

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

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. 63-334951. Owner Lexington Hills Homeowners Association IncPhone No. 208-939-0240Current address 9601 W State St Ste 203, Boise, Idaho 837142. Examiner's name Cody ParkerEXAM DATE February 6, 20183. Accompanied by Mary MayEmail MaryLMay@me.comAddress sameRelationship to permit holder HOA Board MemberPhone No. 208-447-71654. Source Groundwater

tributary to _____

B. OVERLAP REVIEW1. Other water rights with the same place of use ~~None~~ 63-120172. Other water rights with the same source and point of diversion None**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	3	04N	01E	Ada	GPS, Well Driller Report

2. Place(s) of Use:

Method of determination Aerial imagery, digital PLS map

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
04N	01E	3									All	All	All	All		All			

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
D0060393		5			

*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
Flow meter installed						

2. Measurements: _____

85 gpm from flow meter

E. NARRATIVE/REMARKS/COMMENTS

See Attached

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 = 85 gpm $\approx$ 0.19 cfs

within 10% so no justification for limiting below permit rate

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

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

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

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \text{NA}$$

2. Volume Calculations for Other Uses:

Capacity = 25.2 af (per attached sheet)

= 33.0 af (consultant estimate, system was established at time of application)

Consumption = 11.3 afa (per attached sheet, calculated for November-May when no SW is available)

= 42.0 afa (consultant estimate, calculated from water bill per narrative attached to application)

Recommended volume = 67.2 afa

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion	Annual Volume
	From	To	Q (cfs)	V (afa)
Diversion to storage	01/01	12/31	0.20 cfs	
Wildlife Storage	01/01	12/31		67.2 afa
Recreation Storage	01/01	12/31		67.2 afa
Aesthetic Storage	01/01	12/31		67.2 afa
Totals:			0.20 cfs	67.2 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

Date

4-10-18

Reviewer

Date

4/10/18

SEAL

STATE OF IDAHO
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BENEFICIAL USE FIELD REPORT
Narrative

This permit authorizes the diversion of 0.20 cfs and storage of 75.0 afa from groundwater for aesthetic, recreation, and wildlife uses. Proof was submitted on June 25, 2013. I completed this field exam on February 6, 2018.

Water is diverted from a 6" well using a 5-hp submersible pump. The water is discharged into an open vault which is connected to pond 16 (as labeled on the system diagram). Four 5-hp submersible pumps divert water from the vault to ponds 20, 9, and 8. The water then gravity feeds back down the three forks of the system through an open channel to the southernmost ponds. Separate pumps re-divert water at ponds 2 and 19, recirculating water back to the top of the circuits. The pump at pond 2 also supplies water to pond 3. All pumps appear to be operated on an as-needed basis as determined by float valves.

The owners do not use the groundwater when surface water is available from the Farmer's Union Canal. At that point (presumably at the beginning of June) the ponds are already filled with groundwater and irrigation water is circulated through the system and is used at the same rate as it is diverted (no irrigation water is stored). Once surface water is shut off (end of October), the owners resume using groundwater to keep the ponds full.

The well is located at N43°42'26.2" by W116°19'39.5" in the SESW of Sec. 3, T04N, R01E, B.M. The 20 ponds are all located in the NWSW, SWSW, NESW, SESW, and the NWSE QQs of the same section.

A flowmeter is installed at the well and the diversion can be controlled by shutting off power to the pump. At the time of the exam, groundwater was diverted at around 86 gpm (0.19 cfs). The measured diversion rate is not significantly different from the permitted rate of 0.20 cfs so I have recommended 0.20 cfs for the license.

The owners say that all 20 ponds have a maximum depth of around 18 ft. That depth seems hard to believe for the smaller ponds. For instance pond 3 has a surface area of around 1400 ft². For the maximum depth to be 18 ft, the average slope of the sides would need to be around 85% (38.3°). However, the pond-design literature I could find online indicates that ponds can be designed with up to 100% slope (45°). Therefore, I have used 18 ft as the maximum depth for all 20 ponds to estimate the capacity. The total capacity I calculate for the ponds is 24.8 af. There is also around 5180 ft of open channel which is an average of 2.5 ft wide and has around 8 inches of water. Due to the constant recirculation of water, the channel flow may be viewed as additional storage. I estimate the open channel capacity at 0.22 afa. Finally, there are a few wide channel areas which are not considered separate ponds. The total surface area of these is 0.06 acres and their average depth appeared to be around 3 ft. The additional volume from these areas is 0.18 af. I estimate the total system capacity at 25.2 af. Finally, because the water in the channel is accounted for as storage, I have decided to drop the Aesthetic use from the license considering it instead to be included under the Aesthetic Storage component.

