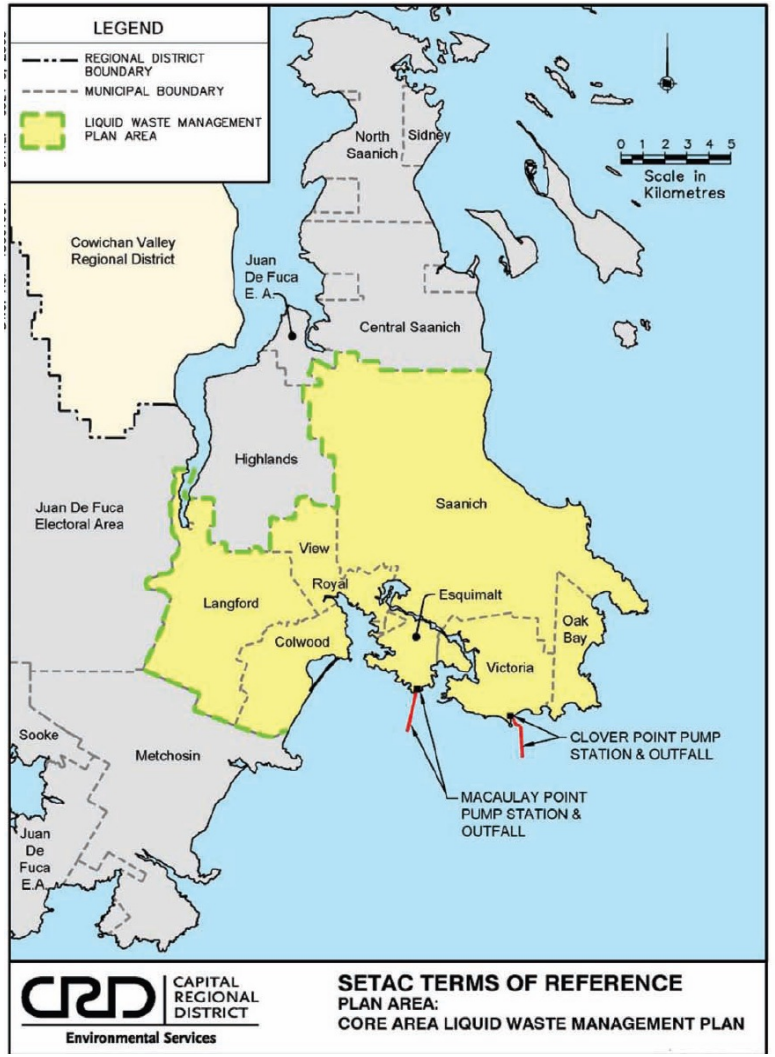
Decentralised Wastewater Management

A sustainable strategy for wastewater management

Key Message

1. ‘Big Plant’ Not the only Option
