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TREATMENT OF WASTEWATERS FROM LIVESTOCK FARMS

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Abstract: Raw wastewater from livestock farms is a mixture of faeces, urine, bedding materials, water from washing and cannot be distributed on agricultural land in this state, and not discharged in natural emissions. That is why it is necessary to purify them, in order to retain and neutralize the harmful substances present in these wastewaters from animal farms, which are not accepted in the aquatic environment where the treated water is discharged and which allow the physical-chemical properties of the water to be restored before use.

The paper analyses the importance of wastewater treatment from livestock farms, respectively the need to build efficient treatment plants. The possibility of using the advanced hydroinformatic tool WEST, developed by DHI Denmark, is presented for the design, exploitation and optimization of such a treatment plant.

• Introduction

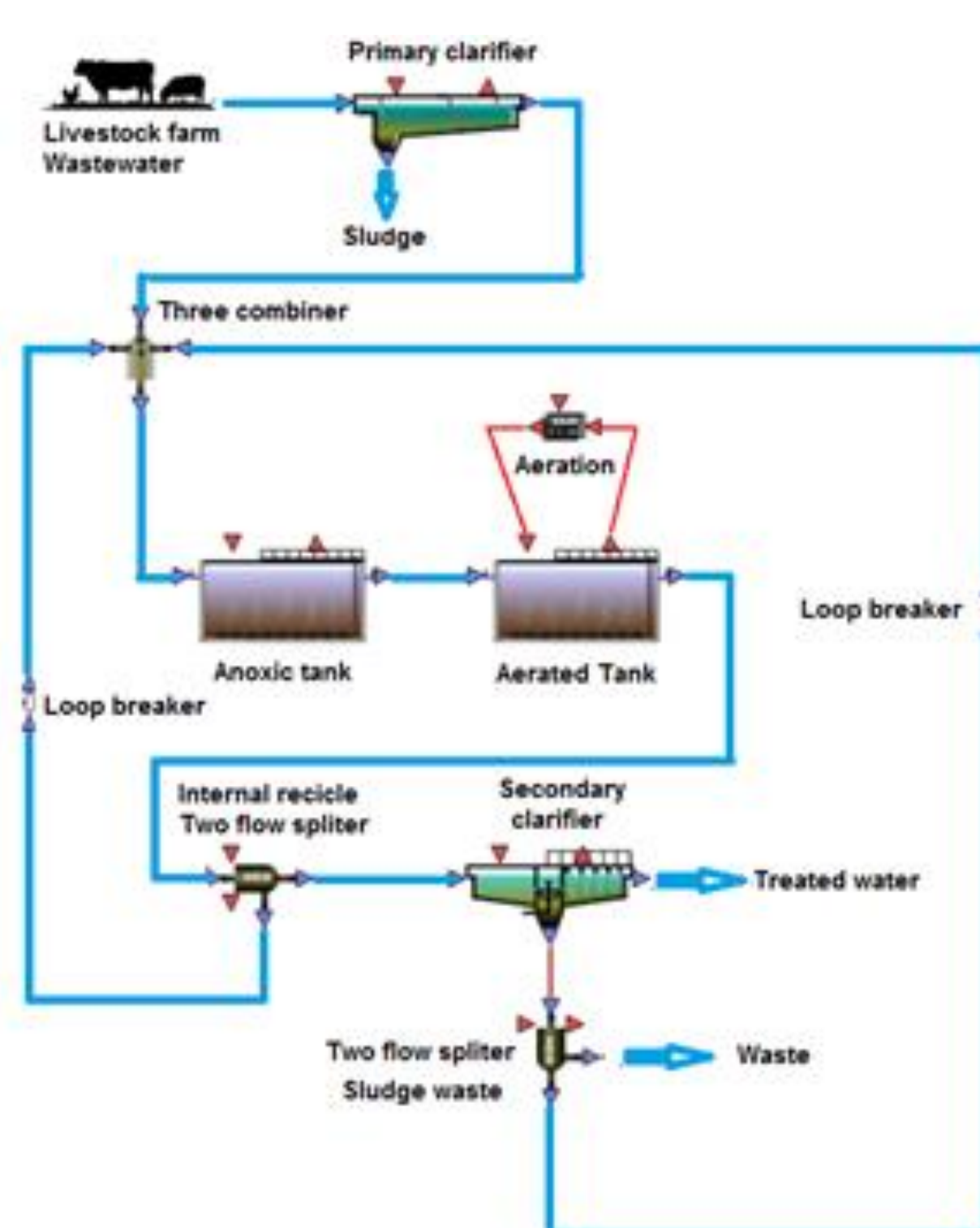
Point pollution of water and soil from zootechnical sources can be caused by: semi-liquid and liquid animal droppings; manure in solid form; effluents from silos where animal feed is kept, respectively untreated or insufficiently treated uncollected wastewater.

