BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

O.A. No. 73 of 2020
(By Video Conferencing)

In the Matter of:

In re: Gas Leak at LG Polymers Chemical Plant in R R Venkatapuram Village Visakhapatnam in Andhra Pradesh

Index

28/05/2020

(Dr. Prashant Gargava)
Member Secretary
Central Pollution Control Board
East Arjun Nagar
Delhi-110032

Dated: - 28.05.2020
Place: - Delhi

Report of the Joint Monitoring Committee constituted by the Hon'ble NGT, Principal Bench, New Delhi as per order dated 08.05.2020 in the Matter of O.A. No. 73 of 2020

Report submitted to
Hon'ble National Green Tribunal
New Delhi

28 May, 2020

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1. PREAMBLE

In reference to the Styrene Leak at M/s LG Polymers Pvt Ltd, Visakhapatnam, Andhra Pradesh, the Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi took up the matter on suo-motu basis as Application No. 73/2020, and issued following orders on 8th May 2020:

"We issue notice to Andhra Pradesh State PCB, District Magistrate, Vishakhapatnam, Central Pollution Control Board (CPCB), Ministry of Environment, Forests & Climate Change (MoEF&CC) and LG Polymers India Pvt. Limited. Notice may be served by email and response if any, be filed before the next date, by email at judicial-ngt@gov.in

We also seek a report from a 6-member Committee comprising:

a. *Justice B. Seshasayana Reddy, Former Judge, A.P. High Court; - (Online till he is able to reach Vizag);*

b. *Prof. Ch V Rama Chandra Murthy, Former Vice Chancellor, Andhra University, Vizag;*

c. *Professor Pulipati King, Head of Chemical Engineering Department, Andhra University, Vizag;*

d. *Member Secretary, CPCB (Online, if travel is restricted due to Covid-19);*

e. *Director, CSIR-Indian Institute of Chemical Technology (Online, if travel is restricted due to Covid-19); and*

f. *Head, NEERI, Vizag.*

The District magistrate, Vishakhapatnam, and Regional Office, Andhra Pradesh State PCB may provide logistic support to the Committee to enable their fact-finding and reporting. The Chairman, CPCB may steer and facilitate the functioning of the Committee using available technology. CPCB will bear the initial cost of functioning of the Committee to the extent necessary. The Committee will be at liberty to take assistance of such experts, individuals and institutions as may be considered necessary. The Member Secretary, CPCB will act as nodal agency for coordination.

The Committee may visit and inspect the site at the earliest and give its report before the next date via email judicial-ngt@gov.in. Site visit may be initially conducted by members available locally in consideration with outside members online. The Committee may specifically report:

a. The sequence of events;

b. Causes of failure and persons and authorities responsible therefor;

c. Extent of damage to life, human and non-human; public health; and environment – including, water, soil, air;

d. Steps to be taken for compensation of victims and restitution of the damaged property and environment, and the cost involved;

e. Remedial measures to prevent recurrence;

f. Any other incidental or allied issues found relevant.

Having regard to the prima facie material regarding the extent of damage to life, public health and environment, we direct LG Polymers India Pvt. Limited to forthwith deposit an initial amount of Rs. 50 Crore, with the District Magistrate, Vishakhapatnam, which will abide by further orders of this Tribunal. The amount is being fixed having regard to the financial worth of the company and the extent of the damage caused.

A copy of this order be sent to Justice B. Seshasayana Reddy, Former judge, A.P. High Court; Prof. Ch V Rama Chandra Murthy, Former Vice Chancellor, Andhra University, Vizag; Professor Pulipati King, Head of Chemical Engineering Department, Andhra University, Vizag; Director, CSIR-Indian Institute of Chemical Technology; Head, NEERI, Vizag; Andhra Pradesh State PCB; District Magistrate, Vishakhapatnam; Central Pollution Control Board (CPCB); Ministry of Environment, Forests & Climate Change (MoEF&CC) and LG Polymers India Pvt., Limited, by email"

The case is listed for further consideration on 18.5.2020."

A copy of the Hon'ble NGT order dated 08.05.2020 is given at **Annexure-I.**

Due to COVID-19 Pandemic situation, there were certain restrictions on movement and travel. *Professor Pulipati King, Head of Chemical Engineering Department, Andhra University, Vizag* expressed his inability to participate as his residence was in the Red Zone and he suggested that Professor P. J. Rao from the same department of the University i.e. Chemical Engineering Department, Andhra University, Vizag may participate. Therefore, Prof. P. J. Rao was included as an expert. Further, Dr. K. V. George, Scientist, NEERI, Nagpur, who was part of the NDRF team, was also included as an expert for technical briefing since the NDRF team reached the site on May 07, 2020 late night and coordinated the activities.

In view of above, site visits were made during May 11 - 13, 2020 by Prof. Ch V Rama Chandra Murthy, Retired Principal, Andhra University College of Engineering, Visakhapatnam, Dr. Shaik Basha, Scientist & Head, CSIR-NEERI, Hyderabad, and Prof. P. J. Rao, Chemical Engineering Department, Andhra University, Vizag and subsequently, on May 15 & 16, 2020 by Justice B. Seshasayana Reddy, Former Judge, A.P. High Court, Prof. Ch. V. Rama Chandra Murthy, Retired Principal, Andhra University College of Engineering, Visakhapatnam, and Prof. P. J. Rao, Chemical Engineering Department, Andhra University,

Vizag. An interim report, based on the site inspection, was submitted on 17th May 2020. Meanwhile, extension of time was sought for submission of consolidated report.

2. SUMMARY OF INTERIM REPORT

In the interim report, committee has discussed about the background/history of the industrial unit i.e. M/s L G Polymer, status of its consent under Water (Prevention & Control of Pollution) Act, 1974 & Air (Prevention & Control of Pollution), 1981, grant of Environmental Clearance (EC) under Environment (Protection) Act, 1986, followed by the chemistry of styrene monomer (chemical that got leaked) and its behaviour in the storage tank. Various GOs related to the accident and compensation given by the Govt. of AP are also discussed. A copy of the interim report is given as **Annexure II**.

The committee, prima-facie, is of the view that the styrene gas/vapour leakage from the affected tank was due to the following reasons:

1. *Insufficient Tertiary Butyl Catechol (TBC, used as inhibitor to avoid polymerization at lower temperatures) concentration in styrene tank due to unavailability of TBC in the plant.*
2. *There is no monitoring system for dissolved oxygen in the vapour space which might have fallen down below 6%.*
3. *The tank has no provision of monitoring temperatures at top layers of the storage.*
4. *Refrigeration system was not being operated for 24 hours.*
5. *Gross human failure and negligence of the Person in-Charge of the plant and maintenance personnel of the storage tanks.*

The interim report clearly outlined the chronological details of efforts made by different stakeholders in obtaining EC. It is a fact that the unit was operating the facility without the requirement of prior EC. The expansion of the unit from time to time, continuity of its operation, efforts made by the unit in getting EC, correspondence of State Environment Impact Assessment Authority (SEIAA) in this regard, role of State Pollution Control Board, are detailed in the interim report page no 1-4. However, as per the correspondence of the SPCB with MoEF&CC after the incident seeking clarification on requirement of EC shows lack of clarity by the SPCB in the provisions of the EIA notification, 2006 and amendments thereof.

The failure of management in handling the crisis, the properties of styrene monomer, the lapses by different managerial staff in maintaining the pre and post operations were detailed in the interim report page no 5 to 10. It is stated that *"Our observations revealed that the management did not take proper care of the affected storage tank and it resulted in auto polymerisation of styrene releasing excess heat which escaped from the goose-neck and dip hatch in the form of vapour"*.

3. SITE VISIT BY THE COMMITTEE

The sequence of the site visit is as follows:

May 11, 2020 to May 13, 2020:

The following members visited the site including industrial unit along with APPCB officials and interacted with the Industry officials, who briefed them about the series of events that happened:

1. Prof. Ch. V. Ramachandra Murthy, Retired Principal, Andhra University College of Engineering, Visakhapatnam
2. Prof. P. J. Rao, Chemical Engineering Department, Andhra University College of Engineering, Visakhapatnam
3. Dr. Shaik Basha, Senior Principal Scientist and Head, CSIR-NEERI, Hyderabad Zonal Centre, Hyderabad

On May 12, 2020, the NGT Committee conducted a public consultation meeting at 10:30 hrs in GVMC Conference Hall with NGOs, residents from affected villages and Industrialists. The committee requested to offer suggestions/representations/remarks on the mishap of LG Polymers Styrene leakage issue and further consequences in that locality including preventive measures. While concluding the meeting, Committee members stated that all suggestions and representations will be given due consideration and thanked all for their valuable suggestions.

May 15, 2020 & May 16, 2020:

Justice B. Seshasayana Reddy, Former Judge, A.P. High Court visited the site along with Prof Ch. V. Ramachandra Murthy, Prof. P. J. Rao and APPCB officials and interacted with the industry officials and prepared an interim report and submitted to Hon'ble NGT on May 17, 2020.

4. ABOUT THE INDUSTRY:

M/s LG Polymers India Pvt Ltd was established in 1961 as "Hindustan Polymers" for manufacturing Polystyrene and its Co-polymers at Visakhapatnam, India. M/s L. G. Polymers (I) Pvt. Ltd. is located at Venkatapuram, Visakhapatnam District in about 219 acres with a built up area of 6 acres and green belt of 55 acres. It manufactures Expandable Polystyrene using Styrene (C_8H_8), Pentane (C_6H_{12}) and HCl as main raw materials. It merged with M/s Mc Dowell & Co. Ltd. of UB Group in 1978. It was taken over by LG Chem (South Korea), and Hindustan Polymers was renamed as LG Polymers India Private Limited (LGPI) in July, 1997. The industry imports styrene monomer from Dubai, Singapore and South Korea. The industry has a strength of total 475 nos. of workers employed including permanent (275 nos.) and

contract (200) workers. It has a consent to operate with validity up to December 31, 2021. It is an old Category A industry, applied for EC under violation window, which is pending at MoEF&CC. Very recently, MoEF&CC (IA Division) issued a letter (F.No. 22-12/2020-IA-III, dated May 15, 2020) stating that the project of LGPIL attracts the provisions of schedule 5(e) of the EIA notification. In the interim report of the committee, the issue of requirement of prior EC, chronology of consent issued by APPCB, correspondence with SEIAA are detailed from page no 1 to 4.

M/s LG Polymers is located at latitudes 17° 45' 28.73" N longitudes 83° 12' 42.38" E at an elevation of 16 m. The Industry is surrounded by vacant land on the north, railway track on the south, green belt of 30 acres on the east and Meghadri Gedda on the West. The residential houses exist closely on west side boundary wall of the industry. Megahdri Gedda reservoir is the nearest water body at a distance of 2 km from the industry. The Google image depicting the location of the industry is shown below:

The images showing the industry for the years 2004, 2009, 2015, 2019 are as below:

Google image dated 23.10.2004

Google image dated 12.10.2009

Google image dated 12.10.2015

Google image dated 06.11.2019

a. Raw material requirement

For Polystyrene: Styrene Monomer, Rubber, Ethyl benzene

For Expandable Polystyrene: Styrene and Pentane

For Engineering plastics: Poly butyl TeraPthalene, Nylon, Acrolonytrile, Butadiene styrene, Glass fiber, Talk powder

b. Products

Polystyrene –313 TPD (limited to 1, 09,000 TPA)

Expandable Polystyrene – 102 TPD (36,000 TPA)

Engineered Plastics - 36.67 TPD.

c. Hazardous waste generation and Disposal

Name of the Hazardous waste	Quantity	Disposal method
ETP Sludge	100 TPA	TSDF, Parawada, Visakhapatnam District for secured land filling
Used / Waste oil/spent Oils	2.0 KLA	Authorized Re-processor / recyclers
Container & Container Liners Of Hazardous Waste & Chemicals	2.0 TPA	After complete detoxification, it shall be disposed of to outside Agencies.

d. Details of Storage Tank

The details of the storage tank as on 10.05.2020/11.05.2020 are as follows:

- Styrene – 2 Tanks (2791.8 Tons (accident) 1830 Tons at the time of accident + 3285 Tons (existing besides the accident tank) having storage of 2725.9 Tons at the time of accident.
- The industry is also having 3 day storage tanks of around 300 KL capacity.
- Pentane – 80 KL + 75 KL x 3, HCL – 10 KL (1 Tank).

Apart from the above, the industry has also taken two tanks of 5500 KL and 7300 KL capacity in the premises of M/s. East India Corporation at Sheelanagar, Visakhapatnam and around 10000 KL of Styrene monomer is stored.

The list of chemicals and fuels stored in the plant as on May 10, 2020 are as follow:

Tank No.	Name	Capacity	Stock MT
TA 111A	Styrene	300	242.6
TA 111b	Styrene	300	242.5
TA 113	EB	19	4.1
TA 114	EB	13	8.2
TA 112	FO	19	12.5
TA 115	FO	19	14.9
TA 118a	Diesel	50	22
TA 116	LP	19	17
TA 118b	LP	44	39.7
A	Pentane	80	41.51
B	Pentane	80	42.34
C	Pentane	75	33.64
m5	Styrene	3285	2725.9

1221a	Styrene	300	70
M6	Styrene	2791.8	0
FPT	Styrene	30	8
FST	Styrene	27	17
FO tank 1	FO	45	38.88
FO tank 2	FO	40	6.5
EIPL	102	4800	4475
EIPL	123	6600	5606

5. PROPERTIES OF STYRENE

Styrene is a colourless, clear liquid. It has a sweet smell and can be found in nature as well as manufactured. Styrene was originally found in the oriental sweetgum tree (Levantstyrax). It can also be found in common foods and beverages, such as strawberries, coffee, cinnamon, peanuts, and tobacco. Manufactured styrene has a wide range of usages and is a component of many goods, including polystyrene, fibreglass, packaging materials, electrical insulation, home insulation, drinking cups and food packaging, rubber, and carpet backing. Styrene is a volatile, highly flammable compound. Styrene vapour is heavier than air. At concentrations normally encountered in the workplace, the air and styrene mixture is not significantly heavier than clean air. Styrene evaporates more rapidly at high temperatures. Styrene can be smelled at very low concentrations. Prolonged exposure to styrene reduces a person's ability to smell it. Styrene liquid is soluble in body fat and can be absorbed through the skin; however, studies have shown that the styrene present in polyester resin is not easily absorbed through the skin. Inhalation is therefore the major route of exposure. It is a Group 2A carcinogen as per IARC Monograph. The details of properties of Styrene is given at **Annexure III**.

6. FINDINGS & SUGGESTIONS

The Committee's findings and observations are based on site visit and interaction with stakeholders. As directed by Hon'ble NGT, the committee's observations & suggestions are as follow:

a) The sequence of events

The unit was closed on March 24, 2020 and started preparations w.e.f. May 04, 2020 for its proposed resumption of operation on May 07, 2020. On the early hours of May 07, 2020 at about 03:00 AM, the tank with 1830 tons of storage had developed the leak of the STYRENE vapours from top of the tank and spread beyond the factory boundary towards the west side due to wind direction and affected the residents of five nearby areas namely, Venkatapuram,

Venkatadri Nagar, Nandamuri Nagar, Pydimamba Colony and BC & SC colony. It appears from an examination of nearby damaged trees that the gas plume moved at a height of about 0-20 feet from the ground towards the nearby settlements. Population within a radius of about 0.5 km was evacuated by the district administration.

The sequence of operations carried out at the factory after the incident as per plant managers is as follows:

- 02:54 hrs: Gas detector alarm noticed in Control room (DCS).
- 03:02 hrs: High VOC alarm noticed in Control room (DCS).
- 03:02 hrs: Immediately DCS operator informed to operator /safety person /Night duty officer.
- 03:02 hrs: M6 Tank temperature started rising.
- 03:03 hrs: Night duty Officer informed everyone about the high vapours at tank farm area.
- 03:03 hrs: Immediately night duty Officer tried to reach the fire hydrant sprinkler valve to open it, but due to high vapour cloud it was impossible to reach it.
- 03:04 hrs: Alerted all other members to bring Self-contained breathing apparatus (SCABA) sets to assembly point.
- 03:07 hrs: Informed plant safety head/Director Operations& others about the emergency.
- 03:07 hrs: Alerted security in-charge to get help from outside agencies (Fire services and Ambulance etc.). Root cause was identified as self-polymerization due to stagnant high polymer content.
- 03:30 hrs: Director Operations& Safety heads & plant officials arrived at site.
- 04:30 hrs: Two members went to open fire hydrant sprinklers using SCABA sets for M5 /M6 /Pentane storage tank.
- 04:32 hrs: Emergency chemicals such as NDM, TDM, Antioxidant (Eunox-76) arrangements done.
- 05:15 hrs: Chemical inhibitors (N-Dodecly Mercaptan, Tertiary Dodecly Mercaptan and Eunox-76) dosing arrangements started immediately. About 2200 litres was pumped inside the tank.
- 06:30 hrs: 10 tonnes and 15 tonnes of Styrene was pumped to feed preparation & feed solution tanks, respectively.
- 07:30 hrs: 70 tonnes of Styrene pumped to one spare storage tank. Water poured through foam pourer & hydrant water sprinklers kept open for affected tank to cool down the tank.

- 09:30 hrs: Neighbouring residential areas of Venkatapuram, Janata Colony, SC & BC Colony, Padmanabhapuram are most affected.
- 22:45 hrs: Tank temperature reached 154°C.
- **08.05.2020 (Friday)**03:30 AM: Temperatures started reducing from 154° C to 120° C by evening. Water has been continuously poured inside & outside tank.
- **09.05.2020 (Saturday)**
- Water has been continuously poured inside & outside tank.
- At 09:00 AM tank temp reached to 100° C.

As reported following chemicals were added to affected tank:

- Eunox-76: 289 kgs
- N-DodeclyMercaptan: 1059 kgs
- TeritaryDodeclyMercaptan: 2487 kgs

A special aircraft was arranged for airlifting the NDRF joint team of 09 experts from Pune and Nagpur including CSIR- NEERI members. They reached on May 07, 2020, 23:00 Hrs. Apart from this, scientists from NEERI, Hyderabad also reached the site for further coordination. A central committee of Mr Shantanu Gite, an industrial expert in handling of styrene from Mumbai, and Dr Anjan Ray, Director CSIR-Indian Institute of Petroleum, Dehradun reached the affected site on evening of May 9, 2020 to assess the situation. This Central Committee made two inspections - one upon arrival and another in the morning of May 10, 2020, the latter along with the AP state-appointed committee constituted for investigating the incident.

The following industry personnel were present during the time of the accident:

S. No	Name	Position	Education	Experience
1	Sh. M Rajesh	Operator	Diploma in Chemical	2 Years
2	Sh. N Sudhakar	Asst. Manager	M. Sc. Organic Chemistry	13 Years
3	Sh. P Balajee	Manager	M. Tech in Chemical Engg.	6 Years
4	Sh. S Atchyut	Engineer	Diploma in Chemical Engg.	2 Years
5	Sh. K Chakrapani	Engineer	B. Sc. Chemistry	7 Years
6	Sh. U V Ramana	Asst. Engineer	B. Sc. Chemistry	5 Years
7	Sh. N Jayaram	Jr. Engineer	B. Sc. Chemistry	4 Years
8	Sh. KS Kiran Kumar	Asst. Manager	Intermediate	30 Years

b) Causes of failures and authorities responsible thereof:

The industrial unit has been closed since March 24, 2020 due to the COVID-19 lockdown. As on the day of lockdown, the raw material, Styrene was available in 4 storage tanks in the factory with the inventory of 1830 tons, 2725.9 tons, 242.6 tons, 242.5 tons.The unit was permitted for daily maintenance activities during the lockdown period with 15 persons per each shift with a total of 45 personnel working per day.

Govt. of Andhra Pradesh announced the resumption of operation of industries from May 04, 2020 and the management had proposed to resume their operations w.e.f. May 07, 2020. On the early hours of May 07, 2020, the tank with 1830 tons of storage had developed the leak of the styrene vapours from the top of the tank and spread beyond the factory boundary towards the west side due to wind direction and affected the residents of 5 nearby areas namely, Venkatapuram, Venkatadri Nagar, Nandamuri Nagar, Pydimamba Colony and BC colony.

The leaked tank was old and does not have temperature sensors at middle and top surface of the tank except only provision to measure the temperature at the bottom of the tank where refrigeration is provided. Due to lockdown, the storage tank was stand still. The styrene polymerises to polystyrene even at ambient temperature, in the absence of inhibitor, which itself is an exothermic reaction with very slow reaction rates. Although the reaction rates are slower, it will cause major operating issues, because of heat liberation and blockages in the tank. The rate of this reaction doubles every 10 ^{0}C. The combination of polymerisation- heat liberation- temperature rise- and further polymerisation can lead to rapid reaction and heating, which is called as a 'run-away reaction'. As the temperature rises, styrene starts vaporising. The pressure in the storage tank will progressively increase, and the safety valves released the styrene vapour into the atmosphere. The increase in temperature and pressure was not observed by the industry. Had the safety valve failed, the whole tank would have been exploded and still bigger catastrophe would have been happened.

Styrene monomer with a boiling point of 145 ^{0}C, in liquid state remains monomer if it is maintained at low temperature preferably 15-18 ^{0}C. If the temperature approached 20 ^{0}C the tank must be cooled and under no circumstances the temperature should exceed 25 ^{0}C. If its temperature is increased, self-polymerization starts slowly, which is an exothermic reaction, thereby liberating heat, which further increases the rate of polymerization and the chain reaction begins. This leads to exponential increase in polymerization. The monomer styrene is stored without letting self-polymerization by adding inhibitor substance like Tertiary Butyl Catechol (TBC). This inhibitor works at low temperature below 25 ^{0}C. TBC is not effective as inhibitor of monomer Styrene at high temperature. Another chemical named N dodecyl mercaptans (DDM) is used as inhibitor at high temperature. Since the content (styrene) is in closed container, rise in temperature increases the tank pressure. To avoid structural failure of tank, safety valves are provided, which gets opened at high pressure and releases the contents thereby reducing the pressure. Five valves are provided at the top of the affected tank roof. During the stagnant storage period, apparently the monomer styrene started self-polymerization leading to increase in temperature as the process is exothermic. The increased

temperature further increased the rate of reaction resulting in increased pressure in the tank. Safety valves on the tank (M6) roof top got opened due to high pressure and started emitting styrene vapours. As per CCTV record, the emission started at about 02:42 hrs from M6 tank having 1830 tonnes of styrene. No alarm generated when vapour leakage occurred and auto sensor of styrene is failed to detect the conc. in ppm.

There is no interlock system arrangement between the temperature and refrigeration system. There is no external water spray arrangement over the storage tank for exceeding ambient air temperature and also any unmanned hose arrangement.

It should be noted that in climate zones and in seasons with significant temperature difference between night and day, the styrene vapours evolved in the headspace at higher temperatures will condense on roofs, walls and internal fittings of storage tanks when it cools off. The phenolic inhibitors have high boiling points and stay in the liquid phase, resulting in the condensed styrene vapours containing no inhibitor. Also, the condensation will result due to long term storage of styrene monomer during 'zero process operation' without maintaining required cooling throughout the tank. The leaked tank does not have any provision for measuring the vapour space temperature. Due to this, building-up of temperatures in top surface could not noticed by the industry. This reflects the clear cut case of negligence on Industry part.

The incident is tragic but it could have been far worse had the affected tank, Tank M6, ruptured and the temperature of the tank contents had shot up far beyond the 154^0 C, well over the boiling point of styrene. An estimated 800 tons (8 lakh kg) of styrene escaped into the surroundings in the incident. It is reported that unit's inability to access personnel protective equipment in a timely manner, safety response preparedness of the site had impact in the early stages of safety operations. Further, the public siren system also could not be activated as it was manual and in an area rendered inaccessible by the vapour cloud else people in surrounding areas could have been alerted quickly and lives saved.

Root cause analysis showed that the problem possibly began on April 20, 2020 when the polymer concentration in Tank M6, which was idled at full capacity since March 25 post-lockdown. It is known that styrene monomer can exhibit reaction runaways because of their exothermic and auto-accelerating nature even at adiabatic conditions. The polymerization runaway "onset" temperature inversely increased with the monomer mass fraction and generally observed to be 66^0 C. Styrene polymerization reaction is relatively highly exothermic with a heat generation at around 71 kJ mol^{-1}. At the same time, even without an initiator, two styrene molecules can undergo a Diels–Alder type of reaction and generate radicals to start self-polymerization upon heating. The polymerisation reaction being exothermic, if contained may become uncontrolled and the bulk styrene temperature may rise to a level at which polymerisation is self-sustaining and very rapid. This results in evolving the release of large quantities of heat together with volumetric expansion and set off an undetected, slow but steady formation and growth of a hotspot within the tank where an exothermic (heat-generating) reaction of polymerization started. By early morning of May 7, the hotspot probably reached critical mass. Somewhere between 1:45 am and 2:40 pm, this led to a runaway reaction and the

temperature shot up in the tank. However, the only two parameters being monitored in the tank - the temperature and the tank level were being measured through gauges at the bottom of the large tank (18m in diameter and 12 m in height) - presumably far from the hotspot, and these picked up the problem after it occurred at 2:40am. The first sign that anything was amiss was picked up the control room operator through a vapour release alert at 2:54 am, and the temperature alert only came 8 minutes later. Mitigation of the impact could have been more effective had the chillers servicing Tank M6 been running. It was switched off at 5pm earlier that evening as per routine site practice as ambient night temperatures required little or no chilling. There was also no automated sprinkler arrangement for vapour loss as this had never been anticipated; the fire water sprinklers had to be manually activated. Another reason for the accident, TBC (inhibitor of the polymerization reaction) is not effective after liquid styrene temperature in storage rises above 52° C. Under these conditions, a short-stopper chemical should be added. It seems LG Chem did not consider this possibility. Also, no TBC was topped up in the affected tank M6 since April 1 since there was no stock at site and the tested TBC level of the contents was apparently in range. Clearly, it can be realized that the TBC level is not a good indicator of safety margins; the polymer content is a better measure for an early alert. With the experience world over of Styrene, it takes considerable amount of idle time to have polymerization inside tank if effective inhibition and chilling is maintained. The unit failed to assess this situation due lack in handling experience by trained man-power.

The root cause thus appears to be the lack of experience of LG Polymers India and their Korean principal, LG Chem, in monitoring and maintaining full tanks of styrene that were idled for a long period of several weeks without operation. Further, M6 is an old tank in design terms and this possibly contributed to the problem. The breather vent through which the boiling styrene escaped was 8 inches in diameter, enabling very significant outflow at the high temperature and pressure generated by the runaway reaction. Operators and any industrial persons are not aware of control measures in such situation is the main cause.

