

**ZUARI INDUSTRIES LTD**  
**Jai Kisaan Bhawan, Zuarinagar-403 726, Goa**

**ENVIRONMENTAL CLEARANCE BY MINISTRY OF ENVIRONMENT AND FORESTS**

(EC no. F.No.J-11011/217/2008-IA-II (I) dated 1<sup>st</sup> September, 2009 and Corrigendum dt. 30<sup>th</sup> October, 2009)

**Project:**

**Revamp of Ammonia plant for changeover of feedstock and fuel from Naphtha to NG/RLNG and reduction of specific energy consumption along with debottlenecking the capacity of Ammonia-Urea plants, changeover of fuel from FO to NG/RLNG in the Utility Boilers as also debottlenecking the capacity of NPK plants A & B along with product mix change at Zuarinagar, Goa by M/s. Zuari Industries Ltd.**

**Status of the project:**

**For the first phase of feedstock and fuel change over in Ammonia and fuel changeover in Utilities boilers to NG/RLNG, the basic and detailed engineering design by M/s.KBR/PDIL/THERMAX is almost completed. For debottlenecking the capacity of NPK plant-A along with product mix change, the front end engineering package is awarded to M/s.INCRO and the design will commence shortly. For NPK plant-B, M/s. HDO have conducted a study and report is awaited.**

**2<sup>nd</sup> COMPLIANCE STATUS REPORT AS ON 1<sup>st</sup> JUNE, 2010 INCLUDING MONITORED DATA FOR DEC 2009 TILL MAY 2010**

Sr.No	Compliance Conditions	Status / Action plan
<b>A. SPECIFIC CONDITIONS:</b>		
i)	The project authority shall treat the industrial and domestic effluent as per the standards notified under Environment (Protection) Rules, 1986 or prescribed by Goa State Pollution Control Board whichever are stringent. The treated wastewater shall be recycled/reused/used for irrigation/green belt development and zero discharge shall be maintained.	The industrial effluent is given primary treatment which includes oil/grit removal, settling and temporary storage in Effluent Treatment Plant and the treated industrial waste water is totally recycled to NPK-A and NPK-B plants for process use. The domestic effluent is treated in Sewage Treatment Plant and the treated domestic effluent is totally recycled to cooling towers as make up or to Holding Ponds. Zero effluent discharge is being maintained since 1989.
ii)	The water consumption shall not exceed 10135 m <sup>3</sup> /day and the permission for drawl of same shall be obtained from concerned Department and a copy shall be submitted to the Ministry and its Regional Office at Bangalore within 3 months.	The water consumption at present is 9970 m <sup>3</sup> /day. A valid Water supply agreement with Govt. of Goa already exists. A copy of the agreement is sent to MoEF, New Delhi vide letter dt. September 11, 2009 and its Regional Office at Bangalore vide latter dt. September 16, 2009. After revamp project, the water consumption shall not exceed 10135 m <sup>3</sup> /day.
iii)	The project authorities shall install efficient air pollution control system like vibopriller to Urea Prilling Tower, low NOX burners to Reformer, Scrubbers, Ammonia Stripper etc. to control particulate and gaseous emissions from the plant to achieve the prescribed standards.	Vibopriller already installed in Urea Prilling Tower. Ammonia Stripper for process condensate and Scrubbers already exist to control particulate and gaseous emissions from process plants and the emissions are within the standards prescribed by GSPCB. Modern design burners with lower NOX emissions are on order and will be installed in Reformer as part of revamp for Gas Conversion. Scrubbers in NPK-A/B plants will be revamped during debottlenecking the capacity based on reports from M/s.INCRO and M/s.HDO to make them more efficient.

