BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, AT NEW DELHI.

OA No. 619/2022

In the matter of:

Mast Ram & Anr.

........Applicant

Versus

State of H.P. & ors.

....Respondents

Verification report of HPSPCB in compliance to order dated 01-05-2024 passed by the Hon'ble NGT, New Delhi.

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	unit.	
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Dated: 17-08-2024

Place: Parwanoo

Respondent No. 4
HPSPCB

Verification Report on behalf of respondent No. 4 i.e. HPSPCB in compliance to order dated 1-5-2024 passed by Hon'ble NGT In OA No. 619/2022 titled as Mast Ram & Anr. Vs State of Himachal Pradesh & Ors.

1. It is submitted that Hon'ble NGT vide order dated 1-5-2024 passed the following directions to the State Board for compliance :-

   "………2.*We have gone through the Compliance report as well as verification report and we find that some of the remedial measures are yet to be complied.*

   3. Respondent No-5 is directed to file additional compliance report and Respondent No.-4 HPPCB is directed to file further verification report through email at least two days before the next date of hearing hereby fixed.

   4. List this matter for further consideration on 21.08.2024…….."

2. That in compliance to the aforementioned directions, it is submitted that the respondent unit had submitted its partial compliance report on 12.08.2024 to the State Board and final technical report of adequacy of ETP conducted by Punjab University, Chandigarh and IIT Ropar on 16.08.2024. The Regional Office, Parwanoo conducted inspection of the unit on 12.08.2024 to verify the compliance made by the unit. The detail of compliance made by the unit is tabulated as under :-

Sr. No	Joint Committee Recommendations	Compliance Status Submitted by the Unit	Physical Verification Report by HPSPCB on 08.04.2024	Latest Physical Verification Report
1.	**Recommendation No 1 & 2:** 1. The industry is neither meeting the norms/conditions of Recycle (ZLD) prescribed in the CTO issued by HPPCB and nor	The Project Proponent is having the utmost intention to comply with all the regulatory requirements and has taken timely efforts as required and	It has been verified through physical inspection of the unit conducted on 08.04.2024 that the unit has achieved Zero Liquid discharge for	The unit was inspected on dated 12.08.2024. The unit was operational during inspection. The effluent treatment plant was

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	meeting the inlet norms of CETP prescribed by the Himachal Government/PPCB for sending the effluent to CETP, in violation of the conditions of Consent to Operate. 2. According to HPPCB Member*"though the ETP of the Industry has been found to be non-operational by the Joint Committee, the industry has been treating a part of effluent (10-15 m3/day) and sending the remaining untreated effluent without complying with the Inlet norms of CETP for the last 04 years, in violation of conditions of CTO"*The industry has been given ETP Upgradation Schedule to	thus achieved the ZLD. That the Project Proponent requests the Hon'ble Tribunal to view certain facts of the matter. The unit of the Project Proponent has never ever discharged any effluent to nearby nallah or into the local environment before or even after treating only 10-15KL of low TDS-low COD effluent in house. As the said unit was established in the year 1984 and many problems were being faced due to factors beyond the reasonable control of the Project Proponent and other factors such as topographical, old structure, and use of traditional equipment. That due to these reasons, the Project Proponent	the Effluent treatment plant. The unit has also provided Online Continuous Effluent Monitoring System (OCEMS) at the final outlet and connected with State Board Server. The unit has not sent any effluent to CETP Baddi Since 11th February 2024. The photographs of the unit Photographs 1-10 taken during the inspection on 08.04.2024 are attached as Annexure-I. **<u>Details</u>:-** The unit is engaged in manufacturing of (i) Loratadine (LB-L10) 180 MTper annum, (ii) Montelukast 72 MT per annum and	operational. The unit was achieving zero liquid discharge. Average daily 45 KL of process effluent from all streams was being generated and treated in ETP of capacity 72 KLD comprising of Equalization Tank, Primary Settling Tanks, Stripper, ATFD, 04 stages MEE, Activated Sludge Process, Secondary settling tanks, Multi-grade & Activated Carbon Filter & Dual Stage Reverse Osmosis System. The treated process effluent is being reused in cooling towers. The unit has installed water meters at inlet and at final outlet (RO permeate and reject).

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	HPPCB, with a deadline of July, 2023 for achieving Zero Liquid discharge (ZLD), which is being monitored by HPPCB, which further confirm that ETP is not adequate to treat the entire effluent and recycle it i.e. ZLD. *It is recommended that the validity period of the CTO granted to the industry by HPPCB, is linked with the deadline for the achieving Zero Liquid Discharge (ZLD) given by the industry.*	despite its best efforts was facing many operational challenges to run the ETP on its full load i.e. 61.50 KL as per the CTO granted and was unable to treat its 100% effluent. Due to which the Project Proponent could not meet the Inlet norms for the effluent being sent to CETP. That it is brought to the kind notice of the Hon'ble Tribunal that another reason was that later the Incinerator of the Project Proponent was shut down and MEE concentrate present in the effluent lead to high inlet parameters. The Project Proponent in 2019 took the decision to overhaul its ETP and thereby requested the PCB to allow it to temporarily send the remaining	iii) Desloratadine 24 M.T. per annum and falls under Red Category. The unit has valid renewal of Consent to Operate till 31.03.2025. The authorization under HWMR Rules 2016 is valid upto 31.03.2028. The unit has provided ETP of capacity 72 KLD for treatment of process effluent. The process effluent is being segregated by the unit into 04 streams i.e. bio-degradable low inorganic effluent, high inorganic effluent, organic effluent and effluent from utilities (sand filter backwash, DM plants, boiler blow down, cooling tower bleed streams etc.).The treatment	The unit has installed Online Continuous Effluent Monitoring System (OCEMS) at the final outlet and connected with State Board Server. The link of the server is https://hppcb.glensserver.com/#/publicPortal/industryDetails/site_146/DRUGS%20AND%20PHARMACEUTICALS . The real time data is being transmitted to State Board server regularly. Copy of OCEMS for last 03 months is attached as **Annexure-A1.** Further, the unit was directed to install 360 degree camera focussing on the Nallah located downstream of the ETP and

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		high TDS-high COD effluent (35-40KL) to CETP for its treatment and disposal till the upgradation of the ETP is done to achieve the ZLD. It is pertinent to mention here that the Project Proponent was paying the treatment charges proportionally as per the formula laid down in the tri-partite agreement. The said project was initiated back in 2019 and steps were taken in a timely manner. Although despite the best efforts at the time there was an unexpected delay in the project due to Covid-19 pandemic and the harsh climatic conditions and severe monsoons of the year 2023, which not only disrupted transportation but wreaked havoc on the day-to-day	process of the unit is as follows: (i) The high inorganic effluent is first fed to solvent stripper wherein solvent is removed from the effluent. The recovered solvent is sent to recyclers and the remaining Mixed Liquid goes to Equalization tank. (ii) bio-degradable low in-organic effluent is directly fed to Activated Sludge Process (ASP) for treatment. (iii) Organic effluent is directly fed to equalization tank. (iv) The effluent from utilities (sand filter backwash, DM Plants, Boiler Blow Down, Cooling tower bleed streams etc.) is directly fed to ASP tanks. The effluent from Equalization tank is fed to Primary Settling Tank (PST) wherein chemical dosing is	connect the same with State Board server. The unit has installed the camera with backup storage space of 20 days and also connected with State Board server for real-time CCTV footage transmission. Photograph of the footage of live streaming to the State Board server is attached as **Photo-P1**. The unit has also provided live stream display screen of this CCTV camera focussed on Nallah at the main gate of the unit. Photograph of public domain display is attached as **Photo-P2.** The unit has not sent any effluent to CETP Baddi since 11th

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		activities of the Project Proponent. That despite of the efforts of the Project Proponent the vendors were unable to deliver their sales and services. That it is humbly submitted that the Project Proponent, despite its best efforts at the time was unable to complete its ZLD scheme by upgrading its ETP in one go, as it needed to go for a trial run and testing of the mechanism to achieve absolute ZLD. That the Project Proponent incurred a cost of approximately an amount of Rs. 3.25 Crores upon installation and commissioning of the requisite equipment's viz. Stripper, MEE, ATFD, RO, along with ASPs. The Project Proponent took a trial run in	done to neutralize the effluent. The outlet of PST goes to MEE feed tank. In MEE effluent is converted into 02 parts i.e. MEE Distillate & MEE concentrate. The MEE Concentrate is then fed to ATDF where concentrate is converted into Salt/dry powder & ATDF distillate. The Salt/dry powder is then sent to TSDF for disposal and ATDF distillate goes to ASP tanks for further treatment. The MEE distillate is directly fed to ASP.	February 2024. The unit has provided Sewage Treatment Plant (STP) of capacity 20 KLD for treatment and disposal of domestic sewage. The treated sewage is being used for gardening purpose within plant premises. The latest analysis reports of samples collected by HPSPCB from the final outlets of ETP & STP is attached as **Annexure-A2**. The analysis results are meeting the prescribed norms. The unit has also provided online continuous emission monitoring

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		the month of November 2023 and started treating and recycling its total effluent with effect from January 11th, 2024, thereby ZLD status was achieved. That it is pertinent to address that, on the last date of hearing, i.e. 19.01.2024, the Project Proponent in good faith and to best to its knowledge made a humble submission before the Hon'ble Tribunal that the unit had achieved ZLD, however due to unforeseen disturbance in MEE and ASP's, the ZLD status was compromised during the test phase due to which untreated effluent was sent to CETP for a brief period of time from 22.01.2024 to 10.02.2024. That no effluent has	The outlet of ASP goes to 02 No. of Secondary Settling Tanks (SST) where dead sludge is removed from the bottom of SST & young/good sludge goes for recirculation in ASP tanks. The outlet of SST goes to Double stage RO System. The RO permeate is re-use in cooling towers & boiler feed & RO reject is sent to MEE feed tank for further treatment. The unit has provided complete effluent treatment plant i.e. Stripper of capacity 12 KLD (Photo-1), MEE of capacity 72 KLD (Photo-2), ATFD of capacity 300 Kg/hr (Photo-3), RO of capacity 60 KLD (Photo-	system at Boiler Stack and connected with State Board Server. The link of the server is https://sustainability.logicladder.com/public/dashboard/industry/NUNqMk5GMW1hNjRhQk5UenprNzFORWhJTE00WGRTUkd0QVNIK0RpZGZuQT0=?back=Sk1UZ2pTeWs1NnNoS08wNWVYeXBWMVNDaVZCZzFLV0JPZkFVRXVLWFhIUT0 . The graph of CEMS data from State Board server for period 1st July 2024 to 13th August 2024 is attached as **Annexure-A3**. The latest analysis report of HPSPCB of boiler stack emission of

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		been sent to CETP thereafter. Explanation: Due to adverse cold weather conditions, growth of bacteria was impacted, so ASPs were unable to perform at its desired capacity and the system was not able to stabilise its biological treatment in ASPs to treat the entire effluent. Due to this, the effluent was sent to CETP for treatment & disposal. Now, the Project Proponent has overcome the issue and restarted the ETP on ZLD. Further, we would like to emphasize here that MEE plant operates at high temperature around 80-100 degrees, and due to scaling of tubes of the calandrias, we need to take planned monthly shutdown of MEE plant.	4), Activated Sludge Process 251 KLD (Photo-5).The unit has achieved ZLD for the Effluent treatment plant as on date. The unit is reusing the final outlet (RO Permeate) into cooling towers and in boiler feed. The unit has also provided Online Continuous Effluent Monitoring System (OCEMS) (Photo-6) at the final outlet and connected with State Board Server. The unit has not sent any effluent to CETP Baddi Since 11th February 2024. Further, the unit has made necessary arrangement by installing utility	is complying with the prescribed emission norms. The report is attached as **Annexure-A4**. Further HPSPCB is also collecting the water samples of the Nallah upstream & downstream of the unit. As per analysis results, the water quality of the nallah is meeting Class-B (Best Designated Use) criteria defined by CPCB. The analysis reports are enclosed herewith as **Annexure-A5**. The unit has not submitted any proposal to install standby MEE to ensure complete zero liquid

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		Thus, during breakdown, and cleaning of the MEE, we need to send 10-12 effluent tankers in a month to CETP, Baddi for treatment & disposal purposes. That as on date, the Project Proponent has done all the necessary corrections and taken appropriate steps for process optimization which have also been successfully implemented and the status now is ZLD w.e.ffrom 11th February 2024. The trend of quantity of tankers being sent to CETP has been gradually declining from the past 2-3 months. The Project Proponent hereby confirms that the ETP is now	coils (Chilled brine and hot water) and temperature display unit to maintain adequate weather conditions in ASP for growth of bacteria. (Photo-8). The unit has proposed to provide standby MEE after completion of adequacy study by PU Chandigarh & IIT Ropar to ensure complete compliance of zero liquid discharge (ZLD) even in case of breakdown/maintenance period. The unit has also provided Sewage Treatment Plant (STP) of capacity 20 KLD is installed for the treatment and disposal of domestic sewage consisting of biological treatment & dual stage filtration i.e. MGF &ACF	discharge (ZLD) even in case of breakdown /maintenance period till now.

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		adequate to treat the entire effluent and recycle it. That it is prayed that the Hon'ble NGT may order for a site inspection to check the compliance status and allow the industry to operate as per the existing CTO.	(**Photo-7**). The treated final outlet of STP is being used for gardening purposed within plant premises.	
2.	**Recommendation No 3** As per record shared with the Joint Committee, the industry is paying 60-80 lacs per month to CETP Baddi for the last 04 years, for the treatment of its effluent, despite having its own ETP. This indicates that either the ETP installed by the industry is not adequate or it is not operated	**Compliance Status Submitted by the Unit:** That based on the inputs from the industry experts, the ETP scheme has been successfully implemented and the progress of the same shall be validated by conducting the adequacy study. The Project Proponent has signed agreements with PU Chandigarh and IIT Ropar for conducting the ETP	**Physical Verification Report By HPSPCB:** The unit has made agreement with PU Chandigarh and IIT Ropar for conducting ETP adequacy study. The teams of these institutes carried out sampling on date 24th February 2024 from the different components of ETP system for analysis. The adequacy report is still awaited.	The unit has submitted final technical report of adequacy of ETP conducted by Punjab University, Chandigarh and IIT Ropar. The report is attached herewith as **Annexure – A6.** The conclusion of final technical report states that *"The*

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	efficiently. *It is therefore recommended that adequacy study of the ETP is done by some reputed institute, so as to find out the shortcomings and upgrade the same.*	adequacy study. A team of scientists from both the institutes had visited the plant site on 16.01.2024, whereby the scope of the study was discussed in length, and it was decided that the technical audit of the ETP will be carried out for its capacity and performance to establish the efficacy of the design and performance. The adequacy study has been started with effective from 24 February 2024, wherein the team has started the collection of the grab and composed samples three times a day and in triplicate from each stage of the ETP for three different times for a period of two and a half months. The said samples will be analysed in the labs of PU,		*comprehensive upgrades in pretreatment, Multi Effect Evaporator (MEE) optimization, Activated Sludge Process (ASP) improvements, and advanced Reverse Osmosis (RO) technology underscore their proactive stance in meeting stringent regulatory standards and preparing for future environmental challenges. The initial phase of sampling highlighted critical areas necessitating immediate attention to align with environmental norms. Collaborating with academic institutions like PU Chandigarh and IIT Ropar for further analysis provided*

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		Chandigarh & IIT Ropar for water quality parameters (DO, pH, TDS, BOD, COD, Oil and grease etc.). The team will jointly submit the report after 2.5 months i.e. on 30th April 2024, which further will be submitted to the Hon'ble Tribunal by the Project Proponent. That in cases of any suggestions for improvement in process parameters and/or in ETP design, the same shall be duly incorporated in a timely manner without any undue delay. The details of the same will be provided to the NGT by the Project Proponent.		*invaluable insights that guided subsequent improvements. These efforts culminated in a robust framework aimed at achieving Zero Liquid Discharge (ZLD) and ensuring sustainable water management practices. Pretreatment initiatives, including the installation of a Primary Tube Settler (PST) and Screw Dewatering Machine, have significantly enhanced the removal of suspended solids and organic matter. This has been pivotal in stabilizing effluent flow rates and reducing Total Dissolved Solids (TDS) to below 200 mg/L, thus optimizing downstream treatment processes*

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				and minimizing environmental impact. Optimizations in the MEE, such as advanced steam flow control and vacuum stabilization measures, have improved evaporation rates and energy efficiency. The separate cooling water systems for the ATFD and MEE condenser further underscore Morepen Laboratories Ltd mucommitment to minimizing resource consumption while maximizing operational efficiency. Enhancements in the ASP, marked by increased sampling frequency and the introduction of bioenzymes, have fostered robust microbial activity critical for

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				organic pollutant degradation. This has resulted in treated water with BOD levels below 30 mg/L and COD levels below 240 mg/L, surpassing regulatory requirements and ensuring environmental compliance. The deployment of advanced RO technology, featuring precise pH control and optimized chemical dosing, has further bolstered water quality by reducing turbidity and effectively removing harmful contaminants. The recycling of RO permeate within the polisher unit not only conserves freshwater resources but also minimizes wastewater discharge, reinforcing Morepen

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				Laboratories Ltd commitment to sustainable water management practices. These systematic upgrades not only align the ETP with current environmental standards but also fortify its resilience against future challenges. By adopting a holistic approach to wastewater treatment, Morepen Laboratories Ltd has not only safeguarded environmental health but also bolstered operational efficiency and sustainability across its facilities".
3.	**Recommendation No 4** In view of the fact that i) The industry has not obtained	**Compliance Status Submitted by the Unit:** i) The Project Proponent has shut	**Physical Verification Report By HPSPCB:** i) Earlier unit was disposing of	The unit has isolated the

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	permission of CPCB for incineration of hazardous waste and therefore the incinerator installed by the Industry for incinerating the concentrated effluent is not in operation, ii) Industry is located at such a location without having any provision to contain contaminated storm/rain water passing through the plant, the discharge of untreated effluent is un-avoidable with the storm water and may lead to the contamination water. It is therefore recommended that Industry is directed by HPPCB to: a) Obtain permission from CPCB for incineration of Hazardous waste; b) make arrangements to	down and isolated its incinerator due to not having proper SOP; hence the same is no longer in use. The Project Proponent had intimated it in writing in the month of October 2022, and the same has been verified by state PCB.The Project Proponent had applied to State PCB with a copy to CPCB in the month of April 2023 for obtaining the SOP for spent residues after distillation to be utilised in captive incineration. Despite this SOP have not been prepared.A follow up request along with an online application has also been submitted in by the Project Proponent in the month of February 2024. It is pertinent to mention here that the incineration of spent	the process hazardous waste i.e. Concentration or evaporation residues through incinerator. ii) After isolation of incinerator, the unit has applied and obtained amendment in HWMR authorization i.e. unit has added one additional category i.e. 37.3 Concentration or evaporation residues. Copy of authorization is attached as Annexure-II. The unit has also made the agreement with TSDF for its disposal Hazardous waste Category 37.3 at the time of	Incinerator from the process and is not being operated. The unit is regularly disposing of Hazardous waste to TSDF and authorised recyclers. The unit has submitted application to CPCB to form & notify SOP's for re-use of Hazardous waste i.e. for Category 37.3 & operation of incinerator. No compliance report received till date from the unit regarding notification of SOPs. The unit has constructed the reservoir of capacity 20 KL for the storage of first half hour rain water of plant premises.

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	contain the storm water contaminated with industrial effluent while passing through the plant and treat it before discharging in the nearby drain; b) to strictly follow the "Guidelines for using treated effluent for irrigation" with regard to treated storm water (contaminated with industrial effluent), prepared by CPCB under the directions of Hon'ble NGT dated 24/5/2019 in the matter of OA No. 348/2017; Shailesh Singh Vs Al-Dua Food Processing Pvt. Ltd.	residues after distillation will be additionally better for captive utilization. As of now, the Project Proponent has a valid authorization permit No.-HPSPCB/HWMR/10026 dated 25.07.2023 and have an agreement with authorized recyclers for its disposal. ii) That it is pertinent to mention here that the storm water drain system and the process drain system are independent and there is no possibility of breach or cross contamination. During the period of rains, the storm water that falls within the premises flows through dedicated flow channel to a reservoir with a dyke wall. Before the release	amendment in HWMR Authorisation. iii) Unit has submitted application to CPCB to form & notify SOP's for re-use of Hazardous waste i.e. for Category 37.3 & operation of incinerator. The application is under process with CPCB. iv) The unit has provided dedicated separate drains for storm water to prevent the mixing with process effluent. v) The unit has provided a temporary reservoir of capacity 06 KL (Photo-10 of Annexure-I) for the storage	Photograph of the reservoir attached as **Photo-P3**.

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		of such water, the first half hour rainwater is routed and stored in a tank, tested for contamination. In case the water has any trace of contaminants, it is rerouted to the effluent treatment plant through a permanent pipeline for treatment and is released thereafter.	of first half hour rain water of plant premises. The unit has made connectivity of this temporary reservoir to ETP for further treatment if found contaminated. Further, unit has submitted required that proper reservoir of capacity 20 KL will be constructed within 2 months. (Copy of undertaking is attached as Annexure-III)	
4.	**Recommendation No 5** The bio-magnification study conducted by the Joint Committee on the soil and two crop growing in the area during period indicates that:	**Compliance Status Submitted by the Unit:** The Project Proponent does not use Nickel and Zinc for manufacturing its products nor of the by-product of part of the effluent. However, in the	**Physical Verification Report By HPSPCB:** The unit has completed soil and crop testing exercise by engaging Thapar University. The Report of Thapar University states that the analysis of	Unit has already submitted the report.

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	• The concentration of Nickel and Zinc in the soil samples collected from downstream locations were found to be exceeding the limits specified by WHO. The high concentration of heavy metals (Zn and Ni) in the soil in the downstream locations despite low heavy metal concentration in the effluent samples collected by the Joint Committee, is an area of concern and indicates discharge to concentrated waste, although no discharge was observed by the Joint Committee at the time of visit. • The transfer Factor and Health	public interest, Project Proponent agrees to conduct similar exercise for other staple crops existing in that area since the absorption of heavy metal varies for crop to crop to avoid the values of HRI exceeding 1 (>1) over a passage of time, in the interest of public health. Project Proponent has conducted the soil and crop testing in consultation with the local PCB as per the season and availability of the crops. Soil and crop testing has been conducted by Thapar Institute, Patiala. The analysis of soil and crop samples shows no adverse impact for the industrial site and nearby area	soil and crop samples shows no adverse impact for the industrial site. (Copy of the report is annexed at Annexure-9 of Additional Compliance Report dated 12.03.2024 filed by respondent no.05).	

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	Risk Index was also determined by the Joint Committee. The values of HRI less than 1(<1), as determined by the Joint Committee, is considered safe for intake of food/vegetables. However, it is necessary to conduct similar exercise for the other staple crops in that area since the absorption of heavy metal varies for crop to crop, to avoid the values of HRI exceeding I (>1) over a passage of time, in the interest of public health.	and there is no adverse impact on the human health.		
5.	**Recommendation No 6:**	**Compliance Status Submitted by the Unit:**	**Physical Verification Report By HPSPCB:**	

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	It was observed during the site visit that industry has taken water connection from surface water supply meant for nearby villagers for irrigation, without obtaining any permission. It is recommended that Industry be directed to immediately disconnect this water connection till permission is obtained from the concerned authority.	There was an old surface water line which the unit had already removed in Jan 2024 and the same was verified by local PCB. The daily total water consumption of the Project Proponent is 100 KLD, and to meet its daily freshwater requirements of (75-80KL), the Project Proponent relies on its in-house borewell (10-15KL) and commercial water tankers (65-70KL) supply from a third party and now is not dependent on the surface water from the nullah. The project Proponent submits that earlier it was withdrawing 10-12KLD water from existing permitted borewell, however after	It has been verified that the surface water supply lines have been dis-connected by the unit. The total fresh water consumption of the unit including domestic purposes is 80 KLD. The unit is meeting daily requirement from borewell extraction of about 30 KLD (Copy of Permission Attached as Annexure-IV) and rest from hired outsource tankers from Kalka (Haryana) area. The unit has provided electro-magnetometer flow meter at outlet of borewell. The work of piezometric hole has been completed	The average daily fresh water consumption of the unit is 90 KL. The unit is meeting requirement from bore well extraction of about 30 KL and rest from hired outsource tankers from Kalka (Haryana) area. The unit has installed piezometer and electromagnetic flow meter on the borewell. Photograph of piezometer is attached as **Photo-P4** and photograph of electromagnetic flow meter is attached as **Photo-P5**.

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		carrying out re-development work of the borewell, the water withdrawal has increased to 25-30KLD, which is being monitored for another 10-15 days to see the consistency. The Project Proponent is committed to install the Piezometer. The process for Piezometer procurement is under process. Additionally, for installing the Piezometer, a borehole is required to be dug which as per the site conditions and terrain requires a period of 30-35 days. The quotes are already collected and soon we will order and start the Piezometric borehole work at site which will be completed by April 30th, 2024. Electro-magnetometer and	by the unit, but the piezometer is yet to be installed. The unit has submitted representation stating that work will be completed within 15 days. (Photo-9, Annexure-I)	

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		Flowmeters are installed on the outlet of borewell line. One standard flowmeter has also been installed on the tanker water supply line.		

Conclusion:-

It is submitted that unit has complied with most of the recommendations of the Joint Committee. However, the unit is also required to comply with following observations of the HPSPCB;

1. SOP's for re-use of Hazardous waste i.e. Category 37.3 (Concentration or evaporation residues) of Schedule – I of Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016 are not notified till date.
2. The unit has not submitted any proposal to install standby MEE to ensure complete zero liquid discharge (ZLD) even in case of breakdown/ maintenance period till now.

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(Respondent no. 04).

Regional Officer, Parwanoo,
HP State Pollution Control Board
Regional Office, Parwanoo, H.P.

Dated: 17/08/2024

Annexure - A1

1768
Real Time Data Acquisition And Monitoring

Site Name: Morepen Laboratory Limited

Report: Custom Report

From Date: 2024/05/01 00:00:00 To Date : 2024/08/13 11:39:58

Description	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
Prescribed Standards	6.5 - 8.5	0 - 250	0 - 30	0 - 100	0 -	0 - 72
Maximum Data	7.87	145.84	121.21	178.84	3.97	91.78
Minimum Data	6.63	4.56	0.0	0.1	0.0	0.0
Geometric Mean	7.37	66.98	7.02	13.52	0.74	7.79
Median	7.43	67.42	7.8	13.86	0.74	5.89
Standard Deviation	0.27	6.98	6.08	7.42	0.68	9.79
Maximum Value At Time	2024-05-26 22	2024-07-11 11	2024-07-16 07	2024-05-24 22	2024-07-30 18	2024-07-31 23
Minimum Value At Time	2024-07-11 02	2024-07-16 06	2024-08-01 16	2024-07-07 13	2024-05-01 03	2024-05-04 00
Valid Data Points	2194	2194	2194	2194	2034	2194
Total Data Points	2508	2508	2508	2508	2508	2508
Data Availability %	87.48%	87.48%	87.48%	87.48%	81.1%	87.48%

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1	2024-05-01 00	7.16	66.81	8.84	13.77	0.39	0.25
2	2024-05-01 01	7.16	67.89	8.84	13.88	0.19	0.42
3	2024-05-01 02	7.16	66.57	8.88	13.88	0.89	1.22
4	2024-05-01 03	7.16	67.41	8.76	13.88	0.00	1.52

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Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
5	2024-05-01 04	7.16	66.96	8.75	13.93	0.00	1.52
6	2024-05-01 05	7.16	67.83	8.73	13.83	0.00	1.52
7	2024-05-01 06	7.16	66.58	8.92	13.88	0.00	1.52
8	2024-05-01 07	7.16	67.76	8.81	13.90	0.67	1.86
9	2024-05-01 08	7.16	65.37	8.98	13.80	0.00	2.20
10	2024-05-01 09	NA	NA	NA	NA	NA	NA
11	2024-05-01 10	7.16	68.45	8.65	13.89	0.42	2.20
12	2024-05-01 11	7.16	66.21	8.66	13.92	1.30	2.46
13	2024-05-01 12	7.16	66.74	8.81	13.88	1.31	3.39
14	2024-05-01 13	7.16	67.37	8.83	13.89	1.27	4.71
15	2024-05-01 14	7.16	66.95	8.86	13.78	1.33	6.01
16	2024-05-01 15	7.16	67.17	8.73	13.84	1.34	7.36
17	2024-05-01 16	7.16	67.47	8.84	13.85	1.26	8.66
18	2024-05-01 17	7.16	67.50	8.75	13.87	1.34	9.98
19	2024-05-01 18	7.16	67.13	8.76	13.86	1.34	11.33
20	2024-05-01 19	7.16	67.16	8.78	13.79	1.33	12.67

1770

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
21	2024-05-01 20	7.17	67.62	8.85	13.78	1.33	14.00
22	2024-05-01 21	7.17	68.11	8.80	13.85	1.33	15.34
23	2024-05-01 22	7.17	67.17	8.79	13.79	1.33	16.68
24	2024-05-01 23	7.17	67.38	8.91	13.87	1.32	18.01
25	2024-05-02 00	7.17	66.97	8.92	13.76	0.24	0.23
26	2024-05-02 01	7.17	67.05	8.87	13.83	0.00	0.25
27	2024-05-02 02	7.17	68.11	8.89	13.90	0.00	0.25
28	2024-05-02 03	7.17	67.40	8.69	13.85	0.00	0.25
29	2024-05-02 04	7.17	67.38	8.79	13.83	0.00	0.25
30	2024-05-02 05	7.17	67.98	8.79	13.78	0.14	0.26
31	2024-05-02 06	7.17	67.27	8.82	13.81	0.60	0.81
32	2024-05-02 07	7.17	67.80	8.75	13.85	1.35	1.69
33	2024-05-02 08	7.17	66.56	8.94	13.77	1.34	3.04
34	2024-05-02 09	7.17	68.03	8.78	13.78	1.33	4.38
35	2024-05-02 10	7.17	68.10	8.86	13.85	1.33	5.72
36	2024-05-02 11	7.16	67.62	8.79	13.78	1.33	7.06

1771

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
37	2024-05-02 12	7.16	67.20	8.84	13.79	1.33	8.40
38	2024-05-02 13	7.16	67.27	8.82	13.79	1.33	9.73
39	2024-05-02 14	7.16	66.95	8.84	13.79	1.32	11.06
40	2024-05-02 15	7.16	66.94	8.82	13.80	1.32	12.39
41	2024-05-02 16	7.16	68.16	8.77	13.88	1.27	13.71
42	2024-05-02 17	7.16	67.13	8.70	13.84	1.33	15.02
43	2024-05-02 18	7.16	66.99	8.77	13.86	1.32	16.36
44	2024-05-02 19	7.17	66.53	8.77	13.83	1.31	17.69
45	2024-05-02 20	7.17	67.01	8.88	13.85	1.31	19.01
46	2024-05-02 21	7.17	67.50	8.82	13.84	1.31	20.32
47	2024-05-02 22	7.17	66.96	8.90	13.76	1.31	21.64
48	2024-05-02 23	7.17	67.03	8.75	13.87	1.30	22.95
49	2024-05-03 00	7.17	66.60	8.83	13.85	1.30	0.67
50	2024-05-03 01	7.17	66.80	8.79	13.91	1.29	1.97
51	2024-05-03 02	7.17	67.75	8.67	13.81	1.29	3.27
52	2024-05-03 03	7.17	67.22	8.91	13.87	1.28	4.56

1772

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
53	2024-05-03 04	7.17	67.13	8.72	13.95	1.28	5.85
54	2024-05-03 05	7.17	67.27	8.84	13.90	1.27	7.13
55	2024-05-03 06	7.17	67.94	8.82	13.88	1.26	8.41
56	2024-05-03 07	7.17	67.04	8.84	13.86	1.25	9.67
57	2024-05-03 08	7.17	67.25	8.63	13.82	1.25	10.93
58	2024-05-03 09	7.17	66.97	8.74	13.90	1.24	12.18
59	2024-05-03 10	7.17	67.58	8.78	13.90	1.24	13.43
60	2024-05-03 11	7.17	67.63	8.77	13.85	1.25	14.68
61	2024-05-03 12	7.17	66.47	8.92	13.82	1.18	15.93
62	2024-05-03 13	7.17	68.85	8.89	13.86	0.90	16.82
63	2024-05-03 14	7.17	66.86	8.87	13.87	1.23	18.03
64	2024-05-03 15	7.17	67.48	8.72	13.86	1.22	19.27
65	2024-05-03 16	7.17	66.66	8.73	13.85	1.22	20.50
66	2024-05-03 17	7.17	67.24	8.82	13.81	1.21	21.72
67	2024-05-03 18	7.17	67.52	8.77	13.91	1.21	22.94
68	2024-05-03 19	7.17	66.95	8.90	13.95	1.19	24.15

1773

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
69	2024-05-03 20	7.17	68.23	8.73	13.87	1.18	25.34
70	2024-05-03 21	7.17	67.24	8.86	13.85	1.18	26.53
71	2024-05-03 22	7.18	66.09	8.92	13.92	1.18	27.72
72	2024-05-03 23	7.18	67.07	8.87	13.84	1.11	28.91
73	2024-05-04 00	7.18	68.21	8.80	13.86	0.00	0.00
74	2024-05-04 01	7.17	67.67	8.67	13.84	0.00	0.00
75	2024-05-04 02	7.17	67.90	8.81	13.82	0.00	0.00
76	2024-05-04 03	7.17	67.31	8.93	13.84	0.00	0.00
77	2024-05-04 04	7.18	66.94	8.83	13.84	0.00	0.00
78	2024-05-04 05	7.18	66.93	8.82	13.79	0.39	0.09
79	2024-05-04 06	7.18	67.34	8.74	13.86	0.00	0.39
80	2024-05-04 07	7.18	67.26	8.78	13.79	0.25	0.47
81	2024-05-04 08	7.18	66.92	8.78	13.78	0.22	0.86
82	2024-05-04 09	7.17	67.60	8.87	13.87	0.00	0.88
83	2024-05-04 10	7.17	67.19	8.79	13.83	0.00	0.88
84	2024-05-04 11	7.17	66.77	8.84	13.84	0.00	0.88

1774

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
85	2024-05-04 12	7.17	67.03	8.86	13.84	0.00	0.88
86	2024-05-04 13	7.17	67.12	8.69	13.84	0.00	0.88
87	2024-05-04 14	7.17	67.95	8.85	13.85	0.00	0.88
88	2024-05-04 15	7.17	66.86	8.81	13.82	0.00	0.88
89	2024-05-04 16	7.17	67.11	8.62	13.82	0.02	0.90
90	2024-05-04 17	7.17	67.20	8.78	13.87	0.00	0.91
91	2024-05-04 18	7.17	67.33	8.66	13.82	0.00	0.91
92	2024-05-04 19	7.17	67.31	8.70	13.80	0.00	0.91
93	2024-05-04 20	7.17	67.34	8.95	13.87	0.00	0.91
94	2024-05-04 21	7.17	67.37	8.62	13.94	0.00	0.91
95	2024-05-04 22	7.18	67.05	8.82	13.76	0.00	0.91
96	2024-05-04 23	7.18	67.87	8.92	13.81	0.00	0.91
97	2024-05-05 00	7.18	69.08	8.78	13.72	0.00	0.00
98	2024-05-05 01	7.18	66.47	8.87	13.87	0.00	0.00
99	2024-05-05 02	7.18	66.73	8.47	13.87	0.00	0.00
100	2024-05-05 03	7.18	67.08	8.88	13.82	0.07	0.01

1775

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
101	2024-05-05 04	7.18	67.99	8.84	13.83	0.43	0.29
102	2024-05-05 05	7.18	66.95	8.81	13.86	0.41	0.72
103	2024-05-05 06	7.18	66.90	8.76	13.83	0.39	1.14
104	2024-05-05 07	7.18	67.38	8.83	13.87	0.18	1.36
105	2024-05-05 08	7.18	66.97	8.74	13.86	0.39	1.69
106	2024-05-05 09	7.17	67.82	8.75	13.78	0.39	2.08
107	2024-05-05 10	7.17	67.53	8.90	13.90	0.18	2.42
108	2024-05-05 11	7.17	67.41	8.77	13.85	0.15	2.49
109	2024-05-05 12	7.17	66.96	8.74	13.81	0.40	2.81
110	2024-05-05 13	7.17	67.59	8.88	13.94	0.38	3.20
111	2024-05-05 14	7.17	67.80	8.85	13.90	0.06	3.45
112	2024-05-05 15	7.17	67.25	8.61	13.84	0.02	3.46
113	2024-05-05 16	7.17	67.56	8.84	13.87	0.00	3.48
114	2024-05-05 17	7.17	66.51	8.89	13.83	0.00	3.48
115	2024-05-05 18	7.17	66.57	8.88	13.83	0.00	3.48
116	2024-05-05 19	7.17	67.22	8.95	13.87	0.00	3.48

1776

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
117	2024-05-05 20	7.17	66.79	8.75	13.86	0.00	3.48
118	2024-05-05 21	7.17	68.04	8.79	13.88	0.00	3.48
119	2024-05-05 22	7.18	67.80	8.77	13.82	0.00	3.48
120	2024-05-05 23	7.18	67.39	8.88	13.87	0.00	3.48
121	2024-05-06 00	7.18	67.33	8.74	13.90	0.00	0.00
122	2024-05-06 01	7.18	67.16	9.03	13.95	0.00	0.00
123	2024-05-06 02	7.18	68.01	8.73	13.84	0.00	0.00
124	2024-05-06 03	7.18	67.87	8.83	13.84	0.00	0.00
125	2024-05-06 04	7.18	67.00	8.81	13.87	0.00	0.00
126	2024-05-06 05	7.18	67.32	8.68	13.82	0.00	0.00
127	2024-05-06 06	7.18	67.99	8.78	13.84	0.00	0.00
128	2024-05-06 07	7.18	67.71	8.90	13.78	0.00	0.00
129	2024-05-06 08	7.18	67.75	8.71	13.79	0.00	0.00
130	2024-05-06 09	7.18	67.25	8.76	13.75	0.00	0.00
131	2024-05-06 10	7.17	67.00	8.70	13.81	0.00	0.00
132	2024-05-06 11	7.17	67.98	8.69	13.83	0.00	0.00

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
133	2024-05-06 12	7.17	68.64	8.81	13.82	0.00	0.00
134	2024-05-06 13	7.17	66.89	8.70	13.82	0.00	0.00
135	2024-05-06 14	7.17	67.74	8.59	13.85	0.00	0.00
136	2024-05-06 15	7.17	67.52	8.76	13.83	0.00	0.00
137	2024-05-06 16	7.17	67.81	8.71	13.85	0.00	0.00
138	2024-05-06 17	7.17	61.96	8.81	13.87	0.00	0.00
139	2024-05-06 18	7.17	67.60	8.82	13.90	0.00	0.00
140	2024-05-06 19	7.17	67.24	8.78	13.85	0.00	0.00
141	2024-05-06 20	7.17	67.90	8.56	13.86	0.00	0.00
142	2024-05-06 21	7.18	67.84	8.72	13.88	0.00	0.00
143	2024-05-06 22	NA	NA	NA	NA	NA	NA
144	2024-05-06 23	NA	NA	NA	NA	NA	NA
145	2024-05-07 00	NA	NA	NA	NA	NA	NA
146	2024-05-07 01	NA	NA	NA	NA	NA	NA
147	2024-05-07 02	NA	NA	NA	NA	NA	NA
148	2024-05-07 03	NA	NA	NA	NA	NA	NA

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
149	2024-05-07 04	NA	NA	NA	NA	NA	NA
150	2024-05-07 05	NA	NA	NA	NA	NA	NA
151	2024-05-07 06	NA	NA	NA	NA	NA	NA
152	2024-05-07 07	7.18	67.29	8.83	13.82	0.50	0.20
153	2024-05-07 08	7.18	67.74	8.97	13.82	0.61	0.80
154	2024-05-07 09	7.18	66.91	8.87	13.82	0.61	1.41
155	2024-05-07 10	7.18	67.35	8.91	13.81	0.62	2.03
156	2024-05-07 11	7.17	68.11	8.77	13.83	0.63	2.66
157	2024-05-07 12	7.17	67.18	8.72	13.87	0.63	3.29
158	2024-05-07 13	7.17	66.92	8.70	13.89	0.62	3.92
159	2024-05-07 14	7.17	66.77	8.74	13.87	0.62	4.55
160	2024-05-07 15	7.17	67.91	8.83	13.77	0.62	5.17
161	2024-05-07 16	7.17	67.53	8.79	13.86	0.62	5.80
162	2024-05-07 17	7.17	67.75	8.69	13.95	0.62	6.42
163	2024-05-07 18	7.17	67.50	8.64	13.90	0.61	7.04
164	2024-05-07 19	7.18	67.20	8.80	13.85	0.60	7.65

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
165	2024-05-07 20	7.18	66.54	8.75	13.84	0.60	8.25
166	2024-05-07 21	7.18	68.09	8.99	13.82	0.60	8.85
167	2024-05-07 22	7.18	67.26	8.77	13.83	0.60	9.46
168	2024-05-07 23	7.18	67.13	8.72	13.87	0.60	10.06
169	2024-05-08 00	7.18	66.74	8.92	13.85	0.60	0.31
170	2024-05-08 01	7.18	68.24	8.83	13.92	0.59	0.91
171	2024-05-08 02	7.18	67.83	8.85	13.83	0.59	1.50
172	2024-05-08 03	7.18	66.71	8.86	13.81	0.59	2.10
173	2024-05-08 04	7.18	67.30	8.69	13.83	0.59	2.69
174	2024-05-08 05	7.18	67.11	8.74	13.89	0.59	3.29
175	2024-05-08 06	7.18	67.80	8.77	13.82	0.58	3.88
176	2024-05-08 07	7.19	67.00	8.78	13.83	0.58	4.46
177	2024-05-08 08	7.18	67.66	8.77	13.83	0.58	5.05
178	2024-05-08 09	7.18	67.72	8.68	13.92	0.57	5.63
179	2024-05-08 10	7.18	67.69	8.87	13.82	0.58	6.20
180	2024-05-08 11	7.18	66.91	8.79	13.77	0.58	6.78

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Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
181	2024-05-08 12	7.18	67.50	8.73	13.84	0.58	7.36
182	2024-05-08 13	7.18	66.86	8.75	13.81	0.58	7.94
183	2024-05-08 14	7.18	67.96	8.66	13.77	0.57	8.52
184	2024-05-08 15	7.17	67.92	8.82	13.87	0.57	9.10
185	2024-05-08 16	7.18	66.94	8.80	13.83	0.57	9.68
186	2024-05-08 17	7.18	67.08	8.70	13.90	0.56	10.25
187	2024-05-08 18	7.18	67.24	8.76	13.79	0.57	10.82
188	2024-05-08 19	7.18	67.50	8.71	13.86	0.56	11.38
189	2024-05-08 20	7.18	66.94	8.62	13.89	0.56	11.95
190	2024-05-08 21	7.18	66.67	8.66	13.78	0.56	12.51
191	2024-05-08 22	7.18	66.57	8.76	13.90	0.56	13.07
192	2024-05-08 23	7.19	67.95	8.82	13.81	0.56	13.63
193	2024-05-09 00	7.18	68.03	8.75	13.83	0.56	0.29
194	2024-05-09 01	7.19	67.30	8.70	13.89	0.55	0.85
195	2024-05-09 02	7.18	66.50	8.65	13.93	0.56	1.41
196	2024-05-09 03	7.19	67.02	8.75	13.80	0.55	1.97

1781

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
197	2024-05-09 04	7.19	67.71	8.77	13.87	0.55	2.53
198	2024-05-09 05	7.19	67.48	8.71	13.92	0.55	3.08
199	2024-05-09 06	7.19	66.77	8.88	13.86	0.55	3.50
200	2024-05-09 07	7.19	65.81	8.95	13.90	0.54	3.64
201	2024-05-09 08	7.19	67.72	8.87	13.86	0.54	3.94
202	2024-05-09 09	7.19	67.44	8.95	13.81	0.54	4.47
203	2024-05-09 10	7.19	67.57	8.94	13.86	0.55	5.02
204	2024-05-09 11	7.18	67.71	8.82	13.78	0.55	5.56
205	2024-05-09 12	7.18	67.83	8.80	13.93	0.55	6.11
206	2024-05-09 13	7.18	67.00	8.80	13.76	0.25	6.57
207	2024-05-09 14	7.18	67.55	8.69	13.87	0.37	6.76
208	2024-05-09 15	7.18	67.00	8.86	13.93	0.57	7.29
209	2024-05-09 16	7.18	68.02	8.64	13.85	0.57	7.86
210	2024-05-09 17	7.18	66.44	8.88	13.82	0.01	8.15
211	2024-05-09 18	7.18	67.52	8.77	13.87	0.00	8.15
212	2024-05-09 19	7.18	66.63	8.67	13.86	0.00	8.15

1782

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
213	2024-05-09 20	7.18	66.95	8.80	13.83	0.00	8.15
214	2024-05-09 21	7.18	67.73	8.80	13.92	0.00	8.15
215	2024-05-09 22	7.19	66.92	8.83	13.83	0.00	8.15
216	2024-05-09 23	7.19	67.00	8.78	13.86	0.00	8.15
217	2024-05-10 00	7.19	66.98	8.82	13.86	0.00	0.00
218	2024-05-10 01	7.19	67.38	8.76	13.81	0.00	0.00
219	2024-05-10 02	7.19	67.41	8.69	13.85	0.00	0.00
220	2024-05-10 03	7.19	67.25	8.68	13.79	0.00	0.00
221	2024-05-10 04	7.19	66.90	8.75	13.91	0.00	0.00
222	2024-05-10 05	7.19	68.06	8.79	13.83	0.00	0.00
223	2024-05-10 06	7.19	68.28	8.77	13.85	0.00	0.00
224	2024-05-10 07	7.19	67.80	8.77	13.80	0.00	0.00
225	2024-05-10 08	7.19	67.71	8.76	13.81	0.00	0.00
226	2024-05-10 09	7.19	67.38	8.73	13.85	0.00	0.00
227	2024-05-10 10	7.19	67.66	8.81	13.84	0.00	0.00
228	2024-05-10 11	7.19	67.57	8.81	13.87	0.00	0.00

1783

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
229	2024-05-10 12	7.19	66.27	8.76	13.83	0.00	0.00
230	2024-05-10 13	7.18	67.42	8.76	13.89	0.00	0.00
231	2024-05-10 14	7.18	67.18	8.72	13.82	0.00	0.00
232	2024-05-10 15	7.18	67.86	8.75	13.83	0.00	0.00
233	2024-05-10 16	7.18	67.28	8.82	13.85	0.00	0.00
234	2024-05-10 17	7.18	66.44	8.75	13.80	0.00	0.00
235	2024-05-10 18	7.19	67.40	8.64	13.88	0.00	0.00
236	2024-05-10 19	7.19	67.38	8.68	13.84	0.03	0.00
237	2024-05-10 20	7.19	67.97	8.83	13.82	0.00	0.00
238	2024-05-10 21	7.19	67.05	8.75	13.91	0.00	0.00
239	2024-05-10 22	7.19	67.07	8.62	13.88	0.00	0.00
240	2024-05-10 23	7.19	66.79	8.79	13.87	0.00	0.00
241	2024-05-11 00	7.19	67.11	8.74	13.85	0.00	0.00
242	2024-05-11 01	7.19	67.70	8.69	13.85	0.00	0.00
243	2024-05-11 02	7.19	68.26	8.67	13.90	0.00	0.00
244	2024-05-11 03	7.20	66.26	8.73	13.90	0.00	0.00

1784

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
245	2024-05-11 04	7.20	66.83	8.67	13.90	0.00	0.00
246	2024-05-11 05	7.20	66.95	8.78	13.83	0.00	0.00
247	2024-05-11 06	7.19	68.74	8.84	13.83	0.00	0.00
248	2024-05-11 07	7.19	66.35	8.80	13.85	0.00	0.00
249	2024-05-11 08	7.19	66.74	8.78	13.90	0.00	0.00
250	2024-05-11 09	7.19	66.67	8.87	13.91	0.00	0.00
251	2024-05-11 10	7.19	67.17	8.81	13.86	0.01	0.01
252	2024-05-11 11	7.19	67.35	8.81	13.83	0.00	0.04
253	2024-05-11 12	7.19	67.18	8.81	13.83	0.00	0.04
254	2024-05-11 13	7.19	68.14	8.77	13.86	0.00	0.04
255	2024-05-11 14	7.19	67.08	8.75	13.86	0.09	0.07
256	2024-05-11 15	7.19	67.36	8.77	13.80	0.01	0.13
257	2024-05-11 16	7.19	66.05	8.83	13.87	0.02	0.13
258	2024-05-11 17	7.18	67.49	8.75	13.84	0.14	0.21
259	2024-05-11 18	7.19	67.54	8.78	13.82	0.07	0.33
260	2024-05-11 19	7.20	68.10	8.72	13.84	0.08	0.41

1785

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
261	2024-05-11 20	7.20	67.11	8.83	13.87	0.00	0.42
262	2024-05-11 21	7.20	67.20	8.87	13.84	0.00	0.42
263	2024-05-11 22	7.20	67.18	8.79	13.79	0.00	0.42
264	2024-05-11 23	7.20	67.19	8.94	13.89	0.00	0.42
265	2024-05-12 00	7.20	68.13	8.76	13.92	0.00	0.00
266	2024-05-12 01	7.20	67.24	8.93	13.80	0.00	0.00
267	2024-05-12 02	7.20	67.08	8.74	13.86	0.00	0.00
268	2024-05-12 03	7.20	66.90	8.69	13.85	0.00	0.00
269	2024-05-12 04	7.20	67.58	8.83	13.85	0.00	0.00
270	2024-05-12 05	7.20	67.08	8.82	13.88	0.00	0.00
271	2024-05-12 06	7.20	67.74	8.74	13.87	0.00	0.00
272	2024-05-12 07	7.20	67.69	8.82	13.87	0.00	0.00
273	2024-05-12 08	7.20	66.57	8.79	13.83	0.00	0.00
274	2024-05-12 09	7.19	67.20	8.82	13.81	0.07	0.01
275	2024-05-12 10	7.19	67.96	8.80	13.83	0.00	0.08
276	2024-05-12 11	7.19	66.85	8.75	13.84	0.00	0.08

1786

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
277	2024-05-12 12	7.19	67.79	8.76	13.81	0.00	0.08
278	2024-05-12 13	7.19	66.10	8.65	13.76	0.00	0.08
279	2024-05-12 14	7.19	67.81	8.76	13.78	0.10	0.16
280	2024-05-12 15	7.19	67.04	8.73	13.74	0.00	0.19
281	2024-05-12 16	7.19	66.35	8.69	13.84	0.00	0.19
282	2024-05-12 17	7.19	66.28	8.73	13.85	0.00	0.19
283	2024-05-12 18	7.19	67.22	8.79	13.94	0.00	0.19
284	2024-05-12 19	7.19	67.47	8.87	13.83	0.00	0.19
285	2024-05-12 20	7.20	68.30	8.84	13.91	0.00	0.19
286	2024-05-12 21	7.20	66.73	8.84	13.81	0.00	0.19
287	2024-05-12 22	7.19	67.26	8.67	13.89	0.00	0.19
288	2024-05-12 23	7.19	67.24	8.79	13.86	0.00	0.19
289	2024-05-13 00	7.20	67.68	8.81	13.83	0.00	0.00
290	2024-05-13 01	7.20	66.79	8.72	13.84	0.00	0.00
291	2024-05-13 02	7.20	66.88	8.81	13.85	0.00	0.00
292	2024-05-13 03	7.19	67.02	8.79	13.85	0.00	0.00

1787

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
293	2024-05-13 04	7.19	68.11	8.62	13.88	0.00	0.00
294	2024-05-13 05	7.20	67.98	8.74	13.89	0.00	0.00
295	2024-05-13 06	7.19	68.18	8.76	13.87	0.00	0.00
296	2024-05-13 07	7.20	67.10	8.79	13.85	0.08	0.01
297	2024-05-13 08	7.20	67.46	8.75	13.85	0.10	0.16
298	2024-05-13 09	7.19	66.18	8.80	13.85	0.00	0.17
299	2024-05-13 10	7.20	66.18	8.77	13.82	0.00	0.17
300	2024-05-13 11	7.19	67.04	8.83	13.84	0.00	0.17
301	2024-05-13 12	7.19	67.17	8.97	13.82	0.50	0.31
302	2024-05-13 13	7.19	68.09	8.69	13.84	0.02	0.71
303	2024-05-13 14	7.19	68.13	8.68	13.90	0.00	0.71
304	2024-05-13 15	7.19	67.29	8.70	13.86	0.19	0.81
305	2024-05-13 16	7.18	66.66	8.77	13.85	0.43	1.15
306	2024-05-13 17	7.19	66.83	8.71	13.85	0.92	1.79
307	2024-05-13 18	7.19	68.41	8.64	13.88	0.94	2.74
308	2024-05-13 19	7.19	67.52	8.75	13.81	0.93	3.68

1788

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
309	2024-05-13 20	7.19	67.30	9.07	13.88	0.93	4.62
310	2024-05-13 21	7.20	67.47	8.81	13.89	0.92	5.55
311	2024-05-13 22	7.19	67.78	8.78	13.90	0.93	6.48
312	2024-05-13 23	7.20	67.67	12.67	13.83	0.91	7.41
313	2024-05-14 00	7.20	66.47	10.96	13.84	0.84	0.41
314	2024-05-14 01	7.20	67.03	16.20	13.75	0.92	1.33
315	2024-05-14 02	7.20	67.29	8.86	13.84	0.92	2.26
316	2024-05-14 03	7.20	66.66	8.59	13.83	0.90	3.17
317	2024-05-14 04	7.20	66.73	8.75	13.90	0.91	4.08
318	2024-05-14 05	7.20	67.62	8.91	13.88	0.90	5.00
319	2024-05-14 06	7.20	67.18	8.76	13.82	0.89	5.90
320	2024-05-14 07	7.20	66.87	8.68	13.86	0.89	6.79
321	2024-05-14 08	7.20	67.34	8.63	13.85	0.88	7.68
322	2024-05-14 09	7.19	67.39	8.71	13.76	0.88	8.57
323	2024-05-14 10	7.19	67.52	8.72	13.83	0.88	9.44
324	2024-05-14 11	7.19	67.07	8.91	13.88	0.89	10.34

1789

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
325	2024-05-14 12	7.19	66.83	8.85	13.82	0.88	11.22
326	2024-05-14 13	7.19	67.74	8.58	13.79	0.87	12.11
327	2024-05-14 14	7.19	87.67	8.32	14.05	0.87	12.96
328	2024-05-14 15	7.12	82.23	8.37	15.92	0.83	13.84
329	2024-05-14 16	7.18	70.45	8.57	14.05	0.00	14.24
330	2024-05-14 17	7.21	69.80	8.59	14.14	0.00	14.24
331	2024-05-14 18	7.21	69.96	8.60	14.19	0.00	14.24
332	2024-05-14 19	7.25	70.10	8.68	14.01	NA	14.24
333	2024-05-14 20	7.24	70.25	8.60	14.10	NA	14.24
334	2024-05-14 21	7.27	69.99	8.56	14.10	NA	14.24
335	2024-05-14 22	7.26	70.77	8.57	14.05	NA	14.24
336	2024-05-14 23	7.26	69.89	8.54	14.04	NA	14.24
337	2024-05-15 00	7.28	70.59	8.61	14.04	NA	0.00
338	2024-05-15 01	7.25	71.00	8.58	13.95	NA	0.00
339	2024-05-15 02	7.24	70.70	8.56	13.91	NA	0.00
340	2024-05-15 03	7.26	69.66	8.54	13.66	NA	0.00

1790

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
341	2024-05-15 04	7.23	70.34	8.44	13.51	NA	0.00
342	2024-05-15 05	7.26	71.28	8.51	13.80	NA	0.00
343	2024-05-15 06	7.38	70.07	8.58	14.01	NA	0.00
344	2024-05-15 07	7.47	69.82	8.67	14.05	NA	0.00
345	2024-05-15 08	NA	NA	NA	NA	NA	NA
346	2024-05-15 09	7.48	102.03	8.08	13.97	NA	0.00
347	2024-05-15 10	7.48	98.19	8.05	14.87	NA	0.00
348	2024-05-15 11	7.49	67.78	3.89	28.74	NA	0.00
349	2024-05-15 12	7.46	69.17	6.01	7.13	NA	0.00
350	2024-05-15 13	7.41	69.27	8.70	14.09	NA	0.00
351	2024-05-15 14	7.41	70.73	8.62	14.15	NA	0.00
352	2024-05-15 15	7.42	70.49	8.60	14.12	NA	0.00
353	2024-05-15 16	7.43	70.27	8.65	14.09	NA	0.00
354	2024-05-15 17	7.41	70.08	8.57	14.46	NA	0.00
355	2024-05-15 18	7.41	68.20	8.45	14.75	NA	0.00
356	2024-05-15 19	7.43	69.49	8.41	14.64	NA	0.00

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
357	2024-05-15 20	7.42	68.04	8.44	14.62	NA	0.00
358	2024-05-15 21	7.43	69.23	8.40	14.60	NA	0.00
359	2024-05-15 22	7.43	67.05	8.42	14.69	NA	0.00
360	2024-05-15 23	7.44	66.45	8.40	14.63	NA	0.00
361	2024-05-16 00	7.43	70.00	8.42	14.74	NA	0.00
362	2024-05-16 01	7.44	66.92	8.43	14.60	NA	0.00
363	2024-05-16 02	7.45	68.84	8.39	14.56	NA	0.00
364	2024-05-16 03	7.45	67.79	8.39	14.54	NA	0.00
365	2024-05-16 04	7.44	69.14	8.46	14.53	NA	0.00
366	2024-05-16 05	7.44	68.53	8.38	14.47	NA	0.00
367	2024-05-16 06	7.44	67.77	8.35	14.47	NA	0.00
368	2024-05-16 07	7.45	69.11	5.72	14.55	NA	0.00
369	2024-05-16 08	7.46	68.86	8.28	12.31	NA	0.00
370	2024-05-16 09	7.46	67.63	8.25	13.85	NA	0.00
371	2024-05-16 10	7.45	67.80	8.25	13.85	NA	0.00
372	2024-05-16 11	7.47	58.74	8.25	13.85	NA	0.00

1792

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
373	2024-05-16 12	7.42	67.52	8.25	13.85	NA	0.00
374	2024-05-16 13	7.44	66.96	8.25	14.46	NA	0.00
375	2024-05-16 14	7.45	66.71	8.25	13.85	NA	0.00
376	2024-05-16 15	7.44	66.88	8.25	13.85	NA	0.00
377	2024-05-16 16	7.45	66.96	8.39	13.85	NA	0.00
378	2024-05-16 17	7.45	66.75	12.32	20.28	NA	0.00
379	2024-05-16 18	7.45	66.55	7.05	12.28	NA	0.00
380	2024-05-16 19	7.45	67.32	7.43	12.42	NA	0.00
381	2024-05-16 20	7.45	67.39	8.22	13.42	NA	0.00
382	2024-05-16 21	7.44	67.73	8.21	13.86	NA	0.00
383	2024-05-16 22	7.44	67.39	8.26	13.54	NA	0.00
384	2024-05-16 23	7.44	67.75	8.32	14.22	NA	0.00
385	2024-05-17 00	7.44	67.63	8.23	13.82	NA	0.00
386	2024-05-17 01	7.44	67.69	8.72	14.03	NA	0.00
387	2024-05-17 02	7.43	67.96	21.34	13.90	NA	0.00
388	2024-05-17 03	7.43	67.30	14.92	13.85	NA	0.00

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
389	2024-05-17 04	7.43	67.70	3.91	13.85	NA	0.00
390	2024-05-17 05	7.44	66.81	3.12	24.65	NA	0.00
391	2024-05-17 06	7.43	67.41	3.04	12.25	NA	0.00
392	2024-05-17 07	7.42	67.33	1.27	58.69	NA	0.00
393	2024-05-17 08	7.42	66.96	1.65	63.64	NA	0.00
394	2024-05-17 09	7.43	67.43	1.49	48.63	NA	0.00
395	2024-05-17 10	7.41	67.82	1.55	30.27	NA	0.00
396	2024-05-17 11	7.47	67.70	17.80	10.05	NA	0.00
397	2024-05-17 12	7.43	67.52	25.43	0.74	NA	0.00
398	2024-05-17 13	7.40	66.87	3.52	0.22	NA	0.00
399	2024-05-17 14	7.40	67.16	3.55	5.90	NA	0.00
400	2024-05-17 15	7.41	67.10	3.84	1.74	NA	0.00
401	2024-05-17 16	7.42	67.64	4.03	36.21	NA	0.00
402	2024-05-17 17	7.42	67.41	4.67	3.98	NA	0.00
403	2024-05-17 18	7.42	67.15	4.98	39.10	NA	0.00
404	2024-05-17 19	7.42	67.20	5.20	10.34	NA	0.00

1794

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
405	2024-05-17 20	7.41	67.46	5.22	34.14	NA	0.00
406	2024-05-17 21	7.41	67.31	5.16	6.80	NA	0.00
407	2024-05-17 22	7.41	67.44	4.51	6.73	NA	0.00
408	2024-05-17 23	7.41	67.64	5.57	9.22	NA	0.00
409	2024-05-18 00	7.41	67.47	4.76	7.40	NA	0.00
410	2024-05-18 01	7.40	67.78	5.41	6.45	NA	0.00
411	2024-05-18 02	7.41	67.26	4.17	6.52	NA	0.00
412	2024-05-18 03	7.41	66.93	25.49	10.01	NA	0.00
413	2024-05-18 04	7.41	66.65	5.55	10.75	NA	0.00
414	2024-05-18 05	7.41	67.32	5.60	10.18	NA	0.00
415	2024-05-18 06	7.41	67.51	5.61	8.66	NA	0.00
416	2024-05-18 07	7.41	67.25	6.43	13.85	NA	0.00
417	2024-05-18 08	7.40	67.14	4.65	4.96	NA	0.00
418	2024-05-18 09	7.41	67.40	6.69	8.28	NA	0.00
419	2024-05-18 10	7.41	67.11	7.64	7.42	NA	0.00
420	2024-05-18 11	7.47	67.42	14.52	7.50	NA	0.00

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
421	2024-05-18 12	7.45	66.71	11.13	7.17	NA	0.00
422	2024-05-18 13	7.43	66.73	6.29	6.34	NA	0.00
423	2024-05-18 14	7.42	67.77	6.02	27.54	NA	0.00
424	2024-05-18 15	7.41	67.28	13.51	7.26	NA	0.00
425	2024-05-18 16	7.41	67.54	13.18	6.23	NA	0.00
426	2024-05-18 17	7.40	67.88	6.21	7.71	NA	0.00
427	2024-05-18 18	7.41	67.28	6.46	27.82	NA	0.00
428	2024-05-18 19	7.41	67.59	6.88	7.84	NA	0.00
429	2024-05-18 20	7.41	67.97	6.52	8.55	NA	0.00
430	2024-05-18 21	7.40	66.98	6.36	7.73	NA	0.00
431	2024-05-18 22	7.41	67.67	6.76	8.38	NA	0.00
432	2024-05-18 23	7.41	67.62	6.43	8.75	NA	0.00
433	2024-05-19 00	7.40	67.18	6.69	9.05	NA	0.00
434	2024-05-19 01	7.40	67.15	6.54	9.16	NA	0.00
435	2024-05-19 02	7.41	67.14	8.90	27.75	NA	0.00
436	2024-05-19 03	7.41	67.44	10.74	9.17	NA	0.00

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
437	2024-05-19 04	7.40	66.99	6.71	9.66	NA	0.00
438	2024-05-19 05	7.40	66.47	6.90	10.51	NA	0.00
439	2024-05-19 06	7.40	67.71	6.85	10.10	NA	0.00
440	2024-05-19 07	7.41	66.98	7.26	9.72	NA	0.00
441	2024-05-19 08	7.41	67.31	7.14	9.69	NA	0.00
442	2024-05-19 09	7.41	67.35	6.72	9.38	NA	0.00
443	2024-05-19 10	7.45	67.22	6.53	8.36	NA	0.00
444	2024-05-19 11	7.48	67.47	6.54	9.14	NA	0.00
445	2024-05-19 12	7.46	67.22	3.95	9.19	NA	0.00
446	2024-05-19 13	7.43	67.84	6.46	9.57	NA	0.00
447	2024-05-19 14	7.42	67.19	6.26	8.45	NA	0.00
448	2024-05-19 15	7.41	67.28	8.29	9.82	NA	0.00
449	2024-05-19 16	7.41	67.14	12.76	7.01	NA	0.00
450	2024-05-19 17	7.41	67.20	6.90	10.79	NA	0.00
451	2024-05-19 18	7.40	67.57	7.17	10.06	NA	0.00
452	2024-05-19 19	7.41	67.03	7.27	10.57	NA	0.00

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
453	2024-05-19 20	7.41	66.52	7.08	11.29	NA	0.00
454	2024-05-19 21	7.41	67.11	7.18	11.63	NA	0.00
455	2024-05-19 22	7.41	66.87	7.05	11.51	NA	0.00
456	2024-05-19 23	7.41	67.61	14.52	11.97	NA	0.00
457	2024-05-20 00	7.41	67.83	7.45	12.26	NA	0.00
458	2024-05-20 01	7.41	67.30	6.74	12.01	NA	0.00
459	2024-05-20 02	7.41	66.90	5.42	11.79	NA	0.00
460	2024-05-20 03	7.41	68.13	7.45	9.41	NA	0.00
461	2024-05-20 04	7.41	67.27	7.31	10.30	NA	0.00
462	2024-05-20 05	7.42	67.19	7.33	12.50	NA	0.00
463	2024-05-20 06	7.42	66.89	7.56	12.11	NA	0.00
464	2024-05-20 07	7.42	66.85	7.17	11.99	NA	0.00
465	2024-05-20 08	7.42	67.50	7.21	11.54	NA	0.00
466	2024-05-20 09	7.42	66.66	14.44	11.05	NA	0.00
467	2024-05-20 10	7.42	67.06	7.09	11.33	NA	0.00
468	2024-05-20 11	7.43	66.98	6.98	7.67	NA	0.00

