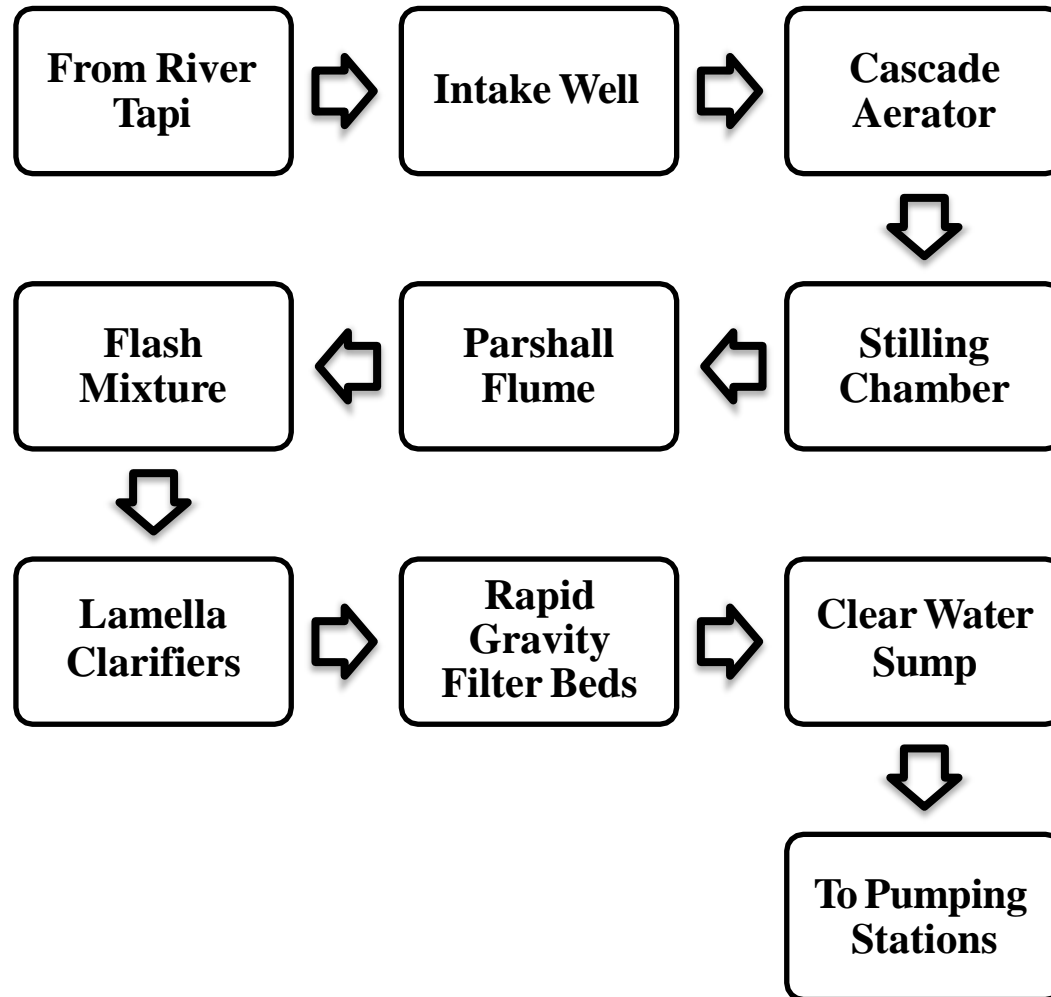


Course Title

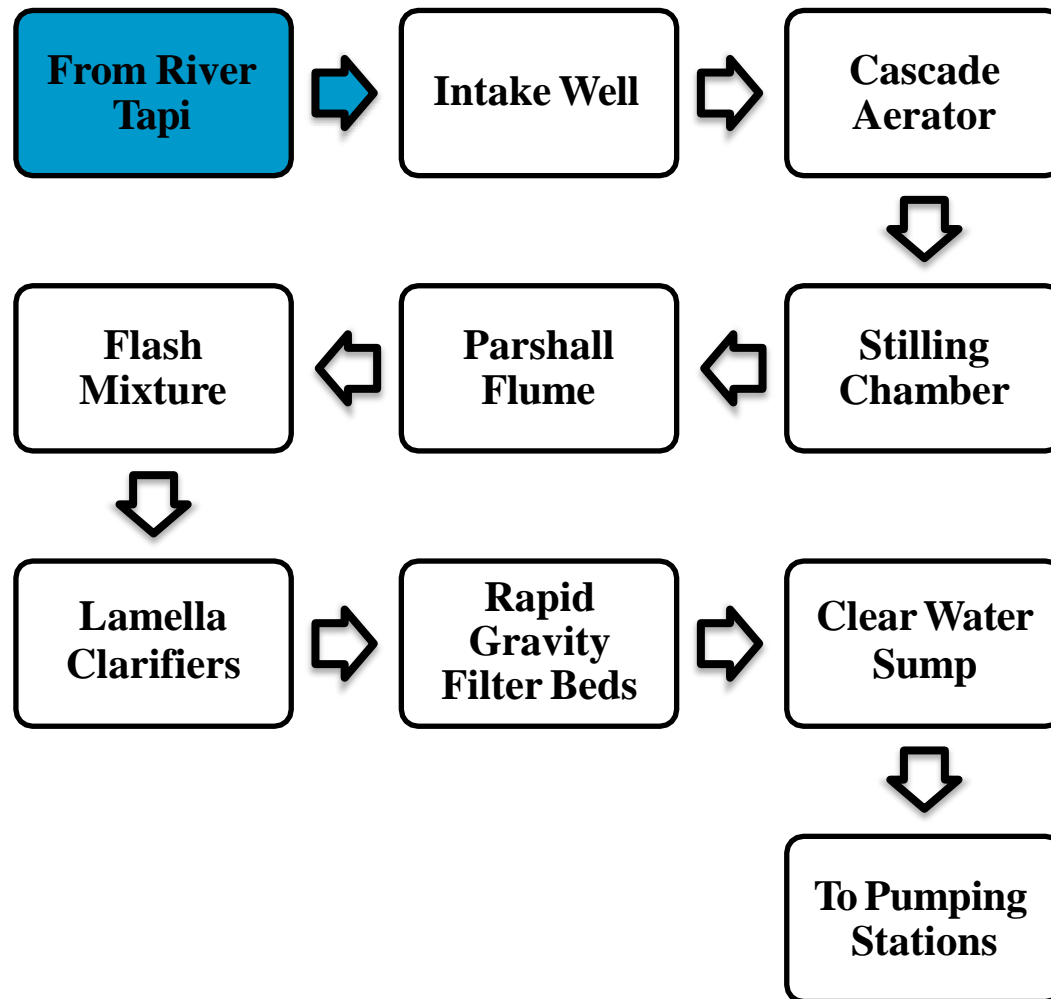
Infrastructure Planning & Management (Maj/CRP-304)

