY PARK
CONSTRUCTION DOCUMENTS
IRRIGATION PLAN

IRRIGATION
PLAN

Drawn By	Checked By
Drawn By: [blank]	Checked By: [blank]
Scale	Sheet
Scale: 1" = 40' - 0"	24" x 36" SHEET

NORTH
6



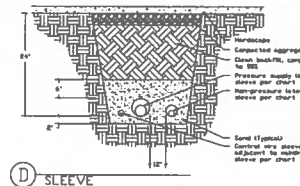
SCH 40 PVC SLEEVING CHART

1" Sleeve	1-4 Wires	1/2" Pipe
1 1/2" Sleeve	5-10 Wires	3/4" Pipe
2" Sleeve	11-20 Wires	1" Pipe
2 1/2" Sleeve	21-30 Wires	1 1/2" Pipe
3" Sleeve	31-40 Wires	2" Pipe
4" Sleeve	41-50 Wires	2 1/2" Pipe
6" Sleeve	61-80 Wires	3" Pipe
8" Sleeve	100+ Wires	4" Pipe

Note: All wires and pipe below hardscape must be sleeved per this chart. Stamp a "3" on concrete with all the sleeve.

SCH 40 PIPE SIZING CHART

1-12 GPM	1" Pipe
13-20 GPM	1 1/2" Pipe
21-28 GPM	2" Pipe
29-45 GPM	2 1/2" Pipe
46-70 GPM	3" Pipe
71-110 GPM	3 1/2" Pipe
111-190 GPM	4" Pipe



EQUIPMENT LEGEND

Symbol	Manufacturer/Model #	Size	Detail	Notes
	Rainbird PESB - PRS-D Remote Control Electric Valve	2"	-	4
	Existing PVC Irrigation Mainline	-	-	3
	PVC Non-Pressure Lateral Line - per specifications	Plan Size	-	2.5.6
Not Shown	UF Rated Control Wire, 14 Ga. Common, 14 Ga. Pilot	-	-	1
	Install (2) additional 14 Ga. Pilot wires to each valve location	-	-	

- Notes:
- Splices to be made in irrigation boxes.
 - 2", 3", 4", and 6" sized pipe to be Class 200. Smaller pipe to be Sch 40.
 - Mainline 4" and larger to be gasketed with mechanical ductile iron fittings.
 - Provide and install Two-Wire Decoder to communicate with Hunter Controller.
 - Sleeve laterals under all concrete per sleeving chart and details.
 - No poly-pipe permitted.

SPRINKLER LEGEND

Symbol	Manufacturer/Model #	Nozzle	Rad.	PSI	Flow GPM	Detail	Notes
	Rainbird 180DPRS	MPR	15'	30	.92 1.85	-	1
	Rainbird 8504-SS	8/14	50'	80	- 9.4 16.2	-	2

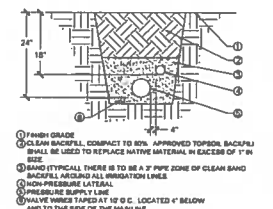
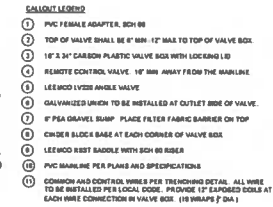
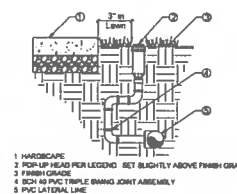
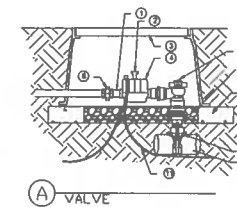
- Notes:
- Install Netafim Drip Irrigation in all of the Bark Beds per Manufacturer's Recommendations and plant water requirements.
 - Locate rotors a minimum of 12' from trees.

CALLOUT LEGEND

- ① Extend and cap lateral lines for future use.

GENERAL NOTES:

Provide a complete and functioning irrigation system.
Adjust existing heads to provide complete turf coverage and not over-spray onto concrete, parking lot or ACHD ROW.



