



Panse Consultants, Pune

Presentation

On

Faecal Sludge Treatment Plant (FSTP)



By
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Panse Consultants

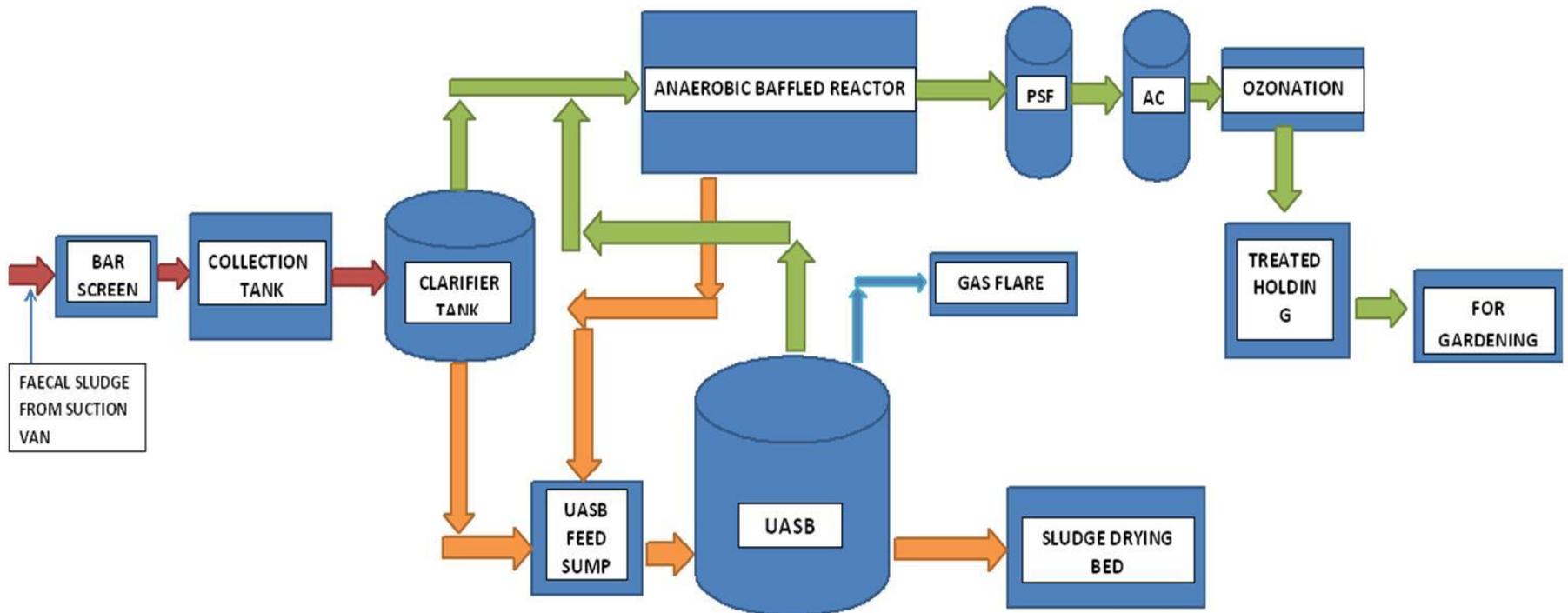
Introduction

- **A group of technocrats in the field of environmental engineering projects.**
- **Experienced & Expert professionals.**
- **ISO – 9001, Crisil rated company.**
- **Established in year 2004.**
- **Areas of operations - EPC/ Environmental Engineering Projects and consultancy.**
- **Innovative solutions in the field of Wastewater & Effluent treatment.**
- **Manufacturing ETP/ STP/ WTP/ FSTP/MSW.**

Faecal Sludge Treatment Plant (FSTP)

- **Faecal sludge reception** - where the truck interfaces with the treatment plant and sludge is unloaded.
- **Primary treatment** – It contains Screen chamber, Primary Clarifier, Grit removal.
- **Liquid treatment** – It contains Clarifier, Anaerobic Baffled Reactor (ABR).
- **Solids treatment** – It Contains Upflow Anaerobic Sludge Blanket (UASB), Sludge Drying Bed.
- **Tertiary treatment** – It Contains Pressure Sand Filter(PSF), Activated Carbon Filter(ACF), Ozonation.

