FILTRALITE® (EXPANDED CLAY) IN A NEW PROCESS FOR THE WATER RECOVERY FOR OLIVE WASHING WASTE WATER BASED ON BIOFILTRATION AND MEMBRANE SEPARATION

Carlos de Juan
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Main Characteristics of Filtralite:

- Expanded Clay manufactured in Norway to be used as filter media for both Physical Filtration and Biological Filtration.
- Made by heating clay to around 1200°C, followed by crushing and sieving.
- Aggregate size from (0.5-20 mm), shape (rounded and crushed) and dry particle densities (500-1,600 kg/m³)
- In addition to its low density and high porosity. Filtralite® offers high abrasion and impact resistance.

Filtralite® develops and manufactures quality filter for:

- PURE Drinking Water
- CLEAN Waste Water
- NATURE On Site Treatment
In the production of olive oil, a preliminary important step is the pre-washing of the collected olives before their milling.

Up to 500 liters of potable water are required per ton of olives.

The wastewater produced by the washing process is a dark smelling liquid with a rather high phenol load.

### STUDY CASE: WATER RECOVERY FOR OLIVE WASHING WASTE WATER BASED ON BIOFILTRATION AND MEMBRANE SEPARATION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH</td>
<td>5,3</td>
</tr>
<tr>
<td>Conductivity [uS/cm]</td>
<td>966</td>
</tr>
<tr>
<td>BOD5 [mg/l]</td>
<td>1215</td>
</tr>
<tr>
<td>COD [mg/l]</td>
<td>1840</td>
</tr>
<tr>
<td>Total Phenols [mg/l]</td>
<td>5,6</td>
</tr>
</tbody>
</table>
STUDY CASE: WATER RECOVERY FOR OLIVE WASHING WASTE WATER BASED ON BIOFILTRATION AND MEMBRANE SEPARATION

- 2m3 Aerobic Fixed-Bed Bioreactor: FILTRALITE®. (flow 500 l/h, residence time 8 hours, air stream 15 Nm3/h).
- Ultrafiltration (UF); removes bacteria and organic matter.
- Nanofiltration (NF); removes polyphenols and saline content.
- Purifying and recovering 80% of water from an olive washing waste water stream.
STUDY CASE: WATER RECOVERY FOR OLIVE WASHING
WASTE WATER BASED ON BIOFILTRATION AND
MEMBRANE SEPARATION

<table>
<thead>
<tr>
<th>PROCESS STEP</th>
<th>Raw Water</th>
<th>After Biological Treatment</th>
<th>After biological Treatment + UF</th>
<th>After biological Treatment + UF+NF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Reduction</td>
<td>Value</td>
<td>Reduction</td>
</tr>
<tr>
<td>Conductivity [uS/cm]</td>
<td>966</td>
<td>927</td>
<td>4,0%</td>
<td>835</td>
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<tr>
<td>BOD5 [mg/l]</td>
<td>1215</td>
<td>668</td>
<td>45,0%</td>
<td>298</td>
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<td>COD [mg/l]</td>
<td>1840</td>
<td>837</td>
<td>54,5%</td>
<td>377</td>
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<tr>
<td>Total Phenols [mg/l]</td>
<td>5,6</td>
<td>4,4</td>
<td>21,0%</td>
<td>1,4</td>
</tr>
</tbody>
</table>

- The optimized process have a **stable biological operation**, capable to **half the organic content of the main stream**.
- This process is **very useful as pretreatment** of the waste stream for the membrane section, which can be operated at relative high fluxes without incurring in short term fouling.

*Reference Avoiding Bio-fouling with Fitralite®, Desalination **Plant Palmachin in Israel**: (Savings for the Cartridge filters means 300.000 €/year)*
Many Thanks

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Bibliographic References

- Jesus Gonzales Lopez, Angelo Chianese, Marco Stoller, Ole Jacob Sortehaug. A NEW PROCESS FOR THE WATER RECOVERY FOR OLIVE WASHING WASTE WATER BASED ON BIOFILTRATION AND MEMBRANE SEPARATION. http://www.filtralite.com/sites/default/files/content-page/10a_-_article_biofiltration_waste_water_pretreatment.pdf