WD

File WD37-0

Water District 37-O
Box 326
Carey, Idaho 83320
208-788-3789

December 29, 2011

Tim Luke
State of Idaho
Department of Water Resources
332 E Front St, PO Box 83720 Boise, ID. 83720-0098

RE: Removal from Water Measurement District

Dear Tim,

As water master of District 37-0 I feel I need to reiterate with you the facts and concerns of the ground water rights for Mutual Gulch and Logans Tunnel . These water rights are from underground sources, but they also flow naturally out of the ground and into the main water source of Muldoon Creek. They are now being measured out of the current head gates for each owner by myself as water master.
Mutual Gulch is approximately a 25-30 minute drive from my property and then at least a 2-3 hour hike into the headwaters. As you will see in the plan we could possibly put the measuring device closer to where the stream flows into Copper Creek which flows into Muldoon Creek.
However Logans Tunnel is another concern, it is located about a 25-30 minute drive and then a 1-2 hour hike into the headwaters, which come out of the side of the mountain that is fairly steep. Finding a level place for measurement before it flows into Muldoon Creek could be an issue.
These are not going to be easy measurements or installations. They are both located in the Sawtooth National Forest and both measurement devices will have to be installed by hand as no motorized vehicles are allowed.
Again, I would like to say that I measure this water now and the owners are assessed by this District. But if you feel it necessary to install measuring devices in order for us to be removed from the UWRWMD we will do so. Please see enclosed plan. If you need anything else please let me know.

Regards,

Bruce Price
Water Master
District 37-0

Water District 37-O
Box 326
Carey, Idaho 83320
208-788-3789

November 28, 2011

Tim Luke
State of Idaho
Department of Water Resources
332 E Front St, PO Box 83720 Boise, ID. 83720-0098

RE: Removal from Water Measurement District

Dear Tim,

Per your suggestion, we as owners of water rights numbered 37-2243B, 37-2243C and 37-1120 in Logan Tunnel and Mutual Gulch located in Water District 37-O propose measuring devices at the headwaters for these streams and to be removed from the UWRWMD. These water rights are not from deep water wells but from other underground sources and are currently being assessed by Water District 37-O by cfs used. We propose to install removable Parshall type weirs and to monitor and or measure said weirs throughout the irrigation season. Accordingly we request to be removed from the Upper Wood Rivers Water Measurement District. If there are any questions or concerns please contact us at the number above. Thank you for your time regarding this matter!

Regards,

Bruce Price ____________________ 37-2243B

George Merrill ____________________ 37-2243C

Terry Clark ____________________ 37-1120

Plans for installation of measurement devices for Mutual Gulch and Logan Tunnell.

Mutual Gulch:

We propose installing a Parshall Flume:

This flume will be installed approximately ¼ mile upstream from the point that the stream flows into Copper Creek.

Logans Tunnel:

We propose the same size and style of flume:

The exact location for this installation really cannot be determined until we can get in there to find and measure a level spot. This could be in the Spring?

5. The cross sectional area of the channel 20 to 30 feet upstream should be at least eight times larger than the area of the orifice. Recommended orifice dimensions and capacities are shown in Fig. 3.

How to Measure

The effective head should be carefully measured. Staff gauges level with the bottom of the orifice should be installed on the upstream and downstream side far enough away from the orifice to avoid turbulence. The difference in the water depth reading on the two gauges is the effective head.

The cross-sectional area of the orifice must be measured carefully. Knowing the head and the area, the discharge can be found from Table 6.

Flumes

Flow measuring flumes are open-channel devices containing a specially-shaped constricted-throat section. They can be constructed from metal, concrete or fiberglass. Standard designs are available to measure water over a wide flow range. Two types are commonly used, Parshall and trapezoidal. Either can be made on the farm or purchased commercially.

Flumes can operate in a flat ditch and require a relatively small head loss. They are self-cleaning and do not require a pool upstream to reduce the approach velocity. Flumes can operate accurately over a wide range of flows. The velocity of water as it approaches the flume has little effect upon its operation. Unless submergence (water backing up in the throat) occurs, only one head measurement is required to obtain the correct flow. The pre-built flumes can easily be re-set in colder areas where the frost might heave them out each winter.

