Reliance
Industries Limited

Vadodara Manufacturing Division

RIL/E&E/MoEFCC/23-24/66 Date: 28.11.2023

To,

SHRI SHRAWAN KUMAR VERMA, IFS (Addl. Charge)
Deputy Director General of Forests (C)
MoEF&CC, Integrated Regional Office, Gandhi Nagar,
A-Wing – 407 & 409, Aranya Bhawan,
Near CH-3 Circle, Sector-10A,
Gandhi Nagar – 382010
Iro.gandhingr-mefcc@gov.in

Sub: Submission of Six-monthly EC compliance Report (Apr -2023 to Sept-2023)

Respected Sir,

Please find enclosed herewith six-monthly EC Compliance report (Apr -2023 to Sept-2023) of Reliance Industries Ltd. Vadodara Manufacturing Division.

We assure you that we are environmentally responsible corporate and are taking all necessary actions to protect environment beyond compliance.

Thanking you,

With regards,

Yours sincerely,
For RIL- Vadodara Manufacturing Division

(Authorized Signatory)

Encl: as Above

Copy:
1) Zonal Office, CPCB, Vadodara (softcopy by-Email)
2) Unit Head, GPCB, Gandhinagar – 382 010
3) Regional Officer, GPCB, Vadodara

R.S. more
G. P. C. Board
GERI Compound
Race Course, Vadodara.
29/11/23

O/C.

Environmental Compliance Report of Stipulated Conditions of Environmental Clearance Apr-2023 to Sept-2023

File No. : J – 11011/212/2017—IA-II(I) dated 04th February, 2021

Industry: **Reliance Industries Limited, Vadodara Manufacturing Division**

Sr. No.	Conditions	Compliance
Specific Conditions		
(i)	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented.	Complied. All the environmental protection measures and safeguards proposed in the documents submitted to the Ministry are duly complied as applicable for the debottlenecking of existing plants. Also, the recommendations with respect to environment management and risk mitigation measures made in EMP for activities during construction phase as well as during operation phase, duly complied as per RIL's current practices and procedures.
(ii)	The Project Proponent proposed post expansion effluent load is expected to be below 20,000 M^3/day. The Project Proponent will recycle 50% of the effluent and discharge treated effluent up to maximum 10,000 M^3/day within next five years.	Complied. The effluent load is below 20,000 m^3/day. The detailed 5 years treated effluent discharge reduction plan has been prepared and duly submitted to MoEFCC & GPCB. The effluent reduction schemes are under implementation.
(iii)	Comprehensive water audit to be conducted on annual basis and report to the concerned Regional Office of MoEF&CC. Outcome from the report to be implemented for conservation scheme.	Complied. Comprehensive Water Audit has been carried out for the year 22-23 and duly submitted to regional office of MoEF&CC, Gandhinagar vide letter no. RIL/E&E/MoEFCC/23-24/17 dtd. 29.05.2023. Recommendations of the audit have been duly implemented.
(iv)	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.	Complied. We have separate network system of storm water across the complex and hence not allowed to mix with process effluent/any wastewater.

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance</th></tr>
<tr><td></td><td></td><td>There are sluice gates at strategic locations in Strom water channel and prior to final outlet. The storm water is duly analyzed as per defined SOP before discharge.</td></tr>
<tr><td>(v)</td><td>Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. flame arresters shall be provided on tank farm, and solvent transfer to be done through pumps.</td><td>Complied.
All the hazardous chemicals are stored in tanks, tank farms, drums, carboys etc. safely as per standard practices.
Also flame arresters are provided on tank farm and transfer of solvent takes place in closed system through pipelines using pumps.</td></tr>
<tr><td>(vi)</td><td>Process organic residue and spent carbon, if any, shall be sent to cement industries. FTP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF. The ash from boiler shall be sold to brick manufactures/cement industry.</td><td>Complied.
Process organic residue is sent for co-processing to cement industries for the said period. The ETP sludge and process inorganics are disposed to company owned TSDF (RIL-VMD owned SLF at Nandesari).
Hazardous Waste disposal data for reporting period is as below:
<table>
<tr><th>Mode of Disposal</th><th>SLF (MT)</th><th>Cement Co-processing (MT)</th><th>Total (MT)</th></tr>
<tr><td>Apr-23</td><td>166.28</td><td>0.0</td><td>166.28</td></tr>
<tr><td>May-23</td><td>119.43</td><td>0.0</td><td>119.43</td></tr>
<tr><td>Jun-23</td><td>28.6</td><td>42.2</td><td>70.8</td></tr>
<tr><td>Jul-23</td><td>0.0</td><td>0.0</td><td>0.0</td></tr>
<tr><td>Aug-23</td><td>0.0</td><td>0.0</td><td>0.0</td></tr>
<tr><td>Sep-23</td><td>0.0</td><td>0.0</td><td>0.0</td></tr>
</table></td></tr>
<tr><td>(vii)</td><td>Regular VOC monitoring shall be done at vulnerable points.</td><td>Complied.
Regular VOC monitoring is carried out in all the plants as per the LDAR program which includes all joints, valves, flanges, fittings, heat exchanges, pumps, storage tanks, drains and compressors seals.