iv)	The gaseous emissions (SO <sub>2</sub> , NO <sub>X</sub> , NH <sub>3</sub> , Urea dust) & Particulate Matter from various process units shall conform to the standards prescribed by the concerned authorities from time to time. Emission data shall be periodically monitored and reports submitted to Ministry's Regional Office, CPCB & SPCB.	Various process unit stack emissions monitoring is carried out by external laboratory recognized by MoEF for SO <sub>2</sub> , NO <sub>X</sub> , NH <sub>3</sub> and Particulate Matter and the reports are being submitted to GSPCB every month. The results conform to the standards prescribed by GSPCB. The compiled data is being submitted to RO-MoEF, ZO-CPCB and GSPCB as Annexure-A along with six monthly compliance reports.
v)	The Company shall undertake measures to reduce fugitive emissions especially of ammonia. The Company shall submit the Risk Assessment study report for the storage and handling of ammonia in the campus.	Survey was carried out to identify the sources of fugitive ammonia emissions like valve gland leaks, pump seal leaks, flange leaks etc. All these sources were attended during the recent annual turnaround in March 2010 for reducing the fugitive ammonia emissions. The report on "Risk Assessment study for storage and handling of ammonia at the plant site of Zuari Industries Ltd, Zuarinagar, Goa" prepared by our Consultant NEERI, Nagpur in October 2009 is submitted to MoEF, New Delhi vide letter dt. November 6, 2009
vi)	The Company shall install the hooter system for leak detection of ammonia in the plant premises.	Reliable Ammonia sensors already exist in Ammonia/Urea and Ammonia storage/handling plants for leak detection and alarms are provided in respective control rooms. Hooter system is procured and installed at strategic locations in plants during the March 2010 annual turnaround. System checked, tested and commissioned.
vii)	The proponent shall upload the status of compliance of the stipulated EC conditions, including monitored data on their 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; SPM, RSPM, SO <sub>2</sub> , NO <sub>X</sub> (Ambient levels as well as stack emissions) or NH <sub>3</sub> , indicated for the project	The status report on compliance of EC conditions including monitored data is displayed on website and the same is being updated periodically. The first of six monthly Compliance Status Report was sent to RO-MoEF, ZO-CPCB and GSPCB simultaneously on 1.12.2009. The criteria pollutants namely SPM, RSPM, SO <sub>2</sub> , NO <sub>X</sub> , NH <sub>3</sub> are being monitored in ambient air twice a week on 24 hourly basis at four stations by an external laboratory recognized by MoEF, New Delhi. The AAQM reports are being sent to GSPCB every month

	shall be monitored and displayed at the convenient location near the main gate of the Company in public domain.	and the results are being displayed and updated on electronic boards at four different locations in public domain, which are already in existence since last two years. All the results conform to the AAQ standards. The AAQM compiled data is being submitted to RO-MoEF, ZO-CPCB and GSPCB as Annexure-B along with six monthly compliance reports. Stack emissions electronic display board is already procured. Support structure for the same is being fabricated. The display board will be erected and commissioned near gate in public domain by 30 <sup>th</sup> June, 2010.
viii)	Spent catalysts shall be sold to authorized venders for its metal value. The other solid wastes shall be segregated and stored in the separate storage space and finally sold to the authorized venders.	Spent catalysts are being sold to only CPCB registered SPCB authorized Venders. Other useful solid wastes are segregated, stored in separate storage places in scrap yard and sold to registered Venders.
ix)	As proposed the Company shall maintain the green belt covering 50% land area of the plant to mitigate the effect of fugitive emissions and noise as per the CPCB guidelines.	Over the last 35 years in operation, green belt covering 50% total land area has already been developed and is being maintained. Efforts are being made to cover more area by tree plantation and sustenance as per Eco-development plan.
x)	The Company shall implement all the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for fertilizer industries.	We have complied with all recommendations relevant to us made in "CREP for Fertilizer Industries" except the phasing out of use of Arsenic for CO2 absorption system in Ammonia plant. The replacement with non-arsenic system will be carried out in March 2012 annual turnaround. The discharged solution will be disposed off in a scientific manner using process developed by NEERI and implemented successfully by us for the disposal of original charge of GV solution.
xi)	Occupational health surveillance of the workers shall be carried out on a regular basis and records shall be maintained as per the Factories Act.	Periodic Medical Checkup of workers (Approx.120) exposed to occupational hazards is being carried out every year and the record is being maintained as per Factories Act. Other workers (Approx.290) are covered under Welfare Medical Checkup once in 18 months. The contract workers

