



Reduction of Odor at Municipal Unitary Enterprise “Vodokanal”, Podolsk, Russia

Location: Municipal Unitary Enterprise “Vodokanal”, Podolsk, Russia

Date of the report: December 1st, 2015

Date of the test: October 22, 23, November 13, 14, 2015.

Background: On pilot tests of biological preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** at sludge dewatering department in wastewater treatment plants.

The Purpose of the Test:

1. To check the technical capabilities and operating capacity of metering unit for bio-preparation at the sludge dewatering department provided by BTA Group Ltd.
2. To evaluate the bio-preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** application efficiency to remove the characteristic odor of sewage sludge (cake) after separation on centrifuge and in its place of storage. Selection of optimum operating dosages of biological preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA**.
3. To evaluate the possible removal of the characteristic odor of sewage sludge at the sludge dewatering department room using the working solution of biological preparations **MICROBE-LIFT®/IND** and SA spraying method.
4. To determine the preferred specific consumption of biological preparations **MICROBE-LIFT®/IND** and SA mixture and to process sludge in ratio - liter / m³ (a mixture of biological preparations, rather than its solution).

Original data

Type of initial sludge: a mixture of raw sludge from primary settlers and compacted surplus activated sludge (in the current working ratio).

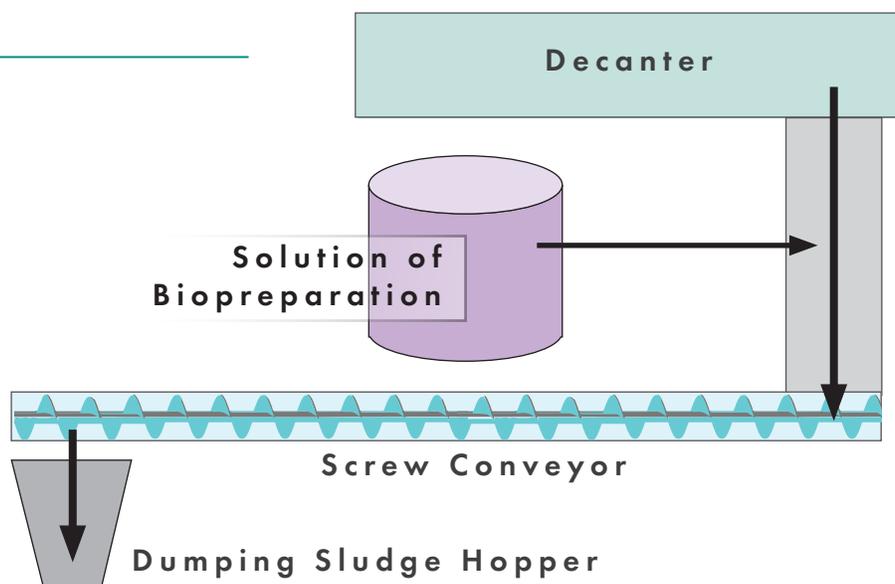
Equipment: Screw conveyor and the decanter (centrifuge) for sludge dewatering Flott weg C4E-4/454 HTS, preparation metering unit.

Test procedure

Industrial tests of biological preparation **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA**

- Bio-preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** were mixed in a ratio of 1:1. Further, by diluting the resulting mixture in non-chlorinated water, the solutions of the following concentrations 3.5% and 2% were prepared. Solutions were prepared in a polyethylene tank in a total volume of 200 liters each.
- The solution was fed to the conveyor by the metering pump in a volume of 7,5 l per 2.65 m cake/h
- The total volume of solution used is ~ 600 liters, including biological preparations in concentration of 3.5% - 200 liters and with biological preparations in concentration of 2% - 400 liters;
- The total volume of processed cake - 212 m³;

Test pattern is shown:



Test results are shown in Table:

Concentration of the mixture of biopreparations in solution. %	3.5 %	2 %
Bio-preparation rate l/m ³ wastewater treatment	0.1	0,06
Odor at the outlet of the conveyor in the hopper compartment	Imperceptible 0 point	Too faint 1 point
Odor near to the storage site in 20 days	Too faint 1 point	Faint 2 points
Odor in the department within the period of biopreparations application	Too faint 1 point	Faint 2 points

In addition to the above results, it was indicated that after spraying a solution of bio-preparations in the sludge dewatering department room (total volume of 10 liters of the solution to the entire area of the department), the intensity of the characteristic odor of sludge in this room has been significantly reduced.

It should also be noted that storage of dewatered sewage sludge (cake) stored and processed by biological preparations was made under the weather conditions, characterized by high humidity with precipitation and average air temperature from + 2 to + 7 during a day and at night to -2 . The effectiveness (aftereffects) of the biological preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** at lower ambient temperatures below + 4 and air access restriction (including due to high humidity), as a rule, is reduced. Under the conditions of dry and warm weather, the effectiveness (aftereffects) of the biological preparations in the stockpiled sludge (cake) is significantly higher (this, in particular, is evidenced by the experience of making similar tests with the processing of dewatered sewage sludge (cake) on Shchelkovo inter-district treatment plants in July 2015).

Summary:

Based on the industrial tests, all tested solutions of mixture of biological preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** showed strong results in the removal of odor from the resulting sludge.

The most preferred specific consumption of mixture of biological preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** for sludge treatment should be regarded as the ratio of 0.1 liter / m³ (a mixture of biological preparations rather than its solution).

It is advisable to periodically process the plant premises by spraying the solution of biological preparations

Conclusions:

The solution of biological preparations such as **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** in a ratio of 1/1, in the total concentration of 3.5% may be recommended to reduce the intensity of the characteristic odor of the cake at the mechanical dewatering department room in order to prevent the spread (blocking) of the odor during transportation and storage of dewatered sewage sludge.

It is advisable to enter the cake processing procedure using the solution of bio-preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** to the Rules and Procedures of the sludge dewatering department.

It is recommended to Company "BTA Group" to prepare a commercial offer for the MUE "Vodokanal" Podolsk for supply and use of preparations **MICROBE-LIFT®/IND** and **MICROBE-LIFT®/SA** with the following initial data:

- Hourly average volume of dewatered sludge (cake) formation- from 3.0 to 3.3 m³;
- Annual formation of dewatered sludge (cake) - 20 498 m³;
- Average moisture of formed sludge (cake) - 75.6%;
- The volume of dewatered sludge accumulated in the storage area - 29 227 m³.

For BTA Group Ltd. For MUE "Vodokanal" Podolsk

A.V.Vershinin
S.V.Kalinovski

For MUE "Vodokanal" Podolsk

Eryomina N.F.
Tokarev N.R.

The Report Is Approved by

A.A. Berezhinskiy

Director General
BTA Group Ltd.

M.V.Yavtushenko

Head of Wastewater Plants
MUE "Vodokanal" Podolsk

For more information on **MICROBE-LIFT®** Technology contact

Ecological Laboratories Inc.

www.EcologicalLabs.com

CS14703