

State of Idaho
Department of Water Resources
Water Right License
Water Right No. 98-7925

Priority: June 14, 2013

Maximum Diversion Rate: 0.11 CFS

Maximum Diversion Volume: 11.0 AF

It is hereby certified that:

ESSENTIAL OIL RESEARCH FARM LLC 3125 W EXECUTIVE PKWY LEHI UT 84043-9572

has complied with the terms and conditions of the permit, issued pursuant to Application for Permit dated June 14, 2013, and has submitted Proof of Beneficial Use on November 09, 2018. An examination confirms water is diverted from:

Source : UNNAMED STREAM

Tributary: FALL CREEK

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
COOLING	12/01 to 03/31	0.11 CFS	6.7 AF
COOLING STORAGE	01/01 to 12/31		11.0 AF
COOLING FROM STORAGE	12/01 to 03/31		6.7 AF
FIRE PROTECTION STORAGE	01/01 to 12/31		4.3 AF

Location of Point(s) of Diversion

UNNAMED STREAM SW¼ SE¼, Sec. 3, Twp 60N, Rge 01W, B.M. BOUNDARY County

Place of Use: COOLING, COOLING STORAGE, COOLING FROM STORAGE, AND
FIRE PROTECTION STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				No QQ	Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE		
60N	01W	3															X			

Conditions of Approval

1. The pond established by the storage of water under this right shall not exceed a total capacity of 2.9 acre-feet or a total surface area of 0.8 acres.
2. Right 98-7925 authorizes the storage of an annual total of 11 acre-feet, comprised of 2.9 acre-feet to be used for the initial filling or carryover storage of the pond, 1.4 acre-feet for the replacement of losses due to seepage and evaporation, and up to 6.7 acre-feet for additional refills for cooling from storage use.
3. Water shall not be diverted from fire protection storage except to fight or repel an existing fire.
4. The cooling and cooling from storage use authorized by this right shall be non-consumptive.
5. This right does not grant any right-of-way or easement across the land of another.

State of Idaho
Department of Water Resources
Water Right License
Water Right No. 98-7925

This license is issued pursuant to the provisions of Idaho Code § 42-219. 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 18th day of JUNE, 2019.

