Nelson, Dan

From: Nelson, Dan
Sent: Thursday, January 02, 2020 3:39 PM
To: 'Marci Pape'
Subject: RE: Permit 63-34595 - Beneficial Use Field Exam package

Hello Marci,

We are moving forward with the licensing of permit 63-34595. You did a very good job on this field report, but we did discover some concerns that I wanted to point out to you for future reference. I have recommended that the permit be licensed for the full amount you recommended in the field report and the permit. While reviewing this permit we found the following information that may be worth reviewing for future applications for permit :

In the pond spreadsheet, we use the soils in the area at the maximum depth of the ponds. You claimed the ponds have an average depth of 8 feet or 96 inches. Without a maximum depth it is hard to determine maximum depth with the average depth, but if we use the Freeform Polygon method (also known as the 2/5 method or 0.4 method), I would assume the maximum depth is 20 feet (8ft/0.4=20ft) or 240 inches.

The soils in this area is a Xeric Haplocalids for all the ponds, but one which is the smallest pond. The smallest pond is in an Elijah Silt Loam. There are three soil types for the Xeric Haplocalids and they all run from 86 inches to 160 inches. The pond depth would be the same regardless if we use the maximum depth or the average depth. One is SW to SC, the second is SW to SM and the third is SC to SM. SW and SM have seepage rate of 0.2 ft per day, and SC has a seepage rate of 0.007 ft per day.

Elijah Silt Loam has three soil types from 109 to 244 inches which are GP to GC, GW to GM, and GP. These soil types all have the same seepage rate of .2 ft/day for GP, GC, GW and GM.

The application uses the OL soil with a seepage rate of 0.02 ft/day, but according to the soils information available to the Department, there are no OL soils in these formations. According to the narrative in the application for permit, the ponds drop about ½ way during the winter months. Some of this is from evaporation (approximately 0.2 af worth of evaporation or .02 feet in pond drop) and the rest would be seepage. The narrative suggests that the ponds drop approximately 3.98 feet during the non-irrigation season or 105 days ({3/1 to 11/15 = 260 days} 365 days – 260 days = 105 days of non-irrigation). This would suggest approximately 0.38 feet of seepage per day (0.38 feet drop in pond level / 105 days = 0.0379 feet per day). Here are the seepage volumes for all of the soil types mentioned above:

Seepage on application and field exam using OL soils = 0.02 ft/day = 35.8 acre-feet
Seepage over winter = 0.0379 ft/day = 67.8 acre-feet
Seepage of SW, SM, GP, GC, GW, and GM = 0.2 ft/day = 979.7 acre-feet
Seepage of SC = 0.007 ft/day = 12.5 acre-feet

As you can see from above, all of the seepage rates that I could calculate were much higher that the seepage rates that you recommended.

When I reviewed the ETidahoStations_poly, I found that ponds were in an area we generally use the Kuna Station (Kuna NWS—USC00105038). The Kuna Station gives a total evaporation loss of 14.9 acre-feet for these ponds. The ponds are also very close to the Boise Airport Station (Boise WSFO Airport NWS—USC00101022). The Airport Station gives a total evaporation loss of 13.5 acre-feet. The application and field exam calculated an evaporation amount from the Caldwell Station of 11.2 af. The Caldwell Station is a

significant distance from these ponds. The seepage amounts from the Kuna and Airport Stations are higher than the amount used in the application for permit and field report.

This spreadsheet is a tool that if used correctly, gives a reasonably close estimate of the seepage and evaporation if the correct information is used. There are various other methods that may be better or worse depending on the information used for those methods. The reason we started using this spreadsheet to give us a tool that provide a reasonable prediction of the water use. Even though it isn't a perfect tool, it has provided reasonably good results so far. As you can see from the information shown above, the permit and license may not be able to supply the water needed for the seepage and evaporation from these ponds. You may want to have your client keep track of the amount of water diverted to the pond and file a new permit if they find that they are losing more water to seepage and evaporation than their permit allows. We can only license the amounts permitted, so we can't increase the volumes you recommended, but I am hoping this information will help you out in the future.

Thank you for doing such a good job on this field report. It make my job much easier.

Respectfully,

Daniel Nelson
Water Right Analyst 3
Idaho Department of Water Resources
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)

From: Marci Pape [mailto:Mpape@spfwater.com]
Sent: Wednesday, December 11, 2019 1:14 PM
To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Subject: RE: Permit 63-34595 - Beneficial Use Field Exam package

Hi, Dan. Here are the GIS files associated with the pond area shapefile. Thanks!

From: Nelson, Dan [mailto:Dan.Nelson@idwr.idaho.gov]
Sent: Wednesday, December 11, 2019 1:00 PM
To: Marci Pape <Mpape@spfwater.com>
Subject: RE: Permit 63-34595 - Beneficial Use Field Exam package

Thank you Marci,

The shape files are always nice to have, then I don't have to try to recreate them. When we get the originals, I will get to work on them as soon as possible.

Dan Nelson

From: Marci Pape [mailto:Mpape@spfwater.com]
Sent: Wednesday, December 11, 2019 12:20 PM
To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Subject: Permit 63-34595 - Beneficial Use Field Exam package

Dan –

On behalf of Wilson Properties, I am submitting the Proof of Beneficial Use and the Beneficial Use Field Exam report for permit 63-34595. Attached is the scanned version of the package, and the original signed documents are being sent today. If you would like me to send you the shapefile the we created, I would be happy to provide that as well.

Thank you.

Marci Pape, P.E. | Project Engineer
SPF Water Engineering, LLC
300 E Mallard Drive, Suite 350 | Boise, ID 83706
p. 208.383.4140 | **f.** 208.383.4156 | **d.** 208.489.2143
e. mpape@spfwater.com | **w.** www.spfwater.com

MEMORANDUM

TO: Water Right File 63-34595

FROM: Daniel Nelson – Analyst 3

DATE: December 23, 2019

SUBJECT: Licensing Review of Water Right 63-34595

The field exam for this right was performed by Certified Field Examiner Marci Pape of SPF Water Engineering.

Ms. Pape recommended that this permit be licensed for 2.21 cfs for diversion to storage and 86.2 af for recreational storage. Ms. Pape discuss the concern about the point of diversion in he SWSE of Section 33, but Department staff have GPS'ed this point of diversion and determined it is in the SWSE. The point of diversion in the SWSE of Section 33, is also on property owned by FC Nova Inc., which is completely in the SWSE of Section 33.

I completely agree with the diversion rates and volumes calculated by Ms. Pape, and the locations Ms. Pape recommended. Ms. Pape sent copies of the shape files she used for this for the ponds in her review of this permit. The shape files submitted by Ms. Pape are very reasonable, and I don't have any issues with these shape files. We already have the locations for the wells, so this too shouldn't be an issue.

History and Overlap:

An extensive analysis has been already been done on Well #1 for this permit. Please see the memorandums dated August 14, 2018 and October 2, 2018 in water right filed 63-12097. According to the field report, Well #1 and Well #2 have not been upgraded, so combined conditions will be needed. This permit will need to be added to the combined limitation condition for Well #1, which will be updated as follows:

> Rights 63-11831, 63-11874, 63-32232, 63-12097, and 63-34595 when combined shall not exceed a total diversion rate of 0.93 cfs from the well located in SWSE, Section 33, T03N, R01E.

Water right 63-12097 is diverted from both Well # 1 and Well #2, which are the same wells listed for this permit. Water right 63-12097 is for supplemental irrigation, which is a completely different use than this permit. However, water right 63-12097 is licensed for a total diversion rate of 2.20 cfs, and the system capacity for these two wells when combined was determined by the field examiner at 3.07 cfs. Therefore, the following condition will also need to be included:

> Rights 63-12097 and 63-34595 when combined shall not exceed a total diversion rate of 3.07 cfs.

The two conditions mentioned above should address all of the overlapping water right issues.

Conditions:

Conditions 219 and 220 matches what the field examiner found, so it should be carried forward to the permit. Condition 01M should be carried forward to licensing, and condition 121 should be changed to condition 103 as is standard. The remaining conditions should not be carried forward to licensing.

