AKSHAYA INNOTECH

Innovating for a better world..





Reclamation Technologies for Cleanup of Polluted Water Bodies.

About Us

Akshaya Innotech is a Startup End-to-End solution provider focused on the discovery, development and commercialization of Novel Water and Wastewater Treatment Technologies, Biotechnology, Probiotics, and Specialty Enzymes for Waste Management.

The company has a dedicated focus on catering to the needs of customers looking for Water, Solid waste, Bioenergy, Wastewater and human healthcare. Backed by a Young and Energetic team consisting of Biotechnologists, Chemists, Engineers, IT Professionals and Marketing and Management Professionals, our products have been developed through extensive research over many years. The company has proven capability in R&D, Scale-up, and has state-of-the-art production facilities to manufacture a wide range of enzymes, mirobes and bioactive molecules.

Akshaya has an immaculately laid portfolio based on its core strengths of knowledge and experience in diversified Sciences such as Environment, Food Technology, Engineering, Aquaculture, Veterinary Biotechnology, Pharmacy, Biochemistry, Microbiology, Chemical engineering and many more.

Akshaya's Environment vertical deals with Liquid and solid waste treatment, pollution abatement and control, wastewater treatment and recovery, biofuel production from solid wastes, recovery and reuse of water, organic manures and providing clean solutions.

This vertical also deals with Bioremediation, Reclamation of contaminated water bodies and sites, control of aquatic weeds using its proprietary biomolecules and enzymes.

The Core value of **Akshaya** is it's committed approach to provide simple, yet effective solutions to multiple problems related to Water, Wastewater, Environment, Chemistry, Food Technology and Aquaculture problems. Working towards a cleaner environment, Akshaya's dedicated team of experts constantly work on bringing the latest and advanced technologies at an affordable cost.

Sister firms:

Vegesna Biosolutions, Akshaya Engineering Innovatives are the sister concern firms of Akshaya InnoTech, which work on large scale projects in association with the company and has experience in completing projects both in Govt ., and Private sector.

Enzymatic Bio- Oxidation- A Versatile tool for Pollutant Removal in Water.



Some Polluted Water Bodies





Gravity of the Situation:

✤ Half of all rivers in Asia are affected by pathogen pollution due to untreated sewage.

Up to 134 million people in Asia, 164 million in Africa and 25 million in Latin
America are at risk of infection from these diseases.

About **3.4 million people** die each year from water Borne diseases

Many of these diseases are due to the presence of human waste in water.

✤ 25 % of the US rivers, 25 % of the European Rivers are Polluted by Sewage.

✤ Agriculture and Aquaculture have emerged as the major cause for pollutio

A Few Facts to be worried about:

Every day, 2 million tons of sewage and industrial and agricultural waste are discharged into the world's water, I,e,. Equal to the weight of the entire human population of 6.8 billion people.

Annually about 1,500 km³ of waste equivalent to six times more water than exists in all the rivers of the world..

Unsafe water causes 4 billion cases of diarrhea each year, and results in 2.2 million deaths, mostly of children under five.

Sanitation and drinking water investments have high rates of return: for every \$1 invested, there is a projected \$3-\$34 economic development return.

Economic losses due to the lack of water and sanitation in Africa as a result of the mortality and morbidity impacts is estimated at \$28.4 billion or about 5% of GDP.

Enzymatic Bio-oxidation : Some tech Facts.....

Bio-oxidation Reaction

Advantages of ABOP

- Effective in removing resistant organic compounds
- Capable of complete mineralization of organic compounds to CO_{2} .
- Not susceptible to the presence of toxic chemicals
- Generally produce innocuous end products
- Can be used to pretreat toxic compounds so that they can be bio-treated

COMPARISION OF VARIOUS ELECTRO-CHEMICAL POTENTIAL

Oxidizing Agent	Oxidation
Potential (V)	

Hydroxyl Radical	2.80
Oxygen (atomic)	2.42
Ozone	2.08
Hydrogen peroxide	1.78
Hypochlorite	1.49
Chlorine	1.36
Chlorine dioxide	1.27
Oxygen (molecular)	1.23
Hypochlorite Chlorine Chlorine dioxide Oxygen (molecular)	1.4 1.3 1.2 1.2

Mode of action of Hydroxyl Radical

Hydroxyl Radical- One Solution to a Multitude of Problems

Advantages of Enzymatic Bio-Oxidation in Sewage & Effluent Treatment

- a. Simple to Apply
- b. One Enzyme cocktail takes care of many problems
- c. Improves Oxygen levels in polluted water bodies.
- d. Can be applied at any time
- e. Savings on Power and Fuel costs
- f. Degrades all pollutants in a single application.
- g. Reduces organic loads in the sewage
- h. Leaves no residues in the environment.
- i. Wastewater treated by the end of drain.
- j. Very effectively Kills pathogens including viruses and Cryptosporidians.
- k. Does not require sophisticated equipment.
- l. Kills larvae and egg stages of mosquitoes and vectors.
- m. Helps prevent water borne diseases

Bio-Oxidation : Case Studies

CASE STUDY I

RESTORATION OF A DRINKING WATER POND

Application Trials of Biooxidation Oxidation Technology in Polluted tanks

Tank before Treatment

Extent of Pond: 10 Acres

Sources of Pollution:

Domestic and Commercial Sewage.

