

Briefing: Integrated Landfill Leachate Treatment

Landfill leachate is the liquid that forms when rain water percolates through the waste deposited in a landfill. As the water passes through landfill deposits, landfill waste contaminates the water, making leachate. Landfill leachate contains chemicals, biologicals, and metal ions such as iron. It is both anoxic and acidic, and has a distinct odour. Unless a landfill has a method of collecting and purifying the leachate, it will enter and contaminate groundwater supplies.

The health risks, if leachate is left untreated and allowed to contaminate groundwater supplies, include: skin irritation, nausea, vomiting, and headache. While chronic exposure can lead to anemia, kidney damage, prostate cancer, lung cancer, memory loss, coma, headaches, and depression.

Successful and cost effective leachate treatment methods are difficult to find. Recycling and collection are the most common ways of dealing with landfill leachate, but these methods of eliminating contaminants are neither effective nor economically attractive. The ideal solution:

- Would not require any manpower or operator involvement

- Would not generate any waste, odour, or off-site disposal
- Would automatically collect and process the leachate
- Would be low cost
- Would be simple to implement and maintain
- Would be remotely operated and controlled

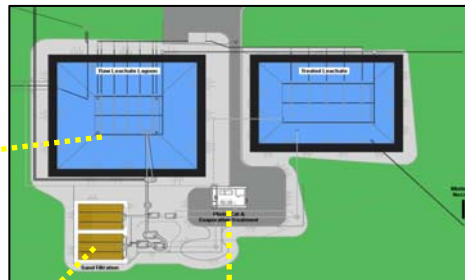
An integrated leachate treatment process that essentially meets all of these requirements is operational in Canada using Purifics' Photo-Cat technology. The three step process shown below involves:

1. Collecting the leachate in a raw leachate lagoon and allowing it to become aerobic
2. Sending the leachate to the recirculating sand filter (RSF) at a controlled rate to remove biomass
3. Processing the leachate water using Photo-Cat to disinfect and remove dissolved chemicals

In this installation, the treated leachate is dispersed through misting or snow fluent (for residual metal removal).



Leachate Lagoon



Recirculating Sand Filter



Photo-Cat

In this process Photo-Cat destroys organic contaminants using a titanium dioxide catalyst and by taking advantage of both oxidative and reductive pathways. Unlike many treatment processes, Photo-Cat is unaffected by ultraviolet transmittance (UVT), and it is capable of treating difficult waters including those with high chlorides and other challenging factors. Photo-Cat is more effective and efficient at treating leachate than traditional AOPs.

Photo-Cat purifies and disinfects the landfill leachate by breaking down the contaminants into carbon dioxide and water. Water leaving the Photo-Cat unit after the purification process requires no further treatment. Photo-Cat eliminates the need for third party unit operation, surge tanks, controls, and other cumbersome equipment. Photo-Cat's System Control and Data Acquisition (SCADA) system provides monitoring and control capabilities locally and remotely over the internet. This allows remote access for quick and easy operator or technical support. In addition, the Photo-Cat has an instant on-off capability which eliminates start up cycles. Consequently, the system can adapt to duty cycles from 0 to 100% automatically.

At the facility in Canada, experience has shown the process to work effectively. Currently, changes to the RSF are currently being conducted to bring them up to the same level of automation as the rest of the process.

Purifics' versatile, Photo-Cat process has a variety of installed applications and is trusted to safely and successfully remove organic contaminants from water by destroying them. As a leader in the field of water purification, Purifics provides one of the most innovative and effective solutions on the market.

The benefits of choosing Photo-Cat to treat landfill leachate are many, making Purifics a leader in the field of groundwater purification.

Fully automated - Photo-Cat is a fully automated, modular technology that allows for

easy installation, monitoring capabilities, and global access to technical support

No labour - Because each Photo-Cat system comes fully automated, the labour typically involved in the treatment of landfill leachate is eliminated

No sludge - The Photo-Cat process does not generate sludge; therefore, the need to handle sludge is also eliminated

No odour - During the purification process, Photo-Cat removes the undesirable odour associated with landfill leachate

No water treatment chemicals - Photo-Cat does not require the use of flocculants or coagulants

No off-site disposal - Because Photo-Cat destroys contaminants and allows for the discharge of purified water back into the environment, off-site disposal and its associated costs are unnecessary

Low maintenance - Unlike the high-maintenance purification systems on the market, Photo-Cat is a wiperless purification technology with a long lamp life and a service interval of over 18,000 hours

Low life-cycle cost - Photo-Cat has one third the lifecycle cost of competing technologies

These benefits make Photo-Cat the best available technology for eliminating the risk and liability associated with landfill leachate

Purifics is a technology leader in air and water treatment, process design, and control systems. Our strength is in solving problems and simplifying solutions through innovative technologies to achieve environmental and economic benefits. Since 1993, we have been providing unique engineered systems, solutions, and products for industry and government.

Contact Purifics for detailed performance and economic data.



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