MANIPAL UNIVERSITY
JAIPUR
(University under Section 3(f) of the UGC Act)

Manipal University Jaipur's Processes to Prevent Water Pollution

Clean and safe water is essential for human health and the environment. As centres of education and innovation, the Manipal University Jaipur has a responsibility to protect and preserve its surrounding ecosystems and communities. One crucial aspect of this responsibility pertains to preventing the entry of polluted water into the water system, including pollution resulting from accidents and incidents at the university.

Manipal University Jaipur takes several steps to ensure compliance with all environmental regulations and standards set by local, state, and federal authorities. This encompasses obtaining permits and licenses that govern water discharges and the prevention of pollution. Manipal University Jaipur consistently monitors its activities to ensure that they do not exceed the established pollution limits. Universities are often exposed to various hazardous materials, including chemicals used in laboratories and maintenance activities. To prevent the contamination of water sources by these substances, Manipal University Jaipur adheres to stringent protocols for their handling, storage, and disposal. Hazardous waste is usually collected and disposed of in accordance with environmental regulations. Stormwater runoff can carry pollutants into local water bodies, contaminating local water bodies. Manipal University Jaipur has implemented comprehensive stormwater management plans to control and treat runoff. It involves installing retention basins, using permeable surfaces, and employing filtration systems to remove contaminants before they can reach nearby rivers or lakes. Manipal University Jaipur has well-defined spill response plans in place, outlining the steps to contain, clean up, and report spills of hazardous materials. Training programs ensure that staff and students are informed about these procedures. Manipal University Jaipur has extensive green spaces. Implementing sustainable landscaping practices can significantly reduce water pollution risks. This includes using native plants that require fewer chemicals and fertilizers, practicing responsible irrigation, and minimizing pesticide use. The university generates wastewater from various sources, including laboratories, restrooms, and dining facilities. To ensure that this wastewater is treated properly, Manipal University Jaipur operates on-site treatment facilities. These facilities are designed to remove contaminants and meet stringent water quality standards before discharging the treated water.

Through compliance with environmental regulations, responsible management of hazardous materials, effective stormwater control, spill response plans, sustainable landscaping, wastewater treatment, research and innovation, and community engagement, Manipal University Jaipur is taking significant steps to prevent polluted water from entering the water system.

MANIPAL UNIVERSITY
JAIPUR

DOR/MRB/2023/SG-05

Dr Monika Sogani,
Department of Biosciences,
School of Basic Sciences,
Manipal University Jaipur

Subject: Project proposal approval and MRB Seed grant sanction letter

Dear Dr Monika,
Congratulations!

This is to inform that you that your MRB seed grant proposal titled "**Development of Microbila Based Polymeric Composite Adsorbents for Efficient Removal of arsenic from Drinking Water**" has been accepted by the committee with the grant of ₹ 5.40 lakhs "Five lakhs and Forty thousand only".

The share of sanctioned grant among the investigators is as under:

1. Dr Monika Sogani, (PI), Manipal University Jaipur,
   Amount Sanctioned - ₹ 4.0 lakhs (Rupees four Lakhs only).
   Note: Dr. Anees A. Y. Khan is a Co-PI from MUJ.

2. Prof. K Balakrishna, (Co-PI), MAHE,
   Amount Sanctioned - ₹ 1.4 lakhs (Rupees One lakh and forty thousand only).

Breakup of the allocated grant budget

Sl. No	Researcher	Institute	Operational (Amount in lakhs and in ₹)		Capital (Amount in lakhs and in ₹)
			Year 1	Year 2	Year 1
1	Dr Monika Sogani	MUJ	1.6	1.5	0.9
2	Prof. K Balakrishna	MAHE	1.0	0.4	NA

Kindly note:

- The amount should be used only for the components mentioned in the proposal.
- The sanctioned amount is to be only utilized by the investigator mentioned under the MRB budget head.
- Investigators must follow the respective finance policies of their institution for utilization of the sanctioned grant.
- PI should submit the report every six months, or else the sanctioned budget will not be passed for utilization.
- In case of PI or Co-PI leaves the organization, the grant is not transferrable and will be seized.
- The travel expenses towards visiting collaborating institutions to be utilized from MAHE mobility grant, and PI or Co-PI will be funded to travel only once a year.

on behalf of MRB

With best regards.