Date	Review



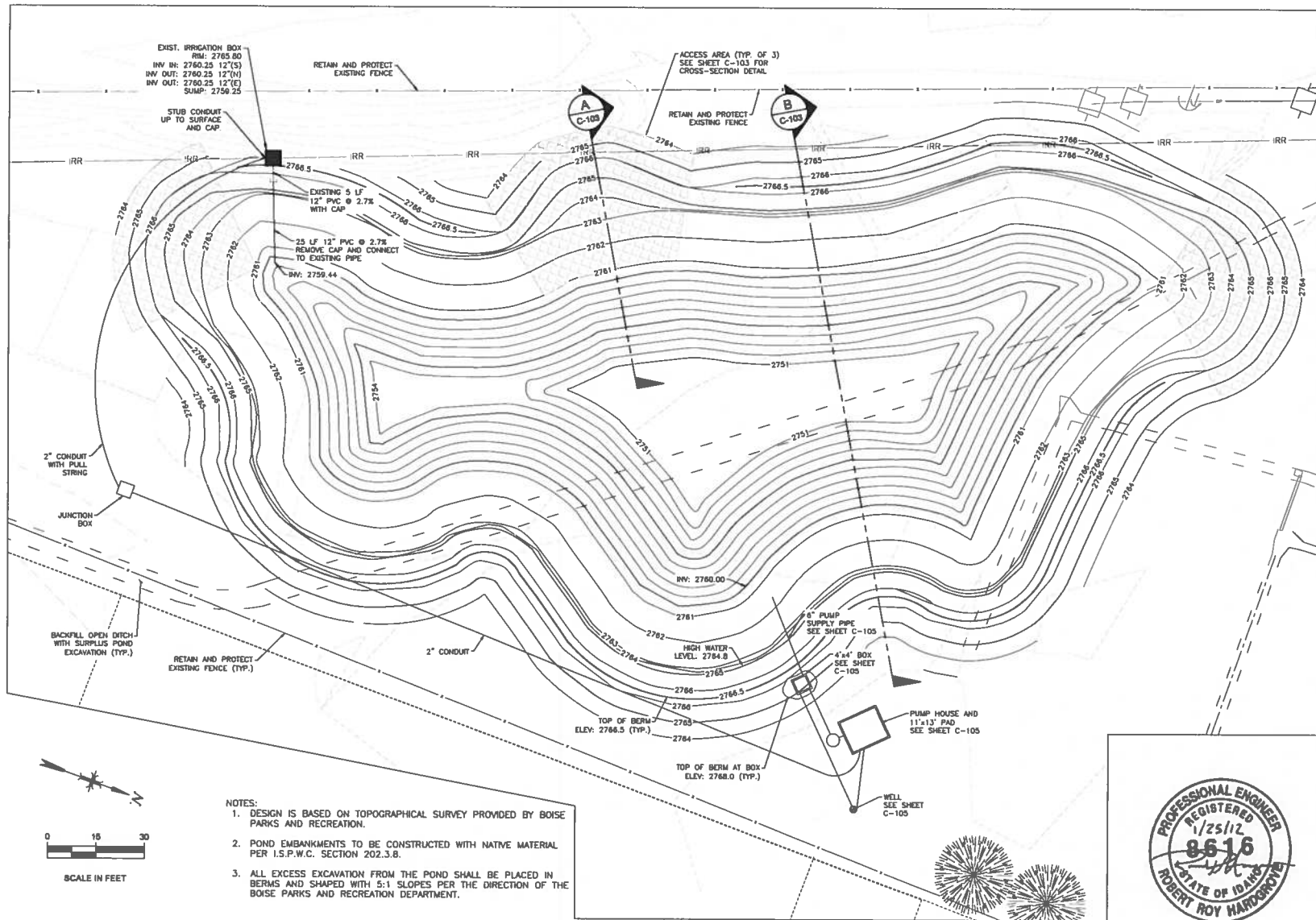
Parks & Recreation

**TERRY DAY PARK
PARKING LOT**
2000 W OVERLAND RD

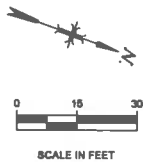
**IRRIGATION
SHEET**

Sheet No.	Sheet No.
Sheet No. 178	Sheet 177/178
Sheet No. 179	Sheet 178/179
Sheet No. 180	Sheet 179/180
Sheet No. 181	Sheet 180/181
Sheet No. 182	Sheet 181/182
Sheet No. 183	Sheet 182/183
Sheet No. 184	Sheet 183/184
Sheet No. 185	Sheet 184/185
Sheet No. 186	Sheet 185/186
Sheet No. 187	Sheet 186/187
Sheet No. 188	Sheet 187/188
Sheet No. 189	Sheet 188/189
Sheet No. 190	Sheet 189/190
Sheet No. 191	Sheet 190/191
Sheet No. 192	Sheet 191/192
Sheet No. 193	Sheet 192/193
Sheet No. 194	Sheet 193/194
Sheet No. 195	Sheet 194/195
Sheet No. 196	Sheet 195/196
Sheet No. 197	Sheet 196/197
Sheet No. 198	Sheet 197/198
Sheet No. 199	Sheet 198/199
Sheet No. 200	Sheet 199/200

Sheet Number
5 of 7



- NOTES:
- DESIGN IS BASED ON TOPOGRAPHICAL SURVEY PROVIDED BY BOISE PARKS AND RECREATION.
 - POND EMBANKMENTS TO BE CONSTRUCTED WITH NATIVE MATERIAL PER I.S.P.W.C. SECTION 202.3.8.
 - ALL EXCESS EXCAVATION FROM THE POND SHALL BE PLACED IN BERMS AND SHAPED WITH 5:1 SLOPES PER THE DIRECTION OF THE BOISE PARKS AND RECREATION DEPARTMENT.



CITY OF BOISE PARKS AND RECREATION
 TERRY DAY PARK - POND, WELL AND PUMP SYSTEM
 POND GRADING PLAN

DRAWN BY: J.HERNDON
 CHECKED BY: B.HARDGROVE
 SCALE: AS SHOWN
 PLOT SCALE:

REVISIONS	DATE	BY	DESCRIPTION
1	1/25/12	J.HERNDON	ISSUED FOR PERMITS AND CONSTRUCTION

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D 0063839

Drilling Permit No. 915241-863885

Water right or injection well # 63-33579

2. OWNER: City of Boise / Parks & Recreation Dept.

Name _____

Address 1104 Royal Blvd.

City Boise State ID Zip 83706

3. WELL LOCATION:

Twp. 3 North ☒ or South ☐ Rge. 2 East ☒ or West ☐

Sec. 15 1/4 SE 1/4 SW 1/4

Gov't Lot _____ County Ada

Lat. 43 35.511 (Deg. and Decimal minutes)

Long. 116 12.380 (Deg. and Decimal minutes)

Address of Well Site Off Kootenai St., east of Columbus turn right

City Boise

Lot. _____ Blk. _____ Sub. Name _____

4. USE:

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

5. TYPE OF WORK:

☒ New well ☐ Replacement well ☐ Modify existing well ☐ Abandonment ☐ Other

6. DRILL METHOD:

☐ Air Rotary ☒ Mud Rotary ☐ Cable ☐ Other

7. SEALING PROCEDURES:

Seal material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method/procedure
Cement mix	22'	198'	812 Gal	Pressure Grout
3/4 Bent.	0'	22'	18 bags	Pour

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
6"	226'	286'	.250	Steel	☒	☐	☐	☒
6"	+4	216'	.250	Steel	☒	☐	☐	☒
					☐	☐	☐	☐
					☐	☐	☐	☐

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

9. PERFORATIONS/SCREENS:

Perforations ☐ Y ☒ N Method _____

Manufactured screen ☒ Y ☐ N Type Johnson

Method of installation Overbore

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
286'	296'	.025		6"	SS	
216'	226'	.015		6"	SS	

Length of Headpipe _____ Length of Tailpipe _____

Packer ☐ Y ☒ N Type _____

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method
16-30 Sand	200'	230'	27 bags	Pour
10-20 Sand	230'	275'	39 bags	Pour

11. FLOWING ARTESIAN:

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

Describe control device _____

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) 98 Static water level (ft) 98

Water temp. (°F) 56 Bottom hole temp. (°F) _____

Describe access port Well Cap

Well test:	Test method:
Drawdown (feet)	Discharge or yield (gpm)
23'	50 GPM
	Test duration (minutes)
	4.5 hours
Pump	Bailer
☒	☐
Air	Flowing artesian
☐	☐

