

**ENVIRONMENTAL CLEARANCE
COMPLIANCES FOR
RIL REFINERIES AT JAMNAGAR**

Reliance Industries Limited, Jamnagar

Environmental Clearance: Letter no J.11011/232/2005 - IA (II) - I Dt. 3rd Aug. 2005

Sr. No.	Stipulations	Status of compliance
1	The company shall ensure strict implementation of compliance to the stipulations made by MOEF vide OM no. J-11011/25/1994-IA~1 dated 15th September, 1995 and 6th September, 2000.	Being Complied
2	The gaseous emissions (SO ₂ , NO _x , CO, NMHC & Benzene) from the various process units shall conform to the standards prescribed under the Environment (Protection) Rules, 1986 or norms stipulated by the SPCB, whichever is more stringent. At no time, the emission level shall go beyond the stipulated standards. 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.	Being complied. The monitoring reports are submitted to GPCB every month. Regular monitoring is carried out by GPCB. The emission levels are well within the stipulated norms.
3	Ambient air quality monitoring stations, [SPM, SO ₂ , NO _x and NMHC, Benzene] shall be set up in the refinery complex in consultation with SPCB, based on occurrence of maximum ground level concentration and downwind direction of wind. The monitoring network must be decided based on modeling exercise to represent short term GLCs.	Complied. Total ten ambient air quality monitoring stations have been set up for monitoring of all the parameters mentioned in NAAQS (2009). The locations were selected based on dispersion modeling study carried out by NEERI & in consultation with GPCB.
	Continuous on-line stack monitoring equipment shall be installed for measurement of SO ₂ and NO _x .	Complied. Continuous on-line stack monitoring equipment have been installed for SO ₂ and NO _x in major stacks.
	Data on VOC shall be monitored and submitted to the SPCB / Ministry.	Being complied. VOC monitoring at the plant periphery is carried out and reports are submitted to GPCB on a monthly basis and MoEF every six months.
4	The total SO ₂ emission from the refinery complex shall not exceed 49TPD after fully stabilizing of the expansion and modernization of the refinery complex and upgrading the existing facilities.	Being complied. The total SO ₂ emission is below 49 TPD.
	SO ₂ emission report may be made on daily basis for all the stacks (fuel burning and process emissions through the computerized mechanism).	Being complied. Computerized statements are prepared for the total SO ₂ emission of the refinery complex (for all the stacks - fuel burning & process emissions) on daily basis.
	Further, regular monitoring of stacks every fortnight must also be carried out to cross check the data obtained from computerized	Each stack is monitored fortnightly by MoEF recognised consultant to cross check computerised monitoring.

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	monitoring by engaging a reputed organization.	
	In addition a monthly Sulphur balance statement indicating type of fluid. Its S content, product s-content. SO ₂ emission etc. may be made. Daily, fortnightly and monthly reports generated as above shall be sent to the GPCB, SPCB and MoEF.	The sulphur balance statement is inspected by GPCB during their visit and submitted whenever required.
5	All the Sulphur Recovery Units shall have tail gas treatment (TGT) facilities and the overall efficiency of the SRU with TGT unit shall be 99.9%.	Complied. The Sulphur Recovery Units has been installed with TGTU. The overall efficiency of SRU with TGTU is more than 99.9%.
6	Ultra Low-NO _x burners shall be provided in the new furnaces to avoid excessive formation of NO _x . The existing low NO _x burners are also to be phased out and replaced with Ultra low-NO _x burners.	The excessive NO _x formation is avoided and kept below the prescribed limits with the use of suitable low NO _x burners.
7	Fugitive emissions of HC from product storage tank farms etc. must be regularly monitored.	Being Complied. The fugitive emissions of HC from the storage tanks are monitored as per the API standards.
	Sensors for detecting HC leakage shall be provided at strategic locations.	Complied. More than 22,000 gas detectors and alarms are installed in the refinery complex at strategic locations for detecting Toxic gas & HC leakage. If the leakage is above the preset values indicated through alarms immediate corrective actions are carried out.
	Necessary measures shall be adopted so as to ensure that the NMHC levels outside the refinery complex premises does not exceed 160 µg/m ³ .	Being complied. Regular monitoring of NMHC levels around the boundary of the refinery complex is conducted. The levels are well within the stipulated norms of 160µg/m ³ .
	Monitored data shall be submitted to the GPCB / CPCB every three months and to Ministry of Environment & Forests every six months.	Being complied. The monitored data is submitted to GPCB on monthly basis and six monthly reports are submitted to MoEF.
8	For control of fugitive emissions, the company shall augment the existing flare system and route all unsaturated hydrocarbons to the flare system in addition to the existing flare system.	Being complied. The safety and emergency discharge of hydrocarbons are routed to flare systems. The flare system is designed for worst case scenario.
	All the pumps and other equipment where there is a likelihood of HC leakages shall be provided with LEL indicators and also provide for immediate isolation of such equipment, in case of a leakage.	Being Complied. All the pumps and other equipment where there is a likelihood of HC leakages mechanical seals are provided. A network of F&G alarm system is installed for immediate detection and corrective actions.
	The company shall adopt Leak Detection and Repair (LDAR) program for quantification and control of fugitive emissions.	Being Complied. The LDAR programs are conducted in for quantification and control of fugitive emissions.

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9	All new stacks shall be of appropriate design and height and shall be attached to pollution control systems, wherever necessary. All stacks in the complex must meet the minimum stack height criteria as prescribed in the Environment Protection Rules.	Complied. All the stacks are provided in accordance with the minimum stack height criteria as prescribed in the Environmental Protection Rules.
10	All new standards / norms which are being proposed by CPCB for refinery projects / petrochemical units shall be applicable for the proposed expansion and modernization of the petrochemical refinery complex. These standards shall be incorporated into the detail designs for the proposed expansion and modernization. The existing refinery complex shall also be upgraded to the new above mentioned emission standards.	The new and the old refinery units are complying with the latest standards notified by MoEF.
11	The Central Pollution Control Board shall carry out independent monitoring of all the stacks for SO ₂ and NO _x .	NA
12	Ground water shall not be tapped for construction, industrial or domestic uses including the township. All the water requirements of the refinery complex shall be met by desalination of seawater.	Being Complied. No groundwater is tapped and used for any of the activities in the refinery complex or township. Desalination plants have been installed to meet the total water demand of the refinery complex. Rain water harvesting through storm water ponds are developed having capacity around 1.3 million cum and is reused.
13	A new effluent treatment plant with primary, secondary and tertiary treatment facility shall be constructed to cater to the additional effluent load. Liquid effluents shall be treated to conform to the standards stipulated by the GPCB / Ministry of Environment & Forests under EPA 1986 and also the new norms being specified.	Complied. A new effluent treatment plant with primary, secondary and tertiary treatment facility including RO system (for improving the quality of treated effluent) has been constructed to cater to the additional effluent load. The treated effluent conforms to the latest standards stipulated by MoEF & GPCB as specified.
	Treated effluent be recycled and reused to achieve zero discharge of effluent. The domestic effluent after treatment and conforming to the prescribed standards shall be used for greenbelt development.	Being complied. The treated effluent from ETP is recycled and reused to achieve zero discharge of effluent. The treated sewage/domestic effluent is reused/recycled in the green belt.
14	The return seawater (brine from desalination plant, cooling tower blow down etc.) shall be discharged to the sea through a properly designed diffuser system. The existing diffuser system shall be augmented to cater to the additional discharge volume. The augmentation of the existing diffuser	Complied. A well designed new diffuser system is installed in consultation with NIO for the discharge of return seawater (brine from desalination plant, cooling tower blow down etc.) from the refinery complex to sea. The new diffuser system and the

