

“Water conservation in Distillery unit – A Case Study”

**BRAJESH KUMAR SRIVASTAV
BHSL**

Introduction to BHSL Group

About Bajaj Group

AN UNMATCHED LEGACY

Bajaj Hindusthan Sugar Ltd was established by late Shri Jamnalal Bajaj, a revered businessman, freedom fighter, and close confidant of Mahatma Gandhi. The company was founded to address a combination of national needs – that of fostering industrial development and promoting inclusive growth, along with saving valuable forex being spent on sugar imports (the last wish was expressed by the Mahatma himself). Nearly a century since its inception, the company remains committed to the enduring principles upon which it was built, preserving a legacy of trust, transparency, and service.



About Bajaj Group

Bajaj Hindusthan Sugar Limited (BHSL) is Asia's No.1 and World's No.4 Integrated Sugar Company. BHSL is having 14 Sugar Unit across Uttar Pradesh in North India, the company has an aggregate sugarcane crushing capacity of 136,000 tones crushed per day (TCD) and 6 Nos of Distillery units in Uttar Pradesh having alcohol distillation capacity of 800 kilolitres per day (KLD)

Units of Bajaj Group

Gola Gokaran Nath, **(Sugar and Distillery)**

Palia Kalan, **(Sugar and Distillery)**

Khambarkhera (district: Lakhimpur Kheri), **(Sugar and Distillery)**

Barkhera (district: Pilibhit),

Kinauni (district: Meerut), **(Sugar and Distillery)**

Gangnauli (district: Saharanpur), **(Sugar and Distillery)**

Thanabhavan (district: Muzaffarnagar),

Budhana (district: Muzaffarnagar),

Bilai (district: Bijnore),

Maqsoodapur (district: Shahjahanpur),

Pratappur (district: Deoria),

Rudauli (district: Basti), **(Sugar and Distillery)**

Kundarkhi (district: Gonda)

Utraula (district: Balrampur).

BHSL Kinauni Unit

The Kinauni Sugar Mills was established in year 2004-05 having crushing capacity of 7000 T.C.D. and crushing capacity expanded up to 12000 T.C.D. The Kinauni Sugar unit is a refinery unit. It also associates with Distillery Unit having the capacity 200KL/160KL Ethanol per day by using the sugar unit by product “B Heavy”/”C Heavy” (Molasses as the Raw material)

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Sustainability initiatives of BHSL Group

[Bajaj Hindusthan Sugar Limited](#) (Bajaj Sugar) and [EverEnviro Private Limited](#) have joined hands to set up [CBG](#) (compressed biogas) plants in Uttar Pradesh.

Bajaj Hindusthan Sugar presently generates around 500,000 M.T. of press mud annually from its 14 operational sugar mills which can potentially help set up CBG plants with a total capacity of 70 M.T. per day. Bajaj Sugar is Asia's largest owner of crushing capacity and globally one of the largest.

Bajaj Hindusthan Sugar Limited marks a significant milestone in our journey towards sustainable energy solutions. Through this alliance, EverEnviro will leverage its expertise to develop, operate, and scale up CBG projects across Uttar Pradesh. The steady supply of press mud from Bajaj Hindusthan's sugar mills will significantly boost the CBG production capacity of our plants. Furthermore, the fermented organic manure produced as a byproduct of CBG will promote regenerative agriculture, enhancing soil health and fertility in the region.

Applicable compliances of CPCB for water

- ❖ Distilleries shall minimize freshwater consumption to 8-10 liters for every liter of alcohol produced.
- ❖ Distillery sector is a water intensive sector. Therefore, distilleries shall maximize water conservation and water recycling thereby ensuring ~80% water recovery
- ❖ Distilleries shall ensure reduction of spent wash generation to 6-8 liters for every liter of alcohol produced.
- ❖ All distilleries india shall be allowed to operate only if they are operating on ZLD (Zero Liquid Discharge)

Applicable compliances – CGWA for water

Central Ground Water Authority (CGWA) constituted vide Govt. of India notification dated the 14th January 1997 has powers under Environment (Protection) act, 1986 (29 of 1986) for regulation and control of Ground Water Management and Development. CGWA has issued guidelines to regulate groundwater extraction and conserve the scarce groundwater resources in the country vide Notification dated 12 Dec., 2018 and 24 Sept, 2020.