Lecture 4:Water Treatment Plant units

Flow Diagram of Water Treatment Plant units



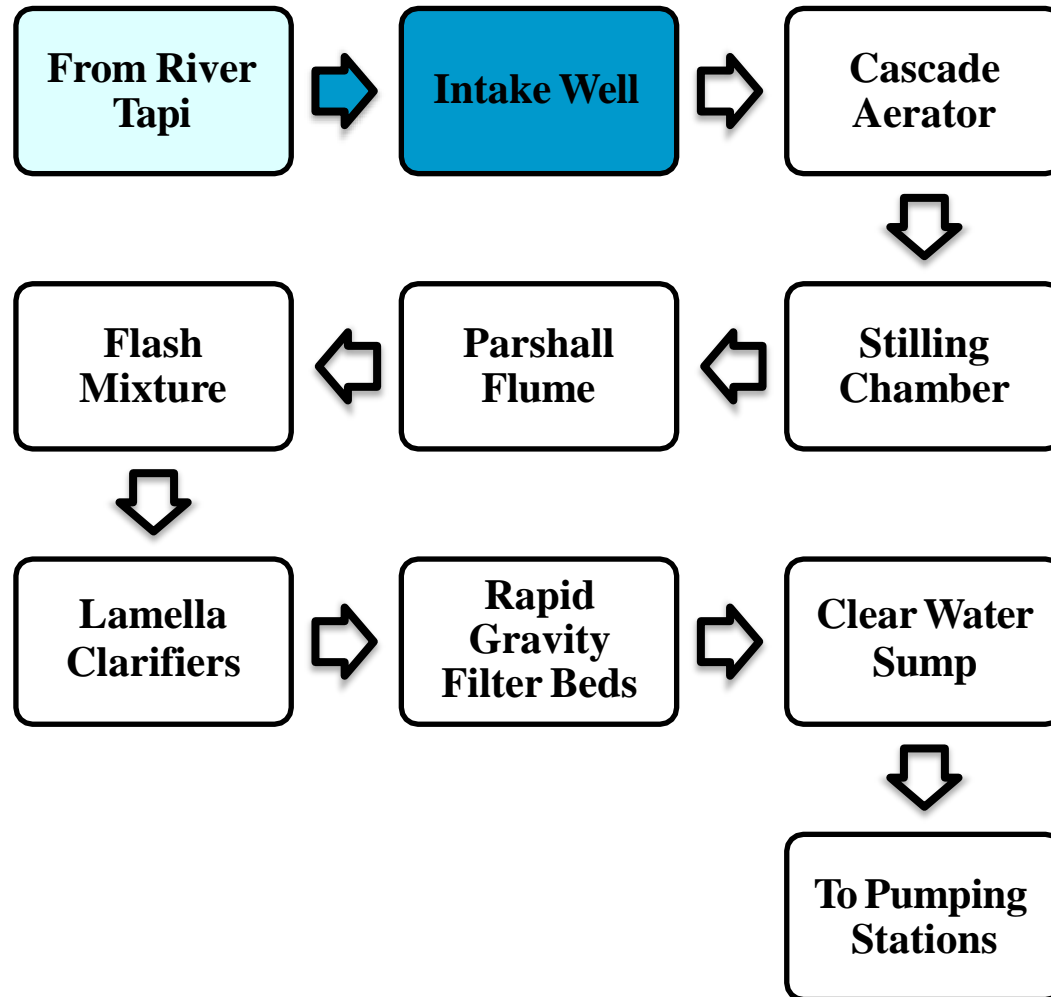
Flow Diagram of Water Treatment Plant



Source of water – River Tapi



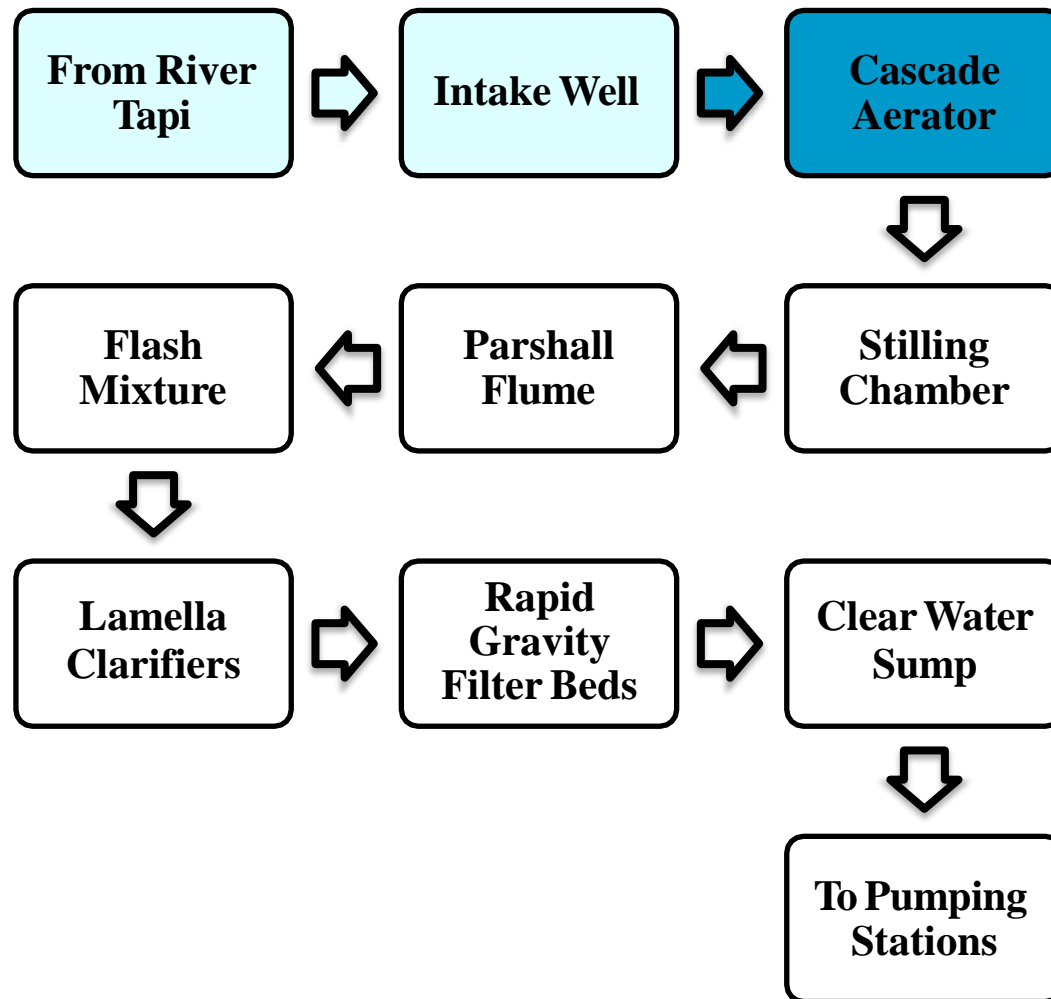
Flow Diagram of Water Treatment Plant



Name of unit	Intake well
Number of units	1
Detail of unit	To draw the water from river Tapi for the water treatment plant



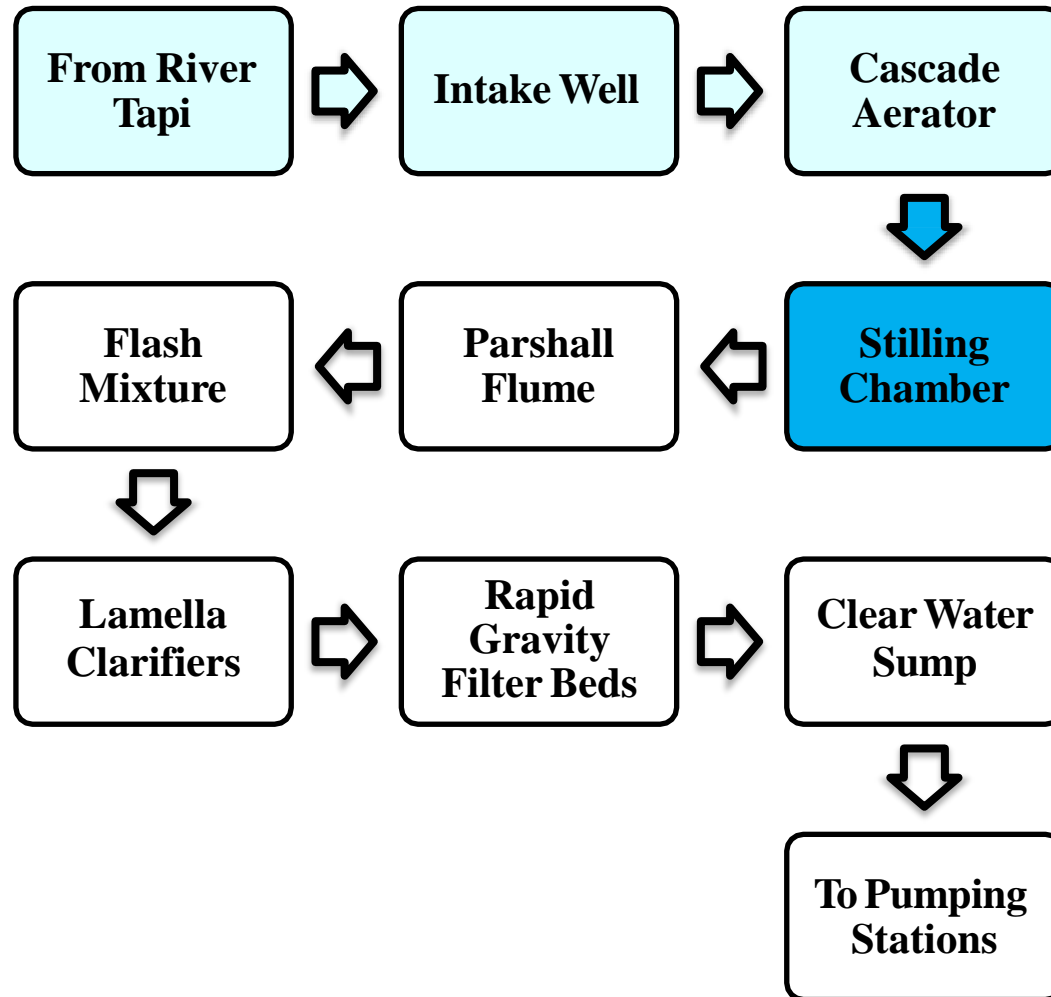
Flow Diagram of Water Treatment Plant



Name of unit	Cascade aeration unit
Number of units	1
Detail of unit	To increase the dissolved oxygen content in raw water



