

GIVENS PURSLEY LLP

Attorneys and Counselors at Law

601 W. Bannock Street
PO Box 2720
Boise, ID 83701
Telephone: 208-388-1200
Facsimile: 208-388-1300
www.givenspursley.com

MICHAEL P. LAWRENCE
Direct: 208-388-1294
mpl@givenspursley.com

Gary G. Allen
Christopher J. Beeson
Jason J. Blakley
Clint R. Bollinger
Jeff W. Bower
Preston N. Carler
Jeremy C. Chou
William C. Cole
Michael C. Creamer
Amber N. Dina
Bradley J. Dixon
Thomas E. Dvorak
Jeffrey C. Fereday
Martin C. Hendrickson
Brian J. Holleran
Kersti H. Kennedy

Neal A. Koskella
Debora K. Kristensen
Michael P. Lawrence
Franklin G. Lee
David R. Lombardi
Kimberly D. Maloney
Kenneth R. McClure
Kelly Greene McConnell
Alex P. McLaughlin
Melodie A. McQuade
Christopher H. Meyer
L. Edward Miller
Patrick J. Miller
Judson B. Montgomery
Emily G. Mueller
Deborah E. Nelson

W. Hugh O'Riordan, LL.M.
Randall A. Peterman
Jack W. Relf
Michael O. Roe
Jamie Caplan Smith
P. Mark Thompson
Jeffrey A. Warr
Robert B. White

RECEIVED

MAR 06 2018

WATER RESOURCES
WESTERN REGION

Kenneth L. Pursley (1940-2015)
James A. McClure (1924-2011)
Raymond D. Givens (1917-2008)

March 6, 2018

Via Hand Delivery

Nick Miller
Western Regional Manager
Idaho Department of Water Resources
2735 Airport Way
Boise, ID 83705-5082

Re: Applications for Permit Nos. 63-34333 and 63-34334 – SPF letter to IDFG

Dear Nick,

At the request of, and as a courtesy to, Tom Bassista with the Idaho Department of Fish and Game (IDFG), my client Thorpe Family Trust (Thorpe) has instructed me to send you the enclosed copy of a January 31, 2018 letter from Terry Scanlan with SPF Water Engineering to Mr. Bassista concerning Applications for Permit Nos. 63-34333 and 63-34334. Mr. Bassista asked that the enclosed letter be included in the Department's files for the Applications.

Please note that the enclosed letter from Mr. Scanlan to Mr. Bassista pre-dates, and in no way alters, amends, or modifies, the February 16, 2018 *Stipulation for Withdrawal of Protests and Issuance of Permits* concerning the Applications between IDFG and Thorpe, which also has been filed with the Department.

Please do not hesitate to contact me if you have any questions.

Sincerely,



Michael P. Lawrence

cc: Tom Bassista (via email)
Terry Scanlan (via email)
Al Barker (via email)

Enclosure

ORIGINAL



January 31, 2018

Tom Bassista
Idaho Department of Fish and Game
3101 South Powerline Road
Nampa, ID 83686
Via email to thomas.bassista@idfg.idaho.gov

Subject: Applications for Permit 63-34333 and 63-34334

Dear Tom:

As a follow up to our conversations, this letter provides a narrative description of the proposed water use under applications for permit 63-34333 and 63-34334 filed in the name of the Thorpe Family Trust (Thorpe). Included is an analysis of potential impacts to flows in the Boise River and a list of proposed conditions of approval.

This letter updates the previous draft narrative letter that I sent to you on November 6, 2017, and addresses issues raised by the Idaho Department of Fish & Game (IDFG) generally, and specifically follows up on an October 11, 2017 on-site meeting attended by you, me, applicant Ryan Thorpe (Thorpe Family Trust), and eight IDFG staff members. At that meeting, we toured portions of the project area, including the proposed point of diversion for 63-34333 and the place of use for 63-34334. We also discussed how the water is used and the benefits of the proposed water right permits to resident and migratory waterfowl and resident wildlife species dependent on riparian and agriculture lands.

Description of Applications

The two applications propose seasonal diversion of water from the Boise River for wildlife and recreation uses on Thorpe-owned land located approximately 1 mile southwest of Parma, in Canyon County. The wildlife and recreational uses are somewhat synonymous, as water is used primarily to attract waterfowl and benefit seasonal wildlife habitat for the purposes of hunting and wildlife viewing.

In general, each application proposes to divert water from the Boise River, and convey the water through existing irrigation channels for shallow flooding of agricultural lands and non-agricultural lands to attract and hold waterfowl. Most of the diverted water returns to the River either through surface channels or as groundwater. Consumption of water diverted under these applications will be minimal because (1) the majority of the use is during fall and winter when evaporation rates are negligible and (2) any transpiration from crops is covered under existing decreed irrigation water rights. Thorpe will agree to conditions limiting the combined diversion

rate for the wildlife/recreation permit and appurtenant irrigation water rights to the amount of the wildlife/recreation permit.

Specifics of each application are provided below; copies of the applications with maps showing the points of diversion, delivery channels, places of use, and location of return flow to the river are enclosed as Attachment A.

- Application 63-34333 proposes diversion of 0.90 cfs for flooding of a 6-acre area. The water would be diverted from the Boise River through an existing slough, and returned to the river ½-mile downstream at the northwest corner of the Thorpe property. The diversion rate is based on the 0.15 cfs/acre standard rate that the Idaho Department of Water Resources (IDWR) has adopted for this type of use. The application includes a 221.5-AF wildlife and recreation storage component to account for the seasonal flooding volume, including theoretical evaporation and seepage volumes. The theoretical seepage loss accounts for 98 percent of the storage volume. The entire 6-acre place of use is overlapped by the place of use for application 63-34334.
- Application 63-34334 proposes diversion of 13.05 cfs for flooding of an 87-acre area. The water would be diverted through the Island Highline Ditch, and return to the river two miles downstream at the northwest corner of the Thorpe property. The diversion rate is based on the 0.15 cfs/acre standard rate that the Idaho Department of Water Resources (IDWR) has adopted for this type of use. The application also includes a 1624.7-AF wildlife and recreation storage component to account for the seasonal flooding volume, including theoretical evaporation and seepage volumes. The theoretical seepage loss accounts for 95 percent of the storage volume. Six acres of the 87-acre place of use are overlapped by the place of use for application 63-34334.

Using the 0.15 cfs/ac standard rate, applications 63-34333 and 63-34334 will not exceed a combined diversion rate of 13.05 cfs for the 87-acre place of use.

Water diverted under both applications returns to the Boise River at the same locations, primarily at a point adjacent to Roswell Road near the common corner to Sections 7, 8, 17, and 18, T5N, R5W. Some of the diverted water infiltrates into the shallow aquifer and ultimately returns to the river as groundwater discharge to the river bed, tributary drains, and tributary wetlands.

The proposed season of use includes the months of September through February for 63-34333 and October through February for 63-34334. Diversion rates will vary through these periods depending on weather, crops, and other factors. It is anticipated that the peak diversion period will be early November through mid-January.

The uses proposed by both applications consist of flow-through water for shallow flooding of agricultural fields and non-irrigated areas near the Boise River for the purpose of seasonal waterfowl habitat. Typically, the areas are flooded to a depth of a few inches, although depending on topography, the flooding depth can range from less than an inch to over a foot.

The non-irrigated lands include (1) an existing low area on the west that will receive water under 63-34333 and 63-34334, and (2) areas further east that will receive water only under 63-34334. See Figure 1 below.

- The low area place of use for 63-34333 and 63-34334 is visible as partially flooded or wet in the June 29, 2017 Google Imagery when the Boise River was still running above 4000 cfs.
- The non-irrigated area place of use for 63-34334 is slightly higher in elevation, and was dryer in the June 29, 2017 image.

The non-irrigated lands are currently enclosed by flood-control dikes, and can be flooded without significant earthwork. Thorpe will control noxious weeds on the non-irrigated lands through a combination grazing, spraying, and cover crop plantings, consistent with the weed control measures used on the agricultural lands.



Figure 1. Non-irrigated areas proposed for seasonal flooding (approximate areas)

Benefits to Wildlife and Public

Some of the flooded areas will be hunted, while other areas will be preserved as waterfowl resting/refuge areas on an annual basis. The dedicated refuge/resting areas may change from year to year. In addition to dedicated refuge areas, less than 20 percent of the property is actively hunted at any particular time during a season (although hunting areas may be rotated through the property over the course of a season) which provides additional areas for waterfowl to rest and feed. The resting/roosting/refuge areas ensure that waterfowl have a secure area to provide hunting opportunity within and adjacent to the property. Thorpe restricts hunting to small-gauge shotguns which minimizes the noise impacts on adjacent resting/roosting/refuge areas. Effective resting/roosting/refuge areas increase the seasonal population of waterfowl in the local area which provides improved hunting success both on and off of the property.