Flumes are relatively expensive when cast in place. Considerable care must be used in forming them to the correct shape and dimensions, such as throat width, drop and diverging sections and gauging wells. The size of the flume is determined by the throat width. For instance, a 6-inch flume would have a 6-inch throat width.

Parshall Flume

The Parshall flume, developed by Ralph Parshall at Colorado State University, is the oldest and most widely used flume. This flume is illustrated in Fig. 4. Dimensions and capacities for Parshall flumes ranging in size from 6 inches to 4 feet are shown in Fig. 5. Larger sizes are available.

How to Install

1. The direction of water flow must be "in line" with the structure. The flow should be reasonable smooth, free from turbulence and uniformly distributed across the channel.

2. The flume should be installed to operate under free flow conditions if possible. Free flow occurs when the elevation of the water surface near the downstream end of the throat section is not high enough to reduce flow due to water backing up in the throat.

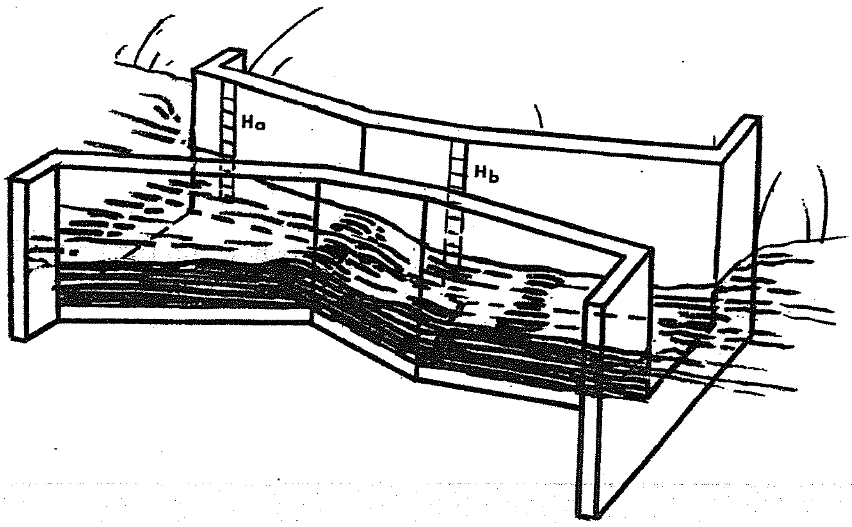


Fig. 4. Parshall measuring flume.

3. In most cases the flume is set with the floor (or crest) elevated above the ditch bottom to prevent excessive submergence. The amount to raise the flume corresponds to the head loss through the structure at about 70% submergence. The flume is set so the water elevation at H_A is higher than the normal tailwater downstream by an amount equal to the head loss. The head loss at 70-submergence is the difference between H_A and 0.7 times H_A or 0.3 H_A.

4. The floor of the converging section must be level both lengthwise and crosswise.

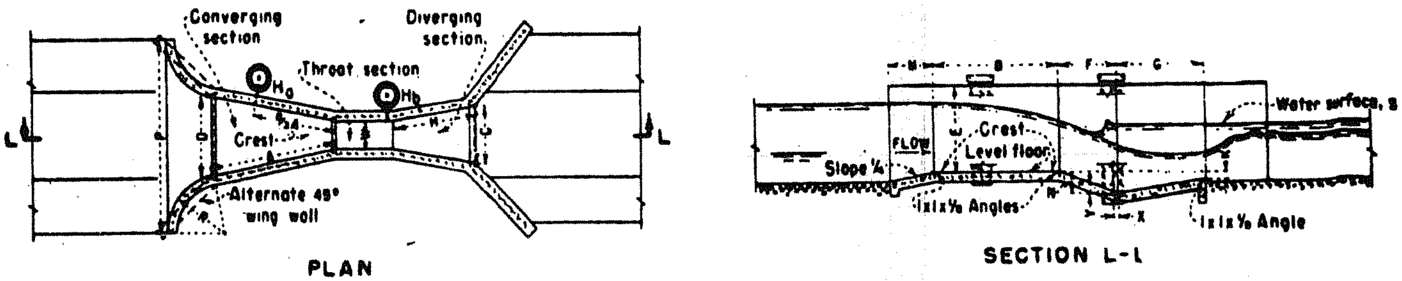
How to Measure

For free flow, one measurement of water depth at H_A is all that is required. Discharge tables are shown in Table 7.