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	system/any other diffuser system in terms of dispersion in the sea shall meet the standards and certified by M/s National Institute of Oceanography. The company shall take the approval of the GPCB for the discharge of the return sea water.	location of discharge is certified by M/s National Institute of Oceanography (NIO) and approved by GPCB. The return seawater quality & dispersion meets the standards
15	The requisite numbers of effluent quality monitoring stations shall be planned with adequate facilities especially for parameters like phenols, sulphides, oil and grease, suspended solids, BOD, COD, pH and flow.	Being complied. The effluent parameters are monitored at various sources and also at different stages of effluent treatment plant for the indicated parameters.
	The salinity and temperature of the return seawater shall be monitored periodically and monitored data submitted to the GPCB and Ministry of Environment & Forests on a periodic basis.	Being complied. The salinity and temperature of the return seawater is monitored before discharge. The monitored data is submitted to GPCB on monthly basis.
16	M/s RIL shall monitor the groundwater quality at the locations as suggested by the Central Ground Water Board. Monitoring results of the same shall be submitted to the GPCB/CPCB and MOEF.	Being complied. Groundwater quality is monitored in nearby villages as suggested by Central Ground Water Board. The monitoring results are submitted to GPCB on monthly basis and on six monthly basis to MoEF.
17	M/s RIL shall undertake rainwater harvesting measures to recharge the ground water in the area in consultation with Central Ground Water Board and Gujarat Pollution Control Board.	Complied. Rainwater Harvesting is carried out through a network of storm water ponds. The storm runoff are collected in the ponds and overflows to the natural drains. However the recharging of ground water is not feasible due to the geological formation which is rocky.
18	M/s RIL shall undertake measures to recover oil from oily sludge and to charge into the feed of Delayed Coker Unit.	Being complied. The Oily sludge recovered from ETP is re-processed in Delayed Coker unit. The oily sludge generated from the storage tank bottom during tank maintenance is sent to a common incineration facility at M/s Saurashtra Enviro Projects Pvt Ltd. Kutch.
	An incinerator has to be provided for the oily rags as per the guidelines of CPCB.	Complied. Oily rags are incinerated in captive Incinerator Plant / common incinerator managed by M/s Saurashtra Enviro Projects Pvt Ltd. Kutch, that is designed as per the guidelines issued by CPCB.
19	Occupational Health Surveillance of the employees and workers shall be done on a regular basis and records maintained as per the Factories Act.	Being Complied. Occupational Health Surveillance of the employees and workers are conducted regularly and the records are maintained as per the Factories Act.

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20	The extension of the existing tank farm shall be designed in such a way that the residual flow including floor washing do not percolate to the marine areas.	Complied. Appropriate design measures have been considered and implemented and standard operating procedures are followed so that the residual flow including floor washing do not percolate to marine areas.
	The augmentation and expansion of the marine facilities like product berths, Crude and product SPMs, seawater intake channel and outfall shall be done in consultation with the National Institute of Oceanography.	Complied. The augmentation and expansion of the marine facilities were carried out in consultation with NIO.
21	The marine water quality shall be regularly monitored for the water quality (temperature, petroleum hydrocarbons, phenols, sulphides, total organic carbon), sediment quality (trace elements, petroleum hydrocarbons, TOC and sediment size) and biological parameters (primary productivity, benthos, fish quality and growth, biomass, phytoplankton and zooplankton). The present monitoring program shall be continued and upgraded for the expansion and modernization of the refinery complex.	Being complied. The marine environment is regularly monitored. During Dec.'97 to Dec.'99, this study was carried out by Saurashtra University. NIO has carried out the Marine Environmental Monitoring in Dec' 2000 & May' 2001; Feb & May' 2005; Jan & May' 2006 ,Feb & May' 2010, Apr & Aug '2012 and Feb & March 2013
22	No discharge of crude oil / products washings shall be done in the Gulf.	No crude oil washings are done in the Gulf as these carriers have segregated ballast tanks.
	No dredging in the sea should be undertaken except where unavoidable during construction and operation while augmenting and expansion of the marine facilities. Details of the same shall be provided to the Director, Marine Park & Sanctuary, Jamnagar, and Gujarat Pollution Control Board.	Complied.
23	The Company shall also comply with all the conditions and safeguards prescribed in the EIA & Risk Assessment Reports prepared by NEERI.	Complied. All the conditions and safeguards prescribed in the EIA & Risk Assessment Reports prepared by NEERI is carried out and implemented.
	Pressurized storage of LPG shall be reduced and company must shift to either cryogenic/mounded storage.	Cryogenic storage for storage of LPG has been provided, where required and feasible.
24	The On-site and Off-site Emergency Preparedness Plans, Oil Spill Contingency Plans, Marine Disaster Management Plan shall be updated for the expansion and modernization for the enhanced refinery throughput and submitted to the Ministry before commissioning at the enhanced capacity.	Complied. The On-site and Off-site Emergency Preparedness Plans, Oil Spill Contingency Plans, Marine Disaster Management Plan were updated for the expansion and modernization for the enhanced refinery throughput and submitted to the Ministry before commissioning at the enhanced capacity.