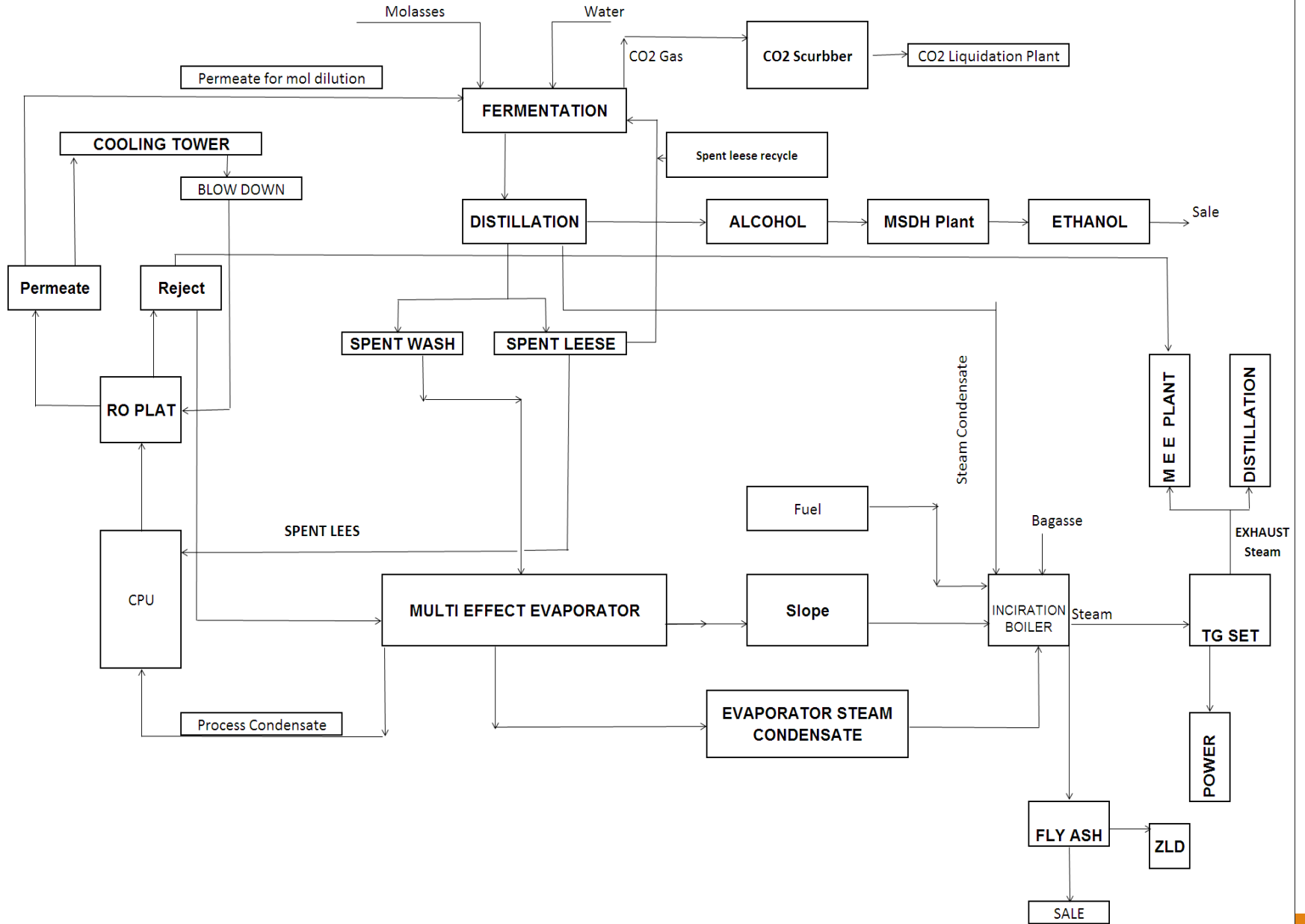
According to the Notification dated 24 September 2020, all new/existing industries, industries seeking expansion, infrastructure projects and mining projects abstracting ground water, are required to seek No Objection Certificate (NOC) from CGWA or, the concerned State/UT Authority.

