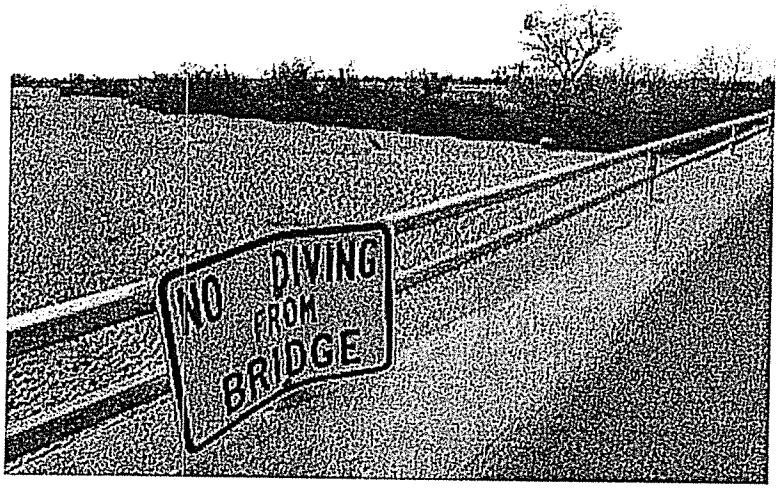
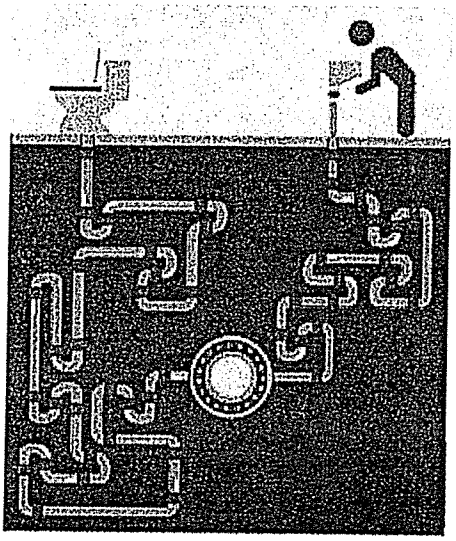
INTRODUCTION Task Card
In a Time of Drought

TASK PROBLEM:
Develop a model that shows how wastewater is treated so that it can be reused as a drinkable source of water.

Focus Question: How are scientists cleaning water to address California's drought?



A sign from wetter times warns people not to dive from a bridge over the Kern river. (David McNew / Getty Images)



From Toilet to Tap illustration (Jody Collins).

Your model will:

- ❑ Show only the **1st TWO** stages (microfiltration and reverse osmosis)
- ❑ Show water as individual molecules made up of atoms
- ❑ Include other substances shown as molecules that are filtered out of water
- ❑ Show what substances are collected during the different stages of filtration
- ❑ Demonstrate relative sizes of the different molecules and atoms
- ❑ Show how different stages filter out progressively smaller particles
- ❑ Show how a "mystery" molecule will move through the stages in their model

Include the following common substances in wastewater to filter out:

- water (H_2O)
- nitrate (NO_3)
- bacteria, like E. Coli
- viruses
- hair
- parts of salt (Na and Cl)
- food, like rice
- protozoa, like amoeba
- carbon dioxide (CO_2)
- sand
- toilet paper

☆USE the Article Called "—
"Drought is Making Treated Wastewater a Tastier Option"
☆ Page 2 - For Particle Size Filtration
Figure 2

Fig. 2

Microfiltration
*Filters out **bacteria**, **protozoa**, and any **solids** floating in the water*

Reverse Osmosis
*Filters out **viruses**, **dissolved salts**, and most **chemicals***

UV and H2O2
*Destroys any remaining **chemicals** and **bacteria** that escaped*

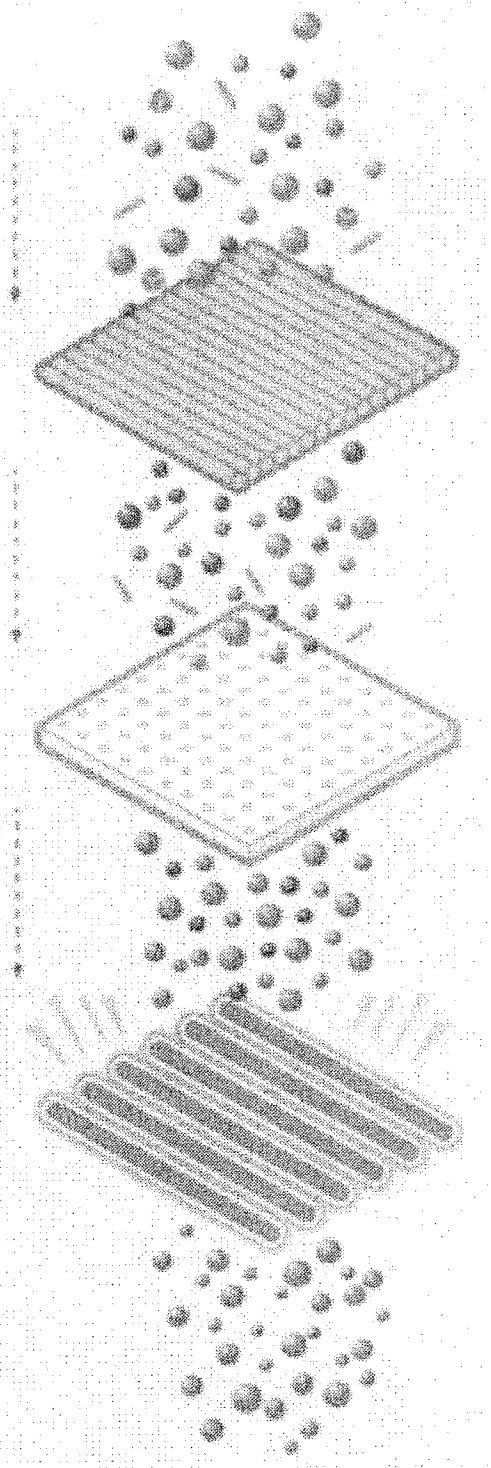


Figure 2.The three stages of the **Direct Potable Reuse process.** Text and image adapted from trojantechnologies.com

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