

State of Idaho
Department of Water Resources
Water Right License
WATER RIGHT NO. 65-12902

PRIORITY: November 02, 1988

Maximum Diversion Volume: 1.4 AF

It is hereby certified that:

CAROLYN THEM PARKER 1000 STORY LANE BAKER CITY OR 97814

has complied with the terms and conditions of the permit, issued pursuant to Application for Permit dated November 02, 1988, and has submitted Proof of Beneficial Use on August 01, 1989. An examination confirms water is diverted from:

SOURCE:
UNNAMED STREAM

TRIBUTARY:
NORTH FORK PAYETTE RIVER

and a water right has been established as follows:

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>ANNUAL DIVERSION VOLUME</u>
IRRIGATION STORAGE	01/01 to 12/31	1.4 AF
IRRIGATION FROM STORAGE	06/01 to 10/01	1.4 AF

LOCATION OF POINT(S) OF DIVERSION:

UNNAMED STREAM NW¼SW¼NW¼ Sec. 22, Twp 18N, Rge 03E, B.M. VALLEY County

PLACE OF USE: IRRIGATION FROM STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
18N	03E	22							10.0										10.0

Total Acres: 10

PLACE OF USE: IRRIGATION STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
18N	03E	22							X										

CONDITIONS OF APPROVAL

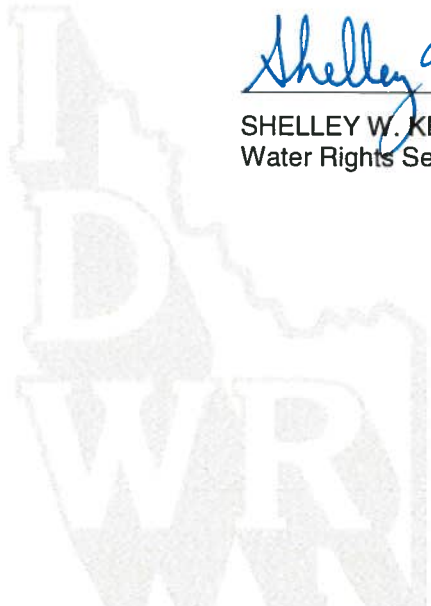
1. This right when combined with all other rights shall provide no more than 3.0 afa per acre at the field headgate for irrigation of the place of use.
2. Use of water under this right will be regulated by a watermaster with responsibility for the distribution of water among appropriators within a water district. At the time of this approval, this water right is within State Water District No. 65, Payette River and Tributaries.
3. After specific notification by the Department, the right holder shall install a suitable measuring device or shall enter into an agreement with the Department to use power records to determine the amount of water diverted and shall annually report the information to the Department.

State of Idaho
Department of Water Resources
Water Right License
WATER RIGHT NO. 65-12902

4. Right 95-12902 authorizes the storage of an annual total of 1.4 acre-feet, 1.0 acre-feet to be used for the initial filling or carryover storage of the pond and 0.4 acre-feet for the replacement of losses due to seepage and evaporation, with no additional refills allowed for the irrigation from storage use.

This license is issued pursuant to the provisions of Section 42-219, Idaho Code. The water right confirmed by this license is subject to all prior water rights and shall be used in accordance with Idaho law and applicable rules of the Department of Water Resources.

Signed this 22nd day of July, 2016.