Process Flow Diagram



Benefits of our technology

- **Solution for effective & sustainable Faecal Sludge Management (FSM)**
- **Has been designed for Faecal sludge & segregated Bio degradable Solid Waste**
- **Hence in case of implementation STP project for city this total plant can be used for Solid Waste Treatment**
- **So there is no wastage of capital & operational Investment**
- **This technology based on UASB so can be easily Shut down & Restart without loss of bacterial culture**
- **No requirement of skilled man power for operation of Plant**

Collection, Transport & Unloading of Faecal Sludge

- **Suction Van is used to pump septic tanks**
- **Regular & Periodic Service**
- **RFID Access Control System**



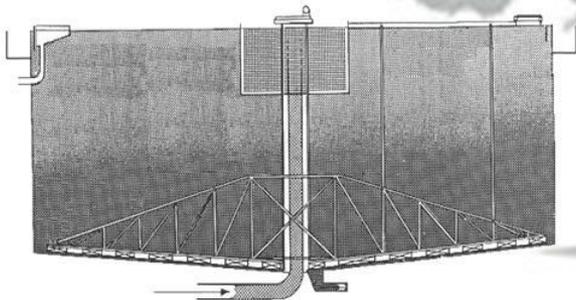
Bar Screen

- **First Unit Operation**
- **Screening removes unwanted solids & grit**
- **To Prevent Damage & Clogging of Equipment**
- **Manually cleaned bar screen**



Clarifier

- **Clarifier means Settling tank built with mechanical means for continuous settling of solids**
- **Concentrated settled matter transferred from bottom to further process**



Upflow Anaerobic Sludge Blanket (UASB)

- **Microorganisms break down biodegradable material in the absence of oxygen.**
- **the process of settlement and digestion by Anaerobic Microorganism.**
- **High reduction of BOD**
- **Can withstand high organic and hydraulic loading rates**
- **Biogas can be used for energy**
- **Gas flare system**

Advantages of Advanced UASB Technology

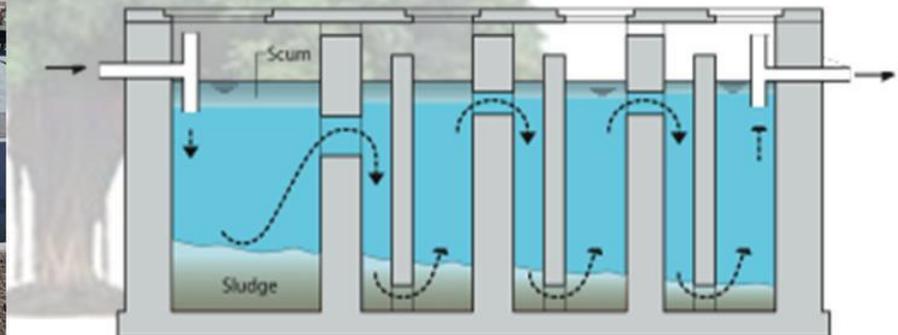
- **Low energy consumption.**
- **Low operation Cost.**
- **Extremely stable to hydraulic load.**
- **Less electromechanical equipment.**
- **High stability to organic shock.**
- **Low sludge production.**
- **Biogas generation (can be used for electricity generation)**
- **Higher removal efficiency.**

Upflow Anaerobic Sludge Blanket (UASB)



Anaerobic Baffled Reactor (ABR)

- **High rate anaerobic digester**
- **It consists of a series of compartments**
- **No moving parts**
- **No mechanical mixing**
- **High Stability to organic shock**
- **Little or no maintenance is required for an ABR**



Pressure Sand Filter & Activated Carbon Filter (PSF & ACF)

- **Multiple layer of sand with a variety in size and specific gravity to remove solids**
- **Activated carbon filter operates through adsorption**
- **simple in construction and easy to operate and maintain**
- **Filters are used to remove organic matter, Odour & Colour**



