ADITYA BIRLA

GRASIM

GIL/ENV/2024-25/58

19 September, 2024

To,

The Regional Officer,

U. P. Pollution Control Board,

H. No. – 162, Uttar Mohal, Near Chandi Hotel

Robertsganj, Sonebhadra (U.P.) - 231216

Sub: Environmental Statement of Chemical Division for the year 2023-24.

Dear Sir,

Please find enclosed herewith the Environmental Statement for our Chemical Division for the FY 2023-24 for your kind perusal.

We hope you will find the above in order.

Thanking you,

Yours Faithfully,

for **GRASIM INDUSTRIES LIMITED,**

Dr. Vinay Kumar Yadav

(Head – Environment & Sustainability)

Encl: Environmental Statement of Chemical Division

Cc.

The Member Secretary,

U. P. Pollution Control Board,

TC-12/V, Vibhuti Khand,

Gomati Nagar, Lucknow – 226 010.

डाक प्राप्ति रसीद

प्राप्ति दिनांक 20/9/24

प्रस्तुतकर्ता के हस्ताक्षर

उ० प्र० प्रदूषण नियंत्रण बोर्ड, लखनऊ

Grasim Industries Limited
Chemical Division Renukoot
P.O.: Renukoot - 231 217,
Distt.: Sonebhadra (U.P.) India

Telephone +91- 5446 - 252044/55/75
Fax +91- 5446 - 252088

Website www.grasim.com
E-mail grasim.renukoot@adityabirla.com
CIN L17124MP1947PLC000410
PAN AAACG4464B

Regd. Office - Birlagram, Nagda - 456331, M.P., India

Grasim Industries Limited

(Chemical Division Renukoot)

FY 2023-24

Environmental Statement (Form – V)

ES for Chemical Division

Prepare & Submitted By

Grasim Industries Limited
Chemical Division, Renukoot
Sonebhadra, U.P. -231217

INTRODUCTION

Department of Environment and Forests, Government of India (GOI) under the Environment (Protection) Act, 1986 has made Environmental Statement mandatory for all industries and the report prepared by competent experts has to be submitted to the concerned Pollution Control Board. This is a measure to check any adverse impacts of the processes on the occupational and surrounding environment.

The Environmental Audit programme included the following:

Assessment of compliance status with respect to environmental regulations and Assessment of environmental management system's capability to cope up with existing requirement of CPCB/UPPCB.

CSIR-NEERI-HZC for Bi-annual monitoring and M/s ETRC - Lucknow has been engaged for monitoring of stack emission, ambient air monitoring, solid waste hazardous, water and effluent testing of M/s. Grasim Industries Limited, Renukoot for monthly monitoring respectively from April, 2023 to March, 2024. Based on these Bi-annual and monthly monitoring reports, Annual Environmental Statement Audit (AESA) for the year 2023 - 2024 has been prepared. This Environmental audit report contains data pertaining to ambient air quality, stack emission, water and wastewater quality, hazardous and non-hazardous solid waste generation and its disposal system and other plant details related to environmental pollution and management.

PLANT SITE AND SURROUNDINGS

M/s- Grasim Industries Limited, Renukoot, Sonebhadra UP is located on distance of 2 km from Renukoot Railway station of district- Sonebhadra, Uttar Pradesh.

PART – A

GENERAL INFORMATION ABOUT THE COMPANY

1. Name of the Company : M/s. Grasim Industries Limited
Chemical Division Renukoot

2. Name & Address of the Owner/Occupier : **HARI KRISHNA AGARWAL**
P.O - Renukoot 231217
Dist. Sonebhadra (U.P.)

3. Registered Office Address : Birla gram Nagda – 456 331 M.P.

4. Factory Address : P.O. Renukoot – 231 217
Distt. Sonebhadra, (U.P.)

5. Production Installed Capacity :

Sl. No.	Name of Product	Consented Capacity (MT/Month)
1	Caustic Soda Lye	10950
2	Liquid Chlorine	8630
3	Hydrochloric Acid	2107
4	Stable Bleaching Powder	5400
5	Aluminium Chloride	1500
6	Poly Aluminium Chloride	6000
7	Chlorinated Paraffin	1800
8	Hydrogen	275
9	Sodium Hypo Chlorite	1000
10	Sodium Sulphate	250
11	H.D.P.E. Drums	1000 (Numbers/Day)
12	G.I. Drums	5000 (Numbers/Day)

6. Year of Establishment : 1964

7. Date of last Environmental Statement submitted : Submitted to U.P. Pollution Control board vide our letter no GIL/ENV/2023-24/58, dated September 18, 2023

PART – B

1. **TOTAL WATER CONSUMPTION**:

Sl. No.	Description	Consumption (m^3/day)
a	Process	832
b	Cooling	1479
c	Domestic	770
d	Green belt	Treated STP effluent is used for green-belt development.

2. WATER CONSUMPTION PER UNIT OF PRODUCT:

Name of Product	Process water consumed per unit of product manufactured (m^3/MT)	
	(2022-23)	(2023-24)
Caustic Soda	7.48	6.54
Liq. Chlorine		
Hydrochloric acid		
Aluminium Chloride		
Stable Bleaching Powder		
Chlorinated Paraffin		
Poly Aluminium Chloride		

3. RAW MATERIAL CONSUMPTION:

Sl. No.	Name of the Raw Material	Name of Product Concerned	Raw material consumed per unit of product manufactured (MT/MT)	
			(2022-23)	(2023-24)
1	Salt	Caustic Soda Lye	1.57	1.56
2	Soda Ash		0.002	3.00
3	M. Flock/Flocal		0.01	0.01
4	Hydrochloric Acid		24.12	25.14
5	Barium Carbonate		6.48	4.85
6	Caustic Soda Lye		0.01	10.48
7	Sulphuric Acid		0.01	14.79
8	Sodium Sulphide/ bisulphite		0.71	0.98
9	Liquid Chlorine	S.B.P	0.42	0.40
10	Chemical / Hydrated Lime		0.74	0.74
11	Aluminium Ingots	Aluminium Chloride	0.205	0.206
12	Chlorine		0.78	0.77
13	Coal	Boiler	0.18	0.21
14	Paraffin Oil	Chlorinated Paraffin	0.42	0.41
15	Chlorine		1.21	1.21
16	Paraffin Oil	Sulpho	-	-
17	Chlorine		-	-
18	Alumina Hydrate (Wet)	PAC – 10% Basis	0.15	0.16
19	HCl		0.15	0.13
20	Sodium Sulphite	Sodium Sulphate	-	0.08

21	Plastic Loterene – TR571	HDPE Drums	6.15 (Kg/Nos)	5.76 (Kg/Nos)
22	Halene – B- 5500	HDPE Drums	2.05 (Kg/Nos)	2.50 (Kg/Nos)
23	GI Sheets	GI Drums	5.0 (Kg/Nos)	4.75 (Kg/Nos)

PART – C

1. WATER POLLUTION

Sl. No.	**Pollutant Parameters**	**Qty. of Pollutants generated**	**Concentration of pollutants in untreated effluent** (completely recycled to achieve ZLD)	**% Variation from prescribed standards**
		(kg/day)	**(mg/l)**	-
1	---	Nil	Nil	–––
Note : It is to be noted that since we are maintaining zero liquid discharge of effluent from August -2017, Hence the above discharge load is also zero.				

Parameter	**Months (FY 2023-24)**												
	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Average**
pH	7.4	7.2	6.5	7.2	7.2	7.5	6.9	7.2	7.4	7.6	7.2	7.7	7.3
TSS	5.6	BDL	BDL	BDL	BDL	5.4	BDL	8.6	8.5	5.6	BDL	5.2	3.2
TDS	1924	572	166	204	118	202.6	208	186	192	186	192	202	362.7
O&G	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cl	14	18.3	114.8	8.1	8.26	15.51	18.01	20	18	20	22.02	13.1	24.2
BOD	6.4	6.8	18	2.4	3.2	4.4	2.6	3.8	3.4	6.66	4.6	4.9	5.6
COD	28	32	65.28	8	12	16	8.16	24	20	32	12	16	22.8

Note: - All parameters are in mg/Ltr except pH.

