

(Potable water and water treatment (practical methods))

Q1. (2020)

This question is about water.

In the UK, potable (drinking) water is produced from different sources of fresh water.

Explain how potable water is produced from fresh water.

[4 marks]

Q2. (2020)

A different country has:

- very little rainfall
- a long coastline
- plentiful energy supplies.

Suggest **one** process this country could use to obtain most of its potable water.

[1 mark]

Q3. (2020)

Waste water is not fit to drink.

Treatment of waste water produces two substances:

- liquid effluent
- solid sewage sludge.

Draw **one** line from each substance to the way the substance is processed.

[2 marks]

Substance**Process**

	Aerobic biological treatment
Liquid effluent	Anaerobic digestion
	Grit removal
Solid sewage sludge	Screening
	Sedimentation

Q4. a). (2020)

Table 1 shows information about the disposal of processed solid sewage sludge in the UK in 1992 and in 2010.

Table 1

Year	Mass of processed solid sewage sludge in millions of kilograms				
	Used as fertiliser	Sent to landfill	Burned	Other methods	Total
1992	440	130	90	338	998
2010	1118	9	260	26	1413

Calculate the percentage of processed solid sewage sludge that was burned in 2010.

Give your answer to 3 significant figures.

Use **Table 1**.

[3 marks]

Percentage (3 significant figures) = _____ %

Q4. b). (2020)

Suggest **one** reason why the total mass of processed solid sewage sludge increased between 1992 and 2010.

[1 mark]

Q4. c). (2020)

Between 1992 and 2010 the proportion of processed solid sewage sludge used as fertiliser increased.

Suggest **two** reasons why.

[2 marks]

1 _____

2 _____

Q5. (2022)

This question is about water.

Sewage is waste water.

Sewage contains organic matter.

Describe how sewage is treated to remove organic matter.

[4 marks]

Q6. a). (2022)

Sea water and ground water are treated to make them potable.

Table 5 shows information about the composition and treatment of sea water and of ground water.

Table 5

	Sea water	Ground water
Concentration of sodium ions and chloride ions before Process 1	Na ⁺ : 0.5 mol/dm ³ Cl ⁻ : 0.5 mol/dm ³	Na ⁺ : 0.001 mol/dm ³ Cl ⁻ : 0.001 mol/dm ³
Process 1	Reverse osmosis	Filtration
Concentration of sodium ions and chloride ions after Process 1	X	Na ⁺ : 0.001 mol/dm ³ Cl ⁻ : 0.001 mol/dm ³
Process 2	Add ozone	Expose to ultraviolet light

Sea water is desalinated during **Process 1**.

Which pair of concentrations could represent **X** in **Table 5**?

[1 mark]

Tick (✓) **one** box.

Na ⁺ : 0.003 mol/dm ³	Cl ⁻ : 0.003 mol/dm ³	☐
Na ⁺ : 0.003 mol/dm ³	Cl ⁻ : 0.5 mol/dm ³	☐
Na ⁺ : 0.5 mol/dm ³	Cl ⁻ : 0.003 mol/dm ³	☐
Na ⁺ : 0.5 mol/dm ³	Cl ⁻ : 0.5 mol/dm ³	☐

Explain why the concentrations of sodium ions and of chloride ions in the ground water in **Table 5** are unchanged by **Process 1**.

[2 marks]

Q6. c). (2022)

Explain why the ground water in **Table 5** requires **Process 2** before the water is safe to drink.

[2 marks]

Q6. d). (2022)

After treatment the ground water in **Table 5** is sold by a company as pure water.

The ground water in **Table 5** is not chemically pure because the water contains sodium ions and chloride ions.

Suggest what the company means by 'pure'.