The property is currently leased to a hunting club with approximately 30 members, providing hunting opportunities to participating members of the public.

Impacts to Flows in the Boise River

Potential impacts to the Boise River consist of a depletion of up to 13.05 cfs for a two-mile reach of river.

The USGS gaging station for the Boise River at Parma is located ¼ mile downstream from the proposed point of return flow for these applications. Attachment B includes USGS Streamflow Data (monthly mean discharge) from this station for the 1971-2016 period. Due to the proximity of the gage, the gage station flows should accurately represent river flows in the potentially depleted reach. A copy of the gage data report from the USGS website is enclosed. In summary, mean monthly discharge at the gage for the past 40 years has been 949 cfs in September, 1030 cfs in October, 995 cfs in November, 1040 cfs in December, 1330 cfs in January, and 1730 cfs in February. Review of monthly averages for the period of record shows that average monthly river flow exceeds 700 cfs approximately 80% of the time in September, 90% of the time in October, 97.5% of the time in November and December, 95% of the time in January, and 92.5% in February. As a result, depletion to the River reaches impacted by these applications typically will be less than 2% of the flow during the main use period of November through January. We reviewed the IDWR water right database and did not find any other non-irrigation season diversions from the Boise River in the two-mile impacted river reach.

Attachment C is a summary of all other Boise River water rights, permits, and applications listing wildlife as a water use. Water rights diverting for wildlife uses upstream from the reach potentially impacted by 63-34333 and 63-34334 discharge the majority of their return flows to the river upstream of the reach potentially impacted by 63-34333 and 63-34334. As a result, there should be very little cumulative impact from upstream wildlife diversions from the River. Similarly, applications 63-34333 and 63-34334 are not expected to have a significant cumulative impact on downstream flows because the diverted water will return to the river as surface water

discharge or groundwater gains near the northwest corner of the Thorpe property, so that there should be no additional downstream cumulative impact as a result of these applications.

Proposed Conditions of Approval

Based on our conversations with you, Thorpe is willing to agree to the following conditions of approvals on the permits. We anticipate that IDWR will include additional standard conditions of approval.

1. The Director retains jurisdiction to require the right holder to provide purchased or leased natural flow or stored water to offset depletion of Lower Snake River flows if needed for salmon migration purposes. The amount of water required to be released into the Snake River or a tributary, if needed for this purpose, will be determined by the Director based upon the reduction in flow caused by the use of water pursuant to this permit.
2. Prior to diversion of water under this right, the right holder shall install and maintain a measuring device and lockable controlling works of a type acceptable to the Department as part of the diverting works.
3. Use of water under this right may be regulated by a watermaster with responsibility for the distribution of water among appropriators within a water district. At the time of this approval, this water right is within State Water District No. 63.
4. Wildlife and wildlife storage use is to create shallow water and moist soil wildlife habitat. These habitats are intended to provide resting, roosting, and refuge areas for waterfowl.
5. Recreation and recreation storage use is for waterfowl hunting and wildlife viewing. Recreation use under this right is for flow-through water and return-flow water associated with recreation storage.
6. This right does not authorize the diversion and use of water released from Lucky Peak Reservoir for stream flow maintenance purposes in connection with Water Right 63-3618.
7. Water diverted under the recreation flow component of this water right, minus evaporation and seepage losses, shall be returned to the Boise River.
8. Water rights 63-34333 and 63-34334 in combination shall be limited to a diversion rate of 13.05 cfs.
9. Diversions under water rights 63-34334 will not exceed 13.05 cfs in combination with diversion of irrigation water rights appurtenant to the 63-34334 place of use.

Summary

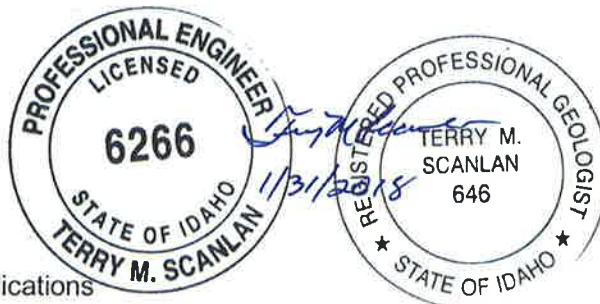
1. Thorpe proposes diversion of up to 13.05 cfs from the Boise River for wildlife and recreation uses primarily focused on waterfowl hunting.
2. The diverted water will return to the river either directly through a surface channel on the Thorpe property or indirectly as seepage losses that are expected to ultimately reach the river as groundwater flow.
3. The 13.05 cfs diversion rate will result in a typical river flow depletion of 2% or less for an approximate 2-mile reach of the river from the Island Highline Ditch point of diversion to the point of return at Roswell Road. Thorpe does not propose to monitor return flow rates on a continuous basis. However, Thorpe will commit to performing spot measurements of return flow rates in December and January during the first year of operation and provide a report to IDF&G by March 01.
4. Thorpe believes that the seasonal habitat and resting areas provided by the project will improve waterfowl hunting not only within the Thorpe property, but on private and public lands within the Parma area. A hunting club leasing the property provides hunting opportunities for participating members of the public.

Please contact me if you have additional questions regarding these applications

Sincerely,



Terry M. Scanlan, P.E., P.G.



Enclosures: Attachment A - Applications
Attachment B - USGS Streamflow Data – Boise River at Parma 1971-2016
Attachment C - Summary of other Boise River Wildlife Water Rights

cc: Ryan Thorpe – Thorpe Family Trust
Michael Lawrence – Givens Pursley LLP

SPF file number: 1214.0020

Attachment A
Applications 63-34333 and 63-34334

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR PERMIT
To appropriate the public waters of the State of Idaho

Ident. No.

RECEIVED**JAN 26 2017**

1. Name of applicant(s) Thorpe Family Trust Phone 208-856-7897
 Mailing address c/o Ryan Thorpe, 28854 Boulder Rd City Parma
 State ID ZIP 83660 Email ryanthorpefarms@gmail.com
 Name connector (check one): ☐ and ☐ or ☐ and/or
2. Name of representative, if any SPF Water Engineering Phone 208-383-4140
 Mailing address 300 E. Mallard Dr., Ste 350 City Boise
 State ID ZIP 83706 Email lgraves@spfwater.com
- a. ☐ Send all correspondence for this application to the representative and not to the applicant OR
☒ Send original correspondence to the applicant and copies to the representative.
- b. ☒ The representative may submit information for the applicant but is not authorized to sign for the applicant OR
☐ The representative is authorized to sign for the applicant. Attach a Power of Attorney or other documentation.
3. Source of water supply Boise River which is a tributary of Snake River

4. Location of point(s) of diversion:

Twp	Rge	Sec	Govt Lot	%	%	%	County	Source	Local name or tag #
5N	5W	17	3		SE	NW	Canyon	Boise River	

5. Water will be used for the following purposes:

Amount 0.90 cfs for Wildlife & Recreation purposes from 9/1 to 2/28 (both dates inclusive)
 (cfs or acre-feet per year)

Amount 221.5 afa for Wildlife & Recreation Storage purposes from 9/1 to 2/28 (both dates inclusive)
 (cfs or acre-feet per year)

Amount 0.90 cfs for Diversion to Storage purposes from 9/1 to 2/28 (both dates inclusive)
 (cfs or acre-feet per year)

Amount _____ for _____ purposes from _____ to _____ (both dates inclusive)
 (cfs or acre-feet per year)

6. Total quantity to be appropriated is (a) 0.90 cubic feet per second (cfs) and/or (b) 221.5 acre-feet per year (af).

7. Proposed diverting works:

- a. Describe type and size of devices used to divert water from the source. Ditch, headgates
- b. Height of storage dam _____ feet; active reservoir capacity _____ acre-feet; total reservoir capacity _____ acre-feet. If the reservoir will be filled more than once each year, describe the refill plan in item 12. For dams 10 feet or more in height AND having a storage capacity of 50 acre-feet or more, submit a separate Application for Construction or Enlargement of a New or Existing Dam. Application required? ☐ Yes ☐ No
- c. Proposed well diameter is _____ inches; proposed depth of well is _____ feet.
- d. Is ground water with a temperature of greater than 85°F being sought? ☐ Yes ☒ No
- e. If well is already drilled, when? _____; drilling firm _____;
 well was drilled for (well owner) _____; Drilling Permit No. _____.