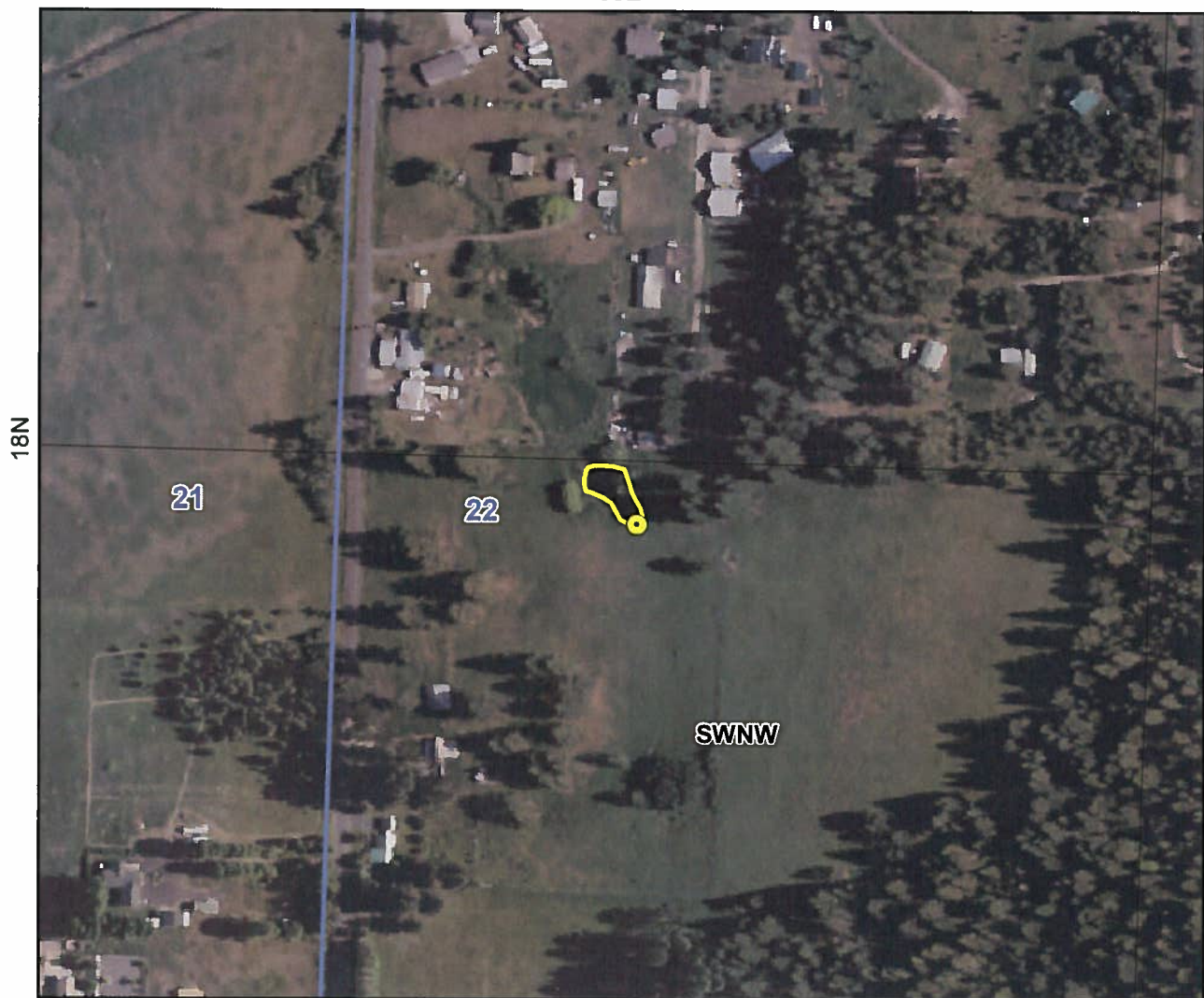
Shelley W. Keen

SHELLEY W. KEEN
Water Rights Section Manager

State of Idaho
Department of Water Resources
Attachment to Water Right License
65-12902