Water quality test or comments: _____

13. LITHOLOGIC LOG and/or repairs or abandonment:

Bore Dia. (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water	
				Y	N
12"	0'	8'	Topsoil		X
12"	8'	53'	Large Gravel		X
12"	53'	64'	Clay w/sand		X
12"	64'	72'	Sandy Clay		X
12"	72'	81'	Sand		X
12"	81'	106'	Sandy Clay		X
12"	106'	112'	Black Sticky Clay		X
12"	112'	120'	Brown Sandy Clay		X
12"	120'	174'	Brown Sand		X
12"	174'	238'	Blue Clay w/sand streak	X	
12"	238'	254'	Brown Sand w/Fine Clay		X
12"	254'	261'	Fine Brown Sand w/Clay		X
12"	261'	275'	Sandy Brown Clay		X
12"	275'	288'	Brown Clay w/sand streaks		X
12"	288'	290'	Medium Coarse Sand	X	
12"	290'	292'	Sandy Clay		X
12"	292'	305'	Brown Sticky Clay		X

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AUG 30 2012

WATER RESOURCES
WESTERN REGION

Completed Depth (Measurable): 296'

Date Started: Jul 17, 2012 Date Completed: Aug 23, 2012

14. DRILLER'S CERTIFICATION:

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

Company Name Adamson Pump & Drilling Co. No. 457

*Principal Driller Dave Adamson Date Aug 29, 2012

*Driller Matt Steffen Date Aug 29, 2012

*Operator II _____ Date _____

Operator I _____ Date _____

* Signature of Principal Driller and rig operator are required.

ATTACHMENT C

FLOW RATE AND VOLUME CALCULATIONS

Submersible Pumps

4" High Capacity Pumps

Ordering Information (See pgs. 2-3 for model number explanation)

1 - 10 HP 4" Pump Ends						
GPM	HP	Stages	Ordering Info.		Dimensions	Wt.
			Model No.	Order No.	Pump End Only	
35	1	6	35FA1S4-PE	93613506	15.00	9
	1.5	8	35FA15S4-PE	93613508	17.50	10
	2	10	35FA2S4-PE	93613510	20.00	11
	3	14	35FA3S4-PE	93613514	25.00	13
	5	22	35FA5S4-PE	93613522	35.00	17
	7.5	34	35FA7S4-PE	93613534	52.17	25
	10	42	35FA10S4-PE	93613542	62.23	31
45	1.5	6	45FA15S4-PE	93614506	21.00	15
	2	8	45FA2S4-PE	93614508	25.50	16
	3	11	45FA3S4-PE	93614511	32.25	19
	5	18	45FA5S4-PE	93614518	47.75	25
	7.5	26	45FA7S4-PE	93614526	65.25	33
	10	31	45FA10S4-PE	93614531	78.30	38
60	2	6	60FA2S4-PE	93616006	21.00	15
	3	8	60FA3S4-PE	93616008	25.50	17
	5	13	60FA5S4-PE	93616013	36.75	21
	7.5	17	60FA7S4-PE	93616017	45.25	25
	10	24	60FA10S4-PE	93616024	61.00	31
90	2	5	90FA2S4-PE	93619005	22.56	15
	3	7	90FA3S4-PE	93619007	28.56	17
	5	12	90FA5S4-PE	93619012	43.56	21
	7.5	19	90FA7S4-PE	93619019	64.50	27

Notes: All dimensions are in inches. Discharge is 2" NPT. Maximum diameter across cable guard is 3.90" on all models. Weight in pounds.