		(Approx.1100) are covered under Welfare Medical Checkup once in 6 years and all the records are maintained.
xii)	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Implementation of our revamp/debottlenecking project of existing plants is expected to involve minimal temporary manpower for which the necessary infrastructure and facilities are already available at site and in the near vicinity. The required housing, necessary infrastructure and other facilities will be provided to the construction labour at the time of implementation of revamp project.
<b>B. GENERAL CONDITIONS</b>		
i)	The project authorities shall strictly adhere to the stipulations of the GSPCB/State Government or any Statutory body.	Stipulations of statutory bodies like Goa State Pollution Control Board, Chief Inspectorate of Factories & Boilers, Directorate of Health Services, Goa Coastal Zone Management Authority, Directorate of Fire & Emergency Services, Directorate of Weight & Measures, Chief Controller of Explosives etc. are being complied on regular basis.
ii)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Noted and will be complied, in case required.
iii)	At no time, the emissions shall exceed the prescribed limits. In the event of failure of any pollution control system adopted by the unit, the unit shall be immediately put out of operation and	The stack emission monitoring as well as ambient air quality monitoring is being carried out by a MoEF recognized external laboratory and the results have been within the prescribed limits. In case of failure of any pollution control

	shall not be restarted until the desired efficiency has been achieved.	system, the concerned plant is shut down, problem is identified, fault rectified and then only plant is started back after ensuring that the results are well within stipulations.
iv)	The locations of ambient quality monitoring stations shall be reviewed in consultations with State Pollution Control Board (SPCB) and additional stations shall be installed, if required, in the downwind direction as well as where maximum ground level concentrations are anticipated.	Four ambient air quality monitoring stations are already in operation. These were established at the locations recommended by CPCB after a proper technical study involving simulations for identifying the distance of maximum GLC of pollutants. The study by CPCB also took into account the human habitation areas like public schools while finalizing their recommendations. Post revamp, the simulation study by NEERI does not indicate any change in the distance of max. GLC.
v)	Dedicated scrubbers and stacks of appropriate height as per the CPCB guidelines shall be provided to control the emissions from various vents. The scrubber water shall be sent to ETP for further treatment.	Dedicated scrubbers are already provided before the emissions pass through the stacks and the scrubber water is totally recycled within the plants. The revamp project involves change of fuel from Naphtha containing around 600 ppm of Sulphur and Furnace oil containing around 3% Sulphur to Natural Gas which is a clean fuel. With this change in fuel, SO2 emission will reduce drastically by about 98%. The heights of all the stacks are found to be appropriate as per CPCB guidelines for revamped plants.
vi)	The Company shall undertake following Waste Minimization measures a) Metering and control of quantities of active ingredients to minimize waste b) Reuse of by-products from the process as raw materials or as raw material substitute in other processes c) Use of “Closed Feed” system into batch reactors d) Venting equipment through vapour recovery system	The following waste minimization measures are being practiced. a) Metering/inventorising of raw materials and products to minimize waste is being practiced. b) Not applicable as there are no by-products in the process c) Not applicable as there are no batch reactors d) Vapour release through equipment during draining/venting is recovered/scrubbed. e) Use of high pressure water system and hoses for equipment cleaning is being practiced.

	e) Use of high pressure hoses for equipment cleaning to reduce wastewater generation.	
vii)	Fugitive emissions in the work zone environment, product, and raw material storage area shall be regularly monitored. The emissions shall conform to the limits imposed by SPCB/CPCB.	The work zone environment in process plants, product and raw material storage areas at different locations is being monitored for Ammonia once in three months and records are maintained. The results conform to the limits prescribed under The Factories Act. The compiled data is being submitted to RO-MoEF, ZO-CPCB and GSPCB as Annexure-C along with six monthly compliance reports.
viii)	The project authorities shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October 1994 and January 2000 and Hazardous Waste (Management and Handling) Rules, 1989 as amended from time to time. Authorization from the SPCB shall be obtained for collection, treatment, storage, and disposal of hazardous wastes.	Authorization from GSPCB for collection, storage and disposal of hazardous wastes is already obtained and is being renewed regularly. The provisions under MSIHC rules and HW rules under EP Act are being complied on regular basis.
ix)	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	Silencers/Enclosures, wherever necessary are provided and noise levels in and around plant area is controlled. All the employees and contract workers use PPEs like ear plugs/ear muffs. Audiometry test on concerned workers is conducted every year as part of periodic medical checkup. The ambient noise level at the factory periphery at different locations in all directions is being monitored once in three months and records are maintained. The results conform to the standards prescribed under Noise Pollution (Regulations and Control) Rules, 2000 under EP Act and Rules. The compiled data is being submitted to RO-MoEF, ZO-CPCB and GSPCB as Annexure-D along with six monthly compliance reports.