SPF WATER ENGINEERING

December 11, 2019

Idaho Department of Water Resources
Attn: Dan Nelson
PO Box 83720
Boise, ID 83720-0098

Subject: Beneficial Use Field Report - Permit No. 63-34595 (Wilson Properties LP)

Dear Dan,

Enclosed on behalf of Wilson Properties is a Statement of Completion for Submitting Proof of Beneficial Use and a Beneficial Use Field Report for permit 63-34595.

Please let me know if you have any questions regarding these documents. If you would like the shapefile that SPF created to represent the pond areas, I would be happy to provide it.

Sincerely,

Marci S. Pape

Marci S. Pape, P.E.

Enclosures

cc: Charles Wilson – Wilson Properties

File: 1252.0010

300 E. Mallard Drive, Suite 350, Boise, Idaho 83706 Tel: 208-383-4140 Fax: 208-383-4156

Form 219 07/11

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

BENEFICIAL USE FIELD REPORT

RECEIVED
DEC 13 2019
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 INFORMATION

Permit No. 63-34595

1. Owner Wilson Properties LP Phone No. 208-424-9322
   Current address 1101 West River Street, Suite 150, Boise, ID 83702
2. Examiner's name Marci Pape (CWRE No. 142) EXAM DATE November 26, 2019
3. Accompanied by Chad Watson Email golfguychad@yahoo.com
   Address c/o Boise Ranch Golf Course, 6501 S Cloverdale Road, Boise, ID 83709
   Relationship to permit holder Head Golf Professional/Manager Phone No. 208-870-4745
4. Source ground water tributary to NA

B. OVERLAP REVIEW

1. Other water rights with the same place of use New York Irrig. District, 63-4607B, 63-12097, City of Meridian, City of Boise
2. Other water rights with the same source and point of diversion 63-11831, 63-32232, 63-11874, 63-12097

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
1			SW	SE	33	3N	1E	Ada	GPS/GIS/Aerial Photography
2			SW	NE	4	2N	1E	Ada	GPS/GIS/Aerial Photography

2. **Place(s) of Use:** Method of determination

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
2N	1E	4	X	X	X														
			L1	L2															

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" = 660 feet

☐ 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
1 (tag A0019161)	Submersible	30	unknown	unknown	6-inch
2 (tag D0077513)	Submersible	40	unknown	Goulds 10RJLC	8-inch

**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
Panametrics Portable Flowmeter	Ultrasonic	GE	PT878	7140	various	April 18, 2018

2. **Measurements:**

Well 1 - See 10 minute flow rate at 415 gpm (0.93 cfs) average in Attachment C

Well 2 - See 10 minute flow rate at 962 gpm (2.14 cfs) average in Attachment C

Measurements for Wells 1 & 2 were taken during BUFE for 63-12097 (7/23/2018)

E. NARRATIVE/REMARKS/COMMENTS

Two wells provide storage water to 4.9 acres of pond area within Boise Ranch Golf Course. Well 1 is located north of Lake Hazel Road and is utilized under a shared well agreement with water rights 63-11831, 63-32232, 63-11874, 63-12097. Well 1 is 10-inch diameter, with total depth of 276 feet. The submersible pump in Well 1 is described in the 63-11831 field exam as a 30-hp National with 126-foot setting depth. Note that the well location is very close to the 1/4 1/4 section line between SWSE and SESW Section 33. Location put in SWSE to be consistent with other water rights listing the well as POD, but actual location is in SESW Section 33.

Well 2 is located within the golf course and is used only for this permit and 63-12097. Well 2 is 12-inch diameter with total depth of 335 feet and is equipped with a 40-hp Goulds 1-stage submersible set at 147 feet on 8-inch drop pipe.

A third well (D0053380) was constructed in the NWNE but was not equipped with a pump at the time of the field examination.

Both wells discharge through pipe to an interconnected pond system. The Well 1 discharge pipe is 8-inch buried PVC; mechanical pipe at the well head is 6-inch. Well 2 discharges through 10-inch buried PVC pipe to the pond located directly east of the well; mechanical pipe at well head is 8-inch. After discharging from the pipes, the water flows through the pond system to a pressure irrigation pump station, and is then pumped into a pressurized irrigation distribution system for sprinkler irrigation of the golf course under water right 63-12097. Surface water irrigation supplies from New York Irrigation District and Tenmile Creek right 63-4607B are delivered through the same pond system as the groundwater. A portion of the water discharged into the pond system is used to maintain water levels in the interconnected ponds. The pond located in the northeast corner of the property is not directly connected to the pond system, so water levels are maintained by periodic filling from the pressurized irrigation system.

Exam Attachments

Attachment A: Field Exam Map

Attachment B: System Components, Well Reports, and Diagrams

Attachment C: Flow Measurement and Pond Storage Data

Attachment D: Exam Photos

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?

F. FLOW CALCULATIONS

☒ Additional computation sheets attached

Measured Method:
Flow meter. See attachment C.

Total measured flow rate from Wells 1 and 2 (0.93 cfs + 2.14 cfs) is 3.07 cfs.

Recommended flow rate = 2.21 cfs per permit

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$V_{I.R}$ = (Acres Irrigated) x (Irrigation Requirement) = _____

$V_{D.R}$ = [Diversion Rate (cfs)] x (Days in Irrigation Season) x 1.9835 = _____

V = Smaller of $V_{I.R.}$ and $V_{D.R.}$ = _____

2. Volume Calculations for Other Uses:
See pond storage calculations included in Attachment C

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use From	Period of Use To	Rate of Diversion Q (cfs)	Annual Volume V (afa)
Diversion to Storage	01/01	12/31	2.21 cfs	
Recreation Storage	01/01	12/31		86.2 afa
		Totals:	2.21 cfs	86.2 afa

2. Recommended Amendments

☐ Change P.D. as reflected on page 1 ☐ Add P.D. as reflected on page 1 ☒ None
☐ Change P.U. as reflected on page 1 ☐ Add P.U. as reflected on page 1 ☐ Other

