Asian Paints Limited
Plot E6 to F13
SIPCOT Industrial Park
Sriperumbudur - 602 105
Dist. Kancheepuram
tel : 91 44 6714 5000 / 5031
www.asianpaints.com

**Ref no: SRI/EHS/23-24/09/04** **Date: 27.09.2023**

**To,**

The District Environmental Engineer,

Tamil Nadu Pollution Control Board,

Plot No.CP-5B, SIPCOT Industrial Growth Centre,

Oragadam, Kancheepuram (Dt) - 602105

**Subject:** Environmental Statement for the financial year ending - 31st March 2023

Dear Sir,

With reference to The Environmental (Protection) rules 1986- Rule 14, please find attached Form V – Environmental Statement for the financial year ending - 31st March

We assure you that we are committed to continuous improvement in all our activities towards environmental protection and management.

Yours truly,

**For Asian Paints Limited,**

**Sunil P**
Associate General Manager

**Enclosure:** Form V Report


**Copy To,**

Tamil Nadu Pollution Control Board

No: 6, Mount Salai,

Guindy, Chennai – 600032.

**FORM V**

(See rule 14)

Environmental Statement for the Financial Year Ending 31st March 2023

**PART A**

| | |
|---|---|
| (i) Name and address of the owner / occupier of the industry operation or process | Shri. Amit Syngle<br>Managing Director & CEO<br>Asian Paints (India) Limited,<br>E6-F13, SIPCOT Industrial Park<br>Sriperumbudur, Kancheepuram District<br>Tamilnadu, Pin Code 602 105 |
| (ii) Industry category | |
| Primary - (STC Code) | 2800 |
| Secondary - (SIC Code) | 2851 |
| (iii) Production capacity – Units | Water Based Paint : 140000 KL per annum<br>Water Based Polymer : 39000 KL per annum |
| (iv) Year of establishment | 2005 |
| (v) Date of last environmental statement submitted | 26th September 2022 |

**Part B**

## 1. Water and Raw Material Consumption:

### (i) Water Consumption $m^3$/day

| | |
|---|---|
| **Process** | 164 $m^3$/day |
| **Cooling and Boiler** | 13 $m^3$/day |
| **Domestic** | 45 $m^3$/day |
| **Total** | 222 $m^3$/day |

| **Name of the Product** | **Process Water consumption per unit of Product** | |
|---|---|---|
| | **During previous financial year** | **During current financial year** |
| Water Based Paints | 0.47 (process water/paint production) | 0.48 (process water/paint production) |

### (ii) Raw Material Consumption

| **S. No** | **Name of the Raw Material** | **Name of the products** | **Consumption of raw material MT per unit of output KL** | |
|---|---|---|---|---|
| | | | **During the Previous FY (21-22)** | **During the Current FY (22-23)** |
| 1 | Pigment | Water Based Paint | 0.087 | 0.081 |
| 2 | Extender | Water Based Paint | 0.391 | 0.411 |
| 3 | Additives | Water Based Paint | 0.169 | 0.1680 |
| | | Water Based Polymer | 0.00019 | 0.0035 |
| 4 | Solvents (Water) | Water Based Paint | 0.450 | 0.482 |
| 5 | Monomers | Water Based Polymer | 0.135 | 0.116 |
| 6 | Others | Water Based Paint | 0.054 | 0.014 |
| | | Water Based Polymer | 0.000 | 0.044 |