Monthly report is being submitted to GPCB.
VOC monitoring data for the reporting period is as below:</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Sr. No.</th><th>Plant</th><th>No. of points covered using Photoionization Detector (LDAR Level III) Apr23 to Sept-23</th></tr>
<tr><td>1</td><td>BBH</td><td>3235</td></tr>
<tr><td>2</td><td>EO/EG</td><td>814</td></tr>
<tr><td>3</td><td>IOP</td><td>606</td></tr>
<tr><td>4</td><td>LDPE</td><td>2605</td></tr>
<tr><td>5</td><td>NCP</td><td>392</td></tr>
<tr><td>6</td><td>PBR-I</td><td>384</td></tr>
<tr><td>7</td><td>PBR-II</td><td>1916</td></tr>
<tr><td>8</td><td>PPCP</td><td>1378</td></tr>
<tr><td>9</td><td>PPIV</td><td>348</td></tr>
<tr><td>10</td><td>PTD</td><td>225</td></tr>
<tr><td>11</td><td>PVC</td><td>453</td></tr>
<tr><td>12</td><td>UB-II</td><td>219</td></tr>
<tr><td>13</td><td>VCM</td><td>1529</td></tr>
<tr><td colspan="3">Note: No major leakage had been observed.</td></tr>
</table>
</td></tr>
<tr><td>(viii)</td><td>The oily sludge shall be subjected to melting pit for oil recovery and the residue shall be bio-remediated. The sludge shall be stored in HDPE lined pit with proper leachate collection system.</td><td>Complied.
The oily sludge is recovered and being sent for cement coprocessing. The residue is being bioremediated. The sludge is stored in HDPE lined pit with proper leachate collection system.
Monthly reports being submitted to GPCB.</td></tr>
<tr><td>(ix)</td><td>Oil catchers/oil traps shall be provided at all possible locations in rain/storm water drainage system inside the factory premises.</td><td>Complied.
Oil catcher/oil traps are provided at all possible locations. Also, 5 nos. of sluice gates provided at strategic locations in storm water drains inside the factory premises to prevent oil/HC carryover in storm water drain.</td></tr>
<tr><td>(x)</td><td>The company shall undertake waste minimization measures as below:

a) Metering and control of quantities of active ingredients to minimize waste.</td><td>Complied.
Measures for waste minimization have been undertaken.
a) All quantities of active ingredients are metered/quantified and closely monitored to minimize wastage and optimized accordingly.</td></tr>
</table>

Sr. No.	Conditions	Compliance
	b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.	b) We are re-using by-products as a raw material in downstream process plants and power plant.
	c) Use of automated filling to minimize spillage.	c) Level sensors/indicators are already installed in tanks to minimize spillage and optimize usage.
	d) Use or Close Feed system into batch reactors.	d) All feed systems in reactors are designed with close loop.
	e) Venting equipment through vapour recovery system.	e) It is a design feature and already provided to all the vents of spheres, flares, etc.
	f) Use of high-pressure hoses for equipment cleaning etc. to reduce wastewater generation.	f) High pressure hoses are already in use for cleaning purpose which saves water and reduce wastewater generation also.
(xi)	The green belt of 5-10 m width shall be developed in 40% of the total project area as committed by PP, mainly along the plant periphery, in downward wind direction, and along road sides etc. selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.	Complied. 40% greenbelt have been developed along the periphery, in downward wind direction, along roadsides and at other available locations. Species have been selected as per the CPCB guideline with consultation with the State Forest Department.
(xii)	As per the Ministry's OM dated 30.09.2020 superseding the OM dated 01.05.2018 regarding the Corporate Environmental Responsibility, and as per the action plan proposed by the project proponent to address the socio-economic and environmental issues in the study area, the project proponent, as committed, shall provide education funds in technical training centers/support in nearby village's schools, support in health care facilities, drinking water supply and funds for miscellaneous activities like solar street lights, battery, solar panel etc., in the nearby villages. The action plan shall to be completed within time as proposed.	Complied. The CER plan spreading over 5 years had been proposed to address the socio-economic and environmental issues in the study area. As per plan, we have utilized the allocated funds towards upliftment of nearby villages through livelihood support, women empowerment, education, environment protection, health and sanitation as follows: **2020-21** ₹ 20.86 Cr **2021-22** ₹ 15.32 Cr **2022-23** ₹ 17.38 Cr