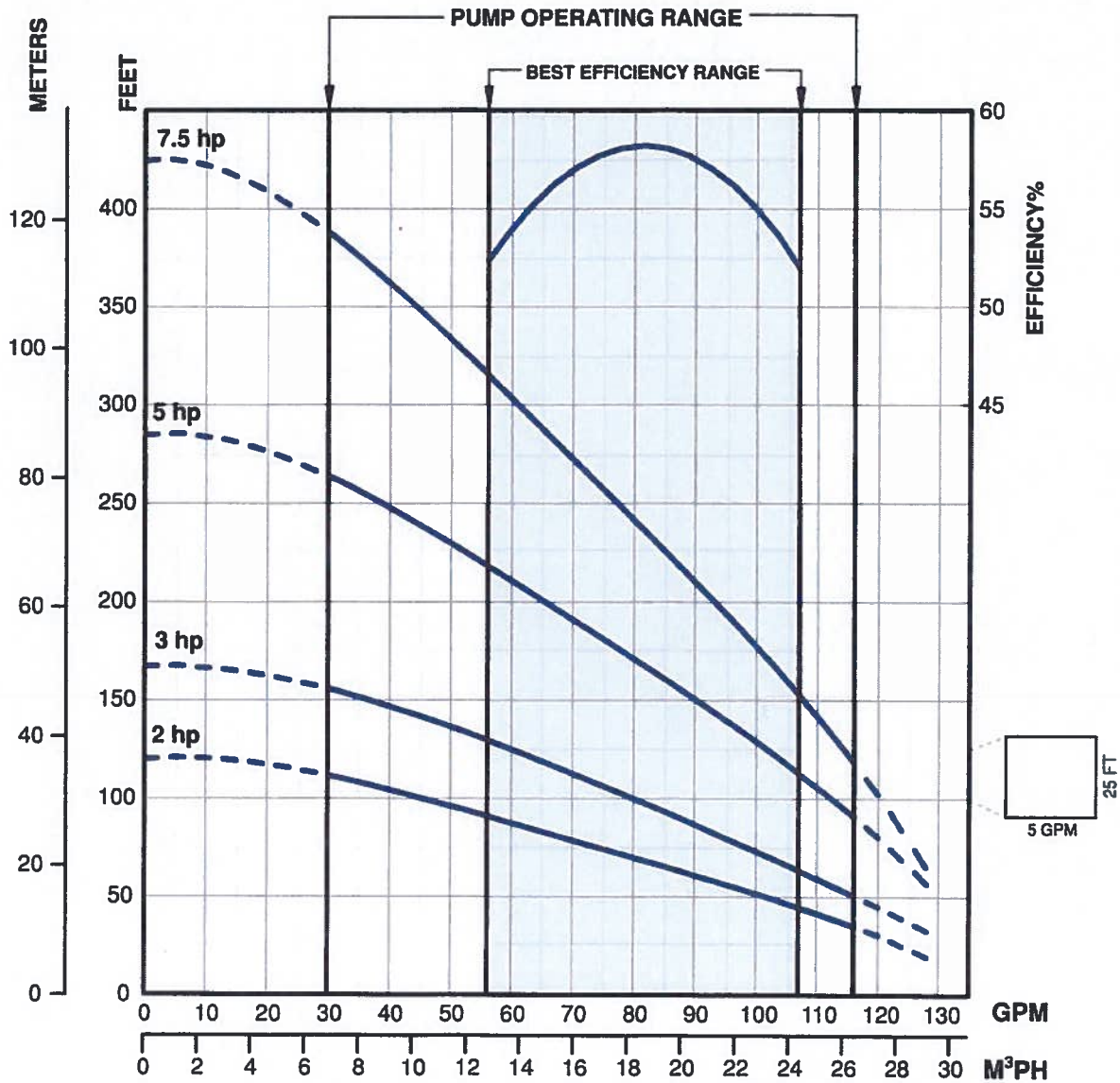
1 - 1.5 HP Single-Phase Units									
GPM	HP	Stages	Volts	2-Wire			3-Wire		
				Model No.	Order No.	Wt.	Model No.	Order No.	Wt.
35	1	6	230	35FA1S4-2W230	93613606	33	35FA1S4-3W230	93613706	33
	1.5	8	230	35FA15S4-2W230	93613608	41	35FA15S4-3W230	93613708	39
45	1.5	6	230	45FA15S4-2W230	93614606	46	45FA15S4-3W230	93614706	44

Notes: All listed above have 2" NPT discharge. Order check valve separately.
Pump and motor will be individually cartoned and require assembly.
Weight in pounds.

