



# Leachate Treatment

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Brochure



Colloide

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# Leachate Treatment Designed by experts

Landfill leachate is the liquid that exists as part of waste in a landfill. This is usually as a result of rainwater entering the landfill but is also due to the natural decomposition of organic material along with other liquids and chemicals that have been discarded.

Rain falling on the top of the landfill is the main contributor to the generation of leachate, and is by far the largest contributor for modern sanitary landfills which do not accept liquid waste. The environmental risks of leachate generation arise from it escaping into the environment around landfills, particularly to watercourses and groundwater.

Landfill leachate is a complex wastewater effluent with a high variability in its physico-chemical characteristics. Proper treatment of this type of water therefore requires significant attention.

Our wide portfolio of innovative technologies allow for the best solution to be applied. Our technology solutions are engineered to meet the specific performance requirements of individual projects.



# Technologies and Treatments

There are various technologies available for treating landfill leachate, including biological treatment, physical/chemical treatment, and "emerging" technologies like reverse osmosis (RO) and evaporation.

By combining different treatment methods, metals can be eliminated more effectively. Coagulation/flocculation have also been shown to be more efficient for removing suspended solids. Through the use of membrane bioreactors and integrated biological techniques up to 100% of ammonia could be removed. Some of the technologies used to treat leachate have been highlighted below.

## MBBR Moving Bed Bioreactor

Colloide's Moving Bed Bioreactor ('MBBR') System provides a highly effective treatment solution using biofilm to provide organic carbon removal and nitrification/de-nitrification where necessary.

The process forms a highly reliable and robust solution for wastewater treatment and uses biofilm carriers in the treatment tanks on which the biomass grows. Aeration then supplies the energy to disperse the carriers.

With standard MBBR, wastewater is treated only with carriers ie. no suspended biomass involved. More specialised process with internal recycles are used for nutrient removal. IFAS processes use both carriers and suspended biomass to carry out the treatment. All of this leaves the MBBR system a highly flexible system whether for a new plant or the upgrade to an existing one.

# SBR

## Sequential Batch Reactor

The SBR process is based on biological treatment of wastewater. In this process, the incoming wastewater is treated on a batch basis – hence the name Sequential Batch Reactor ('SBR').

The influent wastewater enters the SBR tank during the programmed load time. Aeration and mixing (or only mixing) phases allow nitrification and denitrification of the nitrogen present in the wastewater. At the end of the treatment, the aeration and mixing stop and the biological sludge settles in the reactor. The treated effluent is then collected from the top of the SBR tank.

This complete process takes place in one tank, leaving the process very compact. We can aerate, mix (with and without oxygen), chemically dose and settle in this SBR tank, with excellent process flexibility.

One or more tanks can be used in parallel depending on plant requirements.

### Features:

- Complete automation and remote operation of the plant. Highly reliable and easy to operate.
- Ability to treat high incoming loads, no bulking problems. Flexible plants, with various aeration options.
- Compact system with no re-circulation pumps and minor energetic consumption.



# Tertiary Treatment Systems

Tertiary treatment is the final cleaning process that improves wastewater quality before it is reused, recycled or discharged to the environment.

The treatment removes remaining inorganic compounds, and substances, such as the nitrogen and phosphorus.

The aim of tertiary wastewater treatment is to raise the quality of the water to domestic and industrial standards, or to meet specific requirements around the safe discharge of water

In the case of water treated by municipalities, tertiary treatment also involves the removal of pathogens, which ensures that water is safe for drinking purposes.



## Case Study

# Lower Meville Wood Leachate Treatment



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**Client:**  
Fife Council

**M&E sub-contractor:**  
Colloide

Fife Council operates a non hazardous landfill site at Lower Melville Wood near Ladybank in Fife. Colloide was appointed by Fife Council, to design, build and commission a leachate treatment plant, capable of processing up to 175m<sup>3</sup>/day.

The scope included process commissioning of the plant wherein we seeded the plant and operated the plant for 3 months before handing over to the Client.

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**Location:**  
Ladybank,  
Fife

**Project:**  
Leachate Treatment



# Technical information

## The main components of the system

### The final treatment plant included;

- inlet balancing,
- SBR
- Reed bed treatment.