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

03E



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

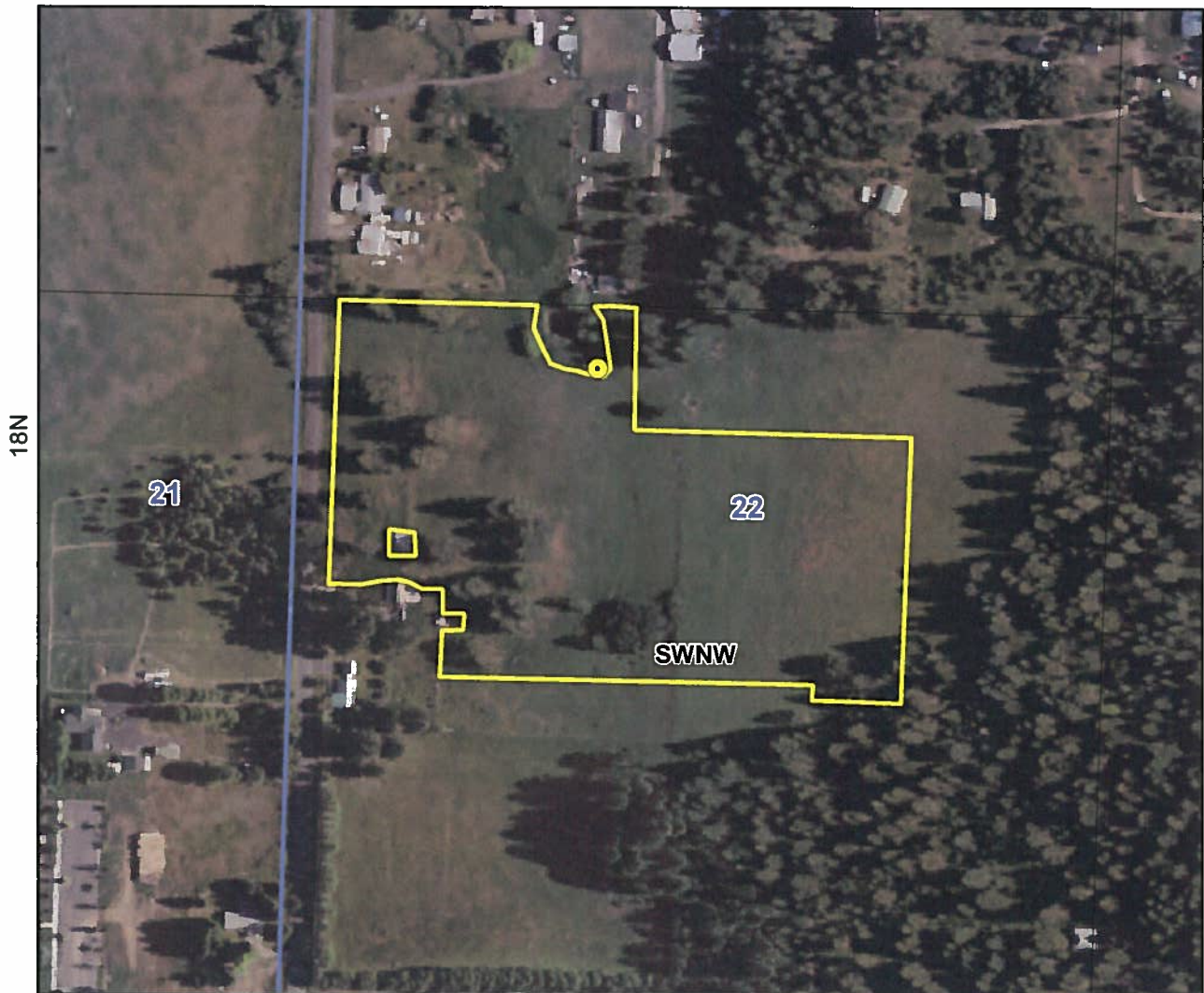
0 0.035 0.07 0.14 Miles



State of Idaho
Department of Water Resources
Attachment to Water Right License
65-12902

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

03E



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



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

July 25, 2016

CAROLYN THEM PARKER
1000 STORY LANE
BAKER CITY OR 97814

RE: License No. 65-12902

Issuance of License

Dear Water Right Holder(s):

The Department of Water Resources has issued the enclosed Water Right License confirming that a water right has been established in accordance with your permit. Please be sure to thoroughly review the conditions of approval and remarks listed on your license.