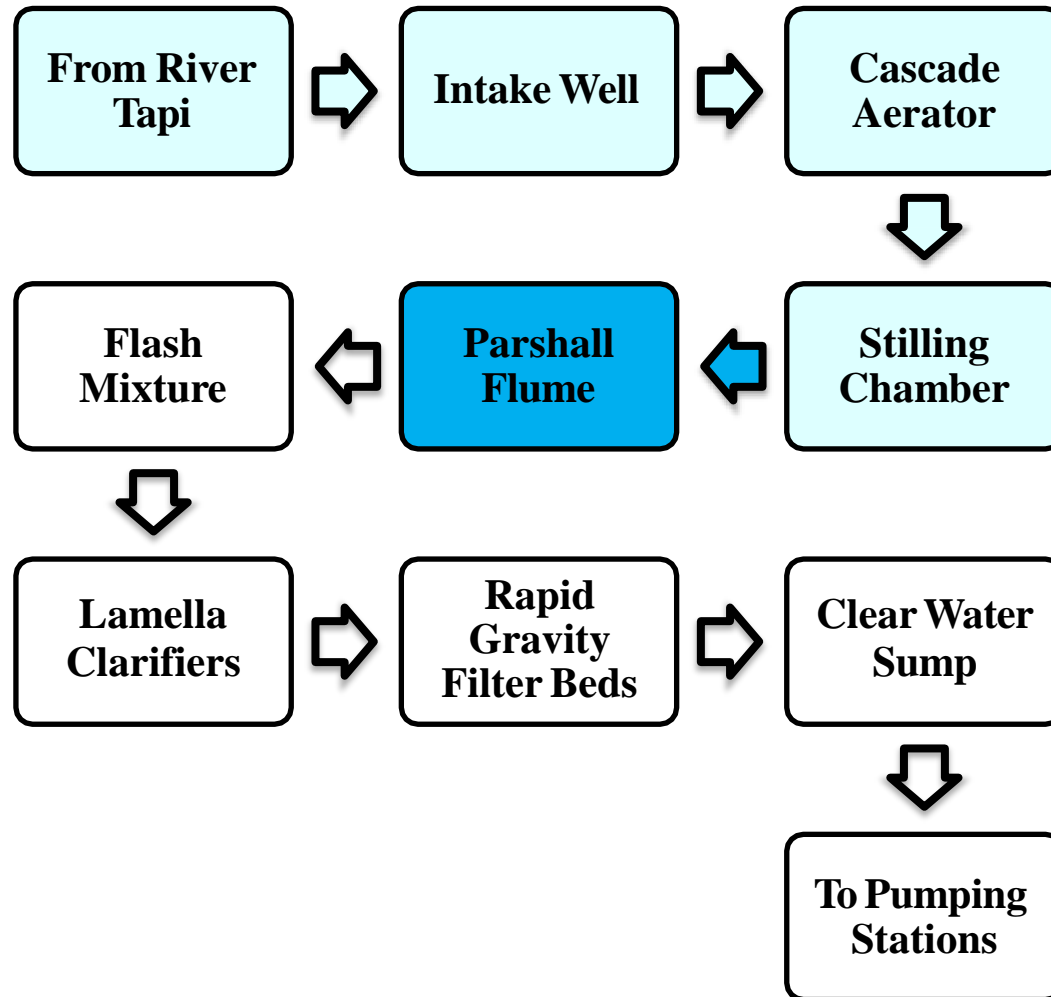
Flow Diagram of Water Treatment Plant



Name of unit	Stilling Chamber
Number of units	1
Detail of unit	To control the quantity of raw water and for pre-chlorination



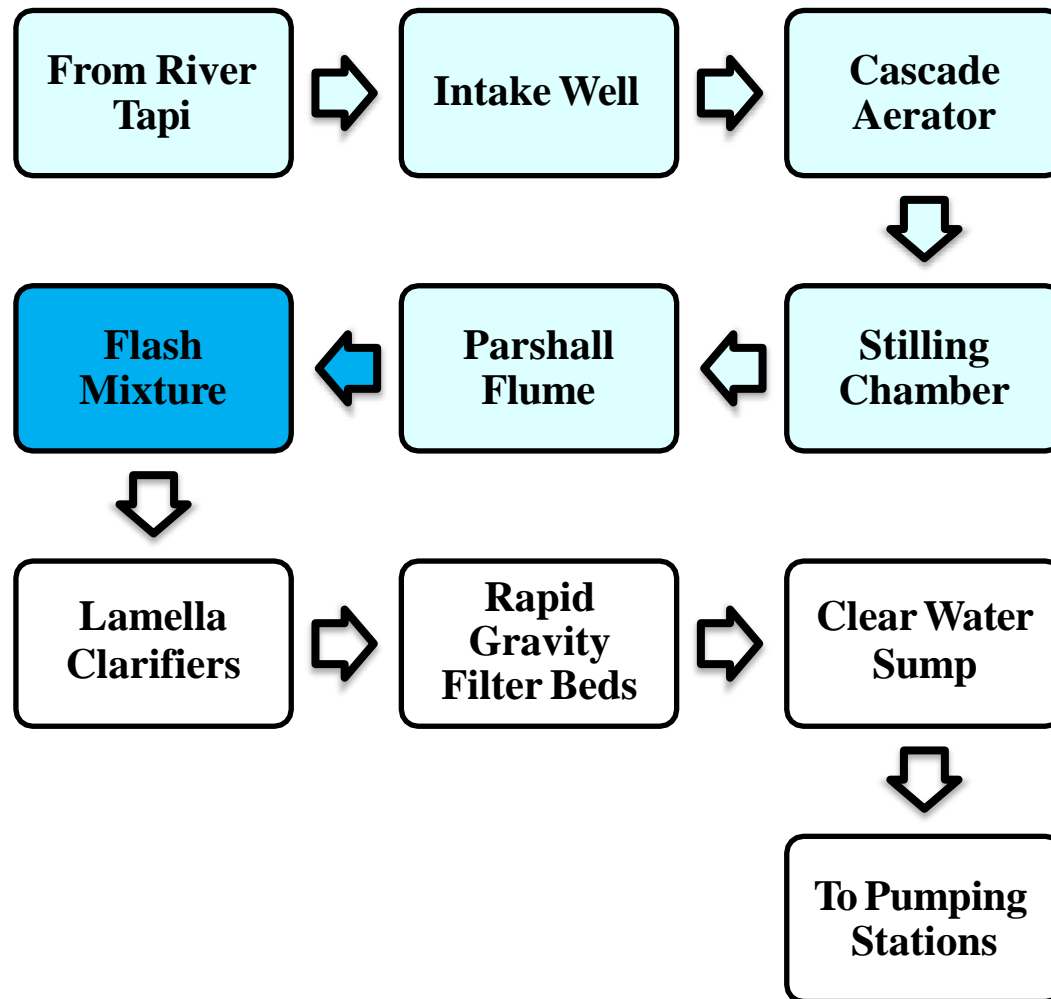
Flow Diagram of Water Treatment Plant



Name of unit	Parshall Flume
Number of units	2
Detail of unit	To measure the quantity of raw water



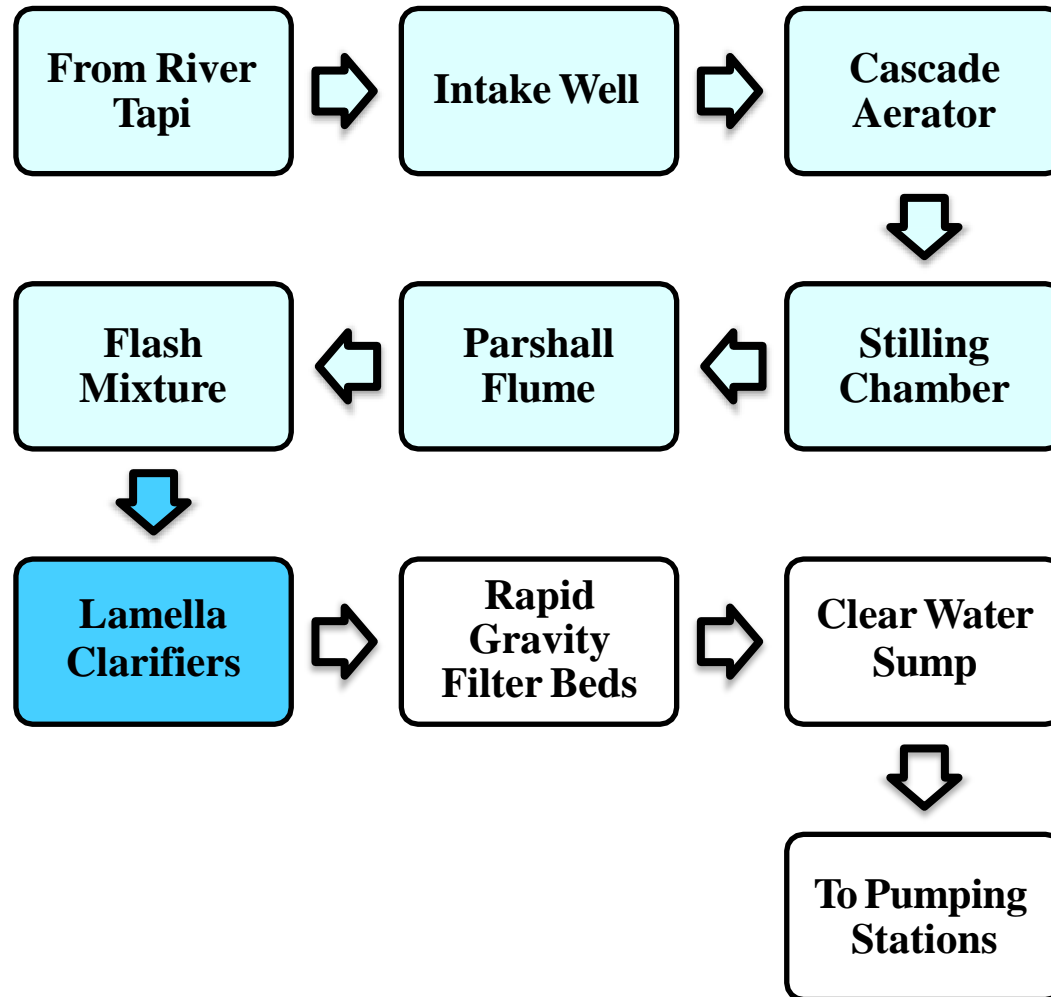
Flow Diagram of Water Treatment Plant



Name of unit	Flash Mixture
Number of units	2
Detail of unit	To mix the liquid alum in raw water



