UWR Rainwater Offset Unit Standard

(UWR RoU Standard)

Concept & Design: Universal Water Registry

www.uwaterregistry.io

Project Concept Note & Monitoring Report

(PCNMR)

Project Name: Water Recycling Project by Aaditiya Aswin Paper Mills Private Limited

UWR RoU Scope:5

Monitoring Period: 01/04/2015-31/12/2024

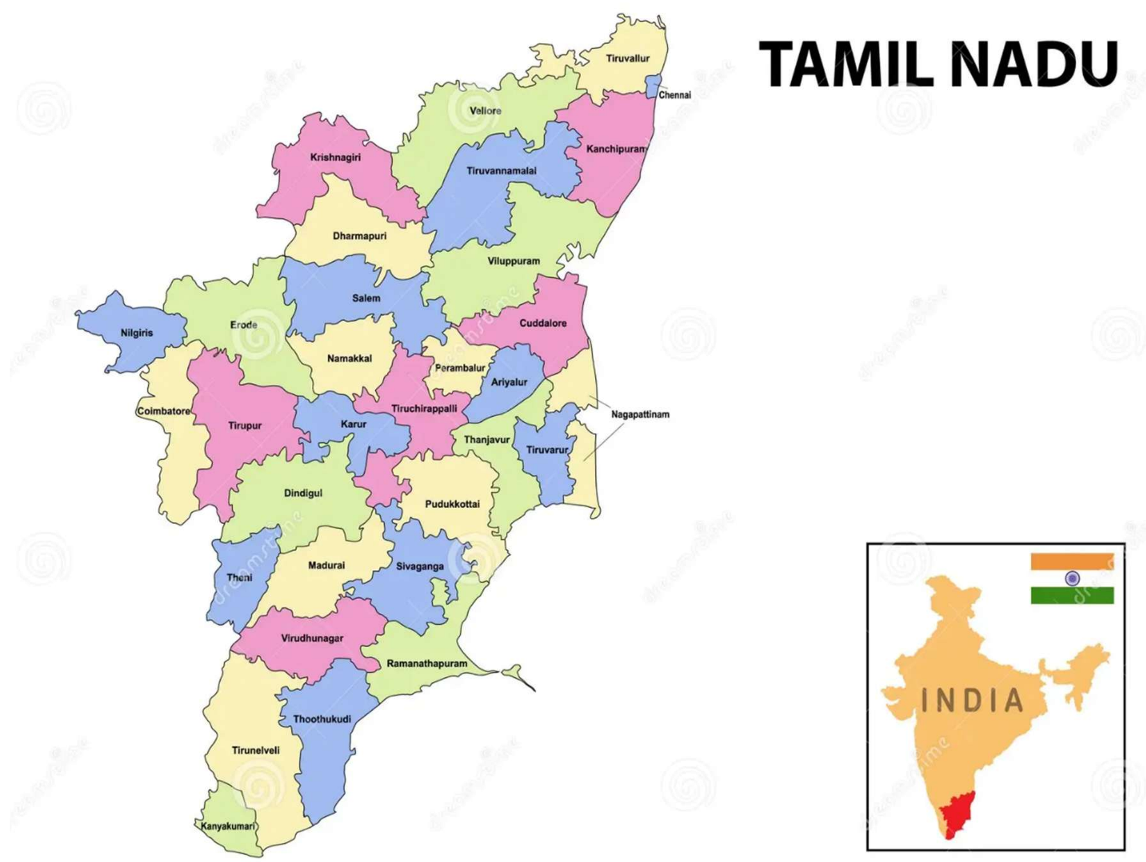
Crediting Period: 01/04/2015-31/12/2024

UNDP Human Development Indicator: 0.685 [1](India)

[1] https://hdr.undp.org/data-center/human-development-index#/indicies/HDI

A.1 Location of Project Activity

State	Tamil Nadu
District	Erode
Block Basin/Sub Basin/Watershed	Please refer to. http://cgwb.gov.in/watershed/basinsindia.html
Lat. & Longitude	11.496164621989637, 77.1571638270658
Area Extent	
No. of Villages/Towns	Ikkaraithathapalli Village, Sathyamangalam Taluk



<u>Geographical Map of Project Location</u>

Category of the Industry :

RED

CONSENT ORDER NO. 2405158914100 DATED: 02/09/2024.