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Narrative

I calculated evaporative and seepage losses for the period when surface water is not available (November through May, guessed based on applicant remarks in the backfile), a 212 day period annually. Using precipitation deficit data from the Boise WSFO Airport station, I determined the total evaporation during this period to be 2.08 afa. Soil types for all the ponds are CL (0.003 ft day⁻¹) and ML (0.02 ft day⁻¹) for an average seepage rate of 0.0115 ft day⁻¹. The total seepage volume is 9.25 acre feet. The source is groundwater so seepage is lost back to the source.

SPF Engineering provided a more direct estimate of the water lost from the system. Their calculation was as follows:

- Average cost to maintain pond levels during non-irrigation season = \$3000/month
- Water rate at the time = \$1.19 per 100 cubic feet
- Average monthly water use = $3000 / 1.19 \times 100 = 252100$ cubic feet/month
- Average monthly water use = $252100 / 43560 = 5.8$ afa/month ~ 6 afa/month
- Non irrigation season = 7 months
- 7 months x 6 afa/month = **42 afa lost from pond system annually**

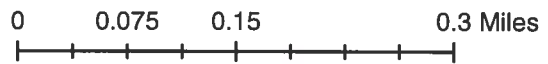
For this license, I recommend that seepage and evaporation calculations from SPF be used for licensing purposes. The total storage volume I am recommending is the 42 afa shown above plus the system capacity of 25.2 afa, for a total of 67.2 afa.

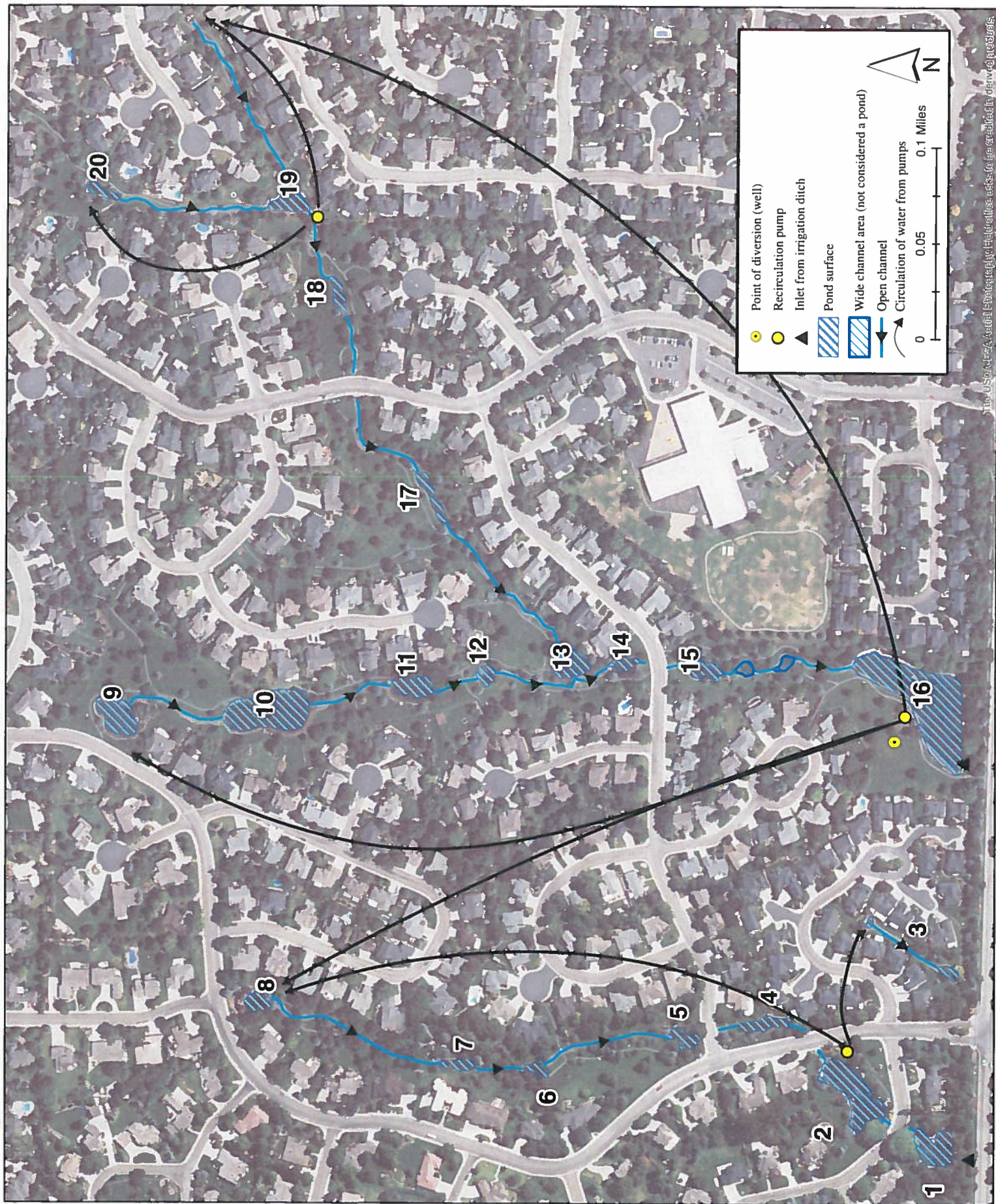
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Department of Water Resources
Beneficial Use Field Report
63-33495