Submersible Pumps

4" High Capacity Pumps

90 GPM Performance Curves



4" Submersible Pump

4400 High Capacity 90 GPM Performance Charts

Capacities in U.S. Gallons per Minute

HP	PSI	DEPTH TO PUMPING WATER LEVEL, OR LIFT, IN FEET SHADED AREAS INDICATE MOST EFFICIENT PERFORMANCE																	
		20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	
2	0	130	120	110	100	90	80	70	60	45	30	10							Shut-off 120 ft.
	10	105	100	90	80	70	55	40	20										
	20	85	75	65	50	35	15												
	30	60	45	30	10														
	40	25	5																
Shut-off PSI		43	39	35	30	26	22	17	13	9	4								
3	0	140	130	120	115	105	100	95	90	80	75	65	55	45	30	15			Shut-off 167 ft.
	10	120	110	105	100	95	85	80	70	65	55	40	25	10					
	20	105	95	90	85	80	70	60	50	35	20	54							
	30	90	80	75	65	55	45	35	15										
	40	75	65	55	40	30	10												
	50	50	40	25	5														
	60	20																	
Shut-off PSI		64	59	55	51	46	42	38	33	29	25	20	16	12	7	3			
5	0	145	135	125	120	110	105	95	85	80	70	55	45	30	10				Shut-off 285 ft.
	10	135	125	115	110	100	95	85	75	65	55	40	25	10					
	20	125	115	110	100	95	85	75	65	55	40	25	5						
	30	115	105	100	90	85	75	65	50	40	20	5							
	40	105	100	90	80	70	60	50	35	20									
	50	95	90	80	70	60	45	35	15										
	60	90	80	70	60	45	30	15											
	70	80	70	55	45	30	10												
	80	65	55	40	25	5													
	90	50	40	25	5														
	100	35	20																
Shut-off PSI		115	106	97	89	80	71	63	54	45	37	28	19	11	2				
7-1/2	0	140	135	125	115	110	100	95	85	75	65	55	45	30	15				Shut-off 425 ft.
	20	130	120	110	105	95	90	80	70	60	50	35	20	5					
	30	120	115	105	100	90	85	75	65	55	40	25	10						
	40	115	110	100	95	85	75	65	55	45	30	10							
	50	110	105	95	85	80	70	60	45	30	15								
	60	105	95	90	80	70	60	50	35	20	5								
	80	95	85	75	65	55	40	25	10										
	100	80	70	60	50	35	20												
	120	65	55	40	25	10													
	140	45	35	20															
	160	25	10																
Shut-off PSI		175	162	149	136	123	110	97	84	71	58	45	32	19	6				

Design Pump Performance

5-hp 90 gpm FPS4400 pump set at 192 feet below ground surface (189' pipe, 3' pitless) on 2.5-inch pipe.

Estimated pumping water level = 135'

Headloss through pitless, check valve, and 2" discharge pipe = 7'

Head loss in drop pipe = 13 ft headloss at C=115.

TDH = $135 + 7 + 13 = 155'$

Pump should produce approximately 88 gpm.

ETIdaho data - Open water - shallow systems (ponds, streams)

Boise WSFO Airport (NWS--101022)

<http://data.kimberly.uidaho.edu/ETIdaho/stcwrstats.py?station=101022&cover=55&stats=Deficit>

24-May-17

	mm/day												growing season	annual	Total
Monthly ^b	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
days/mo	31	28	31	30	31	30	31	31	30	31	30	31			365 days/yr
monthly ET (mm)		2.24	22.94	60.3	82.15	121.5	148.49	125.55	83.7	47.74					694.61 mm/yr
monthly ET(ft)	0	0.007	0.075	0.198	0.270	0.399	0.487	0.412	0.275	0.157	0.000	0.000			2.28 af/yr

Expected annual pond evap

0.66 acre pond area

2.28 ft/yr pond evaporation during months with positive precipitation deficit

1.5 afy, annual pond evaporation (0.66 x 2.28)

