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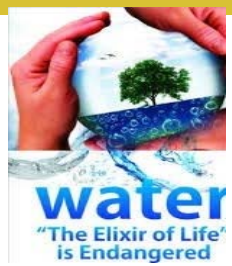
ALLPI ANNUAL REGIONAL CONSULTATIVE FORUM-2018

Focusing on Innovation to
Transform Africa's Leather Sector
towards Productivity and Competitiveness

December 12, 2018

Water is the Elíxíir of Lífe...



1. Every minute a kid dies of diarrhea or other water borne disease in the world.
2. 80% of Surface water and 50% of ground water is polluted and only 2.1% is treated to safe levels.
3. Children in contact with Sewage and Polluted water have stunted growth.
4. Capetown's water supply was shut in April 2018…. And many are to follow suit.
5. Water is going to be the next oil…….. We may have to fight for our share of water… very soon.
6. If we don't care for our water….

   Yesterday it was Cape Town ….

   We may be the next…….

Given an Opportunity….WE WON'T LET THAT HAPPEN…

Vegesna Biosolutions
For a Cleaner Tommorrow..

COMESA/ LLPI

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INTRODUCTION

- **Design engineering consultancy firm for water & wastewater treatment**
- **Established in 1995**
- **Professional team of Biotechnologists, Academicians, Engineers Consultants & Technicians**
- **Consultants for ALLPI, Head Quartered at Addis Ababa, Ethiopia**

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PHILOSOPHY

Responsible Water Resource Management :

- Implementation of best practices for effective quantitative and qualitative planning, development, distribution, and utilization of water.
- Conservation, or reducing water use through improved operation of existing equipment and processes.
- **Serve WATER… Save Humanity…**

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TREATMENT OPTIONS

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- Waste Stablization Pond
- UASB Reactor
- Activated Sludge Process
- Oxidation

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TECHNICAL EXPERTISE

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- Water Treatment Plants
- Sewage Treatment Plants
- Effluent Treatment Plants
- Advanced Oxidation Process
- Bio Oxidation Process
- Zero Liquid Discharge Systems
- Ultra Filtration Systems
- Sea Water Desalination systems

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CLIENTELE

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Leather & Textiles	• K.H.Exports Group of Companies • Shafeeq Shameel & Co-Ambur • Farida Group Ambur,Chennai • Nasser Tanning Co Vaniyambadi • Sura Leathers Ambur • Rajapalayam Spinning & Cotton Mills Ltd.
Real Estate Promoters	• Arun Excello • Mallis Construction Group • L&T Construction
Hospitality & Others	• Prashant Multispeciality Hospitals • Scope International – Tech Park
Consultancy	• ALLPI – CETP /Rwanda –1 MLD /Sudan –3X10 MLD/Eritrea & Uganda • Veriterre Sustainable Energy Research & Consulting (P) Ltd. • Tannery Units • Spinning & Cotton Mills • Diary & Distilleries
Desalination Projects (*WIP)	• Perfect Boards, Kannur 60KLD • 150 MLD – Nemeli, Chennai* • 4 MLD – Narippayur, Ramanathapuram District* • 1MLD - Ramanathapuram District*

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The Up-Hill Task

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Significant water shortages or stress globally:

- Populations, economies, and consumption rates continue to grow.
- Global population has tripled, but our use of water has increased six-fold.

Quality of available water resources has been degraded through human activities

- Excessive use of process chemicals
- Release of untreated sewage and Industrial wastewater.

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OUR TRAJECTORY

CONSULTANCY
Knowledge,
Expertise,
Technology and
Financial
Resources

IMPLEMENTATION
Knowledge,
Expertise,
Technology

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TYPES OF TREATMENT

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Waste Stablization Pond

- Anaerobic
- Facultative
- Aerobic maturation

UASB Reactor

- Multiple tanks in series
- Tapping energy from waste

Activated Sludge Process

- Primary treatment
- Bio reactor
- Secondary treatment
- Tertiary treatment

Oxidation

- Electro oxidation
- Reaction oxidation
- Bio oxidation

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UV

Why Sustainable Waste Water Solutions are Needed?

- Leather Processing uses 30-40 M^3 Water per Ton of Hides – One of the Most Water and Chemical Intensive Industry.

