

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 65-23529
Exam Date: 08/22/2018

1. Current Owner:
SOUTHERN VALLEY COUNTY RECREATION DISTRICT PO BOX 723 CASCADE ID 83611
2. Accompanied by:
Phone No:
Address:
Relationship to permit Holder:

3. **SOURCE:**
GROUND WATER

Method of Determination: Site visit, well log

B. OVERLAP REVIEW

1. Other water rights with the same place of use: YES Overlap

Water Right No.	Source	Purpose of Use	Basis
65-12755	Groundwater	Heating	Decree

Comments: 65-12755 also provides heating use for same facility from 10/01 to 03/31.

2. Other water rights with the same point-of-diversion: YES Overlap

Water Right No.	Source	Purpose of Use	Basis
65-12755	Groundwater	Heating	Decree

Comments: 65-12755 is diverted through the same well and diversion system.

C. DIVERSION AND DELIVERY SYSTEM

1. **LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER L2 (NE¼ NE¼), Sec. 36, Twp 14N, Rge 03E, B.M. VALLEY County

Method of Determination: Site visit, well log

PLACE OF USE: HEATING

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
14N	03E	36	X L2																

Method of Determination: Site visit, aerial imagery

3.

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

X

Indicate weir size/pipe as applicable.

Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.

X

Aerial Photo Attached (required for irrigation of 10+ acres).

X

Photo of Diversion and System Attached

X

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
396832	n/a	30	n/a	n/a	n/a

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
n/a	n/a	n/a	n/a	n/a	n/a	n/a

2. Measurements: No measurements were taken.

E. FLOW CALCULATIONSX

Additional Computation Sheets Attached

Measured Method:

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

See attached theoretical sheet for multiple scenarios.

Permit	1.40 cfs
B.U. Standard Allowance	N/A
B.U. Proof Fee	\$250 → 6.01-7.00 cfs
Theoretical Average	0.73 cfs

License Recommendation 0.73

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

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

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$$

2. Volume Calculations for Other Uses:

The heat aspect has a volume of the refilling of the two pools, plus hot water for the fixtures of the facility. The heating use for the heat exchanger, flooring in the facility, pool deck and outside concrete pad are already covered under overlapping right 65-12755. The two pools have a total capacity of 145,570 gals and are refilled every 8 hours for 183 days of operation a year, giving an annual volume of 245.27 afa. According to the rural and domestic water uses spreadsheet, each person per day for all uses including the use of all fixtures is 60 gal per day. At an average of 73 people per day using the facility, this is an annual volume of 4.91 afa. Therefore, the total volume recommended is 245.27 afa + 4.91 afa = 250.2 afa.

G. NARRATIVE/REMARKS/COMMENTS

Permit 65-23529 authorizes 1.40 cfs of low temperature geothermal groundwater to be used for heating and municipal uses at the Southern Valley County Recreation District's aquatic and fitness center in Cascade, ID. Proof was filed on July 23, 2018 along with a \$250 field exam fee. The field exam was conducted by Sr. WRA Aaron Skinner in August, 2018 and the report was done by WRA Tyler Smith in July 2020.

The diversion system includes an existing well, ID #396832, which was modified in 2013 to increase its depth from 177' bsl to 245' bsl and casing from 12" to 8". The observed operating pressure at the well head was 60 psi. Water is pumped to a mechanical room where it is run through a sand filter, heat exchanger and pressure tank before it is distributed throughout the building. The heat exchanger is used to heat the water for the outdoor pool, and low temperature geothermal water is only used to maintain pool elevations, not initial filling. Thermometers showed the intake temperature of the low temperature geothermal was 100°F.

A return flow of final discharge of geothermal water runs through buried lines then through two settling ponds as required by IDEQ for water quality purposes before it is released back into the North Fork Payette River. Other municipal water is returned to the city's sewer system. A 4' McCrometer flowmeter is installed on a section of discharge pipe to measure a final discharge rate for the geothermal water. During the exam, the reading was ~150 gpm and the operator stated that the highest reading he had observed was ~200 gpm (0.45 cfs). Since this is a rate of discharge, this rate cannot be used to validate the diversion rate.

The well has a 30 hp variable speed pump, the depth at which it was installed unknown to the maintenance crew. Pumps are typically set 5' above screenings, and a screening was installed from 120 to 174 feet bsl per the well log. A theoretical rate was determined using pumping levels of 110-120 feet, giving an average rate of 0.73 cfs. This is considered to be the system capacity and is therefore the overall diversion rate recommended for licensing.

