

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 36-17002
Exam Date: 02/06/2020

1. Current Owner:

AMERICAN FALLS ABERDEEN GROUND WATER DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391 AND
SOUTHWEST IRRIGATION DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391 AND
CAREY VALLEY GROUND WATER DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391 AND
HENRYS FORK GROUND WATER DISTRICT PO BOX 15 SAINT ANTHONY ID 83445-0015 AND
BINGHAM GROUND WATER DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391 AND
MAGIC VALLEY GROUND WATER DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391 AND
NORTH SNAKE GROUND WATER DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391 AND
MADISON GROUND WATER DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391 AND
BONNEVILLE JEFFERSON GROUND WATER DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391 AND
JEFFERSON CLARK GROUND WATER DISTRICT C/O RANDALL C BUDGE
PO BOX 1391 POCATELLO ID 83204-1391

2. Accompanied by: Tom Van Tassel, Hatchery Manager

Phone No: 208-421-8575

Address: 4074 N 2000 E, Filer ID 83328

Relationship to permit Holder: Works for Riverence, the company leasing the facility from I.G.W.A.

3. **SOURCE:**

BILLINGSLEY CREEK
SPRINGS

Tributary

SNAKE RIVER
BILLINGSLEY CREEK

Method of Determination: On-site inspection**B. OVERLAP REVIEW**

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

YES Overlap

Water Right No.	Source	Purpose of Use	Basis
36-2551	Marten-Curren Tunnel	Fish Propagation	Decreed
36-7694	Marten-Curren Tunnel	Fish Propagation	Decreed
36-15501	Marten-Curren Tunnel	Fish Propagation	Decreed
36-17028	Thousand Springs	Fish Propagation/Mitigation	Decreed

Comments: Delivery of 36-17028 was discontinued in early 2017.

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

NO Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A			

Comments: _____

C. DIVERSION AND DELIVERY SYSTEM

1. LOCATION OF POINT(S) OF DIVERSION:

BILLINGSLEY CREEK SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$, Sec. 32, Twp 07S, Rge 14E, B.M. GOODING County
 SPRINGS SE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$, Sec. 32, Twp 07S, Rge 14E, B.M. GOODING County

Method of Determination:

PLACE OF USE: FISH PROPAGATION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
07S	14E	31			X	X													

Method of Determination: Aerial imagery and on-site inspection

3.

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

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

☒ Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Diversion Description
WMIS 410303	Spring collection box below Curren Tunnel
WMIS 410089	Intake pipe below bridge

D. FLOW MEASUREMENTS – estimates of flows are based on telemetry data reported from Curren Tunnel (Aqua Info) & flow data reported to Water District 36A (Water District Diversion Database) during the beneficial use development period (2014-2019)

E. FLOW CALCULATIONS

☒ Additional Computation Sheets Attached

Maximum flow was determined by examining "Annual Water District 36-A Summary Sheets" for flow measurements at the Rangen Hatchery and noting that the November 2018 period was the highest flows reported. Note that this data represents flow at the tail end of the raceways (combined Curren Tunnel flows and 36-17002 flows). An adjustment was made to account for water potentially provided by the Curren Tunnel. Aqua Info flow data for the Curren Tunnel (obtained from the IDWR website) minus the amount that was required to satisfy senior rights from the Curren Tunnel (10.4 cfs during the 2/15 – 11/30 irrigation season) was used for this adjustment. The results of this effort are shown in Attachment # 1. Note that "WD36-A Rangen Hatchery" flows reflect actual data values rather than the rounded values shown in the "Annual Water District 36-A Summary Sheets". As shown on Attachment # 1, the 36-17002 permitted flow of 21.8 cfs was exceeded for the entire month of November 2018.

F. VOLUME CALCULATIONS

The daily net flow rate from the year with the highest reported volume (2019 per "Annual Water District 36-A Summary Sheets") was used to calculate the volume for the entire year based on the following: (daily net flow rate) x 1.9835; daily volume results were then added together for the entire year resulting in a volume of 11,697.15 af. (See Attachment #2).

G. NARRATIVE/REMARKS/COMMENTS

On 2/6/2020, I met with Tom Van Tassel the facility manager; Frank Erwin, former Watermaster for Water District 36A along with the owners of Riverence and several staff from the facility. We toured the facility and then we walked up to the Curren Tunnel to look at all the diversions and pipelines that divert water there. After the tour, Tom asked "what happens next?" I replied that if the flow data was available, my only major concern was the lack of a proper measuring device as required by condition 01J on the permit stating "Prior to diversion of water under this right, the right holder shall install and maintain a measuring device and lockable controlling works of a type acceptable to the Department as part of the control works." The owners replied by telling me since they were leasing the facility, they weren't sure exactly who would be responsible for installing a measuring device, but controlling works were already in place (valves on the pipelines and a check dam at the bridge diversion). I told them the Department would contact IGWA about the measuring device. Frank told me that flows through the facility were estimated by measuring over the boards on the downstream end of the runways just before the water is returned to the creek and that flow data was available.

It should be noted that the elements and conditions of this permit are stipulated in an order issued to resolve protests filed against the original application for permit that was filed by Rangen Inc. This right is conditioned to be "subordinate to all future water rights, other than those for fish propagation, wildlife, recreation, aesthetic, or hydropower uses" and "shall not give rise to any claim against any future rights for the use of water, other than those" previously stated.

This permit accounts for the water that is diverted into the facility from springs and Billingsley Creek. The other fish propagation water rights at this facility list the Martin-Curren Tunnel as their source of water. So, this right will cover water from all other sources utilized for fish propagation at this facility. During the tour of the facility, I observed that the points of diversion for this water right appear to be correct in both location and source description.

The water delivery system (see system diagram) starts at the Curren Tunnel diversion, where two 24" pipes carry water down to a large collection box (which is the springs POD for this right) where additional spring water is also collected. Two pipes then exit the diversion box and deliver water down to the hatch house (one pipe is 12" and the other is 24" in diameter). There are valves on the two pipelines just before they enter the hatch house. From the Hatch house, there is a buried pipeline that carries water to the upper raceways and then another pipeline carries the water from the upper raceways to the middle raceways. The size of these two pipelines is unknown. There is also a 36" diameter pipeline that carries Billingsley Creek water from the bridge diversion down to the middle raceways where the water enters on the north side of the raceways. The middle and lower raceways are connected by underground pipes, that again the diameter of the pipes is unknown. At the bottom end of the lower raceways, the water is diverted back into the Billingsley Creek Channel.

On 8/31/2021, I was informed by David Graybill, IDWR Distribution Staff, that SPF Engineering had completed the installation of two weirs at the facility (see attached Memorandum). I contacted Riverence and planned to go meet with Phil Henderson on the morning of 9/9/2021 to inspect the measuring devices. What I found were two 4.5' contracted rectangular weirs at the lower end of two lower raceways. The weirs had been constructed from metal plates that spanned the lower end of the raceways. They appeared to be functioning properly, with nice aeration beneath the nappe (the sheet of water flowing

over the weir crest). I read the depth of water on the staff gauges and using the flow table provided by SPF Engineering, arrived at a total flow of 16.73 cfs. With the installation of the weirs completed, the measuring device condition is satisfied, and this permit can move forward to licensing. The SPF Engineering memo titled "Completion of Rangen Hatchery Measuring Device(s)" is attached to this report.

Based on the net flow calculated from the data available from the water district and telemetric data from the Curren Tunnel during the development period (2014-2019), I recommend licensing this right with the permitted flow rate of 21.80 cfs and an annual volume of 11,697.15 af.

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>
FISH PROPAGATION	01/01 to 12/31	21.80 CFS	11,697.15 AF

Totals: 21.80 CFS 11,697.15 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

Bill Mills - Water Resource Agent, Senior

Field Examiner's Name Bill Mills Date 9-14-21

Reviewer _____ Date _____



Figure 1: Lower Collection Box (notice the 2 pipes diverting water into box and the two diverting water out)



Figure 2: Pipelines from collection box that divert into hatch house.



Figure 3: Bridge diversion (grated pipe intake) and check dam.



Figure 4: Middle raceway on north end where water diverted from Billingsley Creek enters system



Figure 5: Middle raceways



Figure 6: Lower Raceways prior to weir installation



Figure 7: The 4.5' contracted rectangular weirs



Figure 8: water flowing over south weir out to Billingsley Creek

System Diagram



Attachment #1:

Current Tunnel Flow

(from Aqua Info)

WD 36-A Rangen Hatchery

(Tail end of raceways flow)

<u>Date</u>		<u>(Sr. Water Rights)</u>	<u>Remaining Flow</u>		<u>Hatchery minus remaining flow</u>
10/30/2018	12.62002251	-10.4	2.22	24.17	21.95
10/31/2018	12.43354407	-10.4	2.03	24.30	22.27
11/1/2018	12.2612573	-10.4	1.86	24.42	22.56
11/2/2018	12.18992207	-10.4	1.79	24.54	22.75
11/3/2018	12.0874624	-10.4	1.69	24.66	22.97
11/4/2018	11.94957526	-10.4	1.55	24.79	23.24
11/5/2018	11.96454271	-10.4	1.56	24.91	23.35
11/6/2018	11.91546985	-10.4	1.52	24.89	23.37
11/7/2018	11.80861028	-10.4	1.41	24.88	23.47
11/8/2018	11.58796848	-10.4	1.19	24.86	23.67
11/9/2018	11.44982347	-10.4	1.05	24.85	23.80
11/10/2018	11.3370883	-10.4	0.94	24.83	23.89
11/11/2018	11.28851984	-10.4	0.89	24.82	23.93
11/12/2018	11.12910557	-10.4	0.73	24.80	24.07
11/13/2018	10.8660011	-10.4	0.47	24.84	24.37
11/14/2018	10.78065951	-10.4	0.38	24.87	24.49
11/15/2018	10.75721021	-10.4	0.36	24.91	24.55
11/16/2018	10.74112193	-10.4	0.34	24.94	24.60
11/17/2018	10.70450639	-10.4	0.30	24.98	24.68
11/18/2018	10.67891259	-10.4	0.28	25.01	24.73
11/19/2018	10.57343276	-10.4	0.17	25.05	24.88
11/20/2018	10.51976749	-10.4	0.12	25.08	24.96
11/21/2018	10.44897678	-10.4	0.05	25.07	25.02
11/22/2018	10.39175242	-10.4	-0.01	25.07	25.08
11/23/2018	10.25085813	-10.4	-0.15	25.06	25.21

11/24/2018	10.50371319	-10.4	0.10	25.06	24.96
11/25/2018	10.38454232	-10.4	-0.02	25.05	25.07
11/26/2018	10.22918389	-10.4	-0.17	25.05	25.22
11/27/2018	10.15602975	-10.4	-0.24	25.04	25.28
11/28/2018	10.19300316	-10.4	-0.21	25.02	25.23
11/29/2018	10.24780291	-10.4	-0.15	25.01	25.16
11/30/2018	10.3200088	-10.4	-0.08	24.99	25.07

Annual Summary for Water District 36A Billingsley Creek 360410089 - D - RANGEN HATCHERY

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR 01/01/2015 - 12/31/2015

c - Calculated, e - Estimated, i - Interpolated, m - Measured and n - Not Specified