Received by 1/26/17 Date 1/26/17 Time 1:30PM Preliminary check by CP
 Fee \$ 330.00 Received by RN Receipt No. W044911 Date 1/26/17

63-34333

8. Description of proposed uses (if irrigation only, go to item 9):
- Hydropower; show total feet of head and proposed capacity in kW. _____
 - Stockwatering; list number and kind of livestock. _____
 - Municipal; must complete and attach the [Municipal Water Right Application Checklist](#).
 - Domestic; show number of households _____
 - Other; describe fully. Miscellaneous wildlife, including waterfowl habitat; recreation use for waterfowl hunting and wildlife viewing.

9. Description of place of use:
- If water is for irrigation, indicate acreage in each subdivision in the tabulation below.
 - If water is used for other purposes, place a symbol of the use (example: D for Domestic) in the corresponding place of use below. See instructions for standard symbols.

TWP	RGE	SEC	NE				NW				SW				SE				TOTALS
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
5N	5W	17						6											6

Total number of acres to be ~~irrigated~~ ^{flooded}: 6

10. Describe any other water rights used for the same purposes as described above. Include water delivered by a municipality, canal company, or irrigation district. If this application is for domestic purposes, do you intend to use this water, water from another source, or both, to irrigate your lawn, garden, and/or landscaping? The proposed acres and uses are also proposed on an accompanying application from a separate system.

11. a. Who owns the property at the point of diversion? Applicant
- b. Who owns the land to be irrigated or place of use? Applicant
- c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing: _____

12. Describe your proposal in narrative form, and provide additional explanation for any of the items above. Attach additional pages if necessary. see attached remarks

13. Time required for completion of works and application of water to proposed beneficial use is 5 years (minimum 1 year).

14. **MAP OF PROPOSED PROJECT REQUIRED** - Attach an 8½" x 11" map or maps clearly identifying the proposed point of diversion, place of use, section #, township & range. The map scale shall not be less than two (2) inches equal to one (1) mile.

The information contained in this application is true to the best of my knowledge. I understand that any willful misrepresentations made in this application may result in rejection of the application or cancellation of an approval.

[Signature]
Signature of Applicant

RYAN THORPE OWNER OF TRUST
Print Name (and title, if applicable)

Signature of Applicant

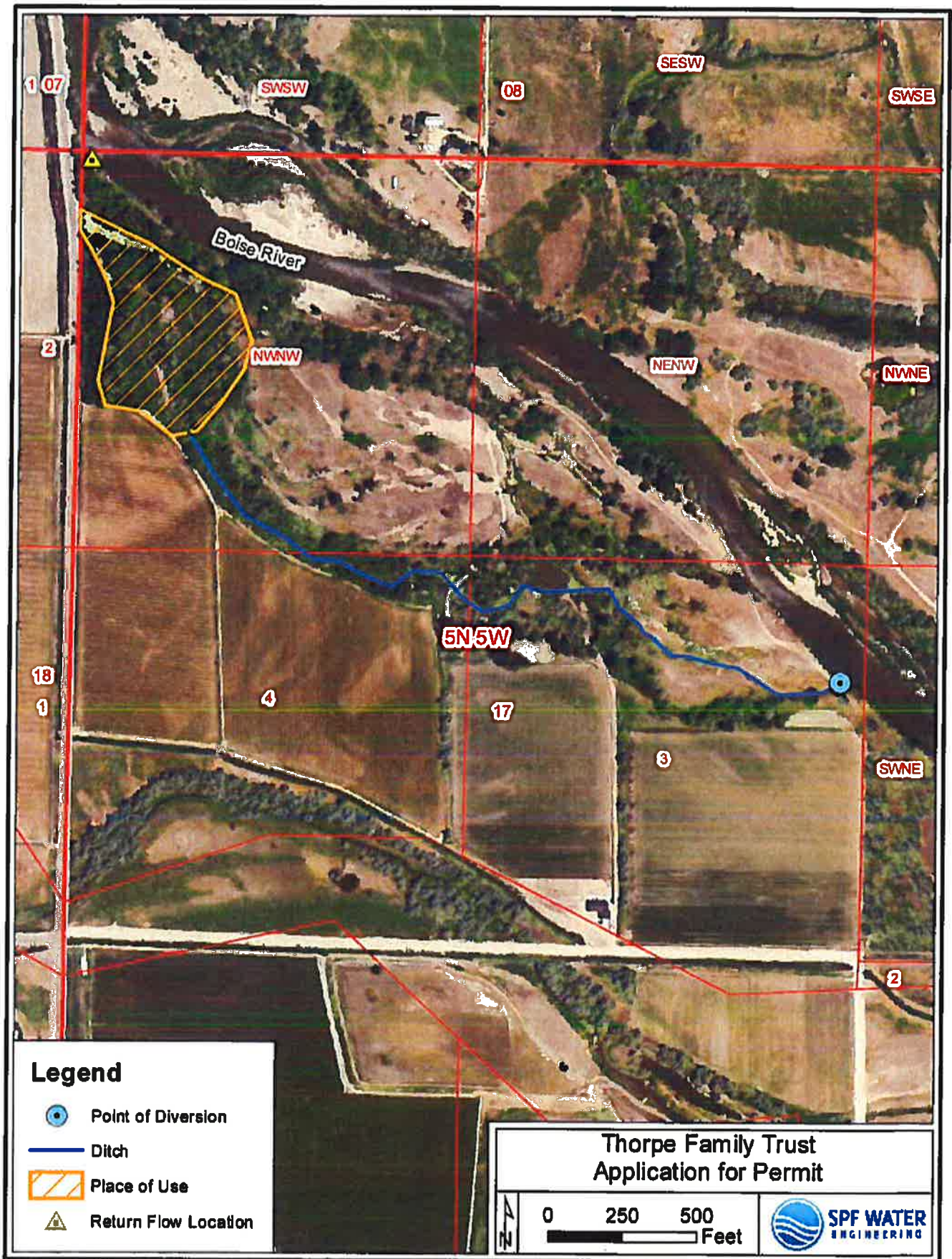
Print Name (and title, if applicable)

Application Remarks:

Proposed flow rate for wildlife/recreation uses is based on diversion of 0.15 cfs per acre for 6 acres of flow-through field flooding. Field flooding depth will range from less than 1 inch up to approximately 12 inches with an average depth of 6 inches. Proposed volumes were calculated using the IDWR storage memo 76 spreadsheet (attached) and account for associated storage, seepage and evaporation amounts. Regarding seepage, the USDA's Web Soils Survey results indicated moulton fine sandy loams (MtB) are predominate on most of the 6 acres. As a result, the rate used for seepage loss was calculated at 0.2 ft/day. Regarding evaporation, positive precipitation deficits from the Parma AgriMet Station for open water-shallow systems from September through February were used to calculate evaporation losses.

The 6 acres are also included on an accompanying application listing the same uses, from the same source, using a separate diversion system. This right, when combined with the accompanying application, will not exceed 0.15 cfs/acre on the 6 overlapping acres.

Volume Calculation					
Seepage					
Area (acres)	Rate (ft/day)	Start Date	End Date	Days	Volume (AF)
6	0.2	1-Sep	28-Feb	180	216
Total					216
Evaporation					
Area (acres)	Rate (mm/day)	End Date	Start Date	Days	Volume (AF)
6	2.67	1-Sep	30-Sep	30	1.58
6	1.13	1-Oct	31-Oct	31	0.69
6	0.1	1-Nov	30-Nov	30	0.06
6	-0.54	1-Dec	31-Dec	31	0.00
6	-0.43	1-Jan	30-Jan	30	0.00
6	0.38	1-Feb	28-Feb	28	0.21
Total				180	2.5
Storage Volume					
Area (acres)	Average Depth (ft)			Volume (AF)	
6	0.5			3	
Total Volume					221.5



63-34333

IDWR STORAGE MEMO NO. 76
SUPPORTING DOCUMENTATION
FOR PROPOSED STORAGE VOLUME

63-34333

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

Absence of an entry indicates that the data were not estimated. The asterisk "*" denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 Issued May 2007(<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties—Canyon Area, Idaho														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H
MtB—Moulton fine sandy loam, 1 to 3 percent slopes														
Moulton	85 B	0-3		Fine sandy loam	SC, SC-SM	A-6, A-2, A-4	0-0-0	0-0-0	90-95-100	90-95-100	65-75-85	35-45-55	25-32-39	6-9-13
		3-21		Fine sandy loam, sandy loam	CL, SC-SM, SC	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-83-90	40-50-60	22-29-35	6-9-13
		21-60		Very gravelly loamy sand, very gravelly sand	GW, GP-GC, GC-GM	A-1	0-0-0	0-0-0	30-45-60	30-40-50	15-25-35	0-8-15	17-21-24	2-4-6
MvA—Moulton loam, 0 to 1 percent slopes														
Moulton	90 C	0-3		Loam	CL-ML, CL	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-85-95	55-65-75	25-32-39	6-9-13
		3-21		Fine sandy loam, sandy loam	SC, SC-SM, CL	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-83-90	40-50-60	22-29-35	6-9-13
		21-60		Very gravelly loamy sand, very gravelly sand	GW, GP-GC, GC-GM	A-1	0-0-0	0-0-0	30-45-60	30-40-50	15-25-35	0-8-15	17-21-24	2-4-6