PROCEEDINGS NO.T1/TNPCB/F.0308PND/RL/PND/W/2024 DATED: 02/09/2024

SUB: Tamil Nadu Pollution Control Board –CONSENT TO OPERATE – DIRECT -M/s. AADITIYA ASWIN PAPER MILLS PRIVATE LIMITED , S.F.No. 58, 59, 60, 61, 62, 63/1&2, 64,65p, 66p, 67p, 68p, 233/1,2,3,5, IKKARAITHATHAPALLI village Sathyamangalam Taluk and Erode District - Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg. (Industry User ID- R15PND2097441)

Ref: 1. CTO Proceedings No. DEE / TNPCB / ERD / FS320062 / W&A / 2008, dated: 21/04/2008
2. RCO Proceedings No. T2 / TNPCB / F.0308PND / RL / PND / W&A / 2023, dated: 15/06/2023
3. Unit's Application No58914100, dated: 05.04.2024
4. IR. No : F.0308PND / RL / AE / PND / 2024, dated 29/07/2024

CONSENT TO OPERATE is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Managing Director
M/s . AADITIYA ASWIN PAPER MILLS PRIVATE LIMITED
S.F No. 58, 59, 60, 61, 62, 63/1&2, 64,65p, 66p, 67p, 68p, 233/1,2,3,5
IKKARAITHATHAPALLI Village
Sathyamangalam Taluk
Erode District.

Authorising the occupier to make discharge of sewage and /or trade effluent.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This CONSENT is valid for the period ending **March 31, 2026**

R SARASAVANI

Digitally signed by R SARASAVANI
Date: 2024.09.04 11:29:59 +05'30'

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

<u>Consent to Operate Report dated 02/09/2024</u>

A.2. Project owner information, key roles, and responsibilities

Project Proponent (PP):	**Aaditiya Aswin Paper Mills Private Limited**
UCR Project Aggregator	Viviid Emissions Reductions Universal Private Limited
Contact Information:	lokesh.jain@viviidgreen.com

Aaditiya Aswin Paper Mills Private Limited operates an integrated Effluent Treatment Plant (ETP) within its paper manufacturing facility located in Sathyamangalam, Tamil Nadu. The plant is designed to manage and treat effluent generated from its 100% recycled paper production process, ensuring environmentally responsible water management in line with industry best practices.

The project owner holds exclusive water user rights within the project boundary and possesses undisputed legal title to the land on which the ETP is established. These entitlements enable the company to independently manage water intake, effluent treatment, and reuse infrastructure. The project is situated within the company's industrial premises, enabling streamlined operations and regulatory compliance.

With a total capital investment estimated between ₹12 to ₹20 Crores, the project encompasses key components such as design, construction, advanced treatment technology installation, commissioning, and environmental permitting. The company has either secured or applied for all necessary statutory approvals including those mandated by the Tamil Nadu Pollution Control Board ensuring adherence to the Water (Prevention & Control of Pollution) Act and other applicable environmental laws.

This initiative represents a long-term commitment to sustainable industrial operations through the treatment and reuse of effluent water. By integrating closed-loop practices and advanced effluent management, Aaditiya Aswin Paper Mills Private Limited demonstrates environmental stewardship aligned with both national regulations and global sustainability goals.

A.2.1 Project RoU Scope

PROJECT NAME	**Water Recycling Project by Aaditiya Aswin Paper Mills Private Limited**
UWR Scope:	Scope 5: Conservation measures taken to recycle and/or reuse water, spent +washing wastewater etc. across or within specific industrial processes and systems, including

	wastewater recycled/ reused in a different process, but within the same site or location of the project activity. Recycled wastewater used in off-site landscaping, gardening or tree plantations/forests activity are also eligible under this Scope.
Date PCNMR Prepared	30/07/2025

A.3. Land use and Drainage Pattern

Not Applicable.

This project activity involves treating and reusing wastewater. It does not include any land-use practices. Also, this is an industrial process designed with technical requirements and following the specified norms of the local pollution control board. Hence, the project activity does not harm any land and Drainage system**.**

A.4. Climate

The operations of the CETP are fully mechanized and located within a covered plant infrastructure. Thus, weather conditions such as temperature and humidity do not impact the process.

All treatment units (biological, filtration, RO, evaporation) function independently of climatic variables. Hence, operational consistency is maintained year-round.

A.5. Rainfall

The facility is designed for effluent treatment and is not dependent on rainwater. Rainwater harvesting is not integrated into this facility as water is derived from industrial operations. Proper drainage channels are installed to prevent rainwater ingress into effluent channels.

A.6. Ground Water

The project activity does not draw water from the ground water reservoirs as it treats and reuses wastewater.

A.7. Alternate methods

The selection of solar evaporation pans by Aaditiya Aswin Paper Mills Private Limited to manage boiler blow-down effluent resulted from a comprehensive evaluation of local physical and hydrological conditions covering topography, rainfall, groundwater dynamics, aquifer conditions, land usage, and water availability at its Sathyamangalam facility in Tamil Nadu.

Regional Topography & Drainage
Sathyamangalam is situated along the eastern edge of the Western Ghats, featuring gently undulating terrain with limited natural drainage systems—stream networks are sparse and intermittent. This landscape results in minimal surface runoff during dry seasons, increasing the risk of localized pooling and making conventional land-based or stream discharge methods impractical.