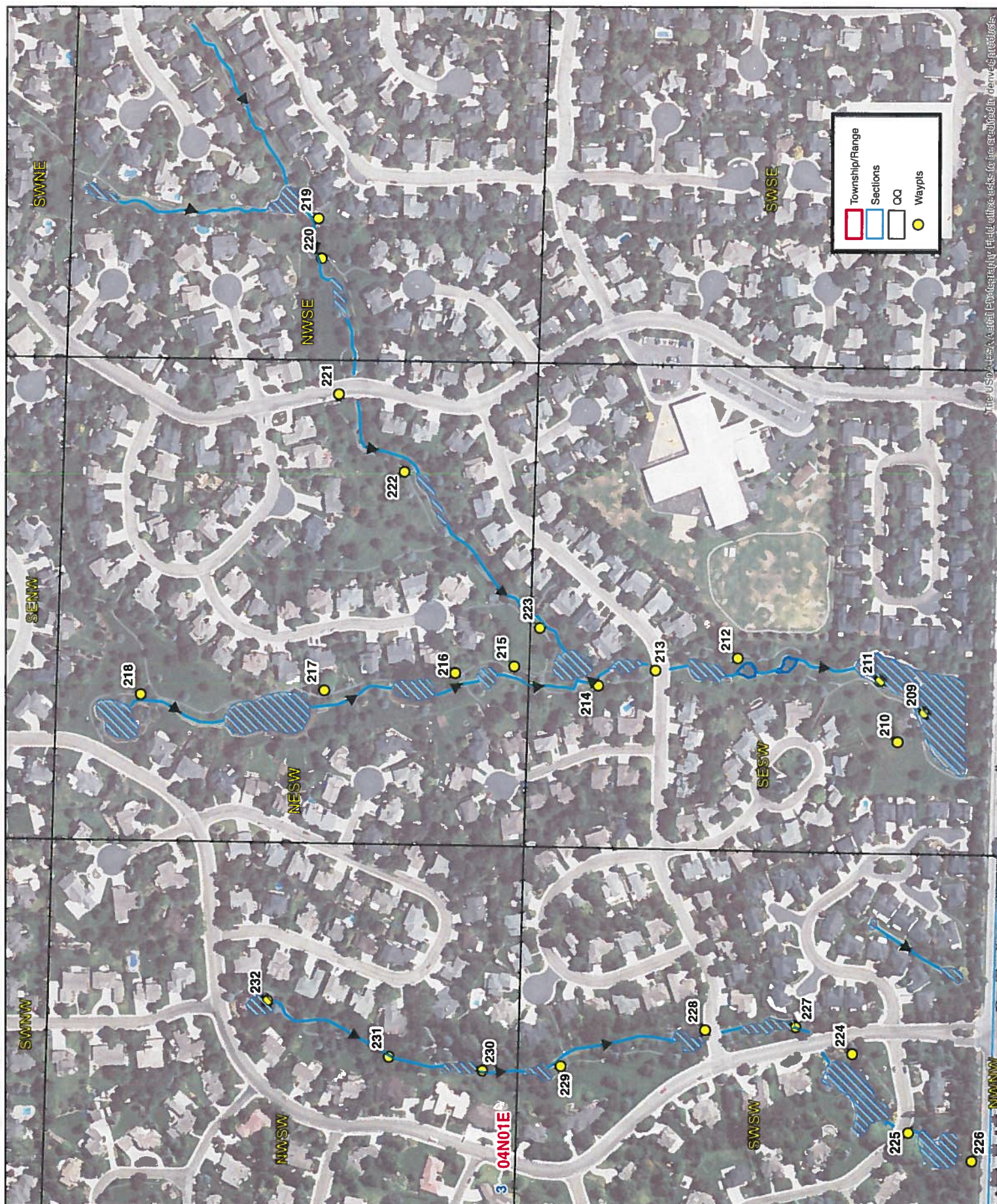
This map depicts the AESTHETIC STORAGE, RECREATION STORAGE, and WILDLIFE STORAGE place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



- Point of Diversion
- Place Of Use Boundary
- Townships
- PLS Sections







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Picture Attachment

WPT 209



Figure 1 Pond 16 just north of Floating Feather Rd. located near the POD

WPT 210



Figure 2 Inside the pump house. The well is controlled by a float valve inside a large circular vault connected to Pond 16. Four 5-hp submersible pumps divert water from the vault to the northernmost points of each of the 3 forks of the system.

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Figure 3 The 6-inch well at WPT 210.



Figure 4 The flow meter located inside the pump house just up from the open discharge into the vault.