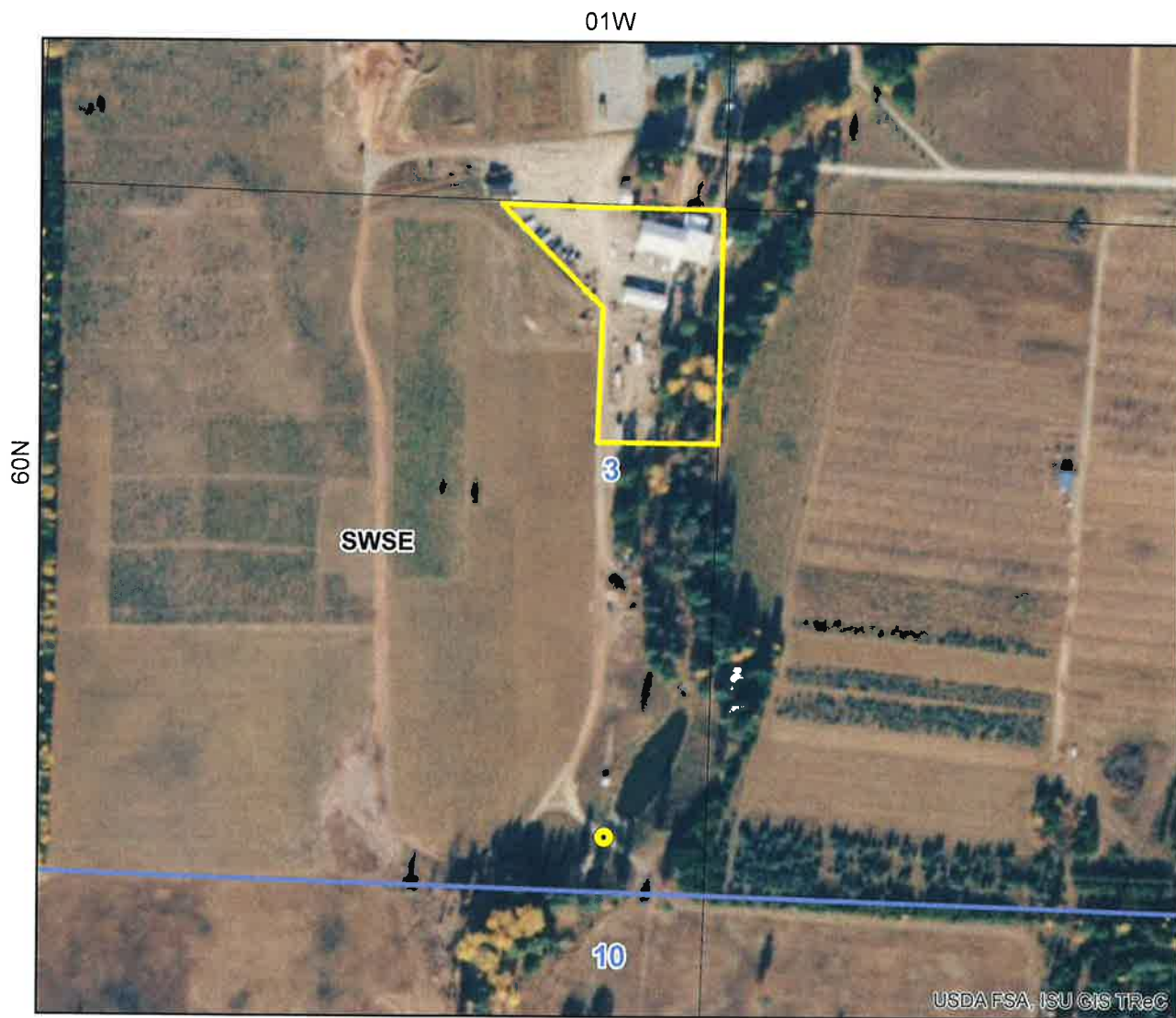


ANGELA GRIMM

Water Rights Section Manager

State of Idaho
Department of Water Resources
Attachment to Water Right License
98-7925

This map depicts the COOLING and COOLING 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.



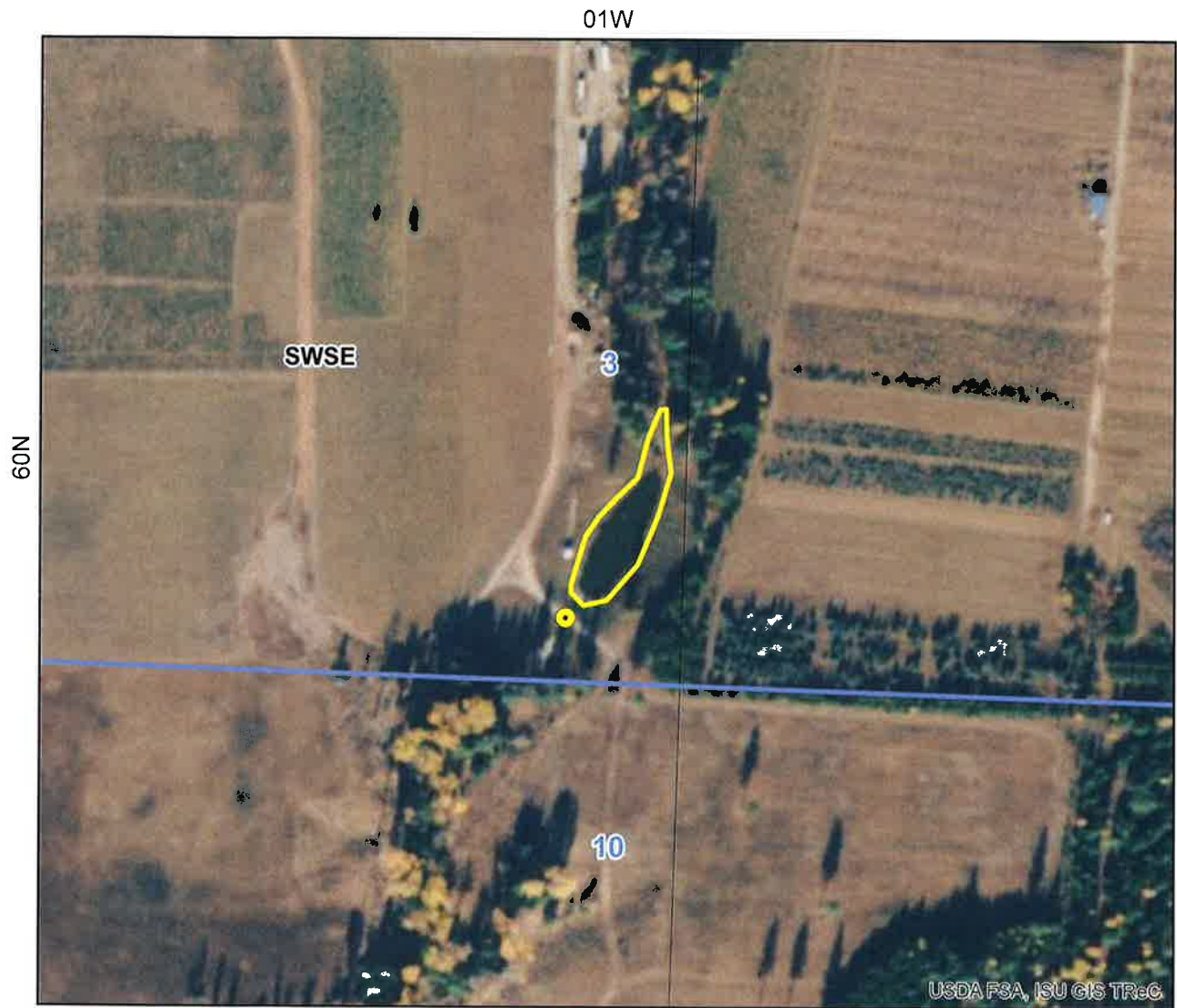
-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters

