Drinking Water: Treatment

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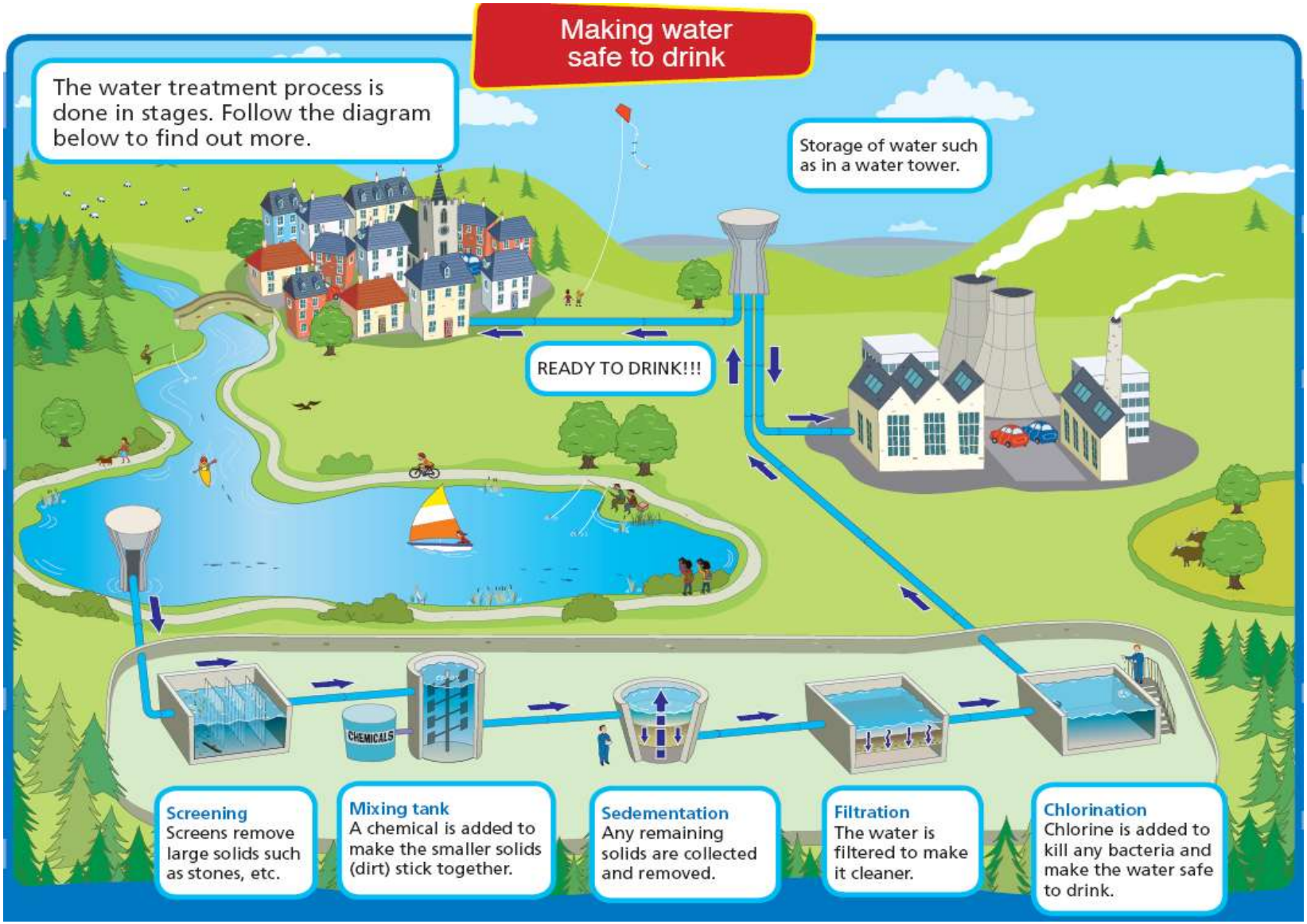
Overiview of Presentation

