

RECEIVED

FORM 1202 Rev. 09/16

WATER RESOURCES
WESTERN REGION

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

Ident. No. 63-34600

1. Name of applicant(s) Michael D. Hatfield Phone 916-969-7155
 Name connector (check one): ☐ and ☐ or ☐ and/or
 Mailing address 24016 Notus Rd City Caldwell
 State ID ZIP 83607 Email hat0665@hotmail.com
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 Ground Water which is a tributary of Boise River
Boise River
 4. Location of point(s) of diversion: Snake River

Twp	Rge	Sec	Govt Lot	1/4	1/4	1/4	County	Source	Local name or tag #
4N	4W	3			NE	NE	Canyon	Boise River	Boise River pump
		3			NE	NE	Canyon	Ground Water	pond centroid & pump
		3	1		NE	NE	Canyon	Ground Water	pond centroid
5N	4W	34			SE	SE	Canyon	Ground Water	pond centroid

5. Water will be used for the following purposes:
 Amount 0.40 cfs for Irrigation purposes from 3/1 to 11/15 (both dates inclusive)
 (cfs or acre-feet per year) Diversion to Storage &
 Amount 0.40 cfs for Wildlife & Recreation purposes from 9/1 to 2/28 (both dates inclusive)
 (cfs or acre-feet per year)
 Amount 164.5 afa for Wildlife & Recreation Storage purposes from 9/1 to 2/28 (both dates inclusive)
 (cfs or acre-feet per year)
 Amount 30.5 afa for Wildlife & Recreation Storage purposes from 1/1 to 12/31 (both dates inclusive)
 (cfs or acre-feet per year)
6. Total quantity to be appropriated is (a) 0.40 cubic feet per second (cfs) and/or (b) 195 acre-feet per year (af).
7. Proposed diverting works:
- a. Describe type and size of devices used to divert water from the source. Ponds, pumps, irrigation distribution system
- b. Height of storage dam n/a feet; active reservoir capacity 20 acre-feet; total reservoir capacity 20 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 Ak Date 8/10/2018 Time 11:25 am Preliminary check by AS
 Fee \$ 240.00 Receipted by Ak Receipt No. W046643 Date 8-10-2018

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	
			L1																
4N	4W	3	17																17
			X															L7	
5N	4W	34																13	13
																		X	

Total number of acres to be irrigated: 20 acres within a 30-acre permissible place of use
& flooded

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? None. Property is within the Lower Centerpoint Ditch Company service area, but is not assessed water delivery.
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 of Applicant