- Uses High Quantity of Salts
  (TDS in Tannery Water goes upto 40000-50000 PPM
  Much Higher than average Seawater.

- High Chromium, Sulfur, Nitrogen, Dyes, Chemicals, Biocides, Surfactants, Stabilizers and …..

- Very High TSS
  Settleable Solids
  Colloidal Solids.

- High Protein and Fat.

- High COD/BOD.

- Low Treatability.

- High risk of Pathogens (from animals), high rate of anaerobic degradation before it reaches the ETP.

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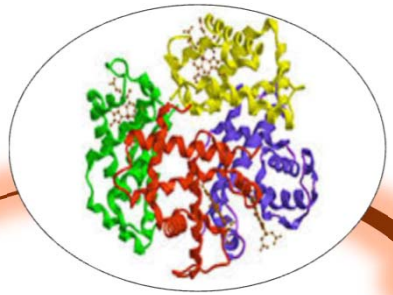
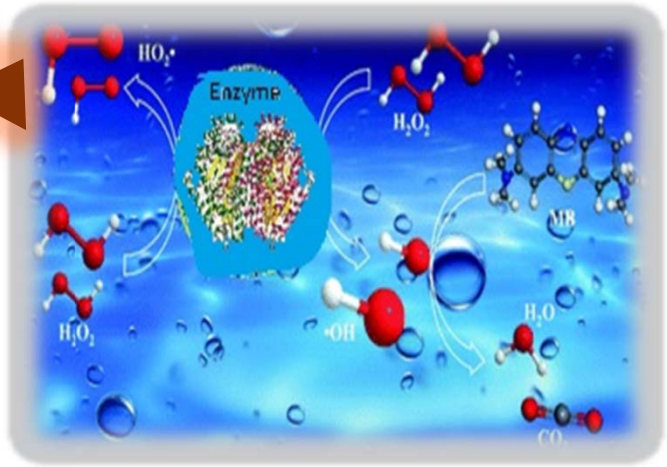
Oxytech Reclamation

For Nature.. By Nature…

A unique Enzymatic water treatment solution that completely degrades all pollutants within in 3-4 Hours at a low cost.





Advantages of Oxytech :

- Versatile to treat wide variety of wastewater.
- Can handle wide range of COD/BOD and hard to treat compounds.
- Has a low foot print compared to conventional process.
- Low in space, Capex and operating cost.
- Effective in removing resistant organic compounds
- Capable of complete mineralization of organic compounds to CO_2.
- Not susceptible to the presence of toxic chemicals
- Produces innocuous end products

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Bio-Oxidation

One Solution to a Multitude of Problems

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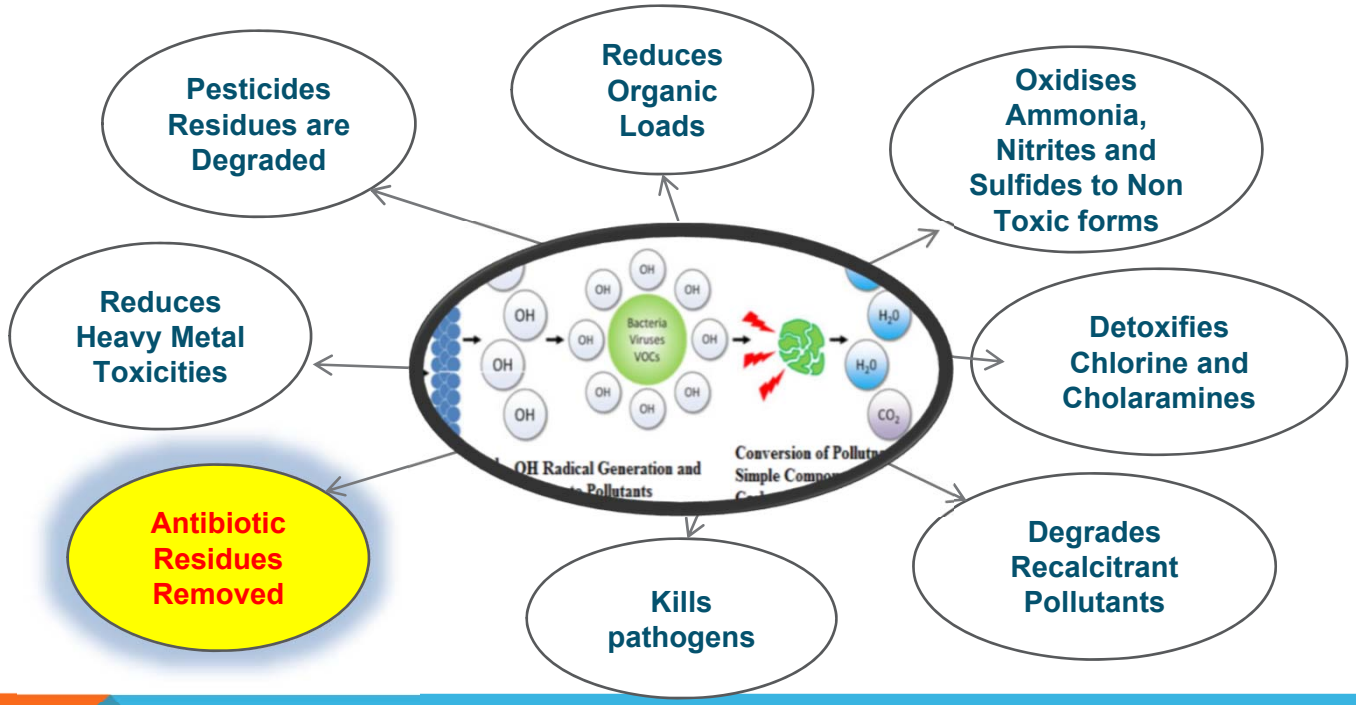
For a Cleaner Tommorrow



