Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

point: from one identifiable place, e.g. a factory outlet pipe; non-point: from many spread-out places, e.g. fertilizer runoff from farmland

2.2

below the outlet, organic matter is decomposed by bacteria, so BOD is high; bacteria use up oxygen, so dissolved oxygen falls; further downstream the organic matter is used up and oxygen dissolves from the air, so oxygen recovers

3.1

(a) nitrate and phosphate cause rapid growth of algae; algae block light, so plants die; dead matter is decomposed by bacteria; bacteria use up oxygen, so fish and other animals die

(b) the dead animals add more organic matter, so decomposition and oxygen loss increase further

3.2

award up to [5]: change the activity: use less fertilizer, apply it at the right time, phosphate-free detergents: cheapest in the long term but needs farmer cooperation; control the release: buffer strips and sewage treatment that removes nutrients: effective but costly to build; clean-up: dredge nutrient-rich sediment, aerate water, remove algae: fast effect but expensive and only treats the symptoms; conclusion: prevention at the source is most sustainable, with clean-up for quick relief

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