

PLACE OF USE: POWER

Method of Determination:

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.

<u>Well or Diversion</u> <u>ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge</u> <u>Size</u>
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5 RAM PUMP

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

D. FLOW MEASUREMENTS

1.

<u>Measurement</u> <u>Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
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N/A

2. Measurements:

E. FLOW CALCULATIONS

Measured Method: SEE ATTACHED FOR POWER FLOW.

☐ Additional Computation Sheets Attached

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

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

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

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

2. Volume Calculations for Other Uses: DOMESTIC WITH UP TO ½ ACRE OF IRRIGATION PER HOME = 1.2 AF X 2 HOMES = 2.4 AF

G. NARRATIVE/REMARKS/COMMENTS

FIELD EXAM SHOWED ONLY 2 HOMES BEING SERVED BY RAM PUMP. APPLICANT REFERED TO IT AS A 5 RAM PUMP AND A RECOMMENDED DIVERSION RATE TO SUPPLY THAT SIZE RAM PUMP RANGE FROM 36 GPM TO 71 GPM. BECUASE THERE WAS NO PLACE TO PROPERLY MEASURE THE FLOW RATE AND BECUASE FLOW WAS AT A REDUCED SUMMER FLOW, 0.10 CFS FOR DOMESTIC USE WILL BE GIVEN TO PROPERLY OPERATE THE RAM. APPLICANT HAD TWO 5/8 HEADS ON POWER SYSTEM THAT RISE OF 40 FT AND RUN OF 300 FT WITH A MAX PSI PRESSURE OF 11. WHEN YOU DO THE MATH FOR THOSE SIZED HEADS YOU GET A FLOW RATE OF 38.4 GPM PER HEAD. POWER WILL BE GIVEN A FLOW RATE OF 0.17 CFS AND A ANNUAL VOLUME OF 123.1 AF. DOMESTIC USE WILL BE GIVEN DIVERSION RATE OF 0.10 CFS AND ANNUAL VOLUME OF 2.4 AF FOR 2 HOMES WITH IRRIGATION UP TO 1/2 ACRE PER HOME.

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

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
DOMESTIC	01/01 to 12/31	0.100 CFS	2.40 AF
POWER	01/01 to 12/31	0.170 CFS	123.10 AF
<u>Totals:</u>		0.270 CFS	125.50 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 ☒ Other

I. AUTHENTICATION

Field Examiner's Name Gordon F. Leclerc Date 1-28-2016

Reviewer [Signature] Date 1-29-2016

Manning's Equation Calculator for Flow Rate in a Circular Conduit Flowing Full

READ ME

S =	0.1333	ft/ft
n =	0.009	manning's coefficient
d =	6.0	pipe diameter (inches)
D =	0.50	pipe diameter (feet)
r =	0.25	pipe radius (feet)
A =	0.20	area (ft ²)
WP =	1.57	wetted perimeter (ft)
R =	0.13	hydraulic radius (ft)
Q =	2.95	flow rate (CFS)

Channel Slope

Slope Options

☐ Manual Entry

☒ Slope Calculator

Slope Calculator

Rise = 40 feet
Run = 300 feet
Slope, S = 0.1333 ft/ft

Pipe Material, (n):

plastic (PVC, abs)

Pipe Diameter (Inches)

6.0 inches

Manning's Equation (1), is an empirical formula that solves for velocity (v) in a open channel under uniform flow. The continuity equation (2) when combined with equation (1) allows for the computation of the flow rate (Q) in an open channel under uniform flow.

In equations (1) and (3), η refers to Manning's Coefficient of Roughness and can be found in tabulated form for many open channel types. R is the hydraulic radius of the open channel and is equal to the area of the open channel divided by the wetted perimeter, $R = A/P$. S is the slope of the energy grade line which is often assumed to be equal to the slope of the channel.

Because Manning's Equation is empirical the units are not arbitrary. To obtain a velocity in ft/s and a flow rate in ft³/s, area must be reported in ft², hydraulic radius must be reported in ft, and S must be reported in ft/ft. Manning's Coefficient of Roughness is a unitless constant.

$$(1) \quad v = 1.49 \left(\frac{1}{\eta} \right) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$

$$(2) \quad Q = vA$$

$$(3) \quad Q = 1.49 \left(\frac{1}{\eta} \right) (A) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$

