

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 85-15750

Exam Date: 9/6/2012

1. Current Owner: BILL COWGER
927 GUN CLUB RD
LEWISTON ID 83501-9789
(208)746-9594
2. Accompanied by: Mr. and Mrs. Cowger

3. **SOURCE**
GROUND WATER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: NONE
2. Other water rights with the same point of diversion: NONE

C. DIVERSION AND DELIVERY SYSTEM1. **LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER NW1/4NW1/4 Sec. 4, Twp 35N, Rge 05W, B.M. NEZ PERCE County

Method of Determination: field visit and GPS (46.410619, -116.975767)

2.

PLACE OF USE: IRRIGATION

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	
35N	05W	4					0.1	0.6											0.7
							L3	L4											

Total Acres: 0.7

DOMESTIC same as IRRIGATION

Method of Determination: Field visit and aerial imagery

3. ☒ Delivery System Diagram Attached (required).
- ☐ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required).
- ☐ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☐ Photo of Diversion and System Attached

4.

<u>Well or Diversion</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
D0005641		2 hp			

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>
No physical measurement obtained. Submersed pump to buried pipe to storage tank.							

2. Measurements:

I will estimate the PD's capacity by conducting a hp equation and calculating the demand of the system.

E. FLOW CALCULATIONS

___y___ Additional Computation Sheets Attached

Measured Method:

1). HORSEPOWER EQUATION

Depth to water = 255' based on the perforations that were reported in well driller's report

Horsepower = 2

Pressure = the water open discharges into one of the storage tank that is located 15' high. $15' \times 0.433 = 6.5$ psi

Efficiency = 70% (IDWR standard)

$$8.8 \times 2 \times 0.7 / 255 + (2.31 \times 6.5) = 12.32/270 = 0.05 \text{ cfs}$$

2). The system consists of 2-1500 gallon storage tank and a 3" main where water is conveyed to 9 different stubs/lots. In addition the system is equipped with fire protection purposes. In order to figure out if 0.05 cfs is enough water to meet the beneficial uses of domestic and irrigation I analyzed the maximum instantaneous demand and daily demands and compared that to the system capacity to make sure it works.

-3000 gallons of storage

-Diversion rate of 0.05 cfs can provide up to 32,000 gallons per day

Daily demand for 9 homes and 0.7 acre of irrigation

$$9 \text{ homes} \times 0.6 = (5.4 \text{ af}/365 \text{ days}) \times 325,850 = 4,800 \text{ gpd}$$

$$0.7 \text{ acre} \times 4 \text{ af} = (2.8 \text{ af}/294 \text{ days}) \times 325,850 = 3,100 \text{ gpd}$$

Total daily demand = ~8,000 gpd

$$\text{Percent of 24 hour well operates} = 8,000 \text{ gallons}/32,000 \text{ gallons per day} = 25\% \times 24 \text{ hours} = \sim 6 \text{ hours}$$

$$\text{Time required to fill 3000 gallon tank} = 3000 \text{ gallons}/23 \text{ gpm} = 130 \text{ minutes}$$

Maximum demand for 9 homes and 0.7 acre of irrigation

Maximum Instantaneous Water Requirements (see attached worksheet)

$$9 \text{ homes} \rightarrow 0.14 \text{ cfs}$$

$$0.14 \text{ cfs} - 0.05 \text{ (live flow)} = 0.09 \text{ cfs or } 40 \text{ gpm}$$

$$0.70 \text{ acres} \times 0.03 = 0.02 \text{ cfs for irrigation purposes or } 9 \text{ gpm}$$

$$\sim 50 \text{ gpm}/3,000 \text{ gallons} = 60 \text{ minutes}$$

Conclusion: Storage tank size and pump capacity appear reasonable in that the daily demand can be supplied with approximately 6 hours of daily operation and the pump runs approximately 130 minutes per cycle. In addition, the system can withstand a full hour of maximum demand conditions without depleting the stored water. The diversion rate of 0.05 cfs is sufficient to serve the permitted uses and will carry over to the license.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 0.7 \text{ acre} \times 4 \text{ af} = 2.8 \text{ afa}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.02 \times 294 \text{ days} \times 1.9835 = 11.7 \text{ af}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 2.8 \text{ af}$$