0 0.0425 0.085 0.17 Miles



State of Idaho
Department of Water Resources
Attachment to Water Right License
98-7925

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



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

0 0.035 0.07 0.14 Miles





State of Idaho

DEPARTMENT OF WATER RESOURCES

322 E FRONT ST STE 648 PO BOX 83720 • BOISE, ID 83720-0098

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

Brad Little
Governor

Gary Spackman
Director

June 21, 2019

ESSENTIAL OIL RESEARCH FARM LLC
3125 W EXECUTIVE PKWY
LEHI UT 84043-9572

RE: License No. 98-7925

Issuance of License

Dear Water Right Holder(s):

The Department of Water Resources ("Department") 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 all the conditions of approval listed on your license. The conditions may include ongoing requirements, such as maintenance of a measuring device or implementation of mitigation, as well as information about how your water use may be administered, such as regulation by a watermaster in a water district.

The license is a PRELIMINARY ORDER issued by the Department pursuant to Rule 730 of the Department's Rules of Procedure (IDAPA 37.01.01.730). It can and will become a final order without further action by the Department unless a party petitions for reconsideration, files exceptions, or requests a hearing as described in the enclosed information sheet.

Also, 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. Water right forms are available from any office of the Department or on the Department's website at idwr.idaho.gov

If you have any questions concerning the enclosed information, please contact me at (208) 287-4951.

Sincerely,

Angela Grimm
Water Rights Section Manager

Enclosure(s)

CERTIFICATE OF SERVICE

I hereby certify that on June ²⁴, 2019, I served a true and correct copy of Water Right License No. 98-7925 by U.S. Mail, postage prepaid, to the following:

ESSENTIAL OIL RESEARCH FARM LLC (Current Owner)
3125 W EXECUTIVE PKWY
LEHI UT 84043-9572

SPF WATER ENGINEERING LLC (Interested Party)
C/O SCOTT N KING
300 E MALLARD DR STE 350
BOISE ID 83706



Darla Block
Technical Records Specialist 1

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: Water Right File 98-7925
FROM: Daniel Nelson – Analyst 3
DATE: April 3, 2019
SUBJECT: Additional Information On Fire Flows

Beneficial Use for Fire Fighting:

Mr. King informed me today that the square footage of the building was actually 9,839 square feet. This would increase the fire flows from 1,500 to 2,750 gpm.

This would change the calculations on my February 19, 2019 memo to the following:

$2.9 \text{ af} \times 325,850 = 944,965$ gallons of storage water

$1,500 \text{ gpm} \times 60 \text{ minutes} = 90,000$ gallons per hour

$2,750 \text{ gpm} \times 60 \text{ minutes} = 165,000$ gallons per hour

$944,965 \text{ gal} / 90,000 \text{ gph} = 10.5$ hours of water available

$944,965 \text{ gal} / 165,000 \text{ gph} = 5.7$ hours of water available

The above calculations doesn't change my conclusions on the beneficial use of fire protection when looking at the full picture of this system. I did however, want to correct my earlier estimates with the correct information.

Nelson, Dan

From: Scott King <SKing@spfwater.com>
Sent: Wednesday, April 03, 2019 9:08 AM
To: Nelson, Dan
Subject: 98-7925 building area

Dan,

I heard back on this one.

The building size is 9839 square feet.

Thank you,
Scott

Scott N. King, P.E. | Supervising Engineer

SPF Water Engineering, LLC

300 E Mallard Drive, Suite 350 | Boise, ID 83706

phone 208.383.4140 | fax 208.383.4156

email sking@spfwater.com | web www.spfwater.com

The information contained in this e-mail is intended only for the individual or entity to whom it is addressed. Its contents (including any attachments) may contain confidential and/or privileged information. If you are not an intended recipient you must not use, disclose, disseminate, copy or print its contents. If you receive this e-mail in error, please notify the sender by reply e-mail and delete and destroy the message.