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25	The Environmental Management Cell and laboratory facilities for the collection of the samples shall be augmented with suitable facilities and qualified personnel and directly report to the chief executive of the refinery complex.	Complied. The Environmental Management Cell and laboratory facilities for the collection of the samples were augmented with suitable facilities. A full-fledged Environmental Cell consisting of suitably qualified engineers is headed by Vice President (Environment), who reports to the Site President.
B. GENERAL CONDITIONS:		
1	The project authorities must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board and the State Government.	Being complied.
2	No further expansion or modernization in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	We have noted this condition and required approvals are obtained as per EIA notification 2006.
3	At no time, the emissions shall go beyond the prescribed standards. 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 shall not be restarted until the desired efficiency has been achieved. .	Being complied.
4	The overall noise levels in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation.	Being complied. Appropriate engineering control measures are provided with acoustic hoods, silencers, enclosures etc. at identified sources of noise generation. The overall noise levels in and around the plant area are kept well within the standards (85 dBA).
	The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	Being complied. Regular monitoring of the ambient noise levels are conducted and conforms to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time). The monitoring data are submitted to GPCB on monthly basis and MoEF on six monthly basis.
5	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. Necessary approvals from Chief Controller of Explosives must be obtained before commission of the project.	Complied. The provisions made in Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 as amended in 2000 for handling of hazardous chemicals etc. are complied with. Necessary approvals from Chief Controller of Explosives have been obtained.

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6	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management and Handling) Rules,2003. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	We are complying with the stipulated conditions in handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. Consolidated Consent & Authorization have been obtained from GPCB for collections/treatment/storage/disposal of hazardous wastes.
7	The project authorities will provide requisite 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. The funds so provided should not be diverted for any other purposes.	Being complied. All the stipulated conditions have been implemented by providing requisite funds 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. The funds so provided are not diverted for any other purposes.
8	The stipulated conditions will be monitored by the Regional of this Ministry at Bhopal/Central Pollution Control Board/State Pollution Control Board.	Are being done.
	A six monthly compliance report and the monitored data should be submitted to them regularly.	A six monthly compliance report and the monitoring data are submitted to MoEF regional office and monthly reports to GPCB.
9	The Project Proponent should 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 from the date of issue of the clearance letter at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office.	Complied. The advertisement regarding information to 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, published within the stipulated period in two local newspaper that are widely circulated in the region on 10th August 2005 in English daily "The Indian Express" and Gujarathi Daily "Jansatha". The copy of the same has been submitted to GPCB.
10	The Project Authorities should inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Complied. The Project Authorities have informed the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities along with the date of commencing the land development work to GPCB & MoEF.

Reliance Industries Limited, Jamnagar

Compliance Report for the conditions of Environment Clearance granted by MoEF vide letter no.: J-11011/149/2007-IA II (I) dtd: 30th March 2010, for Petroleum and petrochemical complex in Multi products Special Economic Zone

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B.	Specific Conditions:	
(i)	The centralized ETP and standalone ETP shall be designed based on the raw water and wastewater quality. Design details of ETP shall be submitted to the Ministry. The effluent shall be segregated into low TDS and High TDS stream which shall after primary, secondary and tertiary treatment shall be used and recycled for green belt development, cooling tower make up etc. The treated effluent shall comply with the prescribed standards. The return sea water shall be discharged into the sea through a multi-port diffuser at a point identified by NIO.	Will be complied with. The ETP is in the design stage.
(ii)	The Company shall provide details of the model used for the diffuser for discharge of saline water into sea and the efficacy of the existing diffuser which is based on the HYDRODYN model and also compare with CORMIX model. The depth of discharge of diffuser shall be determined as per the above model.	Will be complied with. The diffuser design is being taken up.
(iii)	The hot water effluent and outfall shall be discharge as per the prescribed standards.	Will be complied with.
(iv)	The company shall comply with effluent and emission standards for Petrochemical Plants of CPCB/MoEF.	Will be complied with.
(v)	Ambient air quality data for one season other than monsoon within 10km radius of the complex particularly one station shall be established where maximum GLC is anticipated with respect to SO ₂ , NO _x , PM ₁₀ , Ozone, CO, Benzene and Benzopyrene and data submitted to MoEF/CPCB/SPCB.	Will be complied with.
(vi)	Action plan for reduction of SO ₂ and NO _x emissions from the present level shall be submitted to the Ministry.	Will be complied with.
(vii)	The company shall install low NO _x burner to mitigate the NO _x emission and cyclone, ventury scrubbers, sulphur recovery unit and tail gas treatment for mitigating SO ₂ emission.	Will be complied with.

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(viii)	The company shall install detectors for phosgene and specific steps shall be taken for phosgene management.	Will be complied with.
(ix)	The gaseous emissions (SO ₂ , PM ₁₀ , NO _x , CO and NMHC) from the various process units shall conform to the standards prescribed under Environment (protection) Rules, 1986 or norms stipulated by the SPCB whichever is more stringent. At no time, the emission level shall go beyond the stipulated standards. In the event of failure of pollution control system(s) adopted by the unit, the respective unite should not be restarted until the control measures are rectified to achieve the desired efficiency.	Will be complied with.
(x)	The proponent shall upload the status of compliance of the stipulated EC conditions, including monitored data on its website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal office of CPCB and the SPCB. The criteria pollutant namely; Particulate matter (PM ₁₀ , SO ₂ , NO _x , VOC and HC (Ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project shall be monitored and displayed at the convenient location near the main gate of the company in the public domain.	Will be complied with.
(xi)	Process emissions shall be controlled by scrubbers. Flue gas emissions from the various stacks attached to the boilers, furnace/heaters shall conform to the prescribed standards.	Will be complied with.
(xii)	The gaseous emissions from the DG sets shall be dispersed through stack of adequate height as per CPCB/State Pollution Control Board standards. Acoustic enclosures shall be provided to mitigate the noise.	Will be complied with.
(xiii)	The company shall use low sulphur fuel to minimize SO ₂ emission. Stacks which are contributing to more SO ₂ emissions shall be identified and SO ₂ emissions shall be reduced by changing the fuel or by increasing the height of major stacks to bring GLC within the prescribed limits.	Will be complied with.
(xiv)	To control the fugitive emissions, the unit shall have provision for internal floating	Will be complied with.

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	roof tanks with flexible double seal for MS and intermediate products; mechanical seals in pumps; regular inspection of floating roof seals and proper maintenance of floating roof seals for storage tanks; preventive maintenance of valves and other equipment; regular skimming of oil from separators/equalization basin in ETP. The units shall assess and minimize the fugitive VOC emission wherever possible.	
(xv)	Fugitive emissions of HC from product storage tank yards etc must be regularly monitored. Sensors for detecting HC leakage shall also be provided at strategic locations.	Will be complied with.
(xvi)	M/s RIL shall implement Leak Detection and Repair (LDAR) programme using a portable VOC detection instrument shall be done on distribution lines and tanks.	Will be complied with.
(xvii)	Measures shall be undertaken for odour control and inventory of odours compounds shall be maintained.	Will be complied with.
(xviii)	The product-loading gantry shall be connected to the product sphere in closed circuit through the vapour arm connected to the tanker. Data on fugitive emissions shall be regularly monitored and records maintained.	Will be complied with.
(xix)	The company shall ensure that no halogenated organic is sent to the flares. 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. Any stream containing organic carbon, other than halogenated shall be connected to proper flaring system, if not to a recovery device or an incinerator.	Will be complied with. The system will be designed accordingly.
(xx)	The company shall obtain Authorization for collection, storage and disposal of hazardous waste under the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 for management of Hazardous wastes and prior permission from GPCB shall be obtained for disposal of solid / hazardous waste in the TSDF. Details of regarding type of catalyst to be used and plan for disposal of spent catalyst shall be submitted. The company shall incinerate	Will be complied with. The incinerator and secured landfill facility will be designed as per the CPCB guidelines.