- Overview of main types of treatment
- Schematics of basic components of types of treatment
- Most common applications of types of treatment



http://www.anglianwater.co.uk/_assets/media/Fact_File_3_-_Drinking_water_treatment.pdf


DANGER
NO
SWIMMING

Main Types of Treatment

1. Coagulation followed by Rapid Gravity Filtration
2. Dissolved Air Flotation followed by Rapid Gravity Filtration
3. Slow Sand Filtration
4. Membrane Filtration

All followed by disinfection and fluoridation

Main Types of Disinfection

- Chlorination
- Ultraviolet Treatment

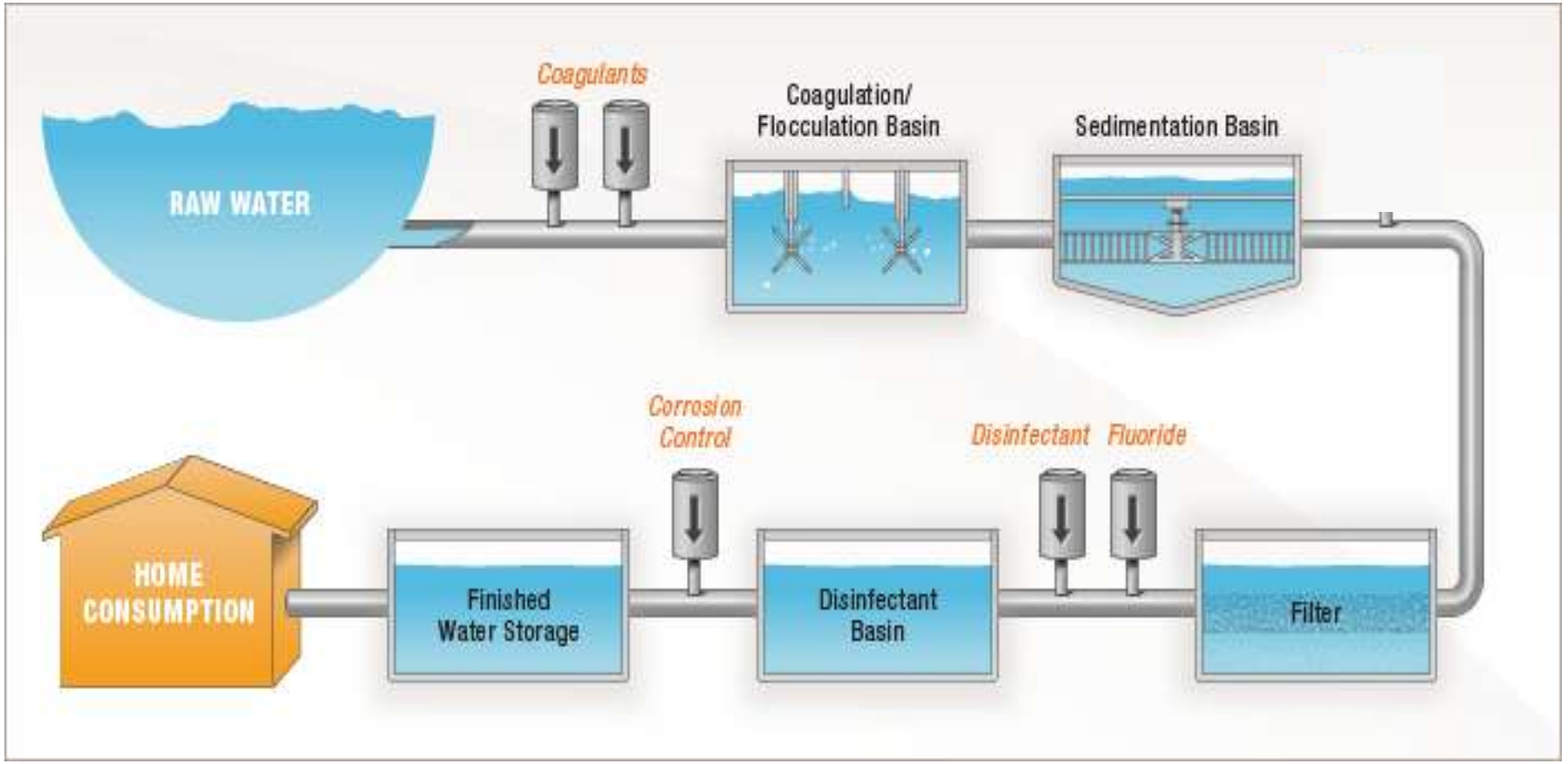
Less Common Types of Treatment

- Ozonation
- Chlorine Dioxide
- Chloramination
- Ion Exchange (e.g. for Nitrate or Arsenic removal)

Coagulation and RGF

- Most common type of treatment (e.g. 7 of 8 largest plants use this technology)
- Used in river sources and lake sources with high colour/turbidity
- Requires good knowledge of chemical dosing and ongoing management of the plant
- Optimisation of the process is key