Overlapping decreed right 65-12755 authorizes 1.18 cfs of heating use from the same point of diversion and place of use as this permit. 65-12755 is only authorized during the winter months from 10/01 to 03/31. It is recommended this permit authorize the heating use from April through September when pool circulation occurs.

The aquatic and fitness center uses the heat aspect of the groundwater to heat concrete slabs at its entrances, the flooring of both stories of the buildings totaling 20,000 ft², refilling of the 2 pools and hot water for 22 fixtures including sinks and showers for an average of 73 people per day at the facility. A residential space heating requirements for geothermal sources spreadsheet was completed for all of the heating uses of the facility. This determined an annual diversion volume of 112.4 AF. However, heating use is already covered by overlapping water right 65-12755, which authorizes 1.18 cfs for heating use. The total heating use of the pools, fixtures, etc. requires a volume of 250.2 afa, and the rate of 0.73 cfs

recommended for this license can produce such a volume

No additional beneficial use for municipal purposes was found, as municipal water from the town of Cascade is provided for the use of cold water for fixtures within the aquatic and fitness center and no irrigation use was found.

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

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
HEATING	01/01 to 12/31	0.73 CFS	250 AF

Totals: 0.73 CFS 250 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 Tyler Smith - Water Resource Agent

Field Examiner's Name  Date 7/22/20

Reviewer  Date 7-27-20

State of Idaho
Department of Water Resources
Well to River System Diagram
Water Right Permit No. 65-23529



Legend

- Well
- Mechanical Room
- Main Supply Line
- - - Buried Pipe
- Open Ditch
- Heating and Municipal

0 0.0375 0.075 0.15 Miles



RESIDENTIAL SPACE HEATING/COOLING REQUIREMENTS FOR COLD OR GEOTHERMAL SOURCES

Worksheet created by Cindy Hodges, 11/93.

Data entered by: Tyler Smith
 Exam Date: 08/22/18
 File No: 65-23529
 Computations for: Heating of aquatic and fitness center facility

REQUIRED DATA:

Area of livable floor space, ft2 (A) 20000
 2 story? (N=1, Y=2) 2
 House efficiency factor (e) * 0.67
 Inside design temperature (Ti) 72
 Average outside temperature (To) ** 31
 Source temperature, degrees F (S) 100
 Heating/cooling days per season (D) 243
 Hours/day system operates (H) 24

CALCULATED DATA:

DESIGN HEAT LOAD (BTU/hr required)
 Formula: $E = [e \times (Ti - To)] A$
 Applies factor of 0.8 for two-story dwelling

E = 439,520 BTU/hour

TEMPERATURE DROP ACROSS SYSTEM
 Formula: $Ts = 0.3 \times [S - Ti]$

Ts = 8.4 degrees F

FLOW RATE REQUIRED (at given source temperature)
 Formula: $Q = E/(500 \times Ts) \times 448.8$

Q = 0.23317 cfs

DIVERTED VOLUME OVER SEASON
 Formula: $Vdiv = Q \times D \times H/24 \times 1.9835$

Vdiv = 112.4 AFA

** Suggested average outside temperatures:

WINTER	SUMMER
4 deg F Boise	80 deg F Boise
6 deg F Grand View	90 deg F Grand View
-8 deg F Cascade	70 deg F Cascade

AVERAGE TEMPERATURE CALCULATION:

-8 DEG MIN + 70 DEG HIGH / 2 =
 31 DEG AVERAGE YEAR ROUND TEMP.

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 65-23529
 Reviewer: Tyler Smith
 Date of Review: 6/25/2020

P/D No.:	Senerio 1	Senerio 2	Senerio 3
PUMP HORSEPOWER	30	30	30
BOOSTER HORSEPOWER	0	0	0
PUMPING LEVEL	110	115	120
DISCHARGE PRESSURE	60	60	60
RATE OF FLOW (cfs)	0.74	0.73	0.71 0.73

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

Assumptions: %70 efficiency.
 No Friction

Examiners Notes:

30 Hp pump at 60 psi. Pump depth is uncertain, but know the well was expanded to 245 feet by Gestrin Well Drilling, Inc. on 10/7/2013. A screen is set at 120 to 174 feet, and pumps are typically set 5' above screenings. A pumping level variation from 110 to 120 feet was used to obtain an average flow of 0.73 cfs. Mr. Gestrin said the pump was rated for 300 gpm or 0.67 cfs.



