About Us:

Swami Rama Himalayan University (SRHU), a NAAC A+ accredited private university in Dehradun, is dedicated to transforming lives through a holistic approach to education. By integrating quality health care services with impactful rural development and social outreach programs, SRHU fosters academic and professional excellence with a focus on societal well-being.

Building on the rich legacy of the **Himalayan Hospital** and the **Himalayan Institute of Medical Sciences—**the first and largest NABH-accredited private teaching hospital and medical college in Uttarakhand—SRHU has spent the last decade empowering the youth to evolve into efficient, ethical, and committed professionals who make a meaningful impact.

SRHU stands out with its unique integration of healthcare and education. We house a multispecialty Himalayan Hospital, Cancer Research Institute (CRI), Ayurveda Centre, and a Rural Development Institute (RDI) under one roof, complemented by seven diverse schools and colleges which are Himalayan Institute of Medical Sciences (HIMS), Himalayan College of Nursing (HCN), Himalayan School of Management Studies (HSMS), Himalayan School of Science & Technology (HSST), Himalayan School of Bio Sciences (HSBS), Himalayan School of Yoga Science (HSYS), Himalayan School of Pharmaceutical Sciences (HSPS).

SRHU recognizes this responsibility and has established a state-of-the-art Sewage Treatment Plant (STP) to efficiently treat and recycle wastewater generated on its campus. The university's STP is designed to align with global sustainability standards, including the United Nations Sustainable Development Goal 6 (Clean Water and Sanitation), and adheres to national environmental guidelines set by the Central Pollution Control Board (CPCB) and the State Pollution Control Board (SPCB).

At SRHU, the STP is not just a facility for wastewater treatment but a vital part of the institution's green campus initiative, promoting environmental conservation and resource efficiency. With a comprehensive multi-stage treatment process, including equalization, pH regulation, aeration, primary and secondary sedimentation, Moving Bed Biofilm Reactor (MBBR) technology, and dual media filtration, the plant ensures that treated water meets the highest quality standards. This treated water is then reused for irrigation, sanitation, and campus maintenance, significantly reducing the university's dependence on fresh water.

INTRODUCTION:

Water conservation and sustainable Waste Water management have become critical global challenges, aligning With the United Nations Sustainable Development Goals (SDG 6: Clean Water and Sanitation). Higher educational institutions play a significant role in environmental stewardship, promoting responsible Water management.

The following facilities are available in the Campus: -

1. Sewerage Treatment Plant (STP)

Sewage treatment is a critical aspect of environmental conservation. Posing significant environmental challenges, improper disposal of sewage can lead to water pollution, diseases and harm to aquatic ecosystems. SRHU ensures that wastewater is properly treated before being used in gardening, minimizing pollution and safeguarding public health. SRHU has taken a significant step towards environmental responsibility by establishing a 1 MLD sewage treatment plant (STP) on its campus. The treated water, having quality parameters in consonance with the statutory limits specified by the state pollution control board, is used for water the plants in parks and other green areas.

The biological treatment system provided within the premises consists of Moving Bed Bio Reactor (MBBR) scheme as illustrated in process flow diagram chart. Raw sewage after bar screening is collected in collection tank from where it is pumped to MBBR aeration tank. The sewage from the MBBR tank is allowed for settling in settling tank. The overflow from the settling tank goes through Pressure Sand Filter (PSF) and Activated Carbon Filter (ACF). The treated sewage is partially taken for gardening and for Ultrafiltration (UF). The manure produced through STP is utilized in green belt. The STP inlet and outlet water is tested every six months from NABL accredited laboratory and found within norms.

2. Effluent Treatment plant (ETP)

SRHU is committed to creating a sustainable and environmentally conscious campus. One significant step towards achieving this goal is the establishment of an Effluent Treatment Plant (ETP) with the increasing population and various activities on campus, SRHU generates a substantial amount of wastewater daily. This wastewater includes water used in laboratories and other facilities like laundry. Without proper treatment, this wastewater poses a threat to the environment, public health, and the overall aesthetics of the campus. Treated water from the ETP is not wasted. It is recycled and reused for non-potable purposes, like irrigation, thus conserving precious freshwater resources. The total capacity of the ETP installed in SRHU is 90 KLD.

