सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण एवं वन मंत्रालय
MINISTRY OF ENVIRONMENT & FORESTS

SPEED POST
क्षेत्रीय कार्यालय, पश्चिम क्षेत्र,
Regional Office, Western Region.
"केन्द्रीय पर्यावरण भवन"
"Kendriya Paryavaran Bhavan"
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क्रमांक: 5-48/ENV/92/380

दिनांक : 26.10.2016

प्रति,

डॉ0 ललित बोकोलिया,
वैज्ञानिक 'एफ',
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,
इंदिरा पर्यावरण भवन, जोर बाग रोड, अलीगंज,
नई दिल्ली - 110003

विषय: **Expansion & Debottelnecking of Petrochemical Plant of Dahej Manufacturing Division (DMD) at Tehsil Vagra District Bahuruch Gujarat By M/s Reliance Industries Limited.**

संदर्भ: 1. No. J-11011/27/90-IA-II dated 14th March 1991
2. No. J-11011/482/2006- IA II (I) dated 11th June 2007
3. No. J-11011/402/2007- IA II (I) dated 20th March 2008

महोदया,

मंत्रालय के उपरोक्त संदर्भित पत्रांकों के संदर्भ में उक्त परियोजनाओं को पर्यावरणीय दृष्टिकोण से अनुमति देते समय अनुबद्ध शर्तों के अनुपालन एंव certification of compliance के निर्देशाअनुसार, अनुवीक्षण प्रतिवेदन (मॉनिटरिंग रिपोर्ट) एतद् द्वारा संलग्न कर प्रेषित है ।

भवदीय

वैज्ञानिक 'एफ'

संलग्न: उपरोक्तानुसार

O/C

प्रतिलिपि: 1. श्रीमति रीता खन्ना, निदेशक, (अनुवीक्षण सैल), पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,इंदिरा पर्यावरण भवन, जोर बाग रोड, अलीगंज,नई दिल्ली - 110003 की ओर सूचनार्थ एंव आवश्यक कार्यवाही हेतु।

2. Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch – 392130 Gujarat - 392130

वैज्ञानिक 'एफ'

Monitoring the Implementation of Environmental Safe Guards
Ministry of Environment &Forest
Western Region, Regional Office, Bhopal
MONITORING REPORT
PART-I
DATA SHEET

1	Project type: River Valley/Mining/Industry / Industry, Thermal/Nuclear/Other (Specify)	Industry (Petrochemical)
2	Name of the Project	Gandhar Petrochemical Complex
3	Clearance letter (s) OM No. & date	No. J-11011/27/90-IA-II dated 14th March 1991
4	Location Districts State Location- Latitude/Longitude	Dahej Bharuch Gujarat Latitude : $21^0$40'35"N & $21^0$41'27"N Longitude : $72^0$33'32"E & $72^0$35'04"N
5	Address for Correspondence	
(a)	Address of the concerned Project Chief Engineer (with Pin Code & telephone / telex / fax numbers	Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch - 392130 Gujarat - 392130 Ph : 02641- 615001 E-mail : pavan.jain@ril.com
(b)	Address of Executive Project Engineer / Manager (with Pin code /fax numbers)	Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch - 392130 Gujarat - 392130 Ph : 02641- 615001 E-mail : pavan.jain@ril.com
6	Salient features	
(a)	Of the Project	Already submitted to the Ministry of Environment & Forest, New Delhi based on which the aforesaid EC has been obtained. India's only Integrated Petrochemical Complex having a capability to produce PVC from a salt. This complex comprises CA, VCM, PVC plants along with other infrastructure facilities like CPP – 65 MW,Captive Jetty. Best Available Technology in the world were selected for these plants.
(b)	Of the Environment Management Plan	EMP was prepared based on the baseline data collected by NEERI and impact prediction were done using mathematical models and superimposition of those impacts on the baseline. EMP includes provision of state of the art Effluent Treatment Plant and Air Pollution control equipment, solid waste management and Green Belt development. Regular environment monitoring is also a part of EMP. Major

		pointsimplemented as per EMPe.g. • selected the state of art clean membrane cell technology for CA plant • Segregated waste water stream and provided ETP for treatment • Provided incinerator with scrubber. • Developed Landfill site with liner and leachate collection system.
7	Breakup of the project area	
(a)	Submergence Area : Forest & Non Forest	No forest land is involved in this project. Prior to project implementation the land was devoid of any vegetation due to saline nature of soil.
(b)	Others	Total area of project 700 ha.
8	Breakup of the project affected population with enumeration of those losing houses / dwelling units only agricultural land only, both dwelling units and agricultural land and landless labourers / artisans : (a) SC, ST / Adivasi (b) Others (please indicate whether these figures are based on any scientific and systematic survey carried out or only provisional figures, if a survey is carried out give details & year of survey.	Not Applicable
9	Financial details	
(a)	Project cost as originally planned and subsequent revised estimates and the year of price reference	Cost of Project was Rs.900 crore as originally planned in 1994, Revised cost was 1000 Crore in 1995-96
(b)	Allocation made for environmental management plan with item wise and year wise break up	Non-recurring (i.e. CAPEX) Rs. 100 Crore (Estimated cost: ETP / Drainages : Rs. 30 Crore, APCE : DM Water / Caustic Scrubber, VCM Incinerator, Low Nox Burnersetc: Rs. 60 Crore, Solid Waste Mgt: Rs. 6 Croreand Green Belt Development - Rs.4 crore) Recurring (i.e. OPEX) / year (O&M of ETP, Green Belt, Waste disposal, Env monitoring) – Rs.50 lakhs
(c)	Benefit / cost ratio / Internal Rate of Return and the year of assessment	Benefit / cost ratio for all our project is more than 1. Project has achieved IRR of more than 12%
(d)	Whether (c) includes the cost of environment management as shown above	Yes
(e)	Actual expenditure incurred on the project so far	Rs.1000 crore
(f)	Actual expenditure incurred on the environmental management plan so far	Non-recurring (i.e. CAPEX) Rs. 105 Crore

		(ETP / Drainages : Rs. 30 Crore, APCE : DM Water / Caustic Scrubber, VCM Incinerator, Low Nox Burners etc: 65 Crores, Solid Waste Mgt: 6 Crores and Green Belt Development - Rs 4 crore) Recurring (i.e. OPEX) / year (O&M of ETP, Green Belt, Waste disposal, Env monitoring etc) – Rs.8 crore for FY 15-16 and Rs. 5 crore for FY 14-15
10	Forest land requirement a) The status of approval for diversion of forest land for non-forestry use b) The status of clearing/felling obtained. c) The status of CA , if any d) Comments on the viability and sustainability of CA programme in the light of actual field experience so far	No requirement of Forest Land
11	The status of clear felling in non-forest areas (such as submergence area of reservoir, approach road etc) if any with quantitative information required	Not Applicable
12	Status of construction (Actual &/or planned) a) Date of commencement b) Date of completion	VCM, PVC, CA&CPP – 60 MW completed and commissioned during 1996-97
13	Reason for delay (if project is yet to start)	Not Applicable
14	Dates of site visit a) Date on which the project was monitored by the RO on previous occasion (if any) b) Date of the site visit for the monitoring report	--- 30.09.2016
15	Details of correspondence with project authorities for obtaining act onplans/ information on status of compliance to safeguards other than the routine letters for logistic support for site visits. (The first monitoring report may contain the details of all the letters issued so far, but the later reports may cover only the letter issued subsequently)	As below
Date	**Letter from RO**	**Date Reply from PA**
		13/09/2016 Mail Received from PA
		20/10/2016 Letter no. GPC/HSE/E/476/2010/1

PART – II & III
DESCRIPTIVE REPORT ON STATUS OF COMPLIANCE FOR THE PERIOD OF APRIL 2016 - SEPTEMBER, 2016 TO CONDITIONS OF ENVIRONMENTAL CLEARANCE AND ENVIRONMENTAL MANAGEMENT

O.M. No.: . J-11011/27/90 -IA-II dated 14th March 1991

<table>
<tr><th>SR. No.</th><th>Conditions of the Environment Clearance</th><th>Compliance Status of the Conditions of EC</th></tr>
<tr><td>1</td><td>The project authority must strictly adhere to the stipulations made by the State Pollution Control Board and the State Govt.</td><td>It has been stated that Stipulations made by the Gujarat Pollution Control Board are strictly adhered to and major stipulations made by GPCB, vide CCA order no W-76082 dated 4th February 2016.

The status of compliance of major stipulations given by GPCB vide CCA as provided by PP is given as below :
<table>
<tr><th>Cond. No.</th><th>CCA Conditions</th><th>Compliance Status of CCA Conditions</th></tr>
<tr><td>3.1</td><td>The quantity of total fresh water consumption shall not exceed 1,27,382 KL/day</td><td>Average fresh water requirement for the period Apr-Sep'16 was 76,791 KLD which is not exceeding the permissible limit of 1,27,382 KLD</td></tr>
<tr><td>3.4.1</td><td>The quality of treated effluent shall conform to the following standards prior to disposal into deep sea (Gulf of Khambhat) through the existing effluent disposal pipeline equipped with multiport diffuser.
Note: Standards are prescribed in CCA</td><td>Treated effluent is being monitored on monthly basis through MoEF approved agency and the quality of effluent maintained well within the norms prescribed by GPCB and then it is discharged through existing effluent disposal pipeline equipped with multiport diffuser.

Results of treated effluent quality monitoring given in Condition No. 8 indicates the conformance to the GPCB prescribed standards vide this CCA.</td></tr>
<tr><td>4.4</td><td>The process emissions through various stacks /vents of reactors , process, vessel shall conform to the following standards
Note : Standards are prescribed in CCA.</td><td>The gaseous emissions from various process units are monitored on monthly basis through MoEF approved laboratory and its results given in the Condition no 4 indicates the conformance to the GPCB prescribed standards vide this CCA.</td></tr>
<tr><td>5.1

Sr. No. 5</td><td>Spent Catalyst (Sr.No. 1)
Spent Oil /Used Oil (Sr.No.5)
Discarded containers (Sr.No.8)

Facility prescribed for Above listed wastes: Collection, Storage, Treatment and Disposal at approved site/ sell to authorize vendor for recycle or by selling to registered refiners.</td><td>Spent catalyst generated from the plants is collected , stored properly and sold to authorized reprocessors for recovery of metal

Spent oil/ used oil generated from the facility is collected in the drums and sold to registered oil recyclers.

Discarded containers generated from the plants are collected,decontaminated, stored properly and then sold to authorized vendor.</td></tr>
</table>
The detailed compliance status report of Consolidated Consents & Authorization (CCA) granted by GPCB has also been provided separately.
Complied.</td></tr>
</table>

	Any expansion of the plant, either with the existing product mix or new product can be taken up only with the prior approval of this Ministry.	All expansion of the plant, either with the existing product mix or new product at RIL Dahej Manufacturing Division is stated to have been carried out with prior environmental clearance from MoEF/SEIAA and are listed below: **Complied.**
3	The project authority must submit comprehensive EIA report for the proposed activity along with the future activity proposed/approved by this Ministry, before July 1991.	The PP informed that Comprehensive EIA study for the proposed activity along with the future activity proposed/approved by MoEF, have been carried out and completed in September 1991 and the report was duly submitted to MoEF. **Complied.**
4	The gaseous emissions from various process units should conform to the standard prescribed by the concerned authorities from time to time.	The gaseous emissionsfrom various process units are monitored on monthly basis through MoEF approved laboratory and its results given by PP indicates the conformance to the GPCB prescribed standards. A summary of the gaseous emission from various process stacks for the period Apr-Sept' 16 as provided by PP is presented below.

Sr. No.	EC	Accorded By	Date of issue
1.	**EC vide letter No. J-11011/482/2006-IA II (I)** for CAPEX project at GandharPetrochemicals Complex	MoEF (I A Division)	11.06.07
2.	**EC vide letter: F.No. J-11011/402/2007– IA II (I)** for expansion project of M/s Reliance Industries Limited, Dahej Manufacturing Division,	MoEF (IA Division)	20.03.08
3.	**EC vide letter No. SEIAA /GUJ/EC/5(e)& 1(d) /124/2011 for** setting up of EODs , Acrylic Acid and Esters, Phenol, PTA, PET Plants and 200 MW CCPP in the existing petrochemical unit at Dahej Manufacturing Division, P.O Dahej, Tal Vagra, Dist. Bharuch by M/s Reliance Industries Limited	SEIAA, Gujarat	23.06.11
3a.	Amendment to EC granted on 23.06.11 vide letter No. SEIAA /GUJ/EC/5(e)& 1(d) /160/2011dtd, 09.08.11	SEIAA, Gujarat	09.08.11
3b.	Amendment to EC granted on 23.06.11 vide letter No. SEIAA /GUJ/EC/5(e)& 1(d) /278/2011dtd. 12.09.12	SEIAA, Gujarat	12.09.12

Plant	Parameter	GPCB Consent Limit	Avg	Min	Max
VCM - Stack attached to Incinerator	PM (mg/Nm^3)	150	12.42	11	14
	SO_2 (mg/Nm^3)	40	12.71	10.46	14.93
	NOx (mg/Nm^3)	25	21.08	19.44	22.77
	HCl (mg/Nm^3)	20	11.75	2.43	19.45
	Cl_2 (mg/Nm^3)	9	1.38	1.32	1.41
	HC (mg/Nm^3)	15	1.69	1.61	1.79
	CO (mg/Nm^3)	150	0.67	0.59	0.77
	VCM (mg/Nm^3)	6.6	ND	ND	ND

		Chlor Alkali Plant - Stacks Attached to Hypo and HCl synthesis Unit	Cl_2 (mg/Nm^3)	9	ND	ND	ND
			HCl (mg/Nm^3)	20	14.18	7.29	18.23
		PVC Plant-Stacks attached to PVC Dryers	PM (mg/Nm^3)	150	12.50	10.00	14.00
			SO_2 (ppm)	100	5.11	4.57	6.12
			NOx (ppm)	50	11.57	10.67	13.54
			CO (mg/Nm^3)	150	0.67	0.60	0.74
			VCM (mg/Nm^3)	6.6	ND	ND	ND
		PTA Plant - Stacks attached to Off gas scrubber, atmospheric scrubber and vent scrubber	PM (mg/Nm^3)	150	ND	ND	ND
			SO_2 (mg/Nm^3)	40	ND	ND	ND
			NOx (mg/Nm^3)	25	ND	ND	ND

It can be seen from the above table that all results are conforming to the standards prescribed by GPCB norms.

Detailed Stack Emission Monitoring Report has been submitted separately.

Complied.

	At no time the emission level should go beyond the stipulated standards.	PP informed that during Apr'16– Sep'16 emission levels have not exceeded the standards prescribed by GPCB. This is reflected in above tabular statement. Also detailed Stack emission monitoring report has been submitted by PP separately. **Complied.**
	In the event of failure of any pollution control system adopted by the unit, the respective unit should be put out of operation immediately and should not be restarted until the control measures are rectified to achieve the desired efficiency.	Pollution control systems in the plant are connected through the DCS system. In the event of failure of pollution control system, a trigger/alarm is raised in the DCS system which prevents the plant from restarting. PP informed that during the period Apr'16– Sep'16, no such failure of pollution control equipment has been observed. **Complied.**
5	Adequate number (a minimum of six) of air quality monitoring stations should be set up in the downwind direction as well as where maximum ground level concentration is anticipated.	As per PP, the site has established 7 ambient air quality monitoring stations within the petrochemical complex based on the mathematical modelling studies carried out considering wind directions and the maximum Ground Level Concentration in downwind direction. A summary of the AAQ monitoring results of Apr- Sep 16 as provided by PP are as given below

Parameter	GPCB Consent Limit	Average	Min	Max
PM_{10}	100 µg/m^3	72.32	60	85
$PM_{2.5}$	60 µg/m^3	**36.71**	27	52
SO_2	80 µg/m^3	5.70	2.1	9.3
NOx	80 µg/m^3	9.90	6.2	14.3
O_3	180 µg/m^3	10.51	7.3	15.2
NH_3	400 µg/m^3	19.35	14	28.3

<table>
<tr><td></td><td>of the plant.</td><td>Steam injection system is reportedly also provided in the flare stacks as well in Gas turbines for reducing NOx generation.

Complied.</td></tr>
<tr><td>7</td><td>The incinerator should have a stand-by system for unforeseen circumstances.</td><td>There are two incinerators at VCM plant, of which one is a standby and can be used during unforeseen circumstances.
Complied.</td></tr>
<tr><td>8</td><td>The project authorities should recycle the waste to the maximum extent and liquid effluent coming out of the plants should meet the stipulated standards.</td><td>Recycling of wastes is practiced to maximum extent both internally and by selling to authorize recyclers as per CCA order no W-76082 dated 4th February 2016, granted by GPCB

The treated effluent is being monitored every month through MoEF approved agency and the same is reported to be conforming to the GPCB standards for the period Apr'16-Sep'16.

The summary of treated effluent quality monitoring reports for Apr-Sept' 16 as provided is presented below:

<table>
<tr><th>Parameter</th><th>Unit</th><th>MoEF Limit</th><th>Average</th><th>Min</th><th>Max</th></tr>
<tr><td>pH</td><td>–</td><td>6.5-8.5</td><td>7.40</td><td>6.82</td><td>7.62</td></tr>
<tr><td>Total Suspended Solids</td><td>mg/l</td><td>100</td><td>15.33</td><td>10.00</td><td>20.00</td></tr>
<tr><td>Oil & grease *</td><td>mg/l</td><td>20</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Phenolic compounds (as C6H5OH)</td><td>mg/l</td><td>5</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Cyanide (as CN)</td><td>mg/l</td><td>0.2</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Fluorides (as F)</td><td>mg/l</td><td>15</td><td>0.46</td><td>0.36</td><td>0.55</td></tr>
<tr><td>Sulphides*</td><td>mg/l</td><td>5</td><td>2.29</td><td>2.00</td><td>2.66</td></tr>
<tr><td>BOD (3 days at 27°C)</td><td>mg/l</td><td>50</td><td>18.83</td><td>14.00</td><td>28.00</td></tr>
<tr><td>COD</td><td>mg/l</td><td>250</td><td>119.50</td><td>92.00</td><td>165.00</td></tr>
<tr><td>Total Chromium (as Cr) *</td><td>mg/l</td><td>2</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Hexavalent Chromium (as Cr+6) *</td><td>mg/l</td><td>1</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Bioassay Test *</td><td>–</td><td>90% survival of fish after 96 hours in 100% effluent</td><td>90% survival of fish after 96 hours in 100% effluent</td><td>-</td><td>-</td></tr>
</table>
(Note : * As MoEF has not notified the norm for this parameter, GPCB standard is considered)

It can be seen from the above data that effluent quality is conforming to the standard stipulated by GPCB.

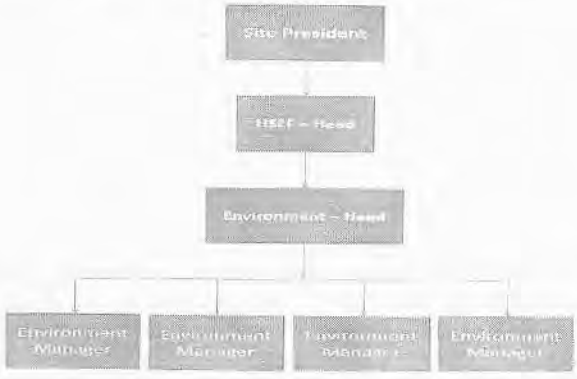
The detailed treated effluent monitoring report has also been submitted separately.