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	the oil cotton ragas only. The design of the incinerator and secured landfill facility shall be as per the CPCB guidelines.	
(xxi)	M/s RIL shall undertake measures for fire fighting facilities in case of emergency.	Will be complied with. Elaborate firefighting facilities will be provided.
(xxii)	The company shall submit time bound action plan for brine management. Further, possibility of setting up of salt manufacturing facility for management of huge volume of brine shall be explored or tie up with the salt manufacturing units in the area for brine disposal.	Noted. Opportunities will be explored for brine usage with salt manufacturing units.
(xxiii)	The company shall prepare integrated risk assessment report considering domino effect which shall be done after freezing overall layout of the Petrochemical Complex with precise location of all individual plants as well as all offsite and battery limit storage areas of the Petrochemical Complex and after all storage capacities and tank sizes are decided.	Will be complied with.
(xxiv)	The Quantitative Risk Assessment (QRA) shall be done in comprehensive manner by taking into all consideration listed below but not limited to, a) Report to consider two mega size refineries in the same industrial area and shall deal with the risk arising out of major incident (VCE, Flash fire) in either the existing refineries or proposed petrochemical complex and its domino effect on the each other b) Report to consider precise layout of particular units, bulk storages and storage quantities determined, details of safety system, safeguard provided against domino effect	Will be complied with
(xxv)	All pressure vessels shall be of SIL-3 level product at par with existing refineries.	Will be complied with.
(xxvi)	Any relief system for major hazardous releases shall have at least double or triple backup system against the possibility of human error.	Will be complied with.
(xxvii)	Risk assessment shall include BLEVE for propane and shall be considered in the lay out plan.	Risk Assessment studies will include BLEVE for propane and will be considered while finalizing the layout plan. Will be complied with.
(xxviii)	The company shall submit reports of last	Will be complied with

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	2-3 years regarding external safety audit.	
(xxix)	<p>Since some of the design parameters have not been frozen at this stage of project, once the Front End Engineering Design Document (FEED) is firmed up, necessary details for integrated QRA study are available particularly with respect to lay out including, the bulk storages with storage quantities determined, details of safety system, safeguard provided against domino effect and other details as prescribed in the specific conditions stipulated above regarding catalyst and the mode of their disposal, steps for mitigation of SO₂ and NO_x releases details of phosgene management and model used for diffuser for discharged of saline water into the sea shall be submitted to the Ministry. The information provided shall be place before the Committee so that the Committee suggests mid-course correction, and if considered necessary additional environmental safeguards are stipulated for compliance by M/s RIL.</p>	<p>Will be complied after finalization of design details.</p>
(xxx)	<p>M/s RIL shall undertake rainwater harvesting measures, to recharge the ground water and also to minimize the water drawl from the weir.</p>	<p>Storm water ponds will be included in the design to collect the run-off water from the plant area. More steps for rainwater harvesting will be taken in consultation with Central Ground Water Board. Further, only sea water drawl is envisaged.</p>
(xxxi)	<p>Green belt in 33% of the plant shall be provided to mitigate the effects of fugitive emissions all around the plant as per CPCB guidelines in consultation with local DFO.</p>	<p>Will be complied with</p>
(xxxii)	<p>Occupational health surveillance programme shall be undertaken as regular exercise for all the employees. The first aid facilities in the occupational health centre shall be strengthened and the medical records of each employees shall be maintained separately.</p>	<p>Being complied with and will be continued</p>
(xxxiii)	<p>Provision shall be made for the housing for the construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile sewage treatment plant, safe drinking water, medical health care, crèche etc. The housing may be in the</p>	<p>Being complied with and will be continued</p>

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	form of temporary structure to be removed after the completion of the project. All the construction wastes shall be managed so that there is no impact on the surrounding environment.	
(xxxiv)	The Company shall comply with all the conditions stipulated vide ministry's clearance letter no. J-111011/232/2005-IA.II(I) dated 3 rd August,2005 for expansion and modernization of petrochemical refinery complex.	Being complied with
B	GENERAL CONDITION:	
i.	The project authorities must strictly adhere to the stipulations made by the Gujarat Pollution Control Board and the state Government.	Will be complied with.
ii.	No further expansion or modernization in the plant should be carried out without prior approval of the ministry of Environment and Forests.	We have noted this condition and required approvals are obtained as per EIA notification 2006.
iii.	At no time, the emission should go beyond the prescribed standards. 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 until the desired efficiency has been achieved.	Will be complied with.
iv.	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules.	Will be complied with.
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. Necessary approvals from chief controller of explosives must be obtained before commission of the project.	Will be complied with
vi.	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the ministry of Environment and Forest as well as the State Government along with the	Will be complied with

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	implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purposes.	
vii.	The stipulated conditions will be monitored by the Regional of this Ministry at Bhopal/Central Pollution Control Board / State Pollution Control Board. A six monthly compliance report and the monitored data should be submitted to them regularly.	Will be complied with
viii	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copy as well as by e-mail) to the respective Regional office of MoEF, the respective zonal office of CPCB and the State Pollution Control Board.	Will be complied with
ix.	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parisad/ Municipal Corporation, Urban local Body and the local NGO, if any, from who suggestions/ representations, if any were received while processing the proposal.	Complied with
x.	The Environmental statement for each financial years ending 31 st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.	Will be complied with
xi.	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at website of Ministry at http://envfor.nic.in This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall	Complied.