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	13.6 ^e	12.2 ⁱ	17.2 ⁱ	15.1 ⁱ	14.7 ⁱ	15.0 ^m	14.5 ⁱ	15.5 ⁱ	15.7 ⁱ	17.6 ⁱ	18.7 ⁱ	13.3 ⁱ
2	13.5 ⁱ	12.1 ^m	17.2 ^m	14.9 ⁱ	14.5 ⁱ	15.0 ⁱ	14.5 ⁱ	15.5 ⁱ	15.7 ⁱ	17.5 ⁱ	18.8 ^m	13.3 ⁱ
3	13.4 ⁱ	12.9 ⁱ	17.3 ⁱ	14.7 ⁱ	14.3 ⁱ	14.9 ⁱ	14.5 ⁱ	15.5 ^m	15.7 ⁱ	17.4 ⁱ	18.1 ⁱ	13.2 ⁱ
4	13.3 ⁱ	13.7 ⁱ	17.3 ⁱ	14.5 ⁱ	14.1 ^m	14.9 ⁱ	14.4 ⁱ	15.5 ⁱ	15.7 ⁱ	17.3 ⁱ	17.5 ⁱ	13.1 ⁱ
5	13.2 ^m	14.5 ⁱ	17.4 ⁱ	14.3 ⁱ	14.2 ⁱ	14.9 ⁱ	14.4 ⁱ	15.6 ⁱ	15.7 ⁱ	17.2 ^m	16.8 ⁱ	13.1 ⁱ
6	13.2 ⁱ	15.3 ⁱ	17.5 ⁱ	14.1 ^m	14.3 ⁱ	14.8 ⁱ	14.4 ^m	15.6 ⁱ	15.7 ⁱ	17.3 ⁱ	16.1 ⁱ	13.0 ⁱ
7	13.1 ⁱ	16.1 ⁱ	17.5 ⁱ	14.1 ⁱ	14.5 ⁱ	14.8 ⁱ	14.5 ⁱ	15.7 ⁱ	15.7 ^m	17.4 ⁱ	15.5 ⁱ	13.0 ^m
8	13.1 ⁱ	16.9 ⁱ	17.6 ⁱ	14.1 ⁱ	14.6 ⁱ	14.8 ^m	14.6 ⁱ	15.7 ⁱ	15.6 ⁱ	17.5 ⁱ	14.8 ⁱ	13.0 ⁱ
9	13.0 ⁱ	17.7 ^m	17.6 ^m	14.1 ⁱ	14.7 ⁱ	14.9 ⁱ	14.6 ⁱ	15.7 ⁱ	15.5 ⁱ	17.6 ⁱ	14.2 ^m	13.0 ⁱ
10	13.0 ⁱ	17.6 ⁱ	17.5 ⁱ	14.1 ⁱ	14.8 ⁱ	15.1 ⁱ	14.7 ⁱ	15.8 ^m	15.5 ⁱ	17.7 ⁱ	14.2 ⁱ	13.1 ⁱ
11	12.9 ⁱ	17.6 ⁱ	17.5 ⁱ	14.2 ⁱ	14.9 ^m	15.2 ⁱ	14.8 ⁱ	15.6 ⁱ	15.4 ⁱ	17.7 ⁱ	14.2 ⁱ	13.1 ⁱ
12	12.9 ^m	17.5 ⁱ	17.4 ⁱ	14.2 ⁱ	14.9 ⁱ	15.4 ⁱ	14.9 ⁱ	15.4 ⁱ	15.3 ⁱ	17.8 ^m	14.2 ⁱ	13.1 ⁱ
13	12.8 ⁱ	17.4 ⁱ	17.4 ⁱ	14.2 ^m	14.9 ⁱ	15.5 ⁱ	14.9 ^m	15.2 ⁱ	15.2 ⁱ	17.8 ⁱ	14.2 ⁱ	13.1 ⁱ
14	12.8 ⁱ	17.3 ⁱ	17.3 ⁱ	14.2 ⁱ	14.9 ⁱ	15.6 ⁱ	15.0 ⁱ	15.1 ⁱ	15.1 ^m	17.8 ⁱ	14.2 ⁱ	13.1 ^m
15	12.7 ⁱ	17.2 ⁱ	17.2 ⁱ	14.1 ⁱ	14.9 ⁱ	15.8 ^m	15.1 ⁱ	14.9 ⁱ	15.7 ⁱ	17.8 ⁱ	14.1 ⁱ	13.1 ⁱ
16	12.7 ⁱ	17.2 ^m	17.2 ^m	14.1 ⁱ	14.9 ⁱ	15.8 ⁱ	15.1 ⁱ	14.7 ⁱ	16.2 ⁱ	17.9 ⁱ	14.1 ^m	13.0 ⁱ
17	12.6 ⁱ	17.3 ⁱ	17.1 ⁱ	14.0 ⁱ	14.9 ⁱ	15.7 ⁱ	15.2 ⁱ	14.5 ^m	16.7 ⁱ	17.9 ⁱ	14.1 ⁱ	13.0 ⁱ
18	12.6 ⁱ	17.3 ⁱ	17.1 ⁱ	14.0 ⁱ	14.9 ^m	15.7 ⁱ	15.3 ⁱ	14.7 ⁱ	17.3 ⁱ	17.9 ⁱ	14.0 ⁱ	12.9 ⁱ
19	12.5 ^m	17.4 ⁱ	17.0 ⁱ	13.9 ⁱ	15.0 ⁱ	15.6 ⁱ	15.4 ⁱ	14.8 ⁱ	17.8 ^m	17.9 ^m	14.0 ⁱ	12.9 ⁱ
20	12.5 ⁱ	17.5 ⁱ	17.0 ⁱ	13.9 ^m	15.0 ⁱ	15.6 ⁱ	15.5 ^m	15.0 ⁱ	17.8 ⁱ	17.9 ⁱ	13.9 ⁱ	12.9 ⁱ
21	12.5 ⁱ	17.5 ⁱ	16.9 ⁱ	14.1 ⁱ	15.1 ⁱ	15.5 ⁱ	15.5 ⁱ	15.2 ⁱ	17.9 ⁱ	18.0 ⁱ	13.9 ⁱ	12.8 ^m
22	12.5 ⁱ	17.6 ⁱ	16.8 ⁱ	14.3 ⁱ	15.2 ⁱ	15.5 ^m	15.5 ⁱ	15.4 ⁱ	17.9 ⁱ	18.0 ⁱ	13.8 ⁱ	12.8 ⁱ
23	12.5 ⁱ	17.6 ^m	16.8 ^m	14.5 ⁱ	15.2 ⁱ	15.4 ⁱ	15.5 ⁱ	15.5 ⁱ	18.0 ⁱ	18.0 ⁱ	13.8 ^m	12.7 ⁱ
24	12.6 ⁱ	17.5 ⁱ	16.6 ⁱ	14.8 ⁱ	15.3 ⁱ	15.2 ⁱ	15.5 ⁱ	15.7 ^m	18.0 ⁱ	18.0 ⁱ	13.7 ⁱ	12.7 ⁱ
25	12.6 ⁱ	17.5 ⁱ	16.4 ⁱ	15.0 ⁱ	15.4 ^m	15.1 ⁱ	15.5 ⁱ	15.7 ⁱ	18.1 ⁱ	18.1 ⁱ	13.7 ⁱ	12.7 ⁱ
26	12.6 ^m	17.4 ⁱ	16.2 ⁱ	15.2 ⁱ	15.4 ⁱ	15.0 ⁱ	15.5 ⁱ	15.7 ⁱ	18.1 ^m	18.1 ^m	13.6 ⁱ	12.7 ⁱ
27	12.5 ⁱ	17.4 ⁱ	16.0 ⁱ	15.4 ^m	15.3 ⁱ	14.8 ⁱ	15.5 ^m	15.7 ⁱ	18.0 ⁱ	18.2 ⁱ	13.6 ⁱ	12.6 ⁱ
28	12.5 ⁱ	17.3 ⁱ	15.8 ⁱ	15.2 ⁱ	15.2 ⁱ	14.7 ⁱ	15.5 ⁱ	15.7 ⁱ	17.9 ⁱ	18.3 ⁱ	13.5 ⁱ	12.6 ^m
29	12.4 ⁱ	--	15.6 ⁱ	15.0 ⁱ	15.2 ⁱ	14.5 ^m	15.5 ⁱ	15.7 ⁱ	17.8 ⁱ	18.4 ⁱ	13.4 ⁱ	12.6 ⁱ
30	12.3 ⁱ	--	15.5 ⁱ	14.8 ⁱ	15.1 ⁱ	14.5 ⁱ	15.5 ⁱ	15.7 ⁱ	17.7 ⁱ	18.5 ⁱ	13.4 ⁱ	12.6 ⁱ
31	12.3 ⁱ	--	15.3 ⁱ	--	15.1 ⁱ	--	15.5 ⁱ	15.7 ⁱ	--	18.6 ⁱ	--	12.6 ^e
Total:	396.5	462.4	524.2	433.1	461.3	455.0	466.5	477.6	498.3	553.1	442.0	400.6
Mean:	12.8	16.5	16.9	14.4	14.9	15.2	15.1	15.4	16.6	17.8	14.7	12.9
Min:	12.3	12.1	15.3	13.9	14.1	14.5	14.4	14.5	15.1	17.2	13.4	12.6
Max:	13.6	17.7	17.6	15.4	15.4	15.8	15.5	15.8	18.1	18.6	18.8	13.3
AC-FT:	786.4	917.1	1039	859.0	915.0	902.5	925.3	947.3	988.5	1096	876.7	794.6

CALENDAR YEAR 01/01/2015 - 12/31/2015

TOTAL CFS: 5570

TOTAL AC-FT: 11049

Annual Summary for Water District 36A Billingsley Creek 360410089 - D - RANGEN HATCHERY

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR 01/01/2016 - 12/31/2016

c - Calculated, e - Estimated, i - Interpolated, m - Measured and n - Not Specified

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	12.6 ^e	13.0 ^m	14.6 ⁱ	14.6 ⁱ	14.6 ⁱ	17.0 ⁱ	16.4 ⁱ	17.6 ^m	18.2 ⁱ	19.4 ⁱ	16.7 ⁱ	16.1 ⁱ
2	12.7 ⁱ	13.3 ⁱ	14.6 ⁱ	14.5 ⁱ	14.4 ^m	17.1 ⁱ	16.4 ⁱ	17.5 ^e	18.3 ⁱ	19.5 ⁱ	16.3 ⁱ	16.1 ⁱ
3	12.8 ⁱ	13.6 ⁱ	14.7 ⁱ	14.4 ⁱ	14.5 ⁱ	17.1 ⁱ	16.5 ⁱ	17.3 ⁱ	18.3 ⁱ	19.6 ⁱ	16.0 ⁱ	16.1 ⁱ
4	12.9 ^m	13.9 ⁱ	14.7 ⁱ	14.4 ^m	14.7 ⁱ	17.2 ⁱ	16.5 ^m	17.2 ^e	18.4 ⁱ	19.7 ⁱ	15.6 ⁱ	16.0 ⁱ
5	13.0 ⁱ	14.2 ⁱ	14.7 ⁱ	14.4 ⁱ	14.8 ⁱ	17.3 ⁱ	16.6 ⁱ	17.1 ⁱ	18.4 ^m	19.7 ⁱ	15.2 ⁱ	16.0 ^m
6	13.1 ⁱ	14.5 ⁱ	14.7 ⁱ	14.4 ⁱ	14.9 ⁱ	17.4 ^m	16.6 ⁱ	16.9 ⁱ	18.3 ⁱ	19.8 ⁱ	14.8 ⁱ	15.9 ⁱ
7	13.2 ⁱ	14.8 ⁱ	14.7 ^m	14.4 ⁱ	15.0 ⁱ	17.5 ⁱ	16.7 ⁱ	16.8 ⁱ	18.2 ⁱ	19.9 ^m	14.4 ^m	15.9 ⁱ
8	13.3 ⁱ	15.1 ^m	14.7 ⁱ	14.5 ⁱ	15.2 ⁱ	17.7 ⁱ	16.8 ⁱ	16.6 ^m	18.1 ⁱ	19.9 ⁱ	14.6 ⁱ	15.8 ⁱ
9	13.4 ⁱ	15.1 ⁱ	14.7 ⁱ	14.5 ⁱ	15.3 ^m	17.8 ⁱ	16.8 ⁱ	16.7 ⁱ	17.9 ⁱ	19.8 ⁱ	14.8 ⁱ	15.7 ⁱ
10	13.5 ⁱ	15.1 ⁱ	14.7 ⁱ	14.5 ⁱ	15.4 ⁱ	17.9 ⁱ	16.9 ⁱ	16.8 ⁱ	17.8 ⁱ	19.8 ^m	15.1 ⁱ	15.6 ⁱ
11	13.6 ^m	15.0 ⁱ	14.7 ⁱ	14.5 ^m	15.4 ⁱ	18.1 ⁱ	17.0 ^m	16.9 ⁱ	17.7 ⁱ	19.9 ⁱ	15.3 ⁱ	15.6 ⁱ
12	13.6 ⁱ	15.0 ⁱ	14.7 ⁱ	14.5 ⁱ	15.5 ⁱ	18.2 ⁱ	16.9 ⁱ	17.0 ⁱ	17.6 ^m	19.9 ⁱ	15.5 ⁱ	15.5 ^m
13	13.6 ⁱ	15.0 ⁱ	14.7 ⁱ	14.4 ⁱ	15.6 ⁱ	18.3 ^m	16.8 ⁱ	17.2 ⁱ	17.6 ⁱ	20.0 ⁱ	15.7 ⁱ	15.4 ⁱ
14	13.5 ⁱ	15.0 ⁱ	14.8 ^m	14.4 ⁱ	15.6 ⁱ	18.2 ⁱ	16.7 ⁱ	17.3 ⁱ	17.7 ⁱ	20.0 ⁱ	15.9 ^m	15.4 ⁱ
15	13.5 ⁱ	14.9 ^m	14.8 ⁱ	14.4 ⁱ	15.7 ⁱ	18.0 ⁱ	16.6 ⁱ	17.4 ^m	17.7 ⁱ	20.1 ⁱ	15.9 ⁱ	15.3 ⁱ
16	13.5 ⁱ	15.0 ⁱ	14.7 ⁱ	14.3 ⁱ	15.7 ^m	17.9 ⁱ	16.5 ⁱ	17.5 ⁱ	17.7 ⁱ	20.1 ⁱ	15.9 ⁱ	15.2 ⁱ
17	13.5 ⁱ	15.1 ⁱ	14.7 ⁱ	14.3 ⁱ	15.9 ⁱ	17.7 ⁱ	16.4 ⁱ	17.5 ⁱ	17.8 ⁱ	20.2 ^e	16.0 ⁱ	15.2 ⁱ
18	13.5 ^m	15.1 ⁱ	14.6 ⁱ	14.3 ^m	16.1 ⁱ	17.6 ⁱ	16.3 ^m	17.6 ⁱ	17.8 ⁱ	20.2 ⁱ	16.0 ⁱ	15.1 ⁱ
19	13.5 ⁱ	15.2 ⁱ	14.6 ⁱ	14.5 ⁱ	16.2 ⁱ	17.4 ⁱ	16.3 ⁱ	17.7 ⁱ	17.8 ^m	20.1 ⁱ	16.0 ⁱ	15.0 ^m
20	13.5 ⁱ	15.3 ⁱ	14.5 ⁱ	14.8 ⁱ	16.4 ⁱ	17.3 ^m	16.4 ⁱ	17.7 ⁱ	18.0 ⁱ	20.0 ⁱ	16.0 ⁱ	14.9 ⁱ
21	13.6 ⁱ	15.3 ⁱ	14.5 ^m	15.0 ⁱ	16.6 ⁱ	17.2 ⁱ	16.4 ⁱ	17.8 ⁱ	18.1 ⁱ	20.0 ⁱ	16.0 ^m	14.8 ⁱ
22	13.6 ⁱ	15.4 ^m	14.5 ⁱ	15.2 ⁱ	16.8 ⁱ	17.0 ⁱ	16.4 ⁱ	17.9 ^m	18.3 ⁱ	19.9 ⁱ	16.0 ⁱ	14.8 ⁱ
23	13.6 ⁱ	15.3 ⁱ	14.6 ⁱ	15.5 ⁱ	17.0 ^m	16.8 ⁱ	16.4 ⁱ	17.9 ⁱ	18.4 ⁱ	19.9 ⁱ	16.1 ⁱ	14.7 ⁱ
24	13.6 ⁱ	15.2 ⁱ	14.6 ⁱ	15.7 ⁱ	17.0 ⁱ	16.7 ⁱ	16.5 ⁱ	18.0 ⁱ	18.6 ⁱ	19.8 ^e	16.1 ⁱ	14.6 ⁱ
25	13.6 ^m	15.1 ⁱ	14.7 ⁱ	16.0 ^m	16.9 ⁱ	16.5 ⁱ	16.5 ^m	18.0 ⁱ	18.7 ⁱ	19.4 ⁱ	16.1 ⁱ	14.5 ⁱ
26	13.5 ⁱ	14.9 ⁱ	14.7 ⁱ	15.8 ⁱ	16.9 ⁱ	16.4 ⁱ	16.6 ⁱ	18.0 ⁱ	18.9 ^m	19.1 ⁱ	16.2 ⁱ	14.4 ^m
27	13.4 ⁱ	14.8 ⁱ	14.8 ⁱ	15.5 ⁱ	16.9 ⁱ	16.2 ^m	16.8 ⁱ	18.1 ⁱ	19.0 ⁱ	18.7 ⁱ	16.2 ⁱ	14.4 ⁱ
28	13.3 ⁱ	14.7 ⁱ	14.8 ^m	15.3 ⁱ	16.9 ⁱ	16.2 ⁱ	16.9 ⁱ	18.1 ⁱ	19.1 ⁱ	18.3 ⁱ	16.2 ^m	14.4 ⁱ
29	13.2 ⁱ	14.6 ^m	14.7 ⁱ	15.1 ⁱ	16.8 ⁱ	16.3 ⁱ	17.1 ⁱ	18.1 ^m	19.2 ⁱ	17.9 ⁱ	16.2 ⁱ	14.4 ⁱ
30	13.1 ⁱ	--	14.7 ⁱ	14.8 ⁱ	16.8 ^m	16.3 ⁱ	17.2 ⁱ	18.1 ⁱ	19.3 ⁱ	17.5 ⁱ	16.1 ⁱ	14.4 ⁱ
31	13.1 ⁱ	--	14.6 ⁱ	--	16.9 ⁱ	--	17.4 ^m	18.2 ⁱ	--	17.1 ⁱ	--	14.4 ^e
Total:	413.4	428.1	455.0	442.9	492.2	518.2	516.4	542.4	546.7	605.0	472.8	471.4
Mean:	13.3	14.8	14.7	14.8	15.9	17.3	16.7	17.5	18.2	19.5	15.8	15.2
Min:	12.6	13.0	14.5	14.3	14.4	16.2	16.3	16.6	17.6	17.1	14.4	14.4
Max:	13.6	15.4	14.8	16.0	17.0	18.3	17.4	18.2	19.3	20.2	16.7	16.1
AC-FT:	819.9	849.2	902.4	878.6	976.2	1027	1024	1075	1084	1199	937.9	934.9