Director Research 18 Sept 2023

Scanned with OKEN Scanner

Manipal Research Board/MRB Project (Sanction Number-DOR/MRB/2023/SG-05)

Project title: **Development of Microbial based Polymeric Composite Adsorbents for Efficient Removal of Arsenic from Drinking Water**

PI Name: **Dr. Monika Sogani**
University and Institute of PI: **Manipal University Jaipur, Jaipur.**

Collaborating Investigator 1 Name: **Dr. Anees Y. Khan**
University and Institute of Collaborating Investigator: **Manipal University Jaipur, Jaipur.**

Collaborating Investigator 2 Name **Dr. K. Balakrishna**
University and Institute of Collaborating Investigator: **MIT, MAHE, Manipal.**

Our Project is aligned with SDG6 and proposes the development and use of *Rhodopseudomonas palustris*-based polymeric adsorbent/biosorbent for the removal of As from drinking water which involves the mechanism of As adsorption on the surface along with its detoxification through microbial metabolic machinery. According to WHO, USEPA & BIS, the acceptable limit for As is 10 ppb, and exceeding this limit leads to significant health issues in humans, endangering millions of life across the globe.

PREVENTION OF WATER POLLUTION AT MANIPAL UNIVERSITY JAIPUR

CLEAN AND SMART CAMPUS

- Solar Power Plant of 2.3 MWp is installed on roof-top of the buildings, Ground Mounted and parking shed in the Campus - one of the largest roof-top Solar Power Plant in India for any Private University.
- The University is a **'Zero Discharge Campus'**, with Rain Water Harvesting, Waste water recycling and reuse and Ground Water recharging in place. Water conservation through campus wide drains and ponds for water collection.
- Sewage treatment plants on both sides of the campus.
- Campus greening through extensive tree plantation.
- The University has a Bio-Gas generation system using Kitchen waste, producing 30kg of Gas per day with 500 kg of Kitchen waste.
- All buildings are optimally designed to maximize daylight and minimize heat gains.
- Digital Campus

MANIPAL UNIVERSITY
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SOLID WASTE MANAGEMENT- Segregation & Collection at Source

Solid waste Generation Data

MANIPAL UNIVERSITY
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MEDICAL WASTE SEGREGATION MANAGEMENT

MANIPAL UNIVERSITY
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(University under Section 2(f) of the UGC Act)