Raw wastewater from livestock farms is a mixture of faeces, urine, bedding materials, water from washing and cannot be distributed on agricultural land in this state, and not discharged in natural emissions.

The treatment of wastewater from livestock farms is necessary to retain and neutralize the harmful substances present in these waters, which are not accepted in the aquatic environment where the treated water will be discharged and which allows the physico-chemical properties of the water to be restored before for use by other downstream consumers. Also, it is necessary to build efficient treatment plants, both technically and financially.

• Material and method

The technological scheme/technological flow of a wastewater from livestock farms treatment plant is presented in the figure.

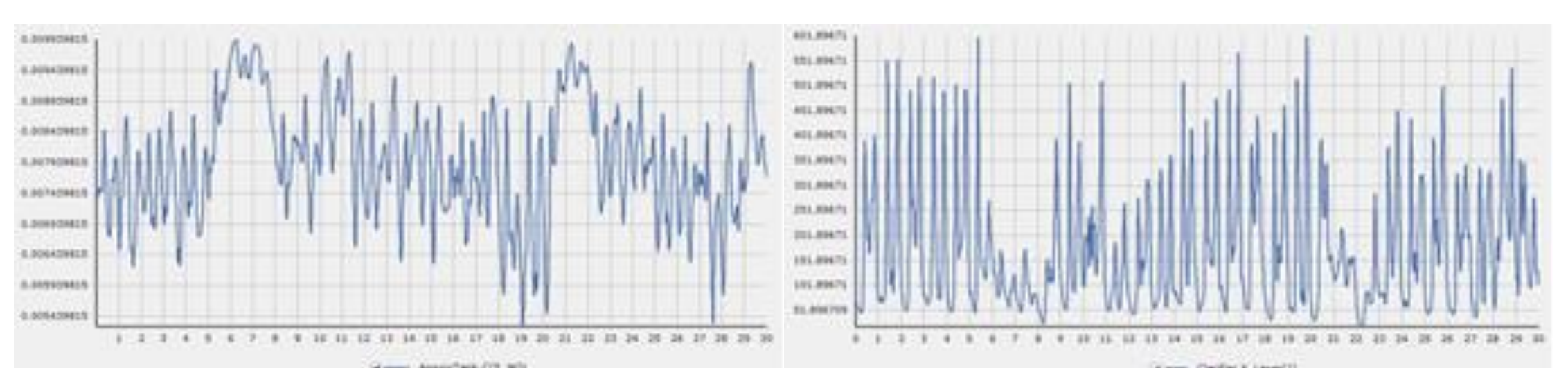


An advanced hydro-informatic tool for the design, exploitation and optimization of such a treatment plant is WEST, developed by DHI Denmark.

The WEST advanced hydroinformatic tool, the WESTforDESIGN module, ASM1Temp method was used to simulate the operation of the wastewater treatment plant.

• Results and discussions

Following the simulation of the operation of the wastewater treatment plant (30-day dynamic simulation), the variation graphs of the concentrations of different substances in each of the plant's units are obtained. For example, are presented the variation of: nitrate concentrations in the anoxic unit and the variation of mass of solids in layer1 of the secondary clarifier .



The table shows the input values to the treatment plant (influent flow), respectively the output values for COD (Chemical Oxygen Demand), TKN (Total Kjeldahl Nitrogen) and TSS (Total Suspended Solids) in effluent flow.

	Input (g/m ³)	Output (g/m ³)
COD	610	207.270
TKN	45	42.538
TSS	409	101.828

A significant reduction is observed in the case of COD and TSS.

• Conclusions

Where there are no treatment plants, in areas with potential pollutants, i.e. with large water users (urban agglomerations, various industries, livestock farms, etc.) the water is contaminated and can be a source of spread of various diseases, such as cholera, dysentery, typhoid fever and poliomyelitis. Considering this situation, the implementation of treatment plants for water quality and safety are crucial for human health and the environment.

Hence the need to create efficient treatment plants, both economically and technically. This can be achieved by using advanced hydroinformatics tools, in order to ensure a quality of purified water that corresponds to the national standards in force.