2. Volume Calculations for Other Uses: Domestic use of 9 homes $\times$ 0.6 af = 5.4 AF**G. NARRATIVE/REMARKS/COMMENTS**

There are two wells that are part of two separate systems at Cowger Additions (POU). One well is used for irrigation purposes for the west side of the subdivision (with the exception of the Cowger's home which is the most southern home) and domestic use for the shop (one bathroom). The old well (drilled around the 70s?) was originally going to be used for the domestic use for the 9 homes but it did not meet quality standards. A new well was put in 1999 and is used for in-house use of 9 homes, irrigation for the east side of the subdivision, and the Cowger's home.

The old well is apparently 65' deep according to the Cowger's and I was able to measure a flow rate at the hydrant that is located at the well—average of 22 seconds to fill a 5 gallon bucket or $5 \times 60 / 22 = 14 \text{ gpm}$. Can back-calculate the hp equation with the psi of 36, depth of well is 65' and diversion rate of 0.03 cfs.

The old well is equipped for 2 pressure tanks for use at the bathroom.

The new well has a 2 horsepower pump and is pumped into 2-1500 gallon storage tanks that are located upstairs at the shop that sit 15' high. From the storage tank there is a 7 horsepower pump that conveys the water to a 3" mainline that then goes to the homes.

Since the system is not integrated, an amendment was necessary to add a PD to 85-7658. I received the amendment and split 85-7658 into 85-15750 (new well) and 85-15751 (old well).

Note that the domestic component between 85-15750 and 85-15751 is limited to 0.05 cfs total based on the amendment the permit holder signed.

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	1/01 to 12/31	0.040 CFS	5.4 AF
IRRIGATION	2/15 to 11/30	0.020 CFS	2.8 AF
<u>Totals:</u>		0.050 CFS	8.2 AF

2. Recommended Amendments

☐ Change P.D. as reflected above ☒ Add P.D. as reflected above ☐ None

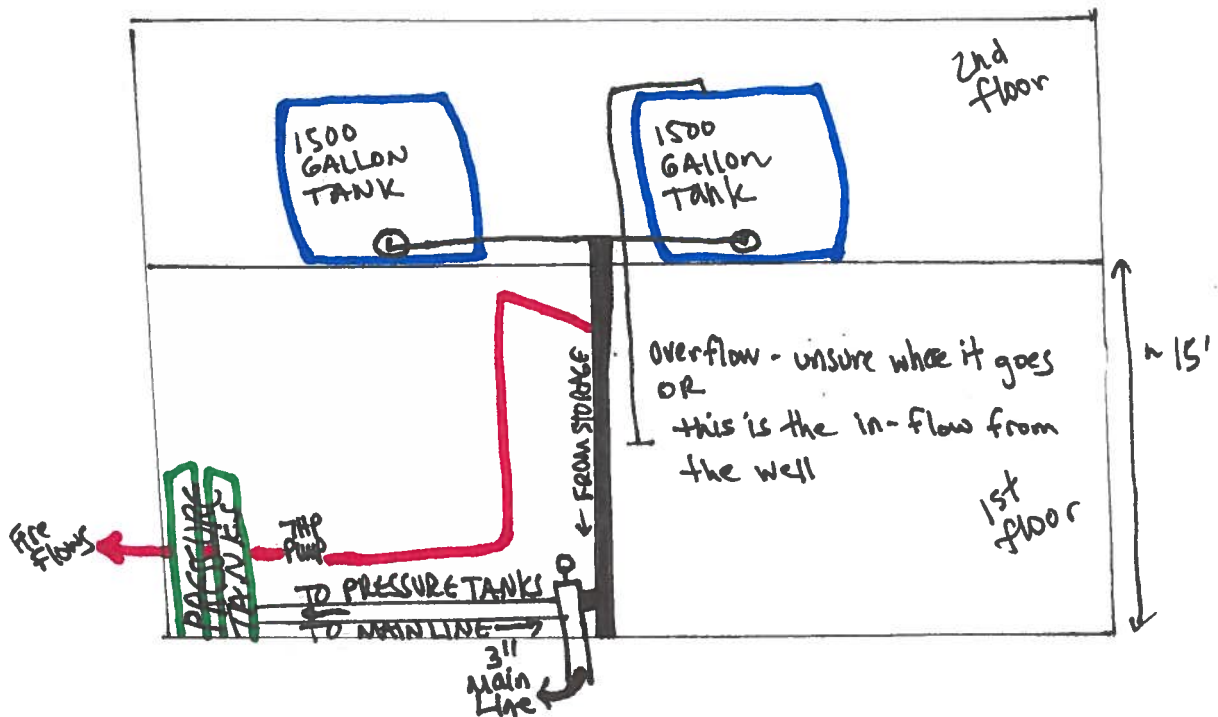
☒ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