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	be forwarded to concerned the Regional Office of the Ministry.	
xii.	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closures and final approval of the project by the concerned authorities and the date of start of the project.	Will be complied with
10.	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Noted
11.	The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.	Noted
12.	Any appeal against this environmental clearance shall lie with the National Appellate Authority, if preferred, within a period of 30 days as prescribed under section 11 of the National Environment Appellate Authority Act, 1997.	Noted
13.	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air, (Prevention & Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986 Hazardous Wastes (Management and Handling) Rules, 2003/ 2008 and the Public Liability Insurance Act,1991 along with their amendments and rules.	Noted

**MONITORING REPORTS FOR
RIL REFINERIES AT JAMNAGAR**

Stack Emission Monitoring Report for the month of April'14 to September'14 (RIL, Jamnagar)

S.No.	Furnace	SO ₂ (mg/Nm ³)		NO _x (mg/Nm ³)		PM (mg/Nm ³)		CO (mg/Nm ³)		HC (mg/Nm ³)		H ₂ S (mg/Nm ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
I	Stack Involving Fuel Burning												
A	CPP												
1	HRSG-1	11.5	14.5	2.6	3.1	2.4	3.1	3.4	3.7	1.5	1.7	-	-
2	HRSG-2	11	13.5	2.6	3.1	2	3.1	3.4	3.7	1.4	1.7	-	-
3	HRSG-3	10.2	14.4	2.6	2.9	2	3.7	3.3	3.7	1.4	1.7	-	-
4	HRSG-4	10.2	12.5	2.6	2.9	2	3.1	3.4	3.8	1.4	1.7	-	-
5	HRSG-5	10.2	13.5	2.6	2.8	2	3.1	3.4	3.7	1.4	1.7	-	-
6	HRSG-6	11.5	14	2.6	2.9	2	3.7	3.4	3.8	1.4	1.7	-	-
7	HRSG-7	10.2	13.5	2.6	3.1	2.4	3.7	3.5	3.7	1.4	1.7	-	-
8	HRSG-8	10.2	13.5	2.6	2.9	2	3.1	3.4	3.7	1.4	2.3	-	-
9	HRSG-9	10.2	13.5	2.5	2.8	2	3.1	3.4	3.7	1.4	1.7	-	-
10	Aux-Bir-1	12	175*	4.1	4.4	2.8	19.5	4	4.5	2.2	2.4	-	-
11	Aux-Bir-2	13.5	184*	4	4.4	2.4	20.4	4.1	4.6	2.1	2.4	-	-
12	Aux-Bir-3	152	184*	4.2	4.4	15.5	20.2	4.2	4.5	2.2	2.4	-	-
13	Aux-Bir-4	12.5	172*	4.1	4.4	2.4	20.4	4.2	4.4	2.2	2.4	-	-
14	Aux-Bir-5	12	184*	4	4.4	3.1	20.4	4.1	4.6	2.1	2.4	-	-
15	Aux-Bir-6	96	184*	4.1	4.4	13.1	20.5	4.2	4.5	2.2	2.4	-	-
B	Crude Complex												
1	CDU-1-F01	12.5	158*	3.4	3.8	3.1	15.6	5.4	6.5	2.3	2.5	-	-
2	CDU-1-F51	13.5	156*	3.4	3.8	2.8	17.4	5.5	6.4	2.2	2.6	-	-
3	VDU-1	10.4	13.5	3	3.2	2	3.1	4.5	5.2	1.8	2.1	-	-
4	CDU-2-F01	12.8	155*	3.4	3.6	3.1	17.5	5.5	6.6	2.3	2.6	-	-
5	CDU-2-F51	135	156*	3.4	3.7	3.1	17.5	5.5	6.6	2.3	2.6	-	-
6	VDU-2	10.2	13.5	3.1	3.2	2	3.1	4.4	5.2	1.9	2.1	-	-

S.No.	Furnace	SO ₂ (mg/Nm ³)		NO _x (mg/Nm ³)		PM (mg/Nm ³)		CO (mg/Nm ³)		HC (mg/Nm ³)		H ₂ S (mg/Nm ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
7	DHT-1	10.2	14.4	2.6	2.9	2	3.1	3.4	3.7	1.5	1.7	-	-
8	DHT-2	10.2	13.5	2.6	2.9	2	3.1	3.4	3.7	1.5	1.7	-	-
9	VGO HT-1	10.2	13.5	2.6	2.9	2	3.1	3.4	3.7	1.4	1.7	-	-
10	VGO HT-2	10.2	13.5	2.6	2.8	2	2.8	3.5	3.6	1.5	1.8	-	-
11	LNHT	Not Operating											
12	Hydrogen-1	8.8	9	3.5	3.6	-	-	3.7		1.7		-	-
13	Hydrogen-2	8.8	10.2	3.2	3.6	-	-	3.6	3.8	1.5	1.8	-	-
14	Hydrogen-3	8.8	10.2	3.2	3.4	-	-	3.5	3.8	1.6	1.9	-	-
15	KHT	10.2	12.2	2.5	2.8	2	2.8	3.4	3.5	1.4	1.6	-	-
16	CNHT	9	12.5	2.5	2.8	2	2.8	3.4	3.6	1.4	1.6	-	-
C	Aromatics												
1	Platforming	11.4	14.6	3.1	3.4	2.4	3.7	3.5	3.8	1.6	1.7	-	-
2	HNHT	9.5	12.2	2.5	2.8	2	2.8	3.3	3.5	1.4	1.5	-	-
3	Xylene-1	48	74	3.2	3.4	8.6	10.5	3.6	3.7	1.6	1.7	-	-
4	Xylene-2	48	68	3.1	3.4	8.5	11	3.5	3.7	1.6	1.7	-	-
5	Xylene-3	44	6.8	3.2	3.4	8.5	11.5	3.6	3.8	1.6	1.8	-	-
6	O-Xylene	11.5	76*	3.1	3.5	2.8	11.6	3.6	3.8	1.6	1.8	-	-
7	Isomar-1	10.2	13.5	3.6	3.8	2	3.1	3.2	3.4	1.4	1.5	-	-
8	Isomar-2	9.5	12.6	3.6	3.8	2	3.1	3.2	3.5	1.4	1.6	-	-
9	Isomar-3	9.5	12.5	3.6	3.7	2.2	3.3	3.2	3.5	1.4	1.5	-	-
10	Tatoray-1	12	14.6	3.7	4	2	4.3	4	4.4	2.1	2.4	-	-
11	Tatoray-2	12	14.6	3.6	4	2.4	3.7	4	4.3	2.1	2.4	-	-
D	Coker												
1	Coker-1	10.2	13.5	3.4	3.7	2.2	2.8	3.4	3.7	1.4	1.6	-	-
2	Coker-2	10.2	12.5	3.5	3.7	2	3.1	3.4	3.7	1.4	1.6	-	-
3	Coker-3	10.2	13.5	3.4	3.6	2	3.7	3.4	3.8	1.4	1.6	-	-