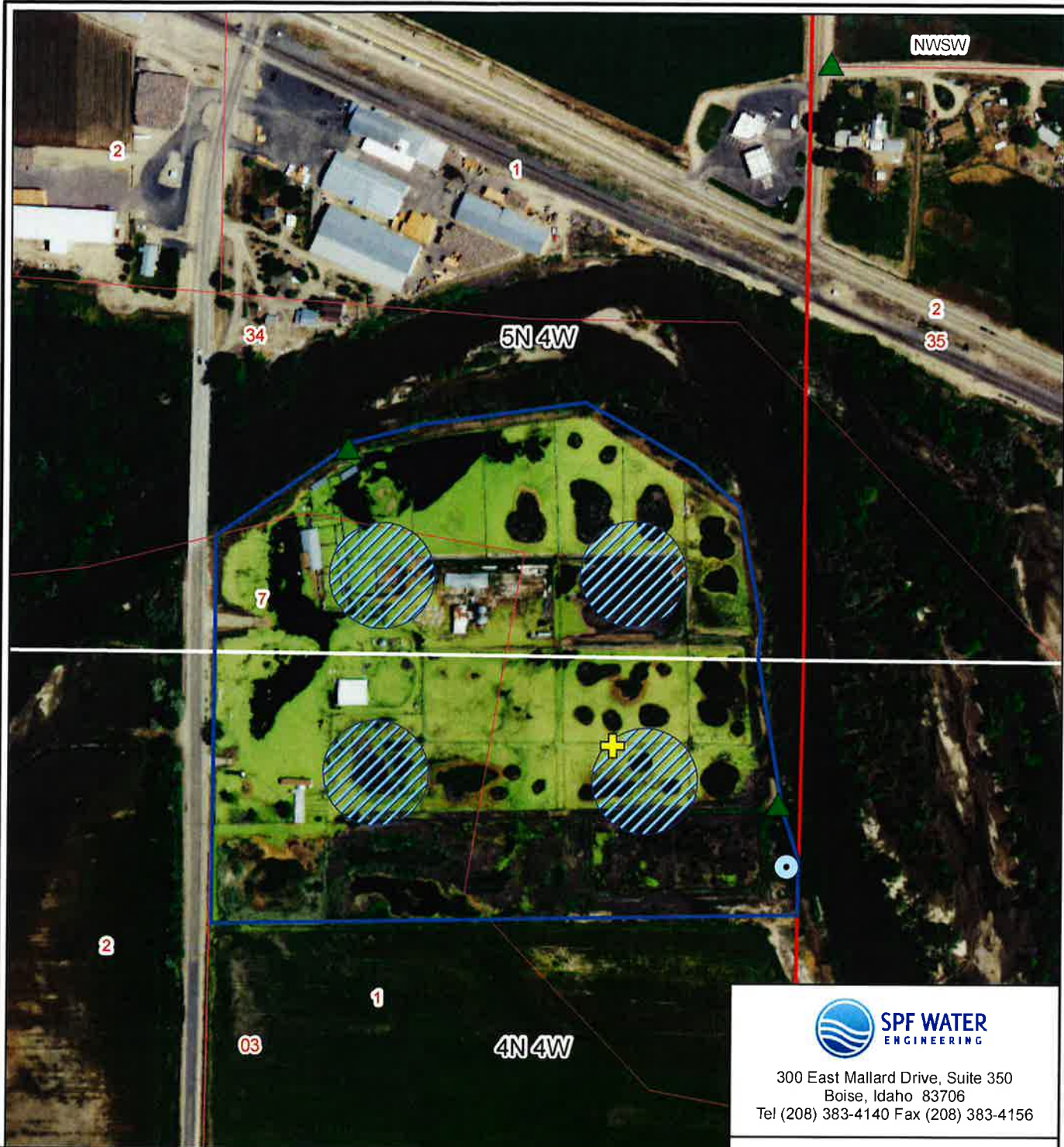
MICHAEL D. HATFIELD

Print Name (and title, if applicable)

Signature of Applicant

Print Name (and title, if applicable)

Path: S:\PROJECTS\H Projects\H Projects\Hatfield, Mike_14160010_Natus Property\PROJECT\GIS\ArcMap_Properties\Map.mxd



Legend

-  Proposed PPU
-  Proposed PODs (pond centroids)
-  Proposed POD (Boise R.)
-  Return Flow Locations
-  Pump for Irrigation & Field Flooding



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

Michael D. Hatfield

Application for Permit

DATE: 8/7/2018

USER: LGraves

PROJECT: 1416.0010



Absolute Scale: 1:3,836

0 100 200 400 Feet

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

63-34600

Application Remarks:

The tables below show how the proposed volume rates for ponds and seasonal field flooding were calculated. **Regarding seepage**, the seepage volume for field flooding will be limited to the irrigation system capacity or 0.40 cfs and 144 ac-ft. Seepage was not calculated for the proposed ponds since they will naturally fill with shallow ground water. **Regarding evaporation**, positive precipitation deficits from the Caldwell AgriMet Station for open water-shallow systems were used to calculate evaporation losses associated with 20 acres of field flooding from September through February and annual evaporative losses associated with 4 acres of proposed pond surface area. **Regarding storage volume**, field flooding depth will range from 1 to 12 inches, with an average depth of 6 inches resulting in a storage volume of 10 ac-ft. The ponds will average 5 feet in depth and have a total surface area of approximately 4 acres.

Volume Calculations - Field Flooding					
Seepage					
Area (acres)	Rate (ft/day)	Start Date	End Date	Days	Volume (AF)
20	0.04	1-Sep	28-Feb	180	144
Total					144
Evaporation					
Area (acres)	Rate (mm/day)	Start Date	End Date	Days	Volume (AF)
20	3.06	1-Sep	30-Sep	30	6.02
20	1.89	1-Oct	31-Oct	31	3.84
20	-0.12	1-Nov	30-Nov	30	0.00
20	-0.78	1-Dec	31-Dec	31	0.00
20	-0.83	1-Jan	30-Jan	30	0.00
20	0.18	1-Feb	28-Feb	28	0.33
0	1.22	1-Mar	31-Mar	31	0.00
0	2.51	1-Apr	30-Apr	30	0.00
0	3.74	1-May	31-May	31	0.00
0	4.22	1-Jun	30-Jun	30	0.00
0	5.01	1-Jul	31-Jul	31	0.00
0	4.27	1-Aug	31-Aug	31	0.00
Total				180	10.2
Storage Volume					
Area (acres)	Average Depth (ft)				Volume (AF)
20	0.5				10
Total Volume					164.2