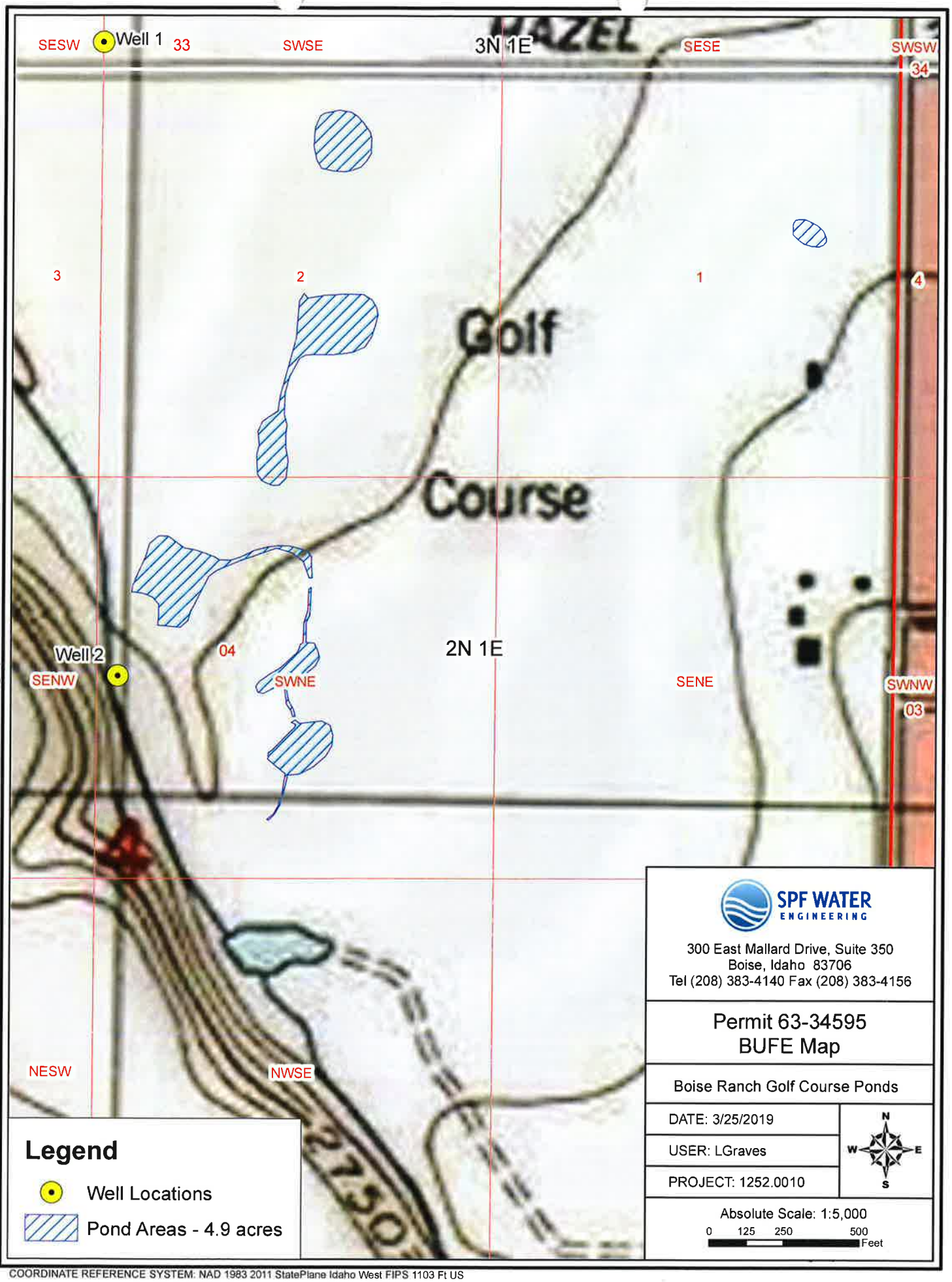
I. AUTHENTICATION

Field Examiner's Signature Marci S. Pape Date 12/11/19

Reviewer _____ Date _____

Attachment A

Field Exam Map



Path: S:\PROJECTS\S thru Z Projects\W Projects\Wilson Properties_1252\0010 Boise Ranch GC Well\0010 Well Consultation\PROJECT\GIS\ArcMap_Projects\Pond PMT.mxd

COORDINATE REFERENCE SYSTEM: NAD 1983 2011 StatePlane Idaho West FIPS 1103 Ft US

SPF WATER ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

Permit 63-34595
BUFE Map

Boise Ranch Golf Course Ponds

DATE: 3/25/2019

USER: LGraves

PROJECT: 1252.0010

N W E S

Absolute Scale: 1:5,000

0 125 250 500 Feet

Path: S:\PROJECTS\S thru Z Projects\W Projects\Wilson Properties_1252\0010 Boise Ranch GC Well\0010 Well Consultation\PROJECT\GIS\ArcMap_Projects\Pond PMT.mxd

COORDINATE REFERENCE SYSTEM: NAD 1983 2011 StatePlane Idaho West FIPS 1103 Ft US

Attachment B

System Components, Well Reports, and Diagrams

Form 238-7
6/07

Well #2

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

COPY

1. WELL TAG NO. D 0077513
Drilling Permit No.
Water right or injection well # 63-12097

2. OWNER: Wilson Properties LLC
Name Boise Ranch Golf Course
Address 1101 W. River St., Ste. 150
City Boise State ID Zip 83702

3. WELL LOCATION:
Twp. 2 North ☒ or South ☐ Rge. 1 East ☒ or West ☐
Sec. 4 ____ 10 acres 1/4 SW 40 acres 1/4 NE 160 acres 1/4
Gov't Lot ____ County Ada
Lat. 43 ° 32.474 (Deg. and Decimal minutes)
Long. 116 ° 20.642 (Deg. and Decimal minutes)
Address of Well Site 6501 S. Cloverdale
(Give at least name of road + Distance to Road or Landmark) 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 ft³)	Placement method/procedure
3/4 Bent. Chips	0'	207'	256 bags	Slow pour

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/ Schedule	Material	Casing	Liner	Threaded	Welded
12"	+2'	235'	.375	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 Set with mainline

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
235'	335'	30		12"	Stainless	304

Length of Headpipe ____ Length of Tailpipe ____
Packer ☐ Y ☒ N Type

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft³)	Placement method
6-9 Silica Snd	341'	207'	14,200 lbs.	Tremie

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) 86' Static water level (ft) 77'
Water temp. (°F) 60° Bottom hole temp. (°F)
Describe access port Tack Welded Plate

Well test:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)
153'	700 GPM	120 min.

Test method:

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	Water N
19"	0'	5'	Topsoil		
19"	5'	45'	Gravel & Sand		
19"	45'	49'	Tan Clay		
19"	49'	51'	Sand		
19"	51'	58'	Gravel & Sand		
19"	58'	61'	Clay		
19"	61'	64'	Sand & Clay Strips		
19"	64'	72'	Silty Clay		
19"	72'	76'	Sand		
19"	76'	86'	Silty Clay		
19"	86'	102'	Gravel & Sand		
19"	102'	105'	Clay & Some Gravel		
19"	105'	107'	Clay & Sand Strips		
19"	107'	121'	Sand & Clay Strips		
19"	121'	145'	Gravel		
19"	145'	196'	Gravel		
19"	196'	203'	Gravel & Clay		
19"	203'	210'	Sand		
19"	210'	220'	Gravel		
19"	220'	225'	Clay		
19"	225'	237'	Sand & Clay Strips		
19"	237'	305'	Sand & Gravel		
19"	305'	335'	Sand & Gravel		
19"	335'	340'	Clay & Gravel		

Completed Depth (Measurable): 335'
Date Started: Apr 3, 2018 Date Completed: May 2, 2018

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 May 4, 2018
*Driller John Lube Date May 4, 2018
*Operator II Sam Navarro Date
Operator I Date

*** Signature of Principal Driller and rig operator are required.**

Boise Ranch Golf Course Irrigation Well - Original Well Test 5/22/2018

Tested by Layne of Idaho, Supervised by Kurt Newbry (SPF Water Engineering).

Pump type: Line-shaft turbine set at 220 feet . Powered by V16 diesel motor.