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Reclamation of Polluted and Eutrophicated Water Bodies:

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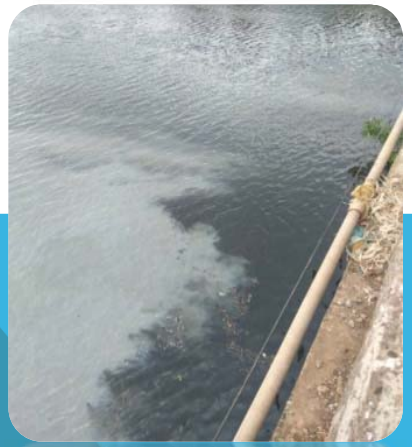
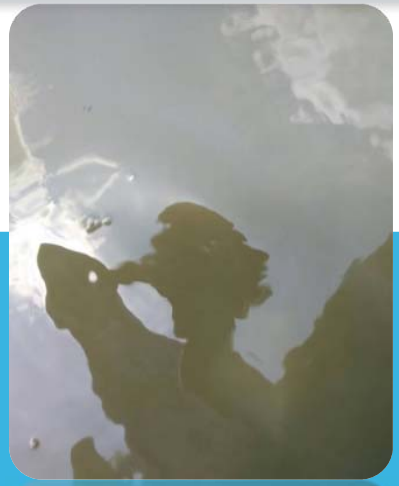
Eutropicated Village Pond

Pond after 1 Hr of application

After 6 Hrs of Treatment

Reclamation of drains contaminated with Sewage and Industrial Effluents





Untreated Application 15 Minutes after Treatment

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Urban Sewerage Lines and Drainages

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Open Drain Cleanup with Biooxidation Technology (Guntur City, India, March 2018)

Before Application

5 Minutes after application

10 minutes after application

Cleaning up Blocked Underground Drains (Vijayawada City,India)

Before Application

10 Minutes after Application

1 Hour Later

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Treatment Options for Tannery and Leather Industry Effluents:

a. Odor removal and control
b. Color removal
c. Chrome removal
d. Pretreatment of Effluents for Sludge Reduction (Lime, PAC and Polyelectrolyte reduction)
a. Biomethanation
b. COD and BOD reduction.
c. Sludge to Fertilizer Conversion.

Triple Radial Filter for TSS Reduction

Available Solutions:

a. Biocoagulants for TSS Reduction and reduction of Chemical Sludge.
b. Oxidative Enzymes for Color, Odor, COD and BOD Removal.
c. Customized Microbes for Tannery Effluent Treatment.
d. Technology for Waste Stabilization Ponds and Phytoremediation .
e. Complete Effluent Treatment Plants with Provision for Zero Liquid Discharge.
f. Solid Waste (Tannery Solids, Bacterial sludge) to Fertilizer conversion Technology.

