

MEMORANDUM

TO: Water Right Files 65-13640, 65-13704, 65-13751, and 65-22911

FROM: Daniel Nelson – Staff Hydrologist

DATE: August 10, 2017

SUBJECT: Licensing Review of Above Rights

The field exams for these rights were performed by Terry Scanlan of SPF Water Engineers. These rights provide water for two ponds and golf course irrigation. The two ponds described in these water rights are known as Annie Pond and Whitetail Pond. The water for these ponds and irrigation use comes from two wells (Well # 2 and Well # 7), and Payette Lake water. All of these rights are so intertwined that I felt a single memo describing the entire system and how each water right relates to the system, would provide a clearer picture of the system as a whole than to try and write a separate memo for each right.

History:

These water rights have a rather long and convoluted history, so I feel it is important to include that history with the water right review to provide the background to understand what transpired to begin the licensing of these water rights.

The original owner of this property was M Resorts LTD. This property appears to have originally been a large ranch or several ranches that were purchased around the same time to create a golf course and other amenities. The properties had several domestic wells and what appears to have been some instream stockwater uses.

In 1992, M Resorts constructed a pond known as Betsy's Pond on an unnamed stream. In 1993, M Resorts filed permit 65-13452, to create a wildlife, aesthetic, and stockwater pond to cover the water use in Betsy's Pond. The permit was protested, but it was later approved with conditions requiring monitoring of the unnamed stream. In 1995, permit 65-13452 lapsed. In 1996, a complaint was filed claiming that M Resorts was still diverting the unnamed stream water, and had constructed several wells without a water right to divert into Betsy's Pond. Department staff visited the site and found that there were 7 existing wells and some of those well may have been diverted into Betsy's Pond during a test pumping exercise. However, Department staff also discovered that a channel had been constructed around Betsy's Pond, to ensure none of the unnamed stream water entered the pond.

The result of the complaint review was that M Resorts filed several applications and had six permits approved to cover the water use from the wells, and provide water for 3 ponds named Betsy's Pond, Whitetail Pond, Annie Pond, and Lake Douglas. Lake Douglas had two decreed water rights from an unnamed stream to the pond. The permit for Lake Douglas was from one of the 7 wells that was decreed for a domestic use for a RV Park that no longer exists. The Douglas Lake permit was not tied into the system that provided water to Annie Pond, Whitetail Pond or the golf course.

SPF Water Engineers performed the field exams on all of these permits except for permit 65-13470 for the ground water use in Lake Douglas, which was done by Department staff. Water right 65-13704 was split into water rights 65-13704 and 65-23452, since Betsy Lake was on its own system and no longer tied into the system supplying water to Whitetail Pond and the irrigation system. The field exams were done in 2010, and two of the permits have been licensed. This leaves 5 permits to be licensed for this permit holder. With the information supplied for these permits, it appears as though we can move forward with licensing these permits.

Overlap:

There are no direct overlapping water rights for the point of diversion from Payette Lake described in water right 65-13640. However, there are three decreed water rights for the City of McCall that appear to be very near the point of diversion for this permit. The City of McCall rights are 65-10344, 65-10345, and 65-12607. You can see in the 2013 aerial imagery that there is a channel in the lake that leads out to the deepest part of the lake. I am assuming that the City of McCall and this permit are using that same channel according to the map supplied by Mr. Scanlan in his May 31, 2017 email.

Permits 65-13704, 65-13751, and 65-22911 all divert out the same two wells known as Well # 2 and Well # 7. Water right 65-13704 originally diverted from Well # 1, Well # 2, and Well # 7, and supplied water to Betsy Pond and Whitetail Pond. However, the system was changed and only Well # 1 now supplies water to Betsy Pond. Water right 65-23452 has been licensed for the water use from Well #1 to Betsy Pond, but water right 65-13704 still needs to be licensed for its share of the water use.

There are several other domestic and stockwater rights in the area, but they do not appear to be a direct overlap. Please review the overlap memo for a more comprehensive overlap analysis.

Points of Diversion:

The permit allowed for diversion to storage, irrigation, irrigation storage, irrigation from storage, recreation, and recreation storage. Mr. Scanlan provided field exams for each water right and provided a very good understanding of what has happened.

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Permit 65-13640 allocates water from Payette Lake to be diverted from the lake in Government Lot 2 (SENW) in Section 8, Township 18 North, Range 3 East. Permits 65-13704, 65-13751, and 65-22911 allocate water to be diverted from two wells are located in the in the SENE quarter of Section 12, Township 18 North, Range 3 East. Mr. Scanlan confirmed these points of diversion in his field exams, and I confirmed the locations with the information available to the Department.

Points of Injection and Points of Rediversion:

Permits 65-13704, 65-13751, and 65-22911 divert water from Well #2 and Well #7. These permits state that water is piped to Annie Pond and then delivered by open channel to Whitetail Pond. During the Licensing review it was discovered that a section of Williams Creek is used to convey the water from Annie Pond to Whitetail Pond. Therefore, an amendment is needed to include a point of injection into Williams Creek and point of Re-diversion from Williams Creek. Mr. Scanlan has been contacted to install head gates and measurement devices on Williams Creek at the point of injection and point of rediversion. They are also going to install a measurement device on an unnamed stream that is being intercepted by the channel from Williams Creek to Whitetail Pond. Mr. Scanlan is currently working with the permit holder to file a new application for permit to seek water from Williams Creek and the unnamed stream to account for any water used from those sources.

Water Uses:

Permits 65-13640 and 65-13704 were approved with a recreation use on the permit. Mr. Scanlan did not include a recreation use recommendation for either of these water rights. A recreation use allows the permit holder the ability to run water through a pond to maintain water quality. There does appear to be an overflow pipe/ditch coming out of Whitetail Pond, but it isn't doesn't appear as though there is a constant flow of water flowing out of Whitetail Pond. Therefore, there doesn't appear any recreation use or flow through Whitetail Pond. Since water right 65-13640 only diverts into Whitetail Pond, no recreational use can be recommended for 65-13640.

However, there is a channel that flows directly between Annie Pond and Whitetail Pond. This channel is used to transport water from the wells to the Whitetail Pond. Therefore, I am going to recommend a recreational use based on the flow out of the wells for recreational use. Water right 65-13704 is the only permit that included the recreational component, so it will be the only right that can have a recreational use allocated to it in the licensing process.

Permit 65-13751 allocated 65 af of stockwater storage, wildlife storage, recreation storage, and aesthetic storage to be used in both Annie Pond and Whitetail Pond. Mr. Scanlan did not recommend the stockwater storage portion of this permit. This seems reasonable, since the two ponds are part of golf course, and it would highly unlikely that livestock would be allowed to be anywhere near the ponds.

The remaining uses for all of these water rights were recommended and can be licensed. It should be noted that there are no conditions limiting the volume diverted to the ponds for storage purposes. This seems reasonable, since it doesn't appear as though the evaporation and seepage losses were considered in the permitting of the storage uses. Both ponds are lined, so the only additional storage that needs to be addressed includes the evaporation losses. There should be adequate storage allowed to cover the capacity of the two ponds and evaporation losses from the two ponds.