A staff gauge attached to the inside wall at H_A will function for a depth measurement. The water surface here is often turbulent and a reading will be more accurate if a stilling well is installed with the zero of the gauge level with the crest of the flume.

The Parshall flume can be operated with a high degree of submergence — up to 70%. This means it will be accurate as long as the ratio H_B/H_A is less than 0.70. Below this figure only H_A need be measured.

When submergence or H_B/H_A is greater than 0.70 a correction must be made. To do this the discharge given by the water depth H_A is multiplied by the correction factor Q/Q_o for the degree of submergence and corresponding flume size shown in Fig. 6. This correction can reduce flow by a factor of up to 45%.



W	A	$\frac{2}{3}$A	B	C	D	E	F	G	H	K	M	N	P	R	X	Y	Free-Flow Capacity Minimum	Maximum
Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Ft-In	Sec-Ft	Sec-Ft
0-3	1-6 3/8	1-1/4	1-6	0-7	0-10 3/16	1 to 1-6	0-6	1-0	1-5/32	0-1	-	0-2¼	-	-	0-1	0-1½	0.03	1.13
0-6	2-7/16	1-4 5/16	2-0	1-3 1/2	1-3 5/8	2-0	1-0	2-0	-	0-3	1-0	0-4½	2-11 1/2	1-4	0-2	0-3	.05	3.9
0-9	2-10 5/8	1-11 1/8	2-10	1-3	1-10 5/8	2-6	1-0	1-6	-	0-3	1-0	0-4½	3-6 1/2	1-4	0-2	0-3	.09	8.9
1-0	4-6	3-0	4-4 7/8	2-0	2-9 1/4	3-0	2-0	3-0	-	0-3	1-3	0-9	4-10 3/4	1-8	0-2	0-3	.11	16.1
1-6	4-9	3-2	4-7 7/8	2-6	3-4 3/8	3-0	2-0	3-0	-	0-3	1-3	0-9	5-6	1-8	0-2	0-3	.15	24.6
2-0	5-0	3-4	4-10 7/8	3-0	3-11 1/2	3-0	2-0	3-0	-	0-3	1-3	0-9	6-1	1-8	0-2	0-3	.42	33.1
3-0	5-6	3-8	5-4 3/4	4-0	5-1 7/8	3-0	2-0	3-0	-	0-3	1-3	0-9	7-3 1/2	1-8	0-2	0-3	.61	50.4
4-0	6-0	4-0	5-10 5/8	5-0	6-4 1/4	3-0	2-0	3-0	-	0-3	1-6	0-9	8-10 3/4	2-0	0-2	0-3	1.3	67.9
5-0	6-6	4-4	6-4 1/2	6-0	7-6 5/8	3-0	2-0	3-0	-	0-3	1-6	0-9	10-1 1/4	2-0	0-2	0-3	1.6	85.6
6-0	7-0	4-8	6-10 3/8	7-0	8-9	3-0	2-0	3-0	-	0-3	1-6	0-9	11-3 1/2	2-0	0-2	0-3	2.6	103.5
7-0	7-6	5-0	7-4 1/4	8-0	9-11 3/8	3-0	2-0	3-0	-	0-3	1-6	0-9	12-6	2-0	0-2	0-3	3.0	121.4
8-0	8-0	5-4	7-10 1/8	9-0	11-1 3/4	3-0	2-0	3-0	-	0-3	1-6	0-9	13-8 1/4	2-0	0-2	0-3	3.5	139.5
10-0		6-0	14-0	12-0	15-7 1/4	4-0	3-0	6-0	-	0-6	-	1-1½	-	-	0-9	1-0	6	200

Fig. 5. Dimensions and capacities for Parshall measuring flume.