S.No.	Furnace	SO ₂ (mg/Nm ³)		NO _x (mg/Nm ³)		PM (mg/Nm ³)		CO (mg/Nm ³)		HC (mg/Nm ³)		H ₂ S (mg/Nm ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
4	Coker-4	10.2	13.5	3.4	3.6	2	3.1	3.4	3.7	1.4	1.6	-	-
II	Stack Involving Process Emission												
A	FCC Complex												
1	FCCC-N	148	170	5.2	5.6	65	78	6.2	6.6	2.4	2.6	-	-
2	FCCC-S	146	166	5.3	5.5	62	76	6.3	6.5	2.3	2.6	-	-
B	Sulphur Complex												
1	SRU-1	1235	1568	5.1	5.4	11.8	14.5	<1	<1	<1	<1	ND	ND
2	SRU-2	1284	1498	5.3	5.5	11.5	14.6	<1	<1	<1	<1	ND	ND
3	SRU-3	1236	1580	5.1	5.4	11.6	14.5	<1	<1	<1	<1	ND	ND
C	ETP-Incinerator												
1	Incinerator	15.8	19.5	1.1	1.2	10.6	14	<1	<1	<1	<1	-	-
III	Stack Involving Material Handling												
A	SGU												
1	SGU-1	8.8	9.5	0.1	0.12	15.5	18.5	-	-	-	-	-	-
2	SGU-2	8.5	10.2	0.1	0.12	15.8	19.2	-	-	-	-	-	-

*Furnace/ Heaters were on dual (Liquid+gas) firing and others having gas firing during sampling

Ambient Air Quality Results Report for the month of April'14 to September'14 (RIL, Jamnagar)

S.No.	Location	PM _{2.5} (µg/m ³)		PM ₁₀ (µg/m ³)		SPM (µg/m ³)		SO ₂ (µg/m ³)		NO _x (µg/m ³)		CO (µg/m ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Chemical Lab	10	38	32	59	106	190	4	25	10	21	477	678
2	Solid Loading	11	41	39	60	114	190	5	27	10	29	455	671
3	ETP	8	41	39	59	101	190	5	21	10	24	452	650
4	Rail Gantry	8	41	39	60	117	188	5	24	11	29	444	652
5	SSO-STP	10	18	39	55	105	178	4	20	10	26	478	633
6	RRTF Admin	12	38	38	59	101	190	5	24	9	29	469	674
	CPCB Standards	60		100		-		80		80		2	

S.No.	Location	Benzene (µg/m ³)		Ozone (µg/m ³)		Lead (µg/m ³)		Arsenic (ng/m ³)		Nickel (ng/m ³)		Benzo (a) Pyrene (ng/m ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Chemical Lab	2	3	14	45	ND	ND	ND	ND	ND	ND	ND	ND
2	Solid Loading	2	3	16	42	ND	ND	ND	ND	ND	ND	ND	ND
3	ETP	2	3	15	30	ND	ND	ND	ND	ND	ND	ND	ND
4	Rail Gantry	2	3	18	36	ND	ND	ND	ND	ND	ND	ND	ND
5	SSO-STP	2	3	12	28	ND	ND	ND	ND	ND	ND	ND	ND
6	RRTF Admin	2	3	15	41	ND	ND	ND	ND	ND	ND	ND	ND
	CPCB Standards	5		100		0.5		6		20		1	

Fugitive Emission Monitoring Report for the month of April'14 to September'14 (RIL, Jamnagar)

Instrument Used : MSA Siris MultiGas Detector

Working Principal : Photo Ionisation Detector

Range:

0-200 ppm with 0.1 ppm resolution, 200-2000 ppm with 1 ppm resolution

Calibration :

100 ppm of isobutylene as standard reference gas

Prescribed Limit : 160 µg/m³ (0.24 ppm)

S. No.	Location	HC (ug/m ³)
1	Sulphur Complex	<0.1 ppm
2	Hydrogen Complex	<0.1 ppm
3	Aromatics Complex	<0.1 ppm
4	Coker-371	<0.1 ppm
5	Propylene Recovery Unit-422	<0.1 ppm
6	Tatory/Orthoxylene-281/251	<0.1 ppm

Workplace Noise Monitoring Report for the month of April'14 to September'14 (RIL, Jamnagar)

S. No.	Area/ Location	Min	Max
1	SRU	67.7	70
2	Hydrogen	67	72
3	Polypropylene	66.3	69
4	CPP	65.6	72
5	MTF	64.9	68
6	PRU/SHP/TAME	66	72
7	RTF	64.5	67
8	RRTF	63	69
9	Platformer	68.7	72
10	P & M	68.2	69
11	Desalter	67.7	71
12	ETP-API	67.2	70
13	ETP-Aeration	66.7	69
14	Desal	72	72.2
15	STP-RCB	67	72.6
16	Coke Loading	73	73
17	Sulphur Loading	71	73.4
18	ATU	72	73.8

Ambient Noise Levels for the month of April'14 to September'14 (RIL, Jamnagar)

S.No	Area/Location	April		May		June		July		August		September	
		Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time
		dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
1	Back side of Laboratory	54	52	53	52	54	53	55	53	56	54	53	52
2	Storm Water pond no.2 near fire station	52	51	53	51	53	52	54	52	54	52	55	53
3	Near ETP	59	57	59	58	61	59	58	57	59	57	59	57
4	Near Main Gate	63	59	62	59	62	59	61	59	62	60	62	59
5	Near Back Boundary Wall (PP Gate)	56	54	56	54	54	52	54	53	55	53	54	52
6	In front of Sulphur Loading plant	61	59	61	59	61	58	61	58	60	59	61	59
7	Near Flare Stack	63	61	61	59	62	60	62	59	63	60	63	61

ETP- Treated Wastewater Quality Report for the month of April'14 to September'14 (RIL, Jamnagar)

S.No.	Parameter	Unit	Minimum	Maximum	Permissible
1	Temperature	Centigrade	29	30	-
2	pH	-	7.3	7.5	6.0 to 8.5
3	Colour	Co. Pt. Scale	<5	<5	---
4	Total Suspended Solid	mg/l	12	14	20
5	Chemical Oxygen Demand	mg/l	42	46	125
6	Biological Oxygen Demand	mg/l	5	6	15
7	Ammonical Nitrogen	mg/l	7.2	7.8	15
8	Oil & Grease	mg/l	1.2	1.8	5
9	Sulphide (as S)	mg/l	ND	ND	0.5
10	Cyanide (as CN)	mg/l	ND	ND	0.2
11	Phenols (as C6H5OH)	mg/l	ND	ND	0.35
12	TKN	mg/l	8.2	9	40
13	P	mg/l	0.8	1	3
14	Chromium (Hexavalent)	mg/l	ND	ND	0.1
15	Total Chromium	mg/l	ND	ND	2
16	Lead as Pb	mg/l	ND	ND	0.1
17	Mecury as Hg	mg/l	ND	ND	0.01
18	Zinc as Zn	mg/l	0.044	0.055	5
19	Nickel as Ni	mg/l	ND	ND	1
20	Copper as Cu	mg/l	ND	ND	1
21	Vanadium as V	mg/l	ND	ND	0.2
22	Benzene	mg/l	0.051	0.062	0.1
23	Benzo (a) Pyrene	mg/l	ND	ND	0.2