Annual Rainfall & Groundwater Recharge
The area receives approximately 650 mm of rainfall annually, predominantly between October and December during the northeast monsoon. The limited distribution and heavy concentration of rainfall reduce effective aquifer recharge, which is further stressed by agricultural and industrial water extraction. GIS-based studies show a notable depletion in groundwater levels over the past decade, with water-tables rising from depths of ~12 m to under ~4 m in certain locations.

Groundwater Quality & Aquifer Status
Local bores yield moderately mineralized and non-potable water, with some zones exceeding safe thresholds for hardness, total dissolved solids, and chloride content. This compromised groundwater discourages dilution-based effluent treatment or freshwater-intensive disposal, highlighting the need for water-efficient and containment-centred solutions.

Regulatory Prohibitions on Surface Discharge
No perennial rivers are available nearby, and the TNPCB mandates strict prohibition of untreated or treated industrial effluent discharge into drains or surface media. Thus, all disposal methods must occur within the plant boundary, with zero discharge to the external environment.

Evaluation of Alternative Treatment Options

- **Zero Liquid Discharge (ZLD)** solutions combining reverse osmosis (RO), multi-effect evaporator (MEE), and crystallizers were reviewed. While ZLD could handle high-strength effluent, the solution was disproportionately expensive in capital, energy, and operational demands for the plant's scale.

- **Constructed Wetlands** were considered as a low-energy alternative yet were ruled out due to constraints in available land and inconsistent treatment performance of industrial effluent with variable COD and TDS levels.

Adoption of Solar Evaporation Pans

As documented in the TNPCB Consent to Operate, the plant routes 0.3 KLD of boiler blow-down effluent into solar evaporation pans, while 745 KLD of remaining process effluent is recycled internally or used for irrigation post-ETP treatment. The evaporation pans utilize solar heat to evaporate water from lined ponds, leaving behind concentrated residues that are periodically collected for regulated disposal.

Technical and Operational Benefits

1. **Cost-effectiveness**: Solar energy reduces operating costs; initial investment is modest compared to ZLD systems.
2. **Water Conservation**: Requires no freshwater for dilution, thus aligning with water-scarce conditions.
3. **Regulatory Compliance**: TNPCB-approved; evaporation pans use HDPE lining to ensure zero seepage, and stormwater controls prevent overflow.
4. **Operational Simplicity**: No complex machinery or power requirement manageable by existing plant staff.
5. **Scalability**: Design accommodates future integration of RO or thermal units if needed.

Given the site's semi-arid climate, limited drainage, declining and saline groundwater, regulatory discharge restrictions, and limited land availability, solar evaporation pans were the most pragmatic and sustainable solution for the limited boiler blow-down effluent. This setup conserves water adheres to regulatory norms and remains adaptable for future technological upgrades.

A.8. Design Specifications

The Effluent Treatment Plant (ETP) is designed to treat wastewater generated from paper and pulp industries, ensuring compliance with environmental regulations while enabling the reuse of treated water. The paper and pulp industry generates large volumes of wastewater containing high levels of organic matter, suspended solids, and chemical additives such as chlorine, lignin, and resins. The system integrates physical, chemical, and biological treatment processes to remove these contaminants, reduce pollutant levels, and produce high-quality effluent suitable for reuse or safe discharge. The treatment process is structured to handle variations in influent quality and flow rates, incorporating advanced separation, filtration, and sludge management technologies to optimize operational performance and environmental sustainability.

Process Flow and Components

1. Collection Tank

The Collection Tank serves as the primary holding unit where wastewater from various sources in the paper and pulp production process is accumulated. This tank facilitates flow equalization, ensuring a steady inflow to the treatment process and preventing hydraulic shocks. It is equipped with level sensors and flow meters for real-time monitoring, and initial screening removes large floating debris such as wood fibres, pulp residues, and other coarse contaminants that could hinder downstream treatment units.

2. Krofta Sedicell (Dissolved Air Flotation - DAF)

Following collection, wastewater enters the Krofta Sedicell SDC-18, an essential component that utilizes Dissolved Air Flotation (DAF) and sedimentation for solid separation. In this process, air is dissolved under high pressure in water and then released at atmospheric pressure within the Sedicell, forming fine microbubbles that attach to suspended particles such as wood fibres, lignin, and ink residues. These buoyant particles rise to the surface, where they are removed using the Spiral Scoop Mechanism, while heavier solids settle and are scraped into sumps for controlled removal. The Sedicell operates with a flow capacity of 110 m^3/hr, an air injection pressure of 6 bar, and an overall solids removal efficiency of 85-95%. This process ensures significant reduction in turbidity, organic loads, and particulate matter before the effluent proceeds to the next stage.