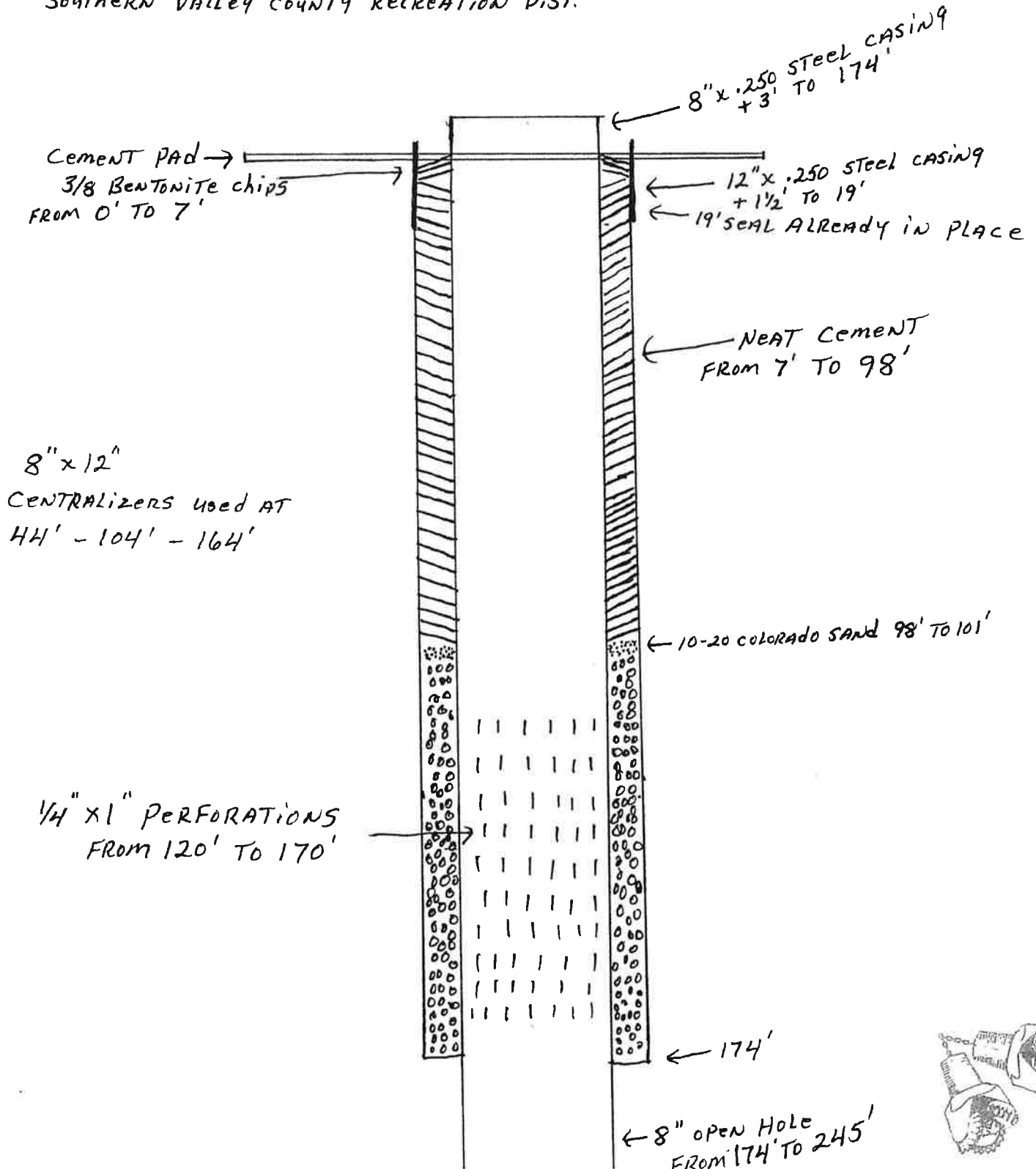
10-8-13

LICENSED - BONDED

ROBERT GESTRIN
1 (208) 325-8637

#3 Plant Lane
Donnelly, Idaho 83615

Southern Valley County Recreation Dist.





Power to the well.