Complied</td></tr>
<tr><td></td><td>There should be only minimum discharge.</td><td>Treated effluent is being recycled within the complex as Cooling tower make up, DM water production, green belt development.
The average of effluent generation, recycle and discharge quantities during reporting period of Apr-Sep'16 is presented below as against the Permissible limits prescribed under the latest EC accorded vide letter no SEIAA/GUJ/EC/5(e)&1(d)/124/2011</td></tr>
</table>

		dated 23rd June 2011. **Description** / **Permissible Limit (KLD)** / **Average (KLD)** Quantity of Effluent Generation: 44,600 / 36,497 Quantity of Effluent Recycle: 14,080 / 13,879 Quantity of Effluent Discharge: 30,520 / 22,618 Percentage of Recycle: 32% / 38% It can be seen from the above data table that the Effluent recycling is done to maximum extent for minimizing discharge from the complex. **Complied.**
9	The liquid effluent to be discharged into the sea should maintain a temperature difference of not more than 5^{0}C as compared to sea water temperature.	The liquid effluent discharged into the sea maintains temperature difference of less than 5^{0}C compared to sea water temperature. PP informed that Guard pond is provided to store the treated effluent to attain atmospheric temperature before discharging into the sea. **Complied.**
10	Only sea water should be used for cooling purposes.	PP submitted that Ministry has amended this condition and allowed use fresh water for cooling purposes, which is complied.
	The project authorities should not draw more than 22 MGD through the jack-up-well in Narmada.	As stated average Fresh water drawl from the jack well in the Narmada river for the reporting period Apr-Sept'16 was 16.9 MGD, which is not exceeding the permissiblelimit for water drawl of 22 MGD. **Complied.**
	In case the flow in Narmada falls below the 2000 cusecs at any point of time alternate arrangements will be made by RIL for obtaining the required quantity of water which may include sea water for cooling purposes and for which plans will be submitted along with comprehensive EIA.	In case of water shortage in Narmada river water, it is informed that RIL-DMD complex has contingency plan to cater to the water requirements e.g. 1. If required, shutting down the some of the process units which consumes more water. 2. Maximize the recycling of treated effluent including sewage. 3. Water requirement for the plants/ green cover will be minimize by considering seasonal requirements during water shortage period. **Complied.**
11	Adequate number of effluent quality monitoring stations must be set up in consultation with the State Pollution Control Board and the effluents monitored should be statistically analysed and the report sent to the Ministry every six month.	Effluent quality monitoring station provided at the inlet and outlet of ETP in consultation with the Gujarat Pollution Control Board. The effluent monitoring reports are submitted to GPCB on a monthly basis and to ministry on six monthly basis. The details of quality of treated effluent is provided and reflected at condition no 8 above. **Complied.**
12	A study should be conducted with the help of National Institute of Oceanography with regard to breeding and spawning habits of fishes and accordingly the marine out fall should be designed.	Study related to breeding and spawning habits of fishes was carried out by NIO. Marine outfall has been designed by NIO after considering the above information. **Complied.**

	Routine toxicity bioassay based on the effluent with sea-fish and fish-food organism must be carried out at least once in a year.	PP explained that Bioassay test for monitoring toxicity is conducted in the laboratory with the test containers for the treated effluent. The local fishes are taken as the Testing animal for this experiment and the test is carried out in the laboratory as per the IS 6582. Result of 90% survival of fish after 96 hours in 100% effluent is achieved for the review period of Apr'16 –Sep'16, The analysis results of Bioassay test is provided in condition no. 8 **Complied.**
14	The treated effluent conforming to the prescribed standards should be utilised for green belt development to the maximum extent possible.	The treated effluent conforming to GPCB standard is utilized for green belt development and also for cooling tower make up and DM water production. **Complied.**
15	The green belt design should be finalised and got approved from this Ministry within a period of one year.	The green belt was designed by NEERI and it was developed as per guidelines given by NEERI. **Complied.**
16	The project authority should prepare a well-designed scheme for solid waste disposal generated during various processes operation or in treatment plant. The plan for disposal should be submitted to the Ministry within two years.	Hazardous and other solid wastes generated at site is being managed in accordance with the Hazardous Waste (M, H & TM) Rules, 2008. Authorisation (W-76082) from GPCB for collection/treatment/ storage/ disposal of hazardous wastes is available which is valid up to 03.11.2020. M/s. National Productivity Council (NPC), New Delhi was retained by RIL for providing the design of the solid waste management system and the solid waste disposal plan was submitted to the Ministry. Hazardous and solid wastes collected, stored and disposed during reporting period Apr-Sep'16 has been provided. Copy of Form - 4 submitted to GPCB for the year 2015-2016 has also been provided. **Complied.**
17	Ground water near the solid waste disposal site as well as around the plant should be regularly monitored.	Ground water quality is being monitored near the solid waste disposal site as well as around the plant using 8 bore wells. The summary of Ground water monitoring results for the period Apr'16-Sep'16 as provided is presented as below.

Parameter	UNIT	Average	Min	Max
pH	--	8.62	8.1	9.2
Conductivity	µS/cm	4700.00	3820	5600
TDS	mg/l	3071.33	2483	3640
Turbidity	NTU	3.27	0.8	6.9
P-alkalinity (as CaCO3)	mg/l	101.17	38	187
M-Alkalinity (as CaCO3)	mg/l	913.33	120	1218
Total Suspended Solids	mg/l	3.67	1	7
Total Hardness (as CaCO3)	mg/l	136.00	75	395
Ca-hardness as CaCO3	mg/l	40.17	28	68
Mg hardness (as CaCO3)	mg/l	95.83	31	337
Chloride (as Cl)	mg/l	587.67	436	707
Sulphates(as SO4)	mg/l	481.83	208	628
Free Residual Cl2	mg/l	0.00	0	0
Iron (as Fe)	mg/l	0.55	0.32	0.96

		The detailed monitoring results have been provided separately. **Complied**
18	A detailed risk analysis based on Maximum Credible Accident Analysis should be done once the process design and lay-out is frozen. Based on this a disaster management plan has to be prepared and after approval by the concerned nodal agency, should be submitted to this Ministry.	It has been explained by PP that Detailed Risk Analysis considering Maximum Risk scenario is carried out for the site based on which the Disaster Management Plan (i.e. On-site Emergency Plan and Off-site Emergency Plan) is prepared for the complex. The DMP is approved by the DISH. The DMP is reviewed periodically **Complied.**
19	The storage tanks and spheres must conform to the stipulations made by the Chief Inspector of Factories, Controller of Explosives etc. Wherever required, it should be supplemented by OISD codes.	Storage tanks and spheres stated to conform to the stipulations made by Legal authorities like the Chief Inspector of Factories, Controller of Explosives and meet the requirements of OISD. **Complied.**
20	A separate environmental management cell with suitably qualified people to carry out various functions should be set up under the control of Senior executive who will report directly to the head of the organization.	The environmental management cell is established at the plant with qualified professionals. The Environment head of the plant reports to Head of HSEF department and who in turn reports to the Site President (i.e. Factory Manager) of the complex. The detailed organogram is presented as below :  **Complied.**
21	The project authority must set up a laboratory facility for collection and analysis of samples under the supervision of competent technical personnel who will directly report to the Chief Executive.	RIL-DMD has a full-fledged Quality Assurance (Laboratory) dept., manned with qualified Lab-technicians under the supervision of competent & well-experienced managers who also carry out the Environmental sample analysis. The QA head directly reports to the Factory Manager of the complex. For the glimpse of Quality Assurance Department, PP has submitted a photograph separately. **Complied.**
22	The villagers who are likely to be displaced due to setting up of the project should be rehabilitated as per Govt. of India Guidelines, or State Govt. guidelines whichever is acceptable to local population. Rehabilitation Master Plan should be submitted and got approved within 6	Rehabilitation plan submitted and approved in the EIA of the plant. **Complied.**

	months of this approval.	
23	The funds earmarked for the environmental protection, measures should not be diverted for other purposes and year-wise expenditure should be reported to this Ministry.	Dedicated Environment management funds are allocated each year and it is not diverted for any other activities at the plant. The recurring environmental expenditure for the year 2015-16 was around Rs 8 Crores. **Complied.**
II.	The Ministry or any other competent authority may stipulate any further condition after reviewing the comprehensive impact assessment report or any other reports prepared by project authorities.	The Ministry or any other competent authority has not added any conditions to this EC. However the expansion of plants were carried out after obtaining Environmental Clearance from MoEF / SEIAA as detailed in condition no. 2 **Complied.**
III.	The Ministry may revoke clearance if implementation of the stipulated conditions is not satisfactory.	This condition is **not applicable to PP.**
IV	The above conditions will be enforced inter-alia under the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act 1981, and Environment (Protection) Act 1986, along with their amendments.	This condition is **not applicable to PP taken cognizance..**

Summary and inference:

The compliance of EC conditions is good. Out of 26 conditions, 24 are found to have been complied, one condition is not applicable to the PP and one condition needs only taking note/ cognizance .

Court Cases and Show cause notices issued:

It has been reported that there is no court case on this project

Details of Notices issued during last three years.

Date	Details of Directions by CPCB/ Show Cause Notice (SCN) issued by GPCB, if any	Date	Reply from PA
Letter no. GPCB-HAZ-GEN-503/316347 dated 04.06.2015	Show Cause Notice issued by GPCB regarding observation of no submission of monthly data of hazardous waste disposed / incinerated at our captive TSDF/Incinerator and foresaid details.	Letter No. RIL/HSE/E/474 dated 19.06.2015	Replied to notice with supporting evidences as we are regularly submitting the details as a part of GPCB Monthly Report in hard copy to GPCB Regional Office Bharuch and GPCB Gandhinagar and also are submitting the required details in GPCB XGN portal. Therefore it is resolved. The query was resolved and no further action has been initiated.

Letter no.: B-29016/ 04/06/PCI-I/44989 dtd. 24.07.2015 received on 24.08.2015	Directions issued by CPCB under regarding installation of on-line effluent and emission monitoring systems	Letter No. RIL/HSE/E/474/2908/PC dated 29.08.2015	Replied to letter with following details 1. Documentary evidence regarding CAPEX raised for installation of online emission & effluent monitoring system. 2. Letter to CPCB through CPMA dtd. 24.06.2015 providing time schedule for completion of establishing online facilities and connecting to GPCB/CPCB server by December 2016. Continuous Emissions Monitoring System is installed and commissioned in all stacks and at ETP outlet.

Scientist 'F'

Counter signed by:
Addl. PCCF (C)

Monitoring the Implementation of Environmental Safe Guards
Ministry of Environment &Forest
Western Region, Regional Office, Bhopal
MONITORING REPORT
PART-I
DATA SHEET

1	Project type: River Valley/Mining/Industry / Industry, Thermal/Nuclear/Other (Specify)	Industry (Petrochemical)
2	Name of the Project	CAPEX Project at Gandhar Petrochemicals Complex
3	Clearance letter (s) OM No. & date	No. J-11011/482/2006- IA II (I) dated 11th June 2007
4	Location Districts State Location- Latitude/Longitude	Dahej Bharuch Gujarat Latitude : $21^0$40'35"N & $21^0$41'27"N Longitude : $72^0$33'32"E & $72^0$35'04"N
5	Address for Correspondence	
(a)	Address of the concerned Project Chief Engineer (with Pin Code & telephone / telex / fax numbers	Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch - 392130 Gujarat - 392130 Ph : 02641- 615001 E-mail : pavan.jain@ril.com
(b)	Address of Executive Project Engineer / Manager (with Pin code /fax numbers)	Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch - 392130 Gujarat - 392130 Ph : 02641- 615001 E-mail : pavan.jain@ril.com
6	Salient features	
(a)	Of the Project	Already submitted to the Ministry of Environment & Forest, New Delhi based on which the aforesaid EC has been obtained. Obtained for capacity expansion (CAPEX) at Gandhar Petrochemical Complex. The complex comprises of CA, VCM,PVC,GCU,EPRU,EO/EG,HDPE,CPP &Utilities. After expansion the Capacity is increased from 19,20,000 TPA to 30,61,660 TPA. Best Available Technology in the world were selected for these plants& designed with state of art technology.
(b)	Of the Environment Management Plan	EMP was prepared based on the baseline data collected by NEERI and impact prediction were done using mathematical models and superimposition of those impacts on the baseline.

		EMP includes provision of state of the art Effluent Treatment Plant and Air Pollution control equipment, solid waste management and Green Belt development. Regular environment monitoring is also a part of EMP. Major points implemented as per EMP e.g. • Developed full-fledged Environment Dept. headed by Environment Head reporting to HSEF- Head who in turn reports to Site President • Modified neutralisation collection facility • Upgraded adsorber of incinerator plant.
7	Breakup of the project area	
(a)	Submergence Area : Forest & Non Forest	Not applicable, No additional land is required as capacity expansion is within existing petrochemical complex.
(b)	Others	Total area of petrochemical complex 700 ha. No additional land is required as this much area is available within existing petrochemical complex.
8	Breakup of the project affected population with enumeration of those losing houses / dwelling units only agricultural land only, both dwelling units and agricultural land and landless labourers / artisans : (a) SC, ST / Adivasi (b) Others (please indicate whether these figures are based on any scientific and systematic survey carried out or only provisional figures, if a survey is carried out give details & year of survey.	Not Applicable
9	Financial details	
(a)	Project cost as originally planned and subsequent revised estimates and the year of price reference	Cost of Project was Rs.425.26 crore in 2007
(b)	Allocation made for environmental management plan with item wise and year wise break up	Non-recurring (i.e. CAPEX) Rs. 40 Crore (Estimated cost: ETP & Drainage modification : Rs. 15 Crore, APCE : Injector for water in thermal oxidiser, revamp of adsorber of incinerator etc: Rs. 20 Crores, Solid Waste Mgt: Rs. 3 Crores and Green Belt Development - Rs. 2 crore) Recurring (i.e. OPEX) / year (O&M of ETP, Green Belt, Waste disposal, Env monitoring) – Rs.80 lakhs
(c)	Benefit / cost ratio / Internal Rate of Return and the year of assessment	Benefit / cost ratio for all our project is more than 1. Project has achieved IRR of more than 12%
(d)	Whether (c) includes the cost of environment management as shown above	Yes
(e)	Actual expenditure incurred on the project so far	Rs.425.26 crore

)	Actual expenditure incurred on the environmental management plan so far	Non-recurring (i.e. CAPEX) Rs. 39 Crore (ETP & Drainage modification : Rs. 14 Crore, APCE : Injector for water in thermal oxidiser, revamp of adsorber of incinerator etc: Rs. 20 Crores, Solid Waste Mgt: Rs. 3 Crores and Green Belt Development - Rs. 2 crore) Recurring (i.e. OPEX) / year (O&M of ETP, Green Belt, Waste disposal, Env monitoring etc) – Rs.8 crore for FY15-16 and Rs. 5 crore for FY14-15
10	Forest land requirement a) The status of approval for diversion of forest land for non-forestry use b) The status of clearing/felling obtained. c) The status of CA , if any d) Comments on the viability and sustainability of CA programme in the light of actual field experience so far	No requirement of Forest Land
11	The status of clear felling in non-forest areas (such as submergence area of reservoir, approach road etc) if any with quantitative information required	Not Applicable
12	Status of construction (Actual &/or planned) a) Date of commencement b) Date of completion	Capacity expansion of plant mentioned above was completed in 2007-08
13	Reason for delay (if project is yet to start)	Not Applicable
14	Dates of site visit a) Date on which the project was monitored by the RO on previous occasion (if any) b) Date of the site visit for the monitoring report	--- 30.09.2016
15	Details of correspondence with project authorities for obtaining act onplans/ information on status of compliance to safeguards other than the routine letters for logistic support for site visits. (The first monitoring report may contain the details of all the letters issued so far, but the later reports may cover only the letter issued subsequently)	As below
Date	**Letter from RO**	**Date Reply from PA**
		13/09/2016 Mail Received from PA
		20/10/2016 Letter no. GPC/HSE/E/476/2010/2
		24/10/2016 Letter No.GPC/HSE/E/476/2010/40

PART – II & III

DESCRIPTIVE REPORT ON STATUS OF COMPLIANCE FOR THE PERIOD OF APRIL 2016 - SEPTEMBER, 2016 TO CONDITIONS OF ENVIRONMENTAL CLEARANCE AND ENVIRONMENTAL MANAGEMENT

O.M. No.: J-11011/482/2006-IA II (I) , dated 11th June 2007

<table>
<tr><th>SR. No.</th><th>Conditions of the EnvironmentClearance</th><th>Compliance Status of the Conditions of EC</th></tr>
<tr><td>1</td><td>The gaseous emissions (SO2, NOx, CO, NMHC, Cl2 and HCl) from the various process units should conform to the standards prescribed under Environment (Protection Rules, 1986 or norms stipulated by the SPCB whichever is more stringent.</td><td>Gaseous emissions of SO_2, NOx, HC, Cl_2 and HCl from process units are monthly monitored through MoEF approved agency and its results shown below indicate the conformance to the GPCB prescribed standards.

A summary of the emission results from process stacks for the period Apr-Sept' 16 as provide by PP is presented below.

<table>
<tr><th>Plant</th><th>Parameter</th><th>GPCBConsent Limit</th><th>Avg</th><th>Min</th><th>Max</th></tr>
<tr><td rowspan="8">VCM - Stack attached to Incinerator</td><td>PM (mg/Nm3)</td><td>150</td><td>12.42</td><td>11</td><td>14</td></tr>
<tr><td>SO2 (mg/Nm3)</td><td>40</td><td>12.71</td><td>10.46</td><td>14.93</td></tr>
<tr><td>NOx (mg/Nm3)</td><td>25</td><td>21.08</td><td>19.44</td><td>22.77</td></tr>
<tr><td>HCl (mg/Nm3)</td><td>20</td><td>11.75</td><td>2.43</td><td>19.45</td></tr>
<tr><td>Cl2 (mg/Nm3)</td><td>9</td><td>1.38</td><td>1.32</td><td>1.41</td></tr>
<tr><td>HC (mg/Nm3)</td><td>15</td><td>1.69</td><td>1.61</td><td>1.79</td></tr>
<tr><td>CO (mg/Nm3)</td><td>150</td><td>0.67</td><td>0.59</td><td>0.77</td></tr>
<tr><td>VCM(mg/Nm3)</td><td>6.6</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td rowspan="2">Chlor Alkali Plant - Stacks Attached to Hypo and HCl synthesis Unit</td><td>Cl2 (mg/Nm3)</td><td>9</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>HCl (mg/Nm3)</td><td>20</td><td>14.18</td><td>7.29</td><td>18.23</td></tr>
<tr><td rowspan="3">PVC Plant-Stacks attached to PVC Dryers</td><td>PM (mg/Nm3)</td><td>150</td><td>12.50</td><td>10.00</td><td>14.00</td></tr>
<tr><td>SO2 (ppm)</td><td>100</td><td>5.11</td><td>4.57</td><td>6.12</td></tr>
<tr><td>NOx (ppm)</td><td>50</td><td>11.57</td><td>10.67</td><td>13.54</td></tr>
<tr><td rowspan="3">PTA Plant - Stacks attached to Off gas scrubber, atmospheric scrubber and vent scrubber</td><td>PM (mg/Nm3)</td><td>150</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>SO2 (mg/Nm3)</td><td>40</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>NOx (mg/Nm3)</td><td>25</td><td>ND</td><td>ND</td><td>ND</td></tr>
</table>

It can be seen from the above data that emissions from the process stack is conforming to the standard stipulated by GPCB.