Stack Emission Monitoring Report for the month of April'14 to September'14 (RIL, Unit of Reliance Jamnagar - SEZ)

S.No.	Furnace	SO ₂ (mg/Nm ³)		NO _x (mg/Nm ³)		PM (mg/Nm ³)		CO (mg/Nm ³)		HC (mg/Nm ³)		H ₂ S (mg/Nm ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
I	Stack Involving Fuel Burning												
A	CPP												
1	HRSG-1	10.2	13.5	2.7	2.8	2.4	2.8	3.5	3.7	1.5	1.6	-	-
2	HRSG-2	10.2	14.6	2.6	2.8	2	3.1	3.4	3.6	1.4	1.7	-	-
3	HRSG-3	10.2	13.5	2.6	2.8	2	3.1	3.4	3.6	1.4	1.7	-	-
4	HRSG-4	10.2	13.5	2.6	3.1	2	3.1	3.4	3.7	1.4	1.7	-	-
5	HRSG-5	10.2	13.5	2.6	3.1	2	3.7	3.4	3.7	1.5	1.7	-	-
6	HRSG-6	11.5	13.5	2.5	2.9	2	3.7	3.4	3.7	1.4	1.7	-	-
7	Aux-Bir-1	10.2	110*	4.1	4.3	2.8	12.4	4.2	4.4	2.2	2.4	-	-
8	Aux-Bir-2	12.5	116*	4.1	4.3	2.8	12	4.1	4.4	2.1	2.4	-	-
9	Aux-Bir-3	10.5	112*	4.1	4.3	2	13.2	4.1	4.4	2.1	2.4	-	-
10	Aux-Bir-4	11.5	117*	4.2	4.4	2.4	11.6	4.2	4.4	2.2	2.4	-	-
B	Crude Complex												
1	CDU-1-F01	12	106*	3.4	3.6	2.4	12.6	5.8	6.6	2.2	2.6	-	-
2	CDU-1-F51	11.2	102*	3.4	3.7	2.8	11.8	6.1	6.5	2.2	2.6	-	-
3	VDU-1	10.2	13.5	3	3.3	2	3.1	4.8	5.2	1.9	2.1	-	-
4	CDU-2-F01	11.5	82*	3.3	3.6	2.4	10.2	5.9	6.5	2.3	2.6	-	-
5	CDU-2-F51	11.5	84*	3.4	3.6	2.4	11	5.8	6.5	2.3	2.1	-	-
6	VDU-2	10.2	12.5	3	3.2	2	3.1	4.8	5.2	2	2.1	-	-
7	VGO HT-1	10.2	13.5	2.7	2.8	2	3.1	3.5	3.7	1.6	1.8	-	-
8	VGO HT-1	10.2	12.5	2.6	2.8	2	3.1	3.4	3.7	1.6	1.7	-	-
9	VGO HT-2	10.2	13.5	2.5	2.9	2	3.1	3.4	3.8	1.5	1.8	-	-
10	VGO HT-2	10.2	12.5	2.6	2.8	2	3.1	3.5	3.7	1.5	1.8	-	-

S.No.	Furnace	SO ₂ (mg/Nm ³)		NO _x (mg/Nm ³)		PM (mg/Nm ³)		CO (mg/Nm ³)		HC (mg/Nm ³)		H ₂ S (mg/Nm ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
C	Hydrogen & Merox Complex												
1	Hydrogen-4	8.8	11.5	3.4	3.7	-	-	3.6	3.9	1.6	1.8	-	-
2	Hydrogen-5	8.8	11.6	3.3	3.7	-	-	3.6	3.8	1.6	1.8	-	-
3	Hydrogen-6	8.8	11.5	3.4	3.7	-	-	3.6	3.9	1.6	1.9	-	-
4	Hydrogen-7	8.8	11	3.4	3.6	-	-	3.6	3.9	1.6	1.9	-	-
5	Hydrogen-8	8.8	10.2	3.4	3.6	-	-	3.6	3.9	1.6	1.9	-	-
D	Coker												
1	Coker-1	10.2	13.5	3.4	3.6	2	3.1	3.4	3.7	1.4	1.6	-	-
2	Coker-2	10.2	13.5	3.2	3.6	2	3.1	3.4	3.7	1.4	1.6	-	-
3	Coker-3	10.2	13.5	3.3	3.6	2	3.1	3.4	3.6	1.4	1.6	-	-
4	Coker-4	10.2	13.5	3.4	3.6	2.4	3.7	3.4	3.7	1.4	1.7	-	-
5	Coker-5	9.5	13.5	3.4	3.7	2	3.7	3.4	3.7	1.4	1.7	-	-
E	Clean Fuel Project												
1	DHDS-1	10.2	12.2	2.5	2.8	2	3.1	3.4	3.7	1.4	1.6	-	-
2	DHDS-1	9.5	13.5	2.5	2.7	2	3.1	3.4	3.7	1.4	1.6	-	-
3	DHDS-2	8.8	13.5	2.4	2.8	2	3.1	3.4	3.7	1.4	1.6	-	-
4	DHDS-2	10.2	12.5	2.4	2.8	2	3.1	3.4	3.7	1.4	1.7	-	-
5	DHDS-2	9.5	12.2	2.5	2.6	2.4	3.1	3.6	3.6	1.5	1.6	-	-
6	Common Facilities	9.5	12.5	2.4	2.8	2	3.1	3.4	3.7	1.4	1.7	-	-
7	LCOHC	9	13.5	2.4	2.7	2	3.1	3.4	3.6	1.4	1.7	-	-
F	Aromatics												
1	Platformer	11.5	14.6	2.7	3.4	2.4	3.7	3.6	3.8	1.5	1.7	-	-
2	Platformer	11.5	14.6	2.7	3.3	2.4	3.1	3.5	3.7	1.5	1.7	-	-
3	HNUU	9.5	11.6	2.5	2.8	2	2.4	3.4	3.5	1.4	1.5	-	-
G	Alkylation												
1	SAR	9.5	11.6	2.4	2.8	2	2.8	3.4	3.6	1.4	1.6	-	-