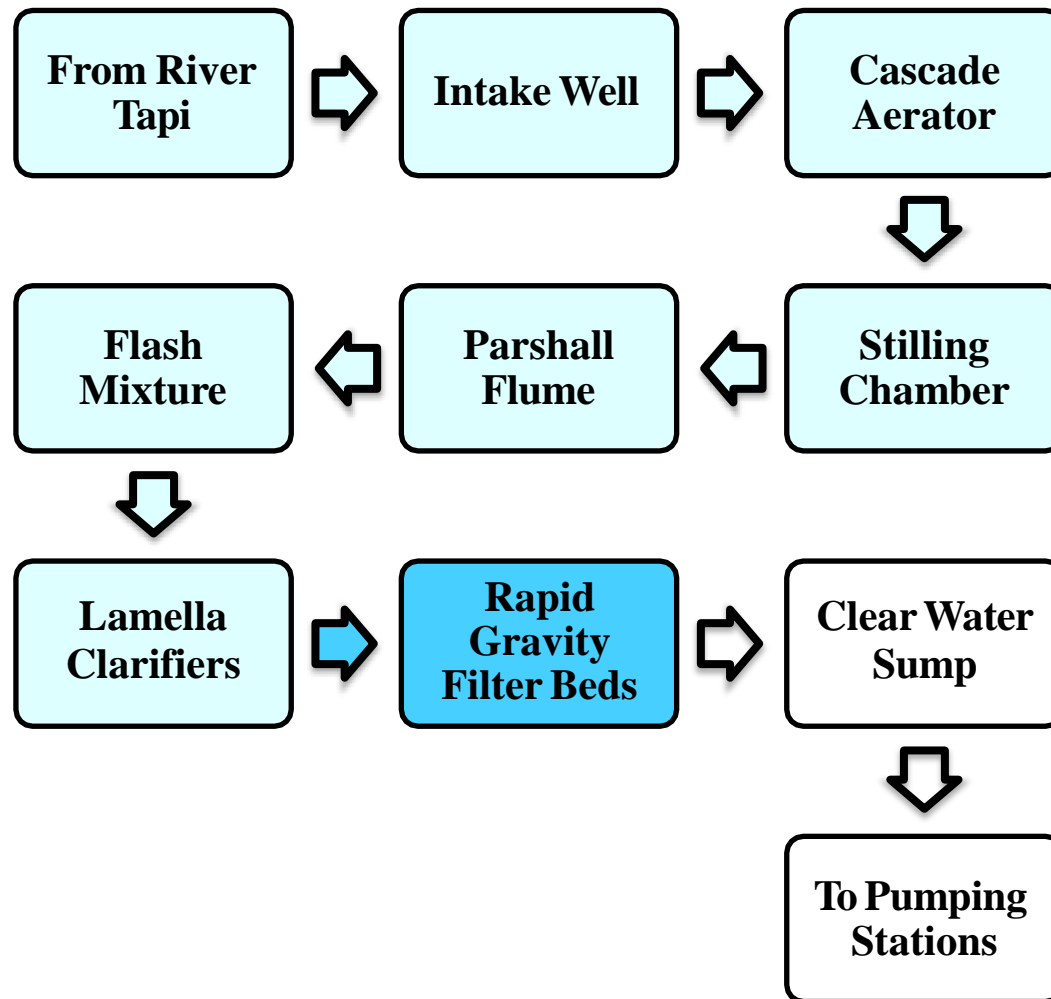
Flow Diagram of Water Treatment Plant



Name of unit	Lamella Clarifiers
Number of units	10
Detail of unit	To decrease the turbidity of raw water partially – primary clarification



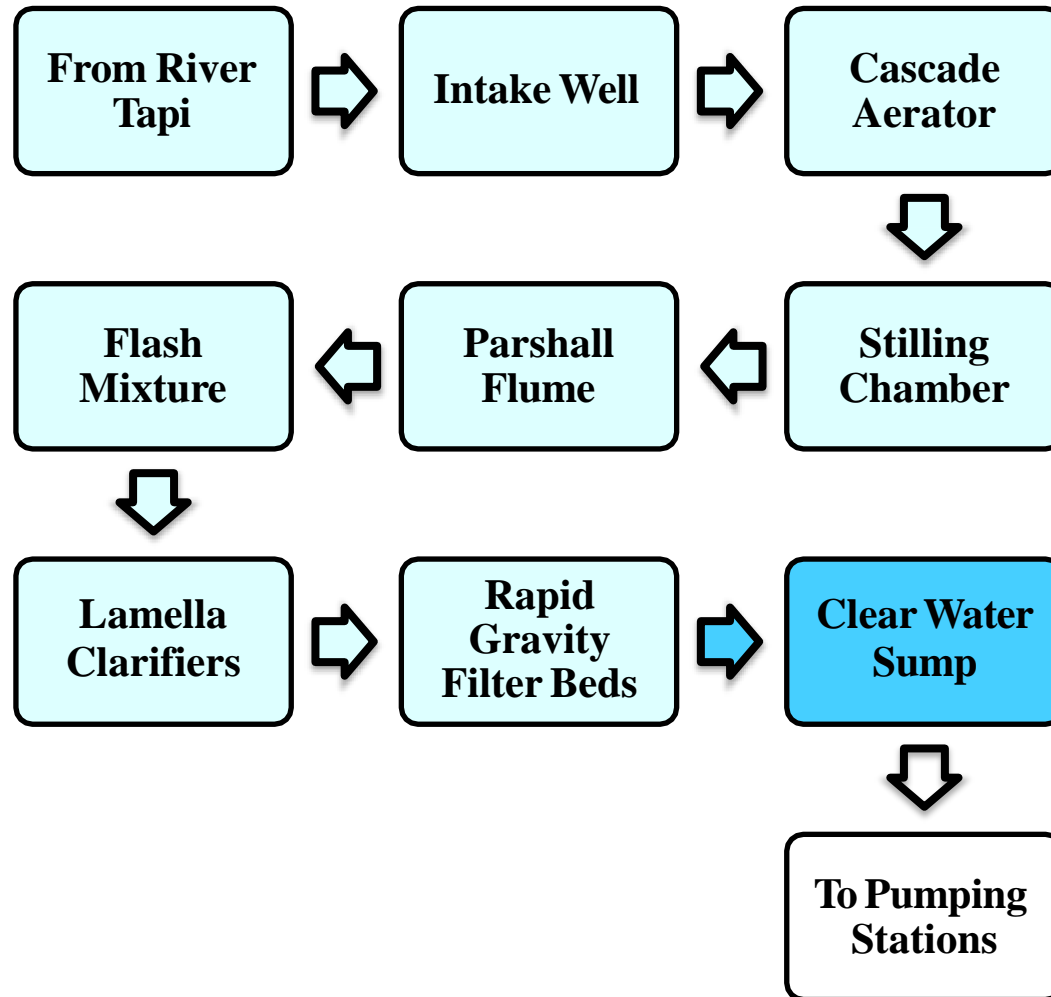
Flow Diagram of Water Treatment Plant



Name of unit	Rapid Gravity Filter Beds
Number of units	14
Detail of unit	the process to pass the water through the layer of filter sand