Details of the above results has been submitted separately.

Complied</td></tr>
<tr><td></td><td>At no time the emission level shall go beyond the stipulated standards.</td><td>As informed, during Apr-Sept'16, emission levels have not exceeded the prescribed standards.

Complied.</td></tr>
<tr><td></td><td>In the event of failure of Pollution control system(s) adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the</td><td>Pollution control systems in the plant are connected through the DCS system. In the event of failure of pollution control system, a trigger/alarm is raised in the DCS system which prevents the plant from restarting and pollution control system is rectified immediately</td></tr>
</table>

<table>
<tr><td></td><td>desired efficiency.</td><td>During the period of Apr'16 to Sep'16, no such failure of pollution control equipment has happened

Complied.</td></tr>
<tr><td>2</td><td>Ambient air quality monitoring stations (SPM, SO2, NOx and NMHC) shall be set up in the petrochemical complex in consultation with SPCB, based on occurrence of maximum ground level concentration and down wind direction of wind.</td><td>The site has established 7 ambient air quality monitoring stations within the petrochemical complex considering wind directions and the maximum Ground Level Concentration in downwind direction.

A summary of the AAQ monitoring results of Apr- Sep' 16 as provided by PP are as given below:

<table>
<tr><th>Parameter</th><th>GPCB Consent Limit</th><th>Average</th><th>Min</th><th>Max</th></tr>
<tr><td>PM_{10}</td><td>100 µg/m^3</td><td>72.32</td><td>60</td><td>85</td></tr>
<tr><td>$PM_{2.5}$</td><td>60 µg/m^3</td><td>36.71</td><td>27</td><td>52.00</td></tr>
<tr><td>SO_2</td><td>80 µg/m^3</td><td>5.70</td><td>2.1</td><td>9.3</td></tr>
<tr><td>NOx</td><td>80 µg/m^3</td><td>9.90</td><td>6.2</td><td>14.3</td></tr>
<tr><td>O_3</td><td>180 µg/m^3</td><td>10.51</td><td>7.3</td><td>15.2</td></tr>
<tr><td>NH_3</td><td>400 µg/m^3</td><td>19.35</td><td>14</td><td>28.3</td></tr>
<tr><td>CO</td><td>4 mg/m^3</td><td>1.14</td><td>0.92</td><td>1.37</td></tr>
<tr><td>Benzene</td><td>5 µg/m^3</td><td><1.0</td><td><1.0</td><td><1.0</td></tr>
</table>

It can be seen from the above table that all results are conforming to the standards prescribed by GPCB.

Detailed AAQ Monitoring data has been provided separately.

Complied.</td></tr>
<tr><td></td><td>The monitoring network must be decided based on modelling exercise to represent short term GLCs</td><td>AAQ monitoring network is decided based on the mathematical modeling carried out by NEERI for short term maximum GLCs.

Complied.</td></tr>
<tr><td></td><td>Continuous online stack monitoring equipment should be installed for measurement of SO2 and NOx.</td><td>Continuous online stack monitoring analysers have been provided for monitoring of SO2 and NOx in all stacks.

Complied.</td></tr>
<tr><td></td><td>Data on VOC shall be monitored and submitted to the SPCB/Ministry.</td><td>VOCs (Benzene) monitoring in ambient air is being done regularly through MoEF approved agency and the results are reportedly being submitted to the GPCB/MoEF. The monitoring results for the VOCs (Benzene) are given in the AAQM summary table of condition no 2 above

VOCs at the process areas are also reportedly being monitored in every plant under the Leak detection and Repair Program (LDAR).

Complied.</td></tr>
<tr><td></td><td>The CPCB shall independently monitor the air quality of the project.</td><td>This condition is not applicable to PP.</td></tr>
<tr><td>3</td><td>Fugitive emissions of HC from product storage tank yards etc. must be regularly monitored.</td><td>Fugitive emissions of HC from product storage tanks are monitored on weekly basis by LEL meters and on monthly basis by PID meters under the Leak Detection and Repair Program.

Complied.</td></tr>
<tr><td></td><td>Sensors for detecting HC leakage shall also be provided at strategic locations.</td><td>370 LEL detectors for monitoring HC leakages have been installed at strategic locations like near the pumps, compressors, storage tanks yards, etc.

Complied.</td></tr>
</table>

	The company shall use low sulphur fuel to minimize SO2 Emission.	The Low Sulfur fuels are used in the plant to minimize SO2 emissions. NG is usage maximized in the plant having sulphur content <1 ppm **Complied.**
4	The company shall install online O2 monitor in the furnaces	20 online O2 monitors are installed in the furnaces to keep the track of combustion efficiency. **Complied.**
	Boilers shall be operated with minimum excess air for optimal fuel consumption and to minimize NOx emission.	Boilers are reportedly operated at minimum excess air and the online O2 monitors in furnaces are used for optimization of the air/fuel ratio for minimizing excess air, thereby NOx generation is minimized **Complied.**
	Fire stack burners and steam injection system shall be designed for smokeless operation to minimize NOx emission.	Steam injection system is provided in flare stacks for reducing NOx generation and have smokeless operation. **Complied.**
5	For Control of fugitive emission, the company shall provide for a main flare system and an auxiliary flare system and route all unsaturated hydrocarbons to the flare system.	All plant vents containing unsaturated hydrocarbons are reportedly routed to the main flareand auxiliary flare (LP flare) system for controlling of fugitive emissions. An auxiliary flare system (LP flare) is provided for routing the discharge from the dump valve on cryogenic tanks.Whereas the main flare systemis provided for all process units and non-cryogenic storage area **Complied.**
	All the pump and other equipment's where there is like hood of HC leakage shall be provided with LEL indicators	370 LEL detectors for monitoring HC leakages have been installed at strategic locations like main pumps, compressors, storage tanks yards, etc. **Complied.**
	also provide for immediate isolation to such equipment, in case of a leakage,	Isolation of leaking equipment is immediately done based on the LEL detector alarm. **Complied.**
	The company shall adopt leak detection and repair (LDAR) programme for quantification and control of fugitive emissions.	LDAR program has been implemented in all plants for quantification and control of fugitive emissions. LDAR is carried out in each plant on quarterly basis. During the review period (Apr'16-Sep'16) the same were carried out at all the plants. **Complied.**
6	The product-loading gantry shall be connected to the product sphere in closed circuit through the vapour arm connected to the tanker	The product loading gantry is connected with the respective product tanks with vapor arm connected to the tanker. The vapors are recovered through vapor recovery system which consists of RARFS scrubber, membrane unit & activated carbon filters and then recovered material is sent back to the tank. This system is installed at Product loading gantry **Complied.**
	Data on fugitive emissions shall be regularly monitored and records maintained.	Fugitive emissions are reportedly being regularly monitored through LDAR program and records maintained. **Complied.**
7	The company shall ensure that no halogenated organic is sent to the flares	No halogenated organics are sent to flares. It is always sent to incinerator unit. **Complied.**
	If any of the halogenated organic are present then the respective streams may be incinerated, if there are no	Halogenated organics from VCM plant are incinerated in the incinerator provided at the plant as recovery is not techno-economically feasible.

	technically feasible or economically viable reduction/recovery options.	**Complied.**
	Any stream containing organic carbon, other than halogenated shall be connected to proper flaring system, if not to a recovery device or an incinerator.	Emission streams containing organic carbon i.e unsaturated hydrocarbons, are stated to be connected to the existing flares. Halogenated compounds are not sent to flare. **Complied.**
8	All new standards/norms that are being proposed by the CPCB for petrochemical plants shall be applicable for the proposed expansion unit.The company shall conform to the process vent standards for organic chemical including non-VOCs and all possible VOCs i.e. TOCs standard and process vent standards for top priority chemicals	The site is conforming to the standards prescribed by CPCB and GPCB whichever is stringent. The process vents of various plants are monthly monitored through MoEF approved agency and its results provided by PP and shown below indicate the conformance to the GPCB prescribed standard which is more stringent. Summary of monthly monitored values for the reporting period Apr-Sep'16 as provided by PP is presented as below

Plant	Parameter	GPCB Consent Limit	Avg	Min	Max
VCM - Stack attached to Incinerator	PM (mg/Nm3)	150	12.42	11	14
	SO2 (mg/Nm3)	40	12.71	10.46	14.93
	NOx (mg/Nm3)	25	21.08	19.44	22.77
	HCl (mg/Nm3)	20	11.75	2.43	19.45
	Cl2 (mg/Nm3)	9	1.38	1.32	1.41
	HC (mg/Nm3)	15	1.69	1.61	1.79
	CO (mg/Nm3)	150	0.67	0.59	0.77
	VCM(mg/Nm3)	6.6	ND	ND	ND
Chlor Alkali Plant - Stacks Attached to Hypo and HCl synthesis Unit	Cl2 (mg/Nm3)	9	ND	ND	ND
	HCl (mg/Nm3)	20	14.18	7.29	18.23
PVC Plant-Stacks attached to PVC Dryers	PM (mg/Nm3)	150	12.50	10.00	14.00
	SO2 (ppm)	100	5.11	4.57	6.12
	NOx (ppm)	50	11.57	10.67	13.54
PTA Plant - Stacks attached to Off gas scrubber, atmospheric scrubber and vent scrubber	PM (mg/Nm3)	150	ND	ND	ND
	SO2 (mg/Nm3)	40	ND	ND	ND
	NOx (mg/Nm3)	25	ND	ND	ND

It can be seen from the above table that all results are conforming to the standards prescribed.

Detailed monitoring report has been provided separately

Complied.

	The company shall install online monitors for VOC measurements. Action on above should be taken during the detailed design stage of NCC and intimate to this ministry	Online detectors (370 LEL type) for VOC measurements have been installed at appropriate locations in the plants based on the properties of chemicals being handled at the particular location. **Complied.**

	The company shall install bag filters to control flue gas emission. Process emission shall be controlled by Scrubbers.	Suitable air pollution control equipment like Bag filters, absorbers, scrubbers, cyclone separator etc are installed as per process requirement of respective plant to control process emissions. **Complied.**
	Flue gas emission from the various stacks attached to the boiler, furnace/heaters shall conform to the prescribed standards.	Flue gas emissions from the stacks attached to the boiler, furnaces/heaters are regularly monitored through MoEF approved agency. The summary of flue gas emission results for the period of Apr-Sept' 16 as provided by PP is presented as below.

Plant	Parameter	GPCB Consent Limit	Avg	Min	Max
Flue gas emissions					
GCU Plant - Stack attached Furnaces	PM (mg/Nm^3)	150	9.38	3.79	12
	SO2 (ppm)	100	4.22	3.02	5.02
	NOx (ppm)	50	10.03	9.21	10.76
VCM Plant - Stack attached to EDC Furnaces	PM (mg/Nm^3)	150	12.89	10	15
	SO2 (ppm)	100	5.04	4.12	6
	NOx (ppm)	50	11.15	9.97	13.54
CPP Plant - Boilers / HRSGs stacks	PM (mg/Nm^3)	150	14.30	10	19
	SO2 (ppm)	100	3.79	2.28	6.16
	NOx (ppm)	100	13.33	8.21	18.09
PET-3 Plant - Stacks attached to Heaters	PM (mg/Nm^3)	150	9.06	7	12
	SO2 (ppm)	100	2.85	2.04	3.83
	NOx (ppm)	50	11.18	9.26	14.29

The above results are conforming to the norms specified by GPCB during review period of Apr-Sep'16.

Detailed stack emission monitoring report has been provided separately.

Complied.

10	The additional effluent generation shall not exceed 39020 m^3/d.	The additional effluent generation from the proposed plant is stated not to exceed 39,020 m^3/day. However the total effluent generation quantity prescribed vide EC no SEIAA/GUJ/EC/5(e)&1(d)/124/2011 dated 23rd June 2011 is 44,600 m3/d . The current effluent generation quantity from the complex for the review period of Apr-Sep'16 as provided by PP is given below:

Description	Permissible Limit	Avg	Min	Max
Effluent generation	44,600 m^3/day	22,594	18,041	25,630

From the above table it can be seen that the average effluent generation rate from the complex for the period Apr-Sep'16 is well below the permissible limit of 44,600 m^3/d.

		Complied.
	The wastewater generated shall be treated in comprehensive wastewater treatment plant.	Wastewater generated from the individual process units is being treated in the comprehensive effluent treatment facility consisting of Primary, Secondary and Tertiary treatment units. **Complied.**
	As reflected in the EIA/EMP report, the company shall maximize the recycling of treated effluent	Advanced Anaerobic UASB system and Membrane based Aeration system i.e., Membrane Bioreactor(MBR), Ultrafiltration and Reverse Osmosis (RO) systems have been commissioned in the plant for achieving the maximum recycling of treated water. Treated effluent is being recycled within the complex as Cooling tower make up, DM water production, green belt development. The average of effluent generation, recycle and discharge quantities during reporting period of Apr-Sep'16 is presented below as against the Permissible limits prescribed under the EC accorded vide letter no SEIAA/GUJ/EC/5(e)&1(d)/124/2011 dated 23rd June 2011

Description	Permissible Limit (KLD)	Average (KLD)
Quantity of Effluent Generation	44,600	36,497
Quantity of Effluent Recycle	14,080	13,879
Quantity of Effluent Discharge	30,520	22,618
Percentage of Recycle	32%	38%

		It can be seen from the above table that the quantity of treated effluent is maximized against the limit **Complied.**
	Treated effluent after conforming to the prescribed standards shall be discharged through the existing marine disposal system.	Treated effluent is being monitored on monthly basis through MoEF approved agency and the quality of effluent is maintained well within the norm prescribed by the MoEF and the same is discharged through the marine disposal system after conforming to the standards. The summary of treated effluent quality monitoring reports for Apr-Sept' 16 as provided by PP is presented below:

Parameter	Unit	MoEF Limit	Average	Min	Max
pH	–	6.5-8.5	7.40	6.82	7.62
Total Suspended Solids	mg/l	100	15.33	10.00	20.00
Oil & grease *	mg/l	20	ND	ND	ND
Phenolic compounds (as C6H5OH)	mg/l	5	ND	ND	ND
Cyanide (as CN)	mg/l	0.2	ND	ND	ND
Fluorides (as F)	mg/l	15	0.46	0.36	0.55
Sulphides*	mg/l	5	2.29	2.00	2.66
BOD (3 days at 27°C)	mg/l	50	18.83	14.00	28.00
COD	mg/l	250	119.50	92.00	165.00
Total Chromium (as Cr) *	mg/l	2	ND	ND	ND
Hexavalent Chromium (as Cr+6) *	mg/l	1	ND	ND	ND
Bioassay Test *	–	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	-	-

*(Note : * As MoEF has not notified the norm for this parameter, GPCB standardis considered)*

The above results indicate that the treated effluent quality is well within the prescribed norms.

Detailed treated effluent monitoring report has been provided separately.

Complied.

A holding pond for treated effluent for bio test shall be constructed before discharging the effluent into the sea.	Bioassay test for monitoring toxicity is conducted in the laboratory with the test containers for the treated effluent. The local fishes are taken as the Testing animal for this experiment and the test is carried out in the laboratory as per the IS 6582. Result of 90% survival of fish after 96 hours in 100% effluent is achieved for the review period of Apr'16 –Sep'16, The analysis results of Bioassay test is provided in the above condition. **Complied.**
The domestic effluent after treatment and conforming to the prescribed standards shall be used for green belt development.	The domestic effluent generated within the site is treated in the biological section of the effluent treatment plant with the prior approval from GPCB and it conforms to the prescribed standards. As mentioned above, about 14,000 KLD of treated effluent is being reused as CW make up, DM water production and for green belt development. The average of effluent generation, recycle and discharge quantities during reporting period of Apr-Sep'16 is presented below as against the Permissible limits prescribed under the latest EC accorded vide letter no SEIAA/GUJ/EC/5(e)&1(d)/124/2011 dated 23rd June 2011

		Complied.
	At no time, the emissions should go beyond the prescribed standards.	At no time, emissions have exceeded the stipulated standards during the reporting period of Apr-Sep'16. **Complied.**
	In the event of failure of any pollution control system adopted by the units, the respective unit should be immediately put out of operation and should not be restarted unit the desired efficiency has been achieved	Pollution control systems in the plant are connected through the DCS system. In the event of failure of pollution control system, a trigger/alarm is raised in the DCS system which prevents the plant from restarting. During the period of Apr-Sep'16, no such failure of pollution control equipment has been observed. **Complied.**
iv	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA)	Noise level at the site is monitored on monthly basis through MoEF approved agency and it is observed to be well within the prescribed workplace noise level of 85 dBA. The summary of Workplace Noise Level monitoring reports for Apr-Sept' 16 as provided by PP is presented below. **Complied.**
	By providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation.	Provision of noise control measures including acoustic hoods, silencers, enclosures etc. has been made for all sources of high noise generation. **Complied.**

Plants	Workplace Noise Levels		
	Average	Min	Max
Chlor Alkali Plant	61.88	57.20	67.90
VCM Plant	58.78	53.50	61.60
PVC Plant	62.55	51.20	73.30
EO-EG Plant	59.90	54.90	67.00
GCU Plant	66.39	56.50	70.30
EPRU	60.64	58.20	63.60
OSBL	53.42	50.60	55.80
HDPE	62.51	50.20	69.50
CPP I	62.14	52.40	84.60
CPP II	65.89	55.60	74.40
CPP III	62.23	45.20	76.70
PTD (Tankfarm)	56.32	52.40	59.80
PET-3	55.42	48.90	59.30
PTA-5	59.18	35.50	75.40
PTA-6	53.49	43.50	62.50
IOP - Air Separation Unit	61.07	59.50	61.80
IOP - Compressor House	57.00	56.10	58.20
IOP - Raw Water treatment Plant	62.10	58.10	64.30
IOP - Fire water treatment plant	60.02	57.60	66.50

Detailed monitoring report is submitted separately.