CALENDAR YEAR 01/01/2016 - 12/31/2016

TOTAL CFS: 5904

TOTAL AC-FT: 11711

Annual Summary for Water District 36A Billingsley Creek 360410089 - D - RANGEN HATCHERY

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR 01/01/2017 - 12/31/2017

c - Calculated, e - Estimated, i - Interpolated, m - Measured and n - Not Specified

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	14.4 ^e	14.4 ⁱ	15.1 ⁱ	--	--	--	--	--	--	--	--	18.7 ⁱ
2	14.6 ^m	14.3 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	21.6 ^m	18.6 ^m
3	14.6 ⁱ	14.2 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	21.5 ⁱ	18.6 ⁱ
4	14.7 ⁱ	14.2 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	21.4 ⁱ	18.6 ⁱ
5	14.7 ⁱ	14.1 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	21.3 ⁱ	18.6 ⁱ
6	14.7 ⁱ	14.1 ^m	15.2 ^m	--	--	--	--	--	--	--	21.2 ⁱ	18.6 ⁱ
7	14.8 ⁱ	14.1 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	21.1 ⁱ	18.6 ⁱ
8	14.8 ⁱ	14.2 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	21.0 ⁱ	18.6 ⁱ
9	14.8 ^m	14.2 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	20.9 ⁱ	18.6 ⁱ
10	14.7 ⁱ	14.2 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	20.8 ⁱ	18.6 ⁱ
11	14.5 ⁱ	14.3 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	20.7 ⁱ	18.6 ⁱ
12	14.4 ⁱ	14.3 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	20.6 ⁱ	18.6 ⁱ
13	14.2 ⁱ	14.3 ^m	15.2 ^m	--	--	--	--	--	--	--	20.5 ⁱ	18.6 ⁱ
14	14.1 ⁱ	14.4 ⁱ	15.1 ⁱ	--	--	--	--	--	--	--	20.4 ⁱ	18.6 ⁱ
15	13.9 ⁱ	14.6 ⁱ	14.9 ⁱ	--	--	--	--	--	--	--	20.3 ⁱ	18.6 ⁱ
16	13.8 ^m	14.7 ⁱ	14.8 ⁱ	--	--	--	--	--	--	--	20.2 ⁱ	18.6 ⁱ
17	13.8 ⁱ	14.8 ⁱ	14.7 ⁱ	--	--	--	--	--	--	--	20.1 ⁱ	18.6 ⁱ
18	13.8 ⁱ	15.0 ⁱ	14.5 ⁱ	--	--	--	--	--	--	--	20.0 ⁱ	18.6 ⁱ
19	13.8 ⁱ	15.1 ⁱ	14.4 ⁱ	--	--	--	--	--	--	--	19.9 ⁱ	18.6 ⁱ
20	13.8 ⁱ	15.2 ^m	14.3 ^m	--	--	--	--	--	--	--	19.8 ⁱ	18.6 ⁱ
21	13.8 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	--	19.7 ⁱ	18.6 ⁱ
22	13.8 ⁱ	15.2 ⁱ	--	--	--	--	--	--	--	--	19.6 ⁱ	18.6 ⁱ
23	13.8 ^m	15.2 ⁱ	--	--	--	--	--	--	--	--	19.5 ⁱ	18.6 ⁱ
24	13.9 ⁱ	15.1 ⁱ	--	--	--	--	--	--	--	--	19.4 ⁱ	18.6 ⁱ
25	14.0 ⁱ	15.1 ⁱ	--	--	--	--	--	--	--	--	19.3 ⁱ	18.6 ⁱ
26	14.1 ⁱ	15.1 ⁱ	--	--	--	--	--	--	--	--	19.2 ⁱ	18.6 ⁱ
27	14.2 ⁱ	15.1 ^m	--	--	--	--	--	--	--	--	19.1 ⁱ	18.6 ⁱ
28	14.3 ⁱ	15.1 ⁱ	--	--	--	--	--	--	--	--	19.0 ⁱ	18.6 ⁱ
29	14.4 ⁱ	--	--	--	--	--	--	--	--	--	18.9 ⁱ	18.6 ⁱ
30	14.5 ^m	--	--	--	--	--	--	--	--	--	18.8 ⁱ	18.6 ⁱ
31	14.4 ⁱ	--	--	--	--	--	--	--	--	--	--	18.6 ^e
Total:	442.0	409.8	300.2	--	--	--	--	--	--	--	585.4	576.2
Mean:	14.3	14.6	15.0	--	--	--	--	--	--	--	20.2	18.6
Min:	13.8	14.1	14.3	--	--	--	--	--	--	--	18.8	18.6
Max:	14.8	15.2	15.2	--	--	--	--	--	--	--	21.6	18.7
AC-FT:	876.8	812.9	595.5	--	--	--	--	--	--	--	1161	1142

CALENDAR YEAR 01/01/2017 - 12/31/2017

TOTAL CFS: 2313

TOTAL AC-FT: 4589

Annual Summary for Water District 36A Billingsley Creek 360410089 - D - RANGEN HATCHERY

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR 01/01/2018 - 12/31/2018

c - Calculated, e - Estimated, i - Interpolated, m - Measured and n - Not Specified