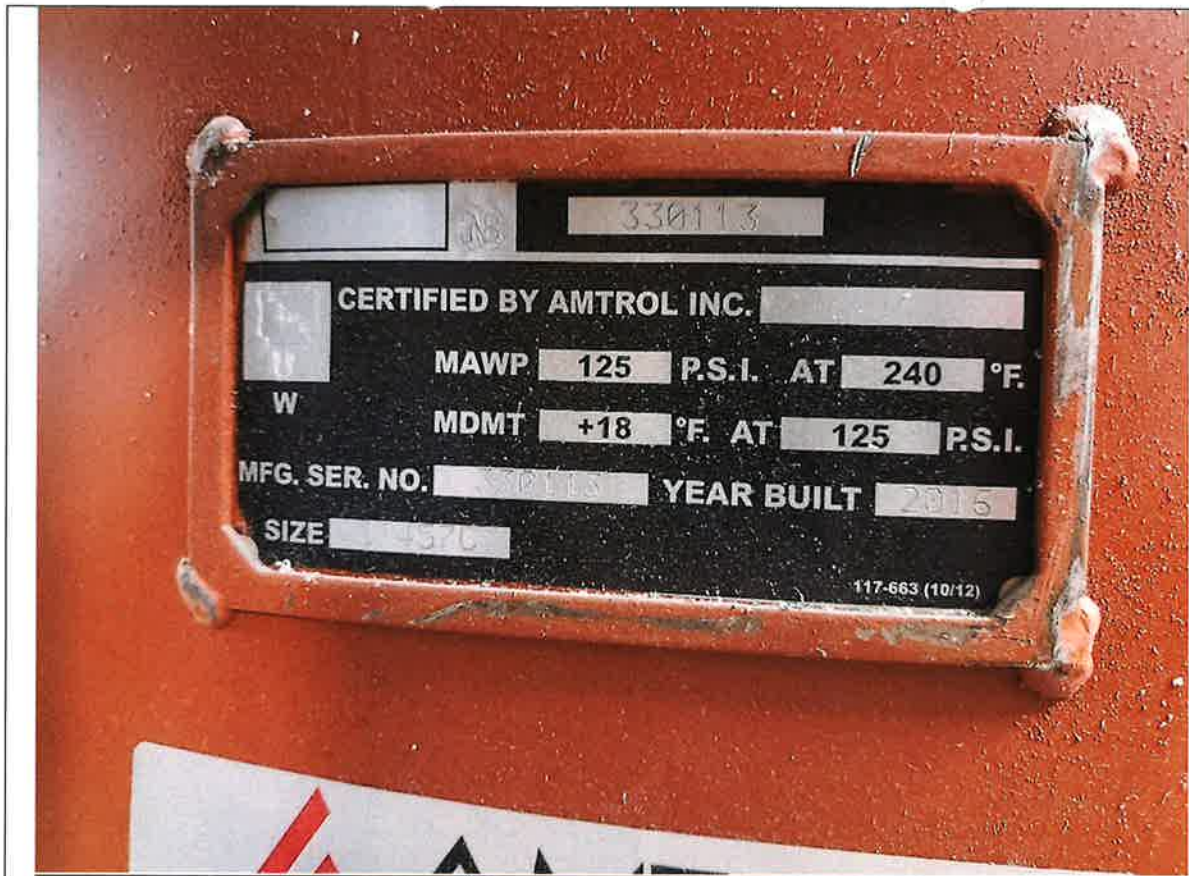
The old Boise Cascade Mill well was modified in 2013 to increased depth from 177 to 245 and casing from 12" to 8".