The license is a PRELIMINARY ORDER issued by the Department pursuant to section 67-5243, Idaho Code. It can and will become a final order without further action by the Department unless a party petitions for reconsideration or files an exception and/or brief within fourteen (14) days of the service date as described in the enclosed information sheet.

Please note that water right owners are required to report any change of water right ownership and/or mailing address to the Department within 120 days of the change. Failure to report these changes could result in a \$100 late filing fee. Contact any office of the Department or visit the Department's homepage on the Internet to obtain the proper forms and instructions.

If you have any questions, please contact me at 208-287-4951.

Sincerely,

Pamela Skaggs

Water Rights Supervisor

Enclosure(s)

cc: SPF WATER ENGINEERING LLC
WATER DISTRICT #65

CERTIFICATE OF SERVICE

I hereby certify that on July 26, 2016, I mailed a true and correct copy, postage prepaid, of the foregoing PRELIMINARY ORDER (Approved License) to the person(s) listed below:

RE: WATER RIGHT NO. 65-12902

**CAROLYN THEM PARKER
1000 STORY LANE
BAKER CITY OR 97814**

**SPF WATER ENGINEERING LLC
C/O SCOTT N KING
300 E MALLARD DR STE 350
BOISE ID 83706**

**WATER DISTRICT #65
RON SHURTLEFF
102 N MAIN ST
PAYETTE ID 83661**



**Darla Block
Technical Records Specialist**

EXPLANATORY INFORMATION TO ACCOMPANY A PRELIMINARY ORDER

(To be used in connection with actions when a hearing was **not** held)

(Required by Rule of Procedure 730.02)

The accompanying order or approved document is a "Preliminary Order" issued by the department pursuant to section 67-5243, Idaho Code. **It can and will become a final order without further action of the Department of Water Resources ("department") unless a party petitions for reconsideration, files an exception and brief, or requests a hearing as further described below:**

PETITION FOR RECONSIDERATION

Any party may file a petition for reconsideration of a preliminary order with the department within fourteen (14) days of the service date of this order. **Note: the petition must be received by the department within this fourteen (14) day period.** The department will act on a petition for reconsideration within twenty-one (21) days of its receipt, or the petition will be considered denied by operation of law. See Section 67-5243(3) Idaho Code.

EXCEPTIONS AND BRIEFS

Within fourteen (14) days after: (a) the service date of a preliminary order, (b) the service date of a denial of a petition for reconsideration from this preliminary order, or (c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration from this preliminary order, any party may in writing support or take exceptions to any part of a preliminary order and may file briefs in support of the party's position on any issue in the proceeding with the Director. Otherwise, this preliminary order will become a final order of the agency.

REQUEST FOR HEARING

Unless a right to a hearing before the Department or the Water Resource Board is otherwise provided by statute, any person aggrieved by any final decision, determination, order or action of the Director of the Department and who has not previously been afforded an opportunity for a hearing on the matter may request a hearing pursuant to section 42-1701A(3), Idaho Code. A written petition contesting the action of the Director and requesting a hearing shall be filed within fifteen (15) days after receipt of the denial or conditional approval.

ORAL ARGUMENT

If the Director grants a petition to review the preliminary order, the Director shall allow all parties an opportunity to file briefs in support of or taking exceptions to the preliminary order and may schedule oral argument in the matter before issuing a final order. If oral arguments are to be heard, the Director will within a reasonable time period notify each party of the place, date and hour for the argument of the case. Unless the Director orders otherwise, all oral arguments will be heard in Boise, Idaho.

CERTIFICATE OF SERVICE

All exceptions, briefs, requests for oral argument and any other matters filed with the Director in connection with the preliminary order shall be served on all other parties to the proceedings in accordance with IDAPA Rules 37.01.01302 and 37.01.01303 (Rules of Procedure 302 and 303).