MEMORANDUM

TO: Water Right File 98-7925

FROM: Daniel Nelson – Analyst 3

DATE: February 19, 2019

SUBJECT: Licensing Review of Water Right 98-7925

The field exam for this right was performed by Certified Field Examiner Scott King of SPF Water Engineering. Mr. King recommended 11 af for cooling storage, 6.7 af for cooling from storage, and 4.3 af for fire protection, and 0.11 cfs for cooling. There are some issues that need to be clarified in this field report.

Mr. King recommended that the place of use and point of diversion were all in the SWSE of Section 3 in Township 60 North, Range 1 West, in Boundary County. I agree with this recommendation. The point of diversion is the dam for an on stream pond that supplies water to an essential oil facility. The facility boils woodchips from various types of trees and runs the steam from the boiling process through a cooling system that extracts the oils.

Overlap:

Water right 98-7750 overlaps the place of use

Diversion Rate:

Mr. King calculated the measurement for this permit using the pump curves of the pumps pumping water from the pond. The pumps have not been used in a couple of years, and were not operable at the time of the field examination. Typically, we require a measurement of the flow rate unless there is a reasonable explanation why the measurement could not be made. The pond is no longer used for cooling purposes which is a reasonable explanation why a measurement could not be made. The information from the pump curve is adequate for the licensing of this exam. I agree with the diversion rate of 0.11 cfs recommended by Mr. King.

Diversion Volume:

Mr. King determined that the volume of the pond is 2.9 af, which seems reasonable. Mr. King added an additional 1.42 af for evaporation for a total of 4.3 af. My calculations show an evaporation amount of 0.8 af and seepage losses of 0.8 af. Even though this is an on-stream pond, I included seepage losses, because this stream is intermittent, only has water early in the year and during rain events. When I included the seepage losses, I found at least 1.6 af of losses

due to seepage and evaporation, which is in line with the 1.4 af found by Mr. King. Therefore, to fill and maintain the pond, the 4.3 af recommended by Mr. King is reasonable. Mr. King recommended the 4.3 af for fire protection, which is also reasonable for this system.

Mr. King did not recommend a volume for the cooling purposes, but did supply the cooling volume calculation of 6.7 af. I requested additional information from Mr. King to determine if this information was reasonable, and after consulting with our heating cooling expert, we determined that the 6.7 af for cooling was a reasonable determination of the amount of water needed for the cooling of this system. The cooling use should have a volume limitation of 6.7 af. Mr. King did correctly determine the cooling from storage at 6.7 af. Mr. King also calculated the cooling storage as 11 af (6.7 af cooling from storage + 4.3 af pond fill and evaporation and seepage losses = 11 af). The total volume for this permit should be limited to 11 af when all of the uses are combined.

It should also be noted that the water diverted from the pond is sent through the cooling system and open discharged back into the creek upstream of the pond. The water discharged back into the stream is then recaptured in the pond to be reused in the cooling system. This allows them to have sufficient water to operate this system, since the intermittent stream cannot provide the amount of water needed without the storage pond recapturing the discharge water. Therefore, any attempts to move this water in the future should carefully reviewed to determine the exact amount of fresh water that is available at the site for other uses downstream that don't have the same system available to recapture and reuse the water from the system.

Beneficial Use for Fire Fighting:

In an email from Mr. King, he informed me that there was no local requirement for rate and/or volume for fire protection of the facility, but that the State had adopted the International Fire Code (IFC). I can confirm this statement from similar to research that I have done on other fire protection permits in different locations.

The IFC does not give a specific determination of the volume of water required, but it does supply a table showing the Minimum Required Fire-Flow and Flow Duration requirements for specific sized buildings. I have included a copy of the table with this memorandum. Using aerial imagery, I determine the approximate square footage of all of the buildings are between 5,000 and 6,000 sq. ft. I am not qualified to determine the building types, so I estimated the required flow rate to be between 1,500 and 2,250 gpm based on the chart supplied by the IFC for structures under 7,700 square feet. This allowed a little room for error in determining the exact size of the buildings from ArcMap.