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance</th></tr>
<tr><td>(xiii)</td><td>The project proponent shall ensure 70% of the employment to the local people, as per the applicable law. The project proponent shall set up a skill development center/provide skill development training to village people.</td><td>Complied.
The current employment of the local people is as per the applicable law. We are providing the skill development training to nearby villagers through various activities as a part of the CSR activities.</td></tr>
<tr><td>(xiv)</td><td>A separate Environmental Management Cell (having qualified person with Environmental Science/Environmental Engineering / specialization in the project area) equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.</td><td>Complied.
We already have a separate Environment Management Cell with qualified personnel for Environmental Management as well as full-fledged NABL accredited laboratory setup to carry out Environment monitoring functions.</td></tr>
<tr><td>(xv)</td><td>The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms.</td><td>Complied.
We have an adequate setup for protection of possible fire hazard during manufacturing process in material handling.
We have well established fire-fighting system in place as per norms.</td></tr>
<tr><td>(xvi)</td><td>Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. In case of the treated effluent to be utilized for irrigation/gardening, real time monitoring system shall be installed at the ETP outlet.</td><td>Complied.
All operational stacks are installed with CEMS (Continuous Emission Monitoring System) for monitoring the quality of flue gases discharged to the atmosphere and we are ensuring that the data is regularly transmitted to CPCB & GPCB server in accordance with the CPCB guidelines.
Real time monitoring system is also installed at the ETP outlet and connected to CPCB & GPCB server.
ETP outlet monitoring data for reporting period is as below:
<table>
<tr><th>Parameter</th><th>UoM</th><th>Min</th><th>Max</th><th>Avg</th></tr>
<tr><td>pH</td><td></td><td>7.2</td><td>7.5</td><td>7.3</td></tr>
<tr><td>COD</td><td>mg/L</td><td>32.0</td><td>48.0</td><td>37.5</td></tr>
<tr><td>BOD</td><td>mg/L</td><td>6.0</td><td>13.0</td><td>9.3</td></tr>
<tr><td>TSS</td><td>mg/L</td><td>24.0</td><td>31.0</td><td>27.8</td></tr>
<tr><td>NH4-N</td><td>mg/L</td><td><0.05</td><td><0.05</td><td><0.05</td></tr>
</table></td></tr>
<tr><td>(xvii)</td><td>PP to set up occupational health Centre for surveillance of the worker's health within and outside the plant on a regular basis. The</td><td>Complied.
A fully operational well maintained occupational health Centre (OHC) is already</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance</th></tr>
<tr><td></td><td>health data shall be used in deploying the duties of the workers. All workers & employees shall be provided with required safety kits/ mask for personal protection.</td><td>setup and available for surveillance of the worker's health on regular basis.
The data from OHC is utilized for deploying workers at various locations in plants. Also required mandatory PPE kits are provided to the employees and workers to ensure safety while carrying out their jobs.</td></tr>
<tr><td>(xviii)</td><td>The National Emission Standards for Petrochemical (Basic & Intermediates) issued by the Ministry vide G.S.R. 820 (E) dated 9th November, 2012 as amended time to time shall be followed.</td><td>Complied.
The National Emission Standards for Petrochemical (Basic and Intermediates) is followed.
Monthly compliance is being submitted to GPCB.
Summary of stack monitoring data for reporting period is as below:
<table>
<tr><th>Stack</th><th>Parameter</th><th>Unit</th><th>Min</th><th>Max</th><th>Avg</th></tr>
<tr><td rowspan="3">GOP-GT 1709</td><td>SO_2</td><td>mg/Nm³</td><td>N.D</td><td>N.D</td><td>N.D</td></tr>
<tr><td>NO_x</td><td>mg/Nm³</td><td>35.38</td><td>120.87</td><td>96.55</td></tr>
<tr><td>CO</td><td>mg/Nm³</td><td>25.94</td><td>140</td><td>87.30</td></tr>
<tr><td rowspan="3">GOP-GT 1710</td><td>SO_2</td><td>mg/Nm³</td><td>N.D</td><td>N.D</td><td>N.D</td></tr>
<tr><td>NO_x</td><td>mg/Nm³</td><td>32.43</td><td>123.82</td><td>92.12</td></tr>
<tr><td>CO</td><td>mg/Nm³</td><td>26.52</td><td>139.6</td><td>89.81</td></tr>
<tr><td rowspan="3">GOP SH 107</td><td>SO_2</td><td>mg/Nm³</td><td>N.D</td><td>N.D</td><td>N.D</td></tr>
<tr><td>NOx</td><td>mg/Nm³</td><td>45.44</td><td>144.85</td><td>112.54</td></tr>
<tr><td>CO</td><td>mg/Nm³</td><td>0.91</td><td>4.2</td><td>2.382</td></tr>
<tr><td rowspan="4">IOP-Boiler -4 & 5</td><td>SPM</td><td>mg/Nm³</td><td>5.2</td><td>5.9</td><td>5.5</td></tr>
<tr><td>SO_2</td><td>mg/Nm³</td><td>28.1</td><td>68.6</td><td>44.7</td></tr>
<tr><td>NO_x</td><td>mg/Nm³</td><td>19.6</td><td>132.1</td><td>89.3</td></tr>
<tr><td>CO</td><td>mg/Nm³</td><td>0.1</td><td>1.3</td><td>0.6</td></tr>
<tr><td rowspan="4">GTPP-HRSG-1</td><td>SPM</td><td>mg/Nm³</td><td>5.1</td><td>6.2</td><td>5.56</td></tr>
<tr><td>SO_2</td><td>mg/Nm³</td><td>N.D</td><td>N.D</td><td>N.D</td></tr>
<tr><td>NO_x</td><td>mg/Nm³</td><td>27.87</td><td>146.82</td><td>104.08</td></tr>
<tr><td>CO</td><td>mg/Nm³</td><td>26.7</td><td>50.6</td><td>36.9</td></tr>
<tr><td rowspan="4">GTPP – HRSG-2</td><td>SPM</td><td>mg/Nm³</td><td>5.1</td><td>6.3</td><td>5.50</td></tr>
<tr><td>SO_2</td><td>mg/Nm³</td><td>N.D</td><td>N.D</td><td>N.D</td></tr>
<tr><td>NO_x</td><td>mg/Nm³</td><td>39.51</td><td>145.53</td><td>109.75</td></tr>
<tr><td>HC</td><td>mg/Nm³</td><td>1.1</td><td>42.3</td><td>17.6</td></tr>
<tr><td rowspan="3">(VC/PVC) R-201 Cracker</td><td>SO_2</td><td>mg/Nm³</td><td>N.D</td><td>N.D</td><td>N.D</td></tr>
<tr><td>NO_x</td><td>mg/Nm³</td><td>13.35</td><td>93.43</td><td>70.94</td></tr>
<tr><td>CO</td><td>mg/Nm³</td><td>1.4</td><td>4.8</td><td>3.1</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">(VC/PVC) Scrubber Vent</td><td>Cl_2</td><td>mg/Nm³</td><td>0.62</td><td>0.98</td><td>0.83</td></tr>
<tr><td>HCl</td><td>mg/Nm³</td><td>0.97</td><td>1.98</td><td>1.44</td></tr>
<tr><td>(VC/PVC) Rotary Dryer</td><td>PM</td><td>mg/Nm³</td><td>5.1</td><td>5.5</td><td>5.23</td></tr>
</table>
Note: N.D is Not detectable
</td></tr>
<tr><td>(xix)</td><td>Recommendations of mitigation measures from possible accident shall be implemented based on Risk Assessment studies conducted for worst case scenarios using latest techniques.</td><td>Complied.
Plant risk assessment has been carried out using PHAST software and all mitigation measures are in place. PIPA (Pre-incident Planning and Assessment) for various probable identified scenarios of emergency for which consequence analysis are done to identify actions required to handle such kind of emergencies.</td></tr>
<tr><td>(xx)</td><td>The project proponent shall develop R&D facilities to develop their own technologies for propylene and polypropylene processing.</td><td>Complied.
We have R&D facility in place working on development of various technologies, products for propylene and polypropylene processing to cater the needs and expectations of our customers.</td></tr>
<tr><td colspan="3">General Conditions</td></tr>
<tr><td>(i)</td><td>No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change/SEIAA, as applicable. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry/SEIAA, as applicable, to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.</td><td>Noted and Agreed.</td></tr>
<tr><td>(ii)</td><td>The energy source for lighting purpose shall be preferably LED based, or advanced having preference in energy conservation and environment betterment.</td><td>Complied.
The lighting fixtures in offices, plants and streets have been replaced by LEDs for energy conservation and environment betterment.</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance</th></tr>
<tr><td>(iii)</td><td>The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Projection) Act, 1986 Rules 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).</td><td>Complied.
The noise levels in and around the plant area is kept well within the standards of EPA 1986 through provision of acoustic enclosures, silencers, and green belt development. –
The ambient noise monitoring is also carried out at various locations at the periphery of the complex area. We are complying with the standards prescribed under the Environment (Projection) Act, 1986 Rules 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime) and report is submitted to GPCB on monthly basis.
Noise monitoring data (in dBA) for reporting period is as below:
<table>
<tr><th>Time</th><th></th><th>VIP Gate</th><th>Dhanora Gate</th><th>Gate No : 5</th><th>ACN Plant backside</th><th>Monitoring Well : 2</th></tr>
<tr><td rowspan="3">6:00 AM to 10:00 PM</td><td>Avg</td><td>62.5</td><td>62.4</td><td>62.2</td><td>62.3</td><td>62.1</td></tr>
<tr><td>Max</td><td>63.9</td><td>63.9</td><td>64.1</td><td>63.6</td><td>63.7</td></tr>
<tr><td>Min</td><td>61.2</td><td>60.9</td><td>60.7</td><td>60.7</td><td>60.5</td></tr>
<tr><td rowspan="3">10:00 PM to 06:00 AM</td><td>Avg</td><td>52.1</td><td>52.4</td><td>52.3</td><td>52.1</td><td>52.2</td></tr>
<tr><td>Max</td><td>53.5</td><td>53.7</td><td>55.3</td><td>53.5</td><td>53.5</td></tr>
<tr><td>Min</td><td>52.1</td><td>52.4</td><td>52.3</td><td>52.1</td><td>52.2</td></tr>
</table></td></tr>
<tr><td>(iv)</td><td>The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. CER activities shall be undertaken by involving local villages and administration and shall be implemented. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.</td><td>Complied.
CER activities are being undertaken for improving the socio-economic conditions, eco-developmental measures including community welfare of the surrounding area as per plan.