FINAL ORDER

The Director will issue a final order within fifty-six (56) days of receipt of the written briefs, oral argument or response to briefs, whichever is later, unless waived by the parties or for good cause shown. The Director may remand the matter for further evidentiary hearings if further factual development of the record is necessary before issuing a final order. The department will serve a copy of the final order on all parties of record.

Section 67-5246(5), Idaho Code, provides as follows:

Unless a different date is stated in a final order, the order is effective fourteen (14) days after its service date if a party has not filed a petition for reconsideration. If a party has filed a petition for reconsideration with the agency head, the final order becomes effective when:

- (a) The petition for reconsideration is disposed of; or
- (b) The petition is deemed denied because the agency head did not dispose of the petition within twenty-one (21) days.

APPEAL OF FINAL ORDER TO DISTRICT COURT

Pursuant to sections 67-5270 and 67-5272, Idaho Code, if this preliminary order becomes final, any party aggrieved by the final order or orders previously issued in this case may appeal the final order and all previously issued orders in this case to district court by filing a petition in the district court of the county in which:

- i. A hearing was held,
- ii. The final agency action was taken,
- iii. The party seeking review of the order resides, or
- iv. The real property or personal property that was the subject of the agency action is located.

The appeal must be filed within twenty-eight (28) days of this preliminary order becoming final. See section 67-5273, Idaho Code. The filing of an appeal to district court does not itself stay the effectiveness or enforcement of the order under appeal.

MEMORANDUM

TO: File 65-12902

FROM: Daniel Nelson – Staff Hydrologist

DATE: July 20, 2016

SUBJECT: Additional Licensing Review of Water Right 65-12902

The field examination for this permit was done in 1999 by Lori Graves from our Western Region Office. The field exam had a few issues that needed to be addressed. I composed a memo dated March 9, 2016 outlining these issues, and sent correspondence to the permit holder and all of the property owner's of the lands recommended for irrigation by the field examiner. The following things are the issues and the steps taken to move this permit to licensing.

- 1.) The field exam describes the stockwater use as water for wild deer. The proof of beneficial use statement also said the stockwater use was actually wildlife use for a mini refuge. There doesn't appear to have been any stockwater use developed under this permit, and the wildlife use was not developed for wildlife exclusively. Therefore, we are going to remove the stockwater use, and maintain the use for this pond as irrigation storage only. Water right license 65-8005 from ground water does allow stockwater, so they should be able to cover any future stockwater uses from their well.
- 2.) The field examiner recommended that this permit be licensed for 10 acres within a 20 acre permissible place of use. A recent assignment of permit allocated all of the water for this permit to Carolyn Them Parker. There are statements from the other property owner's of the original 20 acres releasing all claims against this permit to Ms. Parker. Ms. Parker only has 10 acres of available irrigated ground, so an amendment is no longer necessary.

My original memo stated we needed to use condition X27, but with the amendment, that condition will no longer be needed. With these changes, we can now move forward with the licensing of this permit.





State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

March 18, 2016

NAVARRE S THEM
WALTER J THEM
805 S SAMSON TRAIL
MC CALL ID 83638

RE: Water Right Permit No. 65-12902

Dear Permit Holders:

The Department of Water Resources is reviewing the permit referenced above prior to issuing a water right license. By issuing a license, the Department confirms the extent of development that has been established in compliance with the terms of the permit. The examiner who verified your water use reported that certain elements of the permit have been developed differently than described on your permit. Changes that do not increase the authorized use of water under the permit can be requested and approved in accordance with Section 42-211, Idaho Code. Before a license can be issued, your permit must be amended to depict your water use as it was actually developed.

A field examination was performed on this permit on July 5, 1999, but licensing of the permit was delayed until overlapping water rights were decreed. The field examiner discovered that the pond involved in this permit is used to supplement irrigation on approximately 10 of the 20 acres farmed on this property. The field examiner also found that there was no livestock using the pond for drinking water during the development period.

