

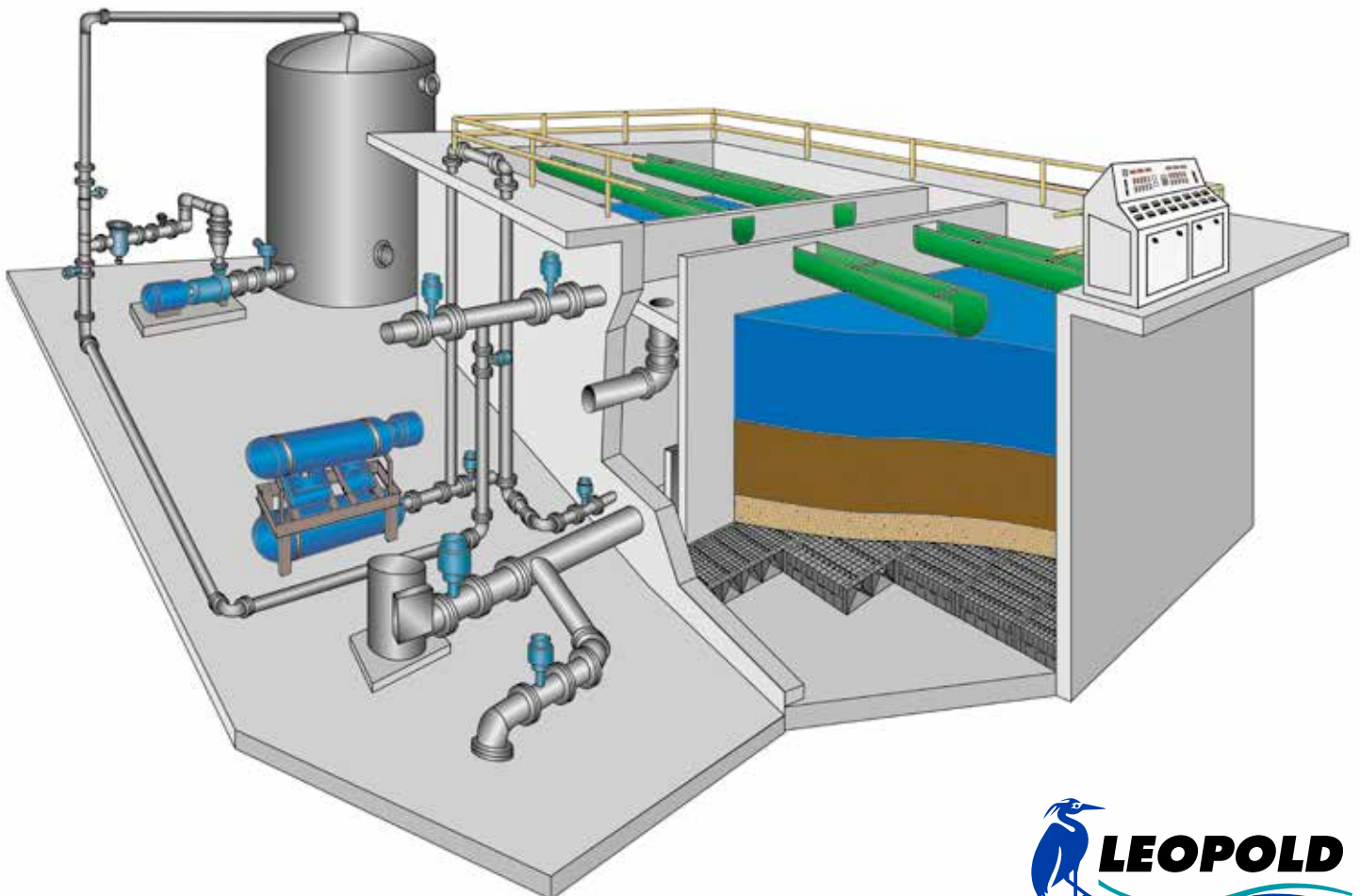
Leopold elimi-NITE[®] 2.0 denitrification system

THE NEXT GENERATION IN NUTRIENT REMOVAL



The Leopold elimi-NITE[®] 2.0 system is the next step in reducing nutrients in the effluent stream of a wastewater treatment plant. The elimi-NITE[®] 2.0 system builds on the existing elimi-NITE[®] denitrification system by adding additional features and increased efficiency as follows:

- Feedback control of the carbon source
- Several types of level control
- Optimum media selection
- Backwash optimization
- Run time optimization



The next generation in nutrient removal

The Leopold® elimi-NITE® 2.0 denitrification system is an effective method of reducing nitrogen in the effluent stream of a wastewater treatment plant by converting nitrate nitrogen to nitrogen gas. The biological conversion is done in an attached growth, downflow, deep bed, mono-media filter. Particulate matter is removed so insoluble phosphorus is removed as well. Since free oxygen will inhibit the activity of the denitrifying process, dissolved oxygen is biologically removed first, thereby creating an anoxic environment for denitrification. A supplemental carbon source or microbiological food is needed because the preceding wastewater treatment processes have removed nearly all of the degradable carbonaceous material from the wastewater. The elimi-NITE® 2.0 system features the following:

Feedback control of the carbon source

The carbon source can be fed based on a mass basis using the filter influent flow rate and nitrate concentration or feed-forward control. Another control loop measuring the filter effluent nitrate concentration can be used in a feedback control system. The elimi-NITE® 2.0 system offers feed-forward control coupled with feedback control to provide an optimal use of methanol that can surpass a feed-forward only control scheme. The elimi-NITE® 2.0 methanol consumption can be near 100% of theoretical values and generally doesn't exceed 110% of overall consumption. As an added benefit, the feedback portion of the unique elimi-NITE® 2.0 control algorithm can achieve and control effluent nitrate concentration at a desired set-point under variable hydraulic and nitrate influent loads. In other words, a desired effluent nitrate concentration can be set and held.

Several types of level control

Constant water level control affords the least amount of dissolved oxygen gain in the feed-water by avoiding splashing of the influent flow. This lowers the overall amount of carbon source needed to achieve process goals. Variable level, while at most times increases the overall methanol usage due to influent splash, can result in somewhat longer run times. The elimi-NITE® 2.0 system design uses variable level and the selection is determined by contaminant loadings and media selection.

Media selection

After comprehensive testing using a state-of-the-art pilot unit and full scale operation, Leopold has the expertise to select the "proper" media for the process application and to meet the treatment goals by balancing regulatory requirements with filter performance.

Backwash optimization

Since media fluidization is not necessary, the filter can use very low backwash rates, sometimes as low as 6 gpm/ ft² (15 m/h). Air scour rates to augment the backwash cycle can be as low as 5 SCFM/ ft² (91 m/h).

Run time optimization

Depending on overall system design, run times can approach 100% of theoretical filter bed loading limits.



Leopold is a brand of Xylem, whose 12,000 employees are addressing the most complex issues in the global water market.

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