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WPT 211



Figure 5 The inlet to pond 16.
Water is pumped to the north of each
fork and gravity feeds back to the
southernmost ponds.

WPT 212



Figure 6 One of the wide areas of
the channel not considered separate
ponds by the right owner. These areas
are shown on the system diagram and
are a maximum of 3' deep.

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Picture Attachment



Figure 7 Pond 15

WPT 213



Figure 8 Pond 14

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Picture Attachment

WPT 214

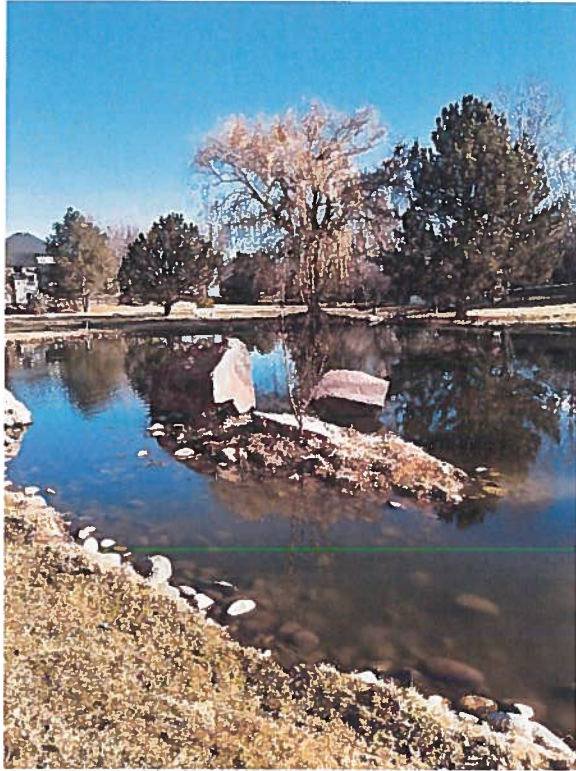


Figure 9 Pond 13. The middle and eastern forks of the system meet at this pond and continue southward as a single channel.

WPT 215



Figure 10 A typical length of channel between ponds. In general, the channel is around 2.5 ft wide with 4 to 8 inches of water.

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Picture Attachment



Figure 11 Pond 12

WPT 217

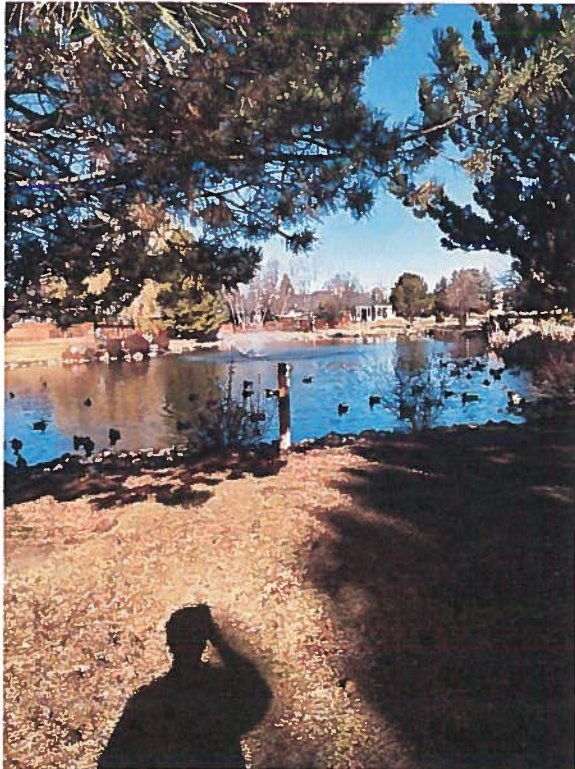


Figure 12 Pond 10

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Picture Attachment

WPT 218



Figure 13 Pond 9, the northernmost pond of the middle circuit. Here, recirculated water can be seen coming from the waterfall feature to the left.

WPT 219

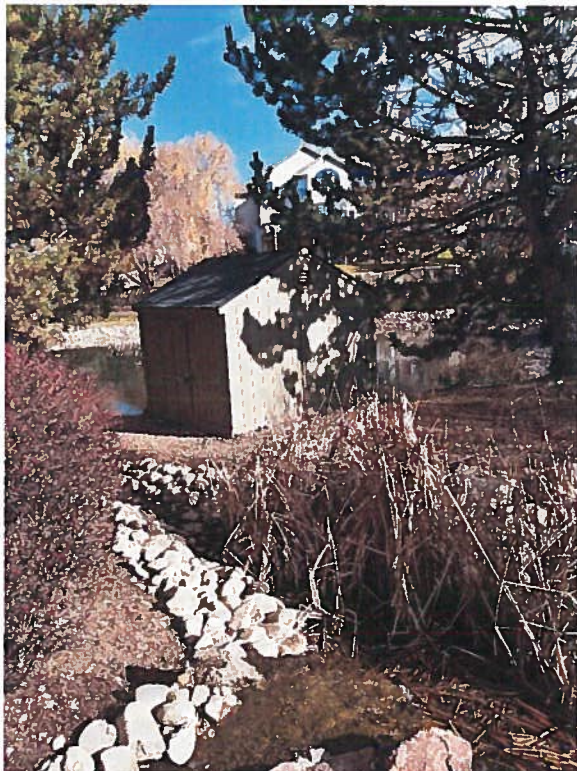


Figure 14 The pump house located along the shore of pond 19. This pump station recirculates water to either pond 20 or to the top of the eastern fork.