3. Water Requirement and supply

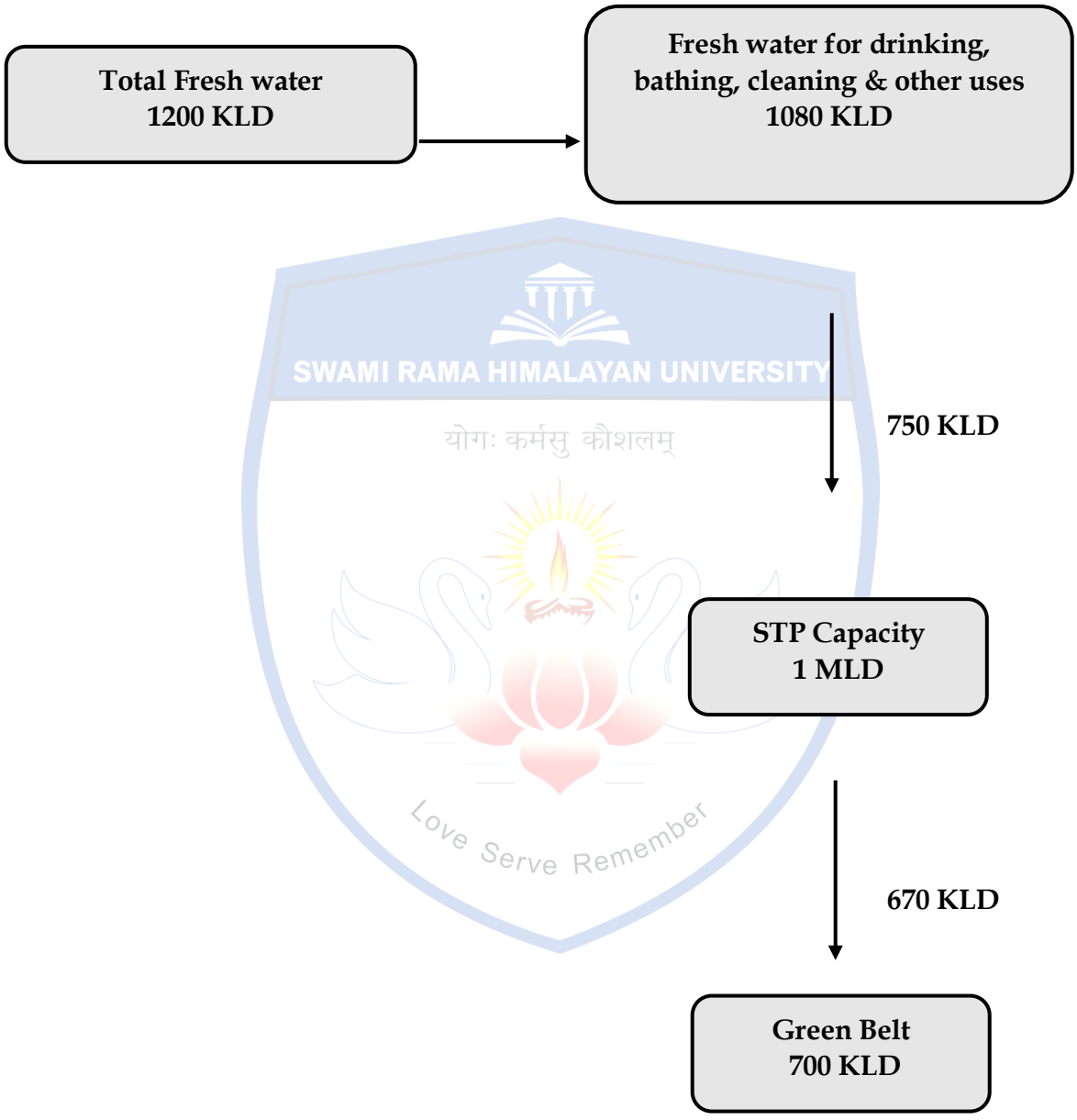
Fresh water requirement - 1200 KLD

Gardening water requirement – 700 KLD (Treated Sewage)

Water Requirement Calculation Table

S.No.	Description	No. of persons	Total Water Requirement (LPD)
1	Hospital- IPD	1200 beds	5,40,000 450 LPD
2	Hospital- OPD	1200 beds	18,000 15 LPD
3	Staff Residence, MBBS Hostel, Hostel mess, Laundry, Nursing Hostel, Medical quarters	3047	4,11,345 135 LPD
4	Kitchen & Laundry for 1200 beds	1200 beds	2,16,000 180 LPD
5	Office staff	400	18,000 45 LPD
	Total		**12,03,345**

Water balance chart



Recycled Water Utilization

The table below presents the recycled water volumes, showing a notable increase in wastewater recycling efficiency in 2024.

MONTH	RECYCLED WATER (LPD) (2023)	RECYCLED WATER (LPD) (2024)	% INCREASE (YoY)
Jan	554634	709026	27.8%
Feb	552684	703902	27.3%
Mar	556008	702636	26.4%
Apr	617520	768900	24.5%
May	661722	816366	23.3%
Jun	706578	817338	15.7%
Jul	701496	782262	11.7%
Aug	702756	794556	13%
Sep	755160	791400	4.8%
Oct	756138	784488	3.7%
Nov	682002	753918	10.5%
Dec	716304	771000	7.6%

- Total Recycled Water (2023): 8.14 million liters
- Total Recycled Water (2024): 9.19 million liters
- Annual Increase in Water Recycling: +12.9%

Applications of Recycled Water

The treated wastewater is utilized across the campus for:

- Irrigation & Landscaping – Reducing groundwater consumption.
- Toilet Flushing – Minimizing potable water wastage.
- Cleaning & Maintenance – Used for roads, pathways, and buildings.