Place of Use:

Permits 65-13640 and 65-13704 allocated water for the same 200 acres. Mr. Scanlan found 147 acres irrigated within the golf course. I tried to recreate the irrigation borders shown on the maps in Mr. Scanlan's field report, and I came up with over 150 acre place of use. Therefore, I created another map removing all of the sand traps, sidewalks, cart lanes, buildings, ponds and areas that did not appear to be irrigated, and I came up with 147.8 acres. I feel Mr. Scanlan's acre calculations are correct.

Mr. Scanlan provided rough borders of the ponds, and submitted pond surface areas in Attachment C of his field report that didn't quite match. The shape file I created for each pond was within 0.1 acres of the surface created by Mr. Scanlan, so I believe we are within a rounding error of less than a tenth of an acre on the ponds.

All of the permits had a recreation use, but Mr. Scanlan did not address the recreation use. However, the ground water permits 65-13704, 65-13751, and 65-22911 all need to flow through Annie Pond through a ditch to Whitetail Pond. I feel we should count this as recreational use for the ground water rights.

Mr. Scanlan also didn't address the recreational use for 65-13640 from Payette Lake. There is no conclusive evidence that there is water flowing through Whitetail Pond, so I am not going to include the recreational use for this permit. I was going to see if we could convert some of the recreational use to cover the evaporation losses from Whitetail Pond, but the diversion volumes records from the Water District, don't show adequate water to cover both the irrigation use and the storage use.

Diversion Rate:

Permit 65-13640 allows a diversion rate of 4.00 cfs for irrigation and diversion to storage. Mr. Scanlan provided a theoretical calculation showing a diversion rate of 1.22 cfs, which was based on a theoretical analysis. Per a request from the Department, Mr. Scanlan read the permit holder's installed flow meter, and reported a diversion rate of 1.26 cfs. Both of these rates appear fairly close, but a review of the Water District records shows that the permit holder diverted 1.60 cfs in mid-July of 2001. The Water District measurement was done during the development period. Mr. Scanlan's measurements were done several years later, and used an average diversion rate based on the volume diverted in 2008. There were several pump records submitted with the field exam, but all of those appear to be associated with the irrigation pumping station at Whitetail Pond. Since the only actual measurements made during the development period were the measurements taken by the Water District, I am recommending the diversion rate of 65-13640 be limited to 1.60 cfs.

The diversion rates for permits 65-13704 (0.25 cfs), 65-13751 (1.50 cfs), and 65-22911 (1.00 cfs) were calculated by Mr. Scanlan at a rate of 0.76 cfs. However, Mr. Scanlan recorded a diversion rate of 0.38 cfs for each well. The field report states the pump in Well #2 is a 10 Hp pump, and the pump in Well # 7 is a 15 Hp pump. Mr. Scanlan read the flow meter installed on Well # 7, and read a diversion rate of 170 gpm or 0.38 cfs. Mr. Scanlan did a theoretical analysis on Well # 2, and calculated the exact same diversion rate of 0.38 cfs. With the different size well pumps in the two wells, I was concerned that the theoretical calculation was incorrect.

I checked the well driller reports on the two wells, and discovered that the two well driller reports did not actually provide a drawdown or pumping water level. Originally, I thought the pumping water levels were included on the well driller reports, but upon further review of the information, it appears as the pumping levels on the well driller reports was actually the location of the pump used for the test. I performed a theoretical analysis on the two wells using the same pressure and the pumping levels I thought were described on the well driller's reports and found that Well # 7 should be able to produce 0.38 cfs, but Well # 2 should only be able to produce 0.30 cfs. I sent the theoretical calculation to Mr. Scanlan and asked for an explanation why the diversion rate for Well # 2 varied so much from the theoretical analysis to the field report recommendation.

Mr. Scanlan sent an email on August 11, 2017 with some additional information including a pump test that was performed on Well # 2. The date of the pump test is unknown. The information from the tests didn't appear to be conclusive evidence of the pumping water levels, so I called Mr. Scanlan on August 14, 2017 for further explanation of what he had done. He stated that he took the average drawdown of the test between 1:20 when the pump was turned up to 150 gpm (74 ft 4 in) to the end of the test at 5:27 (130 ft 10 in) when the well was pumping 220 gpm. Mr. Scanlan felt that the 100 ft average reasonable.

I am concerned that the drawdown was still falling at the end of the test, and the pumping water level never did stabilize throughout the entire test. In Mr. Scanlan's water monitoring report for 2012 required by the permit, he did list a water level of 102.52 in Well # 2, but it should be noted that the report stated that the well was not being pumped at the time of the test, and no water flow had been recorded on the flow meter. I took the information provided by Mr. Scanlan to a Department well drilling specialist, Chad Hersley, and pump testing specialist, Allan Wylie, and they both stated that since the pump test wasn't continued until the pumping water level stabilized, they couldn't determine the actual drawdown from the information provided. However, I do agree with Mr. Scanlan that the pumping water level would be around 100 feet or less for at least 2 to 2 1/2 hours after the well is turned on. The increases in the flow rates during the test does have some bearing on drawdown, so I cannot tell where the water levels would stabilize at a constant flow rate of 170 gpm over a period of more than 2 or 3 hours.

Mr. Scanlan also informed me that Well #7 was measured at 165.5 feet water level with 27 psi at 170 gpm. When plugging in those numbers into the spreadsheet, the efficiency of the well pump would be 65.5 % instead of the standard of 70 %. Since both wells are the same age and the same brand, I used the same efficiency for both pumps. Using the 2012 report water level and the corrected efficiency factor, I calculated a flow rate of 0.35 cfs.

Therefore, I am recommending a combined system capacity for Well #2 and Well #7 of 0.73 cfs instead of the flow rate of 0.76 cfs calculated by Mr. Scanlan. I feel this flow rate is more than generous. To achieve a better flow rate, a measurement would be needed for Well # 2. I have informed Mr. Scanlan, that I was going to make this recommendation. Mr. Scanlan's 2012 report suggests that the well hasn't been run since September of 2006, so there is a possibility that the well is no longer operable. Therefore, a measurement may not be possible without significant work on the well pump and possibly the flow meter. If they have to rebuild the well pump, the measurement may not reflect what was actually diverted prior to proof being submitted for these water rights. At this time, I feel we have no choice but to recommend the 0.73 cfs as the system capacity for these wells. I recommend the following diversion rates for the water rights diverted from these wells:

65-13704 –	Irrigation = 0.73 cfs
	Recreation* = 0.73 cfs
	Diversion to Storage = 0.73 cfs
	Total = 0.73 cfs
65-13751 –	Diversion to Storage = 0.73 cfs
	Total = 0.73 cfs
65-22911 –	Diversion to Storage = 0.73 cfs
	Total = 0.73 cfs

When water rights 65-13704, 65-13751, and 65-22911 are combined they should be limited to a combined diversion rate of 0.73 cfs.

* Please see water usage section of this memo that addresses the recreation use for water right 65-13704.

