

BiOWiSH® Aqua

Industrial Effluent Treatment South Korea Slaughterhouse



Executive Summary

The introduction of BiOWiSH® Aqua into the bioaugmentation process helped a South Korea slaughterhouse meet effluent compliance standards. Before BiOWiSH® Aqua, the slaughterhouse faced significant capital expenditure and third party operation costs to meet the compliance standards set by the Korean Environmental Office. With the improvements generated by BiOWiSH® Aqua and small process modifications, these expenditures have been postponed, leading to substantial expense avoidance.

Over the course of 10 weeks, BiOWiSH® Aqua implementation led to reduced BOD, COD, SS, TN, and TP by 76%, 76%, 89%, 85%, and 61% respectively. In fact, the process worked so well that the slaughterhouse met compliance within 6 weeks.

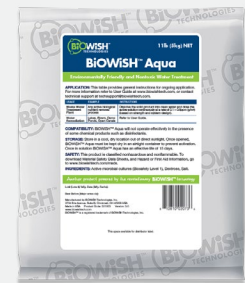
Background

Located in the Choongchung province, South Korea, this slaughterhouse has grown its processing capacity by 30% over the past few years. The present rate of 1600 pigs-per-day meant its waste generation increased from 190 to 300 m³/day. Last year, the Korean Environmental Office declared the industrial park housing this slaughterhouse a clean environment control zone. Larger waste loads and stricter discharge limits meant management faced significant capital expenditure and third-party operation fees to meet environmental compliance.

Solution

BiOWiSH® local partner Smart Bio Korea (SBK) provided an alternative solution. SBK proposed a 10-week program to achieve effluent compliance by introducing small-process modifications and implementing a bioaugmentation program using BiOWiSH® Aqua.

