



Practical investigation – Drinking water treatment flow diagram

Flow diagram

A flow diagram visually represents the steps and orders that must be made to complete a process. To improve students' Working Scientifically skills, flow charting skills are required for students to sequence steps in an explanation, correctly organise steps in a process, and obtain information from a flow diagram.

This activity aims to show students how to create a flow diagram and develop their flow-charting skills. They will also learn about how we treat our drinking water using different separation techniques. Rather than just describe the process in plain text, students can identify the steps by representing them visually

The flow diagram cards include all the necessary process in drinking water treatment based on Orchard Hills Water Filtration Plant. See how we treat raw water into drinking water to protect the public health.

Syllabus links

- **SC4-9WS** – presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations.
- **SC5-9WS** – presents science ideas and evidence for a particular purpose and to a specific audience, using appropriate scientific language, conventions and representations.



We monitor and manage drinking water at nine water filtration plants like this one at Orchard Hills.

Instructions

1. Print off the cards attached.
2. Cut out the arrows and key with dashed lines for your flow diagram.
3. Rearrange the order of the slides to create a flow diagram of how you think we filter water and recycle the solid waste in water treatment.
4. Cut out the items in the sorting game.
5. Place items where you think they are added or removed in water treatment.
6. Check your answers or visit [Orchard Hills Water Filtration Plant](#) page.

Flow diagram cards

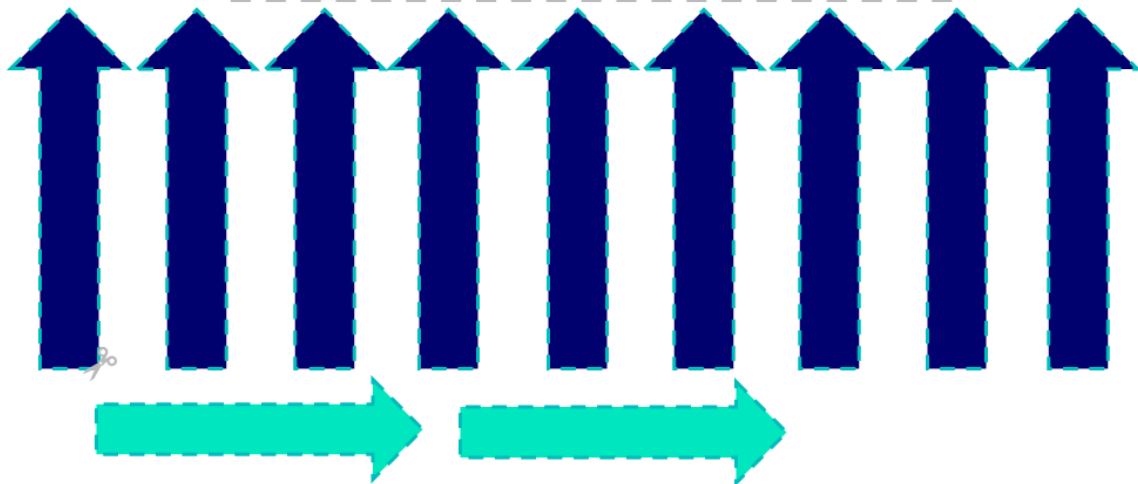
Orchard Hills Water Filtration Plant

Filters rainwater collected in the stunning Lake Burragarang to make water that is safe to drink straight from the tap.



Sydney
WATER

 Water treatment  Solids handling



Raw water

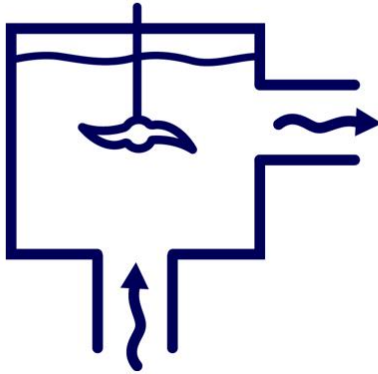
The unfiltered water from Warragamba Dam.

Warragamba Dam is the source of about 80% of Sydney's drinking water.



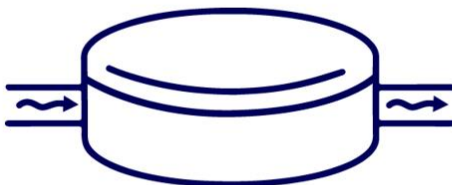
Mixing chamber

We use a large and rapid mixing paddle to spin the water and mix solutions we add.



Clear water tank

Pipes move the clear water into a temporarily before further treatment.



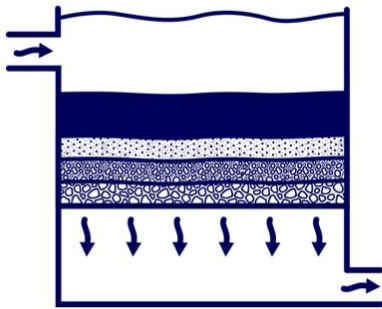
Fluoridation

We add a very small and controlled amount of fluoride under NSW Health guidelines.



Dual media filter

We use filters made of tightly packed beds of sand and crushed coal.



Drinking water

Water used at home for drinking and other purposes like washing and bathing.

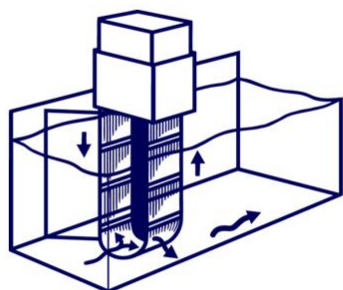
Orchard Hills supplies about 80 million litres to 200,000 people in Greater Penrith area. In Sydney we use more than 1.5 billion litres a day!





Filter backwash lagoon

We collect and dry materials which we wash out of the filters that contain natural particles and nutrients



Fine rotary screen

We use a mesh screen that sieves the water.



Disinfection

We add a very small and controlled amount of chlorine to protect public health and keep the water safe.





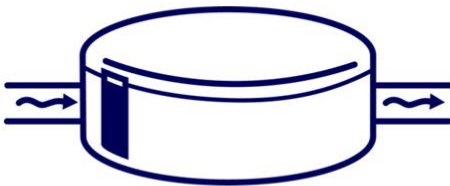
Beneficial reuse

We can remove and process solids to reuse on land (mix with compost for soil replenishment).




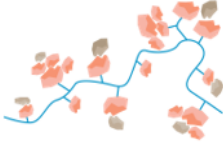




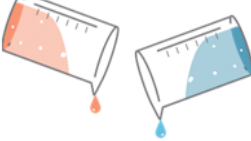

Reservoir

We hold the water for a short period in large tanks usually at a high point to get the water to your home when you turn on the tap.



Sorting game

Cut these cards out and place where you think these items are removed or added in the flow diagram. Discuss why you think it's important to remove or add these items.

 <p>sticks and leaves</p>	 <p>flocs – solid particles clumped together</p>	 <p>fine suspended particles</p>	 <p>pH adjustment</p>
 <p>small freshwater invertebrates</p>	 <p>pathogens</p>	 <p>coagulant & flocculant</p>	 <p>fluoride</p>