

Pump and Pipe System Design

Facility Class
Department of Fisheries and Allied Aquacultures

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Pumping system requirements

1. WE NEED A CERTAIN AMOUNT OF WATER.
2. WE NEED A CERTAIN AMOUNT OF WATER PRESSURE.

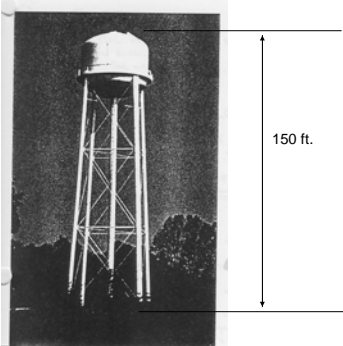
WHERE DOES THE WATER
COME FROM?

ANSWER: 1) CITY WATER MAIN or 2) POND
or 3) WELL or 4) STREAM

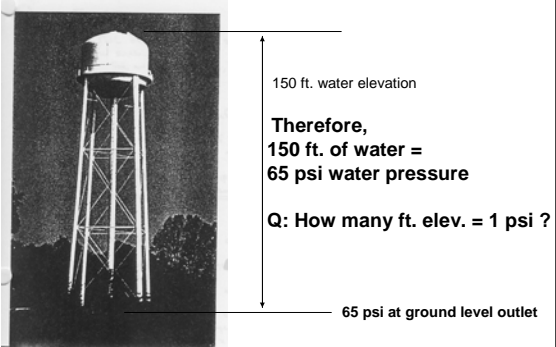
WHERE DOES THE WATER
PRESSURE COME FROM?

ANSWER: 1) ELEVATED STORAGE or 2) PUMPS

Elevation head vs. pressure head

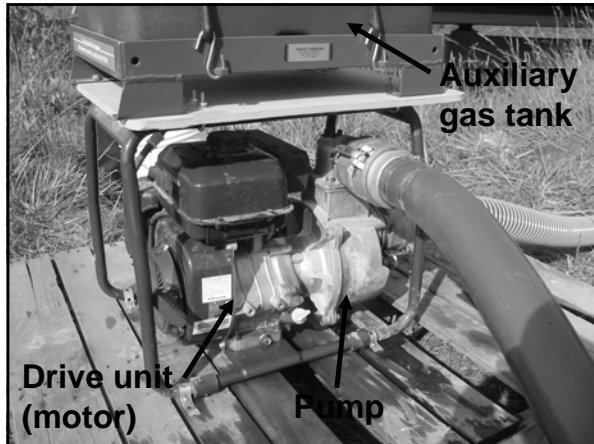


Elevation head vs. pressure head



Pumping plants

Examples



Pump and motor specifications

- Ag pump: suction and discharge ports - 3in.
- Total Head lift 105 ft (~46 psi)
- Suction Head 26 ft.
- Discharge capacity 140 GPM (@ 46 psi)
- H.P. 5.5

Estimate of horsepower:
 $HP = (140 \text{ gpm} \times 105 \text{ ft}) / (3960 \times .70) = \underline{5.3 \text{ HP}}$

Pump and motor specifications

- Pump: example (electric 120 V)
- Total Head lift 10 psi
- Discharge capacity 2 GPM (@ 10 psi)
- H.P. 1/12 (on faceplate)

Rough estimate:
 $HP = (2 \text{ gpm} \times 10 \text{ psi}) / (1709 \times .15) = \underline{.08 \text{ HP}}$