2. Consider alternatives to Ocean discharge

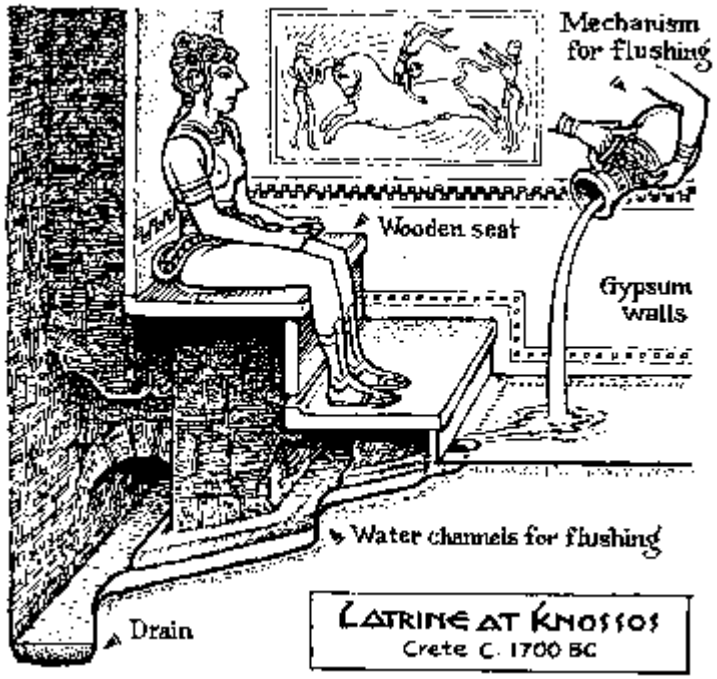


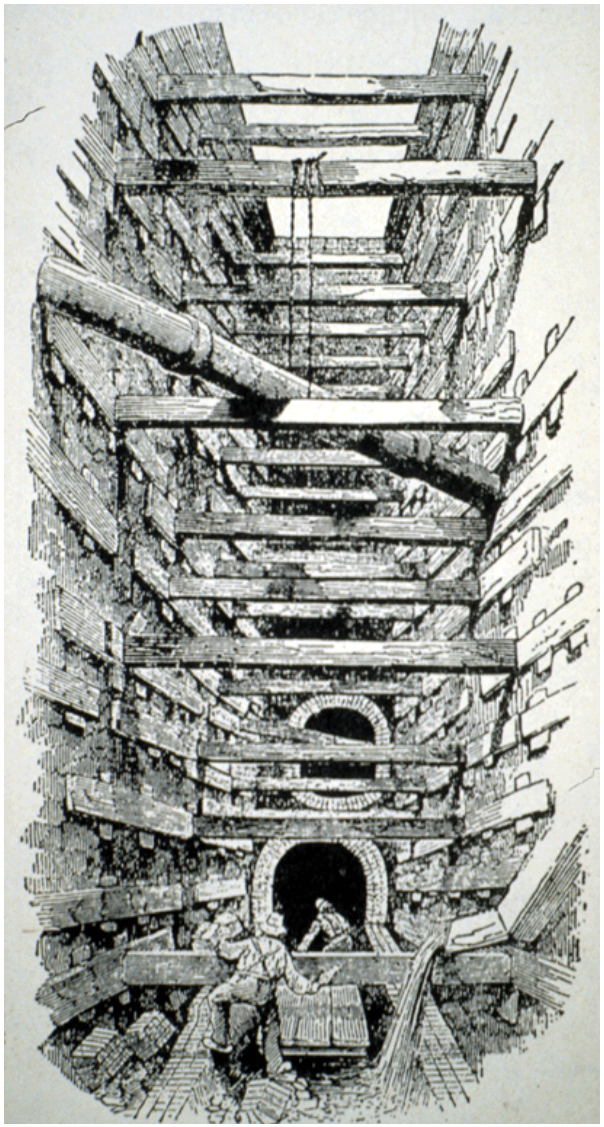
British Columbia Water and Wastewater Association