Custom Soil Resource Report

Engineering Properties—Canyon Area, Idaho														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct. Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>18 inches	3-18 inches	4	10	40	200		
MwA—Moulton loam, saline, 0 to 1 percent slopes			in				L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H
Moulton, saline	90 C		0-3	Loam	CL-ML, CL	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-85-95	55-65-75	25-32-39	6-9-13
			3-21	Fine sandy loam, sandy loam	SC, SC-SM, CL	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-83-90	40-50-60	22-29-35	6-9-13
			21-60	Very gravelly loamy sand, very gravelly sand	GP-GC, GC-GM, GW	A-1	0-0-0	0-0-0	30-45-60	30-40-50	15-25-35	0-8-15	17-21-24	2-4-8
OgA—Ollaga loam, 0 to 1 percent slopes														
Ollaga	85 B		0-8	Loam	CL, CL-ML	A-7, A-4, A-6	0-0-0	0-0-0	100-100-100	100-100-100	85-90-95	60-68-75	22-32-41	6-11-17
			8-35	Loam, fine sandy loam	CL-ML, ML, CL	A-6, A-4	0-0-0	0-0-0	100-100-100	100-100-100	70-83-95	50-63-75	16-23-31	2-7-12
			35-60	Sand, gravel	GP	A-1	0-0-0	0-0-0	35-40-45	35-40-45	25-30-35	0-1-2	0-0-0	NP

Seepage Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total annual seepage losses from a pond.

FILE NUMBER	XX-XXXXX
REVIEWER	Lori Graves
DATE	12/6/2016

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	6	AC.
-------------------------	---	-----

Pond Surface Area (SQ. FT.)	261360	SQ. FT.
-----------------------------	--------	---------

I used the following method to obtain my Soil Classification Information:	NRCS Web Soil Survey	
My Soil Classification Is	SM	
Suggested Seepage Rate (FT./DAY)	0.2000	FT./DAY

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

Convert to GPD	390995	GPD
----------------	--------	-----

Total Seepage Loss (AFA)	438.0	AFA
--------------------------	-------	-----

Though sand and gravel seepage rates may actually be higher, the maximum allowable rate is 0.2 ft/day, pursuant to Administrative Memo "Seepage Loss Standards for Ponds and Reservoirs."

Suggested Seepage Rates for Different Soil Types:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.2 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.02 ft per day
SC (clayey sands, sand clay mixtures) = 0.007 ft per day
CL (Low to medium plasticity clays) = 0.003 ft per day
MH, OH, PT and CH (high plasticity clays) = 0.0003 ft per day
LINED PONDS (liners can be chemical, fabric, or bentonite) = 0 ft per day
Ponds intercepting Groundwater (excavated ponds filled by ground water) = 0 ft per day

PLEASE NOTE: The initial basis for the Suggested Seepage Rates in the table above is found on Page 16 of Seepage from Fish Ponds, Bulletin 599, August 1989 Alabama Agricultural experiment Station, Auburn University, Auburn University Alabama. If you don't know the soil type, please refer to the map provided at the NRCS Web Soil Survey (Tab #1), an ArcMap Soil Classification Map (Tab #1.1), or published NRCS Soil Survey (Tab #1.2). Use "0" if the pond fill relies on the water table.

See application remarks for seepage loss amounts based on seasonal use (180 days), rather than annual use (365 days) used in the calculation above.

Evaporation Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	XX-XXXXX
REVIEWER	Lori Graves
DATE	12/6/2016

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:
P = Precipitation
ET = Evapotranspiration
P _d = Precipitation deficit
P _d = ET - P

USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation 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.

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

Precipitation Deficit

Station: Parma (AgriMet - PMAI)

Month	mm/day ¹	Days per month	mm/Month
Jan	-0.43	31	0.00
Feb	0.38	28	10.64
March	1.28	31	0.00
April	2.00	30	0.00
May	2.63	31	0.00
June	3.42	30	0.00
July	4.29	31	0.00
August	3.80	31	0.00
September	2.67	30	80.10
October	1.13	31	35.03
November	0.10	30	3.00
December	-0.54	31	0.00

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 does 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 properly 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 as a negative value.

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

Total mm/year = 128.77

$$((128.77 \text{ mm/yr}) \div (304.8 \text{ mm/ft})) \times (\text{Surface area of pond, in acres}) = \text{Evaporation Loss in Acre Feet}$$

(128.77 ÷ 304.8) X 6.00 = 2.5 AFA

RECEIVED

MAY 17 2017

STATE OF IDAHO

Ident. No. 63-34334

DEPARTMENT OF WATER RESOURCES

APPLICATION FOR PERMIT

To appropriate the public waters of the State of Idaho

1. Name of applicant(s) Thorpe Family Trust Phone 208-859-2690
 Mailing address c/o Ryan Thorpe, 28854 Boulder Rd City Parma
 State ID _____ ZIP 83660 Email ryanthorpefarms@gmail.com
 Name connector (check one): ☐ and ☐ or ☐ and/or
2. Name of representative, if any SPF Water Engineering Phone 208-383-4140
 Mailing address 300 E. Mallard Dr., Ste 350 City Boise
 State ID _____ ZIP 83706 Email lgraves@spfwater.com
- a. ☐ Send all correspondence for this application to the representative and not to the applicant OR
☒ Send original correspondence to the applicant and copies to the representative.
- b. ☒ The representative may submit information for the applicant but is not authorized to sign for the applicant OR
☐ The representative is authorized to sign for the applicant. Attach a Power of Attorney or other documentation.
3. Source of water supply Boise River which is a tributary of Snake River
4. Location of point(s) of diversion:

Twp	Rge	Sec	Govt Lot	1/4	1/4	1/4	County	Source	Local name or tag #
5N	5W	16			SW	SE	Canyon	Boise River	

5. Water will be used for the following purposes:
- Amount 13.05 cfs for Wildlife & Recreation purposes from 9/30 to 2/28 (both dates inclusive)
 (cfs or acre-feet per year) 9/4
- Amount 1624.7 afa for Wildlife & Recreation Storage purposes from 9/30 to 2/28 (both dates inclusive)
 (cfs or acre-feet per year) 9/4
- Amount 13.05 cfs for Diversion to Storage purposes from 9/30 to 2/28 (both dates inclusive)
 (cfs or acre-feet per year) 9/4
- Amount _____ for _____ purposes from _____ to _____ (both dates inclusive)
 (cfs or acre-feet per year)
6. Total quantity to be appropriated is (a) 13.05 cubic feet per second (cfs) and/or (b) 1624.7 acre-feet per year (af).
7. Proposed diverting works:

- a. Describe type and size of devices used to divert water from the source. Island Highline Ditch Co. ditch, pump, pipes, private ditches
- b. Height of storage dam _____ feet; active reservoir capacity _____ acre-feet; total reservoir capacity _____ acre-feet. If the reservoir will be filled more than once each year, describe the refill plan in item 12. For dams 10 feet or more in height AND having a storage capacity of 50 acre-feet or more, submit a separate Application for Construction or Enlargement of a New or Existing Dam. Application required? ☐ Yes ☐ No
- c. Proposed well diameter is _____ inches; proposed depth of well is _____ feet.
- d. Is ground water with a temperature of greater than 85°F being sought? ☐ Yes ☒ No
- e. If well is already drilled, when? _____; drilling firm _____
 well was drilled for (well owner) _____; Drilling Permit No. _____

For Department Use

Received by _____ Date _____ Time _____ Preliminary check by CP
 Fee \$ 870 Received by RN Receipt No. W044911 Date 1/26/17

8. Description of proposed uses (If irrigation only, go to Item 9):
- Hydropower; show total feet of head and proposed capacity in kW. _____
 - Stockwatering; list number and kind of livestock. _____
 - Municipal; must complete and attach the Municipal Water Right Application Checklist.
 - Domestic; show number of households _____
 - Other; describe fully. Miscellaneous wildlife, including waterfowl habitat; recreation use for waterfowl hunting and wildlife viewing.
9. Description of place of use:
- If water is for irrigation, indicate acreage in each subdivision in the tabulation below.
 - If water is used for other purposes, place a symbol of the use (example: D for Domestic) in the corresponding place of use below. See instructions for standard symbols.