The IFC flow is supposed to be maintained for a minimum of 2 hours, but my research into the average time it takes to put out a fire various lengths from a few minutes to several days depending of the materials in the fire. Fires in lumber yards and chemical plants tend to take longer to put out due to the piles of material and the different chemicals used in lumber processing. The industrial use for this permit uses trees to create essential oils from various tree species by chipping the trees and boiling the oils out of the woodchips, so it is safe to assume that the fire protection would be similar to most lumber yards and chemical plants. I used the following calculations to determine if the pond storage would be a beneficial use for fire protection:

$2.9 \text{ af} \times 325,850 = 944,965 \text{ gallons of storage water}$

$1,500 \text{ gpm} \times 60 \text{ minutes} = 90,000 \text{ gallons per hour}$

$2,250 \text{ gpm} \times 60 \text{ minutes} = 135,000 \text{ gallons per hour}$

$944,965 \text{ gal} / 90,000 \text{ gph} = 10.5 \text{ hours of water available}$

$944,965 \text{ gal} / 135,000 \text{ gph} = 7 \text{ hours of water available}$

Taking into consideration the type of plant operation and the fact there is approximately 411 acres of tree farms associated with this fire protection use, I feel the 2.9 af of fire protection storage is a reasonable amount of water to protect this facility and the surrounding tree farms from fire. The creek is an intermittent stream, so this pond would be the only source of water throughout the majority of the year. The storage does give the fire fighter the better part of a day to fight the fire. Even if the fire is put out in a 2 hour period, there would be a need for additional water to clean up spot fires and to protect the surrounding area.

Conditions:

Conditions 004 and 218 will be carried forward to licensing. Condition 220 will be altered to include current pond dimensions of 2.9 af capacity and 0.8 acre surface area. Condition 219 will be changed to condition 259 with 11 af of total volume, 2.9 af of initial fill, 1.4 af seepage and evaporation, and 6.7 af of refills for cooling purposes.

Condition 027 will be corrected to show that the cooling and cooling from storage uses will be non-consumptive. The evaporation and seepage losses associated with the pond are always considered consumptive, and shouldn't have been included in the original condition on the permit. The remaining conditions will be removed at licensing.

APPENDIX B

TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute) ^b	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^a	Type IV and V-A ^a	Type IIB and IIIB ^a	Type V-B ^a		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

Determination of Possible Losses of Water Through Plant.

Diversion Rate	Total Daily Diversion Volume (Rate X 1.9835 X 12hrs/24day)	Estimated Losses Through Plant that is not Rejected into Creek.	Estimated Volume of Water Lost or Not Diverted Back to the Creek (Daily Volume X Estimated Losses)	Storage Volume (From Field Report)	Numbr of days to Empty Reservoir With Estimated Losses (Storage Volume / Estimated Daily Losses)
0.11	0.1090925	0.05	0.005454625	2.92	535.3255265
0.11	0.218185	0.1	0.0218185	2.92	133.8313816
0.11	0.218185	0.15	0.03272775	2.92	89.22092108
0.11	0.218185	0.2	0.043637	2.92	66.91569081
0.11	0.218185	0.223	0.048655255	2.92	60.01407248
0.11	0.218185	0.25	0.05454625	2.92	53.53255265
0.11	0.218185	0.3	0.0654555	2.92	44.61046054
0.11	0.218185	0.35	0.07636475	2.92	38.23753761
0.11	0.218185	0.4	0.087274	2.92	33.45784541

The water right examiner stated that the copoling system is a closed loop system, so there should be very little if any losses of the water diverted through the cooling plant. The water that is diverted through the plant is reinjected into the creek approximately 935 feet upstream of the onstream pond and refills the pond. The amount of water stored in the pond is 2.92 af and requires an additional 1.6 af for seepage and evaporation to maintain the pond (please see attached pond spreadsheet). If you account for the daily diversions, the above table provides estimate on the water losses of water diverted into the plant that is not diverted back into the Creek. The water right examiner stated that the plant operated for 60 days. According to this chart, approximately 22.3 % of water diverted from the pond would have to be lost to evaporation or other losses to completely empty the pond if no additional water was added to the pond during the 60 day operation period. This does not take into account evaporation or seepage losses from the pond. The evaporation and seepage losses are covered by the fire protection portion of this permit. Eventhough a total of 6.65 af of water per year is diverted to the plant for cooling, a significant amount of that water is returned to the creek and is reused. However, in speaking with Department staff, once the water is discharged into the stream, it becomes part of the stream, so it we should count the entire 6.65 af for cooling and cooling from storage. The attached pond spreadsheet shows the seepage, evaporation and filling of the pond would need 4.55 af to maintain the pond level for fire protection, when combined with the refills required to provide 6.65 af of cooling, the total storage for this permit would be 11.2 af (4.55 af for pond and evaporation and seepage + 6.65 af for cooling use = 11.2 af).

Total Storage Calculations

FILE NUMBER	98-7925
REVIEWER	Dan Nelson
DATE	2/5/2019

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.)	0.76	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	3.84	"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)	2.92	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)	6.65	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)	0.8	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.8	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	11.2	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.