Availability of ground water resources shall be given due regard by CGWA while considering applications for grant of NOC for commercial use. The commercial entities extracting ground water shall be required to submit online **annual water audit report** including an audit of water use.

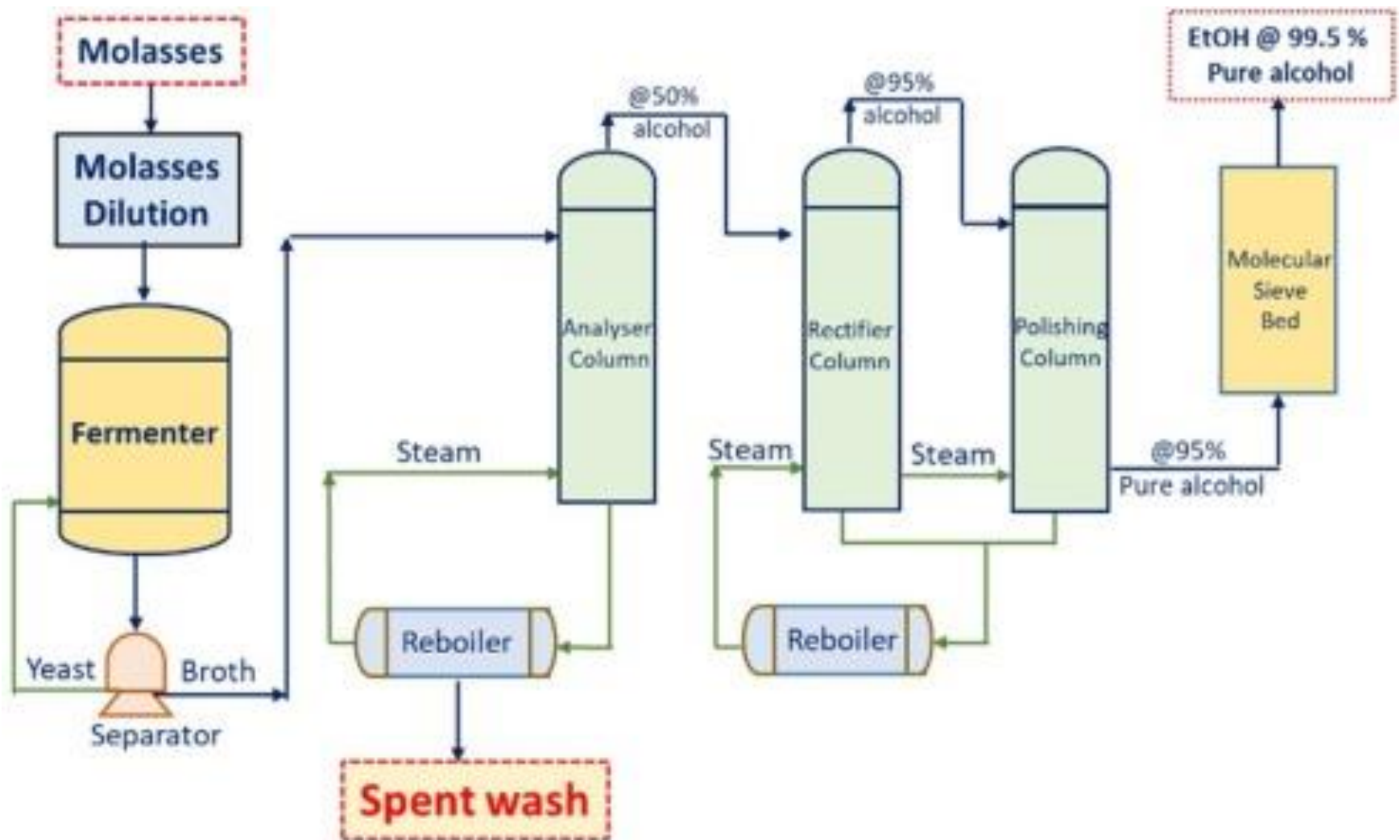
DISTILLERY - Case Studies

PROCESS FLOW DIAGRAM OF 200 KL PER DAY RS / ENA /ETHANOL PLANT

Bajaj Hindusthan Sugar Ltd ,Kinauni Distillery



Process flow chart production unit



Use of water in various processes and utilities and wastewater generation

BAJAJ HINDUSTHAN SUGAR LTD - DISTILLERY UNIT ,KINAUNI, MEERUT					
FRESH WATER REQUIREMENT : 160 KLPD B-Hvy. Molasses Based Distillery : ME Evaporation - Inceneration					
WATER BALANCE- MODE-1					
TOTAL WATER INPUTS			TOTAL WATER OUT PUTS		
DILUTION WATER IN FERMENTATION		KL	550	WATER IN SPENT LEESE	KL 250