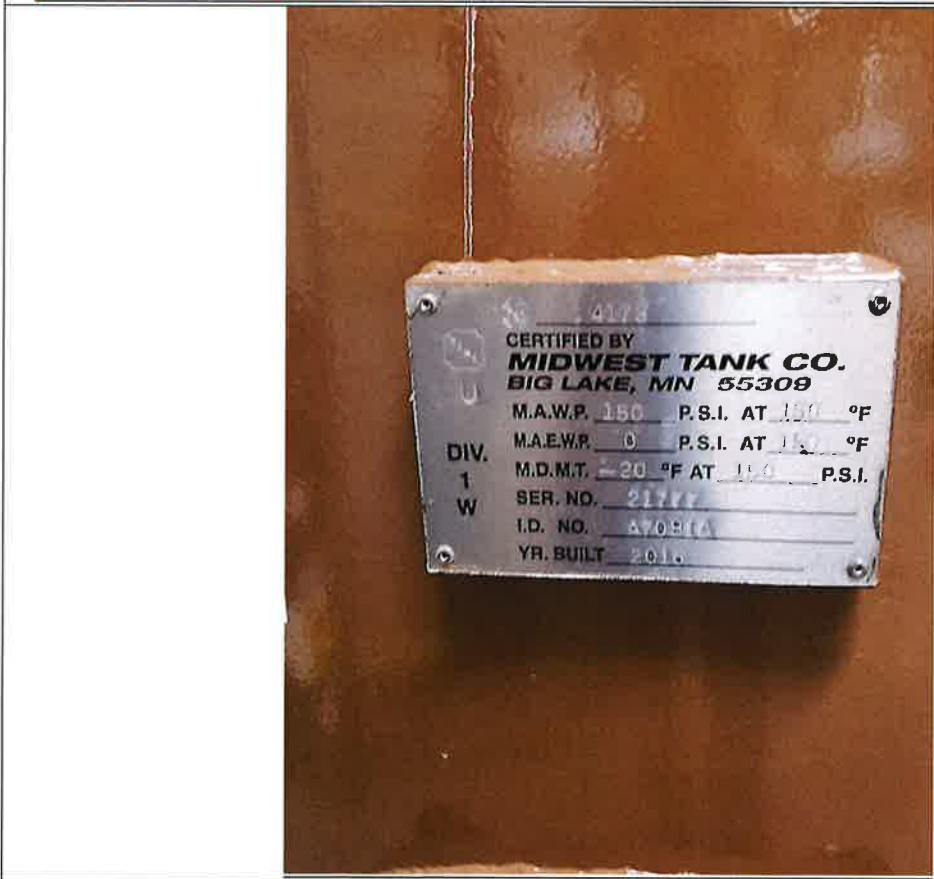
Tag located on the well casing. No well tag was found. Identified as D0064700 (modified well).



Operating pressure at well head.



Amtrol pressure tank specs.



Carbonair sand filter specs.



Intake to mechanical room inside the Aquatic Center.



Geothermal water is ran through a pressure tank and/or sand filter before being used.



Heat exchanger and sand filter for the pool system. Grey pipe is water in. White pipe is water out of the exchanger to the pools.



Heat exchanger is used to heat pool water. Pool water from the geothermal well is only used to maintain pool elevations.



Pressure gauge
and
thermometers
on inlet pipe.



Sondex, Inc
exchanger
specs.