The above scenarios definitely point towards the accountability for lapses on part of the Industry, which rest with Managing Director of the unit, Certified Safety Officer, Safety Department, and Production Department. The role of issuing necessary safety certificate to the industry, the periodic inspections is the primary responsibility of Department of Industries, Factories and Boilers.

c) ***Extent of damage to life, human and non-human; public health; and environment – including, water, soil, air;***

The Ambient Air Quality Monitoring was carried out by APPCB for the parameter Styrene and TVOC in and around M/s L.G. Polymers from May 07, 2020 using hand held meter with minimum detection limit of 0.1 ppm styrene. Monitoring was carried out at eight locations in and around the industries. Venkatapuram village is 100m downwind of industry, Janatha Colony is 200m from opposite to industry, Gopalapatnam is 1.5 km upwind of industry and Pendurthy is around 1.5 km upwind of industry. During monitoring average wind speeds were 1.1 m/s having predominant wind direction from South West to North East. The concentrations

of styrene were high at the time of accident in the villages. The concentrations could not be measured at the time as there were lethal and villages were inaccessible. Subsequently, the concentrations of styrene were measured in the ambient air at 9:30 am. The APPCB officials started the Ambient Air Quality Monitoring with handy samplers from 9.30 am on May 07, 2020 and Ambient Air Quality Monitoring was taken up on regular basis and the results are presented in the below table;

Styrene values (ppm) range recorded at various locations around M/s. LG Polymers

Station	07.05.2020		08.05.2020		09.05.2020		10.05.2020	
	Min	Max	Min	Max	Min	Max	Min	Max
Venkatapuram	0.0	461	0.0	374	0.0	3	0.0	1.5
Janatha Colony	0.0	1.3	0.0	6.2	0.0	0.9	0.0	0.2
Industry main gate	14.2	365	0.0	242	0.0	0.7	0.0	0.4
Gopalapatnam petro bunk	0.0	0.6	0.0	1.7	0.0	0.2	0.0	0.1
Pendurthy Road near way to LG polymers	0.0	1.2	0.0	3.0	0.0	0.2	0.0	0.2
Vepagunta	0.0	22.3	0.0	5.7	0.0	0.1	0.0	0.2
Venkatadri nagar	--	--	0.0	22.7	0.0	1.1	0.0	2.3
Storage tank	--	--	4.9	17.5	2.8	18	0.0	2.5

The team from CSIR-NEERI Hyderabad Zonal Centre arrived at site on May 12, 2020 and conducted extensive sampling and monitoring of ambient air and water bodies of the affected area. The report is given as **Annexure-IV**. From the data available with District Authorities, 12 people and 22 animals have died and estimated 3000 are affected. Venkatapuram village is near to the unit at a distance of 0.1 km. The committee also discussed about the extent of damage to life, human and non-human; public health; and environment – including, water, soil and air. Since the NEERI team has already conducted preliminary studies they may be engaged for further studies.

d) Steps to be taken for compensation of victims and restitution of the damaged property and environment, and the cost involved;

Compensation cost to be paid by industry shall be of two components; (i) Compensation paid by government and (ii) Environmental Compensation and restitution of the damaged property.

i) Compensation announced by Govt.

Government of Andhra Pradesh has announced Rs. 1 crore as compensation to the families of each of the deceased. Government will also compensate victims on ventilator support with

Rs. 10 lakhs, and victims hospitalized but not on life-support with Rs. 1 lakh each. This will be provided in addition to the entire expenses of their hospitalization, critical care and recovery, which will be borne by the government.

Victims, who received primary care treatment due to surface injuries arising out of this gas leak, will be given Rs. 25,000 each. Many animals had also died after inhaling the gas, the government will give compensation of Rs. 20,000 per animal to their owners.

ii) Environmental Compensation and restitution of the damaged property

An elaborate scientific study is required to calculate the actual cost for environmental damage and restoration. The services of NEERI may be utilised since they have conducted the preliminary studies and also have such expertise.

iii) Deposit of Rs. 50 crores by M/s LG Polymers P Ltd

M/s LG Polymers Pvt Ltd failed to deposit Rs. 50 crores as per the Hon'ble NGT order. It is reported that the unit has approached Hon'ble Supreme Court seeking exemption in payments.

e) Styrene Transportation after the incident;

In consultation with LG Chem, South Korea, Govt. of AP, East India Petroleum Private Ltd, who maintain the facility at onshore, with NDRF team started transfer of approx. 12800 tons of Styrene from T-2, T-23, (onshore tanks of 5500 KL capacity and 7300 KL capacity) M5, 111A & 111B tanks at Vizag port and LG Polymers plant in Vizag into vessels, which will carry them to South Korea.

On May 12, 2020, approx. 7900 tons of Styrene was loaded on a vessel and transported to South Korea. Till May 15, 2020 morning, out of 3000-tonStyrene at LG Polymers plant, 2143 tons has been transported to Vizag sea port tank. Remaining 857 tons is being transported. Sea Port storage tank at Vizag holds 4043 tons of Styrene. Once all the Styrene reaches Sea port storage tank from LG Polymers plant, a Second vessel will carry all this remaining 4900 tons Styrene to South Korea. For the complete transparency and accountability of the process, the permissions obtained to send the material back to South Korea, actual quantity and protocol followed shall be submitted immediately by Govt. of Andhra Pradesh, industries department, APPCB and District Magistrate.

f) Suggestions for restoration:

1. The affected tank poses no further risk but the polymerised mass has to be taken out and disposed at TSDF preferably incinerated. Alternate arrangements for converting to useful products may be explored after consultation with experts in the field so that incineration impact can be lowered.

2. Suggested to have all styrene inventories in the storage tanks of LGPI, including two outsourced shore tanks, having no chilling facility.

3. The unit shall be directed to empty all storage tanks with other chemicals, waste-residues, hazardous wastes, spill-material, intermediates, by-products and final product. The unit must share the material safety data sheets of the hazardous chemicals handled by it to concerned departments.

g) Remedial measures to prevent recurrence;

1) Hazard identification and evaluation in a local community, Preparation of Guiding Principles for Accident Prevention, Preparedness and Response for onsite and offsite emergency plans has to be reviewed.
2) A detailed study of the risk assessment and disaster management studies to be carried out by the industry
3) The styrene metabolites are of genotoxic and can cause carcinogenic health impacts to the population exposed based on different factors. It is suggested that the industry shall prepare a comprehensive health monitoring programme along with reputed hospitals for the suspected population at least for five years. Based on the data and health results of the study the monitoring may further continued. The District Administration shall monitor the whole programme for its proper implementation.
4) Preparation of a comprehensive EIA report in accordance with the MoEF&CC guidelines.
5) Safety audit to be conducted by certified third party regularly for onshore facilities under Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 (MSIHC Rules) for styrene import.
6) The distancing criteria for Storage tank of styrene has to be followed as per schedule 1 of MSIHC Rules, 1989.
7) Installation of the automatic siren when any parameter goes out of control. The siren needs to be done within and outside the industry so that the villages around are alarmed about the same
8) Emergency ambulance services to be arranged in the industry premises along with an experienced doctor.
9) Awareness campaigns in the villages around the industry to make them aware of the measures to be taken in case of any accident/ damage from the industry to the area around the industry.
10) Readymade PPE to be placed at the emergency points in case of any accident.
11) Separate safety manual to be prepared for each equipment along with the accidental management plan.

12) Periodic inspection by Department of Factories & Safety to assess the safety measures and documents maintained by the industry. If failed, necessary action shall be initiated against the industry.

13) API RP 575 protocol should be followed for inspection.

14) Design of storage tank should fulfil MoEF&CC notification dated 09.11.2012 with vapour control system.

15) Automatic styrene sensor should be installed in the different direction and residential with minimum detection limit of 1 ppm.

16) Carbon steel and stainless steel are suitable for handling styrene and Blanketing of tanks for fire protection should be considered.

17) The tank must have the capacity to contain the styrene product as well as enough volume for adding diluents to quench the reaction.

18) The administrative failures such as not obtaining Environmental Clearance from MoEF&CC, not implementing the recommendations of APPCB and factories of inspectors in time (based on inspection reports), failure of replacing the old storage tanks and having no safety measures for temperature recordings, no safety audit reports are to be further investigated.

19) The role of factories and inspectors to be specified and their inspection protocol are to be assessed Pan-India. Since safety aspects are part of their mandate an independent audit is required in the light of many accidents reported due to failure of safety measures and lack of training.

20) In order to prevent such accidents, a District Crisis Group (DCG) needs to be established under the chairmanship of District Collector. This group has to meet every 45 days to review the safety and hazard issues of each and every industry. Similarly, State Crisis Group (SCG) needs to be established under Chief Secretary. This committee should meet every 3 months and review the onsite/offsite District emergency plan prepared by DCG and suggest the measures to be taken to minimize the accidents. Both DCG and SCG should make plans to create awareness among the people living in the surrounding area of the industry about chemical hazards and measures to be taken for accidents.

21) It is suggested that each State shall take responsibility in implementing the Chemical Disasters Management, protocol (March 2009 publication) and MHIDC remedial measures and submit Action taken Report.

22) Responsibility Matrices for Disaster Risk Mitigation as per National Disaster Management Plan (May 2016) has to be taken up and assess the implementation schedule by each States and UTs.

h) Any other incidental or allied issues found relevant;

The NGT Committee members conducted a public consultation meeting on May 12, 2020 at 10:30 hrs in GVMC Conference Hall with NGOs, residents from affected villages and Industrialists. The Committee requested to offer suggestions/representations/remarks on the mishap of LG Polymers Styrene gas leakage issue and further consequences in that locality including preventive measures.

The Committee has taken opinion of the participants by interacting with each and every individual, and the main observations of the participants are stated below.

1. The compensation must be paid both by the company and the Government since company is responsible for the accident. Compensation shall be based on Global Compensation norms.
2. The Company should conduct local public awareness campaigns about Do's/ Don'ts during emergency.
3. Since the NEERI team have already conducted preliminary studies and a report has been prepared, it is suggested to engage the services of NEERI, for studies related to environment including water, soil and air.
4. Adjacent to the L.G. Polymers company, VUDA approved layouts also there, hence habitations are developed around the company over a period of time. District administrations shall take more care in approving such layouts.
5. Material auditing, safety inspection reports shall be made online for public
6. All the affected families should be given identity cards and Health cards by the Government and the expenditure on medical bills shall be borne by the unit. District Administration shall make necessary instructions and coordination.
7. In the R.R. Venkatapuram surrounding villages, pregnant women also affected, hence the government has to take necessary monitoring mechanism for the pregnant woman.
8. At the time of gas leakage, the villagers started to run away towards Vizanagaram, but the Police at Kothavalasa check post stopped all the people and directed them to stay in the nearby school. Lack of coordination between the district administrations of Visakhapatnam and Vizianagaram Districts was clearly visible during the incident.
9. The L.G. Polymers company management should be prosecuted under relevant sections Cr.P.C.
10. All factories should be monitored through C.C cameras. The Companies as well as the Government neglected the Community Based Disaster Response system.

11. The Government should ensure that hereafter all companies should take precautions and not to repeat such incidents. Awareness programme should be conducted in the surrounding areas of the industry.
12. The first information was given by civilians to the police control room, but not by the company.
13. Why should building plan approvals given in 200 metres radius adjacent to the Factory. The Urban Development is also responsible for this incident.
14. All companies should have Public Addressing system, so that the public can be warned during the Disaster.
15. The Representatives of industry and CII have stated that The Government should take action for brining World Class Disaster Management system.
16. Many people opined that neither the Inspector of Factory nor Fire officials are aware how to deal with chemical disasters.
17. Maintenance of buffer zone for all industries, stoppage of encroachments and policy of not allocating residential houses near to industry should be strictly followed.
18. The mapping has to be made for the Risk Assessment. It may be gas leakage, solvent firing, explosion etc.
19. Sensitization of public to deal with emergency in local and factory premises.
20. All factories should have mitigation plans for gas leakage solvent fire and should have emergency ward with medical staff for treatment.

The NGT Committee visited all five affected villages (R R Venkatapuram/Venkatapuram, Nandamuri Nagar, Janatha Colony, SC/BC colony and Kancharapalem and physically seen the extent of damage at all places. Also, the committee interacted with local people about the sequence of events due to gas leakage.

i) Scope for further studies;

CSIR-NEERI, Hyderabad Zonal (HZC) has already taken up an independent research study and the sampling work for various environmental components conducted from May 12-16, 2020. Since the NEERI team have already conducted preliminary studies and a report has been prepared, the services of NEERI may be utilised for further studies for calculating the cost of environmental damages related to flora and fauna. The other suggested scope for studies are:

a) Monitoring of the environmental parameters viz., air, groundwater, surface water, soil for the next 10-12 months to assess the long term concentration of styrene
b) Vapour cloud dispersion studies
c) Assessment of the environmental components for styrene concentration

d) Remedial measures for contaminated soil, water

e) Risk assessment studies for the accident

f) Prediction of the effect of the accident over long term and short term through modelling studies

g) Bio-assay test to understand the level of toxicity in the water

Justice B. Seshasayana Reddy, Former Judge, A.P. High Court	Prof. Ch V Rama Chandra Murthy, Retired Principal, AU College of Engineering, Visakhapatnam	Professor P J Rao, Chemical Engineering Department, Andhra University, Vizag;
Dr. Chandrasekhar Director, CSIR-Indian Institute of Chemical Technology, Hyderabad	Dr.Shaik Basha, Scientist and Head, CSIR-NEERI, Hyderabad	Dr. Prashant Gargava Member Secretary, Central Pollution Control Board Delhi

Photographs

Team near M6 Tank with officials of the unit

Briefing with authorities during the inspection

M6 tank on 08-05-2020, Styrene vapours escaping from the storage tank

Visit to affected villages by NGT committee members

Affected animal due to gas leakage in R R Venkatapuram village

Annexure - I

Item No. 12 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No. 73/2020

In re: Gas Leak at LG Polymers Chemical Plant in RR Venkatapuram Village Visakhapatnam in Andhra Pradesh

Date of hearing: 08.05.2020

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. This matter has been taken up *suo-motu* on the basis of media reports[1] to the effect that leakage of hazardous gas, Styrene, took place at 03:45AM on 07.05.2020, from a chemical factory owned by the South Korean company LG Polymers India Pvt., Limited, R.R. Venkatpuram village, Pendurthy Mandal, Vishakhapatnam resulting in death of 11 persons and hospitalization of more than 100 people of whom at least 25 were reported to be serious. These fatalities and injuries are reportedly likely to increase. More than 1000 persons are reported sick. There is also damage to environment and habitat. The media reports give rise to a substantial question of environment, which needs to be gone into by this Tribunal under Sections 14 and 15 of the NGT Act, 2010.

[1] https://www.ndtv.com/india-news/visakhapatnam-lg-polymers-gas-leakage-8-dead-over-1-000-sick-after-gas-leak-at-andhra-chemical-plant-2224643; https://indianexpress.com/article/india/visakhapatnam-gas-leak-live-updates-dead-injured-cm-jagan-mohan-reddy-pm-modi-6397962/

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2. Styrene gas is a hazardous chemical as defined under Rule 2(e) read with Entry 583 of Schedule I to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989. The Rules require on-site and off-site Emergency Plans to ensure prevention of damage. There appears to be failure to comply with the said Rules and other statutory provisions. Leakage of hazardous gas at such a scale adversely affecting public health and environment, clearly attracts the principle of 'Strict Liability' against the enterprise engaged in hazardous or inherently dangerous industry. Such an entity is liable to restore the damage caused under the Environment Law, apart from other statutory liability. The statutory authorities responsible for authorizing and regulating such activities may also be accountable for their lapses, if any, in dealing with the matter. It is also necessary to ensure that all necessary steps are taken to prevent recurrence of such an incident. Without prejudice to any other proceedings, this Tribunal has to perform its statutory obligation of providing relief and compensation to the victims of "environmental damage", as statutorily enacted, and restitution of damaged property and environment. With a view to deal with the issue, it is necessary to ascertain the facts relating to the extent of damage, extent of failure and consider remedial measures. The affected parties have to be given the opportunity of being heard.

3. Accordingly, we issue notice to Andhra Pradesh State PCB, District Magistrate, Vishakhapatnam, Central Pollution Control Board (CPCB), Ministry of Environment, Forests & Climate Change (MoEF&CC) and LG Polymers India Pvt., Limited. Notice may be served by email and response if any, be filed before the next date, by email at judicial-ngt@gov.in.

4. We also seek a report from a 5-member Committee comprising:

   a. Justice B. Seshasayana Reddy, Former Judge, A.P. High Court; - (Online till he is able to reach Vizag);

   b. Prof. Ch V Rama Chandra Murthy, Former Vice Chancellor, Andhra University, Vizag;

   c. Professor Pulipati King, Head of Chemical Engineering Department, Andhra University, Vizag;

   d. Member Secretary, CPCB (Online, if travel is restricted due to Covid-19); and

   e. Director, CSIR-Indian Institute of Chemical Technology (Online, if travel is restricted due to Covid-19);

   f. Head, NEERI, Vizag.

   The District magistrate, Vishakhapatnam, and Regional Office, Andhra Pradesh State PCB may provide logistic support to the Committee to enable their fact-finding and reporting. The Chairman, CPCB may steer and facilitate the functioning of the Committee using available technology. CPCB will bear the initial cost of functioning of the Committee to the extent necessary. The Committee will be at liberty to take assistance of such experts, individuals and institutions as may be considered necessary. The Member Secretary, CPCB will act as nodal agency for coordination.

5. The Committee may visit and inspect the site at the earliest and give its report before the next date via email judicial-ngt@gov.in. Site visit may be initially conducted by members available locally in consideration with outside members online. The Committee may specifically report:

   a. The sequence of events;

b. Causes of failure and persons and authorities responsible therefor;

c. Extent of damage to life, human and non-human; public health; and environment – including, water, soil, air;

d. Steps to be taken for compensation of victims and restitution of the damaged property and environment, and the cost involved;

e. Remedial measures to prevent recurrence;

f. Any other incidental or allied issues found relevant.

6. Having regard to the *prima facie* material regarding the extent of damage to life, public health and environment, we direct LG Polymers India Pvt., Limited to forthwith deposit an initial amount of Rs. 50 Crore, with the District Magistrate, Vishakhapatnam, which will abide by further orders of this Tribunal. The amount is being fixed having regard to the financial worth of the company and the extent of the damage caused.

7. A copy of this order be sent to Justice B. Seshasayana Reddy, Former judge, A.P. High Court; Prof. Ch V Rama Chandra Murthy, Former Vice Chancellor, Andhra University, Vizag; Professor Pulipati King, Head of Chemical Engineering Department, Andhra University, Vizag; Director, CSIR-Indian Institute of Chemical Technology; Head, NEERI, Vizag; Andhra Pradesh State PCB; District Magistrate, Vishakhapatnam; Central Pollution Control Board (CPCB); Ministry of Environment, Forests & Climate Change (MoEF&CC) and LG Polymers India Pvt., Limited, by email.

List for further consideration on 18.5.2020.

Adarsh Kumar Goel, CP

Sheo Kumar Singh, JM

Dr. Nagin Nanda, EM

May 08, 2020
Original Application No. 73/2020
DV

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Annexure-II

17th May, 2020.

INTERIM REPORT

1. ***M/s. Hindustan Polymers Limited*** *was established in 1961 and it was subsequently amalgamated with* ***McDowells Company*** *in 1982. Later on it was taken over by the South Korean Company-LG Chemicals, renamed it as* ***'LG POLYMERS INDIA PRIVATE LIMITED'*** *was continued manufacturing of polystyrene and expandable polystyrene.*

2. ***M/s.LG POLYMERS INDIA PRIVATE LIMITED'*** *hereinafter referred to as 'Company', has obtained consent and authorization for production of 235 Tonnes Per Day (TPD) of 'Polystyrene' and 45 TPD of 'Expandable Polystyrene' vide consent and authorization Order dated 08.05.2007* ***(Annexure-1)*** *of Andha Pradesh Pollution Control Board (hereinafter referred to as Board). The Ministry of Environment and Forest, Government of India, issued notification dt.27.01.1994* ***(Annexure-II)*** *under The Environment Protection Act,1986. The activity of the Company was not covered in the E&F notification dt.27.01.1994. Subsequently, the Ministry of Environment and Forest issued notification dt.14.09.2006* ***(Annexure-III)*** *in supersession of earlier notification. As per the new notification, Petroleum and chemical based processing comes within the purview of mandating requirement of environmental clearance. For better appreciation, we deem it appropriate to refer Para-2 of S.O.1553 and it reads as hereunder:*

> *(2)* ***"Requirement of prior environmental clearance (EC):-*** *The following projects or*

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activities shall require prior environmental clearance from the concerned regulatory authority which shall hereunder after referred to be as the Central Government in the Ministry of Environment and Forest for the matters falling under the category-A in the schedule and at State level the State Environment Impact Assessment Authority (SEIAA) for the matters falling under category-B in the said schedule, before any construction work or preparation of land by the project management except for securing the land, is started on the project or activity.

(i) All new projects or activities listed in the schedule to this notification;

(ii) Expansion and modernization of existing projects or activities listed in the schedule to this notification with addition of capacity beyond the limits specified by the concerned sector i.e., projects or activities which cross the threshold limits given in the schedule after expansion or modernization;

(iii) Any changing in product mix in an existing manufacturing unit included in schedule beyond the specified range;

3. *The Company applied for and obtained CFE (Expansion) of the Board in the year 2008 for increasing the expandable polystyrene from 45 TPD to 65 TPD limiting the polystyrene production to 63000 (sixty-three thousand) TPA without exceeding daily capacity of 235 TPD. Production capacity has been expanded from time to time.*

The present operating capacity of the Company is 313 TPD of polystyrene and 102 TPD of expandable polystyrene.

4. The Company submitted an application for CFE (Expansion) in 2017 for manufacturing a new product viz., engineering plastics of 36.67 TPD in-addition to the existing quantities of polystyrene of 313 TPD and expandable polystyrene of 102 TPD. The Board issued orders dt.03.06.2017 **(Annexure-IV)** and CFO Orders dt. 20.06.2018 **(Annexure-V).**

5. The Company submitted an application for CFE (Expansion) in 2018 for increasing the production of engineering plastics from 36.67 TPD to 62.5 TPD without changing the production quantities of other two products. The Board issued CFE (Expansion) vide Orders dt.27.12.2018 **(Annexure-VI)** and instructed the Company to approach the Ministry of Environment and Forest, for examining the applicability of EIAA notification for increased production of polystyrene and expandable polystyrene from styrene monomer. The Company submitted an application to State level environment Impact Assessment Authority, Andhra Pradesh, for expansion of its capacity from 415 TPD to 655 TPD. The State level Environment Impact Assessment Authority, recommended to transfer the proposal to Ministry of Environment & Forest Climate Change, Govt. of India, New Delhi, for further processing vide letter dt. 07.01.2020 **(Annexure-VII).**

6. The Government of India, Ministry of Environment, Forest and Climate Change (IA) Division clarified under letter dated 15.05.2020 **(Annexure-VIII)** that the project of M/s.LG Polymers Indian Private Limited., attracts the provisions of schedule-V(e) of notification 2006 as amended from time to time. The text of the letter dt.15.05.2020 reads as hereunder:

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"(1) This has reference to the letter No.7063/BCB/ZO-VSP (TECH/2020) dt. 12.05.2020 from the Joint Chief Environment Engineer, AP. Pollution Control Board, Zonal Office, Visakhapatnam., (APPCB-ZO-VSP) Andhra Pradesh, regarding requirement of Environmental clearance of M/s.LG Polymers India Private Limited, Visakhapatnam.

(2) It is to inform that the project of M/s.LG Polymers India Private Limited., Visakhapatnam attracts the provisions of Schedule-V(e) of EIA Notification, 2006 as amended from time to time.

7. Gas leak of styrene occurred in the plant of the Company on the wee hours of 07.05.2020. The Gas leak caused 12 (twelve) deaths and sickness to many people. Some of the affected people numbering 585 (five hundred and eighty-five) took treatment in hospitals both government and private **(Annexure-IX)**.

8. The Hon'ble Tribunal has been pleased to constitute a Committee taking note of leakage of hazardous styrene gas in the Company plant reported in Media to gather sequence of events etc., by Order dt. 08.05.2020 **(Annexure-X)**. The three- members of the Committee viz., (1) Prof.Ch.V.Ramachandra Murthy, Retired Principal, A.U.College of Engineering, Visakhapatnam, (2) Prof. P.Jagannadha Rao, Chemical Engineering Department, A.U. College of Engineering Visakhapatnam; and (3) Dr. Shaik Bhasha, Scientist and Head of ESIR, National Environmental Engineering Institute, Hyderabad, observed the factory premises and affected villages on

11.05.2020 and 12.05.2020 and sent a report dated 14.05.2020.

9. Owing to preoccupied schedule at Hyderabad up to 13.05.2020, one of the members of the Committee Justice Sri B.Seshaseyana Reddy could not join with the other Committee members on 11.05.2020. He came to Visakhapatnam by road on 14.05.2020 and observed the plant premises accompanied by the other two members of the Committee viz., (1) Prof.Ch.V.Ramachandra Murthy, Retired Principal, A.U.College of Engineering, Visakhapatnam, (2) Prof. P.Jagannadha Rao, Chemical Engineering Department, A.U. College of Engineering Visakhapatnam on 15.05.2020.

10. The plant was shut-down on 23.03.2020 due to on going 'Lock-down'. On the Wee-hours of 07.05.2020 there was leakage of Styrene Gas causing panic to the people in the surrounding villages viz., R.R.Venkatapuram, Nandamuri Nagar, Padmanabha Nagar, SC-BC Colony, Kumparapalem.

11 We observed the affected styrene tank. It's capacity is stated to be 2800 MTs and adjacent to it, there is another tank with capacity of 3300 MTs. Sri PPC Mohan Rao, Director (Operations) and Sri G.Raju, Production In-charge are present during our observation of the plant premises. Mr.P.P.C.Mohan Rao, is the Director – Operations of the Company. Mr. G.Raju, is stated to be Incharge of Maintenance of production including the maintenance of machinery. Mr. K.Srinivas Kiran Kumar, Assistant Manager is stated to be Incharge of Storage Tanks.

12. Styrene is a hazardous chemical within the provisions of the Environmental Protection Act.

(a) Styrene is a monomer with a boiling point of 145^{O}C and is a liquid aromatic hydrocarbon bearing molecular formula C_8 H_8 and molecular weight 104. Delayed or immediate effects can be expected after short or long-term exposure of styrene monomer vapors. Styrene vapors are heavier than air and spread along floors.

(b) Styrene is a reactive monomer and required to be stored preferable at temperatures of 15-18^{0}C that is lower than ambient temperatures so that it doesn't polymerize.If the temperature approached 20^{0}C the tank must be cooled and under no circumstances the temperature should exceed 25^{0}C. Maintaining styrene temperature below its flash point of 31^{O}C will prevent vapours from being in flammable range and maintaining the lower temperatures of 27^{O}C extend the shelf life of styrene monomer. Usually Tertiary Butylcatehol-C_{10} H_{14} O_2 (TBC) approximately 15 ppm in solution is added to styrene monomer to prevent polymerization inhibition. There need to be continuous circulation to prevent settling of TBC. In the absence of required TBC concentrations, there is a ready possibility for polymerization of the styrene monomer. Polymerization occurs slowly even at ambient temperatures and becomes rapid at elevated temperatures. If the temperatures of the storage tank increase beyond 25^{0}C the polymerization accelerates increasing the temperatures in the storage tank thereby further accelerating the polymerization leading to vaporization of the styrene monomer. The released vapours are heavier than air and are tend to reach ground levels within after short travel in the windward direction.

(c) *Several factors contribute to the highly hazardous styrene handling and polystyrene production process. Literature survey has indicated that styrene monomer can exhibit reaction runaways because of their exothermic and auto-accelerating nature even at adiabatic conditions. Few studies have shown that the polymerization runaway "onset" temperature inversely increased with the monomer mass fraction and generally observed to be 66^{O}C. Experimental and thermodynamic calculations showed that unstable styrene monomer increased system vapor pressure even at a lower adiabatic temperature rise.Styrene polymerization reaction is relatively highly exothermic with a heat generation at around 71 kJ·mol^{-1} (1) . At the same time, even without an initiator, two styrene molecules can undergo a Diels–Alder type of reaction and generate radicals to start self-polymerization upon heating (2). The polymerisation reaction being exothermic, if contained may become uncontrolled and the bulk styrene temperature may rise to a level at which polymerisation is self-sustaining and very rapid. This will result in evolving the release of large quantities of heat together with volumetric expansion. Styrene can accumulate static charges and hence, special attention should be paid to take precautionary measures against static discharge (3). As soon as a*

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[1] (Wiley-VCH, Ullmann's Polymers and Plastics, 4 Volume Set: Products and processes; John Wiley & Sons, 2016; Vol 1).