Adoption of ZLD meant comprehensive management of wastewater, through reduced use, efficient recycling and treatment to ensure that discharge of liquid wastes by industrial units was completely eliminated. A multi-level approach to water recovery with modifications was implemented in the production processes.

The plant planned and achieved ZLD by following the 3Rs of reduce, reuse and recycle as the first step.

- **Reduce**: Reduction of water consumption across different processes either through technological changes or through process optimization.

- **Reuse**: Use of water generated from one process in the same or different processes after testing the quality of generated water.
- **Recycle**: Treatment of effluents in such a way that maximum water could be recovered for reuse within the production cycle.

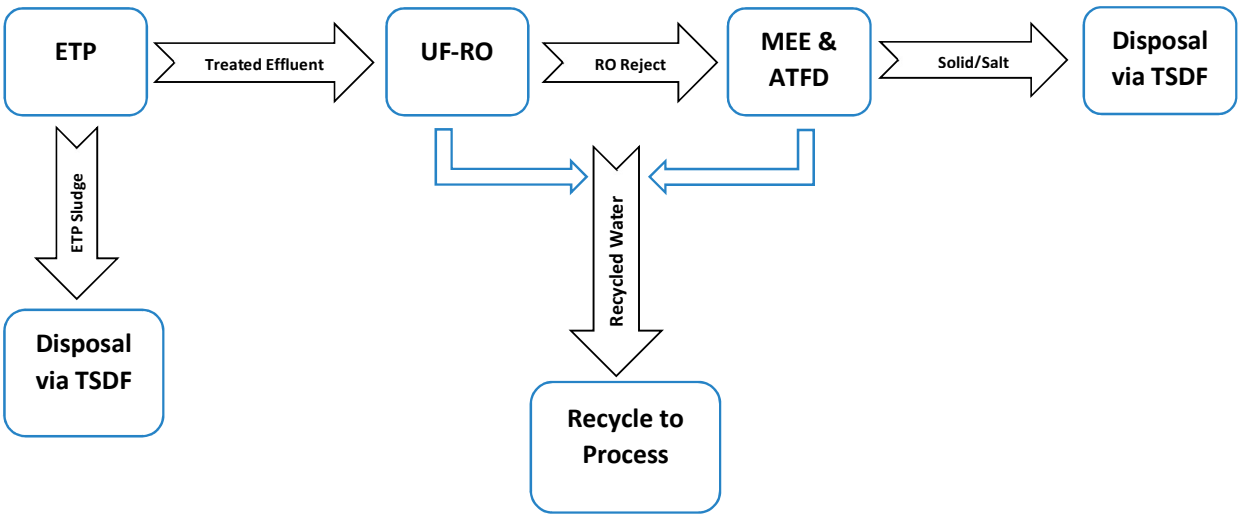
The successful implementation of the 3R processes were, however, preceded by a detailed understanding of the nature of effluents and the quality of wastewater involved. The areas worked on are as explained below:

- Knowing the quality and volume of each effluent generated from different processes
- Segregating and collecting the same quality of effluents for use in same or different processes
- Developing a facility for collection of effluents from different processes for final treatment in ETP
- Reducing the effluent volume as best possible, to make ZLD cost effective

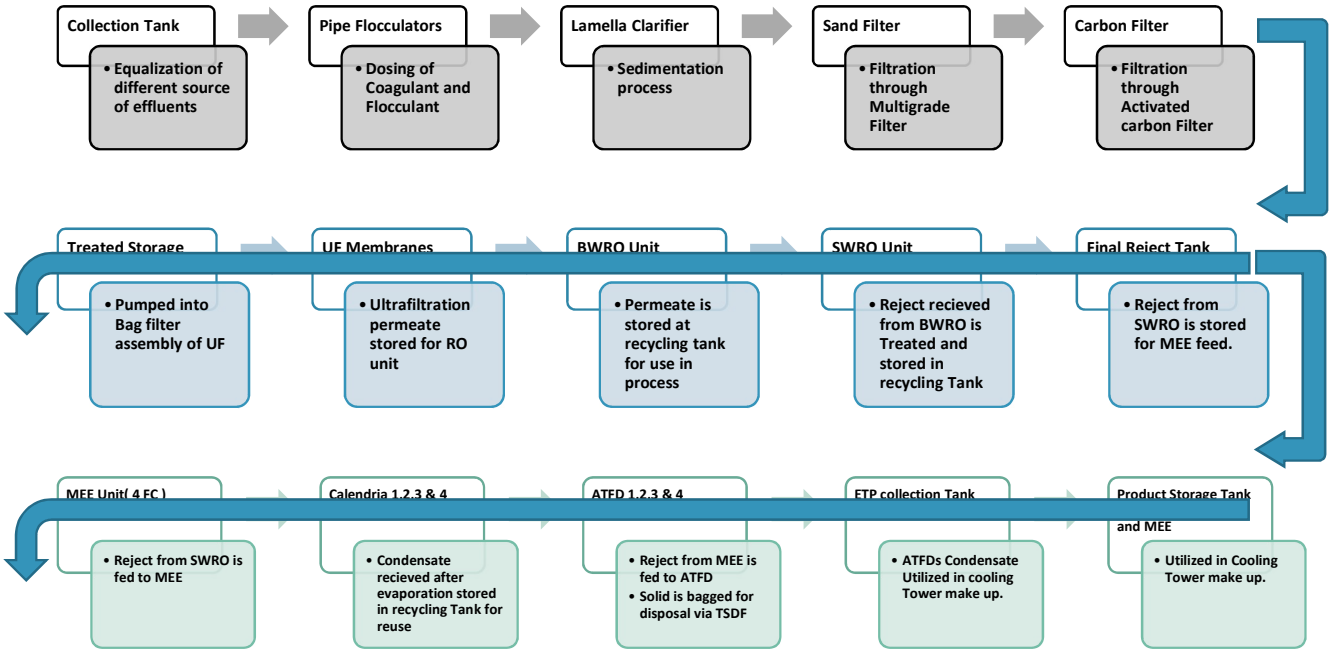
In the second step, the balance wastewater after the 3R approach was passed through Double stage RO plant and Multi-Effect Evaporator to achieve the ZLD status.

The effluent from various sections is collected in effluent collection pit where it is collected for equalization. The pH of the effluent after equalization is maintained in the desired range with alkali or acid, whatever may be the requirement. The neutralized effluent is then passed through pipe flocculator into flocculation tank where dosing of polyelectrolyte is done using flash mixer. Effluent dosed with polyelectrolyte then goes to lamella clarifier where sufficient retention time is given for settling and clarification. By gravity suspended solids settle down and are removed as sludge from the bottom. The sludge is then dewatered at filter press. The water from filter press is again recycled back in collection tank. The filter cake is filled in bags and stored for disposal in TSDF.