The plant included feed and discharge pumping, chemical dosing, controls, instrumentation and associated pipework and secondary steelwork.

The reed beds act as tertiary treatment, treating the wastewaters by degrading organic matter (BOD and COD) and oxidising ammoniacal-N, removing suspended solids and, to a lesser extent, reducing concentrations of nitrate and phosphorus. Other constituents of the effluent are immobilised or absorbed by the plants themselves.





## Case Study

# Craigmore Leachate Treatment Plant



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**Client:**  
RiverRidge Recycling

**M&E sub-contractor:**  
Colloide

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**Location:**  
Craigmore, Ringsend,  
Garvagh.

**Project:**  
Leachate Treatment

Colloide were contracted by RiverRidge Recycling to complete the design and build of a new Leachate Treatment Plant for Craigmore Landfill Site.

The Leachate Treatment Plant upgrade required a contractor to provide one of three options to treat up to 120m<sup>3</sup> / day of leachate arriving in from the various cells of the landfill site. The plant must achieve discharge consent levels as specified by Northern Ireland Environment Agency (NIEA) primarily ammonia levels of 40mg/l.

Colloide's scope of works included the integration of a new leachate treatment plant to an existing Leachate Treatment works in order to meet the trade effluent consent standards. Colloide's solution involved the installation of an Sequential Batch Reactor (SBR) process for the new treatment plant.

# Technical information

## The main components of the system

Colloide provided three solutions to overcome the consent level legislation, the client opted for solution one. Solution one involved upgrading the existing leachate treatment plant with the Colloide's new specially designed SBR process .

### The SBR System included;

- A Fine Bubble Aeration System (Reduces Overall Running Costs).
- Chemical Dosing and
- Scada Systems.

Colloide's SBR process is based on biological treatment of wastewater, facilitated with high performance levels that in turn can be applied to municipal, leachate and industrial wastewaters. If you require a bespoke SBR process plant to be designed specifically Colloide can design, deliver, install and commission a system to meet your requirements.



# Our Experience

Our experience is accumulated over a 20 year period. During this time, we have gained extensive experience in Design, Manufacture, Installation and Commissioning of Leachate Treatment Systems.



# Our Capabilities Meet Your Needs

We understand each project is unique with bespoke requirements. That is why for 20 years our capabilities have expanded to enable the delivery of a wide range of options.

## Capabilities

### Supply chain

We have sourced suppliers and developed a reliable relationship, with suppliers based across the UK and Ireland. Our supply chain is accredited to high Quality, Health and Safety and Environmental standards.

We have the capability to deliver your requirements anywhere across the UK, Ireland, Scotland, and Wales.

### Location

### Availability

We have the capacity to engineer equipment on a short lead time, due to our ability to design and build off-site.

Our standardised design can be adapted to meet bespoke requirements for wastewater and landfill sites.

### Flexibility & adaptability

# Our range of Leachate Options

We have a broad range of options that will be compatible with your requirements.

Our technologies and equipment are factory tested prior to delivery to site ensuring there are minimal delays for the onsite testing and commissioning stage.

**Contact our sales team for further info on all specifications.**



# Our Product Range



Activated Sludge Treatment



Anaerobic Digestion



Biomass Heating and Heat Pumps



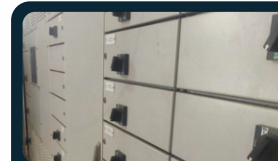
Chemical Dosing



Bridge Scraper Systems



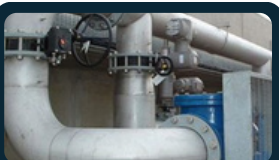
Clarifier Systems



Control Systems



DAF



Deep Bed Sand Filters



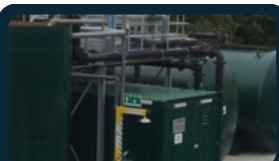
District Heating & Energy Centres



Dynamic Sand Filters



MBBR



MBR



Membrane Filtration



Multi Cell Media Filtration



Pressure Filters



Pumping Stations



SBR



Tekleen Filters



Rapid Gravity Filters



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