In accordance with the plan, we have utilized the allocated funds towards upliftment of nearby villages through livelihood support, women empowerment, education, environment protection, health, and sanitation.</td></tr>
<tr><td>(v)</td><td>The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the</td><td>Complied.
Yearly capital cost and recurring cost earmarked and spent for environment management/ pollution control measures are submitted to the Ministry and GPCB in Form V.</td></tr>
</table>

Sr. No.	Conditions	Compliance
	State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measurers shall not be diverted for any other purpose.	The total Capital Cost incurred in 2022-23 is Rs. 1.6 Cr and Recurring cost is Rs. 9.3 Cr.
(vi)	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.	Not Applicable. Project as it is located within Petrochemical Complex Area Notified by GIDC.
(vii)	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.	Complied. Last submitted six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of required monitored data was submitted to Regional Office of MoEF&CC, Gandhinagar, Zonal office CPCB, Vadodara & GPCB dtd. 29th May-2023 (both in hard copies as well as by e-mail).
(viii)	The environmental statement for each financial year ending 31st March in Form V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.	Complied. Last submitted Environmental Statement in Form V was submitted to GPCB and Regional office of MoEF&CC, Gandhinagar dtd. 04.09.2023 and dtd. 28.09.2023 by e-mail to MoEF&CC, Gandhinagar.
(ix)	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and	Complied. Advertised in 4 local newspapers (3 in vernacular language and 1 English language) dtd. 7th Feb 2021 and the copy forwarded to the Regional Office of the Ministry in Bhopal

Sr. No.	Conditions	Compliance
	may also be seen at Website of the Ministry and at https://parivesh.nic.in/. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	vide letter no. RIL/E&E/EC/21/2867 dtd. 10.03.2021.
(x)	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	Noted and Agreed. The project was started with due approval from GPCB vide CTE dtd. 07.09.2021. The project has been partially completed.
(xi)	This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other court of Law, if any, as may be applicable to this project.	Noted and Agreed.

