

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 65-23304
Exam Date: 07/17/2018

1. Current Owner:
GARDEN VALLEY SCHOOL DISTRICT #71
PO BOX 710
GARDEN VALLEY ID 83622
(208) 462-3756
2. Accompanied by: GARY VAN DYK
Phone No: 208-957-1684
Address: Same
Relationship to Permit Holder: MAINTENANCE DIRECTOR

3. **SOURCE:**
GROUND WATER

TRIBUTARY:

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 65-13834 & 65-23114
2. Other water rights with the same point-of-diversion: 65-13834 & 65-23114

C. DIVERSION AND DELIVERY SYSTEM1. LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER NE¼NE¼ Sec. 27, Twp 09N, Rge 04E, B.M. BOISE County

Method of Determination: ArcMap (aerial photo); GPS – Latitude N.44°05.538', Longitude W.115°57.494

2.

PLACE OF USE: FIRE PROTECTION 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	
09N	04E	26						X											
09N	04E	27	X																

PLACE OF USE: FIRE PROTECTION 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	
09N	04E	27	X																

DIVERSION TO STORAGE same as FIRE PROTECTION STORAGE

Method of Determination: ArcMap (aerial photo); GPS – Latitude N.44°0.9057', Longitude W.115°96.0022

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.

X Indicate weir size/pipe as applicable.X Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater. Aerial Photo Attached (required for irrigation of 10+ acres).X Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
D0009656	Franklin Electric	10	2366218120	Unk	3"
Fire pump	Clarke	140 break	unk, 1700 RPM	Clarke	JU6HUF08
Pond pump	Unk		1760 RPM, 1500 gpm, and 80 PSI	Peerless	6AEF14G

*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
pitot	gauge					

2. Measurements:

Pitot measurements taken on two of seven irrigation stations, both running at same time. See Sprinkler Test

Two irrigation systems with 17 heads. Measured average of 44 PSI on 3 of the 1.56 gpm heads, 48 PSI on remaining 14 heads, 7 at 3 gpm and 7 at 9 gpm, Equal to 89 gpm. + 448.8 = 0.20 cfs

E. FLOW CALCULATIONSX Additional Computation Sheets Attached

Measured Method: Pitot gauge sprinkler test and theoretical

See Sprinkler Test spreadsheet

Theoretical $Q = 8.8 \times 0.7 \times 10/175 + (2.31 \times 70\text{psi}) = 0.20 \text{ cfs} \times 448.8 = 90 \text{ gpm}$

HP = 10 Z = 175' P = 70 PSI.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: N/A

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} =$$

2. Volume Calculations for Other Uses: Fire Retention Storage, Fire Protection from Storage

Fire Retention Storage = surface area of 0.5 ac x 4' d = 2.0 AF (650,500 gallons)

Fire Protection from Storage = 2.0 AF – 1.6 AF dead storage below outlet line = 0.6 AF (180,000 gallons)

G. NARRATIVE/REMARKS/COMMENTS

See License Review Memo – 65-23304 by Mary Condon and Dan Nelson (last updated August 8, 2018)

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
DIVERSION TO STORAGE	01/01 to 12/31	0.20 CFS	
FIRE PROTECTION FROM STORAGE	01/01 to 12/31		0.6 AF
FIRE PROTECTION STORAGE	01/01 to 12/31		2.0 AF
<u>Totals:</u>		0.200 CFS	2.00 AF

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ None

I. AUTHENTICATION

Field Examiner's Name

Date

Reviewer

Date

M. Condon
D. Nelson
Daniel D. Nelson
 August 28, 2018
 8-28-18

FILE NUMBER 65-23304

PHOTOGRAPHER AND DATE OF PHOTOS

DANIEL A NELSON and MARY CONDON 7/20/2018



Diversion to Storage 700', Storage to Fires Suppression 650', Domestic 500'

FILE NUMBER 65-23304

PHOTOGRAPHER AND DATE OF PHOTOS
DANIEL A NELSON and MARY CONDON 7/20/2018



Diversion to Storage 700', Storage to Fires Suppression 650'

65-23304 - System Diagram



Legend

-  Water Right POD
-  Water Right POU
-  Township/Range
-  Sections
-  QQ

The USDA-FSA Aerial Photography Field office asks to be credited in derived products.