Ozonation

- **Advanced technology (Tertiary Treatment)**
- **Ozone is a very powerful oxidizing agent**
- **Inactivation/destruction of pathogenic organisms**
- **After Ozonation, there is no regrowth of microorganisms.**
- **Ozone gas (O₃) is formed by passing air or oxygen through a high-voltage electric field.**

Ozone Generator



Ozone Concentrator



Sludge Drying Bed

- **Simple sludge drying & composting process.**
- **Gravity solid liquid separation**
- **Simple Construction**
- **No energy consumption**
- **No skilled labour required**



Gallery



Reuse

Treated Effluent :

- For Gardening Purpose
- For Cleaning / Washing Suction Vehicles & platform

Dry Sludge :

- For Agriculture & Gardening
- For a soil conditioner



Performance Report

Parameter	Inlet	Outlet	Limit
pH	7.6	7.9	6.5 – 9.0
COD	16000 mg/lit	138 mg/lit	250 mg/lit
BOD	8000mg/lit	27 mg/lit	100 mg/lit
TSS	11000mg/lit	77.6 mg/lit	200 mg/lit
No3	90mg/lit	09mg/lit	10mg/lit

Effluent Discharge Standards

The Environment (Protection) Rules, 1986 545

[SCHEDULE - VI]
(See rule 3A)

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
1.	Colour and odour	See 6 of Annexure-I	--	See 6 of Annexure-I	See 6 of Annexure-I
2.	Suspended solids mg/l, Max.	100	600	200	(a) For process waste water-100 (b) For cooling water effluent 10 percent above total suspended matter of influent.
3.	Particulate size of suspended solids	Shall pass 850 micron IS Sieve	--	--	(a) Floatable solids, max. 3 mm. (b) Settleable solids, max. 850 microns.
4.	***	*	--	***	--
5.	pH Value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
6.	Temperature	shall not exceed 5°C above the receiving water temperature	--	--	shall not exceed 5°C above the receiving water temperature

¹ Schedule VI inserted by Rule 2(d) of the Environment (Protection) Second Amendment Rules, 1993 notified vide G.S.R. 422(3) dated 19.05.1993, published in the Gazette No. 174 dated 19.05.1993.

² Omitted by Rule 2(6)(i) of the Environment (Protection) Third Amendment Rules, 1993 vide Notification No.G.S.R.801(3), dated 31.12.1993.

The Environment (Protection) Rules, 1986 546

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
7.	Oil and grease mg/l Max.	10	20	10	20
8.	Total residual chlorine mg/l Max.	1.0	--	--	1.0
9.	Ammonical nitrogen (as N), mg/l Max.	50	50	--	50
10.	Total Kjeldahl Nitrogen (as NH ₃) mg/l, Max.	100	--	--	100
11.	Free ammonia (as NH ₃) mg/l, Max.	5.0	--	--	5.0
12.	Biochemical Oxygen demand [3 days at 27°C] mg/l max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/l, max.	250	--	--	250
14.	Arsenic (as As), mg/l, max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg), mg/l, Max.	0.01	0.01	--	0.01
16.	Lead (as Pb) mg/l, Max.	0.1	1.0	--	2.0
17.	Cadmium (as Cd) mg/l, Max.	2.0	1.0	--	2.0
18.	Hexavalent Chromium (as Cr+6), mg/l max.	0.1	2.0	--	1.0

¹ Substituted by Rule 2 of the Environment (Protection) Amendment Rules, 1996 notified by G.S.R. 176, dated 24.12.1996 may be read as BOD (3 days at 27°C) wherever BOD 5 days 20°C occurred.

Control & Monitoring System

- **RFID Access Control System.**

- **Water Quality Monitoring System.**



RFID Access Control System

- **Radio frequency identification (RFID) is a wireless technology to maintain Inward / Outward record of Suction vehicles.**
- **UHF long distance reader with passive Card/Tag technology**



RFID Access Control Portal (Daily Vehicle In – Out Report)



Search

Date From : 15-07-2019 To : 19-07-2019

Vehicle No :