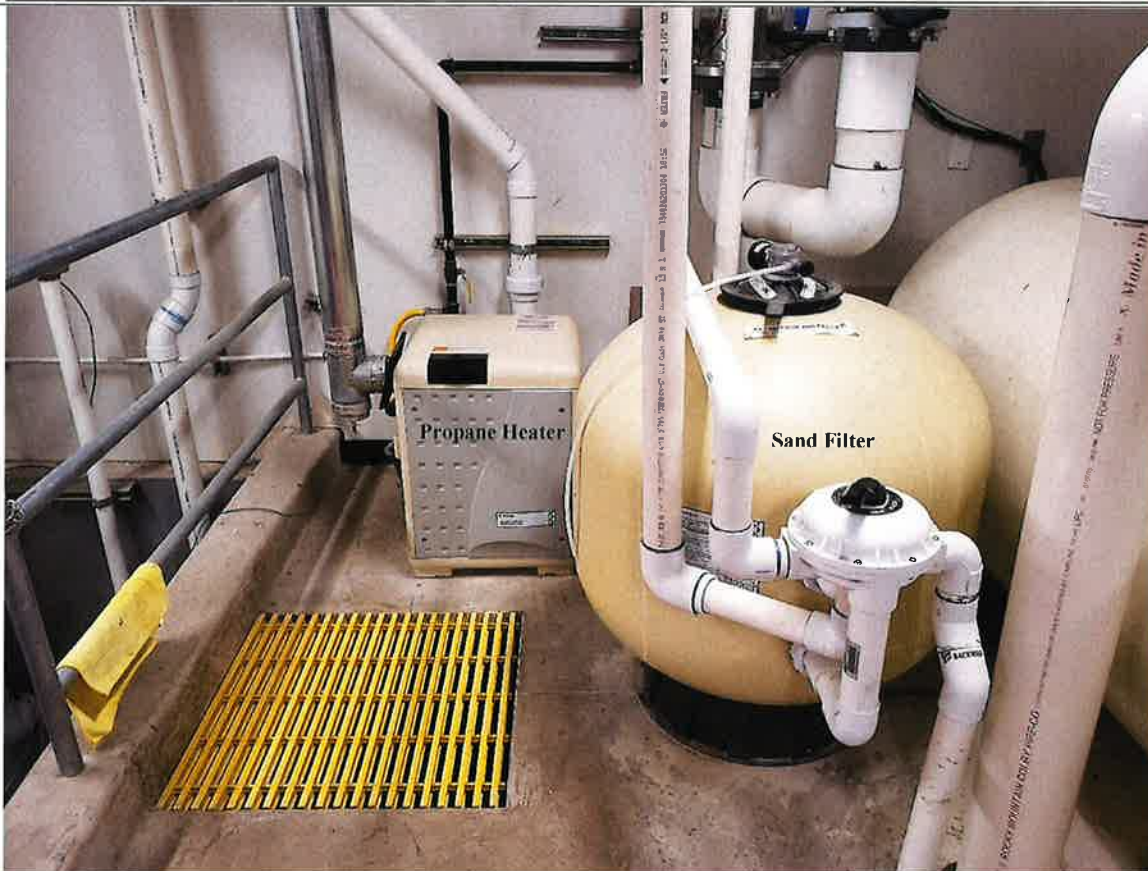
Inlet water
~99° F



Inlet water
~100° F



THS Series sand filter for the pool system.



Propane heater and sand filter for the therapy pool.



Pumps used to circulate water in each pool.



Geothermal discharge from the heating system.



Flow meter that measures final discharge. During the field exam, the reading was ~150 gpm. The highest reading the operators have seen is ~200 gpm.



Buried line runs along the west side of the Aquatic Center from the mechanical room to this ditch. Water flows through two ponds before dumping into the North Fork of the Payette River.



Water flows
from the ditch
into the first
pond.



Second pond
that holds the
geothermal
water before it
releases in to the
river.



Once the pond reaches a certain elevation, water is released in to another ditch that empties into the river.



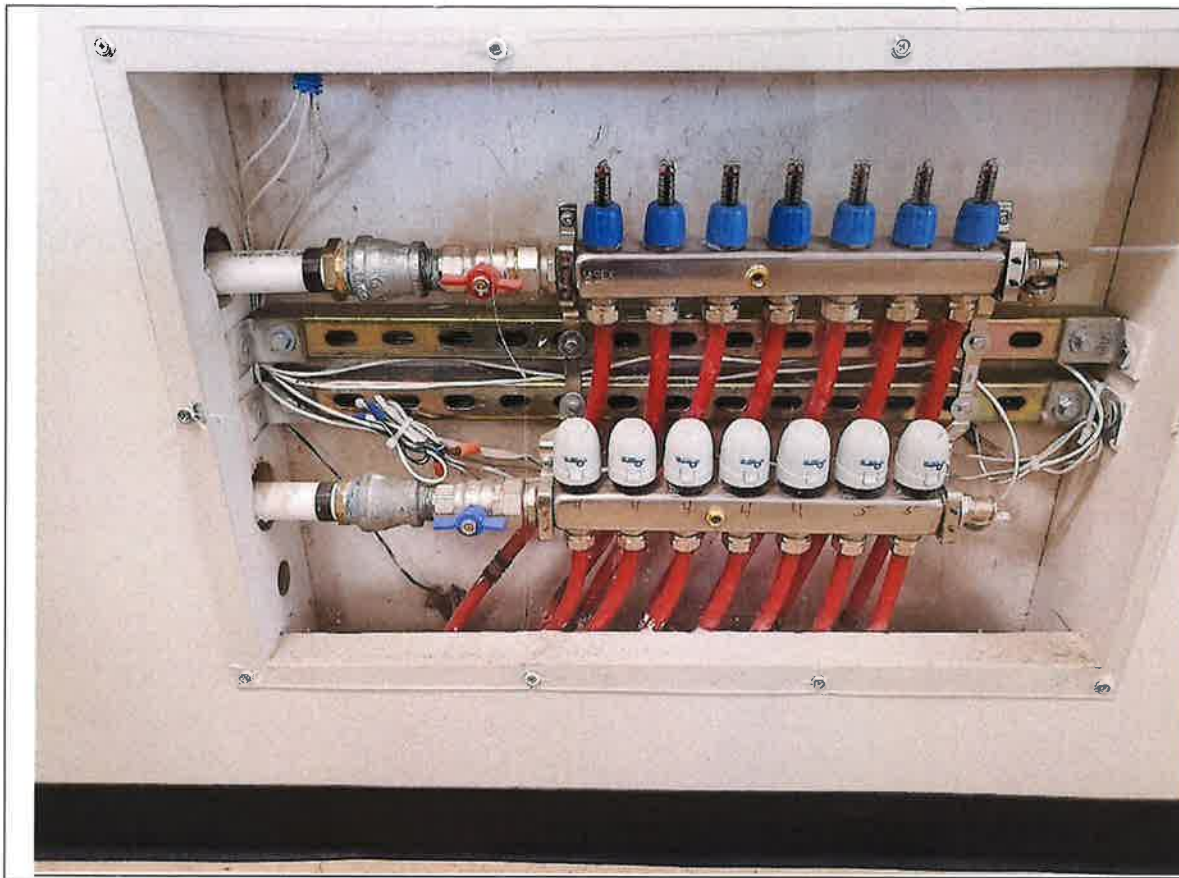
Discharge into the North Fork of the Payette River.