MEMORANDUM

TO: Water Right File 65-23304

FROM: Mary Condon and Dan Nelson

DATE: July 17, 2018 Field Exam (August 8, 2018)

SUBJECT: Licensing Review of Water Right 65-23304

Narrative/Purpose:

Garden Valley School District submitted beneficial use completion for diversion to storage at 0.28 cfs for fire sprinklers before the due date in 2014. Current Point of Contact is Maintenance Supervisor, Gary Van Winkle, who was present at the field exam on July 17, 2018, along with maintenance personnel, Terry. Field exam was performed by Dan Nelson and Mary Condon, beginning at 10 am and ending at approximately 11:15 am. Permit is for Domestic, Diversion to Storage, Fire Protection from Storage, and Fire Protection Storage.

History:

Other water rights held by the school district and licensed in 2013, for domestic and irrigation were 65-13834 & 65-23114, with beneficial use exams performed June 2013. Original permits for 65-13834 & 65-23114 had two points of diversion listed, as does this permit when filed in 1999. However, a new well was drilled sometime after 2008 and before 2013 and the other abandoned, and rights 65-13834 & 65-23114 were licensed with only one POD.

Additionally, prior to current location of the school, it was located just east in the NENW of Sec 26, versus the current location split across Sec 27 in the NENE and Sec 26 in the NWNW. The previous location also has water rights 65-11403, 65-11409 & 65-12560 for Domestic and Irrigation, the first two of which were claimed in the SRBA and the third licensed then claimed in the SRBA in 2000. These original school water rights are still in the name of the school, have a partial overlap on the POU, but the POD is not accessible to the school any longer. This will be further discussed in the overlap analysis.

Proof of Beneficial Use, Ownership, and Beneficial Use:

Proof was submitted December of 2013 by Bob Grim as GVSD Superintendent, with only \$50, and the additional \$50 was submitted in January 2014, before the February 2014 due date. Permit holder claimed full beneficial use for domestic and storage pond for fire sprinklers with a total diversion rate of 0.28 cfs. The proof was signed by Bob Grimm as Superintendent for Garden Valley School District.

A review of ArcMap aerial imagery shows the three ponds (two lined) for storage within the NENE of Sec 27, and the school building and NWNW of Sec 26, both in 09N Twp, 04E Rge, Boise County.

Points of Diversion:

Point of Diversion for existing well is described in the NENE of Sec 27, with plans on the application for permit for a future well in the NWNW of Sec 26, both in 09N Twp, 04E Rge, Boise County. Existing well in the NENE is also POD for their other two water rights, 65-13834 and 65-23114 for Irrigation and

Domestic, respectively. The location of the future well was actually the original well site drilled in 1999, then replaced sometime after 2008 and before 2013 as the existing location. There is not a well driller log for the actual existing well location in the well house for NENE of Sec 27. Diversion to Storage is 700 feet away from inlet to pond, and fire pump from pond to school is approximately 650 feet.

Place of Use:

Place of use for all beneficial uses are described in the NENE of Sec 27 and in the NWNW of Sec 26, both in 09N Twp, 04E Rge, Boise County; the pond is in the NENE while the school building is in the NWNW. There are also some concession stands on the south side of the football field in the NENE of Sec 27, evaluated/marked in previous field exams for Domestic. During the field exam for this permit, Maintenance Director Gary Van Dyk stated only two ponds are in use. The first lined pond is domestic wastewater capture, the middle lined pond is the fire retention pond and the third, which is unlined, is just north of the other two and captures overflow from fire retention pond and additional runoff from the fields. The fire retention pond measures approximately 4 feet deep and has a surface area of 0.5 acres.

Diversion Rate:

Total requested diversion rate is 0.28 cfs, as 0.08 for Domestic and 0.20 for Diversion to Storage. The main well has a 6" 10 HP pump, make unknown, and 3" line, but did not have enough length to attach a measuring device for max flow. After some talk with the Maintenance Director, he stated the max capacity he could accomplish would be by turning off the school and diverting full flow through two of the seven irrigation stations. Using a pitot tube, we measured all 17 sprinkler heads around the soccer field and well house and the VFD read 59.8 Hz during measurements. See sprinkler test. Seven of the heads around the soccer field were Rainbird gray #10's, seven around the well house were Rainbird 32SA #3's, and three others around the well house were Nelson MP 2000 360 degree red heads, measuring between 44 and 48 PSI. The pump PSI in the well house was showing approximately 63 PSI. This put the total at just under 90gpm, or 0.20 cfs. Theoretical (see theoretical analysis) accounting for the well depth of approximately 170 feet, well pump diversion of 65 PSI and sprinkler average of 48 PSI also came to around 90 gpm, or 0.20 cfs. Therefore, the additional 0.08 requested on the permit for the domestic cannot be accomplished through the current works, and has been removed.