Effluent Treatment Flow Diagram:



Effluent treatment process flow –



2. AIR POLLUTION

Sl. No.	Pollutant	Qty. of pollutants generated (kg/day)	Concentration of pollutants in discharge (mg/Nm^3)	% variation from prescribed standards
a.	**Thermax Boiler 's average emission / discharge**			
i	Particulate Matter (PM)	23.95	34.19	Within limits
ii	SO_2	147.15	210.12	-do-
iii	NOx	91.98	131.35	-do-
b.	**CVPL Boiler 's average emission / discharge**			
i	Particulate Matter (PM)	30.63	43.74	Within limits
ii	SO_2	227.55	324.96	-do-
iii	NOx	126.81	181.10	-do-

Summary of Process Boilers Stack Emission Results for FY 2023-24

Unit #	Quarters	Parameters				
		PM	SOx	NOx	CO2	Hg
CVPL	Q 1	44.72	334.18	204.29	9.60	0.00
	Q 2	43.17	338.45	219.8	10.2	0
	Q 3	42.94	320.53	169.60	10.73	0.00
	Q 4	44.12	306.69	130.72	10.80	0.00
Average FY 23-24		**43.74**	**324.96**	**181.10**	**10.33**	**0.00**
Thermax	Q 1	48.95	270.17	163.80	9.80	0.00
	Q 2	45.55	304.71	188.19	10.40	0.00
	Q 3	0.00	0.00	0.00	0.00	0.00
	Q 4	42.28	265.61	173.40	10.85	0.00
Average FY 23-24		**34.19**	**210.12**	**131.35**	**7.76**	**0.00**

Summary of Process Boilers Stack Emission Results for 1st Quarter

Q 1		Parameters				
Unit #	Months	PM	SOx	NOx	CO2	Hg
CVPL	APR	45.28	327.73	204.67	9.6	BDL
	MAY	Stand- By				
	JUN	44.16	340.63	203.9	9.6	BDL
Avg of Q 1		44.72	334.18	204.29	9.60	0.00
Thermax	APR	Stand- By				
	MAY	48.95	270.17	163.8	9.8	BDL
	JUN	Stand- By				
Avg of Q 1		48.95	270.17	163.80	9.80	0.00

Summary of Process Boilers Stack Emission Results for 2nd Quarter

Q 2		Parameters				
Unit #	Months	PM	SOx	NOx	CO2	Hg
CVPL	JUL	Stand- By				
	AUG	Stand- By				
	SEP	43.17	338.45	219.8	10.2	BDL
Avg of Q 2		43.17	338.45	219.80	10.20	BDL
Thermax	JUL	46.23	303.69	188.44	10.2	BDL
	AUG	44.86	305.73	187.94	10.6	BDL
	SEP	Stand- By				
Avg of Q 2		45.55	304.71	188.19	10.40	BDL

Summary of Process Boilers Stack Emission Results for 3rd Quarter

Q 3		Parameters				
Unit #	Months	PM	SOx	NOx	CO2	Hg
CVPL	OCT	41.98	336.97	238.94	10.5	BDL
	NOV	44.26	316.54	138.66	10.8	BDL
	DEC	42.59	308.07	131.2	10.9	BDL
Avg of Q 3		42.94	320.53	169.60	10.73	BDL
Thermax	OCT	Stand- By				
	NOV	Stand- By				
	DEC	Stand- By				
Avg of Q 3		0.00	0.00	0.00	0.00	0.00

Summary of Process Boilers Stack Emission Results for 4th Quarter

Q 4		Parameters				
Unit #	Months	PM	SOx	NOx	CO2	Hg
CVPL	JAN	Stand- By				
	FEB	Stand- By				
	MAR	44.12	306.69	130.72	10.80	BDL
Avg of Q 4		44.12	306.69	130.72	10.80	BDL
Thermax	JAN	41.27	258.73	178.27	10.8	BDL
	FEB	43.29	272.48	168.53	10.9	BDL
	MAR	Stand- By				
Avg of Q 4		42.28	265.61	173.40	10.85	BDL

Summary of Process Stack Emission Results for FY 2023-24

Unit #	Parameters (mg/Nm3)	Q 1			Q 2			Q 3			Q 4			Annual Average
		APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	
Mem - I	HCl	9.2	5.2	5.6	5.3	5.8	6.1	6.8	6.6	6.4	6.2	6.1	6.3	**6.3**
	Cl_2	2.5	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	**0.8**
Mem - II	HCl	8.4	6.8	6.3	5.8	5.4	5.8	6.2	6.3	6.5	6.3	6.2	6.1	**6.3**
	Cl_2	2.5	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	**0.8**
Mem - III	HCl	8.6	6.4	6.2	6.0	5.6	6.0	6.4	6.5	6.3	6.4	6.5	6.4	**6.4**
	Cl_2	3.1	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.7	0.7	**0.7**

Summary of Ambient Air Quality Results

Location	Parameter								
	PM 10 ug/m^3	PM-2.5 ug/m^3	SO_2 ug/m^3	NO_x ug/m^3	Lead (Pb) ug/m^3	CO mg/m^3	O_3 ug/m^3	CO2 NA	Cl_2 NA
ETP plant	78.07	48.57	13.41	19.45	BDL	0.52	16.16	NA	NA
Main gate	80.14	51.31	14.28	21.60	BDL	0.54	16.62	NA	NA
PGD (area)	82.71	51.50	13.72	21.00	BDL	0.53	16.43	NA	NA
Project Office	70.86	45.32	12.95	18.33	BDL	0.52	15.47	NA	NA

PART – D

(As specified under Hazardous Waste (Management and Transboundary Movement) Rules, 2016

Sl. No.	Description	Total quantity in MT (2022-23)	Total quantity in MT (2023-24)
A	**FROM PROCESS**		
1	16.3-Brine Sludge	9848.040	6510.300
2	Sch. II B30-PAC SLUDGE	115.550	119.010
3	5.1-Used Oil	6.200	4.570
4	33.1-FRP Waste	40.890	43.585
5	35.2-Spent Resin	-	3.970
6	5.2-Oil soaked cotton	0.935	1.205
7	Sch. II Cat (B 21)-Asbestos Sheets	35.110	64.720
8	Discarded Filter Medium ETP,RO,PAC Schedule I Cat -36.2	4.810	3.345
9	Discarded Welding rods Schedule II Cat -B28	0.110	0.040
10	Discarded rubber waste Schedule III Cat- B3040	7.505	4.855
11	SBP Sludge Schedule II Cat -B30	325.050	65.990
12	Discarded APCD Filters Schedule I Cat – 35.1	-	1.31
13	Molten Salt (Schedule I Cat : 16.2)	2.62	-
B	**FROM POLLUTION CONTROL FACILITIES**		
1	35.3-ETP SLUDGE	77.065	81.450
2	35.5-MEE Salt Waste	804.550	983.746

❖ * The quantity mentioned here is combined for both Chemical Division and Power division.

PART – E

(Solid Waste)

Sl. No.	Description	Total quantity in MT (2022-23)	Total quantity in MT (2023-24)
a	From process	Nil	Nil
b	From pollution control facilities	Nil	Nil
C 1	Qty. recycled or utilised within limits	Nil	Nil
C2- a	Quantity Sold (Metal Scrap)	755.86	997.92
C2-b	Quantity Sold (HDPE/LDPE Bags, etc.)	231.09	339.85
C2-b	Quantity Sold (Battery Waste)	0.220	0.570
C3	Quantity Disposed (E-waste)	1.995	0.550

PART – F

(Characteristics of Hazardous and Solid Waste)