1798

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
469	2024-05-20 12	7.45	67.66	7.02	11.08	NA	0.00
470	2024-05-20 13	7.44	67.40	6.79	9.80	NA	0.00
471	2024-05-20 14	7.43	67.06	6.93	10.32	NA	0.00
472	2024-05-20 15	7.42	67.23	7.02	10.07	NA	0.00
473	2024-05-20 16	7.42	68.13	7.09	30.39	NA	0.00
474	2024-05-20 17	7.43	67.68	7.29	11.22	NA	0.00
475	2024-05-20 18	7.42	67.08	7.06	11.92	NA	0.00
476	2024-05-20 19	7.42	67.23	7.36	11.94	NA	0.00
477	2024-05-20 20	7.42	67.25	7.35	30.34	NA	0.00
478	2024-05-20 21	7.42	67.20	7.33	11.67	NA	0.00
479	2024-05-20 22	7.43	66.64	7.26	11.52	NA	0.00
480	2024-05-20 23	7.43	66.55	7.47	11.25	NA	0.00
481	2024-05-21 00	7.43	67.74	7.04	11.75	NA	0.00
482	2024-05-21 01	7.43	66.47	7.44	11.28	NA	0.00
483	2024-05-21 02	7.43	67.29	7.20	12.61	NA	0.00
484	2024-05-21 03	7.43	67.25	7.32	12.00	NA	0.00

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
485	2024-05-21 04	7.43	66.46	7.33	15.14	NA	0.00
486	2024-05-21 05	7.43	66.88	7.23	54.27	NA	0.00
487	2024-05-21 06	7.43	66.79	7.62	12.42	NA	0.00
488	2024-05-21 07	7.44	67.83	7.43	12.07	NA	0.00
489	2024-05-21 08	7.43	67.16	6.97	12.07	NA	0.00
490	2024-05-21 09	7.43	67.19	7.20	11.58	NA	0.00
491	2024-05-21 10	7.43	66.86	7.55	12.28	NA	0.00
492	2024-05-21 11	7.45	66.89	5.96	11.21	NA	0.00
493	2024-05-21 12	7.46	66.47	5.76	10.96	0.80	0.00
494	2024-05-21 13	7.45	66.76	7.03	30.57	0.76	0.12
495	2024-05-21 14	7.44	67.72	5.23	12.75	0.76	0.76
496	2024-05-21 15	7.28	68.72	8.55	13.51	0.77	1.09
497	2024-05-21 16	7.27	69.24	8.54	13.51	0.77	1.16
498	2024-05-21 17	7.26	69.15	8.50	13.51	0.79	1.63
499	2024-05-21 18	7.24	68.86	8.50	13.43	0.79	2.43
500	2024-05-21 19	7.21	68.02	8.50	13.31	0.78	3.22

1800

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
501	2024-05-21 20	7.20	68.72	8.46	13.41	0.78	4.01
502	2024-05-21 21	7.18	68.76	8.49	13.39	0.78	4.79
503	2024-05-21 22	7.15	68.85	8.42	13.35	0.79	5.59
504	2024-05-21 23	7.15	67.68	8.57	13.53	0.79	6.38
505	2024-05-22 00	7.18	68.86	8.50	13.74	0.79	0.40
506	2024-05-22 01	7.21	69.57	8.54	13.88	0.79	1.19
507	2024-05-22 02	7.23	69.59	8.51	13.95	0.79	1.98
508	2024-05-22 03	7.26	68.49	8.53	14.01	0.78	2.77
509	2024-05-22 04	7.28	69.07	8.53	14.01	0.78	3.56
510	2024-05-22 05	7.31	69.69	8.52	14.01	0.78	4.35
511	2024-05-22 06	7.44	69.73	8.51	14.01	0.77	5.13
512	2024-05-22 07	7.52	69.19	8.54	14.03	0.77	5.90
513	2024-05-22 08	7.48	70.35	8.53	14.06	0.77	6.68
514	2024-05-22 09	7.45	69.26	8.49	14.02	0.77	7.35
515	2024-05-22 10	7.42	69.36	8.53	13.98	0.77	8.02
516	2024-05-22 11	7.41	69.76	8.54	14.04	0.79	8.81

1801

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
517	2024-05-22 12	7.45	69.48	8.53	14.13	0.79	9.61
518	2024-05-22 13	7.48	69.69	8.49	14.04	0.79	10.40
519	2024-05-22 14	7.47	69.27	8.42	14.05	0.80	11.20
520	2024-05-22 15	7.42	68.31	8.26	13.91	0.79	12.00
521	2024-05-22 16	7.42	68.44	8.32	14.41	0.77	12.81
522	2024-05-22 17	7.43	68.73	8.25	13.93	0.82	13.59
523	2024-05-22 18	7.44	67.63	8.19	13.12	0.78	14.41
524	2024-05-22 19	7.43	68.67	8.22	13.93	0.79	15.20
525	2024-05-22 20	7.42	69.19	8.27	13.84	0.79	15.99
526	2024-05-22 21	7.40	68.20	8.26	13.76	0.79	16.78
527	2024-05-22 22	7.41	68.28	8.23	13.78	0.79	17.57
528	2024-05-22 23	7.41	67.76	8.30	13.75	0.79	18.36
529	2024-05-23 00	7.41	68.26	8.23	13.66	0.79	0.41
530	2024-05-23 01	7.40	68.74	8.19	13.76	0.79	1.20
531	2024-05-23 02	7.40	68.11	8.21	13.71	0.79	1.99
532	2024-05-23 03	7.41	68.81	8.18	13.64	0.79	2.78

1802

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
533	2024-05-23 04	7.41	68.23	8.20	13.63	0.79	3.57
534	2024-05-23 05	7.42	68.52	8.18	13.91	0.79	4.37
535	2024-05-23 06	7.42	68.16	8.20	13.62	0.78	5.16
536	2024-05-23 07	7.47	67.91	8.10	13.64	0.77	5.94
537	2024-05-23 08	7.43	67.77	8.14	13.62	0.78	6.72
538	2024-05-23 09	7.50	67.88	8.13	13.68	0.78	7.51
539	2024-05-23 10	7.55	68.40	8.19	13.56	0.78	8.28
540	2024-05-23 11	7.49	68.68	8.17	13.52	0.79	9.07
541	2024-05-23 12	7.46	68.07	8.21	13.43	0.79	9.86
542	2024-05-23 13	7.46	68.86	8.20	13.42	0.80	10.65
543	2024-05-23 14	7.45	68.33	8.17	13.49	0.81	11.46
544	2024-05-23 15	7.44	68.26	8.22	13.44	0.80	12.27
545	2024-05-23 16	7.44	68.39	8.17	13.45	0.80	13.08
546	2024-05-23 17	7.46	68.47	8.11	13.31	0.79	13.88
547	2024-05-23 18	7.45	68.20	8.18	13.25	0.79	14.68
548	2024-05-23 19	7.46	68.58	8.14	13.46	0.78	15.46

1803

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
549	2024-05-23 20	7.47	67.90	8.17	13.42	0.78	16.25
550	2024-05-23 21	7.46	68.41	8.18	13.43	0.78	17.04
551	2024-05-23 22	7.45	67.93	8.16	13.33	0.79	17.83
552	2024-05-23 23	7.45	68.01	8.12	13.42	0.78	18.62
553	2024-05-24 00	7.46	68.19	8.12	13.37	0.78	0.40
554	2024-05-24 01	7.45	68.34	8.11	13.37	0.78	1.19
555	2024-05-24 02	7.44	67.64	8.02	13.38	0.79	1.97
556	2024-05-24 03	7.42	68.14	8.07	13.43	0.79	2.77
557	2024-05-24 04	7.42	67.93	8.06	13.34	0.79	3.55
558	2024-05-24 05	7.42	67.62	8.07	13.34	0.79	4.35
559	2024-05-24 06	7.40	68.05	8.06	13.41	0.78	5.13
560	2024-05-24 07	7.40	68.00	8.06	13.16	0.77	5.92
561	2024-05-24 08	7.41	67.96	8.07	13.37	0.77	6.69
562	2024-05-24 09	7.41	68.59	8.05	13.34	0.77	7.46
563	2024-05-24 10	7.44	68.08	8.08	13.39	0.77	8.24
564	2024-05-24 11	7.44	69.01	8.09	13.40	0.78	9.02

1804

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
565	2024-05-24 12	7.53	68.03	8.07	13.36	0.77	9.80
566	2024-05-24 13	7.60	67.24	8.10	13.26	0.79	10.59
567	2024-05-24 14	7.66	67.06	8.05	13.26	0.78	11.38
568	2024-05-24 15	7.69	67.65	7.97	13.36	0.79	12.17
569	2024-05-24 16	7.72	68.64	7.91	13.34	0.79	12.96
570	2024-05-24 17	7.75	68.01	7.97	13.39	0.79	13.76
571	2024-05-24 18	7.76	68.03	7.93	13.34	0.78	14.55
572	2024-05-24 19	7.77	67.87	7.94	13.42	0.79	15.34
573	2024-05-24 20	7.79	32.29	12.67	26.38	0.78	16.13
574	2024-05-24 21	7.83	13.40	81.84	161.53	0.78	16.91
575	2024-05-24 22	7.84	28.40	112.00	178.84	0.80	17.71
576	2024-05-24 23	7.68	68.37	9.96	14.38	0.79	18.51
577	2024-05-25 00	7.58	68.14	8.13	14.03	0.79	0.41
578	2024-05-25 01	7.53	67.92	8.07	13.97	0.79	1.20
579	2024-05-25 02	7.50	67.73	8.11	14.00	0.79	1.99
580	2024-05-25 03	7.50	68.03	8.03	13.98	0.79	2.79

1805

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
581	2024-05-25 04	7.47	68.06	8.02	13.91	0.79	3.59
582	2024-05-25 05	7.48	78.15	1.07	3.13	0.79	4.39
583	2024-05-25 06	7.39	76.30	0.19	0.14	0.77	5.17
584	2024-05-25 07	7.22	72.93	0.13	0.13	0.77	5.95
585	2024-05-25 08	7.20	68.07	0.19	0.13	0.76	6.72
586	2024-05-25 09	7.19	68.32	0.15	0.13	0.77	7.49
587	2024-05-25 10	7.18	70.04	0.14	0.16	0.79	8.27
588	2024-05-25 11	7.17	67.78	0.17	0.16	0.73	9.06
589	2024-05-25 12	7.15	67.37	0.13	0.12	0.78	9.80
590	2024-05-25 13	7.14	68.71	0.16	0.16	0.79	10.59
591	2024-05-25 14	7.13	68.15	0.13	0.15	0.79	11.39
592	2024-05-25 15	7.15	69.19	0.10	0.19	0.79	12.19
593	2024-05-25 16	7.18	67.54	6.07	13.09	0.80	12.99
594	2024-05-25 17	7.24	67.83	8.17	13.69	0.52	13.74
595	2024-05-25 18	7.27	68.26	8.14	13.53	0.00	13.91
596	2024-05-25 19	7.28	67.53	8.16	13.39	0.00	13.91

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
597	2024-05-25 20	7.30	67.89	8.10	13.60	0.00	13.91
598	2024-05-25 21	7.36	68.17	8.07	13.56	0.00	13.91
599	2024-05-25 22	7.52	67.53	8.15	13.52	0.00	13.91
600	2024-05-25 23	7.48	68.11	8.15	13.60	0.55	14.09
601	2024-05-26 00	7.45	67.35	8.11	13.52	0.80	0.41
602	2024-05-26 01	7.44	67.72	8.08	13.48	0.80	1.21
603	2024-05-26 02	7.44	68.16	8.12	13.55	0.80	2.01
604	2024-05-26 03	7.42	68.08	8.00	13.49	0.79	2.81
605	2024-05-26 04	7.41	67.65	8.07	13.48	0.79	3.60
606	2024-05-26 05	7.40	67.77	8.07	13.36	0.79	4.39
607	2024-05-26 06	7.40	67.85	8.04	13.44	0.80	5.19
608	2024-05-26 07	7.41	68.06	8.03	13.52	0.79	5.99
609	2024-05-26 08	7.41	68.31	8.01	13.46	0.78	6.78
610	2024-05-26 09	7.41	67.62	8.04	13.44	0.78	7.56
611	2024-05-26 10	7.42	68.13	8.04	13.52	0.80	8.35
612	2024-05-26 11	7.41	68.17	8.03	13.53	0.81	9.17

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
613	2024-05-26 12	7.42	68.86	8.02	13.60	0.80	9.97
614	2024-05-26 13	7.43	68.67	8.06	13.77	0.80	10.78
615	2024-05-26 14	7.43	69.12	8.13	13.79	0.81	11.59
616	2024-05-26 15	7.55	69.38	8.11	13.73	0.81	12.40
617	2024-05-26 16	7.68	69.24	8.09	13.82	0.82	13.23
618	2024-05-26 17	7.73	68.88	8.04	13.81	0.81	14.05
619	2024-05-26 18	7.76	68.76	8.06	13.70	0.80	14.86
620	2024-05-26 19	7.80	69.26	7.98	13.62	0.79	15.67
621	2024-05-26 20	7.81	69.53	7.34	13.68	0.79	16.47
622	2024-05-26 21	7.84	67.21	0.16	0.27	0.80	17.27
623	2024-05-26 22	7.87	66.76	0.13	0.15	0.80	18.07
624	2024-05-26 23	7.60	48.61	0.16	0.13	0.79	18.87
625	2024-05-27 00	7.47	7.16	0.93	6.80	0.79	0.40
626	2024-05-27 01	7.27	24.89	7.94	9.52	0.79	1.19
627	2024-05-27 02	7.18	34.28	9.31	13.85	0.79	1.98
628	2024-05-27 03	7.11	40.87	8.25	13.85	0.79	2.78

1808

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
629	2024-05-27 04	7.04	45.14	5.70	13.85	0.79	3.57
630	2024-05-27 05	7.00	47.07	8.25	13.85	0.79	4.36
631	2024-05-27 06	6.97	48.98	8.25	13.85	0.77	5.15
632	2024-05-27 07	6.99	49.67	8.25	13.85	0.77	5.93
633	2024-05-27 08	6.95	51.43	8.25	13.85	0.77	6.71
634	2024-05-27 09	6.96	54.16	11.69	13.85	0.77	7.48
635	2024-05-27 10	6.96	61.07	49.61	18.23	0.78	8.26
636	2024-05-27 11	6.99	68.29	8.07	14.26	0.78	9.05
637	2024-05-27 12	7.01	68.73	8.06	14.15	0.78	9.83
638	2024-05-27 13	7.03	68.07	8.10	13.99	0.79	10.62
639	2024-05-27 14	7.04	68.73	8.08	13.97	0.79	11.42
640	2024-05-27 15	7.05	68.82	8.14	13.99	0.79	12.21
641	2024-05-27 16	7.06	69.02	8.12	13.96	0.80	13.01
642	2024-05-27 17	7.07	67.39	8.10	13.99	0.80	13.81
643	2024-05-27 18	7.09	67.63	8.03	14.00	0.79	14.61
644	2024-05-27 19	7.10	68.22	8.05	13.93	0.79	15.40

1809

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
645	2024-05-27 20	7.11	68.46	7.98	13.99	0.78	16.19
646	2024-05-27 21	7.12	67.73	8.03	14.04	0.77	16.98
647	2024-05-27 22	7.13	67.84	8.02	14.07	0.78	17.76
648	2024-05-27 23	7.14	68.07	7.98	14.20	0.78	18.54
649	2024-05-28 00	7.15	68.67	8.05	14.08	0.79	0.40
650	2024-05-28 01	7.16	68.75	8.03	14.07	0.79	1.20
651	2024-05-28 02	7.17	68.77	8.00	13.98	0.79	1.99
652	2024-05-28 03	7.21	67.83	7.98	13.97	0.79	2.79
653	2024-05-28 04	7.22	68.09	7.94	13.88	0.79	3.58
654	2024-05-28 05	7.23	68.69	7.97	13.85	0.79	4.38
655	2024-05-28 06	7.23	67.77	7.89	13.90	0.78	5.18
656	2024-05-28 07	7.21	68.29	7.94	13.94	0.77	5.96
657	2024-05-28 08	7.28	68.18	7.99	14.05	0.78	6.74
658	2024-05-28 09	7.32	68.20	8.01	13.93	0.78	7.52
659	2024-05-28 10	7.54	68.09	8.06	13.92	0.42	8.05
660	2024-05-28 11	7.50	67.02	8.04	13.78	0.57	8.63

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
661	2024-05-28 12	7.46	69.27	0.91	2.89	0.79	9.28
662	2024-05-28 13	7.41	67.85	0.16	0.18	0.78	10.02
663	2024-05-28 14	7.43	68.60	3.60	4.51	0.75	10.71
664	2024-05-28 15	7.41	68.06	8.03	13.85	0.77	11.41
665	2024-05-28 16	7.42	68.53	8.08	13.87	0.68	12.09
666	2024-05-28 17	7.43	67.90	8.07	13.83	0.78	12.86
667	2024-05-28 18	7.42	67.75	8.00	13.82	0.78	13.65
668	2024-05-28 19	7.42	67.94	8.04	13.80	0.77	14.43
669	2024-05-28 20	7.42	67.66	8.05	13.82	0.77	15.20
670	2024-05-28 21	7.41	67.84	8.03	13.82	0.77	15.98
671	2024-05-28 22	7.40	67.39	7.98	13.85	0.77	16.75
672	2024-05-28 23	7.40	67.64	8.02	13.73	0.77	17.53
673	2024-05-29 00	7.40	68.05	7.97	13.74	0.78	0.40
674	2024-05-29 01	7.41	67.50	8.05	13.80	0.78	1.18
675	2024-05-29 02	7.41	67.83	7.98	13.65	0.78	1.97
676	2024-05-29 03	7.41	68.10	7.97	13.69	0.79	2.76

1811

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
677	2024-05-29 04	7.41	67.99	7.95	13.69	0.78	3.54
678	2024-05-29 05	7.40	68.03	7.99	13.77	0.78	4.33
679	2024-05-29 06	7.41	67.60	7.89	13.70	0.78	5.11
680	2024-05-29 07	7.41	67.54	7.88	13.65	0.77	5.89
681	2024-05-29 08	7.42	67.82	7.86	13.50	0.76	6.65
682	2024-05-29 09	7.42	68.52	7.93	13.60	0.76	7.37
683	2024-05-29 10	NA	NA	NA	NA	NA	NA
684	2024-05-29 11	NA	NA	NA	NA	NA	NA
685	2024-05-29 12	NA	NA	NA	NA	NA	NA
686	2024-05-29 13	NA	NA	NA	NA	NA	NA
687	2024-05-29 14	NA	NA	NA	NA	NA	NA
688	2024-05-29 15	NA	NA	NA	NA	NA	NA
689	2024-05-29 16	NA	NA	NA	NA	NA	NA
690	2024-05-29 17	NA	NA	NA	NA	NA	NA
691	2024-05-29 18	NA	NA	NA	NA	NA	NA
692	2024-05-29 19	7.46	68.90	7.72	13.58	0.79	7.76

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
693	2024-05-29 20	NA	NA	NA	NA	NA	NA
694	2024-05-29 21	NA	NA	NA	NA	NA	NA
695	2024-05-29 22	NA	NA	NA	NA	NA	NA
696	2024-05-29 23	7.44	68.29	7.86	13.65	0.79	7.98
697	2024-05-30 00	7.43	68.94	7.77	13.36	0.78	0.18
698	2024-05-30 01	NA	NA	NA	NA	NA	NA
699	2024-05-30 02	NA	NA	NA	NA	NA	NA
700	2024-05-30 03	NA	NA	NA	NA	NA	NA
701	2024-05-30 04	NA	NA	NA	NA	NA	NA
702	2024-05-30 05	NA	NA	NA	NA	NA	NA
703	2024-05-30 06	NA	NA	NA	NA	NA	NA
704	2024-05-30 07	NA	NA	NA	NA	NA	NA
705	2024-05-30 08	NA	NA	NA	NA	NA	NA
706	2024-05-30 09	NA	NA	NA	NA	NA	NA
707	2024-05-30 10	NA	NA	NA	NA	NA	NA
708	2024-05-30 11	NA	NA	NA	NA	NA	NA

1813

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
709	2024-05-30 12	NA	NA	NA	NA	NA	NA
710	2024-05-30 13	NA	NA	NA	NA	NA	NA
711	2024-05-30 14	NA	NA	NA	NA	NA	NA
712	2024-05-30 15	NA	NA	NA	NA	NA	NA
713	2024-05-30 16	NA	NA	NA	NA	NA	NA
714	2024-05-30 17	NA	NA	NA	NA	NA	NA
715	2024-05-30 18	NA	NA	NA	NA	NA	NA
716	2024-05-30 19	NA	NA	NA	NA	NA	NA
717	2024-05-30 20	NA	NA	NA	NA	NA	NA
718	2024-05-30 21	NA	NA	NA	NA	NA	NA
719	2024-05-30 22	7.47	64.10	5.29	8.86	0.78	0.48
720	2024-05-30 23	7.48	67.44	5.98	14.02	0.79	1.03
721	2024-05-31 00	7.48	66.70	5.28	13.77	0.79	0.40
722	2024-05-31 01	7.46	66.84	4.79	13.29	0.79	1.20
723	2024-05-31 02	7.46	67.25	5.38	13.99	0.79	1.99
724	2024-05-31 03	7.46	67.47	6.26	13.90	0.80	2.80

1814

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
725	2024-05-31 04	7.47	66.99	7.09	13.89	0.79	3.60
726	2024-05-31 05	7.47	67.43	6.91	13.85	0.79	4.39
727	2024-05-31 06	7.46	67.61	7.25	13.86	0.78	5.18
728	2024-05-31 07	7.47	66.65	7.15	13.88	0.78	5.97
729	2024-05-31 08	7.46	65.53	7.22	13.90	0.78	6.76
730	2024-05-31 09	7.46	71.80	7.35	13.79	0.78	7.54
731	2024-05-31 10	7.47	66.41	7.55	13.78	0.78	8.32
732	2024-05-31 11	7.47	67.99	7.67	13.81	0.78	9.11
733	2024-05-31 12	7.48	68.02	7.77	13.84	0.78	9.89
734	2024-05-31 13	7.48	67.11	7.84	13.79	0.79	10.68
735	2024-05-31 14	7.48	67.09	7.72	13.76	0.78	11.44
736	2024-05-31 15	7.48	67.18	7.82	13.81	0.78	12.19
737	2024-05-31 16	7.49	67.48	7.84	13.77	0.79	12.98
738	2024-05-31 17	7.48	67.20	7.88	13.87	0.79	13.78
739	2024-05-31 18	7.48	67.52	7.89	13.91	0.79	14.57
740	2024-05-31 19	7.48	67.25	7.78	13.81	0.78	15.37

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
741	2024-05-31 20	7.49	67.56	7.74	13.85	0.78	16.15
742	2024-05-31 21	7.50	67.73	7.78	13.88	0.78	16.94
743	2024-05-31 22	7.49	67.91	7.76	13.98	0.78	17.72
744	2024-05-31 23	7.49	67.87	7.76	13.92	0.78	18.51
745	2024-06-01 00	7.49	67.33	7.77	13.91	0.78	0.40
746	2024-06-01 01	7.49	67.81	7.83	13.86	0.78	1.18
747	2024-06-01 02	7.50	66.99	7.85	13.90	0.78	1.97
748	2024-06-01 03	7.50	67.76	7.92	13.87	0.79	2.76
749	2024-06-01 04	7.50	66.84	7.80	13.93	0.78	3.55
750	2024-06-01 05	7.50	67.66	7.78	13.79	0.71	4.34
751	2024-06-01 06	7.50	67.99	7.72	13.87	0.23	4.86
752	2024-06-01 07	7.49	66.31	7.72	13.86	0.00	4.89
753	2024-06-01 08	7.50	67.79	7.64	13.87	0.00	4.89
754	2024-06-01 09	7.50	67.44	7.80	13.81	0.00	4.89
755	2024-06-01 10	7.50	67.71	7.80	13.92	0.00	4.89
756	2024-06-01 11	7.50	67.61	7.79	13.79	0.44	5.01

1816

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
757	2024-06-01 12	7.50	68.02	7.87	13.85	0.81	5.75
758	2024-06-01 13	7.49	68.14	7.77	13.87	0.80	6.56
759	2024-06-01 14	7.50	67.21	7.94	13.92	0.81	7.37
760	2024-06-01 15	7.49	67.51	7.86	13.90	0.81	8.18
761	2024-06-01 16	7.49	67.85	7.85	13.84	0.81	9.00
762	2024-06-01 17	7.49	68.49	7.83	13.94	0.80	9.81
763	2024-06-01 18	7.49	66.78	7.94	13.92	0.80	10.61
764	2024-06-01 19	7.49	66.82	7.93	13.94	0.80	11.41
765	2024-06-01 20	7.49	67.84	7.80	13.96	0.79	12.21
766	2024-06-01 21	7.49	66.99	7.85	13.90	0.80	13.01
767	2024-06-01 22	7.49	67.22	7.83	13.97	0.80	13.81
768	2024-06-01 23	7.50	67.50	7.78	13.91	0.79	14.61
769	2024-06-02 00	7.50	68.07	7.86	13.85	0.79	0.40
770	2024-06-02 01	7.49	67.93	7.77	13.87	0.79	1.20
771	2024-06-02 02	7.49	67.05	7.90	13.90	0.79	1.99
772	2024-06-02 03	7.50	66.85	7.87	13.93	0.79	2.79

1817

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
773	2024-06-02 04	7.50	67.31	7.87	13.93	0.79	3.58
774	2024-06-02 05	7.50	67.14	7.84	13.93	0.78	4.37
775	2024-06-02 06	7.50	68.06	7.86	13.90	0.79	5.16
776	2024-06-02 07	7.49	66.90	7.87	13.87	0.78	5.95
777	2024-06-02 08	7.50	67.08	7.75	13.81	0.78	6.74
778	2024-06-02 09	7.49	67.33	7.80	13.90	0.78	7.52
779	2024-06-02 10	7.50	67.70	7.84	13.87	0.79	8.31
780	2024-06-02 11	7.50	67.42	7.83	13.81	0.79	9.11
781	2024-06-02 12	7.50	67.00	7.85	13.84	0.79	9.90
782	2024-06-02 13	7.50	66.73	7.85	13.80	0.44	10.62
783	2024-06-02 14	7.50	67.83	7.81	13.83	0.71	11.06
784	2024-06-02 15	7.49	67.58	7.84	13.85	0.80	11.86
785	2024-06-02 16	7.49	67.54	7.84	13.87	0.80	12.66
786	2024-06-02 17	7.50	67.52	7.82	13.91	0.79	13.46
787	2024-06-02 18	7.50	66.90	7.79	13.91	0.79	14.25
788	2024-06-02 19	7.49	66.96	7.77	13.93	0.79	15.04

1818

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
789	2024-06-02 20	7.50	67.96	7.87	13.96	0.79	15.84
790	2024-06-02 21	7.50	67.10	7.82	13.94	0.78	16.63
791	2024-06-02 22	7.50	68.03	7.80	13.88	0.78	17.42
792	2024-06-02 23	7.51	67.58	7.87	13.85	0.79	18.21
793	2024-06-03 00	7.51	66.98	7.73	13.90	0.79	0.41
794	2024-06-03 01	7.51	67.70	7.87	13.89	0.79	1.20
795	2024-06-03 02	7.51	68.34	7.90	13.85	0.79	2.00
796	2024-06-03 03	7.52	67.05	7.79	13.92	0.79	2.79
797	2024-06-03 04	7.52	67.58	7.82	13.94	0.79	3.59
798	2024-06-03 05	7.52	67.45	7.84	13.96	0.78	4.38
799	2024-06-03 06	7.52	66.48	7.80	13.92	0.78	5.17
800	2024-06-03 07	7.51	67.02	7.77	13.91	0.44	5.87
801	2024-06-03 08	7.51	66.83	7.77	13.89	0.00	6.00
802	2024-06-03 09	7.51	66.82	7.80	13.90	0.54	6.20
803	2024-06-03 10	7.51	67.23	7.85	13.91	0.77	6.94
804	2024-06-03 11	7.51	67.60	7.80	13.86	0.78	7.72

1819

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
805	2024-06-03 12	7.51	67.46	7.78	13.83	0.78	8.50
806	2024-06-03 13	7.52	67.48	7.82	13.87	0.78	9.28
807	2024-06-03 14	7.51	67.69	7.81	13.94	0.79	10.07
808	2024-06-03 15	7.51	67.15	7.86	13.92	0.79	10.87
809	2024-06-03 16	7.51	66.72	7.74	13.92	0.79	11.66
810	2024-06-03 17	7.52	67.14	7.73	13.85	0.79	12.46
811	2024-06-03 18	7.51	66.86	7.79	13.91	0.75	13.23
812	2024-06-03 19	7.52	67.37	7.80	14.01	0.77	14.00
813	2024-06-03 20	7.51	67.26	7.67	14.03	0.76	14.78
814	2024-06-03 21	7.52	66.54	7.77	13.88	0.79	15.56
815	2024-06-03 22	7.52	67.41	7.86	13.89	0.79	16.37
816	2024-06-03 23	7.52	66.97	7.74	13.88	0.79	17.16
817	2024-06-04 00	7.52	67.84	7.74	13.94	0.79	0.41
818	2024-06-04 01	7.52	67.60	7.81	13.84	0.79	1.20
819	2024-06-04 02	7.53	67.09	7.71	13.95	0.79	2.00
820	2024-06-04 03	7.52	67.07	7.79	13.88	0.79	2.80

1820

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
821	2024-06-04 04	7.52	67.57	7.81	13.85	0.79	3.59
822	2024-06-04 05	7.52	67.28	7.71	13.88	0.79	4.39
823	2024-06-04 06	7.53	67.64	7.76	13.89	0.79	5.19
824	2024-06-04 07	7.53	67.27	7.70	13.91	0.76	5.97
825	2024-06-04 08	7.52	67.55	7.76	13.86	0.77	6.73
826	2024-06-04 09	7.53	67.16	7.68	13.81	0.73	7.47
827	2024-06-04 10	7.52	68.13	7.75	13.90	0.73	8.23
828	2024-06-04 11	7.52	67.56	7.76	13.88	0.78	8.98
829	2024-06-04 12	7.53	67.22	7.79	13.88	0.78	9.76
830	2024-06-04 13	7.53	68.04	7.84	13.86	0.79	10.55
831	2024-06-04 14	7.52	67.75	7.77	13.84	0.78	11.34
832	2024-06-04 15	7.52	67.49	7.86	13.85	0.78	12.13
833	2024-06-04 16	7.53	66.68	7.92	13.82	0.72	12.87
834	2024-06-04 17	7.53	66.85	7.89	13.93	0.78	13.63
835	2024-06-04 18	7.53	67.79	7.85	13.87	0.78	14.42
836	2024-06-04 19	7.54	67.42	7.90	13.87	0.77	15.20

1821

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
837	2024-06-04 20	7.53	66.50	7.70	13.90	0.77	15.97
838	2024-06-04 21	7.54	66.95	7.84	13.90	0.77	16.75
839	2024-06-04 22	7.53	67.53	7.84	13.92	0.77	17.53
840	2024-06-04 23	7.53	67.70	7.80	13.87	0.77	18.30
841	2024-06-05 00	7.53	67.73	7.85	14.77	0.78	0.40
842	2024-06-05 01	7.52	67.21	7.81	13.86	0.78	1.19
843	2024-06-05 02	7.53	67.25	7.80	13.96	0.78	1.97
844	2024-06-05 03	7.53	67.14	7.85	13.90	0.78	2.76
845	2024-06-05 04	7.53	67.31	7.65	13.93	0.78	3.54
846	2024-06-05 05	7.53	67.75	7.67	10.62	0.78	4.32
847	2024-06-05 06	7.53	67.23	7.56	12.89	0.77	5.10
848	2024-06-05 07	7.54	67.32	7.52	13.96	0.72	5.86
849	2024-06-05 08	7.53	67.78	7.43	14.86	0.72	6.59
850	2024-06-05 09	7.54	68.20	6.94	17.94	0.77	7.33
851	2024-06-05 10	7.53	67.82	6.64	13.22	0.76	8.10
852	2024-06-05 11	7.53	67.44	6.94	12.70	0.77	8.88

1822

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
853	2024-06-05 12	7.52	67.93	7.05	27.53	0.77	9.66
854	2024-06-05 13	7.53	66.94	7.24	11.94	0.78	10.43
855	2024-06-05 14	7.52	67.37	7.38	12.27	0.78	11.22
856	2024-06-05 15	7.53	66.54	7.28	12.18	0.77	12.00
857	2024-06-05 16	7.52	67.42	7.30	12.96	0.77	12.77
858	2024-06-05 17	7.52	67.48	7.30	28.05	0.67	13.54
859	2024-06-05 18	7.53	66.99	9.87	12.33	0.00	13.83
860	2024-06-05 19	7.53	66.96	7.66	12.23	0.75	14.20
861	2024-06-05 20	7.53	67.20	7.06	12.43	0.73	14.98
862	2024-06-05 21	7.54	67.07	7.54	13.24	0.75	15.69
863	2024-06-05 22	7.54	67.44	7.37	12.68	0.78	16.47
864	2024-06-05 23	7.54	67.70	7.34	12.59	0.77	17.25
865	2024-06-06 00	7.54	67.24	5.77	13.21	0.77	0.40
866	2024-06-06 01	7.54	67.07	6.95	13.33	0.77	1.16
867	2024-06-06 02	7.53	67.19	7.52	13.41	0.76	1.93
868	2024-06-06 03	7.53	66.94	7.46	13.20	0.76	2.70

1823

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
869	2024-06-06 04	7.54	67.74	7.63	13.13	0.76	3.47
870	2024-06-06 05	7.53	67.98	7.52	13.29	0.76	4.24
871	2024-06-06 06	7.54	67.12	7.57	13.36	0.76	5.00
872	2024-06-06 07	7.54	67.54	7.64	13.28	0.75	5.76
873	2024-06-06 08	7.54	67.66	7.75	13.56	0.73	6.50
874	2024-06-06 09	7.54	67.81	7.71	12.58	0.75	7.25
875	2024-06-06 10	7.53	67.83	7.75	13.55	0.76	8.01
876	2024-06-06 11	7.53	67.51	7.79	13.36	0.76	8.78
877	2024-06-06 12	7.54	67.54	7.83	14.94	0.76	9.54
878	2024-06-06 13	7.53	67.60	7.79	25.65	0.44	10.08
879	2024-06-06 14	7.53	67.21	7.66	13.51	0.78	10.76
880	2024-06-06 15	7.53	67.19	7.81	13.57	0.79	11.55
881	2024-06-06 16	7.54	67.01	7.81	13.60	0.78	12.34
882	2024-06-06 17	7.54	67.81	7.72	13.60	0.78	13.10
883	2024-06-06 18	7.53	66.97	7.82	13.70	0.77	13.93
884	2024-06-06 19	7.53	68.00	7.82	13.80	0.76	14.68

1824

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
885	2024-06-06 20	7.54	66.72	7.62	13.62	0.76	15.45
886	2024-06-06 21	7.53	67.04	7.78	13.76	0.76	16.22
887	2024-06-06 22	7.54	68.51	7.78	13.75	0.76	16.98
888	2024-06-06 23	7.53	66.21	7.76	13.72	0.75	17.75
889	2024-06-07 00	7.54	67.28	7.71	13.77	0.76	0.39
890	2024-06-07 01	7.53	67.19	7.68	13.82	0.76	1.14
891	2024-06-07 02	7.53	67.45	7.75	13.63	0.76	1.90
892	2024-06-07 03	7.53	67.09	7.82	13.83	0.75	2.66
893	2024-06-07 04	7.54	67.50	7.63	13.87	0.75	3.42
894	2024-06-07 05	7.54	67.24	7.90	13.76	0.75	4.17
895	2024-06-07 06	7.54	67.36	7.86	13.78	0.74	4.92
896	2024-06-07 07	7.55	67.30	7.84	13.79	0.74	5.67
897	2024-06-07 08	7.55	67.69	7.85	13.78	0.74	6.42
898	2024-06-07 09	7.53	67.01	7.84	13.75	0.73	7.16
899	2024-06-07 10	7.55	67.10	7.79	13.81	0.73	7.90
900	2024-06-07 11	7.54	67.49	7.85	13.75	0.74	8.64

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
901	2024-06-07 12	7.54	67.20	7.79	13.71	0.74	9.38
902	2024-06-07 13	7.54	66.49	7.78	13.71	0.75	10.13
903	2024-06-07 14	7.54	67.69	7.84	13.78	0.71	10.87
904	2024-06-07 15	7.54	67.52	7.86	13.84	0.75	11.60
905	2024-06-07 16	7.55	67.60	7.86	13.77	0.75	12.36
906	2024-06-07 17	7.54	67.31	7.84	13.86	0.75	13.11
907	2024-06-07 18	7.54	67.15	7.82	13.78	0.75	13.86
908	2024-06-07 19	7.53	66.97	7.81	13.88	0.74	14.61
909	2024-06-07 20	7.54	67.23	7.87	13.82	0.74	15.35
910	2024-06-07 21	7.55	68.02	7.89	13.87	0.73	16.10
911	2024-06-07 22	7.56	67.65	7.85	13.80	0.73	16.83
912	2024-06-07 23	7.55	67.19	7.76	13.88	0.73	17.57
913	2024-06-08 00	7.55	67.49	7.76	13.87	0.74	0.38
914	2024-06-08 01	7.54	67.85	7.81	13.83	0.74	1.12
915	2024-06-08 02	7.53	67.96	7.89	13.87	0.74	1.86
916	2024-06-08 03	7.55	66.60	7.77	13.87	0.74	2.61

1826

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
917	2024-06-08 04	7.54	67.29	7.83	13.90	0.74	3.35
918	2024-06-08 05	7.54	67.28	7.85	13.89	0.73	4.08
919	2024-06-08 06	7.54	67.26	7.88	13.82	0.73	4.82
920	2024-06-08 07	7.55	67.71	7.81	13.83	0.72	5.55
921	2024-06-08 08	7.55	67.57	7.74	13.82	0.72	6.27
922	2024-06-08 09	7.54	67.06	7.73	13.86	0.71	6.99
923	2024-06-08 10	7.55	66.86	7.80	13.81	0.72	7.71
924	2024-06-08 11	7.54	67.47	7.85	13.82	0.72	8.44
925	2024-06-08 12	7.54	67.81	7.75	13.87	0.72	9.17
926	2024-06-08 13	7.54	67.39	7.76	13.78	0.73	9.90
927	2024-06-08 14	7.54	67.42	7.85	13.79	0.73	10.64
928	2024-06-08 15	7.54	67.68	7.88	14.72	0.72	11.38
929	2024-06-08 16	7.54	67.55	7.86	13.80	0.73	12.11
930	2024-06-08 17	7.54	66.66	7.82	13.90	0.73	12.84
931	2024-06-08 18	7.55	67.01	8.00	13.88	0.71	13.57
932	2024-06-08 19	7.54	67.43	7.76	13.85	0.72	14.29

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
933	2024-06-08 20	7.54	67.35	7.48	12.98	0.59	14.92
934	2024-06-08 21	7.54	67.19	7.52	13.35	0.75	15.62
935	2024-06-08 22	7.55	67.99	7.55	13.70	0.75	16.37
936	2024-06-08 23	7.54	67.30	7.73	13.52	0.74	17.12
937	2024-06-09 00	7.54	67.06	7.74	13.75	0.75	0.39
938	2024-06-09 01	7.54	67.81	7.74	13.79	0.75	1.13
939	2024-06-09 02	7.54	67.05	7.65	13.85	0.69	1.86
940	2024-06-09 03	7.55	66.77	7.64	13.73	0.74	2.57
941	2024-06-09 04	7.55	67.09	7.74	13.81	0.73	3.32
942	2024-06-09 05	7.54	67.65	7.83	13.88	0.73	4.05
943	2024-06-09 06	7.55	66.75	7.82	13.88	0.73	4.79
944	2024-06-09 07	7.55	67.37	7.86	13.90	0.72	5.52
945	2024-06-09 08	7.55	67.57	7.76	13.74	0.72	6.24
946	2024-06-09 09	7.54	66.81	7.78	13.84	0.72	6.96
947	2024-06-09 10	7.55	67.69	7.84	13.77	0.73	7.69
948	2024-06-09 11	7.55	67.74	7.87	13.83	0.72	8.42

1828

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
949	2024-06-09 12	7.55	67.06	7.88	13.77	0.72	9.15
950	2024-06-09 13	7.55	67.21	7.80	13.77	0.73	9.88
951	2024-06-09 14	7.54	67.96	7.86	14.23	0.74	10.62
952	2024-06-09 15	7.55	67.82	7.77	14.30	0.73	11.36
953	2024-06-09 16	7.55	66.84	7.84	13.79	0.74	12.10
954	2024-06-09 17	7.55	67.12	7.83	13.88	0.73	12.84
955	2024-06-09 18	7.55	67.25	7.84	13.86	0.73	13.58
956	2024-06-09 19	7.55	67.22	7.88	13.84	0.72	14.30
957	2024-06-09 20	7.56	67.77	7.85	14.78	0.71	15.02
958	2024-06-09 21	7.55	66.95	7.83	13.90	0.71	15.73
959	2024-06-09 22	7.55	66.73	7.76	13.95	0.71	16.45
960	2024-06-09 23	7.55	67.18	7.90	13.83	0.71	17.17
961	2024-06-10 00	7.55	67.59	7.83	13.89	0.72	0.37
962	2024-06-10 01	7.54	67.49	7.88	13.86	0.72	1.09
963	2024-06-10 02	7.55	66.72	7.76	13.81	0.72	1.81
964	2024-06-10 03	7.54	67.29	7.84	13.92	0.72	2.53

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
965	2024-06-10 04	7.55	67.43	7.98	13.87	0.72	3.25
966	2024-06-10 05	7.54	67.67	7.88	13.85	0.72	3.98
967	2024-06-10 06	7.55	67.10	7.87	13.94	0.71	4.70
968	2024-06-10 07	7.55	66.87	7.88	13.82	0.70	5.41
969	2024-06-10 08	7.56	67.01	7.74	13.80	0.70	6.11
970	2024-06-10 09	7.55	67.11	7.75	13.85	0.70	6.81
971	2024-06-10 10	7.54	67.90	7.82	13.75	0.70	7.52
972	2024-06-10 11	7.56	67.77	7.88	13.71	0.08	7.94
973	2024-06-10 12	7.55	66.68	7.82	13.83	0.00	7.94
974	2024-06-10 13	7.54	66.97	7.91	13.77	0.00	7.94
975	2024-06-10 14	7.55	67.59	7.85	16.97	0.00	7.94
976	2024-06-10 15	7.54	67.26	7.91	13.79	0.62	8.20
977	2024-06-10 16	7.55	67.40	7.87	13.94	0.74	8.94
978	2024-06-10 17	7.55	67.51	7.85	13.89	0.74	9.69
979	2024-06-10 18	7.55	67.22	7.90	13.88	0.74	10.43
980	2024-06-10 19	7.55	67.99	7.90	13.83	0.73	11.17

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
981	2024-06-10 20	7.55	67.27	7.81	13.88	0.73	11.90
982	2024-06-10 21	7.55	67.01	7.84	13.85	0.73	12.63
983	2024-06-10 22	7.55	66.79	7.88	13.88	0.73	13.36
984	2024-06-10 23	7.55	66.82	7.87	13.78	0.72	14.09
985	2024-06-11 00	7.55	67.21	7.82	13.91	0.72	0.37
986	2024-06-11 01	7.57	66.81	7.79	13.84	0.73	1.10
987	2024-06-11 02	7.56	67.44	7.89	13.83	0.72	1.83
988	2024-06-11 03	7.56	67.33	7.72	13.92	0.73	2.56
989	2024-06-11 04	7.55	67.54	7.78	13.91	0.72	3.29
990	2024-06-11 05	7.55	67.75	7.83	13.89	0.72	4.01
991	2024-06-11 06	7.55	67.34	7.78	13.87	0.71	4.74
992	2024-06-11 07	7.56	67.32	7.83	13.84	0.71	5.46
993	2024-06-11 08	7.56	67.03	7.84	13.76	0.72	6.18
994	2024-06-11 09	7.56	67.36	7.94	13.81	0.71	6.90
995	2024-06-11 10	7.55	66.69	7.91	13.86	0.72	7.62
996	2024-06-11 11	7.55	67.22	7.91	13.82	0.73	8.35

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
997	2024-06-11 12	7.55	67.22	7.84	13.72	0.72	9.08
998	2024-06-11 13	7.55	67.34	7.81	13.79	0.73	9.81
999	2024-06-11 14	7.56	67.53	7.85	13.86	0.74	10.54
1000	2024-06-11 15	7.55	68.03	7.92	14.08	0.73	11.28
1001	2024-06-11 16	7.55	66.96	7.82	14.41	0.74	12.00
1002	2024-06-11 17	7.55	67.16	7.94	13.89	0.74	12.77
1003	2024-06-11 18	7.55	67.26	7.87	13.89	0.73	13.52
1004	2024-06-11 19	7.56	67.18	7.79	13.93	0.72	14.24
1005	2024-06-11 20	7.55	66.78	7.86	13.94	0.72	14.97
1006	2024-06-11 21	7.55	68.14	7.86	13.85	0.72	15.69
1007	2024-06-11 22	7.56	67.27	7.85	13.89	0.72	16.41
1008	2024-06-11 23	7.57	68.38	7.90	13.92	0.72	17.14
1009	2024-06-12 00	7.56	67.60	7.96	13.82	0.72	0.37
1010	2024-06-12 01	7.56	66.68	7.90	13.84	0.72	1.10
1011	2024-06-12 02	7.55	66.79	7.89	13.83	0.72	1.81
1012	2024-06-12 03	7.55	66.84	7.88	13.87	0.73	2.55

1832

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1013	2024-06-12 04	7.56	67.49	7.82	13.85	0.72	3.28
1014	2024-06-12 05	7.57	67.22	7.90	13.85	0.72	4.00
1015	2024-06-12 06	7.56	67.04	7.78	13.87	0.72	4.73
1016	2024-06-12 07	7.56	67.18	7.88	13.86	0.72	5.45
1017	2024-06-12 08	7.56	67.37	7.83	13.85	0.71	6.17
1018	2024-06-12 09	7.56	66.78	7.91	13.82	0.71	6.89
1019	2024-06-12 10	7.56	67.48	7.90	14.73	0.72	7.60
1020	2024-06-12 11	7.55	66.54	7.78	13.79	0.72	8.33
1021	2024-06-12 12	7.56	67.26	7.84	13.82	0.71	9.05
1022	2024-06-12 13	7.55	67.83	7.80	13.86	0.72	9.77
1023	2024-06-12 14	7.56	67.17	7.92	13.83	0.72	10.50
1024	2024-06-12 15	7.56	66.58	7.83	13.94	0.72	11.23
1025	2024-06-12 16	7.56	67.32	7.89	14.66	0.73	11.96
1026	2024-06-12 17	7.56	67.56	7.80	13.86	0.75	12.71
1027	2024-06-12 18	7.56	66.49	8.00	13.87	0.74	13.45
1028	2024-06-12 19	7.57	67.19	7.89	13.92	0.73	14.20

1833

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1029	2024-06-12 20	7.58	66.89	7.87	13.88	0.73	14.94
1030	2024-06-12 21	7.57	67.35	7.86	13.92	0.73	15.67
1031	2024-06-12 22	7.57	67.14	7.89	13.88	0.73	16.40
1032	2024-06-12 23	7.58	66.93	7.73	13.78	0.74	17.11
1033	2024-06-13 00	7.57	66.75	7.77	13.84	0.73	0.37
1034	2024-06-13 01	7.58	66.82	7.85	13.88	0.74	1.10
1035	2024-06-13 02	7.59	66.95	7.78	13.85	0.74	1.77
1036	2024-06-13 03	7.58	67.00	7.79	13.87	0.74	2.46
1037	2024-06-13 04	7.59	66.96	7.90	13.83	0.74	3.21
1038	2024-06-13 05	7.58	67.15	7.89	13.88	0.74	3.96
1039	2024-06-13 06	7.58	67.20	7.88	13.79	0.73	4.69
1040	2024-06-13 07	7.59	66.74	7.89	13.91	0.71	5.42
1041	2024-06-13 08	7.58	66.97	7.77	14.99	0.72	6.15
1042	2024-06-13 09	7.58	66.50	7.78	13.82	0.72	6.87
1043	2024-06-13 10	7.60	67.52	7.80	13.82	0.73	7.61
1044	2024-06-13 11	7.59	67.16	7.90	13.85	0.72	8.34

1834

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1045	2024-06-13 12	7.58	67.85	7.80	13.76	0.71	9.06
1046	2024-06-13 13	7.58	67.60	7.91	13.78	0.73	9.78
1047	2024-06-13 14	7.58	67.77	7.89	13.83	0.73	10.52
1048	2024-06-13 15	7.58	66.89	7.86	13.83	0.73	11.26
1049	2024-06-13 16	7.58	67.13	8.00	13.81	0.73	11.95
1050	2024-06-13 17	NA	NA	NA	NA	NA	NA
1051	2024-06-13 18	NA	NA	NA	NA	NA	NA
1052	2024-06-13 19	7.59	67.04	7.75	13.85	0.50	12.26
1053	2024-06-13 20	7.59	67.04	7.81	13.85	0.45	12.32
1054	2024-06-13 21	NA	NA	NA	NA	NA	NA
1055	2024-06-13 22	NA	NA	NA	NA	NA	NA
1056	2024-06-13 23	NA	NA	NA	NA	NA	NA
1057	2024-06-14 00	NA	NA	NA	NA	NA	NA
1058	2024-06-14 01	7.60	67.80	7.74	13.92	0.45	0.12
1059	2024-06-14 02	7.60	67.66	7.85	13.87	0.46	0.47
1060	2024-06-14 03	7.60	67.31	7.92	13.78	0.46	0.94

1835

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1061	2024-06-14 04	7.60	66.78	7.90	13.93	0.46	1.41
1062	2024-06-14 05	7.60	66.57	7.91	14.00	0.43	1.69
1063	2024-06-14 06	NA	NA	NA	NA	NA	NA
1064	2024-06-14 07	7.59	67.83	7.79	13.81	0.43	1.89
1065	2024-06-14 08	NA	NA	NA	NA	NA	NA
1066	2024-06-14 09	NA	NA	NA	NA	NA	NA
1067	2024-06-14 10	7.59	67.87	7.84	13.73	0.39	2.10
1068	2024-06-14 11	NA	NA	NA	NA	NA	NA
1069	2024-06-14 12	NA	NA	NA	NA	NA	NA
1070	2024-06-14 13	NA	NA	NA	NA	NA	NA
1071	2024-06-14 14	NA	NA	NA	NA	NA	NA
1072	2024-06-14 15	NA	NA	NA	NA	NA	NA
1073	2024-06-14 16	NA	NA	NA	NA	NA	NA
1074	2024-06-14 17	NA	NA	NA	NA	NA	NA
1075	2024-06-14 18	NA	NA	NA	NA	NA	NA
1076	2024-06-14 19	NA	NA	NA	NA	NA	NA

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1077	2024-06-14 20	NA	NA	NA	NA	NA	NA
1078	2024-06-14 21	NA	NA	NA	NA	NA	NA
1079	2024-06-14 22	NA	NA	NA	NA	NA	NA
1080	2024-06-14 23	NA	NA	NA	NA	NA	NA
1081	2024-06-15 00	NA	NA	NA	NA	NA	NA
1082	2024-06-15 01	NA	NA	NA	NA	NA	NA
1083	2024-06-15 02	NA	NA	NA	NA	NA	NA
1084	2024-06-15 03	NA	NA	NA	NA	NA	NA
1085	2024-06-15 04	NA	NA	NA	NA	NA	NA
1086	2024-06-15 05	NA	NA	NA	NA	NA	NA
1087	2024-06-15 06	NA	NA	NA	NA	NA	NA
1088	2024-06-15 07	NA	NA	NA	NA	NA	NA
1089	2024-06-15 08	NA	NA	NA	NA	NA	NA
1090	2024-06-15 09	NA	NA	NA	NA	NA	NA
1091	2024-06-15 10	NA	NA	NA	NA	NA	NA
1092	2024-06-15 11	NA	NA	NA	NA	NA	NA

1837

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1093	2024-06-15 12	NA	NA	NA	NA	NA	NA
1094	2024-06-15 13	NA	NA	NA	NA	NA	NA
1095	2024-06-15 14	NA	NA	NA	NA	NA	NA
1096	2024-06-15 15	NA	NA	NA	NA	NA	NA
1097	2024-06-15 16	7.60	66.49	7.86	13.77	0.44	0.10
1098	2024-06-15 17	NA	NA	NA	NA	NA	NA
1099	2024-06-15 18	NA	NA	NA	NA	NA	NA
1100	2024-06-15 19	NA	NA	NA	NA	NA	NA
1101	2024-06-15 20	NA	NA	NA	NA	NA	NA
1102	2024-06-15 21	NA	NA	NA	NA	NA	NA
1103	2024-06-15 22	NA	NA	NA	NA	NA	NA
1104	2024-06-15 23	NA	NA	NA	NA	NA	NA
1105	2024-06-16 00	NA	NA	NA	NA	NA	NA
1106	2024-06-16 01	NA	NA	NA	NA	NA	NA
1107	2024-06-16 02	NA	NA	NA	NA	NA	NA
1108	2024-06-16 03	NA	NA	NA	NA	NA	NA

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1109	2024-06-16 04	NA	NA	NA	NA	NA	NA
1110	2024-06-16 05	NA	NA	NA	NA	NA	NA
1111	2024-06-16 06	NA	NA	NA	NA	NA	NA
1112	2024-06-16 07	NA	NA	NA	NA	NA	NA
1113	2024-06-16 08	7.65	67.43	7.92	13.83	0.44	0.18
1114	2024-06-16 09	7.64	67.27	7.79	13.83	0.44	0.58
1115	2024-06-16 10	7.65	67.77	7.82	13.74	0.44	1.02
1116	2024-06-16 11	7.64	68.09	7.87	13.88	0.45	1.46
1117	2024-06-16 12	7.65	67.18	7.82	13.86	0.44	1.91
1118	2024-06-16 13	7.65	66.67	7.84	13.76	0.44	2.35
1119	2024-06-16 14	7.65	67.87	7.88	13.76	0.44	2.80
1120	2024-06-16 15	7.65	67.92	7.94	13.90	0.45	3.25
1121	2024-06-16 16	7.65	68.21	7.86	13.85	0.46	3.71
1122	2024-06-16 17	7.65	66.89	7.78	13.90	0.45	4.17
1123	2024-06-16 18	7.65	67.75	7.83	13.83	0.44	4.62
1124	2024-06-16 19	7.67	67.57	7.87	13.83	0.44	5.06

1839

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1125	2024-06-16 20	7.65	66.86	7.86	13.83	0.44	5.50
1126	2024-06-16 21	7.65	67.43	7.85	13.81	0.44	5.94
1127	2024-06-16 22	7.66	67.71	7.86	13.88	0.44	6.38
1128	2024-06-16 23	7.67	67.75	7.86	13.89	0.44	6.82
1129	2024-06-17 00	7.68	67.56	7.82	13.86	0.45	0.23
1130	2024-06-17 01	7.67	67.54	7.85	13.83	0.45	0.68
1131	2024-06-17 02	7.67	67.90	7.94	13.84	0.45	1.12
1132	2024-06-17 03	7.67	67.55	7.89	14.84	0.44	1.57
1133	2024-06-17 04	7.68	68.10	7.83	13.79	0.44	2.01
1134	2024-06-17 05	7.67	67.50	7.85	13.71	0.44	2.46
1135	2024-06-17 06	7.67	67.32	7.91	13.86	0.44	2.90
1136	2024-06-17 07	7.68	67.21	7.82	13.79	0.44	3.35
1137	2024-06-17 08	7.68	67.46	7.95	14.81	0.44	3.79
1138	2024-06-17 09	7.67	67.22	7.90	13.82	0.43	4.23
1139	2024-06-17 10	7.68	68.61	7.84	13.85	0.43	4.66
1140	2024-06-17 11	7.68	66.90	7.88	13.78	0.44	5.10

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1141	2024-06-17 12	7.67	67.46	7.89	13.78	0.43	5.53
1142	2024-06-17 13	7.67	66.99	7.88	13.78	0.34	5.95
1143	2024-06-17 14	7.67	67.94	7.88	13.79	0.00	6.09
1144	2024-06-17 15	7.67	67.48	7.93	13.63	0.20	6.14
1145	2024-06-17 16	7.67	67.98	7.78	13.88	0.45	6.52
1146	2024-06-17 17	7.67	67.64	7.86	13.84	0.44	6.96
1147	2024-06-17 18	7.67	66.91	7.85	13.87	0.44	7.40
1148	2024-06-17 19	7.67	67.35	7.90	13.79	0.44	7.85
1149	2024-06-17 20	7.67	67.38	7.86	13.81	0.44	8.29
1150	2024-06-17 21	7.67	66.39	7.81	13.84	0.44	8.73
1151	2024-06-17 22	7.68	67.13	7.83	13.79	0.44	9.17
1152	2024-06-17 23	7.68	67.59	7.89	13.87	0.44	9.62
1153	2024-06-18 00	7.68	67.97	7.96	13.91	0.44	0.23
1154	2024-06-18 01	7.68	66.93	7.92	13.85	0.44	0.68
1155	2024-06-18 02	7.68	66.81	7.82	13.83	0.44	1.12
1156	2024-06-18 03	7.69	67.37	7.88	13.84	0.44	1.56

1841

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1157	2024-06-18 04	7.68	67.56	7.89	13.85	0.44	2.00
1158	2024-06-18 05	7.69	67.05	7.85	13.88	0.44	2.44
1159	2024-06-18 06	7.69	67.16	7.86	13.81	0.43	2.88
1160	2024-06-18 07	7.69	66.66	7.78	13.70	0.43	3.31
1161	2024-06-18 08	7.69	67.67	7.72	13.83	0.43	3.74
1162	2024-06-18 09	7.69	67.60	7.91	14.95	0.42	4.17
1163	2024-06-18 10	7.69	67.72	7.91	13.80	0.43	4.59
1164	2024-06-18 11	7.68	68.00	7.87	14.83	0.43	5.02
1165	2024-06-18 12	7.68	67.26	7.84	13.90	0.43	5.45
1166	2024-06-18 13	7.68	67.00	7.84	13.74	0.43	5.89
1167	2024-06-18 14	7.68	67.94	7.84	13.73	0.43	6.32
1168	2024-06-18 15	7.68	66.65	7.82	13.81	0.43	6.76
1169	2024-06-18 16	7.68	66.87	7.88	13.87	0.44	7.20
1170	2024-06-18 17	7.68	66.49	7.90	13.82	0.44	7.65
1171	2024-06-18 18	7.68	67.27	7.95	13.83	0.44	8.09
1172	2024-06-18 19	7.68	67.06	7.91	13.82	0.43	8.53

1842

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1173	2024-06-18 20	7.69	67.61	7.86	13.87	0.44	8.96
1174	2024-06-18 21	7.68	67.20	7.80	13.82	0.44	9.40
1175	2024-06-18 22	7.69	68.18	7.84	13.77	0.44	9.85
1176	2024-06-18 23	7.69	67.93	7.84	13.97	0.45	10.29
1177	2024-06-19 00	7.69	67.27	7.91	13.92	0.44	0.23
1178	2024-06-19 01	7.69	67.28	7.90	13.87	0.44	0.67
1179	2024-06-19 02	7.69	67.13	7.84	13.88	0.44	1.12
1180	2024-06-19 03	7.69	67.51	7.84	13.83	0.44	1.56
1181	2024-06-19 04	7.68	67.04	7.83	13.86	0.44	2.01
1182	2024-06-19 05	7.69	67.33	7.91	15.08	0.44	2.46
1183	2024-06-19 06	7.69	67.28	7.84	13.78	0.44	2.90
1184	2024-06-19 07	7.69	67.13	7.82	13.82	0.43	3.33
1185	2024-06-19 08	7.69	67.31	7.77	13.81	0.44	3.77
1186	2024-06-19 09	7.69	67.84	7.82	13.77	0.43	4.21
1187	2024-06-19 10	7.70	67.40	7.84	13.81	0.44	4.64
1188	2024-06-19 11	7.69	67.10	7.78	13.81	0.44	5.08

1843

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1189	2024-06-19 12	7.70	66.96	7.88	13.89	0.44	5.52
1190	2024-06-19 13	7.70	68.67	7.89	13.84	0.44	5.96
1191	2024-06-19 14	7.69	67.67	7.88	13.79	0.44	6.40
1192	2024-06-19 15	7.69	68.03	7.85	13.87	0.44	6.85
1193	2024-06-19 16	7.69	67.55	7.76	13.76	0.44	7.29
1194	2024-06-19 17	7.69	67.06	7.79	13.90	0.44	7.73
1195	2024-06-19 18	7.69	67.56	7.90	13.95	0.40	8.15
1196	2024-06-19 19	7.69	66.50	7.85	13.95	0.43	8.59
1197	2024-06-19 20	7.69	66.19	7.80	13.92	0.32	9.00
1198	2024-06-19 21	7.71	67.15	7.89	13.83	0.13	9.15
1199	2024-06-19 22	7.70	67.56	7.97	13.79	0.46	9.48
1200	2024-06-19 23	7.70	67.68	7.90	13.77	0.46	9.95
1201	2024-06-20 00	7.70	67.43	7.87	13.87	0.46	0.24
1202	2024-06-20 01	7.69	67.22	7.82	13.84	0.45	0.69
1203	2024-06-20 02	7.71	67.33	7.79	13.78	0.46	1.16
1204	2024-06-20 03	7.71	66.68	7.78	13.89	0.45	1.61

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1205	2024-06-20 04	7.71	67.10	7.84	13.83	0.37	2.02
1206	2024-06-20 05	7.71	66.80	7.76	13.83	0.43	2.44
1207	2024-06-20 06	7.72	67.04	7.91	13.80	0.17	2.78
1208	2024-06-20 07	7.71	67.20	7.90	13.52	0.00	2.82
1209	2024-06-20 08	7.70	67.59	7.77	13.83	0.02	2.82
1210	2024-06-20 09	7.70	66.92	7.72	13.79	0.44	3.06
1211	2024-06-20 10	7.70	67.02	7.68	13.89	0.44	3.50
1212	2024-06-20 11	7.71	67.78	7.86	13.86	0.42	3.94
1213	2024-06-20 12	7.70	67.05	7.79	13.78	0.25	4.30
1214	2024-06-20 13	7.71	67.47	7.79	13.73	0.44	4.61
1215	2024-06-20 14	7.70	67.74	7.73	13.79	0.46	5.06
1216	2024-06-20 15	7.70	67.03	7.76	13.90	0.46	5.52
1217	2024-06-20 16	7.70	67.49	7.88	13.87	0.46	5.95
1218	2024-06-20 17	7.70	67.35	7.78	13.87	0.42	6.44
1219	2024-06-20 18	7.71	66.87	7.78	13.88	0.41	6.84
1220	2024-06-20 19	7.70	67.60	7.82	13.91	0.42	7.25

1845

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1221	2024-06-20 20	7.71	66.78	7.75	13.88	0.43	7.68
1222	2024-06-20 21	7.71	67.38	7.78	13.83	0.44	8.12
1223	2024-06-20 22	7.71	67.84	7.70	13.90	0.44	8.56
1224	2024-06-20 23	7.71	66.89	7.76	13.84	0.44	9.00
1225	2024-06-21 00	7.71	67.16	7.69	13.97	0.44	0.22
1226	2024-06-21 01	7.70	67.84	8.04	13.90	0.44	0.66
1227	2024-06-21 02	7.72	67.56	7.75	13.85	0.44	1.11
1228	2024-06-21 03	7.73	66.85	7.89	13.93	0.45	1.55
1229	2024-06-21 04	7.73	67.17	7.68	13.95	0.44	2.00
1230	2024-06-21 05	7.71	67.12	7.67	13.74	0.44	2.45
1231	2024-06-21 06	7.72	67.42	7.75	13.83	0.44	2.90
1232	2024-06-21 07	7.72	67.73	7.77	13.89	0.43	3.34
1233	2024-06-21 08	7.71	67.17	8.06	13.78	0.43	3.77
1234	2024-06-21 09	7.71	67.33	7.75	13.81	0.43	4.20
1235	2024-06-21 10	7.71	66.82	7.75	13.88	0.43	4.63
1236	2024-06-21 11	7.71	67.05	7.73	13.83	0.45	5.08

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1237	2024-06-21 12	7.70	67.20	7.78	13.92	0.44	5.53
1238	2024-06-21 13	7.70	67.21	7.79	13.84	0.44	5.97
1239	2024-06-21 14	7.69	67.83	7.88	13.79	0.44	6.41
1240	2024-06-21 15	7.67	67.47	7.81	13.81	0.44	6.86
1241	2024-06-21 16	7.67	67.18	7.89	13.83	0.44	7.30
1242	2024-06-21 17	7.67	67.38	7.70	13.80	0.43	7.74
1243	2024-06-21 18	7.68	67.33	7.72	13.86	0.44	8.18
1244	2024-06-21 19	7.69	66.93	7.74	13.89	0.44	8.62
1245	2024-06-21 20	7.67	67.20	7.79	13.93	0.44	9.06
1246	2024-06-21 21	7.68	67.47	7.77	13.81	0.44	9.50
1247	2024-06-21 22	7.68	67.26	7.79	13.85	0.44	9.94
1248	2024-06-21 23	7.68	66.90	7.90	13.82	0.44	10.38
1249	2024-06-22 00	7.68	68.20	7.80	13.91	0.44	0.23
1250	2024-06-22 01	7.69	67.44	7.80	13.85	0.44	0.67
1251	2024-06-22 02	7.68	66.90	7.79	13.85	0.44	1.12
1252	2024-06-22 03	7.69	67.31	7.73	13.88	0.45	1.57