63-34600

Volume Calculations - Ponds					
Evaporation					
Area (acres)	Rate (mm/day)	Start Date	End Date	Days	Volume (AF)
4	3.06	1-Sep	30-Sep	30	1.20
4	1.89	1-Oct	31-Oct	31	0.77
4	-0.12	1-Nov	30-Nov	30	0.00
4	-0.78	1-Dec	31-Dec	31	0.00
4	-0.83	1-Jan	30-Jan	30	0.00
4	0.18	1-Feb	28-Feb	28	0.07
4	1.22	1-Mar	31-Mar	31	0.50
4	2.51	1-Apr	30-Apr	30	0.99
4	3.74	1-May	31-May	31	1.52
4	4.22	1-Jun	30-Jun	30	1.66
4	5.01	1-Jul	31-Jul	31	2.04
4	4.27	1-Aug	31-Aug	31	1.74
Total				180	10.5
Storage Volume					
Area (acres)	Average Depth (ft)			Volume (AF)	
4	5			20	
Total Volume				30.5	

63-34600



STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

Western Region • 2735 Airport Way • Boise, Idaho 83705-5082

Phone: (208) 334-2190 • Fax: (208) 334-2348 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

October 12, 2018

MICHAEL D HATFIELD
24016 NOTUS RD
CALDWELL, ID 83607

Application for Permit No. 63-34600

Dear Applicant(s):

The Department of Water Resources has received your water right application. Please refer to the number referenced above in all future correspondence regarding this application.

A legal notice of the application has been prepared and is scheduled for publication in the PRESS TRIBUNE on 10/18/2018 and 10/25/2018. Protests to this application may be submitted for a period ending ten (10) days after the second publication.

If the application is protested, you will be sent a copy of each protest. All protests must be resolved before the application can be considered for approval. If the protest(s) cannot be resolved voluntarily, the Department will conduct a conference and/or hearing on the matter.

If the application is not protested, the Department will process your application and notify you of any action taken on the application. If your application is approved, the Department will send you a copy of the permit.

Please contact this office if you have any questions regarding the application.

Sincerely,

Rachel Neely
Administrative Assistant

CC:
SPF WATER ENGINEERING LLC
C/O LORI GRAVES
300 E MALLARD DR STE 350
BOISE, ID 83706

Neely, Rachel

From: Neely, Rachel
Sent: Friday, October 12, 2018 9:50 AM
To: 'IDAHO PRESS TRIBUNE'
Subject: Canyon Legal Ad
Attachments: Canyon Cover Letter.docx; Canyon Legal Ad.docx

Good Morning Legal Clerk,

Please see the attached ad for publication on 10/18/2018 & 10/25/2018.

Please confirm these are okay to publish as shown.

Thank you,

October 12, 2018

LEGAL NOTICE DEPARTMENT
PRESS TRIBUNE
PO BOX 9399
NAMPA, ID 83652

RE: Application for Permit No. 63-34600

Dear Legal Notice Department:

Please publish the enclosed legal notice on the dates indicated (once a week for two consecutive weekly issues). If you cannot publish the notice on the proposed dates, please contact us immediately.

An affidavit of publication must be submitted to the Department along with the publication bill. Please send the affidavit and bill to this office before 11/5/2018. Your cooperation is appreciated.

Sincerely,

Rachel Neely
Administrative Assistant

Enclosure(s)

The following application has been filed to appropriate the public waters of the State of Idaho:

63-34600

MICHAEL D HATFIELD

24016 NOTUS RD

CALDWELL, ID 83607

Point of Diversion NENE S3 T04N R04W CANYON County Source BOISE RIVER Tributary SNAKE RIVER

Point of Diversions NENE L1(NENE) S3 T04N R04W CANYON County Source GROUND WATER

Point of Diversions SESE L7(SESE) S34 T05N R04W CANYON County Source GROUND WATER