- Established 1974
- 3,700 Members
- Main objective to advance

History Wastewater Treatment

- Origin of the word ‘Sewer’?
- Began as method of improving public health

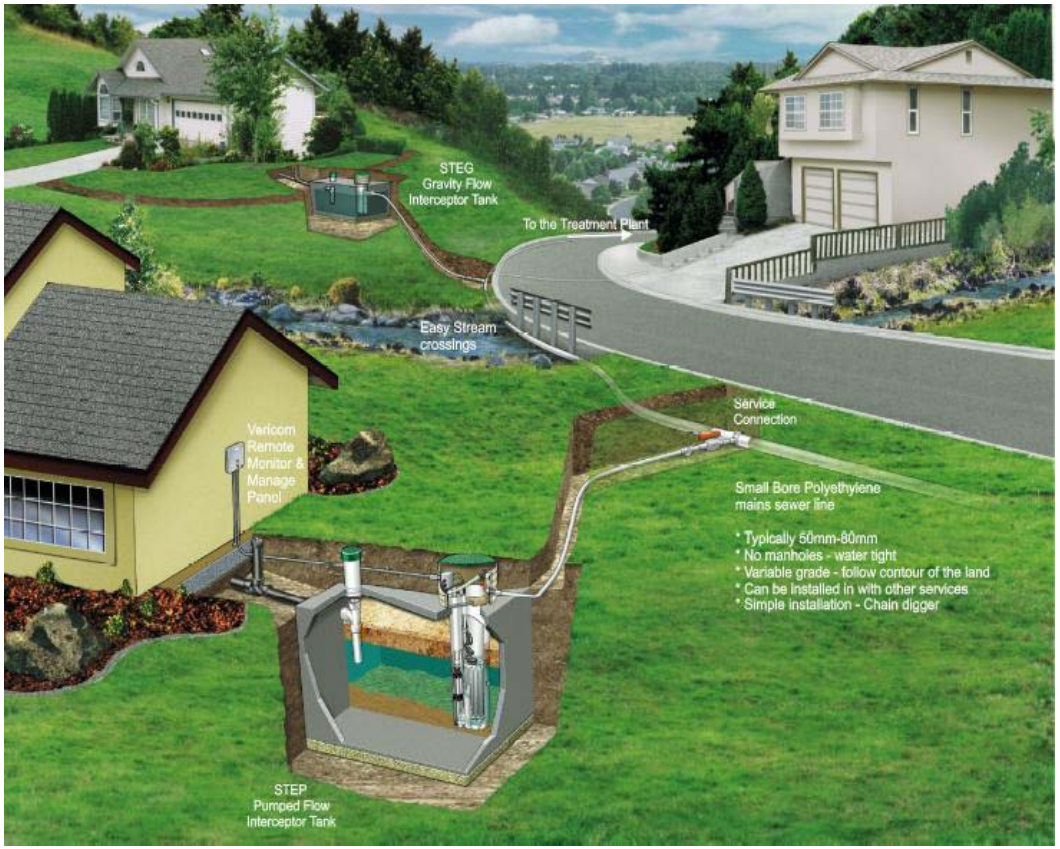




Environmental Concerns led to Construction of WWTP's

What is ‘Decentralised’ Wastewater Management?

- Treat locally
- Discharge to ground / Re-use water



Environmental Benefits

- Reduces infiltration and ex-filtration
- All sewage captured and treated
- Pipes one-sixth the size of conventional pipes because they do not have to accommodate stormwater
- No pump stations, no outfalls, no ocean discharge
- Water used locally

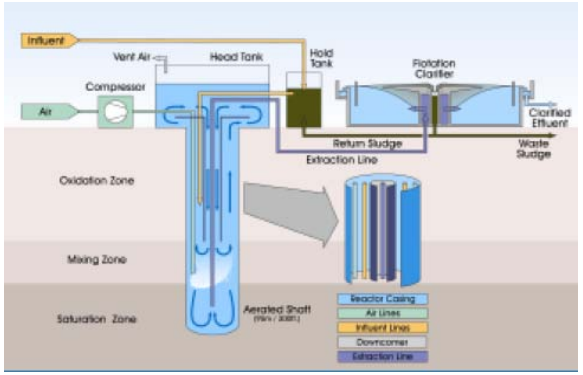
Economic Benefits

- Avoid costly piping costs
- Sooke LWMP – for new systems

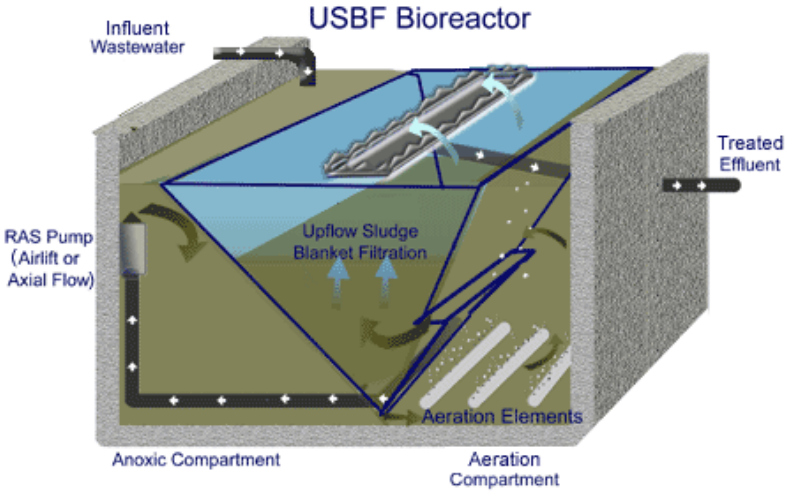
- Mobile Alabama : $5,000 / lot Vs $10,00-$15,000 for Conventional Sewerage