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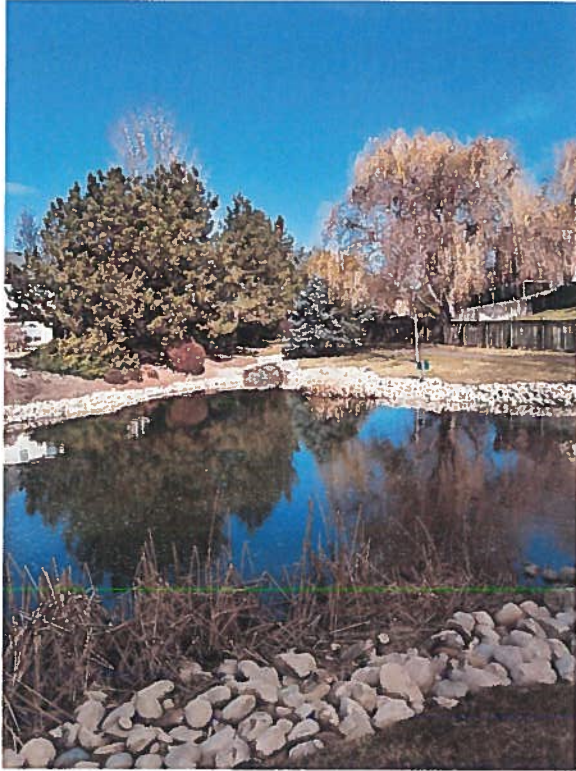


Figure 15 Pond 19

WPT 220



Figure 16 A poor picture of pond
18

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Picture Attachment

WPT 222



Figure 17 Pond 17

WPT 223



Figure 18 Where the western fork
of the system meets pond 13

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Picture Attachment

WPT 224

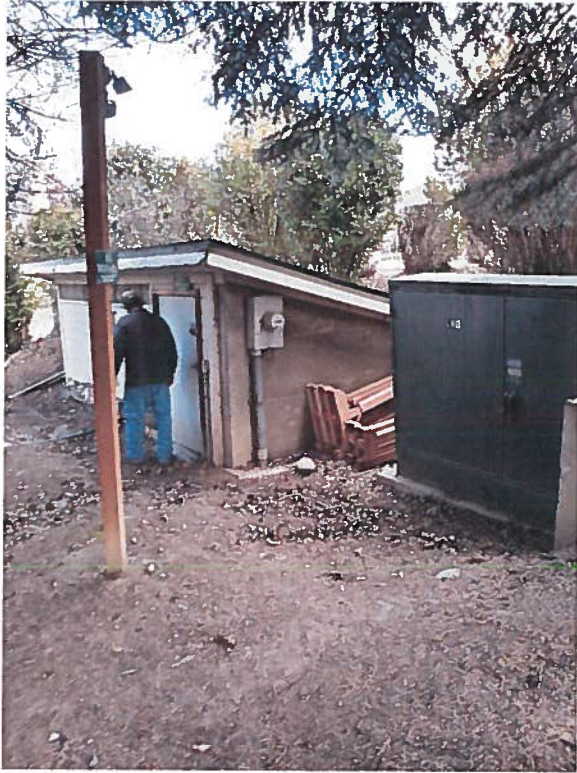


Figure 19 A third pump house located along the shore of pond 2. This pump recirculates water to the top of the western fork of the system to pond 8.

