A Framework for

Safe Recreation in South East Queensland Waterways

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Acknowledgements

• HLW colleagues
• Human Health Expert Panel
• Healthy Waterplay Steering Committee

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Overview

• Why manage recreational waters for microbial pollution?
• Sources of microbial pollution and who’s responsible
• Microbial pollution assessment and management
• Communicating results and providing advice
• Lessons learnt and next steps
Water-based Recreation & Tourism Benefits
Faecal Pollution Illness

Water Borne Pathogens

- Bacteria – E. Coli
- Protozoa – Giardia lamblia
- Viruses – Hepatitis A

Illnesses

- Diarrhoea
- Infections

Source: IEH Web Report W2 at www.le.ac.uk
Oyster Contamination Wallis Lake, NSW

• Impact:
  - 440 people developed hepatitis A
  - 1 in 7 cases hospitalised & 1 person died
  - Oyster, fishing & tourism industry impacted
  - Health costs $12.1 million

• Outcomes:
  - Effluent identified as contamination source
  - Upgrade sewage system
  - Increased monitoring
  - Public toilets installed
  - Regulations regarding disposal from boats
2011 Queensland Floods

Health alert as sewage spill becomes next threat for riverside homes
Source: Courier Mail

Faecal bacteria at dangerously high levels in popular Brisbane waterway, creek users not told
Source: Courier Mail

Source: Healthy Land and Water
Healthy Land & Water

Sunshine Coast Frog Habitat

Mulgowie Riverbank Restoration

Ecosystem health assessment and reporting

Cats Claw Creeper weed removal, Mid Brisbane catchment
7 Step Framework for Managing Risks in Recreational Waters

Step 1: Understand the microbial quality guidelines

Step 2: Select sites for assessment

Step 3: Undertake sanitary inspection

Step 4: Conduct microbial water quality monitoring

Step 5: Microbial assessment & classification of recreational site

Step 6: Reporting & raising awareness

Step 7: Management

Quality assurance
Step 1: Understanding the Guidelines

- Guidelines are quite technical and lacked detail
  so...
  - Training to build capacity
  - Expert Panel & Steering Committee
  - Regionally aligned trigger values
  - EnterosisA tool
  - Regional sanitary survey template
  - Site prioritisation tool
Step 2: Site Selection

Woorim Beach Bribie Island, Moreton Bay Region

Beach in China, Shandong province
Step 3: Sanitary Inspection

• Hazards:
  - Sewage 1km
  - Industrial 1km
  - Animals 200m
  - Stormwater 500m
  - Onsite Septic 200m
  - Recreators 200m
  - Boating 1km
  - Waterways 1km

• Quantify Risk:
  - Likelihood x Consequence = Risk Rating

• Combine Risks and Calculate Score:
  - Apply multipliers based on level of risk
  - Determine Sanitary Inspection Category
  - Very low to Very high
Sources of Microbial Pollution

Boating sewage discharges
Pelican droppings
Failing septic systems
Livestock faeces
Bather shedding
Pet faeces
Stormwater runoff
Industrial discharges
Wildlife faeces
Sewage overflows & infrastructure failures
Upper catchment inputs
Pelican droppings
Pet faeces
Failing septic systems
Step 4: Microbial Assessment

• **Indicator:** Enterococci

• **Trigger Values:** 200 & 500 cfu/100ml (primary contact)

• **Monitoring Considerations:**
  - Routine, exceedance and event based
  - Frequency and time of day
  - Data record sheet including observations
  - Laboratory, equipment, logistics, QA/QC, WHS

• **Statistical analysis:**
  - 100 data points to determine the 95%ile
  - Two years of sampling
Step 5: Site Suitability Grade

- Onsite Inspection
  - Sanitary inspection of catchment
  - Sanitary Inspection Category
  - Suitability grading for recreational water bodies
    - VERY GOOD
    - GOOD
    - FAIR
    - POOR
    - VERY POOR

- Monitoring
  - Assessment of microbial data (100 data points – may be collected over 5 years)
  - Microbial Assessment Category

<table>
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<th>Sanitary inspection category</th>
<th>A ≤40</th>
<th>B 41-200</th>
<th>C 201-500</th>
<th>D &gt; 500</th>
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<tbody>
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<td>Very low</td>
<td>Very good</td>
<td>Very good</td>
<td>Follow up</td>
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<td>Good</td>
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<td>Very high</td>
<td>Follow up</td>
<td>Fair</td>
<td>Poor</td>
<td>Very Poor</td>
</tr>
</tbody>
</table>

Source: NHMRC Guidelines
Recreation Site 1A

Sanitary Inspection Category: **High Risk**
- Stormwater (M), animals (L), recreational use (M) and boating discharges (H)

Microbial Assessment Category: **D**
- 95%ile of 765 cfu/100mL
- >10% chance of gastro per single exposure
- AFRI Illness 1 in 25 exposures

Suitability Grade: **Very Poor**
- Very susceptible to faecal pollution
- Unsuitable for swimming at times
Step 6: Reporting & Raising Awareness

Daily Forecasts

Weekly Reports

Annual Reports

Auckland Council SafeSwim website
Step 6: Reporting & Raising Awareness

- Signage
- Websites
- Social media
- Traditional media
- Community newsletters

Source: City of Gold Coast
Step 7: Management

- Predictive modelling to foresee exceedances
- Further investigation - MST
- Catchment pressures / source management
- Development controls
- Incidence response plans & links with emergency management
Next Steps

• Continue network and maintain resources

• Encourage and support local government in monitoring and assessing recreational sites

• Rainfall based predictive modelling

• Determine microbial sources using scientific methods

• Seek political support for online forecasting

• Further research
  − Appropriateness of Enterococci indicator in freshwater
  − Australian based epidemiological studies