Status of STP / ETP:

Table of STP & ETP parameters Characteristics of Samples

STP Testing Parameter Summery

S.N	Parameter	Plant	Inlet Result	Outlet Result
1	PH	STP	6.75	7.21
2	Chemical oxygen demand (COD), mg/L		708.5	39.4
3	Biochemical Oxygen demand (BOD) at27C for 3 days		141.8	8.3
4	Total Suspended solid (TSS), mg/L		290	17.0
5	Oil & Grease, Mg/L		Less than 4	--
			Microbiological Parameter	
6	Fecal Coliform MPN/ 100 ML		70	<2

ETP Water Testing Parameter Summery- 40 KLD

S.N	Parameter	Plant	Inlet Result	Outlet Result
1	PH	ETP- 40 KLD	7.11	7.06
2	Chemical oxygen demand (COD), mg/L		127.9	78.7
3	Biochemical Oxygen demand (BOD) at27C for 3 days		30.3	19.3
4	Total Suspended solid (TSS), mg/L		380.0	45.0
5	Oil & Grease, Mg/L		Less than 4	Less than 4
			Microbiological Parameter	
6	Fecal Coliform MPN/ 100 ML		13	<2

ETP Water Testing Parameter Summery- 50 KLD

S.N	Parameter	Plant	Inlet Result	Outlet Result
1	PH	ETP 50 KLD	6.82	7.02
2	Chemical oxygen demand (COD), mg/L		846.2	19.7
3	Biochemical Oxygen demand (BOD) at27C for 3 days		171.7	4.5
4	Total Suspended solid (TSS), mg/L		330.0	35.00
5	Oil & Grease, Mg/L		Less than 4	Less than 4
			Microbiological Parameter	
6	Fecal Coliform MPN/ 100 ML		90	<2

STP water Testing Report

Inlet

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TC-5163

TEST REPORT Format No. DARL/QF/50

ULR No.: TC516324000199B1F

Report Issue to: Swami Rama Himalayan University, Swami Rama Nagar Doiwala Dehradun Uttarakhand - 248140.		Report No.	820241225WT003
		Sample Receipt Date	25/12/2024
		Test Started On	25/12/2024
		Date of Completion	30/12/2024
		Issue Date	30/12/2024
Name of Sample	STP Inlet (1 MLD)		
Brand Name	N.S.	Date of Sampling	25/12/2024
Sample Quantity	1 Ltr	Batch/Lot No.	N.S.
Sample Collected by	Our Lab Representative Mr. Rajan	Manufacturing Date	Not Specified
Sampling Method	N.S	Expiry Date	Not Specified
Sample Description	STP Inlet (1 MLD)		

TEST RESULTS

Group Name : Water Discipline : Chemical

S.No.	Test Parameter	Unit	Result	Test Method
1	pH	--	6.75	IS : 3025(P-11):2022 Clause no. 9
2	Total suspended solid(TSS)	mg/L	290.0	IS : 3025(P-17):2022 Clause no. 6.1
3	Biochemical oxygen demand (BOD) at 27OC for 3 days	mg/L	141.8	IS : 3025(P-44):2023 Clause no.9
4	Chemical oxygen demand (COD)	mg/L	708.5	IS : 3025(P-58):2023 Clause no. 9
5	Oil and grease	mg/L	Less than 4	IS:3025(P-39):2021 Clause no 5.5
6	Microbiological Parameter	-	-	
7	Faecal coliform	MPN/100ml	70	IS:1622:1981 Clause no. 3.3.3

Remarks : The Party asked for above test only.

End of Report

Authorised Signatory
Mr. Manmohan pandey
Manmohan pandey
Authorized Signatory (Chemical)

Review by

Page No. 1/1

Note : 1. The results are related to the test items only. 2. Sample will be destroyed after one month from the date of issue of test report. 3. This report is not be reproduced wholly or in part and cannot as an evidence in the court of law and should not be used in any advertisement media without written consent. 4. Laboratory is not responsible for customer provided details. 5. When report is without NABL Symbol & ULR, it implies that these products & tests are not covered under NABL accredited scope.