	The ambient noise levels should conform to the standards prescribed under EPA Rules, 1986 viz. 75 dBA (Day Times) and 70 dBA (Night time)	Ambient noise levels conforms to the standard prescribed under EPA Rules, 1986 viz. 75 dBA (Day Times) and 70 dBA (Night time). The summary of the ambient noise levels or Apr-Sept' 16 as provided by PP is presented below. Detailed monitoring report has been submitted separately. **Complied.**

Monitoring Location	Day Time (Limit - 75dBA)			Night Time (Limit - 70dBA)		
	Average	Min	Max	Average	Min	Max
Security Building	62.8	61.3	63.8	57.7	55.8	59.2
Guest House	58.7	57.1	59.8	55.5	54.1	57.1
Pump House	63.3	62.4	64.4	59.8	58.1	61.8
Main Fire Station	60.40	58.90	61.8	55.28	52.10	58.3
ETP	59.6	58.1	62.1	54.7	51.8	56.8
Jetty	52.2	50.4	53.2	49.9	48.1	50.9
Jageshwar Village	52.8	52.1	53.9	49.3	47.6	50.4

v	The project authorities must strictly comply with the provisions made in Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 as amended in 2000 for handling of hazardous chemicals etc.	Provisions of the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules 1989 as amended in 2000 are being complied ,by ensuring the following activities : • Preparation of safety audit report (submitted to DISH regularly) • Preparation of emergency response plan • Conducting mock drills on regular basis • Provision emergency alert system like sirens , announcement etc and ensuring their healthiness • Mutual aid arrangement with neighboring industries. **Complied.**
	Necessary approvals from Chief Control of Explosives must be provided before commission of the project.	The approvals required for storage of HC from Chief Control of Explosives are in place and they were obtained before commissioning of the project. **Complied.**
vi	The project authorities must strictly comply with the rules and regulations with the Hazardous Wastes (Management and Handling) Rules, 2003.	Handling and Disposal of Hazardous wastes generated at site is being done in accordance with the Hazardous waste (M&H) Handling Rules 2003 and its subsequent amendments thereof. **Complied.**
	Authorization form the State Pollution Control Board must be obtained for collection/treatment/ Storage/ disposal of hazardous wastes.	Hazardous waste Authorization has been obtained from GPCB for collection/treatment/ storage/ disposal of hazardous wastes. Authorization (W-76082) from GPCB for collection/treatment/ storage/ disposal of hazardous wastes is available which is valid up to 03.11.2020. Quantity of Hazardous wastes collected, stored and disposed during reporting period Apr-Sep'16 has been provided by PP separately. Copy of Form - 4 submitted to GPCB for the year 2015-2016 has been submitted separately. **Complied.**
vii	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with	Adequate funds have been allocated for implementing the conditions stipulated statutory authorities. The Environmental Funds expenditure for the year 2015-16 was around Rs. 8 Crores. **Complied**

	the implementation schedule for all the conditions stipulated herein.	
	The funds so provided should not be diverted for any other purpose.	The funds provided for Environmental improvement activities are used only for the said purpose. They are not diverted for other activities at site. **Complied.**
viii	The stipulated conditions will be monitored by the Regional of this Ministry at Bhopal/ Central Pollution Control Board/ State Pollution Control Board.	This condition is monitored by regional office of MOEF&CC. State Board monitored conditions of consent. Complied
	A six monthly compliance report and the monitored data should be submitted to them regularly.	Six monthly compliance report and monitoring data is submitted to MoEF regularly. Last Compliance report was submitted vide our letter no. GPC/HSE/E/476/0106 dated 31st may 2016. Also Stacks, Ambient Air Quality Effluent, Noise monitoring reports & Hazardous reports are submitted to GPCB on monthly basis. **Complied.**
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 State Pollution Control Board/ Committee and may also be seen at website of the Ministry of Environment and Forests at http://www.envfor.nic.in This should be advertised within seven days form 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 copy of the same should be forwarded to the Regional office.	It has been stated that public has been informed about the Environment Clearance accorded to this project through Newspaper in English and Gujarati language. The copy of the newspaper publication has been reportedly submitted to the MoEF along with the first compliance report of this EC. It is gathered that the advertisement was published in Tol, Surat on 30.08.2007 and in Gujarati News Paper namely Sandesh on 30.08.2007. **Complied.**
x	The project Authorities shall inform the Regional Office as well as the Ministry, the date of financial closures and the date of the commencing the land development work.	The project is completed and commissioned. The necessary information about the project's financial closure and project commencement was reportedly provided along with the first compliance report of this EC. **Complied.**
5	The ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory	This condition is **not applicable** to PP
6	The ministry reserves the right to stipulate additional conditions if found necessary.	**This condition is not applicable to PP.**
	The company in a time bound manner will implement these conditions	Company has informed that they had implemented all the conditions prescribed by the Ministry in this EC. **Complied.**
7	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air ((Prevention & Control of Pollution) Act 1981, The	This condition is not applicable to PP but **taken cognizance.**

Environment (Protection) Act, 1986, Hazardous Wastes (Management And Handling) Rules 2003 and the Public Liability Insurance Act,1991 along with their amendments and rules.	

Summary and inference:

The compliance of EC conditions is good. Out of 27 conditions, 23 are found to have been complied, 3 are not applicable to the PP and one condition needs only taking note/ cognizance .

Court Cases and Show cause notices issued:

It has been reported that there is no court case on this project

Details of Notices issued during last three years.

Date	Details of Directions by CPCB/ Show Cause Notice (SCN) issued by GPCB, if any	Date	Reply from PA
Letter no. GPCB-HAZ-GEN-503/316347 dated 04.06.2015	Show Cause Notice issued by GPCB regarding observation of no submission of monthly data of hazardous waste disposed / incinerated at our captive TSDF/Incinerator and foresaid details.	Letter No. RIL/HSE/E/474 dated 19.06.2015	Replied to notice with supporting evidences as we are regularly submitting the details as a part of GPCB Monthly Report in hard copy to GPCB Regional Office Bharuch and GPCB Gandhinagar and also are submitting the required details in GPCB XGN portal. Therefore it is resolved. The query was resolved and no further action has been initiated.
Letter no.: B-29016/ 04/06/PCI-I/44989 dtd. 24.07.2015 received on 24.08.2015	Directions issued by CPCB under regarding installation of on-line effluent and emission monitoring systems	Letter No. RIL/HSE/E/474/2908/PC dated 29.08.2015	Replied to letter with following details 1. Documentary evidence regarding CAPEX raised for installation of online emission & effluent monitoring system. 2. Letter to CPCB through CPMA dtd. 24.06.2015 providing time schedule for completion of establishing online facilities and connecting to GPCB/CPCB server by December 2016. Continuous Emissions Monitoring System is installed and commissioned in all stacks and at ETP outlet.

Scientist 'F

Counter signed by:
Addl. PCCF (C)

Monitoring the Implementation of Environmental Safe Guards
Ministry of Environment &Forest
Western Region, Regional Office, Bhopal
MONITORING REPORT
PART-I
DATA SHEET

1	Project type: River Valley/Mining/Industry / Industry, Thermal/Nuclear/Other (Specify)	Industry (Petrochemical)
2	Name of the Project	Expansion project of M/s Reliance Industries Limited, Dahej
3	Clearance letter (s) OM No. & date	No. J-11011/402/2007- IA II (I) dated 20th March 2008
4	Location Districts State Location- Latitude/Longitude	Dahej Bharuch Gujarat Latitude : $21^0$40'35"N & $21^0$41'27"N Longitude : $72^0$33'32"E & $72^0$35'04"N
5	Address for Correspondence	
(a)	Address of the concerned Project Chief Engineer (with Pin Code & telephone / telex / fax numbers	Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch - 392130 Gujarat - 392130 Ph : 02641- 615001 E-mail : pavan.jain@ril.com
(b)	Address of Executive Project Engineer / Manager (with Pin code /fax numbers)	Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch - 392130 Gujarat - 392130 Ph : 02641- 615001 E-mail : pavan.jain@ril.com
6	Salient features	
(a)	Of the Project	Already submitted to the Ministry of Environment & Forest, New Delhi based on which the aforesaid EC has been obtained. Obtained for capacity expansion for EO/EG, HDPE. EVA& CPPat Dahej Petrochemical Complex. Increased the capacity of EO/EG from 250,260 to 399,760 MTPA, HDPE from 160,000 to 220,000 & capacity of new EVA plant is 13,000 MTPA. Capacity of CPP increased to 195 MW from 154 MW. It is designed with state of art technology.
(b)	Of the Environment Management Plan	EMP was prepared based on the baseline data collected by NEERI and impact prediction were done using mathematical models and

		superimposition of those impacts on the baseline. EMP includes provision of state of the art Effluent Treatment Plant and Air Pollution control equipment, solid waste management and Green Belt development. Regular environment monitoring is also a part of EMP. Major points implemented as per EMP e.g. • Maximised the usage of cleaner fuel such as Natural Gas. • Provided tanks with internal floating roof with flexible double seal • Provided mechanical seal in pumps. • Acoustic enclosures/barriers provided in noisy workplaces. • Maximise treated effluent within the complex.
7	Breakup of the project area	
(a)	Submergence Area : Forest & Non Forest	Not applicable, No additional land is required as expansion of project was within existing petrochemical complex.
(b)	Others	The land requirement for the project was around 18 ha which was accommodated within 700 ha of existing petrochemical complex
8	Breakup of the project affected population with enumeration of those losing houses / dwelling units only agricultural land only, both dwelling units and agricultural land and landless labourers / artisans : (a) SC, ST / Adivasi (b) Others (please indicate whether these figures are based on any scientific and systematic survey carried out or only provisional figures, if a survey is carried out give details & year of survey.	Not Applicable
9	Financial details	
(a)	Project cost as originally planned and subsequent revised estimates and the year of price reference	Cost of Project was Rs.228crore in 2008
(b)	Allocation made for environmental management plan with item wise and year wise break up	Non-recurring (i.e. CAPEX) Rs. 25 Crore (Estimated cost: ETP – Revamp of neutralisation facility & Drainage modification : Rs. 7 Crore, APCE : Installation of CO2 removal system from waste gases, HC recovery etc: Rs. 15 Crore Solid Waste Mgt: Rs. 2 Crore and Green Belt Development - Rs. 1 Crore) Recurring (i.e. OPEX) / year (O&M of ETP, Green Belt, Waste disposal, Env monitoring) – Rs.40 lakhs
(c)	Benefit / cost ratio / Internal Rate of Return and the year of assessment	Benefit / cost ratio for all our project is more than 1. Project has achieved IRR of more than 12%
(d)	Whether (c) includes the cost of environment management as shown above	Yes
(e)	Actual expenditure incurred on the project	Rs. 300 Crore for the expansion project in 2007-

	so far	08
(f)	Actual expenditure incurred on the environmental management plan so far	Non-recurring (i.e. CAPEX) Rs. 35 Crore (ETP – Revamp of neutralisation facility & Drainage modification : Rs. 7 Crore, APCE : Installation of CO2 removal system from waste gases, HC recovery etc: Rs. 25 Crore Solid Waste Mgt: Rs. 2 Crore and Green Belt Development - Rs. 1 Crore) Recurring / year (O&M of ETP, Green Belt, Waste disposal, Env monitoring etc) – Rs.8 crore for FY 15-16 and 5 crore for FY 14-15
10	Forest land requirement a) The status of approval for diversion of forest land for non-forestry use b) The status of clearing/felling obtained. c) The status of CA , if any d) Comments on the viability and sustainability of CA programme in the light of actual field experience so far	No requirement of Forest Land
11	The status of clear felling in non-forest areas (such as submergence area of reservoir, approach road etc) if any with quantitative information required	Not Applicable
12	Status of construction (Actual &/or planned) a) Date of commencement b) Date of completion	Capacity expansion of plant mentioned above was completed in 2008-09
13	Reason for delay (if project is yet to start)	Not Applicable
14	Dates of site visit a) Date on which the project was monitored by the RO on previous occasion (if any) b) Date of the site visit for the monitoring report	--- 30.09.2016
15	Details of correspondence with project authorities for obtaining act onplans/ information on status of compliance to safeguards other than the routine letters for logistic support for site visits. (The first monitoring report may contain the details of all the letters issued so far, but the later reports may cover only the letter issued subsequently)	As below

Date	Letter from RO	Date	Reply from PA
		13/09/2016	Mail Received from PA
		20/10/2016	Letter no. GPC/HSE/E/476/2010/3
		24/10/2016	Letter No. GPC/HSE/E/476/2010/40

DESCRIPTIVE REPORT ON STATUS OF COMPLIANCE FOR THE PERIOD OF APRIL 2016 - SEPTEMBER, 2016 TO CONDITIONS OF ENVIRONMENTAL CLEARANCE AND ENVIRONMENTAL MANAGEMENT

O.M. No.: . J-11011/402/2007-IA II (I), dated 20th March 2008

<table>
<tr><th>SR. No.</th><th>Conditions of the Environment Clearance</th><th>Compliance Status of the Conditions of EC</th></tr>
<tr><td>i</td><td>M/s. RIL shall comply with proposed Effluent and Emission Standards for Petrochemical Plants of CPCB/MoEF for the proposed expansion</td><td>Effluent discharge and Gaseous emissions from the complex are monthly monitored through MoEF approved agency and its results shown below indicate the conformance to the MoEF prescribed standards.

The summary of treated effluent quality monitoring reports for Apr-Sept' 16 as provided by PP is presented below.

<table>
<tr><th>Parameter</th><th>Unit</th><th>MoEF Limit</th><th>Average</th><th>Min</th><th>Max</th></tr>
<tr><td>pH</td><td>-</td><td>6.5-8.5</td><td>7.40</td><td>6.82</td><td>7.62</td></tr>
<tr><td>Total Suspended Solids</td><td>mg/l</td><td>100</td><td>15.33</td><td>10.00</td><td>20.00</td></tr>
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<tr><td>Phenolic compounds (as C6H5OH)</td><td>mg/l</td><td>5</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Cyanide (as CN)</td><td>mg/l</td><td>0.2</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Fluorides (as F)</td><td>mg/l</td><td>15</td><td>0.46</td><td>0.36</td><td>0.55</td></tr>
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<tr><td>Total Chromium (as Cr) *</td><td>mg/l</td><td>2</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Hexavalent Chromium (as Cr+6) *</td><td>mg/l</td><td>1</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Bioassay Test *</td><td>-</td><td>90% survival of fish after 96 hours in 100% effluent</td><td>90% survival of fish after 96 hours in 100% effluent</td><td>-</td><td>-</td></tr>
</table>
(Note : * As MoEF has not notified the norm for this parameter, GPCB standard is considered)

A summary of the emission results from process stacks for the period Apr-Sept' 16 as provided by PP is given below:

<table>
<tr><th>Plant</th><th>Parameter</th><th>MoEF Limit</th><th>Avg</th><th>Min</th><th>Max</th></tr>
<tr><td rowspan="8">VCM - Stack attached to Incinerator</td><td>PM (mg/Nm3) *</td><td>150</td><td>12.42</td><td>11</td><td>14</td></tr>
<tr><td>SO2 (mg/Nm3) *</td><td>40</td><td>12.71</td><td>10.46</td><td>14.93</td></tr>
<tr><td>NOx (mg/Nm3) *</td><td>25</td><td>21.08</td><td>19.44</td><td>22.77</td></tr>
<tr><td>HCl (mg/Nm3)</td><td>20</td><td>11.75</td><td>2.43</td><td>19.45</td></tr>
<tr><td>Cl2 (mg/Nm3)</td><td>9</td><td>1.38</td><td>1.32</td><td>1.41</td></tr>
<tr><td>HC (mg/Nm3)</td><td>15</td><td>1.69</td><td>1.61</td><td>1.79</td></tr>
<tr><td>CO (mg/Nm3)</td><td>150</td><td>0.67</td><td>0.59</td><td>0.77</td></tr>
<tr><td>VCM(mg/Nm3)</td><td>6.6</td><td>ND</td><td>ND</td><td>ND</td></tr>
</table>
</td></tr>
</table>

Chlor Alkali Plant - Stacks Attached to Hypo and HCl synthesis Unit	Cl2 (mg/Nm3)	9	ND	ND	ND
	HCl (mg/Nm3)	20	14.18	7.29	18.23
PVC Plant-Stacks attached to PVC Dryers	PM (mg/Nm3) *	150	12.50	10.00	14.00
	SO2 (ppm) *	100	5.11	4.57	6.12
	NOx (ppm) *	50	11.57	10.67	13.54
PTA Plant - Stacks attached to Off gas scrubber, atmospheric scrubber and vent scrubber	PM (mg/Nm3) *	150	ND	ND	ND
	SO2 (mg/Nm3) *	40	ND	ND	ND
	NOx (mg/Nm3) *	25	ND	ND	ND

(Note : * As MoEF has not notified the norms for this parameter, GPCB standards is considered)

It can be seen from the above data tables that effluent discharge quality and gaseous emissions released from the complex are conforming to the stipulated standards.

Details of the above Treated effluent monitoring results and Stack monitoring results have been submitted separately.

Complied.

ii

The company shall comply with all the condition stipulated by the Ministry for the CAPEX project at Gandhar Petrochemical Complex vide Ministry letter No. J11011/482/2006IA.II(i) dated June 11, 2007

RIL complies to the conditions laid down in the EC granted by the Ministry letter No. J11011/482/2006IAII(I) dated June 11, 2007. Compliance status for the same has been submitted separately.

Complied

iii

The gaseous emissions (SO_2, NOx, CO, NMHC, Cl_2 and HCl) from the various process units should conform to the standards prescribed under Environment (Protection Rules, 1986 or norms stipulated by the SPCB whichever is more stringent.

Gaseous emissions of SO_2, NOx, HC, Cl_2 and HCl from process units are monthly monitored through MoEF approved agency and its results shown below indicate the conformance to the GPCB prescribed standards.

A summary of the emission results from process stacks for the period Apr-Sept' 16 as provided by PP is presented below.

Plant	Parameter	GPCBConsent Limit	Avg	Min	Max
VCM - Stack attached to Incinerator	PM (mg/Nm3)	150	12.42	11	14
	SO2 (mg/Nm3)	40	12.71	10.46	14.93
	NOx (mg/Nm3)	25	21.08	19.44	22.77
	HCl (mg/Nm3)	20	11.75	2.43	19.45
	Cl2 (mg/Nm3)	9	1.38	1.32	1.41
	HC (mg/Nm3)	15	1.69	1.61	1.79
	CO (mg/Nm3)	150	0.67	0.59	0.77
	VCM(mg/Nm3)	6.6	ND	ND	ND
Chlor Alkali Plant - Stacks Attached to Hypo and HCl synthesis Unit	Cl2 (mg/Nm3)	9	ND	ND	ND
	HCl (mg/Nm3)	20	14.18	7.29	18.23
PVC Plant-Stacks attached to PVC Dryers	PM (mg/Nm3)	150	12.50	10.00	14.00
	SO2 (ppm)	100	5.11	4.57	6.12
	NOx (ppm)	50	11.57	10.67	13.54
PTA Plant -	PM (mg/Nm3)	150	ND	ND	ND

		Stacks attached to Off gas scrubber, atmospheric scrubber and vent scrubber	SO2 (mg/Nm3)	40	ND	ND	ND
			NOx (mg/Nm3)	25	ND	ND	ND

It can be seen from the above data that effluent quality is conforming to the standard stipulated by GPCB. Details of the above results can has been submitted separately.

Complied.