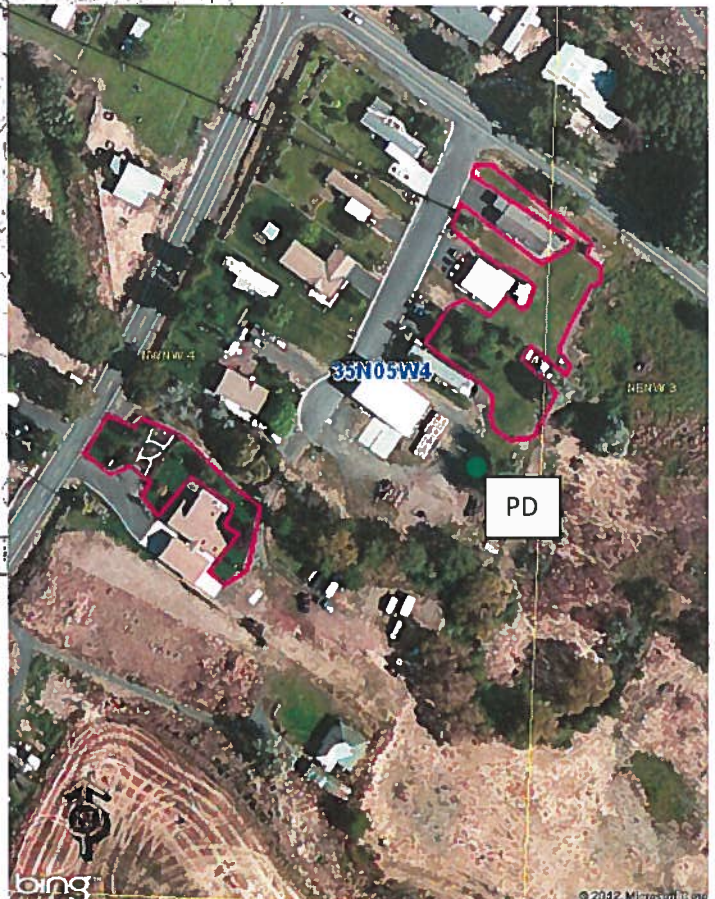
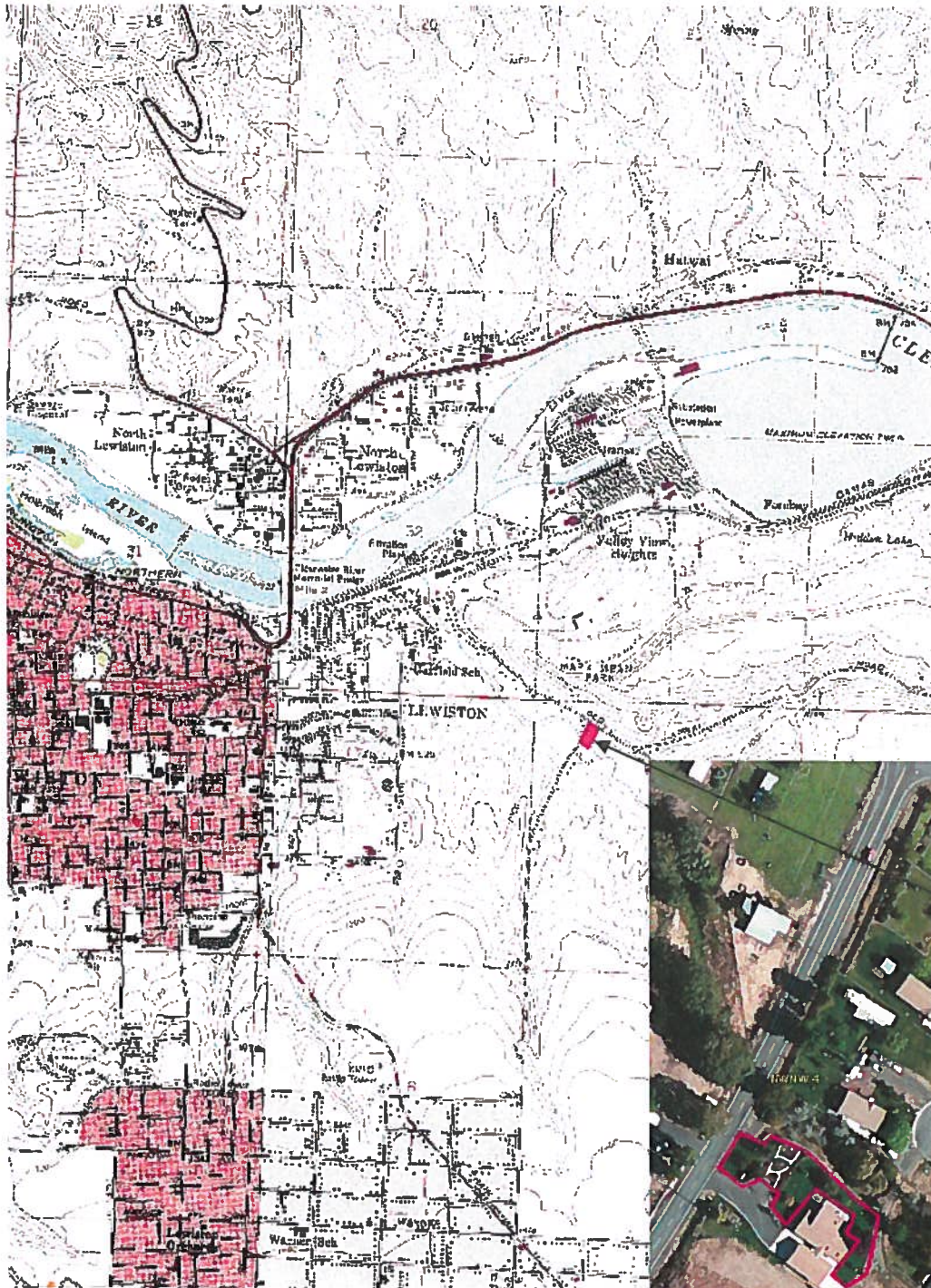
Field Examiner's Name Cherif Palmer Date 2/1/13