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	63-12601
REVIEWER	Dan Nelson
DATE	5/9/2018

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: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	-1.84	31	0.00
Feb	-1.27	28	0.00
March	-0.43	31	0.00
April	0.66	30	19.80
May	1.34	31	41.54
June	1.67	30	50.10
July	2.96	31	91.76
August	2.53	31	78.43
September	1.02	30	30.60
October	-0.54	31	0.00
November	-2.20	30	0.00
December	-2.36	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 = 312.23

$$((312.23 \div (\text{convert to feet})) \times (\text{Surface area of pond, in acres})) = \text{Evaporation Loss in Acre Feet}$$

$$(312.23 \div 304.8) \times 0.76 = 0.8 \text{ AFA}$$

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	98-7925
REVIEWER	Dan Nelson
DATE	2/5/2019

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	0.76	AC.
-------------------------	------	-----

Pond Surface Area (SQ. FT.)	33106	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	CL	
Suggested Seepage Rate (FT./DAY)	0.0030	FT./DAY

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

Convert to GPD	743	GPD
----------------	-----	-----

Total Seepage Loss (AFA)	0.8	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.

Permit 98-7925 – Soils for Pond spreadsheet.



167—Rubson
ashy silt
loam, 8 to
15 percent
slopes

Rubson	85	B	0-2	Slightly decomposed plant material	PT	A-8	0-0-0	0-0-0	100-100-100	100-100-100
			2-3	Moderately decomposed plant material	PT	A-8	0-0-0	0-0-0	100-100-100	100-100-100
			3-5	Ashy silt loam, ashy very fine sandy loam	ML, CL-ML	A-4	0-0-0	0-0-0	100-100-100	100-100-100

		loam, ashy silt loam				100		100			
17-26	Silt loam, very fine sandy loam	CL, ML, CL-ML	A-4, A-6	0-0-0	0-0-0	100- 100- 100	100- 100- 100	94-99- 100- 100	81-86- 100- 93	16-22- -29	2-6
26-32	Silt loam, very fine sandy loam	CL, ML, CL-ML	A-4, A-6	0-0-0	0-0-0	100- 100- 100	100- 100- 100	94-99- 100- 100	81-86- 93- 86	16-22- -29	2-6
32-35	Silt loam, very fine sandy loam	CL, ML, CL-ML	A-4, A-6	0-0-0	0-0-0	100- 100- 100	100- 100- 100	94-99- 100- 100	81-86- 93- 86	16-22- -29	2-6
35-53	Silt loam, very fine sandy loam	CL, ML, CL-ML	A-4, A-6	0-0-0	0-0-0	100- 100- 100	100- 100- 100	93-98- 100- 100	53-58- 65	16-22- -29	2-6
53-58	Silt loam, very fine sandy loam	CL, ML, CL-ML	A-4, A-6	0-0-0	0-0-0	100- 100- 100	100- 100- 100	93-98- 100- 100	53-58- 65	16-22- -29	2-6
58-68	Loamy very fine sand, very fine sandy loam	ML	A-4	0-0-0	0-0-0	100- 100- 100	100- 100- 100	97- 100- 100	60-63- 65	0-16- -19	NP-

MEMORANDUM

TO: Water Right File 98-7925

FROM: Daniel Nelson – Analyst 3

DATE: February 20, 2019

SUBJECT: Telephone Conversation with Scott King

I spoke with Mr. King today concerning the in-house or the potable water supplied to the facility. According to Mr. King, the potable water is supplied by Cabinet Mountain Water District. Mr. King stated that he was shown the supply box for the potable water. Mr. King also stated that this is the water that they are currently using in the cooling units. Mr. King stated earlier that they currently re-use the water in their distilling process in the cooling system and no longer use the water from the pond in the cooling system. The pond is basically used as a fire protection system, since Cabinet Mountain Water District doesn't supply a fire protection water through their system at the facility location. Cabinet Mountain Water District does supply fire protection in the City of Naples and Bonners Ferry, but not in the more remote locations under their service area.

Nelson, Dan

From: Nelson, Dan
Sent: Thursday, February 14, 2019 10:18 AM
To: 'sking@spfwater.com'
Subject: Field Exams Follow-up

Hi Scott,

I am going through my hold files today, and I wanted to make sure I understood everything. Most of this information was discussed in a telephone call, and I don't have a record of some of the conversations. I may have missed something, so please forgive me if I forgot something. I will list them out by file number:

63-33639 – This permit had 2 acres in Lot 4 (SENE) of Section 20, Township 1 South, Ranger 1 West, and 1 acre in Lot 2 (SENE) of Section 29, Township 1 South, Range 1 West that appear to be on Bureau of Land Management (BLM) lands. The question was if we wanted to include these acres or remove them from the file, since they are on land not owned by the permit holder.