ATTACHMENT D
PHOTOS



Place of use



Place of use



Place of use



Pond



Well



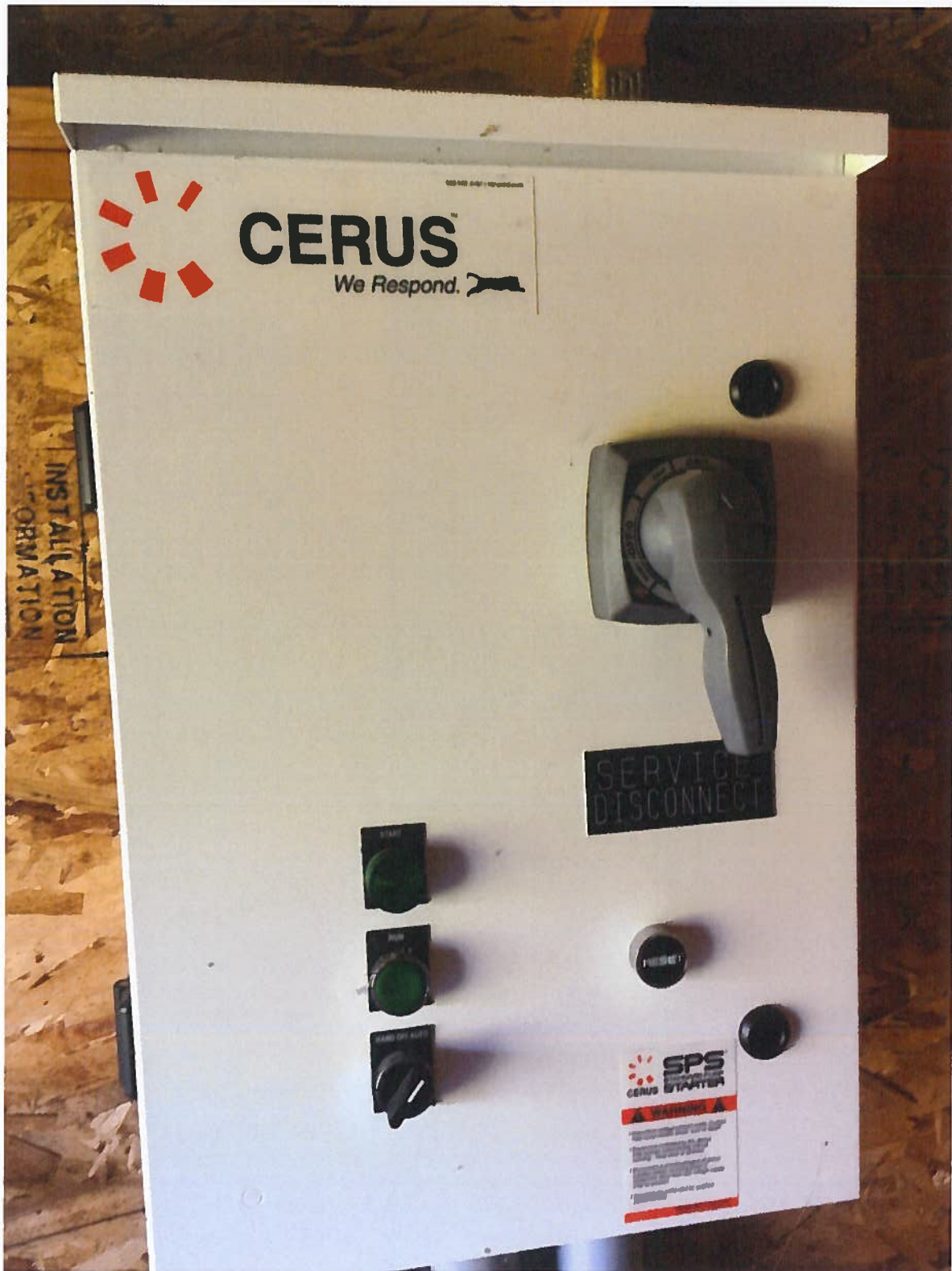
Well casing in foreground. Pump house in background.



Vault with well discharge to pond fill pipe. Flow measurements taken by connecting to lower ball valve with yellow handle



Temporary 2-inch hose, 5-gallon bucket, and 32-gallon trash can for volumetric flow measurement



Irrigation pump control panel



Pressure irrigation pump system pump skid. Submersible pumps in wet well below pump skid.



Pressure irrigation pumping system motor controls



Inlet from irrigation lateral to pond.

ATTACHMENT E
PROOF OF BENEFICIAL USE