[2] Husain, A; Hamielee, A.E.Thermal Polymerization of Styrene, J.Appl. Polym. Sci. 1978, 22, 1207-1223.

[3] Styrene Monomer: Safe Handling Guide, Styrene Producers Association (SPA), PlasticsEurope / Styrenics Chain, July 2018.

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temperature elevates to above 65°C it takes about just 15-20 minutes before a complete runaway.

(d) *An effective storage and handling of styrene monomer requires an inhibitor to be added to the tank. An effective inhibitor and a well-defined induction period that is period where no noticeable polymerization takes place shall be ensured. TBC is used with styrene monomer to increase the induction period, to be an effective inhibitor, TBC must have dissolved oxygen (above 6%) and a concentration of 15 ppm must be maintained in the tank. The TBC breaks down and consumes much faster at increased temperatures.*

(e) *In the case of the recent styrene vapor leak in LG polymers India Private Limited, there is no circulation of styrene monomer since the lockdown started on 23rd march 2020. TBC inhibitor was not available in the plant, much before the day of incident.It is also observed that the tank doesn't have the provision of monitoring temperatures at vapour space whereas temperature sensors are available at the bottom of the tank where the temperatures was recorded as 17°C constantly until the incident occurred. It is expected that there was a temperature rise at the top layer and believed that the polymerization is already started. As the tank is atmospheric storage there is no safety valve existing on the tank whereas one goose neck and dip-hatch are provided on the top of the tank roof. Once the runaway reaction started, the temperatures steeply shot up and formed the vapour cloud in the tank vicinity which got released from the goose neck and dip-hatch nozzles. These vapours travelled towards downwind direction.*

(f) Monomers are thermally unstable. Standard European Behaviour Classification (SEBC) has classified styrene monomer as "floater evaporator". In the present incident, absence of TBC inhibitor, improper refrigeration and stagnant condition of styrene monomer (99.89% concentration) for about 45 days would have led to free radical polymerization of styrene molecules. This polymerization process once initiated will auto-accelerate as the reaction progresses and the system viscosity will drastically increase. The reaction therefore becomes diffusion-controlled (which is known as the gel effect or Trommsdorff–Norrish effect), leading to the thermal runaway of polymerization elevating the temperatures further above 65^{o}C, which will result in rapid increase of the rate of polymerization and rate of heat evolution. Once the temperatures reached and exceeded the boiling point of styrene (145^{o}C), the liquid form boils vigorously along with rapid polymerization resulting in release of violently viscous vapours and these vapours emitted from both goose neck and dip-hatch nozzles at considerably higher concentrations.

13. The affected tank has only bottom sensor to indicate the temperature. The temperature is to maintain not to exceed 20 degree centigrade to keep the styrene in the tank safe. To keep the temperature in the tank within the permissible limit, refrigeration system is adopted. In other words, refrigeration is mandatory to maintain the temperature of styrene so as to not to exceed 17 Degrees centigrade grade. The affected tank has no sensor at the top layer and thereby recording of temperature at top layer level has not been made.

14. Whereas second-tank whose capacity is 3300 MTs has sensors at bottom, in middle and at top layer. The accident

occurred on the Wee hours of 07.05.2020 because of excessive generation of heat on the top layer of styrene in the tank. Our enquiries with the Director (Operations) and the Production Manager Mr. G.Raju, revealed that refrigeration system used to be put-off during night time.

15. *During our observation Mr.G.Raju, tried to explain that he along with workmen made some efforts to add 'para tertiary butylcatechol' (TBC) to reduce the intensity of the situation. He produced inhibitor stock statement to substantiate his plea. We did not see any substance in his statement for the reason that two of the persons* ***(Annexure-XI)*** *who attended the duty viz., (1) M.Atchut, S/o. Gopi, aged 27 years, Shift Incharge; (2) P.Balaji, S/o.Amanna Setty, Manager., stated that the moment they saw dense vapour coming from the tank, they ran out from the plant and they did not see anyone making any effort to subside the intensity of the vapours. Had any workman present at the affected tanks, he should have been the victim of vapour gas and he should have been shifted to hospital for treatment. Our observations revealed that the management did not take proper care of the affected storage tank and it resulted in auto polymerization of styrene releasing excess heat which escaped from the goose-neck and dip hatch in the form of vapour.*

16. *The Company obtained policy* ***(Annexure-XII)*** *under ' Public Liability Act'. The policy is in force as on this day. The policy covers the period from 01.04.2020 to 31.03.2021.*

17. *The Government of Andhra Pradesh issued G.O.Rt.No.449 Revenue, CMRF (WC) Department dt.08.05.2020* ***(Annexure-XIII)*** *according sanction and release of Rs.30.00 crores in favour of kin of the deceased as exgratia*

and financial assistance to the victims for their treatment and financial assistance to the individuals in the affected villages.

18. *The Deputy Chief Inspector of Factories, inspected the plant on 18.12.2019. Copy of the Inspection report* ***(Annexure-XIV)*** *has been made available with the Committee by the Director of Factories, FAC. during the observations of the plant premises. As per the particulars incorporated in the Inspection Report, Mr. PPC Mohan Rao, has been shown as Occupier and Mr.Shashank Kumar, has been shown as Manager.*

19. *The Government of Andhra Pradesh, issued G.O.Rt.No.98 Industries and Commerce (P&I) Department dt. 03.05.2020* ***(Annexure-XV)*** *for resuming of industries. In view of the relaxation given in the G.O., it appears the plant has been making preparations as on the date of incident to resume activities. Before start of the activities in the plant, the unfortunate incident has occurred on the wee-hours of 07.05.2020.*

20. *We are, prima-facie, of the view that styrene gas leakage from the affected tank was due to the following reasons :*

    1. *Insufficient TBC concentration in styrene tank due to unavailability of TBC in the plant.*

    2. *There is no monitoring system for dissolved oxygen in the vapour space which might have fall down below 6%.*

    3. *The tank has no provision of monitoring temperatures at top layers of the storage.*

    4. *Refrigeration system is not being operated for 24 hours.*

5. *Due to human failure and negligence of the persons in-Charge of the plant and maintenance personnel of the storage tanks.*

Justice Sri B.Seshaseyana Reddy.
(Retired Judge of High Court of AP)

Prof.Ch.V.Ramachandra Murthy
Retired Principal, AU College of Engg., Visakhapatnam.

Prof.P.Jagannadha Rao,
Chemical Engineering Dept., of AU College of Engineering, Visakhapatnam.

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Annexure - I

ANDHRA PRADESH POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN, A-3, INDUSTRIAL ESTATE,
SANATHNAGAR, HYDERABAD - 500 018.

Phone: 040-23887500
Fax: 040- 23815631
Grams : Kalusya Nivarana
Website :www.apspcb.org

CONSENT & AUTHORISATION ORDER
BY REGISTERED POST WITH ACKNOWLEDGEMENT DUE

Consent Order No : APPCB/VSP/VSP/109/HO/2007 444 Date :08.05.2007

(Consent Order for Existing/New or altered discharge of sewage and/or trade effluents/outlet under Section 25/26 of the Water (Prevention & Control of Pollution) Act,1974 and amendments thereof, Operation of the plant under section 21 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof and Authorisation / Renewal of Authorisation under Rule 5 of the Hazardous Wastes (Management & Handling) Rules 1989 & Amendment Rules)

CONSENT is hereby granted under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974, under section 21 of Air (Prevention & Control of Pollution) Act 1981 and Authorisation under the provisions of HW (M & H) Rules (hereinafter referred to as 'the Acts', 'the Rules') and the rules and orders made thereunder to

M/s. L.G. Polymers India Pvt Limited
R.R. Venkatapuram Village
Pendurthy Mandal,
Visakhapatnam
Email: info@lgpi.co.in

(hereinafter referred to as 'the Applicant') authorizing to operate the industrial plant to discharge the effluents from the outlets and the quantity of Emissions per hour from the chimneys as detailed below.

i) Out lets for discharge of effluents:

Outlet No.	Outlet Description	Max Daily Discharge	Point of Disposal
1.	Trade Effluents after Treatment	320 KLD	On land for plantation.
2.	Domestic Effluents	40 KLD	Septic Tank Followed by soak pit

ii) Emissions from chimneys:

Chimney No.	Description of Chimney	Quantity of Emissions at peak flow
1.	Attached to 10 Lakh K.Cal/yr GPPS Oil Fired Heater	2040 Nm3/hr
2.	Attached to 12 Lakh K.Cal/yr HIPS Oil Fired Heater	2600 Nm3/hr
3.	Attached to 5 TPH furnace Oil Fired Boiler.	5200 Nm3/hr
4.	Attached to 8 TPH Furnace Oil Fired Boiler (Standby)	8750 Nm3/hr
5.	Attached to Process Emissions from Zinc Stearate Mixing Unit	-
6.	Attached to 4 x 1000 KVA D.G. Sets	--
7.	Attached to 500 KVA D.G. Set	--

iii) HAZARDOUS WASTE AUTHORISATION (FORM – II) [See Rule 3(C) & 5 (5)]

1. Number of Authorisation and date of issue - APPCB/VSP/VSP/109/HWM, Dt:08.05.2007
2. The Vice President -Production, M/s. LG Polymers India Pvt Ltd., is hereby granted an authorisation to operate a facility for collection, reception, storage, transport and disposal of the following wastes with quantities as below:

S.No	Name of the Hazardous waste	Stream	Quantity of Hazardous waste per annum.	Disposal Option
1.	Catch Pot Styrene	1.4 of Schedule-I	4.8	Recycle back into the process.
2.	Semi Polymerised Styrene		1.2	

3.	ETP Sludge	34.4 of Schedule-I	48 TPA	TSDF, Pharma City, Parawada
4.	Used Oil	5.1 of Schedule-I	8 KL	Send to Authorised agencies for reprocessing and recovery
5.	Tank bottom sludge of fuel oil storage tanks	3.3 of Schedule - I	200 Kg / 4Yr	
6.	Detoxified Containers and container liners	33.3 of Schedule-I	3 TPA	Authorised agencies of APPCB.
7.	Used lead acid batteries	22 of Schedule-IV	6 Nos	Return to dealer / manufacturer on buy back basis (or) to authorised recyclers.
8.	Waste electrical cables	21 of Schedule-IV	0.3 Tons	Authorised re-processors of APPCB.
9.	Oil soaked cotton	5.2 of Schedule-I	0.35 Tons	TSDF, Pharma city, Parawada.

at their premises located at R.R.Venkatapuram, Visakhapatnam.

This consent order is valid to manufacture the following products along with quantities only.

S. No	Products	Quantity
1.	Polystyrene	235 TPD
2.	Expandable Polystyrene	45 TPD

This order is subject to the provisions of 'the Acts' and the Rules' and orders made thereunder and further subject to the terms and conditions incorporated in the schedule A, B & C enclosed to this order.

This combined order of consent & Hazardous Waste Authorisation shall be valid for a period ending with the **31st day of December 2007.**

Sd/-
MEMBER SECRETARY

To
The Vice President (Production),
M/s. LG Polymers India Pvt Ltd.,
R.R.Venkatapuram,
Visakhapatnam -530 029.

//T.C.F.B.O//

21/5/07

SENIOR ENVIRONMENTAL ENGINEER (CFO)

SCHEDULE – A

1. **The applicant shall make applications for renewal of Consent (under Water and Air Acts) and Authorisation under HWM Rules at least 60 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts for obtaining Consent & HW Authorisation of the Board.**
2. The industry shall immediately submit the revised application for consent to this Board in the event of any change in the raw material used, processes employed, quantity of trade effluents & quantity of emissions etc.
3. a) All the fugitive emissions shall be controlled with proper measures.
   b)The applicant shall also install the equipment such as wind speed recorder, wind direction recorder.
4. The applicant shall not change or alter either the quality or the quantity or the rate of the discharge or the route of discharge and shall not change or alter either the prescribed quality or the rate of emission without the previous written permission of the Board.
5. The applicant shall, not later than 30 days from the date of issue of this consent order, certify in writing to the Board that the applicant has installed or provided for an alternative electric power source sufficient to operate all facilities installed by the applicant, to comply with the terms and conditions of this consent. In absence of alternative electric power source sufficient to operate all facilities installed by the applicant, to comply with the terms and conditions of this consent, production shall be stopped.
6. Any up-set condition in any plant/plants of the industry, which result in, increased effluent discharge and/ or violation of standards stipulated in this order or the emission of any Air Pollutant into the environment in excess of the standards laid down by the Board, occurs or is apprehended to occur due to accident, or other unforeseen act or event, the person-in-charge of the premises, from where such discharge / emission occurs or is apprehended to occur shall forthwith intimate the fact of such occurrence or the apprehension of such occurrence to this Board, by fax / email under intimation to the Collector and District Magistrate.
7. In case of such episodal discharges / emissions mentioned in item 6 above, the industry should take immediate action to bring down the discharge / emission below the limits prescribed in this order.
8. A good house keeping shall be maintained both within the factory and in the premises. All hoods, pipes, valves, sewers and drains shall be leak proof. Floor washings shall be admitted into the effluent collection system only and shall not be allowed to find their way into storm drains or open areas.
9. a)The industry shall carryout analysis of waste water discharges or emissions through chimneys, for the parameters mentioned in Schedule – B of this order at regular intervals.
   b)The industry shall maintain following records to accessible to the Board, whenever required.
   1. Analysis reports of waste water/ emissions.
   2. Log book for operation of pollution control systems.
   3. Inspection book.
10. The applicant shall set up THREE Ambient Air Quality Monitoring Stations for continuous recording of relevant critical parameters mentioned in Schedule - B as per the CPCB guidelines and submit monthly reports.
11. Separate power connection with energy meter shall be provided for the Pollution Control Equipments and record of power consumption and chemicals consumption for the operation of pollution control equipment shall be maintained separately.
12. The applicant shall comply with the directives/orders issued by the Board in this order and at all subsequent times without any negligence on his part. The applicant shall be liable for such legal action against him as per provisions of the Law/Act in case if non-compliance of any order/directive issued at any time and/or violation of the terms and conditions of this consent order.
13. The applicant shall furnish to the visiting officer and / or the Board any information regarding the construction, installation or operation of the effluent treatment system / air pollution control equipment / secured storage area of Hazardous Waste and such other particulars as may be pertinent for preventing and controlling pollution.
14. The industry is liable to pay compensation for any environmental damage caused by it, as fixed by the Collector and District Magistrate as Civil liability.
15. All the rules & regulations notified by Ministry of Environment and Forests, Government of India in respect of management, handling, transportation and storage of hazardous chemicals and wastes shall be followed.
16. All the rules & regulations notified by Ministry of Law and Justice, Government of India regarding Public Liability Insurance Act, 1991 shall be followed.
17. The occupier shall educate the workers and nearby public of possible accidents and remedial measures.
18. For any accident or spillage of hazardous wastes causing damage to the Environment, the occupier or the transporter as the case shall be held responsible.
19. In case of closure of industry, the un-used/not consumed raw materials falling under the category of Hazardous Chemicals and mentioned in Manufacture, Storage and Import of

Hazardous Chemicals Rules, 1989 and Amendment Rules, 2003 shall be removed and sold to other units within 90 days from the date of closure to prevent any possibility of occurrence of an accident. In case the above hazardous chemicals have lost their properties originally acquired, then they shall be treated, as Hazardous Waste and they should be disposed off only to the agencies authorized by APPCB in a safe manner.

20. The occupier shall prepare/update Emergency preparedness plan for safe handling of hazardous waste from time to time and submit the same to APPCB. Emergency preparedness plan must be implemented immediately whenever there is fire, explosion or release of hazardous waste or hazardous waste constituents, which could endanger to human health or environment.
21. Packaging, labeling and transportation of Hazardous Wastes shall be in accordance with the provisions of the rules issued by the Central Govt. under the Motor Vehicles Act, 1988 and other guidelines issued from time to time. The packaging and labeling shall be based on the composition and hazardous constituent of the waste, however all Hazardous Waste containers should be provided with a general label.
22. The driver who transports Hazardous Waste should be well acquainted about the procedure to be followed in case of an emergency during transit. The transporter shall carry a Transport Emergency (TREM) Card (as given in the guidelines for management and handling of hazardous wastes) duly filled by the Hazardous Waste generator.
23. Containers / Container Liners of Hazardous Chemicals and Hazardous Wastes should be thoroughly detoxified before selling to the agencies authorized by APPCB. Proper records, specific to each Hazardous Chemical / Hazardous Waste containers / Container Liners should be maintained in the following way:
    I) Number of containers received.
    II) Date and method of detoxification.
    III) Name of agencies to whom containers were sold with quantities.
    IV) Transportation particulars.
24. No Hazardous Wastes shall be mixed with any other wastes or shall be discharged to a common, other internal, external sewerage or other drainage system without prior approval of APPCB.
25. If HDPE bags are used for storing Hazardous Wastes, it should be ensured that they are perfectly sealed mechanically or double hot sealed. If MS/HDPE bags or drums are used for storing Hazardous Wastes, these drums / bags should be ensured that they are perfectly sealed.
26. The person authorised shall not rent, lend, sell, transfer their industrial premises without obtaining prior permission of the State Pollution Control Board.
27. Any unauthorised change in personnel, equipment as working condition as mentioned in the application by the person authorized shall constitute a breach of his authorisation.
28. The industry shall comply with the provisions of Batteries (Management & Handling) Rules, 2001.
29. The industry shall put up two sign boards (6x4 ft. each) at publicly visible places at the main gate. The first sign board shall provide information on specific conditions of CFO and Hazardous Waste Authorisation. The second sign board shall display online data on quantity and nature of hazardous chemicals being used in the plant, as well as water, air emissions and solid waste generated within the factory premises.
30. The applicant shall exhibit the Consent & HW Authorisation order of the Board in the factory premises at a prominent place for the information of the inspecting officers of the different departments.
31. Not withstanding anything contained in this conditional letter or consent, the Board hereby reserves the right and powers under Section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 and its amendments thereof and under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and its amendments thereof to review any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Acts by the Board.
32. The authorisation issued under Hazardous Waste (Management and Handling) Rules, 1989 and its amendments thereof, shall comply with the provision of the Environment (Protection) Act, 1986.

Sd/-
MEMBER SECRETARY

SCHEDULE - ☑

Special Conditions

1. The effluent discharged shall not contain constituents in excess of the tolerance limits mentioned below.

Outlet	Parameter	Limiting Standards
1.	P^H	5.50 –9.0
	TSS	100 mg/l
	TDS	2100 mg/l
	Oil and Grease	10 mg/l
	COD	250 mg/l
	BOD	30 mg/l

2. The industry shall take steps to reduce water consumption to the extent possible and consumption shall NOT exceed the quantities mentioned below:

S. No.	Purpose	Quantity
1.	Process and Washings	220 KLD
2.	Boiler Feed	30 KLD
3.	Gardening / Irrigation	470 KLD
4.	Cooling	380 KLD
5.	Domestic	40 KLD
	Total	1140 KLD

3. The industry shall file the water cess returns in Form-I as required under section (5) of Water (Prevention and Control of Pollution) Cess Act, 1977 on or before the 5th of every calendar month, showing the quantity of water consumed in the previous month along with water meter readings. The industry shall remit water cess as per the assessment orders as and when issued by Board.

4. The emissions shall not contain constituents in excess of the prescribed limits mentioned below.

Chimney No.	Parameter	Emission Standards
1 to 7	SPM	115 mg/Nm^3

5. The industry shall comply with ambient air quality standards of TSPM - 200 µg/ m^3; RSPM - 100 µg/ m^3; SO_2 - 80 µg/ m^3; NO_x - 80 µg/m^3.

   Noise Levels: Day time (6 AM to 10 PM) - 75 dB (A)
   Night time (10 PM to 6 AM) - 70 dB (A).

6. The industry shall not increase the capacity beyond the permitted capacity mentioned in this order, without obtaining CFE/CFO of the Board.
7. Industry shall improve the performance of ETP system and explore the possibility of using treated effluent for plantation purpose within their premises and submit report **within a month.**
8. Industry shall establish AAQM Stations where maximum GLC's are expected and residential area. Shall have a network of AAQM Stations in coordination with other industries in the Bowl Area in consultation with the Zonal Officer and Regional Officer
9. The applicant shall submit Environment statement in Form V before 30th September every year as per Rule No.14 of E(P) Rules, 1986 & amendments

Sd/-
MEMBER SECRETARY

SCHEDULE - C

[see rule 3(c) and 5(5)]

[CONDITIONS OF AUTHORISATION FOR OCCUPIER OR OPERATOR HANDLING HAZARDOUS WASTES]

1. Industry shall dispose / sell the hazardous wastes to only industries / agencies authorized by the Board. They shall verify the authorization of the board given to the party before disposing their wastes to the external party.

2. Industry shall take necessary practical steps to prevention of oil spillages and carry over of oil from the premises.

3. The industry shall obtain membership from TSDF, Parawada, Visakhapatnam for disposal of hazardous waste and submit a copy of the same to this office.

4. The industry shall dispose the used lead acid batteries to the manufacturer on buy back system or to the authorized recyclers of APPCB.

5. The industry shall not store hazardous waste for more than 90 days as per HWM Rules, 2003.

6. The industry shall not dispose Waste oils/ Non-ferrous metal scrap / Used lead acid batteries to the traders.

7. The unit shall maintain 6 copy manifest system for transportation of waste generated and a copy shall be submitted to Board Office and concerned Regional Office.

8. Industry shall maintain good house keeping & maintain proper records for Hazardous Wastes stated in Authorisation (FORM II).

9. The unit shall submit the condition wise compliance report of the conditions stipulated in Schedule B and Schedule C of this order on half yearly basis to Board Office, Hyderabad and concerned Regional Office.

Sd/-
MEMBER SECRETARY

To

The Vice President (Production),
M/s. LG Polymers India Pvt Ltd.,
R.R.Venkatapuram,
Visakhapatnam -530 029.

//T.C.F.B.O//

B. Rao 21/5/07
SENIOR ENVIRONMENTAL ENGINEER (CFO)

Annexure-II

ENVIRONMENT IMPACT ASSESSMENT NOTIFICATION

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 27th January, 1994

(Incorporating amendments made on 04/05/1994, 10/04/1997, 27/1/2000, 13/12/2000, 01/08/2001, 21/11/2001, 13/06/2002, 28/02/2003, 7/5/2003, 4/8/2003, 22/9/2003 and 7/7/2004.)

1. S.O. 60 (E) Whereas a notification under clause (a) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986 inviting objections from the public within sixty days from the date of publication of the said notification, against the intention of the Central Government to impose restrictions and prohibitions on the expansion and modernization of any activity or new projects being undertaken in any part of India unless environmental clearance has been accorded by the Central Government or the State Government in accordance with the procedure specified in that notification was published as SO No. 80(E) dated 28th January, 1993;

And whereas all objections received have been duly considered;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby directs that on and from the date of publication of this notification in the Official Gazette, expansion or modernization of any activity (if pollution load is to exceed the existing one), or new project listed in Schedule I to this notification, shall not be undertaken in any part of India unless it has been accorded environmental clearance by the Central Government in accordance with the procedure hereinafter specified in this notification;

2. Requirements and procedure for seeking environmental clearance of projects:

I(a) Any person who desires to undertake any new project in any part of India or the expansion or modernization of any existing industry or project listed in the Schedule-I shall submit an application to the Secretary, Ministry of Environment and Forests, New Delhi.

The application shall be made in the proforma specified in Schedule-II of this notification and shall be accompanied by a project report which shall, inter alia, include an Environmental Impact Assessment Report, an ** Environment Management Plan and details of public hearing as specified in Schedule-IV** prepared in accordance with the guidelines issued by the Central Government in the Ministry of Environment and Forests from time to time. However, Public Hearing is not required in respect of

(i) small scale industrial undertakings located in (a) notified/designated industrial areas/industrial estates or (b) areas earmarked for industries under the jurisdiction of industrial development authorities;
(ii) widening and strengthening of highways;
(iii) mining projects (major minerals) with lease area up to 25 hectares,

(iv) units located in Export Processing Zones, Special Economic Zones
(v) modernisation of existing irrigation projects
(vi) offshore exploration activities, beyond 10 kilometres from the nearest habituated village boundary, gaothans and ecologically sensitive areas such as, mangroves (with a minimum area of 1000 sq.m), corals, coral reefs, national parks, sanctuaries, reserve forests and breeding and spawning grounds of fish and other marine life; .

***Provided further, that for pipeline projects, Environmental Impact Assessment Report will not be required:

Provided further, that for pipeline and highway projects, public hearing shall be conducted in each district through which the pipeline or highway passes through: ***

(b) Cases rejected due to submission of insufficient or inadequate data and *Plans may be reviewed as and when submitted with complete data and *Plans. Submission of incomplete data or plans for the second time would itself be a sufficient reason for the Impact assessment Agency to reject the case summarily.

II In case of the following site specific projects:

(a) mining;
(b) pit-head thermal power stations;
(c) hydro-power, major irrigation projects and/or their combination including flood control;
(d) ports and harbours (excluding minor ports);
(e) *prospecting and exploration of major minerals in areas above 500 hectares; *
(f) greenfield airports, petrochemical complexes and refineries.

The project authorities will intimate the location of the project site to the Central Government in the Ministry of Environment and Forests while initiating any investigation and surveys. The Central Government in the Ministry of Environment and Forests will convey a decision regarding suitability or otherwise of the proposed site within a maximum period of thirty days. *The said site clearance shall be granted for a sanctioned capacity and shall be valid for a period of five years for commencing the construction, operation or mining. *

III (a) The reports submitted with the application shall be evaluated and assessed by the Impact Assessment Agency, *and if deemed necessary it may consult* a committee of Experts, having a composition as specified in Schedule-III of this Notification. The Impact Assessment Agency (IAA) would be the Union Ministry of Environment and Forests. The Committee of Experts mentioned above shall be constituted by the Impact Assessment Agency or such other body under the Central Government authorised by the Impact Assessment Agency in this regard.

(b) The said Committee of Experts shall have full right of entry and inspection of the site or, as the case may be, factory premises at any time prior to, during or after the commencement of the operations relating to the project.

**(c) The Impact Assessment Agency shall prepare a set of recommendations based on technical assessment of documents and data, furnished by the project authorities,

supplemented by data collected during visits to sites or factories if undertaken, and details of public hearing.

The assessment shall be completed within a period of ninety days from receipt of the requisite documents and data from the project authorities and completion of public hearing and decision conveyed within thirty days thereafter.

The clearance granted shall be valid for a period of five years for commencement of the construction or operation of the project. **

No construction work, preliminary or otherwise, relating to the setting up of the project may be undertaken till the environmental and site clearance is obtained.

IV. In order to enable the Impact Assessment Agency to monitor effectively the implementation of the recommendations and conditions subject to which the environmental clearance has been given, the project authorities concerned shall submit a half yearly report to the *Impact Assessment Agency. Subject to the public interest, * the Impact Assessment Agency shall make compliance reports publicly available.

V. If no comments from the Impact Assessment Agency are received within the time limit, the project would be deemed to have been approved as proposed by project authorities.