BiOWiSH® Aqua

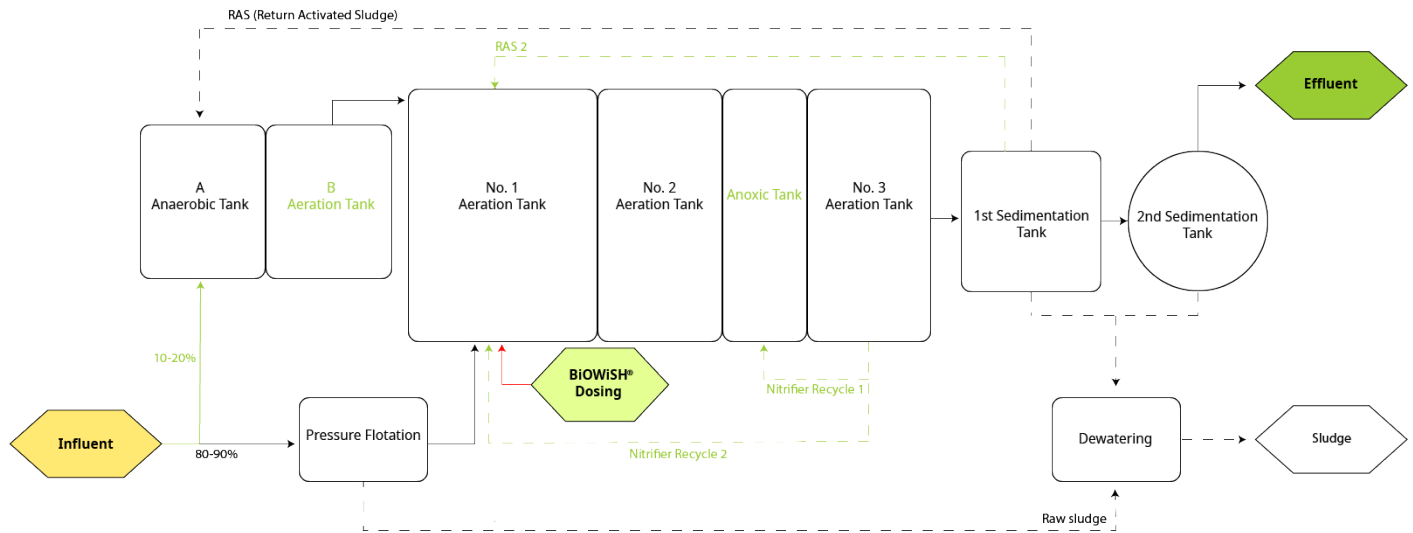


- Rapid nitrification and denitrification in aerobic and anaerobic conditions
- Reduces sludge production
- Increases plant treatment capacity
- Reduces odors
- Reduces aeration requirements
- Reduces need for chemical additives
- Improves plant stability
- Pre-treats influent in collection systems
- Natural and non-toxic

Available Sizes

- 100g/3.5oz
- 1kg/2.2lbs
- 5kg/11lbs
- 10kg/22lbs

The following process schematic shows modifications (green) and BiOWiSH® Aqua dosing:

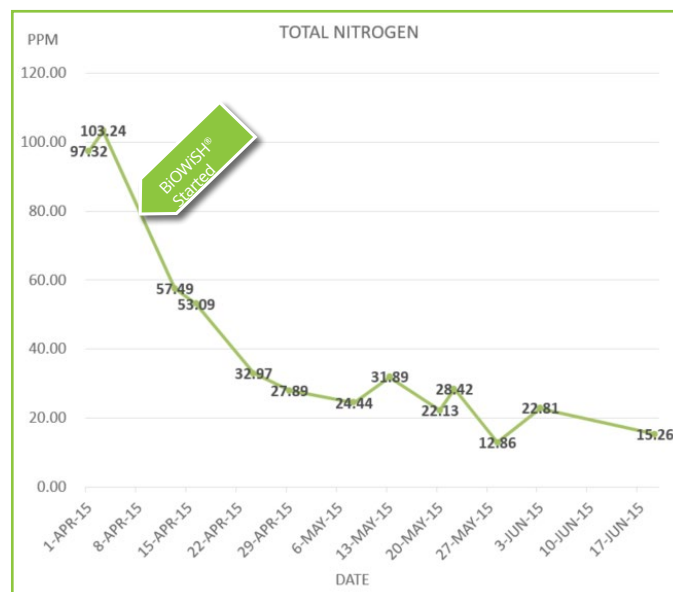


Green characters and lines detail modified processes

Results

The introduction of additional sludge recirculation streams as well as the anoxic stage provided the ideal conditions for BiOWiSH® microorganisms to boost biological carbon degradation and heterotrophic nitrification/denitrification. This resulted in lower COD, BOD, TN and TP values in the effluent.

	BOD mg/L	COD mg/L	SS mg/L	TN mg/L	TP mg/L
Discharge Limit	40.0	50.0	40.0	30.0	4.0
Initial Value	105.0	156.8	124.0	103.2	7.5
6 Weeks	32.1	48.8	18.0	22.1	1.5
10 Weeks	24.8	37.2	13.5	15.3	1.6
Reduction	76%	76%	89%	85%	61%

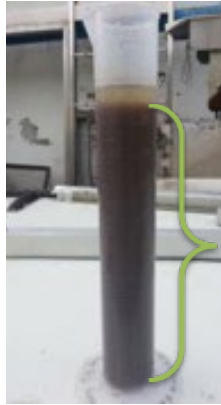


Reduction in effluent total nitrogen over the 10-week period.

Discussion

A few weeks into the trial period, the plant operator and site manager reported improved settling in the secondary clarifier.

SV30 values had improved from 950 mL/L to 750 mL/L in a few weeks:



SV = 950 mL/L



SV = 750 mL/L

Key Benefits

- Improved effluent quality with all parameters within compliance limits using existing plant infrastructure.
- Program cost offset by lower sludge production and energy expenditure per ton of effluent treated.
- Improved effluent clarity.
- Improved plant stability reported by operator.
- Planned expansions for the treatment units have been postponed; this means significant capital avoidance.



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1068-03-EN