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TC-5163

TEST REPORT Format No. DARL/QF/50

ULR No.: TC516324000199B4F

Report Issue to: Swami Rama Himalayan University, Swami Rama Nagar Doiwala Dehradun Uttarakhand - 248140.		Report No.	820241225WT006
		Sample Receipt Date	25/12/2024
		Test Started On	25/12/2024
		Date of Completion	30/12/2024
		Issue Date	30/12/2024
Name of Sample	STP Outlet water		
Brand Name	N.S.	Date of Sampling	25/12/2024
Sample Quantity	1 Ltr	Batch/Lot No.	N.S.
Sample Collected by	Our Lab Representative Mr. Rajan	Manufacturing Date	Not Specified
Sampling Method	N.S	Expiry Date	Not Specified
Sample Description	STP Outlet water		

TEST RESULTS

Group Name : Water Discipline : Chemical

S.No.	Test Parameter	Unit	Result	Limit	Test Method
1	pH	--	7.21	5.5 to 9.0	IS : 3025(P-11) 2022 Clause no. 9
2	Total suspended solid(TSS)	mg/L	17.0	20 Max.	IS : 3025(P-17):2022 Clause no. 6.1
3	Biochemical oxygen demand (BOD) at 27OC for 3 days	mg/L	8.3	10 Max.	IS : 3025(P-44):2023 Clause no.9
4	Chemical oxygen demand (COD)	mg/L	39.4	50 Max.	IS : 3025(P-58):2023 Clause no. 9
5	Oil and grease	mg/L	Less than 4	---	IS:3025(P-39):2021 Clause no 5.5
6	Microbiological Parameter	-	-	--	
7	Faecal coliform	MPN/100ml	<2	--	IS:1622:1981 Clause no. 3.3.3

Remarks : The above tested sample complies as per C.P.C.B. guideline with respect to above test only.

End of Report

Authorised Signatory
Mr. Manmohan Pandey

Review by

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ETP water Testing Report- 40 KLD

Inlet

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TEST REPORT Format No. DARL/QF/50

ULR No.: TC516324000019979F

Report issue to: Swami Rama Himalayan University, Swami Rama Nagar Doiwala Dehradun Uttarakhand - 248140.	Report No.	820241225WT002
	Sample Receipt Date	25/12/2024
	Test Started On	25/12/2024
	Date of Completion	30/12/2024
	Issue Date	30/12/2024

Name of Sample	ETP Inlet (40 KLD)		
Brand Name	N.S.	Date of Sampling	25/12/2024
Sample Quantity	1 Ltr	Batch/Lot No.	N.S.
Sample Collected by	Our Lab Representative Mr. Rajan	Manufacturing Date	Not Specified
Sampling Method	N.S	Expiry Date	Not Specified
Sample Description	ETP Inlet (40 KLD)		

TEST RESULTS

Group Name : Water Discipline : Chemical

S.No.	Test Parameter	Unit	Result	Test Method
Chemical Parameters				
1	pH	--	7.11	IS : 3025(P-11):2022 Clause no. 8
2	Chemical oxygen demand	mg/L	127.9	IS : 3025(P-58):2023 Clause no. 9
3	Total suspended solid (TSS)	mg/L	360.0	IS : 3025(P-17) :2022 Clause no. 6.1
4	Biochemical oxygen demand (BOD) at 270C for 3 days	mg/L	30.3	IS : 3025(P-44) :2023 Clause no.9
5	Oil & Grease	mg/L	Less than 4	IS:3025(P-39) 2023 Clause no.9
Microbiological Parameter				
6	Faecal coliform	MPN/100ml	13	IS:1622:1981 Clause no. 3.3.3

Remarks : The Party asked for above test only.

End of Report

Review by

Authorised Signatory
Mr. Manmohan pandey
Authorised Signatory (Chemical)

Page No. 1/1

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TC-5163

TEST REPORT Format No. DARL/QF/50

ULR No.: TC516324000019982F

Report issue to: Swami Rama Himalayan University, Swami Rama Nagar Doiwala Dehradun Uttarakhand - 248140.	Report No.	820241225WT004
	Sample Receipt Date	25/12/2024
	Test Started On	25/12/2024
	Date of Completion	30/12/2024
	Issue Date	30/12/2024

Name of Sample	ETP Outlet (40 KLD)		
Brand Name	N.S.	Date of Sampling	25/12/2024
Sample Quantity	1 Ltr	Batch/Lot No.	N.S.
Sample Collected by	Our Lab Representative Mr. Rajan	Manufacturing Date	Not Specified
Sampling Method	N.S	Expiry Date	Not Specified
Sample Description	ETP Outlet (40 KLD)		

TEST RESULTS

Group Name : Water Discipline : Chemical

S.No.	Test Parameter	Unit	Result	Limit	Test Method
1	pH	--	7.06	5.5-9.0	IS : 3025(P-11):2022 Clause no. 9
2	Total suspended solid(TSS)	mg/L	45.0	100 Max.	IS : 3025(P-17) :2022 Clause no. 6.1
3	Biochemical oxygen demand (BOD) at 270C for 3 days	mg/L	19.3	30 Max.	IS : 3025(P-44):2023 Clause no.9
4	Chemical oxygen demand (COD)	mg/L	78.7	250 Max.	IS : 3025(P-58):2023 Clause no. 9
5	Oil and grease	mg/L	Less than 4	10 Max.	IS:3025(P-39) :2021 Clause no.5.5
6	Microbiological Parameter	-	-		
7	Faecal coliform	MPN/100ml	<2	--	IS:1622:1981 Clause 3.3.3

Remarks : The Party asked for above test only.