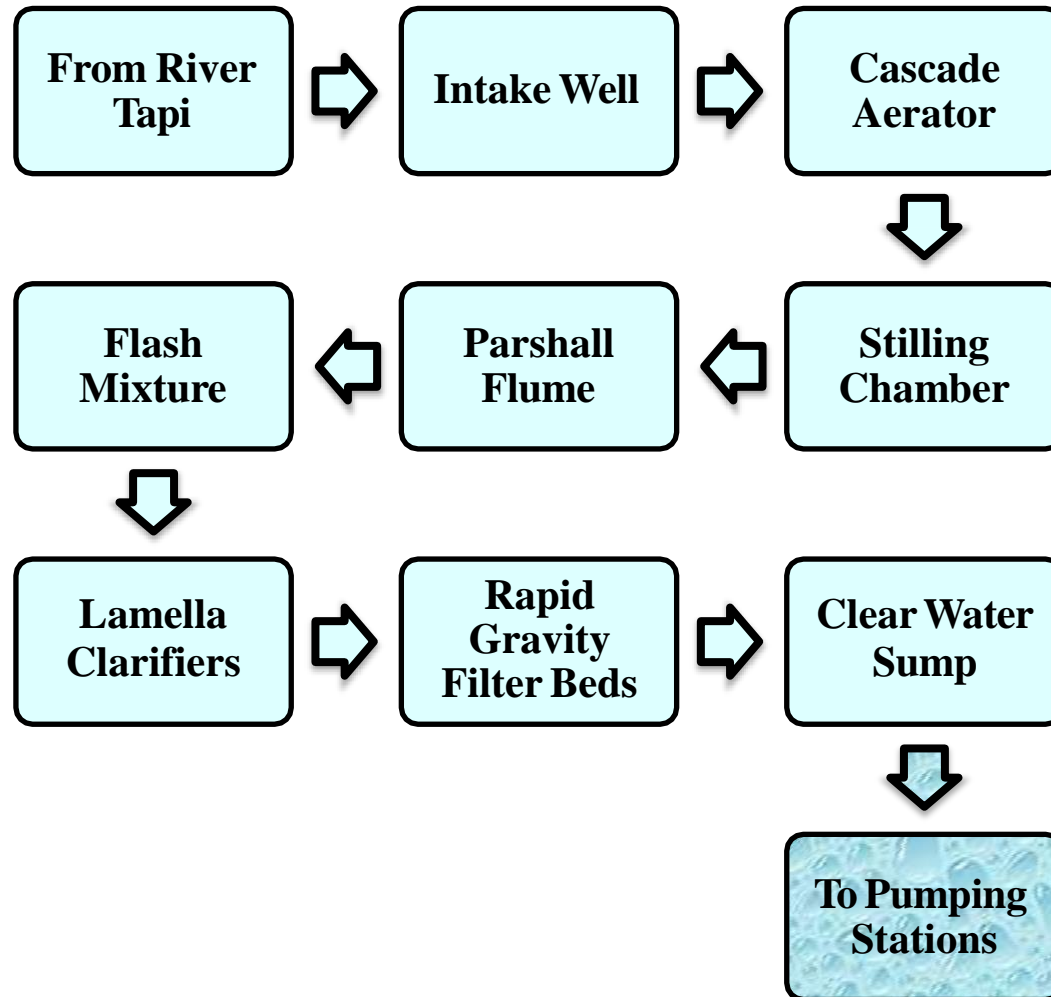
Flow Diagram of Water Treatment Plant



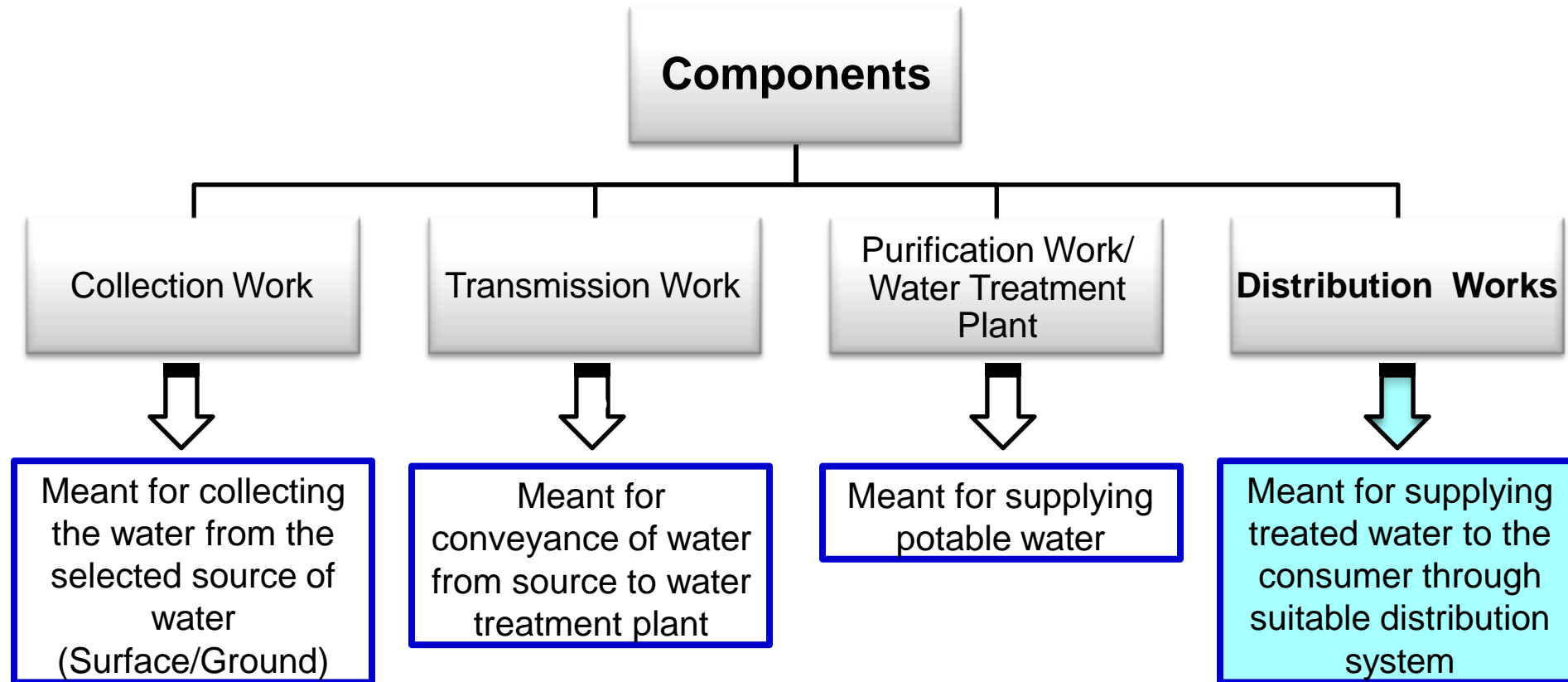
Name of unit	Rapid Gravity Filter Beds
Number of units	1
Detail of unit	To convey the water to the underground tank and for pumping for filter bed backwash



Flow Diagram of Water Treatment Plant

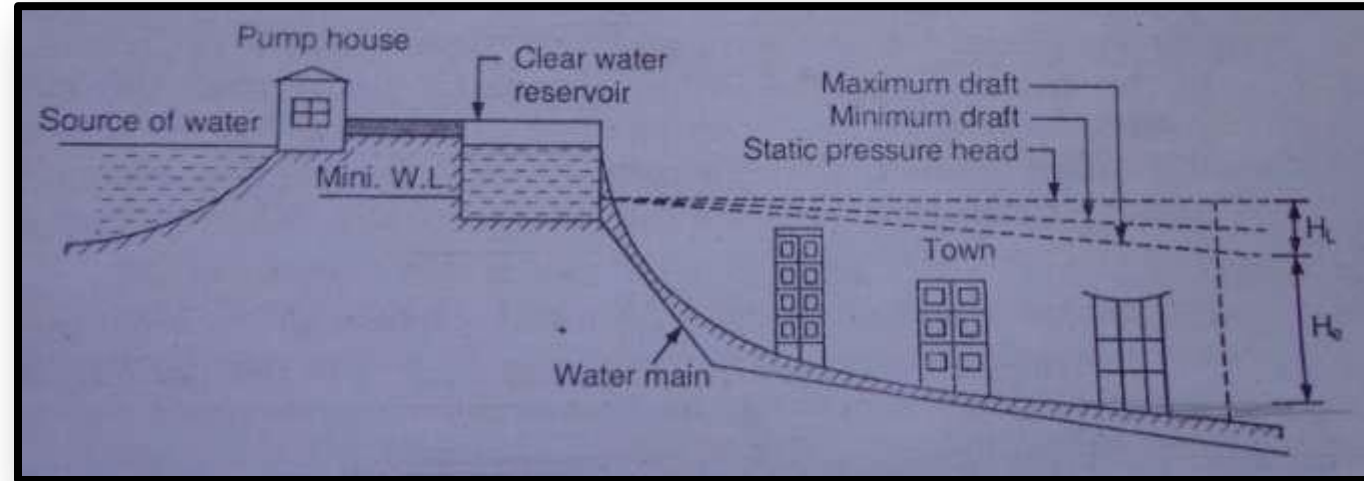
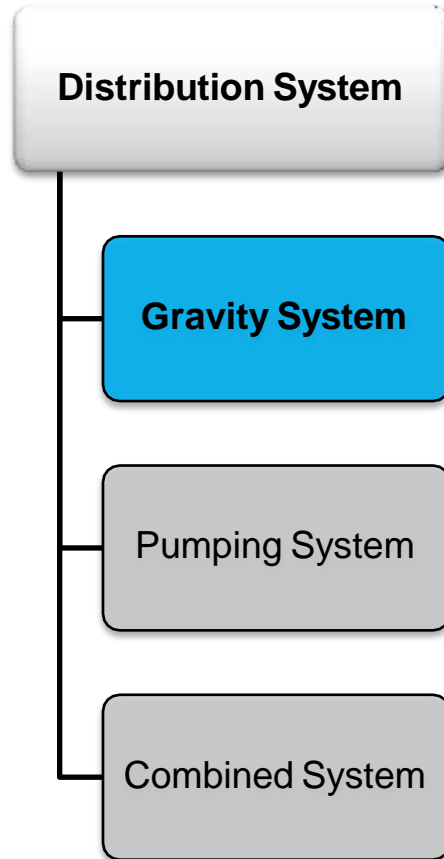