**Part C**

**1. Pollution discharged to environment/unit of output:**

**(a) Water Pollutant - Industrial Effluent**

| S. No (1) | Parameter (2) | Quantity of pollutants discharged (mass/day) (3) | Concentration of pollutants discharged (mass/volume) (4) | TNPCB Limits | Percentage of variation from prescribed standards with reasons (5) | Reason (6) |
|---|---|---|---|---|---|---|
| 1 | pH | NA | 7.08 | 5.5 – 9 | Within Specified limit | Negative Variance/Within Limit Indicates the Quality Parameter of Treated Effluent is Much better than Prescribed Standards |
| 2 | Total Dissolved Solids | 0.57993 | 348.97 | 2100 mg/l | Within Specified limit | |
| 3 | Total Suspended Solids | 0.00798 | 4.80 | 100 mg/l | Within Specified limit | |
| 4 | Particles size of total Suspended solids | NA | All Pass | Small Pass 850 Micron Sieve | -93.890 | |
| 5 | Temperature | NA | 22.11 | 40 *C | -83.248 | |
| 6 | Arsenic as (As) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 0.2 mg/l | -84.539 | |
| 7 | Total Chromium as (Cr) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 2 mg/l | Within Specified limit | |
| 8 | Chromium as (hexavalent Cr+6) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 0.1 mg/l | -97.666 | |
| 9 | Copper as (Cu) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 3 mg/l | Within Specified limit | |
| 10 | Lead as (Pb) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 0.1 mg/l | Within Specified limit | |
| 11 | Nickel as (Ni) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 3 mg/l | Within Specified limit | |
| 12 | Zinc as (Zn) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 1 mg/l | Within Specified limit | |
| 13 | Boron as (B) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 2 mg/l | Within Specified limit | |
| 14 | Cyanide as (CN) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 0.2 mg/l | Within Specified limit | |
| 15 | Total Residual Chlorine | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 1 mg/l | Within Specified limit | |
| 16 | Chloride as CL | 52.85766 | 87.14 | 1000 mg/l | Within Specified limit | |
| 17 | Fluoride as F4 | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 2 mg/l | Within Specified limit | |
| 18 | Ammonical Nitrogen as N | 0.00039 | 0.24 | 50 mg/l | -83.023 | |
| 19 | Total Kjeldahl Nitrogen as (N) | 0.00050 | 0.30 | 100 mg/l | Within Specified limit | |
| 20 | Free Ammonia as (NH3) | BLQ(LOQ:0.1) | BLQ(LOQ:0.1) | 5 mg/l | Within Specified limit | |
| 21 | Dissolved Phosphates as P | 0.00055 | BDL | 5 mg/l | Within Specified limit | |

| S. No (1) | Parameter (2) | Quantity of pollutants discharged (mass/day) (3) | Concentration of pollutants discharged (mass/volume) (4) | TNPCB Limits mg/l | Percentage of variation from prescribed standards with reasons (5) | Reason (6) |
|---|---|---|---|---|---|---|
| 22 | Sulphide as S | BLQ(LOQ:0.1) | BDL | 2 mg/l | Within Specified limit | Negative Variance/With in Limit Indicates the Quality Parameter of Treated Effluent is Much better than Prescribed Standards |
| 23 | Sulphate as SO4 | 0.05408 | BDL | 1000 mg/l | Within Specified limit | |
| 24 | BOD 5 days @ 20c | BLQ(LOQ:2.0) | BDL | 30 mg/l | Within Specified limit | |
| 25 | COD | 0.02167 | BDL | 250 mg/l | Within Specified limit | |
| 26 | Oil and grease | BLQ(LOQ:1.0) | BDL | 10 mg/l | Within Specified limit | |
| 27 | Phenolic Compounds as (C6 H5 OH) | BLQ(LOQ:0.001) | BLQ(LOQ:0.001) | 1 mg/l | Within Specified limit | |
| 28 | Sodium | 0.11924 | 71.75 | - | Within Specified limit | |
| 29 | Residual Sodium Carbonate | -0.00060 | -0.36 | - | -94.796 | |
| 30 | Cadmium (Cd) | BLQ(LOQ:0.05) | BLQ(LOQ:0.05) | 2 mg/l | Within Specified limit | |
| 31 | Mercury as (Hg) | BLQ(LOQ:0.01) | BLQ(LOQ:0.01) | 0.01 mg/l | Within Specified limit | |
| 32 | Selenium as (Se) | BLQ(LOQ:0.01) | BLQ(LOQ:0.01) | 0.05 mg/l | Within Specified limit | |
| 33 | Pesticides | Absent | Absent | Absent | Within Specified limit | |
| 34 | Alpha emitters | BLQ (LOQ 0.0054) | BLQ (LOQ 0.0054) | 10^-7 micro-Curie/ml | Within Specified limit | |
| 35 | Beta emitters | BLQ (LOQ 0.0054) | BLQ (LOQ 0.0054) | 10^-6 micro-Curie/ml | Within Specified limit | |

BLQ - Below Limit of Quantification

LOQ – Limit of Quantification

NA – Not Applicable

Note: Treated effluent is used in cooling tower and hence zero discharge achieved.

**(b) Water Pollutant - Domestic Effluent**

| S. No (1) | Parameter (2) | Quantity of pollutants discharged (mass/day) (3) | Concentration of pollutants discharged (mass/volume) (4) | TNPCB Limits | Percentage of variation from prescribed standards with reasons (5) | Reason (6) |
|---|---|---|---|---|---|---|
| 1 | pH | NA | 6.43 | 5.5 - 9 | Within Specified limit | Negative Variance/Within Limit Indicates the Quality Parameter of Treated Effluent is Much better than Prescribed Standards |
| 2 | Total Suspended Solids | 0.26 | 7.25 | 30 mg/l | -75.83 | |
| 3 | BOD 5 days @ 20c | 0.24 | 6.80 | 20 mg/l | -65.98 | |