Sl. No.	Description	Nature of waste	Composition/Characteristics	Quantity (MT) (FY 2023-24)	Management (Methods of Collection & Disposal)
a	16.3-Brine Sludge	Hazardous	Chloride, Sodium, sulphate, Magnesium, Calcium, Arsenic, Cobalt, Zinc etc.	6510.300	stored at impervious surface Disposed through TSDF
b	Sch. II B30-PAC Sludge	Hazardous	Aluminium, Cadmium, Fluoride, Chloride, etc.	119.010	Filled in HDPE bags and stored at impervious surface Disposed through TSDF
c	5.1-waste Oil	Hazardous	PCBs, Lead, Arsenic, Cadmium, Chromium, PAHs etc.	4.570	Filled in MS drums and stored at impervious surface. Recycled/Disposed through TSDF

d	33.1-FRP Waste	Hazardous	Contaminated FRP scraps	43.585	Stored at impervious surface. Disposed through TSDF
e	35.2-Spent Resin	Hazardous	Spent Resin	3.970	Filled in HDPE bags and stored at impervious surface. Disposed through TSDF
f	5.2-Oil soaked cotton	Hazardous	Oil soaked cotton	1.205	Filled in HDPE bags and stored at impervious surface. Disposed through TSDF
g	Sch. II Cat (B 21)-Asbestos Sheets	Hazardous	Asbestos	64.720	Stored at impervious surface. Disposed through TSDF
h	35.3-ETP SLUDGE	Hazardous	Chloride, Lead Magnesium, Calcium, Arsenic, Cobalt, Zinc etc.	81.450	Filled in HDPE bags and stored at impervious surface. Disposed through TSDF
i	35.5-MEE Salt Waste	Hazardous	Chloride, Sodium, sulphate, Magnesium, Calcium, Arsenic, Cobalt, Zinc etc.	983.746	Filled in HDPE bags and stored at impervious surface. Disposed through TSDF
j	Discarded Filter Medium ETP,RO,PAC Schedule I Cat -36.2	Hazardous	Spent Carbon or Filter Medium	3.345	Filled in HDPE bags and stored at impervious surface. Disposed through TSDF
k	Discarded Welding rods Schedule II Cat - B28	Hazardous	B 28 Ferro silicate Alloys	0.040	Filled in HDPE bags and stored at impervious surface. Disposed through TSDF

l	Discarded rubber waste Schedule III Cat- B3040	Hazardous	Rubber Wastes the following materials, provided they are not mixed with other wastes.	4.855	Filled in HDPE bags and stored at impervious surface. Disposed through TSDF
m	SBP Sludge Schedule II Cat -B30	Hazardous	Aluminium, Cadmium, Fluoride, Chloride, etc.	65.990	Filled in HDPE bags and stored at impervious surface Disposed through TSDF
n	Discarded APCD Filters Schedule I Cat – 35.1	Hazardous	Exhaust Air or Gas Cleaning reside	1.31	Filled in HDPE bags and stored at impervious surface Disposed through TSDF
o	Metal Scrap	Non-Hazardous	Iron/steel scraps	997.92	Sold to recyclers
p	HDPE Bags	Non-Hazardous	Plastic bags	339.85	Sold to recyclers
q	E-waste	Hazardous	Electrical and electronic waste	0.555	Disposed through Recycler/TSDF
r	Battery Waste	Hazardous	Lead acid battery with diluted acid	0.570	Authorized recycler

PART - G

(Impact of pollution control measures on conservation of natural resources and consequently on the cost of production)

Hazardous Waste Management: 2023-24

MEE Salt & ETP Sludge Interim Storage: The unit is now equipped with an intermediate storage of MEE salt & ETP sludge, which has a permanent shed on the top.

Total amount was spent on modification of MEE Salt & ETP Sludge Hazardous Waste Interim storage is 13.50 Lakh (INR).

Revolutionary Sulphate Recovery System Commissioned: A Major Leap in Environmental Sustainability:

On 24th January 2024, Grasim Industries Limited achieved a significant milestone with the commissioning of a new Sulphate recovery System at their Renukoot Plant. This cutting-edge system marks a major advancement in the company's commitment to sustainable and environmentally friendly Industrial Process.

The Newly Installed Sulphate recovery System has brought about remarkable changes in the Plant's operations, particularly in the areas of resource efficiency and waste reduction. One of the most notable achievements is the elimination of barium Carbonate consumption, a Key component in the traditional Sulphate removal Process. By integrating this advanced system, Grasim Industries has not only reduced with barium Carbonate but also mitigated the environmental impact related to its usages.

In addition to the elimination of barium carbonate, the sulphate recovery system has significantly decreased the generation of brine Sludge. Previously, the plant faced challenges with the disposal and management of brine sludge, a byproduct of the sulphate removal process. With the new system in place, the generation of brine sludge has been reduced by an impressive 36% - 40%. This Sludge is recovery from Filter Press with improvement by 25-29% Moisture. This reduction not only ease the burden on waste management practices but also aligns with Grasim Industries' broader Sustainability goals.The Successful implementation of the sulphate recovery system at the Renukoot plant serves as a model for the other facilities within the company and the industry at large. It demonstrates that with the right technology and commitment, it is possible to achieve substantial environmental and operational benefits.The Installation of Nano Filtration Technology (RO) of Sulphate recovery System has brought about notable improvements in the Plant operations. Most significantly, the consumption of barium carbonate, a key raw material in the process, has been eliminated as of January 08, 2024. This milestone was achieved following the commissioning of the cold section of the Sulphate recovery System. After Hot Section Commissioned Anhydrous Sodium Sulphate Produced on 24th Jan 2024. This was a fruitful day the first Consignment of Anhydrous Sodium Sulphate flag off as a by- product on 14 Feb 2024.

As Grasim Industries Limited, Renukoot continues to prioritize sustainability and operational excellence, the Successful commissioning of the Sulphate Recovery System at the Renukoot

facility represent a significant step forward in their journey towards achieving environmental and economic goals.

Water Conservation: Treatment & Recycling:

Apart from recycling the generated effluent within the plant premises, all effluent generated from the plant is treated with an Effluent Treatment Plant (ETP) of 1000 KLD capacity by a Zero Liquid Discharge (ZLD) system. The installed and continuous operation of two ATFD units capacity of 24 KLD (ATFD-3 and ATFD-4) is ensured. The treated condensate from the ATFDs is utilized as make-up water in cooling towers.

The generated MEE salt with treatment of ATFDs disposed of at a TSDF.

Environmental Monitoring:

An amount of 9.02 lakh (INR) was spent towards monitoring of various environmental parameters in FY 2023-24. This consist of air quality monitoring at a frequency of monthly with 24 hourly sampling and water quality monitoring, effluent quality monitoring etc.

An amount of 7.58 Lakh (INR) was spent towards Biannual Environmental Assessment during FY 2023-24 done by recognized institute CSIR-NEERI HZC with objectives -

1. Assessment of the prevailing environmental data w.r.to air, water and noise for a period of three years on biannual basis
2. To delineate suitable environmental management plan, if any

Apart from manual monitoring GRCD has also installed OCEMS for process stacks, as per CPCB guidelines with data connectivity to CPCB server, which being properly maintained by awarding AMC to competent vendor.

GRCD has also installed 02 No's of Continuous Ambient Air Monitoring Station installed for real time Air Quality monitoring. In addition to that weather monitoring station is also installed for weather data.

Cost estimation for pollution control

Sl. No.	Description	Total expenditure (in lacs)	
		(2022-23)	(2023-24)
1	Water Pollution	401.92	1237.66
2	Air Pollution	10.84	18.21
3	Solid & Hazardous waste	502.87	346.28
4	Green Belt development	8	4.50
5	Others	84.51*	101.13*
	Total	**1008.14**	**1707.08**

*Housekeeping Expenses

PART – H

(Additional measures/ investment proposal for environmental protection including abatement of pollution)

GRCD has pro-actively started water sprinkling inside the colony and outside the premises to mitigate the dust exposure for the improvement of Air quality.

Replacement of Existing Lamps with Energy Efficient LED/ Induction Lamp.

GIL is actively involved in awareness programme related to Environment like celebration of Environment Day like every year. Various activities were organized among children, ladies, workers, employees.

PART – I

(Any other particulars for improving the quality of environment)

GIL always puts environmental issues on top priority. As a result of continuous efforts, GIL got certified for the following ISO standards by TUV Nord CERT:

- ISO-9001:2015
- ISO-14001:2015
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GIL trains its employees for environmental conservation activities and need of the ecological balance for sustainable development and operation process.

(Dr. Vinay Kumar Yadav)

ADITYA BIRLA

GRASIM

GIL/ENV/2024-25/57

19 September, 2024

To,
The Regional Officer,
U. P. Pollution Control Board,
H. No. – 162, Uttar Mohal, Near Chandi Hotel
Robertsganj, Sonebhadra (U.P.) – 231216

Sub: Environmental Statement of Captive Power Division for the year 2023-24.

