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Environmental



delivering sustainable solutions

Decentralised Treatment & Re-use

Saudi Water & Energy Forum
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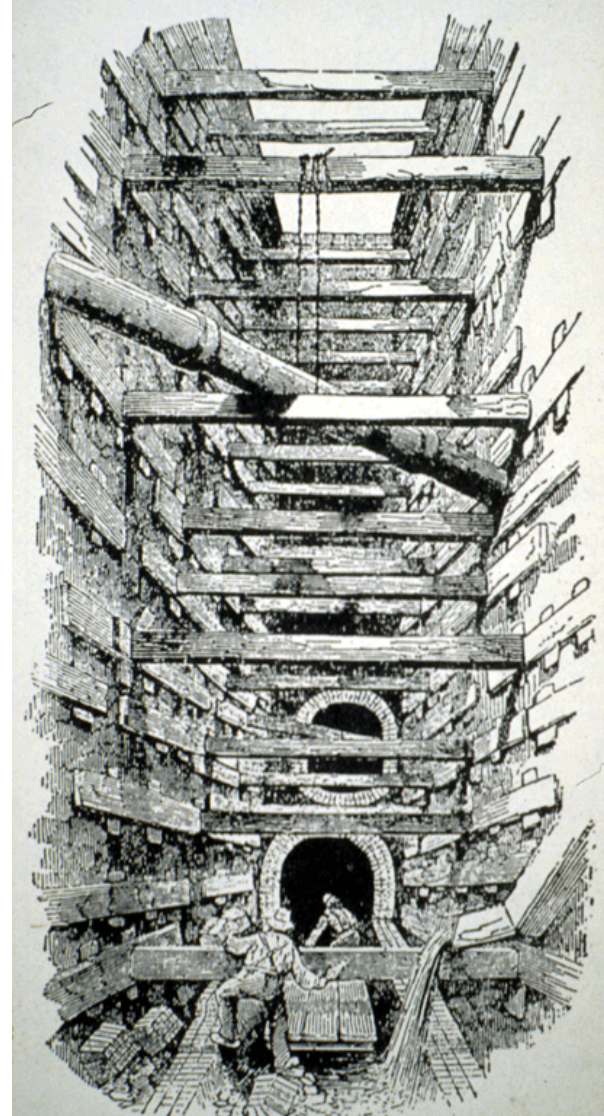
Decentralised Treatment & Re-use

- Water Supply
 - potential to meet 50% of domestic and/or industrial uses
- Energy
 - 50% of the energy used in water services is in water conveyance.
- Costs
 - Saves CAPEX & OPEX
 - Marginal Cost of Tertiary Treatment



Centralised Vs Decentralised

- Centralised model evolved in a world:
 - < 2 Billion People
 - Mostly Rural
 - Lacking in Modern Technology



The Opportunity

- **The Kingdom**

- 40% increase in population over the next 15 years
- 7 New cities planned
- Currently: 1.1m Water connections, 628K Wastewater

- **Ideas**

- Provide more than one type of water
- Implement source separation of different types of water
- Implement re-use on a Distributed Scale with Aquifer Replenishment



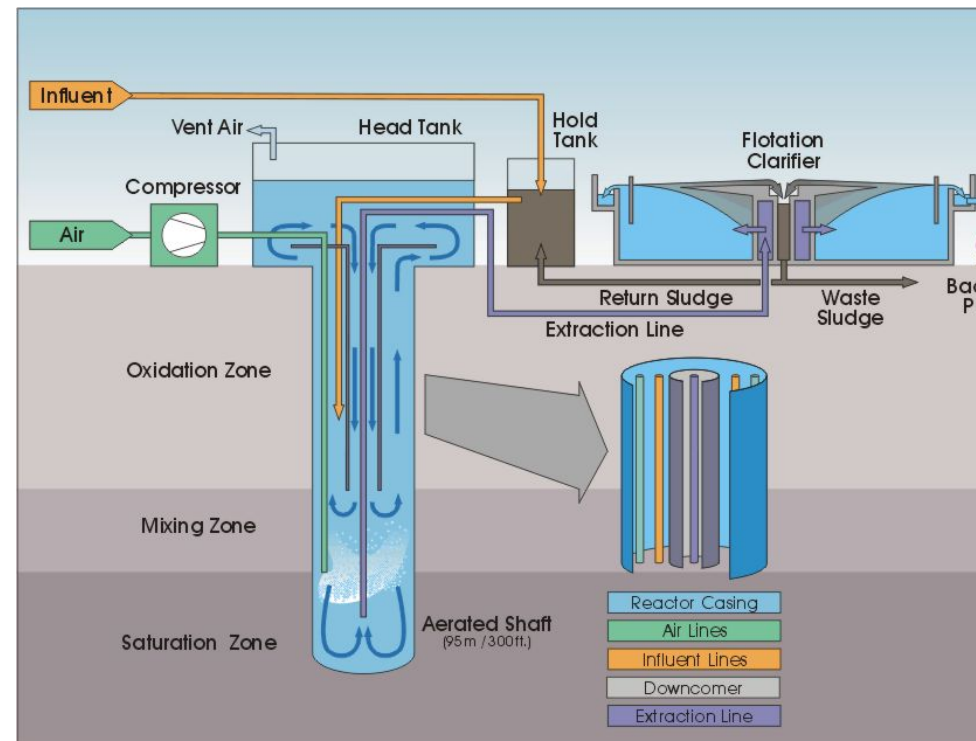
Reasons to Consider Decentralised

- Enables ‘just in time’ capacity building
 - Defers capital costs to the future
 - Allows infrastructure to be paced with development & economic cycles
- Reduces costs associated with conveyance to a centralised facility
 - 80% Capital associated with conveyance
- Facilitates local water re-use and groundwater replenishment



Enabling Technologies

- Anaerobic Membrane Bioreactors
- Deep shaft wastewater treatment
- Use of Waste Heat
 - Oasys Desalination
 - Pasteurisation



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