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Diversion Volume:

These permits allocated various combinations of volumes and types of storage for the two ponds. Permit 65-13640 allocated 80 af of storage for irrigation storage, irrigation from storage, and recreation storage for Whitetail Pond only. Permit 65-13704 allocated 14.4 af of storage for irrigation storage, irrigation from storage, and recreation storage for Annie Pond. Permit 65-13704 also allowed for additional volume to be diverted for irrigation and recreational use (please see the water usage section of this memo). Permit 65-13751 allocated 65 af for stockwater storage, wildlife storage, recreations storage, and aesthetic storage for Annie Pond and Whitetail Pond. The stockwater storage was not recommended by Mr. Scanlan. Please see the water usage portion of this memo for additional information on the stockwater storage for permit 65-13751. Permit 65-22911 allocated storage for fire protection, wildlife storage, recreation storage, aesthetic storage and aesthetic from storage for Annie Pond and Whitetail Pond.

Mr. Scanlan's water monitoring report for 2012 provides the volume of water diverted from the two wells since the permits were issued and the Basin 65 Water District records provides volume records during the development period for water right 65-13640. I have supplied a spreadsheet analyzing the measurement records for the two wells, and found that 14.4 af was pumped in 2001 and an average of 89.7 af was pumped per year from 2006 to 2008. Therefore, I cannot recommend more than 14.4 af of water for water right 65-13704 and 65-13751 when those two rights are combined since proof of beneficial use was filed on both of those rights in 2001. Proof of beneficial use was filed in 2010 for water right 65-22911, so I can recommend 60 af for water right 65-22911. When water rights 65-13704, 65-13751, and 65-22911 are combined I can only recommend a maximum of 74.4 af. According to Mr. Scanlan's report neither well was used from 2008 to 2010.

For Permit 65-13640, it appears as though they only use between 246 af to 371.5 af for irrigation from Payette Lake. This would be about 1.7 to 2.5 acre feet per acre. Records supplied in the field exam show 197 acre feet in 2008, 234 acre feet in 2009, and 142 acre feet partially through the 2010 season. However, proof was submitted in 2001, so these volumes don't describe the use during the development period. The volumes found in the water deliver records during the development period show a diversion volume of 246 af in 1996 and 292 af in 2001. All of these volumes seem reasonable based on standard irrigation practices. The headgate requirement is 3 acre feet per acre or 441 af. The evapotranspiration for lawn turf for the McCall station says that need approximately 228 af of consumptive use or approximately 1.55 af per acre. With these volumes, it doesn't appear as though any water was diverted to Whitetail Pond recreational use.

IDAPA Rule 37.03.02.035.01.j.viii requires that water diverted for irrigation use from a lake must have a volume limitation, so it would appear as though the maximum volume of 292 af is the maximum volume that can be recommended for water right 65-13640. However, the Department doesn't penalize water users for using their water efficiently for irrigation. Therefore, we can allow the full 441 af of for irrigation use.

I created pond spreadsheets for both Annie Pond and Whitetail Pond. Mr. Scanlan confirmed that both ponds are lined, so there should be no seepage losses from the ponds. I determined that capacity of Annie Pond is 27.6 af and the evaporation losses are 4.1 af for a total storage requirement of 31.7 af is needed to maintain Annie Pond. I also determined that capacity of Whitetail Pond is 90.6 af and the evaporation losses are 10.4 af for a total storage requirement of 101 af is needed to maintain Whitetail Pond. With both ponds that combined storage required is 118.2 af capacity and 14.5 af for 132.7 af.

With the volume limitations, it makes it difficult to provide adequate uses for all of the water rights. The following is how I determined what we can recommend for licensing:

Permit 65-13640 – Irrigation = No Volume Required – Surface Water
Irrigation Storage = 80 af
Irrigation From Storage = 80 af
Recreation Storage = 80 af
Total Volume = 441 af

Permit 65-13704 – Irrigation = No Volume Required – Supplemental Use
Irrigation Storage = 14.4 af
Irrigation From Storage = 14.4 af
Recreation Storage = 14.4 af
Recreation = 14.4 af
Total Volume = 14.4 af

Permit 65-13751* – Wildlife Storage = 14.4 af
Aesthetic Storage = 14.4 af
Total Volume = 14.4 af

*Please note: Mr. Scanlan's 2012 report shows that only 14.4 af was diverted from the wells prior to 2001 when proof of beneficial use was filed for water rights 65-13704 and 65-13751. Therefore, we can only allocate water uses for permit 65-13751 that were not included on permit 65-13704, since 65-13704 has the earlier priority date.

When water rights 65-13704 and 65-13751 are combined, they are limited to combined diversion volume of 14.4 af.

Permit 65-22911** - Fire Protection Storage = 60 af
Wildlife Storage = 60 af
Recreation Storage = 60 af
Aesthetic Storage = 60 af
Aesthetic from Storage = 60 af

** Annie Pond only requires 31.7 af of storage, but we can allow multiple fills to provide the aesthetic from storage that supplies water to Whitetail Pond. Whitetail Pond will be included in the storage and from storage places of use.

When water rights 65-13704, 65-13751, and 65-22911 are combined they are limited to a total annual volume of 74.4 af.

When water rights 65-13640, 65-13704, 65-13751, 65-22911 are combined, the total combined storage allowed is limited to 154.4 af (80 af + 14.4 af + 60 af = 154.4 af). A volume of 154.4 is 21.7 af over the amount allowed for storage of 132.7 af. There is 14.4 af allowed for irrigation only use available from 65-13640, and a majority of the water from 65-13640 would be needed for irrigation of the golf course also. Therefore, I feel we can allow the full storage volume and the full diversion volume diverted from the wells as long we have a condition that limits the total volume used for storage.

Conditions:

Permit 65-13640: (No Amendment is needed for this permit)

Condition 1 (01J) should be changed to condition R43. Condition 3 should be split into two separate conditions and carried forward to licensing. Condition 2 (26A) should be removed at licensing. Condition 3 (020) should be updated to current condition with the same code number. Conditions 5 (028) and 6 (07A) should be removed at licensing as is standard. Condition 7 (005) should be changed to condition R05 for including Water District 65. Condition 8 (047) should be carried forward to licensing. Condition 9 (03A) should be replaced with condition R62. Condition 259 should be added and altered to read as follows:

Rights 65-13604, 65-13704, 65-13751, and 65-22911 authorize the storage of an annual total of 133, 118 acre-feet to be used for the initial filling or carryover storage of the ponds, 15 acre-feet for the replacement of losses due to seepage and evaporation for the 2 ponds known locally as Annie Pond and Whitetail Pond.

Condition X35 should be added and altered to read as follows:

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The irrigation components of Rights 65-13640 and 65-13704 when combined shall not exceed a total annual maximum diversion volume of 441 af and the irrigation of 147 acres.

A condition should also be added that states the following:

Storage allocated by this right is limited to the pond known locally as Whitetail Pond.

Permit 65-13704: (An amendment is required on this permit to address the point of injection and the point of redirection from Williams Creek used to divert water from Annie Pond to Whitetail Pond.)