**(c) Air Pollutant**

| Stack | S. No | Parameter | Quantity of pollutants discharged (mass/day) | Concentration of pollutants discharged (mass/Volume) | Percentage of variation from prescribed standards with reasons | Reason |
|---|---|---|---|---|---|---|
| DG1 | 1 | Particulate | 0.019 | 80.24 | -46.51 | Negative Variance/With in Limit Indicates the Quality Parameter of emission is Much better than Prescribed Standards |
| DG2 | 1 | Particulate | 0.013 | 54.05 | -63.97 | |
| DG3 | 1 | Particulate | 0.012 | 53.29 | -100.00 | |
| DG4 | 1 | Particulate | 0.009 | 37.12 | -81.17 | |
| DG5 | 1 | Particulate | 0.001 | 53.74 | -64.18 | |
| Boiler | 1 | Particulate | 0.319 | 26.85 | -82.10 | |
| Incinerator | 1 | Particulate | NA | NA | NA | |
| | 2 | HCL | NA | NA | NA | |
| | 3 | SO2 | NA | NA | NA | |
| | 4 | CO | NA | NA | NA | |
| | 5 | Total Organic Carbon | NA | NA | NA | |
| | 6 | HF | NA | NA | NA | |
| | 7 | NOx | NA | NA | NA | |

**Part D**

**Hazardous Wastes:**

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

| Waste category number as per HW 2016 rules | Type of Hazardous waste | Total quantity in Kg | |
|---|---|---|---|
| | | During previous financial year (21-22) | During current financial year (22-23) |
| 3.1 | Oil containing cargo residue, wash water and sludge | 760 | 1180 |
| 3.3 | Sludge & Filters contaminated with oil | 0 | 0 |
| 5.1 | Used / Spent Oil | 3960 | 2380 |
| 21.1 | Process waste - Recyclable. | 0 | 0 |
| | Process waste – non-Recyclable. | 39250 | 32380 |
| 33.1 | Empty barrels / containers / liners contaminated with Haz chemicals / waste | 3770 | 3260 |
| | Empty barrels / containers / liners contaminated with Haz chemicals / waste | 217414 | 249776 |
| | Empty barrels / containers / liners contaminated with Haz chemicals / waste | 0 | 0 |
| 34.1 | Chemical containing residue arising from decontamination | 0 | 0 |
| 35.1 | Exhaust air or Gas cleaning residue | 620 | 0 |
| 35.2 | Spent ion exchange resin containing toxic metals | 0 | 0 |
| 35.3 | Chemical Sludge from wastewater treatment (Dry sludge) | 26313 | 26158 |
| 35.4 | Oil and grease skimming residues | 410 | 260 |
| 36.2 | Spent Carbons | 640 | 0 |

**Part E**

**Solid Wastes:**

| | Waste Source | Total Quantity (Kg) | |
|---|---|---|---|
| | | During previous financial year 21-22 | During current financial year 22-23 |
| (a) | Paper waste | 37100 | 31690 |
| | Plastic waste (excluding the RM Containers) | 179140 | 182600 |
| | Metal waste (excluding the RM containers) | 24750 | 154350 |
| | Plastic RM containers | 0 | 0 |
| | Metal RM containers | 0 | 0 |
| | Powder waste | 0 | 26610 |
| | Wooden waste | 297160 | 221680 |
| | Garbage waste | 0 | 30960 |
| | Miscellaneous | 0 | 15500 |
| | Total | 538150 | 663390 |
| (b) | From Pollution Control Facility | | |
| | | Nil | Nil |
| (C) | 1. Quantity recycled or re-utilized within the unit<br>2. Sold<br>3. Disposed | | |
| | | Nil | Nil |