The west side of the Aquatic Center that has heating coils in the concrete slab.



Aquatic Center entrance that has heating coils in the concrete slab.



Control panel
for one of the
floor heating
sections.



Thermostat for
the floor
heating.



Geothermal heated showers outside at the pool deck area.



Big pool.
Capacity of
142,000 gallons.



Therapy pool.
Capacity of
3,570 gallons.



A tent is placed
over the pool
during the
winter months
to allow year
round access.

Flow Meter Reading Log for WR Permit No. 65-23529

Created By: Aaron Skinner Water Resource Agent, Sr.

Date	Meter #1 (gallons)	Gallons Used #1	# of Days	GPD #1	Meter #2 (gallons)	Gallons Used #2	GPD #2	Total (gal.)
8/22/2018	168,001				129,003			
8/23/2018	168,082	81	1	81.00	129,137	134	134.00	215
8/25/2018	168,319	237	2	118.50	129,623	486	243.00	362
8/29/2018	168,717	398	4	99.50	129,993	370	92.50	192
9/1/2018	169,107	390	3	130.00	130,088	95	31.67	162
9/5/2018	169,692	585	4	146.25	130,275	187	46.75	193
9/6/2018	169,804	112	1	112.00	130,305	30	30.00	142
9/7/2018	169,858	54	1	54.00	130,466	161	161.00	215
9/8/2018	169,933	75	1	75.00	130,572	106	106.00	181
9/11/2018	170,204	271	3	90.33	131,036	464	154.67	245
9/12/2018	170,360	156	1	156.00	131,141	105	105.00	261
9/13/2018	170,443	83	1	83.00	131,166	25	25.00	108
9/18/2018	173,030	2,587	5	517.40	131,275	109	21.80	539
9/25/2018	173,631	601	7	85.86	132,365	1,090	155.71	242
9/26/2018	173,746	115	1	115.00	132,485	120	120.00	235
9/27/2018	173,833	87	1	87.00	132,584	99	99.00	186
10/1/2018	174,180	347	4	86.75	133,414	830	207.50	294
10/2/2018	174,273	93	1	93.00	133,645	231	231.00	324
10/5/2018	174,569	296	3	98.67	134,247	602	200.67	299
10/8/2018	175,007	438	3	146.00	134,777	530	176.67	323
10/19/2018	175,974	967	11		135,795	1,018		

#	Flow meter Readings	date
1	168001 -	8/22/18
2	12903 12903	8/22/18
1	168082 -	8/23/18
2	129137 129137 -	8/23/18
1	168319	8/25/18
2	129623	8/25/18
1	168606	8/28/18
2	129845	8/28/18
1	168717 -	8/29/18
2	129993 129993 -	8/29/18
	635 776 856 = 1491	
1	169107	9/1/18
2	130088	9/1/18
1	169692	9/5/18
2	130275	9/5/18
1	169804	9/6/18
2	130305	9/6/18
1	169858	9/7/18
2	130466	9/7/18
1	169933	9/8/18
2	130572	9/8/18
1	170204	9/11/18
2	131036	9/11/18
	(1097) 948 = 2045	
1	170360	9/12/18
2	131141 131141	9/12/18
1	170443	9/13/18
1	131166	9/13/18

#	Flow meter	Readings	date
1	173030		9/18/18
2		131275	9/18/18
1	173631		9/25/18
2		132365	9/25/18
1	173746		9/26/18
2		132485	9/26/18
1	173833		9/27/18
2		132584	9/27/18
1	174180		10/1/18
2		133414	10/1/18
1	174273		10/2/18
2		133645	10/2/18
1	174569		10/5/18
2		134247	10/5/18
1	175007		10/8/18
2		134777	10/8/18
1	175974		10/19/18
2		135795	10/19/18

Skinner, Aaron

From: patty@cascaderec.org
Sent: Thursday, January 10, 2019 2:43 PM
To: Skinner, Aaron
Subject: Re: Well Pump for Geothermal

Hi Aaron,

I apologize for the delay in getting back to you. The only information I could find is that we did put in a variable speed drive sometime around 2013, but to my knowledge and my current Board President's knowledge that was the only change made.