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	18.6 ^e	16.4 ⁱ	15.9 ^m	14.8 ⁱ	13.6 ⁱ	15.9 ⁱ	16.6 ⁱ	16.2 ^m	16.0 ⁱ	20.0 ⁱ	24.4 ⁱ	25.0 ⁱ
2	17.8 ⁱ	16.4 ⁱ	15.9 ⁱ	14.7 ⁱ	13.6 ⁱ	16.1 ⁱ	16.6 ⁱ	16.2 ⁱ	16.0 ⁱ	20.7 ⁱ	24.5 ⁱ	25.0 ⁱ
3	17.0 ⁱ	16.4 ⁱ	15.8 ⁱ	14.6 ⁱ	13.6 ⁱ	16.2 ⁱ	16.6 ⁱ	16.2 ⁱ	16.0 ⁱ	21.4 ^m	24.7 ⁱ	24.9 ⁱ
4	16.2 ^m	16.4 ⁱ	15.7 ⁱ	14.6 ^m	13.5 ⁱ	16.4 ^m	16.5 ⁱ	16.2 ⁱ	16.0 ⁱ	21.6 ⁱ	24.8 ⁱ	24.9 ^m
5	16.2 ⁱ	16.4 ⁱ	15.7 ⁱ	14.6 ⁱ	13.5 ⁱ	16.4 ⁱ	16.5 ^m	16.1 ⁱ	16.0 ^m	21.8 ⁱ	24.9 ^m	24.9 ⁱ
6	16.2 ⁱ	16.4 ⁱ	15.6 ⁱ	14.6 ⁱ	13.5 ^m	16.4 ⁱ	16.5 ⁱ	16.1 ⁱ	16.1 ⁱ	21.9 ⁱ	24.9 ⁱ	24.8 ⁱ
7	16.3 ⁱ	16.4 ⁱ	15.5 ⁱ	14.6 ⁱ	13.6 ⁱ	16.4 ⁱ	16.5 ⁱ	16.1 ⁱ	16.2 ⁱ	22.1 ⁱ	24.9 ⁱ	24.8 ⁱ
8	16.3 ⁱ	16.4 ^m	15.5 ^m	14.6 ⁱ	13.7 ⁱ	16.4 ⁱ	16.5 ⁱ	16.1 ⁱ	16.4 ⁱ	22.3 ⁱ	24.9 ⁱ	24.8 ⁱ
9	16.3 ⁱ	16.4 ⁱ	15.5 ⁱ	14.6 ⁱ	13.7 ⁱ	16.3 ⁱ	16.5 ⁱ	16.1 ⁱ	16.5 ⁱ	22.5 ⁱ	24.9 ⁱ	24.7 ⁱ
10	16.3 ⁱ	16.4 ⁱ	15.4 ⁱ	14.6 ⁱ	13.8 ⁱ	16.3 ⁱ	16.5 ⁱ	16.1 ⁱ	16.6 ⁱ	22.6 ^m	24.8 ⁱ	24.7 ⁱ
11	16.3 ^m	16.4 ⁱ	15.4 ⁱ	14.6 ⁱ	13.9 ⁱ	16.3 ^m	16.5 ⁱ	16.1 ⁱ	16.8 ⁱ	22.7 ⁱ	24.8 ⁱ	24.6 ^m
12	16.3 ⁱ	16.4 ⁱ	15.4 ⁱ	14.6 ^m	14.0 ⁱ	16.3 ⁱ	16.5 ⁱ	16.1 ⁱ	16.9 ^m	22.7 ⁱ	24.8 ^m	24.6 ⁱ
13	16.3 ⁱ	16.4 ⁱ	15.4 ⁱ	14.6 ⁱ	14.0 ^m	16.4 ⁱ	16.4 ^m	16.1 ⁱ	16.9 ⁱ	22.7 ⁱ	24.8 ⁱ	24.5 ⁱ
14	16.3 ⁱ	16.3 ⁱ	15.4 ⁱ	14.5 ⁱ	14.1 ⁱ	16.4 ⁱ	16.4 ⁱ	16.1 ⁱ	17.0 ⁱ	22.7 ⁱ	24.9 ⁱ	24.4 ⁱ
15	16.3 ⁱ	16.3 ^m	15.3 ^m	14.4 ⁱ	14.2 ⁱ	16.4 ⁱ	16.4 ⁱ	16.1 ⁱ	17.1 ⁱ	22.8 ⁱ	24.9 ⁱ	24.4 ⁱ
16	16.3 ⁱ	16.3 ⁱ	15.3 ⁱ	14.4 ⁱ	14.3 ⁱ	16.4 ⁱ	16.4 ⁱ	16.0 ⁱ	17.1 ⁱ	22.8 ⁱ	24.9 ⁱ	24.3 ⁱ
17	16.3 ⁱ	16.3 ⁱ	15.3 ⁱ	14.3 ⁱ	14.4 ⁱ	16.4 ⁱ	16.4 ⁱ	16.0 ⁱ	17.2 ⁱ	22.8 ^m	25.0 ⁱ	24.2 ⁱ
18	16.3 ^m	16.2 ⁱ	15.3 ⁱ	14.3 ⁱ	14.5 ⁱ	16.5 ⁱ	16.4 ⁱ	16.0 ^m	17.2 ⁱ	22.9 ⁱ	25.0 ⁱ	24.2 ⁱ
19	16.3 ⁱ	16.2 ⁱ	15.2 ⁱ	14.2 ^m	14.6 ⁱ	16.5 ^m	16.3 ⁱ	16.0 ⁱ	17.3 ⁱ	23.0 ⁱ	25.1 ⁱ	24.1 ^m
20	16.3 ⁱ	16.2 ⁱ	15.2 ⁱ	14.1 ⁱ	14.7 ⁱ	16.5 ⁱ	16.3 ⁱ	16.0 ⁱ	17.4 ⁱ	23.1 ⁱ	25.1 ^m	24.1 ⁱ
21	16.3 ⁱ	16.1 ⁱ	15.2 ⁱ	14.1 ⁱ	14.8 ^m	16.5 ⁱ	16.3 ^m	16.0 ⁱ	17.4 ^m	23.2 ⁱ	25.1 ⁱ	24.0 ⁱ
22	16.3 ⁱ	16.1 ^m	15.2 ^m	14.0 ⁱ	14.9 ⁱ	16.5 ⁱ	16.3 ⁱ	16.0 ⁱ	17.6 ⁱ	23.3 ⁱ	25.1 ⁱ	24.0 ⁱ
23	16.3 ⁱ	16.1 ⁱ	15.2 ⁱ	13.9 ⁱ	15.0 ⁱ	16.6 ⁱ	16.3 ⁱ	16.0 ⁱ	17.7 ⁱ	23.4 ⁱ	25.1 ⁱ	24.0 ⁱ
24	16.3 ⁱ	16.1 ⁱ	15.1 ⁱ	13.8 ⁱ	15.0 ⁱ	16.6 ⁱ	16.3 ⁱ	16.0 ⁱ	17.9 ⁱ	23.4 ^m	25.1 ⁱ	24.0 ⁱ
25	16.3 ^m	16.1 ⁱ	15.1 ⁱ	13.8 ⁱ	15.1 ⁱ	16.6 ⁱ	16.3 ⁱ	16.0 ⁱ	18.0 ⁱ	23.6 ⁱ	25.1 ⁱ	24.0 ⁱ
26	16.3 ⁱ	16.1 ⁱ	15.1 ⁱ	13.7 ^m	15.2 ⁱ	16.6 ⁱ	16.3 ⁱ	15.9 ^m	18.1 ⁱ	23.7 ⁱ	25.1 ⁱ	23.9 ⁱ
27	16.3 ⁱ	16.1 ⁱ	15.0 ⁱ	13.7 ⁱ	15.2 ⁱ	16.6 ^m	16.3 ⁱ	16.0 ⁱ	18.3 ⁱ	23.8 ⁱ	25.0 ^m	23.9 ^m
28	16.3 ⁱ	16.1 ^m	15.0 ⁱ	13.6 ⁱ	15.3 ⁱ	16.6 ⁱ	16.3 ⁱ	16.0 ⁱ	18.4 ⁱ	23.9 ⁱ	25.0 ⁱ	23.9 ⁱ
29	16.4 ⁱ	--	15.0 ^m	13.6 ⁱ	15.4 ^m	16.6 ⁱ	16.3 ^m	16.0 ⁱ	18.6 ^m	24.1 ⁱ	25.0 ⁱ	23.9 ⁱ
30	16.4 ⁱ	--	14.9 ⁱ	13.6 ⁱ	15.5 ⁱ	16.6 ⁱ	16.3 ⁱ	16.0 ⁱ	19.3 ⁱ	24.2 ⁱ	25.0 ⁱ	23.9 ⁱ
31	16.4 ⁱ	--	14.8 ⁱ	--	15.7 ⁱ	--	16.2 ⁱ	16.0 ⁱ	--	24.3 ⁱ	--	23.9 ^e
Total:	509.7	455.4	475.3	428.0	445.9	492.6	508.4	497.3	513.8	705.6	747.4	755.3
Mean:	16.4	16.3	15.3	14.3	14.4	16.4	16.4	16.0	17.1	22.8	24.9	24.4
Min:	16.2	16.1	14.8	13.6	13.5	15.9	16.2	15.9	16.0	20.0	24.4	23.9
Max:	18.6	16.4	15.9	14.8	15.7	16.6	16.6	16.2	19.3	24.3	25.1	25.0
AC-FT:	1011	903.4	942.7	848.9	884.5	977.0	1008	986.4	1019	1399	1482	1498

CALENDAR YEAR 01/01/2018 - 12/31/2018

TOTAL CFS: 6534

TOTAL AC-FT: 12961

Highest flow
during development
period

Annual Summary for Water District 36A Billingsley Creek 360410089 - D - RANGEN HATCHERY

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR 01/01/2019 - 12/31/2019

c - Calculated, e - Estimated, i - Interpolated, m - Measured and n - Not Specified

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	23.9 ^e	19.5 ⁱ	17.2 ⁱ	16.9 ⁱ	16.3 ⁱ	19.0 ⁱ	17.5 ⁱ	16.0 ⁱ	17.5 ⁱ	21.2 ⁱ	22.0 ⁱ	19.1 ⁱ
2	22.2 ⁱ	19.5 ⁱ	17.1 ⁱ	16.9 ⁱ	16.2 ^m	19.1 ⁱ	17.5 ^m	16.0 ⁱ	17.6 ⁱ	21.3 ^m	22.0 ⁱ	19.0 ⁱ
3	20.5 ^m	19.4 ⁱ	16.9 ⁱ	16.9 ^m	16.3 ⁱ	19.2 ⁱ	17.5 ⁱ	15.9 ⁱ	17.7 ^m	21.3 ⁱ	22.0 ⁱ	18.9 ⁱ
4	20.5 ⁱ	19.4 ⁱ	16.8 ^m	16.9 ⁱ	16.4 ⁱ	19.3 ⁱ	17.4 ⁱ	15.9 ⁱ	17.8 ⁱ	21.3 ⁱ	22.0 ⁱ	18.8 ^m
5	20.5 ⁱ	19.4 ⁱ	16.8 ⁱ	16.9 ⁱ	16.4 ⁱ	19.4 ^m	17.4 ⁱ	15.9 ⁱ	17.9 ⁱ	21.4 ⁱ	22.1 ⁱ	18.8 ⁱ
6	20.4 ⁱ	19.4 ^m	16.8 ⁱ	16.8 ⁱ	16.5 ⁱ	19.3 ⁱ	17.3 ⁱ	15.9 ^m	17.9 ⁱ	21.4 ⁱ	22.1 ^m	18.8 ⁱ
7	20.4 ⁱ	19.3 ⁱ	16.8 ⁱ	16.8 ⁱ	16.6 ⁱ	19.2 ⁱ	17.3 ⁱ	15.9 ⁱ	18.0 ⁱ	21.4 ⁱ	22.0 ⁱ	18.8 ⁱ
8	20.4 ⁱ	19.2 ⁱ	16.8 ⁱ	16.8 ⁱ	16.7 ⁱ	19.1 ⁱ	17.2 ⁱ	16.0 ⁱ	18.1 ⁱ	21.4 ⁱ	21.8 ⁱ	18.8 ⁱ
9	20.4 ^m	19.1 ⁱ	16.8 ⁱ	16.8 ⁱ	16.8 ^m	19.0 ⁱ	17.2 ⁱ	16.0 ⁱ	18.2 ⁱ	21.4 ^m	21.7 ⁱ	18.7 ⁱ
10	20.4 ⁱ	19.0 ⁱ	16.8 ^m	16.8 ^m	16.9 ⁱ	18.9 ⁱ	17.1 ^m	16.0 ⁱ	18.3 ^m	21.5 ⁱ	21.5 ⁱ	18.7 ⁱ
11	20.3 ⁱ	18.8 ⁱ	16.8 ⁱ	16.8 ⁱ	17.1 ⁱ	18.8 ^m	17.0 ⁱ	16.0 ⁱ	18.4 ⁱ	21.5 ⁱ	21.3 ⁱ	18.7 ^m
12	20.3 ⁱ	18.7 ^m	16.8 ⁱ	16.7 ⁱ	17.2 ⁱ	18.8 ⁱ	16.9 ⁱ	16.1 ⁱ	18.5 ⁱ	21.6 ⁱ	21.2 ⁱ	18.7 ⁱ
13	20.2 ⁱ	18.6 ⁱ	16.8 ⁱ	16.7 ⁱ	17.3 ⁱ	18.7 ⁱ	16.8 ⁱ	16.1 ^m	18.7 ⁱ	21.6 ⁱ	21.0 ^m	18.7 ⁱ
14	20.2 ⁱ	18.5 ⁱ	16.8 ⁱ	16.7 ⁱ	17.4 ⁱ	18.7 ⁱ	16.7 ⁱ	16.2 ⁱ	18.8 ⁱ	21.6 ⁱ	21.0 ⁱ	18.7 ⁱ
15	20.1 ⁱ	18.4 ⁱ	16.8 ⁱ	16.7 ⁱ	17.6 ⁱ	18.6 ⁱ	16.6 ⁱ	16.3 ⁱ	18.9 ⁱ	21.7 ⁱ	20.9 ⁱ	18.6 ⁱ
16	20.1 ^m	18.4 ⁱ	16.8 ⁱ	16.6 ⁱ	17.7 ^m	18.6 ⁱ	16.5 ⁱ	16.4 ⁱ	19.0 ⁱ	21.7 ^m	20.8 ⁱ	18.6 ⁱ
17	20.0 ⁱ	18.3 ⁱ	16.8 ⁱ	16.6 ^m	17.8 ⁱ	18.5 ⁱ	16.4 ^m	16.5 ⁱ	19.1 ^m	21.7 ⁱ	20.8 ⁱ	18.6 ⁱ
18	20.0 ⁱ	18.2 ⁱ	16.7 ^m	16.6 ⁱ	17.8 ⁱ	18.5 ⁱ	16.4 ⁱ	16.5 ⁱ	19.3 ⁱ	21.8 ⁱ	20.7 ⁱ	18.6 ^m
19	19.9 ⁱ	18.1 ⁱ	16.7 ⁱ	16.6 ⁱ	17.9 ⁱ	18.4 ^m	16.3 ⁱ	16.6 ⁱ	19.6 ⁱ	21.8 ⁱ	20.7 ⁱ	18.6 ⁱ
20	19.8 ⁱ	18.0 ^m	16.7 ⁱ	16.5 ⁱ	18.0 ⁱ	18.3 ⁱ	16.3 ⁱ	16.7 ^m	19.8 ⁱ	21.8 ⁱ	20.6 ^m	18.6 ⁱ
21	19.8 ⁱ	17.9 ⁱ	16.8 ⁱ	16.5 ⁱ	18.0 ⁱ	18.3 ⁱ	16.2 ⁱ	16.7 ⁱ	20.0 ⁱ	21.9 ⁱ	20.4 ⁱ	18.5 ⁱ
22	19.7 ⁱ	17.8 ⁱ	16.8 ⁱ	16.5 ⁱ	18.1 ⁱ	18.2 ⁱ	16.2 ⁱ	16.8 ⁱ	20.2 ⁱ	21.9 ⁱ	20.3 ⁱ	18.5 ⁱ
23	19.7 ^m	17.8 ⁱ	16.8 ⁱ	16.5 ⁱ	18.2 ⁱ	18.1 ⁱ	16.1 ⁱ	16.8 ⁱ	20.4 ⁱ	21.9 ^m	20.1 ⁱ	18.5 ⁱ
24	19.7 ⁱ	17.7 ⁱ	16.8 ⁱ	16.5 ^m	18.2 ^m	18.0 ⁱ	16.1 ^m	16.9 ⁱ	20.7 ^m	21.9 ⁱ	19.9 ⁱ	18.5 ⁱ
25	19.7 ⁱ	17.6 ⁱ	16.8 ^m	16.5 ⁱ	18.3 ⁱ	18.0 ⁱ	16.1 ⁱ	16.9 ⁱ	20.8 ⁱ	21.9 ⁱ	19.8 ⁱ	18.4 ⁱ
26	19.6 ⁱ	17.5 ⁱ	16.8 ⁱ	16.4 ⁱ	18.4 ⁱ	17.9 ⁱ	16.1 ⁱ	16.9 ⁱ	20.9 ⁱ	21.9 ⁱ	19.6 ⁱ	18.4 ^m
27	19.6 ⁱ	17.4 ^m	16.8 ⁱ	16.4 ⁱ	18.5 ⁱ	17.8 ^m	16.1 ⁱ	17.0 ^m	20.9 ⁱ	21.9 ⁱ	19.4 ^m	18.4 ⁱ
28	19.6 ⁱ	17.3 ⁱ	16.8 ⁱ	16.4 ⁱ	18.6 ⁱ	17.7 ⁱ	16.1 ⁱ	17.1 ⁱ	21.0 ⁱ	21.9 ⁱ	19.3 ⁱ	18.4 ⁱ
29	19.6 ⁱ	--	16.8 ⁱ	16.3 ⁱ	18.7 ⁱ	17.7 ⁱ	16.0 ⁱ	17.2 ⁱ	21.1 ⁱ	21.9 ⁱ	19.2 ⁱ	18.4 ⁱ
30	19.5 ⁱ	--	16.8 ⁱ	16.3 ⁱ	18.8 ⁱ	17.6 ⁱ	16.0 ⁱ	17.3 ⁱ	21.1 ⁱ	21.9 ^m	19.1 ⁱ	18.4 ⁱ
31	19.5 ⁱ	--	16.9 ⁱ	--	18.9 ⁱ	--	16.0 ^m	17.4 ⁱ	--	21.9 ⁱ	--	18.4 ^e
Total:	626.3	518.1	521.1	499.1	543.5	556.4	516.2	509.8	576.2	671.2	625.1	577.5
Mean:	20.2	18.5	16.8	16.6	17.5	18.6	16.7	16.5	19.2	21.7	20.8	18.6
Min:	19.5	17.3	16.7	16.3	16.2	17.6	16.0	15.9	17.5	21.2	19.1	18.4
Max:	23.9	19.5	17.2	16.9	18.9	19.4	17.5	17.4	21.1	21.9	22.1	19.1
AC-FT:	1242	1027	1033	990.0	1078	1103	1023	1011	1142	1331	1239	1145