TRUFLOC

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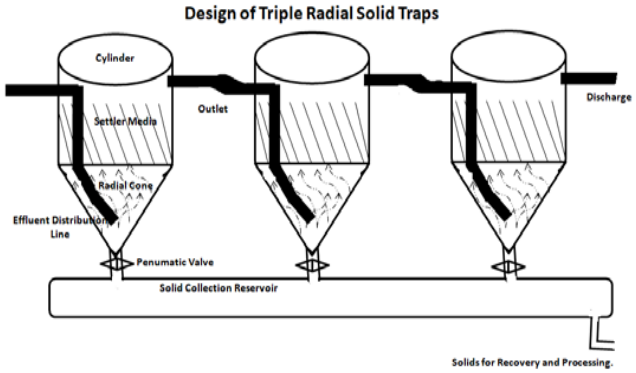
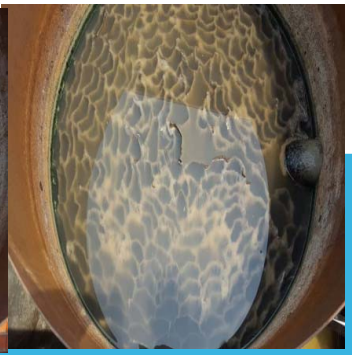
Radial Filter Solid Traps





Radial Filter Solid Traps in Operation

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Removal of TSS and Turbidity from Tannery Effluents

- **Flocculating agent** : TruFloc
- **Chemical Nature** : Bioflocculant derived from Fungal Cellwalls and Phyto extracts.
- **Mode of Action** : Charge Neutralization of Protein and organic molecule surfaces.
- **Dosage** : 5-10 ppm
- **Solubility** : Water
- **TSS Reduction Capacity** : > 90%
- **Max. TSS Loads** : upto 3500 mg/L
- **TSS Load Reduction in the present test sample:**
  - **TSS of Raw Effluent** : 1250 ppm
  - **TSS of Treated Effluent** : 24 ppm.
- **Sludge Volume Reduction** : > 60% compared to conventional Lime and other chemical flocculants.
- **Eco Safety** : 100% Safe to Aquatic and Humans

Tru Floc BioCoagulant for Tannery Effluents

a. Raw

b. After 30 Minutes of Coagulant addition

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Removal of Color and BOD/COD from Tannery Effluents

- **Catalyst used** : Oxytech Enzyme System
- **Chemical Nature** : Enzyme derived from Microbial sources.
- **Mode of Action** : Production of Hydroxyl Radicals and oxidation of the chromophores to achromogenic states.

Digestion of organic matter

Oxidation of Ammonical Nitrogen and Sulfides.

- **Dosage** : 5-10 ppm
- **Solubility:** Water
- **COD Reduction Capacity** : > 70%
- **Max. COD Loads** : upto 35000 mg/L

- **COD Load Reduction in the present test sample:**

COD of Raw Effluent: 5500 ppm
COD of Treated Effluent: 650 ppm.

- **Color Removal :** from Dark Green/Brown to light Yellow and colorless after 6 hours.

Enzymatic Treatment of Dye House Effluent

a. Raw

b. After 2 Hrs of Treatment

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Removal of Color and BOD/COD from Tannery Effluents

- **Catalyst used** : Oxytech Enzyme System
- **Chemical Nature** : Enzyme derived from Microbial sources.
- **Mode of Action** : Production of Hydroxyl Radicals and oxidation of the chromophores to achromogenic states.

➢ **Digestion of organic matter**

Oxidation of Ammonical Nitrogen and Sulfides.