**Part F**

| S. No | Waste | Concentration of Hazardous constituents in the final waste | Disposal Practice |
|---|---|---|---|
| **Hazardous waste** | | | |
| 1 | 3.1 Oil containing cargo residue, wash water and sludge | Organic /inorganic chemicals. | Disposal by co-processing through GEPIL |
| 2 | 3.3 Sludge & Filters contaminated with oil | Organic /inorganic chemicals. | Disposal by offsite Incineration through TNWML |
| 3 | 5.1 Used / Spent Oil | Organic /inorganic chemicals. | Disposal to TNPCB Authorized recycler - Megha Petro Products |
| 4 | 21.1 Wastes and Residues (Dried /Gelled water-based paint, water-based polymer & raw material - Non recyclable) | Contains all paint ingredients and that of water-based polymer (Organic /inorganic chemicals.). | Disposal by co-processing through GEPIL |
| 5 | 21.1 Wastes and Residues (liquid water-based paint, water-based polymer & raw material - recyclable) | Contains all paint ingredients and that of water-based polymer. (Organic /inorganic chemicals) | Collection, storage, and disposal to authorized recyclers |
| 6 | 34.1 Chemical containing residue arising from decontamination | Organic /inorganic chemicals | Collection, storage, and disposal to authorized recyclers |
| 7 | 33.1 Disposal of barrels / containers / used for handling of hazardous wastes / chemicals a) Waste Pigment Containers | HDPE/Polyethylene and Organic /inorganic chemicals. | Transported after sale to authorized vendor for reuse/recycle. |
| 8 | 33.1 Disposal of barrels / containers / used for handling of hazardous wastes / chemicals b) Waste Raw Material Containers and Liners (Recyclable) | Iron/mild steel/HDPE/Polyethylene and Organic /inorganic chemicals | Transported after sale to authorized vendor |
| 9 | 35.2 Spent ion exchange resin containing toxic metals | Organic /inorganic chemicals. | Disposal by co processing through GEPIL |
| 10 | 35.1 Exhaust air or Gas cleaning residue | Organic /inorganic chemicals | Disposal by co processing through GEPIL |

| S. No | Waste | Concentration of Hazardous constituents in the final waste | Disposal Practice |
|---|---|---|---|
| 11 | 35.3 Chemical Sludge from wastewater treatment | Organic chemicals (Contains mixture of all paint ingredients and flocculants used in primary treatment.) | Disposal by co processing through GEPIL |
| 12 | 35.4 Oil & grease skimming residues | Organic /inorganic chemicals. | Disposal by co processing through GEPIL |
| 13 | 36.2 Spent Carbon | Activated carbon | Disposal by co processing through GEPIL |
| **Solid Waste** | | | |
| 1 | Corrugated Waste | Not Applicable | Sold to Scrap Vendor |
| 2 | HDPE Bags | Not Applicable | Sold to TNPCB authorized plastic recycler |
| 3 | Wooden Waste | Not Applicable | Sold to wood recycler |
| 4 | Paper Bags | Not Applicable | Sold to Scrap Vendor |
| 5 | Garbage | Not Applicable | Disposed to common Municipal dumping yard through authorized Vendor |
| 6 | Plastic waste | Not Applicable | Sold to TNPCB authorized plastic recycler |
| 7 | Metal Containers | Not Applicable | Sold to TNPCB authorized Scrap Vendor |
| 8 | Metal waste (other than metal containers) | Not Applicable | Sold to authorized Scrap Vendor |

**Part G**

**Impact of pollution abatement measures taken on conservation of natural resources and on cost of production:**

As a part of natural resource conservation, the plant has taken following initiatives,

**A) Water Conservation Measures**

**a) In Fresh Water Usage:**

Since SIPCOT water parameters are meeting Asian Paints Ltd quality requirements, the water is directly taken for process without reverse osmosis (RO) treatment by passing though ACF (Activated Charcoal Filter) and PSF (Pressure Sand Filter). This initiative has helped the plant in reducing the handling and treatment loss.

**b) Optimizing water usage for cleaning purposes:**

In a conventional system, for cleaning the interior of the processing equipments, post the batch process, water with the pressure of 4 – 5 bar was used. This requires higher quantity of water, which eventually becomes an effluent. In order to optimize the use of water and also to improve the efficiency of cleaning a high-pressure water jet is used. By adopting this process for cleaning the water quantity has been considerably reduced. Figure 1 shows picture of one of the Jet Pump used for cleaning process.

**Fig. 1** High Pressure Jet Pump

**Fig. 2** Pigging of Transfer lines

Post the transfer of semi-finished paint or finished paint from the processing equipment, the transfer lines are to be cleaned for avoiding contamination and hence effluent generation.

To reduce the generation of effluent in cleaning, pigging system as shown in Figure 2 is being used. This has facilitated the collection of the water and reuse in the subsequent batches of the same product stream. This initiative has also helped the plant in reducing the generation of solid waste consistently.

**c) Paint wash water reuse:**

This is another scheme implemented for reuse of wash water generated from cleaning of paint equipment. The wash water thus generated is collected, reused in the subsequent batch of same product. This has minimized effluent generation substantially. The Quality Management System provides guideline for reuse of the wash water.

With the use of this reuse scheme in the plant, the effluent as well as solid waste arising out of the wash water as reduced substantially.

**d) Reuse of Condensate:**

Built in condensate recovery facility is available in MEE, boiler and production processes, operations wherein the steam condensate is recovered and reused.