Additionally, the Diversion to Storage will be reduced from the requested 0.28 cfs to only 0.20 cfs, with a condition on the license for max diversion when combined with irrigation water right 65-13834, they are limited to the 0.28 cfs as it is licensed. Pond motors and pumps for fire suppression were an unknown 140 Break HP, 1700 RPM motor and Clarke Pump, Model JU6HUF08, and an unknown motor with rated 1760 RPM and 80 PSI, 1500 gpm, Peerless Pump with horizontal split casing, serial No. 6AEF14G.

Diversion Volume:

The permit requested 2.0 AF for Fire Protection Storage and 0.6 AF Fire Protection from Storage. Using the pond calculation spreadsheet, with the surface area of 0.5 acres and average depth of 4 feet, 2.0 AF is reasonable for storage. However, they did not account for evaporation or additional fillings, which would have needed an additional 1.5 AF. The pond is lined, so seepage is not a factor. See Pond Analysis Calculation Spreadsheets. Additionally, the 0.6 AF Fire Protection from Storage is to account for the limited volume the system can actually pull from the pond. The pipe sits more than 2 feet above the bottom of the pond, therefore leaving approximately 1.4 AF of dead storage. The system was designed to only pull the 0.6 AF of Storage available for fire protection. Both the Fire Protection Storage of 2.0 AF and the Fire Protection from Storage of 0.6 AF can be approved for the license.

We may have been able to include additional volume if needed for the domestic use with this permit. However, the water right 65-23314 authorizes a total of 30.5 af of water for domestic use. The "Non-

Irrigation Water Requirements" sheet in the Field Examiner's Handbook authorizes a maximum of 25 gallons per day per student for a school. 30.5 af would allow water for approximately 1,089 students and teachers ($\{[30.5 \times 325850]/365 \text{ days}\} / 25 \text{ gpd/student} = 1,089 \text{ students and teachers}$). According to Mr. Van Winkle and Terry, the schools has under 300 students and teachers. Therefore, the District did not develop any additional domestic use under this permit.

Overlap:

Place of Use overlap in the NWNW of Sec 26, T09N, R04E with water rights 65-11403, 65-11409 and 65-12560, for domestic and irrigation are in the name of the school district; however, the school does not have access to half the place of use and the Point of Diversion in the NENW of Sec 26, anymore. These likely need a change of ownership to new land owners, as these rights were not looked at or considered for combined limits during licensing for 65-13834 and 65-23114 either. Gary and Terry during the recent field exam stated there is only the one well in NENE of Sec 27 well house used for domestic and irrigation, and diversion to storage.

Overlap with water rights 65-13834 for irrigation and 65-23114 for domestic in the name of the school district share the well in the NENE of Sec 27, T09N, R04E. It seems the new well was drilled sometime between 2008 and 2013 and well house installed, only one Point of Diversion exists. Water rights 65-13834 and 65-23114 are therefore the only overlapping water rights on the POD and POU.

Water right 65-13834 has a diversion rate of 0.28 cfs and annual volume of 26.3 af. Water right 65-23114 has a total diversion rate of 0.20 cfs and 30.5 af. I am recommending this permit for 0.20 cfs and 2.0 af. The measured capacity of the well was 0.20 cfs. Unfortunately, field exams performed on the existing water rights calculated the diversion rate based on a theoretical calculation that did not match the actual measurement performed on this permit. Also, the previous water rights did not have a combined limitation condition that limited the amount of water being diverted put of this single well. There should have been a combined diversion rate on the existing licenses, but we cannot change or alter those licenses in this process. However, we can prevent this trend from continuing by adding a condition that limits the diversion rate when rights 65-23304, 65-11409, and 65-12560 to 0.48 cfs when combined. When the volumes are all added to together, they are less that the total capacity of the well ($[26.3 + 30.5 + 2 = 58.8 \text{ af}] < [0.20 \text{ cfs} \times 1.9835 \times 365 \text{ days} = 144.8 \text{ af}]$). Therefore we do not need to include the volume limitation in the combined limitation condition.