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1253	2024-06-22 04	7.69	67.85	7.70	13.83	0.44	2.01
1254	2024-06-22 05	7.69	67.36	7.80	13.87	0.45	2.46
1255	2024-06-22 06	7.70	67.64	7.80	13.89	0.44	2.91
1256	2024-06-22 07	7.68	67.50	7.71	13.86	0.44	3.35
1257	2024-06-22 08	7.69	67.27	7.68	13.90	0.43	3.79
1258	2024-06-22 09	7.69	67.19	7.77	13.79	0.44	4.23
1259	2024-06-22 10	7.70	66.78	7.83	13.85	0.45	4.67
1260	2024-06-22 11	7.69	66.81	7.81	13.85	0.45	5.12
1261	2024-06-22 12	7.69	67.05	7.88	13.88	0.44	5.57
1262	2024-06-22 13	7.69	68.14	7.89	13.89	0.45	6.01
1263	2024-06-22 14	7.69	67.50	7.94	13.93	0.44	6.46
1264	2024-06-22 15	7.69	67.81	7.79	13.83	0.44	6.91
1265	2024-06-22 16	7.68	67.22	7.83	13.85	0.42	7.35
1266	2024-06-22 17	7.68	66.98	7.78	13.81	0.45	7.78
1267	2024-06-22 18	7.69	67.23	7.89	13.91	0.44	8.22
1268	2024-06-22 19	7.70	66.57	7.85	13.96	0.44	8.67

1848

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1269	2024-06-22 20	7.69	66.57	7.76	13.84	0.43	9.10
1270	2024-06-22 21	7.69	67.20	7.80	13.89	0.43	9.53
1271	2024-06-22 22	7.69	67.45	7.94	13.66	0.43	9.96
1272	2024-06-22 23	7.70	66.24	7.71	13.69	0.44	10.40
1273	2024-06-23 00	7.69	67.28	7.67	13.78	0.44	0.23
1274	2024-06-23 01	7.69	67.93	7.93	13.69	0.44	0.67
1275	2024-06-23 02	7.69	67.59	8.08	13.80	0.44	1.09
1276	2024-06-23 03	7.70	67.65	7.85	13.90	0.44	1.56
1277	2024-06-23 04	7.69	67.60	7.92	14.20	0.44	2.00
1278	2024-06-23 05	7.70	66.87	7.76	13.75	0.43	2.44
1279	2024-06-23 06	7.70	67.53	7.78	13.84	0.43	2.88
1280	2024-06-23 07	7.70	67.42	7.76	13.86	0.43	3.31
1281	2024-06-23 08	7.70	67.31	7.75	13.79	0.43	3.74
1282	2024-06-23 09	7.69	67.83	7.80	13.86	0.43	4.17
1283	2024-06-23 10	7.69	67.29	7.84	13.87	0.44	4.61
1284	2024-06-23 11	7.69	67.94	7.93	13.74	0.41	5.05

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1285	2024-06-23 12	7.70	67.10	7.87	13.89	0.43	5.46
1286	2024-06-23 13	7.69	67.23	7.84	13.92	0.44	5.90
1287	2024-06-23 14	7.70	67.78	7.79	13.81	0.44	6.34
1288	2024-06-23 15	7.70	67.91	7.76	13.84	0.46	6.79
1289	2024-06-23 16	7.70	67.42	7.88	13.84	0.46	7.25
1290	2024-06-23 17	7.69	67.03	7.91	13.92	0.46	7.72
1291	2024-06-23 18	7.69	67.57	7.94	13.82	0.45	8.18
1292	2024-06-23 19	7.69	67.54	7.87	13.84	0.44	8.62
1293	2024-06-23 20	7.69	67.48	7.94	13.81	0.44	9.07
1294	2024-06-23 21	7.69	67.50	7.82	13.86	0.44	9.51
1295	2024-06-23 22	7.69	67.36	7.93	13.85	0.43	9.95
1296	2024-06-23 23	7.69	67.14	7.80	13.93	0.44	10.40
1297	2024-06-24 00	7.69	68.60	7.79	13.76	0.44	0.22
1298	2024-06-24 01	7.70	67.73	7.68	13.81	0.44	0.66
1299	2024-06-24 02	7.70	66.67	7.69	13.87	0.43	1.10
1300	2024-06-24 03	7.70	66.67	7.85	13.85	0.43	1.54

1850

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1301	2024-06-24 04	7.69	67.50	7.83	13.98	0.43	1.97
1302	2024-06-24 05	7.69	67.87	7.81	13.92	0.43	2.40
1303	2024-06-24 06	7.69	66.77	7.86	13.88	0.42	2.83
1304	2024-06-24 07	7.69	67.25	7.85	13.88	0.41	3.25
1305	2024-06-24 08	7.69	67.49	7.77	13.84	0.42	3.66
1306	2024-06-24 09	7.69	67.33	7.78	13.90	0.42	4.08
1307	2024-06-24 10	7.70	67.93	7.82	13.79	0.42	4.50
1308	2024-06-24 11	7.70	67.65	7.68	13.94	0.41	4.92
1309	2024-06-24 12	7.69	67.29	7.74	13.88	0.41	5.33
1310	2024-06-24 13	7.69	67.61	7.82	14.03	0.37	5.72
1311	2024-06-24 14	7.69	67.56	7.72	13.77	0.41	6.12
1312	2024-06-24 15	7.68	66.94	7.67	13.81	0.42	6.54
1313	2024-06-24 16	7.68	66.90	7.75	13.87	0.44	6.97
1314	2024-06-24 17	7.69	67.61	7.82	13.84	0.44	7.42
1315	2024-06-24 18	7.70	67.68	7.93	13.86	0.43	7.86
1316	2024-06-24 19	7.69	67.94	7.85	13.87	0.41	8.29

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1317	2024-06-24 20	7.69	67.13	7.83	13.84	0.41	8.71
1318	2024-06-24 21	7.69	67.14	7.74	13.81	0.42	9.12
1319	2024-06-24 22	7.69	67.22	7.78	13.86	0.42	9.54
1320	2024-06-24 23	7.69	67.51	7.88	13.88	0.42	9.97
1321	2024-06-25 00	7.69	67.31	7.72	13.88	0.42	0.22
1322	2024-06-25 01	7.69	66.68	7.90	13.83	0.42	0.64
1323	2024-06-25 02	7.69	67.91	7.84	13.86	0.42	1.06
1324	2024-06-25 03	7.70	67.11	7.84	13.89	0.42	1.49
1325	2024-06-25 04	7.68	67.41	7.85	13.84	0.42	1.91
1326	2024-06-25 05	7.70	67.56	7.73	13.85	0.42	2.33
1327	2024-06-25 06	7.69	66.98	7.69	13.84	0.42	2.75
1328	2024-06-25 07	7.69	67.20	7.86	13.90	0.41	3.17
1329	2024-06-25 08	7.70	67.46	7.89	13.83	0.37	3.59
1330	2024-06-25 09	7.69	67.87	7.84	13.85	0.36	3.97
1331	2024-06-25 10	7.69	67.20	7.90	13.89	0.00	4.12
1332	2024-06-25 11	7.69	66.83	7.81	13.82	0.05	4.13

1852

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1333	2024-06-25 12	7.69	66.87	7.79	13.75	0.45	4.40
1334	2024-06-25 13	7.68	67.48	7.74	13.82	0.45	4.86
1335	2024-06-25 14	7.68	67.71	7.79	13.81	0.44	5.31
1336	2024-06-25 15	7.69	67.12	7.85	13.90	0.45	5.75
1337	2024-06-25 16	7.70	66.90	7.83	13.87	0.46	6.21
1338	2024-06-25 17	7.69	67.21	7.72	13.89	0.46	6.67
1339	2024-06-25 18	7.69	67.85	7.81	13.95	0.44	7.13
1340	2024-06-25 19	7.70	67.47	7.87	13.91	0.43	7.57
1341	2024-06-25 20	7.69	67.19	7.83	13.89	0.43	8.00
1342	2024-06-25 21	7.69	67.63	7.81	13.93	0.42	8.43
1343	2024-06-25 22	7.69	67.23	7.87	13.83	0.42	8.86
1344	2024-06-25 23	7.69	67.29	7.75	13.94	0.43	9.29
1345	2024-06-26 00	7.68	66.86	7.77	14.04	0.43	0.22
1346	2024-06-26 01	7.70	67.37	7.78	13.92	0.43	0.65
1347	2024-06-26 02	7.69	67.71	7.75	13.91	0.43	1.08
1348	2024-06-26 03	7.70	67.75	7.92	13.88	0.44	1.52

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1349	2024-06-26 04	7.68	67.29	7.84	13.80	0.43	1.96
1350	2024-06-26 05	7.68	67.43	7.95	13.83	0.43	2.39
1351	2024-06-26 06	7.68	67.71	7.80	13.81	0.42	2.81
1352	2024-06-26 07	7.68	67.30	7.76	13.87	0.42	3.23
1353	2024-06-26 08	7.68	67.76	7.83	13.84	0.42	3.65
1354	2024-06-26 09	7.68	66.83	7.78	13.77	0.42	4.07
1355	2024-06-26 10	7.69	67.67	7.74	13.83	0.43	4.49
1356	2024-06-26 11	7.68	67.45	7.71	13.87	0.43	4.93
1357	2024-06-26 12	7.68	66.73	7.79	13.81	0.42	5.35
1358	2024-06-26 13	7.68	66.95	7.78	13.77	0.44	5.79
1359	2024-06-26 14	7.68	67.25	7.73	13.87	0.46	6.23
1360	2024-06-26 15	7.68	67.86	7.85	13.83	0.46	6.70
1361	2024-06-26 16	7.68	67.57	7.95	13.88	0.44	7.16
1362	2024-06-26 17	7.68	67.18	7.92	13.93	0.43	7.61
1363	2024-06-26 18	7.68	66.96	7.93	13.87	0.44	8.05
1364	2024-06-26 19	7.68	66.58	7.87	13.83	0.42	8.48

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1365	2024-06-26 20	7.69	68.03	7.76	13.85	0.42	8.90
1366	2024-06-26 21	7.69	67.62	7.86	13.92	0.42	9.33
1367	2024-06-26 22	7.69	67.58	8.08	13.85	0.42	9.75
1368	2024-06-26 23	7.68	66.65	7.79	13.83	0.42	10.17
1369	2024-06-27 00	7.68	67.24	7.82	13.84	0.43	0.22
1370	2024-06-27 01	7.68	66.70	7.80	13.85	0.42	0.65
1371	2024-06-27 02	7.68	67.11	7.82	13.85	0.42	1.07
1372	2024-06-27 03	7.69	67.30	7.76	13.92	0.42	1.50
1373	2024-06-27 04	7.68	67.05	7.75	13.90	0.43	1.93
1374	2024-06-27 05	7.68	67.80	7.76	13.79	0.43	2.36
1375	2024-06-27 06	7.69	67.54	7.85	13.74	0.43	2.79
1376	2024-06-27 07	7.68	67.58	7.84	13.79	0.43	3.23
1377	2024-06-27 08	7.68	66.97	7.81	13.91	0.43	3.66
1378	2024-06-27 09	7.68	67.57	7.74	13.86	0.43	4.02
1379	2024-06-27 10	NA	NA	NA	NA	NA	NA
1380	2024-06-27 11	NA	NA	NA	NA	NA	NA

1855

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1381	2024-06-27 12	NA	NA	NA	NA	NA	NA
1382	2024-06-27 13	NA	NA	NA	NA	NA	NA
1383	2024-06-27 14	NA	NA	NA	NA	NA	NA
1384	2024-06-27 15	NA	NA	NA	NA	NA	NA
1385	2024-06-27 16	NA	NA	NA	NA	NA	NA
1386	2024-06-27 17	NA	NA	NA	NA	NA	NA
1387	2024-06-27 18	NA	NA	NA	NA	NA	NA
1388	2024-06-27 19	NA	NA	NA	NA	NA	NA
1389	2024-06-27 20	NA	NA	NA	NA	NA	NA
1390	2024-06-27 21	NA	NA	NA	NA	NA	NA
1391	2024-06-27 22	NA	NA	NA	NA	NA	NA
1392	2024-06-27 23	NA	NA	NA	NA	NA	NA
1393	2024-06-28 00	NA	NA	NA	NA	NA	NA
1394	2024-06-28 01	NA	NA	NA	NA	NA	NA
1395	2024-06-28 02	NA	NA	NA	NA	NA	NA
1396	2024-06-28 03	NA	NA	NA	NA	NA	NA

1856

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1397	2024-06-28 04	NA	NA	NA	NA	NA	NA
1398	2024-06-28 05	NA	NA	NA	NA	NA	NA
1399	2024-06-28 06	NA	NA	NA	NA	NA	NA
1400	2024-06-28 07	NA	NA	NA	NA	NA	NA
1401	2024-06-28 08	NA	NA	NA	NA	NA	NA
1402	2024-06-28 09	NA	NA	NA	NA	NA	NA
1403	2024-06-28 10	NA	NA	NA	NA	NA	NA
1404	2024-06-28 11	NA	NA	NA	NA	NA	NA
1405	2024-06-28 12	7.68	68.09	7.73	13.82	0.79	0.31
1406	2024-06-28 13	7.67	67.12	7.77	13.92	0.60	0.95
1407	2024-06-28 14	7.67	67.77	7.70	13.90	0.75	1.59
1408	2024-06-28 15	7.68	67.86	7.82	13.83	0.71	2.32
1409	2024-06-28 16	7.68	67.44	7.83	13.86	0.75	3.04
1410	2024-06-28 17	7.68	66.35	7.70	13.96	0.82	3.83
1411	2024-06-28 18	7.68	67.14	7.67	13.81	0.83	4.66
1412	2024-06-28 19	7.67	67.22	7.85	13.90	0.82	5.50

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1413	2024-06-28 20	7.67	67.55	7.72	13.93	0.83	6.33
1414	2024-06-28 21	7.67	67.04	7.81	13.86	0.81	7.16
1415	2024-06-28 22	7.67	67.28	7.69	13.87	0.82	7.97
1416	2024-06-28 23	7.69	67.30	7.71	13.92	0.82	8.80
1417	2024-06-29 00	7.69	67.53	7.70	13.84	0.82	0.42
1418	2024-06-29 01	7.68	67.43	7.77	13.90	0.82	1.23
1419	2024-06-29 02	7.68	67.09	7.82	13.86	0.83	2.07
1420	2024-06-29 03	7.68	67.18	7.79	13.84	0.83	2.90
1421	2024-06-29 04	7.68	67.84	7.79	13.84	0.83	3.73
1422	2024-06-29 05	7.67	67.60	7.77	13.92	0.82	4.56
1423	2024-06-29 06	7.67	66.97	7.71	13.78	0.82	5.39
1424	2024-06-29 07	7.68	67.89	7.74	13.97	0.82	6.21
1425	2024-06-29 08	7.67	66.87	7.79	13.86	0.83	7.04
1426	2024-06-29 09	7.68	67.22	7.69	13.85	0.81	7.86
1427	2024-06-29 10	7.67	66.51	7.88	13.76	0.81	8.68
1428	2024-06-29 11	7.68	67.29	7.76	13.82	0.82	9.51

1858

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1429	2024-06-29 12	7.67	66.86	7.69	13.88	0.85	10.34
1430	2024-06-29 13	7.66	67.54	7.78	13.77	0.86	11.20
1431	2024-06-29 14	7.67	67.21	7.86	13.84	0.87	12.07
1432	2024-06-29 15	7.67	67.84	7.88	13.83	0.88	12.95
1433	2024-06-29 16	7.68	67.49	7.77	13.84	0.88	13.84
1434	2024-06-29 17	7.67	67.18	7.81	13.83	0.85	14.72
1435	2024-06-29 18	7.67	67.39	7.78	13.92	0.82	15.56
1436	2024-06-29 19	7.66	67.58	7.79	13.94	0.81	16.38
1437	2024-06-29 20	7.66	66.79	7.74	13.83	0.80	17.18
1438	2024-06-29 21	7.68	67.24	7.73	13.97	0.81	18.00
1439	2024-06-29 22	7.67	66.80	7.75	13.84	0.81	18.82
1440	2024-06-29 23	7.67	67.27	7.68	13.83	0.81	19.63
1441	2024-06-30 00	7.68	67.80	7.82	13.90	0.82	0.42
1442	2024-06-30 01	7.67	67.30	7.65	13.86	0.83	1.25
1443	2024-06-30 02	7.68	67.41	7.83	13.95	0.84	2.08
1444	2024-06-30 03	7.67	67.32	7.77	13.92	0.84	2.93

1859

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1445	2024-06-30 04	7.67	67.16	7.76	13.87	0.84	3.77
1446	2024-06-30 05	7.66	67.85	7.80	13.88	0.84	4.61
1447	2024-06-30 06	7.66	67.25	7.75	13.87	0.83	5.43
1448	2024-06-30 07	7.67	67.23	7.71	13.87	0.83	6.28
1449	2024-06-30 08	7.66	67.02	7.58	13.84	0.84	7.12
1450	2024-06-30 09	7.66	67.33	7.71	13.83	0.84	7.96
1451	2024-06-30 10	7.67	66.53	7.79	14.03	0.84	8.80
1452	2024-06-30 11	7.66	67.50	7.84	13.82	0.84	9.65
1453	2024-06-30 12	7.67	67.39	7.79	13.86	0.86	10.51
1454	2024-06-30 13	7.66	67.25	7.80	15.04	0.88	11.40
1455	2024-06-30 14	7.66	67.69	7.87	13.87	0.88	12.27
1456	2024-06-30 15	7.66	67.34	7.73	13.88	0.89	13.16
1457	2024-06-30 16	7.66	66.85	7.73	13.96	0.80	14.03
1458	2024-06-30 17	7.66	67.25	7.72	13.85	0.87	14.85
1459	2024-06-30 18	7.66	67.50	7.81	13.92	0.85	15.71
1460	2024-06-30 19	7.66	67.67	7.79	13.86	0.84	16.57

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1461	2024-06-30 20	7.66	66.71	7.77	13.90	0.84	17.42
1462	2024-06-30 21	7.66	67.37	7.90	13.88	0.84	18.26
1463	2024-06-30 22	7.65	67.71	7.74	13.89	0.84	19.11
1464	2024-06-30 23	7.65	67.71	7.80	13.85	0.84	19.96
1465	2024-07-01 00	7.66	67.58	7.77	13.98	0.84	0.43
1466	2024-07-01 01	7.65	66.72	7.70	13.90	0.84	1.27
1467	2024-07-01 02	7.66	67.14	7.71	13.82	0.85	2.11
1468	2024-07-01 03	7.66	67.33	7.81	13.77	0.85	2.97
1469	2024-07-01 04	7.67	67.20	7.73	13.89	0.86	3.83
1470	2024-07-01 05	7.66	67.63	7.82	13.82	0.85	4.68
1471	2024-07-01 06	7.67	67.87	7.72	13.80	0.84	5.53
1472	2024-07-01 07	7.67	67.20	7.69	13.77	0.84	6.38
1473	2024-07-01 08	7.66	67.32	7.77	13.79	0.84	7.22
1474	2024-07-01 09	7.66	67.36	7.75	13.82	0.83	8.06
1475	2024-07-01 10	7.65	66.65	7.67	13.98	0.83	8.90
1476	2024-07-01 11	7.66	66.86	7.84	13.87	0.83	9.74

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1477	2024-07-01 12	7.66	67.46	7.80	13.88	0.83	10.56
1478	2024-07-01 13	7.65	67.58	7.79	13.88	0.82	11.40
1479	2024-07-01 14	7.65	67.64	7.89	13.88	0.81	12.22
1480	2024-07-01 15	7.65	67.33	7.74	13.91	0.00	12.61
1481	2024-07-01 16	7.65	67.17	7.79	13.85	0.00	12.61
1482	2024-07-01 17	7.66	66.45	7.77	13.84	0.00	12.61
1483	2024-07-01 18	7.65	67.99	7.78	13.87	0.00	12.61
1484	2024-07-01 19	7.65	67.31	7.82	13.88	0.00	12.61
1485	2024-07-01 20	7.64	67.29	7.79	13.81	0.00	12.61
1486	2024-07-01 21	7.64	67.33	7.82	13.94	0.00	12.61
1487	2024-07-01 22	7.64	67.15	7.89	13.79	0.00	12.61
1488	2024-07-01 23	7.66	67.22	7.84	13.87	0.78	12.99
1489	2024-07-02 00	7.64	66.69	7.78	13.91	0.86	0.45
1490	2024-07-02 01	7.64	66.88	7.78	13.87	0.85	1.31
1491	2024-07-02 02	7.63	67.16	7.71	13.92	0.85	2.17
1492	2024-07-02 03	7.64	67.38	7.68	13.89	0.86	3.03

1862

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1493	2024-07-02 04	7.66	67.88	7.74	13.87	0.85	3.89
1494	2024-07-02 05	7.64	67.39	7.87	13.80	0.85	4.75
1495	2024-07-02 06	7.64	67.01	7.66	13.87	0.85	5.62
1496	2024-07-02 07	7.64	67.07	7.73	13.84	0.85	6.46
1497	2024-07-02 08	7.64	67.44	7.69	13.94	0.85	7.33
1498	2024-07-02 09	7.64	66.79	7.73	13.89	0.84	8.00
1499	2024-07-02 10	NA	NA	NA	NA	NA	NA
1500	2024-07-02 11	7.65	67.48	7.66	13.72	0.82	8.51
1501	2024-07-02 12	7.64	67.06	7.73	13.68	0.84	9.21
1502	2024-07-02 13	7.63	67.88	7.72	13.77	0.88	10.08
1503	2024-07-02 14	7.63	67.69	7.67	13.80	0.90	10.96
1504	2024-07-02 15	7.64	66.79	7.67	13.86	0.90	11.87
1505	2024-07-02 16	7.63	67.31	7.77	13.76	0.88	12.77
1506	2024-07-02 17	7.63	67.26	7.75	13.90	0.88	13.65
1507	2024-07-02 18	7.63	67.60	7.79	13.91	0.87	14.53
1508	2024-07-02 19	7.64	67.04	7.72	13.82	0.86	15.40

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1509	2024-07-02 20	7.63	66.89	7.87	13.89	0.85	16.25
1510	2024-07-02 21	7.64	66.54	7.75	13.87	0.85	17.10
1511	2024-07-02 22	7.63	67.41	7.68	13.91	0.85	17.95
1512	2024-07-02 23	7.63	67.11	7.81	13.87	0.82	18.79
1513	2024-07-03 00	7.64	67.40	7.79	13.84	0.83	0.43
1514	2024-07-03 01	7.64	66.76	7.80	13.89	0.84	1.27
1515	2024-07-03 02	7.63	67.20	7.74	13.85	0.84	2.11
1516	2024-07-03 03	7.62	66.88	7.67	13.83	0.84	2.95
1517	2024-07-03 04	7.63	67.24	8.24	13.85	0.85	3.80
1518	2024-07-03 05	7.64	66.66	7.80	13.86	0.84	4.65
1519	2024-07-03 06	7.62	67.27	7.75	13.91	0.84	5.50
1520	2024-07-03 07	7.63	67.15	7.80	13.79	0.84	6.35
1521	2024-07-03 08	7.62	66.84	7.89	13.88	0.82	7.18
1522	2024-07-03 09	7.62	67.02	7.81	13.84	0.82	8.00
1523	2024-07-03 10	7.63	67.54	7.79	13.84	0.83	8.83
1524	2024-07-03 11	7.63	68.05	7.76	13.97	0.85	9.67

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1525	2024-07-03 12	7.63	67.86	7.73	13.82	0.88	10.54
1526	2024-07-03 13	7.62	67.72	7.79	13.87	0.89	11.44
1527	2024-07-03 14	7.62	66.94	7.81	13.75	0.88	12.34
1528	2024-07-03 15	7.63	67.02	7.76	13.76	0.89	13.24
1529	2024-07-03 16	7.62	67.04	7.82	13.90	0.87	14.12
1530	2024-07-03 17	7.62	67.43	7.82	13.87	0.81	14.84
1531	2024-07-03 18	7.61	67.52	7.72	13.92	0.85	0.44
1532	2024-07-03 19	7.62	67.10	7.86	13.86	0.85	1.30
1533	2024-07-03 20	7.63	67.61	7.72	13.81	0.85	2.14
1534	2024-07-03 21	7.62	67.67	7.76	13.94	0.86	3.00
1535	2024-07-03 22	7.62	67.40	7.74	13.86	0.85	3.86
1536	2024-07-03 23	7.62	67.13	7.73	13.86	0.85	4.71
1537	2024-07-04 00	7.63	67.21	7.78	13.77	0.86	0.44
1538	2024-07-04 01	7.62	67.24	7.74	13.80	0.86	1.30
1539	2024-07-04 02	7.61	67.45	7.77	13.80	0.86	2.17
1540	2024-07-04 03	7.61	67.09	7.63	16.92	0.86	3.03

1865

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1541	2024-07-04 04	7.61	66.42	7.75	13.87	0.85	3.90
1542	2024-07-04 05	7.62	67.32	7.83	13.90	0.84	4.75
1543	2024-07-04 06	7.62	67.34	7.80	13.85	0.84	5.60
1544	2024-07-04 07	7.61	67.87	7.75	13.78	0.83	6.44
1545	2024-07-04 08	7.61	66.95	7.83	13.89	0.84	7.27
1546	2024-07-04 09	7.61	67.13	7.66	13.83	0.85	8.12
1547	2024-07-04 10	7.60	67.10	7.72	13.80	0.87	8.99
1548	2024-07-04 11	7.61	67.66	7.77	13.77	0.87	9.86
1549	2024-07-04 12	7.60	67.59	7.87	13.82	0.83	10.69
1550	2024-07-04 13	7.60	67.33	7.77	13.76	0.87	11.56
1551	2024-07-04 14	7.60	66.80	7.76	13.79	0.90	12.45
1552	2024-07-04 15	7.61	67.12	7.76	13.80	0.94	13.37
1553	2024-07-04 16	7.60	67.77	7.78	13.86	0.69	14.12
1554	2024-07-04 17	7.60	67.57	7.81	13.85	0.89	14.96
1555	2024-07-04 18	7.60	67.82	7.78	13.90	0.87	15.85
1556	2024-07-04 19	7.60	67.17	7.80	13.90	0.86	16.72

1866

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1557	2024-07-04 20	7.59	67.53	7.76	13.83	0.86	17.58
1558	2024-07-04 21	7.60	67.25	7.79	13.88	0.85	18.45
1559	2024-07-04 22	7.59	67.29	7.75	13.85	0.84	19.31
1560	2024-07-04 23	7.60	67.78	7.79	13.88	0.85	20.15
1561	2024-07-05 00	7.60	67.06	7.73	13.81	0.86	0.44
1562	2024-07-05 01	7.59	66.95	7.76	13.90	0.86	1.30
1563	2024-07-05 02	7.60	67.49	7.77	13.83	0.85	2.15
1564	2024-07-05 03	7.59	67.69	7.80	13.90	0.85	3.02
1565	2024-07-05 04	7.61	67.62	7.75	13.89	0.86	3.88
1566	2024-07-05 05	7.60	67.68	7.69	13.91	0.85	4.73
1567	2024-07-05 06	7.60	67.60	7.72	13.79	0.85	5.59
1568	2024-07-05 07	7.60	67.17	7.77	13.86	0.85	6.45
1569	2024-07-05 08	7.60	67.18	7.78	13.83	0.86	7.31
1570	2024-07-05 09	7.58	67.67	7.82	13.83	0.87	8.18
1571	2024-07-05 10	7.59	67.30	7.78	13.82	0.86	9.04
1572	2024-07-05 11	7.58	67.55	7.77	13.86	0.86	9.91

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1573	2024-07-05 12	7.59	66.91	7.73	13.87	0.87	10.78
1574	2024-07-05 13	7.58	67.29	7.68	13.80	0.88	11.65
1575	2024-07-05 14	7.58	67.57	7.78	13.84	0.88	12.54
1576	2024-07-05 15	7.59	67.35	7.84	13.91	0.86	13.42
1577	2024-07-05 16	7.59	67.39	7.79	13.88	0.88	14.29
1578	2024-07-05 17	7.57	67.44	7.68	13.89	0.88	15.18
1579	2024-07-05 18	7.57	67.13	7.77	13.82	0.85	16.04
1580	2024-07-05 19	7.58	67.45	7.75	13.92	0.85	16.90
1581	2024-07-05 20	7.58	67.54	7.74	13.85	0.83	17.75
1582	2024-07-05 21	7.57	67.11	7.72	13.75	0.83	18.59
1583	2024-07-05 22	7.58	67.55	7.75	13.79	0.84	19.43
1584	2024-07-05 23	7.58	67.40	7.80	13.90	0.84	20.28
1585	2024-07-06 00	7.57	67.31	7.73	13.81	0.84	0.43
1586	2024-07-06 01	7.58	67.29	7.73	13.82	0.85	1.28
1587	2024-07-06 02	7.58	67.26	7.68	13.93	0.85	2.12
1588	2024-07-06 03	7.58	67.36	7.77	13.83	0.84	2.97

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1589	2024-07-06 04	7.58	67.68	7.74	13.82	0.84	3.82
1590	2024-07-06 05	7.56	66.99	7.82	13.90	0.84	4.66
1591	2024-07-06 06	7.57	67.20	7.80	13.80	0.80	5.49
1592	2024-07-06 07	7.57	67.28	7.73	13.87	0.83	6.30
1593	2024-07-06 08	7.57	67.44	7.90	13.82	0.83	7.14
1594	2024-07-06 09	7.57	67.27	7.64	13.70	0.85	7.98
1595	2024-07-06 10	7.58	67.89	7.70	13.87	0.86	8.84
1596	2024-07-06 11	7.58	66.79	7.68	13.88	0.84	9.70
1597	2024-07-06 12	7.57	67.57	7.72	13.85	0.84	10.54
1598	2024-07-06 13	7.56	67.27	7.83	13.85	0.86	11.40
1599	2024-07-06 14	7.57	67.08	7.77	13.96	0.84	12.26
1600	2024-07-06 15	7.57	67.16	7.77	13.90	0.84	13.10
1601	2024-07-06 16	7.57	67.38	7.72	13.91	0.89	13.97
1602	2024-07-06 17	7.56	32.87	8.49	6.78	0.85	14.85
1603	2024-07-06 18	7.49	73.81	8.55	15.43	0.84	15.70
1604	2024-07-06 19	7.48	74.10	8.63	15.45	0.84	16.54

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1605	2024-07-06 20	7.48	73.01	8.36	15.33	0.83	17.39
1606	2024-07-06 21	7.48	72.98	8.37	15.36	0.83	18.22
1607	2024-07-06 22	7.49	73.45	8.42	15.33	0.83	19.06
1608	2024-07-06 23	7.49	72.52	8.54	15.34	0.83	19.89
1609	2024-07-07 00	7.50	72.75	8.27	15.30	0.83	0.43
1610	2024-07-07 01	7.51	73.04	8.44	15.54	0.83	1.26
1611	2024-07-07 02	7.52	72.82	8.50	15.42	0.84	2.11
1612	2024-07-07 03	7.53	72.98	8.57	15.39	0.83	2.94
1613	2024-07-07 04	7.55	73.08	8.44	15.44	0.84	3.79
1614	2024-07-07 05	7.36	72.86	8.54	15.35	0.84	4.63
1615	2024-07-07 06	7.33	72.72	8.39	15.26	0.83	5.47
1616	2024-07-07 07	7.32	73.23	8.36	15.24	0.84	6.31
1617	2024-07-07 08	7.32	73.01	8.35	15.15	0.83	7.14
1618	2024-07-07 09	7.32	74.83	6.24	8.47	0.82	7.97
1619	2024-07-07 10	7.29	82.61	0.18	0.19	0.82	8.79
1620	2024-07-07 11	7.27	79.85	0.16	0.17	0.83	9.61

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Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1621	2024-07-07 12	7.26	80.16	0.13	0.16	0.85	10.45
1622	2024-07-07 13	7.23	78.40	0.14	0.10	0.88	11.32
1623	2024-07-07 14	7.20	78.57	0.15	0.16	0.90	12.21
1624	2024-07-07 15	7.21	43.31	0.17	0.16	0.86	13.11
1625	2024-07-07 16	7.14	14.75	0.19	6.22	0.87	13.99
1626	2024-07-07 17	7.08	33.22	4.96	13.85	0.86	14.86
1627	2024-07-07 18	7.03	38.10	5.70	13.85	0.85	15.71
1628	2024-07-07 19	7.04	67.85	2.74	1.50	0.85	16.56
1629	2024-07-07 20	7.08	76.81	0.19	0.16	0.84	17.42
1630	2024-07-07 21	7.11	76.37	0.18	0.16	0.84	18.27
1631	2024-07-07 22	7.13	76.01	0.13	0.13	0.84	19.11
1632	2024-07-07 23	7.15	74.58	0.16	0.17	0.84	19.95
1633	2024-07-08 00	7.18	77.10	0.15	0.16	0.85	0.44
1634	2024-07-08 01	7.20	73.99	0.16	0.14	0.84	1.28
1635	2024-07-08 02	7.20	74.76	0.16	0.12	0.84	2.12
1636	2024-07-08 03	7.22	73.56	0.19	0.19	0.84	2.97

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1637	2024-07-08 04	7.24	73.73	0.16	0.19	0.84	3.82
1638	2024-07-08 05	7.26	73.47	0.19	0.16	0.85	4.67
1639	2024-07-08 06	7.26	74.39	0.16	0.19	0.84	5.52
1640	2024-07-08 07	7.28	72.18	0.19	0.13	0.84	6.37
1641	2024-07-08 08	7.29	75.81	0.19	0.19	0.85	7.22
1642	2024-07-08 09	7.31	73.97	0.13	0.13	0.84	8.07
1643	2024-07-08 10	7.33	77.21	0.16	0.16	0.36	8.77
1644	2024-07-08 11	7.52	74.61	0.12	0.45	0.41	8.95
1645	2024-07-08 12	7.40	70.23	6.39	18.30	0.87	9.71
1646	2024-07-08 13	7.32	69.15	7.82	16.91	0.87	10.58
1647	2024-07-08 14	7.32	69.33	7.83	15.46	0.88	11.45
1648	2024-07-08 15	7.32	68.88	7.77	15.50	0.62	12.29
1649	2024-07-08 16	7.31	69.09	7.70	15.44	0.00	12.50
1650	2024-07-08 17	7.30	68.89	7.58	15.36	0.00	12.50
1651	2024-07-08 18	7.30	69.32	7.65	15.34	0.00	12.50
1652	2024-07-08 19	7.29	68.48	7.82	14.78	0.00	12.50

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1653	2024-07-08 20	7.29	68.62	7.69	14.56	0.00	12.50
1654	2024-07-08 21	7.28	68.77	7.54	14.64	0.00	12.50
1655	2024-07-08 22	7.27	68.54	7.38	14.49	0.00	12.50
1656	2024-07-08 23	7.27	68.85	7.56	14.27	0.00	12.50
1657	2024-07-09 00	7.26	68.71	7.50	14.28	0.00	0.00
1658	2024-07-09 01	7.25	69.20	7.56	14.24	0.00	0.00
1659	2024-07-09 02	7.25	68.68	7.36	14.11	0.00	0.00
1660	2024-07-09 03	7.24	68.32	7.27	14.00	0.00	0.00
1661	2024-07-09 04	7.23	68.86	7.11	14.09	0.00	0.00
1662	2024-07-09 05	7.24	68.67	7.24	14.05	0.00	0.00
1663	2024-07-09 06	7.22	69.02	7.14	13.95	0.25	0.04
1664	2024-07-09 07	7.26	69.06	7.41	14.25	0.85	0.69
1665	2024-07-09 08	7.45	69.28	7.61	14.54	0.87	1.56
1666	2024-07-09 09	7.49	69.32	6.59	9.37	0.88	2.43
1667	2024-07-09 10	7.53	69.83	0.13	0.17	0.89	3.33
1668	2024-07-09 11	7.59	69.68	0.13	0.16	0.91	4.23

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1669	2024-07-09 12	7.62	69.73	0.14	0.17	0.90	5.14
1670	2024-07-09 13	7.63	70.41	0.16	0.13	0.89	6.04
1671	2024-07-09 14	7.64	72.68	0.16	0.18	0.91	6.94
1672	2024-07-09 15	7.66	72.16	0.16	0.16	0.90	7.86
1673	2024-07-09 16	7.67	73.65	0.16	0.13	0.90	8.76
1674	2024-07-09 17	7.69	72.86	0.19	0.16	0.86	9.63
1675	2024-07-09 18	7.69	75.23	0.14	0.18	0.86	10.49
1676	2024-07-09 19	7.71	74.04	0.18	0.17	0.85	11.35
1677	2024-07-09 20	7.77	5.26	0.16	4.50	0.85	12.20
1678	2024-07-09 21	7.79	20.04	0.56	12.46	0.85	13.05
1679	2024-07-09 22	7.80	28.06	4.76	13.85	0.85	13.91
1680	2024-07-09 23	7.80	33.14	6.42	13.85	0.85	14.76
1681	2024-07-10 00	7.81	37.17	8.25	13.85	0.85	0.44
1682	2024-07-10 01	7.81	41.33	8.25	13.85	0.86	1.29
1683	2024-07-10 02	7.82	43.62	8.25	13.85	0.86	2.16
1684	2024-07-10 03	7.82	43.54	8.25	13.85	0.86	3.03

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1685	2024-07-10 04	7.84	44.28	8.25	13.85	0.86	3.90
1686	2024-07-10 05	7.84	43.75	8.25	13.85	0.84	4.76
1687	2024-07-10 06	7.84	47.42	8.25	13.85	0.84	5.60
1688	2024-07-10 07	7.84	47.71	8.25	13.85	0.84	6.45
1689	2024-07-10 08	7.85	49.88	8.25	13.85	0.81	7.28
1690	2024-07-10 09	7.85	51.45	8.25	13.85	0.81	8.09
1691	2024-07-10 10	7.85	54.08	8.25	13.85	0.80	8.87
1692	2024-07-10 11	7.85	51.18	8.25	13.85	0.88	9.74
1693	2024-07-10 12	7.86	52.11	8.25	13.85	0.89	10.63
1694	2024-07-10 13	7.86	54.05	8.25	13.85	0.91	11.53
1695	2024-07-10 14	7.86	54.47	8.25	13.85	0.92	12.46
1696	2024-07-10 15	7.04	57.00	24.78	13.85	0.91	13.38
1697	2024-07-10 16	6.72	54.25	25.75	13.85	0.91	14.29
1698	2024-07-10 17	6.68	99.66	20.41	13.85	0.89	15.20
1699	2024-07-10 18	6.67	33.96	20.30	13.85	0.87	16.07
1700	2024-07-10 19	6.66	73.49	15.69	13.85	0.85	16.93

1875

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1701	2024-07-10 20	6.66	49.56	25.30	13.85	0.84	17.77
1702	2024-07-10 21	6.65	59.79	20.57	13.85	0.84	18.62
1703	2024-07-10 22	6.65	66.75	20.35	13.85	0.84	19.46
1704	2024-07-10 23	6.65	48.74	17.30	13.85	0.85	20.31
1705	2024-07-11 00	6.64	42.71	18.86	13.85	0.86	0.44
1706	2024-07-11 01	6.64	66.40	35.10	13.85	0.86	1.30
1707	2024-07-11 02	6.63	87.37	22.35	13.85	0.86	2.17
1708	2024-07-11 03	6.63	49.92	10.78	13.85	0.85	3.02
1709	2024-07-11 04	6.63	50.36	16.50	13.85	0.85	3.88
1710	2024-07-11 05	6.63	94.06	23.24	13.85	0.85	4.74
1711	2024-07-11 06	6.63	56.73	19.63	13.85	0.84	5.59
1712	2024-07-11 07	6.63	77.99	12.18	13.85	0.83	6.42
1713	2024-07-11 08	6.63	22.56	26.92	13.85	0.79	7.24
1714	2024-07-11 09	6.63	32.28	6.22	13.85	0.85	8.06
1715	2024-07-11 10	6.63	37.72	11.50	13.85	0.87	8.92
1716	2024-07-11 11	6.64	145.84	14.26	16.27	0.87	9.80

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1717	2024-07-11 12	6.66	69.45	7.99	18.24	0.86	10.66
1718	2024-07-11 13	6.68	69.18	7.83	16.84	0.82	11.51
1719	2024-07-11 14	6.70	69.51	7.68	16.48	0.87	12.37
1720	2024-07-11 15	6.72	68.99	7.73	15.90	0.86	13.24
1721	2024-07-11 16	6.73	68.96	7.69	15.68	0.86	14.10
1722	2024-07-11 17	6.75	68.85	7.61	15.33	0.76	14.94
1723	2024-07-11 18	6.76	68.72	7.64	15.31	0.86	15.73
1724	2024-07-11 19	6.76	68.66	7.61	15.00	0.85	16.60
1725	2024-07-11 20	6.78	68.72	7.78	14.87	0.83	17.46
1726	2024-07-11 21	6.79	68.28	7.75	14.59	0.83	18.29
1727	2024-07-11 22	6.79	68.32	7.72	14.50	0.83	19.13
1728	2024-07-11 23	6.80	68.74	7.65	14.38	0.84	19.98
1729	2024-07-12 00	6.81	68.34	7.68	14.38	0.83	0.43
1730	2024-07-12 01	6.82	68.47	7.57	14.50	0.83	1.26
1731	2024-07-12 02	6.82	68.55	7.70	14.73	0.83	2.10
1732	2024-07-12 03	6.83	68.56	7.48	14.09	0.83	2.93

1877

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1733	2024-07-12 04	6.83	68.58	7.48	14.20	0.84	3.77
1734	2024-07-12 05	6.72	62.22	2.78	6.73	0.83	4.61
1735	2024-07-12 06	6.66	69.90	0.16	0.16	0.83	5.45
1736	2024-07-12 07	6.65	65.99	0.15	0.16	0.81	6.27
1737	2024-07-12 08	6.75	58.01	0.17	0.19	0.83	7.09
1738	2024-07-12 09	6.78	57.31	0.19	0.16	0.84	7.93
1739	2024-07-12 10	6.66	66.75	0.19	0.17	0.78	8.76
1740	2024-07-12 11	6.65	62.58	0.16	0.18	0.79	9.54
1741	2024-07-12 12	6.64	71.71	0.19	0.18	0.83	10.36
1742	2024-07-12 13	6.64	74.26	0.16	0.16	0.86	11.22
1743	2024-07-12 14	6.65	60.70	0.16	0.19	0.90	12.10
1744	2024-07-12 15	6.64	60.37	0.18	0.19	0.89	13.01
1745	2024-07-12 16	6.77	68.53	0.16	0.16	0.88	13.90
1746	2024-07-12 17	6.70	58.92	0.15	0.16	0.85	14.77
1747	2024-07-12 18	6.67	66.38	15.39	5.74	0.70	15.50
1748	2024-07-12 19	6.66	93.09	21.63	8.22	0.83	16.31

1878

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1749	2024-07-12 20	6.66	16.53	53.40	9.31	0.82	17.14
1750	2024-07-12 21	6.66	36.48	58.07	13.85	0.81	17.95
1751	2024-07-12 22	6.65	11.54	51.41	13.85	0.81	18.76
1752	2024-07-12 23	6.65	52.66	54.87	13.85	0.81	19.58
1753	2024-07-13 00	6.65	23.50	52.46	13.85	0.82	0.42
1754	2024-07-13 01	6.65	56.43	49.46	13.85	0.82	1.23
1755	2024-07-13 02	6.65	61.66	47.99	13.85	0.82	2.06
1756	2024-07-13 03	6.65	26.85	48.53	13.85	0.81	2.88
1757	2024-07-13 04	6.64	40.60	37.06	13.85	0.81	3.69
1758	2024-07-13 05	6.64	73.68	34.57	13.85	0.82	4.51
1759	2024-07-13 06	6.65	130.18	15.56	19.04	0.81	5.33
1760	2024-07-13 07	6.67	70.00	8.19	23.57	0.82	6.16
1761	2024-07-13 08	6.67	70.30	7.71	19.94	0.82	6.99
1762	2024-07-13 09	6.69	70.04	7.56	17.48	0.82	7.81
1763	2024-07-13 10	6.71	69.27	7.55	16.70	0.82	8.64
1764	2024-07-13 11	6.72	68.86	7.58	16.42	0.83	9.48

1879

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1765	2024-07-13 12	6.74	68.86	7.30	15.20	0.83	10.31
1766	2024-07-13 13	6.75	68.75	7.19	15.08	0.86	11.16
1767	2024-07-13 14	6.76	68.49	7.33	14.10	0.87	12.04
1768	2024-07-13 15	6.77	68.32	7.35	13.85	0.87	12.91
1769	2024-07-13 16	6.77	68.47	7.03	13.85	0.89	13.80
1770	2024-07-13 17	6.78	68.95	7.16	13.85	0.87	14.69
1771	2024-07-13 18	6.79	69.03	7.00	13.85	0.02	15.14
1772	2024-07-13 19	6.80	68.63	7.09	13.85	0.00	15.14
1773	2024-07-13 20	6.80	68.97	6.92	13.85	0.00	15.14
1774	2024-07-13 21	6.81	68.78	7.04	13.85	0.00	15.14
1775	2024-07-13 22	6.81	68.65	7.01	13.85	0.00	15.14
1776	2024-07-13 23	6.81	68.51	7.42	13.85	0.00	15.14
1777	2024-07-14 00	6.76	55.03	4.69	10.87	0.00	0.00
1778	2024-07-14 01	6.65	61.48	0.13	0.19	0.00	0.00
1779	2024-07-14 02	6.64	51.29	0.17	0.16	0.00	0.00
1780	2024-07-14 03	6.64	49.19	0.19	0.10	0.00	0.00

1880

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1781	2024-07-14 04	6.63	56.88	0.16	0.19	0.00	0.00
1782	2024-07-14 05	6.63	50.97	0.14	0.12	0.00	0.00
1783	2024-07-14 06	6.63	59.70	0.18	0.14	0.00	0.00
1784	2024-07-14 07	6.63	27.75	0.13	0.14	0.00	0.00
1785	2024-07-14 08	6.63	40.84	0.16	0.13	0.52	0.16
1786	2024-07-14 09	6.68	64.26	5.75	22.30	0.85	0.94
1787	2024-07-14 10	6.71	69.09	7.63	18.46	0.89	1.81
1788	2024-07-14 11	6.73	69.27	7.63	16.55	0.88	2.70
1789	2024-07-14 12	6.77	68.16	7.46	15.89	0.86	3.56
1790	2024-07-14 13	6.77	68.00	7.44	15.23	0.87	4.43
1791	2024-07-14 14	6.74	131.01	7.63	14.78	0.87	5.31
1792	2024-07-14 15	6.79	61.63	8.76	14.61	0.87	6.20
1793	2024-07-14 16	7.13	52.91	7.54	13.63	0.87	7.07
1794	2024-07-14 17	7.45	67.69	7.44	14.20	0.87	7.95
1795	2024-07-14 18	7.51	67.55	7.35	14.53	0.85	8.81
1796	2024-07-14 19	7.56	67.60	7.67	14.36	0.82	9.65

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1797	2024-07-14 20	7.64	67.47	7.66	14.14	0.82	10.47
1798	2024-07-14 21	7.65	67.97	7.57	14.28	0.82	11.29
1799	2024-07-14 22	7.68	68.39	7.55	14.16	0.82	12.12
1800	2024-07-14 23	7.29	68.25	7.53	14.02	0.83	12.95
1801	2024-07-15 00	7.15	68.10	7.67	14.16	0.82	0.42
1802	2024-07-15 01	7.14	67.94	7.65	14.15	0.82	1.25
1803	2024-07-15 02	7.12	68.25	7.59	14.20	0.82	2.07
1804	2024-07-15 03	7.09	67.90	7.57	14.12	0.81	2.90
1805	2024-07-15 04	7.11	68.31	7.52	13.98	0.82	3.72
1806	2024-07-15 05	7.09	68.24	7.64	14.09	0.82	4.54
1807	2024-07-15 06	7.08	68.20	7.45	14.24	0.80	5.35
1808	2024-07-15 07	6.97	67.45	6.90	12.99	0.62	6.08
1809	2024-07-15 08	6.66	62.06	1.43	1.08	0.17	6.48
1810	2024-07-15 09	6.69	69.84	7.68	16.68	0.85	6.97
1811	2024-07-15 10	6.73	69.14	7.80	15.76	0.89	7.84
1812	2024-07-15 11	6.75	69.30	7.66	15.88	0.88	8.72

1882

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1813	2024-07-15 12	6.77	68.69	7.63	14.83	0.87	9.74
1814	2024-07-15 13	6.77	68.87	7.44	14.70	0.86	10.52
1815	2024-07-15 14	6.82	68.53	7.72	14.81	0.85	11.36
1816	2024-07-15 15	6.81	68.42	7.69	14.22	0.86	12.23
1817	2024-07-15 16	6.82	68.55	7.48	14.23	0.87	13.11
1818	2024-07-15 17	6.81	68.25	7.44	14.03	0.85	13.97
1819	2024-07-15 18	6.83	68.80	7.64	14.31	0.84	14.81
1820	2024-07-15 19	6.83	68.80	7.45	14.42	0.83	15.65
1821	2024-07-15 20	6.83	68.65	7.45	14.25	0.81	16.47
1822	2024-07-15 21	6.83	68.77	7.51	14.09	0.81	17.29
1823	2024-07-15 22	6.83	68.71	7.51	14.29	0.81	18.12
1824	2024-07-15 23	6.83	68.30	7.38	14.68	0.82	18.95
1825	2024-07-16 00	6.85	68.49	7.47	14.73	0.82	0.42
1826	2024-07-16 01	6.86	68.96	7.44	14.39	0.82	1.25
1827	2024-07-16 02	6.86	68.90	7.45	14.51	0.82	2.07
1828	2024-07-16 03	6.87	68.45	7.55	14.47	0.82	2.89

1883

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1829	2024-07-16 04	6.86	68.31	7.53	14.60	0.83	3.72
1830	2024-07-16 05	6.84	56.40	10.10	18.43	0.82	4.56
1831	2024-07-16 06	6.97	4.56	43.23	41.11	0.16	5.10
1832	2024-07-16 07	6.87	37.37	121.21	70.74	0.10	5.19
1833	2024-07-16 08	6.84	58.27	56.71	47.93	0.00	5.22
1834	2024-07-16 09	6.80	70.71	7.49	14.54	0.00	5.22
1835	2024-07-16 10	6.80	69.25	7.19	13.85	0.00	5.22
1836	2024-07-16 11	6.80	69.12	7.06	13.85	0.38	5.31
1837	2024-07-16 12	6.80	68.95	7.10	13.85	0.81	5.99
1838	2024-07-16 13	6.77	68.56	6.96	13.85	0.81	6.83
1839	2024-07-16 14	6.77	68.68	7.25	13.85	0.12	7.28
1840	2024-07-16 15	6.78	68.92	7.16	13.92	0.65	7.61
1841	2024-07-16 16	6.79	68.75	7.41	13.85	0.85	8.44
1842	2024-07-16 17	6.79	68.64	6.94	14.37	0.86	9.32
1843	2024-07-16 18	6.78	68.80	7.20	13.85	0.85	10.19
1844	2024-07-16 19	6.77	68.61	7.11	13.85	0.84	11.04

1884

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1845	2024-07-16 20	6.76	68.75	5.77	8.58	0.85	11.89
1846	2024-07-16 21	6.66	57.29	0.14	0.16	0.84	12.74
1847	2024-07-16 22	6.64	49.12	0.15	0.16	0.84	13.58
1848	2024-07-16 23	6.63	54.89	0.13	0.19	0.83	14.42
1849	2024-07-17 00	6.63	35.68	0.15	0.17	0.83	0.25
1850	2024-07-17 01	NA	NA	NA	NA	NA	NA
1851	2024-07-17 02	NA	NA	NA	NA	NA	NA
1852	2024-07-17 03	NA	NA	NA	NA	NA	NA
1853	2024-07-17 04	NA	NA	NA	NA	NA	NA
1854	2024-07-17 05	NA	NA	NA	NA	NA	NA
1855	2024-07-17 06	NA	NA	NA	NA	NA	NA
1856	2024-07-17 07	NA	NA	NA	NA	NA	NA
1857	2024-07-17 08	NA	NA	NA	NA	NA	NA
1858	2024-07-17 09	NA	NA	NA	NA	NA	NA
1859	2024-07-17 10	NA	NA	NA	NA	NA	NA
1860	2024-07-17 11	NA	NA	NA	NA	NA	NA

1885

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1861	2024-07-17 12	NA	NA	NA	NA	NA	NA
1862	2024-07-17 13	NA	NA	NA	NA	NA	NA
1863	2024-07-17 14	NA	NA	NA	NA	NA	NA
1864	2024-07-17 15	NA	NA	NA	NA	NA	NA
1865	2024-07-17 16	NA	NA	NA	NA	NA	NA
1866	2024-07-17 17	NA	NA	NA	NA	NA	NA
1867	2024-07-17 18	NA	NA	NA	NA	NA	NA
1868	2024-07-17 19	NA	NA	NA	NA	NA	NA
1869	2024-07-17 20	NA	NA	NA	NA	NA	NA
1870	2024-07-17 21	NA	NA	NA	NA	NA	NA
1871	2024-07-17 22	NA	NA	NA	NA	NA	NA
1872	2024-07-17 23	NA	NA	NA	NA	NA	NA
1873	2024-07-18 00	NA	NA	NA	NA	NA	NA
1874	2024-07-18 01	NA	NA	NA	NA	NA	NA
1875	2024-07-18 02	NA	NA	NA	NA	NA	NA
1876	2024-07-18 03	NA	NA	NA	NA	NA	NA

1886

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1877	2024-07-18 04	NA	NA	NA	NA	NA	NA
1878	2024-07-18 05	NA	NA	NA	NA	NA	NA
1879	2024-07-18 06	NA	NA	NA	NA	NA	NA
1880	2024-07-18 07	NA	NA	NA	NA	NA	NA
1881	2024-07-18 08	NA	NA	NA	NA	NA	NA
1882	2024-07-18 09	NA	NA	NA	NA	NA	NA
1883	2024-07-18 10	NA	NA	NA	NA	NA	NA
1884	2024-07-18 11	NA	NA	NA	NA	NA	NA
1885	2024-07-18 12	NA	NA	NA	NA	NA	NA
1886	2024-07-18 13	NA	NA	NA	NA	NA	NA
1887	2024-07-18 14	NA	NA	NA	NA	NA	NA
1888	2024-07-18 15	NA	NA	NA	NA	NA	NA
1889	2024-07-18 16	NA	NA	NA	NA	NA	NA
1890	2024-07-18 17	NA	NA	NA	NA	NA	NA
1891	2024-07-18 18	NA	NA	NA	NA	NA	NA
1892	2024-07-18 19	NA	NA	NA	NA	NA	NA

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1893	2024-07-18 20	NA	NA	NA	NA	NA	NA
1894	2024-07-18 21	NA	NA	NA	NA	NA	NA
1895	2024-07-18 22	NA	NA	NA	NA	NA	NA
1896	2024-07-18 23	NA	NA	NA	NA	NA	NA
1897	2024-07-19 00	NA	NA	NA	NA	NA	NA
1898	2024-07-19 01	NA	NA	NA	NA	NA	NA
1899	2024-07-19 02	NA	NA	NA	NA	NA	NA
1900	2024-07-19 03	NA	NA	NA	NA	NA	NA
1901	2024-07-19 04	NA	NA	NA	NA	NA	NA
1902	2024-07-19 05	NA	NA	NA	NA	NA	NA
1903	2024-07-19 06	NA	NA	NA	NA	NA	NA
1904	2024-07-19 07	NA	NA	NA	NA	NA	NA
1905	2024-07-19 08	NA	NA	NA	NA	NA	NA
1906	2024-07-19 09	NA	NA	NA	NA	NA	NA
1907	2024-07-19 10	NA	NA	NA	NA	NA	NA
1908	2024-07-19 11	NA	NA	NA	NA	NA	NA

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1909	2024-07-19 12	NA	NA	NA	NA	NA	NA
1910	2024-07-19 13	NA	NA	NA	NA	NA	NA
1911	2024-07-19 14	NA	NA	NA	NA	NA	NA
1912	2024-07-19 15	NA	NA	NA	NA	NA	NA
1913	2024-07-19 16	NA	NA	NA	NA	NA	NA
1914	2024-07-19 17	NA	NA	NA	NA	NA	NA
1915	2024-07-19 18	NA	NA	NA	NA	NA	NA
1916	2024-07-19 19	NA	NA	NA	NA	NA	NA
1917	2024-07-19 20	NA	NA	NA	NA	NA	NA
1918	2024-07-19 21	NA	NA	NA	NA	NA	NA
1919	2024-07-19 22	NA	NA	NA	NA	NA	NA
1920	2024-07-19 23	NA	NA	NA	NA	NA	NA
1921	2024-07-20 00	NA	NA	NA	NA	NA	NA
1922	2024-07-20 01	NA	NA	NA	NA	NA	NA
1923	2024-07-20 02	NA	NA	NA	NA	NA	NA
1924	2024-07-20 03	NA	NA	NA	NA	NA	NA

1889

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1925	2024-07-20 04	NA	NA	NA	NA	NA	NA
1926	2024-07-20 05	NA	NA	NA	NA	NA	NA
1927	2024-07-20 06	NA	NA	NA	NA	NA	NA
1928	2024-07-20 07	NA	NA	NA	NA	NA	NA
1929	2024-07-20 08	NA	NA	NA	NA	NA	NA
1930	2024-07-20 09	NA	NA	NA	NA	NA	NA
1931	2024-07-20 10	NA	NA	NA	NA	NA	NA
1932	2024-07-20 11	NA	NA	NA	NA	NA	NA
1933	2024-07-20 12	NA	NA	NA	NA	NA	NA
1934	2024-07-20 13	NA	NA	NA	NA	NA	NA
1935	2024-07-20 14	NA	NA	NA	NA	NA	NA
1936	2024-07-20 15	NA	NA	NA	NA	NA	NA
1937	2024-07-20 16	NA	NA	NA	NA	NA	NA
1938	2024-07-20 17	NA	NA	NA	NA	NA	NA
1939	2024-07-20 18	NA	NA	NA	NA	NA	NA
1940	2024-07-20 19	NA	NA	NA	NA	NA	NA

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1941	2024-07-20 20	NA	NA	NA	NA	NA	NA
1942	2024-07-20 21	NA	NA	NA	NA	NA	NA
1943	2024-07-20 22	NA	NA	NA	NA	NA	NA
1944	2024-07-20 23	NA	NA	NA	NA	NA	NA
1945	2024-07-21 00	NA	NA	NA	NA	NA	NA
1946	2024-07-21 01	NA	NA	NA	NA	NA	NA
1947	2024-07-21 02	NA	NA	NA	NA	NA	NA
1948	2024-07-21 03	NA	NA	NA	NA	NA	NA
1949	2024-07-21 04	NA	NA	NA	NA	NA	NA
1950	2024-07-21 05	NA	NA	NA	NA	NA	NA
1951	2024-07-21 06	NA	NA	NA	NA	NA	NA
1952	2024-07-21 07	NA	NA	NA	NA	NA	NA
1953	2024-07-21 08	NA	NA	NA	NA	NA	NA
1954	2024-07-21 09	NA	NA	NA	NA	NA	NA
1955	2024-07-21 10	NA	NA	NA	NA	NA	NA
1956	2024-07-21 11	NA	NA	NA	NA	NA	NA

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1957	2024-07-21 12	NA	NA	NA	NA	NA	NA
1958	2024-07-21 13	NA	NA	NA	NA	NA	NA
1959	2024-07-21 14	NA	NA	NA	NA	NA	NA
1960	2024-07-21 15	NA	NA	NA	NA	NA	NA
1961	2024-07-21 16	NA	NA	NA	NA	NA	NA
1962	2024-07-21 17	NA	NA	NA	NA	NA	NA
1963	2024-07-21 18	NA	NA	NA	NA	NA	NA
1964	2024-07-21 19	NA	NA	NA	NA	NA	NA
1965	2024-07-21 20	NA	NA	NA	NA	NA	NA
1966	2024-07-21 21	NA	NA	NA	NA	NA	NA
1967	2024-07-21 22	NA	NA	NA	NA	NA	NA
1968	2024-07-21 23	NA	NA	NA	NA	NA	NA
1969	2024-07-22 00	NA	NA	NA	NA	NA	NA
1970	2024-07-22 01	NA	NA	NA	NA	NA	NA
1971	2024-07-22 02	NA	NA	NA	NA	NA	NA
1972	2024-07-22 03	NA	NA	NA	NA	NA	NA

1892

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1973	2024-07-22 04	NA	NA	NA	NA	NA	NA
1974	2024-07-22 05	NA	NA	NA	NA	NA	NA
1975	2024-07-22 06	NA	NA	NA	NA	NA	NA
1976	2024-07-22 07	NA	NA	NA	NA	NA	NA
1977	2024-07-22 08	NA	NA	NA	NA	NA	NA
1978	2024-07-22 09	NA	NA	NA	NA	NA	NA
1979	2024-07-22 10	NA	NA	NA	NA	NA	NA
1980	2024-07-22 11	NA	NA	NA	NA	NA	NA
1981	2024-07-22 12	NA	NA	NA	NA	NA	NA
1982	2024-07-22 13	NA	NA	NA	NA	NA	NA
1983	2024-07-22 14	NA	NA	NA	NA	NA	NA
1984	2024-07-22 15	NA	NA	NA	NA	NA	NA
1985	2024-07-22 16	NA	NA	NA	NA	NA	NA
1986	2024-07-22 17	NA	NA	NA	NA	NA	NA
1987	2024-07-22 18	NA	NA	NA	NA	NA	NA
1988	2024-07-22 19	NA	NA	NA	NA	NA	NA

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
1989	2024-07-22 20	NA	NA	NA	NA	NA	NA
1990	2024-07-22 21	NA	NA	NA	NA	NA	NA
1991	2024-07-22 22	NA	NA	NA	NA	NA	NA
1992	2024-07-22 23	NA	NA	NA	NA	NA	NA
1993	2024-07-23 00	NA	NA	NA	NA	NA	NA
1994	2024-07-23 01	NA	NA	NA	NA	NA	NA
1995	2024-07-23 02	NA	NA	NA	NA	NA	NA
1996	2024-07-23 03	NA	NA	NA	NA	NA	NA
1997	2024-07-23 04	NA	NA	NA	NA	NA	NA
1998	2024-07-23 05	NA	NA	NA	NA	NA	NA
1999	2024-07-23 06	NA	NA	NA	NA	NA	NA
2000	2024-07-23 07	NA	NA	NA	NA	NA	NA
2001	2024-07-23 08	NA	NA	NA	NA	NA	NA
2002	2024-07-23 09	NA	NA	NA	NA	NA	NA
2003	2024-07-23 10	6.76	71.30	8.58	21.04	0.39	0.06
2004	2024-07-23 11	6.79	70.22	8.55	19.28	0.42	0.24

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2005	2024-07-23 12	6.82	69.90	8.09	16.55	0.44	0.62
2006	2024-07-23 13	6.85	70.05	8.00	15.75	0.46	1.07
2007	2024-07-23 14	6.87	70.37	8.02	15.34	0.46	1.54
2008	2024-07-23 15	6.86	69.43	8.17	14.99	0.46	2.00
2009	2024-07-23 16	6.82	69.38	8.05	15.40	0.48	2.47
2010	2024-07-23 17	6.83	78.54	8.07	15.20	0.46	2.95
2011	2024-07-23 18	6.84	86.00	8.08	15.01	0.44	3.40
2012	2024-07-23 19	7.05	69.48	8.05	14.99	0.41	3.82
2013	2024-07-23 20	7.15	65.29	8.12	14.89	0.38	4.21
2014	2024-07-23 21	7.17	67.93	8.04	14.17	0.39	4.60
2015	2024-07-23 22	7.17	68.51	8.03	14.30	0.40	5.00
2016	2024-07-23 23	7.16	68.30	8.10	14.29	0.40	5.40
2017	2024-07-24 00	7.16	68.11	8.09	14.41	0.40	0.21
2018	2024-07-24 01	7.32	62.62	3.65	3.41	0.40	0.61
2019	2024-07-24 02	7.53	59.12	0.19	0.13	0.39	1.00
2020	2024-07-24 03	7.61	60.17	0.16	0.13	0.39	1.41

1895

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2021	2024-07-24 04	7.67	60.15	0.16	0.15	0.39	1.81
2022	2024-07-24 05	7.71	60.88	0.19	0.13	0.39	2.20
2023	2024-07-24 06	7.72	61.43	0.15	0.13	0.39	2.60
2024	2024-07-24 07	7.71	61.53	0.17	0.18	0.40	3.00
2025	2024-07-24 08	7.73	61.44	0.19	0.17	0.41	3.41
2026	2024-07-24 09	7.69	67.09	7.54	14.09	0.43	3.83
2027	2024-07-24 10	7.70	67.68	8.27	17.55	0.42	4.26
2028	2024-07-24 11	7.70	67.97	8.06	14.98	0.40	4.68
2029	2024-07-24 12	7.69	68.06	8.03	14.55	0.41	5.08
2030	2024-07-24 13	7.68	67.92	7.98	14.50	0.44	5.51
2031	2024-07-24 14	7.68	67.91	7.94	14.53	0.44	5.95
2032	2024-07-24 15	7.68	67.92	7.95	14.50	0.43	6.38
2033	2024-07-24 16	7.68	67.74	7.95	14.70	0.43	6.82
2034	2024-07-24 17	7.67	68.17	7.92	14.40	0.40	7.24
2035	2024-07-24 18	7.66	67.88	7.91	14.38	0.39	7.64
2036	2024-07-24 19	7.65	67.66	7.89	14.45	0.39	8.04

1896

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2037	2024-07-24 20	7.64	68.13	7.91	14.54	0.40	8.44
2038	2024-07-24 21	7.65	67.86	7.88	14.51	0.41	8.84
2039	2024-07-24 22	7.64	68.10	7.82	14.22	0.41	9.25
2040	2024-07-24 23	7.63	67.42	7.86	14.41	0.41	9.49
2041	2024-07-25 00	NA	NA	NA	NA	NA	NA
2042	2024-07-25 01	NA	NA	NA	NA	NA	NA
2043	2024-07-25 02	NA	NA	NA	NA	NA	NA
2044	2024-07-25 03	NA	NA	NA	NA	NA	NA
2045	2024-07-25 04	NA	NA	NA	NA	NA	NA
2046	2024-07-25 05	NA	NA	NA	NA	NA	NA
2047	2024-07-25 06	NA	NA	NA	NA	NA	NA
2048	2024-07-25 07	7.55	67.13	5.86	21.10	0.41	0.19
2049	2024-07-25 08	7.51	68.26	7.04	15.95	0.42	0.60
2050	2024-07-25 09	7.49	68.42	6.87	14.22	0.42	1.02
2051	2024-07-25 10	7.47	68.13	7.29	14.57	0.41	1.44
2052	2024-07-25 11	7.45	68.03	7.08	14.04	0.43	1.86