SOLID KITCHEN WASTE MANAGEMENT

Sr.No	Department/ Area of source of waste (Everypoint of waste generation within the campus should be identified and listed - sepa	Types of waste generated in each of the point source (for each type of waste, use separate row)						Day (in kgs/ day
		Food wastage	Paper/Card board	Plastic	Wood	Glass	Metal	
Mar-19	MUJ Academic Blocks		6790	65	60		120	7035
Mar-19	MUJ HOSTEL Blocks	4279						
Apr-19	MUJ Academic Blocks		92	33	44	0	20	189
Apr-19	MUJ HOSTEL Blocks	3689					940	940
May-19	MUJ Academic Blocks		73	28	31	2	17	151
May-19	MUJ HOSTEL Blocks	2452		391			860	1451
Jun-19	MUJ Academic Blocks		68	23	31	1	17	142
Jun-19	MUJ HOSTEL Blocks	1160					700	700
Jul-19	MUJ Academic Blocks		88	36	46	0	26	192
Jul-19	MUJ HOSTEL Blocks	4638					340	340
Aug-19	MUJ Academic Blocks		101	40	47	0	29	217
Aug-19	MUJ HOSTEL Blocks	4596		260			380	640
Sep-19	MUJ Academic Blocks		97	30	62	1	37	227
Sep-19	MUJ HOSTEL Blocks	2529						
Oct-19	MUJ Academic Blocks		170	98	92	0	82	387
Oct-19	MUJ HOSTEL Blocks	4799						
Nov-19	MUJ Academic Blocks		66	35	71	0	79	192
Nov-19	MUJ HOSTEL Blocks	4133						
Dec-19	MUJ Academic Blocks		81	98	48	0	48	187
Dec-19	MUJ HOSTEL Blocks	2033						
Jan-20	MUJ Academic Blocks		112	62	51	0	76	325
Jan-20	MUJ HOSTEL Blocks	6196						
Feb-20	MUJ Academic Blocks		73	70	31	8	82	302
Feb-20	MUJ HOSTEL Blocks	6178						
Mar-20	MUJ Academic Blocks		88	30	46	8	46	158
Mar-20	MUJ HOSTEL Blocks	5139						
Apr-20	MUJ Academic Blocks		23	17	26	2	17	68
Apr-20	MUJ HOSTEL Blocks	NIL						
May-20	MUJ Academic Blocks		40	46	35	5	41	126
Jun-20	MUJ Academic Blocks		38	38	24	3	42	100
Jul-20	MUJ Academic Blocks		42	33	33	6	39	113
Aug-20	MUJ Academic Blocks		20	21	31	3	26	78
Sep-20	MUJ Academic Blocks		27	16	22	6	41	71

Collection frequency & clearance: Twice a day

Time: 9:00 AM & 4:00 PM

HUMAN RESOURCE FOR WASTE MANAGEMENT

HOUSEKEEPING and SUPPORT STAFF AT MUJ

GREEN CLUB @ MUJ since 2012

The Green Club of Manipal University Jaipur has been an active social and environment fruition club since 2012 and has continued to aid a helping hand for the benefactor factor of the environment. Since its inception, the club has motivated the students or the Y-Generation and faculty members to take initiative about the environment that we subsist in which sorrowfully is under rapid depletion. From social awareness, technical solutions, to more evident clean drives and plantation, the club has been working extensively on such projects and pioneers path breaking ideas for the future.

➢ Green Club Report (click here)

MANIPAL UNIVERSITY JAIPUR

(University under Section 2(f) of the UGC Act)

Clean And Smart Campus 2021

T44 Gulmohar *Fabaceae*

T43 Kadamb *Rubiaceae*

T10 Sant Patti *Alstonia scholaris*

T19 Bottle Brush *Callistemon*

T15 Maulsari *Mimusops elengi*

T19 Bottle Brush *Callistemon*

T40 Rugtoora *Ruellia tuberosa*

T? Sheesham *Dalbergia sissoo*

T17 Neem *Azadirachta indica*

T? Ashoka *Saraca asoca*

T? Banjad *Diana longifolia/alnifolia*

T8 Peela Gulmohar *Peltophorum pterocarpum*

MANIPAL UNIVERSITY JAIPUR

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Clean And Smart Campus 2021

T6 Karanja *Millettia pinnata*

Indian sub continent & Southeast Asia

Planted by - Shree Abhay Jain

Year of Plantation - 21st March 2012

Family- Fabaceae

Nature - Evergreen
Climate - Humid & Sub Tropical Region
Leaf Texture - Soft & Shiny
Leaf Shape & Colour - Round & Glossy Deep Green
Foliage Shape - Round
Soil Type -Sandy stony & clayey
Tree Height - 15 to 25 mts.
Bark Diameter - 50 cmts.
Region - Temperate Asia, Australia

Leaf type- Pinnate

Uses

- It is used for landscaping purpose due to large canopy & showy fragrant flowers.
- The bark can be used to treat wounds caused by poisonous fish.
- The fruits & sprouts are used in many traditional remedies.
- Its oil known as Pongamia oil is used in soap making & as a lubricant.
- The residue of oil extraction is used as a fertilizer.