x)	The Company shall develop rain water harvesting structures to harvest run off water for recharge of ground water.	Rain water harvesting for storage in the form of captive lake of 235 MG capacity already exists. We are operating few borewells which are registered with Ground Water Cell, Govt. of Goa and paying cess thereof for the drawl of ground water. Additional measures for rain water harvesting consisting of ground water recharge structures and mini artificial aquifer recharge structures for recharge of ground water for the borewells are implemented in October/November 2009.
xi)	The Company shall undertake eco-development measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within three months of receipt of this letter for approval.	During its operation for last 35 years, the Company has already undertaken many eco-development measures like afforestation, creation and maintenance of green belt around the factory premises etc. The Company has also undertaken community welfare measures like providing land for sulabh toilets for general public in the neighborhood, development of neighboring govt. school playground, maintenance of public gardens in Vasco city, beautification of highway road divider etc as part of Corporate Social Responsibility Schemes. Report on “Eco-development plan and Community Welfare Measures” submitted to GSPCB vide letter dated March 18, 2010
xii)	The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the EIA/EMP report.	As proposed in EIA/EMP report, environmental protection measures and safeguards will be implemented during revamp for gas conversion and debottlenecking the capacity.
xiii)	A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	Zuari is an existing Company in operation for over 35 years. A full fledged laboratory with necessary facilities already exists for carrying out analysis and monitoring. Stack emission and ambient air quality monitoring is outsourced to MoEF approved external laboratory as stipulated by GSPCB. A person of Chief Manager level is dedicated to be in-charge of overall environmental management functions

xiv)	The project authorities shall earmark adequate funds to implement the conditions stipulated by the MoEF as well as the State Govt. along with the implementation schedule for all the conditions stipulated herein. The fund so provided shall not be diverted for any other purpose.	Rs.10.15 crores for capital investment has been earmarked for implementing EC conditions and environment protection measures and Rs.1.05 crores/annum has been earmarked to take care of recurring cost. Out of Rs.10.15 crores, approx. Rs.8 crores will be spent on the various scrubbers additions/revamp/modification including the cost of pumps in NPK-A plant and approx.Rs.2.15 crores will be spent for same purpose in NPK-B plant.
xv)	The implementation of the project vis-à-vis environmental action plans shall be monitored by the concerned Regional Office of the Ministry/SPCB/CPCB. A six monthly compliance status report shall be submitted to the monitoring agencies and shall be posted on the website of the Company.	The first of the six monthly Compliance Status Reports of EC conditions including results of monitored data has been submitted on 1.12.2009 to RO-MOEF, ZO-CPCB and GSPCB and the same will continue every six months. Once the implementation of project starts, the status of progress of project vis-à-vis environmental action plans will also be submitted along with these six monthly compliance status reports which are being put on website of the Company.
xvi)	The project proponent shall also submit six monthly reports on the status of compliance of stipulated EC conditions including results of monitored data (both hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and SPCB.	The first of the six monthly Compliance Status Reports of EC conditions including results of monitored data has been submitted on 1.12.2009 to RO-MOEF, ZO-CPCB and GSPCB in both forms i.e. hard copies as well as e-mail and the same will continue. The second such report is being submitted herewith. The compiled data of stack emission monitoring, ambient air quality monitoring, work zone monitoring and ambient noise level monitoring are being submitted herewith as Annexure – A,B, C and D respectively.
xvii)	A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and Local NGO, if any, from whom suggestions/representations if any, were received while processing the proposal. The clearance letter	Sending copy of clearance letter (EC) to concerned Panchayat, ZilaParishad/Municipal Corpn., Urban Local Body & Local NGO is not applicable to us as public hearing/consultation was exempted in the TOR by EAC while processing our proposal. The clearance letter (EC) is put on website of the Company