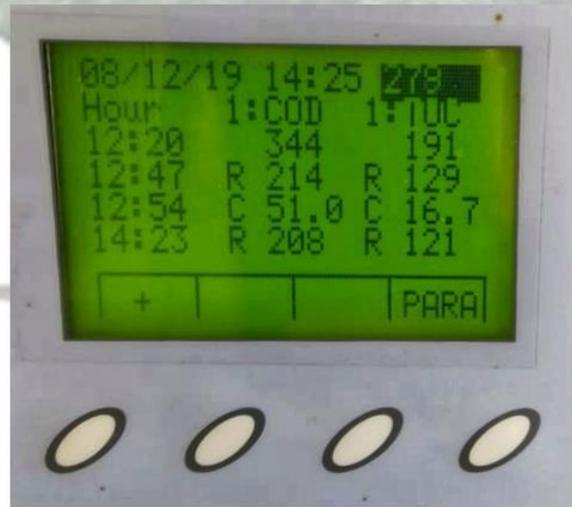
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IN-OUT Report

Vehicle No	In Location	Out Location	IN Punch	OUT Punch	Total Time
Sinnar_1	in	Main Gate2	15-07-2019 02:14:07	15-07-2019 02:20:54	00:06:47
	in	Main Gate2	15-07-2019 03:56:58	15-07-2019 03:57:23	00:00:25
	in	Main Gate2	15-07-2019 04:45:33	15-07-2019 04:45:51	00:00:18
	in	Main Gate2	16-07-2019 10:19:00	16-07-2019 10:35:20	00:16:20
	in	Main Gate2	16-07-2019 12:35:10	16-07-2019 12:35:31	00:00:21
	in	Main Gate2	16-07-2019 02:07:05	16-07-2019 02:07:22	00:00:17
	in	Main Gate2	16-07-2019 03:19:38	16-07-2019 03:19:57	00:00:19
	in	Main Gate2	17-07-2019 09:51:35	17-07-2019 10:08:38	00:17:3
	in	Main Gate2	17-07-2019 11:50:07	17-07-2019 03:18:56	03:28:49
	in	Main Gate2	17-07-2019 04:30:32	17-07-2019 04:30:56	00:00:24
	in	Main Gate2	18-07-2019 09:29:42	18-07-2019 10:44:09	01:14:27
	in	Main Gate2	18-07-2019 10:52:30	18-07-2019 12:39:44	01:47:14
	in	Main Gate2	18-07-2019 04:11:34	18-07-2019 04:30:04	00:18:40

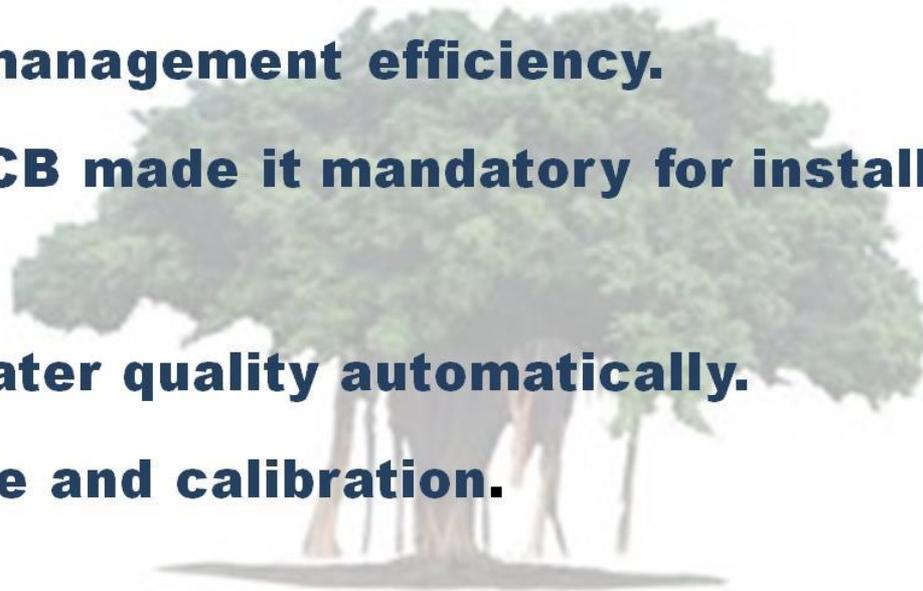
Water Quality Monitoring System

- To monitor multiple water parameters at the same time on the field
- pH, COD, BOD, TSS, TOC, No3, Temp.
- Real Time Monitoring
- Most effective to monitor any problem & plant efficiency
- Easy to operate