Nozzle Flow Rates

Head Pressure		Flow (Gpm) Per Nozzle Diameter (In.)										
(Ft.)	(Psi)	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
5	2.2	—	—	—	—	6.2	8.4	11.0	17.1	24.7	33.6	43.9
10	4.3	—	—	3.9	6.1	8.8	11.6	15.6	24.2	35.0	47.6	62.1
15	6.5	—	2.7	4.8	7.4	10.7	14.6	19.0	29.7	42.8	58.2	76.0
20	8.7	1.4	3.1	5.5	8.6	12.4	16.8	22.0	34.3	49.4	67.3	87.8
30	13.0	1.7	3.8	6.7	10.5	15.1	20.6	26.9	42.0	60.5	82.4	107.0
40	17.3	1.9	4.4	7.8	12.1	17.5	23.8	31.1	48.5	69.9	95.1	124.0
50	21.7	2.2	4.9	8.7	13.6	19.5	26.6	34.7	54.3	78.1	106.0	139.0
60	26.0	2.4	5.4	9.5	14.8	21.4	29.1	38.0	59.4	85.6	117.0	152.0
80	34.6	2.8	6.2	11.0	17.1	24.7	33.6	43.9	68.6	98.8	135.0	176.0
100	43.3	3.1	6.9	12.3	19.2	27.6	37.6	49.1	76.7	111.0	150.0	196.0
120	52.0	3.4	7.6	13.4	21.0	30.3	41.2	53.8	84.1	121.0	165.0	215.0
150	65.0	3.8	9.0	15.0	23.5	33.8	46.0	60.1	93.9	135.0	184.0	241.0
200	86.6	4.3	9.8	17.4	27.1	39.1	53.2	69.4	109.0	156.0	213.0	278.0
250	108.0	4.9	10.9	19.9	30.3	43.6	59.4	77.6	121.0	175.0	238.0	311.0
300	130.0	5.3	12.0	21.3	33.2	47.8	65.1	85.1	133.0	191.0	261.0	340.0
400	173.0	6.1	13.8	24.5	38.3	55.2	75.2	98.2	154.0	221.0	301.0	393.0

$$\left. \begin{array}{l} 8.7 \text{ psi} \\ 11.0 \text{ psi} \\ 13.0 \text{ psi} \end{array} \right\} 4.3 \text{ psi} \quad 2.3 \text{ y} \quad \left. \begin{array}{l} 34.3 \text{ gpm} \\ x \\ 42.0 \text{ gpm} \end{array} \right\} 7.7 \text{ gpm}$$

$$\frac{4.3 \text{ psi}}{7.7 \text{ gpm}} = \frac{2.3 \text{ psi}}{y \text{ gpm}}$$