Condition 1 (26A) should be removed at licensing. Condition 2 (101) should be changed to condition 105 and water right number 65-13640 should be added into the condition.

It was determined during the licensing of water right 65-23452 that no measurement device requirement was needed on the two wells, so conditions 3 (18A) was changed to condition 01M. Condition 01M should be modified to avoid confusing the measurement requirement for the two wells and the measurement requirements needed for the point of injection and point of redirection. The condition should read as follows:

After specific notification by the Department, the right holder shall install on the two points of diversion from ground water 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.

Condition 4 (120) should be changed to condition 103 as is standard. Condition 4 (100) should be changed to condition 065 as is standard, and water right number 65-13640 should be added into the condition. Condition 6 (R62) should be carried forward to licensing. Condition 7 (046) should be removed at licensing as is standard. The portion of Condition 8 regarding the multiple points of diversion in the SENE of Section 12 should be removed at licensing and the actual point of diversions should be described separately in the license point of diversion description. The remaining portion of Condition 8 should be replaced by condition 020 as is standard.

Condition X11 should be added and altered to read as follows:

The right holder shall install and maintain acceptable measuring devices at the point of injection into Williams Creek and at the point of redirection from Williams Creek.

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Condition R02 will also need to be added and altered to address the point of injection and point of redirection for address of the use of Williams Creek as part of the conveyance between the two ponds. The condition should read as follows:

A lockable device subject to the approval of the Department shall be maintained on the diverting works in a manner that will provide the watermaster suitable control of the point of injection and point of redirection from Williams Creek.

Condition R05 will be needed to allow watermaster control of the point of injection and redirection into Williams Creek. Williams Creek is regulated by Water District 65.

Another condition should be added that states the following:

Water diverted under this right is injected into Williams Creek at the authorized point of injection and redirected from Williams Creek at the authorized point of redirection. Water shall not be redirected from Williams Creek unless an equal amount of water is simultaneously being injected into Williams Creek.

Condition 259 should be added and altered to read as follows:

Rights 65-13604, 65-13704, 65-13751, and 65-22911 authorize the storage of an annual total of 133, 118 acre-feet to be used for the initial filling or carryover storage of the ponds, 15 acre-feet for the replacement of losses due to seepage and evaporation for the 2 ponds known locally as Annie Pond and Whitetail Pond.

Condition X35 should be added and altered to read as follows:

The irrigation components of Rights 65-13640 and 65-13704 when combined shall not exceed a total annual maximum diversion volume of 441 af and the irrigation of 147 acres.

Another condition X35 should be added and altered to read as follows:

Rights 65-13704 and 65-13751 when combined shall not exceed a total diversion rate of 0.73 cfs and a total annual maximum diversion volume of 14.4 af for the non-irrigation uses.

A third condition X35 should be added and altered to read as follows:

Rights 65-13704, 65-13751 and 65-22911 when combined shall not exceed a total diversion rate of 0.73 cfs and a total annual maximum diversion volume of 74.4 af for the non-irrigation uses.

A condition should also be added that states the following:

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Storage allocated by this right is limited to the pond known locally as Whitetail Pond.

Permit 65-13751: (An amendment is required on this permit to address the point of injection and the point of redirection from Williams Creek used to divert water from Annie Pond to Whitetail Pond.)

Condition 1 (01M) should be carried forward to licensing. Condition 01M should be modified to avoid confusing the measurement requirement for the two wells and the measurement requirements needed for the point of injection and point of redirection. The condition should read as follows:

After specific notification by the Department, the right holder shall install on the two points of diversion from ground water 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.

Condition 2 (046) should be removed at licensing as is standard. Condition 3 should be split out into several conditions. The portion of Condition 3 that address two points of diversion in the same legal description should be removed and the two wells should be shown as points of diversion on the license. The portion of Condition 4 describing the Aesthetic use should be carried forward to licensing as a separate condition. The portion of Condition 4 describing the stockwater use should be removed, since no stockwater use was developed. The remaining portion of Condition 4 should be changed to standard condition 103.

Condition X11 should be added and altered to read as follows:

The right holder shall install and maintain acceptable measuring devices at the point of injection into Williams Creek and at the point of redirection from Williams Creek.

Condition R02 will also need to be added and altered to address the point of injection and point of redirection for address of the use of Williams Creek as part of the conveyance between the two ponds. The condition should read as follows:

A lockable device subject to the approval of the Department shall be maintained on the diverting works in a manner that will provide the watermaster suitable control of the point of injection and point of redirection.

Condition R05 will be needed to allow watermaster control of the point of injection and redirection into Williams Creek. Williams Creek is regulated by Water District 65.

Another condition should be added that states the following:

Water diverted under this right is injected into Williams Creek at the authorized point of injection and rediverted from Williams Creek at the authorized point of rediversion. Water shall not be rediverted from Williams Creek unless an equal amount of water is simultaneously being injected into Williams Creek.

Condition 259 should be added and altered to read as follows:

Rights 65-13604, 65-13704, 65-13751, and 65-22911 authorize the storage of an annual total of 133, 118 acre-feet to be used for the initial filling or carryover storage of the ponds, 15 acre-feet for the replacement of losses due to seepage and evaporation for the 2 ponds known locally as Annie Pond and Whitetail Pond.

Condition X35 should be added and altered to read as follows:

Rights 65-13704 and 65-13751 when combined shall not exceed a total diversion rate of 0.73 cfs and a total annual maximum diversion volume of 14.4 af for the non-irrigation uses.

A third condition X35 should be added and altered to read as follows:

Rights 65-13704, 65-13751 and 65-22911 when combined shall not exceed a total diversion rate of 0.73 cfs and a total annual maximum diversion volume of 74.4 af for the non-irrigation uses.

A condition should also be added that states the following:

Storage allocated by this right is limited to two ponds known locally as Annie Pond and Whitetail Pond.

Permit 65-23911: (An amendment is required on this permit to address the point of injection and the point of rediversion from Williams Creek used to divert water from Annie Pond to Whitetail Pond.)

Condition 1 (26A) and 2 (046) should not be carried forward to licensing. Condition 4 (077) should be changed to condition 218 since this is a fire protection storage use. Condition 6 (121) should be changed to condition 103 as is standard. Condition 7 (01M) should be carried forward to licensing. Condition 01M should be modified to avoid confusing the measurement requirement for the two wells and the measurement requirements needed for the point of injection and point of rediversion. The condition should read as follows:

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After specific notification by the Department, the right holder shall install on the two points of diversion from ground water 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.

Condition X11 should be added and altered to read as follows:

The right holder shall install and maintain acceptable measuring devices at the point of injection into Williams Creek and at the point of rediversion from Williams Creek.

Condition R02 will also need to be added and altered to address the point of injection and point of rediversion for address of the use of Williams Creek as part of the conveyance between the two ponds. The condition should read as follows:

A lockable device subject to the approval of the Department shall be maintained on the diverting works in a manner that will provide the watermaster suitable control of the point of injection and point of rediversion.

Condition R05 will be needed to allow watermaster control of the point of injection and rediversion into Williams Creek. Williams Creek is regulated by Water District 65.