TWP	RGE	SEC	NE				NW				SW				SE				TOTALS
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
5N	5W	17					7	25	22	33									87
									L4	L3									

Total number of acres to be ~~irrigated~~ flooded: 87

10. Describe any other water rights used for the same purposes as described above. Include water delivered by a municipality, canal company, or irrigation district. If this application is for domestic purposes, do you intend to use this water, water from another source, or both, to irrigate your lawn, garden, and/or landscaping? Six of the 25 acres in the NWNW are also proposed under an accompanying application for the same uses from a separate system.
11. a. Who owns the property at the point of diversion? Applicant
b. Who owns the land to be irrigated or place of use? Applicant
c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing: _____
12. Describe your proposal in narrative form, and provide additional explanation for any of the items above. Attach additional pages if necessary. see attached remarks
13. Time required for completion of works and application of water to proposed beneficial use is 5 years (minimum 1 year).
14. **MAP OF PROPOSED PROJECT REQUIRED** - Attach an 8½" x 11" map or maps clearly identifying the proposed point of diversion, place of use, section #, township & range. The map scale shall not be less than two (2) inches equal to one (1) mile.

The information contained in this application is true to the best of my knowledge. I understand that any willful misrepresentations made in this application may result in rejection of the application or cancellation of an approval.

[Signature]
Signature of Applicant
RYAN THORPE OWNER OF TRUST
Print Name (and title, if applicable)

Signature of Applicant

Print Name (and title, if applicable)

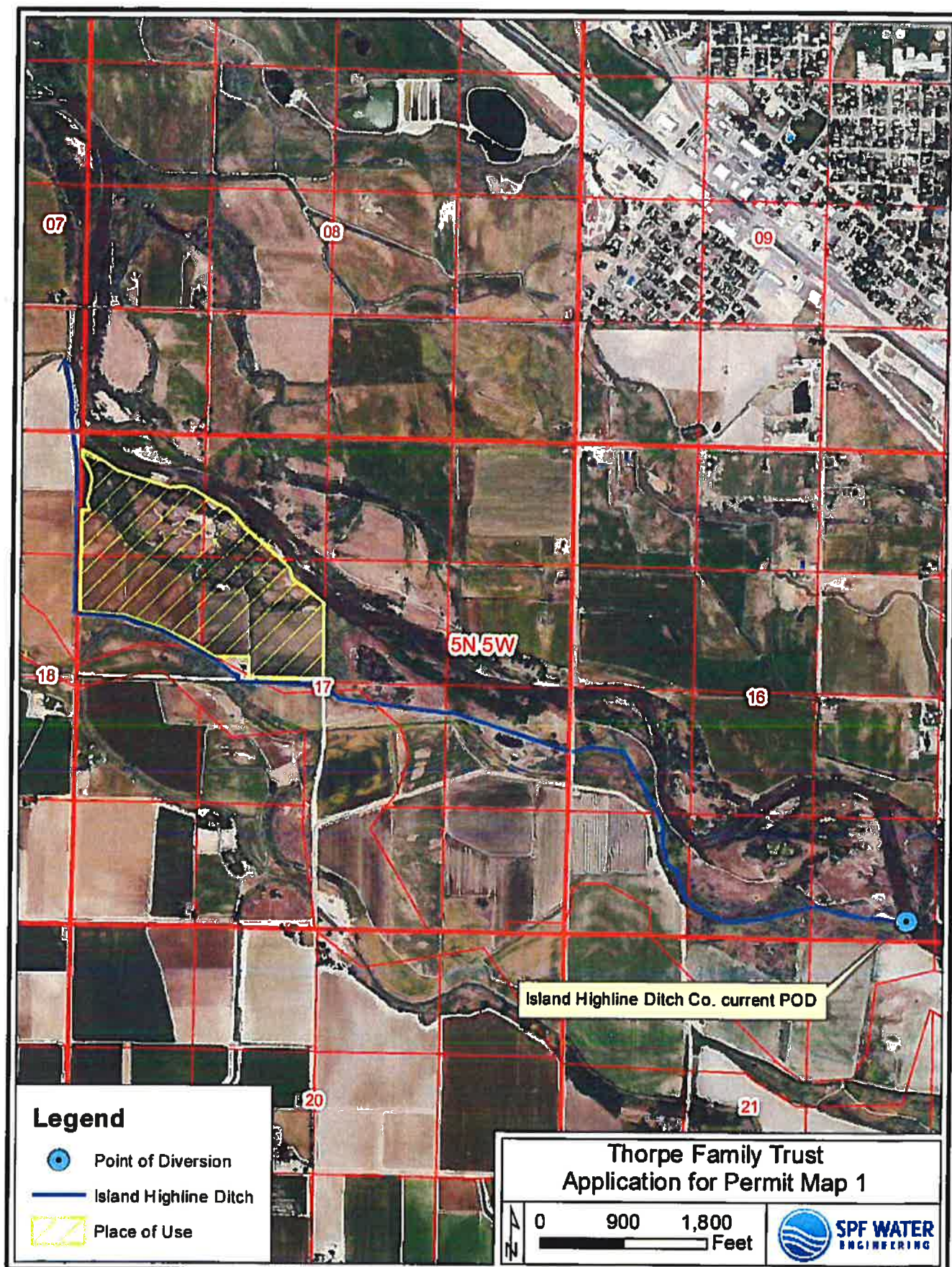
Application Remarks:

Proposed flow rate for wildlife/recreation uses is based on diversion of 0.15 cfs per acre for 87 acres of flow-through field flooding. Field flooding depth will range from less than 1 inch up to approximately 12 inches with an average depth of 6 inches. Proposed volumes were calculated using the IDWR storage memo 76 spreadsheet (attached) and account for associated storage, seepage and evaporation amounts. Regarding seepage, the USDA's Web Soils Survey results indicated moulton fine sandy loams (MtB, No) are predominate on approximately 38 acres and moulton loam (MwA) is predominate on approximately 49 acres. As a result, the rate used for seepage loss was calculated at 0.2 ft/day for 38 acres and 0.02 ft/day for 49 acres. Regarding evaporation, positive precipitation deficits from the Parma AgriMet Station for open water-shallow systems from September through February were used to calculate evaporation losses.

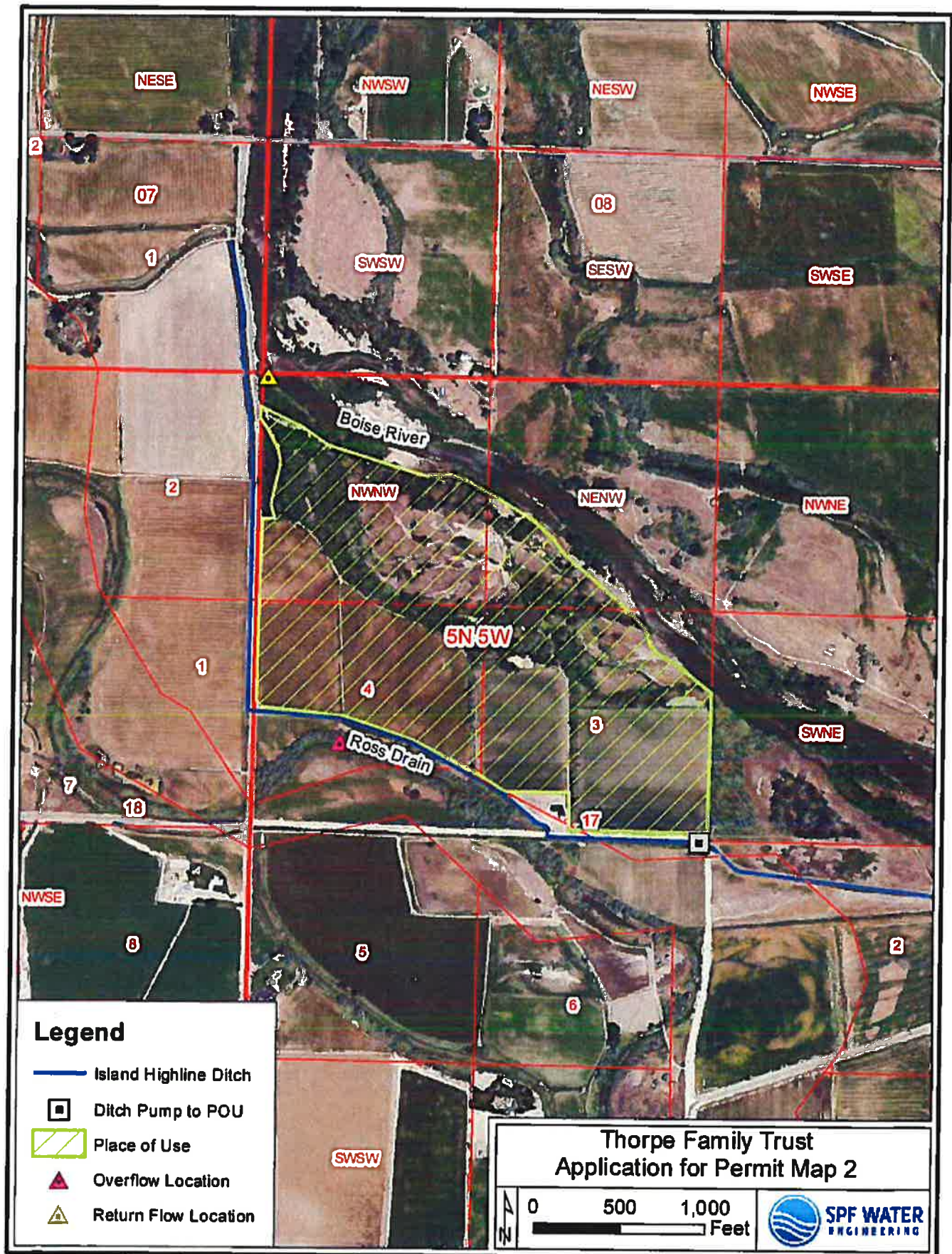
Water is delivered to the property through the Island Highline Ditch. Authorization from the Island Highline Ditch Company President to use the Company's delivery system is attached.