Dear Sir,

Please find enclosed herewith the Environmental Statement for our Captive Power Division for the FY 2023-24 for your kind perusal.

We hope you will find the above in order.

Thanking you,

Yours Faithfully,
for **GRASIM INDUSTRIES LIMITED,**

V K Yadav

Dr. Vinay Kumar Yadav
(Head – Environment & Sustainability)

Encl: Environmental Statement of Captive Power Division

Cc.
The Member Secretary,
U. P. Pollution Control Board,
TC-12/V, Vibhuti Khand,
Gomati Nagar, Lucknow – 226 010.

डाक प्राप्ति रसीद
प्राप्ति दिनांक 20/9/24
प्राप्तकर्ता के हस्ताक्षर
उ०प्र० प्रदूषण नियंत्रण बोर्ड, लखनऊ

Grasim Industries Limited
Chemical Division Renukoot
P.O.: Renukoot - 231 217,
Distt.: Sonebhadra (U.P.) India

Telephone +91- 5446 - 252044/55/75
Fax +91- 5446 - 252088

Website www.grasim.com
E-mail grasim.renukoot@adityabirla.com
CIN L17124MP1947PLC000410
PAN AAACG4464B

Regd. Office - Birlagram, Nagda - 456331, M.P., India

Grasim Industries Limited

(Chemical Division Renukoot)

FY 2023-24

Environmental Statement (Form – V)

ES for Power Generation Division

Prepare & Submitted By

Grasim Industries Limited
Chemical Division, Renukoot
Sonebhadra, U.P. -231217

INTRODUCTION

Department of Environment and Forests, Government of India (GOI) under the Environment (Protection) Act, 1986 has made Environmental Statement mandatory for all industries and the report prepared by competent experts has to be submitted to the concerned Pollution Control Board. This is a measure to check any adverse impacts of the processes on the occupational and surrounding environment.

The Environmental Audit programme included the following:

Assessment of compliance status with respect to environmental regulations and Assessment of environmental management system's capability to cope up with existing requirement of CPCB/UPPCB.

CSIR-NEERI-HZC for Bi-annual monitoring and M/s ETRC - Lucknow has been engaged for monitoring of stack emission, ambient air monitoring, solid waste hazardous, water and effluent testing of M/s. Grasim Industries Limited, Renukoot for monthly monitoring respectively from April, 2023 to March, 2024. Based on these Bi-annual and monthly monitoring reports, Annual Environmental Statement Audit (AESA) for the year 2023 - 2024 has been prepared. This Environmental audit report contains data pertaining to ambient air quality, stack emission, water and wastewater quality, hazardous and non-hazardous solid waste generation and its disposal system and other plant details related to environmental pollution and management.

PLANT SITE AND SURROUNDINGS

M/s- Grasim Industries Limited, Renukoot, Sonebhadra UP is located on distance of 2 km from Renukoot Railway station of district- Sonebhadra, Uttar Pradesh.

PART – A

GENERAL INFORMATION ABOUT THE COMPANY

1. Name of the Company : M/s. Grasim Industries Limited
Power Generation Division Renukoot

2. Name & Address of the Owner/Occupier : **HARI KRISHNA AGARWAL**
P.O - Renukoot 231 217
Dist. Sonebhadra (U.P.)

3. Registered Office Address : Birla gram Nagda – 456 331 M.P.

4. Factory Address : P.O. Renukoot – 231 217
Distt. Sonebhadra, (U.P.)

5. Production Installed Capacity :

Sl. No.	Name of Product	Consented Capacity (MW)
1	Electricity	50 MW (2*25 MW)

6. Year of Establishment : 1996 & 2005

7. Date of last Environmental Statement submitted : Submitted to U.P. Pollution Control board vide our letter no GIL/ENV/2023-24/57, dated September 18, 2023

PART – B

1. **TOTAL WATER CONSUMPTION**:

Sl. No.	Description	Consumption (m^3/day)
a	Process	744
b	Cooling	2013
c	Domestic	-
d	Green belt	Treated STP effluent is used for green-belt development.

2. WATER CONSUMPTION PER UNIT OF PRODUCT:

Name of Product	Water consumed per unit of product manufactured (l/kwh)	
	(2022-23)	(2023-24)
Electricity	2.67	2.79

3. RAW MATERIAL CONSUMPTION:

S .No.	Name of the raw material	Name of Product Concerned	Raw material consumed per unit of product manufactured (g/kwh)	
			(2022-23)	(2023-24)
1	Coal	Electricity	968.9	946.92
2	HSD	Electricity	0.08	0.12

PART – C

1. WATER POLLUTION

Sl. No.	Pollutant Parameters	Qty. of Pollutants generated	Concentration of pollutants in untreated effluent (completely recycled to achieve ZLD)	% Variation from prescribed standards
		(kg/day)	**(mg/l)**	-
1	---	Nil	Nil	–––

Note: It is to be noted that since we are maintaining zero liquid discharge of effluent from August -2017, Hence the above discharge load is also zero.
*All effluent of Power Division is being transferred to Final ETP of Chemical Division and Unit has achieved zero liquid discharge facility from August -2017

Parameter	Months (FY 2023-24)												
	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Average
pH	7.4	7.2	6.5	7.2	7.2	7.5	6.9	7.2	7.4	7.6	7.2	7.7	7.3
TSS	5.6	BDL	BDL	BDL	BDL	5.4	BDL	8.6	8.5	5.6	BDL	5.2	3.2
TDS	1924	572	166	204	118	202.6	208	186	192	186	192	202	362.7
O&G	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cl	14	18.3	114.8	8.1	8.26	15.51	18.01	20	18	20	22.02	13.1	24.2
BOD	6.4	6.8	18	2.4	3.2	4.4	2.6	3.8	3.4	6.66	4.6	4.9	5.6
COD	28	32	65.28	8	12	16	8.16	24	20	32	12	16	22.8

Note: - All parameters are in mg/Ltr except pH.

Adoption of ZLD meant comprehensive management of wastewater, through reduced use, efficient recycling and treatment to ensure that discharge of liquid wastes by industrial units was completely eliminated. A multi-level approach to water recovery with modifications was implemented in the production processes.

The plant planned and achieved ZLD by following the 3Rs of reduce, reuse and recycle as the first step.

- **Reduce**: Reduction of water consumption across different processes either through technological changes or through process optimization.
- **Reuse**: Use of water generated from one process in the same or different processes after testing the quality of generated water.
- **Recycle**: Treatment of effluents in such a way that maximum water could be recovered for reuse within the production cycle.

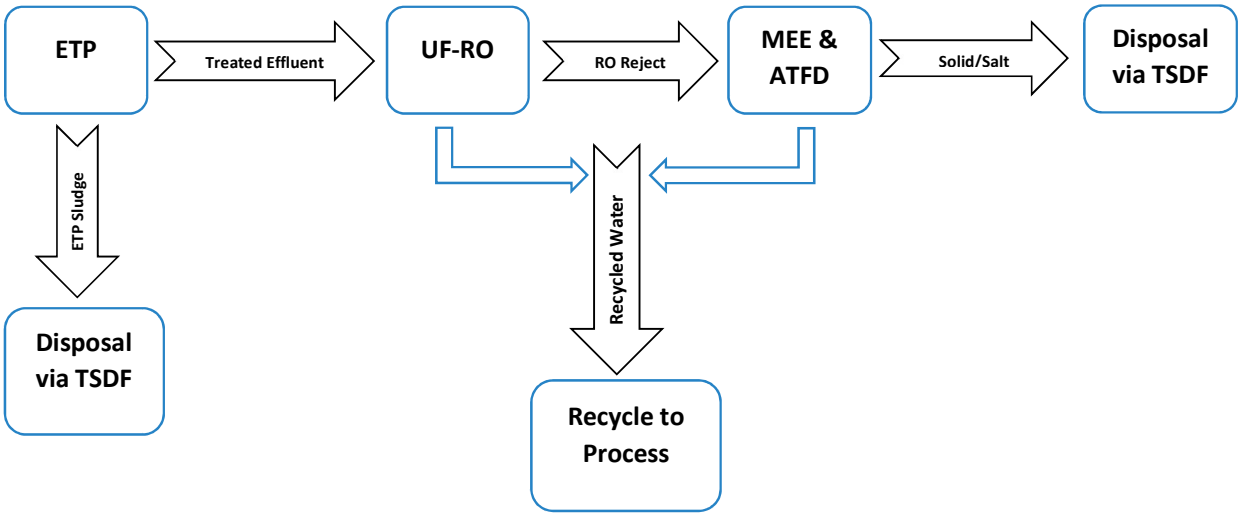
The successful implementation of the 3R processes were, however, preceded by a detailed understanding of the nature of effluents and the quality of wastewater involved. The areas worked on are as explained below:

- Knowing the quality and volume of each effluent generated from different processes
- Segregating and collecting the same quality of effluents for use in same or different processes
- Developing a facility for collection of effluents from different processes for final treatment in ETP
- Reducing the effluent volume as best possible, to make ZLD cost effective

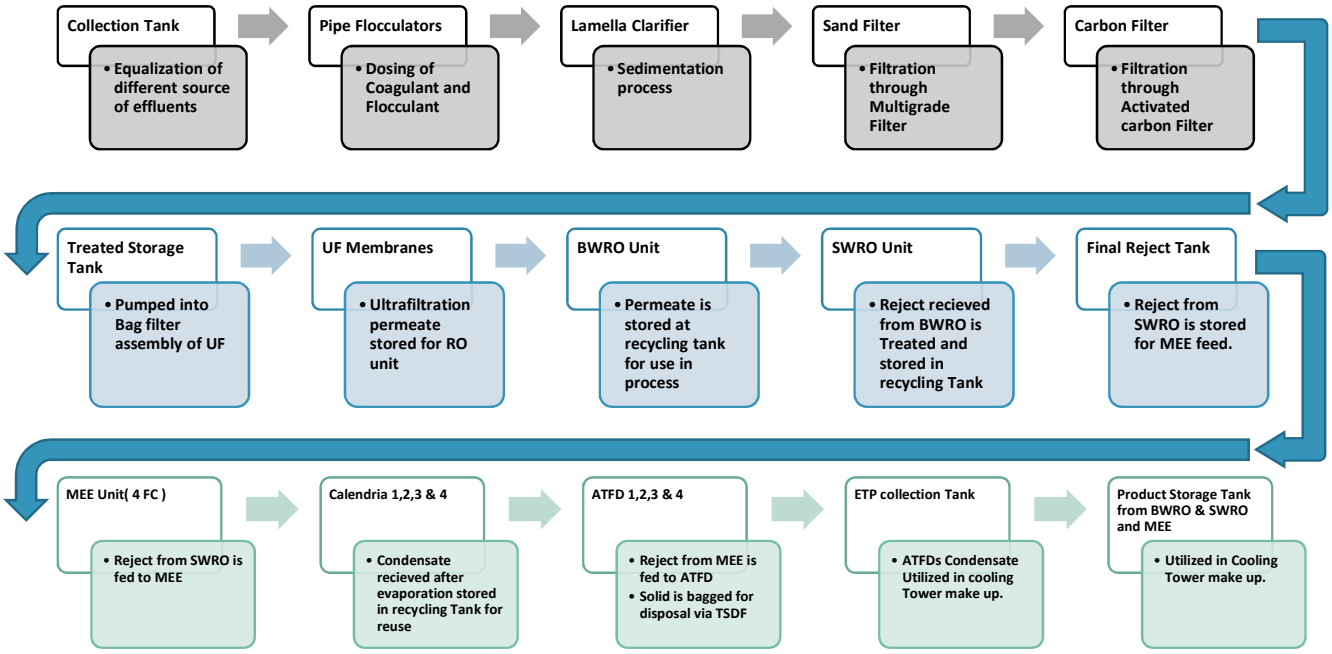
In the second step, the balance wastewater after the 3R approach was passed through Double stage RO plant and Multi-Effect Evaporator to achieve the ZLD status.

The effluent from various sections is collected in effluent collection pit where it is collected for equalization. The pH of the effluent after equalization is maintained in the desired range with alkali or acid, whatever may be the requirement. The neutralized effluent is then passed through pipe flocculator into flocculation tank where dosing of polyelectrolyte is done using flash mixer. Effluent dosed with polyelectrolyte then goes to lamella clarifier where sufficient retention time is given for settling and clarification. By gravity suspended solids settle down and are removed as sludge from the bottom. The sludge is then dewatered at filter press. The water from filter press is again recycled back in collection tank. The filter cake is filled in bags and stored for disposal in TSDF.

Effluent Treatment Flow Diagram:



Effluent treatment process flow –



2. **AIR POLLUTION:**

Unit: PGD 1				
S. No.	**Pollutant Parameters**	**Qty. of pollutants generated (kg/day)**	**Concentration of pollutants in discharge (mg/Nm^3)**	**% variation from prescribed standards**
1	Particulate matter (SPM)	275.77	53.15	Within limits
2	SO2	1673.94	322.63	-do-
3	NOx	997.01	192.16	-do-
Avg. emission (Nm^3/ hr.) :		**216183.29**		

Unit: PGD 2				
S. No.	**Pollutant Parameters**	**Qty. of pollutants generated (kg/day)**	**Concentration of pollutants in discharge (mg/Nm^3)**	**% variation from prescribed standards**
1	Particulate matter (SPM)	227.09	43.55	Within limits
2	SO2	1557.19	298.62	-do-
3	NOx	963.38	184.74	-do-
Avg. emission (Nm^3/ hr.) :		**217276.87**		

Unit #	**Quarters**	**Parameters**				
		PM	**SOx**	**NOx**	**CO2**	**Hg**
PGD 1	**Q 1**	55.56	402.40	209.30	10.73	0.00
	Q 2	53.23	326.48	238.30	11.20	0.00
	Q 3	51.66	294.10	176.25	11.30	0.00
	Q 4	52.16	267.55	144.79	11.17	BDL
Average FY 23-24		**53.15**	**322.63**	**192.16**	**11.10**	**0.00**
PGD 2	**Q 1**	43.73	315.47	200.93	11.10	0.00
	Q 2	44.49	316.40	216.81	11.03	0.00
	Q 3	42.90	296.41	170.57	11.30	0.00
	Q 4	43.08	266.19	150.67	11.15	0.00
Average FY 23-24		**43.55**	**298.62**	**184.74**	**11.15**	**0.00**

Summary of PGD Boilers Stack Emission Results for FY 2023-24

Q 1		Parameters				
Unit #	**Months**	**PM**	**SOx**	**NOx**	**CO2**	**Hg**
PGD 1	**APR**	56.84	413.48	214.85	10.8	BDL
	MAY	57.16	404.18	208.18	10.6	BDL
	JUN	52.67	389.53	204.86	10.8	BDL
Avg of Q 1		**55.56**	**402.40**	**209.30**	**10.73**	**0.00**
PGD 2	**APR**	43.3	316.11	203.13	11.1	BDL
	MAY	44.68	312.53	204.18	11.00	BDL
	JUN	43.2	317.78	195.48	11.2	BDL
Avg of Q 1		**43.73**	**315.47**	**200.93**	**11.10**	**0.00**