T45 Kachnar *Bauhinia variegata*

Eastern Africa

Planted by - Shri Sunil Arora

Year of Plantation - 16-04-2012

Family- Leguminosae - Legumes

Nature - Deciduous

Climate- The desert/desert terrain plain of Western or Eastern Ghats Plateaus, plains of Ganges, Doab Punjab, eastern ranges, north east zone, high altitudes.


Zoomed Image

Shape & Colour of tree - Twigs of tree are slender, light green, angled, hairy and brownish grey in colour.


Leaf type

Foliage of tree -Spreading crown and a short bole.

Soil Type - Acid and Neutral

Height of tree - Small to medium upto 15 M


Flower type

Uses

- Treat hypothyroidism
- Controls blood sugar
- Treatment of digestive system problems

T9 Jamun *Eugnia Jambolana*

Indian sub continent

Planted by - Brig(Dr.) P.S.Siwach(Retd.)

Year of Plantation - 21st March 2012

Family- Myrtaceae

Nature - Evergreen
Climate - Tropical & Sub Tropical Region
Leaf Texture - Smooth, Leathery
Leaf Shape & Colour - Glossy Dark Green,Long with Pointy tips
Foliage Shape - Round
Soil Type - Deep Loamy
Tree Height - 30 mts.
Bark Diameter - 40-100 cmts.
Region - India, Myanmar & Srilanka

Leaf type- Pinnate

Uses

- Jambolan fruits can be eaten raw or are made into jams.
- Fruits have great nutritional value.
- Jambolan is used in medicine for diabetes, swelling of the stomach, constipation, diarrhea & other conditions.
- Jamun fruit is used in treating common cold, cough & flu.
- Jamun fruit helps in regulating blood pressure.
- The tree bark can be used for decoration.

T15 Maulsari *Minusops elengi*

South Asia

Planted by - Ms Krishna Poonia

Year of Plantation - 18-01-2017

Family- Sapotaceae (Mahua family)

Nature -Evergreen

Climate - Summer season

Shape & Colour - Bark: Thick bark and appears dark brown in color


Zoomed image

Foliage of tree - Glossy, dark green leaves

Soil Type -Rich free draining loamy and sandy soil with PH of 5.5-8.5

Height of tree- 9-18 m (30-59 ft)


Flower type

Diameter of trunk - 1m (3ft 3in)

Region - Tropical forest in South Asia, Southeast Asia and northern Australia


Leaf type

Uses

- Treatment and maintenance of oral hygiene
- Rinsing mouth with water solution made with baked helps to strengthening the teeth
- Prevents bad breath
- Keeps gums healthy