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2053	2024-07-25 12	7.43	68.42	7.03	13.82	0.46	2.31
2054	2024-07-25 13	7.41	68.03	7.01	13.85	0.46	2.77
2055	2024-07-25 14	7.41	68.84	7.26	13.92	0.46	3.24
2056	2024-07-25 15	7.42	68.04	7.01	14.07	0.47	3.71
2057	2024-07-25 16	7.48	68.36	6.93	13.85	0.46	4.17
2058	2024-07-25 17	7.40	68.45	6.90	13.85	0.45	4.62
2059	2024-07-25 18	7.29	68.45	6.91	13.85	0.45	5.07
2060	2024-07-25 19	7.26	68.42	7.07	13.85	0.43	5.50
2061	2024-07-25 20	7.24	68.53	6.88	13.85	0.42	5.92
2062	2024-07-25 21	7.22	69.46	6.85	13.85	0.42	6.31
2063	2024-07-25 22	7.21	68.89	6.70	13.85	0.42	6.68
2064	2024-07-25 23	7.20	68.78	6.75	13.85	0.41	7.07
2065	2024-07-26 00	7.19	68.42	6.79	13.85	0.39	0.21
2066	2024-07-26 01	6.91	90.75	5.53	11.78	0.39	0.60
2067	2024-07-26 02	6.82	88.06	3.66	6.62	0.41	1.00
2068	2024-07-26 03	6.89	78.54	4.65	8.08	0.41	1.41

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2069	2024-07-26 04	6.87	103.23	1.67	0.13	0.41	1.82
2070	2024-07-26 05	6.84	111.84	1.35	6.10	0.41	2.23
2071	2024-07-26 06	6.84	96.16	4.00	12.71	0.33	2.60
2072	2024-07-26 07	6.89	72.82	5.17	4.51	0.41	2.98
2073	2024-07-26 08	6.90	93.15	7.64	11.37	0.41	3.40
2074	2024-07-26 09	6.89	68.00	7.71	16.28	0.43	3.82
2075	2024-07-26 10	6.91	67.92	7.72	14.93	0.46	4.27
2076	2024-07-26 11	6.93	68.17	7.66	14.98	0.45	4.72
2077	2024-07-26 12	6.95	68.42	7.61	14.12	0.45	5.17
2078	2024-07-26 13	6.96	68.45	7.56	14.34	0.45	5.63
2079	2024-07-26 14	7.01	68.06	7.56	14.22	0.44	6.07
2080	2024-07-26 15	7.03	67.88	7.42	14.13	0.44	6.52
2081	2024-07-26 16	7.03	68.07	7.47	14.64	0.42	6.95
2082	2024-07-26 17	7.04	68.25	7.63	13.94	0.38	7.35
2083	2024-07-26 18	7.03	67.82	7.48	14.16	0.39	7.74
2084	2024-07-26 19	7.04	68.10	7.56	14.35	0.40	8.14

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2085	2024-07-26 20	7.05	68.04	7.52	13.95	0.41	8.54
2086	2024-07-26 21	7.05	67.88	7.48	14.24	0.41	8.95
2087	2024-07-26 22	7.04	68.12	7.30	14.15	0.40	9.36
2088	2024-07-26 23	7.04	68.02	7.34	14.10	0.40	9.76
2089	2024-07-27 00	7.05	68.00	7.30	14.01	0.41	0.22
2090	2024-07-27 01	7.05	68.27	7.28	14.04	0.41	0.62
2091	2024-07-27 02	7.04	68.14	7.23	14.03	0.42	1.05
2092	2024-07-27 03	7.04	68.40	7.28	13.87	0.43	1.47
2093	2024-07-27 04	7.05	68.65	7.17	13.99	0.43	1.91
2094	2024-07-27 05	7.06	67.95	7.06	14.09	0.43	2.33
2095	2024-07-27 06	7.06	68.42	7.33	13.88	0.43	2.76
2096	2024-07-27 07	6.99	68.07	7.27	13.94	0.41	3.18
2097	2024-07-27 08	7.08	68.69	7.45	14.20	0.44	3.60
2098	2024-07-27 09	7.30	67.49	7.73	14.09	0.44	3.85
2099	2024-07-27 10	NA	NA	NA	NA	NA	NA
2100	2024-07-27 11	NA	NA	NA	NA	NA	NA

1900

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2101	2024-07-27 12	NA	NA	NA	NA	NA	NA
2102	2024-07-27 13	NA	NA	NA	NA	NA	NA
2103	2024-07-27 14	NA	NA	NA	NA	NA	NA
2104	2024-07-27 15	NA	NA	NA	NA	NA	NA
2105	2024-07-27 16	NA	NA	NA	NA	NA	NA
2106	2024-07-27 17	NA	NA	NA	NA	NA	NA
2107	2024-07-27 18	NA	NA	NA	NA	NA	NA
2108	2024-07-27 19	NA	NA	NA	NA	NA	NA
2109	2024-07-27 20	NA	NA	NA	NA	NA	NA
2110	2024-07-27 21	NA	NA	NA	NA	NA	NA
2111	2024-07-27 22	NA	NA	NA	NA	NA	NA
2112	2024-07-27 23	NA	NA	NA	NA	NA	NA
2113	2024-07-28 00	NA	NA	NA	NA	NA	NA
2114	2024-07-28 01	NA	NA	NA	NA	NA	NA
2115	2024-07-28 02	NA	NA	NA	NA	NA	NA
2116	2024-07-28 03	NA	NA	NA	NA	NA	NA

1901

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2117	2024-07-28 04	NA	NA	NA	NA	NA	NA
2118	2024-07-28 05	NA	NA	NA	NA	NA	NA
2119	2024-07-28 06	NA	NA	NA	NA	NA	NA
2120	2024-07-28 07	NA	NA	NA	NA	NA	NA
2121	2024-07-28 08	7.65	58.28	8.25	13.85	0.00	0.00
2122	2024-07-28 09	7.63	52.15	3.66	7.55	0.00	0.00
2123	2024-07-28 10	NA	NA	NA	NA	NA	NA
2124	2024-07-28 11	7.23	67.25	7.83	10.15	0.00	0.00
2125	2024-07-28 12	7.18	68.20	7.86	14.96	0.00	0.00
2126	2024-07-28 13	7.18	68.54	7.81	14.40	0.00	0.00
2127	2024-07-28 14	7.18	68.54	7.77	14.64	0.00	0.00
2128	2024-07-28 15	NA	NA	NA	NA	NA	NA
2129	2024-07-28 16	NA	NA	NA	NA	NA	NA
2130	2024-07-28 17	NA	NA	NA	NA	NA	NA
2131	2024-07-28 18	NA	NA	NA	NA	NA	NA
2132	2024-07-28 19	NA	NA	NA	NA	NA	NA

1902

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2133	2024-07-28 20	NA	NA	NA	NA	NA	NA
2134	2024-07-28 21	NA	NA	NA	NA	NA	NA
2135	2024-07-28 22	7.15	67.63	7.78	14.06	0.00	0.00
2136	2024-07-28 23	7.14	67.96	7.61	13.99	0.00	0.00
2137	2024-07-29 00	7.14	67.96	7.53	13.88	0.00	0.00
2138	2024-07-29 01	7.13	67.57	7.46	13.95	0.00	0.00
2139	2024-07-29 02	7.12	67.96	7.67	14.07	0.00	0.00
2140	2024-07-29 03	7.12	68.13	7.56	14.00	0.00	0.00
2141	2024-07-29 04	7.12	66.61	4.00	8.90	0.00	0.00
2142	2024-07-29 05	6.96	59.65	0.19	0.19	0.00	0.00
2143	2024-07-29 06	6.86	61.61	0.16	0.16	0.00	0.00
2144	2024-07-29 07	6.85	61.93	0.13	0.13	0.00	0.00
2145	2024-07-29 08	6.84	59.99	0.16	0.16	0.00	0.00
2146	2024-07-29 09	6.84	59.18	0.16	0.16	0.48	0.28
2147	2024-07-29 10	7.01	62.12	0.19	0.13	0.00	0.49
2148	2024-07-29 11	7.15	56.55	0.16	0.19	0.00	0.49

1903

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2149	2024-07-29 12	7.18	57.89	0.15	0.16	0.00	0.49
2150	2024-07-29 13	7.20	58.85	0.18	0.16	0.00	0.49
2151	2024-07-29 14	7.22	60.66	0.17	0.10	0.01	0.49
2152	2024-07-29 15	7.23	61.64	0.18	0.16	0.01	0.50
2153	2024-07-29 16	7.25	59.68	0.10	0.16	0.07	0.50
2154	2024-07-29 17	7.26	59.89	0.14	0.15	2.20	1.67
2155	2024-07-29 18	7.27	60.89	0.19	0.13	2.19	3.88
2156	2024-07-29 19	7.28	61.26	0.16	0.13	2.18	6.07
2157	2024-07-29 20	7.29	59.10	0.17	0.18	2.17	8.26
2158	2024-07-29 21	7.30	59.93	0.12	0.17	2.17	10.44
2159	2024-07-29 22	7.30	57.72	0.16	0.14	2.18	12.63
2160	2024-07-29 23	7.31	65.48	5.73	12.01	2.18	14.82
2161	2024-07-30 00	7.32	67.39	8.71	15.00	2.17	1.12
2162	2024-07-30 01	7.33	66.70	8.63	14.90	2.18	3.30
2163	2024-07-30 02	7.33	67.39	8.69	14.93	2.18	5.50
2164	2024-07-30 03	7.55	67.18	8.55	14.95	2.17	7.69

1904

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2165	2024-07-30 04	7.54	67.53	8.65	14.92	2.19	9.87
2166	2024-07-30 05	7.54	67.49	8.76	14.92	2.18	12.07
2167	2024-07-30 06	7.53	67.33	8.69	14.91	2.16	14.25
2168	2024-07-30 07	7.43	67.94	8.92	17.15	2.17	16.42
2169	2024-07-30 08	7.41	67.62	8.80	15.10	2.16	18.62
2170	2024-07-30 09	7.41	67.60	8.80	15.28	2.17	20.78
2171	2024-07-30 10	7.33	67.71	8.61	15.31	2.18	22.96
2172	2024-07-30 11	7.33	67.59	8.83	15.11	2.08	25.14
2173	2024-07-30 12	7.33	68.17	8.81	15.16	2.13	27.20
2174	2024-07-30 13	7.33	68.07	8.66	15.11	2.18	29.37
2175	2024-07-30 14	7.32	67.48	8.64	15.00	2.17	31.55
2176	2024-07-30 15	7.32	67.19	8.81	15.02	2.18	33.75
2177	2024-07-30 16	7.31	67.35	8.71	15.03	0.92	35.58
2178	2024-07-30 17	7.31	67.46	8.71	14.96	2.02	36.37
2179	2024-07-30 18	7.31	67.47	8.69	15.00	3.97	39.79
2180	2024-07-30 19	7.31	67.20	8.56	15.04	3.97	43.77

1905

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2181	2024-07-30 20	7.31	67.40	8.76	15.00	3.96	47.77
2182	2024-07-30 21	7.31	67.40	8.53	14.97	3.93	51.74
2183	2024-07-30 22	7.31	67.44	8.63	15.08	3.92	55.69
2184	2024-07-30 23	7.30	67.54	8.59	14.98	3.93	59.65
2185	2024-07-31 00	7.30	67.52	8.62	14.98	3.90	2.01
2186	2024-07-31 01	7.30	67.42	8.48	14.89	3.92	5.94
2187	2024-07-31 02	7.24	67.37	8.51	14.82	3.91	9.87
2188	2024-07-31 03	7.14	68.31	8.60	14.90	3.92	13.80
2189	2024-07-31 04	7.15	67.33	8.67	14.84	3.92	17.73
2190	2024-07-31 05	7.16	67.00	8.62	14.70	3.92	21.67
2191	2024-07-31 06	7.17	66.18	8.49	14.71	3.86	25.59
2192	2024-07-31 07	7.18	67.41	8.51	14.73	3.84	29.45
2193	2024-07-31 08	7.19	67.56	8.60	14.66	3.88	33.34
2194	2024-07-31 09	7.19	67.40	8.68	14.63	3.82	37.22
2195	2024-07-31 10	7.19	67.75	8.70	14.84	3.83	41.05
2196	2024-07-31 11	7.18	68.12	8.67	14.78	3.85	44.92

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2197	2024-07-31 12	7.18	68.00	8.64	14.90	3.86	48.81
2198	2024-07-31 13	7.18	67.49	8.58	13.29	3.87	52.70
2199	2024-07-31 14	7.18	89.40	7.20	11.02	3.86	56.58
2200	2024-07-31 15	7.16	77.14	7.51	19.44	3.88	60.47
2201	2024-07-31 16	7.15	68.77	8.51	16.16	3.90	64.38
2202	2024-07-31 17	7.15	68.02	8.67	16.68	3.88	68.30
2203	2024-07-31 18	7.15	67.25	8.60	15.82	3.87	72.21
2204	2024-07-31 19	7.15	67.02	8.44	15.93	3.87	76.12
2205	2024-07-31 20	7.15	66.93	8.68	15.17	3.87	80.01
2206	2024-07-31 21	7.15	67.78	8.52	15.11	3.89	83.92
2207	2024-07-31 22	7.15	67.50	8.25	15.55	3.91	87.84
2208	2024-07-31 23	7.14	67.64	8.29	15.16	3.89	91.78
2209	2024-08-01 00	7.14	68.08	8.31	15.29	2.05	1.45
2210	2024-08-01 01	7.14	67.28	8.27	15.28	0.00	2.08
2211	2024-08-01 02	7.14	67.10	8.33	15.07	0.00	2.08
2212	2024-08-01 03	7.17	66.04	7.39	10.27	0.00	2.08

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2213	2024-08-01 04	7.18	60.13	0.16	0.16	0.00	2.08
2214	2024-08-01 05	7.03	60.31	0.17	0.18	0.00	2.08
2215	2024-08-01 06	6.93	60.94	0.13	0.16	1.68	2.44
2216	2024-08-01 07	6.85	62.22	0.18	0.17	3.91	5.73
2217	2024-08-01 08	6.82	61.35	0.16	0.19	3.90	9.68
2218	2024-08-01 09	6.80	62.23	0.16	0.17	3.88	13.60
2219	2024-08-01 10	6.78	63.11	0.16	0.16	2.55	17.23
2220	2024-08-01 11	6.77	65.71	0.19	0.19	3.75	19.94
2221	2024-08-01 12	6.79	65.84	0.16	0.17	3.67	23.69
2222	2024-08-01 13	6.88	63.14	0.19	0.18	3.89	27.58
2223	2024-08-01 14	6.88	64.78	0.19	175.71	3.88	31.49
2224	2024-08-01 15	6.88	43.07	0.14	13.21	3.88	35.40
2225	2024-08-01 16	6.90	63.66	0.00	26.13	3.87	39.29
2226	2024-08-01 17	6.82	60.75	0.00	0.19	3.89	43.18
2227	2024-08-01 18	6.78	61.49	0.00	0.19	3.89	47.09
2228	2024-08-01 19	6.80	63.26	0.00	0.19	3.90	51.00

1908

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2229	2024-08-01 20	6.80	62.62	0.00	0.16	3.88	54.92
2230	2024-08-01 21	6.98	61.64	0.00	0.19	3.90	58.82
2231	2024-08-01 22	6.97	63.47	0.00	0.18	3.91	62.74
2232	2024-08-01 23	6.97	58.88	0.00	0.17	3.92	66.69
2233	2024-08-02 00	6.97	59.08	0.00	0.17	3.92	2.02
2234	2024-08-02 01	6.97	60.87	0.00	0.15	3.92	5.95
2235	2024-08-02 02	6.98	60.68	0.00	0.16	3.93	9.89
2236	2024-08-02 03	6.98	61.77	0.00	0.13	3.92	13.83
2237	2024-08-02 04	6.99	61.96	0.00	0.16	3.92	17.78
2238	2024-08-02 05	6.99	61.15	0.00	0.15	3.91	21.74
2239	2024-08-02 06	7.00	60.88	0.00	0.13	3.88	25.67
2240	2024-08-02 07	7.00	59.98	0.00	0.18	3.87	29.55
2241	2024-08-02 08	7.02	66.53	0.00	13.34	3.86	33.46
2242	2024-08-02 09	7.02	67.88	0.00	18.22	3.88	37.36
2243	2024-08-02 10	7.02	67.95	0.00	16.26	3.53	41.00
2244	2024-08-02 11	7.03	68.43	0.00	15.89	3.88	44.82

1909

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2245	2024-08-02 12	7.04	67.95	0.00	15.55	3.85	48.70
2246	2024-08-02 13	7.05	67.98	0.00	15.56	3.89	52.62
2247	2024-08-02 14	7.06	67.63	0.00	15.59	3.58	56.46
2248	2024-08-02 15	7.07	67.57	0.00	15.45	3.87	60.11
2249	2024-08-02 16	7.07	67.90	0.00	15.44	3.85	64.01
2250	2024-08-02 17	7.07	67.71	0.00	15.39	3.87	67.89
2251	2024-08-02 18	7.07	67.73	0.00	15.36	3.90	71.80
2252	2024-08-02 19	7.07	67.43	0.00	15.29	3.88	75.71
2253	2024-08-02 20	7.08	67.18	0.00	15.17	3.83	79.57
2254	2024-08-02 21	7.08	67.74	0.00	15.38	2.78	83.28
2255	2024-08-02 22	7.08	67.78	0.00	15.11	0.82	84.73
2256	2024-08-02 23	7.08	67.87	0.00	15.16	0.83	85.55
2257	2024-08-03 00	7.09	67.36	0.00	15.20	0.64	0.40
2258	2024-08-03 01	7.09	67.43	0.00	15.30	0.00	0.65
2259	2024-08-03 02	7.09	67.36	0.00	15.11	0.00	0.65
2260	2024-08-03 03	7.09	67.67	0.00	15.00	0.00	0.65

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2261	2024-08-03 04	7.09	67.71	0.00	15.03	0.00	0.65
2262	2024-08-03 05	7.10	68.00	0.00	15.08	0.00	0.65
2263	2024-08-03 06	7.10	67.55	0.00	15.16	0.00	0.65
2264	2024-08-03 07	7.10	67.62	0.00	14.99	0.47	0.78
2265	2024-08-03 08	7.10	67.96	0.00	15.08	0.84	1.54
2266	2024-08-03 09	7.11	98.29	0.00	5.80	0.85	2.38
2267	2024-08-03 10	7.11	70.34	0.00	16.39	0.87	3.25
2268	2024-08-03 11	7.11	67.31	0.00	14.83	0.89	4.14
2269	2024-08-03 12	7.12	67.20	0.00	15.11	0.89	5.04
2270	2024-08-03 13	7.12	66.99	0.00	15.34	0.89	5.93
2271	2024-08-03 14	7.13	65.66	0.00	14.86	0.84	6.82
2272	2024-08-03 15	7.13	67.16	0.00	14.71	0.45	7.34
2273	2024-08-03 16	7.14	67.28	0.00	14.55	0.88	8.12
2274	2024-08-03 17	7.15	66.87	0.00	14.60	0.89	9.01
2275	2024-08-03 18	7.16	67.14	0.00	14.69	0.88	9.90
2276	2024-08-03 19	7.17	67.42	0.00	14.86	0.86	10.78

1911

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2277	2024-08-03 20	7.19	67.35	0.00	14.73	0.86	11.64
2278	2024-08-03 21	7.19	67.45	0.00	14.69	0.86	12.51
2279	2024-08-03 22	7.20	67.69	0.00	14.63	0.87	13.38
2280	2024-08-03 23	7.21	67.73	0.00	14.61	0.87	14.26
2281	2024-08-04 00	7.22	67.58	0.00	14.55	0.87	0.45
2282	2024-08-04 01	7.23	67.52	0.00	14.53	0.87	1.33
2283	2024-08-04 02	7.24	67.46	0.00	14.58	0.88	2.20
2284	2024-08-04 03	7.24	67.67	0.00	14.63	0.88	3.09
2285	2024-08-04 04	7.25	67.73	0.00	10.19	0.87	3.97
2286	2024-08-04 05	7.25	65.56	0.00	0.16	0.87	4.84
2287	2024-08-04 06	7.26	61.98	0.00	0.15	0.86	5.71
2288	2024-08-04 07	7.27	65.60	0.00	0.14	0.86	6.58
2289	2024-08-04 08	7.27	63.23	0.00	0.12	0.87	7.44
2290	2024-08-04 09	7.28	63.47	0.00	6.56	0.87	8.32
2291	2024-08-04 10	7.29	64.48	0.00	14.96	0.87	9.18
2292	2024-08-04 11	7.30	67.88	0.00	15.00	0.88	10.07

1912

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2293	2024-08-04 12	7.30	67.09	0.00	15.00	0.90	10.96
2294	2024-08-04 13	7.31	66.76	0.00	15.00	0.82	11.80
2295	2024-08-04 14	7.31	71.03	0.00	15.00	0.88	12.67
2296	2024-08-04 15	7.32	68.52	0.00	15.00	0.88	13.55
2297	2024-08-04 16	7.30	68.17	0.00	15.00	0.87	14.43
2298	2024-08-04 17	7.30	67.25	0.00	15.00	0.88	15.31
2299	2024-08-04 18	7.30	67.76	0.00	15.00	0.88	16.19
2300	2024-08-04 19	7.29	68.02	0.00	15.00	0.87	17.07
2301	2024-08-04 20	7.30	67.22	0.00	15.00	0.87	17.95
2302	2024-08-04 21	7.30	67.49	0.00	15.00	0.86	18.81
2303	2024-08-04 22	7.31	67.24	0.00	15.00	0.86	19.67
2304	2024-08-04 23	7.31	67.17	0.00	15.00	0.87	20.54
2305	2024-08-05 00	7.30	67.32	0.00	15.00	0.87	0.45
2306	2024-08-05 01	7.30	67.37	0.00	15.00	0.87	1.32
2307	2024-08-05 02	7.30	67.66	0.00	15.00	0.86	2.21
2308	2024-08-05 03	7.30	67.29	0.00	15.00	0.87	3.07

SI No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2309	2024-08-05 04	7.30	67.39	0.00	15.00	0.87	3.94
2310	2024-08-05 05	7.30	101.29	0.00	15.00	0.87	4.81
2311	2024-08-05 06	7.27	80.34	0.00	15.00	0.86	5.68
2312	2024-08-05 07	7.22	75.10	0.00	15.00	0.08	6.20
2313	2024-08-05 08	7.19	74.88	0.00	15.00	0.00	6.20
2314	2024-08-05 09	7.15	75.24	0.00	15.00	0.00	6.20
2315	2024-08-05 10	7.11	69.47	0.00	15.00	0.00	6.20
2316	2024-08-05 11	7.10	75.58	0.00	15.00	0.00	6.20
2317	2024-08-05 12	7.07	74.96	0.00	15.00	0.00	6.20
2318	2024-08-05 13	7.06	71.89	0.00	15.00	0.00	6.20
2319	2024-08-05 14	7.03	71.80	0.00	14.83	0.00	6.20
2320	2024-08-05 15	6.99	71.29	0.00	12.93	0.00	6.20
2321	2024-08-05 16	6.99	71.66	0.00	11.44	0.00	6.20
2322	2024-08-05 17	6.98	69.11	0.00	12.04	0.00	6.20
2323	2024-08-05 18	7.00	67.68	0.00	15.34	0.00	6.20
2324	2024-08-05 19	7.01	67.56	0.00	14.84	0.00	6.20

1914

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2325	2024-08-05 20	7.02	67.65	0.00	14.92	0.00	6.20
2326	2024-08-05 21	7.03	67.16	0.00	15.00	0.00	6.20
2327	2024-08-05 22	7.06	67.15	0.00	15.00	0.54	6.36
2328	2024-08-05 23	7.08	67.56	0.00	15.00	0.86	7.16
2329	2024-08-06 00	7.09	67.76	0.00	15.00	0.86	0.44
2330	2024-08-06 01	7.11	67.48	0.00	15.00	0.86	1.30
2331	2024-08-06 02	7.11	67.34	0.00	15.00	0.86	2.16
2332	2024-08-06 03	7.13	67.41	0.00	15.00	0.86	3.02
2333	2024-08-06 04	7.15	67.28	0.00	15.00	0.85	3.88
2334	2024-08-06 05	7.16	67.39	0.00	15.00	0.85	4.73
2335	2024-08-06 06	7.18	67.58	0.00	15.00	0.84	5.58
2336	2024-08-06 07	7.20	67.53	0.00	15.00	0.83	6.43
2337	2024-08-06 08	7.21	67.48	0.00	15.00	0.85	7.27
2338	2024-08-06 09	7.23	67.59	0.00	15.00	0.85	8.12
2339	2024-08-06 10	7.24	66.78	0.00	15.00	0.85	8.98
2340	2024-08-06 11	7.25	66.52	0.00	15.00	0.85	9.83

1915

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2341	2024-08-06 12	7.27	66.93	0.00	15.00	0.85	10.69
2342	2024-08-06 13	7.29	67.07	0.00	15.00	0.85	11.55
2343	2024-08-06 14	7.30	67.38	0.00	15.00	0.86	12.41
2344	2024-08-06 15	7.31	66.92	0.00	15.00	0.85	13.27
2345	2024-08-06 16	7.32	66.59	0.00	15.00	0.80	14.12
2346	2024-08-06 17	7.43	67.05	0.00	15.00	0.86	14.94
2347	2024-08-06 18	7.54	66.92	0.00	15.00	0.86	15.80
2348	2024-08-06 19	7.52	66.96	0.00	15.00	0.86	16.67
2349	2024-08-06 20	7.50	66.66	0.00	15.00	0.85	17.53
2350	2024-08-06 21	7.47	66.77	0.00	15.00	0.86	18.40
2351	2024-08-06 22	7.45	66.98	0.00	15.00	0.86	19.26
2352	2024-08-06 23	7.47	66.64	0.00	15.00	0.86	20.12
2353	2024-08-07 00	7.52	66.93	0.00	15.00	0.86	0.45
2354	2024-08-07 01	7.45	67.11	0.00	15.00	0.86	1.31
2355	2024-08-07 02	7.31	67.05	0.00	15.00	0.64	2.14
2356	2024-08-07 03	7.31	67.30	0.00	15.00	0.00	2.40

1916

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2357	2024-08-07 04	7.30	66.92	0.00	15.00	0.00	2.40
2358	2024-08-07 05	7.30	67.14	0.00	15.00	0.50	2.55
2359	2024-08-07 06	7.30	66.74	0.00	15.00	0.85	3.34
2360	2024-08-07 07	7.31	67.14	0.00	15.00	0.85	4.20
2361	2024-08-07 08	7.26	69.99	0.00	15.00	0.85	5.05
2362	2024-08-07 09	7.24	69.63	0.00	15.00	0.86	5.91
2363	2024-08-07 10	7.26	67.87	0.00	15.00	0.83	6.74
2364	2024-08-07 11	7.30	67.59	0.00	15.00	0.86	7.59
2365	2024-08-07 12	7.31	67.44	0.00	15.00	0.88	8.46
2366	2024-08-07 13	7.31	67.30	0.00	15.00	0.83	9.33
2367	2024-08-07 14	7.32	67.16	0.00	15.00	0.76	10.16
2368	2024-08-07 15	7.32	67.32	0.00	15.00	0.69	10.86
2369	2024-08-07 16	7.32	66.96	0.00	15.00	0.70	11.56
2370	2024-08-07 17	7.32	67.11	0.00	15.00	0.70	12.27
2371	2024-08-07 18	7.32	67.09	0.00	15.00	0.70	12.97
2372	2024-08-07 19	7.33	67.09	0.00	15.00	0.69	13.67

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2373	2024-08-07 20	7.32	67.13	0.00	15.00	0.70	14.37
2374	2024-08-07 21	7.33	67.16	0.00	15.00	0.70	15.06
2375	2024-08-07 22	7.33	66.91	0.00	15.00	0.69	15.77
2376	2024-08-07 23	7.40	67.33	0.00	15.00	0.71	16.49
2377	2024-08-08 00	7.40	67.03	0.00	15.00	0.71	0.36
2378	2024-08-08 01	7.53	67.08	0.00	15.00	0.71	1.07
2379	2024-08-08 02	7.49	67.43	0.00	15.00	0.72	1.79
2380	2024-08-08 03	7.49	67.11	0.00	15.00	0.71	2.50
2381	2024-08-08 04	7.54	67.55	0.00	15.00	0.71	3.21
2382	2024-08-08 05	7.43	92.95	0.00	15.00	0.70	3.92
2383	2024-08-08 06	7.43	97.01	0.00	15.00	0.69	4.61
2384	2024-08-08 07	7.28	78.19	0.00	15.00	0.70	5.31
2385	2024-08-08 08	7.28	74.14	0.00	15.00	0.70	6.02
2386	2024-08-08 09	7.37	72.34	0.00	15.00	0.71	6.73
2387	2024-08-08 10	7.44	70.40	0.00	15.00	0.72	7.45
2388	2024-08-08 11	7.50	69.20	0.00	15.00	0.71	8.18

1918

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2389	2024-08-08 12	7.56	71.41	0.00	15.00	0.71	8.88
2390	2024-08-08 13	7.50	68.41	0.00	15.00	0.74	9.61
2391	2024-08-08 14	7.45	67.37	0.00	15.00	0.73	10.35
2392	2024-08-08 15	7.45	67.49	0.00	15.00	0.73	11.08
2393	2024-08-08 16	7.45	67.41	0.00	15.00	0.71	11.81
2394	2024-08-08 17	7.45	67.42	0.00	15.00	0.72	12.51
2395	2024-08-08 18	7.45	67.50	0.00	15.00	0.72	13.24
2396	2024-08-08 19	7.45	67.11	0.00	15.00	0.72	13.96
2397	2024-08-08 20	7.44	67.29	0.00	15.00	0.70	14.67
2398	2024-08-08 21	7.45	67.23	0.00	15.00	0.72	15.38
2399	2024-08-08 22	7.45	67.80	0.00	15.00	0.71	16.10
2400	2024-08-08 23	7.45	67.67	0.00	15.00	0.72	16.82
2401	2024-08-09 00	7.45	68.00	0.00	15.00	0.72	0.37
2402	2024-08-09 01	7.51	69.06	0.00	15.00	0.73	1.10
2403	2024-08-09 02	7.32	70.39	0.00	15.00	0.72	1.82
2404	2024-08-09 03	7.29	68.68	0.00	15.00	0.71	2.55

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2405	2024-08-09 04	7.26	69.17	0.00	15.00	0.70	3.26
2406	2024-08-09 05	7.25	69.15	0.00	15.00	0.70	3.98
2407	2024-08-09 06	7.24	68.46	0.00	15.00	0.70	4.67
2408	2024-08-09 07	7.24	68.27	0.00	15.00	0.71	5.39
2409	2024-08-09 08	7.22	68.41	0.00	15.00	0.71	6.10
2410	2024-08-09 09	7.21	70.32	0.00	15.00	0.72	6.82
2411	2024-08-09 10	7.22	68.48	0.00	15.00	0.73	7.55
2412	2024-08-09 11	7.20	69.85	0.00	15.00	0.75	8.29
2413	2024-08-09 12	7.26	66.40	0.00	15.00	0.74	9.06
2414	2024-08-09 13	7.30	67.46	0.00	15.00	0.73	9.80
2415	2024-08-09 14	7.32	67.39	0.00	15.00	0.72	10.53
2416	2024-08-09 15	7.41	67.51	0.00	15.00	0.73	11.26
2417	2024-08-09 16	7.42	67.11	0.00	15.00	0.73	11.99
2418	2024-08-09 17	7.48	67.63	0.00	15.00	0.73	12.72
2419	2024-08-09 18	7.52	66.99	0.00	15.00	0.72	13.44
2420	2024-08-09 19	7.55	67.25	0.00	15.00	0.71	14.16

1920

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2421	2024-08-09 20	7.57	67.41	0.00	15.00	0.70	14.87
2422	2024-08-09 21	7.59	67.11	0.00	15.00	0.70	15.58
2423	2024-08-09 22	7.61	74.41	0.00	15.00	0.71	16.29
2424	2024-08-09 23	7.57	72.45	0.00	15.00	0.71	17.00
2425	2024-08-10 00	7.44	69.49	0.00	15.00	0.71	0.36
2426	2024-08-10 01	7.41	67.55	0.00	15.00	0.71	1.07
2427	2024-08-10 02	7.41	67.54	0.00	15.00	0.72	1.79
2428	2024-08-10 03	7.40	67.41	0.00	15.00	0.71	2.52
2429	2024-08-10 04	7.40	67.20	0.00	15.00	0.72	3.24
2430	2024-08-10 05	7.40	67.38	0.00	15.00	0.71	3.95
2431	2024-08-10 06	7.40	67.08	0.00	15.00	0.71	4.67
2432	2024-08-10 07	7.40	68.14	0.00	15.00	0.70	5.38
2433	2024-08-10 08	7.41	67.04	0.00	15.00	0.72	6.09
2434	2024-08-10 09	7.40	66.41	0.00	15.00	0.70	6.82
2435	2024-08-10 10	7.41	66.39	0.00	15.00	0.54	7.44
2436	2024-08-10 11	7.43	73.79	0.00	15.00	0.55	7.98

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2437	2024-08-10 12	7.43	77.37	0.00	15.00	0.55	8.53
2438	2024-08-10 13	7.42	72.66	0.00	15.00	0.56	9.09
2439	2024-08-10 14	7.41	71.82	0.00	15.00	0.56	9.65
2440	2024-08-10 15	7.44	67.12	0.00	15.00	0.46	10.22
2441	2024-08-10 16	7.45	66.29	0.00	15.00	0.60	10.64
2442	2024-08-10 17	7.47	69.90	0.00	15.00	0.72	11.37
2443	2024-08-10 18	7.46	69.20	0.00	15.00	0.71	12.08
2444	2024-08-10 19	7.53	67.95	0.00	15.00	0.71	12.81
2445	2024-08-10 20	7.52	68.53	0.00	15.00	0.71	13.52
2446	2024-08-10 21	7.50	67.40	0.00	15.00	0.71	14.23
2447	2024-08-10 22	7.50	66.31	0.00	15.00	0.72	14.95
2448	2024-08-10 23	7.43	66.56	0.00	15.00	0.72	15.67
2449	2024-08-11 00	7.40	67.31	0.00	15.00	0.71	0.37
2450	2024-08-11 01	7.41	67.36	0.00	15.00	0.72	1.09
2451	2024-08-11 02	7.41	66.93	0.00	15.00	0.72	1.82
2452	2024-08-11 03	7.42	67.28	0.00	15.00	0.72	2.55

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2453	2024-08-11 04	7.42	67.28	0.00	15.00	0.72	3.28
2454	2024-08-11 05	7.43	67.08	0.00	15.00	0.72	4.00
2455	2024-08-11 06	7.43	66.89	0.00	15.00	0.72	4.72
2456	2024-08-11 07	7.43	66.90	0.00	15.00	0.71	5.45
2457	2024-08-11 08	7.43	67.12	0.00	15.00	0.71	6.16
2458	2024-08-11 09	7.43	67.32	0.00	15.00	0.71	6.87
2459	2024-08-11 10	7.46	67.47	0.00	15.00	0.71	7.58
2460	2024-08-11 11	7.48	67.57	0.00	15.00	0.72	8.30
2461	2024-08-11 12	7.49	66.88	0.00	15.00	0.74	9.03
2462	2024-08-11 13	7.48	67.37	0.00	15.00	0.73	9.77
2463	2024-08-11 14	7.50	66.99	0.00	15.00	0.72	10.50
2464	2024-08-11 15	7.48	67.07	0.00	15.00	0.70	11.21
2465	2024-08-11 16	7.48	66.83	0.00	15.00	0.70	11.91
2466	2024-08-11 17	7.47	67.38	0.00	15.00	0.71	12.61
2467	2024-08-11 18	7.48	67.11	0.00	15.00	0.71	13.33
2468	2024-08-11 19	7.47	67.20	0.00	15.00	0.70	14.04

1923

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2469	2024-08-11 20	7.48	67.31	0.00	15.00	0.70	14.75
2470	2024-08-11 21	7.47	66.35	0.00	15.00	0.71	15.46
2471	2024-08-11 22	7.44	66.56	0.00	15.00	0.70	16.17
2472	2024-08-11 23	7.42	64.13	0.00	15.00	0.71	16.87
2473	2024-08-12 00	7.42	64.47	0.00	15.00	0.71	0.36
2474	2024-08-12 01	7.43	61.53	0.00	15.00	0.72	1.07
2475	2024-08-12 02	7.42	66.41	0.00	15.00	0.72	1.79
2476	2024-08-12 03	7.41	64.42	0.00	15.00	0.72	2.52
2477	2024-08-12 04	7.40	69.37	0.00	15.00	0.72	3.24
2478	2024-08-12 05	7.41	65.70	0.00	15.00	0.72	3.97
2479	2024-08-12 06	7.41	65.54	0.00	15.00	0.71	4.68
2480	2024-08-12 07	7.41	66.92	0.00	15.00	0.70	5.39
2481	2024-08-12 08	7.41	69.59	0.00	15.00	0.66	6.08
2482	2024-08-12 09	7.41	67.09	0.00	15.00	0.70	6.75
2483	2024-08-12 10	7.41	64.21	0.00	15.00	0.67	7.45
2484	2024-08-12 11	7.42	66.40	0.00	15.00	0.72	8.14

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2485	2024-08-12 12	7.43	67.11	0.00	15.00	0.74	8.89
2486	2024-08-12 13	7.43	67.20	0.00	15.00	0.74	9.64
2487	2024-08-12 14	7.43	67.16	0.00	15.00	0.72	10.37
2488	2024-08-12 15	7.44	67.13	0.00	15.00	0.75	11.11
2489	2024-08-12 16	7.44	66.96	0.00	15.00	0.73	11.86
2490	2024-08-12 17	7.44	66.84	0.00	15.00	0.72	12.58
2491	2024-08-12 18	7.44	66.73	0.00	15.00	0.71	13.30
2492	2024-08-12 19	7.44	67.38	0.00	15.00	0.71	14.02
2493	2024-08-12 20	7.44	67.06	0.00	15.00	0.70	14.72
2494	2024-08-12 21	7.45	66.82	0.00	15.00	0.71	15.40
2495	2024-08-12 22	7.45	67.78	0.00	15.00	0.72	16.12
2496	2024-08-12 23	7.45	67.34	0.00	15.00	0.72	16.84
2497	2024-08-13 00	7.45	67.41	0.00	15.00	0.71	0.37
2498	2024-08-13 01	7.46	67.14	0.00	15.00	0.72	1.08
2499	2024-08-13 02	7.45	65.01	0.00	15.00	0.71	1.80
2500	2024-08-13 03	7.45	50.83	0.00	15.00	0.61	2.51

Sl No	Time	ETP_OUTLET-pH - (pH) Raw	ETP_OUTLET-COD - (mg/l) Raw	ETP_OUTLET-BOD - (mg/l) Raw	ETP_OUTLET-TSS - (mg/l) Raw	ETP_OUTLET-Flow - (m3/hr) Raw	ETP_OUTLET-Totalizer Flow - (m3/Day) Raw
2501	2024-08-13 04	7.46	51.27	0.00	15.00	0.51	2.97
2502	2024-08-13 05	7.46	53.00	0.00	15.00	0.73	3.66
2503	2024-08-13 06	7.46	70.01	0.00	15.00	0.72	4.38
2504	2024-08-13 07	7.45	46.48	0.00	15.00	0.72	5.10
2505	2024-08-13 08	7.45	77.03	0.00	15.00	0.71	5.83
2506	2024-08-13 09	7.45	53.77	0.00	15.00	0.71	6.54
2507	2024-08-13 10	7.44	61.57	0.00	15.00	0.72	7.26
2508	2024-08-13 11	7.44	55.58	0.00	15.00	0.73	7.86

17/08/24

Report Details: HPSPCB_Parwanoo | 2024-08-17 11:41:02 | Custom Report

1926

Annexure - A2

H.P.STATE POLLUTION CONTROL BOARD
FORM X
REPORT BY STATE BOARD ANALYST
(See Rule 26)

Report No: 62136/W-13363 **31/07/2024**

I hereby certify that I **Rama Kant Awasthi , SO**, State Board Analyst duly appointed under sub-section (3) of section 53 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) received on **06/07/2024** from **Anurag Raina, JEE**, HP State Pollution Control Board **RO Parwanoo** a **Grab** sample of **Final Outlet of ETP** of **Morepen Laboratories Limited**, **1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana**, **Arki** Distt. **Solan Parwanoo**, H.P. **173220** on dated **05/07/2024** for analysis. The sample was in a condition fit for analysis reported below:

I further certify that I have analyzed the aforementioned sample on **06/07/2024** to **31/07/2024** and declare the result of analysis is to be as follows :-

Method of analysis					
IS- 2488(I-V), IS-3025(Part 44): 1933, 'Standard method for examination of water', 23rd edition prepared and published jointly by:-					
1. American Public Health Association 2. American Water Works Association 3. Water Pollution Control Federation					
SAMPLING PARAMETERS					
Sr. No.	**Parameter Name**	**Results**	**Units**	**Permissible Limit**	**Remark/Result Analysis**
1	pH	8.19		30	Within Permissible Limit
2	TSS	14.0	mg/L	250	Within Permissible Limit
3	Ammonical Nitrogen	0.0	mg/L	1.0	Within Permissible Limit
4	Arsenic	0.0	mg/L	2	Within Permissible Limit
5	Hexavalent Chromium	0.0	mg/L	NA	NA
6	Total Chromium	0.0	mg/L	0.10	Within Permissible Limit
7	Copper	0.0	mg/L	6.8-8.5	Not-In Permissible Limit
8	BOD	4.4	mg/L	100	Within Permissible Limit
9	COD	32.0	mg/L	NA	NA
10	Phenolic Compounds(as C6H5OH)	0.0	mg/L	0.20	Within Permissible Limit
11	Sulphide	0.0	mg/L	NA	NA

1927

12	Zinc	Not Analyzed		NA	NA
13	Lead	0.0	mg/L	NA	NA

The condition of the seals, fastening and container on receipt was as: sealed as **HPPCB262**

Signed this on **31/07/2024**

Remarks of Lab Head:

The parameter Zinc not analysed due to problem in the Lamp.

Sample for Oil & Grease not received as per protocol.

Rama Kant Awasthi , SO
(State Board Analyst)
CL Parwanoo

From:

H.P. STATE POLLUTION CONTROL BOARD,

CL Parwanoo

To:

Morepen Laboratories Limited

1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana, Arki, Distt.Solan Parwanoo, H.P.173220

1928

H.P.STATE POLLUTION CONTROL BOARD
FORM X
REPORT BY STATE BOARD ANALYST
(See Rule 26)

Report No: 44487/W-12617 **10/06/2024**

I hereby certify that I **Rama Kant Awasthi , SO**, State Board Analyst duly appointed under sub-section (3) of section 53 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) received on **14/05/2024** from **Anurag Raina, JEE**, HP State Pollution Control Board **RO Parwanoo** a **Grab** sample of **Final Outlet of ETP** of **Morepen Laboratories Limited**, **1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana**, **Arki** Distt. **Solan Parwanoo**, H.P. **173220** on dated **13/05/2024** for analysis. The sample was in a condition fit for analysis reported below:

I further certify that I have analyzed the aforementioned sample on **14/05/2024** to **10/06/2024** and declare the result of analysis is to be as follows :-

Method of analysis					
IS- 2488(I-V), IS-3025(Part 44): 1933, 'Standard method for examination of water', 23rd edition prepared and published jointly by:-					
1. American Public Health Association 2. American Water Works Association 3. Water Pollution Control Federation					
SAMPLING PARAMETERS					
Sr. No.	**Parameter Name**	**Results**	**Units**	**Permissible Limit**	**Remark/Result Analysis**
1	TSS	8.0	mg/L	100	Within Permissible Limit
2	Ammonical Nitrogen	5.04	mg/L	NA	NA
3	Arsenic	0.0	mg/L	0.20	Within Permissible Limit
4	Hexavalent Chromium	0.0	mg/L	NA	NA
5	Zinc	0.517	mg/L	NA	NA
6	Total Chromium	0.0	mg/L	NA	NA
7	Lead	0.0	mg/L	0.10	Within Permissible Limit
8	Copper	0.0	mg/L	NA	NA
9	pH	7.34		6.8-8.5	Within Permissible Limit
10	BOD	7.6	mg/L	30	Within Permissible Limit
11	Oil and Grease	0.0	mg/L	10	Within Permissible Limit
12	COD	64.0	mg/L	250	Within Permissible Limit

1929

13	Phenolic Compounds(as C_6H_5OH)	0.0	mg/L	1.0	Within Permissible Limit
14	Sulphide	0.0	mg/L	2	Within Permissible Limit

The condition of the seals, fastening and container on receipt was as: sealed as **HPPCB262**

Signed this on **10/06/2024**

Remarks of Lab Head:

-

Rama Kant Awasthi , SO
(State Board Analyst)
CL Parwanoo

From:

H.P. STATE POLLUTION CONTROL BOARD,

CL Parwanoo

To:

Morepen Laboratories Limited

1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana, Arki, Distt.Solan Parwanoo, H.P.173220

1930

H.P.STATE POLLUTION CONTROL BOARD
FORM X
REPORT BY STATE BOARD ANALYST
(See Rule 26)

Report No: 30124/W-13364 **31/07/2024**

I hereby certify that I **Rama Kant Awasthi , SO**, State Board Analyst duly appointed under sub-section (3) of section 53 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) received on **06/07/2024** from **Anurag Raina, JEE**, HP State Pollution Control Board **RO Parwanoo** a **Grab** sample of **Final Outlet of STP** of **Morepen Laboratories Limited**, **1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana**, **Arki** Distt. **Solan Parwanoo**, H.P. **173220** on dated **05/07/2024** for analysis. The sample was in a condition fit for analysis reported below:

I further certify that I have analyzed the aforementioned sample on **06/07/2024** to **31/07/2024** and declare the result of analysis is to be as follows :-

Method of analysis					
IS- 2488(I-V), IS-3025(Part 44): 1933, 'Standard method for examination of water', 23rd edition prepared and published jointly by:-					
1. American Public Health Association 2. American Water Works Association 3. Water Pollution Control Federation					
SAMPLING PARAMETERS					
Sr. No.	**Parameter Name**	**Results**	**Units**	**Permissible Limit**	**Remark/Result Analysis**
1	pH	7.93		6.5-9.0	Within Permissible Limit
2	TSS	6.0	mg/L	99	Within Permissible Limit
3	BOD	2.0	mg/L	30	Within Permissible Limit

The condition of the seals, fastening and container on receipt was as: sealed as **HPPCB262**

Signed this on **31/07/2024**

Remarks of Lab Head:

-

Rama Kant Awasthi , SO
(State Board Analyst)

1931

CL Parwanoo

From:
H.P. STATE POLLUTION CONTROL BOARD,
CL Parwanoo

To:
Morepen Laboratories Limited
1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana, Arki, Distt.Solan Parwanoo, H.P.173220

1932

H.P.STATE POLLUTION CONTROL BOARD
FORM X
REPORT BY STATE BOARD ANALYST
(See Rule 26)

Report No: 71299/W-12620 **10/06/2024**

I hereby certify that I **Rama Kant Awasthi , SO**, State Board Analyst duly appointed under sub-section (3) of section 53 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) received on **14/05/2024** from **Anurag Raina, JEE**, HP State Pollution Control Board **RO Parwanoo** a **Grab** sample of **Final Outlet of STP** of **Morepen Laboratories Limited**, **1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana**, **Arki** Distt. **Solan Parwanoo**, H.P. **173220** on dated **13/05/2024** for analysis. The sample was in a condition fit for analysis reported below:

I further certify that I have analyzed the aforementioned sample on **14/05/2024** to **10/06/2024** and declare the result of analysis is to be as follows :-

Method of analysis					
IS- 2488(I-V), IS-3025(Part 44): 1933, 'Standard method for examination of water', 23rd edition prepared and published jointly by:-					
1. American Public Health Association 2. American Water Works Association 3. Water Pollution Control Federation					
SAMPLING PARAMETERS					
Sr. No.	**Parameter Name**	**Results**	**Units**	**Permissible Limit**	**Remark/Result Analysis**
1	TSS	9.0	mg/L	99	Within Permissible Limit
2	pH	7.30		6.5-9.0	Within Permissible Limit
3	BOD	3.6	mg/L	30	Within Permissible Limit

The condition of the seals, fastening and container on receipt was as: sealed as **HPPCB262**

Signed this on **10/06/2024**

Remarks of Lab Head:

-

Rama Kant Awasthi , SO
(State Board Analyst)

1933

CL Parwanoo

From:
H.P. STATE POLLUTION CONTROL BOARD,
CL Parwanoo

To:
Morepen Laboratories Limited
1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana, Arki, Distt.Solan Parwanoo, H.P.173220

Annexure - A3

PUBLIC DASHBOARD - HIMACHAL PRADESH POLLUTION CONTROL BOARD

logicladder

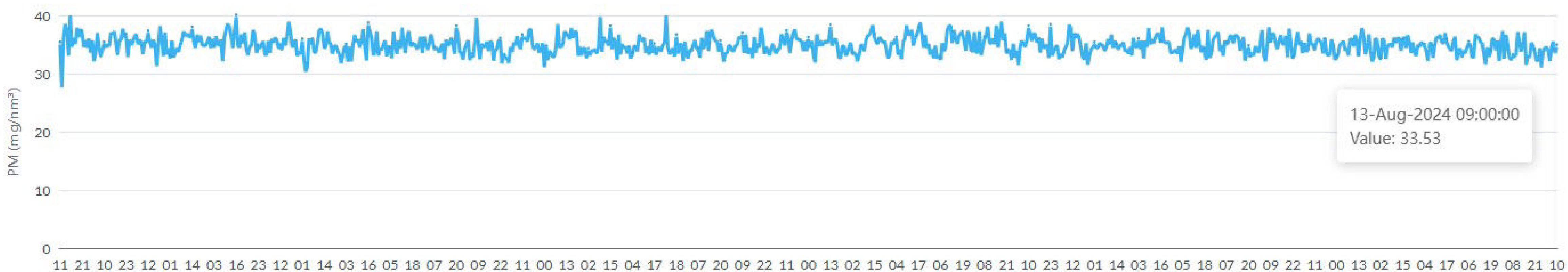
SINGLE PARAMETER TREND

Home

Criteria

Station*	Time Range*	Parameter*	Average Duration*
Stack	2024-07-01 00:00:00 - 2024-08-13 10:59:00	PM	1 hour

PM Trend



17/08/24

H.P.STATE POLLUTION CONTROL BOARD
REPORT BY STATE BOARD ANALYST
(Stack/Ambient Air) Monitoring Report

Report No: 13020942/A-13222 **24/07/2024**

I hereby certify that I **Rama Kant Awasthi , SO**, State Board Analyst duly appointed under sub-section (2) of section 29 of the Air (Prevention and Control of Pollution) Act, 1981 received on **06/07/2024** from **Punesh Kumar , JEE**, HP State Pollution Control Board **RO Parwanoo** a **Grab** sample of **Thimble no.: P-102** of **Morepen Laboratories Limited**, **1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana**, **Arki** Distt. **Solan Parwanoo**, H.P. **173220** on dated **05/07/2024** for analysis. The sample was in a condition fit for analysis reported below:

I further certify that I have analyzed the aforementioned sample on **06/07/2024** to **24/07/2024** and declare the result of analysis is to be as follows :-

SAMPLING PARAMETERS					
Sr. No.	**Parameter Name**	**Results**	**Units**	**Permissible Limit**	**Remark/Result Analysis**
1	PM(Stack)	21.0	mg/Nm3	800	Within Permissible Limit

The condition of the seals, fastening and container on receipt was asfollows:-
Filter paper was enclosed in sealed envelope with the impression of **HPPCB268**. The envelope contained details of sample like source of sample, time and date of collection, name and designation of person who had collected the sample.
Signed this on **24/07/2024**

Remarks of Lab Head:

-

Rama Kant Awasthi , SO
(State Board Analyst)
CL Parwanoo

From:
H.P. STATE POLLUTION CONTROL BOARD,
CL Parwanoo

To:
Morepen Laboratories Limited
1330,1329,828,824,1328,13 Masulkhana, Kasauli Road Parwanoo District Solan, H.P.Masoolkhana, Arki,

1936

Distt.Solan Parwanoo, H.P.173220

Annexure-A5

Table No.-1 : Sampling results Nallah Upstream Of the unit

Sr. No.	Sampling Point	Date of Sampling	pH	BOD	Dissolved Oxygen	Total Coliforms Organism
	Class-B (Best Designated Use) Criteria		(6.5-8.5)	(≤ 3 mg/l)	(≥ 5mg/l)	(≤ 500 MPN/ 100 ml)
1	Masulkhana Nallah U/s of Morepen lab at Village Masulkhana Parwanoo	09.04.2024	7.08	0.3	6.5	33
2		08.05.2024	7.23	0.1	6.8	17
3		12.06.2024	6.81	0.7	6.8	39

Table No.-2 : Sampling results Nallah downstream Of the unit

Sr. No.	Sampling Point	Date of Sampling	pH	BOD	Dissolved Oxygen	Total Coliforms Organism
	Class-B (Best Designated Use) Criteria		(6.5-8.5)	(≤ 3 mg/l)	(≥ 5mg/l)	(≤ 500 MPN/ 100 ml)
1	Masulkhana Nallah U/s of Morepen lab at Village Masulkhana Parwanoo	09.04.2024	6.93	1.2	5.5	280
2		08.05.2024	7.14	1.0	4.8	280
3		12.06.2024	6.83	1.8	6.0	350

**Note: The analysis reports shows that water quality of the nallah is meeting Class-B criteria of best designated use defined by CPCB.*

17/08/24

Annexure - A6

EVALUATION OF ADEQUACY OF ETP OF MOREPEN LABORATORIES LIMITED AT MASULKHANA (PARWANOO) TO MAKE THE FACILITY ZLD

Final Technical Report

Submitted to

Morepen Laboratories Ltd. Masulkhana

Submitted By

PI/CI from

Panjab University Chandigarh and IIT Ropar

SUMMARY OF REPORT

The Effluent Treatment Plant (ETP) at Morepen Laboratories Ltd. Masulkhana categorizes effluents based on Chemical Oxygen Demand (COD) levels to manage treatment effectively. High COD Effluent, ranging from 70,000 to 3,500,000 PPM, poses the greatest challenge due to its high organic pollutant concentration. Low COD Effluent, below 20,000 PPM, and Other Effluent from R&D and QC labs, below 10,000 PPM, are comparatively easier to treat. The plant employs a 12 KLD stripper for high COD effluent, essential for volatile organic compound removal. This process ensures vaporizing contaminants. Low COD effluent undergoes initial treatment in an equalization tank, optimizing subsequent processes for efficient wastewater management.

Teams from IIT Ropar and PU Chandigarh noted no suspended matter in the Effluent Collection Tank, likely due to exclusive use of a pumping system for effluent transfer. Regular maintenance ensures continuous and effective operation, with assurance that no significant debris enters subsequent treatment stages. The inlet section handles effluent from the bottom layer after stripper recovery and overflow, with upstream protection provided by an Oil Pit (Capacity = 1.7 KL).

The equalization tank at Morepen Laboratories Ltd. Masulkhana plays a pivotal role in wastewater management, providing substantial storage of 30.3 KL and a retention time of approximately 19.0 hours. It ensures uniformity in wastewater composition from sources like the Effluent Collection Tank and Floor Wash before onward processing. Controlled entry and outlet structures manage flow rates, preventing hydraulic shocks and maintaining operational efficiency. Manual sampling points monitor pH, temperature, and other parameters, ensuring compliance with operational limits and effective tank performance. Positioned strategically before primary treatment processes, the tank stabilizes influent flow and composition, optimizing downstream treatment units. Real-time level sensors facilitate automated monitoring and control, enhancing operational efficiency. While primarily for homogenizing wastewater, provisions for periodic sludge removal maintain tank effectiveness. Discussions with IIT Ropar and PU Chandigarh highlighted the need for extended effluent holding during maintenance, prompting the installation of additional storage tanks like Effluent Collection Tank with a capacity

of 769.6 m^3 and alternate storage tank No T-5 (479.9 KL). These measures ensure uninterrupted treatment operations and environmental compliance during maintenance periods.

The primary treatment process at Morepen Laboratories Ltd. Masulkhana employs a system of six collection tanks designed to optimize wastewater treatment efficacy. These tanks, totaling 32.4 KL capacity with three tanks operating in series, facilitate crucial chemical flocculation for sedimentation. Proper flocculant dosing and uniform mixing within these tanks are essential for forming stable flocs that settle effectively in subsequent stages. Maintaining optimal pH levels further enhances coagulation efficiency. However, concerns raised by IIT Ropar and PU Chandigarh about direct routing of MEE overflow and other effluents to the primary treatment tank highlight potential challenges in maintaining process consistency. Morepen Laboratories clarifies that the three sequential tanks are strategically designed for lime, alum, and polymer dosing, ensuring treatment effectiveness. The remaining parallel tanks support efficient homogenization, offering adequate retention time for optimal treatment. This configuration balances operational efficiency and treatment effectiveness, meeting stringent wastewater treatment standards effectively.

The Effluent Treatment Plant (ETP) at Morepen Laboratories Ltd. Masulkhana features three aeration tanks totalling 251 KL capacity, divided into ASP 1 and 2 (162 KL) and ASP 3 (89 KL). This design enhances treatment efficiency by employing staged aeration and two clarifiers, ensuring effective settling before progressing to subsequent phases. The aerobic treatment process effectively reduces Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD), crucial for removing organic pollutants. Temperature control within the biological reactor optimizes microbial activity, while pH monitoring maintains ideal conditions for efficient treatment. Proper aeration and uniform mixing prevent anaerobic zones and dead spots, ensuring consistent pollutant degradation. Effective sludge management and potential bio-augmentation further enhance treatment efficacy. Concerns raised by IIT Ropar and PU Chandigarh regarding ASP performance prompted considerations such as nano-bubble aeration and stringent effluent parameter control to optimize microbial processes. Morepen Laboratories addressed high Total Dissolved Solids (TDS) effluent challenges through pre-treatment in PST and filtration using screw press filters, enhancing MEE efficiency and stability. These improvements reflect a commitment to maintaining high treatment standards and operational reliability in the ETP.

The sump at the plant ensures treated water meets processing standards by buffering flow fluctuations. It supports membrane system maintenance, preserving water integrity. Pumps transfer treated effluent from the sump to its final destination, integral to the system's design for efficient water management and treatment.

Optimal pH management is critical across various stages of Morepen Laboratories LTD. Masulkhana's Effluent Treatment Plant (ETP) to maximize treatment efficiency. Strategic pH adjustments and continuous monitoring systems are pivotal to maintain stability and prevent disruptions from pH fluctuations. This approach enhances treatment consistency and efficacy by addressing key control points during primary and biological treatment phases. Effective pH control optimizes contaminant removal and supports microbial activity essential for organic matter degradation, ensuring compliance with discharge standards.

Managing Total Dissolved Solids (TDS) is equally crucial for ETP operations to uphold water quality and regulatory compliance. While the system effectively reduces TDS from 27,000 mg/L at the equalization tank to below 700 mg/L (after RO treatment), continuous monitoring remains essential to mitigate potential disruptions caused by high TDS levels. Controlling TDS is imperative for enhancing the suitability of treated water for reuse in various industrial applications, minimizing equipment damage from scaling and corrosion.

Dynamic Light Scattering (DLS) measurements provide valuable insights into particle size distribution dynamics within the treatment system. Variations in treatment conditions, feed composition, and nucleation processes significantly influence particle size, impacting treatment efficiency. Understanding these dynamics facilitates process optimization to achieve desired particle size distributions, enhancing overall treatment effectiveness.

Maintaining optimal Dissolved Oxygen (DO) levels is crucial in aerobic treatment processes to support microbial activity for organic pollutant degradation. Enhancing DO levels through efficient aeration methods such as fine bubble diffusers oxygenation improves treatment outcomes and water quality, ensuring effective pollutant removal.

Effective management of Chemical Oxygen Demand (COD) is essential to mitigate organic pollutant levels in treated water. Optimizing coagulant and flocculant usage improves sedimentation and filtration processes, reducing COD levels and ensuring compliance with discharge standards. Adjusting Hydraulic Retention Time (HRT) in biological treatment tanks further enhances organic matter degradation efficiency, promoting thorough wastewater treatment.

Developing an emergency response plan for sudden COD increases is crucial to maintaining treatment effectiveness. Such measures ensure rapid response and mitigation strategies to safeguard treated water quality and compliance during unexpected operational challenges.

Integrated management of Biological Oxygen Demand (BOD) alongside COD ensures comprehensive organic pollutant control, supporting consistent treatment outcomes and environmental protection. Utilizing Infrared (IR) spectroscopy for water quality assessment identifies specific contaminants, enabling targeted treatment strategies for improved water purity and regulatory compliance.

The Effluent Treatment Plant (ETP) at Morepen Laboratories Ltd., Masulkhana has undergone substantial improvements following an extensive evaluation aimed at achieving regulatory compliance and enhancing operational efficiency. The initial phase of sampling identified critical areas requiring immediate attention to align with established environmental standards. To address these issues comprehensively, Morepen Laboratories engaged in a collaborative effort with academic institutions like PU Chandigarh and IIT Ropar for further sampling and analysis. This partnership yielded crucial feedback that guided subsequent improvements within the facility.

Key modifications were implemented across various sections of the ETP to streamline operations towards achieving Zero Liquid Discharge (ZLD), ensuring sustainable water management practices. The upgrades began with the pretreatment of incoming effluent in an equalization tank, crucial for stabilizing flow rates and Total Dissolved Solids (TDS) concentrations. The primary tube settler (PST) was enhanced to effectively remove suspended solids, preparing the effluent for further processing. A Screw Sludge Dewatering Machine was introduced to dewater sludge from the PST, reducing waste volume and improving overall treatment efficiency.

The Multi Effect Evaporator (MEE) underwent optimization with the installation of a steam flow controller to stabilize evaporation rates and enhance energy utilization. Vacuum stabilization measures further improved efficiency by maintaining optimal conditions within the evaporator chamber. Additionally, separate cooling water supplies were implemented for the Agitated Thin Film Dryer (ATFD) and MEE condenser to maximize thermal efficiency and minimize energy consumption.

In the Activated Sludge Process (ASP), instrumentation upgrades such as rotameters were installed to ensure precise flow control, promoting uniform air distribution critical for aerobic microbial activity. Bioenzymes were introduced to enhance microbial degradation of organic pollutants, reducing retention times and improving treatment efficacy. Increased sampling frequency enabled better monitoring of key parameters like dissolved oxygen and biochemical oxygen demand (BOD), facilitating timely adjustments to optimize treatment processes.

The Reverse Osmosis (RO) system played a pivotal role in achieving stringent water quality standards by incorporating advanced pH control systems and balanced chemical dosing to reduce turbidity levels. RO permeate water was recycled within the polisher unit for secondary treatment, minimizing freshwater consumption and wastewater discharge.

In conclusion, Morepen Laboratories Ltd proactive approach to transforming their Effluent Treatment Plant (ETP) through strategic upgrades in pretreatment, Multi Effect Evaporator (MEE) optimization, Activated Sludge Process (ASP) improvements, and advanced Reverse Osmosis (RO) technology demonstrates a commitment to sustainable development. These enhancements have not only enabled the facility to meet current regulatory standards but also positioned it to effectively tackle future environmental challenges.

The systematic upgrades in pretreatment have ensured that incoming effluent undergoes thorough initial processing, stabilizing flow rates and reducing Total Dissolved Solids (TDS) to below 200 mg/L. The introduction of a Primary Tube Settler (PST) and screw Sludge Dewatering Machine has significantly improved the removal of suspended solids and sludge management, enhancing overall treatment efficiency.

Optimizing the MEE with advanced controls for steam flow and vacuum stabilization has boosted evaporation rates while conserving energy. The separate cooling water supplies to the ATFD and MEE condenser have maximized thermal efficiency, contributing to reduced operational costs and environmental impact.

Improvements in the ASP, including enhanced instrumentation and increased sampling frequency, have facilitated better control over critical parameters like Dissolved Oxygen (DO) and Biochemical Oxygen Demand (BOD). These enhancements ensure robust microbial activity for efficient organic pollutant removal, resulting in treated water with BOD levels below 30 mg/L and COD levels below 240 mg/L.

The implementation of advanced RO technology with precise pH control and optimized chemical dosing has further improved water quality by reducing turbidity and ensuring the removal of harmful cations and anions. The recycling of RO permeate water within the polisher unit underscores Morepen Laboratories Ltd commitment to water conservation and environmental stewardship.

Overall, these comprehensive upgrades not only align the ETP with stringent environmental regulations but also enhance its resilience to future challenges. By adopting a holistic and forward-thinking approach to wastewater treatment, Morepen Laboratories Ltd has set a benchmark for responsible corporate conduct in sustainable water management practices. This transformation not only safeguards environmental health but also supports long-term operational efficiency and corporate sustainability goals.

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PART 1

ADEQUECY STUDY OF THE EXISTING ETP PLANT OF MOREPEN LABORATORIES LTD., MASULKHANA

There are several methods available for treating wastewater, ranging from small-scale solutions for individual facilities to large-scale wastewater treatment plants designed to handle the effluents of entire industrial complexes. Each method varies in complexity, efficiency, and the types of contaminants it can remove, making it essential to select the appropriate treatment process based on the specific requirements of the industry and the characteristics of the wastewater. In this context, Morepen Laboratories Ltd. has developed an Effluent Treatment Plant (ETP) that serves as a vital component of their environmental management strategy. In general; an Effluent Treatment Plant (ETP) is a specialized facility engineered to treat industrial wastewater by removing harmful contaminants before the effluent is either discharged into the environment or reused within the plant's operations. The design and operation of an ETP are critical for minimizing the environmental impact of industrial activities, ensuring that the wastewater released meets stringent regulatory standards. The treatment process typically involves several stages, including physical, chemical, and biological treatments, each targeting different types of pollutants. These stages collectively work to reduce key parameters such as Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Total Dissolved Solids (TDS), and pH levels, all of which are crucial indicators of water quality.