**e) Optimization in Process:**

By the way of increased batch factor, no of batches that are to be taken, has reduced. This initiative has reduced the heat load from the process. The reduction in dispersion time has reduced the heat load on the cooling water to a considerable limit.

**f) Rainwater Harvesting Scheme:**

The plant has implemented a very elaborate rainwater harvesting system to collect the rainwater. The system comprises of two separate networks of collection and transfer system for roof-top collection and surface run off. This water after filtration is used in the process also and in FY 2022-2023, we have used 24626 KL of harvested rainwater. Since FY22-23, outside the plant through Akash Ganga Trust and National Agro Foundation the factory has created a Rainwater Harvesting potential of 26650 KL per annum based on annual average rainfall.

**g) Occupational well-being**

The plant has implemented a closed loop pipeline system for addition of TBHP material in polymer through automated decanting machine. This initiative has eliminated ergonomical risk of manual handling the materials and short-term exposure to VOC.

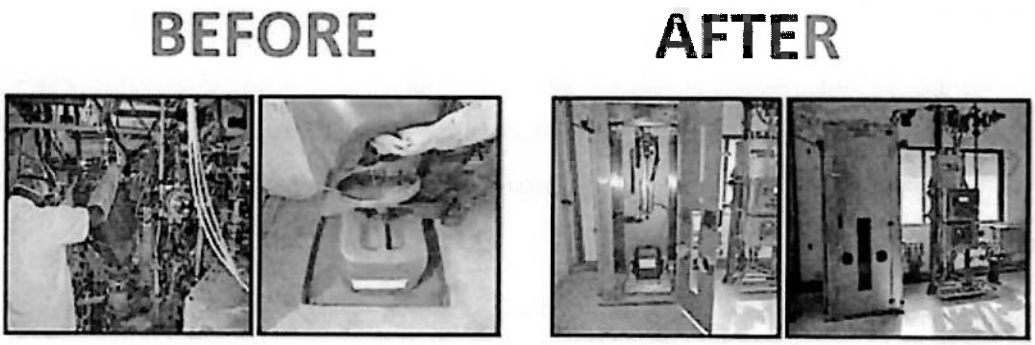


**Fig.3** Closed loop system for TBHP addition.

**B) Industrial Effluent treatment for attaining Zero Discharge:**

Following process is deployed for treatment of industrial effluent,

**a) Oil and Grease Trap**

Wastewater from various sections is pumped to equalization tank through oil and grease trap. The floating matter rises and remains on the surface of the wastewater. The same is removed by oil skimmer and collected in barrels.

**b) Equalization Tanks**

De-oiled wastewater is collected here. Air is continuously purged from the bottom of the tank, through air distribution lines, to facilitate the following,

i. proper mixing
ii. To increase the dissolved oxygen level in the wastewater.
iii. The pH of wastewater is maintained at 9.0. The water from the equalization tank is taken into the primary chamber for further treatment.

**c) Primary Treatment Tank**

The water is dosed with the necessary chemicals like Lime or caustic, Alum and polyelectrolyte, for coagulation and flocculation. Air is continuously purged from the Bottom of the tank, through air distribution lines, to facilitate proper mixing. The settled matter is transferred to centrifuge feed tank for further clarification. The supernatant from the pretreatment tank is pumped to the overhead tank for feeding into the bio reactor. The clarified water from centrifuge is transferred back into the equalization tank. The sludge from the centrifuge is transferred to the sludge drying bed through discharge chute.

**d) Bio Reactor**

The effluent is fed into the bio reactor from the overhead tank. The bio reactor has two sections namely bio wells and clarifier. The effluent travels in a circular way in the bio well and gets collected in the center section of the bio well. Enough air is supplied for increasing the dissolved oxygen and for maintaining the biological activity.

Effluent is conveyed from bio well to the bio clarifier. This effluent thus descends to the bottom of the tank and rising through the clarifying zone at a rate slow enough to allow maximum deposition of impurities before reaching the top. The clarified water from the top moves into launder and is collected in holding tank. The effluent from the holding tank is transferred to the RO feed tank through gravity. The sludge settled in the clarifier is recirculated to the bio well or pumped to sludge drying bed.

**e) HRSCC, PSF and Activated Carbon Filter**

The effluent collected in the RO Feed tank is pumped in to the HRSCC and the flocculation, coagulation agents are added. The clarified effluent flows out of the HRSCC and is collected in the intermediate tank. The settled matter is transferred to the sludge drying bed. The effluent from the intermediate tank is pumped into the RO through the PSF and ACF.