The permit only allowed 10 acres to be irrigated from the pond (storage). Therefore, the permit needs to be amended to reflect the actual use. The enclosed amendment allows 10 acres to be irrigated from the pond within the 20 acres the field examiner found that pond could supply water. The pond only has the capacity to supply only 1 acre-foot of water to this property, so that is the maximum amount of irrigation water that can be used from the pond.

You will also notice that the stockwater portion of this permit was removed from the amendment, because the amendment must reflect the license as closely as possible.

Aerial photos show that pond still exists, so I did not include a relinquishment of permit form with this letter. This is the only water right that authorizes the filling of the pond, so I am assuming that you still wish to have the pond.

The records available to the Department also show that a majority of the land is in different ownership. I have sent copies of this letter to all of the folks that may have an interest in this water right. The individuals that I have found that may have an interest in the water right are Catherine Navarre Them, Caroline Them Parker, and Mathew Alder.

The enclosed Application for Amendment form depicts the elements of the water right as they will appear on the license when it is issued. Please review the amendment form and map carefully. If you concur with the information presented, please sign the form and return it with the \$100.00 filing fee by April 19, 2016. If we do not receive the amendment by April 19, 2016, the permit could be voided or the amount of use reduced.

If you have any questions, please don't hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Daniel A. Nelson", with a long horizontal flourish extending to the right.

Daniel A. Nelson
Staff Hydrologist
Planning Bureau
Idaho Department of Water Resources
Telephone # (208) 287-4856
Email – dan.nelson@idwr.idaho.gov



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

March 18, 2016

CAROLINE THEM PARKER
1000 STORY LN
BAKER CITY OR 97814

RE: Water Right Permit No. 65-12902

Dear Ms. Parker:

The Department of Water Resources is reviewing the permit referenced above prior to issuing a water right license. By issuing a license, the Department confirms the extent of development that has been established in compliance with the terms of the permit. During the process of reviewing this permit for licensing, Department staff discovered that you may now own a portion of the property described in the permit. Therefore, the Department is sending a copy of the amendment to you for your review.

If you have any questions, please don't hesitate to contact me.

Sincerely,

Daniel A. Nelson
Staff Hydrologist
Planning Bureau
Idaho Department of Water Resources
Telephone # (208) 287-4856
Email – dan.nelson@idwr.idaho.gov



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

March 18, 2016

MATHEW ALDER
2475 ASTER ST
SAN DIEGO CA 92109

RE: Water Right Permit No. 65-12902

Dear Ms. Parker:

The Department of Water Resources is reviewing the permit referenced above prior to issuing a water right license. By issuing a license, the Department confirms the extent of development that has been established in compliance with the terms of the permit. During the process of reviewing this permit for licensing, Department staff discovered that you may now own a portion of the property described in the permit. Therefore, the Department is sending a copy of the amendment to you for your review.

If you have any questions, please don't hesitate to contact me.

Sincerely,

Daniel A. Nelson
Staff Hydrologist
Planning Bureau
Idaho Department of Water Resources
Telephone # (208) 287-4856
Email – dan.nelson@idwr.idaho.gov



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

March 18, 2016

CATHERINE NAVARRE THEM
268 BUCKCAMP RD
MC CALL ID 83638

RE: Water Right Permit No. 65-12902

Dear Ms. Parker:

The Department of Water Resources is reviewing the permit referenced above prior to issuing a water right license. By issuing a license, the Department confirms the extent of development that has been established in compliance with the terms of the permit. During the process of reviewing this permit for licensing, Department staff discovered that you may now own a portion of the property described in the permit. Therefore, the Department is sending a copy of the amendment to you for your review.

If you have any questions, please don't hesitate to contact me.

Sincerely,

Daniel A. Nelson
Staff Hydrologist
Planning Bureau
Idaho Department of Water Resources
Telephone # (208) 287-4856
Email – dan.nelson@idwr.idaho.gov

MEMORANDUM

TO: File 65-12902

FROM: Daniel Nelson – Staff Hydrologist

DATE: March 9, 2016

SUBJECT: Licensing Review of Water Right 65-12902

The field examination for this permit was done in 1999 by Lori Graves from our Western Region Office. The field exam had a few issues that need to be addressed. The following things are the issues and what steps will be needed to move this permit to licensing.