	At no time the emission level shall go beyond the stipulated standards.	As informed, during Apr-Sept'16, emission levels have not exceeded the prescribed standards. **Complied.**
	In the event of failure of Pollution control system(s) adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency.	Pollution control systems in the plant are connected through the DCS system. In the event of failure of pollution control system, a trigger/alarm is raised in the DCS system which prevents the plant from restarting and pollution control system is rectified immediately During the period of Apr'16 to Sep'16, no such failure of pollution control equipment has happened **Complied.**
iv	Ambient air quality monitoring stations (SPM, SO2, NOx and NMHC) shall be set up in the petrochemical complex in consultation with SPCB, based on occurrence of maximum ground level concentration and down wind direction of wind.	The site has established 7 ambient air quality monitoring stations within the petrochemical complex considering wind directions and the maximum Ground Level Concentration in downwind direction. A summary of the AAQ monitoring results of Apr- Sep' 16 as provided by PP is given below

Parameter	GPCB Consent Limit	Average	Min	Max
PM_{10}	100 µg/m^3	72.32	60	85
$PM_{2.5}$	60 µg/m^3	36.71	27	52.00
SO_2	80 µg/m^3	5.70	2.1	9.3
NOx	80 µg/m^3	9.90	6.2	14.3
O_3	180 µg/m^3	10.51	7.3	15.2
NH_3	400 µg/m^3	19.35	14	28.3
CO	4 mg/m^3	1.14	0.92	1.37
Benzene	5 µg/m^3	<1.0	<1.0	<1.0

It can be seen from the above table that all results are conforming to the standards prescribed by GPCB.

Detailed AAQ Monitoring data has been separately

Complied.

	The monitoring network must be decided based on modelling exercise to represent short term GLCs	AAQ monitoring network is decided based on the mathematical modeling carried out by NEERI for short term maximum GLCs. **Complied.**
	Continuous online stack monitoring equipment should be installed for measurement of SO2 and NOx.	Continuous online stack monitoring analysers have been provided for monitoring of SO_2 and NOx in all stacks. **Complied.**
	Data on VOC shall be monitored and submitted to the SPCB/Ministry.	VOCs (Benzene) monitoring in ambient air is being done regularly through MoEF approved agency and the results are being submitted to the GPCB/MoEF. The monitoring results for the VOCs(Benzene) are given in the AAQM summary table of condition no iv.

		VOCs at the process areas are also reportedly being monitored in every plant under the Leak detection and Repair Program (LDAR). **Complied.**
	The CPCB shall independently monitor the air quality of the project.	This condition is not **applicable to PP**
v.	Fugitive emissions of HC from product storage tank yards etc. must be regularly monitored.	Fugitive emissions of HC from product storage tanks are monitored on weekly basis by LEL meters and on monthly basis by PID meters under the Leak Detection and Repair Program. **Complied.**
	Sensors for detecting HC leakage shall also be provided at strategic locations.	370 LEL detectors for monitoring HC leakages have been installed at strategic locations like near the pumps, compressors, storage tanks yards, etc. **Complied.**
	The company shall use low sulphur fuel to minimize SO2 Emission.	The Low Sulfur fuels are used in the plant to minimize SO2 emissions. NG is usage maximized in the plant having sulphur content <1 ppm **Complied.**
vi	The company shall install online O2 monitor in the furnaces	20 online O2 monitors are installed in the furnaces to keep the track of combustion efficiency. **Complied.**
	Boilers shall be operated with minimum excess air for optimal fuel consumption and to minimize NOx emission.	Boilers are operated at minimum excess air and the online O2 monitors in furnaces are used for optimization of the air/fuel ratio for minimizing excess air, thereby NOx generation is minimized **Complied.**
	Fire stack burners and steam injection system shall be designed for smokeless operation to minimize NOx emission.	Steam injection system is provided in flare stacks for reducing NOx generation and have smokeless operation. **Complied.**
vii	For Control of fugitive emission, the company shall provide for a main flare system and an auxiliary flare system and route all unsaturated hydrocarbons to the flare system.	All plant vents containing unsaturated hydrocarbons are routed to the main flare and auxiliary flare (LP flare) system for controlling of fugitive emissions. An auxiliary flare system (LP flare) is provided for routing the discharge from the dump valve on cryogenic tanks.Whereas the main flare system is provided for all process units and non-cryogenic storage area **Complied.**
	All the pump and other equipment's where there is like hood of HC leakage shall be provided with LEL indicators	370 LEL detectors for monitoring HC leakages have been installed at strategic locations like main pumps, compressors, storage tanks yards, etc. **Complied.**
	also provide for immediate isolation to such equipment, in case of a leakage,	Isolation of leaking equipment is immediately done based on the LEL detector alarm. **Complied.**
	The company shall adopt leak detection and repair (LDAR) programme for quantification and control of fugitive emissions.	LDAR program has been implemented in all plants for quantification and control of fugitive emissions. LDAR is carried out in each plant on quarterly basis. During the review period (Apr'16-Sep'16) the same were carried out at all the plants. **Complied.**
viii	The product-loading gantry shall be connected to the product sphere in closed circuit through the vapour arm connected to the tanker.	The product loading gantry is connected with the respective product tanks with vapor arm connected to the tanker. The vapors are recovered through vapor recovery system which consists of RARFS scrubber, membrane unit & activated carbon filters and then recovered material is sent back to the tank.This system is

		installed at Product loading gantry **Complied.**
	Data on fugitive emissions shall be regularly monitored and records maintained.	Fugitive emissions are being regularly monitored through LDAR program and records maintained. **Complied.**
ix	The company shall ensure that no halogenated organic is sent to the flares	No halogenated organics are sent to flares. It is always sent to incinerator unit. **Complied.**
	If any of the halogenated organic are present then the respective streams may be incinerated, if there are no technically feasible or economically viable reduction/recovery options.	Halogenated organics from VCM plant are incinerated in the incinerator provided at the plant as recovery is not techno-economically feasible. **Complied.**
	Any stream containing organic carbon, other than halogenated shall be connected to proper flaring system, if not to a recovery device or an incinerator.	Emission streams containing organic carbon i.e unsaturated hydrocarbons, are connected to the existing flares. Halogenated compounds are not sent to flare. **Complied.**
x	The company shall conform to the process vent standards for organic chemical including non-VOCs and all possible VOCs i.e. TOCs standard and process vent standards for top priority chemicals.	The process vents of various plants are monthly monitored through MoEF approved agency and its results shown below indicate the conformance to the prescribed standard. Summary of monthly monitored values for the reporting period Apr-Sep'16 as provided by PP is presented as below

Plant	Parameter	GPCB Consent Limit	Avg	Min	Max
VCM - Stack attached to Incinerator	PM (mg/Nm3)	150	12.42	11	14
	SO2 (mg/Nm3)	40	12.71	10.46	14.93
	NOx (mg/Nm3)	25	21.08	19.44	22.77
	HCl (mg/Nm3)	20	11.75	2.43	19.45
	Cl2 (mg/Nm3)	9	1.38	1.32	1.41
	HC (mg/Nm3)	15	1.69	1.61	1.79
	CO (mg/Nm3)	150	0.67	0.59	0.77
	VCM(mg/Nm3)	6.6	ND	ND	ND
Chlor Alkali Plant - Stacks Attached to Hypo and HCl synthesis Unit	Cl2 (mg/Nm3)	9	ND	ND	ND
	HCl (mg/Nm3)	20	14.18	7.29	18.23
PVC Plant- Stacks attached to PVC Dryers	PM (mg/Nm3)	150	12.50	10.00	14.00
	SO2 (ppm)	100	5.11	4.57	6.12
	NOx (ppm)	50	11.57	10.67	13.54
PTA Plant - Stacks attached to Off gas scrubber, atmospheric scrubber and vent scrubber	PM (mg/Nm3)	150	ND	ND	ND
	SO2 (mg/Nm3)	40	ND	ND	ND
	NOx (mg/Nm3)	25	ND	ND	ND

	The additional effluent generation shall not exceed 16,100 m3/d.	The additional effluent generation from the proposed plant does not exceed 16,100 m3/day. However the total effluent generation quantity prescribed vide EC no. SEIAA/GUJ/EC/5(e)&1(d)/124/2011 dated 23rd June 2011 is 44,600 m3/d . The current effluent generation quantity from the complex for the review period of Apr-Sep'16 as provided by PP is given below: **Description** | **Permissible Limit** | **Avg** | **Min** | **Max** Effluent generation | 44,600 m^3/day | 22,594 | 18,041 | 25,630 From the above table it can be seen that the average effluent generation rate from the complex for the period Apr-Sep'16 is well below the permissible limit of 44,600 m^3/d **Complied.**
	The wastewater generated shall be treated in comprehensive wastewater treatment plant.	Wastewater generated from the individual process units is being treated in the comprehensive effluent treatment facility consisting of Primary, Secondary and Tertiary treatment units. **Complied.**
	As reflected in the EIA/EMP report, the company shall maximize the recycling of treated effluent	Advanced Anaerobic UASB system and Membrane based Aeration system i.e., Membrane Bioreactor(MBR), Ultrafiltration and Reverse Osmosis (RO) systems have been commissioned in the plant for achieving the maximum recycling of treated water. Treated effluent is being recycled within the complex as Cooling tower make up, DM water production, green belt development. The average of effluent generation, recycle and discharge quantities during reporting period of Apr-Sep'16 is presented below as against the Permissible limits prescribed under the EC accorded vide letter no SEIAA/GUJ/EC/5(e)&1(d)/124/2011 dated 23rd June 2011 **Description** | **Permissible Limit (KLD)** | **Average (KLD)** Quantity of Effluent Generation | 44,600 | 36,497 Quantity of Effluent Recycle | 14,080 | 13,879 Quantity of Effluent Discharge | 30,520 | 22,618 Percentage of Recycle | 32% | 38% It can be seen from the above table that the quantity of treated effluent is maximized against the limit **Complied.**
	and treated effluent after conforming to the prescribed standards shall be discharged through the existing marine disposal system.	Treated effluent is being monitored on monthly basis through MoEF approved agency and the quality of effluent is maintained well within the norm prescribed by the MoEF and the same is discharged through the marine disposal system after conforming to the standards. The summary of treated effluent quality monitoring reports for Apr-Sept' 16 is given in condition no. 1. Detailed treated effluent monitoring report has been submitted separately. **Complied.**
	A holding pond for treated effluent for bio test shall be constructed before discharging the effluent into the sea.	Bioassay test for monitoring toxicity is conducted in the laboratory with the test containers for the treated effluent. The local fishes are taken as the Testing animal for this experiment and the test is carried out in the laboratory as per the IS 6582. Result of 90%

<table>
<tr><td></td><td></td><td>survival of fish after 96 hours in 100% effluent is achieved for the review period of Apr'16 –Sep'16, The analysis results of Bioassay test is provided in the above condition.

Complied.</td></tr>
<tr><td></td><td>The domestic effluent after treatment and conforming to the prescribed standards shall be used for green belt development.</td><td>The domestic effluent generated within the site is treated in the biological section of the effluent treatment plant with the prior approval from GPCB and it conforms to the prescribed standards.

As mentioned above, about 14,000 KLD of treated effluent is being reused as CW make up, DM water production and for green belt development.

The average of effluent generation, recycle and discharge quantities during reporting period of Apr-Sep'16 is presented below as against the Permissible limits prescribed under the latest EC accorded vide letter no SEIAA/GUJ/EC/5(e)&1(d)/124/2011 dated 23rd June 2011

<table>
<tr><th>Description</th><th>Permissible Limit (KLD)</th><th>Average (KLD)</th></tr>
<tr><td>Quantity of Effluent Generation</td><td>44,600</td><td>36,497</td></tr>
<tr><td>Quantity of Effluent Recycle</td><td>14,080</td><td>13,879</td></tr>
<tr><td>Quantity of Effluent Discharge</td><td>30,520</td><td>22,618</td></tr>
<tr><td>Percentage of Recycle</td><td>32%</td><td>38%</td></tr>
</table>
Complied.</td></tr>
<tr><td>xiii</td><td>The company shall obtain necessary approval from the state Irrigation Department to meet the additional water requirement.</td><td>The sanction/approval for 22 MGD of water drawl from Narmada River has been obtained from the Vadodara Irrigation Division. Copy of water drawl approval from Irrigation Department for 22 MGD has been provided separately.

Complied.</td></tr>
<tr><td>xiv</td><td>M/s RIL shall undertake rainwater harvesting measures, to recharge the ground water and also to minimize the water drawl from the weir.</td><td>A rain water harvesting pond is established for collecting and storing the rain water. The collected water is used inside the plant to supplement fresh water supply thereby hence minimizing water drawl from the weir to that extent. It also helps in recharging of the ground water.

Complied.</td></tr>
<tr><td>xv</td><td>Green belt shall be raised in an area of 43 ha to mitigate the fugitive emissions from the plant.</td><td>The site has developed around 70 ha of Green cover within Dahej Petrochemical Complex to mitigate the fugitive emissions.

During review period of Apr-Sep'16: 7,790nos trees have been planted in the complex.

Complied.</td></tr>
<tr><td></td><td>Selection of plant species shall be as per the central pollution control board guidelines.</td><td>Native plant species are selected for the green belt development as per the guidelines of CPCB. Few of the plant species existing at the site are: Casuarinaequisetifolia (Suru), Azadirachtaindica (Neem), Millettiapinnata (Karanj), Cassia siamea (Kashid), Albiziaprocera (Shirish), Delonixregia (Gulmohar), Peltophorumpterocarpum etc.

Complied.</td></tr>
<tr><td>xvi</td><td>Occupation Health Surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act.</td><td>Occupation Health Surveillance of the workers is being done on a regular basis and records maintained as per the Factories Act.

Complied.</td></tr>
</table>

	Conditions	
	The forest authorities must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board and the state Government	**Complied and submitted in compliance report of EC 1991.**
	No further expansion or modernization in the plant should be carried out without prior approval of the Ministry of Environment and Forests	All expansion or modernization of petrochemical plants at RIL-DMD have been carried out with prior approval of MoEF. This EC is also issued for expansion of our existing petrochemical complex for which RIL-DMD has got the EC in 1991 and expansion was carried out only after obtaining the prior approval from MoEF. **Complied.**
iii	At no time, the emissions should go beyond the prescribed standards.	At no time, emissions have exceeded the stipulated standards during the reporting period of Apr-Sep'16. Complied.
	In the event of failure of any pollution control system adopted by the units, the respective unit should be immediately put out of operation and should not be restarted unit the desired efficiency has been achieved	Pollution control systems in the plant are connected through the DCS system. In the event of failure of pollution control system, a trigger/alarm is raised in the DCS system which prevents the plant from restarting. During the period of Apr-Sep'16, no such failure of pollution control equipment has been observed. **Complied.**
iv	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA)	Noise level at the site is monitored on monthly basis through MoEF approved agency and it is observed to be well within the prescribed occupational noise level of 85 dBA. The summary of Workplace Noise Level monitoring reports for Apr-Sept' 16 as provided by PP is presented below.

Plants	Workplace Noise Levels		
	Average	Min	Max
Chlor Alkali Plant	61.88	57.20	67.90
VCM Plant	58.78	53.50	61.60
PVC Plant	62.55	51.20	73.30
EO-EG Plant	59.90	54.90	67.00
GCU Plant	66.39	56.50	70.30
EPRU	60.64	58.20	63.60
OSBL	53.42	50.60	55.80
HDPE	62.51	50.20	69.50
CPP I	62.14	52.40	84.60
CPP II	65.89	55.60	74.40
CPP III	62.23	45.20	76.70
PTD (Tankfarm)	56.32	52.40	59.80
PET-3	55.42	48.90	59.30
PTA-5	59.18	35.50	75.40
PTA-6	53.49	43.50	62.50
IOP - Air Separation Unit	61.07	59.50	61.80
IOP - Compressor House	57.00	56.10	58.20
IOP - Raw Water treatment Plant	62.10	58.10	64.30
IOP - Fire water treatment plant	60.02	57.60	66.50

Detailed monitoring report has been submitted separately.

<table>
<tr><td></td><td></td><td>Complied.</td></tr>
<tr><td></td><td>By providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise.generation.</td><td>Provision of noise control measures including acoustic hoods, silencers, enclosures etc. has been made for all sources of high noise generation.

Complied.</td></tr>
<tr><td></td><td>The ambient noise levels should conform to the standards prescribed under EPA Rules, 1986 viz. 75 dBA (Day Times) and 70 dBA (Night time)</td><td>Ambient noise levels conforms to the standard prescribed under EPA Rules, 1986 viz. 75 dBA (Day Times) and 70 dBA (Night time).

The summary of the ambient noise levels or Apr-Sept' 16 as provided by PP is presented below.
<table>
<tr><th rowspan="2">Monitoring Location</th><th colspan="3">Day Time (Limit - 75dBA)</th><th colspan="3">Night Time (Limit - 70dBA)</th></tr>
<tr><th>Average</th><th>Min</th><th>Max</th><th>Average</th><th>Min</th><th>Max</th></tr>
<tr><td>Security Building</td><td>62.8</td><td>61.3</td><td>63.8</td><td>57.7</td><td>55.8</td><td>59.2</td></tr>
<tr><td>Guest House</td><td>58.7</td><td>57.1</td><td>59.8</td><td>55.5</td><td>54.1</td><td>57.1</td></tr>
<tr><td>Pump House</td><td>63.3</td><td>62.4</td><td>64.4</td><td>59.8</td><td>58.1</td><td>61.8</td></tr>
<tr><td>Main Fire Station</td><td>60.40</td><td>58.90</td><td>61.8</td><td>55.28</td><td>52.10</td><td>58.3</td></tr>
<tr><td>ETP</td><td>59.6</td><td>58.1</td><td>62.1</td><td>54.7</td><td>51.8</td><td>56.8</td></tr>
<tr><td>Jetty</td><td>52.2</td><td>50.4</td><td>53.2</td><td>49.9</td><td>48.1</td><td>50.9</td></tr>
<tr><td>Jageshwar Village</td><td>52.8</td><td>52.1</td><td>53.9</td><td>49.3</td><td>47.6</td><td>50.4</td></tr>
</table>
Detailed monitoring report has been submitted separately.

Complied.</td></tr>
<tr><td>v</td><td>The project authorities must strictly comply with the provisions made in Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 as amended in 2000 for handling of hazardous chemicals etc.</td><td>Provisions of the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules 1989 as amended in 2000 are being complied ,by ensuring the following activities :
• preparation of safety audit report (submitted to DISH regularly)
• preparation of emergency response plan
• conducting mock drills on regular basis
• provision emergency alert system like sirens announcement etc and ensuring their healthiness
• Mutual aid arrangement with neighboring industries.

Complied.</td></tr>
<tr><td></td><td>Necessary approvals from Chief Control of Explosives must be provided before commission of the project.</td><td>The approvals required for storage of HC from Chief Control of Explosives are in place and they were obtained before commissioning of the project.

Complied.</td></tr>
<tr><td>vi</td><td>The project authorities must strictly comply with the rules and regulations with the Hazardous Wastes (Management and Handling) Rules, 2003.</td><td>Handling and Disposal of Hazardous wastes generated at site is being done in accordance with the Hazardous waste (M&H) Handling Rules 2003 and its subsequent amendments thereof.