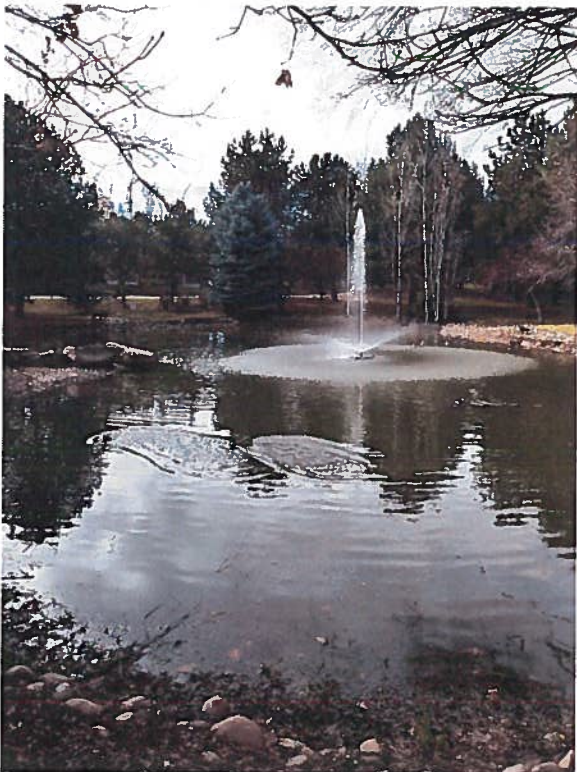


Figure 20 Pond 2

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Picture Attachment

WPT 225



Figure 21 Pond 1, this pond is connected to pond 2 by a culvert which runs under the road. Irrigation water enters both this pond, and pond 16 at their southern borders along Floating Feather Rd.

WPT 226



Figure 22 The headgate from the irrigation canal at the south edge of pond 1. Irrigation water is diverted into the system during the irrigation season. At that point, no groundwater is used in the system.

