**ACTIVITY: Wastewater polishing**

**Activity idea**

In this activity, students compare the three methods used to polish wastewater.

By the end of this activity, students should be able to:

* compare and contrast three methods of polishing wastewater – exposure to UV, chlorination and pumping effluent onto wetlands.

[Introduction/background notes](#Introduction)

[What you need](#need)

[What to do](#Do)

Student handout: [Three methods for tertiary processing (polishing) of wastewater effluent](#methods)

**Introduction/background**

The Mangere Wastewater Treatment Plant in Auckland uses UVC light to disinfect wastewater.

This activity explores this method of wastewater treatment and compares it with chlorination and with pumping effluent onto wetlands.

**What you need**

* Access to the video clips [Three wastewater polishing methods](https://www.sciencelearn.org.nz/videos/75-three-wastewater-polishing-methods), [Tertiary treatment of effluent](https://www.sciencelearn.org.nz/videos/72-tertiary-treatment-of-effluent), [The best conditions to disinfect wastewater](https://www.sciencelearn.org.nz/videos/74-the-best-conditions-to-disinfect-wastewater), [Zapping bugs](https://www.sciencelearn.org.nz/videos/71-zapping-bugs) and [Monitoring UV disinfection](https://www.sciencelearn.org.nz/videos/73-monitoring-uv-disinfection)
* Access to the article [Disinfecting wastewater](https://www.sciencelearn.org.nz/resources/219-disinfecting-wastewater)
* Copies of the student handout [Three methods for tertiary processing (polishing) of wastewater effluent](#methods) (A4 and A3 sizes are provided)

**What to do**

1. In small groups, view the clips of Sanjay Kumarasingham talking about tertiary wastewater treatment ([Three wastewater polishing methods](https://www.sciencelearn.org.nz/videos/75-three-wastewater-polishing-methods), [Tertiary treatment of effluent](https://www.sciencelearn.org.nz/videos/72-tertiary-treatment-of-effluent), [The best conditions to disinfect wastewater](https://www.sciencelearn.org.nz/videos/74-the-best-conditions-to-disinfect-wastewater), [Zapping bugs](https://www.sciencelearn.org.nz/videos/71-zapping-bugs) and [Monitoring UV disinfection](https://www.sciencelearn.org.nz/videos/73-monitoring-uv-disinfection)) and read [Disinfecting wastewater](https://www.sciencelearn.org.nz/resources/219-disinfecting-wastewater).
2. Hand out copies of the student handout [Three methods for tertiary processing (polishing) of wastewater effluent](#methods). Have students make notes about the strengths and weaknesses of the methods as they apply to each of the factors in the left-hand column and add in any other factors they may think of.

**Student handout: Three methods for tertiary processing (polishing) of wastewater effluent**

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor**  | **Exposure of effluent to ultraviolet light** | **Chlorination of effluent** | **Pumping effluent onto wetlands** |
| Cost |  |  |  |
| Footprint |  |  |  |
| Residual effect |  |  |  |
| Time taken to polish |  |  |  |
| Energy used |  |  |  |
| Storage |  |  |  |
| Maintenance |  |  |  |
| Reliability |  |  |  |
| Public acceptance |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor**  | **Exposure of effluent to ultraviolet light** | **Chlorination of effluent** | **Pumping effluent onto wetlands** |
| Cost |  |  |  |
| Footprint |  |  |  |
| Residual effect |  |  |  |
| Time taken to polish |  |  |  |
| Energy used |  |  |  |
| Storage |  |  |  |
| Maintenance |  |  |  |
| Reliability |  |  |  |
| Public acceptance |  |  |  |