- 1.) The field exam describes the stockwater use as water for wild deer. The proof of beneficial use statement also said the stockwater use was actually wildlife use for a mini refuge. There doesn't appear to have been any stockwater use developed under this permit, and the wildlife use was not developed for wildlife exclusively. Therefore, we are going to remove the stockwater use, and maintain the use for this pond as irrigation storage only. Water right license 65-8005 from ground water does allow stockwater, so they should be able to cover any future stockwater uses from their well.
- 2.) The field examiner recommends that this permit be licensed for 10 acres within a 20 acre permissible place of use. Currently mapping technology only shows 20 acres that could possibly be irrigated within the property, so we could license this permit for 10 acres within a 20 acre permissible place of use per standard rounding requirements. Unfortunately, the permit doesn't describe a permissible place of use. Therefore, we will need to attain an amendment to allow the permissible place of use.

It appears as though only Navaree S. Them still lives on the property, so I will send the amendment request to her at the address shown in our tax lot data. It also appears as though the property has been split into 4 separate parcels. Three of the four parcels appear to be owned by family members. The fourth parcel is in the ownership of an individual who doesn't appear to be related to Them. I will copy the letter to the other three property owners.

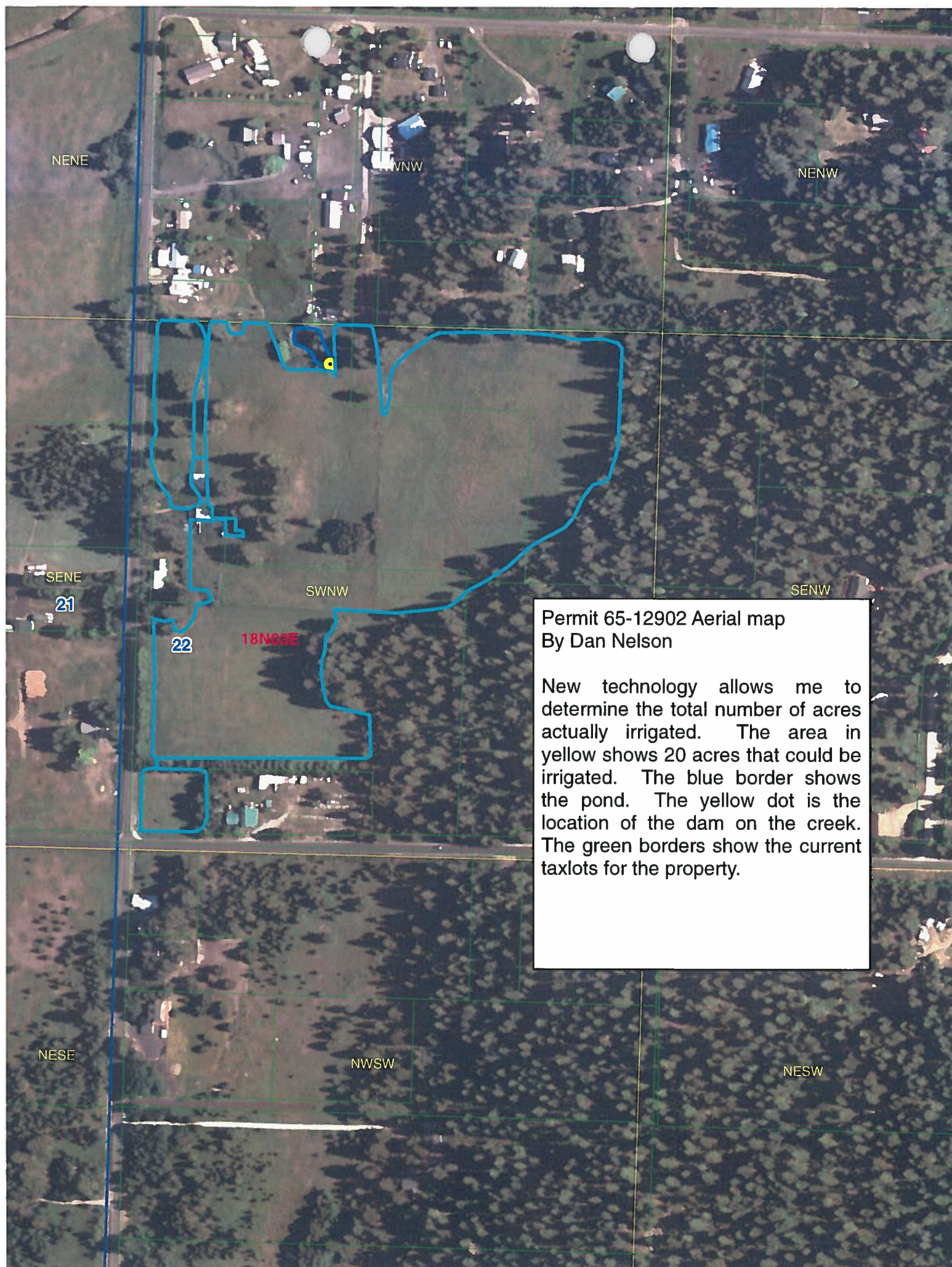
The field examiner recommended 1.4 af of storage, and the pond spreadsheet confirms that 1.4 af of water is used for storage for this pond. The pond has a capacity of 1 af and evaporation and seepage rates of 0.4 af for a total of 1.4 af. The irrigation from storage should be reduced to 1.0 af, while the irrigation storage can remain at 1.4 af to account for the evaporation and seepage.