End of Report

Review by

Authorised Signatory
Mr. Manmohan pandey
Authorised Signatory (Chemical)

Page No. 1/1

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ETP water Testing Report- 50 KLD

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TEST REPORT Format No. DARL/QF/50

ULR No.: TC516324000019978F

Report Issue to: Swami Rama Himalayan University, Swami Rama Nagar Doiwala Dehradun Uttarakhand - 248140.		Report No.	820241225WT001
		Sample Receipt Date	25/12/2024
		Test Started On	25/12/2024
		Date of Completion	30/12/2024
		Issue Date	30/12/2024
Name of Sample	ETP Inlet (50 KLD)		
Brand Name	N.S.	Date of Sampling	25/12/2024
Sample Quantity	1 Ltr	Batch/Lot No.	N.S.
Sample Collected by	Our Lab Representative Mr. Rajan	Manufacturing Date	Not Specified
Sampling Method	N.S	Expiry Date	Not Specified
Sample Description	ETP Inlet (50 KLD)		

TEST RESULTS

Group Name : Water Discipline : Chemical

S.No.	Test Parameter	Unit	Result	Test Method
Chemical Parameters				
1	pH	--	6.82	IS : 3025(P-11):2022 Clause no. 9
2	Chemical oxygen demand	mg/L	846.2	IS : 3025(P-58):2023 Clause no. 9
3	Total suspended solid (TSS)	mg/L	330.0	IS : 3025(P-17) :2022 Clause no. 6.1
4	Biochemical oxygen demand (BOD) at 270C for 3 days	mg/L	171.7	IS : 3025(P-44) :2023 Clause no.9
5	Oil & Grease	mg/L	Less than 4	IS:3025(P-39):2023 Clause no.9
Microbiological Parameter				
6	Faecal coliform	MPN/100ml	90	IS:1622:1981 Clause no. 3.3.3

Remarks : The Party asked for above test only.

End of Report

Authorised Signatory

Review by

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TC-5163

TEST REPORT Format No. DARL/QF/50

ULR No.: TC516324000019983F

Report Issue to: Swami Rama Himalayan University, Swami Rama Nagar Doiwala Dehradun Uttarakhand - 248140.		Report No.	820241225WT005
		Sample Receipt Date	25/12/2024
		Test Started On	25/12/2024
		Date of Completion	30/12/2024
		Issue Date	30/12/2024
Name of Sample	ETP Outlet (50 KLD)		
Brand Name	N.S.	Date of Sampling	25/12/2024
Sample Quantity	1 Ltr	Batch/Lot No.	N.S.
Sample Collected by	Our Lab Representative Mr. Rajan	Manufacturing Date	Not Specified
Sampling Method	N.S	Expiry Date	Not Specified
Sample Description	ETP Outlet (50 KLD)		

TEST RESULTS

Group Name : Water Discipline : Chemical

S.No.	Test Parameter	Unit	Result	Limit	Test Method
1	pH	--	7.02	5.5-9.0	IS : 3025(P-11):2022 Clause no. 9
2	Total suspended solid(TSS)	mg/L	35.0	100 Max.	IS : 3025(P-17) :2022 Clause no. 6.1
3	Biochemical oxygen demand (BOD) at 270C for 3 days	mg/L	4.5	30 Max.	IS : 3025(P-44):2023 Clause no.9
4	Chemical oxygen demand (COD)	mg/L	19.7	250 Max.	IS : 3025(P-58):2023 Clause no. 9
5	Oil and grease	mg/L	Less than 4	10 Max.	IS:3025(P-39) :2021 Clause no 5.5
6	Microbiological Parameter	-	-		
7	Faecal coliform	MPN/100ml	<2	--	IS:1622:1981 Clause 3.3.3

Remarks : The above tested sample complies as per C.P.C.B. guideline with respect to above test only.