**f) Reverse Osmosis (RO) Plants:**

**RO Plant (5.0 m3/hr.)**

The Effluent collected in the RO feed tank is pumped to the HRSCC and the flocculation, coagulation agents are added. The clarified effluent flows out of the HRSCC and is collected in the intermediate tank and the collected effluent pumped to 5.0 m3/hr. RO plant through PSF and ACF. High Pressure PT - RO for further purification. Permeate from PT RO flows to FRP Permeate Tank and Reject is stored in 30 KL Reject Tank. The settled matter is transferred to the sludge drying bed.

**RO Plant (1.5 m3/hr.)**

The reject effluent from the 5.0 m3/hr. RO plant, pumped to laminar flow clarifier and stored in intermediate tank and effluent pumped to1.5m3/hr. RO Plant passes through 5-micron cartridge filter. After cartridge filter the wastewater is pumped through high-pressure pump to reverse osmosis membrane unit. The anti-scalant and antioxidants are dosed to prevent scaling within the RO unit. The total dissolved solids, organic and microbial contaminants are removed by RO membrane filtration. The RO separates the feed into two streams, permeate which contains very low dissolved solids flows to the downstream FRP Permeate Tank. The reject is stored in 60 KL Reject Tank.

**g) Multiple Effect Evaporators (1300 Kg/hr.)**

Reject from RO reject tank is treated in the MEE. Distillate from MEE is collected in FRP Permeate Tank. The concentrate from MEE is treated in ATFD and the slurry dried and collected as salt.

The permeate water from RO plants and MEE is stored in FRP Permeate Tank and is reused in cooling tower. This process ensures zero discharge.

**C) Impact of Pollution abatement and on *cost of production - Rs 367 per ton or KL of product.***

The detail of the expenditure on pollution abatement during the year 2022 - 23 is as given below,

| Sr. No | Environmental Protection measures | Cost (Rs) |
|---|---|---|
| 01 | Operating cost of Effluent treatment plant | **2782070** |
| 02 | Expenditure for environmental monitoring parameters | **1005555** |
| 03 | Expenditure toward ETP improvement, environment related project and instruments/equipment's | **34767904** |
| | **Total** | **38555529** |

## Part – H

**(Additional measures / investment proposal for environmental protection abatement of pollution, Prevention of pollution.)**

The Plant has implemented following measures to minimize waste generation at source as well as to recycle / reuse waste.

**A) Bulk storage facilities:**

Facilities are provided for bulk storage as shown in Fig 4 of various raw materials and are directly transferred to process equipment's through a closed loop system. Usually in a conventional process these raw materials are procured & stored in barrels. Handling these material barrels leads to material loss. It has also reduced waste barrel generation.

**Fig 4.** Bulk Storage

**B) Use of Intermediate Batching Container:**

Certain additives which were handled through barrels are converted to an Intermediate batching container (IBC) of 1000 kg size as shown in the figure 5 below. This is four times that of the material stored in a barrel.

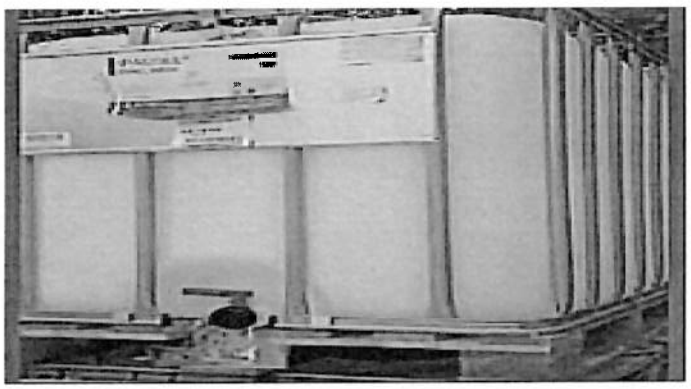

**Fig 5.** Intermediate Bulk Container.

**C) Use of Tankers for transport of Raw materials**:

Certain raw materials which where earlier transported via barrels and IBCs were migrated to tankers. Handling these material barrels/IBCs leads to material loss. It has also reduced waste barrel/IBC generation.

**D) Recycling the Jumbo Bags**:

For charging of powder into the silos, the powder raw materials are brought in the form of Jumbo Bags as shown in Figure 6. Post charging of powder in Silo's, the empty Jumbo bags are packed and sent back to vendor for refill. This initiative has reduced the generation of solid waste.

**Fig 6.** Jumbo Bags

**E) Other Control Measures taken for pollution Prevention:**

**a) Environment Management system**

Sustainability of Environmental Management Systems (ISO 14001) has been ensured through periodic Management reviews and external audits.

**b) Effective Dust and VOC Control**

1. The entire powder handling i.e., from storage to charging into the batches has been controlled through Distributed Control System (DCS) in a closed loop operation. The emission during powder transfer is contained through inbuilt bag filters (**Fig 8**) that are available in the machine. The differential pressure across the filter is measured and the transfer of the powder is controlled through DCS, thus avoiding fugitive emission.