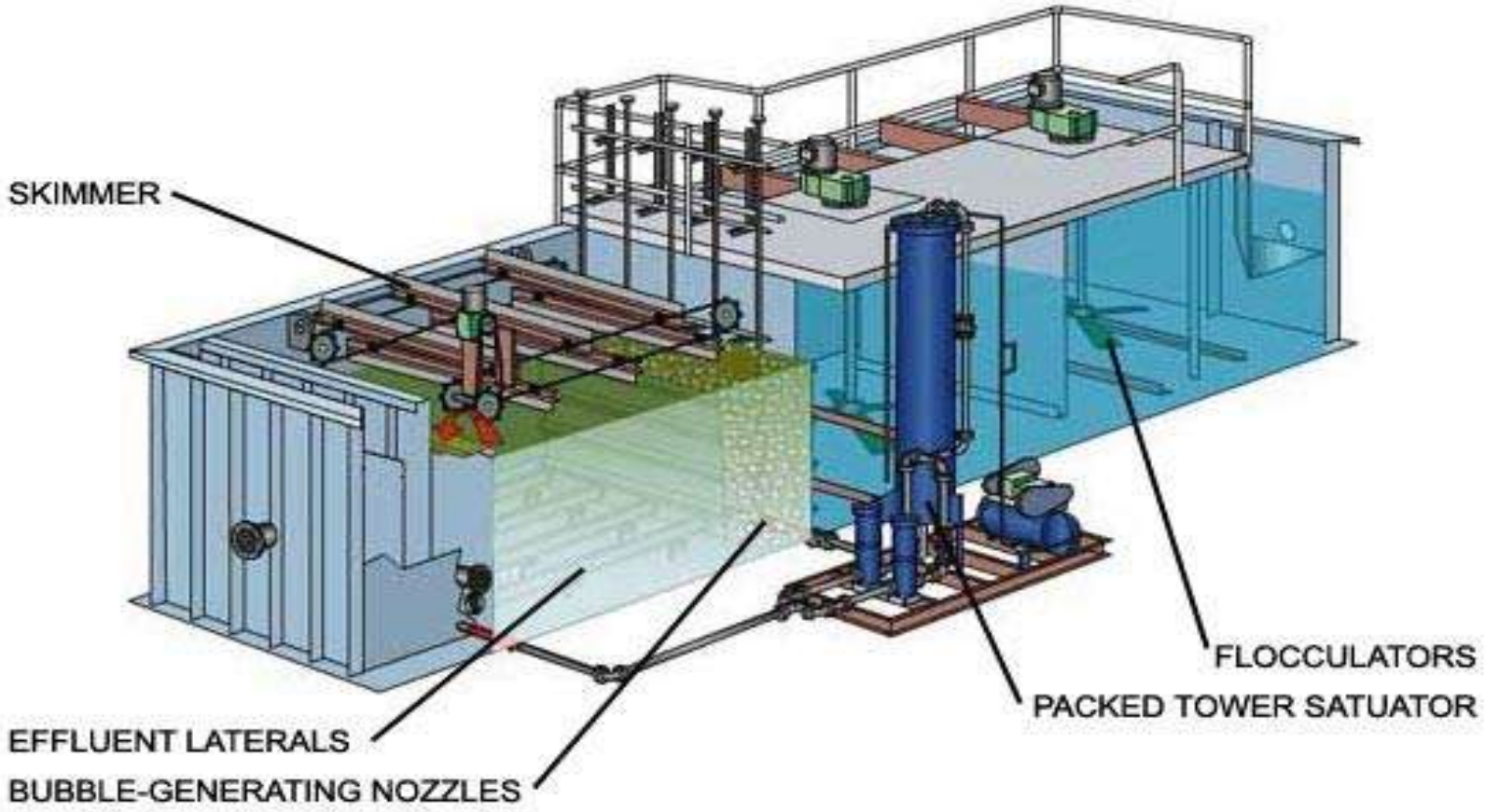
Coagulation and RGF



Dissolved Air Flotation

- Used in similar situations to coagulation plants but easier to control in small plants
- Less space requirements
- Modular process (i.e. good where demand varies throughout the year)

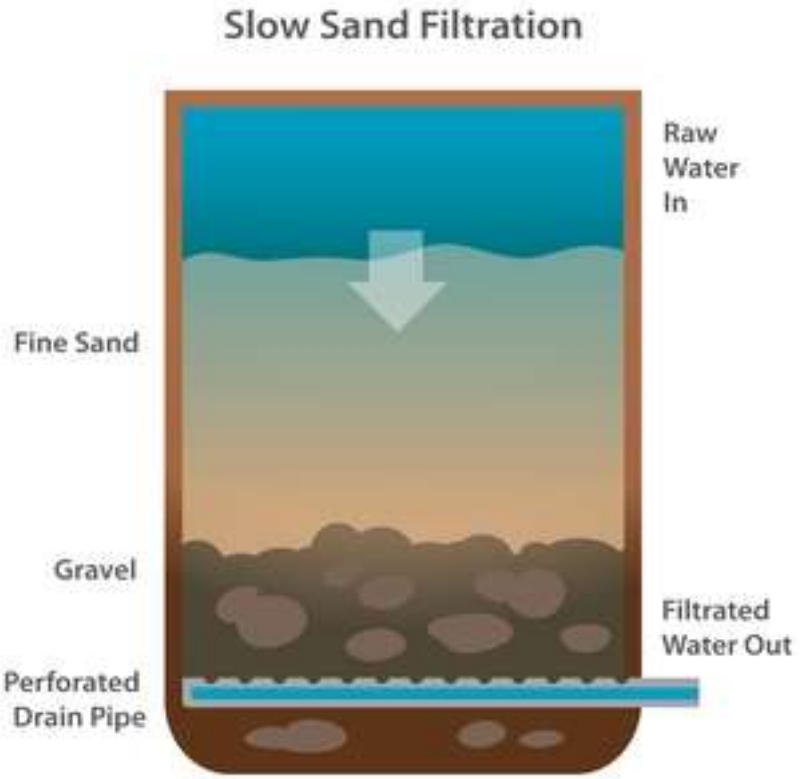
Dissolved Air Flotation



Top of DAF Unit →

Slow Sand Filtration

- Used in stable low coloured lake sources
- Simple technology
- Easy to manage
- Effective for Crypto removal



Membrane Filtration

- Effective barrier to pathogens and micro-organisms (i.e. very effective against *Cryptosporidium)*
- Expensive and energy intensive process
- Limited application in Ireland to supplies where *Cryptosporidium* a risk

Disinfection

- Essential component for all water supplies:
  - To disinfect the water
  - To provide a residual disinfectant in the distribution network to prevent recontamination
- Chlorination most common method
- UV used as primary disinfectant with chlorine as residual in some increasingly

Disinfection: Chlorination

- Chlorine Gas
- Sodium Hypochlorite
- On-site electrochlorination
- Chlorine Tablets


Duty and Standby Dosing Pumps
Chlorine Monitor
Sodium Hypochlorite

Continuous Monitor

UV Lamp

Distribution Network

- Reservoirs
- Rechlorination