	shall also be put up on website of the Company by the proponent.	and is available for public view.
xviii)	The 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 and may also be seen at Website of the Ministry at <a href="http://envfor.nic.in">http://envfor.nic.in</a> . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	General public was informed about the accordance of EC by MoEF and the availability of EC at GSPCB and at Ministry's website through advertisements in two widely circulated local newspapers i.e. The Navahind Times (English) and Tarun Bharat (Marathi), both dated September 8, 2009. Copies of the said advertisements are forwarded to RO of MoEF at Banagalore vide letter dt. September 9, 2009
xix)	The environmental statement for each financial year ending 31 <sup>st</sup> March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986 as amended subsequently, shall also to be put on the website of the Company along with the status of compliance of EC condition and shall also be sent to the respective Regional Office of MoEF by e-mail.	Environmental Statement for each financial year ending 31 <sup>st</sup> March in Form-V as mandated under EP Rules, 1986 is being submitted to GSPCB every year before scheduled date. The Environmental Statement for 2009-10 is being prepared. The same will be put on the website of the Company. This will also be sent to RO-MOEF by e-mail.
xx)	The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	For the first phase of feedstock and fuel change over in Ammonia and fuel changeover in Utilities boilers to NG/RLNG, the basic and detailed engineering design by M/s.KBR/PDIL/THERMAX is almost completed. For debottlenecking the capacity of NPK plant-A along with product mix change, the front end engineering package is awarded to M/s.INCRO and the design will commence shortly. For NPK plant-B, M/s. HDO have conducted a study and report awaited. After completing the entire study, we will approach the concerned authorities for necessary approvals before starting the implementation of the project.

**ZUARI INDUSTRIES LTD, ZUARINAGAR, GOA****Stack Emission Monitoring Data from December 2009 to May 2010**

Stack Description	Parameter	Limits prescribed by GSPCB	Dec. 2009	Jan.2010	Feb.2010	Mar.2010	Apr.2010	May 2010
Urea Prilling Tower	SPM, mg/Nm <sup>3</sup>	150	34.5	37.5	51.6	Annual Shutdown	48.8	48.2
Urea Dust Seperator	SPM, mg/Nm <sup>3</sup>	150	34	33.4	49.7		48.1	46.3
Urea Off Gas Absorber	NH <sub>3</sub> , kg/hr	10	3.7	3.7	3.4		3.2	3.5
Urea Amm. Rec. Absorber	NH <sub>3</sub> , kg/hr	10	1.9	1.9	1.6		1.6	1.9
NPK-A Fumes Stack	NH <sub>3</sub> , kg/hr	10	1.4	1.4	1.1	1.1	1.1	1.3
NPK-A Dryer Stack	SPM, mg/Nm <sup>3</sup>	150	38.4	38.8	65.6	38.4	34.9	31.5
NPK-A Dedusting Stack	SPM, mg/Nm <sup>3</sup>	150	34.2	41.5	40.5	57.4	38	42.7
NPK-B Stack	NH <sub>3</sub> , kg/hr	10	4.3	4.1	3.8	4.2	Annual Shutdown	4.8
	SPM, mg/Nm <sup>3</sup>	150	55.5	50.5	40.5	41.6		44.6
Power Station Boiler Stack	SO <sub>2</sub> , kg/hr	832	353.3	357.2	363.1	Annual Shutdown	375.9	389.6
	SPM, mg/Nm <sup>3</sup>	150	127.9	70.7	127.9		117.8	79.9
DG Set Stack	SO <sub>2</sub> , kg/hr	105.6	Shutdown	Shutdown	11.9	7.9	8.2	9
	SPM, mg/Nm <sup>3</sup>	150			51.8	32.2	55.02	72.1
	NOX, ppmv	1100			68.27	104.87	85.57	95.21
	NHMC, mg/Nm <sup>3</sup>	150			4.66	4.97	4.97	4.76
	CO, mg/Nm <sup>3</sup>	150			6.04	6.44	6.64	6.17

