Recycled Water and Health

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Chemical contaminants

- Potentially harmful chemicals can be present in food, drinking water, soils, and rivers and lakes.
- Can determine if level is safe.
  - Determine exposure (quantities and frequency).
  - Compare with established criteria (e.g. drinking water, food standards) or amounts eaten daily in food with no health effect.

Chemicals of interest

- Heavy metals.
- Endocrine Disrupting Chemicals (EDCs).
- Pharmaceuticals.
- Phthalates.

Heavy metals

- Cadmium, chromium, lead, mercury.
- Levels in Melbourne’s major treatment plants are generally between 10 times and 100 times less than the levels permitted in our drinking water supply.
- This is safe for human health.

Endocrine-disrupting chemicals

- EDCs include estrogen (hormone) and chemicals that mimic the effects of estrogen.
- Also found in food (e.g. phytoestrogens), milk, cosmetics, detergents, pesticides, pharmaceuticals (e.g. contraceptive pill).
- Detected at low concentrations in treated water at the Western Treatment Plant.
  - Amount in 2 litres WTP water equal to 0.08% normal daily intake of EDCs in food.

Pharmaceuticals

- Include medicines, vaccines, and some dietary supplements.
- Can predict the highest possible (absolute worst case) concentrations in raw sewage using data on pharmaceutical use.
- Contraceptive pill, paracetamol and aspirin are highest. Other pharmaceuticals much lower.
- Levels are safe.
  - Highest amount of paracetamol and aspirin that could be ingested in 2 litres recycled water equal to 1/10,000 tablet.
**Phthalates (plasticisers)**
- Present in many plastic, vinyl, adhesive, and other household and industrial products.
- Also found in foods including margarine, eggs, meat, milk and cereals - exposure to these in everyday life is high.
- Levels in sewage are safe.
  - About 10 times less than the Australian Drinking Water Guideline.
  - Amount in 2L sewage is around 100 times to 1000 times less than amount normally consumed daily in food.

**Pathogens**
- Class A defined by microbial standards.
- Class A water safe for:
  - Direct human contact (adults and children alike).
  - Spray irrigating human food crops – no withholding period, no labelling.
  - On-farm produce washing and packing (including ice-making).
- No vaccinations required.

**Victorian Class A guidelines**
- \(<10 \text{ E.coli}/100\text{mL}\)
- 7 log reduction viruses (99.99999%)
- 6 log reduction of protozoa (99.9999%)

**Assurance of water quality**
- Multiple treatment processes (safety nets).
- Each process monitored:
  - Intensive monitoring to ensure processes can remove pathogens to the required levels.
  - Ongoing continuous monitoring to ensure each process is working (within HACCP framework).

**Overall**
- Levels of chemical contaminants anticipated in recycled water well below levels of concern.
- Treatment processes must be demonstrated to remove pathogens to safe levels, and have ongoing monitoring and management within a preventative risk management framework.