- USEPA Report Figures – decentralised competitive with centralised

- Homer Alaska
  - 10,000 population
  - 10 / 15 Effluent
  - Vertreat



- Nanoose Bay, Nanaimo
  - 1,600 population equivalent
  - Re-use Quality Water
  - Ecofluid



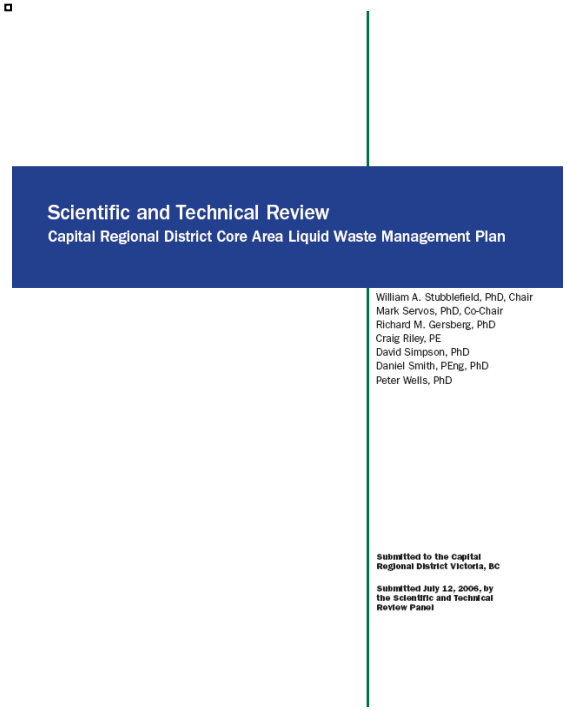
Why a Decentralised Approach?

- Economic Drivers
  - Reduced sewerage and pumping costs
  - Low tech solutions can be applied
- Environmental Drivers
  - Lower energy costs
  - Avoid discharge to surface water bodies – *this is what we are trying to avoid!*
  - Enables re-use of water locally

SETAC Report comment on Decentralised Options

- *'Satellite reclaimed-water production facilities'* - produce a valuable water supply that can ease the strain on local water supplies.

- *Only an economic analysis based on technical components and actual site conditions can determine the difference in cost implementation over the short- and long-term evaluation periods. This is beyond the scope of the Panel's review."*



1997 USEPA Report to Congress on Decentralised Wastewater Management

- *"Properly managed decentralised wastewater systems can provide the treatment necessary to protect public health and meet water quality standards, just as well as centralised systems"*
- *"Additional Benefits …Decentralised systems can achieve significant cost savings while recharging local aquifers and providing other water re-use opportunities close to points of wastewater generation"*