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Picture Attachment

WPT 227



Figure 23 Pond 4

WPT 228

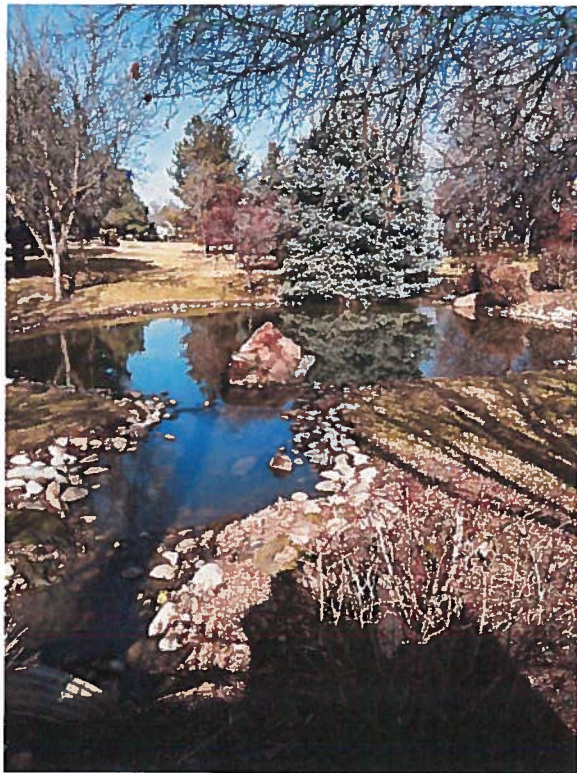


Figure 24 Pond 5

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Picture Attachment

WPT 229



Figure 25 Pond 6

WPT 230

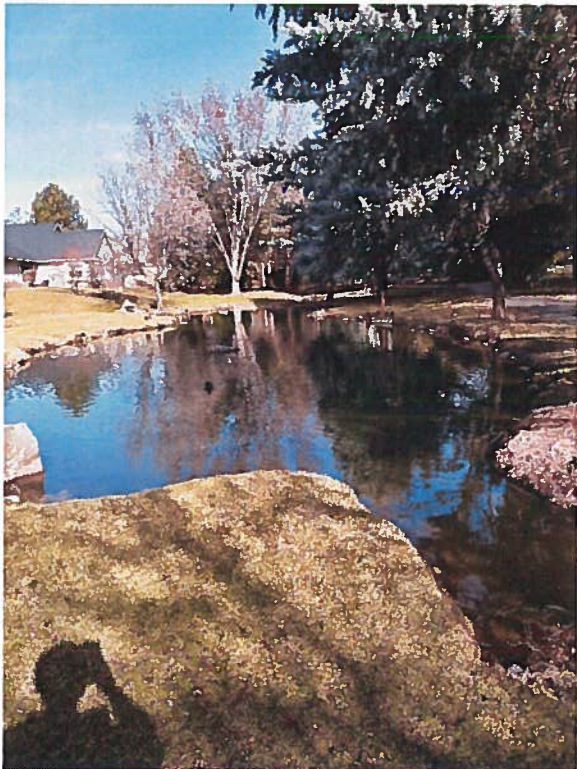


Figure 26 Pond 7

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Picture Attachment

WPT 231

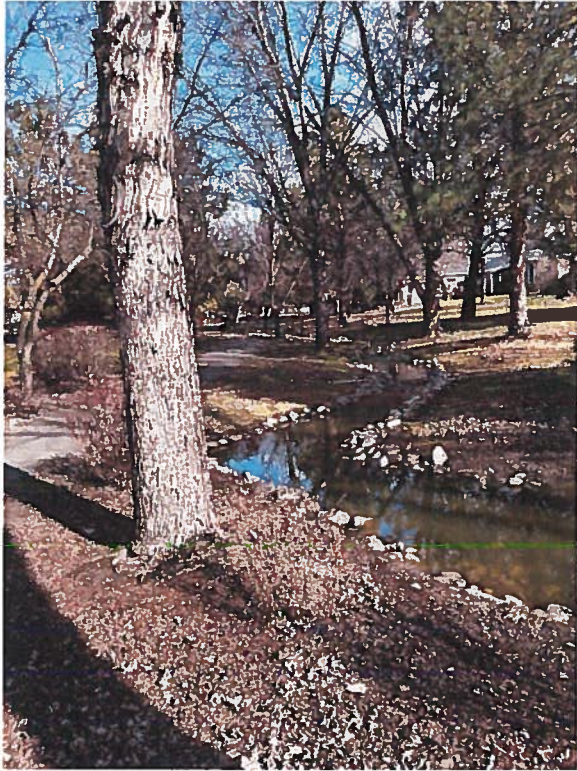


Figure 27 Another typical channel reach. 2-3 ft wide, 4-8 inches deep

WPT 232



Figure 28 Pond 8. This pond receives recirculated water from the pumphouse at pond 2 as well as groundwater from the pumphouse at pond 16

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PONDS					
Pond No	Surface Area (acres)	Depth (feet)	Capacity (acre-feet)	Evaporation (acre-feet)	Seepage (acre-feet)
1	0.19	18	1.368	0.1049377	0.46322
2	0.37	18	2.664	0.203487867	0.90206
3	0.04	18	0.288	0.021998688	0.09752
4	0.1	18	0.72	0.054996721	0.2438
5	0.07	18	0.504	0.038497705	0.17066
6	0.05	18	0.36	0.02749836	0.1219
7	0.06	18	0.432	0.032998033	0.14628
8	0.07	18	0.504	0.038497705	0.17066
9	0.19	18	1.368	0.1049377	0.46322
10	0.49	18	3.528	0.269483933	1.19462
11	0.12	18	0.864	0.065996065	0.29256
12	0.06	18	0.432	0.032998033	0.14628
13	0.16	18	1.152	0.087994753	0.39008
14	0.05	18	0.36	0.02749836	0.1219
15	0.1	18	0.72	0.054996721	0.2438
16	1	18	7.2	0.549967209	2.438
17	0.08	18	0.576	0.043997377	0.19504
18	0.07	18	0.504	0.038497705	0.17066
19	0.12	18	0.864	0.065996065	0.29256
20	0.05	18	0.36	0.02749836	0.1219
TOTAL	3.44		24.768	1.89	8.39

CL-ML soil type
(0.0115 ft/day)
average

Evaporation (Boise WSFO Airport data)				
Month	Days	evap/day (mm)	evap/day(ft)	evap/month(ft)
1	31	-0.66	-0.00216535	0
2	28	0.08	0.00026247	0.007349082
3	31	0.74	0.00242782	0.07526247
4	30	2.01	0.00659449	0.197834652
5	31	2.65	0.00869423	0.269521006
6	0	4.05	0.0132874	0
7	0	4.79	0.01571522	0
8	0	4.05	0.0132874	0
9	0	2.79	0.00915354	0
10	0	1.54	0.00505249	0
11	30	-0.43	-0.00141076	0
12	31	-0.89	-0.00291995	0
	212		0.017979	0.549967209

Open Channel			
Total Length (feet)	Average Width (feet)	Average Depth (feet)	Capacity (acre-feet)
5178.4	2.5	0.22	0.72

Wide Channel Areas			
Total SA (acres)	Average Depth (feet)	Capacity (acre-feet)	Evap (afa)
0.06	3	0.15	0.03

Total channel capacity
0.4 af

Total system capacity
25.2 af

Total non-irrigation season consumption
11.3 afa

Total annual volume required
36.5 afa

* seepage and evaporation calculated for October through April when surface water is not available