3. Primary Clarifier (I ry Clarifier)

The partially treated water then moves to the Primary Clarifier (I ry Clarifier), which allows for gravitational settling of heavier solids. The clarifier effectively reduces Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD) by retaining wastewater for a sufficient period to facilitate sedimentation. Given that paper and pulp effluent contain high concentrations of cellulose fibers and residual chemicals, this stage is critical in reducing organic load. Sludge collected at the bottom is removed and directed to the Drying Beds, while the clarified water advances to the biological treatment phase.

4. Aeration Tank

In the Aeration Tank, oxygen is introduced into the wastewater to support microbial breakdown of organic matter. Paper and pulp wastewater typically contains high organic loads, including lignin and starch, which require extended aeration for effective biodegradation. The Dissolved Oxygen (DO) concentration is maintained between 2-3 mg/L to optimize microbial activity and enhance the efficiency of biochemical oxidation. Microbial consortia specifically selected for breaking down lignin and wood-based organic compounds are introduced to improve efficiency.

5. Secondary Clarifier (II ry Clarifier)

The aerated water then enters the Secondary Clarifier (II ry Clarifier), where biological sludge formed in the aeration process is separated. A portion of this sludge is recycled back to the aeration tank to maintain an active microbial population, while the excess sludge, which may contain wood Fibers, lignin residues, and microbial biomass, is sent to the Drying Beds for dewatering. The clarified effluent is collected in the Treated Water Tank, where it undergoes final polishing to ensure compliance with discharge or reuse standards.

6. **Sand Filter**

Further purification is achieved through a Sand Filter, which removes residual suspended solids and fine particulates. This filter consists of multiple layers of graded sand that trap impurities as water percolates through. The filtration step is particularly important in paper and pulp industries to remove fine wood particles and any remaining colorants before the final treatment stage.

7. **Activated Carbon Filter**

The treated water then undergoes adsorption in the Activated Carbon Filter, which eliminates remaining organic contaminants, odours, and colour compounds, enhancing the overall water quality. In the case of bleached paper production effluent, this step is crucial in removing chlorinated organic compounds and dioxins that may be present due to the use of chlorine-based bleaching agents.

8. **Agri Tank**

The final treated water is stored in the Agri Tank, where it is monitored for suitability before being utilized for agricultural irrigation or artificial groundwater recharge. The treated water can be safely reused for non-potable applications such as forestry irrigation, cooling water, or process water in the paper manufacturing cycle.

Sludge Management System

A robust sludge management system is essential for handling by-products generated during the treatment process.

1. **Drying Bed**

Sludge from the primary and secondary clarifiers is directed to Drying Beds, where moisture is removed through natural evaporation. In paper and pulp effluent treatment, the sludge contains wood fibers, clay coatings, and chemical additives, making proper dewatering essential before disposal or reuse.

2. **Belt Press**

To further reduce sludge volume, a Belt Press applies mechanical pressure to extract additional water. The dewatered sludge can be recycled for secondary paper production, land application, or incineration for energy recovery.

3. **Board Unit**

   The dewatered sludge is then transferred to the Board Unit, where it is stabilized for final disposal or potential reuse. This system ensures that sludge is processed in an environmentally responsible manner, preventing secondary pollution and facilitating resource recovery.

Monitoring and Compliance

Maintaining operational efficiency and regulatory compliance requires continuous monitoring and periodic maintenance of treatment units. Automated control systems are integrated into the plant to provide real-time data collection and process optimization. Effluent parameters such as BOD, COD, pH, TSS, and turbidity are routinely tested to ensure compliance with environmental standards. Preventive maintenance schedules are followed for all equipment, including aerators, clarifiers, filters, and sludge processing units, to minimize downtime and sustain optimal performance.

A.9. Implementation Benefits to Water Security

Aaditiya Aswin Paper Mills Private Limited has implemented an effluent treatment strategy that directly supports local and onsite water security by reducing freshwater dependency and promoting reuse within the facility. The installation of an on-site Effluent Treatment Plant (ETP), along with designated solar evaporation pans for boiler blow-down, ensures controlled management of trade effluent and aligns with Tamil Nadu Pollution Control Board (TNPCB) discharge regulations.

Although no formal artificial recharge structures such as percolation ponds, injection wells, or recharge shafts have been installed to date, the facility's treated effluent reuse system indirectly contributes to water security by minimizing groundwater abstraction. Out of the total 745 KLD of process effluent generated, approximately 585 KLD is recycled internally without treatment, and the remaining 160 KLD is treated in the ETP and then applied on land for irrigation within the facility's premises. This land application not only supports greenbelt development but may also aid in incidental aquifer recharge through sub-surface infiltration, depending on local soil permeability.