Use: DIVERSION TO STORAGE 09/01 to 02/28 0.4 CFS

Use: IRRIGATION 03/01 to 11/15 0.4 CFS

Use: RECREATION 09/01 to 02/28 0.4 CFS

Use: RECREATION STORAGE 01/01 to 12/31 30.5 AF

Use: RECREATION STORAGE 09/01 to 02/28 164.5 AF

Use: WILDLIFE 09/01 to 02/28 0.4 CFS

Use: WILDLIFE STORAGE 01/01 to 12/31 30.5 AF

Use: WILDLIFE STORAGE 09/01 to 02/28 164.5 AF

Total Diversion: 0.4 CFS

Date Filed: 8/10/2018

Places of Use: IRRIGATION, WILDLIFE, RECREATION, WILDLIFE STORAGE, DIVERSION TO STORAGE, RECREATION STORAGE

T04N R04W S3 L1(NENE)

T05N R04W S34 L7(SESE)

Total Acres: 30

Water bearing zone to be appropriated is from 0 to 13 feet.

Permits will be subject to all prior water rights. For additional information concerning the property location, contact Western Region office at (208) 334-2190; or for a full description of the right(s), please see www.idwr.idaho.gov. Protests may be submitted based on the criteria of Idaho Code § 42-203A. Any protest against the approval of the application(s) must be filed with the Director, Dept. of Water Resources, Western Region, 2735 Airport Way, Boise ID 83705 together with a protest fee of \$25.00 for each application on or before 11/5/2018. The protestant must also send a copy of the protest to the applicant.

GARY SPACKMAN, Director

Published on 10/18/2018 and 10/25/2018

Neely, Rachel

From: Neely, Rachel
Sent: Friday, October 12, 2018 12:23 PM
To: Clark, Cynthia Bridge; Skoro, Emily
Subject: Application for Permit No. 63-34600
Attachments: Agency Recommendation Form.docx; Application for Permit 63-34600.pdf

October 12, 2018

IDAHO DEPARTMENT OF WATER RESOURCES
WATER PROJECTS SECTION MANAGER
ATTN: CYNTHIA (BRIDGE) CLARK & EMILY SKORO
322 E FRONT ST
PO BOX 83720
BOISE ID 83720-0098

RE: Application for Permit No. 63-34600

Dear Ms. Clark & Ms. Skoro:

The Idaho Department of Water Resources (IDWR) is seeking written comment and/or recommendation(s) from your agency regarding the above referenced water right application(s). Copy(s) of the application(s) are enclosed with this email for your reference. Please review the application(s), complete the enclosed recommendation form, and submit your reply, if any, to this office by the protest deadline of **November 5, 2018**

If your agency desires to formally protest approval of this application, you may do so by filing a written protest along with a \$25.00 filing fee for each protested application by the protest deadline.

IDWR will assume your agency does not object to this application if a timely response is not received. Please contact me if you have any questions regarding the application. Thank you for your help.

Sincerely,

Rachel Neely

Administrative Assistant I
IDWR-Western Region
2735 Airport Way Boise, ID 83705
Rachel.Neely@idwr.idaho.gov

Neely, Rachel

From: Neely, Rachel
Sent: Friday, October 12, 2018 12:26 PM
To: 'Rex Barrie'
Subject: Application for Permit 63-34600 & Application for Transfer No. 82681
Attachments: Watermaster Recommendation Form_F.PDF; Application for Permit 63-34600.pdf; Application for Transfer 82681.pdf

October 12, 2018

REX BARRIE
WATER DISTRICT #63
PO BOX 767
10769 W STATE ST
STAR ID 83669-0767

RE: Application for Permit 63-34600 & Application for Transfer No. 82681

Dear Watermaster:

The Idaho Department of Water Resources (IDWR) is seeking written comment and/or recommendations from you regarding the above referenced water right applications. Copies of the application are enclosed with this email for your reference. Please review the applications, complete a recommendation form, and submit your reply, if any, to this office by **November 5, 2018**.

IDWR will assume you do not object to these applications if a timely response is not received. Please contact me if you have any questions in this matter. Thank you for your help.

Sincerely,

Rachel Neely

Administrative Assistant I
IDWR-Western Region
2735 Airport Way Boise, ID 83705
Rachel.Neely@idwr.idaho.gov

MEMORANDUM

TO: Application No. 63-34600
FROM: Aaron Skinner – Water Resource Agent, Sr.
DATE: September 27, 2018
SUBJECT: POND STORAGE

The application detailed a pump next to a proposed pond. An irrigation storage and irrigation from storage use was not identified as a beneficial use on the application. A phone conversation with Lori Graves (SPF) on 9/27/2018 clarified the pond use. Irrigation from the pond is proposed as flow through water. As such, no storage component for irrigation is necessary.