Another condition should be added that states the following:

Water diverted under this right is injected into Williams Creek at the authorized point of injection and rediverted from Williams Creek at the authorized point of rediversion. Water shall not be rediverted from Williams Creek unless an equal amount of water is simultaneously being injected into Williams Creek.

Condition 259 should be added and altered to read as follows:

Rights 65-13604, 65-13704, 65-13751, and 65-22911 authorize the storage of an annual total of 133, 118 acre-feet to be used for the initial filling or carryover storage of the ponds, 15 acre-feet for the replacement of losses due to seepage and evaporation for the 2 ponds known locally as Annie Pond and Whitetail Pond.

A second 259 condition should be added just for this permit. This condition should read as follows:

Right 65-22911 authorizes the storage of an annual total of 60 af, 27.6 af to be used for the initial filling or carryover storage of Annie Pond, 4.1 af for the replacement of losses due to evaporation of Annie Pond, and up to 28.3 af for additional refills for aesthetic from storage use to supply additional water to Whitetail Pond for aesthetic storage allocated by water rights 65-13604, 65-13704, and 65-13751.

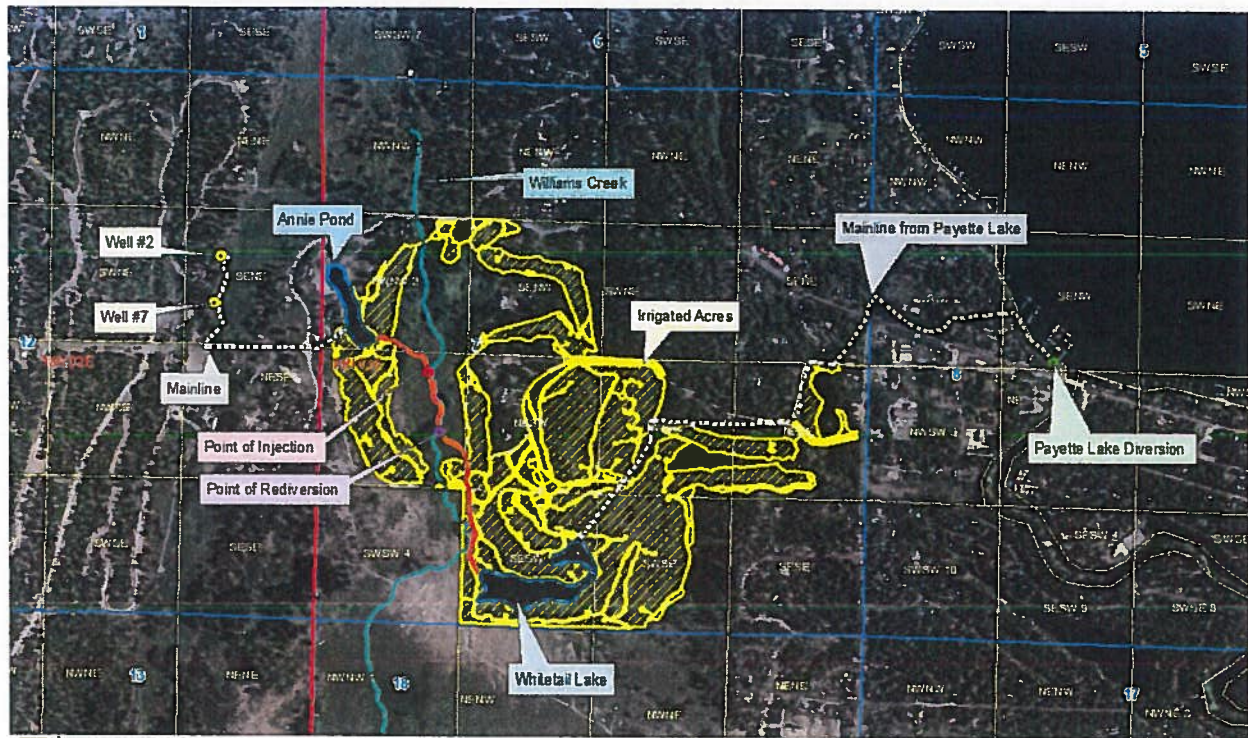
Licensing Memo for 65-13640, 65-13704, 65-13751 and 65-22911

Condition X35 should be added and altered to read as follows:

Rights 65-13704, 65-13751 and 65-22911 when combined shall not exceed a total diversion rate of 0.73 cfs and a total annual maximum diversion volume of 74.4 af for the non-irrigation uses.

Licensing Review Map

Permits 65-13640, 65-13704, 65-13751, and 65-22911



Water for these permits are diverted from two wells called Well # 2 and Well #7 (yellow dots) and from Payette Lake (green dot). The wells divert into Annie Pond and water flows through Annie Pond through a channel to Williams Creek where it is injected into the creek. The water is rediverted from the creek at the point of injection and flows down to Whitetail Pond. Payette Lake water is diverted from Payette Lake and delivered through a buried mainline to Whitetail Pond. All three water sources can be diverted from Whitetail pond to irrigate 147 acres of the golf course.

MEMORANDUM

TO: Water Right Files 65-13470, 65-13640, 65-13704, 65-13751, and 65-22911

FROM: Daniel Nelson – Staff Hydrologist

DATE: February 2, 2017

SUBJECT: Water Rights Owned by Sabala Whitetail LLC

Sabala Whitetail LLC, owns a number of water rights that appear to overlap or have overlapped each other at one time. This memo will attempt to sort out these water rights and provide a bit clearer picture of what is actually happening on this property. It appears that each of these rights are linked by the ponds they serve, so I will separate them out by pond and other uses as required.

BETSY'S POND:

Water Right License 65-23452 (this right is a split of water right 65-13704) – **Ground Water diverted from Well #1**

This license is for	Irrigation -	0.02 cfs – 3.0 af – 1.0 acre
	Recreational Storage -	14.4 af
	<u>Diversion to Storage -</u>	<u>0.25 cfs</u>
	TOTAL	0.25 cfs - 17.4 af - 1.0 acre

Water Right License 65-13738 – **Ground Water diverted from Well #1 .**

This license is for	Stockwater Storage -	20.0 af
	Wildlife Storage -	20.0 af
	Recreational Storage -	20.0 af
	Aesthetic Storage -	20.0 af
	<u>Diversion to Storage -</u>	<u>2.35 cfs</u>
TOTAL	2.35 cfs -	20.0 af

There are no combined limitation limits, so Betsy's Pond is authorized for a combined storage of 34.4 af and a combined diversion to storage of 2.60 cfs.