3. **Nothing contained in this Notification shall apply to:**

(a) any item falling under entry Nos. 3 *18*20* 31*and 32* of the Schedule-I to be located or proposed to be located in the areas covered by the Notifications S.O. No.102 (E) dated 1st February, 1989, S.O. 114 (E) dated 20th February, 1991; *S.O. No. 416 (E) dated 20th June, 1991* and S.O. No.319 (E) dated 7th May, 1992.

(b) any item falling under entry Nos.1,2,3,4,5,7,9,10,13, 14,16,17,19,*21*,25 and 27 of Schedule-I if the investment is less than Rs.100 crores for new projects and less than Rs. 50 crores for expansion/modernization projects;

(c) any item reserved for Small Scale Industrial Sector with investment less than Rs. 1 crore.

(d) defence related road construction projects in border areas.

(e) any item falling under entry No. 8 of Schedule I, if that product is covered by the notification G.S.R. 1037(E) dated 5th December 1989.

(f) Modernisation projects in irrigation sector if additional command area is less than 10,000 hectares or project cost is less than Rs. 100 crores.:

(g) any construction project falling under entry 31 of Schedule-I including new townships, industrial townships, settlement colonies, commercial complexes, hotel complexes, hospitals and office complexes for 1000 (one thousand)persons or below or with an investment of Rs.50,00,00,000/- (Rupees fifty crores) or below.

(h) any industrial estate falling under entry 32 of Schedule-I including industrial estates accommodating industrial units in an area of 50 hectares or below but excluding the industrial estates irrespective of area if their pollution potential is high.

Explanation.-

(i) New construction projects which were undertaken without obtaining the clearance required under this notification and where construction work has not come up to the plinth level shall require clearance under this notification with effect from the 7th day of July, 2004.

(ii) In the case of new Industrial Estates which were undertaken without obtaining the clearance required under this notification, and where the construction work has not commenced or the expenditure does not exceed 25% of the total sanctioned cost, shall require clearance under this notification with effect from the 7th day of July, 2004.

(iii) Any project proponent intending to implement the proposed project under sub-paras (g) and (h) in a phased manner or in modules, shall be required to submit the details of the entire project covering all phases or modules for appraisal under this notification".

4. Concealing factual data or submission of false, misleading data/reports, decisions or recommendations would lead to the project being rejected. Approval, if granted earlier on the basis of false data, would also be revoked. Misleading and wrong information will cover the following:

- False information
- False data
- Engineered reports
- Concealing of factual data
- False recommendations or decisions

[No.Z-12013/4/89-IA-I]

SCHEDULE-I

(See paras 1 and 2)

LIST OF PROJECTS REQUIRING ENVIRONMENTAL CLEARANCE FROM THE CENTRAL GOVERNMENT

1. Nuclear Power and related projects such as Heavy Water Plants, nuclear fuel complex, Rare Earths.
2. River Valley projects including Hydel Power Projects, Major Irrigation Projects and their combination including flood control project except projects relating to improvement work including widening and strengthening of existing canals with land acquisition upto a maximum of 20 metres, (on both sides put together) along the existing alignments provided such canals do not pass through ecologically sensitive areas such as national parks, sanctuaries, tiger reserves and reserve forests..
3. Ports, Harbours, Airports (except minor ports and harbours).
4. Petroleum Refineries including crude and product pipelines; isolated petroleum product storages.
5. Chemical Fertilizers (Nitrogenous and Phosphatic other than single superphosphate).
6. Pesticides (Technical).
7. Petrochemical complexes (Both Olefinic and Aromatic) and Petro-chemical intermediates such as DMT, Caprolactam, LAB etc. and production of basic plastics such as LLDPE, HDPE, PP, PVC.
8. Bulk drugs and pharmaceuticals.
9. Exploration for oil and gas and their production, transportation and storage.
10. Synthetic Rubber.
11. Asbestos and Asbestos products.
12. Hydrocyanic acid and its derivatives.
13. (a) Primary metallurgical industries (such as production of Iron and Steel, Aluminium, Copper, Zinc, Lead and Ferro Alloys).
    (b) Electric arc furnaces (Mini Steel Plants).
14. Chlor alkali industry.
15. Integrated paint complex including manufacture of resins and basic raw materials required in the manufacture of paints.
16. Viscose Staple fibre and filament yarn.
17. Storage batteries integrated with manufacture of oxides of lead and lead antimony alloys.
18. All tourism projects between 200m—500 metres of High Water Line and at locations with an elevation of more than 1000 metres with investment of more than Rs.5 crores.
19. Thermal Power Plants.
20. Mining projects *(major minerals)* with leases more than 5 hectares.
21. Highway Projects **except projects relating to improvement work including widening and strengthening of roads with marginal land acquisition along the existing alignments provided it does not pass through ecologically sensitive areas such as National Parks, Sanctuaries, Tiger Reserves, Reserve Forests**
22. Tarred Roads in the Himalayas and or Forest areas.
23. Distilleries.
24. Raw Skins and Hides
25. Pulp, paper and newsprint.
26. Dyes.

27. Cement.
28. Foundries (individual)
29. Electroplating
30. Meta amino phenol
31. New construction projects
32. New industrial estates

SCHEDULE-II

[See Sub-para 1 (a) of para 2]

APPLICATION FORM

1. (a) Name and Address of the project proposed:

(b) Location of the project:
Name of the Place:
District, Tehsil:
Latitude/Longitude:
Nearest Airport/Railway Station:

(c) Alternate sites examined and the reasons for selecting the proposed site:
(d) Does the site conform to stipulated land use as per local land use plan:

2. Objectives of the project:

3. (a) Land Requirement:
Agriculture Land:
Forest land and Density of vegetation.
Other (specify):

(b) (i) Land use in the Catchment within 10 kms radius of the proposed site:
(ii) Topography of the area indicating gradient, aspects and altitude:
(iii) Erodibility classification of the proposed land:

(c) Pollution sources existing in 10 km radius and their impact on quality of air, water and land:

(e) Distance of the nearest National Park/Sanctuary/Biosphere Reserve/Monuments/heritage site/Reserve Forest:

(f) Rehabilitation plan for quarries/borrow areas:

(g) Green belt plan:

(h) Compensatory afforestation plan:

4. Climate and Air Quality:

(a) Wind rose at site:
(b) Max/Min/Mean annual temperature:
(c) Frequency of inversion:
(d) Frequency of cyclones/tornadoes/cloud burst:
(e) Ambient air quality data:

(f) Nature & concentration of emission of SPM, Gas (CO, CO_2, NOx, CHn etc.) from the project:

5. Water balance:

(a) Water balance at site:
(b) Lean season water availability;
Water Requirement:
(c) Source to be tapped with competing users (River, Lake, Ground, Public supply):
(d) Water quality:
(e) Changes observed in quality and quantity of groundwater in the last years and present charging and extraction details:
(f) (i) The quantum of existing industrial effluents and domestic sewage with incremental load to be released in the receiving water body due to the proposed activities along with treatment details;
(ii) The quantum and quality of water in the receiving water body before and after disposal of solid wastes including municipal solid wastes, industrial effluents and domestic sewage;
(iii) The quantum of industrial effluents and domestic sewage to be released on land and type of land;
(g) (i) Details of reservoir water quality with necessary Catchment Treatment Plan:
(ii) Command Area Development Plan:

6. Solid wastes:

(a) Nature and quantity of solid wastes generated including municipal solid wastes, biomedical wastes, hazardous wastes and industrial wastes".
(b) Solid waste disposal method:

7. Noise and Vibrations:

(a) Sources of Noise and Vibrations:
(b) Ambient noise level:
(c) Noise and Vibration control measures proposed:
(d) Subsidence problem, if any, with control measures:

8. Power requirement indicating source of supply: Complete environmental details to be furnished separately, if captive power unit proposed:

9. Peak labour force to be deployed giving details of:

- Endemic health problems in the area due to waste water/air/soil borne diseases:
- Health care system existing and proposed:

10. (a) Number of villages and population to be displaced:

(c) Rehabilitation Master Plan:

11. Risk Assessment Report and Disaster Management Plan:

Report prepared as per guidelines issued by the Central Government in the MOEF from time to time:

12. (a) Environmental Impact Assessment
(b) Environment Management Plan:
(c) Detailed Feasibility Report:
(d) Duly filled in questionnaire

13. Details of Environmental Management Cell:

I hereby give an undertaking that the data and information given above are due to the best of my knowledge and belief and I am aware that if any part of the data/information submitted is found to be false or misleading

at any stage, the project be rejected and the clearance given, if any, to the project is likely to be revoked at our risk and cost.

Signature of the applicant
With name and full address

Given under the seal of
Organisation on behalf of
Whom the applicant is signing.

Date:
Place:

In respect to item for which data are not required or is not available as per the declaration of project proponent, the project would be considered on that basis.

SCHEDULE-III

[See sub-para III (a) of Para 2]

COMPOSITION OF THE EXPERT COMMITTEES FOR ENVIRONMENTAL IMPACT ASSESSMENT

1. *The Committees will consist of experts in the following disciplines:*

   (i) Eco-system Management
   (ii) Air/Water Pollution Control
   (iii) Water Resource Management
   (iv) Flora/Fauna conservation and management
   (v) Land Use Planning
   (vi) Social Sciences/Rehabilitation
   (vii) Project Appraisal
   (viii) Ecology
   (ix) Environmental Health
   (x) Subject Area Specialists
   (xi) Representatives of NGOs/persons concerned with environmental issues.

2. The Chairman will be an outstanding and experienced ecologist or environmentalist or technical professional with wide managerial experience in the relevant development sector.
3. The representative of Impact Assessment Agency will act as a Member-Secretary.
4. Chairman and Members will serve in their individual capacities except those specifically nominated as representatives.
5. The Membership of a Committee shall not exceed 15.

SCHEDULE -V

(See Sub-para 1 of para 2)
Procedure for Public Hearing

(1) **Process of Public Hearing**: - Whoever apply for environmental clearance of projects, shall submit to the concerned State Pollution Control Board twenty sets of the following documents namely: -

   (i) An executive summary containing the salient features of the project both in English as well as local language along with Environmental Impact Assessment (EIA). However, for pipeline project, Environmental Impact Assessment report will not be required. But Environmental Management Plan including risk mitigation measures is required.
   (ii) Form XIII prescribed under Water (Prevention and Control of Pollution) Rules, 1975 where discharge of sewage, trade effluents, treatment of water in any form, is required.
   (iii) Form I prescribed under Air (Prevention and Control of Pollution) Under Territory Rules, 1983 where discharge of emissions are involved in any process, operation or industry.
   (iv) Any other information or document which is necessary in the opinion of the Board for their final disposal of the application.

(2) **Notice of Public Hearing: -**

(i) The State Pollution Control Board shall cause a notice for environmental public hearing which shall be published in at least two newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned. State Pollution Control Board shall mention the date, time and place of public hearing. Suggestions, views, comments and objections of the public shall be invited within thirty days from the date of publication of the notification.

(ii) All persons including bona fide residents, environmental groups and others located at the project site/sites of displacement/sites likely to be affected can participate in the public hearing. They can also make oral/written suggestions to the State Pollution Control Board.

Explanation: - For the purpose of the paragraph person means: -

(a) any person who is likely to be affected by the grant of environmental clearance;
(b) any person who owns or has control over the project with respect to which an application has been submitted for environmental clearance;
(c) any association of persons whether incorporated or not like to be affected by the project and/or functioning in the filed of environment;
(d) any local authority within any part of whose local limits is within the neighbourhood, wherein the project is proposed to be located.

(3) **Composition of public hearing panel: -** The composition of Public Hearing Panel may consist of the following, namely: -

(i) Representative of State Pollution Control Board;
(ii) District Collector or his nominee;
(iii) Representative of State Government dealing with the subject;
(iv) Representative of Department of the State Government dealing with Environment;
(v) Not more than three representatives of the local bodies such as Municipalities or panchayats;
(vi) Not more than three senior citizens of the area nominated by the District Collector.

(4) **Access to the Executive Summary and Environmental Impact Assessment Report:** - The concerned persons shall be provided access to the Executive Summary and Environmental Impact Assessment report of the project at the following places, namely: -

i) District Collector Office;
(ii) District Industry Centre;
(iii) In the Office of the Chief Executive Officers of Zila Praishad or Commissioner of the Municipal Corporation/Local body as the case may be;
(iv) In the head office of the concerned State Pollution Control Board and its concerned Regional Office.
(v) In the concerned Department of the State Government dealing with the subject of environment.

(5) Time period for completion of public hearing:
The public hearing shall be completed within a period of 60 days from the date of receipt of complete documents as required under paragraph 1.

[No.Z-12013/4/89-IA]

Foot NOTE: -The Principal Notification was published vide number S.O. 60 (E) dated 27th January 1994 and subsequently amended vide numbers

1. S.O. 356(E) dated 4th May, 1994,
2. S.O. 318 (E) dated 10th April, 1997,
3. S.O. 73 (E) dated 27th January, 2000,
4. S.O. 1119 (E) dated 13th December 2000,
5. S.O. 737 (E) dated 1st August 2001,
6. S.O. 1148 (E) dated 21st November 2001,
7. S.O. 632 (E) dated 13th June 2002,
8. S.O. 248(E) dated 28th February 2003,
9. S.O. 506 (e) dated 7th May 2003,
10. S.O. 891 (E) dated 4th August 2003 and
11. S.O 1087(E) dated 22nd September 2003.
12. S.O 801(E) dated 7th July 2004.

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The portions within asterisks and underlined are amendments

Annexure - VII

(Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii)
MINISTRY OF ENVIRONMENT AND FORESTS

New Delhi 14th September, 2006

Notification

S.O. 1533 Whereas, a draft notification **under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986 for imposing** certain restrictions and prohibitions on new projects or activities, or on the expansion or modernization of existing projects or activities based on their potential environmental impacts as indicated in the Schedule to the notification, being undertaken in any part of India[1], unless prior environmental clearance has been accorded in accordance with the objectives of National Environment Policy **as approved by the Union Cabinet on 18th May, 2006** and the procedure specified in the notification, by the Central Government or the State or Union territory Level Environment Impact Assessment Authority (SEIAA), to be constituted by the Central Government in consultation with the State Government or the Union territory Administration concerned under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 for the purpose of this notification, was published in the Gazette of India ,Extraordinary, Part II, section 3, sub-section (ii) vide number S.O. 1324 (E) dated the 15th September ,2005 inviting objections and suggestions from all persons likely to be affected thereby within a period of sixty days from the date on which copies of Gazette containing the said notification were made available to the public;

And whereas, copies of the said notification were made available to the public on 15th September, 2005;

And whereas, all objections and suggestions received in response to the above mentioned draft notification have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986, read with clause (d) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986 and in supersession of the notification number S.O. 60 (E) dated the 27th January, 1994, except in respect of things done or omitted to be done before such supersession, the Central Government hereby directs that on and from the date of its publication the required construction of new projects or activities or the expansion or modernization of existing projects or activities listed in the Schedule to this notification entailing capacity addition with change in process and or technology shall be undertaken in any part of India only after the prior environmental clearance from the Central Government or as the case may be, by the State Level Environment Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of section 3 of the said Act, in accordance with the procedure specified hereinafter in this notification.

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[1]Includes the territorial waters

2. **Requirements of prior Environmental Clearance (EC):-** The following projects or activities shall require prior environmental clearance from the concerned regulatory authority, which shall hereinafter referred to be as the Central Government in the Ministry of Environment and Forests for matters falling under Category 'A' in the Schedule and at State level the State Environment Impact Assessment Authority (SEIAA) for matters falling under Category 'B' in the said Schedule, before any construction work, or preparation of land by the project management except for securing the land, is started on the project or activity:

(i) All new projects or activities listed in the Schedule to this notification;

(ii) Expansion and modernization of existing projects or activities listed in the Schedule to this notification with addition of capacity beyond the limits specified for the concerned sector, that is, projects or activities which cross the threshold limits given in the Schedule, after expansion or modernization;

(iii) Any change in product - mix in an existing manufacturing unit included in Schedule beyond the specified range.

3. **State Level Environment Impact Assessment Authority:-** (1) A State Level Environment Impact Assessment Authority hereinafter referred to as the SEIAA shall be constituted by the Central Government under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 comprising of three Members including a Chairman and a Member – Secretary to be nominated by the State Government or the Union territory Administration concerned.

(2) The Member-Secretary shall be a serving officer of the concerned State Government or Union territory administration familiar with environmental laws.

(3) The other two Members shall be either a professional or expert fulfilling the eligibility criteria given in Appendix VI to this notification.

(4) One of the specified Members in sub-paragraph (3) above who is an expert in the Environmental Impact Assessment process shall be the Chairman of the SEIAA.

(5) The State Government or Union territory Administration shall forward the names of the Members and the Chairman referred in sub- paragraph 3 to 4 above to the Central Government and the Central Government shall constitute the SEIAA as an authority for the purposes of this notification within thirty days of the date of receipt of the names.

(6) The non-official Member and the Chairman shall have a fixed term of three years (from the date of the publication of the notification by the Central Government constituting the authority).

(7) All decisions of the SEIAA shall be unanimous and taken in a meeting.

4. **Categorization of projects and activities:-**

(i) All projects and activities are broadly categorized in to two categories - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and man made resources.

(ii) All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, shall require prior environmental clearance from the Central Government in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification;

(iii) All projects or activities included as Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfill the General Conditions (GC) stipulated in the Schedule, *will* require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification. In the absence of a duly constituted SEIAA or SEAC, a Category 'B' project shall be treated as a Category 'A' project;

5. Screening, Scoping and Appraisal Committees:-

The same Expert Appraisal Committees (EACs) at the Central Government and SEACs (hereinafter referred to as the (EAC) and (SEAC) at the State or the Union territory level shall screen, scope and appraise projects or activities in Category 'A' and Category 'B' respectively. EAC and SEAC's shall meet at least once every month.

(a) The composition of the EAC shall be as given in Appendix VI. The SEAC at the State or the Union territory level shall be constituted by the Central Government in consultation with the concerned State Government or the Union territory Administration with identical composition;

(b) The Central Government may, with the prior concurrence of the concerned State Governments or the Union territory Administrations, constitutes one SEAC for more than one State or Union territory for reasons of administrative convenience and cost;

(c) The EAC and SEAC shall be reconstituted after every three years;

(d) The authorised members of the EAC and SEAC, concerned, may inspect any site(s) connected with the project or activity in respect of which the prior environmental clearance is sought, for the purposes of screening or scoping or appraisal, with prior notice of at least seven days to the applicant, who shall provide necessary facilities for the inspection;

(e) The EAC and SEACs shall function on the principle of collective responsibility. The Chairperson shall endeavour to reach a consensus in each case, and if consensus cannot be reached, the view of the majority shall prevail.

6. Application for Prior Environmental Clearance (EC):-

An application seeking prior environmental clearance in all cases shall be made in the prescribed Form 1 annexed herewith and Supplementary Form 1A, if applicable, as given in Appendix II, after the identification of prospective site(s) for the project and/or activities to which the application relates, before commencing any construction activity, or preparation of land, at the site by the applicant. The applicant shall furnish, along with the application, a copy of the pre-feasibility project report except that, in case of construction projects or activities (item 8 of the Schedule) in addition to Form 1 and the Supplementary Form 1A, a copy of the conceptual plan shall be provided, instead of the pre-feasibility report.

SCHEDULE

(See paragraph 2 and 7)

LIST OF PROJECTS OR ACTIVITIES REQUIRING PRIOR ENVIRONMENTAL CLEARANCE

Project or Activity		Category with threshold limit		Conditions if any
		A	B	
1		**Mining, extraction of natural resources and power generation (for a specified production capacity)**		
(1)	(2)	(3)	(4)	(5)
1(a)	Mining of minerals	≥ 50 ha. of mining lease area Asbestos mining irrespective of mining area	<50 ha ≥ 5 ha .of mining lease area.	General Condition shall apply Note Mineral prospecting (not involving drilling) are exempted provided the concession areas have got previous clearance for physical survey
1(b)	Offshore and onshore oil and gas exploration, development & production	All projects		Note Exploration Surveys (not involving drilling) are exempted provided the concession areas have got previous clearance for physical survey
1(c)	River Valley projects	(i) ≥ 50 MW hydroelectric power generation; (ii) ≥ 10,000 ha. of culturable command area	(i) < 50 MW ≥ 25 MW hydroelectric power generation; (ii) < 10,000 ha. of culturable command area	General Condition shall apply
1(d)	Thermal Power Plants	≥ 500 MW (coal/lignite/naphta & gas based); ≥ 50 MW (Pet coke diesel and all other fuels -)	< 500 MW (coal/lignite/naptha & gas based); <50 MW ≥ 5MW (Pet coke ,diesel and all other fuels)	General Condition shall apply

(1)	(2)	(3)	(4)	(5)
1(e)	Nuclear power projects and processing of nuclear fuel	All projects	-	
2		**Primary Processing**		
2(a)	Coal washeries	≥ 1 million ton/annum throughput of coal	<1million ton/annum throughput of coal	General Condition shall apply (If located within mining area the proposal shall be appraised together with the mining proposal)
2 (b)	Mineral beneficiation	≥ 0.1million ton/annum mineral throughput	< 0.1million ton/annum mineral throughput	General Condition shall apply (Mining proposal with Mineral beneficiation shall be appraised together for grant of clearance)

3		**Materials Production**		
(1)	(2)	(3)	(4)	(5)
3(a)	Metallurgical industries (ferrous & non ferrous)	a)Primary metallurgical industry All projects b) Sponge iron manufacturing ≥ 200TPD c)Secondary metallurgical processing industry All toxic and heavy metal producing units ≥ 20,000 tonnes /annum -	Sponge iron manufacturing <200TPD Secondary metallurgical processing industry i.)All toxic andheavymetal producing units <20,000 tonnes /annum ii.)All other non –toxic secondary metallurgical processing industries >5000 tonnes/annum	General Condition shall apply for Sponge iron manufacturing
3(b)	Cement plants	≥ 1.0 million tonnes/annum production capacity	<1.0 million tonnes/annum production capacity. All Stand alone grinding units	General Condition shall apply

4		**Materials Processing**		
(1)	(2)	(3)	(4)	(5)
4(a)	Petroleum refining industry	All projects	-	-
4(b)	Coke oven plants	≥2,50,000 tonnes/annum -	<2,50,000 & ≥25,000 tonnes/annum	-
4(c)	Asbestos milling and asbestos based products	All projects	-	-
4(d)	Chlor-alkali industry	≥300 TPD production capacityor a unit located out side the notified industrial area/ estate	<300 TPD production capacity and located within a notified industrial area/ estate	Specific Condition shall apply No new Mercury Cell based plants will be permitted and existing units converting to membrane cell technology are exempted from this Notification
4(e)	Soda ash Industry	All projects	-	-
4(f)	Leather/skin/hide processing industry	New projects outside the industrial area or expansion of existing units out side the industrial area	All new or expansion of projects located within a notified industrial area/ estate	Specific condition shall apply
5		**Manufacturing/Fabrication**		
5(a)	Chemical fertilizers	All projects	-	-
5(b)	Pesticides industry and pesticide specific intermediates (excluding formulations)	All units producing technical grade pesticides	-	-

(1)	(2)	(3)	(4)	(5)
5(c)	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	All projects -	-	-
5(d)	Manmade fibres manufacturing	Rayon	Others	General Condition shall apply
5(e)	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	Located out side the notified industrial area/ estate -	Located in a notified industrial area/ estate	Specific Condition shall apply
5(f)	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	Located out side the notified industrial area/ estate	Located in a notified industrial area/ estate	Specific Condition shall apply
5(g)	Distilleries	(i)All Molasses based distilleries (ii) All Cane juice/ non-molasses based distilleries ≥30 KLD	All Cane juice/non-molasses based distilleries <30 KLD	General Condition shall apply
5(h)	Integrated paint industry	-	All projects	General Condition shall apply

(1)	(2)	(3)	(4)	(5)
5(i)	Pulp & paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp with out bleaching	Pulp manufacturing and Pulp& Paper manufacturing industry -	Paper manufacturing industry without pulp manufacturing	General Condition shall apply
5(j)	Sugar Industry	- -	≥ 5000 tcd cane crushing capacity	General Condition shall apply
5(k)	Induction/arc furnaces/cupola furnaces 5TPH or more	- -	All projects	General Condition shall apply
6		**Service Sectors**		
6(a)	Oil & gas transportation pipe line (crude and refinery/ petrochemical products), passing through national parks /sanctuaries/coral reefs /ecologically sensitive areas including LNG Terminal	All projects -		-

(1)	(2)	(3)	(4)	(5)
6(b)	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	-	All projects	General Condition shall apply
7		**Physical Infrastructure including Environmental Services**		
7(a)	Air ports	All projects	-	-
7(b)	All ship breaking yards including ship breaking units	All projects	-	-
7(c)	Industrial estates/ parks/ complexes/ areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes.	If at least one industry in the proposed industrial estate falls under the Category A, entire industrial area shall be treated as Category A, irrespective of the area. Industrial estates with area greater than 500 ha. and housing at least one Category B industry.	-Industrial estates housing at least one Category B industry and area <500 ha. Industrial estates of area> 500 ha. and not housing any industry belonging to Category A or B.	Special condition shall apply Note: Industrial Estate of area below 500 ha. and not housing any industry of category A or B does not require clearance.
7(d)	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	All integrated facilities having incineration &landfill or incineration alone	All facilities having land fill only	General Condition shall apply

(1)	(2)	(3)	(4)	(5)
7(e)	Ports, Harbours	≥ 5 million TPA of cargo handling capacity (excluding fishing harbours)	< 5 million TPA of cargo handling capacity and/or ports/ harbours ≥10,000 TPA of fish handling capacity	General Condition shall apply
7(f)	Highways	i) New National High ways; and ii) Expansion of National High ways greater than 30 KM, involving additional right of way greater than 20m involving land acquisition and passing through more than one State.	i) New State High ways; and ii) Expansion of National / State Highways greater than 30 km involving additional right of way greater than 20m involving land acquisition.	General Condition shall apply
7(g)	Aerial ropeways		All projects	General Condition shall apply
7(h)	Common Effluent Treatment Plants (CETPs)		All projects	General Condition shall apply
7(i)	Common Municipal Solid Waste Management Facility (CMSWMF)		All projects	General Condition shall apply

(1)	(2)	(3)	(4)	(5)
8		**Building /Construction projects/Area Development projects and Townships**		
8(a)	Building and Construction projects		≥20000 sq.mtrs and <1,50,000 sq.mtrs. of built-up area#	#(built up area for covered construction; in the case of facilities open to the sky, it will be the activity area)
8(b)	Townships and Area Development projects.		Covering an area ≥ 50 ha and or built up area ≥1,50,000 sq .mtrs ++	**All projects under Item 8(b) shall be appraised as Category B1

Note:-

General Condition (GC):

Any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life (Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive areas, (iv) inter-State boundaries and international boundaries.

Specific Condition (SC):

If any Industrial Estate/Complex / Export processing Zones /Special Economic Zones/Biotech Parks / Leather Complex with homogeneous type of industries such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates with pre –defined set of activities (not necessarily homogeneous, obtains prior environmental clearance, individual industries including proposed industrial housing within such estates /complexes will not be required to take prior environmental clearance, so long as the Terms and Conditions for the industrial estate/complex are complied with (Such estates/complexes must have a clearly identified management with the legal responsibility of ensuring adherence to the Terms and Conditions of prior environmental clearance, who may be held responsible for violation of the same throughout the life of the complex/estate).