A 20 acre wildlife/recreation storage “pond” was initially calculated using a seepage rate of 0.04 ft/d. The soil characteristics within the 20 acres range from CL – ML – SC. The maximum seepage rate for these characteristics is 0.02 ft/d. SPF’s reasoning was inconclusive. The adjusted volume for the 20 acres storage will be 92.2 AF as outline on the pond analysis spreadsheet that was emailed to SPF on September 11, 2018. Without further justification, a permit would be limited to the new volume per this calculation. The application will be advertised as applied for, but a permit may be issued for a smaller quantity without requiring an amendment or priority date advancement.

Skinner, Aaron

From: Lori Graves <LGraves@spfwater.com>
Sent: Tuesday, September 25, 2018 1:26 PM
To: Skinner, Aaron
Subject: RE: Michael Hatfield - Application for Permit Questions

Aaron,

With regards to item 1, given that the project site is located in the Boise River bottoms, we went with 0.04 ft/d, but 0.02 ft/d will work. Please note, on your evaporation calcs for the pond, a 5-acre pond surface area was used, rather than a 4-acre surface area as proposed. A 4-acre surface area calculates to 10.5 ac-ft for evaporation as proposed.

With regards to item 2, the storage components are necessary because the applicant would like the option of developing a pump system on the river **and/or** the pond. Listing storage components allows the flexibility of pumping from the river to the pond.

Thanks Aaron. Please let me know if you have any further questions.

Lori Graves
SPF Water Engineering
208-383-4140

From: Skinner, Aaron <Aaron.Skinner@idwr.idaho.gov>
Sent: Tuesday, September 11, 2018 11:40 AM
To: Lori Graves <LGraves@spfwater.com>
Subject: Michael Hatfield - Application for Permit Questions

Hi Lori,

I have a few questions about the Hatfield application that are outlined below. When I verified the proposed volumes, I found a few discrepancies. I've attached my spreadsheets for your convenience. Please let me know your thoughts at your earliest convenience.

1. Calculations for field flooding include a seepage rate of 0.04 ft/d. Soil classification around the property vary from CL to ML to SC as shown on the attached spreadsheets titled "field flooding" and "pond." The highest rate relative to these classifications is 0.02 ft/d. Will you provide information on where 0.04 ft/d came from? It may be applicable, but need to justify the rate since it is not one of the Department's "standard" rates.
 - a. This would change the total volume for Wildlife/Recreation (9/1 to 2/28) from 165.5 AF to 92.2 AF.
 - b. Similarly, pond calculations for Wildlife/Recreation Storage (1/1 to 12/31) contain a higher seepage rate; 30.5 AF to 33.1 AF.
2. The submitted project map identifies a pump at the potential edge of a pond. Will irrigation from the pond take place? If so, are irrigation storage and irrigation from storage components necessary?

Let me know if you have any questions.

Best,

Aaron Skinner
Idaho Department of Water Resources

Seepage Loss Calculations (Pond)

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

FILE NUMBER	63-34600
REVIEWER	Aaron Skinner
DATE	9/10/2018

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	4	AC.
-------------------------	---	-----

Pond Surface Area (SQ. FT.)	174240	SQ. FT.
-----------------------------	--------	---------

I used the following method to obtain my Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	GrndWtr	
Suggested Seepage Rate (FT./DAY)	0.0000	FT./DAY

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

Convert to GPD	0	GPD
----------------	---	-----

Total Seepage Loss (AFA)	0.0	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.

Evaporation Loss Calculations (Pond)

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

FILE NUMBER	63-34600
REVIEWER	Aaron Skinner
DATE	9/10/2018

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: Caldwell (NWS -- 101380)

Month	mm/day ¹	Days per month	mm/Month
Jan	0.00	31	0.00
Feb	0.18	28	5.04
March	1.22	31	37.82
April	2.51	30	75.30
May	3.74	31	115.94
June	4.22	30	126.60
July	5.01	31	155.31
August	4.27	31	132.37
September	3.06	30	91.80
October	1.89	31	58.59
November	0.00	30	0.00
December	0.00	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 = 798.77

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

(798.77) ÷ 304.8) X 4.00 = 10.5 AFA

Total Storage Calculations (Pond)

FILE NUMBER	63-34600
REVIEWER	Aaron Skinner
DATE	9/10/2013

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.