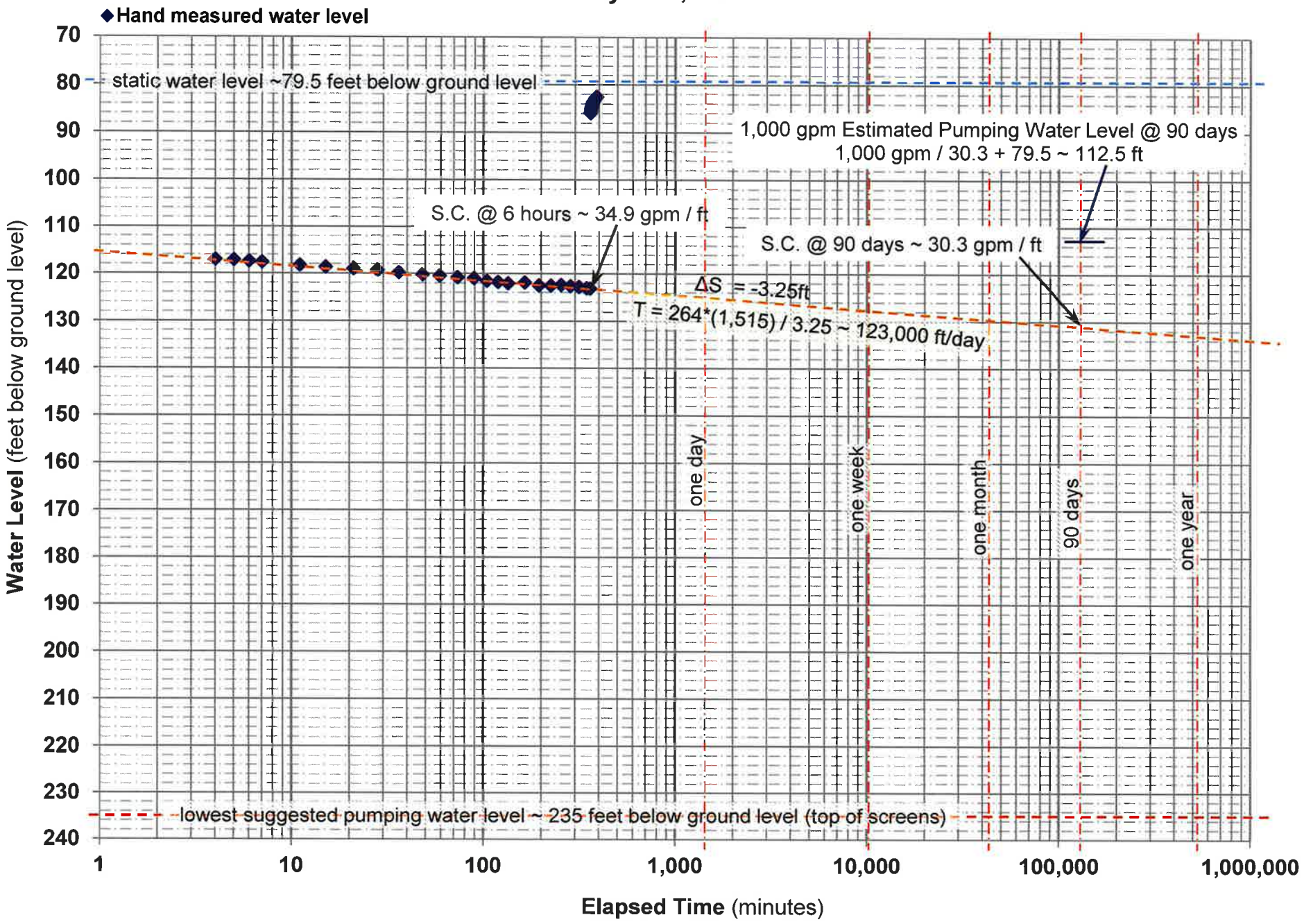
Flow measured with Seametrics electronic flow meter.

Water level measured with electric well sounder.

Measurement point top of casing =2.5 feet above ground surface.

Time (MST)	Date Time	t (min)	t/t'	DTW (ft bmp)	DTW (ft bgs)	Drawdown (ft)	Q (gpm)	Specific Capacity	Remarks
8:46	5/22/18 8:46	0		82.08	79.58				Pump on, minor cloudiness upon initial start up, clears up in 30 sec.
8:50	5/22/18 8:50	4		119.45	116.95	37.37	1,515	40.54	minor sand, clear water
8:51	5/22/18 8:51	5		119.55	117.05	37.47	1,515	40.43	
8:52	5/22/18 8:52	6		119.87	117.37	37.79	1,515	40.09	
8:53	5/22/18 8:53	7		120.02	117.52	37.94	1,525	40.20	
8:57	5/22/18 8:57	11		120.72	118.22	38.64	1,508	39.03	
9:01	5/22/18 9:01	15		121.08	118.58	39.00	1,528	39.18	
9:07	5/22/18 9:07	21		121.42	118.92	39.34	1,519	38.61	
9:14	5/22/18 9:14	28		121.77	119.27	39.69	1,504	37.89	
9:22	5/22/18 9:22	36		122.26	119.76	40.18	1,313	32.68	
9:34	5/22/18 9:34	48		122.68	120.18	40.60	1,513	37.27	
9:45	5/22/18 9:45	59		122.92	120.42	40.84	1,515	37.10	
9:59	5/22/18 9:59	73		123.24	120.74	41.16	1,514	36.78	no sand, clear water
10:15	5/22/18 10:15	89		123.42	120.92	41.34	1,507	36.46	
10:30	5/22/18 10:30	104		124.00	121.50	41.92	1,511	36.04	
10:45	5/22/18 10:45	119		124.25	121.75	42.17	1,524	36.14	
11:00	5/22/18 11:00	134		124.50	122.00	42.42	1,522	35.88	
11:30	5/22/18 11:30	164		124.33	121.83	42.25	1,512	35.78	
12:00	5/22/18 12:00	194		124.92	122.42	42.84	1,515	35.37	
12:30	5/22/18 12:30	224		125.00	122.50	42.92	1,515	35.30	
13:00	5/22/18 13:00	254		124.83	122.33	42.75	1,517	35.48	
13:30	5/22/18 13:30	284		125.08	122.58	43.00	1,510	35.11	
14:00	5/22/18 14:00	314		125.25	122.75	43.17	1,514	35.07	
14:30	5/22/18 14:30	344		125.50	123.00	43.42	1,522	35.05	
14:45	5/22/18 14:45	359		125.58	123.08	43.50	1,518	34.89	Pump off
14:46	5/22/18 14:46	360	360	88.33	85.83	6.25	0		
14:47	5/22/18 14:47	361	181	88.33	85.83	6.25			
14:48	5/22/18 14:48	362	121	87.83	85.33	5.75			
14:49	5/22/18 14:49	363	91	87.42	84.92	5.34			
14:50	5/22/18 14:50	364	73	87.33	84.83	5.25			
14:51	5/22/18 14:51	365	61	87.08	84.58	5.00			
14:52	5/22/18 14:52	366	52	86.92	84.42	4.84			
14:53	5/22/18 14:53	367	46	86.58	84.08	4.50			
14:54	5/22/18 14:54	368	41	86.42	83.92	4.34			
14:55	5/22/18 14:55	369	37	86.42	83.92	4.34			
14:57	5/22/18 14:57	371	31	86.17	83.67	4.09			
14:59	5/22/18 14:59	373	27	85.92	83.42	3.84			
15:01	5/22/18 15:01	375	23	85.83	83.33	3.75			
15:03	5/22/18 15:03	377	21	85.75	83.25	3.67			
15:05	5/22/18 15:05	379	19	85.50	83.00	3.42			
15:08	5/22/18 15:08	382	17	85.25	82.75	3.17			
15:11	5/22/18 15:11	385	15	85.08	82.58	3.00			
15:15	5/22/18 15:15	389	13	85.00	82.50	2.92			