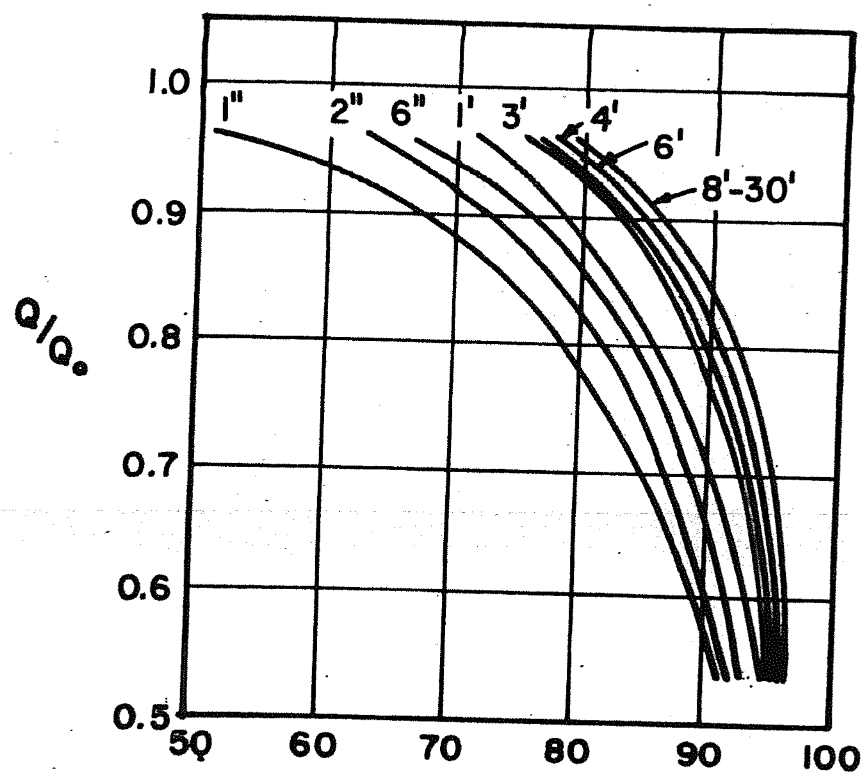


Fig. 6. Parshall measuring flume correction factors for submerged flow.

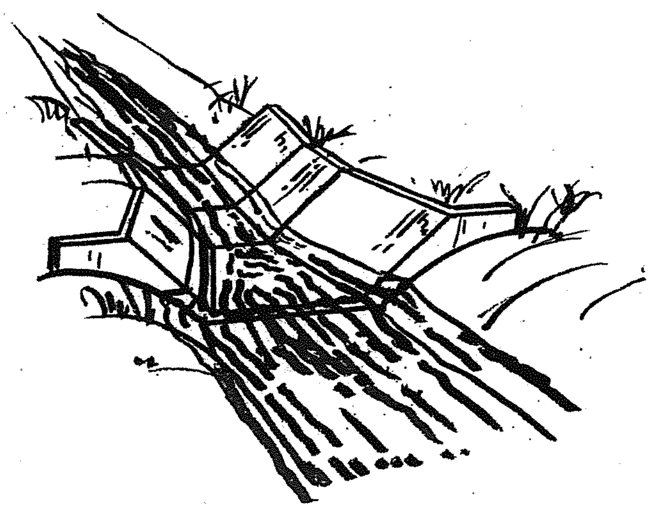
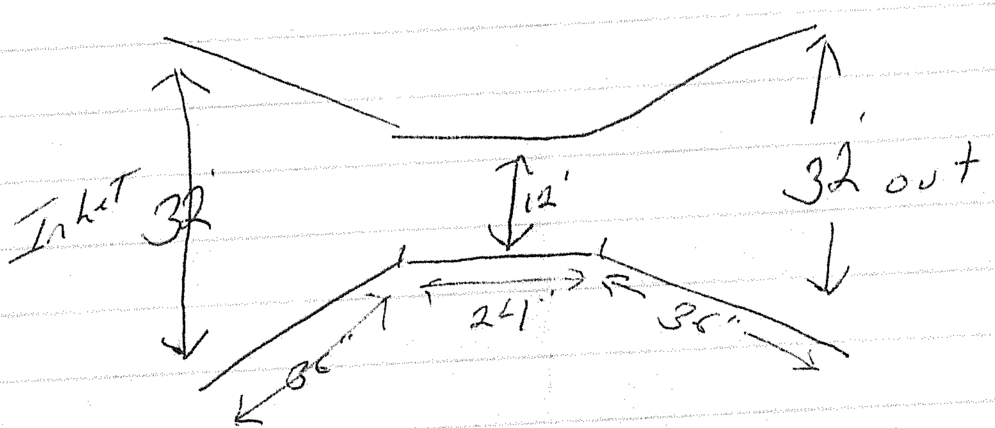