Cleanliness Drive in Dehmi Kalan Jaipur

Cleanliness drive by our housekeeping staff

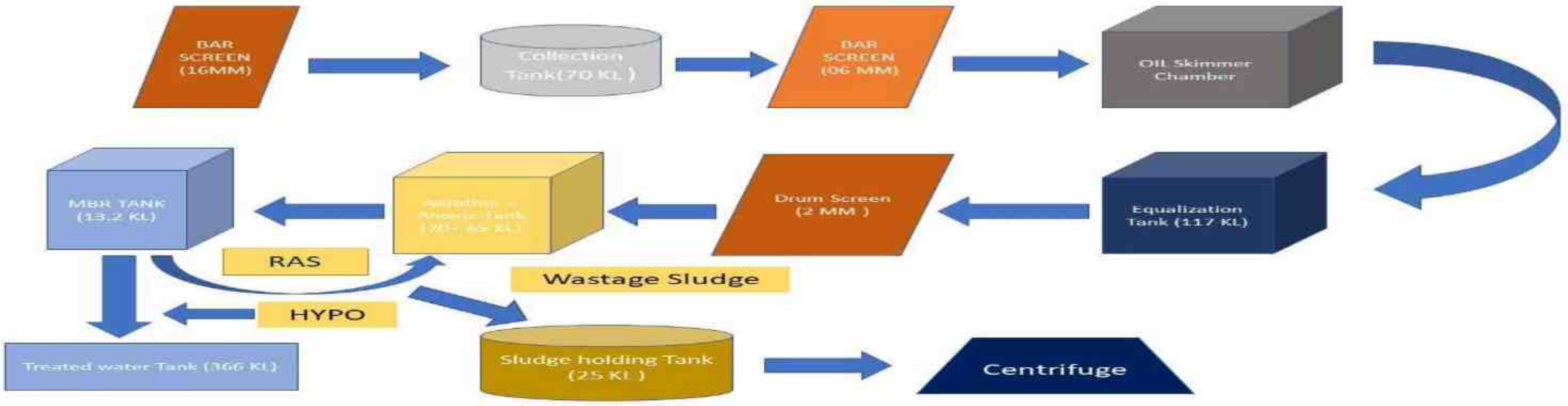
LIQUID WASTE MANAGEMENT-INHOUSE- SEWAGE TREATMENT PLANT

MUJ is equipped with **4 STP** Plants with different capacity 1000 KLD, 350 KLD(two) and 150 KLD **IN TOTAL 1850 KLD**. Sewage treatment removes contaminants from wastewater, which includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safer treated water (it has been used for flushing and gardening). In normalcy are producing 1850KL treated water per day.

- Production of recycle waste-water report (click here)

LIQUID WASTE MANAGEMENT-INHOUSE- SEWAGE TREATMENT PLANT

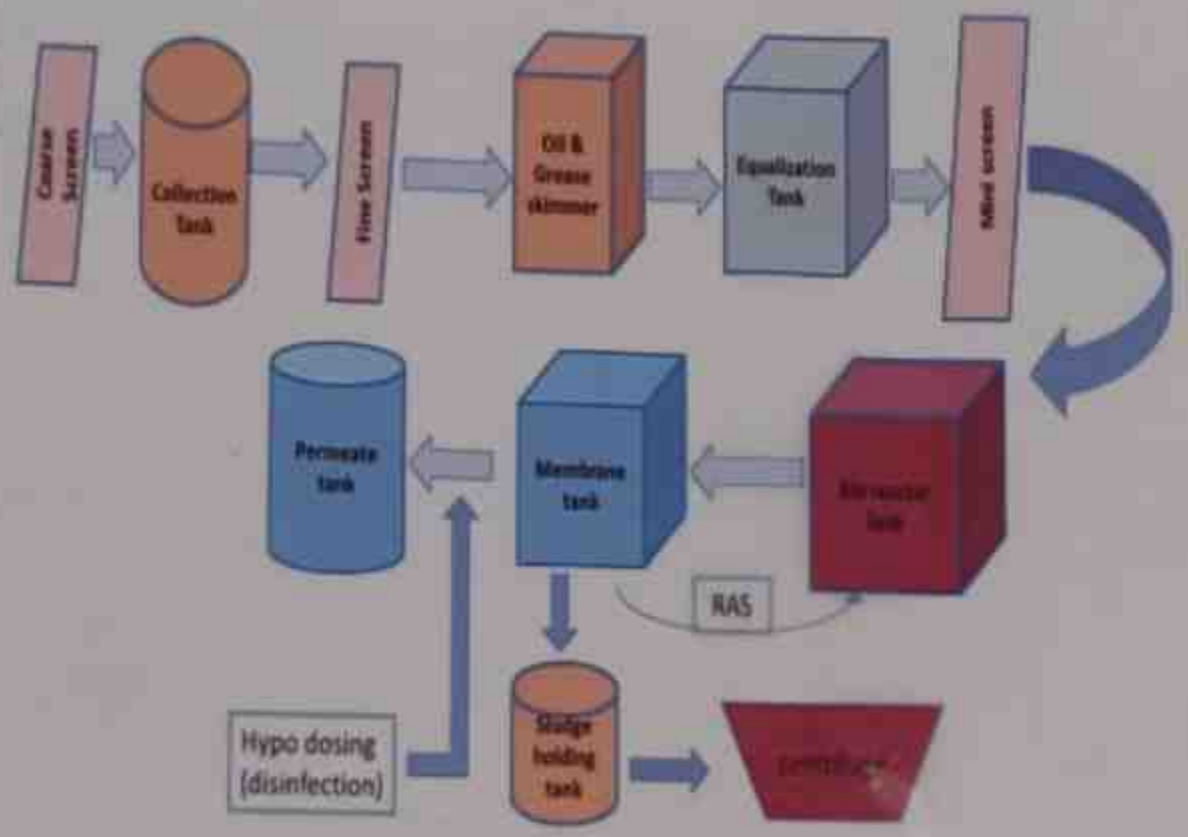
PROCESS FLOW CHART –STP (350 KLD)