Complied.</td></tr>
</table>

	obtained for collection/treatment/ Storage/ disposal of hazardous wastes.	treatment/ storage/ disposal of hazardous wastes. Authorization (W-76082) from GPCB for collection/treatment/ storage/ disposal of hazardous wastes is available which is valid up to 03.11.2020. Quantity of Hazardous wastes collected, stored and disposed during reporting period Apr-Sep'16 has been provided by PP separately. Copy of Form - 4 submitted to GPCB for the year 2015-2016 has been submitted separately. **Complied.**
vii	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein.	Adequate funds have been allocated for implementing the conditions stipulated statutory authorities. The Environmental Funds expenditure for the year 2015-16 was around Rs. 8 Crores. **Complied.**
	The funds so provided should not be diverted for any other purpose.	The funds provided for Environmental improvement activities are used only for the said purpose. They are not diverted for other activities at site. **Complied.**
viii	The stipulated conditions will be monitored by the Regional of this Ministry at Bhopal/ Central Pollution Control Board/ State Pollution Control Board.	This condition is not **applicable to PP**
	A six monthly compliance report and the monitored data should be submitted to them regularly.	Six monthly compliance report and monitoring data is submitted to MoEF regularly. Last Compliance report was submitted vide our letter no. GPC/HSE/E/476/0106 dated 31st may 2016. Also Stacks, Ambient Air Quality Effluent, Noise monitoring reports & Hazardous reports are submitted to GPCB on monthly basis. **Complied.**
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 State Pollution Control Board/ Committee and may also be seen at website of the Ministry of Environment and Forests at http://www.envfor.nic.in This should be advertised within seven days form 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 copy of the same should be forwarded to the Regional office.	The public has been informed about the Environment Clearance accorded to this project through Newspaper in English and Gujarati language. The copy of the newspaper publication has been submitted to the MoEF along with the first compliance report of this EC. It is gathered that the advertisement was published in Tol, Surat on 08.04.2008 and in Gujarati News Paper namely Sandesh on 08.04.2008. **Complied.**
x	The Project Authorities shall inform the Regional Office as well as the Ministry, the date of financial closures and the date of the commencing the land development	The project is completed and commissioned. The necessary information about the project's financial closure and project commencement was provided along with the first compliance report of this EC.

models were and

5	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory	This condition **is not applicable to PP.**
6	The Ministry reserves the right to stipulate additional conditions if found necessary.	This condition **is not applicable to PP.**
	The company in a time bound manner will implement these conditions	Company has implemented all the conditions prescribed by the Ministry in this EC. Complied.
7	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air ((Prevention & Control of Pollution) Act 1981, The Environment (Protection) Act, 1986, Hazardous Wastes (Management And Handling) Rules 2003 and the Public Liability Insurance Act,1991 along with their amendments and rules.	This condition is not applicable to PP but **taken cognizance.**

Summary and inference:

The compliance of EC conditions is good. Out of 27 conditions, 23 are found to have been complied, 3 are not applicable to the PP and one condition needs only taking note/ cognizance .

Court Cases and Show cause notices issued:

It has been reported that there is no court case on this project

Details of Notices issued during last three years.

Date	Details of Directions by CPCB/ Show Cause Notice (SCN) issued by GPCB, if any	Date	Reply from PA
Letter no. GPCB-HAZ-GEN-503/316347 dated 04.06.2015	Show Cause Notice issued by GPCB regarding observation of no submission of monthly data of hazardous waste disposed / incinerated at our captive TSDF/Incinerator and foresaid details.	Letter No. RIL/HSE/E/474 dated 19.06.2015	Replied to notice with supporting evidences as we are regularly submitting the details as a part of GPCB Monthly Report in hard copy to GPCB Regional Office Bharuch and GPCB Gandhinagar and also are submitting the required details in GPCB XGN portal. Therefore it is resolved. The query was resolved and no further action has been initiated.
Letter no.: B-29016/ 04/06/PCI-I/44989 dtd. 24.07.2015 received on	Directions issued by CPCB under regarding installation of on-line effluent and emission monitoring systems	Letter No. RIL/HSE/E/474/2908/PC dated 29.08.2015	Replied to letter with following details 1. Documentary evidence regarding CAPEX raised for installation of online emission & effluent monitoring system. 2. Letter to CPCB through CPMA

24.06.2016			schedule for completion of establishing online facilities and connecting to GPCB/CPCB server by December 2016. Continuous Emissions Monitoring System is installed and commissioned in all stacks and at ETP outlet.

Scientist 'F'

Counter signed by:
Addl. PCCF (C)

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण एवं वन मंत्रालय
MINISTRY OF ENVIRONMENT & FORESTS

SPEED POST
क्षेत्रीय कार्यालय, पश्चिम क्षेत्र,
Regional Office, Western Region,
"केन्द्रीय पर्यावरण भवन"
"Kendriya Paryavaran Bhavan"
लिन्क रोड नं0-3/Link Road No. 3
E-5,रविशंकर नगर/Ravi Shankar Nagar,
भोपाल (म0प्र0)/Bhopal-462016 (M.P.)
फोन: 0755- 2465054, फैक्स: 0755& 2463102
अणुडाक /E-mail: rccfbhopal@gmail.com

क्रमांक: 18-A-92/2011(SEAC)/381

दिनांक : 26.10.2016

प्रति,

डॉ0 ललित बोकोलिया,
वैज्ञानिक 'एफ',
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,
इंदिरा पर्यावरण भवन, जोर बाग रोड, अलीगंज,
नई दिल्ली - 110003

विषय: **Expansion & Debottelnecking of Petrochemical Plant of Dahej Manufacturing Division (DMD) at Tehsil Vagra District Bahuruch Gujarat By M/s Reliance Industries Limited.**

संदर्भ: No. SEIAA /GUJ/EC/5(e)&1(d)/124/2011 Dated : 23rd June 2011

महोदया,

मंत्रालय के उपरोक्त संदर्भित पत्रांकों के संदर्भ में उक्त परियोजनाओं को पर्यावरणीय दृष्टिकोण से अनुमति देते समय अनुबद्ध शर्तो के अनुपालन एंव certification of compliance के निर्देशाअनुसार, अनुवीक्षण प्रतिवेदन (मॉनिटरिंग रिपोर्ट) एतद् द्वारा संलग्न कर प्रेषित है ।

भवदीय

संलग्न: उपरोक्तानुसार

वैज्ञानिक 'एफ'

प्रतिलिपि: 1. श्रीमति रीता खन्ना, निदेशक, (अनुवीक्षण सैल), पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,इंदिरा पर्यावरण भवन, जोर बाग रोड, अलीगंज,नई दिल्ली - 110003 की ओर सूचनार्थ एंव आवश्यक कार्यवाही हेतु।

2. Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch – 392130 Gujarat - 392130

वैज्ञानिक 'एफ'

Monitoring the Implementation of Environmental Safe Guards
Ministry of Environment &Forest
Western Region, Regional Office, Bhopal
MONITORING REPORT
PART-I
DATA SHEET

1	Project type: River Valley/Mining/Industry / Industry, Thermal/Nuclear/Other (Specify)	Industry (Petrochemical)
2	Name of the Project	Setting up of EODs, Acrylic Acid & Esters, Phenol, PTA, PET, Polyester plants and 200 MW CCPP power plant in the existing petrochemical unit at Dahej Manufacturing Division.
3	Clearance letter (s) OM No. & date	No. SEIAA /GUJ/EC/5(e)&1(d)/124/2011 Dated : 23rd June 2011 Amendments in EC : ◦ No. SEIAA /GUJ/EC/5(e)&1(d)/ 160/2011, dated : 9th August 2011 ◦ No. SEIAA /GUJ/EC/ 7(e)/278/2011, Dated : 13th September2012
4	Location Districts State Location- Latitude/Longitude	Dahej Bharuch Gujarat Latitude : 21°40'35"N & 21°41'27"N Longitude : 72°33'32"E & 72°35'04"N
5	Address for Correspondence	
(a)	Address of the concerned Project Chief Engineer (with Pin Code & telephone / telex / fax numbers	Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch - 392130 Gujarat - 392130 Ph : 02641- 615001 E-mail : pavan.jain@ril.com
(b)	Address of Executive Project Engineer / Manager (with Pin code /fax numbers)	Shri Pavan K. Jain Site President, Reliance Industries Limited, Dahej Manufacturing Division, Dahej, P.O. Bharuch, District: Bharuch - 392130 Gujarat - 392130 Ph : 02641- 615001 E-mail : pavan.jain@ril.com
6	Salient features	
(a)	Of the Project	Already submitted to the State Level Environment Impact Assessment Authority (SEIAA), Gujarat based on which the aforesaid EC has been obtained. PTA & PET plants have been established as per EC. PTA & PET are the largestplant in India. Other plants like EODs, Acrylic Acid & Esters, Phenol, Polyester plants and 200 MW CCPP power plant have not been established so far. Technology selected for these plants were one of best technology available in the world.

(b)	Of the Environment Management Plan	EMP was prepared based on the baseline data collected by NEERI and impact prediction were done using mathematical models and superimposition of those impacts on the baseline. EMP includes provision of state of the art Effluent Treatment Plant and Air Pollution Control Equipment, Solid Waste Management and Green Belt development. Regular environment monitoring is also a part of EMP. Major points implemented as per EMP e.g. ◦ Provided separate ETP for treatment of PTA/ PET effluent with advance waste water treatment like UASB alongwith MBR, Ion exchange, UF & RO. ◦ Strengthen the existing Greenbelt. ◦ Recycling treated effluent in cooling tower, firewater make- up & greenbelt development. ◦ Implemented LDAR program in PTA/PET plants.
7	Breakup of the project area	
(a)	Submergence Area : Forest & Non Forest	Not applicable, No additional land is required as expansion of project was within existing petrochemical complex.
(b)	Others	The land requirement for the project was around 89 ha which was accommodated within 700 ha of existing petrochemical complex
8	Breakup of the project affected population with enumeration of those losing houses / dwelling units only agricultural land only, both dwelling units and agricultural land and landless labourers / artisans : (a) SC, ST / Adivasi (b) Others (please indicate whether these figures are based on any scientific and systematic survey carried out or only provisional figures, if a survey is carried out give details & year of survey.	Not Applicable
9	Financial details	
(a)	Project cost as originally planned and subsequent revised estimates and the year of price reference	Cost of Project was Rs.16500crores in 2011
(b)	Allocation made for environmental management plan with item wise and year wise break up	Non-recurring (i.e. CAPEX) Rs. 600 Crore (Estimated cost: New ETP with ASP, Anaerobic UASB, MBR, RO with UF system & Drainage : Rs. 400 Crore, APCE : Scrubbers removal of HC, HPCC for removal of CO from off gases etc: Rs. 185 crore Solid Waste Mgt: Rs. 10 Crore and Green Belt Development - Rs. 5 crore) Recurring (i.e. OPEX / year (O&M of ETP, Green Belt, Waste disposal, Env monitoring) – Rs.3crore
(c)	Benefit / cost ratio / Internal Rate of Return	Benefit / cost ratio for all our project is more than 1.

	and the year of assessment	Project has achieved IRR of more than 12%
(d)	Whether (c) includes the cost of environment management as shown above	Yes
(e)	Actual expenditure incurred on the project so far	Rs.9500 crore for the expansion project in 2015
(f)	Actual expenditure incurred on the environmental management plan so far	Non-recurring (i.e. CAPEX) Rs. 615 Crore (New ETP with Aerobic, Anaerobic USAB, MBR, RO with UF system & Drainage : Rs. 400 Crore, APCE : Scrubbers removal of HC, HPCC for removal of CO from off gases etc: Rs. 200 crore Solid Waste Mgt: Rs. 10 Crores and Green Belt Development - Rs 5 crore) Recurring / year (O&M of ETP, Green Belt, Waste disposal, Env monitoring etc) – Rs.8 crore for FY 15-16 and Rs. 5 crore for FY 14-15
10	Forest land requirement a) The status of approval for diversion of forest land for non-forestry use b) The status of clearing/felling obtained. c) The status of CA , if any d) Comments on the viability and sustainability of CA programme in the light of actual field experience so far	No requirement of Forest Land
11	The status of clear felling in non-forest areas (such as submergence area of reservoir, approach road etc) if any with quantitative information required	Not Applicable
12	Status of construction (Actual &/or planned) a) Date of commencement b) Date of completion	PET & PTA Plants are completed & commissioned in November 2015
13	Reason for delay (if project is yet to start)	Not Applicable
14	Dates of site visit a) Date on which the project was monitored by the RO on previous occasion (if any) b) Date of the site visit for the monitoring report	--- 30.09.2016
15	Details of correspondence with project authorities for obtaining act onplans/ information on status of compliance to safeguards other than the routine letters for logistic support for site visits. (The first monitoring report may contain the details of all the letters issued so far, but the later reports may cover only the letter issued subsequently)	As mentioned below

Date	Letter from RO	Date	Reply from PA
		13/09/2016	Mail Received From PA
		20/10/2016	Letter No. GPC/HSE/E/476/2010/4
		24/10/2016	Letter No.GPC/HSE/E/476/2010/41

PART – II & III

DESCRIPTIVE REPORT ON STATUS OF COMPLIANCE FOR THE PERIOD OF APRIL 2016 - SEPTEMBER, 2016 TO CONDITIONS OF ENVIRONMENTAL CLEARANCE AND ENVIRONMENTAL MANAGEMENT

O.M. No.: . SEIAA/Guj/EC/5(e)&1(d)/124/2011 dated 23rd June 2011 and its amendments dated 9th Aug 2011 (SEIAA/Guj/EC/5(e)&1(d)/160/2011) and 13th Sep. 2012(SEIAA/Guj/EC/7(e)278/2011)

<table>
<tr><th>SrNo</th><th>Conditions of the Environment Clearance</th><th>Compliance to the conditions of the EC</th></tr>
<tr><td colspan="3">A. Specific Condition</td></tr>
<tr><td>A.1</td><td>Water</td><td></td></tr>
<tr><td>1</td><td>Fresh water requirement shall not exceed 1,15,420 KLD after the proposed expansion.

This Condition has been amended vide EC amendment order no SEIAA/GUJ/EC/7(e)278/2011 dated 13th Sep 2012. The amended condition is given below:
"The fresh water requirement shall be read as 1,14,320 KLD instead of 1,15,420 KLD"</td><td>It has been informed that average fresh water consumption in plant has always been less than 1,15,420 KLD. The average fresh water requirement for the period Apr-Sep'16 was 76,791 KLD thus has not been exceeded the permissible limit of 1,14,320 KLD.

The summary of fresh water consumption during reporting period of Apr-Sep'16 as provided by PP is presented as below
<table>
<tr><th colspan="4">Fresh Water Consumption (KLD)</th></tr>
<tr><th>Prescribed Limit</th><th>Avg</th><th>Min</th><th>Max</th></tr>
<tr><td>1,14,320</td><td>76,791</td><td>56,762</td><td>83,391</td></tr>
</table>
Complied.</td></tr>
<tr><td></td><td>It shall be met from river Narmada through Jackwells at Angareshwar</td><td>Fresh Water requirement is met from river Narmada through Jack wells at Angareshwar with prior approval from Irrigation department for water drawl. Copy of letter has been submitted separately

Complied.</td></tr>
<tr><td></td><td>No ground water shall be used for the project</td><td>It has been stated that no ground water is used at site. The water requirement for the complex is met through Narmada water as mentioned in the compliance of condition above.

Complied.</td></tr>
<tr><td>2</td><td>The industrial wastewater generation shall not exceed 44,600 KLD after the proposed expansion</td><td>It has been informed that average industrial effluent generation after commissioning of the PTA and PET plant, is 36,497 KLD for the period of Apr'16 –Sep'16 thus has not been exceeded the permissible limit of 44,600 KLD.

Data for effluent generation quantity for the period April-Sept'16 is as below which is also being submitted to GPCB on monthly basis.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>
<table>
<tr><th colspan="4">Effluent Generation (KLD)</th></tr>
<tr><th>Permissible Limit</th><th>Avg</th><th>Min</th><th>Max</th></tr>
<tr><td>44,600</td><td>36,497</td><td>34,505</td><td>39,145</td></tr>
</table>
Complied.
</td></tr>
<tr><td>3</td><td>The company shall provide ETP consisting of primary, secondary and tertiary treatment facilities for treatment of the effluents from the proposed plants</td><td>The wastewater generated at the plant is treated in Effluent treatment plant consisting of Primary, Secondary and Tertiary effluent treatment units.

Complied.</td></tr>
<tr><td>4</td><td>The ETP shall be operated regularly and efficiently so as to achieve the GPCB norms at the outlet.</td><td>The ETP is operated regularly and efficiently and has achieved the GPCB discharge norms during review period of Apr'16-Sep'16.
A summary of effluent monitoring results for the period Apr-Sep'16 as provided by PP is presented below.
<table>
<tr><th>Parameter</th><th>Unit</th><th>GPCB Consent Limit</th><th>Avg</th><th>Min</th><th>Max</th></tr>
<tr><td>pH</td><td>–</td><td>5.5-9.0</td><td>7.40</td><td>6.82</td><td>7.62</td></tr>
<tr><td>TSS</td><td>mg/l</td><td>100</td><td>15.33</td><td>10.00</td><td>20.0</td></tr>
<tr><td>Oil & grease</td><td>mg/l</td><td>20</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Phenolic compounds (as C_6H_5OH)</td><td>mg/l</td><td>5</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Cyanide (as CN)</td><td>mg/l</td><td>0.2</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Fluorides (as F)</td><td>mg/l</td><td>15</td><td>0.46</td><td>0.36</td><td>0.55</td></tr>
<tr><td>Sulphides</td><td>mg/l</td><td>5</td><td>2.29</td><td>2.00</td><td>2.66</td></tr>
<tr><td>BOD</td><td>mg/l</td><td>100</td><td>18.83</td><td>14.00</td><td>28.0</td></tr>
<tr><td>COD</td><td>mg/l</td><td>250</td><td>119.50</td><td>92.00</td><td>165</td></tr>
<tr><td>Total Chromium (as Cr)</td><td>mg/l</td><td>2</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Hexavalent Chromium (as Cr^{+6})</td><td>mg/l</td><td>1</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>Bioassay Test</td><td colspan="2">90% survival of fish after 96 hours in 100% effluent</td><td colspan="3">90% survival of fish observed after 96 hours in 100% effluent</td></tr>
</table>
From above results, it can be seen that the ETP is operating regularly and efficiently and all the results are complying with the GPCB norms

Detailed treated effluent monitoring report has been submitted separately

Complied.</td></tr>
<tr><td>5</td><td>Out of 44,600 KLD of treated effluent 14,080 KLD shall be reused/recycled in cooling tower, green belt development/horticulture etc.</td><td>It has been informed that average effluent recycle quantity from the complex is around 14,000 KLD. In the review period Apr-Sep'16, out of the 36,497 KLD effluent generated from complex, 13,789 KLD of treated effluent was recycled.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>The summary of treated effluent as provided is given as below.
<table><tr><th>Aspect</th><th>Permissible Limit (in KLD)</th><th>Avg. quantity during Apr-Sep'16 (in KLD)</th></tr><tr><td>Effluent generation</td><td>44,600</td><td>36497</td></tr><tr><td>Effluent Recycle</td><td>14,080</td><td>13,789</td></tr><tr><td>Percentage of Effluent recycling</td><td>32 %</td><td>38 %</td></tr></table>
It can be seen from above results that the effluent is recycled quantity is marginally lower than prescribed , it is more in % as effluent generation itself is almost 8000 KLD less.

Complied.</td></tr>
<tr><td></td><td>Whereas rest of 30,520 KLD shall be discharged into the deep sea (Gulf of Cambay) through the existing effluent disposal pipeline equipped with multiport diffuser.</td><td>It has been informed thataAverage quantity of 22,618 KLD of treated effluent discharged from RIL-DMD into Gulf of Cambay in the deep sea area through existing effluent disposal pipeline during this period of Apr- Sept 2016.A multiport diffuser is provided at the end of treated effluent discharge line for proper dispersion of effluent.

