



# WASTWA

INNOVATIVE COMBINED PROCESS FOR TREATING LEACHATE

... a Solwa Innovation

## THE COMPANY

**SOLWA** is an Innovative Company part of the Multinational Corporation **SANTEX RIMAR GROUP**, which works worldwide with manufacturing branches in Italy, Switzerland, India and China.

Solwa is a specialist in the water treatment sector and dehydration processes, using solar & renewable technologies, awarded by national and international Organizations (i.e. MIT as “Italian innovation of the year”, the UN as “Innovation for Human Development”, “Success Story” for UE Commission).

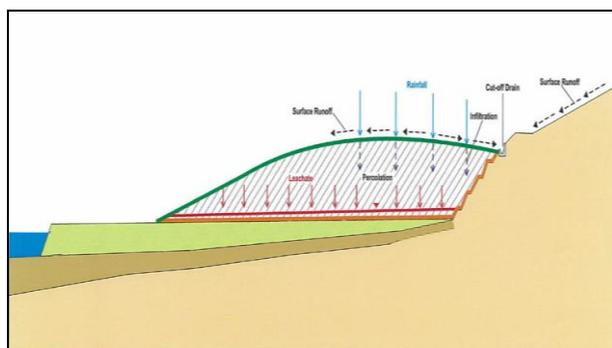
Solwa Technology is employed in different fields:

- **DryWa** for drying sludge
- **DigeWa** for drying digestate
- **WastWa** for treating leachate
- **FoodWa** for drying food
- **SolWa** for water treatment
- **IrriWa** for agriculture in barren areas

## LEACHATE TREATMENT

The leachate is the product from the drainage of rainwater in the waste landfill. This should be equipped with a waterproof system at the bottom, avoiding the drainage of leachate and the resulting pollution of the subsoil. The leachate is extremely pollutant because of its chemical composition of humic acid, heavy metals, ammonia nitrogen and salts. There are very few landfills equipped with a purification plant in situ; in fact most of the leachate is extracted and transported in water treatment plants, where chemical and physical pre-treatments are used before the biological ones, causing environmental problems. Beyond the sustainable aspects, the costs of transport have also a strong impact. It would be more advisable planning the leachate treatment plant in-situ, in order to remove directly the pollutants from leachate.

**WastWa** is an integrated system able to treat the leachate in situ, using different energy-saving techniques and renewable energies.



Typical scheme of a solid waste landfill



Production of leachate in a solid waste landfill

## THE LEACHATE

The leachate composition presents a high variability in quantity and quality during the years. The nitrogen concentration and salts, as heavy metal, cause problems in the normal water treatment plants. The researches driven with phytodepuration to treat leachate, in order to find a cheaper in-situ solution, did not obtain positive results. Even if the phytodepuration removes the heavy metals, as well as organic and nitrogen compounds, the unbalanced ratio C/N enables plants to develop a proper leachate treatment. A pre-treatment is necessary to have a natural leachate treatment plant.

## WASTWA PROCESS

WastWa system is composed of solar stills able to extract more than 50% of water and almost 96% of nitrogen from leachate (in the form of ammonia). The evaporating process is completely powered by solar energy and waste heat of co-generator or torches, without chemical products or complex systems.

The evaporated part is treated by a scrubber to recover the ammonia, obtaining pure ammonium salts for commercial use (agricultural use). On the other hand, the concentrated leachate has a perfect C/N ratio (C/N=10) and it can be treated with a phytodepuration plant. Both the resulting solutions can be discharged into waterways.

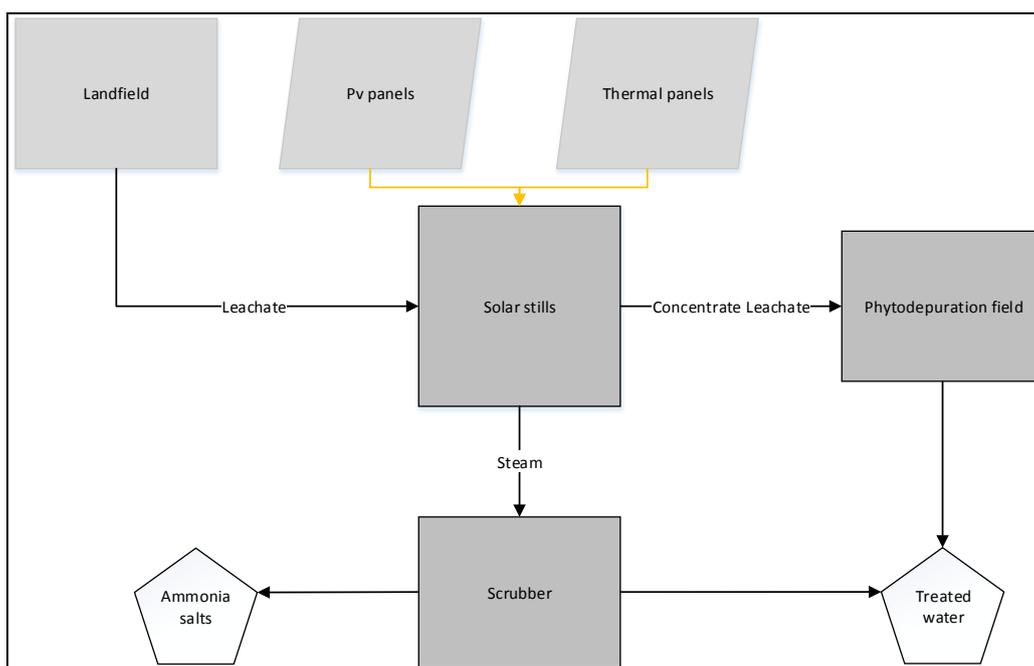
WASTWA ADVANTAGES
In-situ leachate treatment
Stand-alone system using renewable energies
Low operational cost
Reduction in leachate management
Unique environmental treatment
ROI in the short period

WastWa system is completely autonomous and stand-alone, reducing management and treatment costs.