In future phases, the company plans to enhance water conservation by integrating rooftop rainwater harvesting systems and evaluating the feasibility of constructing dedicated artificial recharge structures such as percolation pits or recharge trenches. These measures would supplement the groundwater table, especially in light of the declining aquifer status observed in the Sathyamangalam region.

Through its current practice of effluent recycling, on-land reuse, and low-discharge evaporation handling, the facility demonstrates a closed-loop water management approach. This reduces the burden on external freshwater sources and contributes positively to long-term water availability and aquifer stability in the local watershed.

A9.1 Objectives vs Outcomes

The primary objective of the effluent treatment initiative at Aaditiya Aswin Paper Mills Private Limited was to establish a closed-loop water management system aimed at reducing dependence on freshwater extraction, ensuring regulatory compliance, and promoting sustainable industrial operations within the water-stressed region of Sathyamangalam. The project was designed to efficiently treat and reuse process effluent, safely manage high-TDS boiler blow-down through environmentally appropriate solutions such as solar evaporation and eliminate the discharge of untreated or treated effluent into external land or water bodies. In doing so, the company also aimed to support internal greenbelt development and lay the groundwork for future water conservation infrastructure such as artificial recharge pits and rooftop rainwater harvesting systems.

Since the implementation of the ETP and solar evaporation pans, the outcomes have been significant. Around 585 KLD of process effluent is now directly recycled within the facility without treatment, while 160 KLD is treated through the ETP and reused for land irrigation, eliminating the equivalent demand for freshwater. Boiler blow-down effluent, approximately 0.3 KLD, is effectively managed through solar evaporation pans, preventing the risk of salinity contamination and ensuring safe disposal. The reuse of treated effluent for irrigation has also improved vegetation cover within the plant boundary, contributing to soil moisture retention and potential sub-surface recharge. As a result, the facility has reduced its dependency on borewell sources and strengthened its resilience against seasonal water scarcity.

Operationally, the project has ensured sustained compliance with Tamil Nadu Pollution Control Board regulations, with documented flow monitoring, treated effluent testing, and systematic logbook maintenance. The combined outcome has not only safeguarded the facility's operations from water-related disruptions but also positioned it as a low-discharge, resource-conscious industrial unit. Moving forward, the mill is exploring the integration of recharge trenches and rooftop rainwater harvesting as part of its long-term water stewardship strategy.

A9.2 Interventions by Project Owner / Proponent / Seller

To achieve the objectives of sustainable water management and regulatory compliance, Aaditiya Aswin Paper Mills Private Limited undertook a series of structured interventions as part of the effluent treatment project. The first step involved conducting a technical assessment of the facility's water consumption patterns, effluent characteristics, and discharge risks. This was followed by the design and implementation of a customized Effluent Treatment Plant (ETP) to treat up to 745 KLD of process effluent, based on the quality parameters prescribed by the Tamil Nadu Pollution Control Board (TNPCB). The plant layout included primary, secondary, and tertiary treatment stages, along with dedicated pipelines and flow meters to monitor water movement and ensure accurate tracking of reuse volumes.

Simultaneously, the company installed solar evaporation pans to manage 0.3 KLD of high-TDS boiler blow-down effluent. These pans were engineered with HDPE lining and overflow controls to prevent groundwater contamination and ensure safe containment of residual salts. To maximize internal water reuse, the mill established clear operating protocols for the direct recycling of 585 KLD of process water and application of 160 KLD of treated water for on-premises irrigation and greenbelt development. These interventions reduced pressure on the facility's borewells and helped maintain the ecological balance within the premises.

In support of these physical interventions, capacity-building efforts were initiated among the operations and maintenance teams to ensure continuous compliance with TNPCB norms. Staff were trained in effluent sampling, flow monitoring, logbook maintenance, and emergency response protocols for upset conditions. The company also implemented a computerized data recording system to track water usage, recycling efficiency, and treatment plant performance on a real-time basis. In addition, land within the facility was earmarked for future implementation of rainwater harvesting and artificial recharge structures, based on the seasonal variation in groundwater availability.

Together, these interventions reflect a proactive and systematic approach by the project proponent to reduce freshwater dependency, ensure legal compliance, and contribute to local water security through responsible effluent management and internal reuse.

A.10. Feasibility Evaluation

The effluent treatment project implemented at Aaditiya Aswin Paper Mills Private Limited has been evaluated to be economically feasible, both in terms of capital investment and ongoing operational costs, particularly when compared to alternative high-end solutions such as full-scale Zero Liquid Discharge (ZLD) systems. The company opted for a modular and cost-effective strategy by combining an in-house Effluent Treatment Plant (ETP) with solar evaporation pans for boiler blow-down management. This hybrid setup allowed the facility to meet environmental compliance standards while maintaining financial sustainability.