The average effluent discharge during Apr-Sep'16 as provided by PP is presented below:
<table><tr><th>Description</th><th>Permissible Limit (KLD)</th><th>Average (KLD)</th></tr><tr><td>Quantity of Effluent Discharge</td><td>30,520</td><td>22,618</td></tr></table>
It can be seen from above results that the, the average effluent discharge from the has not exceeded the permissible limit of 30,520 KLD during reporting period.

Complied.</td></tr>
<tr><td>6</td><td>The unit shall provide metering facility at the inlet and outlet of the ETP and maintain the records of the same</td><td>Metering facility i.e. Flow meters have been provided at the inlet and outlet of ETP and records are maintained.

Complied.</td></tr>
<tr><td></td><td>Also provide online monitoring system for pH, TDS, & TOC parameters at the outlet of the ETP</td><td>Online pH, TOC, BOD, COD & TSS analyzers are provided at the outlet of the ETP.

It has not been explained as to why the online facility for TDS not provided.

Almost complied.</td></tr>
<tr><td>7</td><td>A proper logbook of ETP operation and so showing the quantity of effluent generated, utilized for plantation/gardening etc. shall be maintained and furnished to the GPCB from time to time</td><td>Logbook of ETP operation is maintained and it includes quantity of effluent generation and recycled within the complex for Gardening, etc. The same has been furnished to GPCB from time to time as and when asked.</td></tr>
</table>

		The details of quantity of effluent generation & recycle are given in condition no. 5. **Complied.**
8	Regular performance evaluation of the ETP shall be undertaken every year to check its adequacy through credible institutes like LD college of Engineering, NPC or such other institutes of similar repute. Its records shall be maintained.	It has been informed that Performance evaluation of ETP by external agencies is being carried out regularly through environmental auditor appointed by GPCB and the records are maintained. Department of Civil Engineering, Dharmasinh Desai University, College Road Nadiad, who is GPCB identified environmental auditor has done annual environmentalaudit which includes performance evaluation of ETP for the year 2015-16. The report is submitted regularly to GPCB. **Complied.**
9	The effluent disposal pipeline shall be monitored regularly by the company. It shall be ensured that there is no leakage from the pipeline	It has been stated that Effluent disposal pipeline is being regularly checked by site maintenance department for leakages through walkthrough surveys. During Apr – Sep '16, no leakage was observed **Complied.**
	In case of any such eventualities, the company shall immediately stop disposal through pipeline and take the corrective measures in consultation with the GPCB and the District Collector	It has been informed that During Apr – Sep'16, no such eventualities have arisen. **Complied.**
10	The post project environmental monitoring through the reputed institutes / organizations shall be carried out in order to assess the changes if any in coastal environment due to disposal of effluent	The post project environment monitoring of coastal environment has been carried out by NIO while carrying out EIA of subsequent projects to assess the changes. There was no adverse impact observed on the coastal environment due to RIL DMD. **Complied.**
11	The unit shall join and participate financially and technically for any common environmental facility infrastructure as and when the same is taken up either by GIDC or GPCB or any such authority created for this purpose by the Govt/GIDC	It has been stated that during the review period of Apr-Sep'16, no such proposal came from GIDC / GPCB. RIL will participate financially and technically in any such project proposed or being taken up by Govt/GIDC/GPCB. Complied
A.2	Air	
12	Only natural gas shall be used as a fuel in the proposed expansion.	Only PTA and PET plants have been commissioned out of proposed plants of this EC. Natural gas is being used as a fuel in the PET plant during review period of Apr-Sep'16. Whereas PTA plant does not require any fuel as it has no furnace, boilers, heaters or vaporizers. **Complied.**
13	All fuel combustion units shall be operated with min. excess air so that fuel combustion is optimized and emission of NOx is minimized	All fuel combustion units are reportedly operated at minimum excess air to optimize fuel combustion and minimize the emission of NOX. The online O2 monitors in furnaces are used for

<table>
<tr><td></td><td></td><td>optimizing the air/fuel ratio. By controlling the flow of air, NOx generation is minimized.

Complied.</td></tr>
<tr><td></td><td>Tangential / low NOx burners in all combustion units with online analyser shall be implemented in the proposed plants.</td><td>Low NOX burners have been provided in the combustion units with online analyzers in the plants.

Complied.</td></tr>
<tr><td>14</td><td>Process emission like SO_2, NOx, PM, etc. shall be controlled with the adequate air pollution control equipment (APCEs).</td><td>Adequate Air Pollution Control Equipment (APCEs) for controlling process emissions such as SO_2, NO_x, PM, etc. have been reportedly provided in the stacks to meet the prescribed norms. The summary of PTA and PET stacks emission monitoring results for the period Apr-Sep'16 as provided by PP is presented as below.

<table>
<tr><th>Plant</th><th>Parameter</th><th>APCE</th><th>GPCB Limit</th><th>Avg</th><th>Min</th><th>Max</th></tr>
<tr><td rowspan="3">PTA Plant - Stacks attached to Off gas scrubber, atmospheric scrubber &vent scrubber</td><td>PM (mg/Nm^3)</td><td rowspan="3">Hydro-sonic scrubber followed by cyclone separator</td><td>150</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>SO_2 (mg/Nm^3)</td><td>40</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td>NOx (mg/Nm^3)</td><td>25</td><td>ND</td><td>ND</td><td>ND</td></tr>
<tr><td rowspan="3">PET-3 Plant - Stacks attached to Heaters</td><td>PM (mg/Nm^3)</td><td rowspan="3">Low NOx burner</td><td>150</td><td>9.06</td><td>7</td><td>12</td></tr>
<tr><td>SO2 (ppm)</td><td>100</td><td>2.85</td><td>2.04</td><td>3.83</td></tr>
<tr><td>NOx (ppm)</td><td>50</td><td>11.2</td><td>9.26</td><td>14.29</td></tr>
</table>

The above results indicate that the values are well within the norms prescribed by GPCB.

Detailed monitoring report has been provided separately.

Complied.</td></tr>
<tr><td></td><td>These APCEs shall be operated efficiently and effectively to achieve the norms prescribed by the GPCB at stack/vent outlets</td><td>The above results are complying with the norms prescribed by GPCB and PP submits that this indicates that APCE provided at PTA and PET plants are operating efficiently and effectively.

Complied</td></tr>
<tr><td>15</td><td>Stacks and vents of adequate height as per the prevailing norms along with port holes and sampling facilities shall be provided.</td><td>Stacks and vents of PTA & PET plant are having adequate height as per the prevailing norms along with port holes and sampling facilities.

6 process vents of PTA plant are of 51, 53 and 44 meter heights and 4 flue gas stack of PET plant</td></tr>
</table>

		with 60 meter height has been provided withport holes and sampling facility. It complies with prevailing norms of stack height. The summary of the stack emission monitoring report for period of Apr-Sep'16 is given in condition no 14. Detailed monitoring report has been provided separately. **Complied.**
16	The company shall install online monitoring system in the proposed plants with an arrangement to reflect the monitored data on the company's server , which can be accessed by the GPCB on real time basis	Continuous online monitoring equipment have been installed for all stacks. During Apr-Sep 16, the access of online stack monitoring results for 11 stacks out of 39 stacks is given to CPCB. For remaining stacks the connectivity to CPCB and GPCB is ready for connecting. **However, on arrangement to reflect the monitored data on the company's server, which can be accessed by the GPCB on real time basis, the action is yet to be completed. This may be intimated on completion.** **Partly Complied**
17	The fugitive emission in the work zone environment shall be monitored. The emissions shall conform to the standards prescribed by the concerned authorities from time to time(e.g. Directorate of Industrial Safety & Health)	The fugitive emission in the work zone environment (i.e. Work place environmental monitoring) is monitored periodically for existing facilities including PTA and PET plant. Occupational exposure is compared against standards prescribed by the concerned authorities periodically (e.g Directorate of Industrial Safety & Health &ACGIH (American Conference of Governmental Industrial Hygienist) **Standards need to be mentioned and compared in a tabular form and submitted in future compliance report. Without comparison of values with standards, full compliance may not be accomplished.** **Partly complied**
	Following steps shall be taken to reduce the fugitive emission of VOCs: Provision of internal floating roof tanks with flexible double seal for storage tanks	PP informed of the following actions: Storage Tanks are stated to be designed as per API standard in the PTA and PET plants and it is provided with internal floating roof with flexible double seal. **Complied.**
	Provision of mechanical seals in pumps	Mechanical seals are provided in the pumps / compressors of the PTA and PET plants. **Complied.**
	Regular inspection of floating roof seals and proper maintenance of floating roof seals for existing tanks	Regular inspection and properpreventive maintenance of floating roof seals isbeing carried out.

		Complied.
	Preventive maintenance of valves and other equipment	Preventive maintenance of valves and other equipment is being done regularly in the plants as per schedule. Complied.
	regular skimming of oil from separators /equalization basin in the ETP	Regular skimming of oil from oil separators / equalization tank is carried out in the ETP.The collected oil is then transferred to Slop oil tank. Complied.
	Fugitive emission monitoring at regular intervals	Fugitive emission monitoring is done in all plants at regular intervals through the Leak Detection and Repair Program. Complied.
	strengthening /maintaining existing green belt	- Strengthening of green belt through gap plantation and maintenance of the existing greenbelt spread over the area of 70 ha is being done. During review period of Apr-Sep'16: 7,790 trees were planted in the complex. Complied.
	use of high grade gasket material for packing and Provision of motor operated valves for critical services such as high vapour pressure components and chemicals.	High grade gasket material for packing is used and motor operated valves for critical services such as high vapour pressure components and chemicals are provided. Complied.
	implementation of Leak Detection and Repair (LDAR) programme using a portable VOC detection instrument	Leak Detection and Repair Program (LDAR) is implemented throughout the complex including PTA and PET plants and monitoring is being done by using portable VOC detection instruments. Complied
	monitoring of dioxin and furan from the stacks of incinerators at a regular interval to keep close vigil on such emissions due to burning organo-chlorine compounds, if any	Not applicable as no incinerator is installed in PTA and PET plants. Not Applicable
18	Regular performance evaluation of the air pollution control systems shall be undertaken every year to check its adequacy , through credible institutes like LD college of Engineering, NPC or other such other institutes of similar repute, and its records shall be maintained and furnished to the GPCB from time to time	Performance evaluation of air pollution control systems by external agencies is being regularly carried out through environmental auditor appointed by GPCB. Department of Civil Engineering, Dharmasinh Desai University, College Road Nadiad has done Annual audit which includes performance evaluation of APCE for the year 2015-16. The report is submitted regularly to GPCB. Complied.
19	The company shall install and operate continuous ambient air quality monitoring station within the premises.	Continuous Ambient Air Quality Monitoring Station (CAAQMS)is installed within the premises

		Complied.
	The monitoring station shall be fixed in consultation with the GPCB	Location of CAAQMS is fixed reportedly by consulting GPCB official in his visit and after getting their concurrence. Complied
A.3	**Hazardous /Solid Waste**	
20	The company must strictly comply with the rules and regulations with regards to handling and disposal of Hazardous waste in accordance with the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 as may be amended from time to time	Hazardous wastes generated from PTA and PET plants is reported to be managed in accordance with the Hazardous Waste Rules, 2008, its amendments. The authorization obtained from GPCB under these rules vide Authorization Order No. W-76082 dtd. 04.02.2016, valid upto 03.11.2020. Complied.
21	Authorization from the GPCB must be obtained for collection/treatment / storage/disposal of hazardous wastes.	Authorization for Hazardous wastes management is obtained from GPCB vide Authorization Order No. W-76082 dtd. 04.02.2016, for collection/treatment/storage/disposal of hazardous wastes from the complex. The hazardous waste is being disposed as per methods prescribed in the Authorization. Copy of Form-4 submitted to GPCB for year 2015-2016 has been provided separately. Complied.
22	The hazardous wastes shall be stored in separate designated hazardous waste storage facility with impervious bottom and leachate collection facility before its disposal.	Hazardous wastes at respective plants are stored in a designated area having impervious bottom with peripheral drain for collection of leachate /spill. Complied.
23	ETP sludge, incinerator ash etc. shall be disposed in the secured landfill site	ETP sludge is being disposed in the secured landfill site of BEIL, Ankleshwar. Incinerator is not installed for PTA and PET plants hence there is no generation of Incinerator ash. Complied.
24	The wastes like spent resins from phenol plant, spent oxide filter cartridges, spent charcoal, adsorbents, oil cotton rags etc. shall be disposed by incineration.	Phenol plant is not established hence spent resin from it is not generated. Other wastes are handled as per the Hazardous Waste authorization granted by GPCB. It was clarified later that incineration is being followed for waste disposal. Complied.
25	Spent catalysts, alumina desiccant, spent lead acid batteries, degraded Dowtherm, spent molecular sieve etc., and shall be sold only to the registered reprocessors / recyclers.	Spent catalysts, spent lead acid batteries, degraded dowtherm, spent molecular sieve etc., are sold only to the registered reprocessors / recyclers. Complied.
26	Discarded containers/ barrels/ bags/liners shall be either reused or sold only to the authorised recyclers after decontamination.	Discarded containers/barrels /bags generated from respective plants get decontaminated, labelled as Decontaminated and then sold to the authorized recyclers as per GPCB directives.

		Dedicated drum decontamination facility has been provided for all plants including PTA and PET plants. **Complied.**
27	Used oil shall be sold only to the registered recycler	Used oil is reported to be sold to the registered recyclers/reprocessors. **Complied.**
A.4	**Safety**	
28	Provisions of the : -Manufacture, Storage & Import of Hazardous Chemical Rules, 1989 -Factories Act , 1948 shall be strictly complied with.	Provisions of the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules 1989 as amended in 2000 and Factories Act, 1948 are stated to be complied ,by ensuring the following activities : ◦ Preparation of safety audit report (submitted to DISH regularly) ◦ Preparation of emergency response plan ◦ Conducting mock drills on regular basis ◦ Provision emergency alert system like sirens , announcement etc. and ensuring their healthiness ◦ Mutual aid arrangement with neighboring industries. **Complied.**
29	Recommendations made in the Risk Assessment Study Report submitted by the project proponent shall be implemented	Recommendations made in the risk assessment study report are stated to be implemented and complied with for existing units including PTA and PET plants. e.g. ◦ Constructed control rooms blast proof & shock proof wall. ◦ Storage area is separated from process areas and flammable materials ◦ Provided proper dyke for storage tanks with fire protection measures **Complied.**
30	All necessary precautionary measures shall be taken to avoid any kind of accident during storage and handling of: · Toxic chemicals or · Hazardous chemicals.	Following safety measures have been stated to be adopted by PP to avoid accidents at the site during storage and handling of toxic / hazardous chemicals: ◦ Separate dyke area provided for the different products and storage areas ◦ Storage areas are separated from building process areas and flammable materials. ◦ Level indicators, trips & alarm systems. ◦ Adequate Fire protection systems are provided. **Complied.**
31	All the materials shall be stored in optimum quantity and all necessary permissions in this regard shall be obtained (if required)	All materials are reported to be stored only in required quantities matching with the production capacities and permission from PESO, Nagpur

	before commencing the expansion activities.	has been obtained for the same. **Complied.**
32	Storage and use of hazardous chemicals shall be minimized to the extent possible and	Hazardous chemicals are stated to be stored only as per the requirement matching with the production capacities and permission granted by PESO. **Complied.**
	All necessary precautions shall be taken to mitigate the risk generated out of it.	Necessary precautions are reportedly taken for safe storage / handling of hazardous / toxic chemicals as detailed in point no. 30. **Complied.**
	Storage of hazardous chemicals shall be in multiple small capacity tanks/containers instead of one single large capacity tank for safety purpose.	Hazardous chemical storage quantities are stated to be maintained only in minimum quantity as per requirement. The chemicals are stored in tanks of optimum size instead of small quantity capacity tanks for safety purpose. **Complied.**
33	During material transfer, spillages shall be avoided and Garland drain be constructed to avoid mixing of accidental spillages with domestic wastewater or storm water	Adequate control measures are informed to be taken to avoid spillage during material transfer job. Dedicated Garland / drainage network has been established in PTA and PET plants to avoid mixing of accidental spillages with domestic wastewater or storm water. **Complied.**
34	All the storage tanks shall be fitted with appropriate controls to avoid any leakages, bund/dyke walls shall be provided for storage tanks for Hazardous Chemicals.	As stated , all storage tanks has Proper safety mechanisms including level indicators, level alarms, bund/dyke walls are provided to avoid leakages / spillages of hazardous chemicals. **Complied.**
	Close handling system for chemicals shall be provided	Chemicals from the storage tanks are reportedly transferred to the reactors in an automated manner with a closed loop system to avoid any manual exposure. **Complied.**
35	Tie up shall be done with nearby health care unit for seeking immediate medical attention in the case of emergency, regular medical check-up of the workers and keeping its record etc.	Occupational Health Center (OHC) is established at the petrochemical complex for providing immediate medical help in case of emergencies. Periodical medical checkup done for the RIL employees as well as for contract workers and records are maintained for the same. However tie up is said to be not feasible due to around 45 km distance of nearby health care. **This condition and compliance needs to be reviewed since objective seems to be fulfilled although not as per mandated condition. Therefore, for the reporting period this may be taken as complied.** **Complied.**
36	Personal protective equipments shall be provided to workers and its usage shall be ensured and supervised.	Personal Protective Equipments (PPEs) are provided to employees and contractors and are stated to be compulsory before entering the plant.