USEPA Comparative Cost Estimates

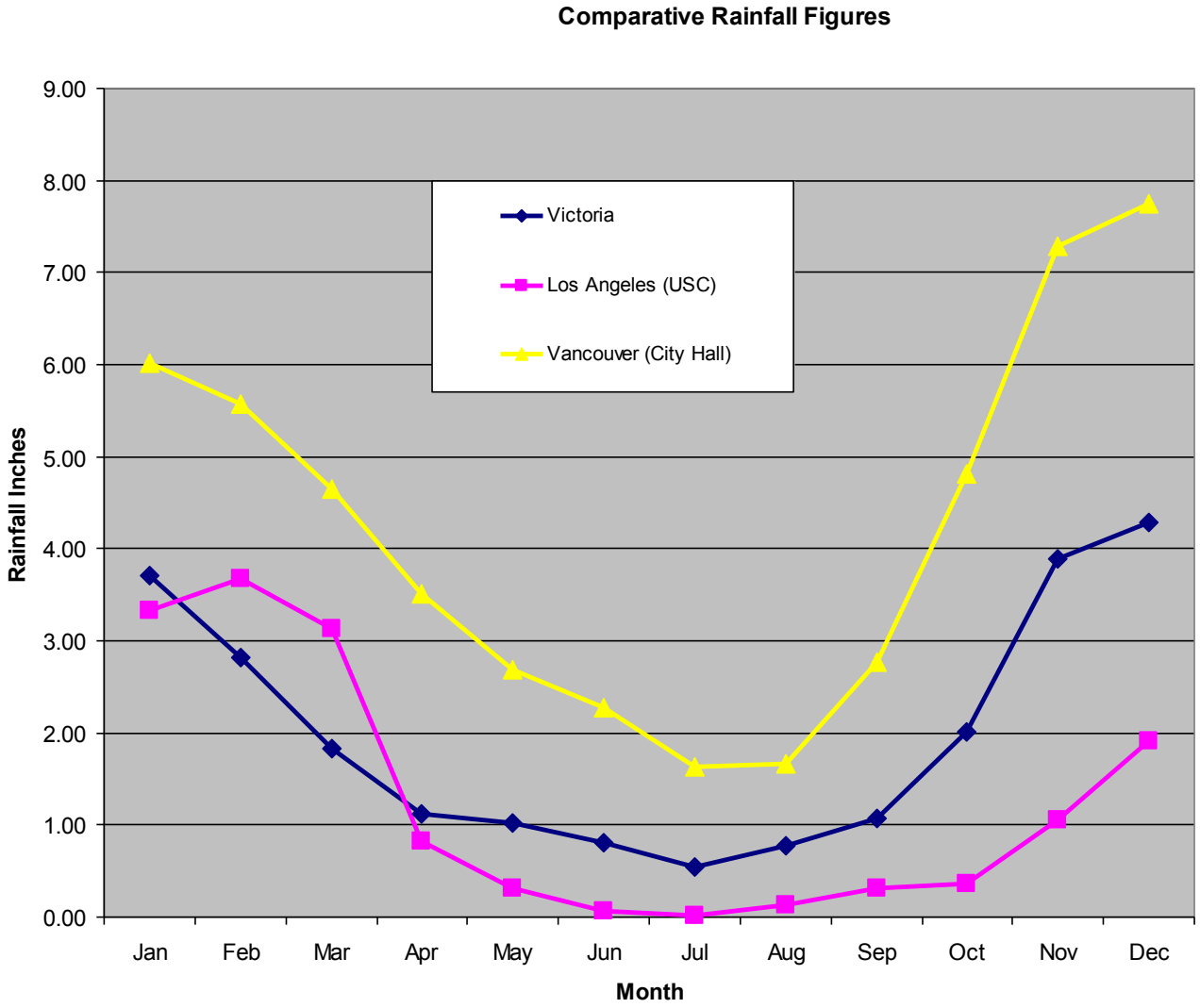
	Collection System	Treatment	Total Capital	Operational	Total Annual Cost (Amortised)
Centralised System					
Main sewer 1 mile away	$3,320,000	$464,000	$3,784,000	$83,800	$389,000
Main sewer 5 miles away	$5,370,000	$464,000	**$5,834,000**	**$95,900**	$566,700
Cluster System	$827,000	$2,953,000	**$3,780,000**	**$18,000**	$322,900
On-site			**$2,117,000**	**$59,240**	$229,900

1550 people in 443 homes

Why Reclaim Water

- You need the water
  - BC – greatest flow of water of all the provinces
  - Victoria – Canada's driest major city in the summer
- Reclaimed water cheaper than new water
- Environmentally Beneficial
- Reduces wastewater disposal costs