The capital investment for the ETP infrastructure was optimized by aligning the treatment capacity with the plant's actual effluent load, avoiding overdesign and unnecessary expenditure. The operational model primarily leverages gravity-based flow, biological treatment, and filtration systems, which require minimal energy input and can be efficiently managed by existing staff with limited additional training. Solar evaporation pans further reduce energy costs, utilizing natural heat for effluent volume reduction without the need for mechanical evaporators or thermal systems.

From a regulatory perspective, the project has ensured continued validity of Consent to Operate from the Tamil Nadu Pollution Control Board (TNPCB), thereby preventing compliance-related production delays or penalties. This regulatory assurance further enhances operational and financial stability. Additionally, by recycling approximately 585 KLD of untreated process effluent and reusing 160 KLD of treated water for irrigation, the project significantly reduces the mill's dependence on external freshwater sources, resulting in tangible cost savings on water procurement and energy associated with groundwater pumping.

Though no formal third-party audit report has been appended to date, internal feasibility assessments have confirmed that the current system achieves a favourable balance of capital efficiency, environmental compliance, and operational resilience. The chosen treatment model remains scalable, allowing for the future addition of advanced treatment components such as RO or MEE if required, without dismantling the existing infrastructure. In conclusion, the project activity has proven to be both economically viable and environmentally responsible, ensuring long-term water sustainability for the facility.

A.11. Ecological Aspects & Sustainable Development Goals (SDGs):

The sustainable development attributes attached to the project activity are demonstrated below:

Sustainable Development Goals Targeted	Most relevant SDG Target/Impact	Indicator (SDG Indicator)
	3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	The PP showcases how recycling and reusing wastewater can prevent depletion of natural water reserves and prevent water scarcity during droughts. The hazardous impact of industrial wastewater is now avoided due to this project. The PP ensures water availability in the nearest to the project location.
	6.3: By 2030, improve water quality by reducing pollution, eliminating dumping, and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and substantially increasing recycling and safe reuse globally	The PP has showcased recycling and safe reuse of 5500 million liters within the industry during this monitored period, which directly correlates to this indicator 6.3.

8 DECENT WORK AND ECONOMIC GROWTH	8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	Number of jobs created, and the Number of people trained as part of this project activity.
13 CLIMATE ACTION	13.2: Integrate climate change measures into national policies, strategies, and planning	Recycling and reusing wastewater is an effective solution for climate change adaptation because it helps mitigate the impacts of droughts, floods, and other extreme weather events that are becoming increasingly common due to climate change due to water scarcity. The quantity of wastewater recycled and reused by the PP is the SDG indicator.

A.12. Recharge Aspects:

NA

A.12.1 Solving for Recharge

NA

Water Budget Component	Typical Estimated Uncertainty (%)	Description
Surface Inflow	1%	In accordance with the RoU Standard version 8, and considering that the flow meters are calibrated, PP has accounted for a 1% uncertainty factor in both inflow and outflow volumes to maintain a conservative approach Consequently, an uncertainty factor of 0.98 is applied to all ROUs.
Precipitation	NA	Not Available
Surface Outflow	1%	In accordance with the RoU Standard version 8, and considering that the flow meters are

		calibrated, PP has accounted for a 1% uncertainty factor in both inflow and outflow volumes to maintain a conservative approach. Consequently, an uncertainty factor of 0.98 is applied to all ROUs.
Evapotranspiration	NA	Clemmens and Burt, 1997; typical accuracy based on free water surface evaporation coefficient.
Deep Percolation	NA	Not Available

A.13. Quantification Tools

Baseline scenario:

The baseline scenario is the situation were, in the absence of project activity, the PP would have one or all of the following options:

a. Installed multiple bore wells within the project boundary which would have depleted the local groundwater resources (aquifers); **and/or**

b. Diverted existing safe drinking water resources from the surrounding residential area; **and/or**

c. Discharged the ETP effluent without further recycling and reuse.

> Hence the following baseline scenario is applicable for this project activity:
>
> "The net quantity of treated ETP effluent / wastewater that would be discharged directly into the local drain/sewer without further being recycled and/or reused daily post treatment per year."

The net quantity of treated water used is measured via flow meters installed at the site. The primary set of data records are kept at plant level, managed by the PP's team (as defined under the Organization Chart under Appendix 2. Also, for conservative purposes, the working days or operational days have been assumed at 330 days in a year during the 1st monitoring period. However, the number of days is not an influential parameter on RoUs calculation as RoUs are calculated based on the total quantity of treated water being recycled & reused.

NOTE: - The Effluent Treatment Plant was commissioned on 23/04/2008. As per RoU Standard Version 8, the Project Proponent (PP) is eligible to claim RoUs from 01/01/2014 onward. However, the PP has selected 01/04/2015 as the start date of the crediting period, as this is the earliest date from which formal logbook records have been consistently maintained and documented.