Annexure – IV

ANDHRA PRADESH POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN, A - 3, INDUSTRIAL ESTATE,
SANATHNAGAR, HYDERABAD - 500 018

Phone: 23887500
Website :www.appcb.ap.nic.in

APPCB/VSP/VSP/109/CFE/HO/2014 Dt: 03.06.2017

M/s. L.G. Polymers India Pvt. Ltd.,
R.R. Venkatapuram,
Visakhapatnam.
info@lgpi.co.in

Sir,

Sub: APPCB - CFE - M/s. L.G. Polymers (I) Pvt. Ltd., R.R. Venkatapuram, Visakhapatnam - Amendment to the CFE order – Decision of the Committee – Communicated – Reg.

Ref: 1) CFE order dt. 04.05.2017.
2) Industry's representation dt. 10.05.2017.
3) CFE Committee meeting held on 20.05.2017.

In the reference 1st cited, the Board had issued CFE to the industry to manufacture additional product viz., Engineering Plastics as detailed below:

Sl. No.	Name of the Products and By-products	As per CFE order dt. 19.12.2016	Proposed	Total capacity
1	Polystyrene	313 TPD (1,09,000 TPA)	----	313 TPD (1,09,000 TPA)
2	Expandable Polystyrene	102 TPD (36,000 TPA)	----	102 TPD (36,000 TPA)
3	Engineering Plastics	---	36.67 TPD	36.67 TPD

Raw material to produce Engineering plastics.

Sl. No.	Name of the raw material	quantity
1	Additives Glass Fiber Talc	6.70 MTPD
2	Poly Butylene Terephthalate	7.66 MTPD
3.	Polycarbonate	13.40 MTPD
4	Polypropylene	2.17 MTPD
5	Polyamide	2.62 MTPD
6	Acrylonitrile Butadiene styrene	4.12 MTPD

The Board issued above CFE order dt. 04.05.2017 incorporating the following additional condition:

The industry shall obtain the clarification from the MoEF & CC regarding applicability of EIA Notification for the proposed additional product. If the Ministry clarifies that the industry does not require EC, the industry can start production of the additional product. Otherwise, the industry shall comply with the directions issued by the MoEF & CC.

The industry vide reference 2nd cited informed that the MoEF & CC, GoI, New Delhi vide amendment to EIA Notification dt. 25.06.2014 had exempted manufacture of products from polymer granules from the purview of EIA Notification. The industry, therefore, requested to delete the above condition from the CFE order.

The item was placed before the CFE Committee meeting held on 20.05.2017. The representatives of the industry attended the meeting. They have submitted a copy of Environmental Management Plan (EMP). It is observed from the EMP that the industry would use some of the raw materials viz., Talc and Additives in the powder form and not in the form of granules. After detailed discussions, the Committee opined that the condition stipulated by the Board in the CFE order dt. 06.05.2017 to obtain clarification from the MoEF&CC, GoI, New Delhi holds good.

In view of the above, the industry shall obtain the clarification from the MoEF & CC regarding applicability of EIA Notification before starting the construction work for the proposed additional product. If the Ministry clarifies that the industry does not require EC, the industry can start construction of the unit to produce additional product. Otherwise, the industry shall comply with the directions issued by the MoEF & CC, New Delhi.

This is for information and to take further necessary action.

Yours faithfully,
Sd/-
MEMBER SECRETARY

-// T.C.F.B.O //-

Jt. Chief Environmental Engineer (UH-1)

Annexure- V

ANDHRA PRADESH POLLUTION CONTROL BOARD
D.No.33-26-14D/2, Near Sunrise Hospital, Pushpa Hotel Centre,
Chalamalavari Street, Kasturibaipet, Vijayawada - 520 010
Phone. No.0866-2463200, Website : www.appcb.ap.nic.in

RED CATEGORY
CONSENT & AUTHORISATION ORDER

Consent Order No : APPCB/VSP/VSP/14082/HO/CFO/2018 Date :20.06.2018

CONSENT is hereby granted for Operation under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof and Authorisation under Rule 6 of the Hazardous & Other Wastes (Management and Transboundary, Movement) Rules, 2016 and the rules and orders made there under (hereinafter referred to as 'the Acts', `the Rules') to:

M/s. L.G. Polymers India Pvt., Limited (Expansion)
R.R. Venkatapuram Village
Pendurthy Mandal, Visakhapatnam - 530 029
Email: info@lgpi.co.in

(Hereinafter referred to as 'the Applicant') authorizing to operate the industrial plant to discharge the effluents from the outlets and the quantity of emissions per hour from the chimneys as detailed below:

i) Out lets for discharge of effluents:

Outlet No.	Outlet Description	Max Daily Discharge KLD	Point of Disposal
1.	Trade Effluents after Treatment	5	Onland for plantation after treatment in ETP.
2.	Domestic Effluents	2	Onland for plantation after treatment in STP.

ii) Emisstions from chimneys: NIL

iii) HAZARDOUS WASTE AUTHORISATION (FORM - II) [See Rule 6 (2)]: NIL

This consent order is valid to manufacture the following products along with quantities indicated only:

S. No	Products	Quantity
1.	**Engineering Plastics**	36.67 TPD

This order is subject to the provisions of `the Acts' and the Rules' and orders made thereunder and further subject to the terms and conditions incorporated in the schedule A, B & C enclosed to this order.

This combined order of consent & Hazardous Waste Authorisation shall be valid for a period ending with the 30th day of April, 2023.

Bandla Siva Sankar Prasad
Digitally signed by Bandla Siva Sankar Prasad
Date: 2018.06.21 11:57:23 +05'30'

Chairman

To
M/s. L.G. Polymers India Pvt.Limited., (expansion)
R.R. Venkatapuram Village
Pendurthy Mandal,Visakhapatnam - 530 029

Copy to:
1. The Commissioner of Industries, First floor, Government Regional Printing Press Buildings, Mutyalampadu, Vijayawada - 520 011
2. The JCEE, Zonal Office, Visakhapatnam for information and necessary action.
3. The JCEE, Unit Head-II, APPCB, Vijayawada for information.
4. The Environmental Engineer, Regional Office, Visakhapatnam for information and necessary action.

SCHEDULE - A

1. Any up-set condition in any industrial plant / activity of the industry, which result in, increased effluent / emission discharge and/ or violation of standards stipulated in this order shall be informed to this Board, under intimation to the Collector and District Magistrate and take immediate action to bring down the discharge / emission below the limits.
2. The industry should carryout analysis of waste water discharges or emissions through chimneys for the parameters mentioned in this order on quarterly basis and submit to the Board.
3. All the rules & regulations notified by Ministry of Law and Justice, Government of India regarding Public Liability Insurance Act, 1991 should be followed as applicable.
4. The industry should put up two sign boards (6x4 ft. each) at publicly visible places at the main gate indicating the products, effluent discharge standards, air emission standards, hazardous waste quantities and validity of CFO and exhibit the CFO order at a prominent place in the factory premises.
5. Not withstanding anything contained in this consent order, the Board hereby reserves the right and powers to review / revoke any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Acts by the Board.
6. The applicant shall submit Environment statement in Form V before 30th September every year as per Rule No.14 of E(P) Rules, 1986 & amendments thereof.
7. The applicant should make applications through Online for renewal of Consent (under Water and Air Acts) and Authorization under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts and detailed compliance of CFO conditions for obtaining Consent & HW Authorization of the Board. The industry should immediately submit the revised application for consent to this Board in the event of any change in the raw material used, processes employed, quantity of trade effluents & quantity of emissions. Any change in the management shall be informed to the Board. The person authorized should not let out the premises / lend / sell / transfer their industrial premises without obtaining prior permission of the State Pollution Control Board.
8. Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules 1982, to Appellate authority constituted under Section 28 of the Water(Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air(Prevention and Control of Pollution) Act, 1981.

SCHEDULE - B

WATER POLLUTION:

1. The effluent discharged shall not contain constituents in excess of the tolerance limits mentioned below:

Outlet	Parameter	Limiting Standards
1&2	P^H	6.5 -8.5
	TSS	100 mg/l
	TDS	2100 mg/l
	Oil and Grease	10 mg/l
	COD	250 mg/l
	BOD	30 mg/l

2. The source of water is ground water. The following is the permitted water consumption:

Sl. No.	Purpose	Quantity (KLD)
1	Industrial cooling, boiler feed	30
2	Domestic & Gardening purposes.	2
	Total	32

Separate meters with necessary pipe-line shall be maintained for assessing the quantity of water used for each of the purposes mentioned above.

3. The industry shall place the chemical drums and / or any drums in the concrete platform only. The Platform shall be provided with sufficient dyke wall and effluent collection system.

AIR POLLUTION

4. The industry shall provide wet scrubber as air pollution control equipment to control process emissions.
5. The industry shall comply with ambient air quality standards of PM_{10}(Particulate Matter size less than 10μm) - 100 μg/ m^3; $PM_{2.5}$(Particulate Matter size less than 2.5 μm) - 60 μg/ m^3; SO_2

- 80 µg/ m^3; NO_x - 80 µg/m^3, NH_3 - 400 µg/m^3 outside the factory premises at the periphery of the industry.

Standards for other parameters as mentioned in the National Ambient Air Quality Standards CPCB Notification No.B-29016/20/90/PCI-I, dated 18.11.2009 shall be complied. Following standards prescribed for noise shall be complied.

Noise Levels: Day time (6 AM to 10 PM) - 75 dB (A)
Night time (10 PM to 6 AM) - 70 dB (A).

6. The industry shall operate Sewage Treatment Plant for treatment of domestic effluents and maintain records.
7. The industry shall consuming treated effluent in the process to maximum extent after treatment and maintain records.

GENERAL

8. The industry shall not manufacture any product, other than those mentioned in this order.
9. The industry shall comply with CPCB directions dated 05.02.2014 / 02.03.2015 and guidelines issued regarding online monitoring systems issued from time to time.
10. There shall not be any spillages / chemicals / effluents on ground. The drums containing chemicals & wastes shall be stored on elevated platform with a provision to collect leachate / spillages in the collection pit. In no case the drums shall be stored on the naked open ground.
11. System of leak detection and repair of pump / pipeline shall be installed in the plant and immediate response team shall be identified for preventive maintenance.
12. The industry shall comply with all the rules, regulations, standards and directions issued by CPCB, MoEF&CC and APPCB.
13. The industry shall comply with the conditions stipulated in the CFE (Expansion) order dated 04.05.2017.
14. The industry shall develop green belt in all the vacant places. In future, excess green belt over and above 33 % of total area can be utilized for industrial activity as per requirement of industry.

Bandla Siva Sankar Prasad

Digitally signed by Bandla Siva Sankar Prasad
Date: 2018.06.21 11:07:45 +05'30'

Chairman

To
M/s. LG Polymers India Pvt Ltd.,
(expansion)
R.R.Venkatapuram,
Visakhapatnam - 530 029

Annexure – V

ANDHRA PRADESH POLLUTION CONTROL BOARD
D.No.33-26-14D/2, Near Sunrise Hospital, Pushpa Hotel Centre,
Chalamalavari Street, Kasturibaipet, Vijayawada - 520 010
Phone. No.0866-2463200, Website : www.appcb.ap.nic.in

RED CATEGORY
CONSENT & AUTHORISATION ORDER

Consent Order No : APPCB/VSP/VSP/14082/HO/CFO/2018 Date :20.06.2018

CONSENT is hereby granted for Operation under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof and Authorisation under Rule 6 of the Hazardous & Other Wastes (Management and Transboundary, Movement) Rules, 2016 and the rules and orders made there under (hereinafter referred to as 'the Acts', `the Rules') to:

M/s. L.G. Polymers India Pvt., Limited (Expansion)
R.R. Venkatapuram Village
Pendurthy Mandal, Visakhapatnam - 530 029
Email: info@lgpi.co.in

(Hereinafter referred to as 'the Applicant') authorizing to operate the industrial plant to discharge the effluents from the outlets and the quantity of emissions per hour from the chimneys as detailed below:

i) Out lets for discharge of effluents:

Outlet No.	Outlet Description	Max Daily Discharge KLD	Point of Disposal
1.	Trade Effluents after Treatment	5	Onland for plantation after treatment in ETP.
2.	Domestic Effluents	2	Onland for plantation after treatment in STP.

ii) Emissions from chimneys: NIL

iii) HAZARDOUS WASTE AUTHORISATION (FORM - II) [See Rule 6 (2)]: NIL

This consent order is valid to manufacture the following products along with quantities indicated only:

S. No	Products	Quantity
1.	Engineering Plastics	36.67 TPD

This order is subject to the provisions of `the Acts' and the Rules' and orders made thereunder and further subject to the terms and conditions incorporated in the schedule A, B & C enclosed to this order.

This combined order of consent & Hazardous Waste Authorisation shall be valid for a period ending with the 30th day of April, 2023.

Bandla Siva Sankar Prasad
Digitally signed by Bandla Siva Sankar Prasad
Date: 2018.06.21 11:07:23 +05'30'
Chairman

To
M/s. L.G. Polymers India Pvt.Limited., (expansion)
R.R. Venkatapuram Village
Pendurthy Mandal,Visakhapatnam - 530 029

Copy to:
1. The Commissioner of Industries, First floor, Government Regional Printing Press Buildings, Mutyalampadu, Vijayawada - 520 011
2. The JCEE, Zonal Office, Visakhapatnam for information and necessary action.
3. The JCEE, Unit Head-II, APPCB, Vijayawada for information.
4. The Environmental Engineer, Regional Office, Visakhapatnam for information and necessary action.

SCHEDULE - A

1. Any up-set condition in any industrial plant / activity of the industry, which result in, increased effluent / emission discharge and/ or violation of standards stipulated in this order shall be informed to this Board, under intimation to the Collector and District Magistrate and take immediate action to bring down the discharge / emission below the limits.
2. The industry should carryout analysis of waste water discharges or emissions through chimneys for the parameters mentioned in this order on quarterly basis and submit to the Board.
3. All the rules & regulations notified by Ministry of Law and Justice, Government of India regarding Public Liability Insurance Act, 1991 should be followed as applicable.
4. The industry should put up two sign boards (6x4 ft. each) at publicly visible places at the main gate indicating the products, effluent discharge standards, air emission standards, hazardous waste quantities and validity of CFO and exhibit the CFO order at a prominent place in the factory premises.
5. Not withstanding anything contained in this consent order, the Board hereby reserves the right and powers to review / revoke any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Acts by the Board.
6. The applicant shall submit Environment statement in Form V before 30th September every year as per Rule No.14 of E(P) Rules, 1986 & amendments thereof.
7. The applicant should make applications through Online for renewal of Consent (under Water and Air Acts) and Authorization under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts and detailed compliance of CFO conditions for obtaining Consent & HW Authorization of the Board. The industry should immediately submit the revised application for consent to this Board in the event of any change in the raw material used, processes employed, quantity of trade effluents & quantity of emissions. Any change in the management shall be informed to the Board. The person authorized should not let out the premises / lend / sell / transfer their industrial premises without obtaining prior permission of the State Pollution Control Board.
8. Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules 1982, to Appellate authority constituted under Section 28 of the Water(Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air(Prevention and Control of Pollution) Act, 1981.

SCHEDULE - B

WATER POLLUTION:

1. The effluent discharged shall not contain constituents in excess of the tolerance limits mentioned below:

Outlet	Parameter	Limiting Standards
1&2	P^H	6.5 -8.5
	TSS	100 mg/l
	TDS	2100 mg/l
	Oil and Grease	10 mg/l
	COD	250 mg/l
	BOD	30 mg/l

2. The source of water is ground water. The following is the permitted water consumption:

Sl. No.	Purpose	Quantity (KLD)
1	Industrial cooling, boiler feed	30
2	Domestic & Gardening purposes.	2
	Total	32

Separate meters with necessary pipe-line shall be maintained for assessing the quantity of water used for each of the purposes mentioned above.

3. The industry shall place the chemical drums and / or any drums in the concrete platform only. The Platform shall be provided with sufficient dyke wall and effluent collection system.

AIR POLLUTION

4. The industry shall provide wet scrubber as air pollution control equipment to control process emissions.
5. The industry shall comply with ambient air quality standards of PM_{10}(Particulate Matter size less than 10μm) - 100 μg/ m^3; $PM_{2.5}$(Particulate Matter size less than 2.5 μm) - 60 μg/ m^3; SO_2

- 80 µg/ m^3; NO_x - 80 µg/m^3, NH_3 - 400 µg/m^3 outside the factory premises at the periphery of the industry.

Standards for other parameters as mentioned in the National Ambient Air Quality Standards CPCB Notification No.B-29016/20/90/PCI-I, dated 18.11.2009 shall be complied.

Following standards prescribed for noise shall be complied.

Noise Levels: Day time (6 AM to 10 PM) - 75 dB (A)
Night time (10 PM to 6 AM) - 70 dB (A).

6. The industry shall operate Sewage Treatment Plant for treatment of domestic effluents and maintain records.
7. The industry shall consuming treated effluent in the process to maximum extent after treatment and maintain records.

GENERAL

8. The industry shall not manufacture any product, other than those mentioned in this order.
9. The industry shall comply with CPCB directions dated 05.02.2014 / 02.03.2015 and guidelines issued regarding online monitoring systems issued from time to time.
10. There shall not be any spillages / chemicals / effluents on ground. The drums containing chemicals & wastes shall be stored on elevated platform with a provision to collect leachate / spillages in the collection pit. In no case the drums shall be stored on the naked open ground.
11. System of leak detection and repair of pump / pipeline shall be installed in the plant and immediate response team shall be identified for preventive maintenance.
12. The industry shall comply with all the rules, regulations, standards and directions issued by CPCB, MoEF&CC and APPCB.
13. The industry shall comply with the conditions stipulated in the CFE (Expansion) order dated 04.05.2017.
14. The industry shall develop green belt in all the vacant places. In future, excess green belt over and above 33 % of total area can be utilized for industrial activity as per requirement of industry.

Bandla Siva Sankar Prasad

Chairman

To
M/s. LG Polymers India Pvt Ltd.,
(expansion)
R.R.Venkatapuram,
Visakhapatnam - 530 029

Annexure – VI

ANDHRA PRADESH POLLUTION CONTROL BOARI
D.No. 33-26-14 D/2, Near Sunrise Hospital, Pushpa Hotel Centre,
Chalamalavari Street, Kasturibaipet, Vijayawada – 520010.
Website :www.appcb.ap.nic.in

CONSENT ORDER FOR ESTABLISHMENT

Order No. APPCB/VSP/VSP/109/CFE/HO/2014 **Dt: 27.12.2018**

Sub: APPCB – CFE - **M/s. L.G. Polymers (I) Pvt. Ltd., R.R. Venkatapuram, Visakhapatnam** - Consent for Establishment (CFE) of the Board for **expansion** under Sec.25 of Water (P & C of P) Act, 1974 and Under Sec.21 of Air (P&C of P) Act, 1981 - Issued - Reg.

Ref: 1) Industry's CFE application received through APOCMMS on 29.11.2018.
2) R.O's inspection report dt. 07.12.2018.
3) CFE Committee meeting held on 21.12.2018.

1. In the reference 1st cited, an application was submitted to the Board seeking Consent for Establishment (CFE) for **expansion** with installed capacity as mentioned below, with an additional project cost of Rs. 20.0 Crores.

Sl. No.	Name of the Product	As per CFE (exp) order dt. 04.05.2017 & 07.08.2017 (Amend)	Expansion	Capacity after expansion
1	Polystyrene	313 TPD (1,09,000 TPA)	---	**313 TPD (1,09,000 TPA)**
2	Expandable Polystyrene	102 TPD (36,000 TPA)	---	**102 TPD (36,000 TPA)**
3	Engineering Plastics	36.67 TPD	25.83 TPD	**62.50 TPD**

2. As per the application, the above activity is to be located in the existing premises at R.R. Venkatapuram, Visakhapatnam District in an existing area of 219 Acres.

3. The above site was inspected by the Environmental Engineer & Asst. Environmental Engineer-III, Regional Office, Visakhapatnam A.P Pollution Control Board on 07.12.2018 and observed that the site is surrounded by

North : Vacant Land
South : Railway Track
East : Green Belt of 30 Acres
West : Gedda

4. The Board, after careful scrutiny of the application, verification report of Regional Officer and recommendations of the CFE Committee, hereby issues **CONSENT FOR ESTABLISHMENT FOR EXPANSION** to the project under Section 25 of Water (Prevention

& Control of Pollution) Act 1974 and Section 21 of Air (Prevention & Control of Pollution) Act, 1981 and the rules made there under. **This order is issued to manufacture the products as mentioned at para (1) only.**

5. This Consent order issued is subject to the conditions mentioned in the Annexure.

6. This order is issued from pollution control point of view only. Zoning and other regulations are not considered.

7. **This order is valid for period of 7 years from the date of issue.**

Encl: Annexure

VIVEK YADAV
Digitally signed by VIVEK YADAV
Date: 2018.12.27 21:56:47 +05'30'

MEMBER SECRETARY

To

M/s. L.G. Polymers India Pvt. Ltd., (expn)
R.R. Venkatapuram,
Visakhapatnam.
info@lgpi.co.in

Copy to: 1. The JCEE, Z.O: Visakhapatnam for information and necessary action.
2. The EE, R.O: Visakhapatnam for information and necessary action.

Annexure

1. The proponent shall obtain Consent for Operation (CFO) from APPCB, as required Under Sec.25/26 of the Water (P&C of P) Act, 1974 and under sec. 21/22 of the Air (P&C of P) Act, 1981, before commencement of the trail runs.

2. The applicant shall provide separate energy meters for Effluent Treatment Plant (ETP) and Air pollution Control equipments to record energy consumed. An alternative electric power source sufficient to operate all pollution control systems shall be provided.

3. The industry shall construct separate storm water drains. No effluents shall be discharged in to the storm water drains.

Water:

4. The source of water is ground water and the maximum permitted water consumption is as following:

S. No	Purpose	As per CFE (Exp) order dt. 04.05.2017 & 07.08.2017 (Amend) (KLD)	Expansion (KLD)	Capacity after expansion (KLD)
1.	Process	185.00	---	185.00
2.	Cooling & Boiler feed	355.00	15.00 *	370.00 *
3.	Domestic	42.00	2.00	44.00
	Total	**582.00**	**17.00**	**599.00**

* The industry proposed for water consumption for cooling purpose only and the same is proposed to be recycled from the treated waste water.

Separate meters with necessary pipe-line shall be provided for assessing the quantity of water used for each of the purposes mentioned above.

5. The maximum waste water generation shall not exceed the following:

Sl. No.	Source	As per CFE (Exp) order dt. 04.05.2017 & 07.08.2017 (Amend) (KLD)	Expansion (KLD)	Capacity after expansion (KLD)
1.	Process & washings	185.00	---	185.00
2.	Cooling blow down	23.00	3.00	26.00
3.	Boiler blowdown	10.00	---	10.00
4.	Domestic	42.00	2.00	44.00
	Total	**260.00**	**5.00**	**265.00**

Treatment & disposal after expansion:

Source of Effluent	Treatment	Mode of final disposal
Process washings	ETP (Phase – I): The 150 KLD ETP consists of equalization tank, neutralization tank, clarifier followed by sludge drying beds for treatment of wastewater generating from EPS Plant	To ETP – II
Waste water treated in ETP – 1 and boiler / cooling tower blow downs	ETP (Phase – II): 250 KLD biological ETP consists of Collection tank, aeration tank, clarifier, chlorination tank, Duel filter system (activated carbon bed, and sand bed filter), Treated water sump	On land for plantation / Recycled for process washings
Domestic	The 50 KLD STP consists of Equalization tank, Aeration tank, tube settler, Clarified water tank, sludge hooding tank, Duel filter system (activated carbon bed, and sand bed filter).	On land for plantation

6. All the units of the ETP shall be maintained properly impervious to prevent ground water pollution.

7. The industry shall provide magnetic flow meters with totalisers at the inlet and outlet of ETP.

8. Floor washing shall be admitted into the effluent collection system only and shall not be allowed to find their way in storm drains or open areas. All pipe valves, sewers, drains shall be leak proof.

9. The capacity of existing STP shall be increased to treat the domestic waste water generated (42 KLD).

Air:

10. The Air pollution Control equipment shall be installed along with the commissioning of the activity and shall comply with the following for controlling air pollution:

As per CFE (Exp) order dt. 04.05.2017 & 07.08.2017:

Sl. No	Details of Stack	Stack 1	Stack 2	Stack 3	Stack 4
1.	Attached to	GPPS Oil Fired Heater	HIPS Oil Fired Heater	Oil fired Boilers – 2 Nos.	DG Sets
2.	Capacity	12 Lakhs K.cal/yr	10 Lakhs K.cal/yr	1 X 5 TPH & 1 X 8 TPH (Standby)	4 X 1000 KVA & 1 X 500 KVA DG
3.	Stack height	30.5 m	34 m	33 m & 34 m	21.65 & 10 m + 21.65 m
4.	Details of Air Pollution Control Equipment	---	-----	Wet scrubbers (2nos.)	

After expansion:

Sl. No	Details of Stack	Stack 1	Stack 2	Stack 3	Stack 4
1.	Attached to	GPPS Oil Fired Heater	HIPS Oil Fired Heater	Oil fired Boilers – 2 Nos.	DG Sets
2.	Capacity	12 Lakhs K.cal/yr	10 Lakhs K.cal/yr	2 X 5 TPH & 1 X 8 TPH (Standby)	4 X 1000 KVA, 1 X 500 KVA DG & 1 X 1500 KVA DG
3.	Stack height	30.5 m	34 m	2 X 33 m & 1 X 34 m	21.65 m, 10 m & 30.5 m
4.	Details of Air Pollution Control Equipment	---	-----	Wet scrubbers (2nos.)	Silencers and Acoustic enclosures

11. The industry shall implement adequate measures to control all fugitive emissions from the plant.

12. The proponent shall ensure compliance of the National Ambient Air quality standards notified by MoEF, GoI vide notification No. GSR. 826 (E), dated. 16.11.2009 during construction and regular operational phase of the project at the periphery.

    The generator shall be installed in a closed area with a silencer and suitable noise absorption systems. The ambient noise level shall not exceed 75 dB(A) during day time and 70 dB(A) during night time.

Solid Waste:

13. The proponent shall comply with the following with respect to disposal of solid waste even after proposed additional product:

S. No.	Type of waste	As per CFE (Exp) order dt. 04.05.2017 & 07.08.2017	Expansion	After expansion	Mode of final disposal
a)	Used Oil / Waste Lubrication Oil	2.0 KLA	1.0 KLA	3.0 KLA	Shall be used as lubricant within the premises / to authorized Re-processors / Recyclers / to the Cement industries to use as alternate fuel in the kiln
b)	Container& Container Liners Of	2.0 TPA	----	2.0 TPA	To outside agencies, after complete

	Hazardous Waste & Chemicals				detoxification for re-use / recycle.
c)	Used Lead Acid Batteries	--	8 Nos.	8 Nos.	To dealers on buy back system.
d)	ETP Sludge	100 TPA	----	100 TPA	To TSDF for secured land filing / Cement industries for co-processing.
e)	Waste from pollution control equipment	----	4.0 TPA	4.0 TPA	To be sent to recyclers / TSDF.

14. The proponent shall place the chemical drums and / or any drums in a shed provided with concrete platform only. The Platform shall be provided with sufficient dyke wall and effluent collection system. The industry shall provide containers detoxification facility. Container & Container liners shall be detoxified at the specified covered platform with dyke walls and the wash wastewater shall be routed to low TDS collection tank.

