Activity 4.1 – Water Quality Testing

- **If your school belongs to Waterwatch or Streamwatch** contact your school coordinator to get assistance with this activity.
- **If your school does not belong to Waterwatch or Streamwatch** you may wish to contact Oz GREEN to obtain a Low Cost Water Testing Kit, or use the contact information on the first page to find out how your school can join these programs.

In this activity, students will evaluate the water quality of their local waterway through a series of indicator tests. The results of their water quality testing and the information they gather from local government and catchment boards, will enable them to identify the major threats to the waterway. Once data is collected they can combine the information and look for patterns and relationships between land use, community attitudes and behaviours and water quality (see Section 5).

**Estimated Lesson Time:**
Water testing in the field: 2 to 3 hours
Interpreting and presenting data: 1 to 2 hours

**HSIE Stage 5A2 Outcomes**
- 5.1 Identifies gathers and evaluates geographical information
- 5.2 Analyses, synthesises and organises geographical information
- 5.3 Selects and uses written oral and graphic forms to communicate geographical information
- 5.4 Demonstrates a sense of place about Australian environments

There are also links to
Stage 5A2 Changing Australian Environments (5.1, 5.2, 5.3, 5.4)
Stage 6 - 8.2.1 Biophysical Interactions (P1, P3, P8, P9, P12)

**Keywords**
- phosphates
- pH
- dissolved oxygen
- turbidity
- pollution
- disease
- contamination
- nitrate
- faecal coliform
- bacteria
- algae
- habitat
- toxic
- biodiversity

**Process**
Caution: Assume all waterways are polluted with sewage and toxic substances. Wear waterproof gloves, gum boots and take precautions to prevent the transmission of diseases such as hepatitis by carefully washing hands with soap and water after testing.

1. Select the sites that you wish to test.
2. Choose the other sources of water quality data that are available.
3. To conduct tests, work with your school Waterwatch or Streamwatch Coordinator or contact Oz GREEN to obtain a Low Cost Water Testing Kit.
4. Follow the instructions set out in the kit.
5. Collate date – use Table 4.1 to interpret data and compare with ANZECC Guidelines.
6. Identify pollution issues impacting on water quality and their possible source.
### Table 4.1: Interpreting Water Quality Data

<table>
<thead>
<tr>
<th>Water Quality Data</th>
<th>Interpretation</th>
<th>Possible Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolved oxygen levels below 5mg/L</td>
<td>Oxygen levels below level required to maintain ecological health of waterway</td>
<td>Organic matter, leaves, Sewage</td>
</tr>
<tr>
<td>Phosphorous level above 0.05 mg/L</td>
<td>Nutrient levels above ANZECC guidelines for protection of ecological health of</td>
<td>Fertiliser, Detergents, Sewage</td>
</tr>
<tr>
<td></td>
<td>freshwater ecosystems – danger of algal bloom</td>
<td></td>
</tr>
<tr>
<td>Turbidity levels above 10 NTU</td>
<td>Excess sediment is washing into waterway</td>
<td>Construction sites, Erosion of soil from cleared land</td>
</tr>
<tr>
<td>Biochemical oxygen demand above 2mg/L</td>
<td>Excess organic matter in waterway</td>
<td>Excess leaves and other organic matter, Sewage, Excess growth of water plants and algae</td>
</tr>
<tr>
<td>Faecal coliform* levels above 600 colonies/100 mL</td>
<td>Water is unsafe for swimming.</td>
<td>Sewage, Animal droppings, Dairy and feedlot contamination</td>
</tr>
<tr>
<td>Water smells of oil and grease; oily ‘rainbow’ slick on the surface of the water</td>
<td>Water is being contaminated by oils and greases</td>
<td>Oil dripping from cars onto roads and driveways, Oil and grease being tipped into stormwater drain, Illegal dumping</td>
</tr>
<tr>
<td>Rubbish and litter</td>
<td>Rubbish on streets being washed into stormwater system</td>
<td>Uncovered rubbish bins, Bad attitudes – people littering</td>
</tr>
</tbody>
</table>

* There are no single sample guidelines for faecal coliform specified by ANZECC. If a single sample is collected, Beachwatch suggests a reading of 600 colonies should not be exceeded. If four samples are collected over a period of up to a month, then the level for safe swimming is if the average of the counts is less than 150 colonies/100 mL.