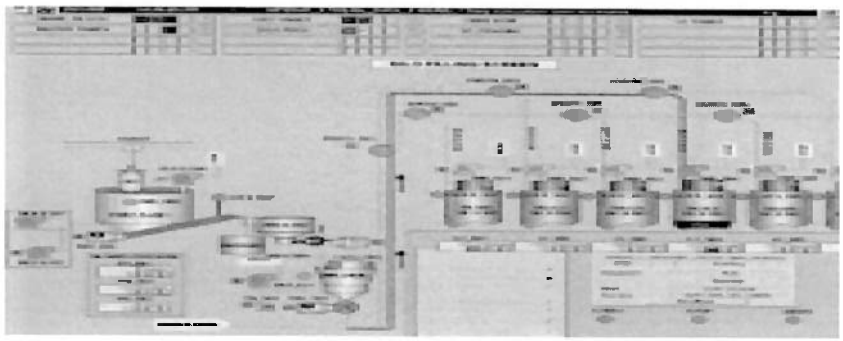

**Fig 7.** Closed Loop powder handling system

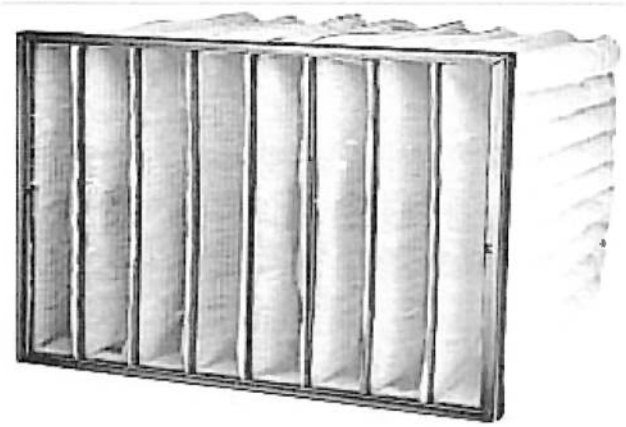

**Fig 8.** Filter Bags used for filtration.

2. The scrubbers are attached to process vents available in Water based paint section and that in water-based polymer section.
3. Online VOC meters are available in the Water based paint block & Water based polymer block and are connected to the CARE AIR CENTRE.
4. Stack monitoring of all the boiler, DG and Scrubber stacks are being done monthly and reports of the same are being submitted to TNPCB on respective months.
5. Ambient air monitoring is regularly done by MoEF & CC approved laboratory and reports are being submitted to TNPCB every month.

**c) Retrofitting of Emission control devices In DG sets:**

We had installed and commissioned emission control device for DG sets. These devices are tested over ISO-8178 5 mode D2 cycle from International Centre for Automotive Technology (ICAT), Manesar which is one of the CPCB recognized labs in India.

| S.NO | DG Capacity | Retrofit Device Serial Number |
|---|---|---|
| 1 | 750 KV | 52(1)/CKR/CKR/102/103/CKR/U01-105/N/U01/CKR |
| 2 | 750 KV | 52(2)/CKR/CKR/I02/I03/CKR/U01-I05/N/U01/CKR |
| 3 | 750 KV | 52(3)/CKR/CKR/I02/I03/CKR/U01-I05/N/U01/CKR |
| 4 | 1010 KV | 52(4)/CKR/CKR/102/103/CKR/U01/N/U01/CKR |

## Part I

**(Any other particulars for improving the quality of the environment)**

**a) Green belt development:**

As part of Green Belt development, plantation of trees was carried out throughout the year including during World Environment Day celebration and "Srivanam" (Dense Forest made with native species) was created based on Miyawaki method. Total of 2750Nos of trees planted behind the admin block area (Fig 9).

**Fig.9** Srivanam 1

Srivanam phase – II was created near the barrel godown area on June 5th World Environment Day based on Miyawaki method. Total of 3500 Nos of trees were planted (Fig.10).

**Fig.10** Srivanam 2

Additionally, after obtaining approval from SIPCOT, the outside area – median (Fig 11) of SIPCOT road is developed and maintained by our factory.


**Fig.11** Outside factory garden

**b) Wastewater management:**

Chemical dosing system for the cooling tower was replaced with electrolysis process (Fig.12). Resulted in reduction in cooling blow down effluent by 7 to 10KL/ month and cooling tower fresh water top up reduction by 30KL/month.