15. The following rules and regulations notified by the MoE&F, GoI shall be implemented.

    a) Hazardous waste and other wastes (Management and Transboundary Movement) Rules, 2016.
    b) Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
    c) Batteries (Management & Handling) Rules, 2010.
    d) E-Waste (Management) Rules, 2016.
    e) Construction and Demolition waste Management Rules, 2016.

Other Conditions:

16. Existing green belt shall be maintained all along the boundary & vacant spaces with tall growing trees with good canopy and it shall not be less than 33% of the total area.

17. Concealing the factual data or submission of false information / fabricated data and failure to comply with any of the conditions mentioned in this order attracts action under the provisions of relevant pollution control Acts.

18. Notwithstanding anything contained in this conditional letter or consent, the Board hereby reserves its right and power Under Sec. 27(2) of Water (Prevention and Control of Pollution) Act, 1974 and Under Sec.21(4) of Air (Prevention and Control of Pollution) Act, 1981 to revoke the order, to review any or all the conditions imposed herein and to make such modifications as deemed fit and stipulate any additional conditions.

19. Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules,1982, to such authority (hereinafter referred to as the Appellate Authority) constituted under Section 28 of Water (Prevention and Control of Pollution)Act,1974 and Section 31 of the Air (Prevention and Control of Pollution) Act, 1981.

VIVEK YADAV

Digitally signed by VIVEK YADAV
Date: 2018.12.27 21:57:17 +05'30'

MEMBER SECRETARY

To

M/s. L.G. Polymers India Pvt. Ltd., (expn)
R.R. Venkatapuram,
Visakhapatnam.
info@lgpi.co.in

Annexure – VII

O/C

State Level Environment Impact Assessment Authority (SEIAA)
Andhra Pradesh
Ministry of Environment, Forests & Climate Change,
Government of India
D.No.33-26-14 D 2, Near Sunrise Hospital, Pushpa Hotel Centre,
Chalamavari Street, Kasturibaipet, Vijayawada-520010

Lr. No SEIAA/AP/VSP/IND/VIO/04/2018 **Dt.07.01.2020**

To
The Director (I.A-II Section),
Ministry of Environment & Forests and Climate Change,
(Impact Assessment Division)
Government of India,
3rd Floor, Vayu Wing, Indira Paryavaran Bhavan,
Aliganj, Jor Bag Road,
New Delhi- 1100030.

Sir,

09.01.2020 DESPATCHED

Sub: SEIAA, Andhra Pradesh - M/s. L.G. Polymers India Pvt.Ltd., at Sy.No.29 to 45, 83/1 and 83/3, Industrial Zone, RR Venkatapuram (V), Pendurti (M), Visakhapatnam District, Andhra Pradesh - Environmental Clearance - Transfer of File to MoEF&CC - Reg.

Ref:
1. Application received through online on 10.05.2019.
2. 128th SEAC, A.P. meeting held on 21.06.2019
3. 120th SEIAA,A.P. meeting held on 09.07.2019.
4. SEIAA/VSP/IND/VIO/04/2018/971-831, dt. 12.08.2019
5. Proposal No. SIA/AP/IND2/24597/2018, dt. 23.10.2019

Apropos the above, M/s. L.G. Polymers India Pvt.Ltd., at Sy.No.29 to 45, 83/1 and 83/3, Industrial Zone, RR Venkatapuram (V), Pendurti (M), Visakhapatnam District, Andhra Pradesh applied to SEIAA, Andhra Pradesh for grant of Post facto clearance for regularization of existing activities and expansion for as 'B' category case since this industrial site was set up in 1965 and area is a VUDA Notified Industrial Zone as per approved Master Plan 2021 of Visakhapatnam passed in June, 2006.

The application received through online on 10.05.2019 and the same was placed in the SEAC, A.P. & SEIAA,A.P. meetings vide reference 2nd & 3rd cited.

The SEIAA,A.P. recommended to transfer the proposal to MoEF&CC, GoI, New Delhi for further processing.

P.T.O

The industry vide reference 5th cited, stated that they have pursued with the MoEF&CC officials on 22nd November,2019 to ascertain the process of transferring of the file as there is no provision for transfer of file through online from SEIAA,A.P. to MoEF&CC. Also the proponent mentioned that a covering letter be addressed Joint Secretary (IA Division), MoEF&CC giving detailed chronology of events till date and copies of all supporting documents.

In this regard, the following is submitted.

1. Copies of EDS raised by SEIAA and reply from Industry.
2. Agenda and Minutes of Meeting of the 128th SEAC meeting dt 20-24th June 2019, wherein this case was discussed.
3. Agenda and Minutes of Meeting of the 120th SEIAA meeting dt 09th & 10th July 2019, wherein this case was discussed.
4. Letter for transfer of file to MoEF&CC.
5. Request letters received by SEIAA from time to time.

In view of the above, the project file of M/s. L.G. Polymers India Pvt.Ltd., at Sy.No.29 to 45, 83/1 and 83/3, Industrial Zone, RR Venkatapuram (V), Pendurti (M), Visakhapatnam District, Andhra Pradesh received vide reference cited (with all relevant documents) is hereby transferred to MoEF&CC, New Delhi to take necessary action.

Yours faithfully,

8/1/2020

MEMBER SECRETARY.
SEIAA, AP.

Copy to:

M/s. L.G. Polymers India Pvt.Ltd., at Sy.No. 29 to 45,83/1 and 83/3, Industrial Zone, RR Venkatapuram (V), Pendurti (M), Visakhapatnam District, Andhra Pradesh.

Annexure – VIII

F. No. 22-12/2020-IA.III
Government of India
Ministry of Environment, Forest and Climate Change
(IA Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi – 110003

Dated: 15th May, 2020

To
The Joint Chief Environmental Engineer,
Andhra Pradesh Pollution Control Board,
Zonal Office-Visakhapatnam (APPCB-ZO-VSP),
AP Pollution Control Board Rd, Vuda Layout,
Madhavadhara, Visakhapatnam,
Andhra Pradesh 530009

Subject: Clarification on requirement of Environmental Clearance by M/s LG Polymers (I) Pvt Ltd., Visakhapatnam — reg.

This has reference to the letter no. No.7063/PCB/ZO-VSP/Tech./2020 dated 12.05.2020 from Joint Chief Environmental Engineer, Andhra Pradesh Pollution Control Board, Zonal Office-Visakhapatnam (APPCB-ZO-VSP), Andhra Pradesh regarding requirement of Environmental Clearance by M/s LG Polymers (I) Pvt Ltd., Visakhapatnam.

2. It is to inform that the project of M/s LG Polymers (I) Pvt Ltd., Visakhapatnam attracts the provisions of schedule 5(e) of the EIA Notification 2006 as amended from time to time.

This issues with the approval of competent authority

15/5/2020

(Sharath Kumar Pallerla)
Director

Copy to

1. The Chairman, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Arjun Gali, Vishwas Nagar, Shahdara, Delhi, 110032.

2. The Chairman, Andhra Pradesh Pollution Control Board, D.No.22 B-3-2, Kanukolanu Vari Street, Near Power Pet Railway Station, Eluru, Andhra Pradesh 534002.

Annexure – IX

Abstract

	Total Admissions	Eligibility for Rs.25,000/-	Eligibility for Rs.1,00,000/-	Eligibility for Rs.10,00,000/-	Grand Total
KGH	324	5	319	**0**	**324**
CHCs	94	94	0	**0**	**94**
Private Hospital	167	0	166	**1**	**167**
Total		**99**	**485**	**1**	**585**

Sd/- Dr.S.Triupathi Rao
District Medical & Health Officer
Visakhapatnam

Status of Patients Admitted in APVVP Hospitals and CHCs, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
1	322	CHC GOPALAPATNAM	P.Kumar	25	MALE			25000
2	323	CHC GOPALAPATNAM	Yellamma	30	FEMALE			25000
3	324	CHC GOPALAPATNAM	N.Devi	26	FEMALE			25000
4	325	CHC GOPALAPATNAM	SONIYA	15	FEMALE			25000
5	326	CHC GOPALAPATNAM	D.Kalyani	33	FEMALE			25000
6	327	CHC GOPALAPATNAM	TEJA	13	MALE			25000
7	328	CHC GOPALAPATNAM	B.Satyanarayana	43	MALE			25000
8	329	CHC GOPALAPATNAM	Annapoorna	34	FEMALE			25000
9	330	CHC GOPALAPATNAM	A.Seshu Babu	32	MALE			25000
10	331	CHC GOPALAPATNAM	M.Mani	23	FEMALE			25000
11	332	CHC GOPALAPATNAM	M.Aruna Kumari	36	FEMALE			25000
12	333	CHC GOPALAPATNAM	M.Meera	2	FEMALE CHILD			25000
13	334	CHC GOPALAPATNAM	Ramanamma	35	FEMALE			25000
14	335	CHC GOPALAPATNAM	Pavani	36	FEMALE			25000
15	336	CHC GOPALAPATNAM	E.Kavya	16	FEMALE			25000
16	337	CHC GOPALAPATNAM	A.Chandra Sekhar Rao	70	MALE			25000
17	338	CHC GOPALAPATNAM	Priya	4	FEMALE CHILD			25000
18	339	CHC GOPALAPATNAM	Manohar	25	MALE			25000
19	340	CHC GOPALAPATNAM	Pranab Kumar	23	MALE			25000
20	341	CHC GOPALAPATNAM	K.Prem Kumar	14	MALE			25000
21	342	CHC GOPALAPATNAM	Vara Prasad	35	MALE			25000
22	343	CHC GOPALAPATNAM	Varalakshmi	35	FEMALE			25000
23	344	CHC GOPALAPATNAM	S.Prasad	26	MALE			25000
24	345	CHC GOPALAPATNAM	Padma	22	FEMALE			25000
25	346	CHC GOPALAPATNAM	Ramanamma.n	30	MALE			25000
26	347	CHC GOPALAPATNAM	P.Madhuri	20	FEMALE			25000
27	348	CHC GOPALAPATNAM	A.Nikhil	10	MALE			25000
28	349	CHC GOPALAPATNAM	A.Bhavya	13	MALE			25000
29	350	CHC GOPALAPATNAM	Yakib	18	MALE			25000
30	351	CHC GOPALAPATNAM	Hemanth RAJU	20	MALE			25000
31	352	CHC GOPALAPATNAM	Eswara Rao	40	MALE			25000
32	353	CHC GOPALAPATNAM	N.Penta Rao	60	MALE			25000
33	354	CHC GOPALAPATNAM	S.Mahalakshmi	70	FEMALE			25000
34	355	CHC GOPALAPATNAM	Demudamma	30	FEMALE			25000
35	356	CHC GOPALAPATNAM	B.Ganishta	2	FEMALE CHILD			25000
36	357	CHC GOPALAPATNAM	G Satyanarayana	41	MALE			25000
37	358	CHC GOPALAPATNAM	V.Swarna Latha	43	FEMALE			25000
38	359	CHC GOPALAPATNAM	Pydiraju	44	MALE			25000
39	360	CHC GOPALAPATNAM	K.Jyothi	24	FEMALE			25000
40	361	CHC GOPALAPATNAM	B.Satyavathi	22	FEMALE			25000
41	362	CHC GOPALAPATNAM	G Leela Prasad	25	MALE			25000
42	363	CHC GOPALAPATNAM	G.Srinivas	28	MALE			25000
43	364	CHC GOPALAPATNAM	P.Lakshmi	40	FEMALE			25000
44	365	CHC PENDURTHI	AAKULA SURYAPRAKESH RAO	43	M			25000
45	366	CHC PENDURTHI	AKULA MOWLI	17	M			25000
46	367	CHC PENDURTHI	BALLA LAKSHMI	42	F			25000
47	368	CHC PENDURTHI	BEHARA RAJESH	38	M			25000
48	369	CHC PENDURTHI	BOTCHA GOPALA RAO	54	M			25000
49	370	CHC PENDURTHI	DASRI VASU	23	M			25000
50	371	CHC PENDURTHI	DUKKA SHARMILA	9	FCH			25000
51	372	CHC PENDURTHI	DUKKA VIJAYA KUMARI	30	F			25000
52	373	CHC PENDURTHI	YELLAPU GANESH	32	M			25000
53	374	CHC PENDURTHI	ELLAPU JAWALLANAIDU	40	M			25000
54	375	CHC PENDURTHI	ELLAPU LAKSHMI	30	F			25000

Status of Patients Admitted in APVVP Hospitals and CHCs, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
55	376	CHC PENDURTHI	YELLAPU SATYAVATHI	58	F			25000
56	377	CHC PENDURTHI	JOGA TULASI RAM	27	M			25000
57	378	CHC PENDURTHI	JOGI LAKSHMI	48	F			25000
58	379	CHC PENDURTHI	KARANAM JASAWANTH	13	M			25000
59	380	CHC PENDURTHI	MUTTA MADHAVA	50	M			25000
60	381	CHC PENDURTHI	MUTTA PARVATHI	48	F			25000
61	382	CHC PENDURTHI	NAGULAPALLI GANESH	40	M			25000
62	383	CHC PENDURTHI	NANDAVARUPU GOWATHMI	28	F			25000
63	384	CHC PENDURTHI	RAJI LAKSHMI	28	F			25000
64	385	CHC PENDURTHI	DUKKA JAGADESH	47	M			25000
65	386	CHC PENDURTHI	THAMATAPU MADHURI	25	F			25000
66	387	CHC PENDURTHI	SIDDABATHULA ANURADHA	32	F			25000
67	388	CHC PENDURTHI	DASARI PUSPAVALLI	22	F			25000
68	389	CHC PENDURTHI	V.PYDIRAJU	45	M			25000
69	390	CHC PENDURTHI	NIMMADALA MANGA	37	F			25000
70	391	CHC PENDURTHI	BANDARULANKA MANGA	34	F			25000
71	392	CHC PENDURTHI	MOLLITI SRINU	28	M			25000
72	393	CHC PENDURTHI	SIVAKOTI BADRINADH	7	Mch			25000
73	394	CHC PENDURTHI	PALAKA SATYAVATHI	55	F			25000
74	395	CHC PENDURTHI	KARRI JYOTHI	38	F			25000
75	396	CHC PENDURTHI	CHITTIBOYINA KUMARI	24	F			25000
76	397	CHC PENDURTHI	KINTHADA UMA	17	F			25000
77	398	CHC PENDURTHI	DUKKA RAMI REDDY	65	M			25000
78	399	CHC PENDURTHI	GORLI CHINNAMULU	44	F			25000
79	400	CHC PENDURTHI	GONNABOTHULA MAHALAKSHMI	68	M			25000
80	401	CHC PENDURTHI	BANDARU LANKA RAMAPRASAD	20	M			25000
81	402	CHC PENDURTHI	VANTAKU MADHAVI	28	F			25000
82	403	CHC PENDURTHI	SENATHI GANESWARI	32	F			25000
83	404	CHC PENDURTHI	KALLIDENDI SAI RANI	45	F			25000
84	405	CHC PENDURTHI	JONNAPILI SATYANARAYANA	40	M			25000
85	409	CHC AGANAMPUDI	G BHARATHI, VENKATAPURAM, GOPALAPATNAM	27	FEMALE	9912208090		25000
86	410	CHC AGANAMPUDI	G CHANDRA SEKHAR, VENKATAPURAM, GOPALAPATNAM	43	MALE	9912208090		25000
87	411	CHC AGANAMPUDI	G JASWANTH SRI, VENKATAPURAM, GOPALAPATNAM	11	FEMALE CHILD	9912208090		25000
88	412	CHC AGANAMPUDI	G HARJITH VAMSI, VENKATAPURAM, GOPALAPATNAM	10	MALE CHILD	9912208090		25000
89	413	CHC AGANAMPUDI	G MAHALAKSHMI, VENKATAPURAM, GOPALAPATNAM	49	FEMALE	9912208090		25000
90	414	CHC AGANAMPUDI	P SIVA SANKARA RAO, KOTTAPALEM, GOPALAPATNAM	57	MALE	9502180013		25000
91	415	CHC AGANAMPUDI	P KANAKA DURGA, KOTTAPALEM, GOPALAPATNAM	45	FEMALE	9502180013		25000
92	416	CHC AGANAMPUDI	P JAGADEESH, KOTTAPALEM, GOPALAPATNAM	23	MALE	9502180013		25000
93	417	CHC AGANAMPUDI	P LAVANYA, KOTTAPALEM, GOPALAPATNAM	28	FEMALE	9502180013		25000
94	418	CHC AGANAMPUDI	P ASWANI, KOTTAPALEM, GOPALAPATNAM	26	FEMALE	9502180013		25000

Sd/- Dr.S.Tripathi Rao
District Medical & Health Officer
Visakhapatnam

Status of Patients Admitted in King George Hospital, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
1	King George Hospital	Yedla Anitha	20	F			25000
2	King George Hospital	K.Lakshmi Anusha	18	F			25000
3	King George Hospital	B.Venkayamma	60	F			25000
4	King George Hospital	P.Prasad	37	M			25000
5	King George Hospital	G.Satyavathi	52	F			25000

Sd/- Dr.S.Triupathi Rao
District Medical & Health Officer
Visakhapatnam

Status of Patients Admitted in King George Hospital, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
1	1	King George Hospital	M Shyam Kumar	41	M			100000
2	2	King George Hospital	K.Nikilesh	18	M			100000
3	3	King George Hospital	T.Padmapriya	30	F			100000
4	4	King George Hospital	K.Ananatha lakshmi	32	F			100000
5	5	King George Hospital	B.Manga	34	F			100000
6	6	King George Hospital	D.Anil	25	M			100000
7	7	King George Hospital	G.Apparao	64	M			100000
8	8	King George Hospital	Y.Beulah	33	F			100000
9	9	King George Hospital	D.Haritha	23	F			100000
10	10	King George Hospital	D Varahalamma	65	F			100000
11	11	King George Hospital	BORA PARVATHI	43	F			100000
12	12	King George Hospital	B.Nirmala	41	F			100000
13	13	King George Hospital	Balireddy Bhavani	24	F			100000
14	14	King George Hospital	Aespa Ramesh	30	M			100000
15	15	King George Hospital	S. Shankar rao	55	M			100000
16	16	King George Hospital	Georu Lakshmi	30	F			100000
17	17	King George Hospital	Seerapu Appala Konda	45	F			100000
18	18	King George Hospital	Gantla Gopi	30	M			100000
19	19	King George Hospital	Gandabaine Subhangi	37	F			100000
20	20	King George Hospital	Pendurthy Ramesh	52	M			100000
21	21	King George Hospital	Pendurthy Bharathi	40	F			100000
22	22	King George Hospital	Gali Krishna Veni	32	F			100000
23	23	King George Hospital	Pithani Kanaka Maha laxmi	21	F			100000
24	24	King George Hospital	Yelamanchili Ramesh	25	M	7569798956		100000
25	25	King George Hospital	Golayani Sai kiran	26	M	9550398961		100000
26	26	King George Hospital	ABHILASH NOOKALA	14	M	9553480490		100000
27	27	King George Hospital	Boddeti Prasad	35	F	7730094036		100000
28	28	King George Hospital	Goryapu Raju	28	M	9949254264		100000
29	29	King George Hospital	Siraz Uddin	22	M	9705865837		100000
30	30	King George Hospital	Byri Chandramouli	17	M	7673915233		100000
31	31	King George Hospital	Gantla Lalitha	31	F	9603503436		100000
32	32	King George Hospital	Aakula Manikanta	26	M	8396387321		100000
33	33	King George Hospital	Shaik Yakub ali	19	M	7330935797		100000
34	34	King George Hospital	Aspe Veravenkata Vara prasad	34	M	8367324056		100000
35	35	King George Hospital	Aspe Veeralaxmi	28	F	9989363099		100000
36	36	King George Hospital	Palla Laxman Sai Teja	21	M	9246798416		100000
37	37	King George Hospital	G.Srinivas Reddy	25	M	9246798416		100000
38	38	King George Hospital	B.Vijaya Laxmi	28	F	7013527611		100000
39	39	King George Hospital	B.Hemanth	25	M			100000
40	40	King George Hospital	Peethala Laxmi	32	F	9705767563		100000
41	41	King George Hospital	P.Pydi Raju	36	M			100000
42	42	King George Hospital	Janatha Reddy Vasantha	47	F			100000
43	43	King George Hospital	Koramanjili Raju	38	M	9704114585		100000
44	44	King George Hospital	Bennada Appala Swamy	40	M	9581842040		100000
45	45	King George Hospital	Bennada Kanaka Mahalaxmi	36	F	9490504449		100000
46	46	King George Hospital	Sarvasiddi Ganesh	14	M			100000
47	47	King George Hospital	Sarvasiddi Rajesh Kumar	16	M	9390998258		100000
48	48	King George Hospital	Byri Mohan Rao	52	M	6302256898		100000
49	49	King George Hospital	Byri Bhavya Sri	20	F	6302256898		100000
50	50	King George Hospital	Mammid Laxmi	45	F	9398387321		100000
51	51	King George Hospital	Pandiripatti Nirmala	35	F	9398387321		100000
52	52	King George Hospital	Sanadi Srikanth	22	M	8179562137		100000
53	53	King George Hospital	Peethala Mahalaxmi	61	F	7995119026		100000
54	54	King George Hospital	Lonula Nookaraju	65	M	8185065593		100000
55	55	King George Hospital	Peethala parvathi	49	M			100000

Status of Patients Admitted in King George Hospital, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
56	56	King George Hospital	Ellapu Aswani Kumar	26	M			100000
57	57	King George Hospital	Kondamanjili Surya Kala	35	F			100000
58	58	King George Hospital	Akula Karuna	67	F	7997602179		100000
59	59	King George Hospital	Mammudi Mery sweety	16	F			100000
60	60	King George Hospital	Nammi Srinivas	42	M	6303363770		100000
61	61	King George Hospital	Sarvasiddi Laxmi	32	F	8179562137		100000
62	62	King George Hospital	P.Appala Swamy	79	M	9676956627		100000
63	63	King George Hospital	G.Mahalaxmi	48	F	8978200673		100000
64	64	King George Hospital	G.Kanakaraju	45	M	9346339997		100000
65	65	King George Hospital	K.Nooka ratnam	52	F	6281885420		100000
66	66	King George Hospital	E.Lokesh	15	M	6281885420		100000
67	67	King George Hospital	E.Appala Raju	48	M	8985644825		100000
68	68	King George Hospital	P.Gowtham	18	M	6301224662		100000
69	69	King George Hospital	D.Nagendrababu	30	M	9603164167		100000
70	70	King George Hospital	G.Girinadh	50	M			100000
71	71	King George Hospital	E.Chinnammulu	42	F	9908092944		100000
72	72	King George Hospital	B.Appa rao	48	M	9494474875		100000
73	73	King George Hospital	G.Jhansi	15	F			100000
74	74	King George Hospital	T.Pavani	20	F	7995621522		100000
75	75	King George Hospital	A.Sujatha	29	F	6301443974		100000
76	76	King George Hospital	L.Prasanth	15	M	6281885420		100000
77	77	King George Hospital	I.Sivaji	26	M	97050222e6		100000
78	78	King George Hospital	P.Ashalatha	39	F	9985155714		100000
79	79	King George Hospital	Ch.Indra priyadarshini	35	F	9989873002		100000
80	80	King George Hospital	Y.Eswaramma	58	F	8179418138		100000
81	81	King George Hospital	G.Murali Mohan	37	M	8897592877		100000
82	82	King George Hospital	Ch.Balayya	64	M			100000
83	83	King George Hospital	P.Pranab Kumar	22	M	9290727235		100000
84	84	King George Hospital	D.Bindu	17	F	9177009111		100000
85	85	King George Hospital	Y.Chaitanya	28	M			100000
86	86	King George Hospital	T.Likhith	19	M	8328416221		100000
87	87	King George Hospital	N.Srinu	35	M	8688272446		100000
88	88	King George Hospital	P.Appalanarasamma	58	F	7989950547		100000
89	89	King George Hospital	L.Sandya	20	F			100000
90	90	King George Hospital	M.Billigraham	22	M	9652317358		100000
91	91	King George Hospital	N.Varalaxmi	45	F			100000
92	92	King George Hospital	U.Rajesh	22	M	7997564574		100000
93	93	King George Hospital	K.Anand Sayar	27	M	9032583391		100000
94	94	King George Hospital	N.Laxmi	60	F			100000
95	95	King George Hospital	Ch.Devi	35	F	9030166906		100000
96	96	King George Hospital	N.Murali	15	M	7702841887		100000
97	97	King George Hospital	G.Ramanamma	40	F			100000
98	98	King George Hospital	E.Ramulamma	70	F	9177601132		100000
99	99	King George Hospital	D.Joga Rao	24	M			100000
100	100	King George Hospital	S.Satyaveni	30	F	7702674378		100000
101	101	King George Hospital	Manoj Kumar	12	M			100000
102	102	King George Hospital	Y.Koteswara rao	21	M			100000
103	103	King George Hospital	G.Ganesh	41	M			100000
104	104	King George Hospital	Ch.Kiran Kumar	38	M			100000
105	105	King George Hospital	Y.Shyamala	22	F	6281885420		100000
106	106	King George Hospital	P.Appalakonda	35	F	9702143169		100000
107	107	King George Hospital	G.Rama laxmi	23	F	9885170016		100000
108	108	King George Hospital	P.Sathwika	17	F			100000
109	109	King George Hospital	S.Vamsi	20	M	9553480490		100000
110	110	King George Hospital	P.Durga lakshmi	45	F			100000

