Introduction
In this activity students are asked to plan an innovative hypothetical method to prevent stormwater pollution in their local waterway. They will need to decide between a source control or an end-of-pipe solution. They may decide to adopt an existing method or design something completely different.

Estimated lesson time: Introduction: 40 minutes. This activity is suitable for homework or a class research assignment.

Geography Stage 5A3 Outcomes
5.1 Identifies gathers and evaluates geographical information
5.2 Analyses, organises and synthesises geographical information
5.3 Selects and uses appropriate written oral and graphic forms to communicate geographical information.
5.4 Demonstrates a sense of place about Australian environments.
5.6 Analyses the impact of different perspectives on geographical issues at local, national and global scales.
5.9 Applies geographical knowledge, understanding and skills to demonstrate active and informed citizenship.

There are also links to Stage 5A2 Changing Australian Environments (5.1, 5.2, 5.3, 5.4, 5.6, 5.9)

Keywords
• filter
• degradation
• sediment
• bund
• gross pollution trap
• habitat
• capacity
• erosion
• retention
• infiltration
• wetland
• fishway

Process
1. Identify Issue
Students work individually or in teams to imagine they are professionals faced with the challenge of coming up with an innovative design to clean up the local creek. They could:
make a list of stormwater pollution sources based on the results of their own investigations in Sections 4, 5 and 6

2. Develop an Innovative Solution
Students brainstorm ideas about how to prevent pollution. Their approach could be to:
• design a small community education project targeting one issue or group, or
• develop an on-site method for pollution control, or
• design an 'end-of-pipe' stormwater treatment device.

They may also like to contact their local council to find out what stormwater pollution prevention activities are being implemented in the local area.

3. Present Ideas
Individuals/student teams can present their design to the class. If the solution is to a school issue they may also like to make a presentation to the school principal. It may be interesting to invite a representative of local government to hear their ideas.
Introduction

Your brief is to design a hypothetical innovative method to prevent stormwater pollution.

Step 1: Choose an issue that was identified during your investigations in Section 4, 5 and 6.

Step 2: Decide on your approach.
- Do you want to prevent pollution at source (on-site practices or education program)?
- Do you want to develop an end-of-pipe solution?

Step 3: Design your ‘solution to pollution’ using the guidelines set out below to help you.

Step 4: Prepare a presentation about your solution to pollution.

Step 5: Present your solution to pollution design to your class, to the principal and/or local council.

1. Guidelines for Source Control
   A. On-site Source Control
      The best way of protecting local waterways from stormwater pollution is to prevent pollution at source.
      Careful planning will enable pollution to be prevented. The following steps can be taken to improve environmental performance.

      Transport of Materials on and Off-site
      Transport of materials on and off a site are activities that increase the risk of stormwater pollution. All delivery areas should be bunded to ensure that no pollutants can escape to stormwater if an accidental spill occurs.

      On-Site Storage of Chemicals and Wastes
      Chemicals and wastes need to be stored away from stormwater drains, in clearly marked and sealed containers in an under cover and securely bunded area.

      Cleaning Practices
      Outdoor areas should be swept and kept clean of rubbish. It is illegal to hose off surfaces into the stormwater.

      Be Prepared for Accidents
      Plan what to do in the event of an accidental spillage. Spill clean-up equipment should be kept on site and close to areas where there is a risk of spillage.

   B. Community Education Source Control
      When planning a community education project, it is important to consider the following questions:
      1. What is the problem being targeted?
      2. Who is affected by this problem? (Who are the stakeholders?)
      3. Who is the target group for the project?
      4. What do you want the project to achieve (outcomes)?
      5. How are you going to achieve this?
      6. What kind of support is needed to do the project?
      7. What steps do we need to take to achieve our desired outcome (develop an action plan)?
      8. How will we know our project has achieved what we want it to (monitoring and evaluation)?

   Useful Community Education Methods
      The best methods for a community education project will depend on the target group. Some useful techniques include:
      - audio visual tools (video, slides, photos)
      - awards
      - case studies of positive role models
      - debate
      - demonstration
      - displays
      - focus groups
      - media coverage
      - talks, workshops
      - print material such as posters and brochures

      You may like to conduct a survey to find out the most useful or preferred techniques for your target group. You will also need to plan how you could conduct the education program.

2. Guidelines for Stormwater Treatment Devices
   Refer to table 7.1 for a summary of stormwater treatment devices.

   The following ideas need to be put into practice when designing stormwater treatment devices.
   a. Decide where the device can be located to give most effective results.
   b. Think about the existing situation and sources of pollution. What will be the impact of your device on the local waterway?
   c. Think about how to landscape the site. Think about the potential to create natural habitat.
d. Develop a draft of your design and ask others to give you feedback about your ideas.
e. Develop a final design.
f. Consider the safety issues involved and include warning signs and fences where necessary.

**Stormwater Treatment Devices**

![Figure 7.1 – Gross Pollution Trap (GPT)](image)

**Figure 7.1** – Gross Pollution Trap (GPT)

![Figure 7.2 – GPT side view](image)

**Figure 7.2** – GPT side view

![Figure 7.3 – Constructed Wetlands](image)

**Figure 7.3** – Constructed Wetlands

![Figure 7.4 – Wetlands, side view](image)

**Figure 7.4** – Wetlands, side view

Source Figure 7.2 and 7.4 – *Managing Urban Stormwater – Treatment Techniques* NSW EPA, 1997

Source Figure 7.1 and 7.3 – Department of Planning, 1993