[1 mark]

Q7. (2024)

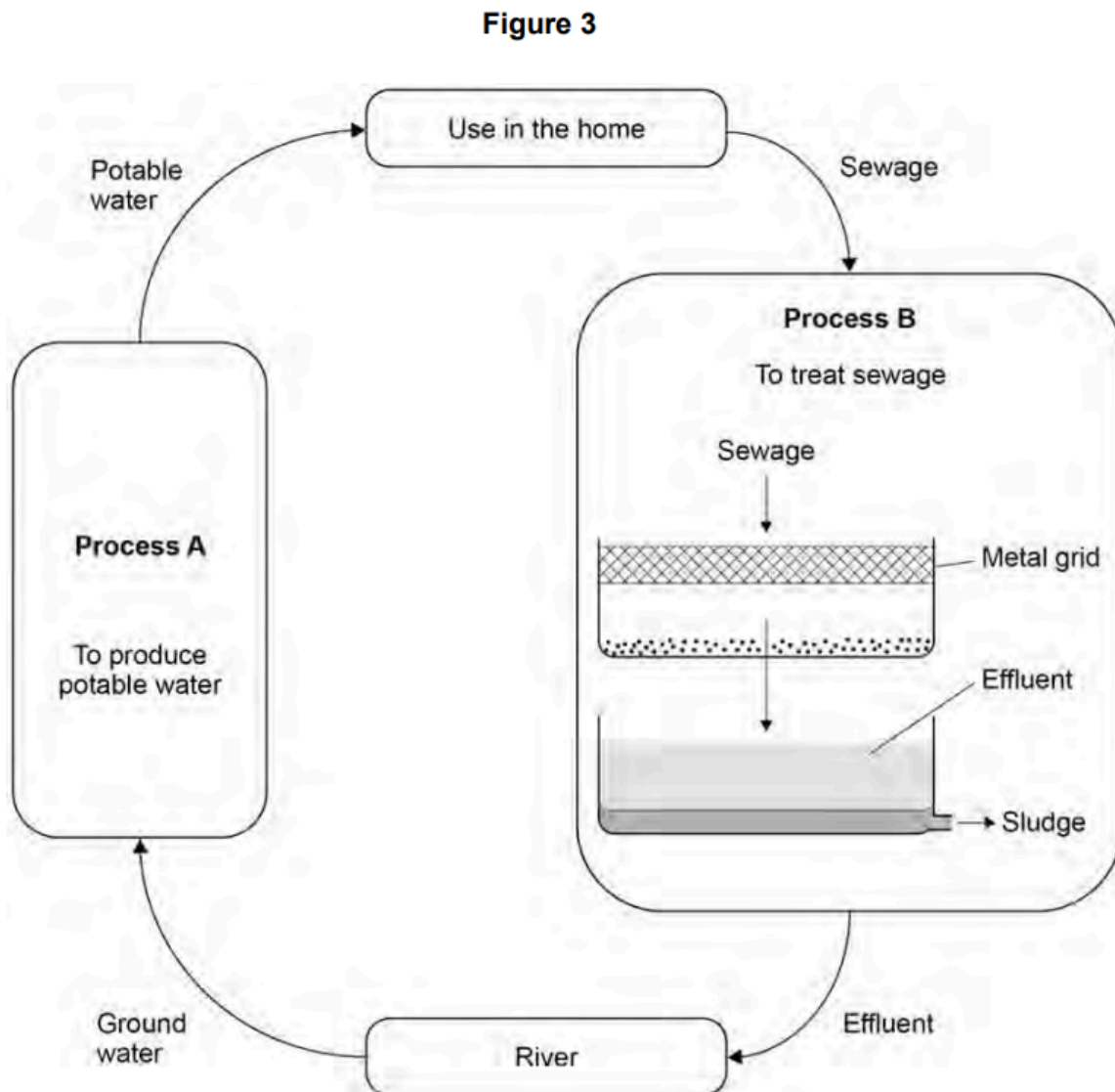
Water collected from rivers is used in the home for drinking and flushing toilets.

Water used in the home must be potable.

Potable water is safe to drink.

Waste water produced after use in the home is called sewage.

Figure 3 shows how water is collected from rivers and returned to rivers after use.



Explain what happens to water in **Process A** and in **Process B** in **Figure 3**.

Do **not** refer to use of water in the home.

[6 marks]