Components of Water Supply Scheme



Distribution Work

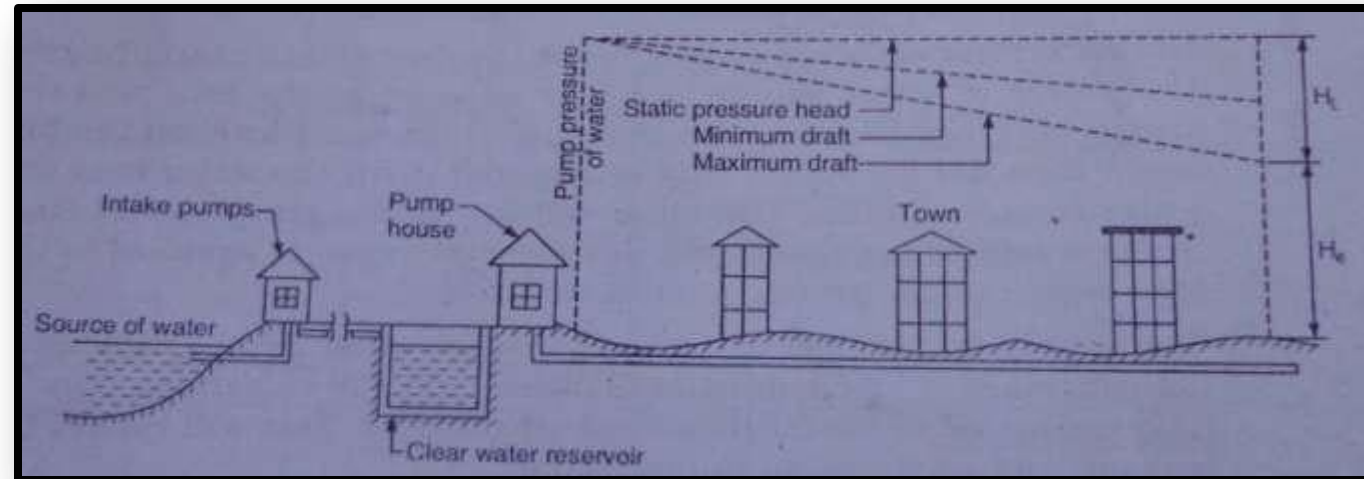
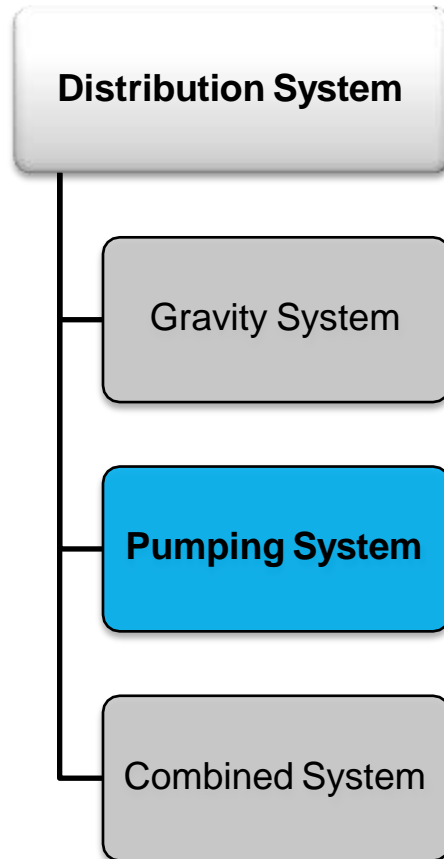
City Level Distribution



- This method is suitable when source of supply is at sufficient height than the city.
- The water flows in the mains is due to the gravitational force.
- In this system, pumping is not required at any stage.

Distribution Work

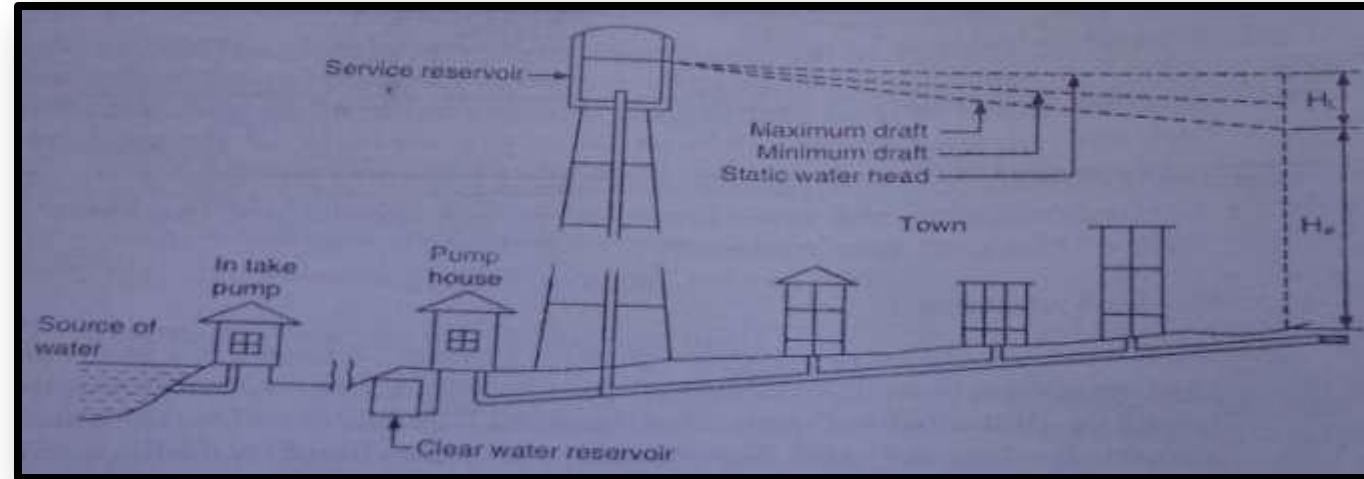
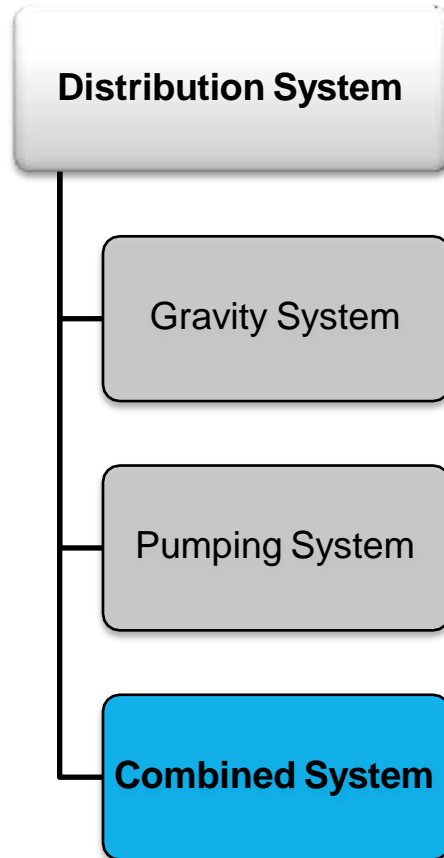
City Level Distribution



- In this system the treated water is directly pumped in to the distribution mains without storing it any where.
- It is also called as pumping without storage system.
- Continuous water is required at the pumping station.