Q 2		Parameters				
Unit #	**Months**	**PM**	**SOx**	**NOx**	**CO2**	**Hg**
PGD 1	**JUL**	55.36	337.72	247.87	11.2	BDL
	AUG	52.64	325.62	248.74	11.1	BDL
	SEP	51.68	316.09	218.3	11.3	BDL
Avg of Q 2		**53.23**	**326.48**	**238.30**	**11.20**	**0.00**
PGD 2	**JUL**	45.05	329.03	222.21	10.9	BDL
	AUG	43.18	305.74	208.19	11	BDL
	SEP	45.23	314.44	220.03	11.2	BDL
Avg of Q 2		**44.49**	**316.40**	**216.81**	**11.03**	**0.00**

Q 3		Parameters				
Unit #	**Months**	**PM**	**SOx**	**NOx**	**CO2**	**Hg**
PGD 1	**OCT**	52.47	304.94	227.11	11.4	BDL
	NOV	51.25	294.59	142.75	11.2	BDL
	DEC	51.25	282.76	158.9	11.3	BDL
Avg of Q 3		**51.66**	**294.10**	**176.25**	**11.30**	**0.00**
PGD 2	**OCT**	42.57	308.14	220.02	11.3	BDL
	NOV	43.29	300.55	144.57	11.4	BDL
	DEC	42.85	280.54	147.11	11.2	BDL
Avg of Q 3		**42.90**	**296.41**	**170.57**	**11.30**	**0.00**

Q 4		Parameters				
Unit #	**Months**	**PM**	**SOx**	**NOx**	**CO2**	**Hg**
PGD 1	**JAN**	52.46	277.46	142.72	11.1	BDL
	FEB	53.7	270.17	152.92	11.02	BDL
	MAR	50.33	255.03	138.74	11.4	BDL
Avg of Q 4		**52.16**	**267.55**	**144.79**	**11.17**	BDL
PGD 2	**JAN**	43.59	270.17	149.3	11	BDL
	FEB	42.56	262.21	152.04	11.3	BDL
	MAR	SHUTDOWN				
Avg of Q 4		**43.08**	**266.19**	**150.67**	**11.15**	**BDL**

Summary of Ambient Air Quality Results

Location	**Parameter**								
	PM 10	**PM-2.5**	**SO_2**	**NO_x**	**Lead (Pb)**	**CO**	**O_3**	**CO2**	**Cl_2**
	ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3	mg/m^3	ug/m^3	NA	NA
ETP plant	78.07	48.57	13.41	19.45	BDL	0.52	16.16	NA	NA
Main gate	80.14	51.31	14.28	21.60	BDL	0.54	16.62	NA	NA
PGD (area)	82.71	51.50	13.72	21.00	BDL	0.53	16.43	NA	NA
Project Office	70.86	45.32	12.95	18.33	BDL	0.52	15.47	NA	NA

PART – D

(As specified under Hazardous Waste (Management and Transboundary Movement) Rules, 2016

Sl. No.	Description	Total quantity in MT (2022-23)	Total quantity in MT (2023-24)
A	**FROM PROCESS**		
1	5.1-waste Oil	6.200*	4.570*
B	**FROM POLLUTION CONTROL FACILITIES**		
	-	-	-

- * The quantity mentioned here is combined for both Chemical Division and Power division.

PART – E

(Solid Waste)

Sl. No.	Description	Total quantity in MT (2022-23)	Total quantity in MT (2023-24)
a	**From process**		
1.	Bottom Ash	8501 MT	18680.21 MT
b	**From pollution control facilities**		
1.	Fly Ash	110747 MT	117107.22 MT
C1	Qty. recycled or utilised within limits	3398 MT*	9179.12 MT*
C2	Sold	-	-
C3	Disposed/utilized	115881**	126608.31**

- * Quantity is utilized in brick manufacturing, construction.
- ** Quantity is sent to cement industry for utilization and filling of low lying area.

PART – F

(Characteristics of Hazardous and Solid Waste)

Sl. No.	Description	Nature of waste	Composition/Characteristics	Quantity (MT) (FY 2023-24)	Management (Methods of Collection & Disposal)
1.	Waste Oil	Hazardous	PCBs, Lead, Arsenic, Cadmium, Chromium, PAHs etc.	4.570*	Filled in MS drums and stored at impervious surface. Recycled/Disposed through TSDF
2	Fly Ash	Non-Hazardous	Sodium oxide, magnesium oxide, alumina, silica, calcium oxide, iron oxide, etc.	117107.22	Stored in silos and dispatch to cement industries
3.	Bottom Ash	Non-Hazardous	Unburned carbon, Silica Oxide, calcium oxide, Ferric oxide , etc.	18680.21	Stored and utilized in filling low-lying area, construction and in brick manufacturing

❖ * The quantity mentioned here is combined for both Chemical Division and Power division.

PART - G

(Impact of pollution control measures on conservation of natural resources and consequently on the cost of production)

Cost estimation for pollution control

Sl. No.	Description	Total expenditure (in lacs)	
		(2022-23)	(2023-24)
1	Water Pollution	1.5	1.85
2	Air Pollution	71.76	101.54
3	Solid & Hazardous waste	127.2	95.16
4	Green Belt development	2	1
5	Others	5.7	11.98*
Total		**235.04**	**211.53**

*Housekeeping Expenses

PART – H

(Additional measures/ investment proposal for environmental protection including abatement of pollution)

Dust Suppression: water sprinkling system has been installed and maintained for the mitigation of fugitive emission.

Air Pollution Control Measure: Annual maintenance of ESP unit is being done for the optimum efficiency of the units.

Coal unloading area: the cold is transported by wagon/rail to premises as to reduce carbon footprints and frequent movement of trucks, besides rail tracks the area is being concreted for better management of coal that reduced the problem of dust and chances of land contamination especially in rainy season.

Plantation: A total of 5000 plants were planted at the site from FY-2023-24 to create a denser and greener environment around the Grasim Campus. This resulted in the increase of the overall green cover present in the plant which will subsequently contribute to the carbon sequestration. The "Aditya Udyan" has allowed all types of visitors to visit the plantation site at all times. Furthermore, attributes like dynamic colour programmed fountain is added in the Udyan to enhance the aesthetic appeal and subsequently, it will inherit the culture and idea of Clean & Green Grasim Campus. No doubt our "Aditya Udyan" has become a must visit site for all nature lovers, to watch beautiful Birds & Butterflies relishing in their natural habitat.

Water Conservation: Treatment & Recycling:

Apart from recycling the generated effluent within the plant premises, all effluent generated from the plant is treated with an Effluent Treatment Plant (ETP) of 1000 KLD capacity by a Zero Liquid Discharge (ZLD) system. The installed and continuous operation of two ATFD unit's capacity of 24 KLD (ATFD-3 and ATFD-4) is ensured. The treated condensate from the ATFDs is utilized as make-up water in cooling towers.

The generated MEE salt with treatment of ATFDs disposed of at a TSDF.

PART – I

(Any other particulars for improving the quality of environment)

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A separate fully equipped Environment laboratory is maintained at GIL for monitoring Environmental parameters as per EC condition.

GIL trains its employees for environmental conservation activities and need of the ecological balance for sustainable development and operation process.

Electrostatic Precipitators (ESP) for Particulate Matter

In the boilers are equipped with electrostatic precipitators (ESP) for controlling the fly ash emissions. Fly ash emissions from the power plant are controlled by installation of electrostatic precipitator. The ESP has been provided with each unit to limit the particulate emissions in the flue gas to within 100 mg/Nm3 and 50 mg/Nm3 for Unit No. 1 & 2, respectively. Ash handling system has provided for removing the furnace and fly ash. The scheme of ESP and its typical view are shown in Figure 1 and 2.

The electrostatic precipitator utilizes electrostatic forces to separate dust particles from the gas to be cleaned. The gas is conducted to a chamber containing "curtains" of vertical steel plates. These curtains divide the chamber into a number of parallel gas passages. A frame with secured wires is located within each passage. All the frames are linked to each other to form a rigid frame work. The entire frame work is held in place by four support insulators, which insulate it electrically from all parts which are grounded.