**NOTE:**

Stack emission monitoring was carried out by M/s.Italab(Goa) Pvt.Ltd, Goa, an external laboratory recognized as "Environmental Laboratory" by the Ministry of Environment and Forests, New Delhi

**ANNEXURE - B****ZUARI INDUSTRIES LTD, ZUARINAGAR, GOA****Ambient Air Quality Monitoring Data from December 2009 till May 2010**

	SPM, ug/m3			RSPM or PM-10, ug/m3			SO2, ug/m3			NOX, ug/m3			Ammonia, ug/m3		
NAAQ Standards	500			100			80			80			400		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
<b>December 2009</b>															
Station -I	99.02	62.86	161.44	68.69	41.7	87.97	1.08	0.46	1.71	19.62	9.26	33.57	50.41	28.18	70.32
Station -II	126.12	87.79	163.28	71.62	46.03	104.13	1.84	0.93	4.98	31.02	19.09	42.94	61.64	44.67	78.22
Station -III	65.81	51.52	82.91	49.15	35.39	62.21	1.1	0.48	1.87	19.16	10.75	30.83	45.83	28.83	99.11
Station -IV	78.14	53.89	117.24	53.39	36.02	73.89	1.12	0.47	2.96	20.52	14.6	32.48	44.79	26.95	53.69
<b>January 2010</b>															
Station -I	96.41	58.23	122.93	69.8	40.09	98.3	1.93	0.63	8.12	9.95	5.02	21.88	53.63	12.24	187.07
Station -II	126.14	72.05	156.27	82.44	60.96	115.72	2.8	0.61	6.83	18.28	12.62	24.33	68.63	16.05	168.68
Station -III	81.54	49.61	104.74	57.27	38.05	88.19	1.42	0.61	2.91	8.76	2.49	15.44	44.61	14.23	147.24
Station -IV	86.13	56.34	136.56	65.2	51.14	88.52	3.53	0.46	9.23	10.57	5.52	18.25	54.39	22.97	89.23
<b>February 2010</b>															
Station -I	74.88	56.71	110.84	53.98	30.76	83.81	1.49	0.46	5.35	9.46	6.87	14.96	55.21	25.69	113.85
Station -II	136.13	86.92	249.35	73.11	34.65	105.93	2.1	0.92	4.21	12.02	6.41	16.46	55.03	33.2	113.35
Station -III	74.06	47.76	100.04	45.8	21.38	70.41	1.66	0.97	3.81	8.4	4.02	12.75	38.55	21.84	63.24
Station -IV	68.88	38.7	97.95	49.86	17.56	79.58	1.78	0.32	4.39	8.68	6.41	12.56	56.61	16.63	96.85

Station-I: At D-Colony area  
Station-II: Near Govt. Primary School  
Station-III: Near Jai Kisaan Club  
Station-IV: At C-Colony area

**NOTE:**

Ambient air quality monitoring carried out on 24 hourly basis twice a week by M/s.Italab(Goa) Pvt.Ltd, Goa, an external laboratory recognized as "Environmental Laboratory" by the Ministry of Environment and Forests, New Delhi  
(PM-10 max.values at Station-II are higher due to other commercial activities in the vicinity)