FORM- V **For the Year 2022-23**

ENVIRONMENTAL STATEMENT REPORT for Year 2022-23

M/S Reliance Industries Limited, Vadodara Manufacturing Division

PART- A

(i) Name and address of the owner/ : **Sh. Rajiv Agarwal,**

Occupier of the Industry, operation or process : **Site President**
Reliance Industries Ltd.
Vadodara Manufacturing Division
P.O Petrochemicals
Vadodara-391346

(ii) Date of the last environmental Audit report submitted : **30th June, 2023**

(iii) Production Capacity : **Please Refer Annexure: I**

(iv) Year of Establishment : **Please Refer Annexure: II**

(v) Last Environment Statement Submitted : **29th September 2022**

PART- B

WATER AND RAW MATERIAL CONSUMPTION

(i) Water consumption m^3 /d

Cooling: (Spraying) : 13,700 m^3/d
Domestic : 4,100 m^3/d
Process : 13,958 m^3/d

Name of Products	Water consumption per unit of Products	
	During the previous Financial Year	During the Reporting Financial Year
Polymers and Chemicals	9.52 m^3/MT	9.68 m^3/MT

(ii) Raw Material Consumption

Name of raw material consumed	Name of products	Consumption of raw material per unit of output	
		During the previous financial year	During the Reporting financial year
Please Refer Annexure: III			

PART- C
Pollution discharges to environment/ unit of output.
(Parameter as specified in the consent issued)

(i) Pollution	Quality of Pollutants Discharged (Mass/day)	Concentration of Pollutants discharges (mass/volume)	Percentage of variation from prescribed standards
a) Water	**Please Refer Annexure: IV**		
b) Air	**Please Refer Annexure: V**		

PART- D
(HAZARDOUS WASTES)

Hazardous Wastes	Total Quantity (MT)	
	During the previous financial year	During the reporting financial year
(a) From process	1,690.245	2,838.81
(b) From pollution Control Facilities	575.047	703.14

For Details, Please Refer Annexure: VI

PART- E
SOLID WASTES

	TOTAL QUANTITY (MT)	
	During the Previous Financial Year	During the reporting Financial Year
(a) From Pollution Control Equipment	**NA**	**NA**
(b) From Process	**Nil**	**Nil**

PART- F

Please specify the characterizations (in terms of composition of quantum) of Hazardous as well solid waste and indicate disposal practice adopted for both these categories of wastes.

Please Refer Annexure: VI

PART- G

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production.

i. Leak Detection and Repair (LDAR) Level III carried out for fugitive emission control and environment protection.
ii. Implementation of various energy saving schemes leading to reduction of GHG emission.
iii. Condensate recovery, waste heat recovery and treated effluent reuse has been carried out throughout the year.
iv. Reusable/Recyclable hazardous wastes recycled through registered recyclers.
v. Incinerable hazardous waste sent to cement industry for co-processing.
vi. The various pollution Abatement measures such as pollution control equipments, scrubbers, recycling of vent gases, has resulted in substantial reduction in consumption of natural resources, reduction in emission levels etc.

PART- H

Additional measures/ investment proposal for environmental protection including abatement of pollution, prevention of pollution.

Sr. No.	Category	Expenditure
1	Treatment and disposal costs	₹ 5,97,98,051
2	Insurance for environmental liability	₹ 64,154
3	External services for environmental management	₹ 81,83,485
4	External certification of management systems	₹ 5,71,975
5	Personnel for general environmental management activities	₹ 60,00,000
6	Extra expenditure to install cleaner technologies	₹ 1,55,74,995
7	Other environmental management costs	₹ 1,82,34,101
Total		**₹ 10,84,26,761**

PART- I

Any other particulates in respect of environmental protection and abatement of pollution.

1. Site is ISO – 14001-2015 standard certified.
2. Sapling distribution and plantation of trees was carried out during World Environment Day.
3. Environment awareness activities for employee's being carried out.

(Signature of a person carrying out an Industry - operation or process)

Name : **Sh. Rajiv Agarwal**
Designation : **Site President**
Address : **Reliance Industries Ltd.**
Vadodara Manufacturing Div.
Vadodara-391346

Date: **04.09.2023**
Place: **Vadodara**

ANNEXURE – I

PRODUCTION CAPACITY (TPA)

Plant	Product	Capacity (TPA)
GAP *	Orthoxylene	45,408
	Paraxylene	48,600
	Dimethyl Terphthalate	39,996
GOP	Ethylene	3,00,000
	Propylene	1,80,000
	Carbon Black Feed Stock	36,000
	Butadiene	78,000
	Benzene	86,880
	C4 Rafinate	73,020
	Pyrolysis Gasoline (PGH)	2,20,020
	NRS	1,65,000
	Mix C4	1,27,020
	Toluene	27,000
	Heavy Aromatics	54,000
	Power Generation	4.6 MWH
	Steam	96 TPH
LAB *	Linear Alkyl Benzene	83,040
	Heavy Normal Paraffin (HNP)	8,400
	Light Normal Paraffin (LNP)	2,400
	Normal Paraffin	60,000
	Heavy Alkylates	4,800
EO/EG	Ethylene Glycol	25,680
	Ethylene Oxide	22,080
	Di Ethylene Glycol (DEG)	1,620
	Tri Ethylene Glycol(TEG)	180
	Poly Ethylene Glycol (PEG)	1,800
AF*	Monocomponent Acrylic	12,000
DSAF*	Monocomponent Acrylic Fiber	12,000
PBR – I	PolyButadiene	47,160
PR*	Petroleum Resin	5,004
PP-I*	Polyproylene (PP-I)	36,000
PPCP(PP-II)	Polypropylene PPCP (PP-II)	64,080
LDPE	Low Density Polyethylene	1,60,020
ACN *	Acrylonitrile	30,000
ACR*	Methyl Acrylates	2,040
	Ethyl Acrylates	3,000
	Butyl Acrylates	4,008
VC/PVC	Ethylene Dichloride	1,00,020
	Vinyl Chloride Monomer	93,240
	Poly Vinyl Chloride	94,800
IOP	HP Steam (TPH)	476 TPH
	Electricity (MWH)	25 MWH
GPP	HP Steam (TPH)	144 TPH
	Electricity (MWH)	65.4 MWH
CF*	Carbon Fiber	12
PP – IV	Polypropylene	1,60,440
PBR – II	Poly Butadiene Rubber	63,600