DM PLANT		KL	1560	MEE STEAM CONDENSATE	KL 260
- DISTILLATION PLANT		KL	154	STEAM CONDENSATE DIST. PLANT	KL 240
- MEE PLANT		KL	30	BOILER AUXILLARIES STEAM CONDENSATE	KL 0
- BOILER AUXILLARIES		KL	15		
- MISC.		KL	30	PROCESS CONDENSATE AFTER CPU	KL 850
				RO & DM PLANT REJECTS	KL 280
OTHER DOMESTIC USAGE		KL	10	COOLING TOWER BLOW DOWN	KL 50
MISCELLANEOUS		KL	5	BOILER BLOW DOWN	KL 20
COOLING TOWER MAKE UP		KL	152	MISCELLANEOUS	KL 6
		KL	2506		1956
RECYCLES AND UTILIZATION STREAMS					
SPENT LEESE RECYCLED - Fermentation		KL	150		
SPENT LEESE RECYCLED - CPU			100		
STEAM CONDENSATE OF MEE PLANT		KL	234		
STEAM CONDESATE FROM Dist. Plant		KL	240		
BOILER AUXILLARIES CONDENSATE		KL	280		
RO & DM PLANT REJECTS		KL	300		
PROCESS CONDENSATE IN PROCESS		KL	500		
COOLING TOWER MAKE UP		KL	152		
TOTAL RECYCLING/RE-UTILIZATION PER DAY		KL	1956		
TOTAL FRESH WATER EXTRACTION		KL	500	SO FRESH WATER CONSUMPTION	KL/KL 3.1