Conditions:

01M 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.

F06 The following rights are diverted through point(s) of diversion described above: 65-23114 and 65-13834. POD located in Sec 27 T9N R4E NENE.

Fire protection storage is lined pond not to exceed 2 af capacity. 1.4 af allowance for ice/evaporation.

077 Water shall not be diverted for fire protection use under this right except to fight or repel an existing fire.

ADD condition X35 Rights 65-23304, 65-13834 & 65-23114 when combined shall not exceed a total diversion rate of 0.48 cfs.

(Replace with 103 at licensing) 121 The Director retains jurisdiction to require the right holder to provide purchased or leased natural flow or stored water to offset depletion of Lower Snake River flows if needed for salmon migration purposes. The amount of water required to be released into the Snake River or a tributary, if needed for this purpose, will be determined by the Director based upon the reduction in flow caused by the use of water pursuant to this permit.

103 When ordered by the Director, the right holder shall provide mitigation acceptable to the Director to offset depletion of lower Snake River flows needed for migrating anadromous fish. The amount of water required for mitigation, which is to be released into the Snake River or a tributary for this purpose, will be determined by the Director based upon the reduction in flow caused by the use of water pursuant to this right. Any order of the Director issued in accordance with this paragraph shall be in conformance with applicable rules allowing the right holder due process as the need for mitigation and the amount of mitigation are determined.

Remove:

WB5 Domestic use is for inside school buildings and does not include lawn, garden, landscape, or other types of irrigation. (REMOVE, no domestic use on licensing)

106 Prior to the diversion and use of water under this approval, the right holder shall comply with applicable water quality permitting requirements administered by the Department of Environmental Quality or the Department of Agriculture. REMOVE at licensing

26A Project construction shall commence within one year from the date of permit issuance and shall proceed diligently to completion unless it can be shown to the satisfaction of the Director of the Department of Water Resources that delays were due to circumstances over which the permit holder had no control. REMOVE at licensing

004 This right does not grant any right-of-way or easement across the land of another. REMOVE at licensing, POD and POU owned by school district

046 Right holder shall comply with the drilling permit requirements of Section 42-235, Idaho Code and applicable Well Construction Rules of the Department. REMOVE at licensing

Garden Valley School District
Water Permit 65-23304 Review

POD	Process	Basis	Status	RightID	Priority Date	Source List	Water Use List	Current Owns Other Owner	Application ID	Approval Date	Diversion Rat	Total Acres	Acres Limit	Volume	Water District
65-23304	Water Permit	Permit	Active	623128	6/11/2008	GROUND V DIVERSION TO STORAGE	GROUND V DIVERSION TO STORAGE	GARDEN VALLEY SCHOOL DISTRICT #71	2/6/2009	0.200	0.200				
65-23304	Water Permit	Permit	Active	623128	6/11/2008	GROUND V DOMESTIC	GROUND V DOMESTIC	GARDEN VALLEY SCHOOL DISTRICT #71	2/6/2009	0.089	0.089				
65-23304	Water Permit	Permit	Active	623128	6/11/2008	GROUND V FIRE PROTECTION FROM ST	GROUND V FIRE PROTECTION FROM ST	GARDEN VALLEY SCHOOL DISTRICT #71	2/6/2009					0.6	
65-23304	Water Permit	Permit	Active	623128	6/11/2008	GROUND V FIRE PROTECTION STORAGE	GROUND V FIRE PROTECTION STORAGE	GARDEN VALLEY SCHOOL DISTRICT #71	2/6/2009					2.0	
65-13834	Water Right	License	Active	667913	1/26/1999	GROUND V IRRIGATION	GROUND V IRRIGATION	GARDEN VALLEY SCHOOL DISTRICT #71		0.280		7.5		26.3	
65-23114	Water Right	License	Active	667852	12/13/2006	GROUND V DOMESTIC	GROUND V DOMESTIC	GARDEN VALLEY SCHOOL DISTRICT #71		0.200				30.5	
These water right diversions are no longer accessible to the school															
65-11025	? Overlapping POU														
65-11403	Water Right	Decreed	Active	218727	4/1/1936	SPRING DOMESTIC	SPRING DOMESTIC	GARDEN VALLEY SCHOOL DISTRICT #71		0.010				0.2	65 - Payette River and Tributaries
65-11409	Water Right	Decreed	Active	217429	11/23/1964	GROUND V DOMESTIC	GROUND V DOMESTIC	GARDEN VALLEY SCHOOL DISTRICT #71		0.020				0.4	65 - Payette River and Tributaries
65-12560	Water Right	Decreed	Active	423808	9/29/1982	GROUND V DOMESTIC, IRRIGATION	GROUND V DOMESTIC, IRRIGATION	GARDEN VALLEY SCHOOL DISTRICT #71		0.050		2.0		10.0	
Conditions															
65-11403	Water Right	Decreed	Active	218727	4/1/1936	SPRING DOMESTIC	SPRING DOMESTIC	GARDEN VALLEY SCHOOL DISTRICT #71		0.010				0.2	65 - Payette River and Tributaries
65-12560	Water Right	Decreed	Active	423808	9/29/1982	GROUND V DOMESTIC, IRRIGATION	GROUND V DOMESTIC, IRRIGATION	GARDEN VALLEY SCHOOL DISTRICT #71		0.050		2.0		10.0	
											irrigation				
											0.03				