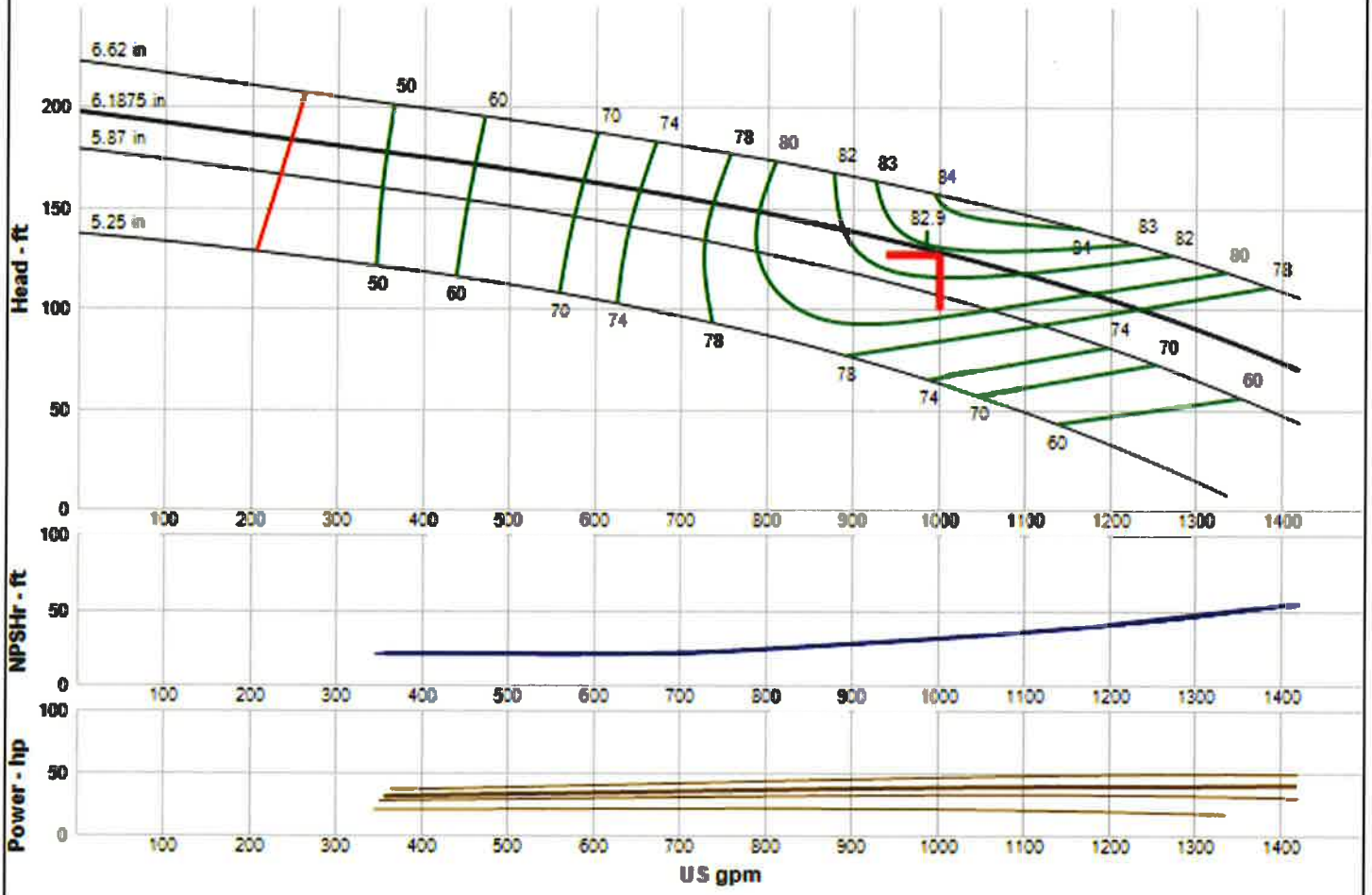
Boise Ranch Golf Course Irrigation Well
1,515 GPM Constant Rate Discharge Test
May 22nd, 2018



xylem
Let's Solve Water

PERFORMANCE CURVE

Quote Number: 9003-180523-013
Product Name: VIS -Submersible Vertical Turbine (Borehole) Pumps
Product Id: GWT_VIS



Sizing Criteria

Series	GWT_VIS	Max Power on Design Curve	41 Hp
Size	10RJLC	Max Power on Max Imp Trim	50 Hp
Additional Size	-	Flow at BEP	985 USGPM
Speed	3540	Head at BEP	130 ft
Number of Stages	1	NPSH Required	32 ft
Stages	1 Stage	Specified NPSH Avail.	34 ft
Frequency	60 Hz	NPSHaMargin	2 ft
Impeller Trim	6.1875 inch	Min Flow	246 USGPM
Additional Impeller Trim	0 inch	Flow on Max Imp Trim @ Max Power	1335 USGPM
Impeller Maximum Trim	6.62 in inch		
Specified Flow	1000 USGPM	Shut-Off Head	198 ft
Specified Head	127 ft	Shut-Off Disc Pressure	85.7 psi
Flow at Design	1000 USGPM	Fluid Type	Water
Head at Design	129 ft	Temperature	70 F
Head at Design	129 ft	Allowable Sphere Size	0.75 inch
Run-Out Flow	0 USGPM	Exact Bowl Diameter	9.5 inch
Run-Out Head	0 ft	Curve ID	E6410REPC1
Efficiency at Design	82.8	Thrust K Factor [lb/ft]	7
Best Efficiency	82.9	Add Thrust K Factor [lb/ft]	7

Form 238-7 4/92 C

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

WELL DRILLER'S REPORT

State 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.

KC

1. WELL OWNER

Name Darwin McKay

Address 3220 E. Lake Hazel Rd. Meridian, ID

Drilling Permit No. 63-92-W-0960-000

Water Right Permit No. 63-11831

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Well diameter increase ☐ Modification
☐ Abandoned (describe abandonment or modification procedures such as liners, screen, materials, plug depths, etc. in lithologic log, section 9.)

3. PROPOSED USE

☐ Domestic ☒ Irrigation ☐ Monitor
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED

☒ Rotary ☒ Air ☐ Auger ☐ Reverse rotary
☐ Cable ☐ Mud ☐ Other _____ (backhoe, hydraulic, etc.)

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.250 inches	10 inches	+ 2 feet	254 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 ☐ Gun
Size of perforation? _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer _____ Type _____
Top Packer or Headpipe _____
Bottom of Tailpipe _____

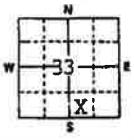
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____

Surface seal depth 20 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 Top of Well

6. LOCATION OF WELL

Sketch map location must agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
County Ada
Address of Well Site 3220 E. Lake Hazel Rd. Meridian, ID (give at least name of road)
T. 3 N ☒ or S ☐
SW ¼ SE ¼ Sec. 33, R. 1 E ☒ or W ☐

7. WATER LEVEL

Static water level 64 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. Quality _____
Describe artesian or temperature zones below.

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
350		1

090916

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
10"	1	2½	Top Soil		
"	2½	80	Sand & Gravel		
"	80	81	Clay Layer		
"	81	83	Coarse Sand		
"	83	90	Clay Tan Hard		
"	90	107	Sand (Med.-Coarse)		
"	107	113	Sandy Clay		
"	113	115	Sand-coarse-gravel		
"	115	125	Sand " " v.little	X	
"	125	130	Factured Clay-Sand-Gravel		
"	130	135	Sand/fine	X	
"	135	140	Sand/fine	X	
"	140	145	Sandy Clay		
"	145	155	Sand/pea gravel v. litt.	X	
"	155	157	Soft Clay		
"	157	175	Sandy w/gravel		
"	175	195	Sandy w/gravel		
"	195	199	Sandy Clay Tan		
"	199	209	Sand a lot	X	
"	209	216	Clay		
"	216	217	Sand fine	X	
"	217	220	Clay & Sand Pocket	X	
"	220	221	Clay		
"	221	228	Coarse Sand	X	
"	228	235	Sand & Clay Mix		
"	235	256	Gravel & Sand		
"	256		Sand & Pea Gravel a lot	X	

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APR 22 1993
AUG 09 1993
Department of Water Resources
Western Regional Office

10.

Work started 12/31/92 finished 4/14/93

11. DRILLER'S CERTIFICATION

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

Firm Name Adamson Pump & Drilling Firm No. 457
Address Nampa, ID Date 4/15/93
Signed by Drilling Supervisor Dave Adamson
and
(Operator) DAVE ADAMSON
(If different than the Drilling Supervisor)

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

832893

Office Use Only
Well ID No. 302281
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

Form 238-7 6/02 (03)

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

1. WELL TAG NO. D 0039124
DRILLING PERMIT NO. 88199 · 832893
Water Right or Injection Well No. 63 - 11831

2. OWNER:
Name Darwin McKay
Address 3220 E. Lake Hazel Rd
City Meridian State Id Zip 83642

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 3 North ☒ or South ☐
Rge. 1E East ☐ or West ☐
Sec. 33 SW 1/4 (10 acres) SW 1/4 (10 acres) SE 1/4 (160 acres)
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site 3220 E Lake Hazel Rd
City Meridian
(Give at least name of road + Distance to road or Landmark)
Lt. ____ Blk. ____ Sub. Name ____

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 Material	From	To	Weight / Volume	Seal Placement Method
Same as original Bent.	0	20		

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
10	+2	254	.250	steel	☐	☐	☐	☐
Same as original					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe 20' Length of Tailpipe ____
Packer ☒Y ☐N Type K. Packer

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method ____
Screen Type & Method of Installation Johnson washdown

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
256	276	.030		6"	SS	☐	☐
						☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
64 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: ____

12. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
3-400	—	—	

Water Temp. ____ Bottom hole temp. ____
Water Quality test or comments: ____
Depth first Water Encounter ____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
10	256	276	sand gravel	X	

RECEIVED
MAY 23 2005
WATER RESOURCES
WESTERN REGION

Completed Depth 276 (Measurable)
Date: Started 05-13-05 Completed 05-16-05

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 & Drill Firm No. 457
Principal Driller Dave Adamson Date 05-19-05
and
Driller or Operator II Dave Adamson Date 05-19-05
Operator I ____ Date ____
Principal Driller and Rig Operator *Required.*
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES


Well 1
Well 1 buried pipe to pond (approximate location; 8-inch PVC)
E Lake Hazel Rd
Buried pipe (approximate location; 8-inch PVC)
W Medalist Dr
pressure irrigation pump station
To PI system
Buried pipe (approximate location; PVC, 12-inch reducing to 10-inch)
mixed water gravity flow path
Well 2
S Coverdale Rd
W Nanegg Dr
Well 2 buried pipe, 10-inch PVC
surface water delivery from NYID and Tenmile Creek

Attachment C

Flow Measurement Data
Pond Storage Data

Permit:	63-12097
Owner:	Wilson Properties LP
Site Name:	Well 2
POD Location:	2N 1E 04 SWNE
Tag No:	77513
Meter:	GE TransPort PT878
Type:	Portable Ultrasonic Time Flight Liquid Flow Meter
Serial Number:	7140
Calibration Date:	April 18, 2018
Operator:	Scott King

Date/Time	Volume (gal/m)	(+)Total (gal)	(-)Total (gal)	Error #
7/23/2018 13:12	963	3853	0	0
7/23/2018 13:13	959	4772	0	0
7/23/2018 13:14	959	5746	0	0
7/23/2018 13:15	958	6717	0	0
7/23/2018 13:16	963	7692	0	0
7/23/2018 13:17	963	8636	0	0
7/23/2018 13:18	962	9586	0	0
7/23/2018 13:19	964	10577	0	0
7/23/2018 13:20	964	11515	0	0
7/23/2018 13:21	959	12505	0	0
7/23/2018 13:22	961	13454	0	0

Time	10	minutes
Volume	9600	gallons
Rate	962	gpm
Rate	2.14	cfs

Discharge Pressure <5 psi

Permit:	63-12097
Owner:	Wilson Properties LP
Site Name:	Well 1
POD Location:	3N 1E 33 SESW
Tag No:	A0019161
Meter:	GE TransPort PT878
Type:	Portable Ultrasonic Time Flight Liquid Flow Meter
Serial Number:	7140
Calibration Date:	April 18, 2018
Operator:	Scott King

Date/Time	Volume (gal/m)	(+)Total (gal)	(-)Total (gal)	Error #
7/23/2018 14:01	410	28653	0	0
7/23/2018 14:02	411	29081	0	0
7/23/2018 14:03	412	29494	0	0
7/23/2018 14:04	413	29902	0	0
7/23/2018 14:05	411	30314	0	0
7/23/2018 14:06	417	30727	0	0
7/23/2018 14:07	413	31138	0	0
7/23/2018 14:08	409	31553	0	0
7/23/2018 14:09	410	31967	0	0
7/23/2018 14:10	410	32373	0	0
7/23/2018 14:11	413	32785	0	0

Time	10	minutes
Volume	4132	gallons
Rate	415	gpm
Rate	0.93	cfs

MBER	
R	Lori Graves
	7/23/2018

User Input
Calculated value
Formula Explanations

Pond Surface Area (AC.)	4.9	AC.
ond Surface Area (SQ. FT.)	213444	SQ. FT.
the following method to obtain Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	OL	
ested Seepage Rate (FT./DAY)	0.0200	FT./DAY

ula: (Surface Area X Seepage Rate) X 7.48 = Gallons Per Day Loss

Convert to GPD	31931	GPD
Total Seepage Loss (AFA)	35.8	AFA

Though sand and gravel seepa rates may actually be higher, maximum allowable rate is 0. ft/day, pursuant to Administr Memo "Seepage Loss Standar Ponds and Reservoirs."

Suggested Seepage Rates for Different Soil Types:
GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = **0.2 ft per day**
ML (inorganic silts - very fine sands, silty, or clayey fine sands) = **0.02 ft per day**
y sands, sand clay mixtures) = **0.007 ft per day**
o medium plasticity clays) = **0.003 ft per day**
PT and CH (high plasticity clays) = **0.0003 ft per day**
ONDS (liners can be chemical, fabric, or bentonite) = **0 ft per day**
tercepting Groundwater (excavated ponds filled by ground water) = **0 ft per day**

NOTE: The initial basis for the Suggested Seepage Rates in the table above is found on Page 16 of Seepage from Fish Ponds, Bulletin 1989 Alabama Agricultural experiment Station, Auburn University, Auburn University Alabama. If you don't know the soil type, plea the map provided at the NRCS Web Soil Survey (Tab #1) , an ArcMap Soil Classification Map (Tab #1.1), or published NRCS Soil Surve 2) . Use "0" if the pond fill relies on the water table.

JMBER	
VER	Lori Graves
	7/23/2018

User Input
lculated value
ula Explanations

cronyms used on imberly Research ter website are efined below:
cipitation
apotranspiration
ecipitation deficit
-P

USING THIS SPRE SHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitatio Deficit for a station most representative of the pond under examination. The Precipitation Deficit is the total amount of free water surface evaporation minus the precipitation for a given area, which gives the total amount of evaporative losses incurred by the pond. There are several weather sites that are used throughout the state. IDWR staff can find the nearest site using Arc Map. The shape file containing the sites can be found at X:/Spatial/Climate/ETIdahostations.shp.

Instructions:

1. Use the link below to navigate to ET Idaho 2012.
2. Select the station which is most representative to your pond location.
3. Click Submit Query.
4. Under "Land Covers with Evapotranspiration Estimates," select "Open Water - Shallow Systems (ponds, streams)" or "Open Water - small stock ponds" depending on the pond size.
5. Click the link to "Precipitation Deficit."
6. Reference and copy (ctrl + C) the first subheading "Mean" values.
7. Click the "Paste Values from ET Idaho" button. The table will automatically enter a zero (0) for any negative precipitation deficit values.

nd at: http://data.kimberly.uidaho.edu/ETIdaho/

Precipitation Deficit

Station: Caldwell (NWS -- 101380)

Month	mm/day[1]	*Days per month*	mm/Month
Jan	-0.66	31	0.00
Feb	0.08	28	2.24
March	0.74	31	22.94
April	2.01	30	60.30
May	2.65	31	82.15
June	4.05	30	121.50
July	4.79	31	148.49
August	4.05	31	125.55
September	2.79	30	83.70
October	1.54	31	47.74
November	-0.43	30	0.00
December	-0.89	31	0.00

Total mm/year =	694.61

PLEASE NOTE: The seasonal average for precipitation deficit should not be used for calculations because precipitation often exceeds evaporation during wetter months of the year. If the pond is kept full, excess precipitation during wetter months do not serve to refill the pond during drier months.

For example, see Sandpoint KSPT (NWS -- 108137), the annual precipitation deficit is -106 mm. However, April through September have positive precipitation deficit values. To proper estimate the annual volume of water necessary to refill a pond due to evaporation losses, the table will automatically enter a zero (0) for each month that the precipitation value is reported a negative value.

As described above, precipitation offsets evaporation in winter months, so the net effect is that wintertime precipitation defici usually zero.