Distribution Work

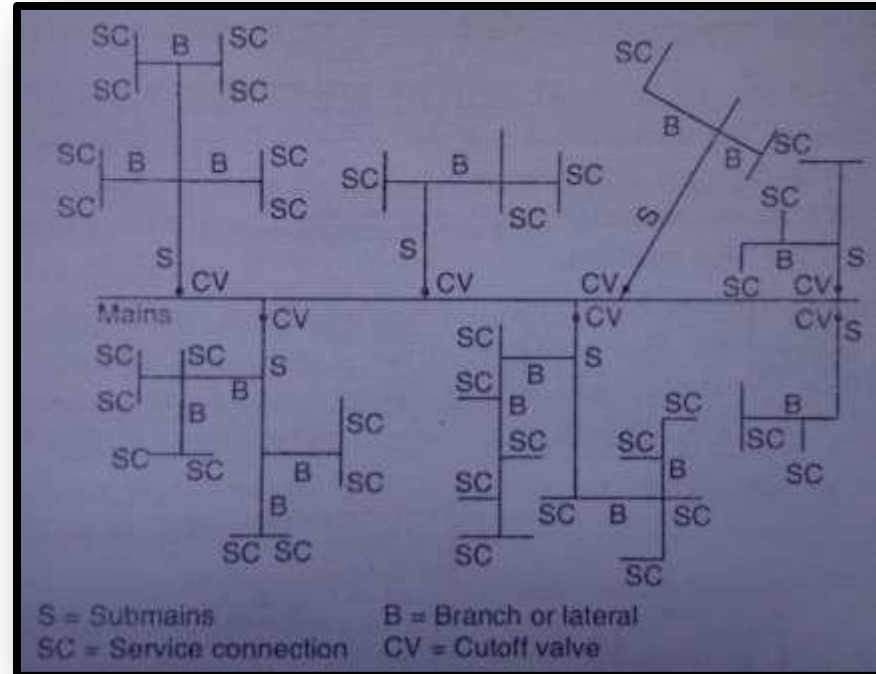
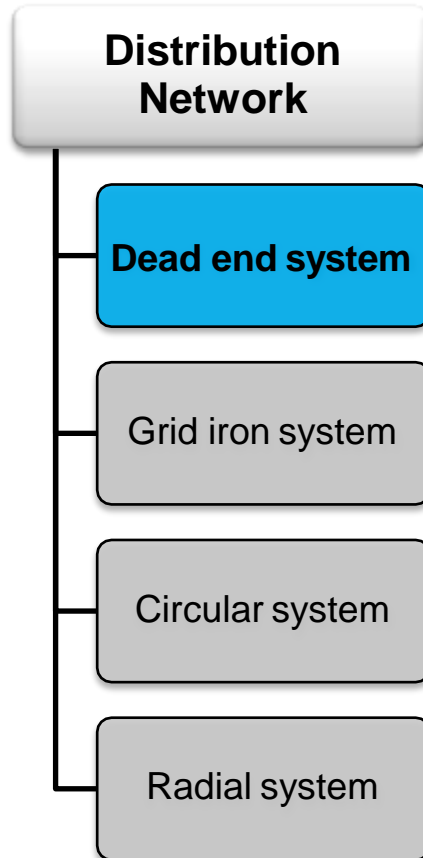
City Level Distribution



- This is the most common system adopted in most of the cases.
- Treated water is pumped at a constant rate and stored into an elevated distribution reservoir, from where it is distributed to the consumer by the action of gravity.

Distribution Work

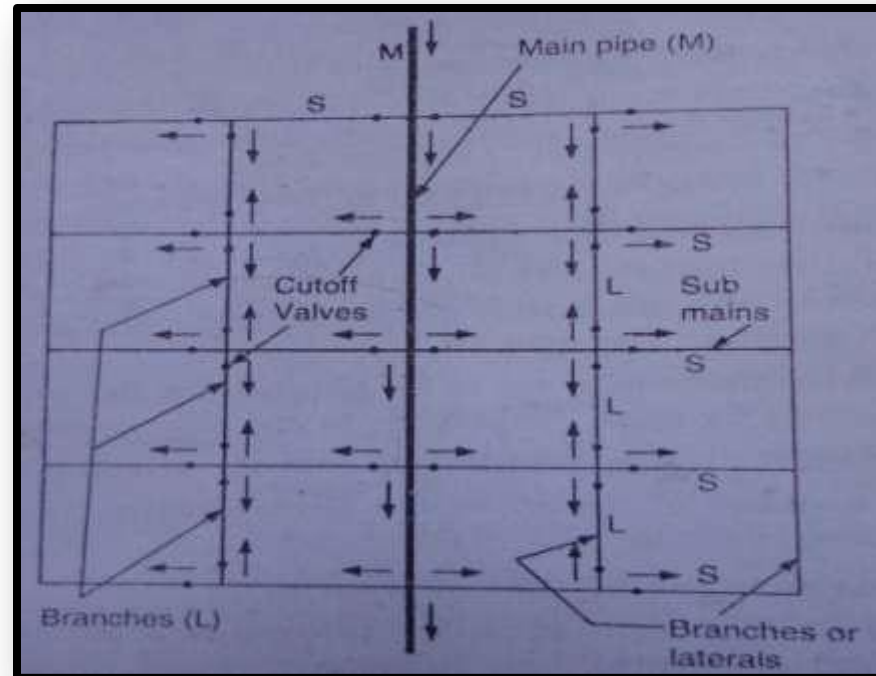
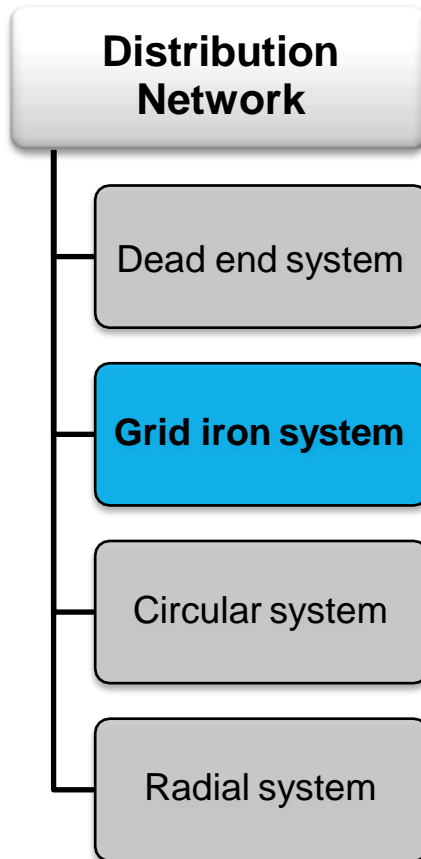
Unit Level Distribution



- One main supply line along the main road
- Submains are connected to the main in both the direction
- Submain divides into branch pipes (Laterals)
- Service connections are given to the consumer from the laterals

Distribution Work

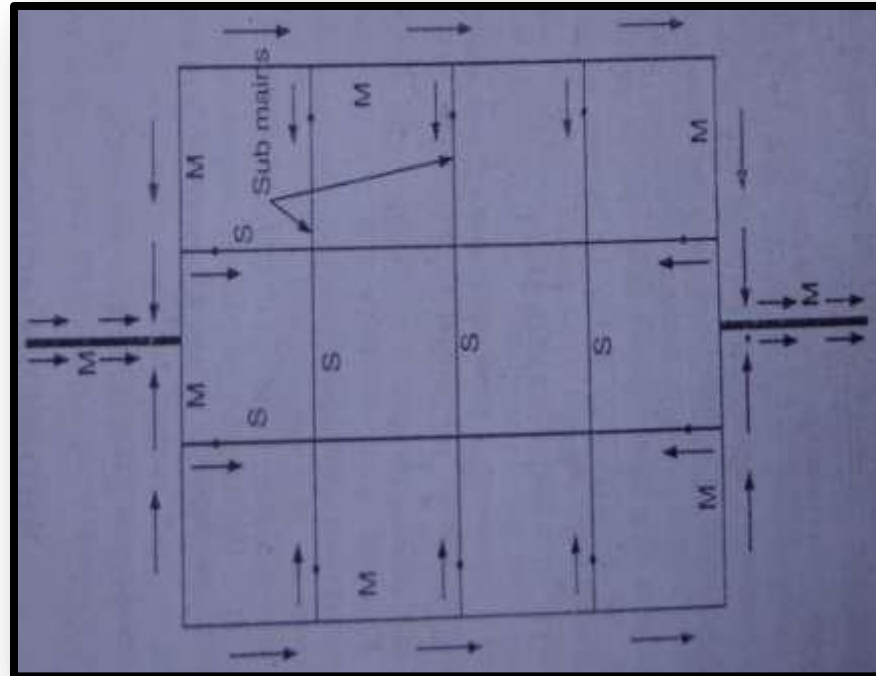
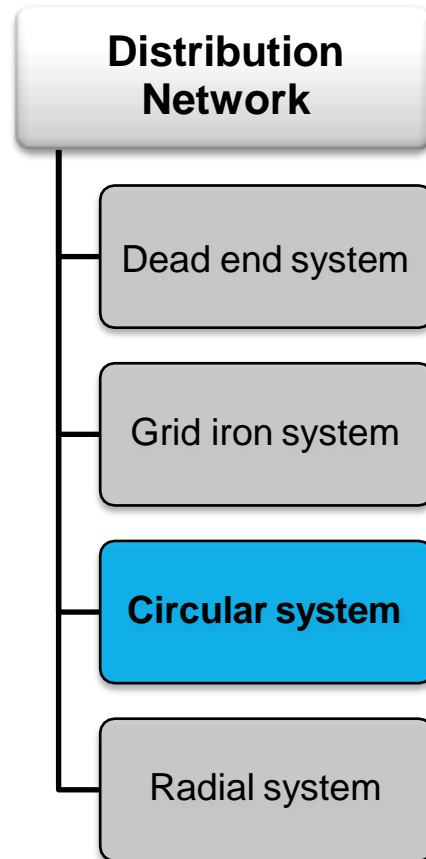
Unit Level Distribution