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Place of Use Comparison

Basin/Seq	Owner	Source	Use
63-10370	DE AUSTI	GROUND	IRRIGATION
63-10370	DE AUSTI	GROUND	STOCKWATER
63-10380	BOCHENI	GROUND	IRRIGATION
63-10384	KELLY, R	GROUND	IRRIGATION
63-11401	KRAEMER	GROUND	IRRIGATION
63-11413	CITY OF I	GROUND	MUNICIPAL
63-11869	JOHNSTO	GROUND	IRRIGATION
63-12017	CITY OF I	GROUND	AESTHETIC
63-12017	CITY OF I	GROUND	DIVERSION TO STO
63-12017	CITY OF I	GROUND	RECREATION
63-12017	CITY OF I	GROUND	RECREATION STOR
63-12017	CITY OF I	GROUND	WILDLIFE
63-12017	CITY OF I	GROUND	WILDLIFE STORAG
63-12061	ANDERSK	BOISE	IRRIGATION
63-12147	EAGLE W	GROUND	MUNICIPAL
63-1230	FARMERS	BOISE	IRRIGATION
63-1230	GIENS P	BOISE	IRRIGATION
63-1230	LEXINGT	BOISE	IRRIGATION
63-12448	CITY OF I	GROUND	MUNICIPAL
63-12448	CHASE, R	BOISE	IRRIGATION
63-12559	EAGLE W	GROUND	MUNICIPAL
63-12559	CHASE, R	BOISE	IRRIGATION
63-1266	BOWERM	BOISE	IRRIGATION
63-1478	BOISE VA	BOISE	IRRIGATION
63-1478	BOISE VA	BOISE	IRRIGATION
63-147D	BOISE VA	BOISE	IRRIGATION
63-165M	BOISE CT	BOISE	IRRIGATION
63-16721	ADAMS, I	GROUND	DOMESTIC
63-16758	BRUTSM/	GROUND	DOMESTIC
63-17431	ANDREG	GROUND	DOMESTIC
63-17614	BARTON, G	GROUND	DOMESTIC
63-18006	BROICH, I	GROUND	DOMESTIC
63-18006	BROICH, I	GROUND	STOCKWATER
63-18008	JONES, H	GROUND	DOMESTIC
63-18008	JONES, H	GROUND	STOCKWATER
63-18023	LEVANDK	GROUND	DOMESTIC
63-18023	LEVANDK	GROUND	STOCKWATER
63-18111	GRAY, SH	GROUND	DOMESTIC
63-18786	BEAL, CA	GROUND	DOMESTIC
63-18875	KRAEMER	GROUND	DOMESTIC
63-18875	KRAEMER	GROUND	STOCKWATER
63-19483	JACOBSE	GROUND	DOMESTIC
63-19483	JACOBSE	GROUND	STOCKWATER
63-19843	FARMERS	BOISE	IRRIGATION
63-21729	FARMERS	WASTE W	IRRIGATION
63-21827	MC CALL	GROUND	DOMESTIC
63-22395	DINGLEY	GROUND	DOMESTIC
63-22396	DINGLEY	GROUND	DOMESTIC
63-22643	MYERS, C	GROUND	DOMESTIC
63-22804	SHUTZ, D	GROUND	DOMESTIC
63-2360	BOISE VA	BOISE	IRRIGATION
63-248	FARMERS	BOISE	IRRIGATION
63-297	FARMERS	BOISE	IRRIGATION
63-30147	GEORGE, G	GROUND	DOMESTIC
63-30147	GEORGE, G	GROUND	STOCKWATER
63-31198	BOISE VA	BOISE	IRRIGATION
63-31832	BOISE VA	BOISE	IRRIGATION
63-31833	BOISE VA	BOISE	IRRIGATION
63-31870	PRESCOT	GROUND	COMMERCIAL
63-31870	PRESCOT	GROUND	DOMESTIC
63-32028	SANTUCC	GROUND	IRRIGATION
63-33495	LEXINGT	GROUND	AESTHETIC STORA
63-33495	LEXINGT	GROUND	RECREATION STOR
63-33495	LEXINGT	GROUND	WILDLIFE STORAG

Different use
Overlapping water right. 63-33495 is meant to replace use of the overlapping right for the uses described

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04N01E3

Basin/Seq/Owner	Source	NENE	NWNE	SWNE	SENE	NENW	NWNW	SWNW	SENW	NESW	NWSW	SWSW	SESW	NESE	NWSE	SWSE	SESE
63-10370	DE AUSTI GROUND WATER	X															
63-10380	BOCHENE GROUND WATER	X															
63-11401	KRAEME GROUND WATER	X															
63-11413	CITY OF E GROUND WATER											X					
63-11869	JOHNSTO GROUND WATER	X															
63-12017	CITY OF E GROUND WATER											X					
63-12448	CITY OF E GROUND WATER											X					
63-16721	ADAMS, I GROUND WATER					X											
63-16758	BRUTSM/ GROUND WATER		X														
63-17431	ANDREG GROUND WATER	X															
63-17614	BARTON, GROUND WATER	X															
63-18006	BROICH, I GROUND WATER					X											
63-18008	JONES, H GROUND WATER					X											
63-18023	LEVAND C GROUND WATER					X											
63-18111	GRAY, SH GROUND WATER						X										
63-18786	BEAL, CA GROUND WATER							X									
63-18875	KRAEME GROUND WATER	X															
63-19483	JACOBSE GROUND WATER						X										
63-21827	MC CALL GROUND WATER		X														
63-22395	DINGLEY GROUND WATER	X															
63-22396	DINGLEY GROUND WATER	X															
63-22643	MYERS, C GROUND WATER		X														
63-22804	SHUTZ, D GROUND WATER						X										
63-30147	GEORGE, GROUND WATER						X										
63-31870	PRESCOT GROUND WATER				X												
63-32928	SANTUCC GROUND WATER		X														
63-33495	LEXINGT GROUND WATER												X				