Identified Best Practices which are being implemented

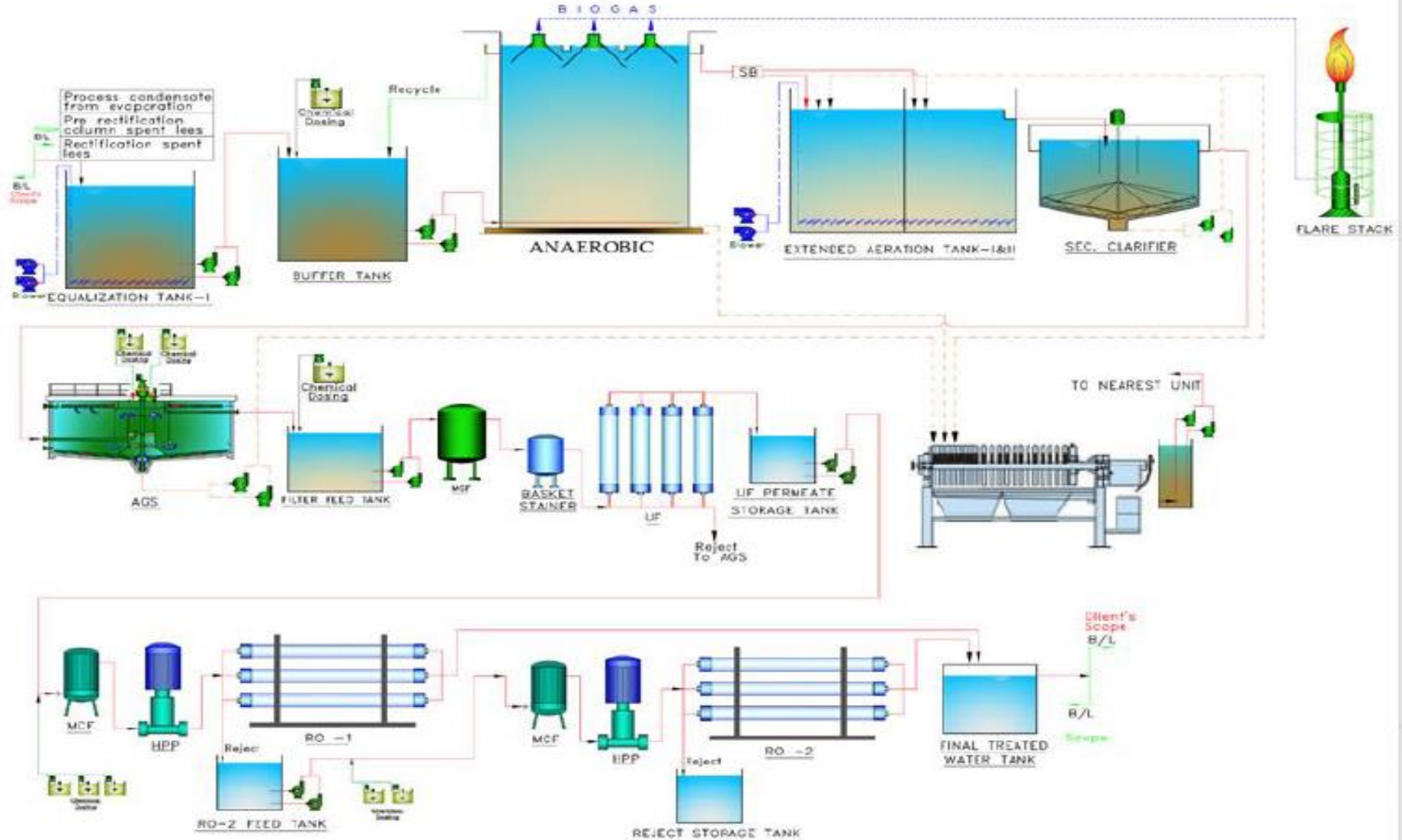
Water Conservation Initiatives taken : Implemented the best process technology and wastewater treatment scheme for reuse and recycle and have become Zero Liquid Discharge plant. The List of water conservation measures taken by plant during last 5 years is as below.

Sr.No.	Water Conservation/Saving Measure Undertaken
1	Installation of MEE which treats 1050 KLD of spent wash and generates slope for reuse in boiler and condensate for reuse after treatment in CPU.
2.	Installation of CPU to treat the wastewater from MEE , CT Blow Down, Boiler Blow Down and treated water is used in fermentation for Dilution of Molasses
3.	Installation of UF & RO plant to use the CPU treated water for Cooling Tower makeup. RO reject is fed in MEE,
4.	Sewage treated water is being utilized in Green Belt development

Multi Effect Evaporator



SCHEMATIC DIAGRAM SHOWING SCHEME OF CPU



INCINERATION/SLOPE FIRED BOILER



Benefits

The plant has reduced the freshwater consumption from 8.7 KL to 3.4 KL of water /KL of production in last 5 Financial years. The main contribution is recycled of treated water in process and cut off the freshwater requirement on the same.

The annual water audit work of Bajaj Group is being carried out by FICCI. They also cross verified the reduction trend in specific water consumption of BHSL Distillery unit at Kinauni Meerut.

Year	Specific Fresh Water Consumption
2019-20	8.7 KL of Water/KL of Alcohol Production
2020-21	4.7 KL of Water/KL of Alcohol Production
2021-22	4.6 KL of Water /KL of Alcohol production
2022-23	3.7 Klot Water/KL of Alcohol Production
2023-24	3.4 KL of Water/KL of Production

Think Today for Better Tomorrow

Thank You