Total Influent Sewage: 1 Million Liters Per Day.

Biomass Present: 5 Tons of fish.

Problems:

Obnoxious Odors, Mosquito Breeding, High BOD, Severe Eutropication. Detoriated Water Quality, Water Borne Diseases to Residents.

Tank at 1 hour of treatment Treatment

At 2 Hr of Treatment

Result:

- a. Obnoxious Odors controlled within 1 Hour.
- b. Algal Mat formed on the surface completely digested.
- c. Mosquito Larvae completely killed.
- d. BOD Reduced from 860 ppm to 50 ppm.
- e. Clear lake by the end of 6 hours of application.

CASE STUDY II Clean up of Polluted Rivulet

Application Trials of Bio-Oxidation Technology in drains contaminates with Sewage and Industrial Effluents.

Trials on Yenamadurru Drain at Palakoderu Bridge during May 2017

During Application

Case Study : Kudikunta Lake

- **Extent** : 8 Acres
- Location : Masjid Banda, Kondapur

Surrounded by many lake view apartments.

Population impact : Around 10000.

Once a Drinking water source to 22000 People.

Now turned to a cesspool.

First Visit report:

- Unbearable stink
- Floating Garbage
- Plastics
- Muck with Sulfur bacterial biofilm.
- ✤ No life in lake.
- Pathogens
- Bottom Anaerobic digestion
- ✤ Low oxygen levels.
- Mosquitoes
- ✤ Rags
- Flowing Sewers

Few Deaths due to Dengue and Typhoid in Cyber meadows society.

Unbearable stench causing respiratory problems. Residents planning to leave the area to other areas.

First stage of Cleaning: January 2018

Initiation of enzyme application

Active Enzyme reaction (2nd Hr of dosing)

Enzyme application over the lake.

End of Day 1:

- Stench reduced by 90%.
- Organic matter reduced in the lake.
- > Turbidity reduced by 60%.
- Clarity of water increased.
- Residents happy with reduced stench.
- Mosquitoes reduced.

Third dose of Cleaning: February 2018

Enzyme application

Enzyme digesting organic matter.

Kdikunta Lake Before and After Biooxidation

After Biooxidation

S.No.	Parameter	Before Treatment	After Treatment
1	COD	1028	120
2	TSS	659	118
3	TDS	1680	1260
4	рН	8.9	7.4
5	Alkalinity	780	450
6	Hardness	870	592
7	Hydrogen Sulfide	8.1	0.03
8	Ammonia	5.2	0.2
9	Chlorides	325	182
10	Sulfates	460	113
11	Phosphates	482	98
12	Dissolved Oxygen	1.2	4.9
13	Smell	Septic	Nill
14	Color	Brownish	Light green
(II) ===			

Impact:

- ✓ Reduced stench.
- ✓ Reduced Toxic gases.
- ✓ Less Mosquitoes.
- \checkmark More oxygen in the lake.
- ✓ Residents comfort brought back.
- \checkmark Kids venturing out to play outdoors.

✓ About 20000 People impacted positively.

Contamination of Gopicheruvu downstream reduced

One Important Change:

Residents of the area adjoining the lake saw the results and are convinced that the lake can be further improved with their active participation.

A lake restoration committee has been formed by the residents to prevent plastics; garbage being dumped into the lake.

Proactive action from GHMC towards lake improvement initiated.

Our Proposal:

- a. In Drain Treatment of Sewage
- b. Low cost treatment systems for Sewage treatment
- c. Manpower free cleanup of blocks in drains

Come.. Let us Build a sustainable tomorrow

Akshaya InnoTech D.No. 47-11-24, Flat No. 504, Chillapalli Complex, Dwaraka Nagar First Lane, Visakhapatnam, A.P.-530016 "The Elixir of Life is Endangered Website: https:// aitwater.com Email: ainnotechindia@gmailco info@aitwater.com

Call us : +91 9177893456, +91 8897911862 +91 9701713713, +91 8913596064