		This is being ensured regularly. However, this needs strict enforcement as during visit all employees were not found wearing PPEs. Complied.
	First Aid Box and required antidotes for the chemicals used in the unit shall be made readily available in adequate quantity.	First Aid box is available at strategic locations in each plant and antidotes for chemicals are readily available at OHC in adequate quantity. Complied.
38	Training shall be imparted to all the workers on safety and health aspects of chemicals handling.	It is reported that Training is imparted to all the workers on safety and health aspects of chemicals handling. It is informed that the chemical handling related, safety and health training is imparted to all workers on RIL role and all contractor workers as well. The level-1 and level-2 training is provided to the contract workers which includes the safe work practices related to safe chemical handling and use of PPEs. At RIL-Dahej, employees are imparted safety training through induction and refresher training on safe work practices, safe chemical handling and use of PPE. Complied.
39	Occupational health surveillance of the workers shall be done and its records shall be maintained	Occupational health surveillance of the workers is done and its records are maintained. Complied.
	Pre-employment and periodical medical examination for all the workers shall be undertaken as per the Factories Act & Rules.	Pre-employment and periodical medical examination is carried out by OHC annually and records are maintained. It is said that these as per the Gujarat Factories Act & Rules. Complied.
40	Handling and charging of the chemicals shall be done in such a manner that minimal human exposure occurs.	Raw materials from the storage tanks are stated to be transferred to the reactors in an automated manner with a closed loop system to avoid any human exposure. Complied
41	Transportation of hazardous chemicals shall be done as per the provisions of the Motor Vehicle Act & Rules.	Transportation of hazardous chemical is stated to be carried out as per the Motor Vehicle Act & Rules like: ◦ Emergency information panel on Carrier ◦ The product name, UN number, and CTU (Container carrier unit) identification number on the shipping document. ◦ Training imparted to drivers by RIL Driver SafetyTraining Center and it is valid for one year for liquid / gas carrier drivers and two year for carrier driver. ◦ Refresher training also shall be given by Driver Safety Training Center. ◦ TREM Card. ◦ Instruction to drivers on emergency

		situations. Complied.
A5	Noise	
42	To minimize the noise pollution the following noise control measures shall be implemented.	These measures are reportedly ensured in the PTA and PET plants by addressing the requirements during the design phase itself. Following have been submitted by the PP:
	· Selection of any new plant equipment shall be made with specification of low noise levels	Low noise generating equipment have been selected in the design stage itself.
	· Manufacturers / suppliers of major noise generating machines / equipments like air compressors, feeder pumps, turbine generators, etc. shall be instructed to make required design modifications wherever possible before supply and installation to mitigate the noise generation and to comply with the national / international regulatory norms with respect to noise generation for individual units	Low noise generating equipment have been selected in the design stage itself. Equipment meet the national regulatory norms.
	· Regular maintenance of machinery and vehicles shall be undertaken to reduce the noise impact	Regular & preventive maintenance of machinery and vehicles is undertaken.
	· Noise suppression measures such as enclosures, buffers and /or protective measures shall be provided.	Noise suppression measures like acoustic chambers are provided wherever required.
	· Employees shall be provided with ear protection measures like earplugs and earmuffs.	PPEs like ear muffs and ear plugs are mandatory for use by everyone working in high noise areas.
	· Proper oiling, lubrication and preventive maintenance shall be carried out of the machineries and equipments to reduce noise generation	Proper oiling, lubrication and preventive and regular maintenance of machineries and equipment is done to reduce noise generation.
	· Construction equipment generating minimum noise and vibration shall be chosen	Construction equipment generating low noise and vibration was chosen during the erection of the plant.
	· Ear plugs and/muffs shall be made compulsory for the construction workers working near the noise generating activities / machines / equipment.	Use of PPEs like ear plugs /ear muffs are made compulsory at site. It is being ensured and supervised through work permit procedure, Contractor Field Round and Daily Field round by Plant Safety Representative at plants.
	· Vehicles and construction equipment with internal combustion engines without proper silencer shall not be allowed to operate.	Vehicles and construction equipment with internal combustion engines without proper silencer were not allowed to operate during the erection of the plant.

	Construction equipment meeting the norms specified by EP Act, 1986 shall only be used.	Construction equipment meeting the norms specified by EP Act, 1986 were used during the construction phase of the plants.
	Noise control equipment and baffling shall be employed on generators especially when they are operated near the residential and sensitive areas.	Low Noise generating DG sets are being used at the site. The site is with in industrial zone. No residential or sensitive zone nearby.
	Noise levels shall be reduced by the use of adequate mufflers on all motorized equipment	Noise mufflers for motorized equipment have been provided on all the motorized equipment **Complied.**
43.	The overall noise level in and around the plant areas shall be kept well within the prescribed standards by providing noise control measures including acoustic insulation, hoods, silencers, enclosures, vibration dampers etc. on all sources of noise generation.	Noise control measures such as acoustic hoods, silencers etc. are stated to have been provided at high noise generating source with-in the plant. The summary of Wokplace Noise Level monitoring reports for the period Apr-Sept' 16 is presented below : It can be seen from the above results that the noise level in& around the plant are well within the prescribed limit of 85 dB(A). The ambient noise level monitoring has been carried out on monthly basis in existing complex

Plants	Workplace Noise Levels in dB(A) Permissible limit 85 dB(A)		
	Avg	Min	Max
Chlor Alkali Plant	61.88	57.20	67.90
VCM Plant	58.78	53.50	61.60
PVC Plant	62.55	51.20	73.30
EO-EG Plant	59.90	54.90	67.00
GCU Plant	66.39	56.50	70.30
EPRU	60.64	58.20	63.60
OSBL	53.42	50.60	55.80
HDPE	62.51	50.20	69.50
CPP I	62.14	52.40	84.60
CPP II	65.89	55.60	74.40
CPP III	62.23	45.20	76.70
PTD (Tankfarm)	56.32	52.40	59.80
PET-3	55.42	48.90	59.30
PTA-5	59.18	35.50	75.40
PTA-6	53.49	43.50	62.50
IOP - Air Separation Unit	61.07	59.50	61.80
IOP - Compressor House	57.00	56.10	58.20
IOP - Raw Water treatment Plant	62.10	58.10	64.30
IOP - Fire water treatment plant	60.02	57.60	66.50

		including PTA & PET plants at 7 locations during day time and night time. The summary of report is given condition no. 44 The detailed monitoring report for the period Apr-Sep 16 has been submitted separately. **Complied.**
	The ambient noise levels shall confirm to the standards prescribed under the Environment (Protection) Act and Rules.	Ambient noise levels conforms to the standard prescribed under EPA Rules, 1989 viz. 75 dBA (Day Times) and 70 dBA (Night time).The summary of the ambient noise levels or Apr-Sept' 16 as provided by is presented below.

Monitoring Location	Day Time Limit : 75 dB(A)			Night Time Limit : 70 dB(A)		
	Avg	Min	Max	Avg	Min	Max
Security Building	62.8	61.3	63.8	57.7	55.8	59.2
Guest House	58.7	57.1	59.8	55.5	54.1	57.1
Pump House	63.3	62.4	64.4	59.8	58.1	61.8
Main Fire Station	60.40	58.90	61.8	55.28	52.10	58.3
ETP	59.6	58.1	62.1	54.7	51.8	56.8
Jetty	52.2	50.4	53.2	49.9	48.1	50.9
Jageshwar	52.8	52.1	53.9	49.3	47.6	50.4

		The above results indicates that the ambient noise levels during the reporting period Apr-Sep'16 has not been exceeded the prescribed limit. Detailed monitoring report has been provided separately. **Complied.**
	Workplace noise levels for workers shall be as per the Factories Act and Rules.	Workplace noise levels for workers is maintained well below the limit of 85 dB(A)as per the Factories Act and Rules. The results of work place level is given in the condition no. 43 **Complied.**
A.6	**ENERGY CONSERVATION**	
44	The project proponent shall install energy efficient devices and appliances conforming to the Bureau of Energy Efficiency norms	Energy efficient devices are slated to have been provided in the plant like variable frequency drives. **Complied.**
45	The energy audit shall be conducted at regular intervals and the recommendations of the audit report shall be implemented.	As reported, Electrical Energy Audit is being carried out once in two years by third party. Recommendations of the audit report are implemented. **In future EC compliance Report, recommendations to be enumerated and action taken elaborated as in absence of these important outcomes, the condition cannot be fully complied..**

		Partly Complied.
	The project proponent shall implement the application of solar energy which shall be utilized as solar lighting for illumination of common areas, lighting of internal roads and passages in addition to utilization of solar water heating systems.	Use of Solar energy is already explored and under evaluation and approval stage. **But, it should have done already. This is to be implemented at the earliest.** **Under compliance.**
47	The transformers and motors shall have minimum efficiency of 85%.	Transformers and motors of efficiency higher than 85% are reportedly selected at design stage itself by the PP. Complied.
48	Variable frequency drives shall be installed	Variable Frequency Drives are reportedly installed at PTA and PET plants. Complied.
49	Energy conservation measures shall include use of electronic lighting system, use of CFL tubes to minimize energy use, use of programmable timers for pumping system and lighting, water level controllers for water pumps, centralized cooling etc.	Energy conservation methods like use of LED lighting for office and street lighting are being implemented. **in respect of and lighting, water level controllers for water pumps, centralized cooling etc.compliance needs to be ensured.** **In future EC compliance report, detailed action taken of each item as mandated need to be elaborated .** Complied Partly Complied.
50	Energy saving practices as follows shall be practiced:	The PP informed as under:
	◦ Constant monitoring of energy consumption and defining targets for energy conservation.	Department level targets have been fixed and energy consumption is monitored against those targets. Constant Monitoring of energy consumption is done by Energy cell with BEE Qualified energy manager, energy auditor.
	· Adjusting the settings and illumination levels to ensure minimum energy used for desired comfort level	Illumination level audit is being carried out once in two years as a Part of Electrical audit. Sensors have been provided in few office rooms to automatically switch off lighting in case of no movement in the room.
	· Use of solar cells for lighting	Solar cells for traffic lights are installed.
	· Use of solar water heater for canteen & washing area.	Use of Solar energy for water heating is already explored and Solar water heater project is under evaluation.
	· Proper load factor shall be maintained by the unit	Adequate load factor is maintained.
	· Provision of day light roof to utilize	Day light roofs are provided at our store and

	maximum natural light in the production plant instead of electrical lighting.	warehouse areas.
	· Use of electronic ballast to save energy	Electronic ballast is provided in lighting equipment.
	· Automatic switching system for lighting and water tank pumping shall be used.	Automatic switching system for lighting are provided at various areas of plants. Automatic switching system for water tank pumping is also provided
	· To the maximum extent possible and technically feasible, energy efficient equipment like motors, pumps, air conditioning systems shall be selected.	Being complied.
	· Gravity flow shall be preferred wherever possible to save pumping energy.	Gravity flow has been utilized wherever possible.
	· Promoting awareness on energy conservation	Regular training and awareness campaigns are carried out for all employees on energy conservation. RIL Dahej has 12 BEE certified energy professionals
	· Training to the staff on methods of energy conservation and to be vigilant for this.	Training is being imparted regularly by our Learning and Development Department. Complied.
A.7	**CLEANER PRODUCTION AND WASTE MINIMISATION**	
51	The unit shall undertake the Cleaner Production Assessment study through a reputed institute / organization and shall form a CP team in the company. The recommendations thereof along with the compliance shall be furnished to the GPCB.	It is informed that the Site has adopted the best available technology for achieving resource reduction and waste minimization. It is reported that a Cleaner Production assessment study is planned and the PP is in touch with different institutes / organizations for the study. **This is to be expedited as it remains not complying.** **Not Complied.**
52	The company shall undertake the following waste minimization measures:	PP submitted the following:
	a. Metering and control of quantities of active ingredients to minimize waste.	All active ingredients are metered at all the plant. Metering and control is provided for active ingredients to ensure waste minimization.
	b. Reuse of by-products from the process as raw materials or raw materials substitutes in other process.	Reuse of by-products is implemented wherever possible such as Productive management of waste residue streams is done in PTA plant by recovering Suspended solids powder resulting in reuse of solid waste.
	c. Use of automated and enclosed filling to minimize spillages	Automated and enclosed material transfer system implemented to minimize spillages.
	d. Use of closed feed system into batch reactors.	Closed feed system provided in the process units.

	e. Dry cleaning / mopping of floor washing	Practiced at all the administrative buildings including plant control rooms.
	f. Use of high pressure hoses for cleaning to reduce wastewater generation.	High pressure hoses are used for cleaning which ensures reduction in wastewater generation.
	g. Regular preventive maintenance for avoiding leakage, spillage etc.	At plant level regular preventive maintenance of equipment is carried out and maintained in the SAP system. **Complied.**
A.8	**GREEN BELT AND OTHER PLANTATION**	
53	The unit shall develop green belt within premises as per the CPCB guidelines.	It has been informed that around 70 ha of green belt as per the CPCB guidelines at Dahej Petrochemical Complex. Trees have been planted throughout the periphery of the complex as well as wherever open spaces are available. Land scaping(through lawns and shrubs) have been done in areas where tree plantation is not possible. Every year plantation drive is being done to strengthen the green cover in the complex. During review period of Apr-Sep'16: 7,790 trees have been planted in and around the complex. Native plant species are selected for planting of the green belt as per the guidelines of CPCB. Few of the plant species existing at the site are: Casuarinaequisetifolia (Suru), Azadirachtaindica (Neem), Millettiapinnata (Karanj), Cassia siamea (Kashid), Albiziaprocera (Shirish), Delonixregia (Gulmohar), Peltophorumpterocarpum etc. **Complied.**
	In addition to that, the unit shall take up adequate plantation on road sides and suitable open areas in the GIDC estate, nearby schools, gram panchayat areas and any other open areas in consultation with GIDC / local bodies / GPCB and submit an action plan of plantation for next three years to the GPCB.	Adequate plantation carried out on road sides near the site and open areas of GIDC near site. During review period of Apr-Sep'16 , 7,790 trees is reported to have been planted in and around the complex. **However, gap filling needs to be continued and proper density to be ensured.** **Complied.**
B. ADDITIONAL CONDITIONS		
54	Industries shall prepare and implement a scheme for reuse / recycle of effluent by adopting best technologies available	To maximum recycle and reuse of effluent, the PP has reportedly designed and commissioned effluent treatment units. They are consisting of Advanced Anaerobic UASB system and Membrane based Aeration system i.e., Membrane Bioreactor (MBR), Ultrafiltration and Reverse Osmosis (RO) systems. **Complied.**
C. GENERAL CONDITIONS		
55	In the event of failure of any pollution control system adopted by the unit, the unit shall be safely closed down and shall not be restarted until the desired efficiency of	Pollution control systems in the plant are connected through the DCS system. In the event of failure of pollution control system, a trigger/alarm is raised in the DCS system which

	the control equipment has been achieved.	prevents the plant from restarting. It is informed that during the period of Apr-Sep'16, no such failure of pollution control equipment has been observed. **Complied.**
56	The company shall strictly follow all the recommendations mentioned in the Chapter on Corporate Responsibility for Environment Protection (CREP) published by the Central Pollution Control Board as may be applicable.	Recommendations mentioned in the CREP are being complied. **However, details may be enumerated in future compliance reports.** **Complied**
57	Pucca flooring / impervious layer shall be provided in the work areas, chemical storage areas and chemical handling areas to minimize soil contamination.	Pucca flooring has been provided in all work areas, chemical storage areas and chemical handling areas as required. **Complied.**
	Leakages from the pipes, pumps, shall be minimal and if occurs shall be arrested promptly.	All pipes and material transfer systems are said to be visually inspected at regular frequency and leaks are promptly identified and arrested. **Complied.**
59	All recommendations made in the EIA, EMP and other documents Submitted by the project proponent shall be strictly implemented.	Recommendations of EIA/EMP has been implemented. **Complied.**
60	The project proponent shall also comply with any additional condition that may be imposed by The SEAC or SEIAA or any other competent authority for the purpose of the environmental protection and management.	PP submitted by PP that no additional condition has been imposed by SEIAA, Gujarat for this EC. **Not Applicable**
61	No further expansion or modifications in the plant shall be carried out without prior approval of the MoEF / SEIAA, as the case may be. In case of deviations or alterations in the project proposal from those submitted to MoEF/SEIAA/SEAC for clearance, a fresh reference shall be made to the SEIAA / SEAC to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Expansion or Modification of the RIL-DMD complex has been carried out after obtaining the required Environmental Clearance (EC) under the EIA Notification, 2006. First EC was taken to establish greenfield petrochemical complex in 1991. Its expansion took place with the EC taken in 2007,2008& 2011. This EC is application was also made for the further expansion of this petrochemical complex. It has been stated that no changes/deviations have taken place at the DMD complex during the review period. **Complied.**
62	The project authorities shall earmark adequate funds to implement the conditions stipulated by SEIAA as well as GPCB along with the implementation schedule for all the conditions stipulated herein.	As submitted by PP, adequate fund have been allocated for implementing the conditions stipulated conditions given by SEIAA and GPCB. Recurring expenditure incurred to comply with the conditions stipulated by MoEF/ SEIAA/GPCB for year 2015-2016 is about 8 crore. **Complied.**

	The funds so provided shall not be diverted for any other purpose.	Funds allocated for Environmental management is used only for that purpose and stated to be not diverted for any other use. **Complied.**
63	The applicant shall inform the public that the project has been accorded environmental clearance by The SEIAA and that the copies of the clearance letter are available with the GPCB and may also be seen at the Website of SEIAA / SEAC / GPCB. This shall be advertised within seven days from the date of the clearance letter, in at least two local newspapers that are widely circulated in the region, one of which shall be in the Gujarati language and the other in English. A copy each of the same shall be forwarded to the concerned Regional Office of the Ministry.	As informed, the public was informed through public notice published published in English New Paper in Times of India on 13.09.2011 and Gujarati Newspaper in Divya Bhaskar on 11.09.2011 and the information has also been forwarded to the Regional Office of the MoEF, Bhopal. . Complied.
64	It shall be mandatory for the project management to submit half-yearly compliance report in respect of the stipulated prior environmental clearance terms and conditions in hard and soft copies to the regulatory authority concerned, on 1st June and 1st December of each calendar year.	Six monthly compliance report is being submitted to MoEF Bhopal regularly. Last compliance report was submitted vide letter No GPC/HSE/E/476/0106 dated 31st may 2016. **Complied.**
65	The project authorities shall also adhere to the stipulations made by the Gujarat Pollution Control Board.	All the stipulations laid down by GPCB is stated to be complied with. Complied
66	The project authorities shall inform the GPCB, RO of MoEF and SEIAA about the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	The PP informed that the project is already commenced and the necessary information about the 'project's financial closure and project commencement was provided along with the first compliance report of this EC. Complied
67	The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not found satisfactory.	This condition is not applicable to PP
68	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2008 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	This condition is not applicable to PP but taken cognizance.
69	This Environmental Clearance is valid for five years from the date of issue.	Taken cognisance of.

Summary and inference:

The compliance seems to be generally good. Of the total of 69 conditions, 58 are fully complied, 1 is almost complied, 4 are partly complied,1 is under compliance, 2 are found not applicable, 1 is not complied and 2 require to be taken cognisance. The inadequacies and deficiencies and guidelines for future compliance have been indicated in bold letters against these conditions.

Court case and Notices:

It has been reported that there is no court case on this project

Details of Notices issued during last three years.

Date	Details of Directions by CPCB/ Show Cause Notice (SCN) issued by GPCB, if any	Date	Reply from PA
Letter no. GPCB-HAZ-GEN-503/316347 dated 04.06.2015	Show Cause Notice issued by GPCB regarding observation of no submission of monthly data of hazardous waste disposed / incinerated at our captive TSDF/Incinerator and foresaid details.	Letter No. RIL/HSE/E/474 dated 19.06.2015	Replied to notice with supporting evidences as we are regularly submitting the details as a part of GPCB Monthly Report in hard copy to GPCB Regional Office Bharuch and GPCB Gandhinagar and also are submitting the required details in GPCB XGN portal. Therefore it is resolved. The query was resolved and no further action has been initiated.
Letter no.: B-29016/ 04/06/PCI-I/44989 dtd. 24.07.2015 received on 24.08.2015	Directions issued by CPCB under regarding installation of on-line effluent and emission monitoring systems	Letter No. RIL/HSE/E/474/2908/PC dated 29.08.2015	Replied to letter with following details 1. Documentary evidence regarding CAPEX raised for installation of online emission & effluent monitoring system. 2. Letter to CPCB through CPMA dtd. 24.06.2015 providing time schedule for completion of establishing online facilities and connecting to GPCB/CPCB server by December 2016. Continuous Emissions Monitoring System is installed and commissioned in all stacks and at ETP outlet.

Scientist 'F'

Counter signed by:
Addl. PCCF (C)