A. ETP PLANT DESCRIPTIONS: MOREPEN LABORATORIES LTD. MASULKHANA

In the Effluent Treatment Plant (ETP) under discussion, the management and treatment of effluent streams are carefully organized based on the Chemical Oxygen Demand (COD) levels of the wastewater. The plant has identified three distinct categories of effluent:

High COD & TDS Effluent: This category includes effluents with extremely high COD levels, ranging from 70,000 to 3,500,000 parts per million (PPM) and TDS ranging from 20000 to 30000ppm. These effluents are typically the most challenging to treat due to the high concentration of organic pollutants.

Low COD & TDS Effluent: This stream consists of wastewater with COD levels below 20,000 PPM and TDS ranging from 7000 to 10000ppm. While still significant, the treatment of this stream is less complex compared to the high COD effluent.

Other Effluent: This category includes wastewater from Research and Development (R&D), Quality Control (QC) laboratories, and cooling towers, with COD levels generally below 10,000 PPM. These effluents are typically easier to manage due to their lower pollutant load.

For the high COD effluent, which represents the most concentrated and difficult-to-treat waste, the plant employs a stripper with a capacity of 12 Kilolitres per Day (KLD). A stripper is a vital component in the ETP, specifically designed to handle effluents with high levels of volatile organic compounds (VOCs) and other volatile contaminants. The operation of a stripper involves passing the contaminated water through a packed column. Within this column, air or steam is introduced, causing the VOCs and other volatile substances to vaporize and separate from the liquid phase. This process is crucial in reducing the concentration of harmful chemicals in the effluent, ensuring that the water meets the necessary standards before undergoing further treatment. Strippers are particularly effective for wastewater containing solvents, ammonia, and other volatile substances that are typically present in high COD effluents. By removing these contaminants, the stripper plays a critical role in ensuring that the treated water is safe for discharge or further processing. After the stripping process, the bottom layer, which consists of heavier, non-volatile components, is sent to the equalization chamber through an oil pit and an effluent collection tank. The treatment of low COD effluent also begins in the equalization tank. This tank serves as the initial stage for equalizing the wastewater before it undergoes further treatment processes. Like the high COD effluent, low COD wastewater is also directed to the equalization tank through the oil pit and an effluent collection tank. The equalization tank ensures that the wastewater is homogenized, reducing fluctuations in the flow and composition, which is essential for the efficiency of subsequent treatment stages.

PLANT DESIGN DETAILS (As on 24/02/2024)	
Plant Capacity (Designed)	72 m^3/day
Flow Rate (Designed)	3 m^3/hr
Flow Rate (Currently)	1.6 m^3/hr
COD (ETP Inlet)	<30000 ppm
BOD (ETP Inlet)	<13000 to 15000ppm
pH (ETP Inlet)	5 to 9
TDS (ETP Inlet)	20000 to 30000 ppm

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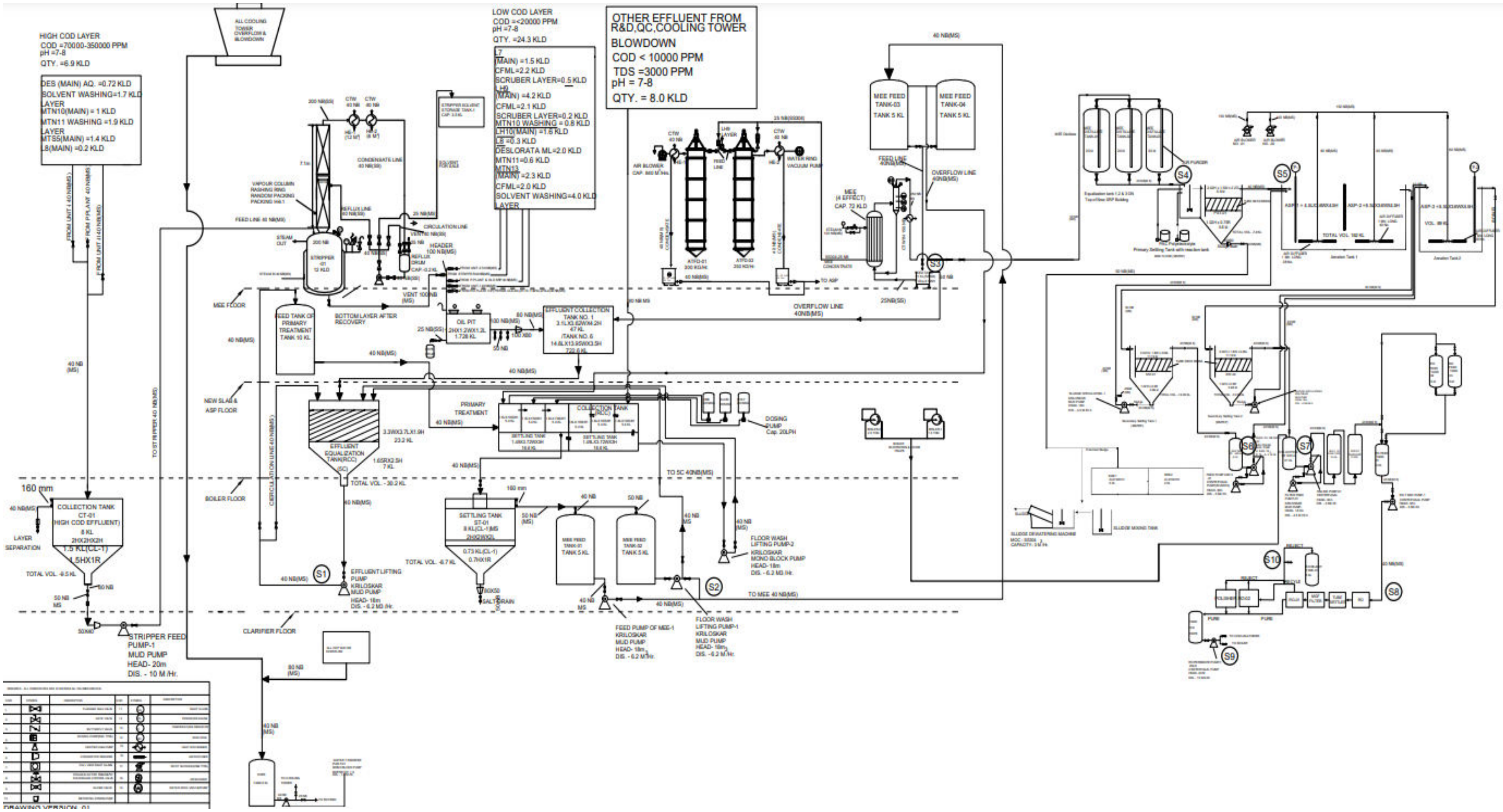

Figure 1A.1. Block Diagram of ETP plant existing on 24/02/24

EFFLUENT COLLECTION TANK: The inlet screening process is an essential and foundational step in the wastewater treatment process, designed to protect and ensure the smooth operation of the entire Effluent Treatment Plant (ETP). Positioned at the entrance of the ETP, inlet screens or gratings serve as the first line of defence against large debris and solid materials that might be present in the incoming wastewater. These screens are meticulously engineered with openings of specific sizes to effectively capture and retain sizable objects, preventing them from entering the treatment system. The primary function of inlet screening is to remove large debris such as sticks, leaves, plastics, rags, and other solid waste that could potentially cause significant problems if allowed to pass further into the treatment plant. These materials, if not intercepted, can lead to several operational challenges. For instance, large debris can become lodged in pumps, pipes, or other mechanical components of the treatment system, causing clogs and blockages. Such obstructions can severely disrupt the flow of wastewater, leading to inefficiencies in the treatment process and potentially causing damage to critical equipment. One of the most significant benefits of the inlet screening process is its role in protecting downstream equipment. Wastewater treatment plants rely on a variety of mechanical components, including pumps, aerators, and mixers, to effectively treat the wastewater. These components are designed to handle water and smaller particles, not large solid objects. By capturing large debris at the inlet, the screening process prevents these materials from reaching and damaging sensitive equipment, thereby reducing the likelihood of costly repairs and maintenance. Furthermore, preventing clogs in pumps and pipes through effective inlet screening has a direct impact on the overall efficiency of the treatment plant. Clogged pumps and pipes can lead to reduced flow rates, which in turn can slow down the entire treatment process. This can cause backups in the system, leading to overflow situations that are both hazardous and costly to manage. Additionally, clogs require manual removal, which increases the maintenance demands on the plant's operations team. This not only diverts resources but also increases the plant's operational costs. Inlet screening also plays a crucial role in protecting the biological and chemical treatment stages that follow in the wastewater treatment process. Large solid objects can interfere with the effectiveness of these processes, either by physically obstructing treatment tanks or by introducing materials that are difficult to break down. By removing large debris at the outset, inlet screening ensures that the subsequent treatment stages can operate at their full capacity, focusing on removing the finer particles, chemicals, and biological contaminants present in the wastewater.

The technical details of the Effluent Collection Tank have been tabulated below:

EFFLUENT COLLECTION TANK		
Number of Units		02
Feed Flow Rate		1.6 m^3/hr
Tank Number	TANK No. 1	TANK No. 6
Capacity	47 m^3	722.6 m^3
Height / Depth	4.2 m	3.5 m
Area required	11.22 m^2	206.46 m^2
Length	3.62 m	14.8m
Width	3.1 m	13.95m
Free Board	0.5 m	0.5 m
Volume (Available)	4.2 m × 3.62 m × 3.1 m = 47 m^3	14.8 m × 13.95 m × 3.5 m = 722.6 m^3
MOC	RCC	RCC
Retention Time (With Current Flow Rate)	10.0 days Min; 19.00 days (Maximum)	
OIL PIT	Capacity	1.7 m^3
	Height / Depth	1.2 m
	Area required	1.44 m^2
	Length	1.2 m
	Width	1.2 m
	Volume (Available)	1.2 m × 1.2 m × 1.2 m = 1.7 m^3

Observations & Recommendations

The details of observations and recommendations of team IIT Ropar & PU Chandigarh are presented below:

- During visits by teams from IIT Ropar & PU Chandigarh: it was observed that there were not any suspended matter in the Effluent Collection Tank; this can be because all the effluents transfer through pipes with gravity only.
- At the moment; the concerned official has ensured that no significant debris are passing through to the subsequent treatment stages.

- The inlet section is designed to cater the effluent from: 1) Bottom layer after recovery from stripper, and 2) Overflow line of MEE plant. However; upstream of this tank is provided with the Oil Pit (Capacity = 1.7 KL) for effluent of 1.

EQUALIZATION TANK: An equalization tank, also known as an equalization basin or EQ tank, is a crucial component of an Effluent Treatment Plant (ETP). Its primary function is to stabilize and homogenize the characteristics of incoming wastewater, ensuring that the treatment processes downstream can operate efficiently and effectively. This tank is particularly beneficial in industrial settings where wastewater is generated intermittently or where there are significant variations in flow rate and composition. By serving as a buffer, the equalization tank helps to smooth out these fluctuations, creating a more consistent flow of wastewater into the treatment plant. One of the key roles of an equalization tank is to equalize the pH levels and temperatures within the wastewater. Industrial processes often produce wastewater with varying pH levels and temperatures, which can pose challenges to subsequent treatment stages. For instance, extreme pH values can inhibit biological treatment processes, while high temperatures can affect the solubility of gases and the activity of microorganisms. The equalization tank mitigates these issues by blending the incoming wastewater, resulting in a more uniform pH and temperature profile. This, in turn, protects the downstream treatment units from sudden shocks that could otherwise disrupt their operation. In addition to stabilizing pH and temperature, the equalization tank also plays a vital role in managing variations in the concentration of pollutants within the wastewater. Industrial discharges can vary significantly in their chemical composition, with some batches containing higher concentrations of contaminants than others. Without an equalization tank, these variations could lead to overloading of treatment units, potentially causing them to become inefficient or even fail. By mixing the wastewater and diluting high concentrations of pollutants, the equalization tank helps to ensure that the treatment plant receives a more consistent and manageable influent. Moreover, the equalization process reduces the risk of hydraulic overloading in the treatment plant. During periods of peak flow, the tank acts as a reservoir, temporarily holding excess wastewater and releasing it at a controlled rate. This prevents the treatment units from being overwhelmed and allows them to function optimally. In summary, the equalization tank is an essential element of an ETP, providing critical stabilization of wastewater characteristics, protecting downstream processes, and ensuring the overall efficiency and reliability of the treatment plant.

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EQUALIZATION TANK		
Number of Units		01
Rectangular Part (Upper) Tank No-5C	Feed Flow Rate	1.6 m^3/hr
	Capacity (Planned)	23.2 m^3 + 7.1 m^3 = 30.3 m^3 (Including peak flow factor)
	Retention Time (With Current Flow Rate)	18.9 hours
	Height	1.9 m
	Area required	206.46 m^2
	Length	3.7 m
	Width	3.3 m
	Volume (Available)	3.3 m × 3.7 m × 1.9 m = 23.2 m^3
	MOC	RCC with anticorrosive coating
Circular Cone Part (Lower)	Height	2.5 m
	Radius	1.65 m
	Volume (Available)	7.1 m^3
	MOC	RCC with anticorrosive coating
EQUALIZATION TANK BLOWER		
Capacity		Not applicable

Pressure	Not applicable
MOC	Not applicable
Aeration grid for equalization tanks	Not applicable
Coarse air diffusers for equalization tanks	Not Applicable
EFFLUENT TRANSFER PUMP	
Type	Gravity Flow
Capacity	Not Required
Head	Not Required
Suitable sized compressor for air operated diaphragm pumps	Not Required
LIME / NaOH / CHEMICAL DOSING	
Number of Units	Not Provided
Material Flow Rate	Not Applicable
Capacity	Not Applicable
MOC	Not Applicable

Observations & Recommendations

The details of observations and recommendations of team IIT Ropar & PU Chandigarh are presented below:

- The equalization tank at Morepen Laboratories Ltd. Masulkhana is designed with a substantial storage capacity of 30.3 KL, allowing for nearly 19.0 hours of retention time. This capacity ensures that incoming wastewater undergoes sufficient residence time to achieve homogeneity before advancing to subsequent processing stages. This homogenization is crucial as it promotes uniformity in the composition of the wastewater, which is essential for consistent and effective treatment downstream. The equalization tank is designed to receive the effluent from: 1) Effluent Collection Tank, and 2) Floor Wash.

- Controlled entry structures positioned at the inlet of the equalization tanks serve a critical role in managing the introduction of wastewater. These structures regulate the flow rate and volume of wastewater entering the tank, which helps prevent hydraulic shock and ensures a steady flow conducive to effective equalization. Similarly, outlet structures carefully manage the discharge of equalized wastewater into subsequent treatment stages, maintaining operational efficiency throughout the treatment process.
- Manual sampling points integrated into the design of the equalization tanks allow for regular monitoring of key wastewater parameters. Parameters such as pH, temperature, and other relevant characteristics are measured and analyzed at these points. This monitoring ensures that the wastewater remains within specified operational limits, facilitating optimal performance of the equalization tank and subsequent treatment processes. Regular monitoring also enables prompt adjustments or interventions if deviations from desired parameters are detected.
- Strategically positioned before primary treatment processes such as sedimentation or biological treatment units, the equalization tank plays a crucial role in ensuring a smooth and consistent influent to these downstream units. By equalizing variations in flow rate and composition, the tank enables downstream units to operate efficiently and effectively. This positioning not only enhances treatment efficiency but also helps in maintaining the overall stability and reliability of the wastewater treatment system.
- To enhance operational automation within the plant, the installation of level sensors in the equalization tank can provide real-time monitoring of wastewater volume. This data is instrumental in controlling the flow rate into and out of the tank, optimizing operational efficiency, and ensuring that the tank operates within its designed capacity. Level sensors enable proactive management of wastewater levels, reducing the risk of overflow or underflow and supporting overall process stability.
- While the equalization tank primarily focuses on homogenizing wastewater and not on sludge management, some sludge may settle within the tank over time. However, the current Effluent Treatment Plant (ETP) includes provisions for removing any accumulated sludge if necessary. This periodic removal process ensures that the equalization tank continues to operate effectively without compromising its primary function of equalizing wastewater characteristics.

- ***Query of IIT Ropar & PU Chandigarh Team:*** If the plant requires maintenance, it becomes necessary to hold the effluent for a few days to ensure that no untreated wastewater is released into the environment during the maintenance period. Typically, this holding requirement is managed by the equalization tank, which is designed to temporarily store effluent until the plant can resume normal operations. However, in the current scenario, the equalization tank at the facility has a capacity that allows it to hold the effluent for only 19 hours, which is significantly less than the required duration for extended maintenance activities. This limited capacity poses a challenge, as it may not provide sufficient time for necessary repairs or upkeep without risking overflow or interruptions in the treatment process. Therefore, alternative strategies, such as using additional storage tanks or temporarily reducing wastewater generation, may need to be considered to address this shortfall during maintenance periods.

- ***Response of Concerned Officials of Morepen Laboratories Ltd. Masulkhana:*** The Effluent Treatment Plant (ETP) is now equipped with an Effluent Collection Tank with a total capacity of 769.6 m^3 (722.6 m^3 + 47 m^3). This tank is designed to hold effluent for up to 19 days, based on the current flow rates, ensuring that there is adequate storage for effluent during maintenance or emergencies. As a result, the equalization tank is specifically designed for homogenizing the effluent rather than for long-term storage. The homogenization process ensures that the wastewater entering subsequent treatment stages is uniform in composition, which is crucial for effective treatment. To verify the effectiveness of the equalization process, the team from IIT Ropar and PU Chandigarh collected grab and composite samples from the equalization tanks. If the process were incomplete, there would be significant differences in the data from these samples. However, the observed deviations are within acceptable limits, indicating that the equalization is being completed within the time provided by the tank. Therefore, alternative strategies, such as using additional storage tanks or temporarily reducing wastewater generation has been considered. The ETP has an alternate storage tank No T-5 having capacity 479.9 KL to be considered to address this shortfall during maintenance periods.

PRIMARY TREATMENT: The Morepen Laboratories Ltd. in Masulkhana, the Effluent Treatment Plant (ETP) is a vital infrastructure that plays a significant role in ensuring the safe and effective treatment of wastewater before it is released back into the environment or further processed. One of the key components of this ETP is the flocculation tank, which serves as a crucial element in the overall wastewater treatment process. The primary function of the flocculation tank is to facilitate the process of flocculation, a critical step in the treatment of wastewater. Flocculation is a process where fine, suspended particles in the wastewater, which are too small to settle on their own, are aggregated into larger, more easily settleable masses known as flocs. This aggregation process is essential because these small particles, if left untreated, can carry a variety of pollutants and impurities that would otherwise be difficult to remove in subsequent treatment stages. The formation of flocs is typically achieved by adding flocculants to the wastewater. Flocculants are chemicals, often polymers that encourage the fine particles to stick together. These chemicals work by creating bridges between the particles, thereby forming larger clusters or flocs. The flocculation tank provides a controlled environment where these flocculants can interact effectively with the wastewater, promoting the aggregation process. Within the flocculation tank, gentle agitation mechanisms are employed to enhance the effectiveness of the flocculation process. These mechanisms are designed to stir the wastewater just enough to encourage the collision and adherence of particles without breaking up the newly formed flocs. This controlled agitation is critical because it ensures that the flocs remain intact and continue to grow to a size that allows them to settle out of the water in subsequent treatment stages. Once the flocculation process is complete, the wastewater is typically directed to a settling tank, also known as a sedimentation tank. In the settling tank, the heavier flocs, now significantly larger than the original suspended particles, settle to the bottom of the tank due to gravity. This process separates the solid waste from the clarified water, with the solids forming a sludge layer at the bottom of the tank, and the clarified water rising to the top. The clarified water, now free from most of the suspended solids, is then directed to further treatment stages, where any remaining impurities are removed. Following the flocculation and settling processes, the wastewater moves to a primary clarifier, and another essential unit within the ETP. The primary clarifier plays a pivotal role in the initial physical treatment stage of the wastewater. As the wastewater enters the primary clarifier, it is evenly distributed across the tank, allowing for a controlled reduction in flow velocity. This slowdown in the flow allows the heavier particles and suspended solids to settle at the bottom of the clarifier, forming sludge. Simultaneously, lighter substances and particles, which may still be present in the wastewater, rise to the surface, forming a layer of scum. The primary clarifier is equipped with mechanisms designed to remove this floating material, ensuring that the clarified water, now largely free of suspended solids and scum, can proceed to the next stages of treatment. These subsequent stages may include secondary or tertiary treatment processes, depending on the specific design and requirements of the ETP. The sludge collected at the bottom of the primary clarifier is typically directed to sludge handling units, where it undergoes further processing, such as thickening, digestion, or dewatering, before final disposal or reuse. Together, the flocculation tank and primary clarifier play critical roles in the initial stages of wastewater treatment at the ETP. They significantly reduce the pollutant loads in the wastewater, thereby enhancing the efficiency and effectiveness of the overall treatment process.

COLLECTION TANK		
TANK	Number of Units	06
	Feed Flow Rate	1.6 m^3/hr
	Capacity (Planned)	6 X 5.4 m^3 = 32.4 m^3
	Retention Time (Each Tank)	3.3 hrs
	Depth / Height (Each Tank)	3.0 m
	Area required (Each Tank)	1.8 m^2
	Length (Each Tank)	1.8 m
	Width (Each Tank)	1.0 m
	Volume (Available)	5.4 m^3
	MOC	RCC
AGITATOR	Drive	Gear driven
	Type	Helical type
	MOC of Shaft	SS 304
	MOC of Base Frame	MS
PAC / PE DOSING SYSTEM		

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TANK	Capacity	5.4KL
	MOC	RCC
PUMP	Capacity	By gravity
	MOC	NA
AGITATOR	Drive	Gear driven
	Type	Helical type
	MOC of Shaft	SS 304
	MOC of Base Frame	MS
LIME DOSING SYSTEM		
TANK	Capacity	5.4
	MOC	RCC
PUMP	Capacity	By gravity
	MOC	RCC
AGITATOR	Drive	Gear driven
	Type	Helical type
	MOC of Shaft	SS 304
	MOC of Base Frame	MS
ALUM DOSING SYSTEM		
TANK	Capacity	5.4KL
	MOC	RCC
PUMP	Capacity	By gravity

	MOC	NA
AGITATOR	Drive	Gear driven
	Type	Helical type
	MOC of Shaft	SS 304
	MOC of Base Frame	MS
SETTLING TANKS (Treatment cum settling tanks)		
TANKS	Number of Units	03
	Feed Flow Rate	1.6 m^3/hr
	Capacity (Total)	16.6 m^3 +16.6 m^3 + 8.7 m^3 = 41.9 m^3
Tank-1	Depth / Height	3.0 m
	Area required	5.54 m^2
	Length (Each Tank)	3.72 m
	Width (Each Tank)	1.49
	Volume (Available)	3.0 m × 3.72 m × 1.49 m = 16.6 m^3
	MOC	RCC
Tank-2	Depth / Height	3.0 m
	Area required	5.54 m^2
	Length (Each Tank)	3.72 m
	Width (Each Tank)	1.49

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	Volume (Available)	3.0 m × 3.72 m × 1.49 m = 16.6 m^3
	MOC	RCC
Tank-3 Rectangular Part (Upper)	Height	2.0 m
	Length	2.0 m
	Width	2.0 m
	Volume (Available)	2.0 m × 2.0 m × 2.0 m = 8.0 m^3
	MOC	MS
Tank-3 Circular Cone Part (Lower)	Height	0.7 m
	Radius	1.0 m
	Volume (Available)	0.73 m^3
	MOC	MS
SLUDGE TRANSFER PUMP	Capacity	Gravity Flow
	Head	Not Required
	MOC:	Not Required
SLUDGE BED-1 / SLUDGE DEWATERING MACHINE-1		3.0 m^3 / hr
SLUDGE BED-2 / SLUDGE DEWATERING MACHINE-2		0.5 m^3 / hr

Observations & Recommendations

The details of observations and recommendations of team IIT Ropar are presented below:

- The primary treatment process at the facility includes a set of collection tanks specifically designed to facilitate effective wastewater treatment. These tanks are essential for the initial stages of the treatment process, where chemical flocculation plays a crucial role. The collection tanks provided for this purpose have a total capacity of 32.4 KL, distributed across six individual tanks, each with a capacity of 5.4 KL. With a feed flow rate of 1.6 m^3 per hour, the available retention time in each tank is approximately 3.3 hours. This retention time is particularly well-suited for the formation of reasonably sized flocs, which are necessary for efficient sedimentation and subsequent treatment stages.
- In the context of the primary treatment process, chemical flocculation is a critical step. The effectiveness of flocculation depends heavily on the proper dosing of flocculants, which are the chemicals used to aggregate the fine suspended particles in the wastewater. Optimizing the dosage of these flocculants is vital to ensure that the particles come together to form flocs of the desired size. Additionally, uniform mixing of the feed within the collection tanks is essential to maximize the efficiency of the flocculation process. By achieving consistent mixing, the flocculants can interact evenly with the wastewater, promoting the formation of stable flocs that can be easily settled out in the subsequent sedimentation tanks.
- Maintaining the pH of the wastewater within a specific range is another crucial aspect of the primary treatment process, particularly for effective coagulation and sedimentation. The pH of the wastewater can significantly influence the efficiency of the flocculation process, as certain pH levels are more conducive to the formation of flocs. If the pH is not within the recommended range, the flocculants may not work as effectively, leading to suboptimal flocculation and poor sedimentation. Therefore, pH adjustment may be necessary, depending on the characteristics of the influent. To address this, it is recommended to introduce a pH monitoring system as part of the primary treatment process.
- The implementation of a pH monitoring system would provide real-time data on the pH levels of the wastewater, allowing for timely adjustments to be made as needed. This proactive approach not only ensures that the pH remains within the optimal range for

coagulation and sedimentation but also helps in conserving resources by avoiding the overuse of chemicals. By maintaining the required pH range, the overall efficiency of the primary treatment process can be significantly enhanced, leading to better wastewater quality and a more sustainable operation. This approach not only optimizes the use of flocculants but also ensures that the entire treatment process is more efficient and cost-effective.

- ***Query of IIT Ropar & PU Chandigarh Team:*** It has been observed that the overflow from the Multi Effect Evaporator (MEE) is being directly routed to the primary treatment tank instead of first passing through the equalization tank. Additionally, effluents from the R&D department, Quality Control (QC) labs, and the cooling tower are also being directly mixed with the primary treatment tank. This practice can have significant implications for the efficiency and uniformity of the primary treatment process. This bypassing the equalization tank, the varying characteristics of these effluents, such as different pH levels or concentrations of contaminants, may disrupt the consistency needed for optimal operation. The equalization tank is designed to homogenize the wastewater, ensuring that the primary treatment process receives a more uniform influent, which is crucial for maintaining the effectiveness of the treatment. Directly mixing these effluents with the primary treatment tank can lead to fluctuations in the process, potentially reducing the overall treatment efficiency and compromising the quality of the treated water.
- ***Response of Concerned Officials of Morepen Laboratories Ltd, Masulkhana:*** This response addresses the query from the team at IIT Ropar and PU Chandigarh regarding the operation of the six collection chambers in the primary treatment process. Contrary to the assumption that all six chambers operate in series, only the first three are connected in series. Each of these three chambers is dedicated to a specific dosing process: lime dosing, alum dosing, and polymer dosing, respectively. This sequence has been carefully designed based on our extensive experience to ensure optimal utilization and effectiveness of the treatment process. The remaining three chambers operate in parallel, providing a combined capacity of 16.2 KL (3 chambers x 5.4 KL each). With the current feed flow rate at 1.6 KL per hour, this setup offers approximately 10 hours of retention time, which is sufficient for the homogenization and effective operation of the primary treatment. This configuration has been chosen to balance efficiency and effectiveness, ensuring that the treatment process runs smoothly and meets the required standards for wastewater treatment.

AEROBIC TREATMENT (ACTIVATED SLUDGE PROCESS): Aerobic treatment is a widely utilized biological wastewater treatment process that operates in the presence of oxygen. In this method, microorganisms, primarily aerobic bacteria, use oxygen to metabolize and break down organic pollutants present in the wastewater. These organic pollutants, often referred to as biochemical oxygen demand (BOD), are converted into simpler, less harmful substances like carbon dioxide, water, and biomass. This process is fundamental to the secondary treatment stage of Effluent Treatment Plants (ETPs), where it serves to further reduce the concentration of organic matter in the wastewater following primary treatment. The primary purpose of aerobic treatment is to harness the natural metabolic activity of microorganisms to degrade organic pollutants. Various biological processes are employed to achieve this, with the most common being the activated sludge process. In this process, wastewater is introduced into an aeration tank, where it is mixed with a culture of microorganisms known as activated sludge. The aeration tank is designed to provide a continuous supply of oxygen, which is essential for the microorganisms to thrive and efficiently consume the organic pollutants. As these microorganisms metabolize the organic matter, they multiply and form a dense microbial community that enhances the overall treatment process. The aeration tank plays a crucial role in the aerobic treatment process. It is equipped with mechanisms, such as diffusers or mechanical aerators, which ensure a steady supply of oxygen is dissolved into the wastewater. This oxygen is vital for the survival and metabolic activity of the aerobic microorganisms. As the microorganisms break down the organic pollutants, they convert them into simpler compounds that are less harmful to the environment. The biological activity within the aeration tank significantly reduces the BOD of the wastewater, which is a key indicator of the organic pollution load. After the aerobic treatment phase, the mixture of treated water and microorganisms, commonly referred to as activated sludge, is transferred to a clarifier. In the clarifier, the activated sludge is allowed to settle, separating the treated water from the microbial biomass. The settled sludge is either recycled back into the aeration tank to maintain an adequate population of microorganisms or removed for further treatment or disposal. The clarified water, now with significantly reduced organic content and BOD, is sent for additional treatment processes, depending on the specific requirements of the ETP. In the context of an Effluent Treatment Plant, the biological reactor is a critical component that facilitates the biological treatment processes necessary for the degradation of organic pollutants. These reactors provide an optimal environment for microorganisms to efficiently break down pollutants. The biological treatment process, including aerobic digestion, not only reduces the concentration of organic pollutants but also plays a crucial role in improving the overall quality of the treated water. This is achieved by significantly lowering the BOD, reducing ammonia and nitrogen compounds through nitrification and denitrification processes, and diminishing the population of harmful pathogens, thereby enhancing the safety of the treated effluent. Furthermore, secondary treatment processes, including aerobic treatment, often target the removal of suspended solids that may have bypassed primary treatment. The process ensures that fine particles and other residual contaminants are effectively removed, resulting in a higher quality of treated water. The clarified water, after undergoing aerobic treatment and settling in the clarifier, is substantially improved in terms of organic content and is typically ready for further treatment, depending on the ETP's design and environmental regulations.

A clarifier is a crucial component of an Effluent Treatment Plant (ETP) that plays a vital role in separating solids from liquids during the secondary stage of wastewater treatment. This stage follows treatment and is focused on further reducing the levels of suspended and dissolved organic matter in the effluent. The primary function of the clarifier is to facilitate the final separation and removal of biological sludge or flocs that have formed as a result of biological treatment processes. In biological treatment processes, such as activated sludge, trickling filters, or other biological reactors, microorganisms break down the organic pollutants present in the wastewater. This breakdown leads to the formation of flocs or biomass clumps. After the wastewater has undergone these biological processes, the partially treated effluent, which still contains suspended solids and biomass, is directed to the secondary clarifier. The clarifier consists of a large settling tank designed to slow down the flow of water, allowing gravity to separate the heavier particles. As the flow decelerates, the biological sludge and flocs, being denser, settle to the bottom of the clarifier. The clarified water, now mostly free of suspended solids, rises to the top and is collected for either further treatment or discharge. The sludge that settles at the bottom of the clarifier is typically managed in one of two ways: it is either returned to the biological treatment process as return activated sludge or sent for further processing, including dewatering. The effective removal of these remaining solids and biomass is essential to achieving the desired effluent quality, ensuring that the water is clean enough to meet regulatory standards for discharge into the environment. Clarifiers are integral to the success of the wastewater treatment process, as they ensure the final removal of solids after biological treatment, leading to a higher quality effluent. Their proper design, operation, and maintenance are critical for optimizing the separation of solids from water, thus enhancing the overall efficiency and effectiveness of the ETP. By efficiently managing the solids removal process, clarifiers help maintain the balance and effectiveness of the entire treatment system, ultimately contributing to sustainable wastewater management.

AEROBIC TREATMENT		
PRE-TREATMENT	Distillate Holding Tank	Provided with a total capacity of 3 X 20 m^3 = 60 m^3
	Chemical Dossing	Provided provision for PAC Polyelectrolyte
	Chemical Mixing Tank	Provided with adequate capacity = 200 ltr
	Primary Settling Tank	Provided with a total capacity of 7.4 m^3 (With Tube Deck Media)
	Pre-Aeration Tank	Not Available
AERATION TANK-1&2 (ASP-1&2)	Feed Flow Rate	1.6 m^3/hr
	Number of Units	01
	Capacity	162 m^3
	Retention Time	101 hr
	Depth	4.5 m
	Area required	36 m^2
	Length	10 m
	Width	3.6 m
	Free Board	0.46 m
	Volume	10 m × 3.6 m × 0.46 m = 16.56m^3
	MOC	RCC
AERATION TANK-3 (ASP-3)	Feed Flow Rate	1.6 m^3/hr
	Number of Units	01
	Capacity	89 m^3
	Retention Time	56 hr
	Depth	4.5 m
	Area required	19.8 m^2
	Length	5.5 m
	Width	3.6 m

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	Free Board	0.46 m
	Volume	5.5 m × 3.6 m × 0.46 m = 9 m^3
	MOC	RCC
AIR BLOWER		
Capacity		840 M^3/hr
Pressure		600 mbar
MOC		Silicon fine bubble air diffuser
Air diffusers		Size – 65 x 1020mm
SECONDARY SETTLING TANK-1 (SST-1)		
TANK	Number of Units	01
	Feed Flow Rate	1.6 m^3/hr
	Type	Tube Deck Media
	Capacity	12.05 m^3
	Side Water Depth	2.02 m
	Clarifier width	1.8 m
	MOC	M S
SLUDGE TRANSFER PUMP	Capacity	4.5 m^3/hr
	Head	18 m
	MOC: Casing	CI
	MOC: Impeller	MS
SECONDARY SETTLING TANK-2 (SST-2)		

TANK	Number of Units	01
	Feed Flow Rate	1.6 m^3/hr
	Type	Tube Deck Media
	Capacity	12.05 m^3
	Side Water Depth	2.02 m
	Clarifier width	1.8 m
	MOC	M S
SLUDGE TRANSFER PUMP	Capacity	4.5 m^3/hr
	Head	18 m
	MOC: Casing	CI
	MOC: Impeller	MS

Observations & Recommendations

The details of observations and recommendations of team IIT Ropar & PU Chandigarh are presented below:

- The Effluent Treatment Plant (ETP) at the facility includes three aeration tanks with a combined total capacity of 251 KL, divided into two stages: ASP 1 and 2 with a capacity of 162 KL, and ASP 3 with a capacity of 89 KL. The decision to utilize three separate tanks rather than a single 251 KL tank is a commendable design principle. This multi-tank system allows for more efficient management of the aeration process, providing a staged approach to treatment. By incorporating two clarifiers between the stages, the design ensures that materials are effectively settled before the effluent enters the next tank or phase. This setup not only enhances the overall treatment process but also allows for better control and flexibility in managing the wastewater treatment. The staged design reduces the risk of system overloads, ensures more uniform treatment, and improves the quality of the final effluent.

- Aerobic treatment has been found to be effective in present ETP for reducing the biochemical oxygen demand (BOD) and chemical oxygen demand (COD) in wastewater, which are key indicators of organic pollution. By efficiently breaking down organic pollutants through the activity of aerobic microorganisms, this process significantly improves the overall quality of the treated water.
- Maintaining the optimal temperature for microbial activity within the aerobic treatment process is crucial for ensuring the efficiency of the system. Different microorganisms need at specific temperature ranges, and the performance of the biological reactor can be significantly affected by temperature variations. Adjusting the temperature to suit the specific needs of the microorganisms present in the reactor ensures that they remain active and efficient in breaking down organic pollutants. This consideration is particularly important in environments where external temperature fluctuations might impact the internal conditions of the reactor. By carefully monitoring and controlling the temperature, the treatment process can be optimized, leading to improved pollutant degradation and overall system performance.
- The pH level within the biological reactor plays a vital role in the success of the aerobic treatment process. Most biological processes, including those involving aerobic microorganisms, operate best within a neutral to slightly alkaline pH range. Monitoring and controlling the pH level within this range is essential to maintaining an environment that supports optimal microbial activity. If the pH deviates too far from the ideal range, it can hinder the effectiveness of the microorganisms, leading to reduced treatment efficiency. Therefore, a reliable pH monitoring system has been maintained to ensure that the pH remains within the desired range, allowing the biological processes to function at their best and resulting in high-quality treated effluent.
- In aerobic biological reactors, providing sufficient aeration is crucial for maintaining adequate dissolved oxygen levels. A well-aerated environment supports the growth and activity of aerobic microorganisms, which are responsible for breaking down organic pollutants in the wastewater. The design of the aeration system must ensure that oxygen is evenly distributed throughout the reactor, preventing the formation of anaerobic zones where microbial activity would be significantly reduced. Proper aeration not only

enhances the efficiency of the treatment process but also helps prevent the buildup of harmful gases and odors. In this particular ETP; the optimal dissolved oxygen levels has been maintained, so the reactor can effectively degrade organic pollutants, leading to improved effluent quality and a more stable treatment process.

- The ETP design includes uniform mixing to prevent the formation of dead zones within the reactor, where pollutants could potentially accumulate and escape treatment. Uniform mixing ensures that all areas of the reactor are exposed to the same level of treatment, allowing the microorganisms to access and break down organic pollutants more effectively. This design feature is crucial for maintaining the efficiency of the treatment process, as it prevents the buildup of untreated or partially treated wastewater in certain areas of the reactor. By promoting even distribution of both the wastewater and the microorganisms, the uniform mixing system has been provided to achieve a more consistent and effective treatment outcome.
- The ETP has incorporated effective waste sludge handling and removal procedures to maintain the overall efficiency of the aerobic treatment process. Regular removal of excess sludge is essential to prevent the accumulation of inert material within the reactor, which can hinder the activity of the microorganisms and reduce the treatment efficiency. Proper sludge management ensures that the reactor remains in optimal condition, with sufficient space for active microorganisms to thrive and degrade organic pollutants. By implementing these procedures, the ETP has maintained a high level of treatment performance, resulting in better effluent quality and a more stable operation.
- In certain situations, bio-augmentation introducing specific microbial cultures or enzymes into the reactor can be considered to enhance the breakdown of targeted pollutants. This approach is particularly useful when the existing microbial community may be insufficient to effectively degrade certain contaminants present in the wastewater. By supplementing the reactor with specialized microorganisms or enzymes, the treatment process can be optimized to address specific challenges, leading to improved pollutant removal and better overall system performance. Bio-augmentation is a flexible tool that can be applied as needed to maintain the effectiveness of the aerobic

treatment process.

- ***Query of IIT Ropar & PU Chandigarh Team:*** Following the analysis of the first set of sampling data, it became evident that the Activated Sludge Process (ASP) was not performing within the desired operational range. This underperformance raised concerns about the efficiency of the microbial activities essential for the breakdown of organic pollutants in the wastewater. To address this issue, the team considered enhancing the microbial processes through two potential strategies. The first option involves the introduction of aeration via nano-bubbles, a technique that could significantly improve the oxygen transfer efficiency within the ASP. Nano-bubbles are ultra-fine bubbles that provide a greater surface area for oxygen dissolution, thereby increasing the availability of dissolved oxygen in the wastewater. This would extend the residence time, allowing microbes more time to metabolize organic matter, which could lead to improved treatment efficiency. The second option is to implement strict monitoring and control of the key parameters of the effluent entering the ASP. By closely regulating factors such as pH, temperature, and organic load, the treatment process could be optimized, ensuring that the conditions are ideal for microbial activity. This approach would help maintain the ASP within its optimal operating range, enhancing overall system performance.
- ***Response of Concerned Officials of Morepen Laboratories Ltd. Masulkhana:*** We have implemented several measures to manage the high Total Dissolved Solids (TDS) effluent effectively. Initially, the effluent is collected in an equalization tank to stabilize its flow. Prior to entering the Multi Effect Evaporator (MEE), it undergoes pre-treatment in a Primary Tube Settler (PST). The sediment settled at the bottom is filtered using a screw press filter, ensuring that only pretreated water reaches the MEE. These steps have notably reduced fouling in the MEE and improved its operational efficiency. Additionally, to stabilize steam supply and minimize fluctuations at the MEE, we have installed a steam flow controller. A Mass Flow Meter has also been integrated into the feed line, enhancing system monitoring and control. Vacuum stabilization has been implemented to further reduce fouling, particularly in the ATFD and MEE condenser cooling water supplies. These adjustments have collectively enabled the Effluent Treatment Plant (ETP) to

consistently meet required parameters.

CLARIFLOCCULATOR: A clariflocculator is a specialized piece of equipment used during the sedimentation stage in water treatment processes. It effectively separates suspended solids from water by combining the principles of flocculation and clarification. The term "clariflocculator" is derived from the words "clarification" and "flocculation," reflecting its dual function. In the initial stage, a flocculating agent is added to the water to encourage the formation of flocs-larger particles formed by the aggregation of smaller suspended particles. These larger and denser flocs are easier to settle. The water containing these flocculated particles enters the clariflocculator through an inlet system, where it is evenly distributed within a central feed well. Inside the clariflocculator, a rapid mixing zone facilitates thorough mixing, promoting the coagulation of particles and aiding in the formation of larger flocs. The water then passes into a flocculation zone, where gentle swirling allows the flocs to grow as they collide and adhere to one another. Next, the water moves into a clarification zone, where the larger flocs settle under gravity, forming a sludge layer at the bottom. The clarified water rises to the top and is collected from the peripheral launder, ensuring it is free from most suspended solids. The accumulated sludge at the bottom is periodically removed to maintain system efficiency. Commonly used in water treatment plants for both drinking water purification and wastewater treatment, clariflocculators ensure that treated water meets quality and clarity standards. Their design and operation may vary depending on the specific treatment requirements and water characteristics.

CLARIFLOCCULATOR (In RO Plant)		
COAGULATION SECTION	Number of Units	1
	Feed Flow Rate	1.6 m^3/hr
	Capacity	0.75 m^3
	Depth	1.5 m
	Area required	1 m^2
	Length	1 m

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	Width	1 m
	MOC	M S
AGITATOR	Drive	Direct drive with gear box
	Type	Helical gear box
	MOC of Shaft	SS
	MOC of Base Frame	MS
PAC / PE DOSING SYSTEM (In RO Plant)		
Flocculation section	Capacity	0.200 m^3
	Number of Units	1
	MOC	HDPE
PUMP	Capacity	200 lph
	Quantity	1
	MOC	SS
AGITATOR	Drive	Direct drive with gear box
	Type	Helical gear box
	MOC of Shaft	SS
	MOC of Base Frame	MS
CLARIFIER (In RO Plant)		
SETTLING SECTION	Number of Units	1
	Feed Flow Rate	1.6 m^3/hr

	Capacity	3.0 m^3
	Side Water Depth	1.5 m
	Clarifier Diameter / width	1.5 m
	Free Board	0.15 m
	MOC	M S
SLUDGE TRANSFER PUMP	Capacity	Gravity Flow
	Head	Not applicable
	Quantity	Not applicable
	MOC: Casing	Not applicable
	MOC: Impeller	Not applicable

TREATED EFFLUENT SUMP: A treated effluent sump is a containment or storage structure designed to hold treated wastewater, commonly known as effluent, after it has undergone various treatment processes in a wastewater treatment plant (WWTP) or effluent treatment plant (ETP). The term "sump" refers to a pit or reservoir used for the collection and storage of liquids. After undergoing primary, and secondary, processes, the wastewater is considered treated effluent. This effluent is directed to a sump for temporary storage before it is discharged or reused. The treated effluent sump allows for a final check on the quality of the water before its release into the next stage.

INLET SUMP		
Number of Units	As detailed below	
TREATED EFFLUENT SUMP-1(RO FEED TANK)	Feed Flow Rate	1.6 m^3/hr
	Capacity	10 m^3 (Including peak flow factor)

	Proposed Depth	3.1m
	Area required	3.5 m^2
	Proposed Length	Cylindrical
	Proposed Width/ Diameter	2.1 m
	Free Board	0.2 m
	Volume	m × m × m = 0.69 m3
TREATED EFFLUENT SUMP-2 (RO Permeate tank)	Feed Flow Rate	1.6 m^3/hr
	Capacity	10 m^3 (Including peak flow factor)
	Retention Time	Not applicable Min-(Maximum)
	Proposed Depth	3.16 m
	Area required	3.54 m^2
	Proposed Length	Cylindrical
	Proposed Width/ Diameter	2.125 m
	Free Board	0 m
	Volume	m × m × m = 0 m3

Observations & Recommendations

The details of observations and recommendations of team IIT Ropar & PU Chandigarh are presented below:

- Monitoring and testing can be performed to ensure that the treated water meets the standards for further processing. The sump provides a buffer or storage capacity to accommodate fluctuations in the treated effluent flow. This helps manage variations in the volume of treated water produced by the treatment plant.
- As per the concerned official of the plant; the sump is designed to use when the membrane system is under maintenances. It helps maintain the integrity of the treated water before its further projection to treatment.
- Depending on the specific design of the system, pumps have been used to transfer the treated effluent from the sump to the membrane system, before reaching to the final destination.

REVERSE OSMOSIS (RO) SYSTEM: Reverse osmosis (RO) represents a specialized filtration method that employs a semi-permeable, thin membrane with fine pores. This membrane allows the passage of pure water while rejecting larger molecules like dissolved salts and impurities such as bacteria. The application of reverse osmosis is widespread, catering to drinking water systems, industrial boilers, food and beverage processing, cosmetics, pharmaceutical production, seawater desalination, and various other uses. Having been a recognized technology for over a century, it has been commercially employed since the 1960s. Key features of RO systems include simplicity in design and operation, low maintenance requirements, and modular characteristics. These systems effectively remove both inorganic and organic pollutants simultaneously. RO processes enable the recovery and recycling of waste process streams without affecting the material being recovered. Additionally, they often require less energy, offering lower capital and operating costs compared to many conventional treatment systems. RO contributes to reducing waste stream volumes, allowing for more efficient treatment by processes like incineration. RO systems can be integrated with other treatment processes, including oxidation, adsorption, stripping, or biological treatment, producing high-quality product water for reuse or discharge. Applications for RO processes encompass treating wastewater with organic matter, electroplating wastewater, metal finishing, pulp and paper, mining, petrochemical, textile, food processing industries, radioactive wastewater, municipal wastewater, and contaminated groundwater. The membranes used in reverse osmosis systems consist of a dense polymer barrier layer facilitating separation. Each membrane is a spiral-wound sheet of semi-permeable material, available in different diameters. RO water treatment plants remove unwanted particles like salts, improving fluid properties. Crossflow, an advanced RO technology, allows membranes to clean themselves continually. High-pressure pumps (HPP) are essential for pushing fluid through the membrane. For brackish water, approximately 10 to 20 bars of osmotic pressure are applied to separate saltwater as rejection and good water as a product. RO is effective in rejecting various substances, including sugar, bacteria, salts, proteins, particles, dyes, and other constituents. The process involves forcing water molecules through a 0.0001-micron semi-permeable membrane using water pressure. The high-pressure pump increases pressure on the salt side, forcing water across the membrane, leaving dissolved salts in the reject stream. Permeate or product water, with 95% to 99% of dissolved salts removed, is the result. The RO membrane must be housed to maintain pressure and supply energy to force water through, separating it from unwanted substances.

MULTI EFFECT EVAPORATOR: In the realm of efficient water evaporation, a multiple-effect evaporator stands as a notable apparatus, utilizing steam heat to evaporate water. The process unfolds in a sequence of vessels, each maintained at decreasing pressure levels. Water is boiled successively, and the vapour from one effect serves as the heating medium for the next, which operates at a lower boiling point. The latent heat in water vapour can be recycled by compressing the vapour thermally or mechanically to a higher pressure and temperature. Multi-Effect Evaporators combine two or more bodies to conserve steam, condensed solely in the first-effect heat exchanger. As water evaporates in the first-effect vapour body, it condenses in the second-effect heat exchanger, providing energy for evaporation in the second-effect vapour body and onward for additional effects. The vapour from the last effect is directed to a condenser. These evaporator bodies operate under vacuum to lower the boiling temperature. A multiple effect is an evaporation unit comprising linked evaporators, significantly reducing energy consumption. The first effect is directly heated, and subsequent effects are heated by vapours from preceding ones. The last effect's process vapours condense on a heat sink. Steam enters the steam compartment, and the feed flows down the tube walls. Vapour and liquids separate in the cyclone separator. The product is evenly distributed into heating tubes in the head, forming a thin film on the tube wall. As the liquid flows downward, it is rapidly heated, partially evaporated by heat transfer steam. Vapour and liquids are separated at the bottom. Concentrates are collected after each calendrias and sent to the Agitated thin film dryer for drying.

AGITATED THIN FILM DRYER (ATFD): An Agitated Thin Film Dryer (ATFD) is a specialized dryer used for the continuous transformation of liquid or slurry into a powder or granular form. This operates on the same principle as an Agitated Thin Film Evaporator (ATFE), forming a thin film on the surface of a heated drum or tube. In Effluent Treatment Plant (ETP), the ATFD plays a pivotal role in waste management. It consists of a cylindrical body with a heating jacket and a bladed rotor inside. Blades spread wet concentrate in a thin film over the heated wall, facilitating drying. Heat transfer occurs through steam, leaving dried solids at the bottom. Key benefits/advantages of Agitated Thin Film Dryer:

- Reduced evaporation time compared to solar pans.
- Elimination of manual waste salt handling, reducing manpower needs.
- Operational continuity during rainy seasons, avoiding overflow of solar pans.
- Smaller footprint compared to solar pans, preventing groundwater contamination.

- Reduction in sludge volume and weight, minimizing disposal costs.
- Mitigation of odour generation and potential environmental impacts.

RO PLANT: PRE-TREATMENT			
Components & Type	Multi Grade Filter (MGF)		Provided
	Activated Carbon Filter (ACF)		Provided
	Tube Settler		Provided
	UF MODULE		Not Provided
RO PLANT: MULTISTAGE MODULE			
RO FEED PUMP	Capacity		3.3 m^3/hr
	Head		35 m
	MOC		SS 316
	Drive		Motor Driven
	Units		W
SMBS DOSING SYSTEM	Dosing Tank	Type	cylindrical
		Capacity	100 litres
		MOC	PE White
		Units	1
	Dosing Pump	Type	Metering
		Capacity	4 lph
		MOC	PP
		Units	W
ANTI SCALING DOSING SYSTEM	Dosing Tank	Type	cylindrical
		Capacity	200 litters
		MOC	LLDPE
		Units	1
	Dosing Pump	Type	Metering
		Capacity	4 lph
		MOC	PP
		Units	W+S
PRE-FILTERATION UNIT BEFORE RO SYSTEM		Capacity	3.3 m^3/hr
		MOC	SS316

1977

		Size	5 microns
HIGH PRESSURE PUMP FOR MULTISTAGE RO PLANT Stage-1	Type		Vertical
	Capacity		6.5 m^3/hr
	MOC		SS316
	Units		W
	Head		250 m
HIGH PRESSURE PUMP FOR MULTISTAGE RO PLANT Stage 2	Type		Reciprocating
	Capacity		2.0 m^3/hr
	MOC		SS316
	Units		W
	Head		400 m
HIGH PRESSURE PUMP FOR MULTISTAGE RO PLANT -Polisher	Type		vertical
	Capacity		3.3 m^3/hr
	MOC		SS316
	Units		W
	Head		150 m
RO MEMBRANE HOUSING RO-Stage-1	Size		8” X 40” unit-8
	MOC		FRP
	Units		8 (AS per OEM Design)
RO MEMBERANE RO Stage-2	Size		4” X 40” unit-8
	MOC		FRP
	Units		8 (AS per OEM Design)
RO MEMBERANE RO Polisher	Size		4” X 40” unit-12
	MOC		FRP
	Units		12 (AS per OEM Design)
RO FLUSHING / CLEANING SYSTEM	Dosing Tank	Type	Cylindrical
		Capacity	500/200 litters
		MOC	LLDPE
		Units	2 set
	Pump	Type	Centrifugal
		Capacity	2.0 m^3/hr
		MOC	SS316

1978

		Units	1 set
WATER STORAGE TANK	Reject		5 KL HDPE tank
	Permeate		10 KL HDPE Tank

Design basis for Evaporator		**MEE**	**ATFD**
	Unit	Feed: RO Reject Water & High TDS effluent	Feed: Concentrate from Evaporator
Feed Rate	M^3/hr	3	0.3
Initial Solid	%	1.5 to 3	3
Concentrate final Solids	%	10 to 15%	10 to 15%
Concentrate Output	Kg/hr	150-300	100
Concentrate Outlet temperature	°C	80	80
Water Evaporation Rate	Kg/hr	2700 to 2850	200
Solids Recovery Rate	Kg/hr	Not Applicable	150 -300

Utility for Evaporator and ATFD		**Unit**	**Value**
Cooling Water	Cooling Water Inlet Temperature (MEE)	°C	<30
	Cooling Water Inlet Temperature (ATFD)	°C	32
	Cooling water for Evaporator	m^3/hr	80
	Cooling water for ATFD	m^3/hr	26
	Cooling Tower Capacity	TR	210
Steam Parameters	Steam Pressure	Kg/cm^2	3 (G)
	Steam Temperature	°C	130
	Steam for Evaporator	Kg/hr	860
	Steam for ATFD	Kg/hr	250
	Total Steam Capacity	Kg/hr	1100

B. MONITORING THE EFFICIENCY OF ETP OF MOREPEN LABORATORIES LTD. MASULKHANA THROUGH WATER QUALITY TESTING

The effectiveness of any Effluent Treatment Plant (ETP) is often gauged through the transparency of the treated water. However, solely relying on visual observations of the removal of suspended materials doesn't provide insight into the overall performance of the ETP from an environmental standpoint. To assess the efficiency of the ETP at Morepen Laboratories Ltd. Masulkhana, this technical report necessitated the evaluation of water quality parameters at various intervals. Sampling occurred during different periods of the day (morning, afternoon, and evening), with each sample undergoing triplicate analysis. Morepen Laboratories Ltd. Masulkhana staff, alongside teams from IIT Ropar, conducted the initial sampling on 24/02/24. Triplicate samples were gathered and tested at the three different laboratory of IIT Ropar and PU Chandigarh. The analysis focused on parameters like pH, Total Dissolved Solids (TDS), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD), as well as Cation and Anion Analysis. BIS protocols have been used for the determinations of these parameters. Additionally, an investigation into the nature of materials responsible for TDS, COD, and BOD was planned using IC Chromatography; and IR spectroscopic studies."

pH Control of ETP of Morepen Laboratories Ltd., Masulkhana: The management of pH levels in an Effluent Treatment Plant (ETP) holds paramount importance in the realm of wastewater treatment. pH, determining the acidity or alkalinity of a solution, employs considerable influence over the effectiveness of diverse treatment methodologies and the ecological impacts of treated effluent. Numerous biological treatment procedures, including activated sludge, exhibit sensitivity to pH levels. Sustaining pH within an optimum range amplifies the efficacy of microorganisms responsible for the decomposition of organic substances. The solubility of diverse chemicals in wastewater is subject to pH, accentuating the necessity of pH control. Strategic pH regulation proves pivotal in facilitating the precipitation of metals or nutrients during chemical treatment procedures like coagulation and precipitation. A steadfast adherence to the recommended pH range guarantees the attainment of desired disinfection efficiency. Regulatory guidelines frequently outline acceptable pH levels for discharged effluent. Compliance with these standards is imperative, ensuring environmental adherence and averting adverse repercussions on receiving water bodies. The evaluation of pH of various stages of ETP of Morepen Laboratories Ltd. Masulkhana is detailed below in table.

Table 1B.1 pH analysis of water samples collected from the ETP under study.

Sr. No	Date	Time	Sample Name	Sample Code	pH Determination			
					1st	2nd	3rd	Avg
1	24/02/2024	Morning	Equalization tank	V1-SS1-M	7.00	7.04	7.06	7.03
2	24/02/2024	Morning	MEE Feed Tank 01 Outlet	V1-SS2-M	7.16	7.18	7.22	7.19
3	24/02/2024	Morning	MEE feed Tank 03 and 04 outlet	V1-SS3-M	7.11	7.15	7.17	7.14
4	24/02/2024	Morning	Primary Settling tank Inlet	V1-SS4-M	12.23	12.21	12.19	12.21
5	24/02/2024	Morning	Primary Settling tank outlet	V1-SS5-M	10.57	10.59	10.59	10.58
6	24/02/2024	Morning	Secondary Settling tank 01 outlet	V1-SS6-M	7.86	7.89	7.91	7.89
7	24/02/2024	Morning	Secondary Settling tank 02 outlet	V1-SS7-M	7.92	7.96	7.97	7.95
8	24/02/2024	Morning	RO inlet at RO settler	V1-SS8-M	6.26	6.35	6.34	6.32
9	24/02/2024	Morning	RO reject	V1-SS9-M	7.22	7.30	7.31	7.28
10	24/02/2024	Morning	RO permeate	V1-SS10-M	7.22	7.21	7.16	7.20

11	24/02/2024	Evening	Equalization tank	V1-SS1-E	7.13	7.29	7.3	7.24
12	24/02/2024	Evening	MEE Feed Tank 01 Outlet	V1-SS2-E	7.13	7.18	7.19	7.17
13	24/02/2024	Evening	MEE feed Tank 03 and 04 outlet	V1-SS3-E	7.12	7.15	7.15	7.14
14	24/02/2024	Evening	Primary Settling tank Inlet	V1-SS4-E	10.14	10.11	10.08	10.11
15	24/02/2024	Evening	Primary Settling tank outlet	V1-SS5-E	10.05	10.59	10.06	10.23
16	24/02/2024	Evening	Secondary Settling tank 01 outlet	V1-SS6-E	7.96	7.99	7.99	7.98
17	24/02/2024	Evening	Secondary Settling tank 02 outlet	V1-SS7-E	7.78	7.79	7.80	7.79
18	24/02/2024	Evening	RO inlet at RO settler	V1-SS8-E	7.14	7.17	7.18	7.16
19	24/02/2024	Evening	RO reject	V1-SS9-E	7.94	8.00	8.02	7.99
20	24/02/2024	Evening	RO permeate	V1-SS10-E	7.49	7.45	7.40	7.45
21	24/02/2024	Composite	Equalization tank	V1-SS1-C	7.26	7.31	7.34	7.30
22	24/02/2024	Composite	MEE Feed Tank 01 Outlet	V1-SS2-C	7.51	7.56	7.65	7.57
23	24/02/2024	Composite	MEE feed Tank 03 and 04 outlet	V1-SS3-C	7.59	7.61	7.63	7.61
24	24/02/2024	Composite	Primary Settling tank Inlet	V1-SS4-C	11.59	11.55	11.56	11.57

25	24/02/2024	Composite	Primary Settling tank outlet	V1-SS5-C	10.55	10.53	10.54	10.54
26	24/02/2024	Composite	Secondary Settling tank 01 outlet	V1-SS6-C	7.96	7.99	7.99	7.98
27	24/02/2024	Composite	Secondary Settling tank 02 outlet	V1-SS7-C	7.89	7.94	7.94	7.92
28	24/02/2024	Composite	RO inlet at RO settler	V1-SS8-C	6.61	6.66	6.66	6.64
29	24/02/2024	Composite	RO reject	V1-SS9-C	7.56	7.61	7.63	7.60
30	24/02/2024	Composite	RO permeate	V1-SS10-C	7.80	7.61	7.59	7.67

TDS (Total dissolved solids) Control of ETP of Morepen Laboratories Ltd. Masulkhana:

The term Total Dissolved Solids (TDS) encompasses all inorganic and organic substances present in water, capable of passing through a 2-micron filter. Generally, TDS is the cumulative sum of cations and anions within water. Constituents of TDS typically involve ions and ionic compounds like carbonate, bicarbonate, chloride, fluoride, sulfate, phosphate, nitrate, calcium, magnesium, sodium, and potassium. However, any ion present contributes to the overall total. Organic ions, including pollutants, herbicides, and hydrocarbons, are part of TDS. Additionally, soil organic matter compounds, such as humic/fulvic acids, are encompassed by TDS. Various methods exist for TDS measurement, with a straightforward approach involving water sample filtration followed by evaporation at 180 °C in a pre-weighed dish until weight stabilization. The weight increase of the dish indicates TDS, reported in mg/L. Alternatively, TDS can be estimated from the sample's electrical conductivity using a correlation equation dependent upon specific conductivity. Lastly, TDS calculation involves measuring individual ions and summing them. While TDS provides a quantitative measure of dissolved inorganic chemicals, it lacks specificity about their nature. The toxicity of individual solutes varies, yet TDS tests do not distinguish between them. Hence, further analysis of treated water through chromatography and spectroscopy has been planned to elucidate the nature of inorganic matter.

Table 1B.2. TDS analysis of water samples collected from the ETP under study.

Sr. No	Date	Time	Sample Name	Sample Code	TDS Determination			
					1st	2nd	3rd	Avg (ppm)
1	24/02/2024	Morning	Equalization tank	V1-SS1-M	27688.05	27948.05	28013.05	27883.05
2	24/02/2024	Morning	MEE Feed Tank 01 Outlet	V1-SS2-M	28338.05	28403.05	28468.05	28403.05
3	24/02/2024	Morning	MEE feed Tank 03 and 04 outlet	V1-SS3-M	28728.05	29183.05	29248.05	29053.05
4	24/02/2024	Morning	Primary Settling tank Inlet	V1-SS4-M	4457.05	4535.05	4535.05	4509.05
5	24/02/2024	Morning	Primary Settling tank outlet	V1-SS5-M	3690.05	3729.05	3722.55	3713.88
6	24/02/2024	Morning	Secondary Settling tank 01 outlet	V1-SS6-M	4249.05	4301.05	4301.05	4283.72

1984

7	24/02/2024	Morning	Secondary Settling tank 02 outlet	V1-SS7-M	2624.05	2630.55	2617.55	2624.05
8	24/02/2024	Morning	RO inlet at RO settler	V1-SS8-M	4899.05	4918.55	4905.55	4907.72
9	24/02/2024	Morning	RO reject	V1-SS9-M	9202.05	9228.05	9208.55	9212.88
10	24/02/2024	Morning	RO permeate	V1-SS10-M	647.00	647.65	649.60	648.08
11	24/02/2024	Evening	Equalization tank	V1-SS1-E	26973.05	26973.05	27103.05	27016.38
12	24/02/2024	Evening	MEE Feed Tank 01 Outlet	V1-SS2-E	28338.05	28793.05	28793.05	28641.38
13	24/02/2024	Evening	MEE feed Tank 03 and 04 outlet	V1-SS3-E	28663.05	28858.05	28858.05	28793.05
14	24/02/2024	Evening	Primary Settling tank Inlet	V1-SS4-E	3885.05	3872.05	3878.55	3878.55
15	24/02/2024	Evening	Primary Settling tank outlet	V1-SS5-E	3202.55	3202.55	3215.55	3206.88
16	24/02/2024	Evening	Secondary Settling	V1-SS6-E	4262.05	4314.05	4327.05	4301.05

1985

			tank 01 outlet					
17	24/02/2024	Evening	Secondary Settling tank 02 outlet	V1-SS7-E	3540.55	3586.05	3586.05	3570.88
18	24/02/2024	Evening	RO inlet at RO settler	V1-SS8-E	3599.05	3657.55	3664.05	3640.22
19	24/02/2024	Evening	RO reject	V1-SS9-E	10476.05	10469.55	10469.55	10471.72
20	24/02/2024	Evening	RO permeate	V1-SS10-E	647.65	650.25	650.25	649.38
21	24/02/2024	Composite	Equalization tank	V1-SS1-C	27168.05	27363.05	27363.05	27298.05
22	24/02/2024	Composite	MEE Feed Tank 01 Outlet	V1-SS2-C	27558.05	27948.05	28078.05	27861.38
23	24/02/2024	Composite	MEE feed Tank 03 and 04 outlet	V1-SS3-C	27558.05	27948.05	28013.05	27839.72
24	24/02/2024	Composite	Primary Settling tank Inlet	V1-SS4-C	3235.05	3280.55	3274.05	3263.217
25	24/02/2024	Composite	Primary Settling tank outlet	V1-SS5-C	3365.05	3443.05	3449.55	3419.217
26	24/02/2024	Composite	Secondary	V1-	2520.05	2559.05	2559.05	2546.05

1986

			Settling tank 01 outlet	SS6-C				
27	24/02/2024	Composite	Secondary Settling tank 02 outlet	V1-SS7-C	2338.05	2357.55	2357.55	2351.05
28	24/02/2024	Composite	RO inlet at RO settler	V1-SS8-C	4171.05	4223.05	4229.55	4207.88
29	24/02/2024	Composite	RO reject	V1-SS9-C	10528.05	10684.05	10697.05	10636.38
30	24/02/2024	Composite	RO permeate	V1-SS10-C	639.85	641.8	642.45	641.37

Ion Chromatography: Ion Chromatography is a technique used for separating and analysing ions in a liquid sample. It is a form of liquid chromatography that is widely employed in environmental testing, water analysis, and various research fields. IC is particularly useful for determining the concentration of ions in a sample, including both inorganic and organic ions. In the context of wastewater treatment and Effluent Treatment Plants (ETPs), Ion Chromatography can be utilized to assess the composition of effluent, measure the concentration of specific ions, and ensure compliance with environmental regulations. It helps in understanding the quality of treated water and identifying any potential contaminants that may be present in the effluent.