All of the conditions for this permit must be updated and additional conditions will be needed. Condition 1 (03A) will be changed to condition R62. Condition 2 (005) will be changed to condition R05. Condition 01M will be added as per standards for small water rights in a water district. I have opted to go with condition 259 on this permit instead of condition 220 to ensure that multiple fills of the reservoir are not authorized by this water right. Condition X27 should also be used to describe the permissible place of use.



Permit 65-12902 Aerial map
By Dan Nelson

New technology allows me to determine the total number of acres actually irrigated. The area in yellow shows 20 acres that could be irrigated. The blue border shows the pond. The yellow dot is the location of the dam on the creek. The green borders show the current taxlots for the property.



Permit 65-12902 Aerial map
By Dan Nelson

New technology allows me to determine the total number of acres actually irrigated. The area in yellow shows 20 acres that could be irrigated. The blue border shows the pond. The yellow dot is the location of the dam on the creek. The green borders show the current taxlots for the property.

Total Storage Calculations

FILE NUMBER	65-12902
REVIEWER	Dan Nelson
DATE	12/28/2015

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.)	0.1	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	10	"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)	1	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)	0.3	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.1	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	1.4	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.

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	65-12902
REVIEWER	Dan Nelson
DATE	12/28/2015

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: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	-1.93	31	0.00
Feb	-1.46	28	0.00
March	-0.70	31	0.00
April	0.73	30	21.90
May	1.38	31	42.78
June	2.42	30	72.60
July	4.12	31	127.72
August	3.49	31	108.19
September	1.93	30	57.90
October	0.46	31	14.26
November	-1.99	30	0.00
December	-2.50	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 = 445.35

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

(445.35 ÷ 304.8) X 0.10 = 0.1 AFA

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	65-12902
REVIEWER	Dan Nelson
DATE	12/28/2015

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	0.1	AC.
-------------------------	-----	-----

Pond Surface Area (SQ. FT.)	4356	SQ. FT.
-----------------------------	------	---------

I used the following method to obtain my Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	SC	
Suggested Seepage Rate (FT./DAY)	0.0070	FT./DAY

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

Convert to GPD	228	GPD
----------------	-----	-----

Total Seepage Loss (AFA)	0.3	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.