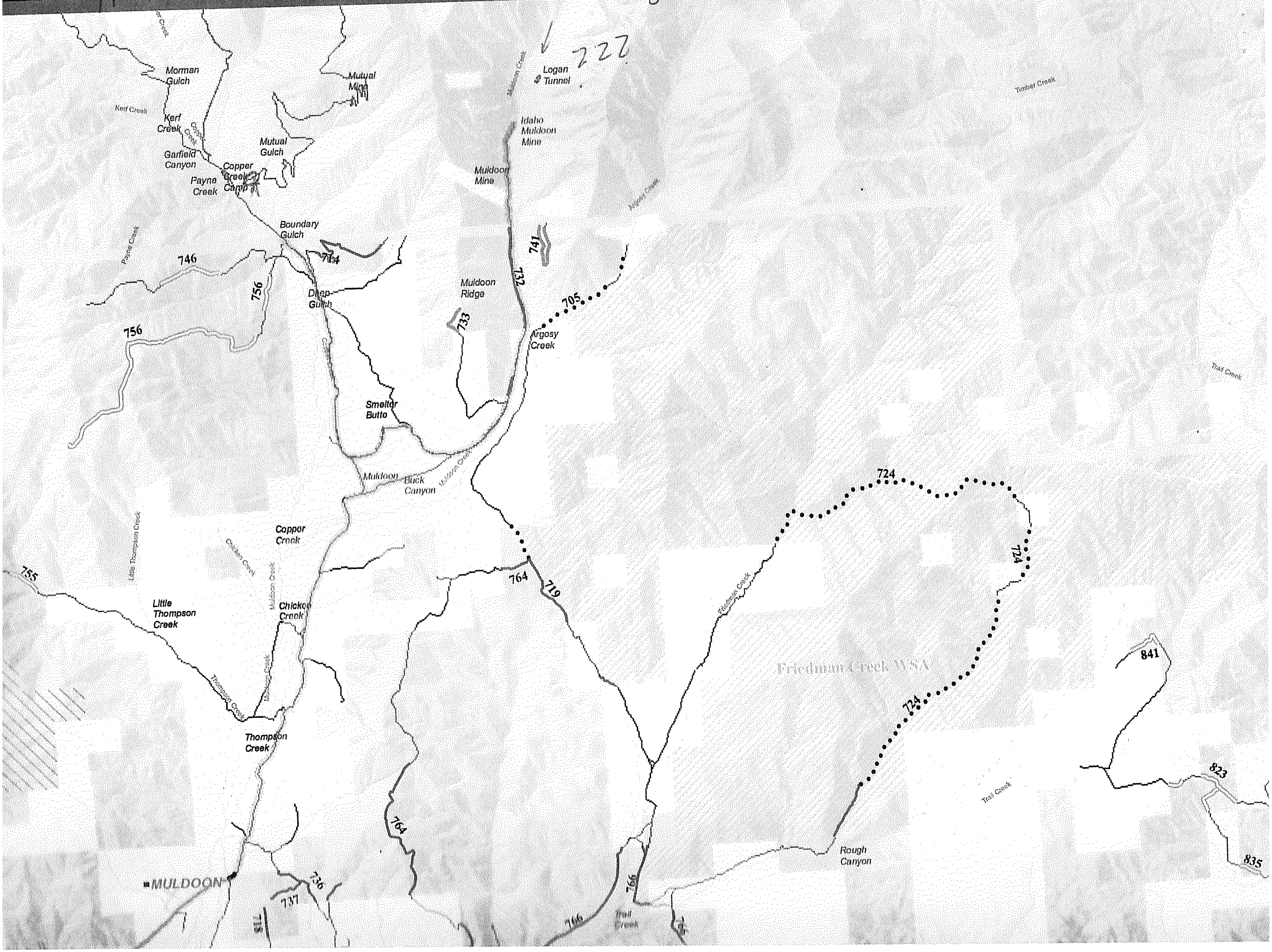
Fig. 7. Trapezoidal flume.

Parshall



24" Deep

* approximate location ... level ground ...



▭ approximate location

MULDOON CANYON SW QUADRANGLE
IDAHO
7.5 MINUTE SERIES (ORTHOPHOTOQUAD)