Permit Number - 65-23304

Tested By - Dan Nelson & Mary Condon

Date - July 17, 2018

Sprinkler	PSI	Rated Flow in gpm	
1	44	1.56	Nelson MP2000 360 Red
2	44	1.56	
3	44	1.56	
4	44	3	Rainbird 32SA #3
5	44	3	
6	46	3	
7	46	3	
8	46	3	
9	44	3	
10	44	3	
11	46	9	Rainbird falcon 6504 #10
12	48	9	
13	48	9	
14	48	9	
15	46	9	
16	48	9	
17	48	9	
Total		88.68	

GROUNDWATER THEORETICAL ANALYSIS

FILE: 65-23304

DATE: 7-17-18

BY: JAN MARY

THEORETICAL RATE OF FLOW: $Q = \frac{(8.8 \times \text{HP}) \times (\text{EFF.})}{\text{TDH}}$

Q = CFS

HP = Total Brake Horsepower of pumping plant (including booster)

Eff. = Pumping plant efficiency (assume 70% or 0.70)

TDH = Total dynamic head = [(LIFT) + (PSI X 2.31)]

LIFT = Depth to water in FEET from land surface to pumping water level

PSI = Pumping pressure measured in PSI near pump (if open discharge assume [0])

$$Q = \frac{(8.8) \times (10 \text{ Hp.}) \times (0.70) = 61.6}{[(170) + (65 \times 2.31)] = 320.15} = 0.19 \times 448.8 = 85.27$$

LIFT FROM:

Measurement ()

Owner ()

Area estimate (X)

Well Logs ()

Booster (Y) (N)

PSI FROM:

Measurement ()

Owner ()

Estimate ()

Owner Gage (X)

NOTES ON PUMP:

Motor Make, Serial or ID

Pump Make, Serial or ID, rating

REMARKS: we measured 89 gpm, so
The measurement seems reasonable

Total Storage Calculations

FILE NUMBER	65-23304
REVIEWER	Mary Condon
DATE	8/16/2018

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.)	0.5	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	4	"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	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)	1.5	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	3.5	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.

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	65-23304
REVIEWER	Mary Condon
DATE	8/16/2018

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	0.31	31	9.61
Feb	0.86	28	24.08
March	1.68	31	52.08
April	2.73	30	81.90
May	3.90	31	120.90
June	4.78	30	143.40
July	5.56	31	172.36
August	4.92	31	152.52
September	3.23	30	96.90
October	1.74	31	53.94
November	0.57	30	17.10
December	0.20	31	6.20

Total mm/year = 930.99

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.

$$[(930.99 \text{ mm/yr}) \div (\text{convert to feet})] \times (\text{Surface area of pond, in acres}) = \text{Evaporation Loss in Acre Feet}$$

(930.99 ÷ 304.8) X 0.50 = 1.5 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	65-23304
REVIEWER	Mary Condon
DATE	8/16/2018

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	0.5	AC.
-------------------------	-----	-----

Pond Surface Area (SQ. FT.)	21780	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	GP	
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
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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.