CALENDAR YEAR 01/01/2019 - 12/31/2019

TOTAL CFS: 6740

TOTAL AC-FT: 13369

Highest Volume

Site Type: *ESPA Springs*

Measurement Site:

Current Tunnel

Data Frequency:

From:

January 2, 2015

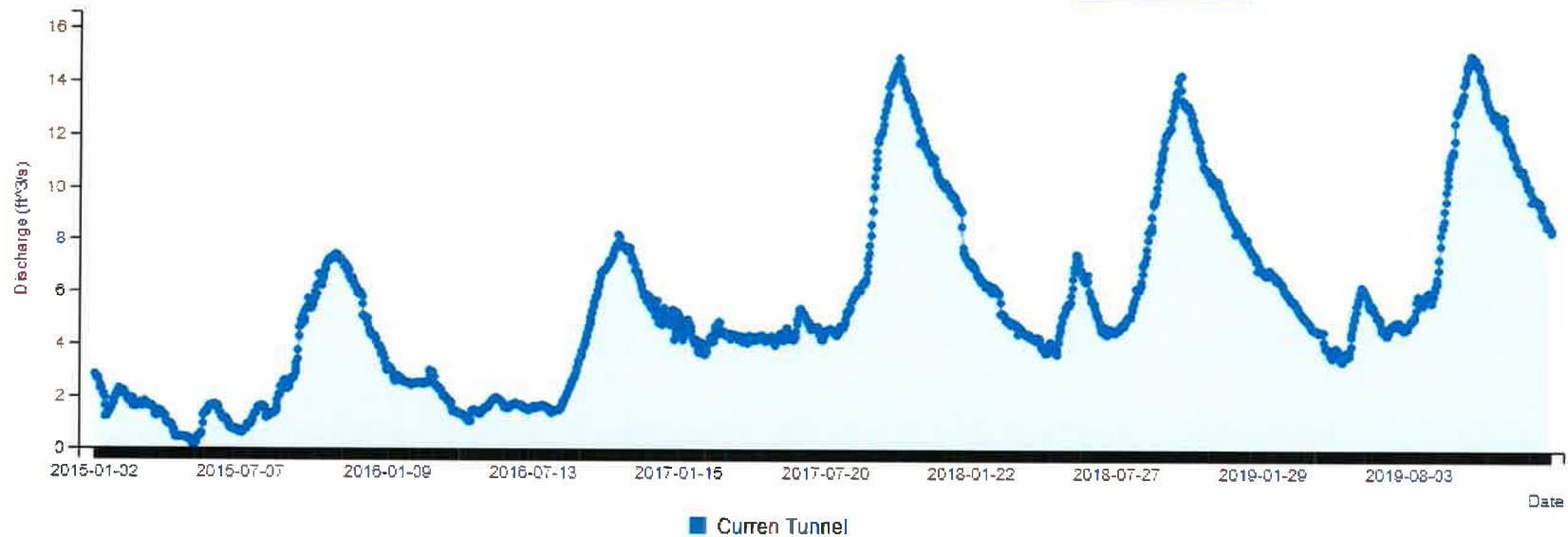
To:

February 1, 2020

Create:

Chart

CSV



*Current Tunnel (Aqua Info) 1/2/2015 - 2/1/2020
from IDWR website*

Attachment #2:

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>	<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>		<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
1/1/2019	8.309498896	-0.42	7.889498896	23.90	16.01	31.755835
1/2/2019	8.19038378	-0.42	7.77038378	22.19	14.42	28.60130877
1/3/2019	8.076397157	-0.42	7.656397157	20.50	12.84	25.47528624
1/4/2019	8.015209119	-0.42	7.595209119	20.48	12.88	25.55698271
1/5/2019	8.046693372	-0.42	7.626693372	20.45	12.82	25.4350287
1/6/2019	8.040242351	-0.42	7.620242351	20.43	12.81	25.4081543
1/7/2019	8.084143922	-0.42	7.664143922	20.41	12.75	25.28140553
1/8/2019	7.937495942	-0.42	7.517495942	20.38	12.86	25.5127768
1/9/2019	7.851143391	-0.42	7.431143391	20.40	12.97	25.72372708
1/10/2019	7.801629074	-0.42	7.381629074	20.35	12.97	25.72276373
1/11/2019	7.759766464	-0.42	7.339766464	20.31	12.97	25.72645822
1/12/2019	7.685118366	-0.42	7.265118366	20.26	12.99	25.77534772
1/13/2019	7.618814952	-0.42	7.198814952	20.22	13.02	25.82752054
1/14/2019	7.570748154	-0.42	7.150748154	20.17	13.02	25.82368604
1/15/2019	7.503229603	-0.42	7.083229603	20.13	13.05	25.87826908
1/16/2019	7.483847165	-0.42	7.063847165	20.10	13.04	25.85720915
1/17/2019	7.446143759	-0.42	7.026143759	20.04	13.01	25.81298385

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>	<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>		<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
1/18/2019	7.431459123	-0.42	7.011459123	19.97	12.96	25.70326583
1/19/2019	7.248532559	-0.42	6.828532559	19.91	13.08	25.94709067
1/20/2019	6.888059292	-0.42	6.468059292	19.84	13.37	26.52324439
1/21/2019	7.270116834	-0.42	6.850116834	19.78	12.93	25.64642326
1/22/2019	7.258507872	-0.42	6.838507872	19.71	12.87	25.53060464
1/23/2019	7.089366639	-0.42	6.669366639	19.70	13.03	25.84626127
1/24/2019	7.053338683	-0.42	6.633338683	19.67	13.04	25.85821772
1/25/2019	6.966820136	-0.42	6.546820136	19.65	13.10	25.99015726
1/26/2019	6.932664789	-0.42	6.512664789	19.62	13.11	25.99839939
1/27/2019	6.836484387	-0.42	6.416484387	19.60	13.18	26.14950322
1/28/2019	6.815768772	-0.42	6.395768772	19.57	13.17	26.13108764
1/29/2019	6.804890705	-0.42	6.384890705	19.55	13.17	26.11299429
1/30/2019	6.786469003	-0.42	6.366469003	19.50	13.13	26.05035873
1/31/2019	6.758890759	-0.42	6.338890759	19.48	13.14	26.06539018
2/1/2019	6.696376574	-0.42	6.276376574	19.47	13.19	26.16955207
2/2/2019	6.678591446	-0.42	6.258591446	19.45	13.19	26.16515887
2/3/2019	6.705004623	-0.42	6.285004623	19.44	13.15	26.09293333
2/4/2019	6.788604763	-0.42	6.368604763	19.42	13.05	25.88744245

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>	<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>		<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
2/5/2019	6.879394634	-0.42	6.459394634	19.41	12.95	25.68752574
2/6/2019	6.923777436	-0.42	6.503777436	19.40	12.90	25.57965746
2/7/2019	6.81146525	-0.42	6.39146525	19.29	12.90	25.58424368
2/8/2019	6.723864475	-0.42	6.303864475	19.17	12.87	25.51997981
2/9/2019	6.682882036	-0.42	6.262882036	19.06	12.80	25.38308348
2/10/2019	6.733058112	-0.42	6.313058112	18.95	12.64	25.06537424
2/11/2019	6.71172558	-0.42	6.29172558	18.83	12.54	24.86966731
2/12/2019	6.612421129	-0.42	6.192421129	18.70	12.51	24.80878269
2/13/2019	6.538500265	-0.42	6.118500265	18.61	12.49	24.77688972
2/14/2019	6.504931691	-0.42	6.084931691	18.53	12.45	24.68479299
2/15/2019	6.570965173	-10.4	-3.829034827 0	18.44	18.44	36.57574
2/16/2019	6.576897738	-10.4	-3.823102262 0	18.36	18.36	36.41706
2/17/2019	6.53360412	-10.4	-3.86639588 0	18.27	18.27	36.238545
2/18/2019	6.47753132	-10.4	-3.92246868 0	18.19	18.19	36.079865
2/19/2019	6.42464796	-10.4	-3.97535204 0	18.10	18.10	35.90135
2/20/2019	6.384633073	-10.4	-4.015366927 0	18.00	18.00	35.703
2/21/2019	6.40731803	-10.4	-3.99268197 0	17.92	17.92	35.54432
2/22/2019	6.314815864	-10.4	-4.085184136 0	17.84	17.84	35.38564

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>			<u>Net Flow*</u>		
2/23/2019	6.223460851	-10.4	-4.176539149	0	17.76	17.76	35.22696
2/24/2019	6.126295888	-10.4	-4.273704112	0	17.68	17.68	35.06828
2/25/2019	6.087871434	-10.4	-4.312128566	0	17.60	17.60	34.9096
2/26/2019	6.087203581	-10.4	-4.312796419	0	17.52	17.52	34.75092
2/27/2019	6.033987573	-10.4	-4.366012427	0	17.40	17.40	34.5129
2/28/2019	5.990166283	-10.4	-4.409833717	0	17.28	17.28	34.27488
3/1/2019	5.960940138	-10.4	-4.439059862	0	17.16	17.16	34.03686
3/2/2019	5.894952338	-10.4	-4.505047662	0	17.05	17.05	33.818675
3/3/2019	5.845917454	-10.4	-4.554082546	0	16.93	16.93	33.580655
3/4/2019	5.784132036	-10.4	-4.615867964	0	16.80	16.80	33.3228
3/5/2019	5.715129002	-10.4	-4.684870998	0	16.80	16.80	33.3228
3/6/2019	5.705226938	-10.4	-4.694773062	0	16.79	16.79	33.302965
3/7/2019	5.684684838	-10.4	-4.715315162	0	16.79	16.79	33.302965
3/8/2019	5.693871739	-10.4	-4.706128261	0	16.79	16.79	33.302965
3/9/2019	5.69040387	-10.4	-4.70959613	0	16.78	16.78	33.28313
3/10/2019	5.622703917	-10.4	-4.777296083	0	16.80	16.80	33.3228
3/11/2019	5.559377781	-10.4	-4.840622219	0	16.79	16.79	33.302965
3/12/2019	5.515264565	-10.4	-4.884735435	0	16.79	16.79	33.302965

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>			<u>Net Flow*</u>		
3/13/2019	5.533396485	-10.4	-4.866603515	0	16.78	16.78	33.28313
3/14/2019	5.463369634	-10.4	-4.936630366	0	16.77	16.77	33.263295
3/15/2019	5.368361192	-10.4	-5.031638808	0	16.76	16.76	33.24346
3/16/2019	5.283319735	-10.4	-5.116680265	0	16.75	16.75	33.223625
3/17/2019	5.238682249	-10.4	-5.161317751	0	16.75	16.75	33.223625
3/18/2019	5.218734979	-10.4	-5.181265021	0	16.70	16.70	33.12445
3/19/2019	5.179701574	-10.4	-5.220298426	0	16.72	16.72	33.16412
3/20/2019	5.124533869	-10.4	-5.275466131	0	16.74	16.74	33.20379
3/21/2019	5.07797198	-10.4	-5.32202802	0	16.76	16.76	33.24346
3/22/2019	5.070494275	-10.4	-5.329505725	0	16.77	16.77	33.263295
3/23/2019	5.046371141	-10.4	-5.353628859	0	16.79	16.79	33.302965
3/24/2019	5.012417603	-10.4	-5.387582397	0	16.81	16.81	33.342635
3/25/2019	4.97043737	-10.4	-5.42956263	0	16.80	16.80	33.3228
3/26/2019	4.924630216	-10.4	-5.475369784	0	16.81	16.81	33.342635
3/27/2019	4.90331291	-10.4	-5.49668709	0	16.82	16.82	33.36247
3/28/2019	4.880134853	-10.4	-5.519865147	0	16.82	16.82	33.36247
3/29/2019	4.793644489	-10.4	-5.606355511	0	16.83	16.83	33.382305
3/30/2019	4.74774972	-10.4	-5.65225028	0	16.84	16.84	33.40214