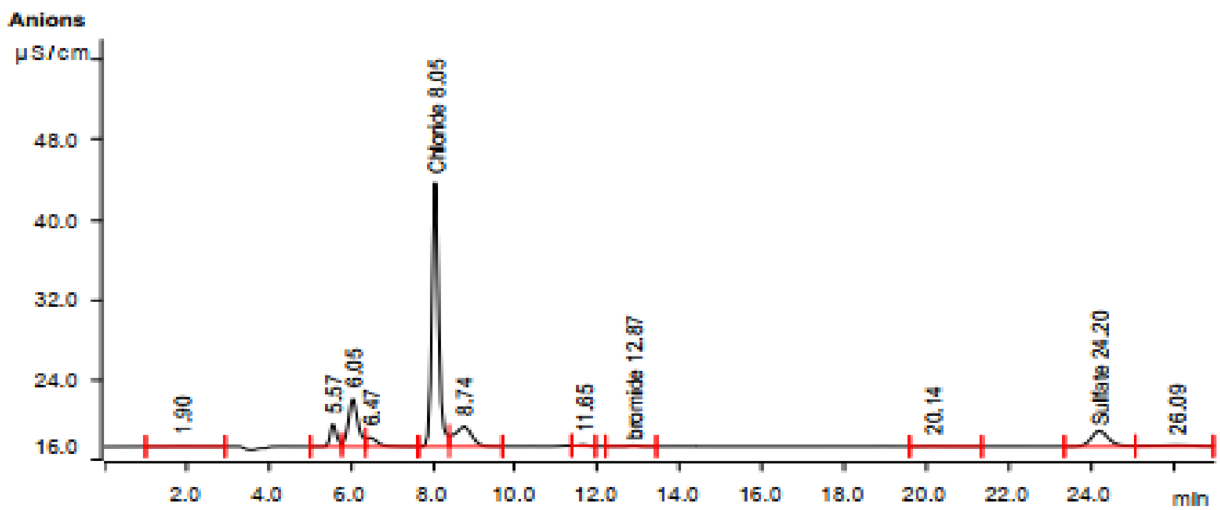

Figure 1B.1. Ion chromatogram of the sample collected as grab sample of the Morning of 24/02/2024 from R.O. (Permeate Tank).

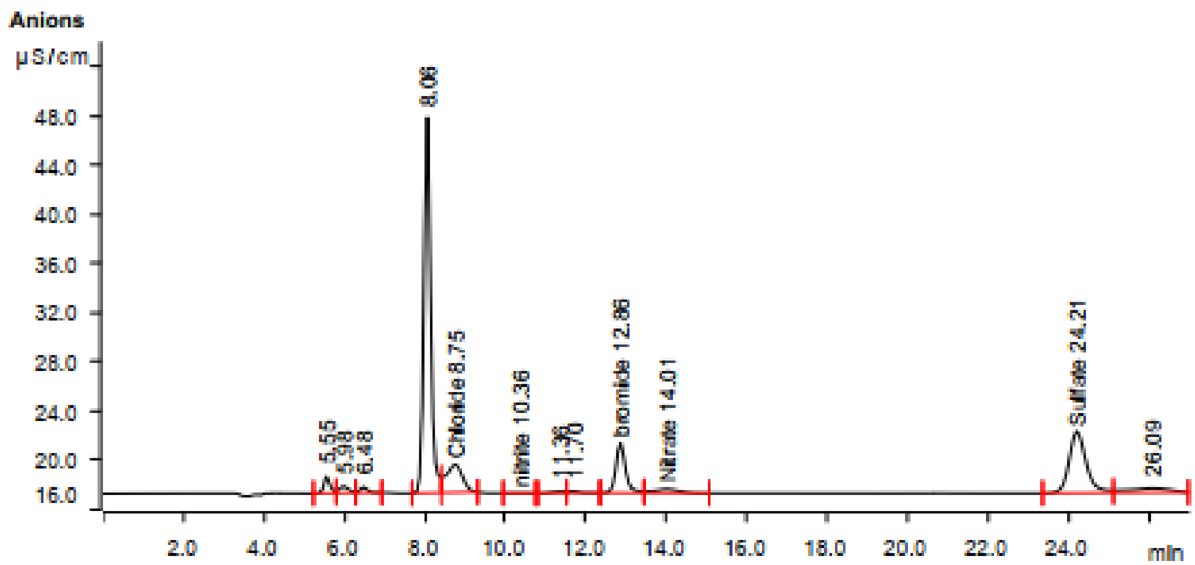

Figure 1B.2. Ion chromatogram of the sample collected as grab sample of the Evening of 24/02/2024 from R.O. (Permeate Tank).

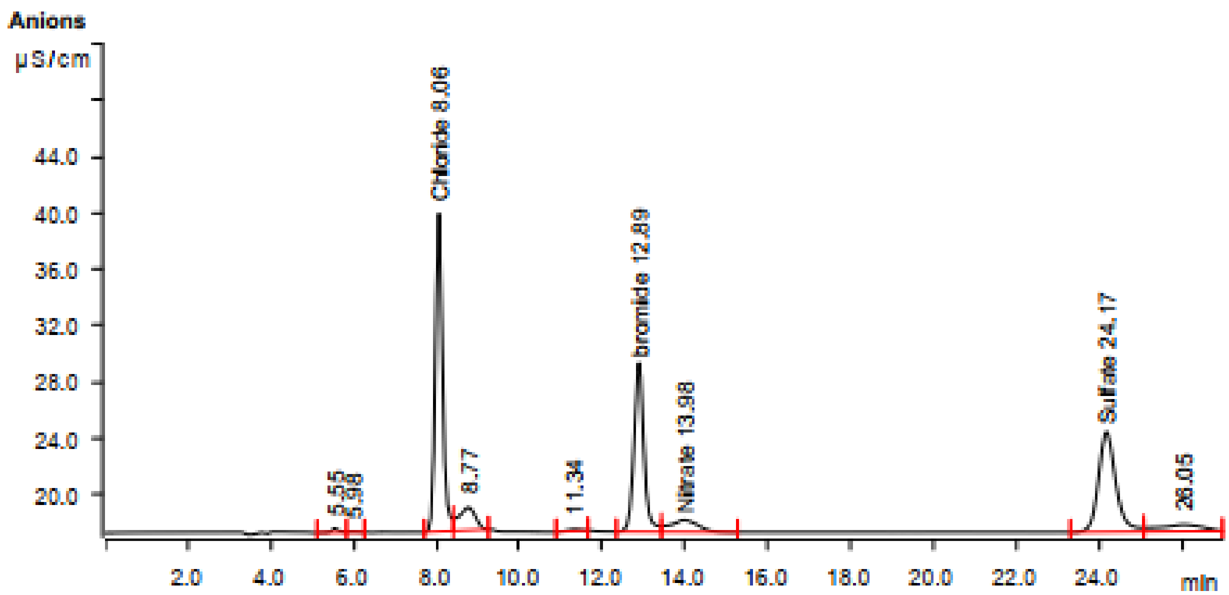

Figure 1B.3. Ion chromatogram of the sample collected as composite sample of 24/02/2024 from R.O. (Permeate Tank).

Table 1B.3. Metal ions analysis (Using ICP-MS) of water samples collected from from R.O. (Permeate Tank) of ETP in plant under study.

S. No.	Sample Name/ Code	Date	Time	Concentrations of Metal Ions in ppb				
				^{23}Na	^{24}Mg	^{39}K	^{44}Ca	^{52}Cr
1	RO permeate/ V1-SS10-M	24/02/2024	Morning	33614.465	33.649	8309.265	29.673	0.27
2	RO permeate/ V1-10-E	24/02/2024	Evening	30022.268	55.525	7559.7	53.308	0.076
3	RO permeate/	24/02/2024	Composite	25915.734	225.699	6780.381	867.866	0.648

	V1-10-C							

S. No.	Sample Name/ Code	Date	Time	Concentrations of Metal Ions in ppb				
				^{56}Fe	^{60}Ni	^{75}As	^{202}Hg	^{207}Pb
1	RO permeate/ V1-SS10-M	24/02/2024	Morning	13.965	2.229	0.195	0.548	<0.000
2	RO permeate/ V1-10-E	24/02/2024	Evening	8.086	0.559	0.205	0.673	<0.000
3	RO permeate/ V1-10-C	24/02/2024	Composite	25.973	2.122	0.311	1.643	<0.000

Dissolved Oxygen of ETP of Morepen Laboratories Ltd. Masulkhana.: The significance of Dissolved Oxygen (DO) in wastewater treatment is paramount, with its relevance varying across different stages within an Effluent Treatment Plant (ETP). DO represents the quantity of oxygen dissolved in water, playing a pivotal role in supporting biological processes, especially those involving microorganisms engaged in breaking down organic pollutants. Preliminary treatment, focused on removing large solids and debris, does not typically prioritize dissolved oxygen. However, aeration or mixing in preliminary treatment may indirectly impact oxygen content. Primary treatment, centred on eliminating settle-able and floating solids through processes like sedimentation, doesn't primarily concern itself with maintaining adequate dissolved oxygen levels. Yet, oxygen concentrations may influence solid settling characteristics. Biological treatment processes, encompassing activated sludge, trickling filters, and sequencing batch reactors, heavily rely on dissolved oxygen. Microorganisms, primarily bacteria, utilize oxygen in aerobic respiration to consume organic pollutants, aiding in breaking down and stabilizing organic matter. Optimal DO levels are vital for maximizing biological treatment efficiency. Insufficient DO can result in reduced microbial activity, incomplete pollutant removal, and the generation of undesirable by-products. DO saturation levels reflect the maximum oxygen dissolution capacity in water under specific temperature and pressure conditions. Monitoring DO saturation ensures water's capability to support aerobic biological processes. Aeration systems, frequently employed to boost dissolved oxygen levels in treatment tanks, facilitate oxygen transfer from air to water, sustaining favourable conditions for microbial activity. Dissolved oxygen solubility is temperature-dependent, with warmer water holding less dissolved oxygen than colder water. Seasonal variations or temperature changes merit consideration. Optimal DO levels hinge on specific biological processes within the treatment plant, generally aiming for concentrations above 2 mg/L for aerobic treatment. Continuous monitoring of DO levels is essential for adjusting aeration systems and ensuring efficient biological treatment.

COD (Chemical oxygen demand) Control of ETP of Morepen Laboratories Ltd. Masulkhana.: An indispensable parameter in wastewater treatment, Chemical Oxygen Demand (COD) gauges the oxygen quantity necessary to chemically oxidize and disintegrate organic and inorganic compounds in water. The significance of COD monitoring fluctuates across diverse stages within an Effluent Treatment Plant (ETP). Evaluating influent wastewater COD offers a perspective on the overall organic load entering the treatment plant. Elevated influent COD levels may signal substantial organic pollutants, prompting the need for tailored treatment approaches. While primary treatment centres on physically removing settle-able solids through processes like sedimentation, COD might not be the primary concern in this stage. Nevertheless, heightened COD levels can contribute to the downstream treatment processes' overall load. COD holds critical importance in biological treatment processes (activated sludge, trickling filters, sequencing batch reactors), where microorganisms dismantle organic pollutants. Oversight and regulation of COD levels optimize microbial activity, ensuring the efficient elimination of organic matter. In some tertiary treatment processes, COD reduction remains a consideration for additional refinement and adherence to stringent effluent standards. Techniques such as filtration, chemical precipitation, and adsorption might be employed to address residual COD. The BOD-to-COD ratio provides insights into wastewater biodegradability, with a lower ratio suggesting the presence of less biodegradable or refractory organic compounds. COD serves as a pivotal indicator of the overall organic content in wastewater. Monitoring COD levels aids in gauging the treatment processes' efficiency in diminishing organic pollutants. Elevated COD levels can contribute to biological oxygen demand (BOD) and nutrient loading in receiving water bodies. Efficient COD removal plays a crucial role in mitigating environmental impact.

Table 1B.4. COD analysis of water samples collected from the ETP under study.

Sr. No	Date	Time	Sample Name	Sample Code	COD Determination			
					1st	2nd	3rd	Avg

1991

								(mg/l)
1	24/02/2024	Morning	Equalization tank	V1-SS1-M	51430.4	52326.4	51968	51908.3
2	24/02/2024	Morning	MEE Feed Tank 01 Outlet	V1-SS2-M	48115.2	48652.8	49100.8	48622.9
3	24/02/2024	Morning	MEE feed Tank 03 and 04 outlet	V1-SS3-M	39692.8	40230.4	40499.2	40140.8
4	24/02/2024	Morning	Primary Settling tank Inlet	V1-SS4-M	30464	29478.4	28851.2	29597.9
5	24/02/2024	Morning	Primary Settling tank outlet	V1-SS5-M	22668.8	24192	23296	23385.6
6	24/02/2024	Morning	Secondary Settling tank 01 outlet	V1-SS6-M	18368	19174.4	18816	18786.1
7	24/02/2024	Morning	Secondary Settling tank 02 outlet	V1-SS7-M	13888	13798.4	13350.4	13678.9
8	24/02/2024	Morning	RO inlet at RO settler	V1-SS8-M	10483.2	10214.4	10572.8	10423.5
9	24/02/2024	Morning	RO reject	V1-SS9-M	17830.4	17382.4	17113.6	17442.1
10	24/02/2024	Morning	RO permeate	V1-SS10-M	6361.6	5734.4	6182.4	6092.8

1992

11	24/02/2024	Evening	Equalization tank	V1-SS1-E	56985.6	56806.4	57702.4	57164.8
12	24/02/2024	Evening	MEE Feed Tank 01 Outlet	V1-SS2-E	50086.4	50982.4	50444.8	50504.5
13	24/02/2024	Evening	MEE feed Tank 03 and 04 outlet	V1-SS3-E	43276.8	42470.4	41932.8	42560
14	24/02/2024	Evening	Primary Settling tank Inlet	V1-SS4-E	33420.8	32614.4	34406.4	33480.5
15	24/02/2024	Evening	Primary Settling tank outlet	V1-SS5-E	26342.4	25446.4	26790.4	26193.1
16	24/02/2024	Evening	Secondary Settling tank 01 outlet	V1-SS6-E	18278.4	18636.8	19532.8	18816
17	24/02/2024	Evening	Secondary Settling tank 02 outlet	V1-SS7-E	14694.4	14963.2	14246.4	14634.7
18	24/02/2024	Evening	RO inlet at RO settler	V1-SS8-E	11737.6	12275.2	12006.4	12006.4
19	24/02/2024	Evening	RO reject	V1-SS9-E	21414.4	20966.4	21683.2	21354.7
20	24/02/2024	Evening	RO permeate	V1-SS10-E	8243.2	7974.4	7526.4	7914.7

1993

21	24/02/2024	Composite	Equalization tank	V1-SS1-C	56806.4	56358.4	55731.2	56298.7
22	24/02/2024	Composite	MEE Feed Tank 01 Outlet	V1-SS2-C	49728	49190.4	49459.2	49459.2
23	24/02/2024	Composite	MEE feed Tank 03 and 04 outlet	V1-SS3-C	40588.8	41126.4	41574.4	41096.5
24	24/02/2024	Composite	Primary Settling tank Inlet	V1-SS4-C	32883.2	32614.4	32076.8	32524.8
25	24/02/2024	Composite	Primary Settling tank outlet	V1-SS5-C	24998.4	24550.4	23654.4	24401.1
26	24/02/2024	Composite	Secondary Settling tank 01 outlet	V1-SS6-C	19622.4	19174.4	18726.4	19174.4
27	24/02/2024	Composite	Secondary Settling tank 02 outlet	V1-SS7-C	13798.4	14246.4	13350.4	13798.4
28	24/02/2024	Composite	RO inlet at RO settler	V1-SS8-C	10214.4	10662.4	11110.4	10662.4
29	24/02/2024	Composite	RO reject	V1-SS9-C	17830.4	18278.4	18726.4	18278.4
30	24/02/2024	Composite	RO permeate	V1-SS10-C	7078.4	7526.4	6988.8	7197.9

BOD (Biological oxygen demand) Control of ETP of Morepen Laboratories Ltd. Masulkhana.: BOD, or Biochemical Oxygen Demand, serves as a fundamental metric measuring the dissolved oxygen required by microorganisms for breaking down organic matter in water through biological processes. This parameter is a crucial indicator of the presence of organic pollutants in wastewater, typically denoted in milligrams of oxygen consumed per litre of water (mg/L) over a specific period, often 5 days (BOD_5) at 20 degrees Celsius. In an Effluent Treatment Plant (ETP), the BOD concentration undergoes influence from diverse factors. The initial BOD level in influent wastewater is determined by the types and concentrations of organic pollutants. Industrial discharges, introducing high-strength organic wastewater, notably impact influent BOD. Preliminary treatment processes, such as screening and grit removal, primarily target the physical removal of large solids and debris. Although these processes don't directly reduce BOD, they safeguard downstream treatment units from interference and damage. Primary treatment involves physically separating settle-able solids through processes like sedimentation. While the primary goal is solids removal, there may be some reduction in BOD as suspended organic matter settles. Biological treatment processes, like activated sludge, are engineered for the biological degradation of organic pollutants. Microorganisms metabolize organic matter, resulting in reduced BOD levels. Adequate aeration and mixing prove crucial for sustaining microbial activity and optimizing BOD removal efficiency. BOD levels in the effluent from biological treatment units are contingent on microbial process efficiency and the extent of organic matter decomposition. Tertiary treatment processes, encompassing filtration, adsorption, or chemical precipitation, may further diminish BOD levels in the treated effluent. Filtration physically removes remaining suspended solids and organic matter, while adsorption processes target dissolved organic compounds.

Table 1B.5. BOD analysis of water samples collected from the ETP of Morepen Laboratories Ltd. Masulkhana.

Sr. No	Date	Time	Sample Name	Sample Code	BOD Determination			
					1st	2nd	3rd	Avg (mg/l)

1995

1	24/02/2024	Morning	Equalization tank	V1-SS1-M	9982.6	10156.5	10087	10075.4
2	24/02/2024	Morning	MEE Feed Tank 01 Outlet	V1-SS2-M	8950	9050	9133.3	9044.4
3	24/02/2024	Morning	MEE feed Tank 03 and 04 outlet	V1-SS3-M	7875.6	7982.2	8035.6	7964.5
4	24/02/2024	Morning	Primary Settling tank Inlet	V1-SS4-M	4857.1	4700	4600	4719
5	24/02/2024	Morning	Primary Settling tank outlet	V1-SS5-M	3489.7	3724.1	3586.2	3600
6	24/02/2024	Morning	Secondary Settling tank 01 outlet	V1-SS6-M	2779.7	2901.7	2847.5	2843
7	24/02/2024	Morning	Secondary Settling tank 02 outlet	V1-SS7-M	2032.8	2019.7	1954.1	2002.2
8	24/02/2024	Morning	RO inlet at RO settler	V1-SS8-M	1485.7	1447.6	1498.4	1477.2
9	24/02/2024	Morning	RO reject	V1-SS9-M	2567.7	2503.2	2464.5	2511.8
10	24/02/2024	Morning	RO permeate	V1-SS10-M	901.6	812.7	876.2	863.5
11	24/02/2024	Evening	Equalization	V1-	11060.9	11026.1	11200	11095.7

1996

			tank	SS1-E				
12	24/02/2024	Evening	MEE Feed Tank 01 Outlet	V1-SS2-E	9316.7	9483.3	9383.3	9394.4
13	24/02/2024	Evening	MEE feed Tank 03 and 04 outlet	V1-SS3-E	8586.7	8426.7	8320	8444.5
14	24/02/2024	Evening	Primary Settling tank Inlet	V1-SS4-E	5328.6	5200	5485.7	5338.1
15	24/02/2024	Evening	Primary Settling tank outlet	V1-SS5-E	4055.2	3917.2	4124.1	4032.2
16	24/02/2024	Evening	Secondary Settling tank 01 outlet	V1-SS6-E	2766.1	2820.3	2955.9	2847.4
17	24/02/2024	Evening	Secondary Settling tank 02 outlet	V1-SS7-E	2150.8	2190.2	2085.2	2142.1
18	24/02/2024	Evening	RO inlet at RO settler	V1-SS8-E	1663.5	1739.7	1701.6	1701.6
19	24/02/2024	Evening	RO reject	V1-SS9-E	3083.9	3019.4	3122.6	3075.3
20	24/02/2024	Evening	RO permeate	V1-SS10-E	1168.3	1130.2	1066.7	1121.7
21	24/02/2024	Composite	Equalization tank	V1-SS1-C	11026.1	10939.1	10817.4	10927.5

22	24/02/2024	Composite	MEE Feed Tank 01 Outlet	V1-SS2-C	9250	9150	9200	9200
23	24/02/2024	Composite	MEE feed Tank 03 and 04 outlet	V1-SS3-C	8053.3	8160	8248.9	8154.1
24	24/02/2024	Composite	Primary Settling tank Inlet	V1-SS4-C	5242.9	5200	5114.3	5185.7
25	24/02/2024	Composite	Primary Settling tank outlet	V1-SS5-C	3848.3	3779.3	3641.4	3756.3
26	24/02/2024	Composite	Secondary Settling tank 01 outlet	V1-SS6-C	2969.5	2901.7	2833.9	2901.7
27	24/02/2024	Composite	Secondary Settling tank 02 outlet	V1-SS7-C	2019.7	2085.2	1954.1	2019.7
28	24/02/2024	Composite	RO inlet at RO settler	V1-SS8-C	1447.6	1511.1	1574.6	1511.1
29	24/02/2024	Composite	RO reject	V1-SS9-C	2567.7	2632.3	2696.8	2632.3
30	24/02/2024	Composite	RO permeate	V1-SS10-C	1003.2	1066.7	990.5	1020.1

Particle size analysis of water samples collected from R.O. (Permeate Tank) at ETP of Morepen Laboratories Ltd. Masulkhana: Dynamic Light Scattering (DLS) plays a crucial role in evaluating the impact of tertiary treated water, especially in assessing the size distribution of particles or colloids present in the water. DLS, measures the Brownian motion of particles in a fluid by analysing the fluctuations in scattered light. The speed of the Brownian motion is related to the size of the particles. DLS provides information about the particle size distribution in the tertiary treated water. It can detect particles in the nanometre to micrometre range, which is critical for understanding the nature of suspended particles or colloids. By analysing the particle size distribution, DLS assists in monitoring the efficiency of tertiary treatment processes. It helps evaluate whether the treatment methods applied are effectively reducing the size and concentration of particles in the water. DLS is used to evaluate the potential environmental impact of treated water discharge. It helps identify any remaining particulate matter in the water that could have ecological consequences. The quality of treated water is often associated with the presence and characteristics of suspended particles. DLS aids in assessing the quality by providing insights into the size and distribution of these particles.

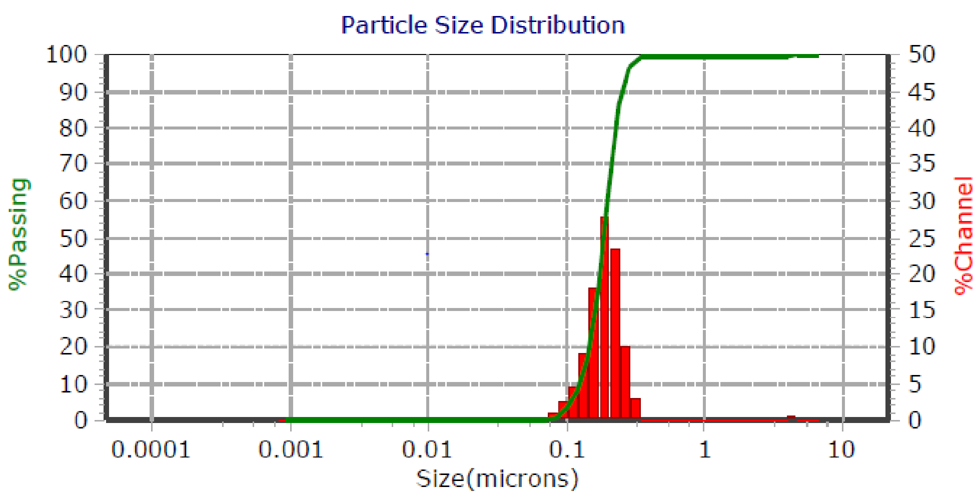

Figure 1B.4 DLS analysis for particle size determination of the sample collected as grab sample of the Morning of 24/02/2024 from R.O. (Permeate Tank).

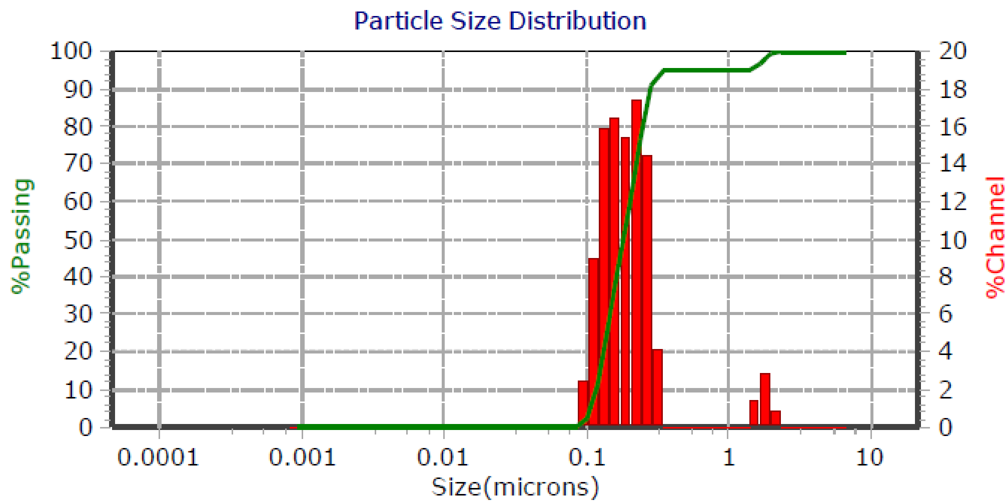

Figure 1B.5. DLS analysis for particle size determination of the sample collected as grab sample of the Evening of 24/02/2024 from R.O. (Permeate Tank)..

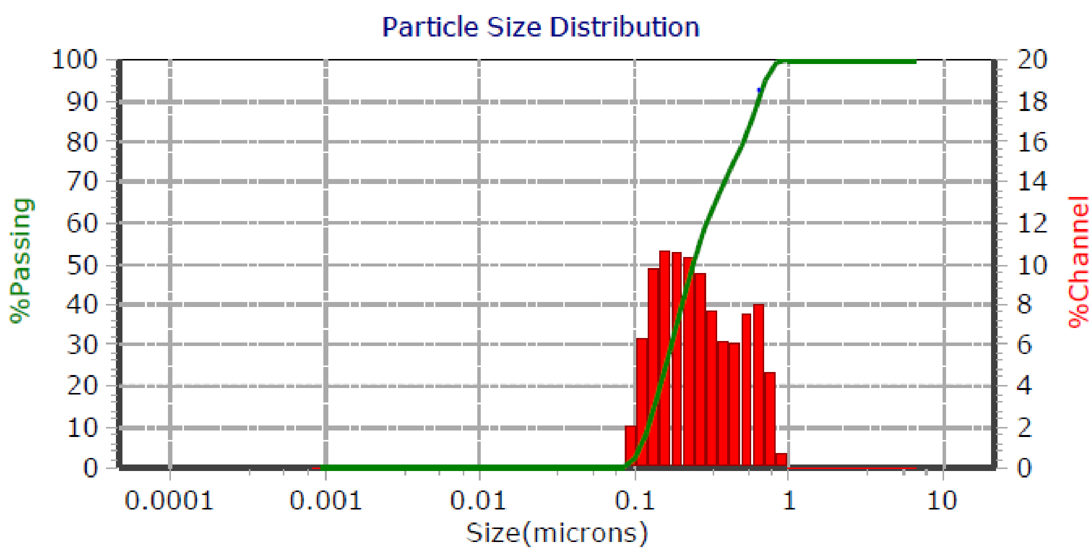

Figure 1B.6. DLS analysis for particle size determination of the sample collected as composite sample of 24/02/2024 from R.O. (Permeate Tank).

Functional groups analysis materials present in the water samples collected from R.O. (Permeate Tank) at ETP of Morepen Laboratories Ltd. Masulkhana: In Effluent Treatment Plant (ETP) water analysis, Infrared (IR) spectroscopy is a valuable analytical technique used to study the composition of water samples. IR spectroscopy is based on the principle that different chemical bonds absorb infrared radiation at characteristic frequencies. IR spectroscopy helps identify functional groups present in organic compounds within the water sample. Common functional groups, such as hydroxyl (-OH), carbonyl (C=O), and amino (-NH_2), exhibit distinct absorption peaks. IR spectra provide information about the concentration of specific compounds based on the intensity of absorption bands. This enables quantitative analysis of various organic and inorganic constituents in the water. IR spectroscopy is particularly useful for monitoring organic contaminants, including oils, solvents, and other pollutants. The technique can detect the presence of specific organic compounds by analysing characteristic absorption peaks.

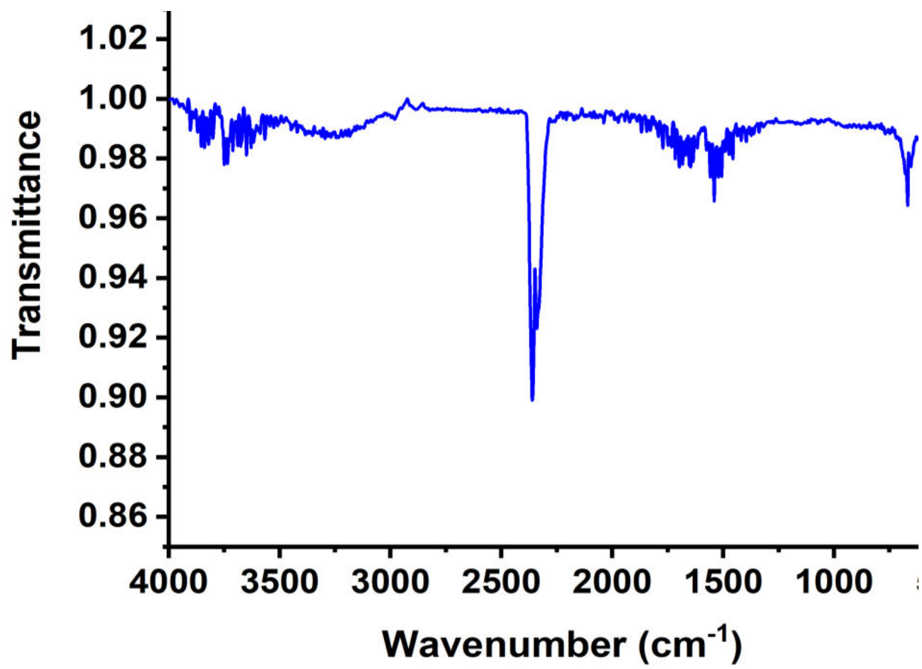

Figure 1B.7. IR analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Morning of 24/02/2024 from R.O. (Permeate Tank).

2001

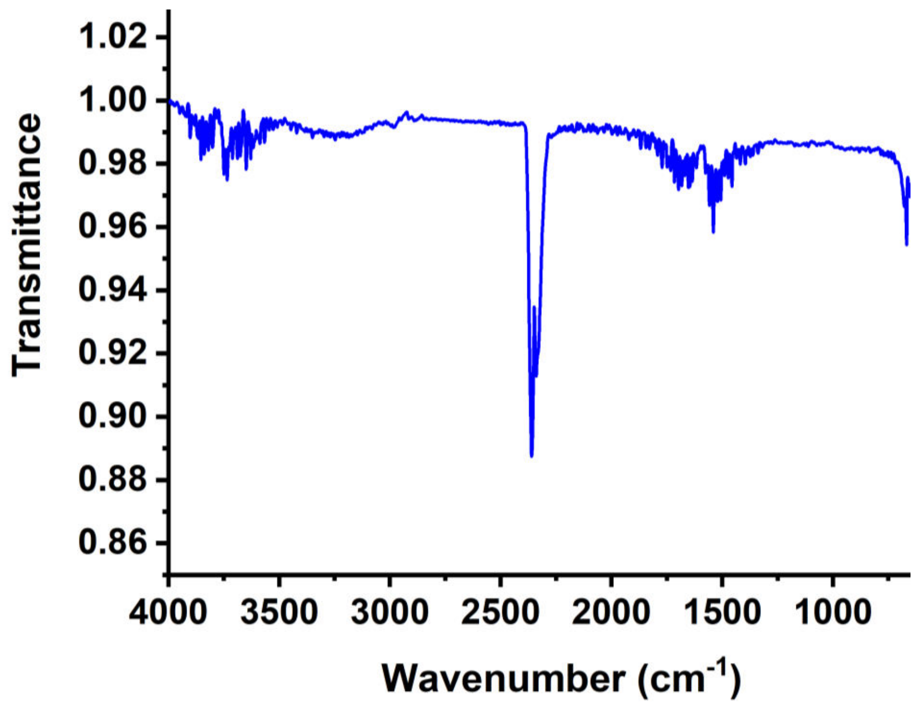

Figure 1B.8. IR analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Evening of 24/02/2024 from R.O. (Permeate Tank).

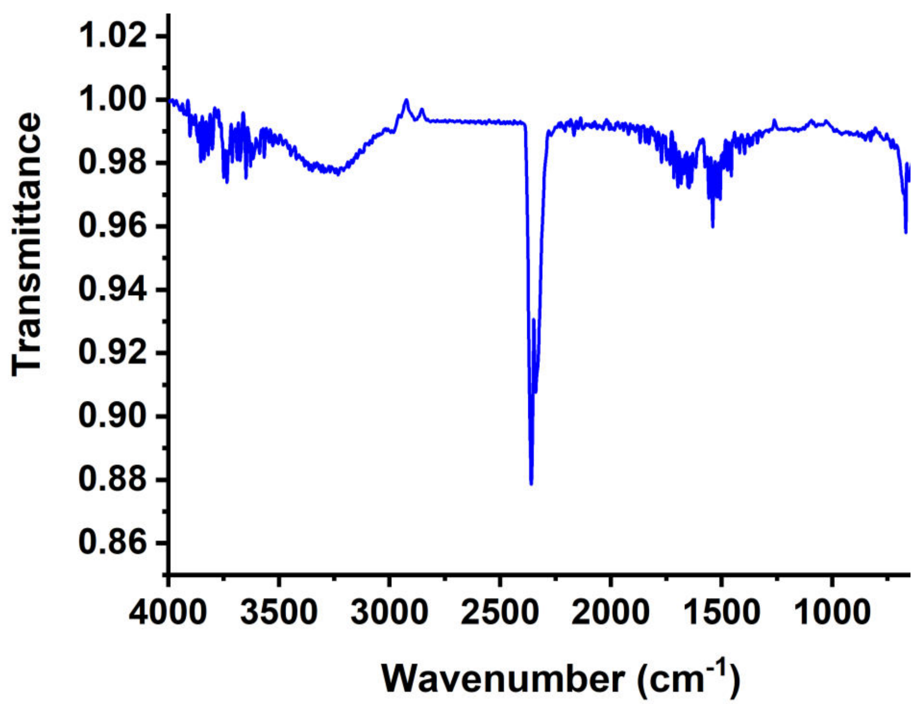

Figure 1B.9. IR analysis (pre-concentrated through SPME) for the sample collected as composite sample of 24/02/2024 from R.O. (Permeate Tank).

UV-Vis Absorption Spectroscopy and Water Quality: UV-Vis absorption spectroscopy is a powerful analytical technique employed in the monitoring of treated water to assess the quality of the water post-treatment. This method relies on the absorption of ultraviolet (UV) and visible (Vis) light by chemical substances present in the water, providing valuable insights into the concentration of specific compounds. UV-Vis absorption spectroscopy is based on the principle that molecules absorb light in the UV-Vis region as electrons transition from lower to higher energy states. The absorption of light is characteristic of specific chemical bonds and allows the identification and quantification of substances in the water.

UV-Vis spectroscopy is particularly effective in detecting and quantifying organic compounds, such as humic substances and dissolved organic matter, which can impact water quality. Peaks in the UV region indicate the presence of aromatic compounds, allowing for the assessment of the efficiency of the water treatment process in removing such contaminants. UV-Vis spectroscopy assists in measuring colour and turbidity in water. High absorbance values in the visible region may indicate the presence of particulate matter or colloidal substances.

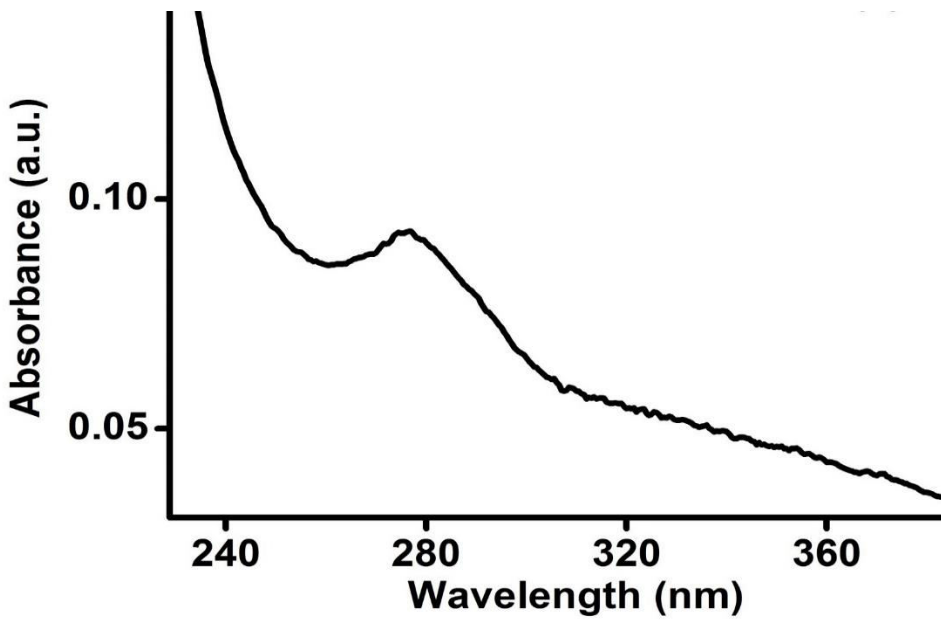

Figure 1B.10. UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Morning of 24/02/24 from R.O. (Permeate Tank).

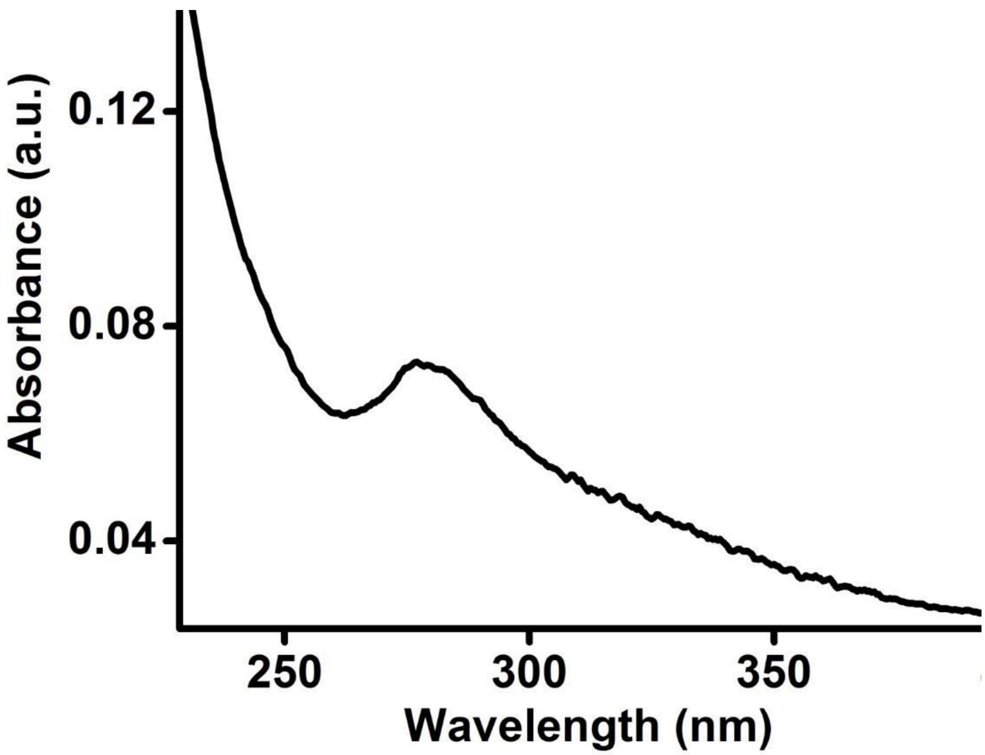

Figure 1B.11 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Evening of 24/02/24 from R.O. (Permeate Tank).

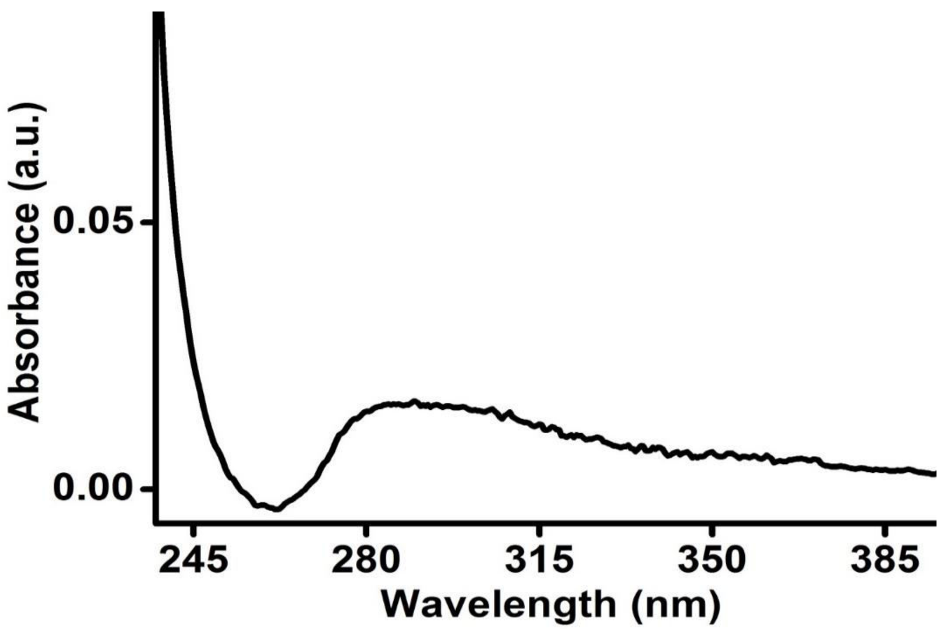

Figure 1B.12 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as composite sample of 24/02/24 from R.O. (Permeate Tank).

2004

Observations & Recommendations

The details of observations and recommendations of team IIT Ropar and PU Chandigarh are presented below:

Optimal pH adjustment is advised at multiple junctures within Morepen Laboratories Ltd. Masulkhana. This is critical because maintaining the pH within the appropriate range at various stages of the treatment process can significantly enhance the efficiency of the treatment system. In addition to regular pH adjustments, it is further recommended to introduce a pH monitoring system that is strategically placed throughout the treatment sequence. These monitoring points should be situated at key stages of the process where pH fluctuations are most likely to occur, ensuring that any deviations from the optimal pH range are detected and corrected in real-time. This proactive approach not only helps in maintaining the stability of the treatment process but also prevents any potential disruptions that could arise from pH imbalances, ultimately leading to a more effective and consistent treatment outcome.

• Different phases of the treatment process are earmarked as pH control points, signifying areas where pH adjustment may be necessary. This approach is primarily implemented at two critical stages: the primary treatment and biological treatment phases. During the primary treatment, pH control is crucial for optimizing the removal of suspended solids, oil, grease, and other contaminants. In the biological treatment phase, maintaining the pH within a specific range is essential for the survival and activity of microorganisms that degrade organic matter. If the pH deviates from the optimal range, the efficiency of these biological processes can be compromised, leading to incomplete treatment and potential violations of discharge standards. By identifying and focusing on these control points, the treatment process can be fine-tuned to achieve better overall performance.

• Managing Total Dissolved Solids (TDS) in an Effluent Treatment Plant (ETP) holds significant importance for upholding water quality within acceptable thresholds and adhering to environmental regulations. Elevated TDS concentrations can disrupt treatment procedures, particularly during the biological treatment phases, where high TDS levels can inhibit microbial activity and reduce the overall efficiency of the treatment process. Controlling TDS is crucial to ensuring that the treatment system operates effectively and meets the required discharge standards. Under the present investigation, it has been found that at the equalization tank, the

TDS levels remain in the range of 27,000 mg/L, and the treatment system is able to restore the required TDS level of treated water below 700 mg/L. This demonstrates the system's ability to handle high TDS concentrations effectively, but continuous monitoring and management are essential to prevent any potential issues.

• In ETPs targeting treated water for reuse, controlling TDS becomes paramount. Elevated TDS levels can impact the suitability of water for diverse industrial and non-potable applications, such as cooling towers, boilers, and irrigation. High TDS can lead to scaling, corrosion, and reduced efficiency of equipment, making the treated water less desirable for reuse. Therefore, if TDS can be controlled before the RO system by adopting any of the following strategies: a) implementing a UF membrane system; b) inserting a sand filter; or c) modulating the flow rate, it can significantly extend the lifespan of the RO membrane and improve the overall efficiency of the treatment system. These measures not only protect the RO system but also enhance the quality of the treated water, making it more suitable for various reuse applications.

• Although the treated water was free from many heavy metal ions or detected with only a few ppb concentrations, IC studies revealed the presence of some anions in the treated water. These anions have a correlation with the TDS, indicating that while the heavy metals have been effectively removed, there are still some dissolved salts present that contribute to the overall TDS levels. The presence of these anions, suggests that further optimization of the treatment process may be necessary to reduce TDS levels even further. By identifying the specific anions present, targeted treatment strategies can be developed to address these residual contaminants, ensuring that the treated water meets all regulatory standards and is of the highest quality.

• Consequently, it is advised to continually assess TDS levels using TDS meters or conductivity meters, which provide an estimate based on water electrical conductivity. Regular monitoring of TDS is essential for maintaining the effectiveness of the treatment process and ensuring compliance with discharge regulations. By keeping a close eye on TDS levels, operators can quickly identify any deviations from the norm and take corrective action before these issues escalate. This proactive approach helps to prevent potential problems, such as scaling in downstream equipment, and ensures that the treated water is of consistently high quality.
Continuous and periodic Dynamic Light Scattering (DLS) measurements have provided valuable insights into changes in particle size distribution over time, offering a detailed understanding of

the underlying processes occurring within the system. These fluctuations in particle size distribution can be attributed to several key factors.

- Firstly, variations in the treatment process itself can significantly impact particle size. Changes in parameters such as temperature, pH, or the addition of coagulants and flocculants can alter the conditions under which particles form, grow, or aggregate. For instance, if the treatment process is modified to improve efficiency or to address a particular issue, this could lead to a shift in the size distribution of particles as the conditions under which they are stabilized or destabilized change.

- Secondly, variations in the feed composition play a crucial role. The feed entering the treatment process may have differing concentrations of dissolved solids, organic matter, or contaminants at different times. These variations can influence how particles form and grow, leading to changes in the size distribution. For example, an increase in the concentration of certain ions or organic molecules could promote the formation of larger particles through aggregation or could cause existing particles to break down into smaller sizes.

- Lastly, the presence of specific components that can initiate nucleation—such as certain ions, molecules, or even pre-existing particles—may trigger the formation of new particles. This nucleation process can lead to a significant shift in the particle size distribution, as newly formed particles grow and evolve over time. Such components can act as seeds, around which other materials aggregate, leading to the formation of particles of various sizes and contributing to the observed changes in distribution.

• Improving the dissolved oxygen (DO) levels in an Effluent Treatment Plant (ETP) is crucial for promoting the health of aquatic organisms and the overall effectiveness of the treatment process. In aerobic treatment processes, the DO levels play a significant role in supporting the growth and activity of aerobic microorganisms that break down organic pollutants. During the initial stages of aeration, the DO levels remain around 0.7 mg/L in the first tank, and with further aeration, they increase to 1.6 mg/L. To enhance oxygen transfer and improve the efficiency of the treatment process, fine bubble diffusers are often more effective than coarse bubble diffusers. Fine bubbles provide a larger surface area for oxygen transfer, resulting in higher DO levels. Additionally, consider adding oxygenation systems such as nano-bubbles, which inject pure oxygen into the treatment process. This method can be more efficient than relying solely on air for aeration, leading to improved treatment outcomes and better water quality.

• Variations in COD levels have been observed at the equalization tank, with values ranging from around 45,000 to 50,000 mg/L. The aerobic treatment process has been found to be successful in lowering the COD levels during the treatment of wastewater, while the RO system has not been as efficient in managing the COD of treated water. One possible reason for this inefficiency is that water with higher COD levels is entering the RO system, exceeding the system's capacity to handle such high organic loads. To address this issue, it is advised to control the COD levels before the effluent enters the RO system. This could involve pre-treatment processes that reduce the COD levels, ensuring that the RO system operates within its design parameters and effectively removes any remaining contaminants.

• Monitoring the role of different coagulants and flocculants is essential to augment the removal of suspended solids and colloidal particles, which are significant contributors to COD. By optimizing the use of coagulants and flocculants, the efficacy of sedimentation and filtration processes can be enhanced, leading to more efficient removal of these particles from the wastewater. This, in turn, can help to reduce the overall COD levels, improving the performance of the subsequent treatment stages and ensuring that the treated water meets the required discharge standards.

• Optimizing the performance of biological treatment processes, such as activated sludge systems or bio-filters, is crucial for effectively reducing organic pollutants responsible for elevated COD levels. These biological processes rely on microorganisms to break down organic matter, and their efficiency can be influenced by various factors, including the composition of the wastewater, the concentration of pollutants, and the operating conditions of the treatment system. By fine-tuning these processes, it is possible to achieve higher removal rates of organic pollutants, leading to lower COD levels and better overall treatment outcomes.

• Adjusting the hydraulic retention time (HRT) in biological treatment tanks is another important strategy to ensure adequate contact time for microbial degradation of organic pollutants. If the HRT is too short, the microorganisms may not have enough time to fully break down the organic matter, leading to higher COD levels in the treated water. By optimizing the HRT, it is possible to enhance the efficiency of the biological treatment process, ensuring that the wastewater is treated thoroughly before being discharged or subjected to further treatment.

• Developing an emergency response plan to address abrupt increases in COD levels is essential for maintaining the effectiveness of the treatment process. Such a plan could involve contingency measures or temporary adjustments to treatment processes to handle sudden spikes in organic load. For example, if different chemical processes are in place, it may be necessary to monitor, segregate, and mitigate the COD of effluent at plant-level collection pits. This approach allows for rapid response to unexpected changes in wastewater composition, minimizing the impact on the overall treatment system and ensuring that the treated water remains within acceptable quality parameters.

• Variations in BOD levels have been observed to coincide with those of COD. Given this correlation, it is recommended to follow all the points mentioned for COD management. Effective management of BOD is crucial for ensuring the overall quality of the treated water, as high BOD levels can indicate the presence of biodegradable organic matter that could consume oxygen in receiving waters, leading to environmental harm. By addressing the factors that influence both COD and BOD levels, it is possible to achieve more consistent and reliable treatment outcomes, ensuring that the effluent meets all regulatory requirements.

• IR spectroscopy aids in quality control by assessing the purity of water, offering a detailed analysis of the water's chemical composition. This technique can identify impurities or contaminants that may be present in the water, helping ensure compliance with regulatory standards. The presence of specific peaks in the IR spectrum, such as those in the region of 1400-1750 cm-1, indicates the presence of aromatic and/or carbonyl compounds, while bands in the region of 2500 cm-1 suggest the presence of aliphatic materials. Each compound has a unique IR spectrum, acting like a fingerprint, which allows for the identification of specific contaminants or compounds present in the water. This capability facilitates targeted treatment strategies, as the IR spectrum can be matched with known data to determine the exact nature of the compounds in question. By identifying these compounds, the treatment process can be adjusted to specifically target and remove them, improving the overall quality of the treated water and ensuring that it meets all necessary regulatory standards.

2009

PART 2

ADEQUECY STUDY OF THE UPDATED ETP PLANT OF MOREPEN LABORATORIES LTD., MASULKHANA

In light of the findings from the initial phase of sampling, the analysis has highlighted the necessity for a thorough overhaul of the Effluent Treatment Plant (ETP) at Morepen Laboratories Ltd., Masulkhana, to ensure compliance with regulatory standards. The results have identified several areas requiring immediate attention to align operations with established norms. Consequently, it has been decided that Morepen Laboratories Ltd., Masulkhana, will address all issues highlighted in the first part of the report. To facilitate this process, a collaborative effort involving teams from PU Chandigarh and IIT Ropar was engaged to conduct further sampling. The findings has provided critical feedback to guide ongoing improvements at the facility. The objective was clear: to continue refining operations until the ETP consistently meets regulatory requirements. This involvement ensured that the next phase of sampling will be conducted rigorously, with a focus on validating the effectiveness of the corrective measures undertaken by Morepen Laboratories Ltd., Masulkhana. Throughout this endeavor, ongoing communication and collaboration between all stakeholders has proven to be very important. With the support of academic institutions and a clear roadmap for improvement, the company is poised to achieve sustainable operations that align with prescribed standards. This concerted effort not only strengthens operational efficiency but also emphasizes a commitment to environmental stewardship, setting a benchmark for responsible corporate conduct in the industry. The details of the modifications of the plant are presented below:

A. MEASURES TAKEN FOR STREAMLINING OF ETP PLANT FOR ZLD IN MASULKHANA

Several control measures have been implemented to upgrade the Effluent Treatment Plant (ETP) at Morepen Laboratories Ltd., Masulkhana, aimed at enhancing its operational efficiency and compliance with regulatory standards.

Pretreatment of incoming effluent: The crucial measure involves the initial collection of incoming high Total Dissolved Solids (TDS) effluent in an equalization tank. This step is pivotal as it allows for the leveling out of flow rates and concentrations, thereby optimizing subsequent treatment processes.

- The effluent undergoes pretreatment in a Primary Tube Settler (PST), before feeding to MEE. This stage serves to separate suspended solids and other contaminants from the wastewater, facilitating cleaner and more manageable effluent for further processing. The sedimentation process in the PST enables the removal of particulate matter, thereby preparing the effluent for more efficient treatment downstream.
- The sludge collected at the bottom of the PST undergoes filtration in a Screw Dewatering Machine. This filtration step is essential in extracting excess water from the sludge, resulting in a drier and more concentrated solid residue. By effectively separating solids from liquids, the Screw Dewatering Machine not only minimizes waste volume but also enhances the overall efficiency of the treatment process.
- The pretreated water, now significantly clarified and free from excess solids, is then fed into a MEE. By evaporating water under controlled conditions, the MEE reduces the volume of wastewater to be discharged while concentrating pollutants for more effective disposal or reuse.
- These integrated control measures yield several benefits crucial to the ETP's performance. Firstly, by reducing the initial TDS levels through equalization and pretreatment, the likelihood of fouling in subsequent processes, particularly the MEE, is significantly minimized. This reduction in fouling not only enhances the operational lifespan of equipment but also ensures smoother and more consistent treatment performance over time.

MEE Optimization: To optimize the MEE at Morepen Laboratories Ltd., Masulkhana, several strategic measures have been implemented, to enhancing efficiency and performance in wastewater treatment.

- Firstly, a steam flow controller has been installed to ensure a consistent and reliable supply of steam to the MEE. This controller effectively minimizes fluctuations in steam supply, thereby stabilizing the evaporation process and optimizing energy utilization. By maintaining a steady steam flow, the MEE operates more efficiently, achieving better evaporation rates and overall system performance.
- In addition to the steam flow controller, a mass flow meter has been integrated into the feed line of the MEE. This meter accurately measures the mass flow rate of the incoming wastewater, providing essential data for monitoring and controlling the treatment

process. With precise measurement capabilities, operators can adjust process parameters as necessary, ensuring optimal conditions for evaporation and concentration of contaminants.

- Furthermore, vacuum stabilization measures have been implemented following reduced fouling of the MEE system. By stabilizing the vacuum levels within the evaporator chamber, the system can operate at optimal efficiency levels consistently. Vacuum stabilization not only improves the evaporation efficiency but also enhances the reliability and longevity of equipment, reducing maintenance requirements and operational downtime.
- Moreover, a critical enhancement involves the separate supply of cooling water to the Agitated Thin Film Dryer (ATFD) and the MEE condenser. This segregation ensures that each component receives the appropriate cooling capacity required for optimal performance. By optimizing the cooling water supply, heat exchange processes within both the ATFD and MEE condenser are maximized, thereby improving overall thermal efficiency and reducing energy consumption.

Activated sludge Process: To enhance the efficiency and performance of the Activated Sludge Process (ASP) within the Effluent Treatment Plant (ETP) at Morepen Laboratories Ltd., Masulkhana, following strategic improvements have been introduced. These advancements aim to optimize the biological treatment of wastewater, ensuring effective removal of contaminants while maintaining operational reliability and environmental compliance.

- The significant instrumentation upgrades have been implemented throughout the ASP process. Rotameters have been installed in the feed line, providing precise measurement and control of the flow rate of influent wastewater into the treatment system. This enhancement ensures that the ASP receives a consistent and controlled influx of wastewater, optimizing the biological treatment process for maximum efficiency and performance.
- The rotameters have been strategically installed in air lines within the ASP. These devices facilitate the even distribution of air throughout the aeration tanks, crucial for maintaining optimal oxygen levels essential for aerobic microbial activity. By ensuring uniform air distribution, the ASP can achieve uniform mixing and sufficient oxygenation, enhancing the biological degradation of organic pollutants in the wastewater.

- Furthermore, brine circulation systems have been incorporated to control temperature within the ASP. Temperature control is critical for maintaining the optimal operating conditions required by the microbial communities responsible for biodegradation. The introduction of brine circulation systems enables precise temperature regulation, ensuring that the ASP operates within the optimal temperature range to support microbial activity and overall treatment efficiency.
- To strengthen operational oversight and process control, the frequency of sampling and analysis has been increased to twice daily. This intensified monitoring schedule allows for more frequent assessment of key parameters such as dissolved oxygen levels, pH, biochemical oxygen demand (BOD), and chemical oxygen demand (COD). By enhancing the frequency of sampling and analysis, operators can promptly identify any fluctuations or deviations in process parameters, enabling timely adjustments to optimize treatment performance and maintain compliance with regulatory standards.
- In addressing the handling of sludge from the tube settler, a Screw Dewatering Machine filtration system has been installed. This equipment efficiently separates and dewater sludge collected at the bottom of the settler, reducing its moisture content and volume. By utilizing a Screw Dewatering Machine, Morepen Laboratories Ltd. minimizes sludge disposal costs and facilitates the recovery of valuable resources from the wastewater treatment process.
- The bioenzymes have been introduced to fortify the microbial populations within the ASP. These bioenzymes serve to enhance the metabolic activities of bacteria responsible for biodegradation. By augmenting microbial activity, bioenzymes accelerate the breakdown of organic pollutants, improving treatment efficiency and reducing the overall retention time required for effective wastewater treatment.

Reverse Osmosis (RO) system: The implementation of Reverse Osmosis (RO) technology at Morepen Laboratories Ltd., Masulkhana, has significantly enhanced the efficiency and effectiveness of their Effluent Treatment Plant (ETP). These improvements for sustainable water management and compliance with stringent environmental standards are detailed below:

- To optimize the treatment process, an online caustic pH control system has been integrated into the tube settler stage. This system allows for precise and automated dosing of caustic soda directly into the settler via a pipeline. By maintaining the pH level within the optimal range, the efficiency of solids settling is improved, ensuring better separation of suspended solids from the wastewater. This enhancement not only enhances treatment efficiency but also minimizes chemical usage, contributing to operational cost savings and environmental benefits.

- In addition to pH control, effective and balanced chemical dosing has been implemented to control turbidity in the wastewater. Turbidity levels have been successfully reduced to less than 50 NTU (Nephelometric Turbidity Units). The strategic application of chemicals ensures that suspended particles and colloids are adequately flocculated and settled out, further improving the overall clarity and quality of treated effluent.
- Furthermore, the RO system incorporates water recycling practices, particularly in the polisher unit. RO permeate water, which is purified through membrane filtration, is recycled within the polisher for secondary treatment. This recycling reduces freshwater consumption and minimizes wastewater discharge, thereby conserving water resources and reducing the environmental impact of plant operations. The recycled RO water undergoes further polishing to remove residual contaminants, ensuring that the treated effluent meets or exceeds regulatory standards before final discharge.

The advancements made in the Effluent Treatment Plant (ETP) at Morepen Laboratories Ltd. highlight the company's proactive position towards sustainable water management. Through comprehensive upgrades across key components such as the Primary Settling Tank (PST), Multi Effect Evaporator (MEE), Activated Sludge Process (ASP), and Reverse Osmosis (RO) system, Morepen Laboratories has significantly enhanced treatment efficiency and regulatory compliance.

Beginning with the PST, the introduction of advanced instrumentation including rotameters for precise flow measurement and control has optimized the initial stage of wastewater treatment. This ensures that incoming effluent is evenly distributed and processed, leading to more effective sedimentation and separation of solids. In parallel, enhancements in the MEE have included the installation of a steam flow controller to maintain a consistent supply, crucial for stable evaporation rates and energy efficiency. The ASP has seen significant improvements with increased sampling and analysis frequencies, now conducted twice daily. This heightened monitoring allows for better control over key parameters such as dissolved oxygen levels and pH, essential for fostering robust microbial activity and efficient organic pollutant removal. Furthermore, the RO system has been pivotal in achieving stringent water quality standards.

The updated design and operational details of the ETP, including the Block Diagram depicted in Figure 2A.1 as of July 20th, 2024, encapsulate these advancements. This visual representation highlights the integrated approach adopted by Morepen Laboratories, aligning technological innovation with environmental responsibility.

PLANT DESIGN DETAILS (As on 20th July 2024)	
Plant Capacity (Designed)	72 m^3/day
Flow Rate (Designed)	3 m^3/hr
Flow Rate (Currently)	1.6 m^3/hr
COD (ETP Inlet)	<30000 ppm
BOD (ETP Inlet)	<13000 to 15000ppm
pH (ETP Inlet)	5 to 9
TDS (ETP Inlet)	20000 to 30000 ppm
COD (Treated Water)	<250 ppm
BOD (Treated Water)	<30 ppm
pH (Treated Water)	7 to 7.5
TDS (Treated Water)	< 200 ppm

2015

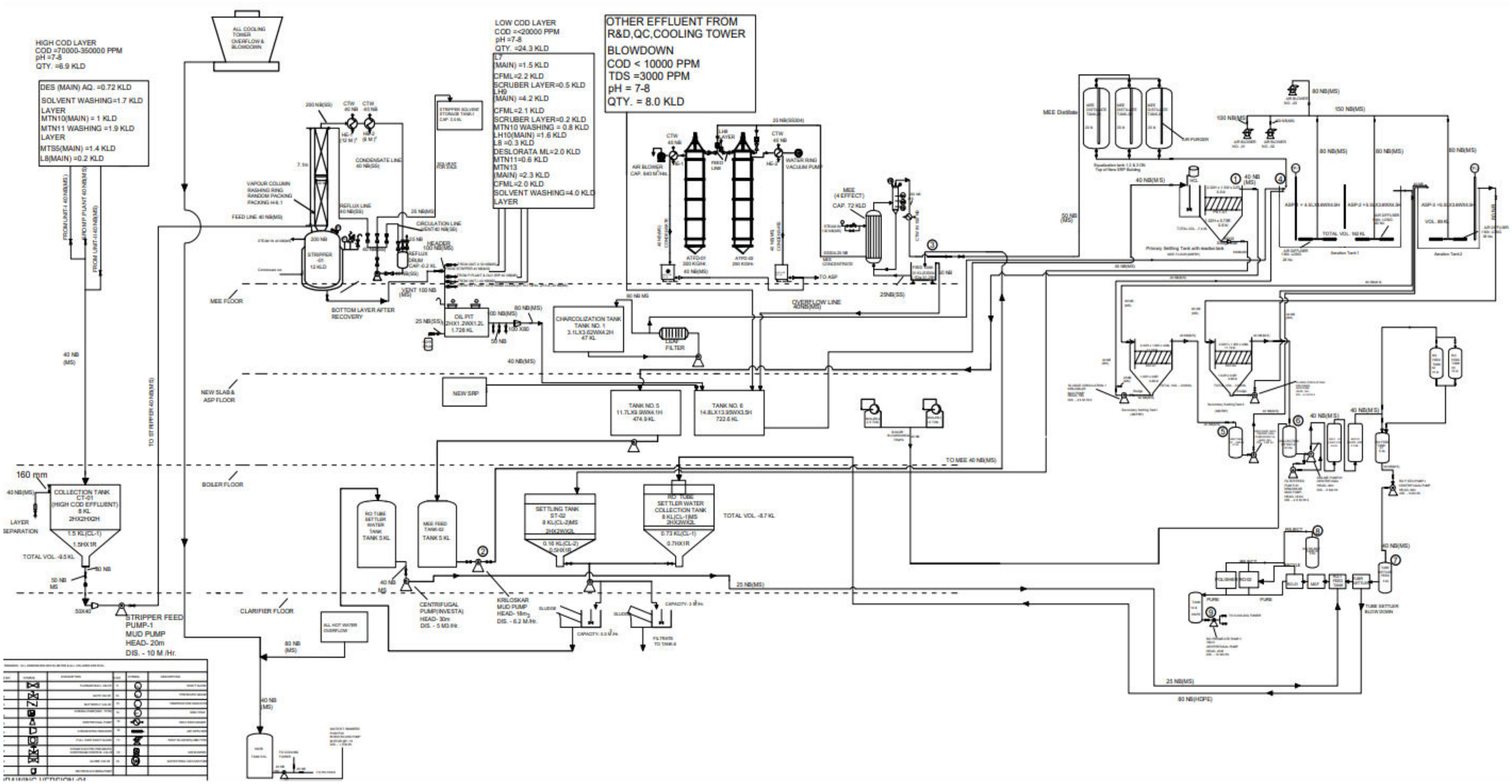

Figure 2A.1. Block Diagram of Updated ETP System

2016

B. MONITORING THE EFFICIENCY OF ETP OF MOREPEN LABORATORIES LTD. MASULKHANA THROUGH WATER QUALITY TESTING

To accurately assess the efficiency of the Effluent Treatment Plant (ETP) at Morepen Laboratories Ltd. Masulkhana, this technical report provides a thorough evaluation of various water quality parameters across multiple intervals. Initial sampling, conducted on 24/02/24, involved staff from Morepen Laboratories Ltd. Masulkhana working with teams from IIT Ropar and PU Chandigarh, with samples analyzed at PU Chandigarh and IIT Ropar's laboratory. On the light of the results of first sampling; the team has suggested some changes in the plant and subsequent set of samplings occurred on 10/06/2024 and 20/07/2024, carried out by Morepen Laboratories Ltd. Masulkhana staff in collaboration with teams from IIT Ropar & PU Chandigarh. While the clarity of treated water is a common measure of an ETP's performance, relying solely on visual inspection of suspended material removal does not offer a complete view of the ETP's environmental effectiveness. Therefore, the report includes a detailed analysis of parameters such as pH, Total Dissolved Solids (TDS), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD), and Cation and Anion Analysis, following BIS standards and each sample analysed in three different labs. Additionally, plans are included in the updated report to investigate the specific materials responsible for TDS, COD, and BOD using IC Chromatography, and Infrared Spectroscopy. Sampling was performed at different times of the day: morning, afternoon, and evening; with each sample undergoing triplicate testing.

pH Control of ETP of Morepen Laboratories Ltd. Masulkhana: Proper regulation of pH is essential for effective chemical treatments like coagulation and precipitation. pH, which measures a solution's acidity or alkalinity, plays a significant role in the performance of various treatment methods and the environmental impact of the treated effluent. Many biological treatment processes, including activated sludge and biological processes, are particularly sensitive to pH fluctuations. Maintaining pH within an optimal range enhances the efficiency of microorganisms responsible for breaking down organic matter. Additionally, pH affects the solubility of various chemicals in wastewater, highlighting the necessity of pH control. Adhering to the recommended pH range ensures effective disinfection and compliance with regulatory standards for discharged effluent, thus safeguarding the environment and preventing adverse effects on receiving water bodies. The pH levels at different stages of the ETP at Morepen Laboratories Ltd. Masulkhana are detailed in the table below.