WHITETAIL POND AND ANNIE POND:

Water Right Permit 65-13704 (this right is the other portion of the split with right 65-23452) – **Ground Water diverted from Wells #2 and #7.** Please Note: The amounts described in the permits are the amounts listed on the permits, and do not reflect the license recommendations. The license recommendation will be addressed in each licensing memorandum. **This permit is for Whitetail Pond only.**

This Permit is for	Irrigation -	1.75 cfs –	N/A af –	199.0 acres
	Irrigation Storage -		80.0 af	
	Irrigation From Storage -		80.0 af -	199.0 acres
	Recreation -	1.75 cfs		
	Recreational Storage -		80.0 af	
	<u>Diversion to Storage -</u>	<u>1.75 cfs</u>		
	TOTAL	1.75 cfs -	80.0 af -	199.0 acres

Water Right Permit 65-13751 – **Ground Water diverted from Wells #2 and #7.** Please Note: The amounts described in the permits are the amounts listed on the permits, and do not reflect the license recommendations. The license recommendation will be addressed in each licensing memorandum. **This permit is for Whitetail Pond and Annie Pond.**

This Permit is for	Stockwater Storage -		65.0 af	
	Wildlife Storage -		65.0 af	
	Recreational Storage -		65.0 af	
	Aesthetic Storage -		65.0 af	
	<u>Diversion to Storage -</u>	<u>1.50 cfs</u>		
	TOTAL	1.50 cfs -	65.0 af -	

Water Right Permit 65-13640 – **Payette Lake Water.** Please Note: The amounts described in the permits are the amounts listed on the permits, and do not reflect the license recommendations. The license recommendation will be addressed in each licensing memorandum. **This permit is for Whitetail Pond only.**

This Permit is for	Irrigation -	4.00 cfs –	N/A af –	200.0 acres
	Irrigation Storage -		80.0 af	
	Irrigation From Storage -		80.0 af -	200.0 acres
	Recreation -	4.00 cfs		
	Recreational Storage -		80.0 af	
	<u>Diversion to Storage -</u>	<u>4.00 cfs</u>		
	TOTAL	4.00 cfs -	80.0 af -	200.0 acres

Water Right Permit 65-22911 - **Ground Water diverted from Wells #2 and #7.** Please Note: The amounts described in the permits are the amounts listed on the permits, and do not reflect the license recommendations. The license recommendation will be addressed in each licensing memorandum. **This permit is for Whitetail Pond and Annie Pond.**

This Permit is for	Fire Protection Storage-	60.0 af
	Wildlife Storage -	60.0 af
	Recreational Storage -	60.0 af
	Aesthetic Storage -	60.0 af
	Aesthetic From Storage-	60.0 af
	<u>Diversion to Storage -</u>	<u>1.00 cfs</u>
	TOTAL	1.00 cfs - 60.0 af -

LAKE DOUGLAS:

Water Right Decree 65-7007 – **Unnamed Stream Tributary to North Fork Payette River.**
This is an on-stream pond.

This Decree is for	Stockwater Storage -	1.4 af
	Stockwater From Storage -	1.4 af
	Domestic From Storage -	1.2 af
	<u>Recreation Storage -</u>	<u>5.6 af</u>
	TOTAL	5.6 af

Water Right Decree 65-13453 – **Unnamed Stream Tributary to North Fork Payette River.**
This is an on-stream pond.

This Decree is for	Wildlife Storage -	10.6 af
	<u>Aesthetic Storage -</u>	<u>10.6 af</u>
	TOTAL	10.6 af

Water Right Permit 65-13470 – **Ground Water** (there is no well designation number for this well).

This Permit is for	Stockwater -	0.02 cfs
	Wildlife -	0.04 cfs
	<u>Aesthetic -</u>	<u>0.04 cfs</u>
	TOTAL	0.04 cfs

Water Right Decree 65-8209 – **Ground Water** – This is the same well used for 65-13640. The field exam states that this well was originally used for an RV park that doesn't exist.

This Decree is for	<u>Domestic -</u>	<u>0.04 cfs</u>	<u>1.2 af</u>
	TOTAL	0.04 cfs	1.2 af

VARIOUS OTHER DOMESTIC TYPE USES NOT RELATED TO PONDS:

Water Right Decree 65-8356 – **Unnamed Stream Tributary to Sinks** – This area is now a golf course, so it is unlikely this right is still valid.

This Decree is for	Stockwater -	0.03 cfs	1.4 af
	TOTAL	0.03 cfs	1.4 af

Water Right Decree 65-8357 – **Ground Water** – In 1987 and 1992 aerial photos, there is no evidence of home in this 40 acre tract. I think this right belongs to the home in the SESE of Section 7 in Township 18 North, Range 3 East.

This Decree is for	Domestic -	0.04 cfs	1.2 af
	TOTAL	0.04 cfs	1.2 af

Water Right Decree 65-8260 – **Ground Water** – There are 3 homes in this 40 acre tract, and only 2 of them are owned by the right holder. I am not sure which home this right serves. The other home could be served by the well associated with Douglas Lake and water right 65-8209.

This Decree is for	Domestic -	0.04 cfs	1.2 af
	TOTAL	0.04 cfs	1.2 af

Water Right Decree 65-8296 – **Ground Water** – This home is located on the lake front, and there is a home owned by the right holder in this area.

This Decree is for	Domestic -	0.04 cfs	1.2 af
	TOTAL	0.04 cfs	1.2 af

Water Right Decree 65-10293 – **Ground Water** – This home is located on the lake front, and there is a home owned by the right holder in this area.

This Decree is for	Domestic -	0.04 cfs	1.2 af
	TOTAL	0.04 cfs	1.2 af

Water Right Permit 78-12324 – **5 Ground Water Points of Diversion.** – This system is for a 89 home subdivision approximately ¼ mile west of the golf course.

This Permit is for	Irrigation -	1.78 cfs	89 acres (within 320 acre PPU)
	Domestic -	0.40 cfs	
	Fire Protection -	1.78 cfs	
	TOTAL	1.78 cfs -	89 acres (within 320 acre PPU)

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: Sabala Whitetail
 Reviewer: Dan Nelson
 Date of Review: 8/11/2017

P/D No.:

PUMP HORSEPOWER
 BOOSTER HORSEPOWER

PUMPING LEVEL

DISCHARGE PRESSURE

RATE OF FLOW (cfs)

Well #2
10
0
103
27
0.35
156

Well #7
15
0
165.5
27
0.38
170

Maximum Pump Test Level
10
0
131
27
0.30
134

The above calculates the formula =

$$Q = \frac{8.8 * (\text{Efficiency}) * \text{hp}}{\text{depth to water} + 2.31 * (\text{psi}) + \text{friction}}$$

Assumptions: %65.5 efficiency.
 No Friction

Examiners Notes:

My original analysis of the theoretical calculations supplied by the consultant didn't seem to be accurate. I contacted the consultant and he informed me by telephone that he basically took an average of the drawdown test performed on the well. Mr. Scanlan supplied the pump test in his August 11, 2017 email. Mr. Scanlan stated that he took the average drawdown of the test between 1:20 when the pump was turned up to 150 gpm to the end of the test at 5:27 when the well was pumping 220 gpm. Mr. Scanlan felt this was a reasonable average. I am still concerned that the drawdown was still falling when the test was completed, and the pumping water level never did stabilize throughout the entire test. In Mr. Scanlan's water monitoring report for 2012 required by the permit, he did list a water level of 102.52 in Well # 2. I took the information provided to Department well drilling specialist Chad Hersley and pump testing specialist Allan Wylie, and they both stated that since the pump test wasn't continued until the pumping water level stabilized, they couldn't determine the actual drawdown from the information provided. However, I do agree with Mr. Scanlan that the pumping water level would be at 100 feet or less for at least 2 to 2 1/2 hours after the well was turned on. The increases in the flow rates during the test does have some bearing on drawdown, so I cannot tell what the drawdown would be after the water levels in the well had stabilized. Mr. Scanlan did inform me that Well #7 was measured at 165.5 feet water level with 27 psi at 170 gpm. When plugging in those numbers into the spreadsheet, the efficiency of the well pump would be 65.5 % instead of the standard of 70 %. Since both wells are the same age and the same brand, I used the same efficiency for both pumps.