[(mm/yr) ÷ (convert to feet)] X (Surface area of pond, in acres) = Evaporation Loss in Acre Feet

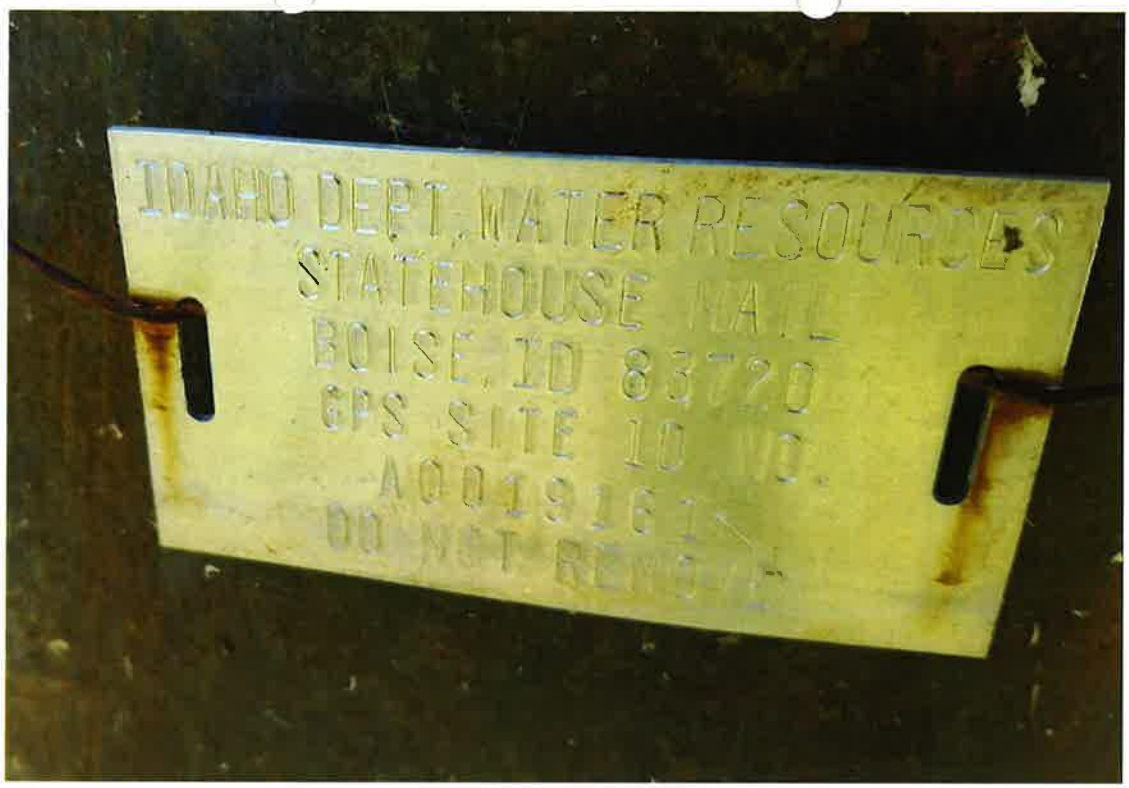
(694.61 ÷ 304.8) X 4.90 = 11.2 AFA

Area)	4.9	Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Pond :h)	8	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. No know the maximum depth and not the average depth, the Field Examiner's Handbook suggests multiplying the maximum depth by 0.4 to get the average depth, or you can use any method th reasonable to attain average depth.
pacity)	39.2	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. know the capacity, divide the capacity by surface area and enter the average pond depth in the above. Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modifi manually, the formula will be altered for future use.

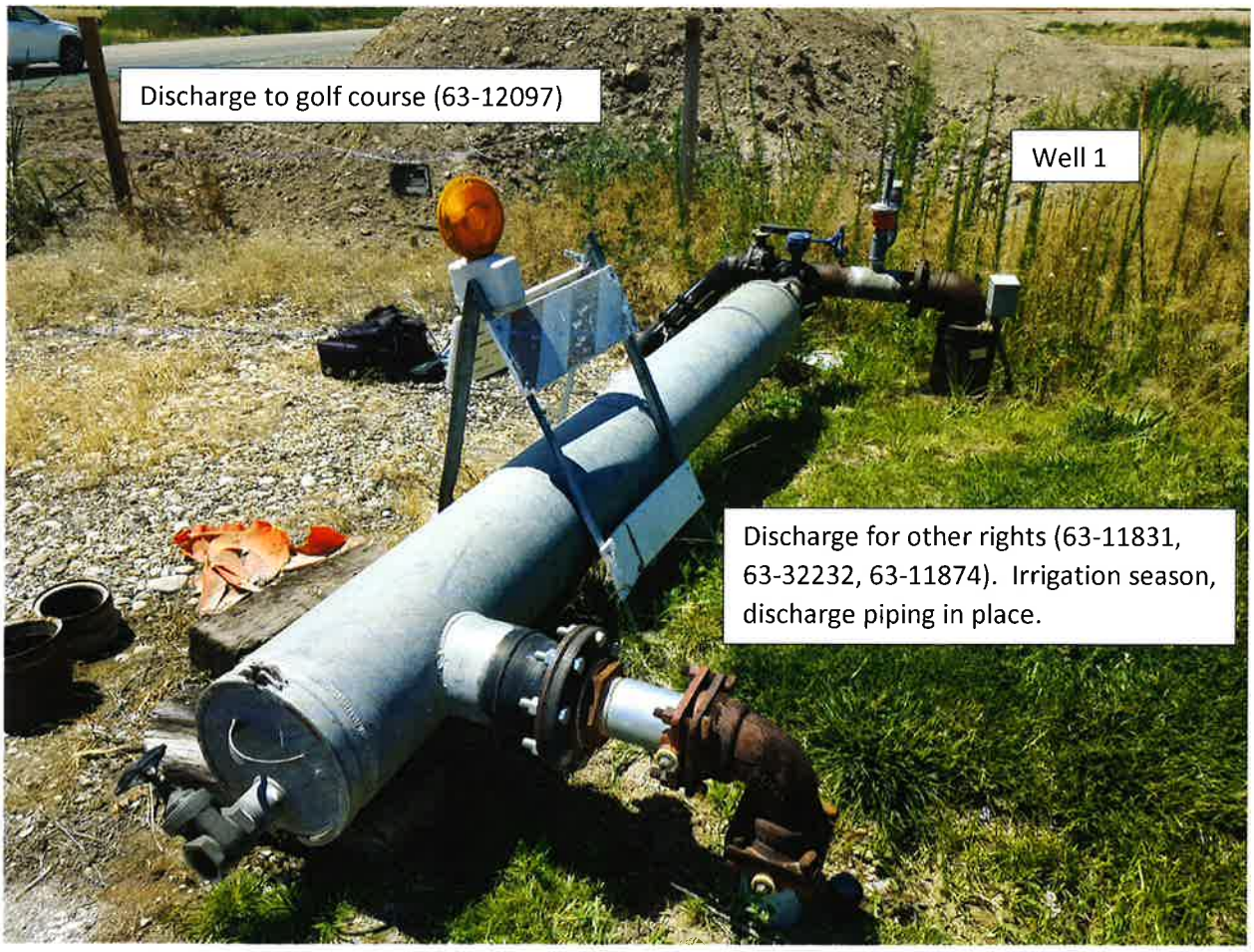
e Fill Above o Fulfill orage Multiple ")	0	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a *from st* component if the *from storage* component exceeds a one time fill. This section should not incl amount of water needed to fill the pond initially or the amount of water needed to maintain th level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2 feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet c storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet r acre feet from the initial fill = 5 acre feet of additional storage needed). Note: You must have a "From Storage" component exceeding the initial fill on the permit to inc volume in this space.
ted oss (AF)	35.8	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
ted on Loss)	11.2	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" she
lume red)	86.2	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Evaporation Loss amounts to determine the total amount of storage required.

