

THE PROBLEM

Currently there are two different water treatment plant types that are primarily used, drinking water treatment and wastewater treatment. This system of two separate plants requires twice as much land use, energy use, chemical use, and construction and operation costs. Water distressed areas are in dire need of more drinking water, while compounding the issue by pouring purified water out of the wastewater plant back into the environment.

THE IDEA

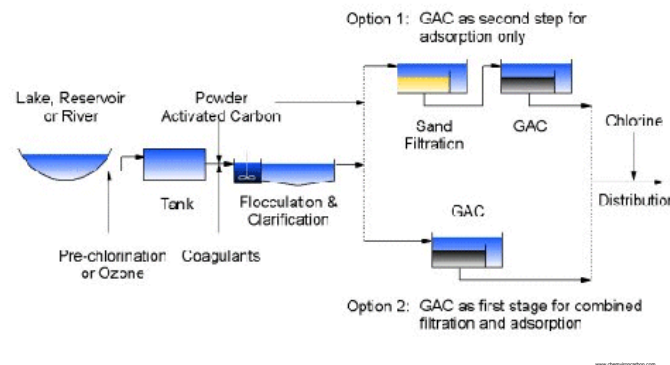
This project addresses the processes used to treat wastewater to at least the same purity levels as that of drinking water. Utilizing recycled wastewater for drinking water is as safe as standard drinking water that we use now.

THE OUTCOME

The use of recycling wastewater to drinking water will decrease the negative aspects of having two separate water treatment plants while still producing the same level of safety as traditional drinking water treatment plants.

SUSTAINABILITY

By combining two plants into one and recycling wastewater into drinking water there will be large savings within economics, land use, and chemicals used. Multiple benefits will be achieved such as lowering utility costs for the public because the amount of chemicals needed, reducing man power to operate, and decreasing the cost of construction and maintenance. There are negative impacts on the environment by taking in water from a natural source, but utilizing the output from the wastewater will decrease the volume and impact to the environment. This will also decrease the amount of sludge that would have to be transported to a landfill because there is less water that will have to be treated overall.



Standard water treatment plants take in water from sources such as river, lakes, and ground water and through various processes cleans the water to safe drinking levels.

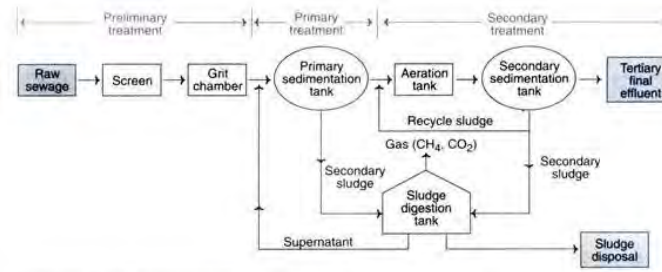
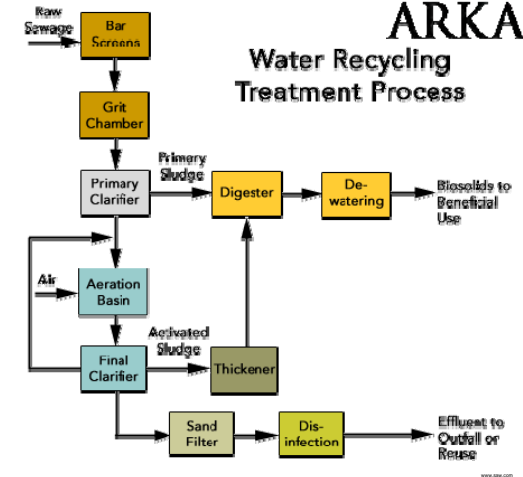


Fig. 57.18 : A diagrammatic representation of a flow chart of conventional sewage treatment plant.

Wastewater treatment plants take raw sewage and through processes similar to drinking water plants but with additional processes to bring the water to a safe level to be placed back into the environment without causing negative effects.



The process to recycle water is very similar to the wastewater treatment process. There is no sub-process that is not already within the wastewater process due to both processes taking the same black water and making it as pure as standard drinking water. The primary difference is that wastewater plants pump the pure water back into the environment while the recycling plant provides pure water to the drinking water supply.

Substance	Drinking water	Waste Water
Cryptosporidium	X	X
Giardia Lamblia	X	X
Viruses	X	X
Other Pathogens	X	X
Chlorines	X	X
Nitrogens	X	X
Fluorides	X	X
Heavy Metals	X	X
pH		X
Turbidity, NTU	X	X
BOD		X
COD		X

Both drinking and wastewater treatment processes regulate similar output substances. However, wastewater treatment outflow is more regulated, allowing the outflow easily to be to the quality of drinking water outflow.