Lemna has been the world leader for more than 25 years in high-performance lagoon-based wastewater treatment technologies. We have 100’s of treatment facilities with installations on four continents.

Headquartered in Minneapolis, Minnesota, Lemna designs and installs systems for all municipal and industrial applications. Lemna provides a full range of wastewater design and engineering services, backed by exceptional results and customer service.

“LEMNA PROVIDES A SIMPLE SOLUTION FOR WASTEWATER TREATMENT PROBLEMS”
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**Easy to Operate**
- Minimal operator requirements
- No complicated sludge handling
- No solids return/recycle
- Start-up and operator training provided

**Flexible Designs**
- New or existing lagoons
- Reliable at high or low flows
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**Aerated Lagoon Upgrades**

**Case Study: Jasonville, Indiana**

**Project Background:** The wastewater treatment plant, located in Jasonville, Indiana, was an existing lagoon system that no longer performed to the new environmental regulations for Ammonia. The Ammonia removal process, which is difficult in any wastewater treatment system, is especially complex in cold weather climates like Jasonville.

- **JASONVILLE CBOD DATA**
- **JASONVILLE TSS DATA**
- **JASONVILLE AMMONIA DATA**

This system was designed to incorporate the existing lagoons and aeration equipment to create the most cost effective system. There were two existing large wastewater treatment ponds. The entire first pond was incorporated into this design and half of the second pond was used by constructing a berm in that pond. The aeration pond has a detention time of 15.8 days. The aeration cell is partially mixed. New diffused aeration was added to supplement the existing aeration. The third cell is a settling cell with a detention time of 7.4 days. The settling pond is followed by a Lemna Polishing Reactor (LPR) consisting of sixteen media modules for effluent polishing.

**Site Performance:** The Jasonville facility provides reliable removal of CBOD, TSS and Ammonia over a wide range of operating conditions including high flows, cold operating temperatures and variable loads.

**LeMTec™ Biological Treatment Process** is an effective, reliable and affordable solution for existing aerated municipal and industrial wastewater lagoon facilities. The system incorporates the LeMTec™ Modular Cover to create a reduced footprint and an operation that is virtually odor-free. The LeMTec™ system is the highest performing pond-based aerated lagoon process in the world. Utilizing a series of aerobic treatment cells followed by an anaerobic settling zone and polishing reactor, the LeMTec™ Process is capable of achieving year-round effluent limits as low as 10 mg/l BOD, 15 mg/l TSS and 2 mg/l NH₃-N for typical municipal or pre-treated industrial wastewater. Other nutrients such as Phosphorus can also be addressed within the process.

**Existing Lagoons or New Construction**

**LeMTec™ Facultative Treatment Process** is an effective, reliable and affordable solution for existing facultative municipal and industrial wastewater lagoon facilities. At a fraction of the cost of other traditional systems, the LeMTec™ Facultative Treatment Process is unmatched in its ability to meet stringent effluent limits that other traditional pond-based systems can't reach. Utilizing a series of facultative treatment cells followed by a covered settling zone and Lemma Polishing Reactor, the LeMTec™ Process is capable of achieving year-round effluent limits as low as 10 mg/l BOD, 15 mg/l TSS and 2 mg/l NH₃-N.
BOD Removal

Achieving BOD levels below 10 mg/l reliably and consistently throughout the year. BOD removal to below 30 mg/l is accomplished in the complete mix and partial mix cells of the treatment process with final polishing to below 10 mg/l in the Lemna Polishing Reactor, if required. Lemna’s design minimizes temperature fluctuations and the adverse treatment effects of peak flow events on BOD removal. Our low horsepower design is efficient in both aeration and mixing and requires a smaller footprint that is typically 12 days or less in detention time.

Phosphorus Removal

We use a chemical dosing system, low horsepower pumps and mixers that make operation easy. Phosphorus is precipitated chemically by the addition of coagulants, including alum or ferric chloride. Precipitation causes contaminants that are either dissolved or suspended to settle out of solution as solid floc particles that are removed along with waste biological sludge. Our system is low cost and reliable.
The Lemna Polishing Reactor (LPR) reduces Ammonia Nitrogen (NH₃-N) and BOD. The majority of both BOD and Ammonia removal in the Lemna design occurs in the complete mix cell. However, the LPR is included in the LBTP design to meet low BOD₅ (<10 mg/l) and NH₃-N (<1 mg/l) limits if required. The LPR utilizes fixed media to promote an environment for submerged attached-growth bacteria. The LPR is composed of stainless steel hardware and frames that compress UV resistant PVC media, making the reactor sturdy and one of the best filters in the industry.

The settling pond, covered with the LemTec™ Modular Cover, creates an effective zone for clarification of biosolids. The cover prevents algae growth by eliminating sunlight and improves clarification in two ways: 1) it prevents wind action on the water surface, thereby establishing a quiescent zone for solids to settle; and 2) the insulation minimizes seasonal and diurnal temperature fluctuation thereby reducing stirring by thermal currents. In addition, the anaerobic environment in the settling pond digests the biosolids significantly over time with no sludge disposal required for at least 5 to 7 years.

**Ammonia Removal**

**TSS Removal**
THE LEMTEC™ BIOLOGICAL TREATMENT PROCESS

"We have done numerous projects over the last five years using Lemna Technologies Inc., and I highly recommend this company. They are very proficient, have excellent take-offs, detailed instructions, the product is easy to install and their supervisors are knowledgeable and skilled. We look forward to the next opportunity to work with them."  **Contractor - T.S., Louisiana**

"Since installation, we have noticed excellent odor control, algae control, and our effluent test levels are remarkable. To encourage the choice of Lemna Technologies products, we welcome anyone interested to tour our facilities and/or review our weekly test results."  **Client - J.R., Iowa**

"Lemna’s cover and staff have provided performance as promised. Anytime we’ve had questions related to technical support, Lemna has been prompt in their response. I can safely state that maintenance on our cover has been virtually non-existent, and I highly recommend Lemna for anyone considering them for a cover or liner."  **Client - R.L., Minnesota**

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