Please let me know if I can be of further assistance.

Patty

Quoting "Skinner, Aaron" <Aaron.Skinner@idwr.idaho.gov>:

Patty,

I spoke with Bob Gestrin who expanded the well depth to 245 feet back in 2013. To the best of his knowledge, the existing pump was a 30 horse power (Hp) pump rated at 300 gallons per minute (gpm). Bob also said Gem Pump submitted a bid around that time to replace the pump. I contacted Gem Pump who said they did not end up doing any of the work. Do you or any of the Board Members know if the 30 Hp pump was replaced with a different rated pump around 2013? All my calculations reflect the 300 gpm pump. Please let me know at your convenience if any knowledge differs than what I've explained here.

Thank you,

Skinner, Aaron

From: patty@cascaderec.org
Sent: Thursday, November 01, 2018 2:53 PM
To: Skinner, Aaron
Subject: Re:

Hi Aaron,

I spoke with Doug to confirm calculations and we came up with about 20,000 square feet of area that is heated (our upstairs uses geothermal heat as well as all of our decking).

As far as the meters, the one circled in your attachment measures the total geothermal water and the second meter measures geothermal water for showers, washing machine, toilet etc that flow to the city sewer system.

I hope this helps! Please let me know if there are further questions.

Thanks!

Patty

Quoting "Skinner, Aaron" <Aaron.Skinner@idwr.idaho.gov>:

Patty,

Thank you for the flow meter numbers. I've calculated daily usage to better understand the rec centers use. I do have a couple questions I was hoping you or the maintenance guys can answer below.

- I calculated the footprint of the aquatic center to be ~5,200 ft² using the heating loop map that was provided during our field exam. The original application referenced a 22,000 ft² building. Will you please verify the square footage of the heating area (building, snowmelt areas, pool area, etc.)? The formula to calculate a volume limit on the water right license is dependent of the square footage, so I want to make sure I'm accurate.
- The flow records we received identify two meters. Will you please let explain the location of each meter and what water they are measuring?

- I've attached a picture of the totalizer (circled in yellow) I remember from our visit, which measured flow that was sent to the City of Cascade's system.

Any help is appreciated.

Best,

Aaron Skinner

Idaho Department of Water Resources

Water Resource Agent, Sr.

(208) 334-2190

aaron.skinner@idwr.idaho.gov

Patty Wold
District Manager
Cascade Aquatic and Recreation Center
333 Kelly's Parkway
P.O. Box 723
Cascade, ID 83611
208-382-5136
CascadeRec.org

[Facebook/SVCRD](#)



State of Idaho

DEPARTMENT OF WATER RESOURCES

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

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

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

July 30, 2018

COPY

SOUTHERN VALLEY COUNTY RECREATION DISTRICT
PO BOX 723
CASCADE, ID 83611

RE: Scheduling Field Exam for Water Right Permit No. 65-23529

Dear Permit Holder:

We are planning to conduct water right examinations in the vicinity of the above-referenced permit **this season**. An examination is needed to verify the water use in order to issue a water right license.

The above-referenced permit authorizes **1.40 cfs of GROUND WATER** for **HEATING AND MUNICIPAL** use. **If you have developed a beneficial use and still own the place of use property, please contact me at your earliest convenience to schedule an examination.**

If you did not develop a beneficial use of water under the permit during the beneficial use period, a license cannot be issued and the permit should be relinquished. If that use was developed, but have ceased using the water and you currently carry no interest in it, please relinquish the permit by submitting the enclosed Relinquishment of Permit form (no fee required).

Please contact me within the next thirty (30) days at (208) 334-2190 to either schedule an examination or submit a relinquishment form. If the Department does not received a response by August 31, 2018, your permit will become void. Thank you for your attention to this matter.

Sincerely,

Aaron Skinner
Water Resource Agent
Idaho Department of Water Resources
Phone: (208) 334-2190
Email: aaron.skinner@idwr.idaho.gov

Enclosures: Relinquishment of Permit form
Water Permit Report and Map