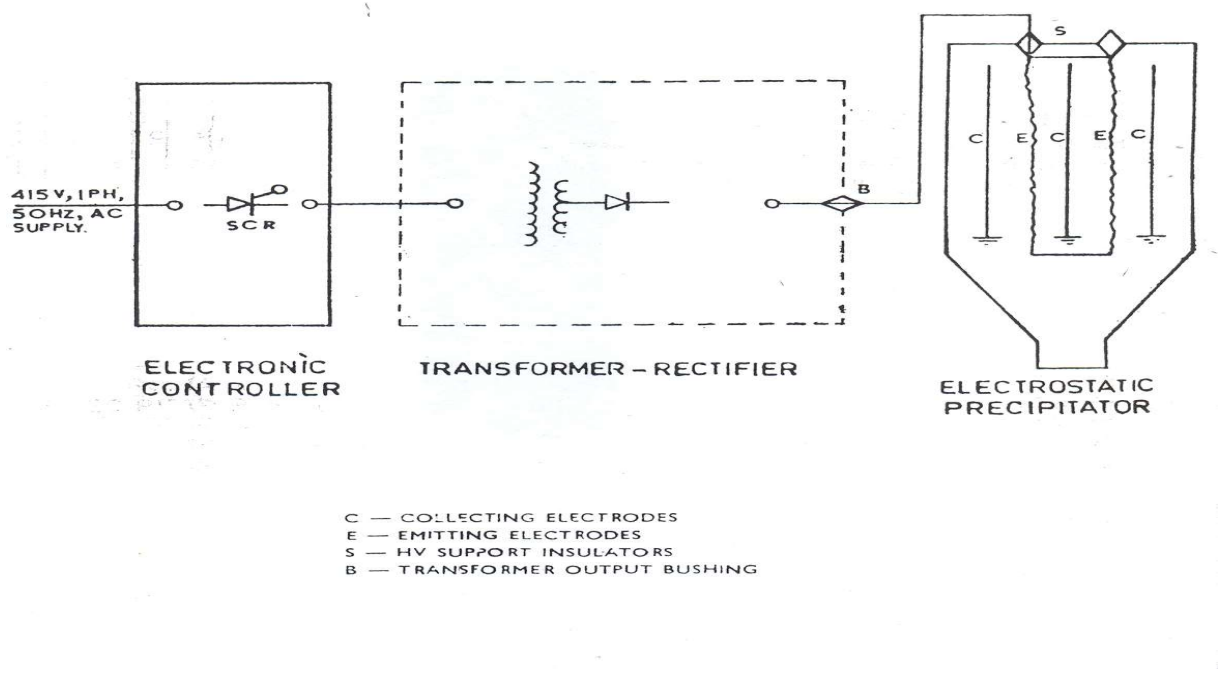

Figure No. 1: SCHEME OF ELECTROSTATIC PRECIPITATOR

A high voltage direct current is connected between the framework and the ground, thereby creating a strong electrical field between the wires in the framework and the steel curtains. The electrical field becomes strongest near the surface of the wires so strong that an electrical discharge “the corona discharge” develops along the wires. The gas is ionized due to the corona discharge and large quantities of positive and negative ions are formed. The positive ions are immediately attracted towards the negative wires by the strength of the field. The negative ions, however, have to traverse the entire space between the electrodes to reach the positive curtains. Enroute towards the steel curtain, the ions collide with and adhere to the dust particles in the gas. The particles thereby become electrically charged and also begin to migrate in the same direction as the ions towards the steel curtains and stick on to them. These curtains are rapped periodically to dislodge the dust, which is collected in the hoppers.

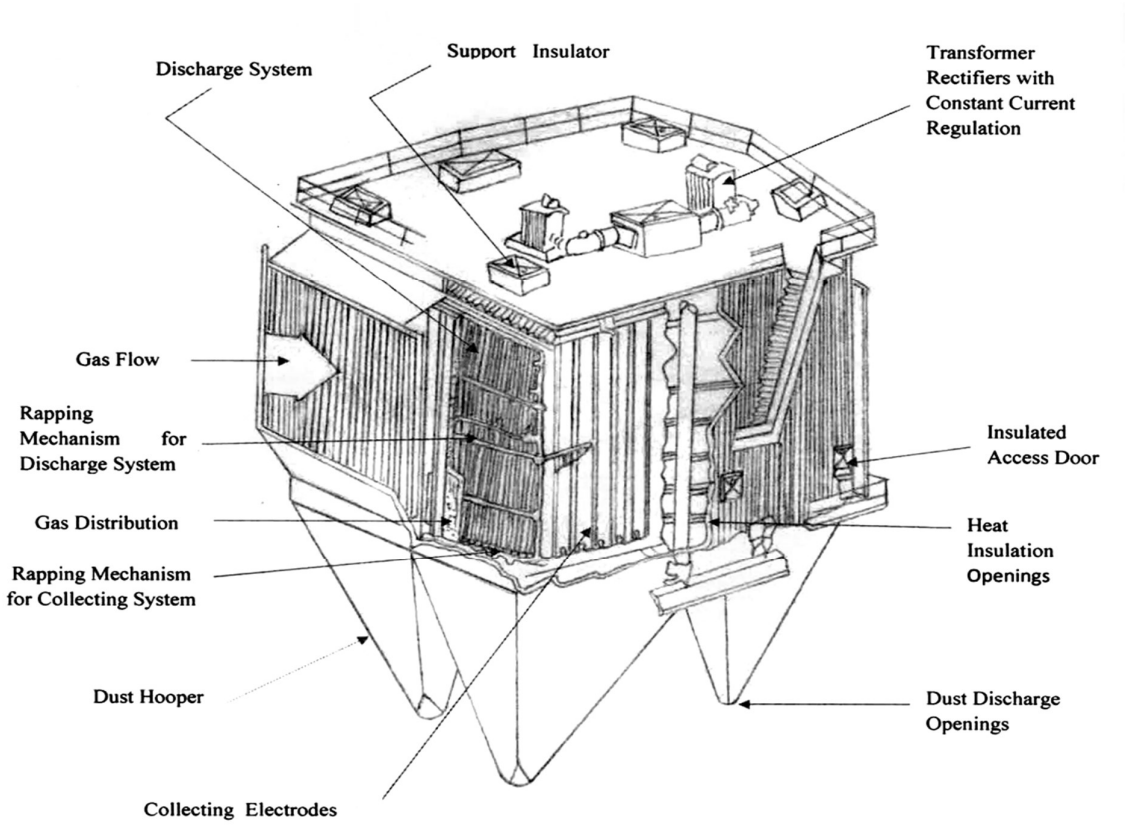

Figure No. 2: TYPICAL VIEW OF ELECTROSTATIC PRECIPITATOR (ESP)

Sources of Emission of the Air Pollutants and Adopted Control Measures

S. No.	Pollutant	Sources of Emission	Control Measures
1.	SPM	Coal handling and crushing	Sprinklers in the coal storage areas, dust suppression system in the coal crushing units, transfer hopper and conveyor transfer points.
		Fuel combustion (coal with high percentage of inert & diesel)	Electrostatic Precipitator
2.	SO_2	Combustion of coal (containing 0.3 to 0.4% sulphur) used for generation of steam	Two flue stacks with 75 meter height.

Ash Disposal

Ash is being disposed in dry condition by disposal system. There is possibility of air pollution nuisance in connection with dry ash disposal system hence GIL installed silo and using closed bulkers for transportation to avoid air pollution.

Replacement of Existing Lamps with Energy Efficient LED/ Induction Lamp.

GRCD has pro-actively started water sprinkling inside the colony and outside the premises to mitigate the dust exposure for the improvement of Air quality.

GIL is actively involved in awareness programme related to Environment like celebration of Environment Day like every year. Various activities were organized among children, ladies, workers, employees.

V.K. Yadav

(Dr. Vinay Yadav)