Reviewer _____ Date _____

System Diagram in the Shop



NOTE: Mr. Cowger was not sure how the system was configured and I had a hard time identifying what pipes went where and for what purpose. My system diagram above is my best guess as to how the system works.

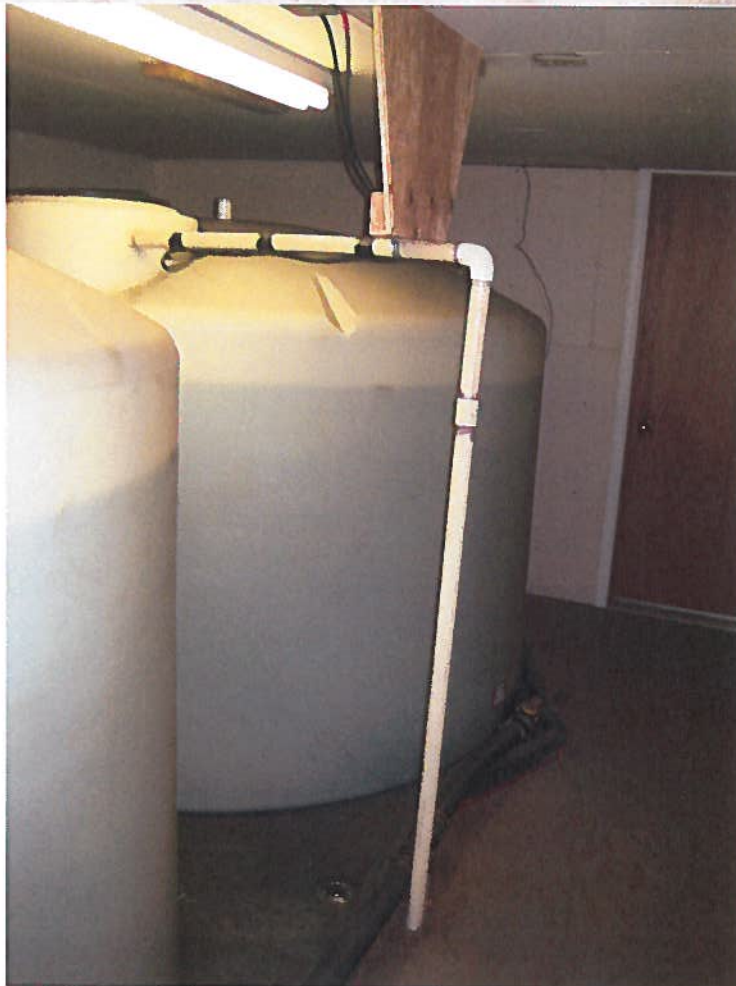


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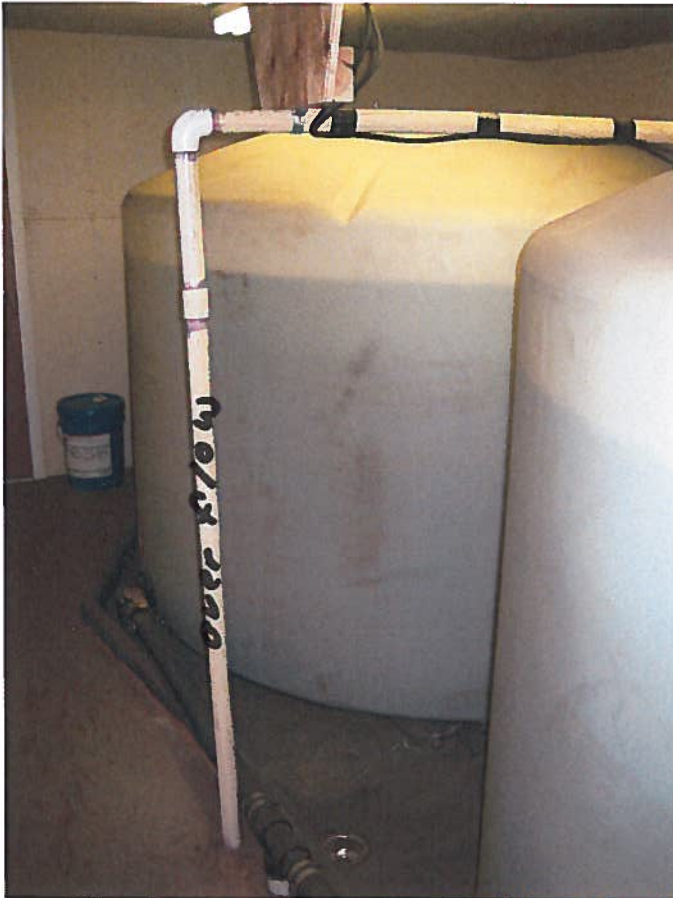
well 00005641

