



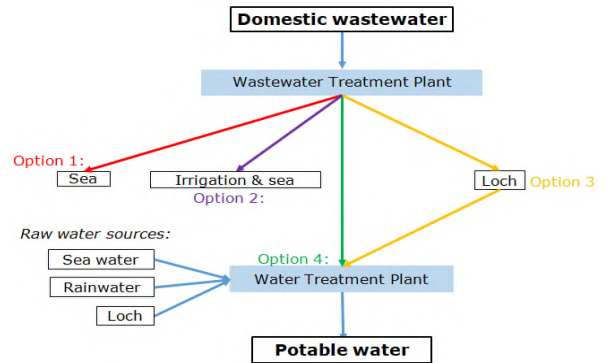
# The Islanders

**Objective:** To develop a robust and sustainable water management strategy to safeguard the water resources and the environment on a small remote island.

## Challenges:

- ✓ Isolated small island (9km<sup>2</sup>)
- ✓ Seasonal variation 80 to 160 PE
- ✓ Logistics: minimal use of consumables
- ✓ Site of Specific Scientific Interest (SSSI)
- ✓ Strict discharge regulations:
  - ❖ EU Bathing Water Directive
  - ❖ Scottish EPA

## Water Management Strategy Options:



## Option 4: Direct Potable Reuse

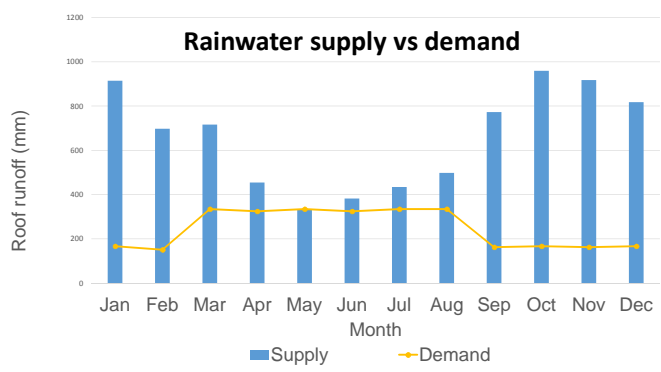
**Covered sludge storage**

- Low sludge volume 32m<sup>3</sup>/yr

**Brine – for disposal**

**Rainwater**

- Sufficient volume to meet demand 1024 mm/yr (UK Met Office)



- EQ**
  - Prevents downstream shock loads.
  - Consistent BOD, solids, TKN and TP.
- Screen**
  - Microscreen Filter (MSF) rotating drum
  - Increased TSS & BOD Removal, less wash water
- MBR**
  - Adaptability for fluctuation in population
  - Low sludge production (0.43m<sup>3</sup>/day)
- RO**
  - Removes dissolved solids - high quality permeate
  - Carbamazepine removal
- Ads**
  - AMERSORB 560 for micro pollutant removal
  - 1,4 dioxane & VOC removal
- UV**
  - 6 log removal of bacteria, viruses & protozoa
  - 1 log NDMA removal
- Supply**
  - Residual Chlorine for distribution
  - Coliform / Nitrate / Ammonia consents achieved

## Conclusions:

- ✓ Direct potable reuse with rainwater harvesting was the most suitable strategy for the island.
- ✓ An advanced membrane-based WWT process was identified as the most robust and reliable process.
- ✓ High quality drinking water with a small footprint
- ✓ Fully automated (remotely operated) plant with minimal use of consumables and waste generation.

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