End of Report

Authorised Signatory

Review by

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Standard Operating Procedure for STP – 1 MLD

Objective : To lay down SOP for STP

Scope : This sop shall be applicable for STP

Responsibility : Assistant Engineer (Mech)/ Operator/supervisor/ technician

Accountability : Head (E&M)

PLANT OPERATING PROCEDURE:

- Start the Raw Water Pump (R1) and kept the pump delivery flow as per the design flow and excess flow of sewage is by-passed to the Collection Sump by using the Control valve.
- Start filling the aeration tank by maintaining the desired flow of plant.
- Switch ON the Air blower and open the air control valves provided.
- Check for air distribution in the diffusers
- Aerate the aeration tank continuously
- Check for brown color of the sewage in the aeration tank which shows good bacterial growth in the aeration tank
- Once bacterial growth achieved operate the system as per the cycle provided for MBBR system.
- When the water falls into the Intermediate tank from secondary clarifier start the Dosing Pumps (DP1).
- The secondary treatment water is passed through a Sand Filter, followed by an Activated Carbon Filter, which is the Tertiary Treatment water.
- The Tertiary Treatment water passing out of both the filters should be clear, free of odor and turbidity.
- To maintain the MLSS, sludge recirculation pump is provided, by using control valve

recirculates half of the sludge from the secondary clarifier to the aeration tank. The remaining sludge is drained into the Sludge drying bed for proper maintenance of the plant.

Parameters to be checked daily

- ✓ Check pH of raw water in equalization sump (twice daily) – to maintain between 7 and 8.
- ✓ Check pH at final output of water (daily twice).
    - *If pH is not around 8 adjust the PH in equalization sump and aeration tank.*
- ✓ Check the sodium hypochlorite dosing.

  The prescribed qty. should be dosed every day.

  Sodium hypochlorite concentration should be 1 to 2 mg/l at the outlet.

  This can be checked by chlorine testing kit on site or sample taken and sent to laboratory.

- ✓ Check air blower, raw water pump and Recirculation sludge pump, filter feed pump etc for functioning.
- ✓ Strictly follow backwash schedule of sand /carbon filter – to be carried out every four hours.
- ✓ Air Blower should run continuously for 24 hrs., 365 days.

Sludge Management

Re-use of Sludge

Periodically the dried sludge shall be removed from the Sludge dry bed and it can be used in Garden as manure to the plants.

Filter Operation and Maintenance

Operation

1) During startup switch on the Filter feed Pump (P1) or open the Inlet Valve to Multi-port Valve after putting the Multi-port Valve handle on bypass for 2 to 5 minutes to drain so that any dirt, burr, debris in piping is washed off to drain.

2) Switch off the Filter feed pump (P1) or close the inlet valve to depressurize the Multi-port Valve and rotate the handle position of Multi-port Valve for direct inlet to outlet then switch on the Inlet Pump.

Backwash

Backwash must be carried out at 8 hrs interval in filter units for around 15 minutes till the clear water comes out. First do the backwash for Sand Filter. Then do the backwash for Carbon Filter. The following procedure for Backwash must be followed.

- Set the Multi-Port Valve in backwash mode.
- Run the Filter feed Pump for 15 Minutes and switch off.
- Set the Multi-Port Valve in Rinse mode.
- Run the Filter feed Pump for 5 Minutes and switch off.
- Set the Multi-Port Valve in Filter mode.

Maintenance

- Do not transfer any stresses on inlet or outlet piping to the Multi-port Valve.
- Drain tubing discharge point should be 200 mm lower than bottom of vessel. It should not be adjusted or altered.
- If injector does not provide suction at 2 kg/cm^2 then it is likely that the injector filter screen is clogged with debris. Unscrew the upper housing of the Valve. Pull out the screen filter carefully, clean and refit the valve. If the filter screen is okay, air trapped in the vessel may be reducing suction rate. Turn valve handle to bypass for fast rinse for 2 to 3 mins so as to expel the air. Turn Valve switch back to direct line.

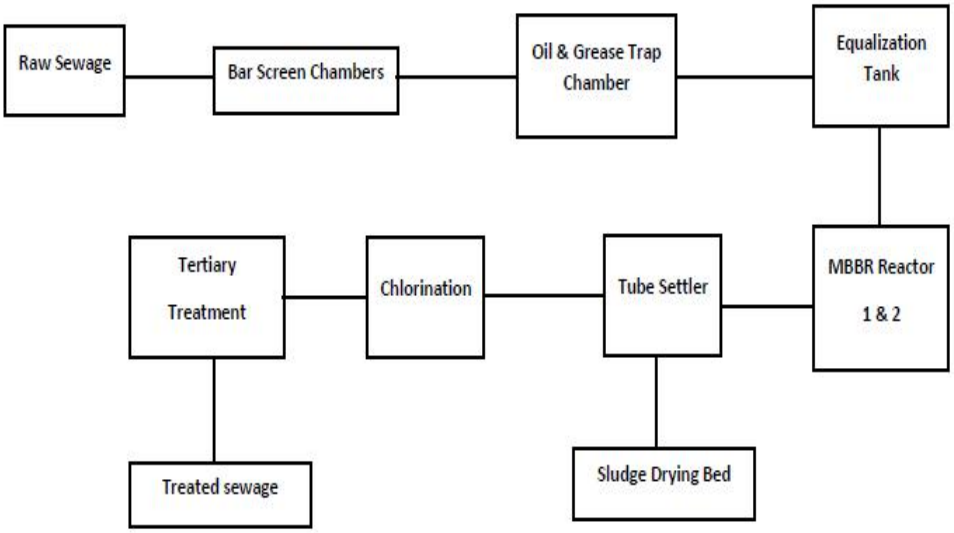
स्वामी राम हिमालयन विश्वविद्यालय
Swami Rama Himalayan University