*** Plant under shutdown during reporting period**

ANNEXURE – II

DATE OF COMMISSIONING OF PLANT

Sl. No.	PRODUCTION NAME	PLANTS ABBREVATION	YEAR OF COMMENCEMENT
1.	Gujarat Aromatics Plant	GAP	
	A. Xylene Plant		1973-74 Exp.1988-89
	B. Dimethyl Terephthalate Plant		1973-74 Exp. 1982-83
2.	Gujarat Olefins Plant	GOP	1978-79
	A. Naphtha Cracker	NCP	
	B. Benzene Butadiene Hydrogenation	BBH	
3.	Linear Alkyl Benzene Plant	LAB	1978-79 Exp. 1987-88
4.	Ethylene Glycol Plant	EG	1978-79 Tech. Deg. 1985-86
5.	Low Density Polyethylene	LDPE	1978-79
6.	Polypropylene Plant.	PP-I	1978-79
7.	Polypropylene Copolymer PPCP	(PP-II)	1987-88
8.	Polybutadiene Rubber Plant	PBR-I	1978-79.
9.	Petroleum Resin Plant	PR	1984-85
10.	Vinyl Chloride & Poly-Vinyl Chloride	VC/PVC	1983-84.
11.	Acrylonitrile Plant	ACN	1978-79 Exp. 1987-88
12.	Acrylates Plant	ACR	1982-83.
13.	Acrylic Fibre (Mono Component)	AF	1978-79.
14.	Dry Spun Acrylic Fibre Plant	DSAF	1987-88.
15.	Carbon Fibre Plant	CF	1990.
16.	Integrated Off Site Plant	IOP	1978-79.
17.	Gas Turbine Power Plant	GTPP	1987.
18.	Polypropylene Plant (New)	PP-IV	1997.
19.	Poly Butadiene Rubber Plant	PBR-II	1997.

ANNEXURE – III

RAW MATERIAL CONSUMPTION PER UNIT OF PRODUCTION

Sr. No.	Plant	Products	Raw Materials	Consumption per Unit of Production (Kg/ MT)	
				2021-22	2022-23
1	GAP	Ortho & Para Xylene, DMT	Naphtha	*	*
			C5 Stream	*	*
			Para Xylene	*	*
			Methanol	*	*
2	GOP	Ethylene, Propylene, Carbon Black Feed Stock (CBFS), Mix C4, Butadiene, Benzene, Toluene, C4 Raffinate, Pyrolysis Gasoline, Naphtha Return Stream, Heavy Aromatics	Naphtha/recycled HC	1,918	1,909
			High Boilers	1.62	1.8
			Lean LPG	*	*
			AFS	210	214
			Pyrolysis Gasoline	708	696
			Mix C4	296	293
3	LAB	Linear Alkyl Benzene, N-paraffin, Heavy Alkylates, Heavy Normal Paraffin, Light Normal Paraffin	Kerosene	*	*
			Benzene	*	*
			Hydrogen	*	*
4	ACN	Acrylonitrile	Propylene	*	*
			Ammonia	*	*
5	DSAF	Monocomponent Acrylic Fiber	Acrylonitrile	*	*
			Methyl Acrylate	*	*
			Sodium methyl sulfonate	*	*
			Dimethyl Formamide	*	*
6	VC/ PVC	Ethylene Dichloride, Vinyl Chloride Monomer, Poly vinyl Dichloride	Ethylene	250	250
			EDC	876.8	836.8
			Chlorine	10.67	12.7
		Poly Vinyl Chloride	VCM	987	1000.9
7	CF	Carbon Fiber	SAF	*	*
8	PP-II	Poly Propylene Co Polymer	Propylene	915	999
			Hexane	18.12	19.9
			Ethylene	71.8	79.11
9	LDPE	Low Density Polyethylene	Ethylene	1,018	1,023.2
10	PP-I*	Poly Propylene	Propylene	*	*
			Heptane	*	*
			Butanol	*	*
11	PBR-I	Poly Butadiene rubber	Butadiene 1:3	1,004.65	1,006.4
			Butene – 1	9.04	10.2
			Benzene	37.31	40.5
			Butadiene 1:2	1.38	1.4
12	EG	Ethylene Oxide, Ethylene Glycols, DEG, TEG, PEG	Ethylene	781.87	674.69
			Oxygen	778.44	618.65

Sr. No.	Plant	Products	Raw Materials	Consumption per Unit of Production (Kg/ MT)	
				2021-22	2022-23
13	ACR	Methyl Acrylate Ethyl Acrylate Butyl Acrylate	Acrylonitrile	*	*
			Methanol	*	*
			Sulfuric Acid	*	*
			Acrylonitrile	*	*
			Ethanol	*	*
			Sulfuric Acid	*	*
			Acrylonitrile	*	*
			Butanol	*	*
			Sulfuric Acid	*	*
14	AF	Mono component Acrylic Fiber	Acrylonitrile	*	*
			Methyl Acrylate	*	*
			Sodium Methallyl Sulfonate	*	*
			Nitric Acid	*	*
15	PP-IV	Poly Propylene	Propylene	1,059.68	1,055.4
			Ethylene	2.49	1.8
			Hydrogen	0.293	0.298
16	PBR-II	Poly Butadiene Rubber	Butadiene 1:3	1,046.5	1,049.1
			Heptane	8.84	8.8
			Toluene	31.62	30.75
17	PR	Petroleum Resin	Pyrolysis Gasoline	*	*