Six of the 25 acres proposed in the NWNW overlap with an accompanying application proposing the same uses, from the same source, using a separate system. This right, when combined with the accompanying application, will not exceed 0.15 cfs/acre on the 6 overlapping acres.

Volume Calculation					
Seepage					
Area (acres)	Rate (ft/day)	Start Date	End Date	Days	Volume (AF)
38	0.2	1-Sep	28-Feb	180	1368
49	0.02	1-Sep	28-Feb	180	176.4
Total					1544.4
Evaporation					
Area (acres)	Rate (mm/day)	End Date	Start Date	Days	Volume (AF)
87	2.67	1-Sep	30-Sep	30	22.86
87	1.13	1-Oct	31-Oct	31	10.00
87	0.1	1-Nov	30-Nov	30	0.86
87	-0.54	1-Dec	31-Dec	31	0.00
87	-0.43	1-Jan	30-Jan	30	0.00
87	0.38	1-Feb	28-Feb	28	3.04
Total				180	36.8
Storage Volume					
Area (acres)	Average Depth (ft)			Volume (AF)	
87	0.5			43.5	
Total Volume					1624.7



63 - 34 334



63 - 34 33 4

IDWR STORAGE MEMO NO. 76
SUPPORTING DOCUMENTATION
FOR PROPOSED STORAGE VOLUME

63-34334

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

Absence of an entry indicates that the data were not estimated. The asterisk "*" denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007 (<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties—Canyon Area, Idaho														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pot Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H
MtB—Moulton fine sandy loam, 1 to 3 percent slopes														
Moulton	85 B		0-3	Fine sandy loam	SC, SC-SM	A-6, A-2, A-4	0-0-0	0-0-0	90-95-100	90-95-100	65-75-85	35-45-55	25-32-39	6-9-13
			3-21	Fine sandy loam, sandy loam	CL, SC-SM, SC	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-83-90	40-50-60	22-29-35	6-9-13
			21-60	Very gravelly loamy sand, very gravelly sand	GW, GP-GC, GC-GM	A-1	0-0-0	0-0-0	30-45-60	30-40-50	15-25-35	0-8-15	17-21-24	2-4-6
MtA—Moulton loam, 0 to 1 percent slopes														
Moulton	90 C		0-3	Loam	CL-ML, CL	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-85-95	55-65-75	25-32-39	6-9-13
			3-21	Fine sandy loam, sandy loam	SC, SC-SM, CL	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-83-90	40-50-60	22-29-35	6-9-13
			21-60	Very gravelly loamy sand, very gravelly sand	GW, GP-GC, GC-GM	A-1	0-0-0	0-0-0	30-45-60	30-40-50	15-25-35	0-8-15	17-21-24	2-4-6

Custom Soil Resource Report

Engineering Properties—Canyon Area, Idaho															
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pot. Fragments		Percentage passing sieve number—					Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
			In				L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H
MwA—Moulton loam, saline, 0 to 1 percent slopes															
Moulton, saline	90	C	0-3	Loam	CL-ML, CL	A-6, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-85-95	55-65-75	25-32-38	6-9-13	
			3-21	Fine sandy loam, sandy loam	SC, SC-SM, CL	A-8, A-4	0-0-0	0-0-0	90-95-100	90-95-100	75-83-90	40-50-60	22-29-35	6-9-13	
			21-60	Vary gravelly loamy sand, very gravelly sand	GP-GC, GC-GM, GW	A-1	0-0-0	0-0-0	30-45-60	30-40-50	15-25-35	0-8-15	17-21-24	2-4-6	
No—Notus soils															
Notus	85	A	0-1	Sandy loam	SM, SC-SM	A-2, A-4	0-0-0	0-0-0	95-98-100	90-95-100	55-70-85	25-38-50	17-21-24	2-4-6	
			1-14	Fine sandy loam	SC-SM, SM	A-2, A-4	0-0-0	0-0-0	95-98-100	90-95-100	55-70-85	25-38-50	17-21-24	2-4-6	
			14-60	Stratified sand to gravel	GP	A-1	0-0-0	0-0-0	35-40-45	35-40-45	25-30-35	0-1-2	0-0-0	NP	
OgA—Ollaga loam, 0 to 1 percent slopes															
Ollaga	85	B	0-8	Loam	CL, CL-ML	A-7, A-4, A-6	0-0-0	0-0-0	100-100-100	100-100-100	85-90-95	60-68-75	22-32-41	6-11-17	
			8-35	Loam, fine sandy loam	CL-ML, ML, CL	A-6, A-4	0-0-0	0-0-0	100-100-100	100-100-100	70-83-95	50-63-75	18-23-31	2-7-12	
			35-60	Sand, gravel	GP	A-1	0-0-0	0-0-0	35-40-45	35-40-45	25-30-35	0-1-2	0-0-0	NP	
Re—Riverwash															
Riverwash	100		0-60	Stratified sand to gravel	—	—	—	—	—	—	—	—	—	—	—

Seepage Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total annual seepage losses from a pond.

FILE NUMBER	XX-XXXXX
REVIEWER	Lori Graves
DATE	12/6/2016

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	38	AC.
-------------------------	----	-----

Pond Surface Area (SQ. FT.)	1655280	SQ. FT.
-----------------------------	---------	---------

I used the following method to obtain my Soil Classification information;	NRCS Web Soil Survey	
My Soil Classification is	SM	
Suggested Seepage Rate (FT./DAY)	0.2000	FT./DAY

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

Convert to GPD	2476299	GPD
----------------	---------	-----

Total Seepage Loss (AFA)	2773.8	AFA
--------------------------	--------	-----

Though sand and gravel seepage rates may actually be higher, the maximum allowable rate is 0.2 ft/day, pursuant to Administrative Memo "Seepage Loss Standards for Ponds and Reservoirs."

Suggested Seepage Rates for Different Soil Types:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.2 ft per day
OL and ML (Inorganic silts - very fine sands, silty, or clayey fine sands) = 0.02 ft per day
SC (clayey sands, sand clay mixtures) = 0.007 ft per day
CL (Low to medium plasticity clays) = 0.003 ft per day
MH, OH, PT and CH (high plasticity clays) = 0.0003 ft per day
LINED PONDS (liners can be chemical, fabric, or bentonite) = 0 ft per day
Ponds Intercepting Groundwater (excavated ponds filled by ground water) = 0 ft per day

PLEASE NOTE: The Initial basis for the Suggested Seepage Rates in the table above is found on Page 16 of Seepage from Fish Ponds, Bulletin 599, August 1989 Alabama Agricultural experiment Station, Auburn University, Auburn University Alabama. If you don't know the soil type, please refer to the map provided at the NRCS Web Soil Survey (Tab #1), an ArcMap Soil Classification Map (Tab #1.1), or published NRCS Soil Survey (Tab #1.2). Use "0" if the pond fill relies on the water table.

See application remarks for seepage loss amounts based on seasonal use (180 days), rather than annual use (365 days) used in the calculation above.

Seepage Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total annual seepage losses from a pond.