2017

Table 2.1. pH analysis of water samples collected from the ETP under study.

Sr. No	Date	Time	Sample Name	Sample Code	pH Determination			
					1st	2nd	3rd	Avg
1.	10/06/2024	Morning	Primary Settling tank Inlet	V2-SS1-M	13.02	13.03	13.02	13.02
2.	10/06/2024	Morning	MEE feed Tank 01 Outlet	V2-SS2-M	11.36	11.37	11.28	11.34
3.	10/06/2024	Morning	MEE feed Tank 03 and 04 outlet	V2-SS3-M	11.38	11.37	11.32	11.36
4.	10/06/2024	Morning	Primary Settling tank Outlet	V2-SS4-M	10.97	10.92	11.1	11.00
5.	10/06/2024	Morning	Secondary Settling tank 01 outlet	V2-SS5-M	7.47	7.45	7.63	7.52
6.	10/06/2024	Morning	Secondary Settling tank 02 outlet	V2-SS6-M	7.56	7.58	7.59	7.58
7.	10/06/2024	Morning	RO inlet at RO settler	V2-SS7-M	7.58	7.59	7.71	7.63
8.	10/06/2024	Morning	RO reject	V2-SS8-M	7.67	7.7	7.64	7.67
9.	10/06/2024	Morning	RO permeate	V2-SS9-M	6.7	6.74	6.65	6.70
10.	10/06/2024	Afternoon	Primary Settling tank Inlet	V2-SS1-A	12.9	12.92	13.02	12.95

2018

11.	10/06/2024	Afternoon	MEE feed Tank 01 Outlet	V2-SS2-A	11.53	11.53	11.52	11.53
12.	10/06/2024	Afternoon	MEE feed Tank 03 and 04 outlet	V2-SS3-A	11.55	11.54	11.57	11.55
13.	10/06/2024	Afternoon	Primary Settling tank Outlet	V2-SS4-A	11.03	10.99	11.07	11.03
14.	10/06/2024	Afternoon	Secondary Settling tank 01 outlet	V2-SS5-A	7.61	7.58	7.6	7.60
15.	10/06/2024	Afternoon	Secondary Settling tank 02 outlet	V2-SS6-A	7.28	7.25	7.2	7.24
16.	10/06/2024	Afternoon	RO inlet at RO settler	V2-SS7-A	7.68	7.69	7.60	7.66
17.	10/06/2024	Afternoon	RO reject	V2-SS8-A	7.72	7.73	7.62	7.69
18.	10/06/2024	Afternoon	RO permeate	V2-SS9-A	6.81	6.86	6.93	6.87
19.	10/06/2024	Evening	Primary Settling tank Inlet	V2-SS1-E	11.57	11.55	11.57	11.56
20.	10/06/2024	Evening	MEE feed Tank 01 Outlet	V2-SS2-E	12.51	12.55	12.59	12.55
21.	10/06/2024	Evening	MEE feed Tank 03 and 04 outlet	V2-SS3-E	12.49	12.49	12.54	12.51
22.	10/06/2024	Evening	Primary Settling tank Outlet	V2-SS4-E	10.82	10.81	11.11	10.91

2019

23.	10/06/2024	Evening	Secondary Settling tank 01 outlet	V2-SS5-E	7.63	7.6	7.8	7.68
24.	10/06/2024	Evening	Secondary Settling tank 02 outlet	V2-SS6-E	7.38	7.4	7.42	7.40
25.	10/06/2024	Evening	RO inlet at RO settler	V2-SS7-E	7.89	7.91	7.80	7.87
26.	10/06/2024	Evening	RO reject	V2-SS8-E	7.69	7.69	7.6	7.66
27.	10/06/2024	Evening	RO permeate	V2-SS9-E	7.08	7.06	7.1	7.08
28.	10/06/2024	Composite	Primary Settling tank Inlet	V2-SS1-C	12.67	12.66	12.71	12.68
29.	10/06/2024	Composite	MEE feed Tank 01 Outlet	V2-SS2-C	11.99	11.99	12.11	12.03
30.	10/06/2024	Composite	MEE feed Tank 03 and 04 outlet	V2-SS3-C	11.9	11.9	11.96	11.92
31.	10/06/2024	Composite	Primary Settling tank Outlet	V2-SS4-C	10.85	10.81	11	10.89
32.	10/06/2024	Composite	Secondary Settling tank 01 outlet	V2-SS5-C	7.74	7.76	8	7.83
33.	10/06/2024	Composite	Secondary Settling tank 02 outlet	V2-SS6-C	7.63	7.65	7.93	7.74
34.	10/06/2024	Composite	RO inlet at RO settler	V2-SS7-C	7.75	7.78	7.70	7.74

35.	10/06/2024	Composite	RO reject	V2-SS8-C	7.83	7.82	7.76	7.80
36.	10/06/2024	Composite	RO permeate	V2-SS9-C	6.89	6.91	7.27	7.02
37.	20/7/2024	Morning	Primary Settling tank Inlet	V3-SS1-M	7.59	7.58	7.7	7.62
38.	20/7/2024	Morning	MEE feed Tank 01 Outlet	V3-SS2-M	7.63	7.63	7.64	7.63
39.	20/7/2024	Morning	MEE feed Tank 03 and 04 outlet	V3-SS3-M	7.62	7.61	7.58	7.60
40.	20/7/2024	Morning	Primary Settling tank Outlet	V3-SS4-M	7.07	7.05	7.09	7.07
41.	20/7/2024	Morning	Secondary Settling tank 01 outlet	V3-SS5-M	7.45	7.5	7.47	7.47
42.	20/7/2024	Morning	Secondary Settling tank 02 outlet	V3-SS6-M	7.12	7.17	7.1	7.13
43.	20/7/2024	Morning	RO inlet at RO settler	V3-SS7-M	7.27	7.2	7.21	7.23
44.	20/7/2024	Morning	RO reject	V3-SS8-M	7.67	7.66	7.56	7.63
45.	20/7/2024	Morning	RO permeate	V3-SS9-M	7.48	7.49	7.4	7.46
46.	20/7/2024	Afternoon	Primary Settling tank Inlet	V3-SS1-A	7.52	7.53	7.54	7.53
47.	20/7/2024	Afternoon	MEE feed Tank 01	V3-SS2-A	7.63	7.62	7.66	7.64

			Outlet					
48.	20/7/2024	Afternoon	MEE feed Tank 03 and 04 outlet	V3-SS3-A	7.46	7.48	7.51	7.48
49.	20/7/2024	Afternoon	Primary Settling tank Outlet	V3-SS4-A	7.28	7.24	7.21	7.24
50.	20/7/2024	Afternoon	Secondary Settling tank 01 outlet	V3-SS5-A	7.32	7.34	7.36	7.34
51.	20/7/2024	Afternoon	Secondary Settling tank 02 outlet	V3-SS6-A	7.15	7.16	7.18	7.16
52.	20/7/2024	Afternoon	RO inlet at RO settler	V3-SS7-A	7.5	7.5	7.51	7.50
53.	20/7/2024	Afternoon	RO reject	V3-SS8-A	7.39	7.4	7.43	7.41
54.	20/7/2024	Afternoon	RO permeate	V3-SS9-A	7.32	7.33	7.33	7.33
55.	20/7/2024	Evening	Primary Settling tank Inlet	V3-SS1-E	7.58	7.59	7.61	7.59
56.	20/7/2024	Evening	MEE feed Tank 01 Outlet	V3-SS2-E	7.52	7.51	7.5	7.51
57.	20/7/2024	Evening	MEE feed Tank 03 and 04 outlet	V3-SS3-E	7.52	7.52	7.54	7.53
58.	20/7/2024	Evening	Primary Settling tank Outlet	V3-SS4-E	7.38	7.32	7.27	7.32

59.	20/7/2024	Evening	Secondary Settling tank 01 outlet	V3-SS5-E	7.16	7.17	7.18	7.17
60.	20/7/2024	Evening	Secondary Settling tank 02 outlet	V3-SS6-E	7.07	7.1	7.14	7.10
61.	20/7/2024	Evening	RO inlet at RO settler	V3-SS7-E	7.39	7.38	7.39	7.39
62.	20/7/2024	Evening	RO reject	V3-SS8-E	7.27	7.32	7.34	7.31
63.	20/7/2024	Evening	RO permeate	V3-SS9-E	7.16	7.18	7.2	7.18
64.	20/7/2024	Composite	Primary Settling tank Inlet	V3-SS1-C	7.67	7.63	7.65	7.65
65.	20/7/2024	Composite	MEE feed Tank 01 Outlet	V3-SS2-C	7.54	7.57	7.57	7.56
66.	20/7/2024	Composite	MEE feed Tank 03 and 04 outlet	V3-SS3-C	7.55	7.57	7.56	7.56
67.	20/7/2024	Composite	Primary Settling tank Outlet	V3-SS4-C	7.14	7.12	7.11	7.12
68.	20/7/2024	Composite	Secondary Settling tank 01 outlet	V3-SS5-C	7.24	7.28	7.25	7.26
69.	20/7/2024	Composite	Secondary Settling tank 02 outlet	V3-SS6-C	6.99	7.01	7.02	7.01
70.	20/7/2024	Composite	RO inlet at RO settler	V3-SS7-C	7.2	7.22	7.25	7.22

71.	20/7/2024	Composite	RO reject	V3-SS8-C	7.42	7.44	7.47	7.44
72.	20/7/2024	Composite	RO permeate	V3-SS9-C	7.17	7.16	7.17	7.17

TDS (Total dissolved solids) Control of ETP of Morepen Laboratories Ltd. Masulkhana:

Total Dissolved Solids (TDS) refers to all inorganic and organic substances in water that can pass through a 2-micron filter. TDS is essentially the total concentration of cations and anions present in the water. Common TDS constituents include ions and ionic compounds such as carbonate, bicarbonate, chloride, fluoride, sulfate, phosphate, nitrate, calcium, magnesium, sodium, and potassium. Organic ions, including pollutants, herbicides, and hydrocarbons, as well as soil organic matter compounds like humic and fulvic acids, are also part of TDS. TDS can be measured using various methods. A simple approach involves filtering the water sample, evaporating it at 180°C in a pre-weighed dish until the weight stabilizes, and then calculating TDS based on the weight increase of the dish, reported in mg/L. Alternatively, TDS can be estimated from the sample's electrical conductivity using a correlation equation specific to conductivity. Another method involves summing the concentrations of individual ions. While TDS provides a general measure of dissolved inorganic substances, it does not specify the nature of these substances. Since TDS tests do not differentiate between individual solutes, further analysis through chromatography and spectroscopy is planned to better understand the nature of the inorganic matter present.

Table 2.2. TDS analysis of water samples collected from the ETP under study.

Sr. No	Date	Time	Sample Name	Sample Code	TDS Determination			
					1st	2nd	3rd	Avg (ppm)
1.	10/06/2024	Morning	Primary Settling tank Inlet	V2-SS1-M	107004.95	106809.95	118964.95	110926.62

2.	10/06/2024	Morning	MEE feed Tank 01 Outlet	V2-SS2-M	56304.95	56239.95	56239.95	56261.62
3.	10/06/2024	Morning	MEE feed Tank 03 and 04 outlet	V2-SS3-M	47984.95	48049.95	61504.95	52513.28
4.	10/06/2024	Morning	Primary Settling tank Outlet	V2-SS4-M	2939.95	2933.45	3141.45	3004.95
5.	10/06/2024	Morning	Secondary Settling tank 01 outlet	V2-SS5-M	1048.45	1054.95	1015.95	1039.78
6.	10/06/2024	Morning	Secondary Settling tank 02 outlet	V2-SS6-M	1951.95	1925.95	1925.95	1934.62
7.	10/06/2024	Morning	RO inlet at RO settler	V2-SS7-M	2094.95	2101.45	2114.45	2103.62
8.	10/06/2024	Morning	RO reject	V2-SS8-M	7912.45	7918.95	7879.95	7903.78
9.	10/06/2024	Morning	RO permeate	V2-SS9-M	190.45	190.45	196.95	192.62
10.	10/06/2024	Afternoon	Primary Settling tank Inlet	V2-SS1-A	117079.95	117014.95	129169.95	121088.28

11.	10/06/2024	Afternoon	MEE feed Tank 01 Outlet	V2-SS2-A	64559.95	64429.95	64819.95	64603.28
12.	10/06/2024	Afternoon	MEE feed Tank 03 and 04 outlet	V2-SS3-A	58644.95	58774.95	63519.95	60313.28
13.	10/06/2024	Afternoon	Primary Settling tank Outlet	V2-SS4-A	2783.95	2757.95	3095.95	2879.28
14.	10/06/2024	Afternoon	Secondary Settling tank 01 outlet	V2-SS5-A	957.45	950.95	937.95	948.78
15.	10/06/2024	Afternoon	Secondary Settling tank 02 outlet	V2-SS6-A	1750.45	1743.95	1782.95	1759.12
16.	10/06/2024	Afternoon	RO inlet at RO settler	V2-SS7-A	2003.95	2003.95	2413.45	2140.45
17.	10/06/2024	Afternoon	RO reject	V2-SS8-A	4616.95	4590.95	4564.95	4590.95
18.	10/06/2024	Afternoon	RO permeate	V2-SS9-A	203.45	209.95	170.95	194.78
19.	10/06/2024	Evening	Primary Settling tank Inlet	V2-SS1-E	78794.95	78924.95	92184.95	83301.62

20.	10/06/2024	Evening	MEE feed Tank 01 Outlet	V2-SS2-E	77884.95	77819.95	98489.95	84731.62
21.	10/06/2024	Evening	MEE feed Tank 03 and 04 outlet	V2-SS3-E	72749.95	71969.95	95174.95	79964.95
22.	10/06/2024	Evening	Primary Settling tank Outlet	V2-SS4-E	1958.45	1945.45	2881.45	2261.78
23.	10/06/2024	Evening	Secondary Settling tank 01 outlet	V2-SS5-E	879.45	866.45	1249.95	998.62
24.	10/06/2024	Evening	Secondary Settling tank 02 outlet	V2-SS6-E	1639.95	1639.95	1964.95	1748.28
25.	10/06/2024	Evening	RO inlet at RO settler	V2-SS7-E	1899.95	1932.45	2432.95	2088.45
26.	10/06/2024	Evening	RO reject	V2-SS8-E	2569.45	2536.95	3329.95	2812.12
27.	10/06/2024	Evening	RO permeate	V2-SS9-E	313.95	320.45	300.95	311.78
28.	10/06/2024	Composite	Primary Settling tank Inlet	V2-SS1-C	98294.95	97839.95	124294.95	106809.95

29.	10/06/2024	Composite	MEE feed Tank 01 Outlet	V2-SS2-C	59814.95	60269.95	75219.95	65101.62
30.	10/06/2024	Composite	MEE feed Tank 03 and 04 outlet	V2-SS3-C	61309.95	60854.95	78079.95	66748.28
31.	10/06/2024	Composite	Primary Settling tank Outlet	V2-SS4-C	2731.95	2705.95	3069.95	2835.95
32.	10/06/2024	Composite	Secondary Settling tank 01 outlet	V2-SS5-C	846.95	840.45	1087.45	924.95
33.	10/06/2024	Composite	Secondary Settling tank 02 outlet	V2-SS6-C	905.45	918.45	957.45	927.12
34.	10/06/2024	Composite	RO inlet at RO settler	V2-SS7-C	2153.45	2166.45	2393.95	2237.95
35.	10/06/2024	Composite	RO reject	V2-SS8-C	4512.95	4493.45	4733.95	4580.12
36.	10/06/2024	Composite	RO permeate	V2-SS9-C	170.95	177.45	274.95	207.78
37.	20/7/2024	Morning	Primary Settling tank Inlet	V3-SS1-M	10959	10952.5	10959	10956.83

38.	20/7/2024	Morning	MEE feed Tank 01 Outlet	V3-SS2-M	10965.5	10972	10972	10969.83
39.	20/7/2024	Morning	MEE feed Tank 03 and 04 outlet	V3-SS3-M	10913.5	10946	10978.5	10946.00
40.	20/7/2024	Morning	Primary Settling tank Outlet	V3-SS4-M	442.65	445.9	440.05	442.87
41.	20/7/2024	Morning	Secondary Settling tank 01 outlet	V3-SS5-M	363.35	364	354.25	360.53
42.	20/7/2024	Morning	Secondary Settling tank 02 outlet	V3-SS6-M	345.8	345.8	344.5	345.37
43.	20/7/2024	Morning	RO inlet at RO settler	V3-SS7-M	473.85	472.55	471.9	472.77
44.	20/7/2024	Morning	RO reject	V3-SS8-M	1181.05	1180.4	1172.6	1178.02
45.	20/7/2024	Morning	RO permeate	V3-SS9-M	152.95	160.1	158.8	157.28
46.	20/7/2024	Afternoon	Primary Settling tank Inlet	V3-SS1-A	11180	11199.5	11180	11186.50

47.	20/7/2024	Afternoon	MEE feed Tank 01 Outlet	V3-SS2-A	11212.5	11180	11167	11186.50
48.	20/7/2024	Afternoon	MEE feed Tank 03 and 04 outlet	V3-SS3-A	11167	11160.5	11180	11169.17
49.	20/7/2024	Afternoon	Primary Settling tank Outlet	V3-SS4-A	423.15	425.75	423.8	424.23
50.	20/7/2024	Afternoon	Secondary Settling tank 01 outlet	V3-SS5-A	357.5	356.85	357.5	357.28
51.	20/7/2024	Afternoon	Secondary Settling tank 02 outlet	V3-SS6-A	345.15	342.55	344.5	344.07
52.	20/7/2024	Afternoon	RO inlet at RO settler	V3-SS7-A	464.1	463.45	461.5	463.02
53.	20/7/2024	Afternoon	RO reject	V3-SS8-A	1186.9	1186.25	1185.6	1186.25
54.	20/7/2024	Afternoon	RO permeate	V3-SS9-A	152.3	152.3	151.65	152.08
55.	20/7/2024	Evening	Primary Settling tank Inlet	V3-SS1-E	8450	8398	8378.5	8408.83

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56.	20/7/2024	Evening	MEE feed Tank 01 Outlet	V3-SS2-E	8352.5	8404.5	8411	8389.33
57.	20/7/2024	Evening	MEE feed Tank 03 and 04 outlet	V3-SS3-E	8411	8430.5	8391.5	8411.00
58.	20/7/2024	Evening	Primary Settling tank Outlet	V3-SS4-E	430.95	429.65	429.65	430.08
59.	20/7/2024	Evening	Secondary Settling tank 01 outlet	V3-SS5-E	360.75	360.1	362.05	360.97
60.	20/7/2024	Evening	Secondary Settling tank 02 outlet	V3-SS6-E	351.65	349.7	348.4	349.92
61.	20/7/2024	Evening	RO inlet at RO settler	V3-SS7-E	470.6	469.95	467.35	469.30
62.	20/7/2024	Evening	RO reject	V3-SS8-E	1202.5	1215.5	1216.8	1211.60
63.	20/7/2024	Evening	RO permeate	V3-SS9-E	145.15	145.15	145.8	145.37
64.	20/7/2024	Composite	Primary Settling tank Inlet	V3-SS1-C	10972	10991.5	11011	10991.50

65.	20/7/2024	Composite	MEE feed Tank 01 Outlet	V3-SS2-C	11238.5	11193	11206	11212.50
66.	20/7/2024	Composite	MEE feed Tank 03 and 04 outlet	V3-SS3-C	11193	11160.5	11154	11169.17
67.	20/7/2024	Composite	Primary Settling tank Outlet	V3-SS4-C	430.3	430.3	430.95	430.52
68.	20/7/2024	Composite	Secondary Settling tank 01 outlet	V3-SS5-C	360.1	358.15	358.15	358.80
69.	20/7/2024	Composite	Secondary Settling tank 02 outlet	V3-SS6-C	339.95	339.3	338	339.08
70.	20/7/2024	Composite	RO inlet at RO settler	V3-SS7-C	462.8	462.15	461.5	462.15
71.	20/7/2024	Composite	RO reject	V3-SS8-C	1201.85	1205.1	1204.45	1203.80
72.	20/7/2024	Composite	RO permeate	V3-SS9-C	149.7	148.4	147.75	148.62

Ion Chromatography: Ion Chromatography (IC) is a specialized analytical technique used to separate and analyze ions present in liquid samples. As a subset of liquid chromatography, IC is extensively utilized across various fields, including environmental testing, water analysis, and research. This method excels in quantifying both inorganic and organic ions in a sample, making it invaluable for assessing the ion composition of complex mixtures. In the realm of wastewater treatment and Effluent Treatment Plants (ETPs), Ion Chromatography plays a crucial role. It enables the detailed analysis of effluent composition by measuring the concentration of specific ions, which is essential for evaluating the quality of treated water. This analysis is pivotal for ensuring that wastewater treatment processes meet stringent environmental regulations and standards. IC aids in identifying potential contaminants within the effluent, thereby contributing to the overall understanding of the treatment efficiency and the safety of the discharged water. By providing precise data on ion concentrations, IC supports the optimization of treatment processes and the management of environmental impact. This capability makes Ion Chromatography a key tool for maintaining compliance with regulatory requirements and safeguarding water quality.

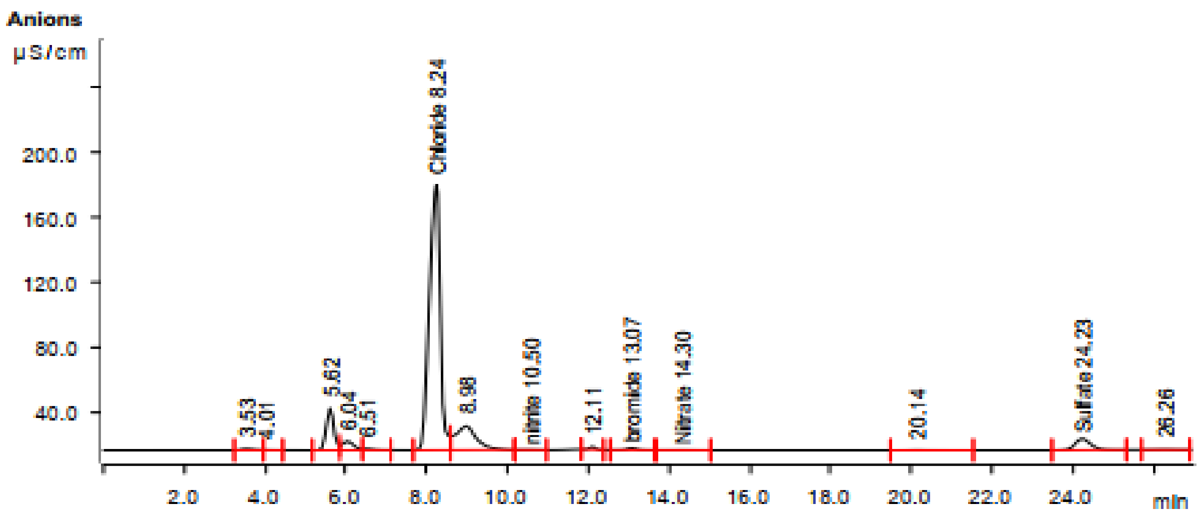

Figure 2B.1. Ion chromatogram of the sample collected as grab sample of the Morning of 10/06/2024 from R.O. (Permeate Tank).

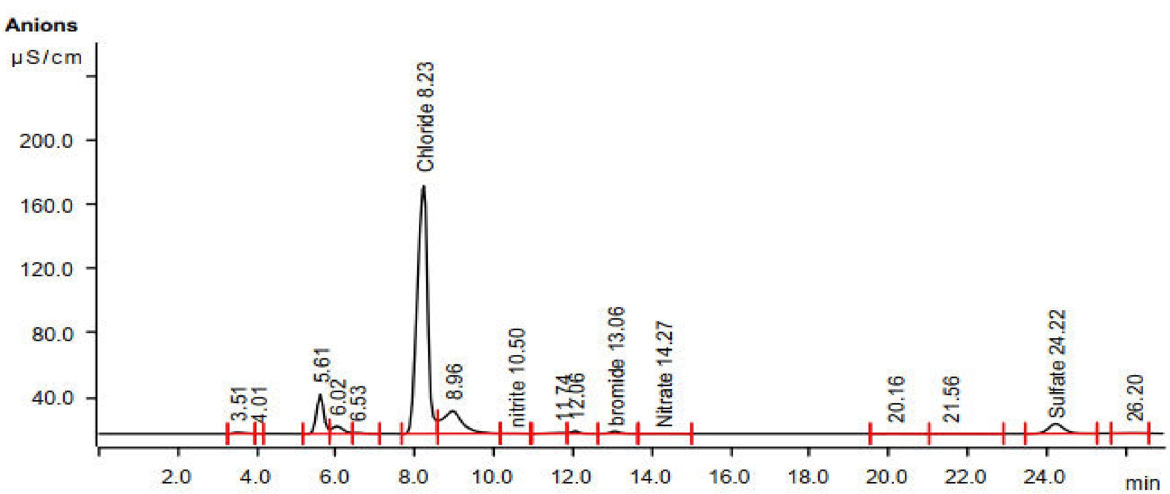

Figure 2B.2. Ion chromatogram of the sample collected as grab sample of the Afternoon of 10/06/2024 from R.O. (Permeate Tank).

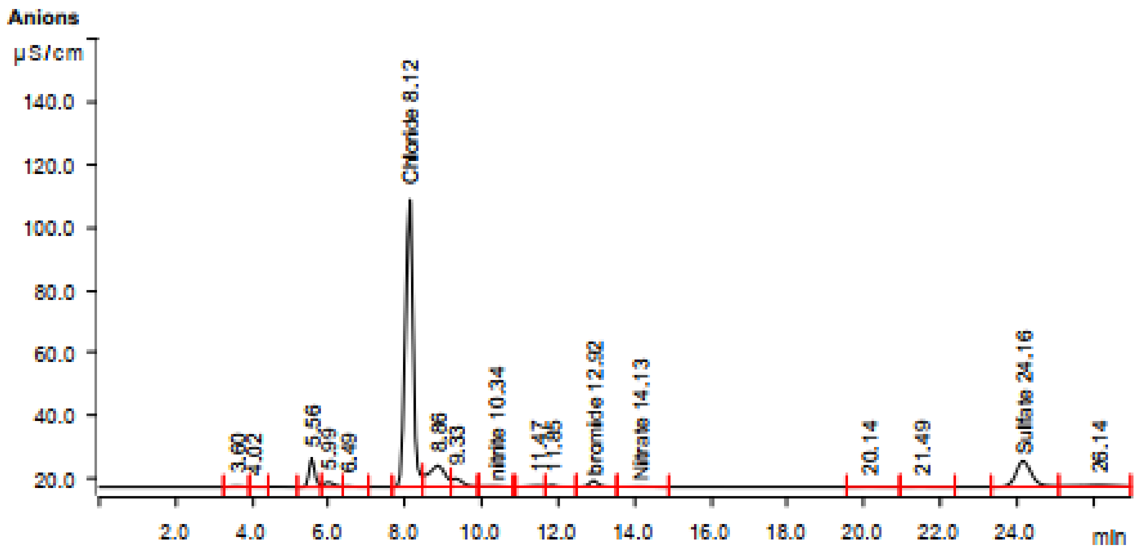

Figure 2B.3. Ion chromatogram of the sample collected as grab sample of the Evening of 10/06/2024 from R.O. (Permeate Tank).

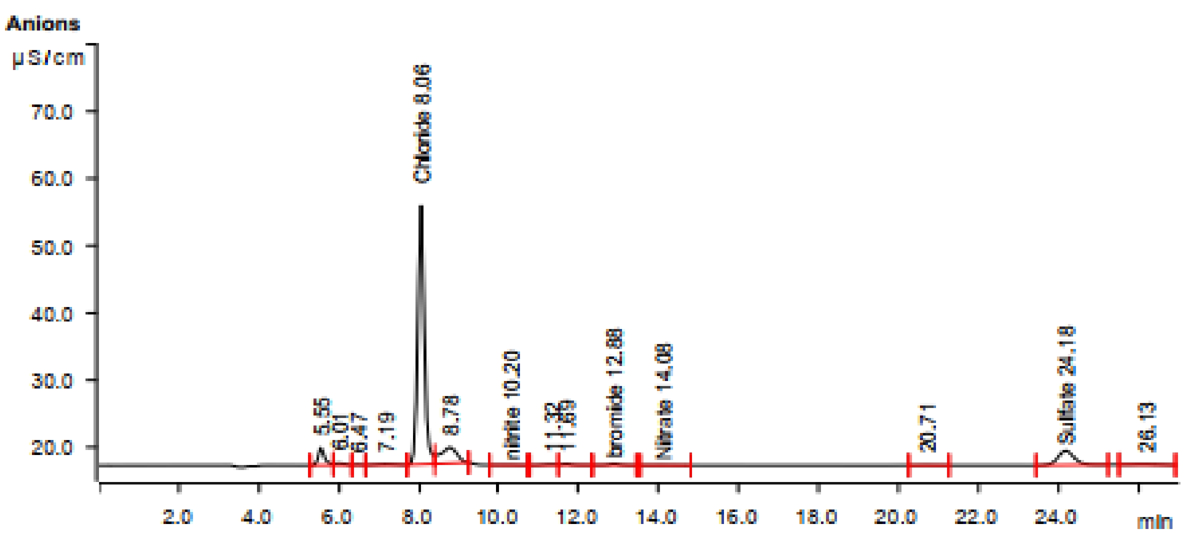

Figure 2B.4. Ion chromatogram of the sample collected as composite sample of 10/06/2024 from R.O. (Permeate Tank).

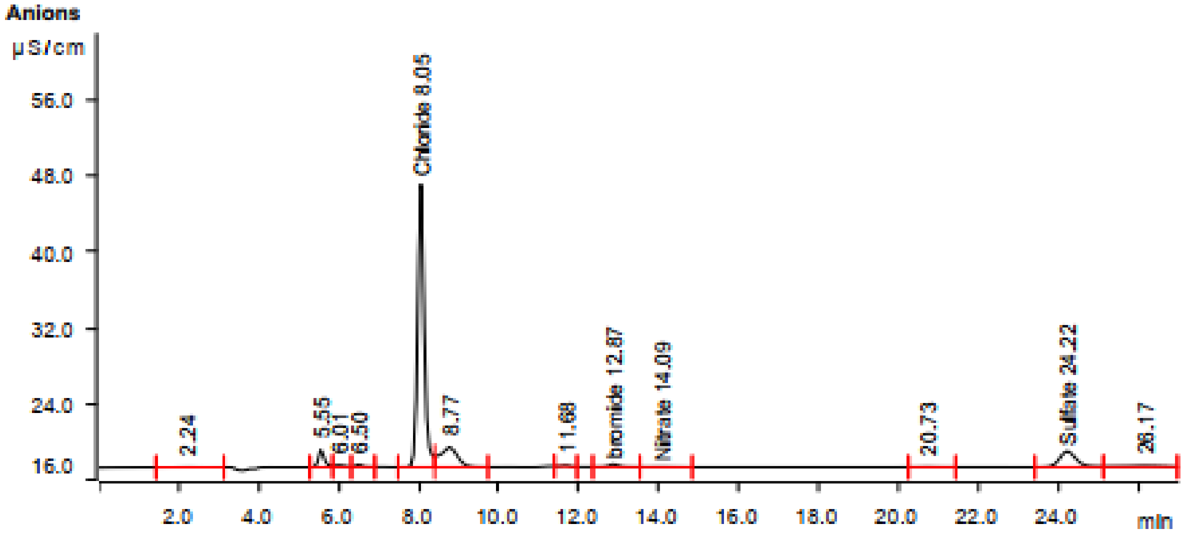

Figure 2B.5. Ion chromatogram of the sample collected as grab sample of the Morning of 20/07/2024 from R.O. (Permeate Tank).

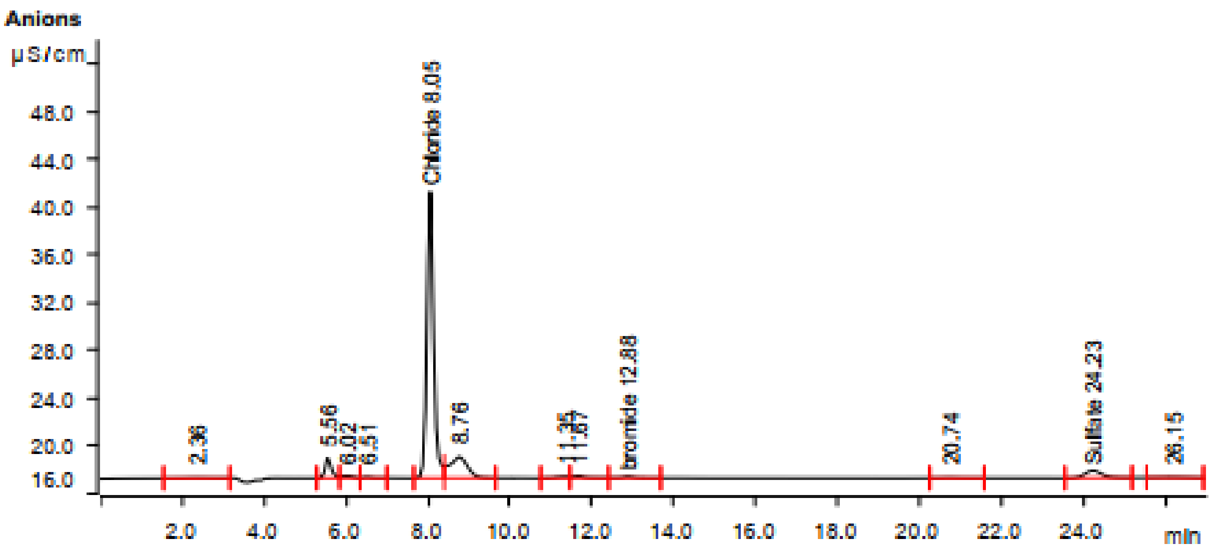

Figure 2B.6. Ion chromatogram of the sample collected as grab sample of the Afternoon of 20/07/2024 from R.O. (Permeate Tank).

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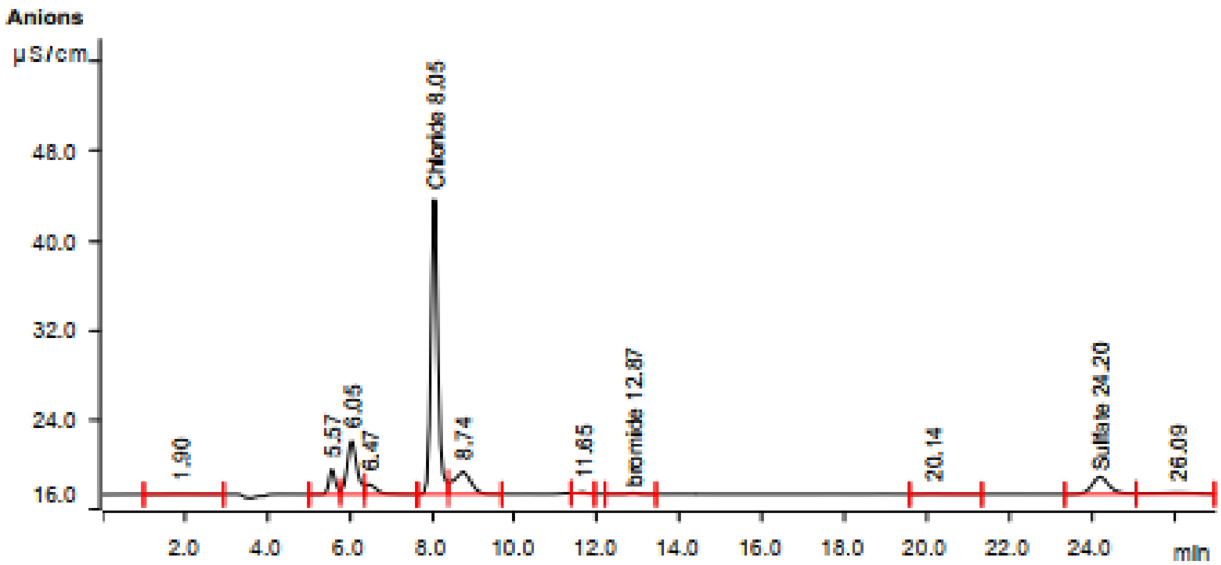

Figure 2B.7. Ion chromatogram of the sample collected as grab sample of the Evening of 20/07/2024 from R.O. (Permeate Tank).

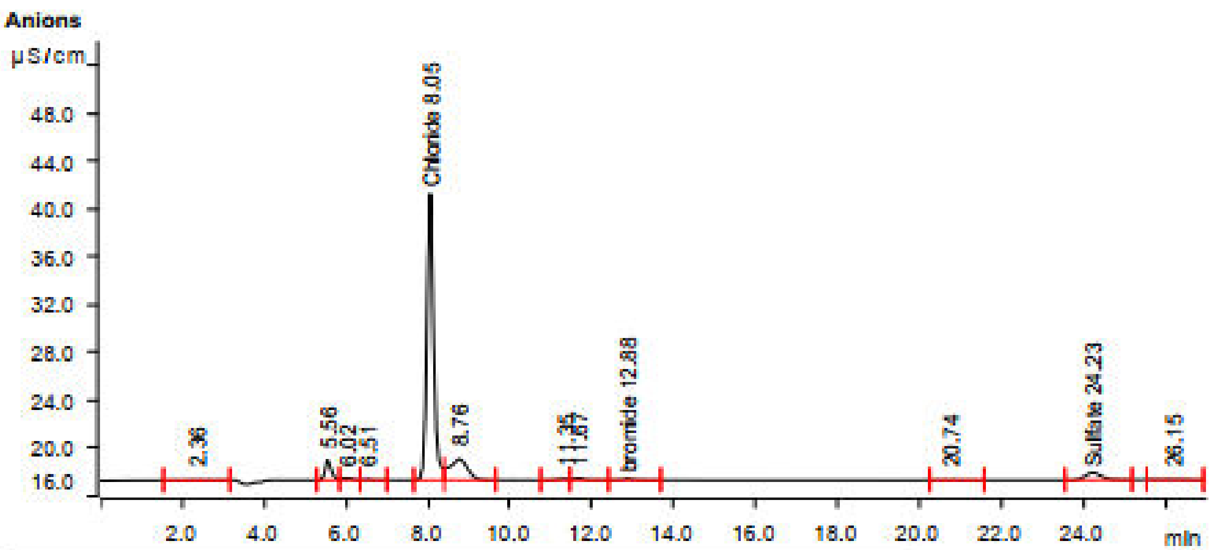

Figure 2B.8. Ion chromatogram of the sample collected as composite sample 20/07/2024 from R.O. (Permeate Tank).

Table 2.3. Metal ions analysis (Using ICP-MS) of water samples collected from Finial Discharge of ETP in plant under study.

S. No.	Sample Name/ Code	Date	Time	Concentrations of Metal Ions in ppb				
				^{23}Na	^{24}Mg	^{39}K	^{44}Ca	^{52}Cr
1	RO permeate/ V2-SS9-M	10/06/2024	Morning	20786.52	213.999	15359.25	250.388	0.329
2	RO permeate/ V2-SS9-A	10/06/2024	Afternoon	19431.79	162.144	13726.98	160.024	0.000
3	RO permeate/ V2-SS9-E	10/06/2024	Evening	16676.1	216.776	11854.2	174.451	0.000
4	RO permeate/ V2- SS9-C	10/06/2024	Composite	15662.97	184.854	12158.15	304.927	0.196
5	RO permeate/ V3-SS9-M	20/7/2024	Morning	29641.96	13088.94	1680.546	15514.27	0.548
6	RO permeate/ V3-SS9-A	20/7/2024	Afternoon	29907.72	13077.67	1652.119	15274.44	0.000
7	RO permeate/ V3-SS9-E	20/7/2024	Evening	27501.58	11988.64	1660.788	14591.32	0.413
8	RO permeate/ V3- SS9-C	20/7/2024	Composite	24346.21	10900.3	1567.477	14217.26	0.000

2037

S. No.	Sample Name/ Code	Date	Time	Concentrations of Metal Ions in ppb				
				^{56}Fe	^{60}Ni	^{75}As	^{202}Hg	^{207}Pb
1	RO permeate/ V2-SS9-M	10/06/2024	Morning	6.885	0.445	0.308	0.463	0.187
2	RO permeate/ V2-SS9-A	10/06/2024	Afternoon	0.000	0.129	0.327	1.971	0.000
3	RO permeate/ V2-SS9-E	10/06/2024	Evening	0.000	0.186	0.364	0.514	0.056
4	RO permeate/ V2- SS9-C	10/06/2024	Composite	76.266	0.713	0.344	0.977	0.089
5	RO permeate/ V3-SS9-M	20/7/2024	Morning	0.000	0.272	1.088	12.607	0.000
6	RO permeate/ V3-SS9-A	20/7/2024	Afternoon	0.000	0.499	1.392	0.894	0.000
7	RO permeate/ V3-SS9-E	20/7/2024	Evening	2.704	0.562	1.432	1.343	0.014
8	RO permeate/ V3- SS9-C	20/7/2024	Composite	0.000	0.41	1.432	1.08	0.000

Dissolved Oxygen of ETP of Morepen Laboratories Ltd, Masulkhana.: Dissolved Oxygen (DO) is critically important in wastewater treatment, with its significance varying at different stages of an Effluent Treatment Plant (ETP). DO measures the amount of oxygen dissolved in water and is crucial for supporting biological processes, particularly those involving microorganisms that break down organic pollutants. While preliminary treatment, which focuses on removing large solids and debris, does not directly prioritize DO levels, aeration or mixing during this phase can indirectly affect oxygen content. In primary treatment, which targets the removal of settleable and floating solids through sedimentation, maintaining high levels of dissolved oxygen is not a primary concern. However, oxygen levels can influence the efficiency of solid settling. The biological treatment stages, including activated sludge systems, trickling filters, and sequencing batch reactors, rely heavily on DO. Here, microorganisms, mainly bacteria, use oxygen in aerobic respiration to break down organic matter. Maintaining optimal DO levels is essential for maximizing the efficiency of these biological processes. Low DO can lead to reduced microbial activity, incomplete pollutant removal, and the formation of unwanted by-products. DO saturation indicates the maximum amount of oxygen that can dissolve in water under specific temperature and pressure conditions. Monitoring DO saturation is crucial for ensuring that water can support aerobic biological processes. Aeration systems are often used to increase DO levels in treatment tanks, facilitating the transfer of oxygen from the air to the water and creating ideal conditions for microbial activity. Since DO solubility decreases as water temperature increases, temperature variations must be considered. Optimal DO levels, typically above 2 mg/L for aerobic processes, are essential for effective biological treatment. Continuous monitoring of DO is necessary to adjust aeration systems and maintain efficient treatment.

COD (Chemical oxygen demand) Control of ETP of Morepen Laboratories Ltd. Masulkhana: Chemical Oxygen Demand (COD) is a vital parameter in wastewater treatment that measures the amount of oxygen required to chemically oxidize and break down both organic and inorganic compounds in water. The importance of monitoring COD varies at different stages of an Effluent Treatment Plant (ETP). By assessing the COD of influent wastewater, one can predict the overall organic load entering the treatment system. High influent COD levels may indicate significant organic pollution, necessitating specific treatment strategies. During primary treatment, which focuses on physically removing settleable solids through sedimentation, COD is not usually the main focus. However, elevated COD levels can still impact the overall load of subsequent treatment stages. In biological treatment processes; such as activated sludge systems, trickling filters, and sequencing batch reactors; the COD is crucial as microorganisms use oxygen to break down organic pollutants. Managing and controlling COD levels is essential for optimizing microbial activity and effectively removing organic matter. In some tertiary treatment stages, reducing COD is important for further refinement and compliance with stringent discharge standards. Techniques like filtration, chemical precipitation, and adsorption may be used to address remaining COD. The ratio of BOD to COD provides insights into the biodegradability of wastewater, with a lower ratio indicating less biodegradable or more resistant organic compounds. Overall, COD is a key indicator of the organic content in wastewater, and monitoring it helps assess the effectiveness of treatment processes in reducing organic pollutants. High COD levels can contribute to increased biological oxygen demand (BOD) and nutrient loading in receiving water bodies, making efficient COD removal crucial for minimizing environmental impact.

Table 2.4. COD analysis of water samples collected from the ETP under study.

Sr. No	Date	Time	Sample Name	Sample Code	COD Determination			
					1st	2nd	3rd	Avg (mg/l)
1.	10/06/2024	Morning	Primary Settling tank Inlet	V2-SS1-M	28116	27834.8	27561.6	27837.5
2.	10/06/2024	Morning	MEE feed Tank 01 Outlet	V2-SS2-M	21621.6	21405.4	21700.8	21575.9
3.	10/06/2024	Morning	MEE feed Tank 03 and 04 outlet	V2-SS3-M	18612	18425.9	18532.8	18523.6
4.	10/06/2024	Morning	Primary Settling tank Outlet	V2-SS4-M	13780.8	13643	13543.2	13655.7
5.	10/06/2024	Morning	Secondary Settling tank 01 outlet	V2-SS5-M	10296	10193	10137.6	10208.9
6.	10/06/2024	Morning	Secondary Settling tank	V2-	8712	8624.9	8157.6	8498.2

			02 outlet	SS6-M				
7.	10/06/2024	Morning	RO inlet at RO settler	V2-SS7-M	5860.8	5802.2	6494.4	6052.5
8.	10/06/2024	Morning	RO reject	V2-SS8-M	10296	10193	9504	9997.7
9.	10/06/2024	Morning	RO permeate	V2-SS9-M	2376	2352.2	2217.6	2315.3
10.	10/06/2024	Afternoon	Primary Settling tank Inlet	V2-SS1-A	26532	26266.7	24948	25915.6
11.	10/06/2024	Afternoon	MEE feed Tank 01 Outlet	V2-SS2-A	22730.4	22503.1	20988	22073.8
12.	10/06/2024	Afternoon	MEE feed Tank 03 and 04 outlet	V2-SS3-A	17344.8	17171.4	18770.4	17762.2
13.	10/06/2024	Afternoon	Primary Settling tank Outlet	V2-SS4-A	14295.6	14152.6	14652	14366.7
14.	10/06/2024	Afternoon	Secondary Settling tank 01 outlet	V2-SS5-A	11761.2	11643.6	11008.8	11471.2
15.	10/06/2024	Afternoon	Secondary Settling tank	V2-SS6-A	9781.2	9683.4	9424.8	9629.8

			02 outlet					
16.	10/06/2024	Afternoon	RO inlet at RO settler	V2-SS7-A	6692.4	6625.5	6732	6683.3
17.	10/06/2024	Afternoon	RO reject	V2-SS8-A	9702	9605	10058.4	9788.5
18.	10/06/2024	Afternoon	RO permeate	V2-SS9-A	2138.4	2117	2217.6	2157.7
19.	10/06/2024	Evening	Primary Settling tank Inlet	V2-SS1-E	24274.8	24032.1	24076.8	24127.9
20.	10/06/2024	Evening	MEE feed Tank 01 Outlet	V2-SS2-E	19918.8	19719.6	19958.4	19865.6
21.	10/06/2024	Evening	MEE feed Tank 03 and 04 outlet	V2-SS3-E	15958.8	15799.2	15998.4	15918.8
22.	10/06/2024	Evening	Primary Settling tank Outlet	V2-SS4-E	13503.6	13368.6	14097.6	13656.6
23.	10/06/2024	Evening	Secondary Settling tank 01 outlet	V2-SS5-E	9622.8	9526.6	10216.8	9788.7
24.	10/06/2024	Evening	Secondary Settling tank	V2-SS6-E	7246.8	7174.3	6652.8	7024.6

			02 outlet					
25.	10/06/2024	Evening	RO inlet at RO settler	V2-SS7-E	4870.8	4822.1	4672.8	4788.6
26.	10/06/2024	Evening	RO reject	V2-SS8-E	7484.4	7409.6	7761.6	7551.9
27.	10/06/2024	Evening	RO permeate	V2-SS9-E	1623.6	1607.4	1663.2	1631.4
28.	10/06/2024	Composite	Primary Settling tank Inlet	V2-SS1-C	24987.6	24737.7	24631.2	24785.5
29.	10/06/2024	Composite	MEE feed Tank 01 Outlet	V2-SS2-C	22294.8	22071.9	22413.6	22260.1
30.	10/06/2024	Composite	MEE feed Tank 03 and 04 outlet	V2-SS3-C	19324.8	19131.6	18691.2	19049.2
31.	10/06/2024	Composite	Primary Settling tank Outlet	V2-SS4-C	14374.8	14231.1	14810.4	14472.1
32.	10/06/2024	Composite	Secondary Settling tank 01 outlet	V2-SS5-C	12196.8	12074.8	12276	12182.5
33.	10/06/2024	Composite	Secondary Settling tank	V2-SS6-C	8434.8	8350.5	8791.2	8525.5

			02 outlet					
34.	10/06/2024	Composite	RO inlet at RO settler	V2-SS7-C	6692.4	6625.5	6890.4	6736.1
35.	10/06/2024	Composite	RO reject	V2-SS8-C	9820.8	9722.6	10296	9946.5
36.	10/06/2024	Composite	RO permeate	V2-SS9-C	2098.8	2077.8	2296.8	2157.8
37.	20/7/2024	Morning	Primary Settling tank Inlet	V3-SS1-M	16869.6	16700.9	17028	16866.2
38.	20/7/2024	Morning	MEE feed Tank 01 Outlet	V3-SS2-M	15008.4	14858.3	15404.4	15090.4
39.	20/7/2024	Morning	MEE feed Tank 03 and 04 outlet	V3-SS3-M	13741.2	13603.8	13899.6	13748.2
40.	20/7/2024	Morning	Primary Settling tank Outlet	V3-SS4-M	9068.4	8977.7	9226.8	9091
41.	20/7/2024	Morning	Secondary Settling tank 01 outlet	V3-SS5-M	2708.6	2681.6	2787.8	2726
42.	20/7/2024	Morning	Secondary Settling tank	V3-SS6-M	2201.8	2179.7	2122.6	2168

			02 outlet					
43.	20/7/2024	Morning	RO inlet at RO settler	V3-SS7-M	1972.1	1952.4	1908.7	1944.4
44.	20/7/2024	Morning	RO reject	V3-SS8-M	3231.4	3199	3342.2	3257.5
45.	20/7/2024	Morning	RO permeate	V3-SS9-M	182.2	180.3	150.5	171
46.	20/7/2024	Afternoon	Primary Settling tank Inlet	V3-SS1-A	18889.2	18700.3	18612	18733.8
47.	20/7/2024	Afternoon	MEE feed Tank 01 Outlet	V3-SS2-A	16948.8	16779.3	16671.6	16799.9
48.	20/7/2024	Afternoon	MEE feed Tank 03 and 04 outlet	V3-SS3-A	14731.2	14583.9	15008.4	14774.5
49.	20/7/2024	Afternoon	Primary Settling tank Outlet	V3-SS4-A	9860.4	9761.8	9464.4	9695.5
50.	20/7/2024	Afternoon	Secondary Settling tank 01 outlet	V3-SS5-A	3469	3434.3	3500.6	3468
51.	20/7/2024	Afternoon	Secondary Settling tank	V3-SS6-A	2708.6	2681.6	2787.8	2726

			02 outlet					
52.	20/7/2024	Afternoon	RO inlet at RO settler	V3-SS7-A	2154.2	2132.7	2217.6	2168.2
53.	20/7/2024	Afternoon	RO reject	V3-SS8-A	3912.5	3873.4	4007.5	3931.1
54.	20/7/2024	Afternoon	RO permeate	V3-SS9-A	194	192.1	190.1	192.1
55.	20/7/2024	Evening	Primary Settling tank Inlet	V3-SS1-E	17938.8	17759.4	18176.4	17958.2
56.	20/7/2024	Evening	MEE feed Tank 01 Outlet	V3-SS2-E	14929.2	14779.9	15404.4	15037.8
57.	20/7/2024	Evening	MEE feed Tank 03 and 04 outlet	V3-SS3-E	13582.8	13447	13780.8	13603.5
58.	20/7/2024	Evening	Primary Settling tank Outlet	V3-SS4-E	9979.2	9879.4	10018.8	9959.1
59.	20/7/2024	Evening	Secondary Settling tank 01 outlet	V3-SS5-E	2534.4	2509.1	2328.5	2457.3
60.	20/7/2024	Evening	Secondary Settling tank	V3-SS6-E	2027.5	2007.2	2075	2036.6

			02 outlet					
61.	20/7/2024	Evening	RO inlet at RO settler	V3-SS7-E	1687	1670.1	1726.6	1694.5
62.	20/7/2024	Evening	RO reject	V3-SS8-E	3231.4	3199	2993.8	3141.4
63.	20/7/2024	Evening	RO permeate	V3-SS9-E	130.7	129.4	142.6	134.2
64.	20/7/2024	Composite	Primary Settling tank Inlet	V3-SS1-C	18374.4	18190.7	18572.4	18379.2
65.	20/7/2024	Composite	MEE feed Tank 01 Outlet	V3-SS2-C	15285.6	15132.7	15523.2	15313.8
66.	20/7/2024	Composite	MEE feed Tank 03 and 04 outlet	V3-SS3-C	13028.4	12898.1	13424.4	13117
67.	20/7/2024	Composite	Primary Settling tank Outlet	V3-SS4-C	9028.8	8938.5	9345.6	9104.3
68.	20/7/2024	Composite	Secondary Settling tank 01 outlet	V3-SS5-C	3231.4	3199	3025.4	3151.9
69.	20/7/2024	Composite	Secondary Settling tank 02 outlet	V3-SS6-C	2534.4	2509.1	2486.9	2510.1
70.	20/7/2024	Composite	RO inlet at RO settler	V3-SS7-C	1964.2	1944.5	2075	1994.6

71.	20/7/2024	Composite	RO reject	V3-SS8-C	3310.6	3277.5	3421.4	3336.5
72.	20/7/2024	Composite	RO permeate	V3-SS9-C	166.3	164.7	146.5	159.2

BOD (Biological oxygen demand) Control of ETP of Morepen Laboratories Ltd. Masulkhana: Biochemical Oxygen Demand (BOD) is a key measure of the amount of dissolved oxygen needed by microorganisms to decompose organic matter in water through biological processes. This metric is essential for assessing the presence of organic pollutants in wastewater, typically expressed in milligrams of oxygen consumed per liter of water (mg/L) over a specified period, often 5 days (BOD5) at 20 degrees Celsius. In an Effluent Treatment Plant (ETP), BOD concentrations are influenced by various factors. The initial BOD level of influent wastewater depends on the types and amounts of organic pollutants present. Industrial discharges with high organic content can significantly raise the influent BOD. Preliminary treatment stages, such as screening and grit removal, focus on the physical elimination of large solids and debris. Although these processes do not directly reduce BOD, they prevent damage and interference in subsequent treatment stages. Primary treatment aims to remove settleable solids through processes like sedimentation. While its primary objective is to eliminate solids, this stage can also lead to a slight reduction in BOD as suspended organic matter settles out. Biological treatment stages, such as activated sludge systems, are designed for the microbial breakdown of organic pollutants, resulting in a reduction of BOD levels. Effective aeration and mixing are critical for maintaining microbial activity and optimizing BOD removal efficiency. BOD levels in the effluent from biological treatment depend on the effectiveness of the microbial processes and the degree of organic matter decomposition. Tertiary treatment processes, including filtration, adsorption, or chemical precipitation, may further reduce BOD levels. Filtration removes any remaining suspended solids and organic matter, while adsorption targets dissolved organic compounds.

Table 2.5. BOD analysis of water samples collected from the ETP of Morepen Laboratories Ltd. Masulkhana.

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Sr. No	Date	Time	Sample Name	Sample Code	BOD Determination			
					1st	2nd	3rd	Avg. (mg/l)
1.	10/06/2024	Morning	Primary Settling tank Inlet	V2-SS1-M	6761.9	6457.1	6628.6	6615.9
2.	10/06/2024	Morning	MEE feed Tank 01 Outlet	V2-SS2-M	5200	5466.7	5219	5295.2
3.	10/06/2024	Morning	MEE feed Tank 03 and 04 outlet	V2-SS3-M	4177.8	4355.6	4160	4231.1
4.	10/06/2024	Morning	Primary Settling tank Outlet	V2-SS4-M	3237.2	3423.3	3181.4	3280.6
5.	10/06/2024	Morning	Secondary Settling tank 01 outlet	V2-SS5-M	2000	1769.2	1969.2	1912.8
6.	10/06/2024	Morning	Secondary Settling tank 02 outlet	V2-SS6-M	1660.4	1434	1554.7	1549.7
7.	10/06/2024	Morning	RO inlet at RO settler	V2-SS7-M	1208.2	1387.8	1338.8	1311.6
8.	10/06/2024	Morning	RO reject	V2-SS8-M	2000	2076.9	1846.2	1974.4
9.	10/06/2024	Morning	RO	V2-SS9-M	452.8	362.3	422.6	412.6

			permeate					
10.	10/06/2024	Afternoon	Primary Settling tank Inlet	V2-SS1-A	6381	6323.8	6000	6234.9
11.	10/06/2024	Afternoon	MEE feed Tank 01 Outlet	V2-SS2-A	5466.7	5276.2	5047.6	5263.5
12.	10/06/2024	Afternoon	MEE feed Tank 03 and 04 outlet	V2-SS3-A	3893.3	4088.9	4213.3	4065.2
13.	10/06/2024	Afternoon	Primary Settling tank Outlet	V2-SS4-A	3358.1	3293	3441.9	3364.3
14.	10/06/2024	Afternoon	Secondary Settling tank 01 outlet	V2-SS5-A	2284.6	2346.2	2138.5	2256.4
15.	10/06/2024	Afternoon	Secondary Settling tank 02 outlet	V2-SS6-A	1864.2	1743.4	1796.2	1801.3
16.	10/06/2024	Afternoon	RO inlet at RO settler	V2-SS7-A	1379.6	1346.9	1387.8	1371.4
17.	10/06/2024	Afternoon	RO reject	V2-SS8-A	1884.6	1961.5	1953.8	1933.3
18.	10/06/2024	Afternoon	RO permeate	V2-SS9-A	407.5	483	422.6	437.7

19.	10/06/2024	Evening	Primary Settling tank Inlet	V2-SS1-E	5838.1	6028.6	5790.5	5885.7
20.	10/06/2024	Evening	MEE feed Tank 01 Outlet	V2-SS2-E	4790.5	5019	4800	4869.8
21.	10/06/2024	Evening	MEE feed Tank 03 and 04 outlet	V2-SS3-E	3582.2	3760	3591.1	3644.4
22.	10/06/2024	Evening	Primary Settling tank Outlet	V2-SS4-E	3172.1	3414	3311.6	3299.2
23.	10/06/2024	Evening	Secondary Settling tank 01 outlet	V2-SS5-E	1869.2	2007.7	1984.6	1953.8
24.	10/06/2024	Evening	Secondary Settling tank 02 outlet	V2-SS6-E	1381.1	1230.2	1267.9	1293.1
25.	10/06/2024	Evening	RO inlet at RO settler	V2-SS7-E	1004.1	906.1	963.3	957.8
26.	10/06/2024	Evening	RO reject	V2-SS8-E	1453.8	1361.5	1507.7	1441
27.	10/06/2024	Evening	RO permeate	V2-SS9-E	309.4	324.5	317	317
28.	10/06/2024	Composite	Primary	V2-SS1-C	6009.5	6181	5923.8	6038.1

			Settling tank Inlet					
29.	10/06/2024	Composite	MEE feed Tank 01 Outlet	V2-SS2-C	5361.9	5190.5	5390.5	5314.3
30.	10/06/2024	Composite	MEE feed Tank 03 and 04 outlet	V2-SS3-C	4337.8	4248.9	4195.6	4260.8
31.	10/06/2024	Composite	Primary Settling tank Outlet	V2-SS4-C	3376.7	3302.3	3479.1	3386
32.	10/06/2024	Composite	Secondary Settling tank 01 outlet	V2-SS5-C	2369.2	2338.5	2384.6	2364.1
33.	10/06/2024	Composite	Secondary Settling tank 02 outlet	V2-SS6-C	1607.5	1532.1	1675.5	1605
34.	10/06/2024	Composite	RO inlet at RO settler	V2-SS7-C	1379.6	1281.6	1420.4	1360.5
35.	10/06/2024	Composite	RO reject	V2-SS8-C	1907.7	1984.6	2000	1964.1
36.	10/06/2024	Composite	RO permeate	V2-SS9-C	400	369.8	437.7	402.5
37.	20/7/2024	Morning	Primary Settling tank	V3-SS1-M	3872.7	3972.7	3909.1	3918.2

			Inlet					
38.	20/7/2024	Morning	MEE feed Tank 01 Outlet	V3-SS2-M	3525.6	3590.7	3618.6	3578.3
39.	20/7/2024	Morning	MEE feed Tank 03 and 04 outlet	V3-SS3-M	3017.4	3095.7	3052.2	3055.1
40.	20/7/2024	Morning	Primary Settling tank Outlet	V3-SS4-M	1948.9	2042.6	1983	1991.5
41.	20/7/2024	Morning	Secondary Settling tank 01 outlet	V3-SS5-M	558.4	545.3	574.7	559.5
42.	20/7/2024	Morning	Secondary Settling tank 02 outlet	V3-SS6-M	404.4	386.9	389.8	393.7
43.	20/7/2024	Morning	RO inlet at RO settler	V3-SS7-M	406.5	401.6	393.5	400.5
44.	20/7/2024	Morning	RO reject	V3-SS8-M	627.7	643.1	649.2	640
45.	20/7/2024	Morning	RO permeate	V3-SS9-M	29.7	29.9	28.7	29.4
46.	20/7/2024	Afternoon	Primary Settling tank Inlet	V3-SS1-A	4336.4	4381.8	4272.7	4330.3

47.	20/7/2024	Afternoon	MEE feed Tank 01 Outlet	V3-SS2-A	3981.4	3962.8	3916.3	3953.5
48.	20/7/2024	Afternoon	MEE feed Tank 03 and 04 outlet	V3-SS3-A	3234.8	3156.5	3295.7	3229
49.	20/7/2024	Afternoon	Primary Settling tank Outlet	V3-SS4-A	2119.1	2085.1	2034	2079.4
50.	20/7/2024	Afternoon	Secondary Settling tank 01 outlet	V3-SS5-A	715.1	702	721.6	712.9
51.	20/7/2024	Afternoon	Secondary Settling tank 02 outlet	V3-SS6-A	497.5	503.3	512	504.3
52.	20/7/2024	Afternoon	RO inlet at RO settler	V3-SS7-A	444.1	455.5	457.1	452.2
53.	20/7/2024	Afternoon	RO reject	V3-SS8-A	760	766.2	778.5	768.2
54.	20/7/2024	Afternoon	RO permeate	V3-SS9-A	28.3	28.7	28.2	28.4
55.	20/7/2024	Evening	Primary Settling tank Inlet	V3-SS1-E	4118.2	4081.8	4172.7	4124.2
56.	20/7/2024	Evening	MEE feed	V3-SS2-E	3507	3581.4	3618.6	3569

			Tank 01 Outlet					
57.	20/7/2024	Evening	MEE feed Tank 03 and 04 outlet	V3-SS3-E	2982.6	3017.4	3026.1	3008.7
58.	20/7/2024	Evening	Primary Settling tank Outlet	V3-SS4-E	2144.7	2119.1	2153.2	2139
59.	20/7/2024	Evening	Secondary Settling tank 01 outlet	V3-SS5-E	522.4	512.7	480	505
60.	20/7/2024	Evening	Secondary Settling tank 02 outlet	V3-SS6-E	372.4	357.8	381.1	370.4
61.	20/7/2024	Evening	RO inlet at RO settler	V3-SS7-E	347.8	357.6	355.9	353.8
62.	20/7/2024	Evening	RO reject	V3-SS8-E	627.7	593.8	581.5	601
63.	20/7/2024	Evening	RO permeate	V3-SS9-E	24.9	21.9	27.2	24.7
64.	20/7/2024	Composite	Primary Settling tank Inlet	V3-SS1-C	4218.2	4172.7	4263.6	4218.2
65.	20/7/2024	Composite	MEE feed Tank 01	V3-SS2-C	3590.7	3637.2	3646.5	3624.8

			Outlet					
66.	20/7/2024	Composite	MEE feed Tank 03 and 04 outlet	V3-SS3-C	2860.9	2843.5	2947.8	2884.1
67.	20/7/2024	Composite	Primary Settling tank Outlet	V3-SS4-C	1940.4	2025.5	2008.5	1991.5
68.	20/7/2024	Composite	Secondary Settling tank 01 outlet	V3-SS5-C	666.1	643.3	623.7	644.4
69.	20/7/2024	Composite	Secondary Settling tank 02 outlet	V3-SS6-C	465.5	430.5	456.7	450.9
70.	20/7/2024	Composite	RO inlet at RO settler	V3-SS7-C	404.9	409.8	427.8	414.2
71.	20/7/2024	Composite	RO reject	V3-SS8-C	643.1	667.7	664.6	658.5
72.	20/7/2024	Composite	RO permeate	V3-SS9-C	26.7	26.4	26.9	26.7

Particle size analysis of water samples collected from R.O. (Permeate Tank) at ETP of Morepen Laboratories Ltd Masulkhana: Dynamic Light Scattering (DLS) is essential for evaluating the effectiveness of tertiary treated water, particularly in analyzing the size distribution of particles or colloids in the water. Also known as Photon Correlation Spectroscopy, DLS measures the Brownian motion of particles by examining fluctuations in scattered light. The rate of this motion is indicative of particle size. DLS provides detailed information on the particle size distribution in tertiary treated water, detecting particles ranging from nanometers to micrometers. This is crucial for understanding the nature of suspended particles or colloids present. By analyzing particle size distribution, DLS helps monitor the efficiency of tertiary treatment processes, assessing whether these methods effectively reduce the size and concentration of particles. Additionally, DLS is valuable for evaluating the potential environmental impact of treated water discharge. It identifies any residual particulate matter in the water that could pose ecological risks. The overall quality of treated water is often linked to the presence and characteristics of suspended particles, and DLS contributes by offering insights into their size and distribution.