* **Plant under shutdown during reporting period**

ANNEXURE – IV

CHARACTERISTICS OF WASTEWATER BEFORE AND AFTER TREATMENT FOR THE YEAR 2022-23

Sr. No.	Parameter	MDL	GPCB Std	After Treatment			Before treatment			No. of occasion Exceeding Standards after Treatment
				Min	Max	Avg.	Min	Max	Avg.	
1	pH	0.1	6.5-8.5	7.48	8.36	7.9	5.5	9.0	6.90	Nil
2	Temperature (°C)	-	40	19.0	38	29.5	-	-	-	Nil
3	Colour (Units)	5.0	100	20	30	20.05	30	40	30.1	Nil
4	Suspended Solids (mg/l)	10.0	100	8.0	11	10.03	20	26	22.5	Nil
5	O&G (mg/l)	0.5	10	1.0	1.4	1.19	-	-	-	Nil
6	Phenolic Compounds (mg/l)	0.01	1	-	BDL	BDL	-	-	-	Nil
7	Cyanides (mg/l)	0.02	0.2	-	0.03	0.03	-	-	-	Nil
8	Fluorides (mg/l)	0.2	1.5	0.48	1.08	0.71	0.43	0.81	0.6	Nil
9	Sulfides (mg/l)	0.1	2.0	-	0.4	0.4	-	-	-	Nil
10	Ammonical Nitrogen (mg/l)	5.0	50	0.10	0.12	0.118	-	-	-	N
11	Arsenic (mg/l)	0.05	0.2	-	BDL	BDL	-	-	-	Nil
12	Total Chromium (mg/l)	0.5	2	-	BDL	BDL	-	-	-	Nil
13	Hexavalent chromium (mg/l)	0.01	0.1	-	BDL	BDL	-	-	-	Nil
14	Copper (mg/l)	0.5	3	-	BDL	BDL	-	-	-	Nil
15	Lead (mg/l)	0.04	0.1	-	BDL	BDL	-	-	-	Nil
16	Mercury (mg/l)	0.005	0.01	-	BDL	BDL	-	-	-	Nil
17	Nickel (mg/l)	0.5	3	-	BDL	BDL	-	-	-	Nil
18	Zinc (mg/l)	0.5	5	0.02	0.05	0.03	-	-	-	Nil
19	BOD 5 days at 20 °C (mg/l)	5.0	100	10	20	16.47	55	182	106.4	Nil
20	COD (mg/l)	3.0	250	84	158	129.49	108	667	248.0	Nil
21	Chlorides (mg/l)	5.0	2,000	218	933	535	-	-	-	Nil
22	Sulphates (mg/l)	10.0	1,000	26	264	167.87	-	-	-	Nil
23	Total Dissolved Solids(mg/l)	10.0	5,000	442	1,374	854.3	-	-	-	Nil
24	Insecticide/Pesticide	-	Absent	Absent	Absent	Absent	-	-	-	Nil
25	Bio-assay Test (% survival)	10	90% Survival of fish after 96 hour in 100% effluent	100% Survival of fish after 96 hours in 100 % treated effluent	100% Survival of fish after 96 hours in 100 % treated effluent	100% Survival of fish after 96 hours in 100 % treated effluent	-	-	-	Nil

MDL: Minimum Detection Limit; BDL: Below Detection Limit

AVERAGE QUANTITY OF TREATED FINAL EFFLUENT PUMPED TO VECL 2022-23

Treated Effluent	Consent Limit (m^3/d)	Actual (m^3/d)
Total	18,800	7,516

CHARACTERISTICS OF TREATED EFFLUENT USED FOR GARDENING PURPOSE FOR THE YEAR 2022-23

Sr. No.	Parameters		MDL	Consented Norms	Minimum	Maximum	Average
1	pH	UOM	2.0	6.5-8.5	7.12	7.51	7.2
2	Temperature	(^{0}C)	-	40	26.5	29.1	27.7
3	Colour	Pt.Co Scale	1.0	100	20	25	24.6
4	Suspended Solids	(mg/l)	2.0	100	12	23	17.8
5	Oil & Grease	(mg/l)	1.0	10	BDL	BDL	BDL
6	Phenolic Compound	(mg/l)	0.02	1	BDL	BDL	BDL
7	Cyanide	(mg/l)	0.05	0.2	BDL	BDL	BDL
8	Fluoride	(mg/l)	0.05	2	0.29	0.48	0.4
9	Sulphide	(mg/l)	1.0	2	BDL	BDL	BDL
10	Amm. N_2	(mg/l)	0.05	50	BDL	BDL	BDL
11	Arsenic	(mg/l)	0.01	0.2	BDL	BDL	BDL
12	Total Chromium	(mg/l)	0.02	2	BDL	BDL	BDL
13	Hexavalent chromium	(mg/l)	0.02	0.1	BDL	BDL	BDL
14	Copper	(mg/l)	0.03	3	BDL	BDL	BDL
15	Lead	(mg/l)	0.02	0.1	BDL	BDL	BDL
16	Mercury	(mg/l)	0.01	0.01	BDL	BDL	BDL
17	Nickel	(mg/l)	0.02	3	BDL	BDL	BDL
18	Zinc	(mg/l)	0.03	5	BDL	BDL	BDL
19	Cadmium	(mg/l)	0.01	2	BDL	BDL	BDL
20	BOD 5 days at 20 ^{o}C	(mg/l)	2.0	30	3	6	4.8
21	COD	(mg/l)	5.0	100	12	20	17.6
22	Chlorides	(mg/l)	1.0	600	40	109	79.4
23	Sulphates	(mg/l)	1.0	1,000	7	86	31.9
24	TDS	(mg/l)	3.0	2,100	196	384	265.8
25	Free Ammonia	(mg/l)	0.05	5	BDL	BDL	BDL
26	SAR	%	0.01	26	0.75	1.32	1.0
27	Bio assay test		10	90% Survival of fish after 96 hour in 100% effluent	100% Survival of fish after 96 hours in 100 % gardening effluent	100% Survival of fish after 96 hours in 100 % gardening effluent	100% Survival of fish after 96 hours in 100 % gardening effluent