MBBR Technology

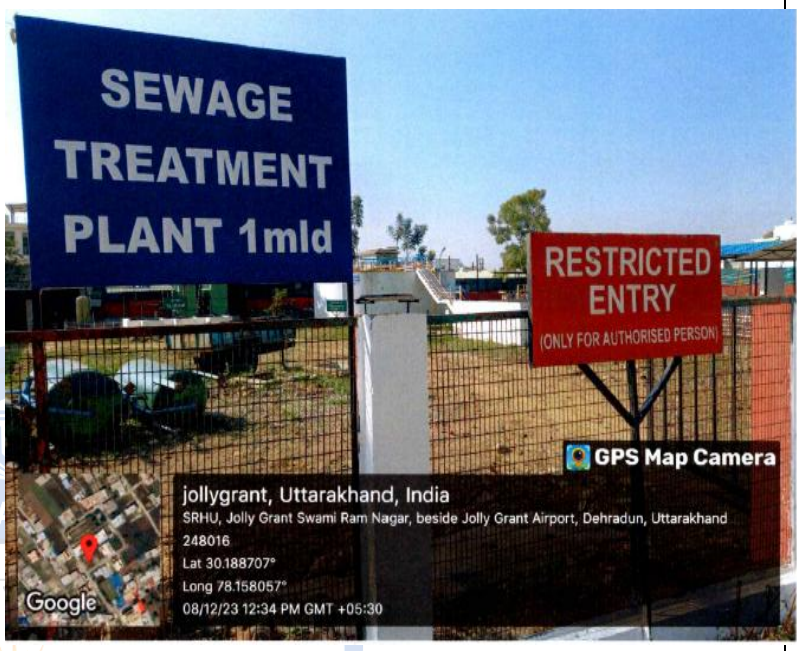
Sewerage Treatment Plant

Process Flow Diagram

Capacity- 1000 KLD



STP Plant Figure



Standard Operating Procedure for ETP – 90m^3/d

PLANT OPERATING PROCEDURE:

- Start the Raw Water Pump (R1) and kept the pump delivery flow as per the design flow and excess flow of effluent is by-passed to the Collection Sump by using the Control valve.
- Switch ON the Air blower and adjust the air flow for continuous homogenous mixing of effluent and chemicals.
- Switch on the PAC Dosing pump in the Equalization tank and Oxidation cum Kill tank.
- Start filling the Coagulation tank and switch on Dosing pumps for Caustic soda and PAC dosing for Neutralization.
- Start the Dosing pump for Poly electrolyte in the primary tank to settle the remaining suspended solids along with sludge.
- Aeration to be given in both the aeration tank -1 & 2.
- Overflow water from Aeration tank -2 enters into the secondary clarifier by gravity for settling.
- When the water falls into the Filter feed tank from secondary clarifier start the Sodium hypochlorite & Hydrogen Peroxide Dosing Pumps.
- The secondary treatment water is passed through a Sand Filter, followed by an Activated Carbon Filter, which is the Tertiary Treatment water.
- The Tertiary Treatment water passing out of both the filters should be clear, free of odor and turbidity.
- To maintain the MLSS, sludge recirculation pump is provided, by using control valve recirculates half of the sludge from the secondary clarifier to the aeration tank. The remaining sludge is drained into the Basket centrifuge for proper maintenance of the plant.

Parameters to be checked daily

- ✓ Check pH of raw water in equalization sump (twice daily) – to maintain between 7 and 8.
- ✓ Check pH at final output of water (daily twice).
    - *If pH is not around 8 adjust the PH in equalization sump and aeration tank.*
- ✓ Check the sodium hypochlorite dosing.
    - *The prescribed qty. should be dosed every day.*
    - *Sodium hypochlorite concentration should be 1 to 2 mg/l at the outlet. This can be checked by chlorine testing kit on site or sample taken and sent to laboratory.*
- ✓ Check air blower, raw water pump and Recirculation sludge pump, filter feed pump etc for functioning.
- ✓ Strictly follow backwash schedule of sand /carbon filter – to be carried out every four hours.
- ✓ Air Blower should run continuously for 24 hrs, 365 days.