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>			<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
3/31/2019	4.686758792	-10.4	-5.713241208	0	16.85	16.85	33.421975
4/1/2019	4.641119904	-10.4	-5.758880096	0	16.85	16.85	33.421975
4/2/2019	4.613749318	-10.4	-5.786250682	0	16.86	16.86	33.44181
4/3/2019	4.627431194	-10.4	-5.772568806	0	16.90	16.90	33.52115
4/4/2019	4.621464723	-10.4	-5.778535277	0	16.88	16.88	33.48148
4/5/2019	4.587696731	-10.4	-5.812303269	0	16.86	16.86	33.44181
4/6/2019	4.579197617	-10.4	-5.820802383	0	16.84	16.84	33.40214
4/7/2019	4.546514844	-10.4	-5.853485156	0	16.81	16.81	33.342635
4/8/2019	4.505647408	-10.4	-5.894352592	0	16.79	16.79	33.302965
4/9/2019	4.509318705	-10.4	-5.890681295	0	16.77	16.77	33.263295
4/10/2019	4.517391345	-10.4	-5.882608655	0	16.80	16.80	33.3228
4/11/2019	4.496231127	-10.4	-5.903768873	0	16.77	16.77	33.263295
4/12/2019	4.507771485	-10.4	-5.892228515	0	16.74	16.74	33.20379
4/13/2019	4.509994567	-10.4	-5.890005433	0	16.71	16.71	33.144285
4/14/2019	4.47133265	-10.4	-5.92866735	0	16.69	16.69	33.104615
4/15/2019	4.495338969	-10.4	-5.904661031	0	16.66	16.66	33.04511
4/16/2019	4.50449904	-10.4	-5.89550096	0	16.63	16.63	32.985605
4/17/2019	4.15260222	-10.4	-6.24739778	0	16.60	16.60	32.9261

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
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<u>Date</u>			<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
4/18/2019	3.92579367	-10.4	-6.47420633	0	16.58	16.58	32.88643
4/19/2019	3.897005211	-10.4	-6.502994789	0	16.56	16.56	32.84676
4/20/2019	3.877786283	-10.4	-6.522213717	0	16.54	16.54	32.80709
4/21/2019	3.879051878	-10.4	-6.520948122	0	16.51	16.51	32.747585
4/22/2019	3.855561755	-10.4	-6.544438245	0	16.49	16.49	32.707915
4/23/2019	3.790678216	-10.4	-6.609321784	0	16.47	16.47	32.668245
4/24/2019	3.665379174	-10.4	-6.734620826	0	16.50	16.50	32.72775
4/25/2019	3.591848348	-10.4	-6.808151652	0	16.47	16.47	32.668245
4/26/2019	3.512422155	-10.4	-6.887577845	0	16.43	16.43	32.588905
4/27/2019	3.557148502	-10.4	-6.842851498	0	16.40	16.40	32.5294
4/28/2019	3.656401585	-10.4	-6.743598415	0	16.36	16.36	32.45006
4/29/2019	3.756705323	-10.4	-6.643294677	0	16.33	16.33	32.390555
4/30/2019	3.802545258	-10.4	-6.597454742	0	16.30	16.30	32.33105
5/1/2019	3.883971998	-10.4	-6.516028002	0	16.26	16.26	32.25171
5/2/2019	3.919718896	-10.4	-6.480281104	0	16.20	16.20	32.1327
5/3/2019	3.854592059	-10.4	-6.545407941	0	16.28	16.28	32.29138
5/4/2019	3.779962073	-10.4	-6.620037927	0	16.36	16.36	32.45006
5/5/2019	3.693251469	-10.4	-6.706748531	0	16.44	16.44	32.60874

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>			<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
5/6/2019	3.609050623	-10.4	-6.790949377	0	16.52	16.52	32.76742
5/7/2019	3.474647574	-10.4	-6.925352426	0	16.60	16.60	32.9261
5/8/2019	3.405584375	-10.4	-6.994415625	0	16.68	16.68	33.08478
5/9/2019	3.376977479	-10.4	-7.023022521	0	16.80	16.80	33.3228
5/10/2019	3.433432107	-10.4	-6.966567893	0	16.93	16.93	33.580655
5/11/2019	3.477384104	-10.4	-6.922615896	0	17.06	17.06	33.83851
5/12/2019	3.524917005	-10.4	-6.875082995	0	17.19	17.19	34.096365
5/13/2019	3.609829112	-10.4	-6.790170888	0	17.31	17.31	34.334385
5/14/2019	3.731982844	-10.4	-6.668017156	0	17.44	17.44	34.59224
5/15/2019	3.706660879	-10.4	-6.693339121	0	17.57	17.57	34.850095
5/16/2019	3.647791419	-10.4	-6.752208581	0	17.70	17.70	35.10795
5/17/2019	3.573631591	-10.4	-6.826368409	0	17.77	17.77	35.246795
5/18/2019	3.606501028	-10.4	-6.793498972	0	17.83	17.83	35.365805
5/19/2019	3.781274677	-10.4	-6.618725323	0	17.90	17.90	35.50465
5/20/2019	3.98489854	-10.4	-6.41510146	0	17.96	17.96	35.62366
5/21/2019	4.335194996	-10.4	-6.064805004	0	18.03	18.03	35.762505
5/22/2019	4.504925605	-10.4	-5.895074395	0	18.10	18.10	35.90135
5/23/2019	4.682997845	-10.4	-5.717002155	0	18.16	18.16	36.02036

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>			<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
5/24/2019	4.841834879	-10.4	-5.558165121	0	18.20	18.20	36.0997
5/25/2019	4.975144664	-10.4	-5.424855336	0	18.30	18.30	36.29805
5/26/2019	5.12485595	-10.4	-5.27514405	0	18.40	18.40	36.4964
5/27/2019	5.306670571	-10.4	-5.093329429	0	18.50	18.50	36.69475
5/28/2019	5.528174604	-10.4	-4.871825396	0	18.60	18.60	36.8931
5/29/2019	5.633452333	-10.4	-4.766547667	0	18.70	18.70	37.09145
5/30/2019	5.783758457	-10.4	-4.616241543	0	18.80	18.80	37.2898
5/31/2019	5.960566744	-10.4	-4.439433256	0	18.90	18.90	37.48815
6/1/2019	6.085976548	-10.4	-4.314023452	0	19.00	19.00	37.6865
6/2/2019	6.212454069	-10.4	-4.187545931	0	19.10	19.10	37.88485
6/3/2019	6.259002631	-10.4	-4.140997369	0	19.20	19.20	38.0832
6/4/2019	6.250700593	-10.4	-4.149299407	0	19.30	19.30	38.28155
6/5/2019	6.210363229	-10.4	-4.189636771	0	19.40	19.40	38.4799
6/6/2019	6.12305637	-10.4	-4.27694363	0	19.29	19.29	38.261715
6/7/2019	6.05152386	-10.4	-4.34847614	0	19.19	19.19	38.063365
6/8/2019	5.988574219	-10.4	-4.411425781	0	19.08	19.08	37.84518
6/9/2019	5.926444103	-10.4	-4.473555897	0	18.97	18.97	37.626995
6/10/2019	5.889077535	-10.4	-4.510922465	0	18.87	18.87	37.428645

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>			<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
6/11/2019	5.786551596	-10.4	-4.613448404	0	18.80	18.80	37.2898
6/12/2019	5.584643027	-10.4	-4.815356973	0	18.75	18.75	37.190625
6/13/2019	5.527835045	-10.4	-4.872164955	0	18.70	18.70	37.09145
6/14/2019	5.499479147	-10.4	-4.900520853	0	18.65	18.65	36.992275
6/15/2019	5.450658256	-10.4	-4.949341744	0	18.60	18.60	36.8931
6/16/2019	5.503551665	-10.4	-4.896448335	0	18.55	18.55	36.793925
6/17/2019	5.566180222	-10.4	-4.833819778	0	18.50	18.50	36.69475
6/18/2019	5.484670797	-10.4	-4.915329203	0	18.45	18.45	36.595575
6/19/2019	5.334837398	-10.4	-5.065162602	0	18.40	18.40	36.4964
6/20/2019	5.309206559	-10.4	-5.090793441	0	18.33	18.33	36.357555
6/21/2019	5.267922064	-10.4	-5.132077936	0	18.25	18.25	36.198875
6/22/2019	5.136263529	-10.4	-5.263736471	0	18.18	18.18	36.06003
6/23/2019	5.067073173	-10.4	-5.332926827	0	18.11	18.11	35.921185
6/24/2019	5.071769731	-10.4	-5.328230269	0	18.04	18.04	35.78234
6/25/2019	5.062728953	-10.4	-5.337271047	0	17.96	17.96	35.62366
6/26/2019	5.024377695	-10.4	-5.375622305	0	17.89	17.89	35.484815
6/27/2019	4.968466097	-10.4	-5.431533903	0	17.80	17.80	35.3063
6/28/2019	4.857634295	-10.4	-5.542365705	0	17.73	17.73	35.167455

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>			<u>Net Flow*</u>		
6/29/2019	4.715160611	-10.4	-5.684839389	0	17.67	17.67	35.048445
6/30/2019	4.569063255	-10.4	-5.830936745	0	17.60	17.60	34.9096
7/1/2019	4.555302932	-10.4	-5.844697068	0	17.54	17.54	34.79059
7/2/2019	4.527437546	-10.4	-5.872562454	0	17.50	17.50	34.71125
7/3/2019	4.490464914	-10.4	-5.909535086	0	17.45	17.45	34.612075
7/4/2019	4.433358554	-10.4	-5.966641446	0	17.40	17.40	34.5129
7/5/2019	4.396729194	-10.4	-6.003270806	0	17.35	17.35	34.413725
7/6/2019	4.393103419	-10.4	-6.006896581	0	17.30	17.30	34.31455
7/7/2019	4.469338823	-10.4	-5.930661177	0	17.25	17.25	34.215375
7/8/2019	4.546559977	-10.4	-5.853440023	0	17.20	17.20	34.1162
7/9/2019	4.631804212	-10.4	-5.768195788	0	17.15	17.15	34.017025
7/10/2019	4.685927612	-10.4	-5.714072388	0	17.10	17.10	33.91785
7/11/2019	4.735890128	-10.4	-5.664109872	0	17.01	17.01	33.739335
7/12/2019	4.761038408	-10.4	-5.638961592	0	16.91	16.91	33.540985
7/13/2019	4.728619475	-10.4	-5.671380525	0	16.82	16.82	33.36247
7/14/2019	4.732754535	-10.4	-5.667245465	0	16.72	16.72	33.16412
7/15/2019	4.833259931	-10.4	-5.566740069	0	16.63	16.63	32.985605
7/16/2019	4.885170854	-10.4	-5.514829146	0	16.53	16.53	32.787255

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>			<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
7/17/2019	4.802796451	-10.4	-5.597203549	0	16.40	16.40	32.5294
7/18/2019	4.736116115	-10.4	-5.663883885	0	16.36	16.36	32.45006
7/19/2019	4.770750424	-10.4	-5.629249576	0	16.31	16.31	32.350885
7/20/2019	4.784199414	-10.4	-5.615800586	0	16.27	16.27	32.271545
7/21/2019	4.842806684	-10.4	-5.557193316	0	16.23	16.23	32.192205
7/22/2019	4.900876228	-10.4	-5.499123772	0	16.19	16.19	32.112865
7/23/2019	4.8222918	-10.4	-5.5777082	0	16.14	16.14	32.01369
7/24/2019	4.711514461	-10.4	-5.688485539	0	16.10	16.10	31.93435
7/25/2019	4.65632221	-10.4	-5.74367779	0	16.09	16.09	31.914515
7/26/2019	4.628503665	-10.4	-5.771496335	0	16.08	16.08	31.89468
7/27/2019	4.589124478	-10.4	-5.810875522	0	16.07	16.07	31.874845
7/28/2019	4.595022094	-10.4	-5.804977906	0	16.05	16.05	31.835175
7/29/2019	4.647381337	-10.4	-5.752618663	0	16.04	16.04	31.81534
7/30/2019	4.648897299	-10.4	-5.751102701	0	16.03	16.03	31.795505
7/31/2019	4.660224119	-10.4	-5.739775881	0	16.00	16.00	31.736
8/1/2019	4.708391419	-10.4	-5.691608581	0	15.97	15.97	31.676495
8/2/2019	4.771407702	-10.4	-5.628592298	0	15.95	15.95	31.636825
8/3/2019	4.822061197	-10.4	-5.577938803	0	15.92	15.92	31.57732

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>			<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>			<u>Net Flow*</u>		
8/4/2019	4.850356922	-10.4	-5.549643078	0	15.90	15.90	31.53765
8/5/2019	4.938251898	-10.4	-5.461748102	0	15.87	15.87	31.478145
8/6/2019	4.987716465	-10.4	-5.412283535	0	15.90	15.90	31.53765
8/7/2019	4.997178586	-10.4	-5.402821414	0	15.93	15.93	31.597155
8/8/2019	4.973638924	-10.4	-5.426361076	0	15.96	15.96	31.65666
8/9/2019	5.02917859	-10.4	-5.37082141	0	15.99	15.99	31.716165
8/10/2019	5.148945496	-10.4	-5.251054504	0	16.01	16.01	31.755835
8/11/2019	5.376819332	-10.4	-5.023180668	0	16.04	16.04	31.81534
8/12/2019	5.708415617	-10.4	-4.691584383	0	16.07	16.07	31.874845
8/13/2019	5.882425219	-10.4	-4.517574781	0	16.10	16.10	31.93435
8/14/2019	5.912846173	-10.4	-4.487153827	0	16.19	16.19	32.112865
8/15/2019	5.806545517	-10.4	-4.593454483	0	16.28	16.28	32.29138
8/16/2019	5.654105097	-10.4	-4.745894903	0	16.37	16.37	32.469895
8/17/2019	5.579252292	-10.4	-4.820747708	0	16.45	16.45	32.628575
8/18/2019	5.580977138	-10.4	-4.819022862	0	16.54	16.54	32.80709
8/19/2019	5.608640008	-10.4	-4.791359992	0	16.63	16.63	32.985605
8/20/2019	5.618862304	-10.4	-4.781137696	0	16.70	16.70	33.12445
8/21/2019	5.538334538	-10.4	-4.861665462	0	16.74	16.74	33.20379