MDL: Minimum Detection Limit; BDL: Below Detection Limit

Total Treated Effluent Recycled for Gardening = 722 m^3/day

ANNEXURE – V

STACK EMISSIONS FROM BOILERS/HEATERS/FURNACES & PROCESS VESSELS (2022-23)

Plant	Stack No.	GPCB Prescribed Parameters	SPM	SO2	NOx	HC	Cl2	HCl	No. times exceeding limits
			Result mg/Nm3	Result mg/Nm3	Result mg/Nm3	Result mg/Nm3	Result mg/Nm3	Result mg/Nm3	
GOP	GT-1709	SO2, NOx, HC	-	N.D.	112.04	1.37	-	-	Nil
GOP	GT-1710	SO2, NOx, HC	-	N.D.	116.39	1.35	-	-	Nil
GOP	Super Heater-107 & 108	SO2, NOx, HC	-	N.D.	153.61	1.20	-	-	Nil
GTPP	HRSG-1	SO2, NOx, SPM	5.51	N.D.	200.11	-	-	-	Nil
GTPP	HRSG-2	SO2, NOx, SPM	5.46	N.D.	234.08	-	-	-	
IOP	Boiler – 4	SO2, NOx, SPM, HC	5.45	40.20	162.99	1.19	-	-	Nil
IOP	Boiler – 5	SO2, NOx, SPM, HC	5.61	41.5	173.9	1.18	-	-	
VC/ PVC	Scrubber	CL2, HCL	-	-	-	-	0.82	1.21	Nil
VC/ PVC	PVC Dryer	PM	5.28	-	-	-	-	-	Nil
VC/ PVC	Cracker R-201	SO2, NOx, HC	-	N.D.	94.15	1.18	-	-	Nil

ND: Non-Detectable; Other Consented Plants/stacks were Non-operational during reporting period.

QUANTITY OF POLLUTANTS DISCHARGE TO AIR ENVIRONMENT FOR THE YEAR 2022-23

Parameter	Load Tons/day
SO_2	0.114
NOx	2.91
PM	0.083

ANNEXURE – VI

HAZARDOUS WASTE DISPOSAL QUANTITY, CHARACTERIZATION & DISPOSAL PRACTICE (2022-23)

Category	Characterization	Disposal Practice	Disposal (MTA)
1.1-Sch.I	Furnace / Reactor residue and debris	*Secured Landfill*	19.42
1.1-Sch.I	Furnace / Reactor residue and debris	*incineration/ Cement co-processing/ pre-processing*	2.65
1.2-Sch.I	Tarry Residues and still bottom from distillation	*Captive Incineration/Cement Co-processing/ pre-processing*	0.00
1.3-Sch.I	Oily Sludge Emulsions	*Captive Incineration/Cement Co processing/ pre-processing*	65.93
1.4-Sch.I	Organic Residues	*Captive Incineration/Cement Co processing/ pre-processing*	0.00
1.6-Sch.I	Spent catalysts and molecular sieves	*Sale to registered recycler*	9.719
1.6-Sch.I	Spent catalysts and molecular sieves	*Secured Landfill/ incineration/ Cement Co processing/ pre-processing*	36.89
1.6-Sch.I	Spent catalyst from LAB modification	*Secured Landfill/ Sale to registered recycler*	0.00
1.7-Sch.I	Oil Emulsions (Slop oil)	*Captive incineration/ Cement Co processing/ pre-processing*	92.12
1.7-Sch.I	Oil Emulsions (Slop oil)	*Sale to registered recycler*	74.7
35.3-Sch.I	ETP Sludge containing hazardous constituents	*Secured Landfill/Cement Co-processing/ pre-processing*	703.135
5.1-Sch.I	Used / Spent Oil	*Sale to reg. recycle/ Captive incineration*	294.52
22.2-Sch.I	Residues from preparation of VCM*	*Incineration / Cement Co-processing/ pre-processing*	2,220.67
22.2-Sch.I	Residues from preparation of VCM	*Sale to reg. recycler*	21.2
22.2-Sch.I	Residues from preparation of ACN	*Secured Landfill/ incineration*	0.00
22.2-Sch.I	Non Polymerized residues	*Secured Landfill/ incineration/ Cement Co-processing/ pre-processing*	0.00
35.2-Sch.I	Spent Resin	*Secured Landfill/incineration/sale to registered recycler/Cement Co-processing/ pre-processing*	0.00
36.2-Sch.I	Filters and filter mat. With organic liquids in them, e.g. Mineral oil, synthetic oil and organic chlorine comp.	*Captive incineration/Cement Co-processing/ pre-processing*	0.00
37.2-Sch.I	Ash from incineration of haz-waste, flue gas residues	*Landfill/Cement Co-processing/ incineration*	0.00
B-15	Acid Sludge	*Landfill/ incineration/recycle-reuse*	0.00
C-1	Highly flammable substances	*Captive Incineration/Cement Co-processing/pre-processing*	0.00
C-3	Process waste	*Captive Incineration/Cement Co-processing/pre-processing*	0.00
33.2-Sch.I	Contaminated cotton waste	*Incineration/Cement Co-processing/pre-processing*	1.00
Sch. IV	copper scarp	*Sale to reg. recycler*	0.00
15.2-Sch.I	Asbestos	*Secured Landfill/incineration*	0.00
Total Hazardous Waste			***3,541.944***
33.1-Sch.I	Discarded Containers/ Barrels/ Liners/ used for Hz waste/ chemicals	*Decontamination within premise/ sale to registered recycler*	6,669 Nos.

Note: RIL-VMD Captive Secured Landfill: *RIL-VMD, Survey No. 162, Block 300, Vill – Angadh, Nandesari.*

**** Residues from preparation of VCM:*** *Authorized Captive RIL Incineration @ RIL-HMD/RIL-DMD.*