Status of Patients Admitted in King George Hospital, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
111	111	King George Hospital	G.Srinivas	37	M			100000
112	112	King George Hospital	G.Nagamani	28	F			100000
113	113	King George Hospital	B.Anusha	20	F	8897592877		100000
114	114	King George Hospital	A.Siddeswara Rao	29	M			100000
115	115	King George Hospital	Pithala Ganesh	40	M			100000
116	116	King George Hospital	Patnala Sampath	22	M	8333837706		100000
117	117	King George Hospital	Nookala Pavana Murthy	35	M	7995989918		100000
118	118	King George Hospital	Nilopu Kiran	28	M			100000
119	119	King George Hospital	Patnala Adinarayana	57	M			100000
120	120	King George Hospital	Rokkala Saubagyavathi	66	F			100000
121	121	King George Hospital	Dasari Kondamma	80	F			100000
122	122	King George Hospital	Emandi Simhachalam	60	F	9640946994		100000
123	123	King George Hospital	Saddasi David Nelson	69	M	8019819244		100000
124	124	King George Hospital	Kondaru Velu babu	39	M	8639833698		100000
125	125	King George Hospital	Balireddy Musalayya	90	M	9032218233		100000
126	126	King George Hospital	Desari Johny	14	M	8333869223		100000
127	127	King George Hospital	Dasari Beenapriyanka	20	F	8790255691		100000
128	128	King George Hospital	Balireddy Narasamma	65	F	8179361299		100000
129	129	King George Hospital	Balireedy Balarama Krishna	22	M	9533419510		100000
130	130	King George Hospital	Ganta Appala Naidu	46	M	8790255691		100000
131	131	King George Hospital	Dasari GovindaRao	44	M	9908347336		100000
132	132	King George Hospital	Meetta Ramu	49	M	9573534629		100000
133	133	King George Hospital	Gumagani Satyanarayana	41	M	9505976047		100000
134	134	King George Hospital	Aakula Ramalakshmi	40	F	9565019537		100000
135	135	King George Hospital	Chinni Venkatesh	20	M	9502196479		100000
136	136	King George Hospital	Chinni Laxmi	45	F	9573534629		100000
137	137	King George Hospital	Arisivilli Siva	30	M	9392204965		100000
138	138	King George Hospital	Arisivilli Gayatri	28	F	9505976047		100000
139	139	King George Hospital	Seerabi Venkataratnam	65	F			100000
140	140	King George Hospital	Patnala Vinodh Kumar	28	M			100000
141	141	King George Hospital	Nuneela Ammoru	76	M	9963115910		100000
142	142	King George Hospital	Denkada Appala Swamy	67	M	8309861483		100000
143	143	King George Hospital	Yellapu sunitha	27	F	8309861483		100000
144	144	King George Hospital	Doddi Madhavi	40	F	8688496449		100000
145	145	King George Hospital	Doddi Govinda Rao	45	M	8688496449		100000
146	146	King George Hospital	Yenneti Kumar Raju	18	M	7995119029		100000
147	147	King George Hospital	Muarthipati Suvarna	18	F			100000
148	148	King George Hospital	B.Jayanthi	45	F	9640946994		100000
149	149	King George Hospital	Shaik Meerabi	55	F	9885837715		100000
150	150	King George Hospital	Kondre Sailaja	32	F	9848216748		100000
151	151	King George Hospital	Mokale Mangadevi	30	F	8985644825		100000
152	152	King George Hospital	Bantu Seeta	30	F	8985644825		100000
153	153	King George Hospital	Temba Usharani	38	F	7731960618		100000
154	154	King George Hospital	Donkada Vara Lakshmi	55	F	8688550084		100000
155	155	King George Hospital	Bangari Ngagaraju	39	M	7396387321		100000
156	156	King George Hospital	Boddu Apparao	70	M	9381468155		100000
157	157	King George Hospital	Pinnapolu Pavan	15	M	8106820687		100000
158	158	King George Hospital	Shatty Bangaraju	39	M	9949254264		100000
159	159	King George Hospital	Ganta Venu	28	F	9603589616		100000
160	160	King George Hospital	Pasupalate Chandrika	38	F	8978081693		100000
161	161	King George Hospital	Rajiya Begum Shaik	27	F	9885837715		100000
162	162	King George Hospital	A.Nagamani	38	F	9985881560		100000
163	163	King George Hospital	GANTLA VARALAKSHMI	38	F	8309932452		100000
164	164	King George Hospital	POLAVARAPU LAKSHMI	35	F	8500634941		100000
165	165	King George Hospital	PITTA YALLAYYAMMA	30	F	8309932452		100000

Status of Patients Admitted in King George Hospital, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
166	166	King George Hospital	PITTA DURGA PRASAD	17	M	6281885420		100000
167	167	King George Hospital	PRAGADA RAMYA	20	F	7036067411		100000
168	168	King George Hospital	NADIPILLI VARA LAKSHMI	30	F	7997603124		100000
169	169	King George Hospital	SUNNAPU TRIVENI	30	F	7337005124		100000
170	170	King George Hospital	ERNAKI SUBBA LAKSHMI	61	F	9705229065		100000
171	171	King George Hospital	ERNAKI VENKTA SURYA LAKSHMI	41	F	8555824961		100000
172	172	King George Hospital	PATNALA VENKATA LAKSHMI	26	F	7780777315		100000
173	173	King George Hospital	SINDIN JANUKAMMA	80	F	9705022266		100000
174	174	King George Hospital	KILAPARTHI BHARATHI	35	F	9618774331		100000
175	175	King George Hospital	NAPASETHI SRINIDHI	31	F	9951418456		100000
176	176	King George Hospital	NOMILA RAMULAMMA	60	F	9912993366		100000
177	177	King George Hospital	KOLTA KANAKALAMMA	40	F	9000488590		100000
178	178	King George Hospital	SALAPU VIJAYA LAKSHMI	28	F	9000488590		100000
179	179	King George Hospital	AAKELA SURYA PRAKASARAO	43	M	8499909608		100000
180	180	King George Hospital	REDDY RAGHU	17	M	9441663204		100000
181	181	King George Hospital	R.CHINNARI	22	F	9701291249		100000
182	182	King George Hospital	BORA VENU GOPALAREDDY	54	M	7995335663		100000
183	183	King George Hospital	N.LATHA	31	F	9640946994		100000
184	184	King George Hospital	BURRI SURESH	40	M	7989303979		100000
185	185	King George Hospital	ELLAPU ESWARA RAO	39	M	7989303979		100000
186	186	King George Hospital	PADAGALA ANURADHA	23	F	9963115910		100000
187	187	King George Hospital	PADAGALA VENKATA LAKSHMI	43	F	9966002213		100000
188	188	King George Hospital	YALAMANCHILI PYDIRAJU	58	M	8465856907		100000
189	189	King George Hospital	GALI SRINU	30	M	9493203228		100000
190	190	King George Hospital	ANAPARTHI KANNAMMA	45	F	9848388578		100000
191	191	King George Hospital	P.MANGAMMA	41	F	8106022916		100000
192	192	King George Hospital	N.LAKSHMI	35	F	8897091859		100000
193	193	King George Hospital	N.SAI BHARGAVI	13	F	7036594517		100000
194	194	King George Hospital	E. MARUTHI	23	F	9951973128		100000
195	195	King George Hospital	D.VIJAYA	45	F	9553480490		100000
196	196	King George Hospital	S.JAYA LAKSHMI	58	F	970585532		100000
197	197	King George Hospital	G.KANAKA LAKSHMI	54	F	9704024870		100000
198	198	King George Hospital	D.VAMSI KRISHNA	21	M	7987173625		100000
199	199	King George Hospital	SK NOOR SAHEB	61	M	9676956627		100000
200	200	King George Hospital	D.CHINNARAO	52	M	9676956627		100000
201	201	King George Hospital	A.MOULI	17	M	8367551121		100000
202	202	King George Hospital	T.MOHAN	38	M	9177486971		100000
203	203	King George Hospital	M.APPARAO	58	M	9177486971		100000
204	204	King George Hospital	G.KANAKA RAJU	56	M	9640995449		100000
205	205	King George Hospital	B.PRADEEP	39	M	6301224662		100000
206	206	King George Hospital	T.VINAY	14	M	9291435861		100000
207	207	King George Hospital	S.SANNI BABU	36	M	9177486971		100000
208	208	King George Hospital	NEELAPU.RAMYA	21	F	9963115910		100000
209	209	King George Hospital	B.R.KISHORE	26	M	6300509976		100000
210	210	King George Hospital	V.KANAKA RAJU	53	M	8978343506		100000
211	211	King George Hospital	V.MALLIKA	49	F	9640995449		100000
212	212	King George Hospital	M.VARAHALAMMA	62	F	9392357357		100000
213	213	King George Hospital	P.ESWARA RAO	25	M	6300509976		100000
214	214	King George Hospital	CH.NAGA RAJU	38	M	6302256898		100000
215	215	King George Hospital	PILLA PYDIRAJU	30	M			100000
216	216	King George Hospital	K.NAGAMBIKA	48	F	9985685316		100000
217	217	King George Hospital	S.SANTHOSH KUMAR	30	M	9542423283		100000
218	218	King George Hospital	M.ESWARA RAO	44	M	9603243496		100000
219	219	King George Hospital	G.RAVI SANKAR	32	M	9296484761		100000
220	220	King George Hospital	P VISHWANADH	48	M	95503938916		100000

Status of Patients Admitted in King George Hospital, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (609 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
221	221	King George Hospital	P.BHEEMA RAJU	35	M	9390654561		100000
222	222	King George Hospital	B.LEELA	40	F	8523064333		100000
223	223	King George Hospital	G.SANYASAMMA	40	F	9603020181		100000
224	224	King George Hospital	B.SRINIVASA RAO	35	M	9440077338		100000
225	225	King George Hospital	G.REVATHI	26	F	8688550084		100000
226	226	King George Hospital	P.LAKSHMI	26	F	7674080228		100000
227	227	King George Hospital	B.ROSHINI	20	F	9701291249		100000
228	228	King George Hospital	BALA SANJEEVI RAO	50	M	9885620829		100000
229	229	King George Hospital	K.CHINNA	30	M	9885620829		100000
230	230	King George Hospital	G. JYOTHI	25	F			100000
231	231	King George Hospital	B.HEMA	38	F	9502196479		100000
232	232	King George Hospital	E.BHARATHI	26	F	6309578979		100000
233	233	King George Hospital	K.JYOTHI	40	F	9989721392		100000
234	234	King George Hospital	S.VENKATA LAKSHMI	26	F	8297823395		100000
235	235	King George Hospital	I.Saroja	40	F	8897047812		100000
236	236	King George Hospital	I.SIMHACHALAM	40	F	9989721392		100000
237	237	King George Hospital	G.PADMAVATHI	38	F	6304651196		100000
238	238	King George Hospital	K.SWATHI	32	F	9985881560		100000
239	239	King George Hospital	BVHM.PRIYANKA	21	F	6302756345		100000
240	240	King George Hospital	B.ESWARI	28	F	9989721392		100000
241	241	King George Hospital	E.JUVVALA NAIDU	40	M	9704424189		100000
242	242	King George Hospital	SHAINAZ PARVEEN	25	F	9490707816		100000
243	243	King George Hospital	E.LAKSHMI	30	F	9490707816		100000
244	244	King George Hospital	P.RAMU	27	M	9505529111		100000
245	245	King George Hospital	N.RAMANAMMA	42	F			100000
246	246	King George Hospital	E.SATYAVATHI	65	F	6300930490		100000
247	247	King George Hospital	Sk.Bibijaan	45	F			100000
248	248	King George Hospital	Sk.Madeena	35	F	9000254195		100000
249	249	King George Hospital	D.Laxmi	35	F			100000
250	250	King George Hospital	V.Vasanthakumari	35	F	900254195		100000
251	251	King George Hospital	Usha rani	32	F	8985191943		100000
252	252	King George Hospital	A.KondalaRao	35	F	9705022266		100000
253	253	King George Hospital	I.Parasuram	52	M	9000254195		100000
254	254	King George Hospital	G.Pratibha	13	F			100000
255	255	King George Hospital	Y.Jayalaxmi	25	F	9291435864		100000
256	256	King George Hospital	T.Anil Kumar	35	M	9704900542		100000
257	257	King George Hospital	N.Penta Rao	66	M	9505976047		100000
258	258	King George Hospital	T.Appalanarasamma	40	F	9966445837		100000
259	259	King George Hospital	Y.Sowmya	21	F	8498880853		100000
260	260	King George Hospital	J.Praneeth	7	MCH	91933940118		100000
261	261	King George Hospital	S.Manasalakshmi	13	FCH	9490707816		100000
262	262	King George Hospital	P.Chaitanya	15	MCH	9618195569		100000
263	263	King George Hospital	Sk.Nashriya	6	FCH	6303834411		100000
264	264	King George Hospital	N.Vivek	10	MCH			100000
265	265	King George Hospital	Y.Sarojini	5	FCH	9966412480		100000
266	266	King George Hospital	T.Tarun	13	MCH	8019728950		100000
267	267	King George Hospital	G.Badrinadh	11	MCH	7989187580		100000
268	268	King George Hospital	Ch.Jayavardhan	5	MCH	9704782924		100000
269	269	King George Hospital	G.Himasri	12	FCH			100000
270	270	King George Hospital	G.Yogesh	2	MCH			100000
271	271	King George Hospital	G.Harshini	10	FCH	8897592877		100000
272	272	King George Hospital	S.Jaitna sri	3	FCH			100000
273	273	King George Hospital	P.Kushal	7	MCH			100000
274	274	King George Hospital	P.Lasya	10	FCH			100000
275	275	King George Hospital	B.Haithvik	2	MCH			100000

Status of Patients Admitted in King George Hospital, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
276	276	King George Hospital	P.Shashanth	11	MCH	9618195569		100000
277	277	King George Hospital	B.Sanjay	4	MCH	8179795229		100000
278	278	King George Hospital	Ch.Venkata Kavyasri	2	FCH	7995989918		100000
279	279	King George Hospital	Mohit	5	MCH	9505580703		100000
280	280	King George Hospital	S.Manideep	5	MCH	7995989918		100000
281	281	King George Hospital	B.Lokesh	8	MCH	8978663192		100000
282	282	King George Hospital	E.Surya	4	MCH	9704114585		100000
283	283	King George Hospital	K.Hashini	12	FCH	9704114585		100000
284	284	King George Hospital	Y.Jashmitha	2	FCH	8106424288		100000
285	285	King George Hospital	K.Teja	6	FCH	7036067411		100000
286	286	King George Hospital	P.Tejesh	10	MCH	7032633992		100000
287	287	King George Hospital	A.Pravalika	5	FCH	7382555695		100000
288	288	King George Hospital	E.Prathyusha	5	FCH			100000
289	289	King George Hospital	A.Thanushka	5	MCH	7794943979		100000
290	290	King George Hospital	Sk.Rizwana	8	FCH	9963340906		100000
291	291	King George Hospital	P.Poojitha sri	7	FCH	9000254195		100000
292	292	King George Hospital	P.Namratha hashini	12	FCH	9849722289		100000
293	293	King George Hospital	P.Chinmai	9	FCH	9553480490		100000
294	294	King George Hospital	P.Chetan	14	FCH	7569798956		100000
295	295	King George Hospital	T.Sushmitha	12	FCH	7995119029		100000
296	296	King George Hospital	E.Deepu	12	MCH	8519828157		100000
297	297	King George Hospital	E.Bhavyasri	9	FCH	8179899531		100000
298	298	King George Hospital	T.Manikanta	10	MCH	9398898767		100000
299	299	King George Hospital	Y.Charan	9	MCH	9505482079		100000
300	300	King George Hospital	Y.Lohith	4	MCH	8179849914		100000
301	301	King George Hospital	Ch.Uday Kiran	4	MCH			100000
302	302	King George Hospital	T.Keerthana	9	MCH	8608508245		100000
303	303	King George Hospital	G.Srikar	7	MCH	8008508245		100000
304	304	King George Hospital	Ch.Kavya Kiran	9	MCH	8897398424		100000
305	305	King George Hospital	G.Kalyani	7	FCH	7995571044		100000
306	306	King George Hospital	S.Chandini	10	FCH	7995571044		100000
307	307	King George Hospital	P.Akhilapriya	3	FCH	8897398424		100000
308	308	King George Hospital	P.Durgesh	12	MCH	6300338652		100000
309	309	King George Hospital	Ch.Megha harsha	7	MCH			100000
310	310	King George Hospital	K.Nikhil	5	MCH	9390654561		100000
311	311	King George Hospital	B/o K.Jhansi	3 months	MCH			100000
312	312	King George Hospital	S.CHARAN MADAV	13	M	9951682289		100000
313	313	King George Hospital	P.Kanaka rao	55	M	9553562222		100000
314	314	King George Hospital	P.Venkaiamma	80	F			100000
315	315	King George Hospital	A.Siva Kumar	23	M			100000
316	316	King George Hospital	A.Saramma	23	F			100000
317	317	King George Hospital	Baby of Nagamani	2 months	FCH			100000
318	318	King George Hospital	V.Uday	7	MCH	7390654561		100000
319	319	King George Hospital	B.Yogesh	9	MCH	9704398001		100000

Sd/- Dr.S.Tripathi Rao
District Medical & Health Officer
Visakhapatnam

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (56th List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
1	419	SR HOSPITALS GOPALAPATNAM	BABY MEENAKSHI, VENKATAPURAM	5	FEMALE	8886099104	GENERAL	100000
2	420	SR HOSPITALS GOPALAPATNAM	N. LAKSHMI, VENKATAPURAM	22	FEMALE	6303889388	GENERAL	100000
3	421	SR HOSPITALS GOPALAPATNAM	B.ANUSHA, DRNO:2-160, VENKATAPURAM	20	FEMALE	9121917609	GENERAL	100000
4	422	SR HOSPITALS GOPALAPATNAM	BABY S.JASHWA, DRNO:3-121, VENKATAPURAM	8Month	MALE	8074540609	GENERAL	100000
5	423	SR HOSPITALS GOPALAPATNAM	NAGIREDDY MANJULA, DRNO:3-121, VENKATAPURAM	10	FEMALE	8074540609	GENERAL	100000
6	424	SR HOSPITALS GOPALAPATNAM	S.LAKSHMI, DRNO:3-118, VENKATAPURAM	55	FEMALE	8074540609	GENERAL	100000
7	425	SR HOSPITALS GOPALAPATNAM	S.LAKSHMI, DRNO:3-118, VENKATAPURAM	24	FEMALE	8074540609	GENERAL	100000
8	426	SR HOSPITALS GOPALAPATNAM	SANTHOSH KUMAR, DRNO:3-118, VENKATAPURAM	30	MALE	8074540609	GENERAL	100000
9	427	SR HOSPITALS GOPALAPATNAM	DINESH GOSWAMY, DRNO:7-5, VENKATAPURAM	23	MALE	9030187673	GENERAL	100000
10	428	SR HOSPITALS GOPALAPATNAM	S.SURYA KANTHAM, DRNO:3-27, RAMALAYAM VEEDHI, VENKATAPURAM	52	FEMALE	7396548843	GENERAL	100000
11	429	SR HOSPITALS GOPALAPATNAM	A.SRINIVAS, DRNO:3-121, VENKATAPURAM	31	MALE	9573186454	GENERAL	100000
12	430	SR HOSPITALS GOPALAPATNAM	A.SUSHEELA, VENKATAPURAM	53	FEMALE	9573186454	GENERAL	100000
13	431	SR HOSPITALS GOPALAPATNAM	B.YOGESH, VENKATAPURAM	9	MALE	8886289989	GENERAL	100000
14	432	SR HOSPITALS GOPALAPATNAM	B.JANAKI, VENKATAPURAM	28	FEMALE	8886289989	GENERAL	100000
15	433	SR HOSPITALS GOPALAPATNAM	S.RAJESH, VENKATAPURAM	27	MALE	8971103703	GENERAL	100000
16	434	SR HOSPITALS GOPALAPATNAM	K.SRINIVASA RAO, VENKATAPURAM	45	MALE	9699527143	GENERAL	100000
17	435	SR HOSPITALS GOPALAPATNAM	S.APPALANARASAMMA, DRNO:2-128, RAMALAYAM VEEDHI, VENKATAPURAM	35	FEMALE	8956247102	GENERAL	100000
18	436	SR HOSPITALS GOPALAPATNAM	G.TATHA RAO, DRNO:2-159, VENKATAPURAM	58	MALE	8852036974	GENERAL	100000
19	437	SR HOSPITALS GOPALAPATNAM	G.JAGGAYAMMA, VENKATAPURAM	70	FEMALE	9705941985	GENERAL	100000
20	438	SR HOSPITALS GOPALAPATNAM	N.RAMYA, VENKATAPURAM	21	FEMALE	9032218233	GENERAL	100000
21	439	SR HOSPITALS GOPALAPATNAM	J.VEERA LAKSHMI, DRNO:3/103, GOLLA VEEDHI,VENKATAPURAM	36	FEMALE	9676158922	GENERAL	100000
22	440	SR HOSPITALS GOPALAPATNAM	V.MAINA, GOLLA VEEDHI,VENKATAPURAM	20	FEMALE	9676483189	GENERAL	100000
23	441	Apollo Hospitals, Health City, Visakhapatanam	Mr. D S JAGANADHAM, VIRATANAGAR GOPALAPATNAM-	47	Male	91-8019773934	will Discharge today	100000
24	442	Apollo Hospitals, Health City, Visakhapatanam	Ms. PRAHARSHA PANI, 4-43/4/3/4 VENKATADRIGARDANCE VENKATAPURAM BESIDE L.G.POLYMERS GOPALAPATNAM-	18	Female	91-8328683008	will Discharge today	100000

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
25	443	Apollo Hospitals, Health City, Visakhapatanam	Ms. K AMRUTHA VARSHINI, 4-43/1/3 VENKATADRIGARDANCE BESIDE LG POLYMERS-	14	Female	91-9866247419	will Discharge today	100000
26	444	Apollo Hospitals, Health City, Visakhapatanam	Mr. CHAKRAPANI PAKA, 4-43/4 VENKATAPURAM VENKATADRI GARDANCE GOPALAPATNAM-	54	Male	91-9966103818	will Discharge today	100000
27	445	Apollo Hospitals, Health City, Visakhapatanam	Mrs. MEKA SUSHILA, PLOT NO:12 VENKATAPURAM GOPALAPATNAM-	65	Female	91-9492824887	Dicharge planned tommorrow	100000
28	446	Apollo Hospitals, Health City, Visakhapatanam	Mr. BODDU NARAYANA RAHUL, 43-5-15 BESIDE LG POLYMERS VENKATADRI GARDANCE GOPALAPATNAM-	19	Male	91-7842800006	will Discharge today	100000
29	447	Apollo Hospitals, Health City, Visakhapatanam	Ms. SAMEERA ., LG POLYMERS GOPALAPATNAM VSKP-	17	Female	91-7842800006	will Discharge today	100000
30	448	Apollo Hospitals, Health City, Visakhapatanam	Mr. SATYANARAYANA BODDU, 4-43-15, VENKATADARI GARDENS, VENKATAPURAM-	49	Male	91-9490119426	will Discharge today	100000
31	449	Apollo Hospitals, Health City, Visakhapatanam	Mr. APPA RAO, VENTADRIPURAM, BESIDE LG POLYMER, GOPALPATNAM-	45	Male	91-8912867777	shifting to room today	100000
32	450	Apollo Hospitals, Health City, Visakhapatanam	Mrs. SEETHA LAKSHMI, VENTADRIPURAM, BESIDE LG POLYMER, GOPALPATNAM-	28	Female	91-9985291987	will Discharge today	100000
33	451	Apollo Hospitals, Health City, Visakhapatanam	Mrs. MESALA LAKSHMI, VENTADRIPURAM, BESIDE LG POLYMER, GOPALPATNAM-	35	Female	91-9989827232	will Discharge today	100000
34	452	Apollo Hospitals, Health City, Visakhapatanam	Mr. KIRAN KUMAR, 2-44, VENKATDRI GARDENS, BESIDE LG POLYMERS,GOPALPATNAM-	36	Male	91-8008726216	Critical	100000
35	453	Apollo Hospitals, Health City, Visakhapatanam	Mrs. N LAXMI, 2-85 VENKATAPURAM RAMALAYAM GOPALAPATNAM-	45	Female	91-9491736437	will Discharge today	100000
36	454	Apollo Hospitals, Health City, Visakhapatanam	Mr. T JAGADEESH, VENKATAPURAM BESIDE LG POLYMERS GOPALAPATNAM-	25	Male	91-8886417999	will Discharge today	100000
37	455	Apollo Hospitals, Health City, Visakhapatanam	Mr. B KAMALAKAR, VENTADRIPURAM, BESIDE LG POLYMER, GOPALPATNAM-	33	Male	91-9849995748	will Discharge today	100000
38	456	Apollo Hospitals, Health City, Visakhapatanam	Mr. KORONI VENU GOPAL, IST LANE, VENKATADRIPURAM,GOPALPATNAM-	48	Male	91-8978362699	will Discharge today	100000
39	457	Apollo Hospitals, Health City, Visakhapatanam	Ms. P PRATYUSH PANI, 4-43/4/3/4 VENKATADRI GARDANCE BESIDE L.G.POLYMER GOPALAPATNAM-	23	Female	91-9966103818	will Discharge today	100000

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
40	458	Apollo Hospitals, Health City, Visakhapatanam	Mr. DNS PHANI TEJA, 3-59/1 GOLLAPETA VENKATAPURAM GOPALAPATNAM-	18	Male	91-9182143852	will Discharge today	100000
41	459	Apollo Hospitals, Health City, Visakhapatanam	Mrs. B GOWRI, DURGA NAGAR, VENKADRIPURAM, GOPALPATNAM-	30	Female	91-7995040063	will Discharge today	100000
42	460	Apollo Hospitals, Health City, Visakhapatanam	Mrs. BODDU RAMU, 4-43/16 BESIDE LG POLYMERS VENKATAPURAM GOPALAPATNAM-	43	Female	91-9491736437	will Discharge today	100000
43	461	Apollo Hospitals, Health City, Visakhapatanam	Mrs. B RAMA SUNDARI, C/O K SATYA RAO VENKATADRI GARDANCE GOPALAPATNAM-	58	Female	91-9848487535	will Discharge today	100000
44	462	Apollo Hospitals, Health City, Visakhapatanam	Mrs. S ANURADHA, RR VENKATAPURAM, GOPALAPATNAM.-	44	Female	91-8309541555	will Discharge today	100000
45	463	Apollo Hospitals, Health City, Visakhapatanam	Mrs. KURMILLI ANNAPOORNA, 4-43/1/3 VENKATADRI GARDANCE BESIDE LGPOLYMERS-	38	Female	91-9866247419	will Discharge today	100000
46	464	Apollo Hospitals, Health City, Visakhapatanam	Mr. P RAJA NAIDU, 2-90/1 VENKATADRI GARDANCE BESIDE LG POLYMERS GOPALAPATNAM-	50	Male	91-9908093924	will Discharge today	100000
47	465	Apollo Hospitals, Health City, Visakhapatanam	Ms. G GAYATHRI, 2-95 VENKATAPURAM GOPALAPATNAM-	12	Female	91-9966808441	will Discharge today	100000
48	466	Apollo Hospitals, Health City, Visakhapatanam	Mr. SUDHAKAR A V N ., 16-107,OPP SAI BABA TEMPLE,PRAHALADA PURAM,SIMHACHALAM,Vepada, Andhra Pradesh	40	Male	91-900017239	Dicharge planned tommorrow	100000
49	467	Apollo Hospitals, Health City, Visakhapatanam	Mrs. POTNURU CHINNAMMALU, #4-43/5/5, Venkatadri gardens, Gopalapatnam Visakhapatnam	64	Female	91-9494180180	will Discharge today	100000
50	468	Apollo Hospitals, Health City, Visakhapatanam	Mr. P PREM KOUSHIK, #4-43/5/5, Venkatadri gardens, Gopalapatnam Visakhapatnam	18	Male	91-9494180180	will Discharge today	100000
51	469	Apollo Hospitals, Health City, Visakhapatanam	Mr. POTNURU RANGANATH, #4-43/5/5, Venkatadri gardens, Gopalapatnam Visakhapatnam	44	Male	9494180180	will Discharge today	100000
52	470	Apollo Hospitals, Health City, Visakhapatanam	Mrs. DALAI VARA LAKSHMI, #4-43/5/5, Venkatadri gardens, Gopalapatnam Visakhapatnam	37	Female	9494180180	will Discharge today	100000
53	471	Apollo Hospitals, Health City, Visakhapatanam	Ms. POTNURU VENKATA HARSHITHA, #4-43/5/5, Venkatadri gardens, Gopalapatnam Visakhapatnam	14	Female	9494180180	will Discharge today	100000
54	472	Apollo Hospitals, Health City, Visakhapatanam	Ms. BANTUPALLI JANANI, BC COLONY VEPAGUNTA PENDURTHY VISAKHAPATNAM-	19	Female	91-8096748680	2 days	100000
55	473	Apollo Hospitals, Health City, Visakhapatanam	Mrs. PILLI MOHINI SAI, 1-161 OLD ADIVIVARAM SIMHACHAAM-	23	Female	91-9000807015	Critical	100000