13238600 H RESORTS
DISCHARGE, CUBIC FEET PER SECOND, IRRIGATION YEAR NOVEMBER 2000 TO OCTOBER 2001
MEAN VALUES

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.5	1.2	0.7
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.5	1.2	0.7
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.5	1.2	0.7
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.5	1.2	0.7
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.5	1.2	0.7
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.5	1.5	0.7
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.2	1.1	0.7
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.2	1.1	0.7
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.2	1.1	0.7
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.2	1.1	0.7
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.2	1.1	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.2	1.1	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	1.2	1.1	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	1.2	1.1	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	1.4	1.1	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	1.4	0.7	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	1.4	0.7	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	1.4	0.7	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.1	1.4	0.7	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.1	1.4	0.7	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	1.1	1.4	0.7	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	1.1	1.0	0.7	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	1.4	1.0	0.7	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	1.4	1.0	0.7	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	1.4	1.0	0.7	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	1.4	1.0	0.7	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	1.4	1.0	0.7	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	1.4	1.0	0.7	0.0
29	0.0	0.0	0.0	---	0.0	0.0	1.2	0.6	1.4	1.0	0.7	0.0
30	0.0	0.0	0.0	---	0.0	0.0	1.2	0.6	1.4	1.0	0.7	0.0
31	---	0.0	0.0	---	0.0	---	1.2	---	1.4	1.0	0.7	0.0
TOTAL	0	0	0	0	0	0	11	22	42	39	28	6
MEAN	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.4	1.2	0.9	0.2
MAX	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.6	1.5	1.5	0.7
MIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.1	1.0	0.7	0.0
AC-FT	0	0	0	0	0	0	21	43	84	77	55	12
IRRIGATION YEAR 2001			TOTAL	148	MEAN	0	AC-FT	292				

D20

DISCHARGE, CUBIC FEET PER SECOND, IRRIGATION YEAR NOVEMBER 1996 TO OCTOBER 1997
MEAN VALUES

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1	0.3	0.3	0.0	0.3	0.4	0.3	0.3	0.5	0.4	0.7	0.5	0.4
2	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.5	0.5	0.7	0.6	0.3
3	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.5	0.6	0.8	0.4	0.4
4	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.4	0.8	0.7	0.4	0.2
5	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.4	0.8	0.7	0.4	0.3
6	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.4	0.8	0.8	0.4	0.3
7	0.3	0.3	0.0	0.3	0.4	0.3	0.3	0.5	0.8	0.8	0.5	0.3
8	0.2	0.3	0.0	0.3	0.4	0.3	0.3	0.6	0.8	0.8	0.4	0.2
9	0.2	0.3	0.0	0.0	0.3	0.3	0.3	0.7	0.6	0.8	0.5	0.2
10	0.2	0.3	0.0	0.0	0.3	0.3	0.4	0.4	0.5	1.4	0.4	0.2
11	0.2	0.3	0.0	0.0	0.3	0.3	0.4	0.4	0.5	0.6	0.3	0.2
12	0.2	0.3	0.0	0.0	0.3	0.3	0.4	0.4	0.6	0.5	0.4	0.2
13	0.3	0.3	0.0	0.0	0.3	0.3	0.4	0.4	0.7	0.5	0.4	0.2
14	0.3	0.3	0.0	0.0	0.3	0.3	0.5	0.5	0.8	0.6	0.4	0.2
15	0.3	0.3	0.0	0.3	0.3	0.3	0.5	0.5	0.8	0.6	0.3	0.2
16	0.1	0.3	0.0	0.3	0.3	0.3	0.5	0.5	0.8	0.7	0.3	0.2
17	0.1	0.3	0.0	0.3	0.3	0.3	0.6	0.5	0.7	0.6	0.3	0.2
18	0.1	0.3	0.0	0.3	0.3	0.3	0.5	0.5	0.6	0.5	0.3	---
19	0.1	0.3	0.0	0.3	0.3	0.3	0.5	0.6	0.6	0.5	0.3	---
20	0.1	0.3	0.0	0.0	0.4	0.3	0.6	0.5	0.7	0.5	0.3	---
21	0.1	0.3	0.0	0.0	0.3	0.3	0.5	0.5	0.8	0.6	0.3	---
22	0.1	0.3	0.0	0.0	0.3	0.3	0.6	0.6	0.8	0.6	0.4	---
23	0.2	0.3	0.0	0.0	0.3	0.3	0.5	0.5	0.8	0.6	0.3	---
24	0.2	0.3	0.0	0.0	0.3	0.3	0.4	0.6	0.8	0.5	0.4	---
25	0.2	0.3	0.0	0.0	0.3	0.3	0.5	0.6	0.8	0.5	0.4	---
26	0.3	0.3	0.0	0.0	0.3	0.3	0.4	0.7	0.8	0.4	0.3	---
27	0.3	0.4	0.0	0.0	0.3	0.3	0.4	0.7	0.8	0.5	0.4	---
28	0.3	0.4	0.0	0.0	0.3	0.3	0.4	0.7	0.8	0.5	0.3	---
29	0.2	0.4	0.0	---	0.3	0.3	0.4	0.6	0.5	0.5	0.3	---
30	0.3	0.4	0.0	---	0.3	0.3	0.4	0.5	0.6	0.5	0.3	---
31	---	0.4	0.0	---	0.3	---	0.5	---	0.6	0.6	---	---
TOTAL	7	10	0	4	10	9	13	16	22	20	11	4
MEAN	0.2	0.3	0.0	0.1	0.3	0.3	0.4	0.5	0.7	0.6	0.4	0.2
MAX	0.3	0.4	0.0	0.3	0.4	0.3	0.6	0.7	0.8	1.4	0.6	0.4
MIN	0.1	0.3	0.0	0.0	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.2
AC-FT	13	19	0	8	19	18	26	31	43	39	22	8

IRRIGATION YEAR 1997

TOTAL

124

MEAN

0

AC-FT

246

D20

Well #2

Date	Reading	Total Days	Gallons per day Average	Gallons Per Day Times 365 days	Acre Feet Per Year
7/8/2001	1182700				
7/19/2002	1770395	377	1558.873	568988.5279	1.7
7/31/2006	1770395				
7/31/2008	1992567	730	304.3452	111086	0.3