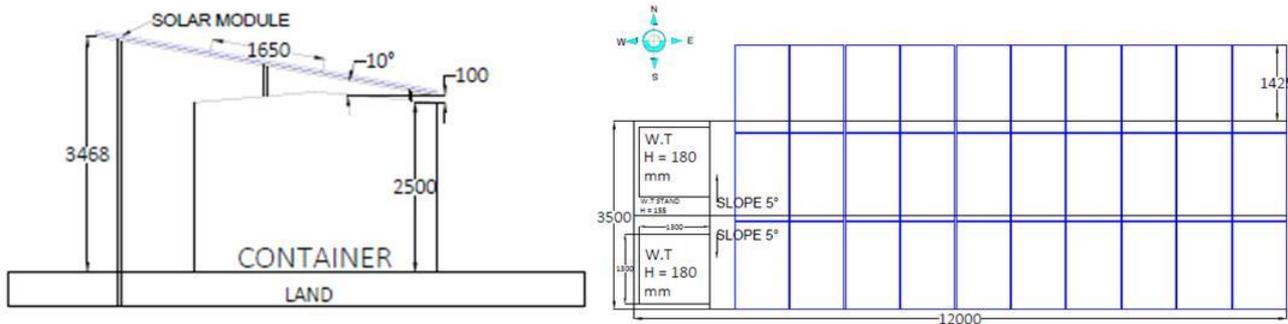
Advantages of RFID and Online Monitoring System

- **Daily Performance of Plant can be evaluated**
- **Eliminates possibility of human Error.**
- **Increase management efficiency.**
- **CPCB, MPCB made it mandatory for installation of this system.**
- **Monitor Water quality automatically.**
- **Easy to use and calibration.**



Solar power Plant

- 7.5 Kw On grid Solar system with Net metering
- It provides clean electricity for all treatment plant operations
- Pollution free energy generation system
- High efficiency crystalline Modules
- Reduces electricity bill
- Low Operation & Maintenance cost.
- Roof top mount



Total Power Consumption (70 KLD)

Sr No.	Equipment For Process	Power (KW)	Operation Time(Hrs)	Units
1	Collection Pump	1.491	12	17.88
2	UASB Feed Pump	1.491	12	17.88
3	Filter Feed Pump	1.491	12	17.88
4	Ozonation Pump	0.745	12	08.94
5	Ozonator	0.820	12	09.48
6	Treated water Pump	1.491	12	17.88
7	Motor For Clarifier	0.372	02	0.744
8	Lamps	0.300	08	02.40
9	Instruments	0.745	12	08.94
			Total Units/Day	103.00
			Per Unit Rate	7.00
			Total Cost/Day (RS)	721.00

Challenges faced during Sinnar Project

- **Government approvals. (Prolonged Delay for DPR Approval)**
- **Site Location (Remote Area- Create Security Problem)**
- **Land Issues (Hard Rock)**
- **Problems of Non availability of Water for plant Operation and for working staff.**
- **Problem faced during unloading of sludge.**
- **Floating and grit material trouble to pumps corrective action has taken modification in bar screen and screen channel added.**
- **Electricity- Fluctuation in Electric Supply. (voltage)**
- **Internet connectivity for online monitoring system.**

Training & Research Centre

- **Under CEPT's management**
- **On field research & development**
- **Process efficiency monitoring**
- **Training Programs for field education**



Sinnar Project Funding Details

- **Plant Erection & Operational Cost has been funded under 14th Pay Commission.**
- **Provision of advanced technologies:-(RFID access control system, Online water quality monitoring system), Solar Power Plant, Vehicle washing platform has been made.**

Work	Fund Raised by	Amount
FSTP Erection	Under 14 th Pay Commission	1,51,06,727.00
Operation & Maintenance(For 3 Year)	Under 14 th Pay Commission	25,00,000.00

Thank You

For Your Attention



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