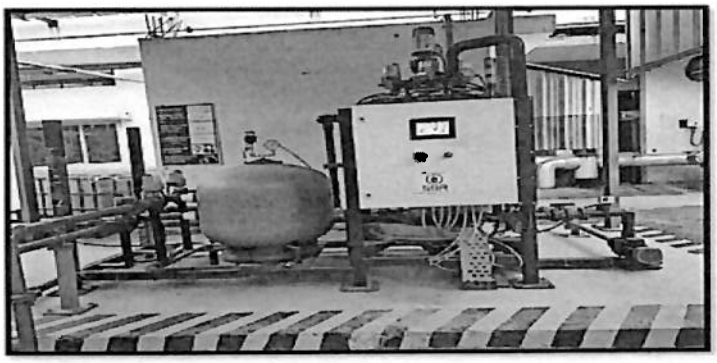

**Fig.12** Electrolysis process

**c) Fuel Conservation & Emission reduction:**

Introduction of a Heat pump & Heat recovery unit for heating water for process requirement leading to

1. Fuel reduction an average of 38 Tonnes per year
2. Reduction in usage of boiler.
3. Carbon footprint – scope 1 emission reduction of 30%
4. 2400 KL DM water reduction per year.

**d) Biodiversity development inside the plant:**

To improve biodiversity inside the plant, dense forest, pond and butterfly garden, herbal garden was created. Our effort in improving and preserving biodiversity was recognized through "CII-ITC Sustainability awards 2018 – in Biodiversity."

**e) Mud puddling in butterfly garden:**

Mud puddling (Fig.13) improves pollination of butterflies. This methodology ensured native way of approach. The count of butterfly species increased 12%.

**Fig.13** Butterfly Mud puddling

**f) Bamboo Garden - Green Meeting Area:**

Increased oxygen zone area by creating space for meeting through Bamboo Garden (Fig.14) & improving health of employees through ecosystem services.

**Fig.14** Bamboo Garden

**g) Vertical Garden in EHS & Admin:**

Initiatives like vertical gardening (Fig.15) and placing indoor plants were done inside plant which will impact in reducing ambient temperature, refreshment & reduce stress of employees.

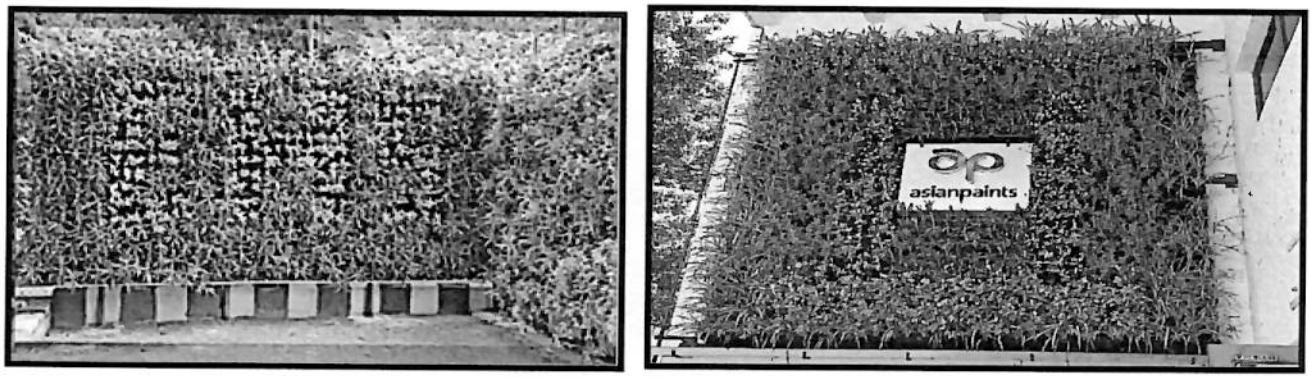


**Fig.15** Vertical Garden

**h) Eco Park:**

Eco Park inside plant with an aquarium and pollination booth to improve health and recreation services to employees. The park ensures walkway and a zone for refreshment to employees. Shown in Fig.16.

**Fig.16** Eco Park

**i) Urban Forest:**

Plantation of trees were carried out for around 2300 Sq. mt and named as Urban Forest (Fig. 17) (Dense Forest made with native species). Totally 1500 nos of trees planted behind tank farm area.

**Fig. 17** Urban Forest

**j) Kurungadu:**

Plantation of trees were carried out for around 1600 Sq.mt and named as Kurungadu (Fig. 18) (Dense Forest made with native species). Totally 1300 nos of trees and 1200 nos of shrubs planted beside barrel godown area.

**Fig. 18** Kurungadu

(Signature of the person carrying out the industry)

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Designation: Associate General Manager

Address:

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Date: 26.09.2023