S.No.	Furnace	SO ₂ (mg/Nm ³)		NO _x (mg/Nm ³)		PM (mg/Nm ³)		CO (mg/Nm ³)		HC (mg/Nm ³)		H ₂ S (mg/Nm ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
II	Stack Involving Process Emission												
A	FCC Complex												
1	FCCC-N	140	154	5.2	5.6	38	46	6.2	6.6	2.2	2.6	-	-
2	FCCC-S	136	155	5.2	5.5	36	45	6.2	6.5	2.2	2.7	-	-
B	Sulphur Complex												
1	SRU-1	416	486	5.1	5.4	10.6	13.6	<1	<1	<1	<1	-	-
2	SRU-2	415	506	5.2	5.5	11.5	14.4	<1	<1	<1	<1	-	-
3	SRU-3	417	460	5.2	5.5	11.5	14.6	<1	<1	<1	<1	-	-
C	Alkylation												
1	SAR	122	178	5	5.3	9	13.2	-	-	-	-	-	-
III	Stack Involving Material Handling												
A	Sulphur Pestilation Unit												
1	SPU-1	8.8	9.5	0.1	0.13	15.7	19.5	-	-	-	-	-	-
2	SPU-2	8.8	10.2	0.1	0.12	16.2	19.4	-	-	-	-	-	-

*Furnace/ Heaters were on dual (Liquid+gas) firing and others having gas firing during sampling

Ambient Air Quality Monitoring Report for the month of April'14 to September'14 (RIL, Unit of Reliance Jamnagar – SEZ)

S.No	Location	PM _{2.5} (µg/m ³)		PM ₁₀ (µg/m ³)		SPM (µg/m ³)		SO ₂ (µg/m ³)		NOx (µg/m ³)		CO (µg/m ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Sulphur Load office	9	25	40	59	125	194	5	25	9	30	483	633
2	ZETP	10	41	41	59	103	191	4	24	9	30	480	648
3	Sulphur Recovery Unit	10	35	39	60	121	190	4	29	8	29	497	650
4	RTF	8	35	39	56	107	184	4	16	6	21	477	669
	CPCB Standards	60		100		-		80		80		2	

S.No	Location	Benzene (µg/m ³)		Ozone (µg/m ³)		Lead (µg/m ³)		Arsenic(As) (ng/m ³)		Nickel (Ni) (ng/m ³)		Benzo (a) Pyrene (ng/m ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Sulphur Load office	2	3	13	38	ND	ND	ND	ND	ND	ND	ND	ND
2	ZETP	2	3	18	58	ND	ND	ND	ND	ND	ND	ND	ND
3	Sulphur Recovery Unit	2	3	16	41	ND	ND	ND	ND	ND	ND	ND	ND
4	RTF	2	3	14	30	ND	ND	ND	ND	ND	ND	ND	ND
	CPCB Standards	5		100		0.5		6		20		1	

Fugitive Emission Monitoring Report for the month of April'14 to September'14 (RIL, Unit of Reliance Jamnagar – SEZ)

Instrument Used : MSA Siris MultiGas Detector

Working Principal : Photo Ionisation Detector

Range:

0-200 ppm with 0.1 ppm resolution, 200-2000 ppm with 1 ppm resolution

Calibration :

100 ppm of isobutylene as standard reference gas

Prescribed Limit : 160 µg/m³ (0.24 ppm)

S. No.	Location	HC (ug/m ³)
1	Sulphur Complex	<0.1 ppm
2	Hydrogen Complex	<0.1 ppm
3	Aromatics Complex	<0.1 ppm
4	Coker-371	<0.1 ppm
5	Propylene Recovery Unit-422	<0.1 ppm
6	Tatory/Orthoxylene-281/251	<0.1 ppm

Workplace Noise Monitoring Report for the month of April'14 to September'14 (RIL, Unit of Reliance Jamnagar – SEZ)

S. No.	Area/ Location	Min	Max
1	VGO Hydrotreater	70	70
2	Desalter	71	72
3	DHDS-2	71	71
4	Desal	70	70
5	Aromatics	71	72
6	SPU	70	70
7	Platformer	72	72
8	CPP	70	71
9	Polypropylene	68	69
10	ETP-API	71	71
11	ETP-Aeration	70	72
12	Clean Fuel Project	70	70
13	Alkylation	71	71
14	SRU	70	70
15	Hydrogen	69	70
16	ATU	71	71
17	ZRTF	69	69
18	CDU/VDU	72	72
19	FCC	71	72
20	Coker	71	72
21	Cab-Parking	62	62
22	DHDS-1	71	71

Ambient Noise Monitoring Report for the month of April'14 to September'14 (RIL, Unit of Reliance Jamnagar – SEZ)

S.No.	Area/Location	April		May		June		July		August		September	
		Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time
		dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
1	Near Cargo Gate-1	64	60	62	59	62	58	63	60	61	58	62	59
2	Near NMC, Avenue L	56	55	55	52	55	53	55	54	56	53	53	51
3	Near PP Ware House, Avenue L	53	52	56	53	54	52	56	54	56	54	55	54
4	Near Pond 7	55	52	53	51	54	52	54	51	54	52	56	55
5	Near Cargo Gate-2	62	59	62	60	61	59	62	59	61	59	62	59
6	Near Sulfur Gate	61	60	62	60	61	59	61	58	60	59	60	58
7	Near Clean Fuel Project Nr. Avenue F	61	60	62	59	62	60	60	59	62	60	62	59

ETP- Treated Wastewater Quality Report for the month of April'14 to September'14 (RIL, Unit of Reliance Jamnagar – SEZ)

S.No.	Parameter	Unit	Minimum	Maximum	Permissible
1	Temperature	Centigrade	28	30	-
2	pH	-	7.2	7.5	6.0 to 8.5
3	Colour	Co. Pt. Scale	Colourless	Colourless	---
4	Total Suspended Solid	mg/l	12	14	20
5	Chemical Oxygen Demand	mg/l	38	46	125
6	Biological Oxygen Demand	mg/l	<5	6	15
7	Ammonical Nitrogen	mg/l	6.5	7.6	15
8	Oil & Grease	mg/l	1	1.2	5
9	Sulphide (as S)	mg/l	ND	ND	0.5
10	Cyanide (as CN)	mg/l	ND	ND	0.2
11	Phenols (as C6H5OH)	mg/l	ND	ND	0.35
12	TKN	mg/l	7.5	9	40
13	P	mg/l	0.8	0.9	3
14	Chromium (Hexavalent)	mg/l	ND	ND	0.1
15	Total Chromium	mg/l	ND	ND	2
16	Lead as Pb	mg/l	ND	ND	0.1
17	Mecury as Hg	mg/l	ND	ND	0.01
18	Zinc as Zn	mg/l	ND	ND	5
19	Nickel as Ni	mg/l	ND	ND	1
20	copper as Cu	mg/l	ND	ND	1
21	Vanadium as V	mg/l	ND	ND	0.2
22	Benzene	mg/l	ND	ND	0.1
23	Benzo (a) Pyrene	mg/l	ND	ND	0.2