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
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<u>Date</u>		<u>(Senior Water Rights)</u>			<u>Net Flow*</u>		
8/22/2019	5.641850257	-10.4	-4.758149743	0	16.77	16.77	33.263295
8/23/2019	5.7883811	-10.4	-4.6116189	0	16.81	16.81	33.342635
8/24/2019	5.888610473	-10.4	-4.511389527	0	16.85	16.85	33.421975
8/25/2019	5.990531306	-10.4	-4.409468694	0	16.89	16.89	33.501315
8/26/2019	6.049011368	-10.4	-4.350988632	0	16.92	16.92	33.56082
8/27/2019	6.010071554	-10.4	-4.389928446	0	17.00	17.00	33.7195
8/28/2019	5.898223172	-10.4	-4.501776828	0	17.11	17.11	33.937685
8/29/2019	5.845201042	-10.4	-4.554798958	0	17.21	17.21	34.136035
8/30/2019	5.80317547	-10.4	-4.59682453	0	17.32	17.32	34.35422
8/31/2019	5.63803619	-10.4	-4.76196381	0	17.42	17.42	34.55257
9/1/2019	5.676010836	-10.4	-4.723989164	0	17.53	17.53	34.770755
9/2/2019	5.895955323	-10.4	-4.504044677	0	17.63	17.63	34.969105
9/3/2019	6.056973595	-10.4	-4.343026405	0	17.70	17.70	35.10795
9/4/2019	6.156185303	-10.4	-4.243814697	0	17.78	17.78	35.26663
9/5/2019	6.305167778	-10.4	-4.094832222	0	17.86	17.86	35.42531
9/6/2019	6.381185656	-10.4	-4.018814344	0	17.94	17.94	35.58399
9/7/2019	6.416744387	-10.4	-3.983255613	0	18.03	18.03	35.762505
9/8/2019	6.581627068	-10.4	-3.818372932	0	18.11	18.11	35.921185

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>		<u>Flow at lower end of</u>		<u>Daily AF from</u>
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<u>Date</u>		<u>(Senior Water Rights)</u>			<u>Net Flow*</u>		
9/9/2019	6.924504895	-10.4	-3.475495105	0	18.19	18.19	36.079865
9/10/2019	7.322367471	-10.4	-3.077632529	0	18.30	18.30	36.29805
9/11/2019	7.853069997	-10.4	-2.546930003	0	18.42	18.42	36.53607
9/12/2019	8.265166255	-10.4	-2.134833745	0	18.53	18.53	36.754255
9/13/2019	8.542578233	-10.4	-1.857421767	0	18.65	18.65	36.992275
9/14/2019	8.630287302	-10.4	-1.769712698	0	18.77	18.77	37.230295
9/15/2019	8.795975229	-10.4	-1.604024771	0	18.89	18.89	37.468315
9/16/2019	9.180558051	-10.4	-1.219441949	0	19.00	19.00	37.6865
9/17/2019	9.55028522	-10.4	-0.84971478	0	19.10	19.10	37.88485
9/18/2019	9.925347365	-10.4	-0.474652635	0	19.32	19.32	38.32122
9/19/2019	10.18869952	-10.4	-0.211300483		19.55	19.33	38.341055
9/20/2019	10.46015173	-10.4	0.060151731		19.77	19.71	39.09448404
9/21/2019	10.71117729	-10.4	0.311177287		19.99	19.68	39.03294485
9/22/2019	10.91881537	-10.4	0.518815366		20.21	19.69	39.05746472
9/23/2019	11.11703344	-10.4	0.717033443		20.44	19.72	39.12050417
9/24/2019	11.28016431	-10.4	0.880164311		20.70	19.82	39.31264409
9/25/2019	11.33613062	-10.4	0.936130617		20.77	19.83	39.34047992
9/26/2019	11.35323522	-10.4	0.953235223		20.85	19.90	39.46523294

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>	<u>Flow at lower end of</u>		<u>Daily AF from</u>
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<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
9/27/2019	11.47035828	-10.4	1.07035828	20.92	19.85	39.37176435
9/28/2019	11.85246842	-10.4	1.452468416	21.00	19.55	38.7725289
9/29/2019	12.51901118	-10.4	2.11901118	21.07	18.95	37.58928632
9/30/2019	12.89431451	-10.4	2.494314515	21.14	18.65	36.98371716
10/1/2019	12.95819866	-10.4	2.558198664	21.22	18.66	37.01568295
10/2/2019	13.00327877	-10.4	2.603278766	21.30	18.70	37.08494657
10/3/2019	12.98769624	-10.4	2.587696236	21.32	18.73	37.15552452
10/4/2019	13.07401504	-10.4	2.674015042	21.34	18.67	37.02398116
10/5/2019	13.2151697	-10.4	2.815169701	21.36	18.54	36.7836709
10/6/2019	13.23481483	-10.4	2.83481483	21.38	18.55	36.78437479
10/7/2019	13.36829526	-10.4	2.968295262	21.40	18.43	36.55928635
10/8/2019	13.49488072	-10.4	3.094880719	21.42	18.33	36.34787409
10/9/2019	13.60852113	-10.4	3.208521128	21.40	18.19	36.08279834
10/10/2019	13.97200483	-10.4	3.572004825	21.45	17.88	35.46100343
10/11/2019	14.07353268	-10.4	3.673532676	21.50	17.83	35.35879794
10/12/2019	14.25298958	-10.4	3.852989578	21.55	17.70	35.10202017
10/13/2019	14.49882537	-10.4	4.098825374	21.59	17.49	34.69374487
10/14/2019	14.64791299	-10.4	4.24791299	21.64	17.39	34.49720458

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<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
10/15/2019	14.68521053	-10.4	4.285210534	21.69	17.40	34.52239991
10/16/2019	14.69236199	-10.4	4.292361987	21.70	17.41	34.52805
10/17/2019	14.83426564	-10.4	4.434265641	21.73	17.30	34.3060891
10/18/2019	14.99180302	-10.4	4.591803015	21.76	17.17	34.05311872
10/19/2019	15.06917322	-10.4	4.669173224	21.79	17.12	33.95915991
10/20/2019	15.04297801	-10.4	4.642978009	21.83	17.19	34.09045812
10/21/2019	15.01863201	-10.4	4.618632015	21.86	17.24	34.1982534
10/22/2019	14.89767946	-10.4	4.49767946	21.89	17.39	34.49766779
10/23/2019	14.92565626	-10.4	4.52565626	21.90	17.37	34.46201081
10/24/2019	14.91321071	-10.4	4.513210715	21.90	17.39	34.48669655
10/25/2019	14.72071138	-10.4	4.320711376	21.89	17.57	34.84868398
10/26/2019	14.72431423	-10.4	4.324314235	21.89	17.57	34.84153772
10/27/2019	14.75637268	-10.4	4.356372682	21.88	17.52	34.75811479
10/28/2019	14.71099945	-10.4	4.310999446	21.88	17.57	34.8481126
10/29/2019	14.69061615	-10.4	4.290616154	21.87	17.58	34.86870786
10/30/2019	14.55546402	-10.4	4.155464024	21.90	17.74	35.19628711
10/31/2019	14.31267142	-10.4	3.912671422	21.93	18.02	35.73737123
11/1/2019	14.18134165	-10.4	3.781341652	21.95	18.17	36.03753383

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>	<u>Flow at lower end of</u>		<u>Daily AF from</u>
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<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
11/2/2019	14.17372769	-10.4	3.77372769	21.98	18.21	36.11214113
11/3/2019	14.11121737	-10.4	3.711217375	22.00	18.29	36.27580034
11/4/2019	14.01216512	-10.4	3.612165115	22.03	18.42	36.53177549
11/5/2019	13.92715135	-10.4	3.527151346	22.05	18.52	36.74007031
11/6/2019	13.81994394	-10.4	3.41994394	22.10	18.68	37.0518912
11/7/2019	13.64166317	-10.4	3.241663172	21.95	18.71	37.1079861
11/8/2019	13.5021361	-10.4	3.1021361	21.80	18.70	37.08721304
11/9/2019	13.39307998	-10.4	2.993079976	21.65	18.66	37.00600087
11/10/2019	13.28019041	-10.4	2.880190409	21.49	18.61	36.91255732
11/11/2019	13.17462376	-10.4	2.77462376	21.34	18.57	36.82442377
11/12/2019	13.06366623	-10.4	2.663666227	21.19	18.53	36.74698304
11/13/2019	13.02317403	-10.4	2.62317403	21.00	18.38	36.45043431
11/14/2019	12.99123787	-10.4	2.591237866	20.95	18.36	36.41460469
11/15/2019	12.89168505	-10.4	2.491685045	20.89	18.40	36.49305771
11/16/2019	12.80401515	-10.4	2.404015151	20.84	18.44	36.56777595
11/17/2019	12.73861389	-10.4	2.338613886	20.78	18.44	36.57848936
11/18/2019	12.67991704	-10.4	2.279917043	20.73	18.45	36.59573955
11/19/2019	12.73193789	-10.4	2.331937889	20.67	18.34	36.3735462

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>	<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>		<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
11/20/2019	12.87063354	-10.4	2.470633535	20.60	18.13	35.95959838
11/21/2019	12.82772281	-10.4	2.427722814	20.43	18.00	35.7075168
11/22/2019	12.77769194	-10.4	2.377691935	20.26	17.88	35.46955805
11/23/2019	12.62191392	-10.4	2.221913921	20.09	17.87	35.44134874
11/24/2019	12.43790319	-10.4	2.037903188	19.93	17.89	35.48897403
11/25/2019	12.49360215	-10.4	2.093602153	19.76	17.67	35.04130013
11/26/2019	12.55488905	-10.4	2.154889045	19.59	17.44	34.58254258
11/27/2019	12.60670615	-10.4	2.206706151	19.40	17.19	34.10289835
11/28/2019	12.7060517	-10.4	2.306051696	19.31	17.00	33.72733146
11/29/2019	12.75267031	-10.4	2.352670311	19.23	16.88	33.47618344
11/30/2019	12.70666522	-10.4	2.30666522	19.14	16.83	33.38891954
12/1/2019	12.45277979	-0.42	12.03277979	19.05	7.02	13.91865628
12/2/2019	12.26084898	-0.42	11.84084898	18.96	7.12	14.12083605
12/3/2019	12.06162139	-0.42	11.64162139	18.88	7.24	14.35732398
12/4/2019	11.94328388	-0.42	11.52328388	18.80	7.28	14.43336643
12/5/2019	11.94932481	-0.42	11.52932481	18.79	7.26	14.40154924
12/6/2019	11.82962532	-0.42	11.40962532	18.78	7.37	14.61913817
12/7/2019	11.75784535	-0.42	11.33784535	18.77	7.43	14.74167875

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>	<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>		<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
12/8/2019	11.7644966	-0.42	11.3444966	18.75	7.41	14.688816
12/9/2019	11.72477952	-0.42	11.30477952	18.74	7.44	14.74775982
12/10/2019	11.59454365	-0.42	11.17454365	18.73	7.56	14.98624767
12/11/2019	11.44311972	-0.42	11.02311972	18.70	7.68	15.22709203
12/12/2019	11.30001756	-0.42	10.88001756	18.69	7.81	15.49110016
12/13/2019	11.28031282	-0.42	10.86031282	18.67	7.81	15.49051453
12/14/2019	11.29543747	-0.42	10.87543747	18.66	7.78	15.44067978
12/15/2019	11.31219862	-0.42	10.89219862	18.64	7.75	15.36776404
12/16/2019	11.16122424	-0.42	10.74122424	18.63	7.89	15.64738672
12/17/2019	10.93685927	-0.42	10.51685927	18.61	8.09	16.05274465
12/18/2019	10.8584283	-0.42	10.4384283	18.60	8.16	16.18847746
12/19/2019	10.89268591	-0.42	10.47268591	18.58	8.11	16.08085749
12/20/2019	10.7766412	-0.42	10.3566412	18.55	8.19	16.25152719
12/21/2019	10.68169257	-0.42	10.26169257	18.53	8.27	16.40018779
12/22/2019	10.65409248	-0.42	10.23409248	18.51	8.28	16.41526256
12/23/2019	10.71347784	-0.42	10.29347784	18.49	8.20	16.2578017
12/24/2019	10.74052415	-0.42	10.32052415	18.46	8.14	16.14465035
12/25/2019	10.73404564	-0.42	10.31404564	18.44	8.13	16.11783046

<u>Discharge From Curren Tunnel</u>		<u>-Irr/Stockwater</u>	<u>Remaining Flow</u>	<u>Flow at lower end of</u>		<u>Daily AF from</u>
<u>(CFS)</u>		<u>/Domestic Uses</u>		<u>Springs & Creek</u>		<u>Creek & Springs</u>
<u>Date</u>		<u>(Senior Water Rights)</u>		<u>Net Flow*</u>		
12/26/2019	10.63969649	-0.42	10.21969649	18.40	8.18	16.22563201
12/27/2019	10.51388737	-0.42	10.09388737	18.40	8.31	16.4751744
12/28/2019	10.4702222	-0.42	10.0502222	18.41	8.36	16.58161927
12/29/2019	10.34609588	-0.42	9.926095885	18.41	8.48	16.82782381
12/30/2019	10.26529538	-0.42	9.84529538	18.42	8.57	17.00792661

Yearly Volume = 11697.15346

*Net Flow is the flow measured at the lower end of the raceways minus the remaining flows from the Curren Tunnel

MEMORANDUM

DATE: August 30, 2021

TO: David Graybill (IDWR)

FROM: Peter Vidmar, P.E.