FILE NUMBER	XX-XXXXX
REVIEWER	Lori Graves
DATE	12/6/2016

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	49	AC.
-------------------------	----	-----

Pond Surface Area (SQ. FT.)	2134440	SQ. FT.
-----------------------------	---------	---------

I used the following method to obtain my Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	ML	
Suggested Seepage Rate (FT./DAY)	0.0200	FT./DAY

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

Convert to GPD	319312	GPD
----------------	--------	-----

Total Seepage Loss (AFA)	357.7	AFA
--------------------------	-------	-----

Though sand and gravel seepage rates may actually be higher, the maximum allowable rate is 0.2 ft/day, pursuant to Administrative Memo "Seepage Loss Standards for Ponds and Reservoirs."

Suggested Seepage Rates for Different Soil Types:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.2 ft per day
OL and ML (Inorganic silts - very fine sands, silty, or clayey fine sands) = 0.02 ft per day
SC (clayey sands, sand clay mixtures) = 0.007 ft per day
CL (Low to medium plasticity clays) = 0.003 ft per day
MH, OH, PT and CH (high plasticity clays) = 0.0003 ft per day
LINED PONDS (liners can be chemical, fabric, or bentonite) = 0 ft per day
Ponds Intercepting Groundwater (excavated ponds filled by ground water) = 0 ft per day

PLEASE NOTE: The initial basis for the Suggested Seepage Rates in the table above is found on Page 16 of Seepage from Fish Ponds, Bulletin 599, August 1989 Alabama Agricultural Experiment Station, Auburn University, Auburn University Alabama. If you don't know the soil type, please refer to the map provided at the NRCS Web Soil Survey (Tab #1), an ArcMap Soil Classification Map (Tab #1.1), or published NRCS Soil Survey (Tab #1.2). Use "0" if the pond fill relies on the water table.

See application remarks for seepage loss amounts based on seasonal use (180 days), rather than annual use (365 days) used in the calculation above.

Evaporation Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	XX-XXXXX
REVIEWER	Lori Graves
DATE	12/6/2016

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:
P = Precipitation
ET = Evapotranspiration
P _d = Precipitation deficit
P _d = ET - P

USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation 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.

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

Precipitation Deficit

Station: Parma (AgriMet -- PMAI)

Month	mm/day ¹	Days per month	mm/Month
Jan	-0.43	31	0.00
Feb	0.38	28	10.64
March	1.28	31	0.00
April	2.00	30	0.00
May	2.63	31	0.00
June	3.42	30	0.00
July	4.29	31	0.00
August	3.80	31	0.00
September	2.67	30	80.10
October	1.13	31	35.03
November	0.10	30	3.00
December	-0.54	31	0.00

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 does 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 properly 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 as a negative value.

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

Total mm/year = 128.77

$[(\text{mm/yr}) + (\text{convert to feet})] \times (\text{Surface area of pond, in acres}) = \text{Evaporation Loss in Acre Feet}$

$$\left(\frac{128.77}{304.8} \right) \times 87.00 = 36.8 \text{ AFA}$$

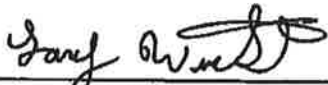
Idaho Department of Water Resources
2735 Airport Way
Boise, ID 83705

Re: Application for Permit for Thorpe Family Trust

To Whom It May Concern:

Island Highline Ditch Co. authorizes Ryan Thorpe (Thorpe Family Trust) to use the Island Highline Ditch Co. delivery system for transport of Boise River water for wildlife/recreation field flooding from September through February as proposed on their application for permit.

Sincerely,



Larry Winchester, President/Manager
Island Highline Ditch Co.

1-21-17

Date

Attachment B
USGS Streamflow Data



[USGS Home](#)
[Contact USGS](#)
[Search USGS](#)

National Water Information System: Web Interface

[USGS Water Resources](#)

Data Category:

Surface Water

Geographic Area:

Idaho

GO

Click to hide News Bulletins

- [Please see news on new formats](#)
- [Full News](#)

USGS Surface-Water Monthly Statistics for Idaho

Click to hide state-specific text

[Idaho Water Science Center](#) | [Subscribe to Water Alerts](#) | [Threatened and Endangered Stations in Idaho](#)

The statistics generated from this site are based on approved daily-mean data and may not match those published by the USGS in official publications. The user is responsible for assessment and use of statistics from this site. For more details on why the statistics may not match, [click here](#).

USGS 13213000 BOISE RIVER NR PARMA ID

Available data for this site

Time-series: Monthly statistics

GO

Canyon County, Idaho
Hydrologic Unit Code 17050114
Latitude 43°46'54", Longitude 116°58'22" NAD83
Drainage area 3,906 square miles
Gage datum 2,196.49 feet above NGVD29

Output formats

[HTML table of all data](#)

[Tab-separated data](#)

[Reselect output format](#)

00060, Discharge, cubic feet per second,												
YEAR	Monthly mean in ft ³ /s (Calculation Period: 1971-09-01 -> 2016-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1971									1,167	1,425	1,034	1,000
1972	2,857	6,441	7,214	6,737	5,489	3,501	796.9	820.9	1,152	1,171	976.9	1,032
1973	912.1	802.2	726.1	600.0	617.6	746.4	668.0	666.5	871.2	1,069	1,012	986.9
1974	1,000	2,642	5,268	6,499	6,327	5,388	1,308	819.2	885.9	1,109	1,079	1,022
1975	941.6	967.4	2,711	6,780	6,225	2,492	797.3	912.2	936.8	1,293	1,118	1,049
1976	2,038	2,126	2,393	3,925	3,633	1,301	740.7	1,088	1,219	1,182	1,073	952.5
1977	782.3	685.9	592.1	219.4	440.4	315.2	305.3	339.1	556.2	750.6	780.4	781.7
1978	889.2	894.5	986.3	4,583	2,769	715.6	762.2	789.4	1,054	1,007	898.0	803.8

1979	778.4	1,243	714.1	587.2	440.7	491.6	497.1	665.5	711.9	929.4	915.7	811.9
1980	874.5	869.2	839.4	1,089	4,118	3,563	988.1	778.1	1,346	971.0	922.8	887.5
1981	829.6	847.3	1,162	1,478	1,593	2,597	635.7	555.1	795.0	1,053	976.6	1,004
1982	1,013	4,919	6,747	6,693	5,842	3,317	3,098	1,001	1,183	1,996	1,279	2,274
1983	4,255	4,456	6,196	6,940	6,705	6,817	2,848	1,580	1,482	1,738	1,006	2,512
1984	5,080	3,119	3,130	4,368	6,762	4,269	1,846	1,057	2,587	2,395	2,322	1,957
1985	1,706	921.7	819.0	895.4	914.3	622.7	565.8	635.3	1,266	1,149	964.5	1,647
1986	1,074	2,882	7,168	6,942	5,134	3,745	973.2	843.3	1,386	1,183	2,283	1,375
1987	843.8	847.5	821.1	283.4	658.2	559.1	503.1	523.1	685.0	827.1	890.9	821.6
1988	756.1	726.3	669.5	432.3	506.4	480.7	300.7	305.8	415.7	570.7	829.5	750.6
1989	712.8	811.1	1,072	3,392	1,178	563.9	577.6	739.0	989.0	989.0	916.6	809.0
1990	770.3	745.2	533.9	356.5	714.5	554.5	406.4	519.4	633.2	844.4	899.1	785.1
1991	779.7	742.4	664.2	538.0	780.6	670.8	533.8	424.1	550.3	668.1	818.8	722.2
1992	656.1	657.8	505.5	243.5	276.3	315.6	281.9	187.4	183.5	423.2	633.3	606.1
1993	652.2	653.3	975.5	1,704	3,791	1,440	1,010	922.1	877.5	1,002	934.3	873.6
1994	843.5	792.6	708.5	482.8	805.7	520.7	699.6	596.4	400.5	668.4	755.2	776.9
1995	758.4	742.6	694.3	1,606	4,551	2,591	2,369	1,028	1,070	1,089	977.3	1,664
1996	1,715	4,756	7,143	5,625	5,010	4,217	1,064	1,132	1,117	1,058	996.3	1,358
1997	6,882	7,916	7,466	6,835	5,255	3,938	1,364	1,532	1,464			
2002										838.4	866.7	798.5
2003	815.1	799.8	677.1	731.3	859.1	813.2	818.7	844.0	859.4	959.6	886.8	831.5
2004	889.2	1,229	873.0	645.5	1,042	771.0	781.1	761.2	853.5	898.8	883.8	806.2
2005	761.3	750.0	656.6	452.4	1,025	590.3	573.0	702.6	804.0	774.8	846.4	927.5
2006	1,048	4,121	3,845	5,640	6,773	2,920	889.3	967.9	948.8	899.6	863.8	809.5
2007	817.0	773.9	659.4	599.2	575.2	794.2	933.7	675.3	694.7	811.7	790.4	764.8
2008	745.8	777.3	733.9	661.4	2,688	947.0	865.8	839.2	850.1	910.8	885.7	922.3
2009	834.1	763.4	731.1	570.5	1,585	3,601	714.2	759.0	916.2	1,022	901.6	1,109
2010	944.3	882.9	781.5	610.8	1,403	3,034	779.1	571.9	823.5	937.1	934.2	1,021
2011	1,260	924.9	1,287	6,219	6,867	4,357	1,792	634.4	885.7	1,055	935.0	853.6
2012	955.9	1,162	3,753	6,533	5,242	1,410	865.7	575.7	836.4	906.4	941.4	915.9
2013	859.0	874.0	703.8	367.7	709.3	418.5	312.8	423.3	815.9	839.8	864.3	802.5
2014	760.1	954.4	851.1	1,567	540.5	838.3	734.4	558.1	887.9	931.1	995.8	1,010
2015	1,085	962.5	806.3	353.7	1,286	366.3	867.5	537.2	812.6	854.4	900.1	911.1
2016	854.6	836.9	770.5	3,255	2,281	1,982	625.6	564.6	938.1			
Mean of monthly Discharge	1,330	1,730	2,130	2,700	2,840	1,960	937	747	949	1,030	995	1,040

