

Case study on Septx Compound Use in the field of wastewater treatment process

Site: Hilton Marsa Alam

Duration: Thursday, 17th, 09, 2015 to Sunday, 27th 09, 2015

Company Producer: American company (Bio Natural America)

Authorized Distributor: Valens Company for Trading and Services LCC

Introduction

Based on the US company (BNA)'s aim - which is specialized in the production of (Probiotics) - in the transfer of its expertise in the field of wastewater treatment to the Egyptian market. One of the main products of the company is (Septx) Compound used in the field of wastewater treatment.

Based on the aforementioned, coordination was set with the company; owner of Hilton Marsa Alam (Dream Sharam Company) to have hands-on experiment in the wastewater treatment plant to determine the actual results of the use of the compound in the Egyptian environment.

Wastewater Treatment Plant

Coordination was set with the engineer responsible for the operation of the wastewater treatment plant that belongs to the hotel.

Plant Capacity: 500 m² / daily

Company Owner of the Plant: Dream Sharam Company

Company Operator of the Plant: Metito Company

Treatment Phases:

- The wastewater is collected from sub-septic tanks in the tourist resort and transferred to the previous main septic tank of the plant.
- Water pumps are used to draw waters from the main septic tank to the plant and pass through an initial pipe of solid waste to do simple filtering where fabrics like paper or plastic bags are filtered (Screening Filter).
- Water then reaches the ventilated cabinets; these are tanks with tops open equipped with huge air staplers continuing to pump air and flipping water for 24 hours.
- The water is then transferred to the sedimentation tank, which works by gravity in solids sedimentation which are returned by the pumps to the aeration tanks to complete the cycle (Returned Activated Sludge) R.A.S.
- After the completion of the treatment phase with chlorine, water passes on the wall of a final liquidation and from that to the collection tank for a few hours and then it is pulled by pumps to production tanks in preparation for use in irrigation of green spaces in the tourist resort.

Note:

- The experiment has been carried out during the high occupancy rate of the hotel since it was during the Eid al-Adha holiday season, which means increasing the proportion of the loads on the water treatment plant of the hotel.
- By inspection, a quantity of dense deposits were found on walls and floors of the aeration and sedimentation tanks of the plant, also other dense amounts of sludge were found floating on the face of the sedimentation tank station.

Tests:

It was agreed to complete the following tests on the plant content following four criteria:

1. Smell
2. Turbidity, sludge
3. Sedimentation and shape of the docks
4. Chemical Analysis

Experiment and measurements:

Duration of the experiment is 10 days. The compound (Septx) was added as follows:

- First day: 1.5 kg
- Second day: 1.2 kg
- Third day: 400 grams
- Fourth day: 1.1 kg
- Fifth day: 250 grams
- Sixth day: 150 grams
- Seventh day until the tenth day (end of the experiment): 100 grams

Distribution and Addition:

The aforementioned amounts were distributed as follows:

Day	Aeration tank	Sedimentation tank	Main tank
1	350 grams	150 grams	1kilo
2	500 grams	500 grams	200 grams
3	200 grams	100 grams	100 grams
4	500 grams	500 grams	100 grams
5	125 grams	75 grams	50 grams
6	60 grams	45 grams	45 grams
7-10	30 grams	30 grams	40 grams

Observation and Follow-up:

By daily follow-up, the following observations were noted:

Smell

- At the first observation, there were some bad odors when approaching 100 meters from the plant, this was causing inconveniencies to residents of the administrative residence or for workers in the plant or even anyone who resides near the station.
- In the beginning of the experiment and after adding the product after five hours, workers and residents near the plant noticed the disappearance of odors from the area and the surrounding areas. Also, the senior engineer at the hotel noticed the disappearance of the smells definitively from the irrigation water, he even filled a bottle of water for irrigation directly to test the improved odor to assure himself of its disappearance completely and then

paid a field visit to the treatment plant and he also noted the disappearance of odors inside the station, despite being very closer to the main tanks of the plant.

Turbidity and sludge

- After five hours of adding the product, the sludge disappeared completely from the top of the sedimentation basin and then the turbidity disappeared completely from sedimentation basin to the extent that the bottom of sedimentation basin appeared whose color was black as a result of sludge sediment since long periods.
- 12 hours after adding the product, the turbidity ratio increased significantly and the color of the water of sedimentation basin turned to the black color, and the same was for the production basin and then the sediment sludge began floating in the bottom of the sedimentation basin gradually on the surface of the tub.
- Almost a day after adding the product a layer of sludge floated on the surface of the sedimentation basin as a result of the disturbance of the sediment that was in the pelvic floor and the thickness of sludge increased gradually until the second day to become 2 cm basin covering almost the entire deposition.
- The beginning from the end of the third day, and as a result of the compound (Septx) interaction with the sludge, the latter began to crumble gradually until it disappeared completely after the fourth day despite an increase in the load on the treatment plant due to higher occupancy rate of the hotel.
- **Results and observations interpretation:** The product first interacted with the dissolved sludge that was on a lees form in the basin, which led to the complete disappearance of turbidity at the beginning of treatment, and after the elimination of the dissolved sludge it started to deal with the sediment sludge on the floors and walls and walls of the basins. The treatment was on two phases; the first was a shredding phase which ended by the sludge floating on the surface of the tub and then the phase of the gradual elimination of the sludge until it disappeared completely on the fourth day.
- The sharp decrease in the volume of sludge led to the increase of the shortage of biomass plant (Biomass). This explains the low results of the values of the BOD and COD.
- Due to lower COD and BOD values, the station's need for ventilation became less, which means the possibility of reducing the number of motors or fans used for ventilation at the station, leading to provided extra energy needed to run the station.

Shape of basins

- Before treatment, big sediments were observed on the walls of all the basins of the station either reception or sedimentation or ventilation.
- Beginning of the second day of the experiment, the workers noticed that the walls of sediment basins began to precipitate decompose and thaw in the sink until it started gradually to disappear and the color of the walls seemed to turn back to white.

Chemical Analysis:

A sample was taken after 10 days of treatment using the compound (Septx):

Analysis element	Unit	Result
Odor	-----	Odorless
Turbidity	N.T.U	0.32
PH Value	-----	7
COD	Mg O2 / L	15
BOD	Mg O2 / L	4
Ammonia	Mg / L	1.6
Nitrate	Mg / L	2.3
Nitrite	Mg / L	0.06

The walls of the ventilation basin in pre-treatment (showing dense sediments on the walls of the basin):



The walls of the ventilation basin after the second day of the start of treatment (observe the loss of sediment from the walls appearing)

The walls of the reception basin after the first day of treatment (note the start of loss of sediment on the walls):



The walls of the reception basin after the tenth day of treatment (observe the change and loss of water color of the majority of the sediment from the walls):



Sedimentation basin on the first day of treatment (disappearance of sludge floating in the tub and the increased turbidity because of the interaction with the residual sludge)



Sedimentation basin on

the second day of treatment (sediment sludge began to appear on the surface as a result of disturbance from the bottom and walls):



Sedimentation basin on the third day of treatment (floating of sediment sludge to cover the entire surface, the layer should be on the surface with thickness of 2 cm)



floating on the surface began regularly):



Sedimentation basin on the fifth day (the completion of the disposal of sludge floating layer and the start of the appearance of the water's surface in a pure form)



Sedimentation basin on the sixth day (the disappearance of floating sludge layer completely and the appearance of the surface of water in a more pure shape)