Attachment D

Exam Photos



Well 1 Tag



Well 1 (7/23/18 Exam)

Well 1 discharge piping with portable flow meter attached

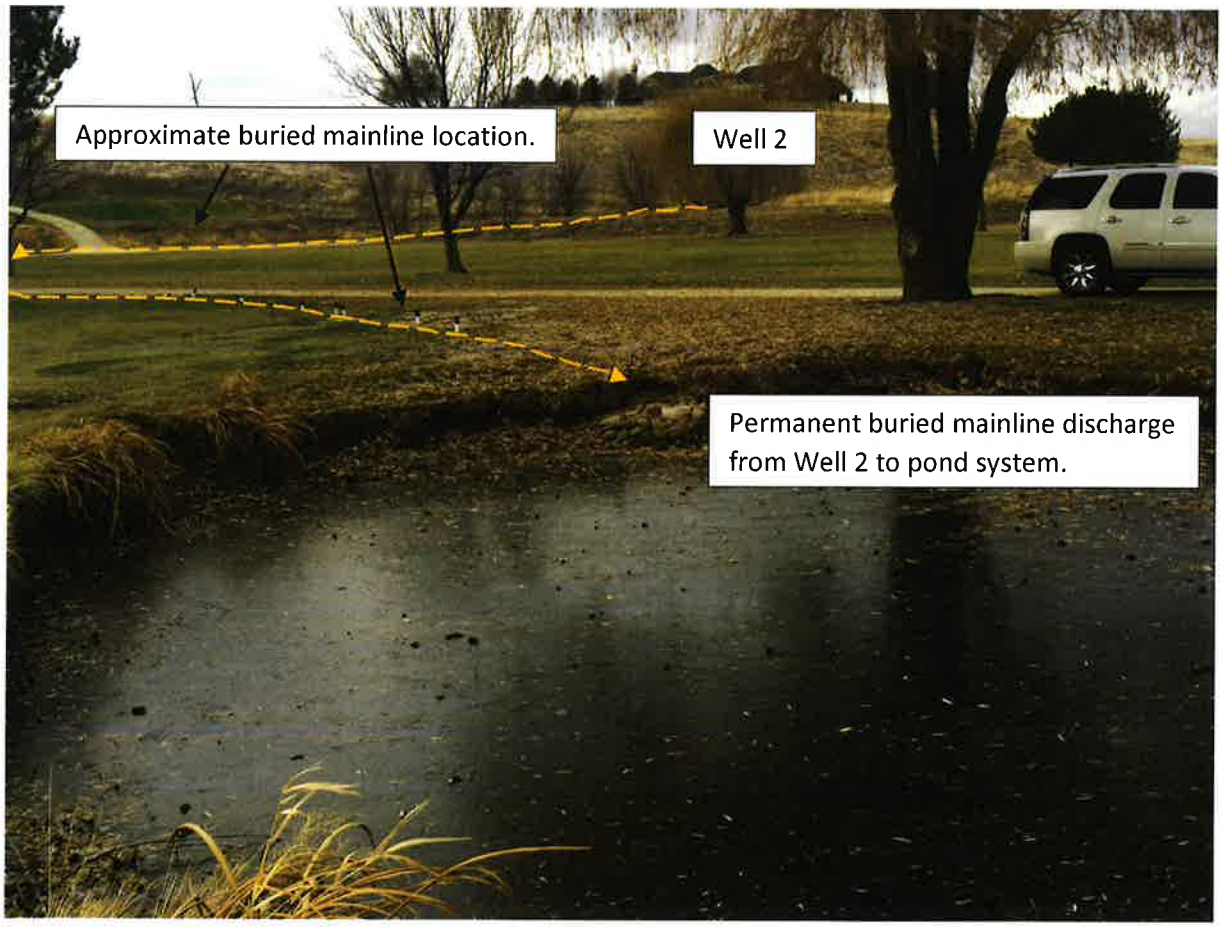
Well 1 pump controls. Controls for unrelated surface water pump also.

Well 1 (11/26/19 Exam)

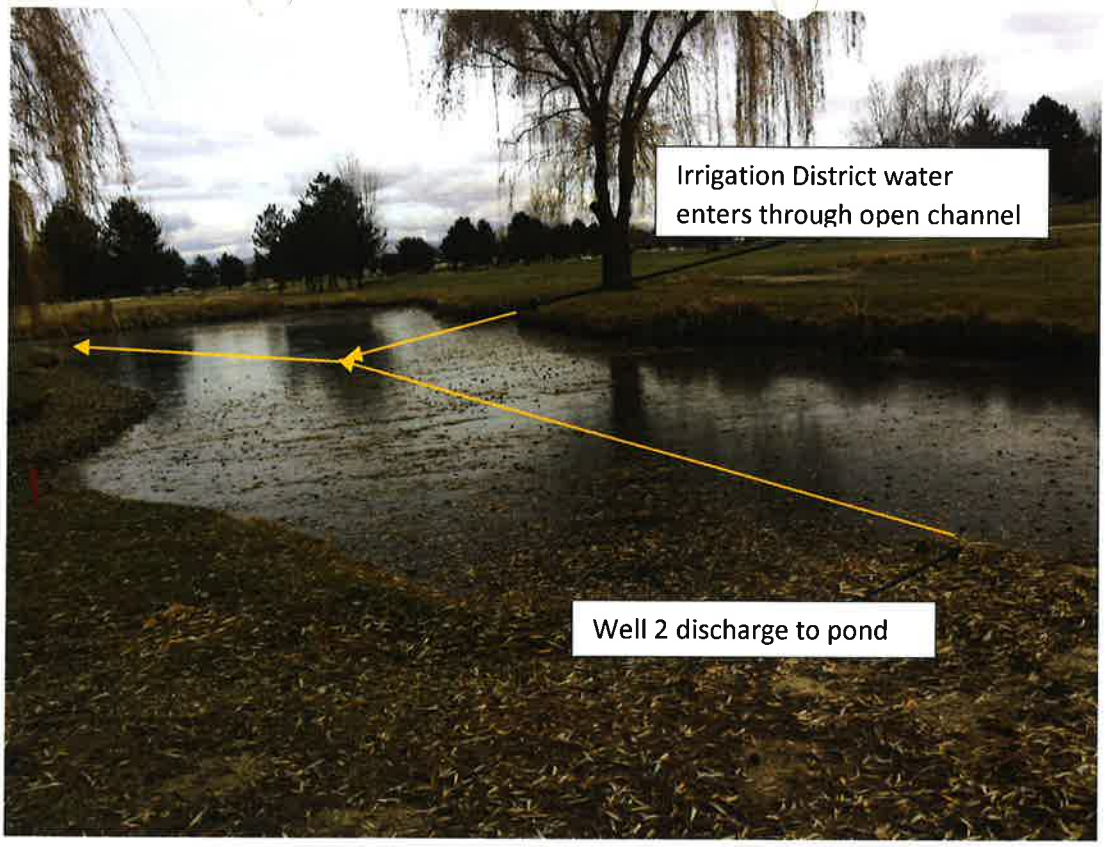
Well 2 Pump Panel. Pump is constant speed.

Well 2 and discharge piping. Mechanical piping appurtenances (from right to left) include discharge elbow, air/vacuum valve, pressure gage, check valve, 2-inch ball valve for winterization, straight spool for future flow meter, pressure relief valve, and butterfly valve (not visible, but located immediately past pressure relief valve).

Temporary 10-inch aluminum mainline (as of 7/23/2018), prior to installation of permanent buried mainline. Portable ultrasonic flow meter used for flow measurement shown on pipe.



Buried mainline discharge to golf course pond system. Buried mainline follows cart path from Well 2 to this pond.



Well 2 discharge to pond system in lower right. Irrigation District water enters from upper right (SE edge of pond). Mixed water exits through an open channel at the north end of pond to remaining ponds.

Intermediate pond located just south of pump station pond. Mixed Well 2 groundwater and irrigation district water enters the pond through a buried pipe (right side of photo, SE corner of pond) and exits the intermediate pond through a channel to the north.

Pressure irrigation pump station (right) and pond (left) looking north-northwest. Water from Well 1 enters north side of this pond through buried pipe. Water from Well 2 enters southwest corner of pond through open channel.

Pressure irrigation pump station with discharge pipe and filter (foreground) looking west. Water from Well 2 enters the pond through an open channel at far side of the pond.

Northernmost pond in system, looking southeast. Water from Well 2 enters pond through buried pipeline from the pump station pond. Water from Well 1 enters pond through buried pipeline.

Pond north of clubhouse. Pond is filled directly from irrigation system.