

## Maintaining quality of supply

Water Management Best Practice Webinar

Dr Ric Horobin, Water & Environment Director

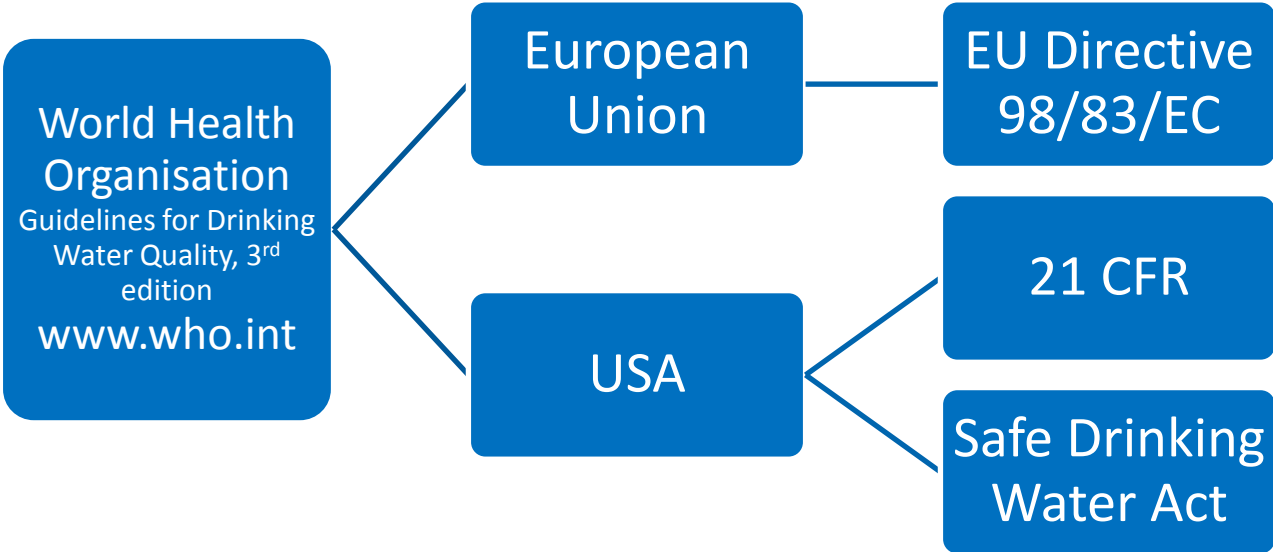
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# Agenda

- ◆ Legislation
- ◆ Key issues with water quality
- ◆ What can go wrong?
  - Self supply
  - Municipal supply
- ◆ Case studies
  - Borehole contamination incident
  - Change in aquifer chemistry
  - Change in municipal chemistry
  - Change in municipal organic loading



# Legislation



# Key issues with water quality

## Microbiological issues

- ◆ Risk to product quality
- ◆ Risk to brand image
- ◆ Colonisation of pipework in plant and cost to remove
- ◆ Impact on treatment
  - Colonisation of RO

## Chemical issues

- ◆ Change in chemistry
- ◆ Fluctuations affect treatment efficiency
- ◆ Presence of pollutants
  - ◆ Hydrocarbons
  - ◆ Pesticides
  - ◆ Nitrate
  - ◆ .....



# What can go wrong?

## Self supply

- ◆ Source failure
  - Contamination incident
  - Deterioration in quality
  - Asset failures
- ◆ Treatment failure
- ◆ Distribution and storage

## Municipal

- ◆ Poor quality supply
- ◆ Changes in supply source
- ◆ Change outside of potable water requirements
- ◆ Treatment failure
- ◆ Distribution and storage



# Case study 1

## Borehole contamination incident

### What happened?

- ◆ Hydrocarbons found in the borehole
- ◆ Impacted on treatment chain
- ◆ Restricted use of borehole water
- ◆ Additional cost of mains supply
- ◆ Reduction in water availability



# Case study 1

## Borehole contamination incident

### Causes?

- ◆ Failed sump pump
- ◆ Poor construction
- ◆ Lack of knowledge about the borehole
- ◆ Little/no monitoring
- ◆ Lack of protective management



### How can this be prevented?

- ◆ Management and risk assessment of the asset
- ◆ Routine monitoring and inspection
- ◆ Development of aquifer protection zone