Well #7

Date	Reading	Total Days	Gallons per day Average	Gallons Per Day Times 365 days	Acre Feet Per Year
7/8/2001	2443700				
7/19/2001	6689740	377	11262.71	4110887.533	12.6
7/31/2006	32292400				
7/31/2008	90530329	730	79777.98	29118964.5	89.4

Total Volume pumped in 2001 =	14.4 af
Total Volume pumped in 2006-8 =	89.7 af

M Resorts / Bezates Monitoring Summary
(Water level measuring points for wells and North Spring is top of steel casing)

Monitoring Point	Date	Depth to Water (feet)	Discharge Rate (gpm)	Totalizer Reading (gallons)	Specific Conductance (uS)	Ammonia (NH3-N) (mg/L)	Nitrate (NO3-N) (mg/L)	Nitrogen (TKN) (mg/L)	Phosphate (Total P) (mg/L)	Total Dissolved Solids (TDS) (mg/L)	Remarks
M Resort Well 1	8/4/2000				137	<0.04	<0.20	30.1	<0.05	104	no flow meter, pump discharging to pond, sampled for nutrients and herbicides at pump house
	5/6/2001				144	<0.04	<0.20		0.09	84	pump off, turned on for sampling
	7/8/2001				140	<0.04	<0.20	<0.1	0.07	100	pump on, sampled at cabin hose bib
	9/29/2001				139	<0.04	<0.20	<0.1	0.08	120	
	7/19/2002				139	<0.04	<0.20	<0.1	0.09	80	pump on, sampled at cabin hose bib
	7/28/2003				133	<0.04	<0.20	<0.1	1.44	116	
	7/31/2004				136	<0.04	<0.20	<0.1	0.10	104	sampled at cabin hose bib
	7/31/2005				130	<0.04	<0.20	<0.1	0.08	118	sampled at cabin hose bib
	7/31/2006				133	<0.04	<0.20	<0.1	0.17	78	sampled at well house
	7/31/2008				135	<0.04	<0.20	<0.1	0.09	128	sampled at well house
	7/30/2010				128	<0.04	<0.20	<0.1	0.08	72	sampled from irrigation box hose bib
	7/25/2012				130	<0.04	<0.20	<0.1	0.09	182	sampled at well house
M Resort Well 2	8/4/2000	60.75									
	9/1/2000	62.86									
	11/11/2000										
	5/6/2001			16085							pump installed (not operable) but no sounding tube for water levels
	7/8/2001			1182700							5.4 acre feet pumped
	9/29/2001			1770395							
	7/19/2002			1770395							pump off
	9/28/2002			1770395							pump off
	7/28/2003			1770295							pump off
	9/29/2003			1770396							pump off
	7/31/2004			1770295							pump off
	9/20/2004			1770295							pump off
	7/31/2005			1770295							pump off
	9/26/2005			1770295							pump off
	7/31/2006			1770295							pump off
	9/26/2006			1991609							pump off
	7/31/2008			1992567							pump off
	7/30/2010			1992567							pump off
	9/17/2010			1992567							pump off
	7/25/2012	102.52		1992567							pump off
	9/29/2012			1992567							pump off
M Resort Well 5	8/4/2000	26.83									
	9/1/2000	28.88									
	11/11/2000	26.34									
	2/17/2001										
	3/31/2001										could not locate well due to snow cover
	5/6/2001	18.40									could not locate well due to snow cover
	7/8/2001	27.03									
	9/29/2001	33.97									
	7/19/2002	25.33									
	9/28/2002	30.45									
	7/30/2003	31.05									
	9/29/2003	33.02									
	7/31/2004	33.44									
	9/20/2004										
	7/31/2005										could not measure due to temporary burial
	9/26/2005										could not measure due to temporary burial
	7/31/2006										could not measure due to temporary burial
	9/28/2006										could not measure due to temporary burial
	7/31/2008										could not measure due to temporary burial
	9/1/2008										could not measure due to temporary burial
	7/30/2010										could not measure due to temporary burial
	7/25/2012										could not measure due to temporary burial
	9/29/2012										could not measure due to temporary burial
M Resort Well 7	8/4/2000	57.75									
	9/1/2000	59.86									
	11/11/2000	56.99									
	2/17/2001	51.41									
	3/31/2001	49.23									pump installed (not operable) with sounding tube
	5/6/2001	47.63		16288							
	7/8/2001	58.15		2443700							initial totalizer reading
	9/29/2001	65.65		6889740							2427412 gallons pumped, pump off
	7/19/2002	56.21		6889740							pump off; 20.5 af pumped in 2001
	9/28/2002	62.18		6889740							pump off
	7/28/2003	62.78		6889688							pump off; no pumping in 2002
	9/29/2003	65		6889788							
	7/31/2004	136.65	118	13658900							
	9/20/2004	67.49		19927313							pump on; 118 gpm
	7/31/2005	66.19		19927313							pump off; 40.6 acre feet pumped
	9/26/2005	63.55		19927313							pump off
	7/31/2006	143.9	150	32292400	128	<0.04	<0.20	<0.1	0.11	84	pump on, 150 gpm
	9/26/2006	165.5		43750200							pump off
	7/31/2008	157.49	NA	90530329							pump on
	9/1/2008	162.44	NA	90530329							pump on, meter not functioning
	7/30/2010	149.91	NA	90530329							pump on, meter not functioning
	9/17/2010	159.06	NA	90530329							pump on, meter not functioning
	7/25/2012	158.12	NA	90530329							pump on, meter not functioning
	9/29/2012	166.29	NA	90530329							pump on, meter not functioning

Total Storage Calculations

FILE NUMBER	Annie's Pond
REVIEWER	Dan Nelson
DATE	8/11/2017

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.)	2.8	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	9.86	"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)	27.6	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)		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)	4.1	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	31.7	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	Annie's Pond
REVIEWER	Dan Nelson
DATE	8/11/2017

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

Total mm/year = 445.35

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.

$$((445.35 \div 304.8) \times 2.80) = 4.1 \text{ AFA}$$

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	Annie's Pond
REVIEWER	Dan Nelson
DATE	8/11/2017

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	2.8	AC.
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Pond Surface Area (SQ. FT.)	121968	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	Lined	
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.

Total Storage Calculations

FILE NUMBER	Whitetail Lake
REVIEWER	Dan Nelson
DATE	8/11/2017

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.)	7.1	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	12.76	"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)	90.6	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)		The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: If a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 acre feet from the initial fill = 5 acre feet of additional storage needed). Note: You must have a "From Storage" component exceeding the initial fill on the permit to include a volume in this space.
Estimated Seepage Loss (AF)	0.0	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	10.4	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	101.0	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	Whitetail Lake
REVIEWER	Dan Nelson
DATE	8/11/2017

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
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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

$$((445.35 \div 304.8) \times 7.10) = 10.4 \text{ AFA}$$

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	Whitetail Lake
REVIEWER	Dan Nelson
DATE	8/11/2017

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	7.1	AC.
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Pond Surface Area (SQ. FT.)	309276	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	Lined	
Suggested Seepage Rate (FT./DAY)	0.0000	FT./DAY

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

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

Total Seepage Loss (AFA)	0.0	AFA
--------------------------	-----	-----

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

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

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