MONTH	TOTAL INLET COLLECTION TANK TO ETP (in m³)	TREATED WATER REUSED FOR PROCESS (in m³)	RoUs
Apr-15	3298.5	5550	5439
May-15	4064.72	5828	5711
Jun-15	3545.7	5730	5615
Jul-15	5460.34	5890	5772
Aug-15	3156.64	5890	5772
Sep-15	3318.33	5700	5586
Oct-15	3332.19	5828	5711
Nov-15	3298.5	5730	5615
Dec-15	3428.94	5890	5772
Jan-16	3332.19	5859	5742
Feb-16	5067.16	5180	5076
Mar-16	5048.35	5859	5742
Apr-16	3512.4	4470	4381
May-16	3128.52	3348	3281
Jun-16	2667.33	4260	4175
Jul-16	3156.64	4340	4253
Aug-16	3428.94	3999	3919
Sep-16	3224.7	4020	3940
Oct-16	3408.45	3968	3889
Nov-16	3318.33	4650	4557
Dec-16	3332.19	4681	4587
Jan-17	3408.45	5301	5195
Feb-17	3671.36	4144	4061
Mar-17	3663.89	4371	4284
Apr-17	5354.4	17700	17346
May-17	5740.27	15438	15129
Jun-17	5673.3	14070	13789
Jul-17	5420.66	9641	9448
Aug-17	5610.07	16120	15798
Sep-17	4885.5	15780	15464
Oct-17	6103.28	16182	15858
Nov-17	5679.6	9990	9790
Dec-17	5837.3	17484	17134
Jan-18	4922.8	18228	17863
Feb-18	4783.8	15680	15366

Mar-18	5750.19	16430	16101
Apr-18	5564.7	14490	14200
May-18	5532.88	15872	15555
Jun-18	5555.1	14940	14641
Jul-18	5862.41	16430	16101
Aug-18	4953.8	17081	16739
Sep-18	4546.5	9750	9555
Oct-18	5616.58	14756	14461
Nov-18	5490	16800	16464
Dec-18	5514.59	18042	17681
Jan-19	5837.3	16616	16284
Feb-19	4446.4	16212	15888
Mar-19	5296.35	17050	16709
Apr-19	5435.4	11010	10790
May-19	5673	8556	8385
Jun-19	5336.7	16530	16199
Jul-19	5837.3	15438	15129
Aug-19	4922.8	14973	14674
Sep-19	5125.5	8400	8232
Oct-19	5750.19	8525	8355
Nov-19	5354.4	8280	8114
Dec-19	5740.27	8184	8020
Jan-20	5862.41	11563	11332
Feb-20	4474.4	9800	9604
Mar-20	4698.05	8308	8142
Apr-20	0	0	0
May-20	3428.94	8370	8203
Jun-20	3224.7	10500	10290
Jul-20	3408.45	4340	4253
Aug-20	4064.72	8060	7899
Sep-20	3545.7	8700	8526
Oct-20	5460.34	4588	4496
Nov-20	5435.4	7620	7468
Dec-20	5673	8029	7868
Jan-21	5514.59	8091	7929
Feb-21	5272.4	9492	9302
Mar-21	4922.8	10850	10633
Apr-21	5125.5	10170	9967
May-21	5750.19	4340	4253
Jun-21	5354.4	8400	8232
Jul-21	5740.27	9579	9387
Aug-21	5862.41	10075	9874
Sep-21	5245.8	9600	9408
Oct-21	5610.07	11222	10998
Nov-21	4885.5	10200	9996

Dec-21	6103.28	11594	11362
Jan-22	5868.92	10230	10025
Feb-22	3297.28	8988	8808
Mar-22	4388.05	11780	11544
Apr-22	5779.5	9660	9467
May-22	5896.82	3875	3798
Jun-22	5562.3	7920	7762
Jul-22	6199.07	11346	11119
Aug-22	5722.29	11129	10906
Sep-22	5732.1	10560	10349
Oct-22	5316.81	10788	10572
Nov-22	5214	9660	9467
Dec-22	5670.52	10602	10390
Jan-23	5296.35	10106	9904
Feb-23	5193.72	4648	4555
Mar-23	5532.88	10509	10299
Apr-23	5571.6	11880	11642
May-23	5740.27	10292	10086
Jun-23	5673.3	8970	8791
Jul-23	5420.66	8215	8051
Aug-23	5610.07	10199	9995
Sep-23	5383.5	7500	7350
Oct-23	5672.07	10230	10025
Nov-23	5120.1	8580	8408
Dec-23	5103.53	9114	8932
Jan-24	5159.02	9362	9175
Feb-24	4916.24	9744	9549
Mar-24	5871.71	9796	9600
Apr-24	4885.5	3775.275	3700
May-24	6103.28	4716.216	4622
Jun-24	2733.9	2080.47	2039
Jul-24	3650.56	1303.86	1278
Aug-24	3629.48	1479.32	1450
Sep-24	3027.6	2162.7	2119
Oct-24	2756.24	1968.81	1929
Nov-24	3054.81	2181.9	2138
Dec-24	3428.94	2449.31	2400
TOTAL			**10,51,006**

