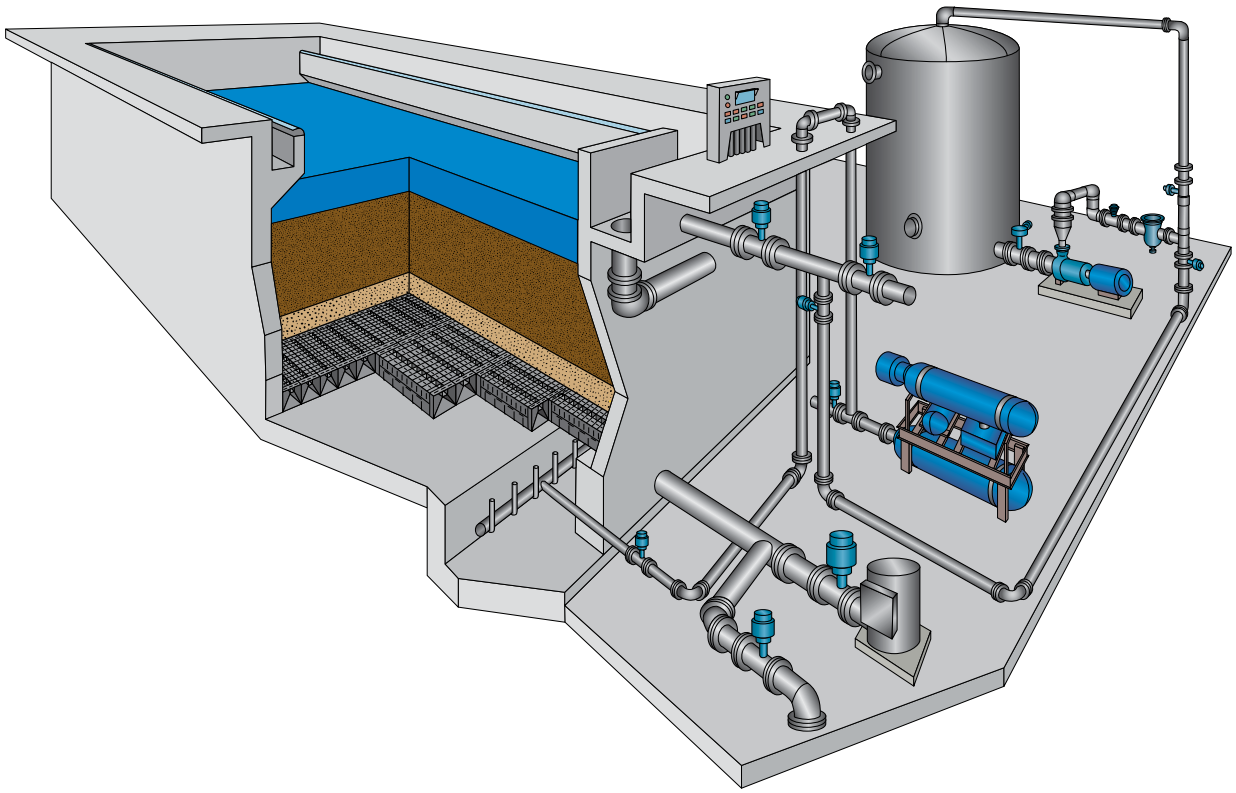
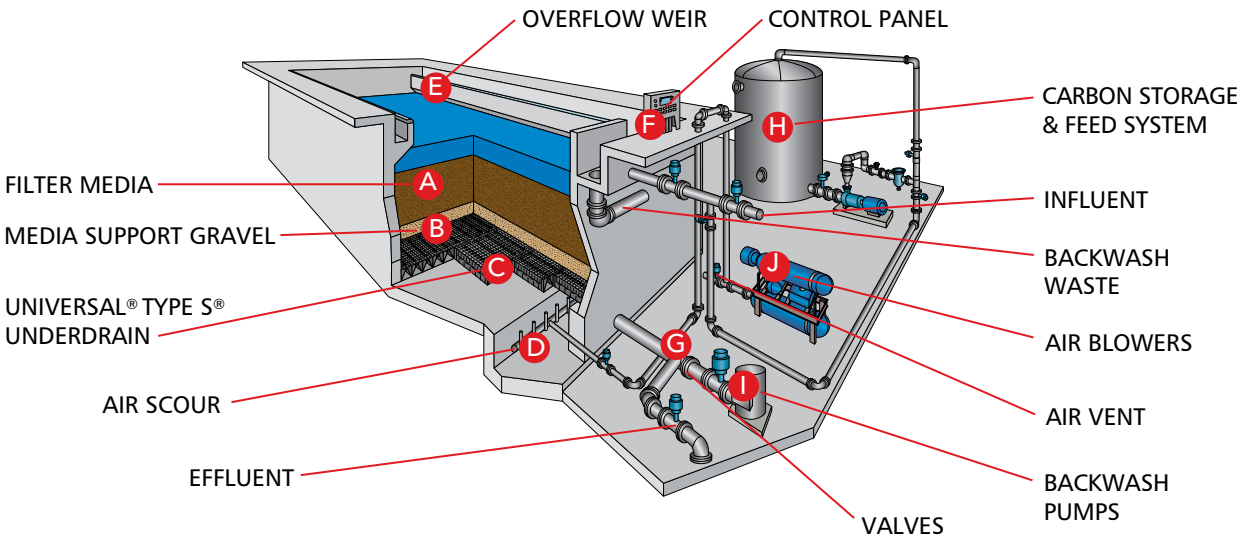
Leopold® elimi-NITE® Denitrification System