CC: Matt Doperalski (WD36A), Lynn Carlquist (IGWA), Dean Stevenson (IGWA), Tom Van Tassel, SPF File 535.0280

RE: Completion of Rangen Hatchery Measuring Device(s)



BACKGROUND

SPF Water Engineering, LLC, (SPF) was asked to develop a plan for and facilitate the installation of measuring device(s) at the Idaho Ground Water Appropriators (IGWA)'s Rangen Hatchery near Hagerman, Idaho. The Idaho Department of Water Resources (IDWR) reviewed and approved this plan in May of 2021. This letter is being sent as notification that the work was completed consistent with the approved plan.

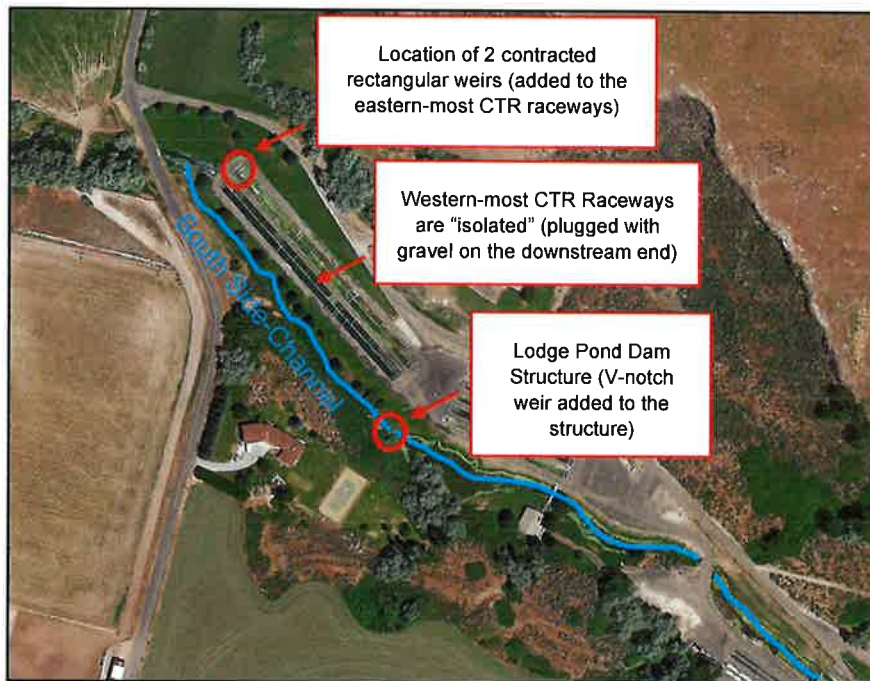


Figure 1. Proximity map of Rangen measuring devices.

LODGE POND DAM

The installation of a measuring device at the lodge pond dam involved the utilization of the existing concrete structure that is in good condition. A $\frac{1}{4}$ " steel plate with a V-notch (Figure 2) was bolted to the downstream side of the concrete structure. A length of angle iron was placed at the foot of the plate to secure the plate at the bottom. All steel to steel and steel to concrete surfaces were sealed with waterproof sealant (Figure 3). $\frac{1}{2}$ " inch anchor bolts were used to secure the steel plate to the concrete. The rating for this V-notch weir is provided in Attachment A.



Figure 2. Upstream view of lodge pond dam V-notch weir.



Figure 3. Application of waterproof sealant.

CTR RACEWAYS

The installation of measuring devices within the CTR raceways involved the utilization of existing concrete structures that are in good condition (Figures 4 and 5). $\frac{1}{4}$ " steel plates with contracted rectangular weirs were bolted to the upstream side of the concrete structures within the center portion of each of the two raceways. A length of angle iron was placed at the foot of the steel plate to secure the plate at the bottom. A $\frac{1}{4}$ " full height steel plate was secured on the right and left sides within each of the two raceways. A length of angle iron was placed at the foot of the right and left plates and on the sidewalls to secure each of the right and left steel plates. All steel to steel and steel to concrete surfaces were sealed with waterproof sealant. $\frac{1}{2}$ " inch anchor bolts were used to secure the steel to the concrete.

For the most part, most of the concrete and metal surface interfaces were sealed with the application of waterproof Sealant (Figure 3). However, there were some gaps between concrete and metal interfaces exceeded what could be sealed with a bead of waterproof sealant by itself. In these cases, a piece of backer rod (polyethylene closed cell foam) was coated with waterproof sealant and compressed between the concrete and metal interfaces to seal the gap (Figure 6).

It should be noted that the floors of the two individual CTR raceways are not at the exact same elevation. Thus, the two individual staff plates had to be carefully set (referenced to the appropriate contracted rectangular weir) to ensure that the point of zero flow (PZF) for both raceways is the same (1.48 feet). The rating table provided in Attachment B can be used for both CTR raceways.



Figure 4. Downstream view of CTR raceways.



Figure 5. Left CTR raceway with weir plates and staff gauge.



Figure 6. Backer rod (polyethylene closed cell foam).

SUMMARY

As of August 26, 2021, the weirs have been installed consistent with the approved plan and functional. These measuring devices will be used by the staff at the Rangen Hatchery to determine flow rate being diverted through the CTR raceways.

As is with any measuring device, routine inspections and proper maintenance will be necessary. If at any time these measuring devices need to be repaired or modified, IGWA will contact the watermaster to obtain approval of their plan.

Attachment A

Lodge Pond Dam - V-Notch Weir - Flow Calculations

Water Level (ft)	Flow (cfs)
1.35	0.00
1.36	0.00
1.37	0.00
1.38	0.00
1.39	0.00
1.40	0.00
1.41	0.00
1.42	0.00
1.43	0.01
1.44	0.01
1.45	0.01
1.46	0.01
1.47	0.02
1.48	0.02
1.49	0.02
1.50	0.03
1.51	0.03
1.52	0.04
1.53	0.04
1.54	0.05
1.55	0.05
1.56	0.06
1.57	0.07
1.58	0.07
1.59	0.08
1.60	0.09
1.61	0.10
1.62	0.11
1.63	0.12
1.64	0.13
1.65	0.14
1.66	0.15
1.67	0.16
1.68	0.17
1.69	0.18
1.70	0.20
1.71	0.21
1.72	0.23
1.73	0.24
1.74	0.26
1.75	0.27
1.76	0.29
1.77	0.31
1.78	0.33
1.79	0.34
1.80	0.36
1.81	0.38
1.82	0.40
1.83	0.42
1.84	0.45

Water Level (ft)	Flow (cfs)
1.85	0.47
1.86	0.49
1.87	0.52
1.88	0.54
1.89	0.57
1.90	0.59
1.91	0.62
1.92	0.64
1.93	0.67
1.94	0.70
1.95	0.73
1.96	0.76
1.97	0.79
1.98	0.82
1.99	0.86
2.00	0.89
2.01	0.92
2.02	0.96
2.03	0.99
2.04	1.03
2.05	1.06
2.06	1.10
2.07	1.14
2.08	1.18
2.09	1.22
2.10	1.26
2.11	1.30
2.12	1.34
2.13	1.39
2.14	1.43
2.15	1.48
2.16	1.52
2.17	1.57
2.18	1.62
2.19	1.66
2.20	1.71
2.21	1.76
2.22	1.81
2.23	1.87
2.24	1.92
2.25	1.97
2.26	2.02
2.27	2.08
2.28	2.14
2.29	2.19
2.30	2.25
2.31	2.31
2.32	2.37
2.33	2.43
2.34	2.49

Water Level (ft)	Flow (cfs)
2.35	20.72
2.36	20.94
2.37	21.16
2.38	21.39
2.39	21.61
2.40	21.83
2.41	22.06
2.42	22.29
2.43	22.52
2.44	22.75
2.45	22.98
2.46	23.21
2.47	23.45
2.48	23.68
2.49	23.92
2.50	24.16
2.51	24.40
2.52	24.64
2.53	24.89
2.54	25.13
2.55	25.38
2.56	25.62
2.57	25.87
2.58	26.12
2.59	26.37
2.60	26.63
2.61	26.88
2.62	27.14
2.63	27.40
2.64	27.66
2.65	27.92
2.66	28.18
2.67	28.44
2.68	28.71
2.69	28.97
2.70	29.24
2.71	29.51
2.72	29.78
2.73	30.05
2.74	30.33
2.75	30.60
2.76	30.88
2.77	31.16
2.78	31.44
2.79	31.72
2.80	32.00
2.81	32.28
2.82	32.57
2.83	32.86
2.84	33.15

Water Level (ft)	Flow (cfs)
2.85	6.92
2.86	7.03
2.87	7.15
2.88	7.27
2.89	7.38
2.90	7.50
2.91	7.62
2.92	7.74
2.93	7.86
2.94	7.99
2.95	8.11
2.96	8.24
2.97	8.36
2.98	8.49
2.99	8.62
3.00	8.75
3.01	8.88
3.02	9.02
3.03	9.15
3.04	9.28
3.05	9.42
3.06	9.56
3.07	9.70
3.08	9.83
3.09	9.98
3.10	10.12
3.11	10.26
3.12	10.40
3.13	10.55
3.14	10.70
3.15	10.85
3.16	10.99
3.17	11.14
3.18	11.30
3.19	11.45
3.20	11.60
3.21	11.76
3.22	11.92
3.23	12.07
3.24	12.23
3.25	12.39
3.26	12.55
3.27	12.72
3.28	12.88
3.29	13.05
3.30	13.21
3.31	13.38
3.32	13.55
3.33	13.72
3.34	13.89

Attachment B

CTR Raceways - Contracted Rectangular Weirs - Flow Calculations

Water Level (ft)	Flow (cfs)
1.48	0.00
1.49	0.01
1.50	0.04
1.51	0.08
1.52	0.12
1.53	0.17
1.54	0.22
1.55	0.27
1.56	0.33
1.57	0.40
1.58	0.47
1.59	0.54
1.60	0.61
1.61	0.69
1.62	0.77
1.63	0.86
1.64	0.94
1.65	1.03
1.66	1.12
1.67	1.22
1.68	1.32
1.69	1.42
1.70	1.52
1.71	1.62
1.72	1.73
1.73	1.84
1.74	1.95
1.75	2.06
1.76	2.17
1.77	2.29
1.78	2.41
1.79	2.53
1.80	2.65
1.81	2.77
1.82	2.90
1.83	3.03
1.84	3.16
1.85	3.29
1.86	3.42
1.87	3.55
1.88	3.69
1.89	3.83
1.90	3.97
1.91	4.11
1.92	4.25
1.93	4.39
1.94	4.54
1.95	4.68
1.96	4.83
1.97	4.98
1.98	5.13

Water Level (ft)	Flow (cfs)
1.99	5.29
2.00	5.44
2.01	5.59
2.02	5.75
2.03	5.91
2.04	6.07
2.05	6.23
2.06	6.39
2.07	6.55
2.08	6.72
2.09	6.88
2.10	7.05
2.11	7.22
2.12	7.39
2.13	7.56
2.14	7.73
2.15	7.90
2.16	8.08
2.17	8.25
2.18	8.43
2.19	8.60
2.20	8.78
2.21	8.96
2.22	9.14
2.23	9.32
2.24	9.51
2.25	9.69
2.26	9.88
2.27	10.1
2.28	10.2
2.29	10.4
2.30	10.6
2.31	10.8
2.32	11.0
2.33	11.2
2.34	11.4
2.35	11.6
2.36	11.8
2.37	12.0
2.38	12.2
2.39	12.4
2.40	12.6
2.41	12.8
2.42	13.0
2.43	13.2
2.44	13.4
2.45	13.6
2.46	13.8
2.47	14.0
2.48	14.2
2.49	14.4

Water Level (ft)	Flow (cfs)
2.50	14.6
2.51	14.8
2.52	15.0
2.53	15.2
2.54	15.4
2.55	15.7
2.56	15.9
2.57	16.1
2.58	16.3
2.59	16.5
2.60	16.7
2.61	16.9
2.62	17.2
2.63	17.4
2.64	17.6
2.65	17.8
2.66	18.0
2.67	18.3
2.68	18.5
2.69	18.7
2.70	18.9
2.71	19.2
2.72	19.4
2.73	19.6
2.74	19.8
2.75	20.1
2.76	20.3
2.77	20.5
2.78	20.7
2.79	21.0
2.80	21.2
2.81	21.4
2.82	21.7
2.83	21.9
2.84	22.1
2.85	22.4
2.86	22.6
2.87	22.8
2.88	23.1
2.89	23.3
2.90	23.5
2.91	23.8
2.92	24.0
2.93	24.3
2.94	24.5
2.95	24.7
2.96	25.0
2.97	25.2
2.98	25.5
2.99	25.7
3.00	25.9