FILE NUMBER 65-23304

PHOTOGRAPHER AND DATE OF PHOTOS
DANIEL A NELSON and MARY CONDON 7/20/2018



View of the Fire Protection Storage looking south, arrow at left is the inlet control and line into the pond. Deck and walkway are over inlet for Fire Suppression House. Outlet overflow is to the west.

Below is inside the Fire Suppression House, and pump



FILE NUMBER 65-23304

PHOTOGRAPHER AND DATE OF PHOTOS
DANIEL A NELSON and MARY CONDON 7/20/2018



Above, fire pump inside the Fire Suppression House.

Below is main pump from well for diversion for domestic, irrigation and to storage for fire suppression



Condon, Mary

From: Gary VanDyk <gvandyk@gvdsd.net>
Sent: Wednesday, July 11, 2018 8:46 AM
To: Condon, Mary
Subject: Re: FW: Field Exam for Permit 65-23304

Thanks Mary, I have it on the sched. Hope we can make it happen this time.

On Tue, Jul 10, 2018 at 2:50 PM, Condon, Mary <Mary.Condon@idwr.idaho.gov> wrote:

Gary,

Per our conversation today, we have rescheduled the field exam for Tuesday, July 17th at 10:00am, and we will meet you in the parking lot near the well in the NW corner.

Here is the original string of emails with the requirements to be met while we are there.

Best,

Mary

Mary Condon

Water Supply Bank Specialist

Planning & Projects Bureau

Idaho Department of Water Resources

Main: (208) 287-4936

Fax: (208) 287-6700

From: Gary VanDyk [mailto:gvandyk@gvdsd.net]
Sent: Thursday, June 21, 2018 6:21 AM

To: Condon, Mary <Mary.Condon@idwr.idaho.gov>
Subject: Re: Field Exam for Permit 65-23304

1-208-957-1684

Thanks!

On Wed, Jun 20, 2018 at 2:01 PM, Condon, Mary <Mary.Condon@idwr.idaho.gov> wrote:

Gary,

It could take up to 2 hours, but if everything is accessible and working it could take as little time as an hour. I will be joined by Dan Nelson to perform the exam.

Again, measurements must be done while we are there so please be sure we have the pipe accessible for us to measure and the pump can divert to max.

A contact phone number for you would be greatly appreciated. We will see you on June 29th at 10am, in the school parking lot closest to the well.

Thank you,

Mary

From: Gary VanDyk [mailto:gvandyk@gvdsd.net]
Sent: Wednesday, June 20, 2018 1:16 PM

To: Condon, Mary <Mary.Condon@idwr.idaho.gov>
Subject: Re: Field Exam for Permit 65-23304

I will put you on my schedule, about how long does that field exam take?

On Wed, Jun 20, 2018 at 9:49 AM, Condon, Mary <Mary.Condon@idwr.idaho.gov> wrote:

Hi Gary,

We would like to come out at 10:00 on Friday, June 29th.

Mary

From: Gary VanDyk [mailto:gvandyk@gvdsd.net]
Sent: Wednesday, June 20, 2018 8:40 AM
To: Condon, Mary <Mary.Condon@idwr.idaho.gov>
Subject: Re: Field Exam for Permit 65-23304

Hi Mary

When would you like to come out to perform this? I am here almost every day during the summer.

Thanks.

On Tue, Jun 19, 2018 at 3:50 PM, Condon, Mary <Mary.Condon@idwr.idaho.gov> wrote:

Good afternoon,

We are attempting to schedule a beneficial field exam within the next several weeks for domestic, fire protection and storage under permit 65-23304. In order to perform the exam, we will need to measure the flow from the well pump operating on max/full diversion. The pipe from the pump on which we will measure must be accessible and have straight length equal to or greater than three times the diameter of the pipe.

Please contact us as soon as possible to schedule this field exam. My direct line is 208-287-4936.

Best,

Mary Condon

Water Supply Bank Specialist

Planning & Projects Bureau

Idaho Department of Water Resources

Main: (208) 287-4936

Fax: (208) 287-6700

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Gary VanDyk

Maintenance Director

Garden Valley School District.

1-208-462-3756 ext 1017

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Gary VanDyk

Maintenance Director

Garden Valley School District.