** No Incomplete data have been used for statistical calculation

Questions about sites/data?
Feedback on this web site

[Automated retrievals](#)

[Help](#)

[Data Tips](#)

[Explanation of terms](#)

[Subscribe for system changes](#)

[News](#)

[Accessibility](#)

[Plug-Ins](#)

[FOIA](#)

[Privacy](#)

[Policies and Notices](#)

[U.S. Department of the Interior](#) | [U.S. Geological Survey](#)

Title: Surface Water data for Idaho: USGS Surface-Water Monthly Statistics

URL: <https://waterdata.usgs.gov/id/nwis/monthly?>

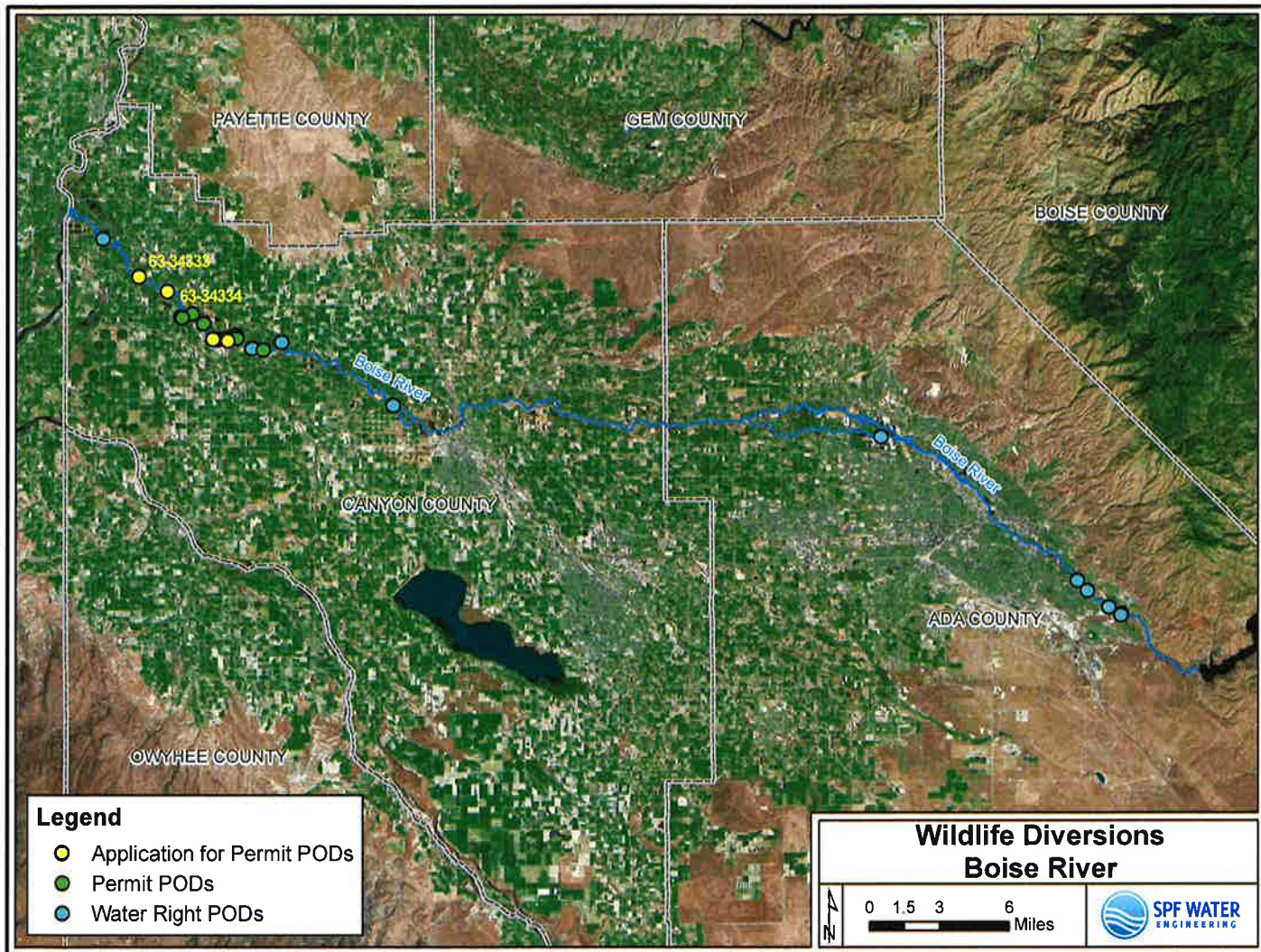


Page Contact Information: [Idaho Water Data Support Team](#)

Page Last Modified: 2017-09-25 17:44:50 EDT

0.83 0.75 caww02

Attachment C
Summary of Boise River Water Rights
Listing Wildlife as a Purpose of Use



Boise River Water Rights Listing Wildlife as a Use

Water Right	Basis	Priority Date	Owner	Diversion Rate (cfs)	Remarks
63-149A	Decreed	6/1/1865	South Boise Water Co	40.00	2 points of diversion in SE Boise
63-278	Decreed	4/1/1865	Riverview Ventures	0.80	Ridenbaugh Canal (SE Boise)
63-279B	Decreed	4/1/1870	Riverview Ventures	0.32	Ridenbaugh Canal (SE Boise)
63-287D	Decreed	6/1/1882	Russell Ruff	0.04	Warm Springs Ditch (Eagle Island)
63-7721	Decreed	2/12/1973	J Glaisyer	6.00	Atwell Ditch (3 mi west of Caldwell)
63-9944	Decreed	8/11/1982	Dan L Bilbao Jr	1.00	Baxter Ditch (2 mi west of Notus)
63-10397	License	3/6/1987	Burdge Family Trust	3.00	3 mi west of Notus
63-10810	License	6/12/1989	J R Kemp	4.10	2 mi west of Parma
63-11617	Permit	12/13/1991	The Tina Iest Family LLLP	3.00	2 points of diversion
63-17034	Decreed	11/16/1904	Idaho Foundation For Parks & Lands Inc	0.00	Barber Dam (SE Boise)
63-32066	Permit	12/8/2004	The Tina Iest Family LLLP	20.50	Andrew Ditch (4 mi west of Notus)
63-32238	Permit	7/9/2005	Erlebach Properties LP	10.00	3 mi west of Notus
63-32459	Permit	4/5/2005	G O Investments Idaho LLC	6.00	Haas Ditch (2.5 mi S of Parma)
63-32467	Permit	12/28/2005	Tree Top Ranches LP	20.00	Andrew Ditch (4 mi west of Notus)
63-32911	Permit	12/28/2005	Tree Top Ranches LP	20.00	3 mi SE of Parma
63-33507	Permit	5/11/2011	G O Investments Idaho LLC	6.00	Haas Ditch (2.5 mi S of Parma)
63-33640	Application	8/7/2015	E G Johnson Farms Inc	3.00	4 mi west of Notus
63-33910	Permit	2/3/2014	BID LLC	4.50	4 mi west of Notus
63-34333	Application	1/26/2017	Thorpe Family Trust	0.90	1 mi SW of Parma
63-34334	Application	1/26/2017	Thorpe Family Trust	13.05	Island Highline Ditch (1.5 mi S of Parma)
63-34384	Application	5/16/2017	Greg Obendorf, Ann Obendorf	23.50	Andrew Ditch (4 mi west of Notus)
63-34414	Application	7/3/2017	BID LLC	24.30	4 mi west of Notus
63-34415	Application	7/3/2017	BID LLC	24.20	5 mi west of Notus