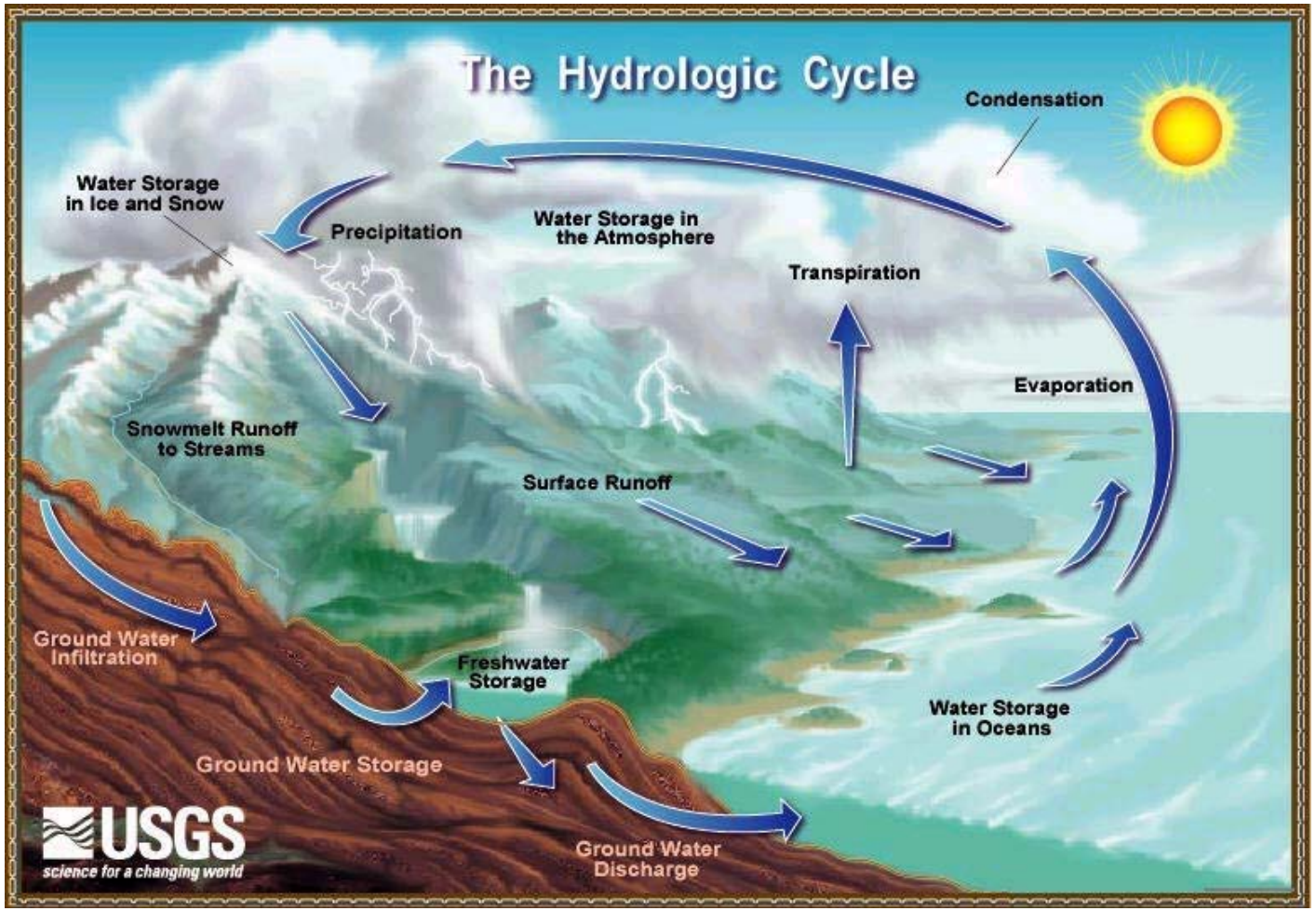
Comparative Rainfall : Vancouver, Victoria & LA



Van: 50”
Vic : 24”
LA : 15”

Why Re-use Water?

Water has no memory



Water Reclamation in the US

- California
  - 570,000 ML re-used in 1996 (4.4M people)
  - City of Avalon : separate non-potable distribution system
  - Irvine Ranch : Reclaimed water = 20% of water use
  - LA City : 120 ML/day to be re-used
  - LA County : 6 water reclamation plants
- Arizona
  - Re-uses 35% of municipal wastewater produced
  - Grand Canyon Village – 1st dual distribution system

Wastewater Standards and Re-use Standards Merging

	BOD	SS	Total Nitrogen	Total Phosphorous	Disinfection
Non-potable Re-use	**20**	**20**	**-**	**-**	High Level
Ocean Discharge	30	30			
Surface Water (>0.1MGD) & Quays	**5**	**5**	**3**	**1**	High Level

Unique Opportunity – inform yourselves and get a 21st century solution

- Review all the options
- Look at latest thinking
- Don't buy into yesterdays answers or ways of thinking
- Can be part of an overall strategy
- A 'one' size fits all solution may not be most economic or sustainable solution
- The best management option may combination of different approaches
- Use the appropriate solution for each catchment