## WASTWA TECHNICAL DESCRIPTION

WastWa is a process completely different from the current leachate treatment methods on the market, thanks to its performances, design and environmental technologies used. WastWa can be placed directly on the landfill cap. Purified water is extracted from leachate using Solwa patented solar stills (eliminating almost all the chemical compounds). The analytic results of evaporated water have confirmed the possibility to discharge it into waterways, after a scrubber treatment.

Furthermore, the concentrated leachate is moved into a phytodepuration field to be treated. The phytodepuration treatment is calibrated to treat the concentrated liquid coming from WastWa system. The process mimics the natural wetlands or swamps (basins of water). The plant species filter the chemical compounds as nutrients, metals and organic solvents, removing them from water. At ground level, the bacterial flora interacts with the plant roots to remove organic substances and convert liquid nitrogen in gas nitrogen (N), using nitrification-denitrification processes and removing their volatility. The phytodepuration system has a sub superficial horizontal flow.



WastWa system scheme

All the patented solar stills of WastWa are modules that achieve all leachate yields and treat any chemical composition. The modules are not conditioned by the landfill cap irregularities and the breakdowns. They are composed of PV panels and solar heat panels positioned in parallel, allowing non-stop operations also during the maintenance period.

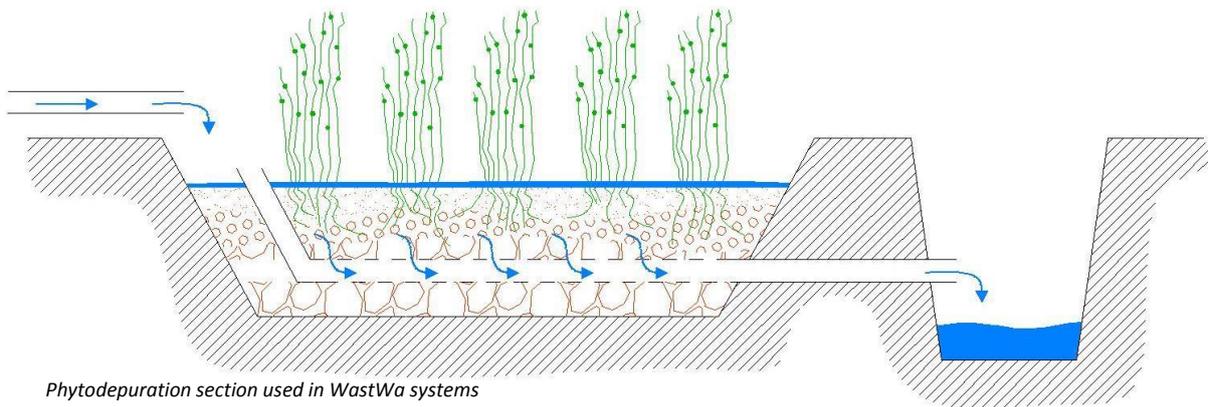
The final exit water flow from WastWa is pure water, which can be discharged into waterways, according with local environmental legislation.



*Phytodepuration plant for leachate*



*Solar still modules used in WastWa system*



*Phytodepuration section used in WastWa systems*

## WASTWA TECHNICAL ADVANTAGES

- **REVOLUTIONARY IN-SITU LEACHATE TREATMENT**  
with a specific patented technology powered only by solar radiation, WastWa treats any leachate directly on the landfill cap
- **SAVING THE 50% OF YOUR LEACHATE COSTS**  
eliminating transport to an external water treatment plant and eliminating operational costs
- **NO LANDFILL MODIFICATION**  
in the landfill cap no modifications are necessary, thanks to its specific shape (panels and modules)
- **ONLY ECOFRIENDLY SOLUTIONS**  
the leachate is treated with the best phytodepuration system and technology powered by renewable energies, without chemicals or membranes
- **HIGH EFFICIENCY**  
the waste heat, which is recovered by torches or co-generators, combined with surfaces exploitation (as landfill cap) allows the use of existing areas, valorising the available resources
- **ANY LEACHATE CAN BE TREATED**  
high scalability of each module and an optimized phytodepuration system to solve all the leachate yields
- **FASTER EVAPORATION BY INNOVATIVE SOLAR STILLS**  
higher water evaporation from leachate thanks to a specific thermo and fluid dynamic model, able to extract 50% of more water compared to competitors
- **MINIMAL MAINTENANCE NEEDS**  
the only maintenance is the scrubber and the phytodepuration systems (once per year)
- **AMMONIA EXTRACTION AND VALUE**  
pure ammonia salts can be extracted from leachate, producing ammonium sulphate for chemical industries (90% recovery of nitrogen from leachate, before moving it to the phytodepuration plant)
- **FLEXIBLE TREATMENT**  
WastWa recognizes automatically the leachate characteristics and it is self-regulating to achieve always the best performances
- **EASY ICT MANAGEMENT**  
a special software has been developed for all the devices (pc, tablet, smart phone, etc.) to monitor and manage WastWa remotely as locally, recording all the main data for your needs
- **FOCUS ON YOU**  
all performing data are continually sent to Solwa offices to optimize the machine to your needs and give you the best customer assistance as well as provide you with spare parts