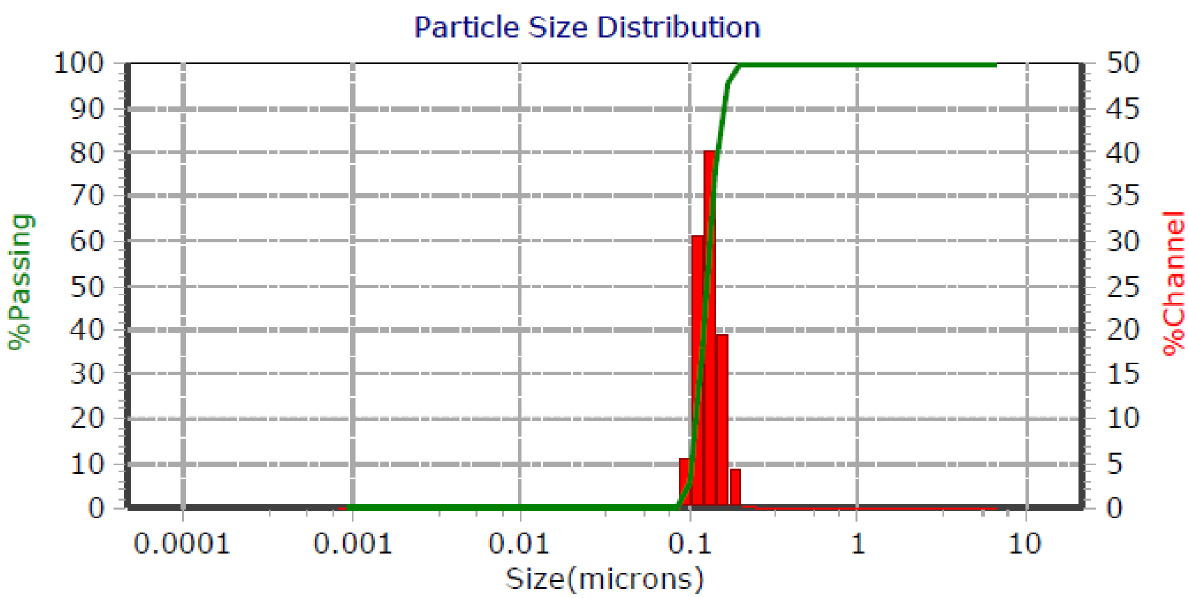

Figure 2B.9 DLS analysis for particle size determination of the sample collected as grab sample of the Morning of 10/06/2024 from R.O. (Permeate Tank).

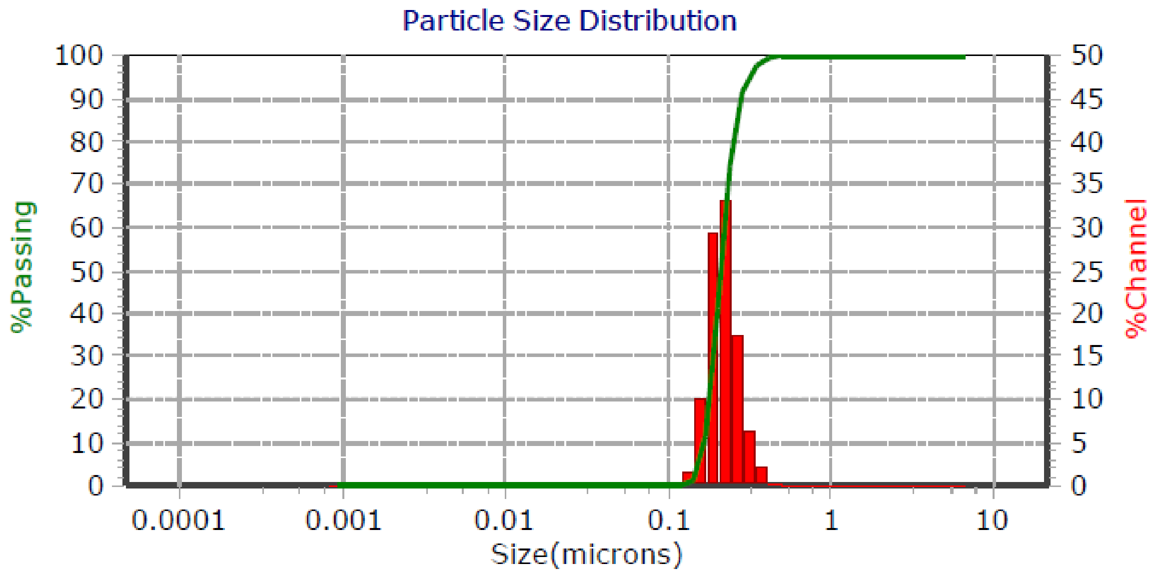

Figure 2B.10 DLS analysis for particle size determination of the sample collected as grab sample of the Afternoon of 10/06/2024 from R.O. (Permeate Tank).

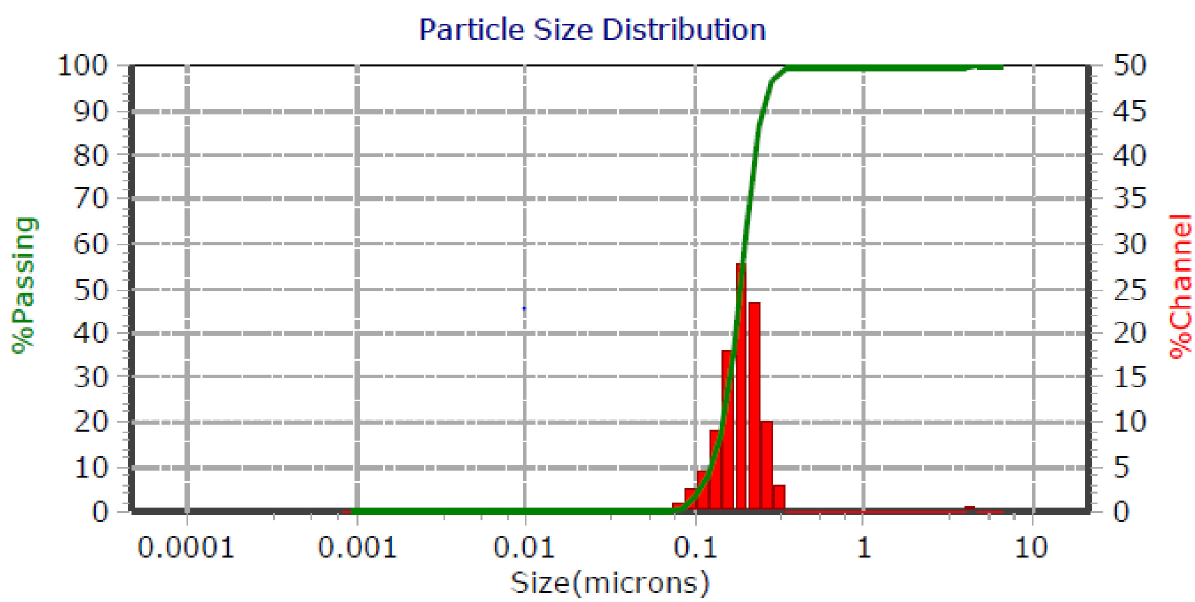

Figure 2B.11 DLS analysis for particle size determination of the sample collected as grab sample of the Evening of 10/06/2024 from R.O. (Permeate Tank).

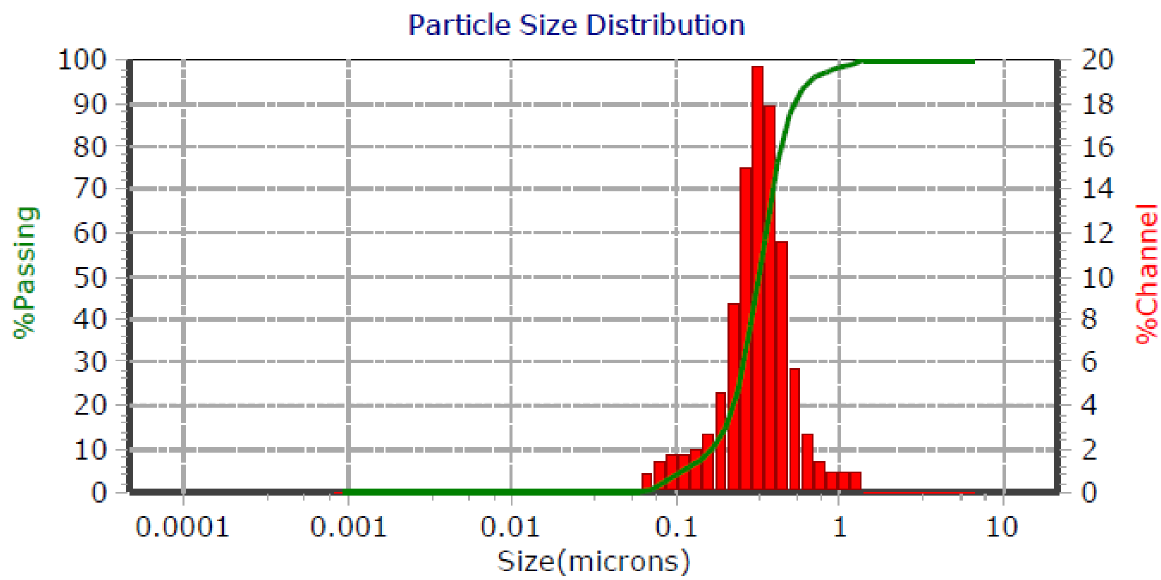

Figure 2B.12 DLS analysis for particle size determination of the sample collected as composite of 10/06/2024 from R.O. (Permeate Tank).

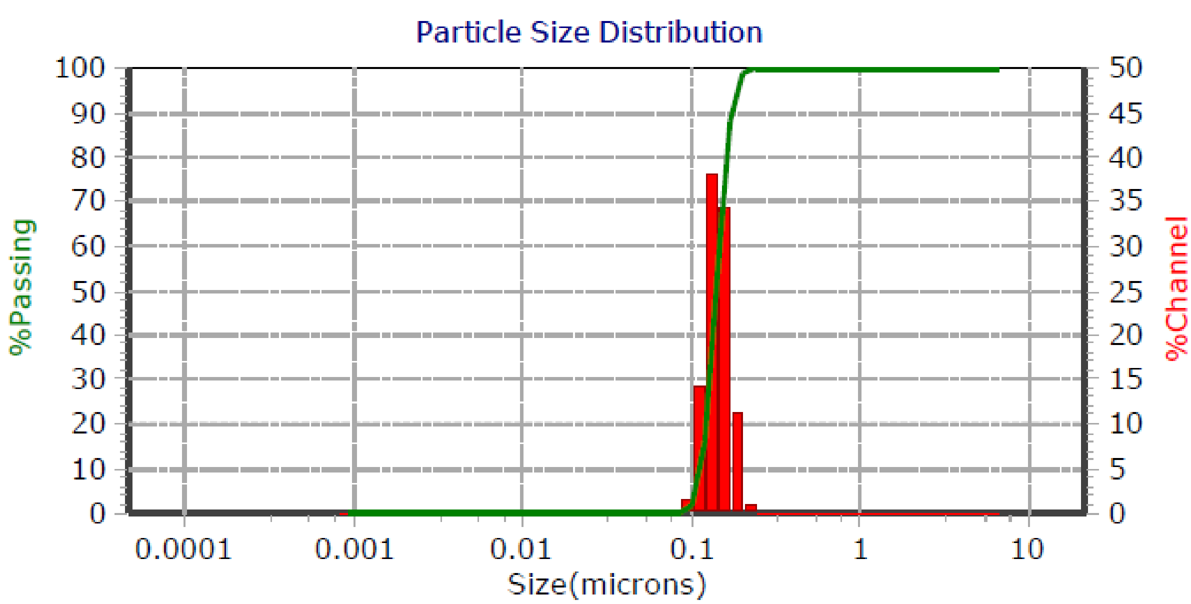

Figure 2B.13 DLS analysis for particle size determination of the sample collected as grab sample of the Morning of 20/07/2024 from R.O. (Permeate Tank).

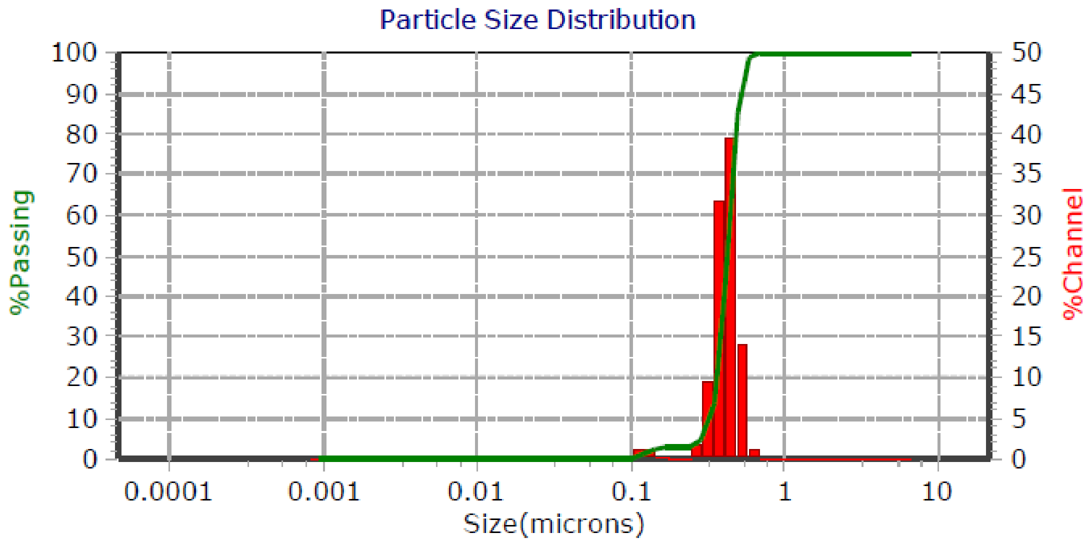

Figure 2B.14 DLS analysis for particle size determination of the sample collected as grab sample of the Afternoon of 20/07/2024 from R.O. (Permeate Tank).

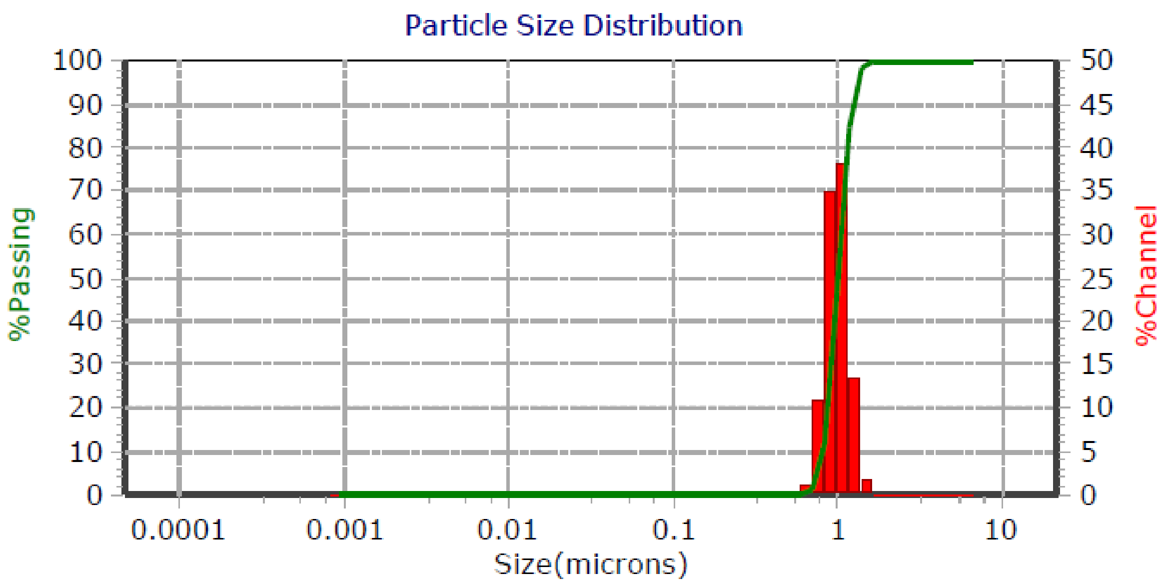

Figure 2B.15 DLS analysis for particle size determination of the sample collected as grab sample of the Evening of 20/07/2024 from R.O. (Permeate Tank).

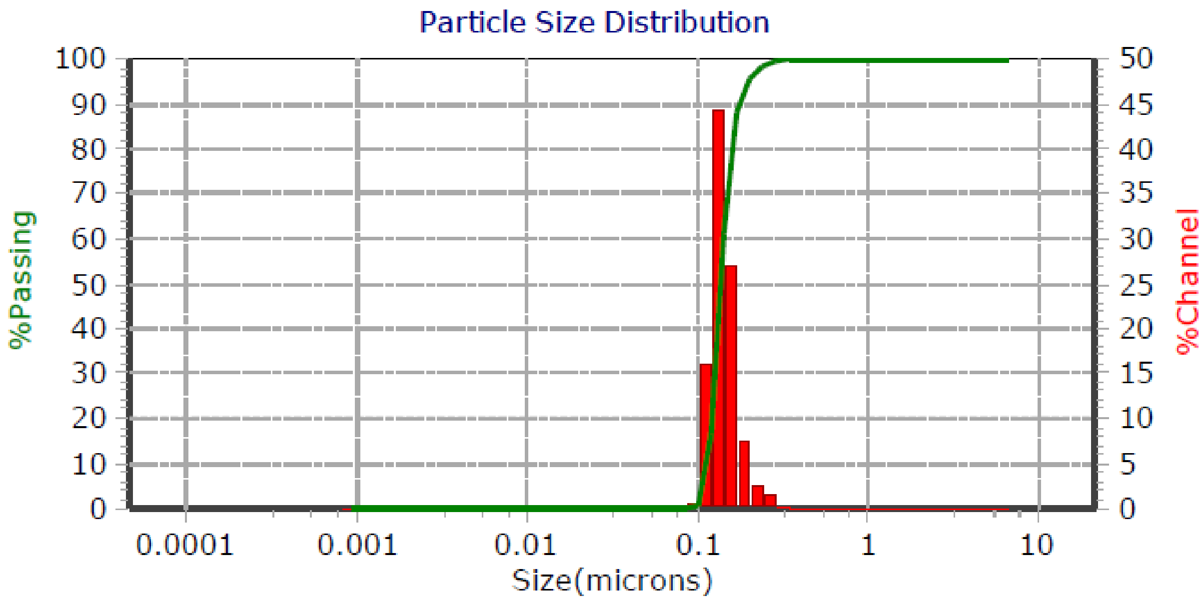

Figure 2B.16 DLS analysis for particle size determination of the sample collected as composite sample of 20/07/2024 from R.O. (Permeate Tank).

Functional groups analysis materials present in the water samples collected from R.O. (Permeate Tank) at ETP of Morepen Laboratories Ltd. Masulkhana: In water analysis for Effluent Treatment Plants (ETPs), Infrared (IR) spectroscopy is a crucial analytical method for examining the composition of water samples. IR spectroscopy operates on the principle that different chemical bonds absorb infrared radiation at specific frequencies. This technique identifies functional groups in organic compounds present in the water sample, such as hydroxyl (-OH), carbonyl (C=O), and amino (-NH2), each of which has unique absorption peaks. The IR spectra reveal the concentration of these compounds by analyzing the intensity of these absorption bands, allowing for a quantitative assessment of both organic and inorganic components. IR spectroscopy is particularly effective for detecting organic contaminants, such as oils, solvents, and other pollutants, by analyzing their distinctive absorption peaks.

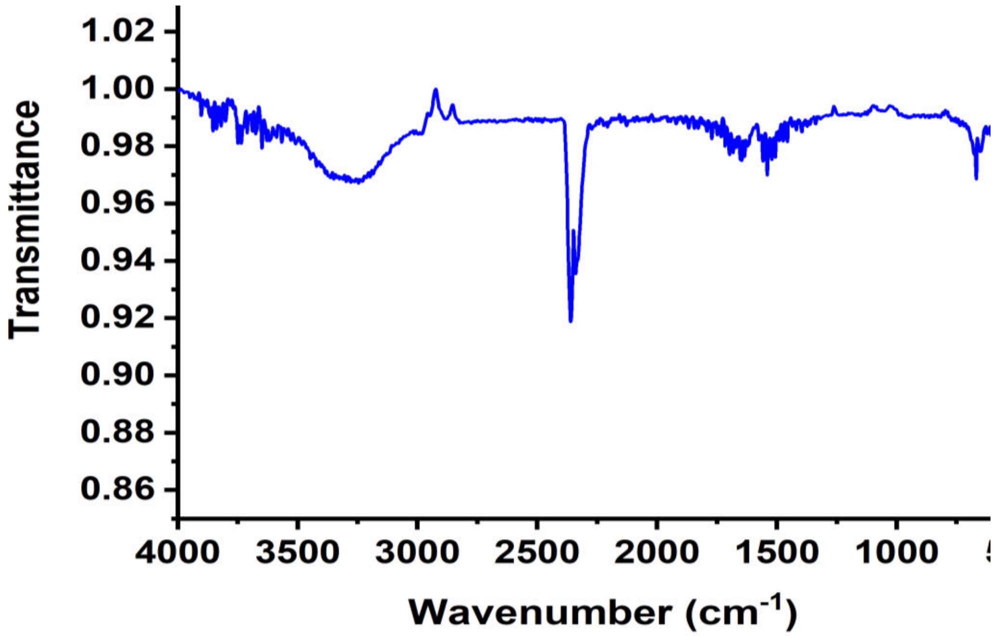

Figure 2B.17 IR Spectroscopic analysis for functional group determination of the sample collected (pre-concentrated through SPME) as grab sample of the Morning of 10/06/2024 from R.O. (Permeate Tank).

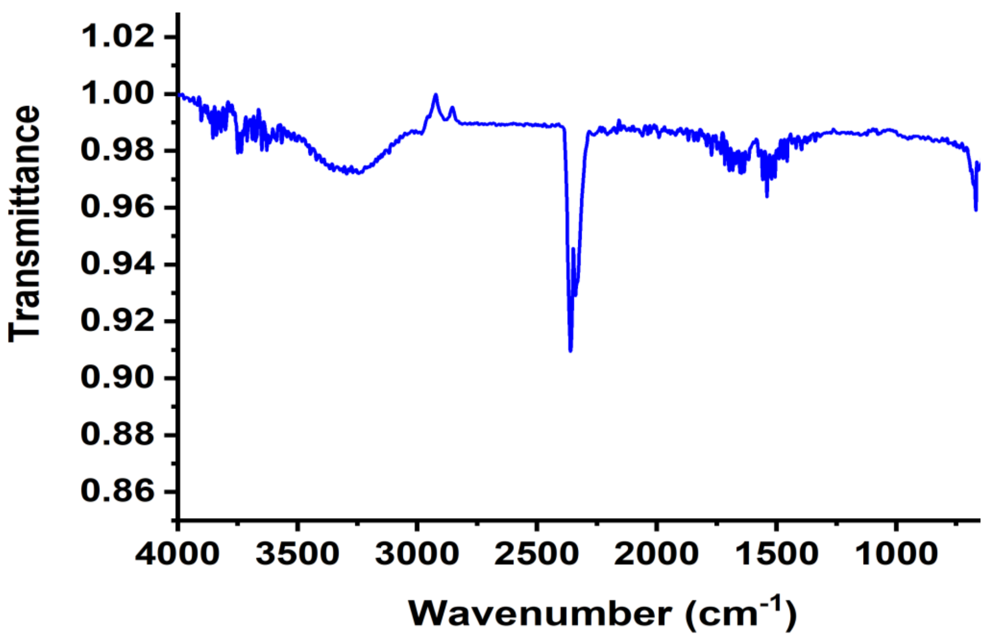

Figure 2B.18 IR Spectroscopic analysis for functional group determination of the sample collected (pre-concentrated through SPME) as grab sample of the Afternoon of 10/06/2024 from R.O. (Permeate Tank).

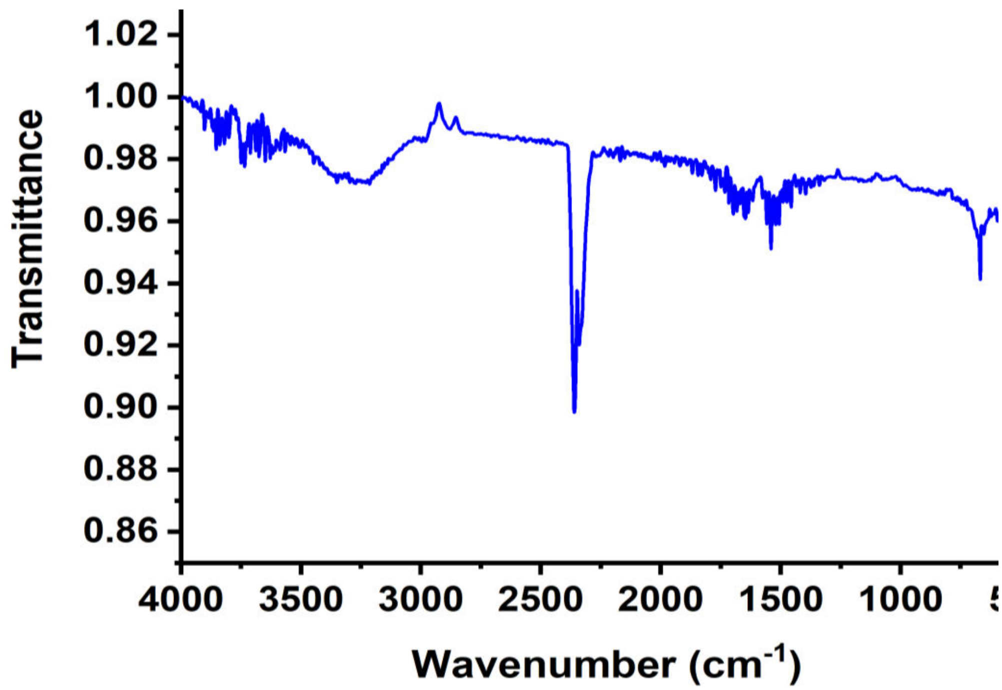

Figure 2B.19 IR Spectroscopic analysis for functional group determination of the sample collected (pre-concentrated through SPME) as grab sample of the Evening of 10/06/2024 from R.O. (Permeate Tank).

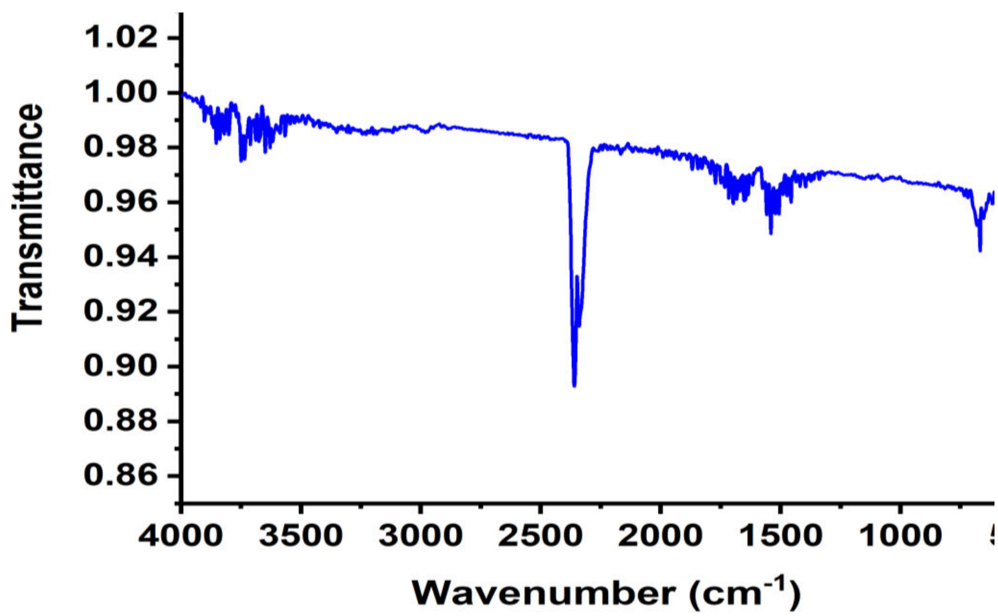

Figure 2B.20 IR Spectroscopic analysis for functional group determination of the sample collected (pre-concentrated through SPME) as composite sample of 10/06/2024 from R.O. (Permeate Tank).

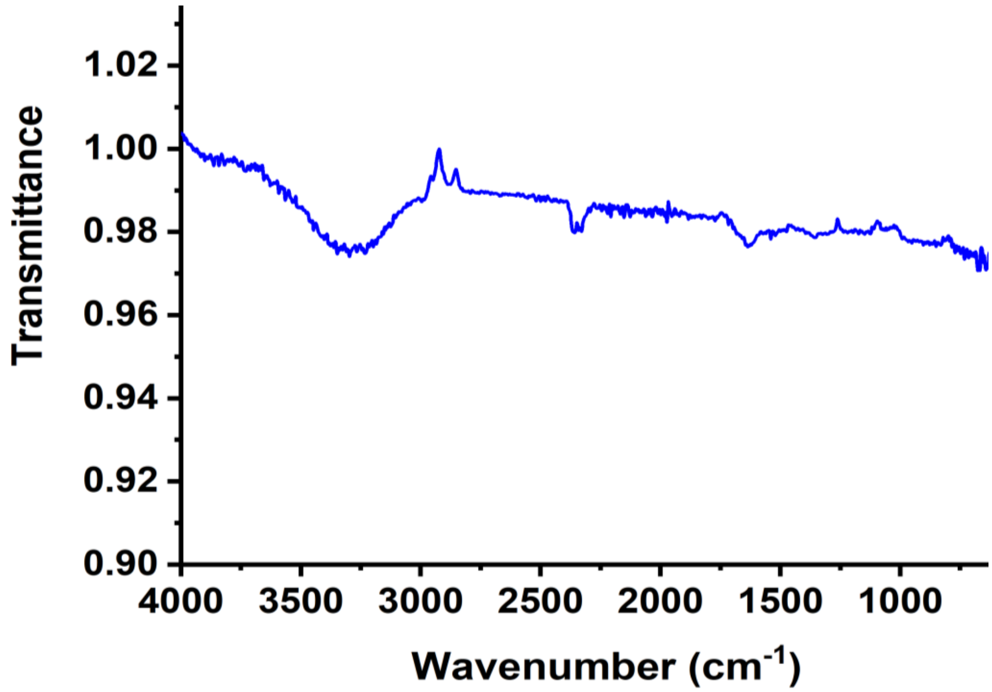

Figure 2B.21 IR Spectroscopic analysis for functional group determination of the sample collected (pre-concentrated through SPME) as grab sample of the Morning of 20/07/2024 from R.O. (Permeate Tank).

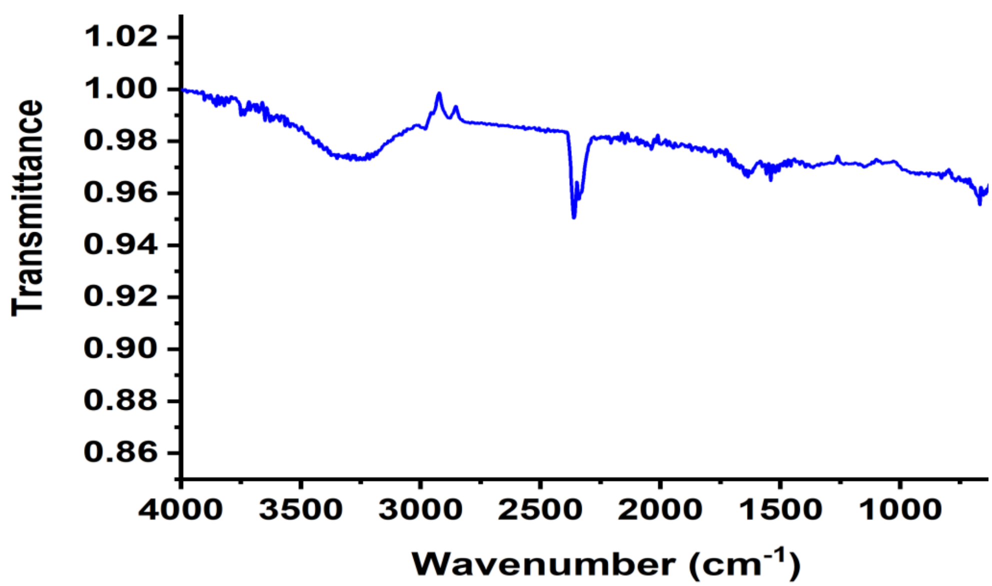

Figure 2B.22 IR Spectroscopic analysis for functional group determination of the sample collected (pre-concentrated through SPME)as grab sample of the afternoon of 20/07/2024 from R.O. (Permeate Tank).

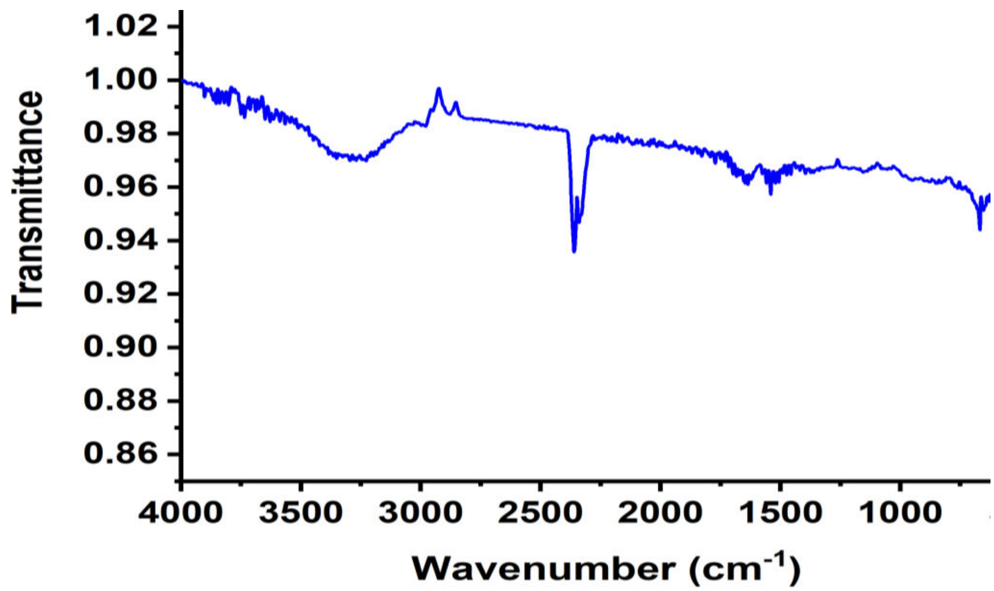

Figure 2B.23 IR Spectroscopic analysis for functional group determination of the sample collected (pre-concentrated through SPME) as grab sample of the Evening of 20/07/2024 from R.O. (Permeate Tank).

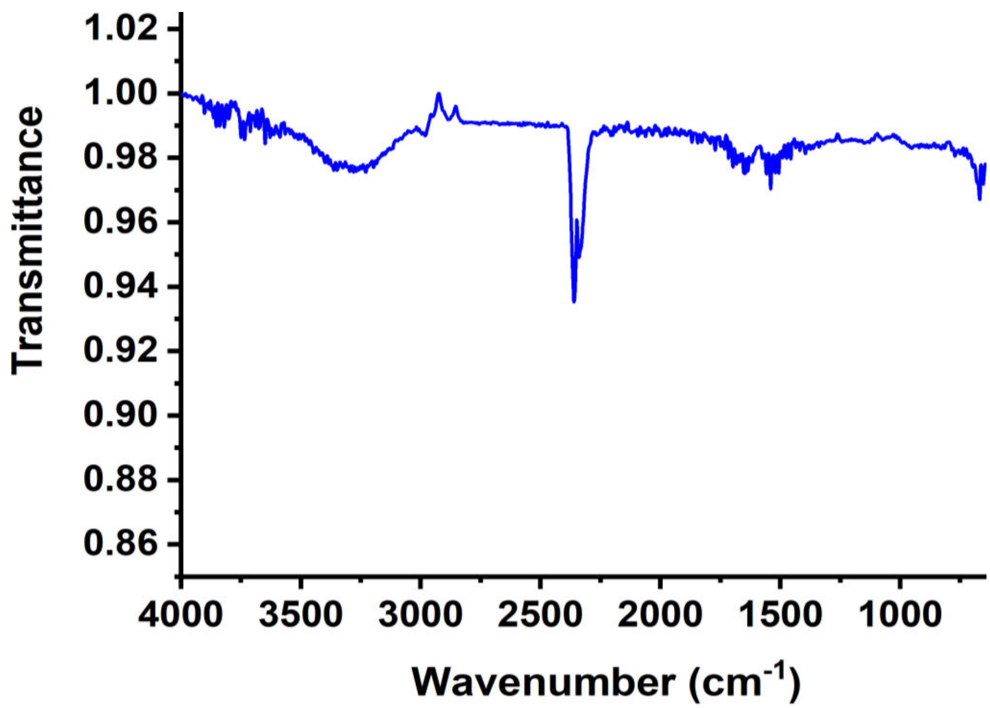

Figure 2B.24 IR Spectroscopic analysis for functional group determination of the sample collected (pre-concentrated through SPME) as composite sample of 20/07/2024 from R.O. (Permeate Tank).

UV-Vis Absorption Spectroscopy and Water Quality: UV-Vis absorption spectroscopy is a robust analytical method used to evaluate the quality of treated water after treatment. This technique measures how ultraviolet (UV) and visible (Vis) light is absorbed by chemical substances in the water, offering insights into the concentration of specific compounds. The method operates on the principle that molecules absorb light within the UV-Vis spectrum as electrons move from lower to higher energy levels. The specific patterns of light absorption are indicative of particular chemical bonds, enabling the identification and quantification of various substances in the water. UV-Vis spectroscopy is especially effective for detecting and quantifying organic compounds such as humic substances and dissolved organic matter, which can affect water quality. Absorption peaks in the UV range can reveal the presence of aromatic compounds, helping to evaluate how well the water treatment process removes these contaminants. Additionally, UV-Vis spectroscopy is useful for assessing water color and turbidity, as high absorbance in the visible spectrum may suggest the presence of particulate matter or colloidal substances.

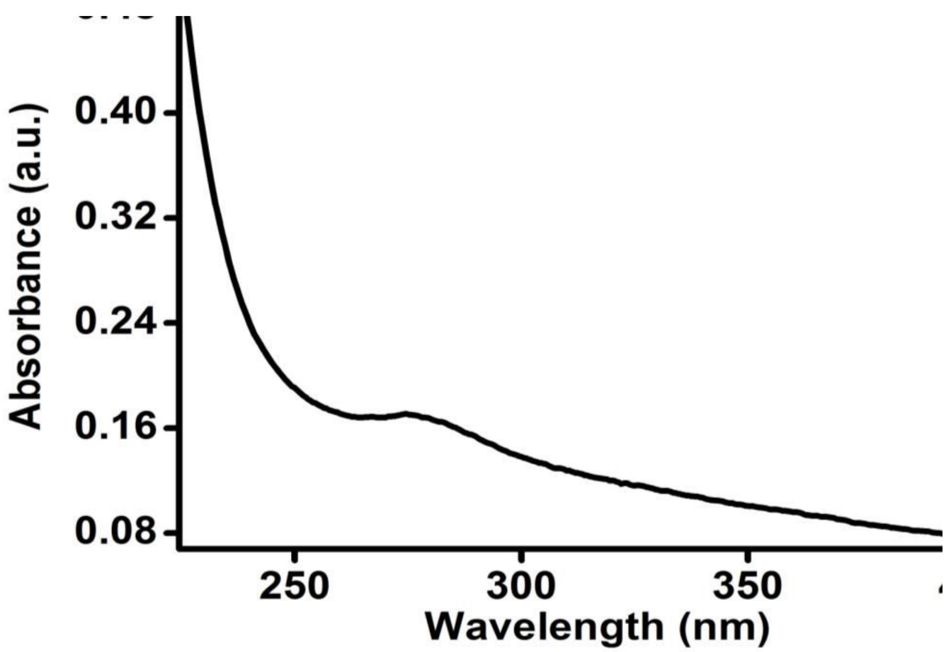

Figure 1B.25 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Morning of 10/06/24 from R.O. (Permeate Tank).

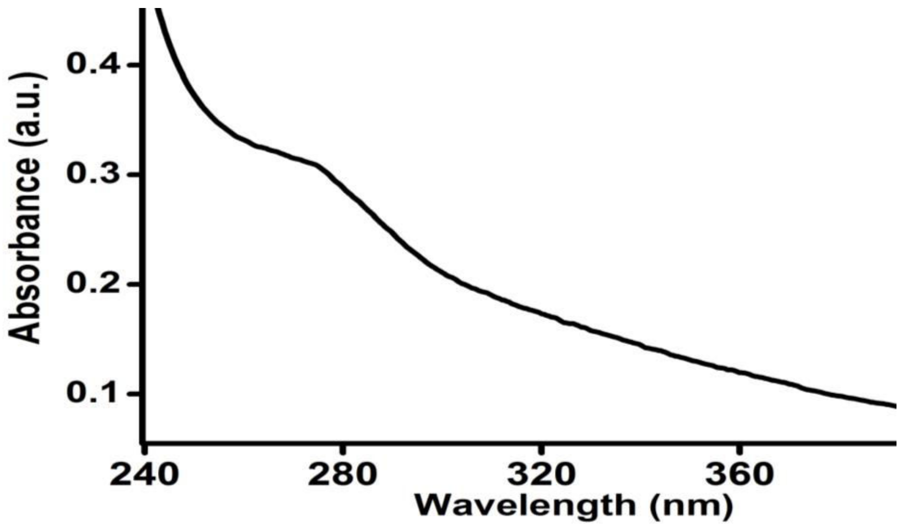

Figure 1B.26 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Afternoon of 10/06/24 from R.O. (Permeate Tank).

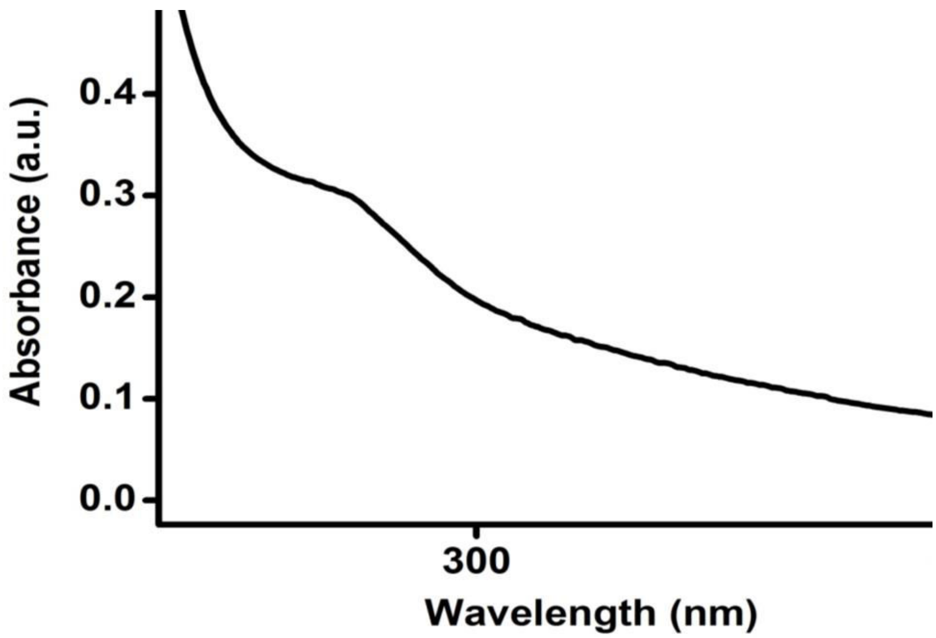

Figure 1B.27 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Evening of 10/06/24 from R.O. (Permeate Tank).

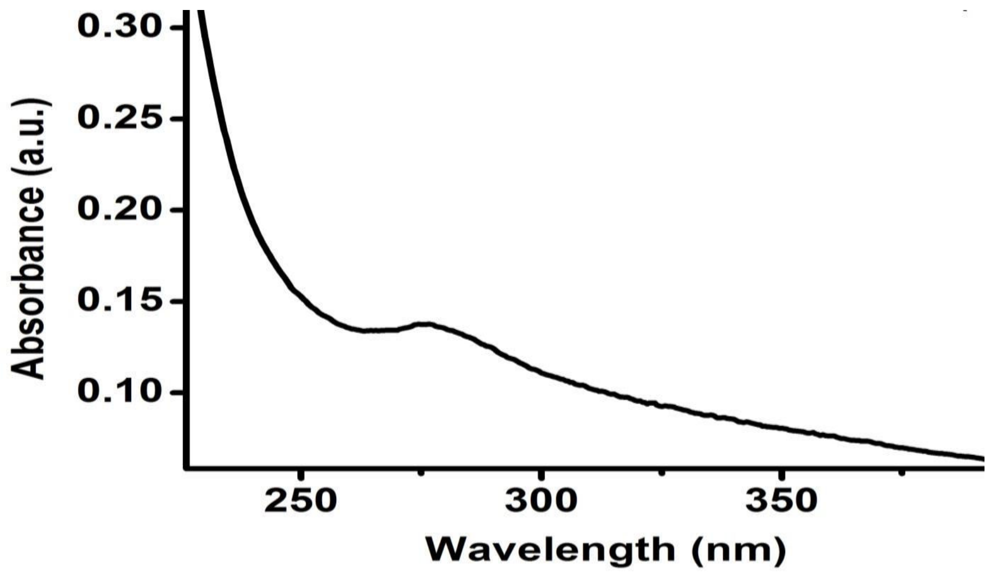

Figure 1B.28 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as composite sample of 10/06/24 from R.O. (Permeate Tank).

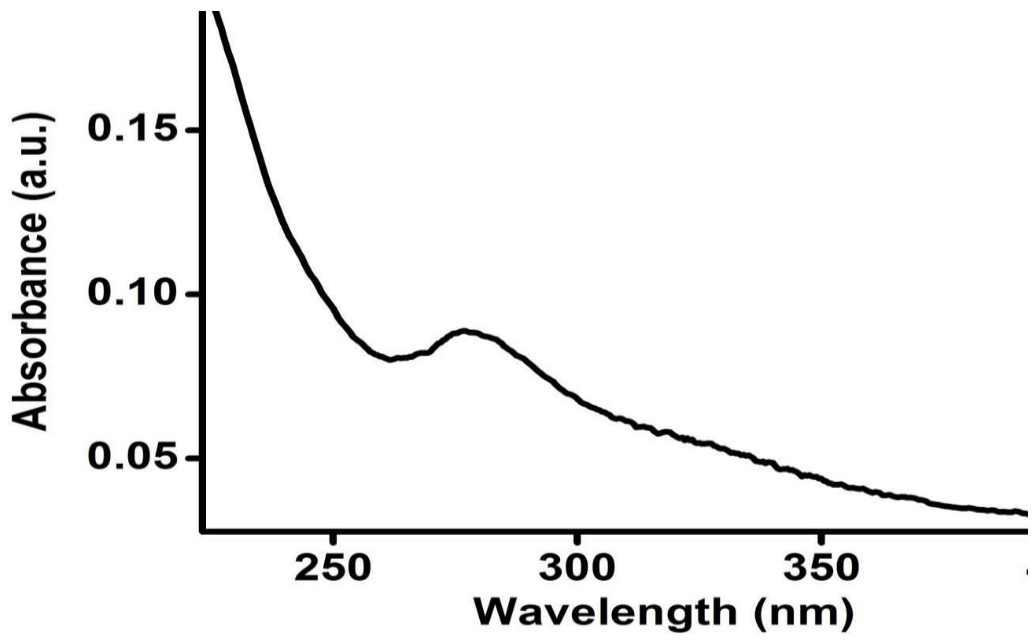

Figure 1B.29 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Morning of 20/07/24 from R.O. (Permeate Tank).

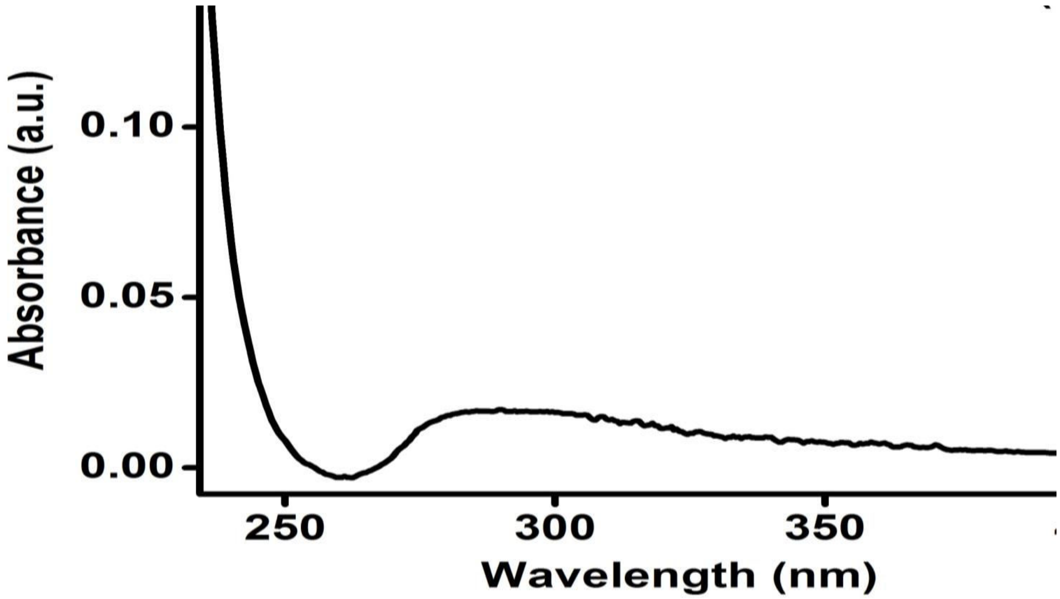

Figure 1B.30 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Afternoon of 20/07/24 from R.O. (Permeate Tank).

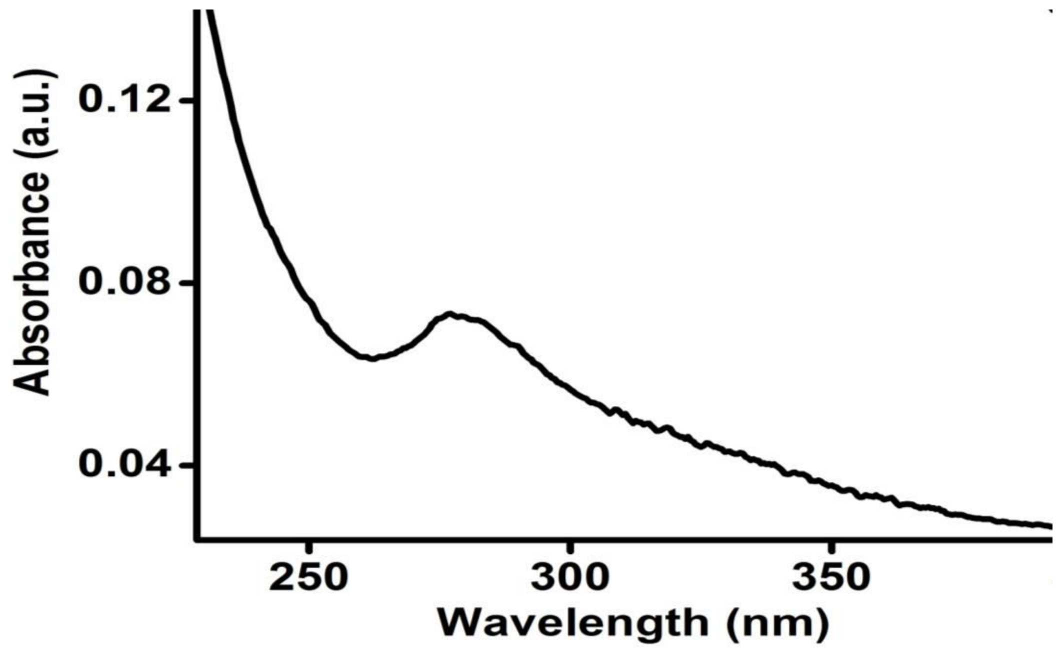

Figure 1B.31 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as grab sample of the Evening of 20/07/24 from R.O. (Permeate Tank).

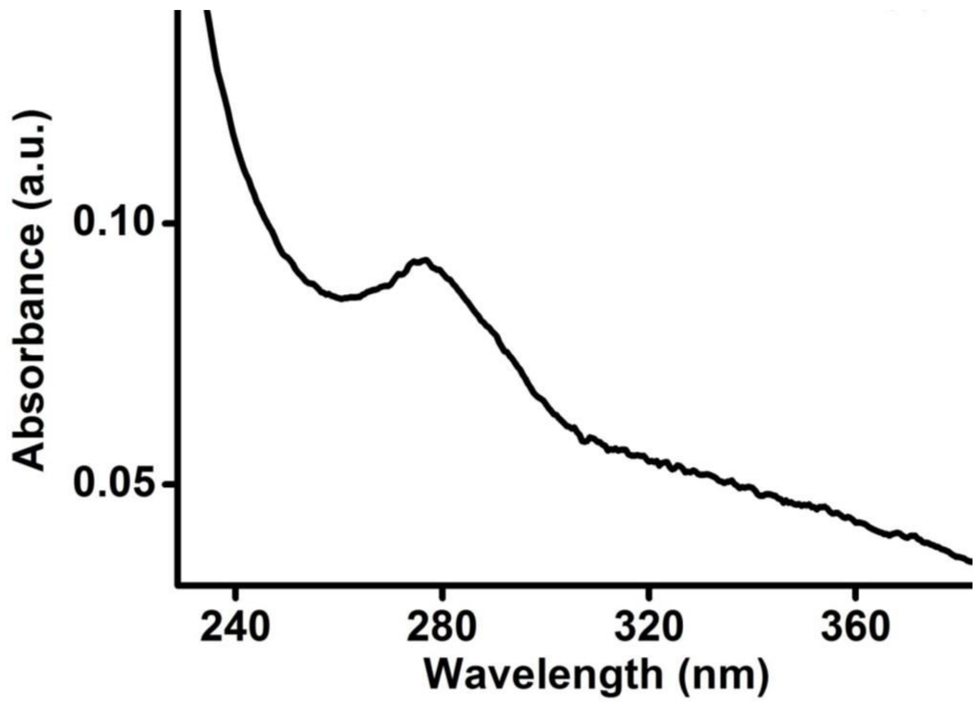

Figure 1B.32 UV-Vis Absorption Spectroscopic analysis (pre-concentrated through SPME) for the sample collected as composite sample of 20/07/24 from R.O. (Permeate Tank).

CONCLUSION

Morepen Laboratories Ltd., Masulkhana has embarked on a transformative journey towards sustainable development through strategic enhancements across its Effluent Treatment Plant (ETP). The comprehensive upgrades in pretreatment, Multi Effect Evaporator (MEE) optimization, Activated Sludge Process (ASP) improvements, and advanced Reverse Osmosis (RO) technology underscore their proactive stance in meeting stringent regulatory standards and preparing for future environmental challenges. The initial phase of sampling highlighted critical areas necessitating immediate attention to align with environmental norms. Collaborating with academic institutions like PU Chandigarh and IIT Ropar for further analysis provided invaluable insights that guided subsequent improvements. These efforts culminated in a robust framework aimed at achieving Zero Liquid Discharge (ZLD) and ensuring sustainable water management practices. Pretreatment initiatives, including the installation of a Primary Tube Settler (PST) and Screw Dewatering Machine, have significantly enhanced the removal of suspended solids and organic matter. This has been pivotal in stabilizing effluent flow rates and reducing Total Dissolved Solids (TDS) to below 200 mg/L, thus optimizing downstream treatment processes and minimizing environmental impact. Optimizations in the MEE, such as advanced steam flow control and vacuum stabilization measures, have improved evaporation rates and energy efficiency. The separate cooling water systems for the ATFD and MEE condenser further underscore Morepen Laboratories Ltd mucommitment to minimizing resource consumption while maximizing operational efficiency. Enhancements in the ASP, marked by increased sampling frequency and the introduction of bioenzymes, have fostered robust microbial activity critical for organic pollutant degradation. This has resulted in treated water with BOD levels below 30 mg/L and COD levels below 240 mg/L, surpassing regulatory requirements and ensuring environmental compliance. The deployment of advanced RO technology, featuring precise pH control and optimized chemical dosing, has further bolstered water quality by reducing turbidity and effectively removing harmful contaminants. The recycling of RO permeate within the polisher unit not only conserves freshwater resources but also minimizes wastewater discharge, reinforcing Morepen Laboratories Ltd commitment to sustainable water management practices. These systematic upgrades not only align the ETP with current environmental standards but also fortify its resilience against future challenges. By adopting a holistic approach to wastewater treatment, Morepen Laboratories Ltd has not only safeguarded environmental health but also bolstered operational efficiency and sustainability across its facilities. Looking ahead, continual monitoring and adaptation will be crucial to maintaining these high standards and adapting to evolving regulatory requirements. Morepen Laboratories Ltd proactive stance and collaborative efforts with academic partners exemplify a commitment to innovation and responsible corporate citizenship in environmental stewardship. These efforts set a benchmark for industry peers, demonstrating that environmental sustainability and business success can go hand in hand.

In short, Morepen Laboratories Ltd., Masulkhana's ETP transformation stands as a testament to the power of strategic planning, technological innovation, and collaborative partnerships in achieving sustainable development goals. This journey highlights their operational excellence, and long-term corporate sustainability. As they continue to lead by example, they inspire others in the industry to prioritize environmental stewardship and embrace sustainable practices for a healthier future.

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Photographs

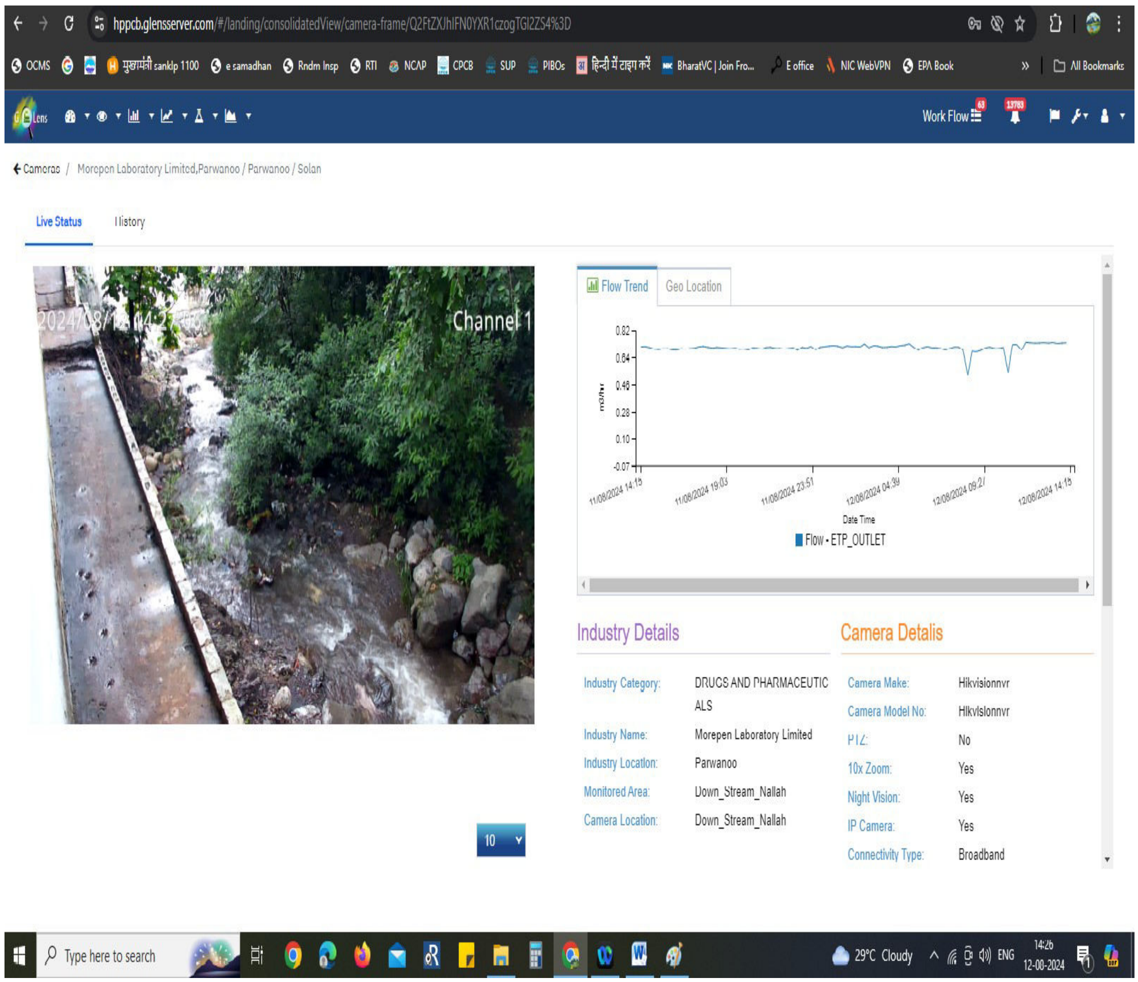

Photo-P1: Photograph of the footage of live streaming to the State Board server

Photo-P2: CCTV camera focussed on Nallah installed at the main gate of the unit

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Photo-P3: Reservoir of capacity 20 KL for the storage of first half hour rain

Photo-P4: Photograph of piezometer

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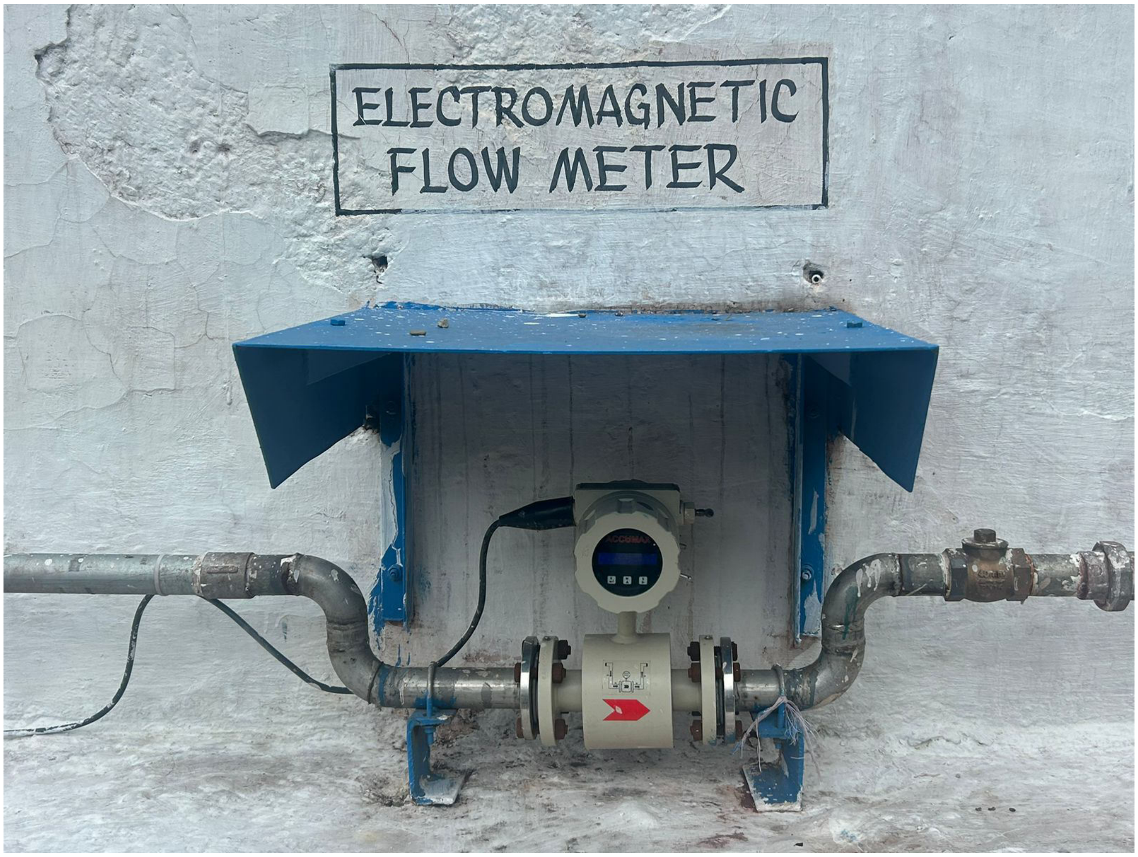

Photo-P5: Photograph of electromagnetic flow meter