The Solution for Reducing Nitrogen in Wastewater Effluent

The Leopold® elimi-NITE® denitrification system harnesses the advantages of deep-bed, mono-media filters to effectively and efficiently remove nitrogen in wastewater effluent. In addition to nitrogen, an elimi-NITE denitrification system can remove suspended solids. The Leopold elimi-NITE denitrification system is distinguished by a number of features and associated benefits.



The Anatomy of a Leopold® elimi-NITE® Denitrification System



A Media

Hard, predominantly siliceous sand, either well-rounded or sub-angular, varying in size from 1.5 mm to 3.0 mm.

B Support Gravel

Well-rounded, hard, predominantly siliceous gravel, varying in size from ⅛ in. to ¾ in. (3 mm to 19 mm).

C Underdrain

Leopold® Type S® Universal® dual parallel lateral underdrain provides superior distribution of back-wash water and air.

D Air Header Piping

When air piping is required, it is made of stainless steel and designed to provide uniform distribution of air for air scour.

E Weirs

Provided for the top of the washwater troughs to split the influent flow between filters, to distribute flow within the filter, and to remove backwash water uniformly from the filter.

F Instrumentation

Leopold® FilterWorx® controls developed specifically to control all aspects of filter operation.

G Valves

Both automated and manually operated valves control flow to and from the filters.

H Carbon Storage and Feed System

Usually designed to handle methanol, controls the carbon feedpace based on the amount of nitrate coming into the system.

I Backwash Pumps

Supply backwash water to the filters for cleaning the filters and for gas release.

J Air Blowers

Supply air for air scour during filter backwashing.

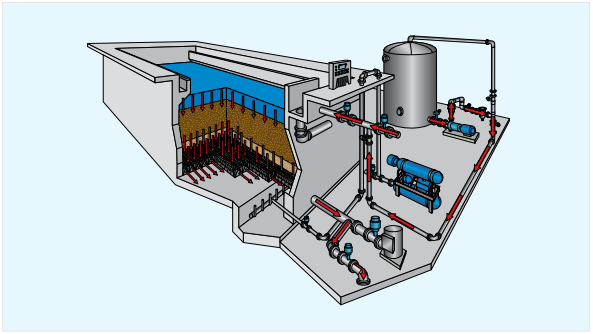
Mudwell Pumps

Pump the spent backwash water to a designated area for treatment of the spent backwash water.