98-7925 – This permit we needed to know how much fire protection was needed. I had given you until 2/19/2019 to supply the information, so it isn't late. I just wanted to know how things are going and if I need to a letter.

63-33938 – This is the Thornton file, that needed the measurement devices and reporting. I understood they were going to request an extension of time to supply the measurement information.

I just wanted to make sure I had my ducks in row, and didn't miss any communication from you on any of these. In order to keep things moving, if you could get this information back to me by March 29, 2019, I would really appreciate it.

Thank you

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

MEMORANDUM

TO: Water Right Permit Files 98-7925

FROM: Daniel A. Nelson

DATE: February 5, 2019

SUBJECT: Telephone Conversation with Scott King of SPF Water Engineering.

I spoke with Scott King. SPF Water Engineering, who was the water right examiner that submitted the field reports for water right permit 98-7925. Mr. King and I discussed the need to provide proof of the need for fire protection storage. I informed Mr. King that he would need to provide some information that shows why the fire protection storage is needed. This could include but is not limited to a statement from the fire marshal or the permit holder's insurance company.

Nelson, Dan

From: Scott King <SKing@spfwater.com>
Sent: Wednesday, January 23, 2019 7:42 AM
To: Nelson, Dan
Subject: FW: IDWR letter requesting additional information

Dan,
Here's the information on the condensers for Young Living that you requested. Please review and let me know if this is sufficient.

Thank you,
Scott

From: Brett Packer <bpacker@youngliving.com>
Sent: Monday, January 14, 2019 3:51 PM
To: Scott King <SKing@spfwater.com>
Cc: Linda Jones (LJones@hollandhart.com) <LJones@hollandhart.com>
Subject: Re: IDWR letter requesting additional information

Scott,

The use of the non contact cooling water is for condensing steam that is carrying essential oils in our steam extraction process, which of course you are aware of.

We have three condensers in use. They are 137" long and have a diameter of 30" internally they have 245 1/2 stainless tubes running the entire length of the condensers. The steam is on the inside of the 1/2" tubes with the cooling water of course traveling on the surface area outside of the tubes in the shell.

They are fed by two 45 GPM pumps. Currently we use the bi-product water from our process as our non contact cooling water. The condensers were fabricated in house at our distillery in Mona Utah so they do not have a make/ model or serial number.

We currently run the condensers on an average of 6 days a week 10 hours a day.

"Approximate" operating hours would be a hard one as every day at the distillery is different for a variety of reasons. However we are usual shut down in the Spring for two months due to load limit road closures, and again in August if Fire Hazards are too great to run our logging crew.

I again apologize for my delays in following up, please let me know if you need clarification or additional info.

Thanks,

B.P.

Brett Packer

Farm Manager
Highland Flats Farm
Y.L.E.O. Research Farm
and Distillery

NAPLES IDAHO
Phone: (208)267-0800
bpacker@youngliving.com



From: Scott King <SKing@spfwater.com>
Sent: Wednesday, December 5, 2018 10:21:08 AM
To: Brett Packer
Cc: Linda Jones (LJones@hollandhart.com)
Subject: IDWR letter requesting additional information

Hello Brett,

I hope the season is treating you well.

Attached is a letter from IDWR asking for additional information on the water right permit I did a beneficial use field exam on. Dan would like more information on the cooling use. He and I spoke about it, and what he would like are details on how the water is used for cooling, the cooling equipment (e.g., make, model, number of units, water flow requirements), and number of operating hours and days, etc., to support the amount of water *beneficially used*.

Per our phone call a few minutes ago, the facility used one (or more?) tube and shell condensers. Could you give number, make, dimensions, etc. Also, approximate operating hours and days for the year of most use to calculate an annual volume.

Let me know if you have any questions.

Thanks much,
Scott

Scott N. King, P.E. | Supervising Engineer

SPF Water Engineering, LLC

300 E Mallard Drive, Suite 350 | Boise, ID 83706

phone 208.383.4140 | **fax** 208.383.4156

email sking@spfwater.com | **web** www.spfwater.com

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State of Idaho

DEPARTMENT OF WATER RESOURCES

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C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

November 11, 2018

SPF WATER ENGINEERS
ATTN SCOTT KING
300 E MALLARD DR SUITE 300
BOISE ID 83706

RE: Field exam report for water right permit 98-7925

Dear Mr. King:

I have reviewed the field exam you supplied for water right permits 98-7925. During my review I discovered some issues that need to be clarified concerning the cooling system and the measurement method used.