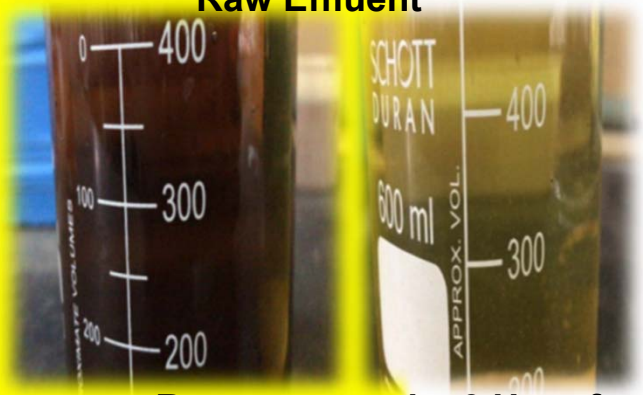
- **Dosage** : 5-10 ppm
- **olubility** : Water
- **COD Reduction Capacity** : > 70%
- **Max. COD Loads** : upto 35000 mg/L

COD Load Reduction in the present test sample:

COD of Raw Effluent : 4200 ppm
COD of Treated Effluent : 570 ppm.

- **Color Removal :** from Dark Green/Brown to light Yellow and colorless after 3 hours.

Enzymatic Treatment of Equalized Raw Effluent



a. Raw **b. 3 Hrs of Treatment**

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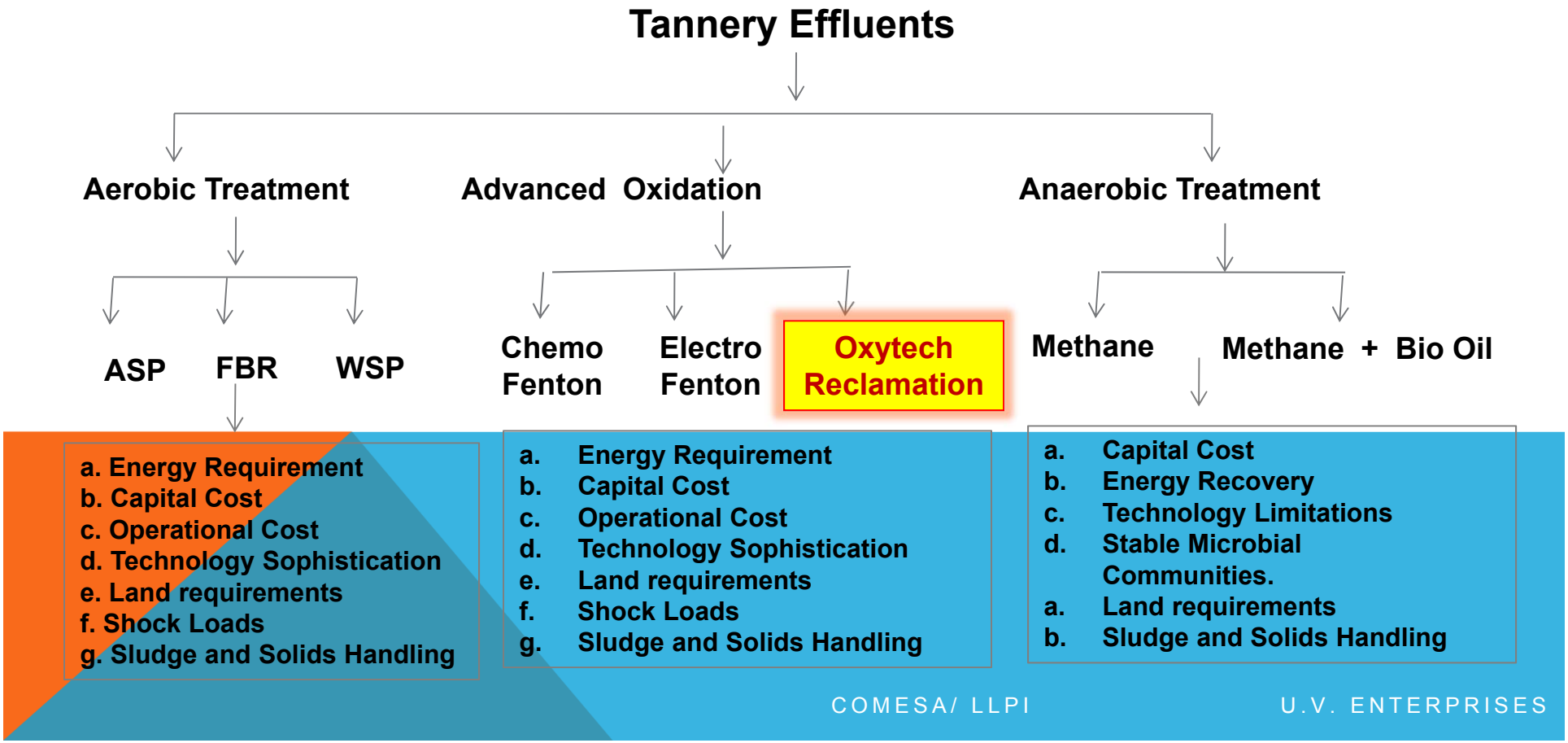
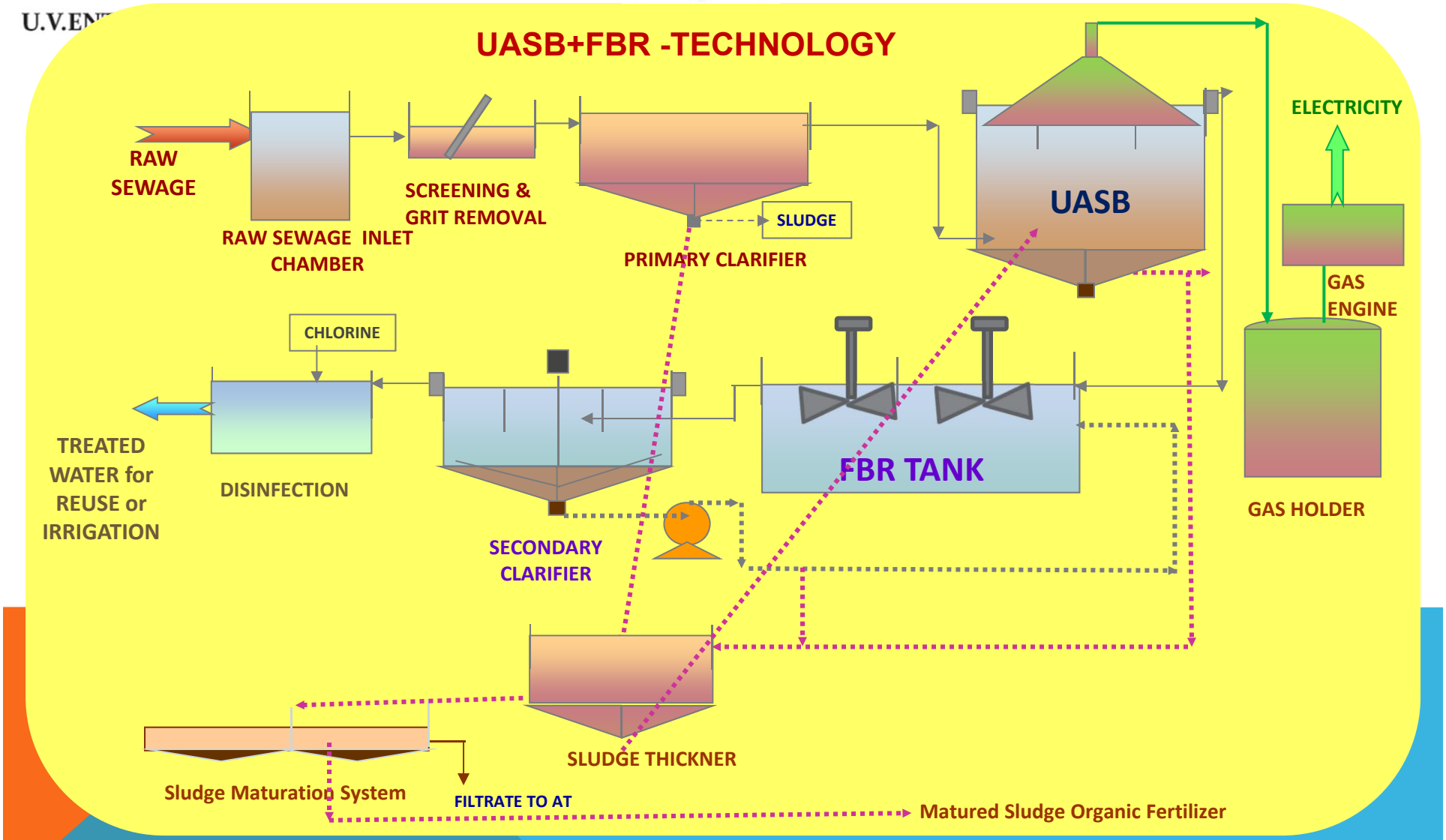
Options for Treatment of Tannery Effluents