- Main line is laid along the main road
- Submains are taken in both directions along minor roads
- From Submains branches are taken out and are interconnected

Distribution Work

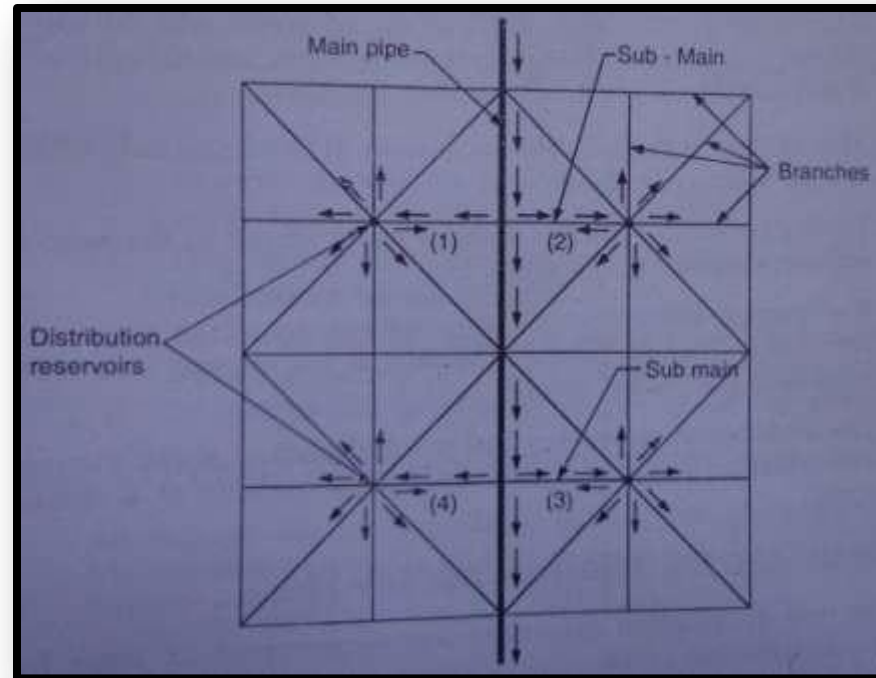
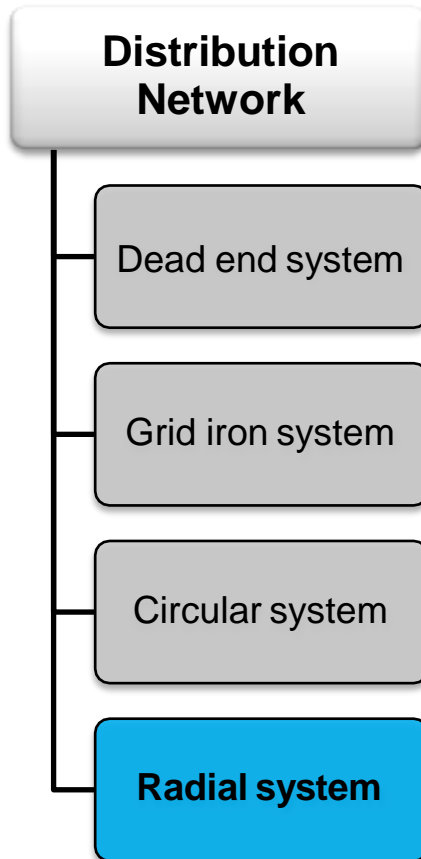
Unit Level Distribution



- Main pipes are laid on the periphery of blocks
- Branches, submains are laid along the inner roads
- Submains and branches are taken off from the boundary mains and are interconnected.

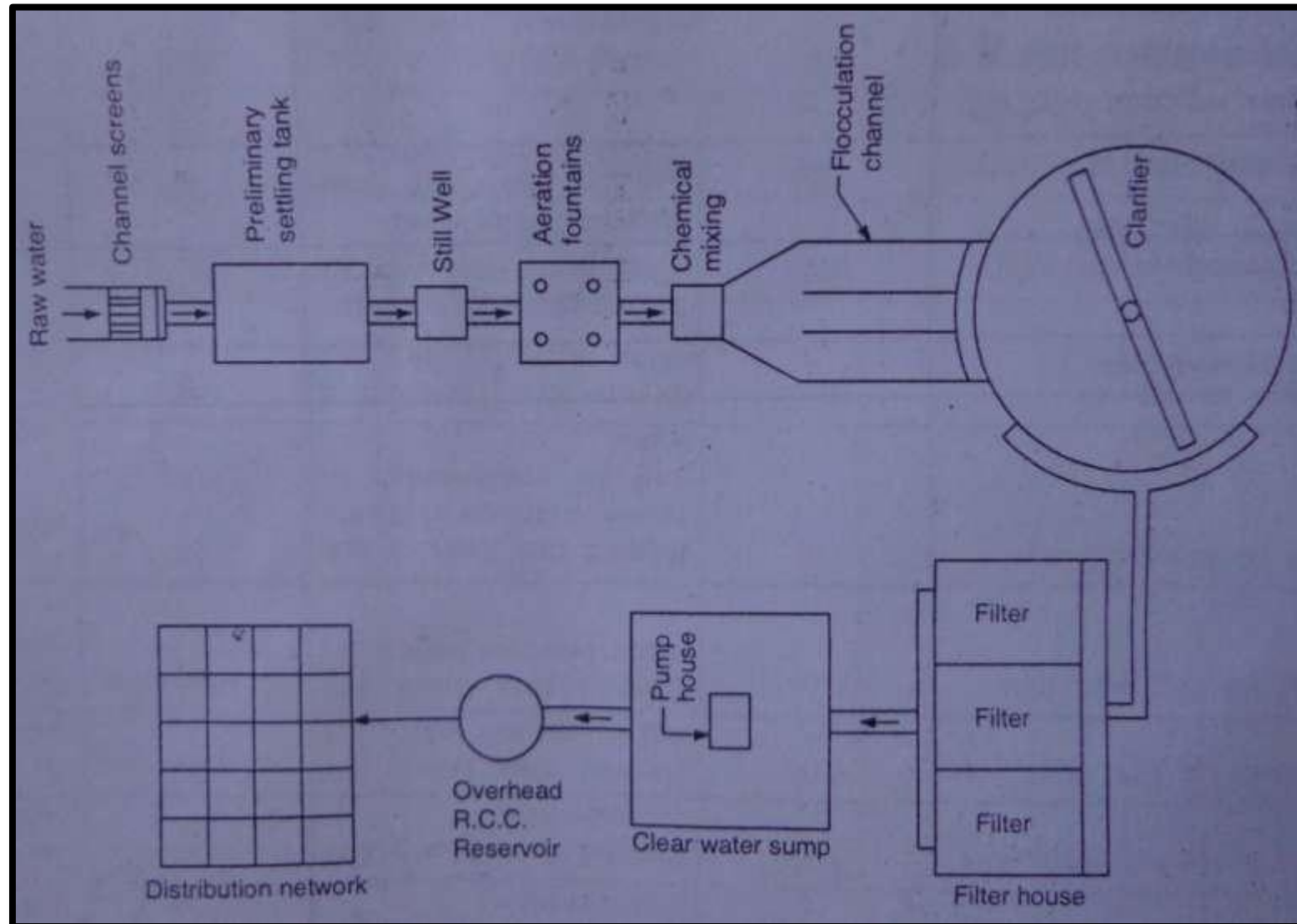
Distribution Work

Unit Level Distribution



- Water is pumped into the distribution reservoir kept in the middle of each zone.
- Supply pipes are laid radially ending towards the boundary of the area to be served.

Schematic Layout of a Water Treatment Plant



Planning Consideration

- Urban water supplies are under the control of building, public works, and health departments. Rural water supply, where it is not obtained from on site wells, is controlled by water rights that run in conjunction with the land.
-
- These rights merely assure the downstream landowner that the upstream landowner will not interfere with the flow of water before it reaches the boundary of his or her property.
- Lack of water not only limits human settlement, but can seriously interfere with industry. Management of this important resource is the most effective planning tool.

- Needs must be assessed continually, new supplies must be sought out, and up to date technology must be applied. Rehabilitation of older parts of the system must be regularly scheduled. A well managed system will supply good quality water in adequate quantity at reasonable cost in an unobtrusive manner.
- If properly planned for gray water from a subdivision can be reused after minimal treatment. Gray water is the effluent from showers, laundries, or once through cooling processes, which contains no biological wastes and therefore can be reused for irrigation, fire protection, or even for the flushing of toilets and urinals.
- It is necessary to have carefully separated piping systems for this purpose, but this is a small price to pay for useful water in water short areas.

- Ponds and lakes should be designed for multiple uses. A pond can serve as a retention basin for storm water, to prevent floods in an area.
- Finally, water can be used for its aesthetic value. Where fountains are included, ponds can substitute for unsightly cooling towers. When recreational uses for the pond are added, the best of all multiple purposes has been attained.

Organizations

Notable organizations in the water supply field include the following

- American public work association
- American water work association
- Water pollution control federation
- National board of fire underwrites (Fire protection standards)
- U.S. Public health service