The Idaho Administrative Code Beneficial Use Examination Rules, IDAPA 37.03.02.035.02.d addresses these issues as follows:

j. For each use of water the examiner shall report an annual diversion volume based on actual beneficial use during the development period for the permit. The method of determining the annual diversion volume shall be shown. The annual diversion volume shall account for seasonal variations in factors affecting water use, including seasonal variations in water availability. For irrigation, the volume shall be based on the field headgate requirements in the map titled Irrigation Field Headgate Requirement appended to these rules (see Appendix A located at the end of this chapter). Annual diversion volumes for heating and cooling uses may be adjusted to account for documented weather conditions during any single heating or cooling season from among the fifty (50) years immediately prior to submitting proof of beneficial use for the permit. For storage uses that include filling the reservoir and periodically replenishing evaporation and seepage losses throughout the year, the annual diversion volume shall be the sum of the amounts used for filling and for replenishment. Volumes may include reasonable conveyance losses actually incurred by the water user. The following water uses are exempt from the volume reporting requirement: (3-29-12)

As you can see from the IDAPA rule shown above, all field exams reports for cooling uses require a volume for that use. Your report did provide a volume calculation, but it did not provide the needed detail to determine the actual amount of water beneficially used for cooling purposes. Instead, the field report provided the amount of water diverted without the information needed to determine the extent of beneficial use.

The Idaho Administrative Code Beneficial Use Examination Rules, IDAPA 37.03.02.035.01.a and b addresses these issues are as follows:

- a. All items of the field report must be completed and must provide sufficient information for the Director to determine the extent of the water right developed in order for the report to be acceptable to the Director.
- b. Permitted uses partially developed by the permit holder shall be described in detail. Permitted uses which were not developed by the permit holder shall be noted. Uses determined to exist which are not authorized by the permit being examined shall also be described in detail.

You didn't supply adequate information to determine if the cooling use is for a building or equipment. You also didn't provide the calculations needed to determine the extent of beneficial use.

If this cooling use is for a building, volumes for cooling uses are usually determined by calculating the amount of water required to operate the closed-loop cooling system, the square footage being heated, the difference in temperature between the inside temperature to outside temperature, and the amount of time the closed-loop system is required to operate to maintain the needed inside temperature for the year. If you don't have access to this information, you may try to contact the cooling unit installer/designer to provide you with the system design information that should include the amount of water required to efficiently operate the cooling system throughout the year. Most cooling systems are designed based on these criteria, and the installer/designer should have reasonable knowledge of the volume of water that is needed to properly cool the building year round. Volumes calculated without taking into account the information above will not be acceptable unless you can provide calculations that reflect current industry standards for designing a cooling system for this specific sized building taking into account local temperature.

If this cooling use is for equipment, then there should also be similar industry standards and requirements for the equipment used. The equipment used should also have a specification sheet that we can use to determine the extent of beneficial use for the number of hours of production.

MEASUREMENTS:

In your field report, you supplied a theoretical calculation, but you did not supply any information which states why an actual measurement could not be made. The IDAPA Beneficial Use Examination Rule 37.03.02.040.04 states the following:

04. Unacceptable Measurements. Theoretical diversion rates or theoretical carrying capacities are not acceptable as a measure of the rate of diversion except as indicated in these rules and for some diversion systems where the flow rate cannot be measured accurately due to the physical characteristics of the diversion and distribution system.
(3-29-12)

I can accept a theoretical measurement if there was no means to actually measure the water. However, we will need to a valid reason for not having a measurement for this system. From the photos, there appears to be adequate pipe length from the intake pipeline to measure the water from the pond, so we will need some reasoning why the pump couldn't be operated during the field examination.

CONCLUSION:

The IDAPA Beneficial Use Examination Rules 37.03.02.035.02.c states the following:

If the Director determines that a field report prepared by a certified water right examiner is acceptable but that additional information is needed to clarify the field report, he will notify the examiner in writing of the information required. If the additional information is not submitted within thirty (30) days or within the time specified in the written notice, the priority date of the permit will be advanced one (1) day for each day the information submittal is late. Failure to submit the required information within one (1) year of the date of the department's request is cause for the Director to take action to cancel the permit.

The Department has determined that this field report needs to be clarified to license this permit. Please supply the information requested in 30 days or the Department will begin to advance the priority date of this permit as described above.

Respectfully,



Daniel Nelson

Staff Hydrologist

Idaho Department of Water Resources

Telephone (208) 287-4856

Fax (208) 287-6700 (attn: Dan Nelson)