User Input
Calculated value
Formula Explanations

Surface Area (AC.)	4	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	5	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you 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 that seems reasonable to attain average depth.
Pond Capacity (AF)	20	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.
Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	0	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 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 include a volume in this space.
Estimated Seepage Loss (AF)	0.0	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	10.5	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	30.5	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Loss, and Evaporation Loss amounts to determine the total amount of storage required.

Flow Rate into Pond (CFS)	0.40	The "Flow Rate into Pond" depicts the actual flow, either measured or estimated, into the pond. For offstream facilities, this will be equivalent to "diversion to storage" rate.
Highest Daily Evaporation Rate From Evaporation Tab. (mm/Day)	5.01	This number is carried over from the "Evaporation Loss" sheet. It is the highest recorded number in the "Precipitation Deficit Table".
Required Daily Maintenance Volume (AF/Day)	0.07	"Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year to maintain pond volume. It is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (CFS)	0.03	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determined by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	27	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i>
Days Required to Fill the Pond at 13,000 Gallons per Day	-774	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i> Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.

Seepage Loss Calculations (Field Flooding)

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

FILE NUMBER	63-34600
REVIEWER	Aaron Skinner
DATE	9/10/2018

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	20	AC.
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Pond Surface Area (SQ. FT.)	871200	SQ. FT.
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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
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Convert to GPD	130332	GPD
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Total Seepage Loss (AFA)	72.0	AFA
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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.

Evaporation Loss Calculations (Field Flooding)

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

FILE NUMBER	63-34600
REVIEWER	Aaron Skinner
DATE	9/10/2018

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: Caldwell (NWS -- 101380)

Month	mm/day ¹	Days per month	mm/Month
Jan	0.00	31	0.00
Feb	0.18	28	5.04
March	0.00	31	0.00
April	0.00	30	0.00
May	0.00	31	0.00
June	0.00	30	0.00
July	0.00	31	0.00
August	0.00	31	0.00
September	3.06	30	91.80
October	1.89	31	58.59
November	0.00	30	0.00
December	0.00	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 = 155.43

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

(155.43 ÷ 304.8) X 20.00 = 10.2 AFA

Total Storage Calculations (Field Flooding)

FILE NUMBER	63-34600
REVIEWER	Aaron Skinner
DATE	9/10/2018

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.

User Input
Calculated value
Formula Explanations

Surface Area (AC.)	20	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	0.5	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you 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 that seems reasonable to attain average depth.
Pond Capacity (AF)	10	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.
Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	0	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 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 include a volume in this space.
Estimated Seepage Loss (AF)	72.0	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	10.2	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	92.2	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Loss, and Evaporation Loss amounts to determine the total amount of storage required.

Flow Rate into Pond (CFS)	0.40	The "Flow Rate into Pond" depicts the actual flow, either measured or estimated, into the pond. For offstream facilities, this will be equivalent to "diversion to storage" rate.
Highest Daily Evaporation Rate From Evaporation Tab. (mm/Day)	3.06	This number is carried over from the "Evaporation Loss" sheet. It is the highest recorded number in the "Precipitation Deficit Table".
Required Daily Maintenance Volume (AF/Day)	0.40	"Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year to maintain pond volume. It is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (CFS)	0.20	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determined by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	25	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i>
Days Required to Fill the Pond at 13,000 Gallons per Day	-28	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i> Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.



August 8, 2018

RECEIVED
AUG 10 2018
WATER RESOURCES
WESTERN REGION

Angie Grimm
IDWR Western Region Office
2735 Airport Way
Boise, ID 83705

Subject: Application for Permit

Dear Angie,

Enclosed on behalf of Michael Hatfield, is an *Application for Permit* requesting use of shallow ground water and Boise River water for ponds, field flooding and irrigation uses. Please see the application's attached narrative for further details.

Check No. 1024 for \$290 is enclosed for the filing fee. Thank you very much for your consideration and assistance in this matter. Please call me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Lori Graves", is written over a light blue horizontal line.

Lori Graves
Water Rights Specialist

Cc: Michael Hatfield

Enclosures

SPF file number: 1416.0010