UASB+FBR -TECHNOLOGY
RAW SEWAGE
RAW SEWAGE INLET CHAMBER
SCREENING & GRIT REMOVAL
PRIMARY CLARIFIER
SLUDGE
UASB
ELECTRICITY
GAS ENGINE
GAS HOLDER
CHLORINE
TREATED WATER for REUSE or IRRIGATION
DISINFECTION
FBR TANK
SECONDARY CLARIFIER
SLUDGE THICKNER
Sludge Maturation System
FILTRATE TO AT
Matured Sludge Organic Fertilizer

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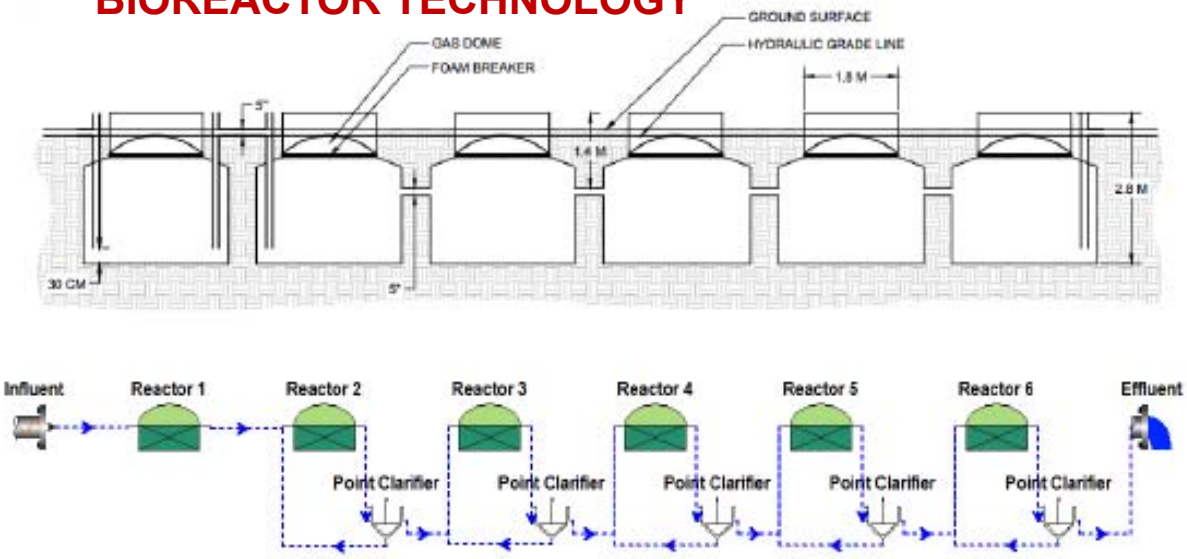
Advantages of UASB + FBR :

a. Can handle a wide variety of effluents with organic loads.
b. Generates valuable fuel in the form of methane.
c. Scope for generation of power and heat.
d. Requires zero external power.
e. Recovery of high quality organic fertilizer rich in Nitrogen, phosphorus.
f. Zero recurring costs.
g. Faster rate of return on investment.
h. 100% safe and can operate under high shock loads.
i. A 100% self sustainable model for handling the Tannery waste waters.

BIOOILS PRODUCTION – USING PLUG FLOW ANAEROBIC BIOREACTOR TECHNOLOGY



Advantages:

a. Can be constructed of Locally Available Materials
b. Simple Technology
c. Space can be utilized effectively
d. Simultaneous Production of Fuel Grade Lipids and Biogas.
e. Sludge converted to Oil and Organic Fertilizer.
f. Minimal Processing
g. Suitable for small Communities and Industries.

Way Forward

- Combined technology of anaerobic followed by aerobic treatment.
- Provides clean and safe water.
- No requirement of costly chemicals, sophisticated equipment and high energy costs.
- Recycle / Reuse
- Techno-economically viable technologies
- Improvement in O&M
- Stringent Policies & Implementation by Govt.
- Promotion of PPP Models.

BecaUSE Water. . . and Time . . . are Precious!

THANK YOU !

Team UV Enterprises:

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