How the Leopold® elimi-NITE® Denitrification System Works

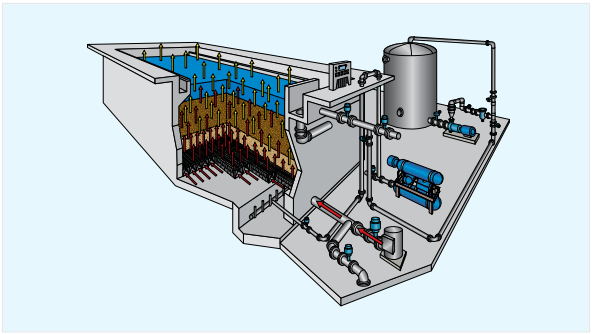
Normal Filter Cycle

- Methanol, or another carbon source, is added to the filter influent to provide an organic substrate for the denitrifying microbiological culture in the filter media.
- Nitrified effluent enters the filter and passes through the filter media, where it contacts the denitrifying culture.
- The culture metabolizes the nitrate, changing it to nitrogen gas that becomes embedded in the filter bed.



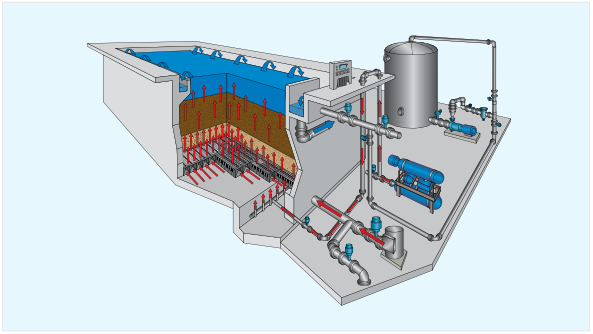
Nitrogen Release Cycle

- Small bubbles of nitrogen gas accumulate in the filter media, trapped by the media and the filter downward flow.
- A short backwash cycle–or "bump"–releases the trapped bubbles of nitrogen gas into the atmosphere.



Full Backwash Cycle

- A complete backwash cycle–performed as usual–cleans the media, removing influent suspended solids trapped during the normal filter cycle and some of the microbiology.



Features and Benefits

Biological Denitrification

- Converts nitrate-nitrogen to harmless nitrogen gas in an attached-growth, microbiological system. Removes nearly all nitrate-nitrogen, achieving levels below 1 mg/liter.

Effluent Suspended Solids Removal

- Simultaneous removal with denitrification. Deep-bed filtration is an efficient method for storing solids and handling wide swings in solids loading while providing long filter runs.

Type S® Dual Parallel Lateral Underdrain

- Superior uniformity of backwash distribution and cost-effective, efficient media cleaning, ensuring full use of the filter bed.

FilterWorx® Control System

- PLC-based controls developed exclusively for optimum filter operation with unparalleled control and data logging capability. Close filter control is required for release of gases from the filter bed and backwash sequencing maintained to prevent loss of microbiology.

Engineered Filter Media® Products

- Silica media in a variety of sizes and shapes is available to provide efficient performance. The filter bed is engineered to specific effluent requirements.

Flexibility in Filter Design

- Not restricted to one type of filter layout based on underdrain design limitations. System can be designed to a variety of site conditions or to existing filter basins.

Sole Source Responsibility

- With most of the engineered components manufactured by ITT Water & Wastewater and the remaining system items selected for quality and optimum performance, we take complete responsibility for total system function, providing assurance of proper and reliable operation.

Leopold Gold Tag™ Service

- Experienced technicians assist with installation, then provide follow-on assistance through start-up and commissioning. In addition, on-site piloting can be provided to demonstrate system performance, if required.

Call to learn more about how the Leopold® elimi-NITE® denitrification system can deliver the results you require.

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