Sludge Management

Dispose Sludge

M/S Bharat Oil & waste management Ltd (BOWML) duty authorized by UEPPCB Dehradun to treat, store, recycle or dispose of hazardous waste. Periodically the dried sludge shall be removed and it give to M/S Bharat Oil & waste management.

Backwash

Backwash must be carried out at 8 hrs interval in filter units for around 15 minutes till the clear water comes out. First do the backwash for Sand Filter. Then do the backwash for Carbon Filter. The following procedure for Backwash must be followed.

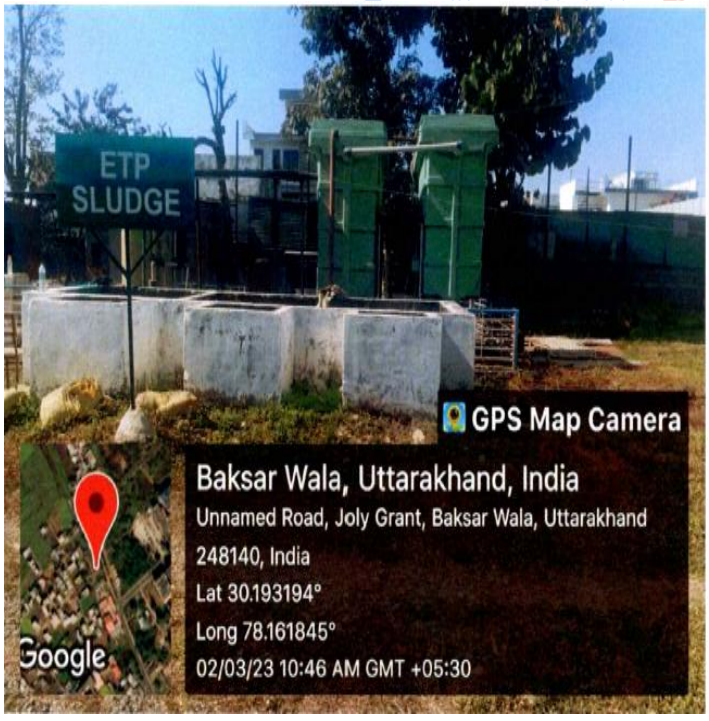
- Set the Multi-Port Valve in backwash mode.
- Run the Filter feed Pump for 15 Minutes and switch off.
- Set the Multi-Port Valve in Rinse mode.

- Run the Filter feed Pump for 5 Minutes and switch off.
- Set the Multi-Port Valve in Filter mode.

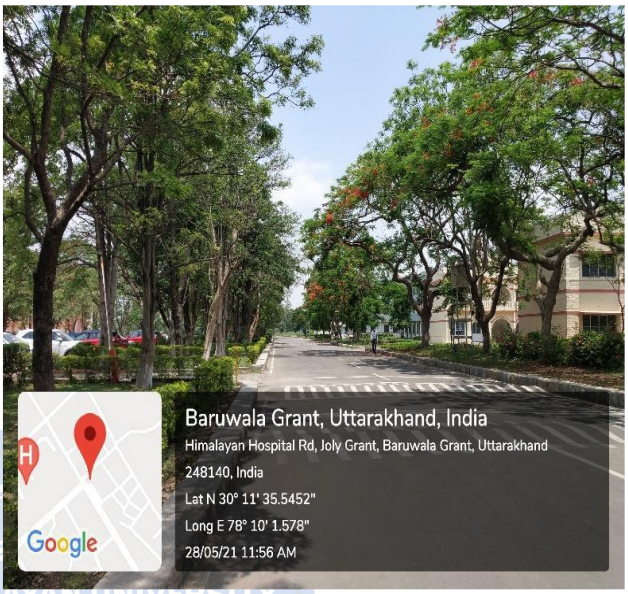
Maintenance

- Do not transfer any stresses on inlet or outlet piping to the Multi-port Valve.
- Drain tubing discharge point should be 200 mm lower than bottom of vessel. It should not be adjusted or altered.
- If injector does not provide suction at 2 kg/cm^2 then it is likely that the injector filter screen is clogged with debris. Unscrew the upper housing of the Valve. Pull out the screen filter carefully, clean and refit the valve. If the filter screen is okay, air trapped in the vessel may be reducing suction rate. Turn valve handle to bypass for fast rinse for 2 to 3 mins so as to expel the air. Turn Valve switch back to direct line.

ETP Plant Figure



Greenbelt Development:



For more information

https://cdn.srhu.edu.in/naac-ssr/cr7/7.1/7.1.3/STP%20ETP%20video.mp4

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