$$(4.3)(y) = (7.7)(2.3)$$

$$y = \frac{(7.7)(2.3)}{4.3}$$

$$= 4.1$$

$$x = 34.3 + 4.1 = 38.4 \text{ gpm}$$

$$11 \text{ psi} = 38.4 \text{ gpm}$$

State of Idaho
Department of Water Resources
Water Right License
96-9215



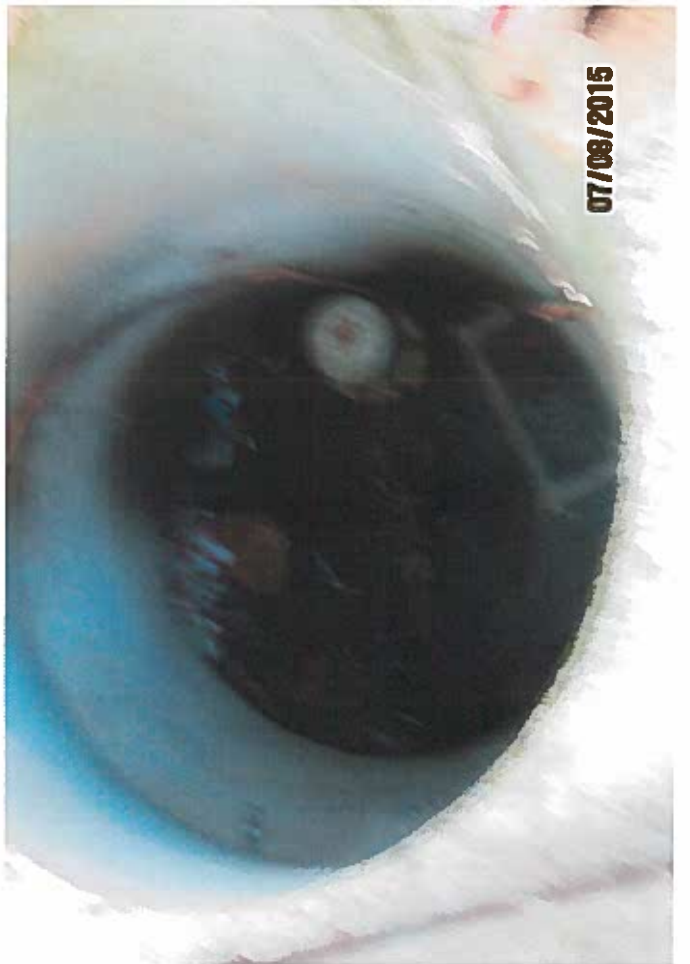
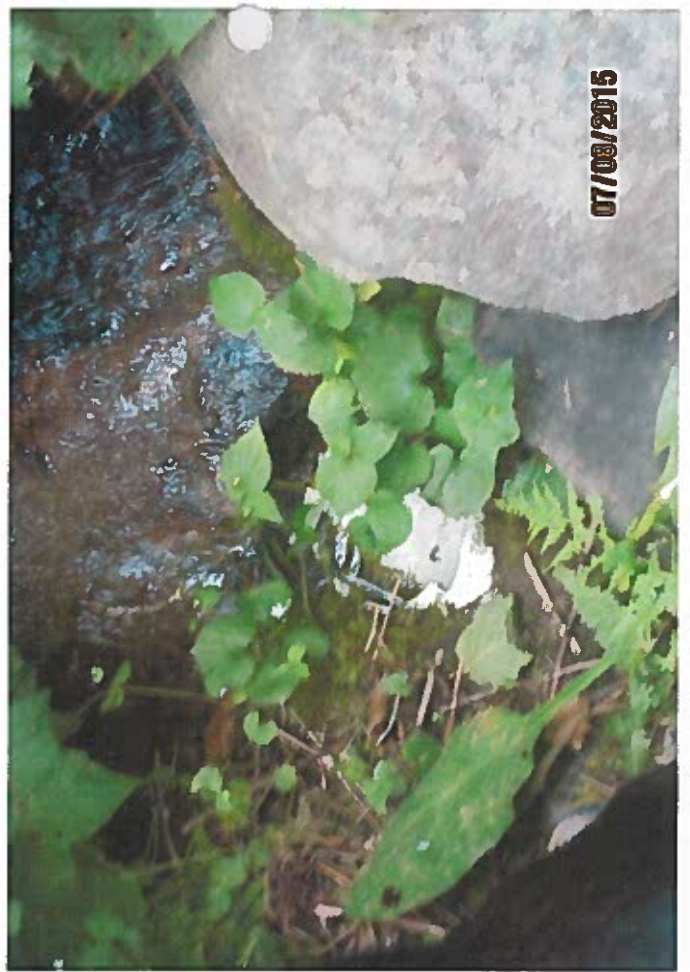
0 0.0375 0.075 0.15 Miles

-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections

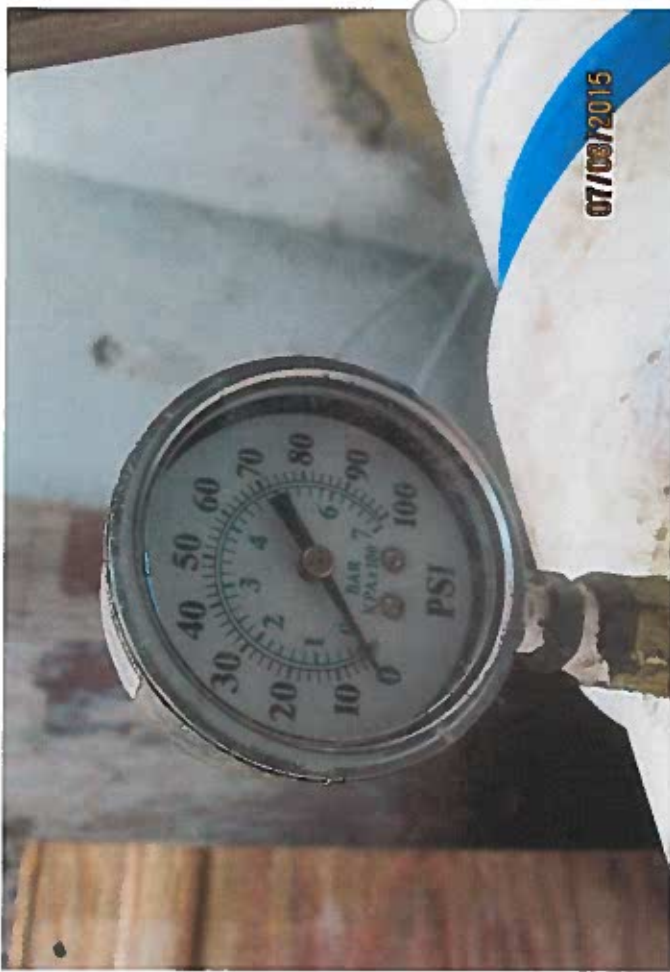




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