Picture is facing east



Storage tanks

15750



2 x 1500 gallon storage tanks



Pressure tanks

15750



7hp pump
40 psi
3" main line



Storage tanks are
uptains

15750



Place of use
Picture facing north
located to the east
of the shop



Place of use
Picture looking north
located on the west
of the shop

15750



Cowger's Property

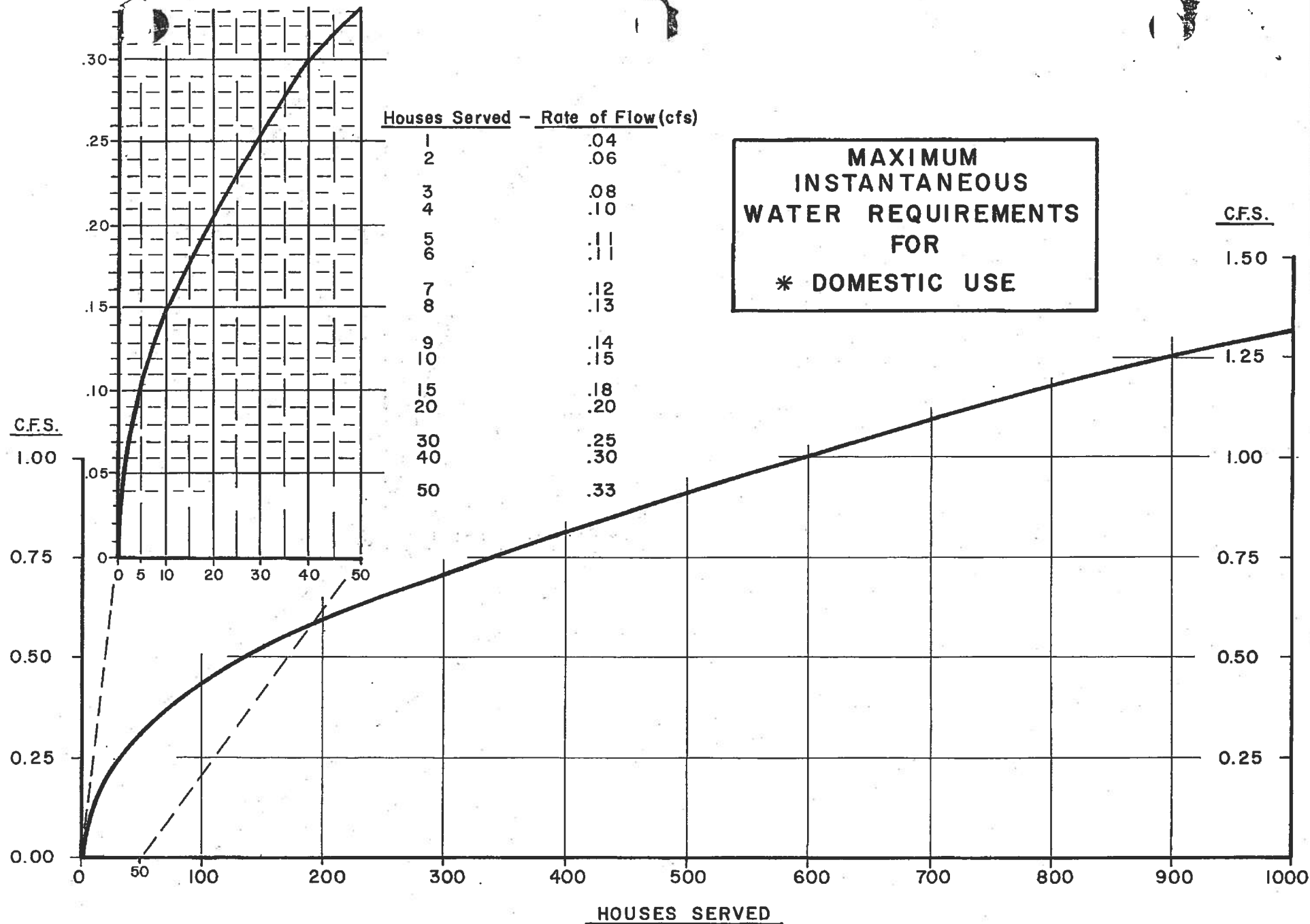


FIG. 1.

* From Community Water Systems Source Book, J. Ameen, 1977, Technical Proceedings, North Carolina.)