Quantification

Year	Total ROUs (1000 Liters)/yr UCR Cap (1 million RoUs/yr
2015	50995
2016	53541
2017	143297
2018	184729
2019	146779
2020	88080
2021	111341
2022	114207
2023	108038
2024	49999
Total	**10,51,006**

A.14. UWR Rainwater Offset Do No Net Harm Principles

The project activity at Aaditiya Aswin Paper Mills Private Limited demonstrates alignment with the Universal Water Register (UWR)'s "Do No Net Harm" principles through a series of integrated water management practices aimed at enhancing sustainability and inclusivity.

Firstly, the initiative contributes to increasing sustainable water yield by minimizing dependence on groundwater extraction in an aquifer-stressed zone like Sathyamangalam. The reuse of approximately 745 KLD of process effluent through direct recycling and irrigation reduces pressure on already-depleted groundwater reserves. This conservation-based operation supports the long-term replenishment of aquifers by limiting abstraction and promoting sub-surface recharge through greenbelt irrigation.

Secondly, the treated effluent is not only reused immediately but also helps conserve water by offsetting the need for external sourcing, thereby allowing available freshwater resources in the region to be conserved for other critical uses, including domestic supply and agriculture. The facility has earmarked space and budget provisions for future storage and recharge structures that would enable storage of excess water during monsoon periods for deferred use in drier months.

Lastly, the project has made strides in promoting inclusive workforce development, particularly through the active participation of women in operations and monitoring functions related to the ETP. Women employees have been trained in logbook maintenance, sample collection, data entry, and compliance documentation. The company encourages gender inclusivity in environmental roles and aims to expand this through structured training sessions and leadership opportunities in upcoming water stewardship initiatives.

In short, the project activity actively supports UWR’s "Do No Net Harm" framework by conserving groundwater, promoting on-site water reuse, preparing for long-term rainwater capture and storage, and fostering gender-inclusive participation in water governance at the facility level.

A.15. Scaling Projects-Lessons Learned-Restarting Projects

The Effluent Treatment Plant (ETP) at Aaditiya Aswin Paper Mills Private Limited presents a scalable model for water-efficient, regulation-compliant industrial wastewater management in the recycled paper manufacturing sector. Key lessons learned through its implementation point to ways in which the system can be expanded in capacity and functionality while avoiding ecological harm.

To scale up the ETP safely, any future augmentation must be based on a detailed hydrological impact assessment and a phased expansion approach. This includes optimizing flow balance between recycled and treated water streams, upgrading existing biological systems to handle higher organic loads, and increasing holding capacity through modular treated-water tanks rather than expanding land-based application. Ecological harm can be avoided by ensuring that any increase in treated effluent is matched with increased in-facility reuse, rather than external discharge. Furthermore, solar evaporation infrastructure can be expanded using additional lined containment areas to handle incremental high-TDS streams without impacting soil or groundwater.

To further introduce advanced technologies into the paper mill sector, several low-footprint and energy-efficient systems can be considered. For example, Membrane Bioreactors (MBR) can significantly improve COD and BOD removal in a compact space, suitable for mills with limited land availability. Dissolved Air Flotation (DAF) units can improve sludge dewatering and reduce secondary treatment loads. Where energy use allows, partial integration of reverse osmosis (RO) and forward osmosis (FO) for tertiary polishing could increase treated water quality, supporting high-value reuse in paper manufacturing processes. Online monitoring systems and SCADA-based automation can improve compliance, reduce labour, and prevent process upsets.

The Aaditya Ashwin experience suggests that successful implementation requires active staff training, regulatory engagement, and adaptable operations. Restarting or upgrading a stalled or underperforming ETP in similar paper mills should begin with a root-cause diagnosis typically around design mismatch, lack of automation, or inconsistent flow loads and then progressively retrofit key components while preserving the existing functional elements. Importantly, any scaling or restart strategy must include safeguards for soil, groundwater, and downstream users to ensure that environmental integrity is maintained.

The Aaditya Ashwin ETP demonstrates that efficient, eco-safe wastewater management in the paper industry is not only viable at scale but can also be continuously upgraded with appropriate technologies and strategic planning ensuring resilience, compliance, and sustainability.

Appendix

Flow Meter details

ETP FLOW CHART