# Case study 2

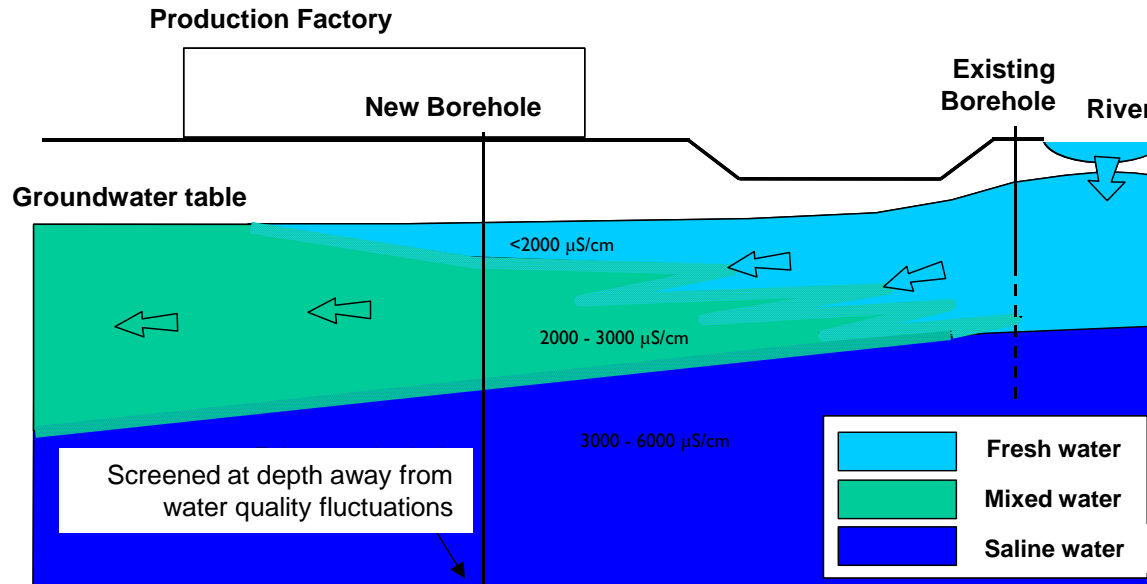
## Change in aquifer chemistry

### What happened?

- ◆ Change in chemistry over time
- ◆ Fluctuations in water quality causing problems for water treatment

### Causes?

- ◆ Shallow aquifer is recharged with fresh water from river
- ◆ Deeper aquifer contains saline groundwater
- ◆ Existing boreholes draw water from shallow and deep aquifer



# Case study 2

## Change in aquifer chemistry

### Solutions

- ◆ Drill deep well to draw water with stable chemistry

but...

- ◆ High treatment costs

- ◆ Drill two wells: one shallow well to tap freshwater, one scavenger well to reduce saline water upconing

but...

- ◆ High pumping costs



# Case study 3

## Change in municipal chemistry

### What happened?

- ◆ Plant supplied from an upland reservoir
- ◆ Soft water
- ◆ No need for alkalinity reduction
- ◆ During drought, municipal source changed to...
- ◆ Groundwater source with high mineralisation
- ◆ High alkalinity did not meet plant specification



# Case study 3

## Change in municipal chemistry

### Solution

- ◆ De-alkalisers?
  - \$2.5m
  - Not needed all the time
- ◆ Dedicated storage reservoir installed
  - \$0.7m
- ◆ Online/real-time monitoring
- ◆ Pre-treatment storage & bypass arrangements
- ◆ Engage in discussion with municipal supplier
- ◆ Consider move to self supply



# Case study 4

## Change in municipal organic loading

### What happened?

- ◆ Potable municipal supply from lowland source
- ◆ Relatively old treatment works
- ◆ Issues with algal blooms in summer
- ◆ Solved by ozonation, but occasional equipment failures
- ◆ Impact on certain bottled products due to breakdown of algae (polysaccharides)



# Case study 4

## Change in municipal organic loading

### Solution

- ◆ Communication between municipality and plant
- ◆ Both on a commercial and technical basis
- ◆ Consider that this is QA on the raw material (in this case, water)
- ◆ Short term - stop production of sensitive products when O<sub>3</sub> not operating
- ◆ Longer term - installation of additional treatment at plant



# Summary

- ◆ Many factors can affect quality
- ◆ Each situation needs careful investigation
- ◆ Consider your incoming water supply as you would other raw materials
- ◆ Subject it to QA



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Dr. Ric Horobin

[rhorobin@zenithinternational.com](mailto:rhorobin@zenithinternational.com)

Or telephone Zenith International head office on 0044 (0)1225 327900.

[www.zenithinternational.com](http://www.zenithinternational.com)