## ANNEXURE - B

## ZUARI INDUSTRIES LTD, ZUARINAGAR, GOA

## Ambient Air Quality Monitoring Data from December 2009 till May 2010

NAAQ Stan	SPM, ug/m3			RSPM or PM-10, ug/m3			SO2, ug/m3			NOX, ug/m3			Ammonia, ug/m3		
	500			100			80			80			400		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
<b>March 2010</b>															
Station -I	85.04	69.19	115.83	57.16	41.07	78.12	1.1	0.41	2.05	12.71	5.37	21.37	61.13	29.04	96.96
Station -II	116.83	94.03	153.75	69.19	40.24	95.96	2.35	0.96	4.87	17.76	7.14	33.49	57.7	34.65	81.49
Station -III	80.18	65.23	115.51	45.59	29.06	74.86	1.46	0.75	2.87	9.89	4.14	17.41	40.54	20.51	62.74
Station -IV	69.18	49.52	88.65	47.15	25.23	70.63	1.69	0.47	3.4	13.22	3.84	25.75	57.68	21.01	83.1
<b>April 2010</b>															
Station -I	78.73	63.64	99.64	43.4	28.14	56.28	2.42	0.83	4.84	17.48	7.07	29.48	78.85	16.61	108.8
Station -II	98.66	63.03	151.11	42.78	29.03	87.96	2.99	1.15	5.17	19.89	8.93	31.42	72.26	21.2	98.45
Station -III	69.12	58.69	92.39	29.11	23.87	35.28	2.24	0.97	3.22	14.26	6.26	21.94	58.2	12.13	88.97
Station -IV	48.82	38.7	61.77	22.46	18.25	29.17	2.44	0.55	4.41	17.15	5.64	27.93	72.91	17.65	114.6
<b>May 2010</b>															
Station -I	79.57	60.25	114.78	36.48	23.57	59.63	1.42	0.35	2.64	20.48	12.34	31.02	71.88	45.56	103.8
Station -II	98.72	68.43	120.16	40.66	27.32	59.82	1.7	0.82	2.74	23.58	15.59	31.81	58.46	43.31	84.6
Station -III	77.5	57.69	98.31	36	29.67	52.61	1.44	0.72	2.85	18.29	9.15	29.89	61.85	38.79	75.34
Station -IV	65.14	44.35	92.31	31.9	20.62	55.93	1.51	0.48	2.72	19.25	9.38	29.87	68.62	39.14	91.35

Station-I: At D-Colony area

Station-II: Near Govt. Primary School

Station-III: Near Jai Kisaan Club

Station-IV: At C-Colony area

**NOTE:**

Ambient air quality monitoring carried out on 24 hourly basis twice a week by M/s.Italab(Goa) Pvt.Ltd, Goa, an external laboratory recognized as "Environmental Laboratory" by the Ministry of Environment and Forests, New Delhi

**ANNEXURE - C**

**ZUARI INDUSTRIES LTD., ZUARINAGAR, GOA**

**WORK ZONE MONITORING**

Sr. No.	Work Zone	Fugitive Ammonia Level in ppm	
		8.1.2010	30.4.2010
1.	RMH plant - Amm. Tanker unloading area	4	3
2.	Ammonia plant – Amm. Receiver/Economiser area	7	5
3.	Ammonia Hortonsphere Amm. Pump area	8	5
4.	Urea plant – Amm. Pump area	18	15
5.	Urea plant – Amm. Condensor area	6	6
6.	NPK-A plant – Pre-Neutralizer area	5	4
7.	NPK-A plant – Amm. Granulator area	3	3
8.	NPK-A plant - Dryer area	4	2
9.	NPK-B plant – Pre-Neutralizer area	7	5
10.	NPK-B plant – Amm. Granulator area	4	4
11.	NPK-B plant - Dryer area	3	3
12.	Product Handling plant - Urea bagging area	7	6
13.	Product Handling plant - NPK-A bagging area	7	5
14.	Product Handling plant - NPK-B bagging area	6	4
15.	Product Handling plant - Urea bulk area	19	17
16.	Product Handling plant - NPK-A bulk area	17	15
17.	Product Handling plant - NPK-B bulk area	7	7

**ANNEXURE - D**

**ZUARI INDUSTRIES LTD., ZUARINAGAR, GOA**

**AMBIENT NOISE LEVEL MONITORING**

	<b>Date</b>	<b>6/1/2010</b>		<b>26/4/2010</b>	
<b>S.No.</b>	<b>Locations</b>	<b>Noise Level (dB) Day time</b>	<b>Noise Level (dB) Night time</b>	<b>Noise Level (dB) Day time</b>	<b>Noise Level (dB) Night time</b>
1	Near Main Gate	67	65	63	58
2	Near Gate No.1	69	64	65	61
3	Near DAP gate	67	65	68	64
4	Near Post Office	58	59	60	58
5	Near Goa Carbonic factory	63	62	62	60
6	Near D-colony view point	55	58	58	55
7	Behind Administration Building	57	55	54	50
8	Near Railway siding road junction in B-colony	54	50	50	48
9	Near Railway siding (Vasco end)	53	51	55	53