Process description of STP plant

1	**Coarse Screen: -**	Provided to remove screen particles greater than 16 mm.
2	**Fine Screen : -**	To remove any screen particles greater than 6 mm.
3	**Collection Tank: -**	To transfer raw sewage to Oil and Grease Skimmer.
4	**Oil & Grease skimmer: -**	To separate coarse particles and oil & grease respectively.
5	**Equalization tank: -**	Homogenization of the effluent and feed the flow uniformly in secondary process.
6	**Drum Screen / Mini Screen: -**	To separate particles greater than 2mm size before entering to Bioreactor.
7	**Bioreactor tank: -**	Aeration tank is provided with bacterial culture to reduce organic pollutants in presence ofoxygen.
8	**MBR tanks: -**	Provided with Cassettes of membranes to separate water from mix liquid suspended solids.
9	**Sludge holding tank: -**	Wastage sludge stored in to this tank.
10	**Centrifuge: -**	Solid liquid separation of sludge.
11	**Disinfection: -**	HYPO dosing in to treated water discharge line.
12	**Permeate tank: -**	Treated water stored in this tank to supply for Horticulture & Flushing.

STP – PROCESS FLOW CHART



- Coarse Screen: Provided to remove screen particles greater than 16 mm.
- Fine Screen: To remove any screen particles greater than 6 mm.
- Collection Tank: To transfer raw sewage to Oil and Grease Skimmer.
- Oil & Grease skimmer: To separate coarse particles and oil &grease respectively.
- Equalization tank: homogenizationof the effluent and feed the flow uniformly in secondary process.
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- Bioreactor tank:Aeration tank is provided with bacterial culture to reduce organic pollutants in presence of oxygen.
- MBR tanks: Provided with Cassettes of membranes to separate water from mix liquid suspended solids.
- Sludge holding tank: wastage sludge stored in to this tank.
- Centrifuge:Solid liquid separation of sludge.
- Disinfection:HYPO dosing in to treated water discharge line.
- Permeate tank:treated water stored in this tank.

ACURE SOLUTION ENVIRO ENGINEERS | 07/11/2023

T.P.	350KLD	150KLD	UGR	MUJ	FACULTY
H.	7.7	-	P.H.	—	7.5
D.S.	804	-	HARDNESS	—	06
BIDITY	—	-	T.D.S.	—	691
EPRO	-0.48	-	TURBIDITY	—	—
-LET	230 m^3	-	F.R.C.	—	0.2
T-LET	181 m^3	-	PRODUCTION	—	32 m^3
ERGY, KW	317	06	REG.	—	Done
DG & E waste.	—	-			
V-30	950	-			
D.O.	—	-			

⇒ D.O. Meter Not Calibrate
⇒ Trb Meter (N/W)
⇒ U.P.S. (N/W) properly

MUJ-UGR = Filter feed Pump N. 1, 2 sent for Maintenance. (25/10/2023)