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
56	474	Apollo Hospitals, Health City, Visakhapatanam	Mr. RAVI SANJAY RAGHAVA, 6-38,SCandBC COLONY,RR VENKATA PURAM,-	14	Male	91-7995315269	Stable	100000
57	475	Apollo Hospitals, Health City, Visakhapatanam	Mrs. SAVALAPURAM VARALAXMI, 7-121-31/1 SAI NAGAR L G POLIMARS NEAR GOPALAPATNAM-	54	Female	91-9441575292	Stable	100000
58	476	Care Hospial, Ram Nagar, Visakhapatnam	Palisetty Venkatalakshmi,	43	FEMALE	9885454196, 7675808099	Stable	100000
59	477	Care Hospial, Ram Nagar, Visakhapatnam	Palisetty Srinivas,	48	MALE	9885454196, 7675808099	Stable	100000
60	478	Care Hospial, Ram Nagar, Visakhapatnam	Palisetty Bhanuprakash,	18	MALE	9885454196, 7675808099	Stable	100000
61	479	Care Hospial, Ram Nagar, Visakhapatnam	Annepu Eswara rao,	45	MALE	9440637388, 7032526843	LAMA because of death in the same family	100000
62	480	Care Hospial, Ram Nagar, Visakhapatnam	Annepu Padmavathi,	38	FEMALE	9440637388, 7032526843	LAMA "	100000
63	481	Care Hospial, Ram Nagar, Visakhapatnam	Annepu Chandra Kiran,	17	MALE	9440637388, 7032526843	LAMA "	100000
64	482	Care Hospial, Ram Nagar, Visakhapatnam	Sivakoti Jyoshna,	16	FEMALE	9959383068	Under observation	100000
65	483	Care Hospial, Ram Nagar, Visakhapatnam	Palapala Varalakshmi,	60	FEMALE	9966001894	Under observation	100000
66	484	Care Hospial, Ram Nagar, Visakhapatnam	Gali Bapineedu,	61	MALE		Under observation	100000
67	485	Care Hospial, Ram Nagar, Visakhapatnam	Balireddy Narasinga Rao,	30	MALE	9963850412	Stable	100000
68	486	Care Hospial, Ram Nagar, Visakhapatnam	Kilampally Srivani,	50	FEMALE		Stable	100000
69	487	Care Hospial, Ram Nagar, Visakhapatnam	Idadasri Padma,	35	FEMALE	9502645262, 9949739559	Stable	100000
70	488	Care Hospial, Ram Nagar, Visakhapatnam	Idadasri Srishanth,	9	Male	9502645262, 9949739559	Stable	100000
71	489	Care Hospial, Ram Nagar, Visakhapatnam	Ippili Parvathi,	55	FEMALE	9502645262, 9949739559	Stable	100000
72	490	Care Hospial, Ram Nagar, Visakhapatnam	Vegi Jayalakshmi,	37	FEMALE	9885454480	Stable	100000
73	491	Care Hospial, Ram Nagar, Visakhapatnam	Chittimoju Lakshmi,	18	FEMALE	9553041202	Stable	100000

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
74	492	Care Hospial, Ram Nagar, Visakhapatnam	Chittimoju Sanju,	6	Male	9553041202	Stable	100000
75	493	Care Hospial, Ram Nagar, Visakhapatnam	T Bhagavan,	42	Male		Discharged on LAMA	100000
76	494	Care Hospial, Ram Nagar, Visakhapatnam	V. Lakshmi,	35	Female		Stable	100000
77	495	Care Hospial, Ram Nagar, Visakhapatnam	K.Venkata Rao,	46	Male		Stable	100000
78	496	Care Hospial, Ram Nagar, Visakhapatnam	N. Lokeswar Raju,	27	Male		Stable	100000
79	497	Care Hospial, Ram Nagar, Visakhapatnam	P. Ramayya,	44	Male		Stable	100000
80	498	Care Hospial, Ram Nagar, Visakhapatnam	A. Nagaraju,	32	Male		Stable	100000
81	499	Care Hospial, Ram Nagar, Visakhapatnam	K. Prem,	13	Male		Stable	100000
82	500	Care Hospial, Ram Nagar, Visakhapatnam	Satwik. I,	13	Male		Stable	100000
83	501	Care Hospial, Ram Nagar, Visakhapatnam	N.Varalakshmi,	34	Female	7674999327	Stable	100000
84	502	Care Hospial, Ram Nagar, Visakhapatnam	S.Swamy Naidu,	35	Male	8332897237, 9494905596	Stable	100000
85	503	Care Hospial, Ram Nagar, Visakhapatnam	Nagisetty Gayatri gireeshma anitha,	19	Female	9652692878, 8978917850	Stable	100000
86	504	Care Hospial, Ram Nagar, Visakhapatnam	T Harini,	12	Female	6305898828	Stable	100000
87	505	Care Hospial, Ram Nagar, Visakhapatnam	T Devi,	31	Female	6305898828	Stable	100000
88	506	Care Hospial, Ram Nagar, Visakhapatnam	M Polamma,	55	Female	6305898828	Stable	100000
89	507	Care Hospial, Ram Nagar, Visakhapatnam	Neelapu Ganesh,	23	Male	7893451418	Stable	100000
90	508	Care Hospial, Ram Nagar, Visakhapatnam	G Chandrasekhar,	19	Male	7013033866	Stable	100000
91	509	Care Hospial, Ram Nagar, Visakhapatnam	G Mounika,	23	Male	9704105042	Stable	100000
92	510	Care Hospial, Ram Nagar, Visakhapatnam	Battina Sairam,	30	Male	7093192980, 7386833240	Stable	100000

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
93	511	Care Hospial, Ram Nagar, Visakhapatnam	B ANANDA RAO,	24	Male	9848984741	Stable	100000
94	512	Care Hospial, Ram Nagar, Visakhapatnam	T BHARGAV,	16	Male	9848984741	Stable	100000
95	513	Care Hospial, Ram Nagar, Visakhapatnam	N TRIVENI SAI DURGA,	18	Female	7386342028	Stable	100000
96	514	Care Hospial, Ram Nagar, Visakhapatnam	A JEEVARDHAN,	19	Male	9542903455-7036434856	Stable	100000
97	515	Care Hospial, Ram Nagar, Visakhapatnam	T RAJESH,	24	Male	9121949559	Stable	100000
98	516	Care Hospial, Ram Nagar, Visakhapatnam	N CHINNA THALLI,	65	Female	9133443516	Stable	100000
99	517	Care Hospial, Ram Nagar, Visakhapatnam	N RAM PRASAD,	31	Male	9133443516	Stable	100000
100	518	Care Hospial, Ram Nagar, Visakhapatnam	P YEUKONDALU,	45	Male	8179942552	Stable	100000
101	519	Care Hospial, Ram Nagar, Visakhapatnam	T CHINNA,	55	Male	8179942552	Stable	100000
102	520	MB Multi Specaility Hospittal, Health City, Visakhapatnam	V Appala Konda,	58	FEMALE		GENERAL	100000
103	521	MB Multi Specaility Hospittal, Health City, Visakhapatnam	N Prasanna,	23	FEMALE		GENERAL	100000
104	522	MB Multi Specaility Hospittal, Health City, Visakhapatnam	P Komala Deep,	10	MALE		GENERAL	100000
105	523	MB Multi Specaility Hospittal, Health City, Visakhapatnam	P.Greeshmanth Sai,	14	MALE		Critical	100000
106	524	MB Multi Specaility Hospittal, Health City, Visakhapatnam	Ayitha Earni Babu,	38	MALE		GENERAL	100000
107	525	MB Multi Specaility Hospittal, Health City, Visakhapatnam	D Kanaka Raju,	51	MALE		GENERAL	100000
108	526	MB Multi Specaility Hospittal, Health City, Visakhapatnam	Peethala Lakshmi,	45	FEMALE		GENERAL	100000
109	527	MB Multi Specaility Hospittal, Health City, Visakhapatnam	Dhakarapu Vijaya Kumari,	43	FEMALE		GENERAL	100000
110	528	MB Multi Specaility Hospittal, Health City, Visakhapatnam	Dhakarapu Vamsi,	21	MALE		GENERAL	100000
111	529	MB Multi Specaility Hospittal, Health City, Visakhapatnam	Palla Siva Kumari,	35	FEMALE		GENERAL	100000

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
112	530	Q1 Hoapital, Health City, Visakhapatnam	M Anil Kumar,	17	MALE	9959089052	Discharged	100000
113	531	Q1 Hoapital, Health City, Visakhapatnam	M Neela Kanta,	18	MALE	9959089052	Discharged	100000
114	532	Q1 Hoapital, Health City, Visakhapatnam	Marisetti Ammaji,	40	FEMALE	7995361583	Discharged	100000
115	533	Seven Hills Hospital, Visakhapatnam	K.Tejaswi,	8	FEMALE	7702222446	GENERAL	100000
116	534	Seven Hills Hospital, Visakhapatnam	K.Keethana,	9	FEMALE	7702222446	GENERAL	100000
117	535	Seven Hills Hospital, Visakhapatnam	K.Shiva,	37	MALE	7702222446	GENERAL	100000
118	536	Seven Hills Hospital, Visakhapatnam	K.Venkata Chandini,	28	FEMALE	7708888446	GENERAL	100000
119	537	OMNIRK Hospital, Ram Nagar, Visakhapatnam	B Yesu Thalli,	34	FEMALE	7995488457	Discharge	100000
120	538	Suraksha Hospital, Marripalem, Visakhapatnam	N Uma Devi, Venkatapuram	26	Female	7981778646		100000
121	539	Suraksha Hospital, Marripalem, Visakhapatnam	S Jyothi, Sai Nagar, Venkatapuram	36	FEMALE	9603076386	General	100000
122	540	Suraksha Hospital, Marripalem, Visakhapatnam	N Sai Charan, Venkatapuram	7	MALE	8464973960 7396394670	General	100000
123	541	Suraksha Hospital, Marripalem, Visakhapatnam	N Kumar, Venkatapuram	32	MALE		General	100000
124	542	Suraksha Hospital, Marripalem, Visakhapatnam	Y Ramanamma, GOLLA VEEDHI,VENKATAPURAM	45	FEMALE	7416770618	General	100000
125	543	Suraksha Hospital, Marripalem, Visakhapatnam	Y Ramesh, GOLLA VEEDHI,VENKATAPURAM	26	MALE	7416770618	General	100000
126	544	Suraksha Hospital, Marripalem, Visakhapatnam	Y Jagadeesh, GOLLA VEEDHI,VENKATAPURAM	25	MALE	9000953855 9059771496	General	100000
127	545	Suraksha Hospital, Marripalem, Visakhapatnam	Y Lakshmi, GOLLA VEEDHI,VENKATAPURAM	40	FEMALE	9000953855 9059771496	General	100000
128	546	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	P.Harish Bhardwaj, Sambasadam, R.R.Venkatapuram	26	MALE	8464909091	General	100000
129	547	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	P.Srilaxmi Prabhavathi, Sambasadam, R.R.Venkatapuram	27	FEMALE	9573907258	General	100000
130	548	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	P.Umesh Bhardwaj, Sambasadam, R.R.Venkatapuram	32	MALE	9573907258	General	100000
131	549	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	C.Atchya, viman nagar, visakhapatnam	26	FEMALE	9551570549	General	100000
132	550	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	M.Ramachandra rao, Ramalayam street, R.R.Venkatapuram	33	MALE	9182467915	General	100000

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
133	551	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	S.K.Subhan, nandamuri nagar masjid, R.R.Venkatapuram	18	MALE	7780760894	General	100000
134	552	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	B.Raviteja, Kapu veedhi, gavara jaggavapalem	20	MALE	9030974599	General	100000
135	553	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	S.Mary vandhana, R.R.Venkatapuram, visakhapatnam	23	FEMALE	8978694973	General	100000
136	554	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	N.Appalanarasamma, R.R.Venkatapuram, visakhapatnam	55	FEMALE	9876543210	Refer to KGH	100000
137	555	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	N.Pavani, R.R.Venkatapuram, visakhapatnam	2	FEMALE	9876543210	Refer to KGH	100000
138	556	KIMS Icon Hospital, Sheela Nagar, Visakhapatnam	P.Prasad, R.R.Venkatapuram, visakhapatnam	5	FEMALE	9876543210	Refer to KGH	100000
139	557	Pinnacle Hospital, Health City, Visakhapatnam	Bonu Sony, Marripalem Vuda Layouot	36	Female	9951822228	GENERAL	100000
140	558	Pinnacle Hospital, Health City, Visakhapatnam	S Varaha Narasimham, Simhachalam	59	Male	9866692926	GENERAL	100000
141	559	Pinnacle Hospital, Health City, Visakhapatnam	D.Gopala Venkata Ramana, Gopalapatnam	40	Male	9849408014	GENERAL	100000
142	560	Pradhama Hosptal, Visakhapatnam	Boddeda Narsimha rao, nadhamuri nagar ,venkata puram,Vsp	70	Male	9989114463		100000
143	561	Pradhama Hosptal, Visakhapatnam	D.Chaithanaya, D.No :2-170 Gopalapatnam ,Vsp	21	Male	7207881595		100000
144	562	Pradhama Hosptal, Visakhapatnam	D.Manga Laxmi, D.No :2-170 Gopalapatnam ,Vsp	38	Male	7207881595		100000
145	563	Pradhama Hosptal, Visakhapatnam	D.Srinivas rao, D.No :2-170 Gopalapatnam ,Vsp	45	Male	7207981595		100000
146	564	Pradhama Hosptal, Visakhapatnam	CH.Sony, D.No: F Block ,F-1 ,Ambedkar colony.Vsp	18	Female	9100757375		100000
147	565	Pradhama Hosptal, Visakhapatnam	C.Santhi, D.No :4-2 ,Golla Veedhi ,venkatapuram,Vsp	38	Female	7893174897		100000
148	566	Pradhama Hosptal, Visakhapatnam	C.Karthisha, D.No:4-15 , Golla Veedhi ,Venkatapuram ,vsp	16	Female	7893124987		100000
149	567	Pradhama Hosptal, Visakhapatnam	V.rajesh, D.No:3-129 ,Venkataputam ,Vsp	30	Male	7893124987		100000
150	568	Pradhama Hosptal, Visakhapatnam	V.Appa Rao, D.No:3-129 ,Venkataputam ,Vsp	55	Male	7893124897		100000
151	569	Pradhama Hosptal, Visakhapatnam	V.Dandamma, D.No:3-129 ,Venkataputam ,Vsp	50	Female	7893124897		100000
152	570	Apollo Hospitals, Health City, Visakhapatanam	Mr. SAI KARTHIK BARLA, 8-272/11, VUDA COLONY, NEAR RAITHU BAZAR, GOPALAPATNAM-	23	Male	8309485761	General	100000
153	571	Apollo Hospitals, Health City, Visakhapatanam	Mr. BONTHU SUDARSANA JYOTHI, NEAR KUMARI KALYANAMANDAPAM GOPALAPATNAM-	28	Male	7013002322	General	100000

Status of Patients Admitted in Private Hospitals, (LG Polymers Gas Leakage Incident), Visakhapatnam

S.No	S.No (569 List)	Hospital Name	Patient Name & Address	Age	Gender	Contact No.	Status	Amount
154	572	Apollo Hospitals, Health City, Visakhapatanam	Mr. VVK SAI RAJ, 4-43/4/3/4 VENKATADRI GARDANCE BESIDE, GOPALAPATNAM-	24	Male	9701619090	General	100000
155	573	Apollo Hospitals, Health City, Visakhapatanam	Mr. MATTA SANTOSH KUMAR, 13-270 INDRA NAGAR GOPALAPATNAM PRAHALADAPURAM VSP-	30	Male	8125556955	General	100000
156	574	Apollo Hospitals, Health City, Visakhapatanam	Mrs. RAVADA ANJANI DEVI, 6-86 BACK SIDE JP SHOP OLD SBI DOWN MAIN ROAD GOPALAPATNAM VSP-	39	Female	8106911877	General	100000
157	575	Apollo Hospitals, Health City, Visakhapatanam	Mr. GANTLA SANKARA RAO, 2-61 GESAPATRUNIPALEM KOTHAVALASA CHINTALAPALEM-	35	Male	8019728882	General	100000
158	576	Apollo Hospitals, Health City, Visakhapatanam	Ms. BURIDI RADHIKA, #14-33, Indira Nagar, Gopalapatnam, Visakhapatnam	1o	Female	8500504601	General	100000
159	577	Apollo Hospitals, Health City, Visakhapatanam	Mrs. GEDELA BALAMANI, 4-43/5/3 VENKATADRI GARDDEN VENKATAPURAM VISAKHAPATNAM-	34	Female	9985026425	General	100000
160	578	Apollo Hospitals, Health City, Visakhapatanam	Mrs. ADIREDDY CHELLAYAMMA, H.NO:13-170,OPPISITE SVLN COLLEGE,RRV PURAM.-	81	Female	9248777755	General	100000
161	579	Apollo Hospitals, Health City, Visakhapatanam	Mr. GEDELA KAMESWARARAO, 4-43/5/3,VENKATADRI GARDENS,VENKATAPURAM.-	64	Male	9985026425	General	100000
162	580	Apollo Hospitals, Health City, Visakhapatanam	Mr. PEDAPUDI APPALARAJU, 36-93-348/5 ASSRR COLONY KANCHERAPALEM VSKP-	35	Male	9866004824	General	100000
163	581	Care Hospial, Ram Nagar, Visakhapatnam	Nagisetty Gayatri gireeshma anitha,	19	Female	9652692878, 8978917850	General	100000
164	582	MB Multi Specaility Hospittal, Health City, Visakhapatnam	VURUKUTI SRINIVASA RAO, 4-3,GOLLAVEEDHI,VENKATAPURAM, VISAKHAPATNAM	37	Male	9246179417	General	100000
165	583	MB Multi Specaility Hospittal, Health City, Visakhapatnam	VURUKUTI RAJESH, 4-2,GOLLAVEEDHI,VENKATAPURAM, VISAKHAPATNAM	30	Male	7286958435	Critical	100000
166	584	MB Multi Specaility Hospittal, Health City, Visakhapatnam	DEVARA ANITHA, 50-75-33,GANESH NAGAR,AKKAYAPALEM,VISAKHAPATNAM	27	Female	8919175029	Critical	100000

Sd/- Dr.S.Triupathi Rao
District Medical & Health Officer
Visakhapatnam

Annexure– X

Item No. 12 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No. 73/2020

In re: Gas Leak at LG Polymers Chemical Plant in RR Venkatapuram Village Visakhapatnam in Andhra Pradesh

Date of hearing: 08.05.2020

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. This matter has been taken up *suo-motu* on the basis of media reports[1] to the effect that leakage of hazardous gas, Styrene, took place at 03:45AM on 07.05.2020, from a chemical factory owned by the South Korean company LG Polymers India Pvt., Limited, R.R. Venkatpuram village, Pendurthy Mandal, Vishakhapatnam resulting in death of 11 persons and hospitalization of more than 100 people of whom at least 25 were reported to be serious. These fatalities and injuries are reportedly likely to increase. More than 1000 persons are reported sick. There is also damage to environment and habitat. The media reports give rise to a substantial question of environment, which needs to be gone into by this Tribunal under Sections 14 and 15 of the NGT Act, 2010.

[1] https://www.ndtv.com/india-news/visakhapatnam-lg-polymers-gas-leakage-8-dead-over-1-000-sick-after-gas-leak-at-andhra-chemical-plant-2224643;
https://indianexpress.com/article/india/visakhapatnam-gas-leak-live-updates-dead-injured-cm-jagan-mohan-reddy-pm-modi-6397962/

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2. Styrene gas is a hazardous chemical as defined under Rule 2(e) read with Entry 583 of Schedule I to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989. The Rules require on-site and off-site Emergency Plans to ensure prevention of damage. There appears to be failure to comply with the said Rules and other statutory provisions. Leakage of hazardous gas at such a scale adversely affecting public health and environment, clearly attracts the principle of 'Strict Liability' against the enterprise engaged in hazardous or inherently dangerous industry. Such an entity is liable to restore the damage caused under the Environment Law, apart from other statutory liability. The statutory authorities responsible for authorizing and regulating such activities may also be accountable for their lapses, if any, in dealing with the matter. It is also necessary to ensure that all necessary steps are taken to prevent recurrence of such an incident. Without prejudice to any other proceedings, this Tribunal has to perform its statutory obligation of providing relief and compensation to the victims of "environmental damage", as statutorily enacted, and restitution of damaged property and environment. With a view to deal with the issue, it is necessary to ascertain the facts relating to the extent of damage, extent of failure and consider remedial measures. The affected parties have to be given the opportunity of being heard.

3. Accordingly, we issue notice to Andhra Pradesh State PCB, District Magistrate, Vishakhapatnam, Central Pollution Control Board (CPCB), Ministry of Environment, Forests & Climate Change (MoEF&CC) and LG Polymers India Pvt., Limited. Notice may be served by email and response if any, be filed before the next date, by email at judicial-ngt@gov.in.

4. We also seek a report from a 5-member Committee comprising:

   a. Justice B. Seshasayana Reddy, Former Judge, A.P. High Court; - (Online till he is able to reach Vizag);

   b. Prof. Ch V Rama Chandra Murthy, Former Vice Chancellor, Andhra University, Vizag;

   c. Professor Pulipati King, Head of Chemical Engineering Department, Andhra University, Vizag;

   d. Member Secretary, CPCB (Online, if travel is restricted due to Covid-19); and

   e. Director, CSIR-Indian Institute of Chemical Technology (Online, if travel is restricted due to Covid-19);

   f. Head, NEERI, Vizag.

   The District magistrate, Vishakhapatnam, and Regional Office, Andhra Pradesh State PCB may provide logistic support to the Committee to enable their fact-finding and reporting. The Chairman, CPCB may steer and facilitate the functioning of the Committee using available technology. CPCB will bear the initial cost of functioning of the Committee to the extent necessary. The Committee will be at liberty to take assistance of such experts, individuals and institutions as may be considered necessary. The Member Secretary, CPCB will act as nodal agency for coordination.

5. The Committee may visit and inspect the site at the earliest and give its report before the next date via email judicial-ngt@gov.in. Site visit may be initially conducted by members available locally in consideration with outside members online. The Committee may specifically report:

   a. The sequence of events;

b. Causes of failure and persons and authorities responsible therefor;

c. Extent of damage to life, human and non-human; public health; and environment – including, water, soil, air;

d. Steps to be taken for compensation of victims and restitution of the damaged property and environment, and the cost involved;

e. Remedial measures to prevent recurrence;

f. Any other incidental or allied issues found relevant.

6. Having regard to the *prima facie* material regarding the extent of damage to life, public health and environment, we direct LG Polymers India Pvt., Limited to forthwith deposit an initial amount of Rs. 50 Crore, with the District Magistrate, Vishakhapatnam, which will abide by further orders of this Tribunal. The amount is being fixed having regard to the financial worth of the company and the extent of the damage caused.

7. A copy of this order be sent to Justice B. Seshasayana Reddy, Former judge, A.P. High Court; Prof. Ch V Rama Chandra Murthy, Former Vice Chancellor, Andhra University, Vizag; Professor Pulipati King, Head of Chemical Engineering Department, Andhra University, Vizag; Director, CSIR-Indian Institute of Chemical Technology; Head, NEERI, Vizag; Andhra Pradesh State PCB; District Magistrate, Vishakhapatnam; Central Pollution Control Board (CPCB); Ministry of Environment, Forests & Climate Change (MoEF&CC) and LG Polymers India Pvt., Limited, by email.

List for further consideration on 18.5.2020.

Adarsh Kumar Goel, CP

Sheo Kumar Singh, JM

Dr. Nagin Nanda, EM

May 08, 2020
Original Application No. 73/2020
DV

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Annexure — X1

LG POLYMERS INDIA PVT. LTD - VISAKHAPATNAM
DETAILS OF MANPOWER ATTENDANCE

	Permanent Employees				Contract employees			
06-05-2020	Shift	Officer	Worker	No	Shift	Officer	Worker	No
	A	12	1	13	A		26	26
	G	82	12	94	G		21	21
	B	1		1	B		15	15
	C	11	1	12	C		8	8
	Total	106	14	120	Total	0	70	70
07-05-2020	Shift	Officer	Worker	No	Shift	Officer	Worker	No
	A	21	2	23	A		16	16
	G	45	1	46	G		1	1
	B	4	1	5	B		8	8
	C	6		6	C		17	17
	Total	76	4	80	Total	0	42	42

Cor 15/12/2020

A shift : 06:00 to 14:00 hr.

G shift : 08:00 to 17:00 hr.

B shift : 14:00 to 22:00 hrs

C shift : 22:00 to 06:00 h.

Night duty officers.

'A' SHIFT EMPLOYEES / CONTRACTOR WORKERS DETAILS
AS ON 07 MAY 2020 (Continued from 06.05.2020 C Shift)

S/No	Name of Employee	Dept	Mobile No	Timings
1.	Mr Chakrapani	GPPS		18.00Hrs to 06.00Hrs
2.	Mr Achyut	GPPS		-do-
3.	Mr Gowri Nath Babu	HIPS	7396731002	-do-
4.	Mr R Mohan	HIPS	9550213753	-do-
5.	Mr T Shyam	HIPS	6305438183	-do-
6.	Mr S Pavan	Elect		-do-
7.	Mr Balavenkata Rao	Elect	9290524552	-do-
8.	Mr E Venkata Rao	Elect	9440643492	-do-
9.	Mr Ravi Krishna	EPS		-do-
10.	Mr UV Ramana	GPPS		-do-
11.	Mr. Jaya Ram	GPPS		-do-
12.	Mr P Balajee	EPS (NDO)	8500892218	22.00Hrs to 06.00Hrs
Contract Workers				
1.	T Uma Maheshwara Rao	Security	9603110016	21.30 Hrs to 05.30 Hrs
2.	G Srinivasa Rao	-do-	8897553186	-do-
3.	Y Rama Krishna	-do-		-do-
4.	G. Yeruku Naidu	-do-	8978319637	-do-
5.	P Venkata Raju	-do-	9553454956	-do-
6.	E. Eswara Rao	-do-	9505336542	-do-
7.	D S Raju	Canteen		18.00 Hrs to 06.00 Hrs
8.	G Jagadish	First Aid	9030532741	-do-
9.	S Sanyasi Raju	Driver		-do-
10.	DJ Ganesh	Safety		-do-
11.	M Venkata Ramana	Flt Driver		-do-
12.	M Narasinga Rao	Flt Driver		-do-

Annexure — XII

THE NEW INDIA ASSURANCE CO. LTD.
(Government of India Undertaking)

POLICY SCHEDULE FOR PUBLIC LIABILITY (Act Only) INSURANCE

Insured's Name	:	M/S L G POLYMERS INDIA PVT LTD			
Insured's Details			Issuing Office Details		
Customer ID	:	PO05873380	Office Code	:	VIZAG DO-III TIED DO 620300 (620300)
Address	:	R.R VENKATAPURAM VISAKHAPATNAM ,ANDHRA PRADESH 530029	Address	:	D.NO 49-01-09, IIND FLOOR, DALI RAJU SUPER MARKET, AKKAYYAPALEM MAIN ROAD,VISHAKAPATNAM - 530 016 ,530016
Phone No	:	08912520883	Phone No	:	08912517737 / 08912591977
E-mail/Fax	:	info@lgpi.co.in, / 08912520338	E-mail/Fax	:	nia.620300@newindia.co.in / 08912517781
PAN No	:	AAACL8528P	S.Tax Regn. No	:	AAACN4165CST178
GSTIN/UIN	:	37AAACL8528P1ZU / NA	GSTIN	:	37AAACN4165C2ZP
	:		SAC	:	997139 (Other non-life insurance services excl RI)

Policy Details					
Policy Number	:	62030036203300000003	Business Source Code		
Period of Insurance	:	From 01/04/2020 12.00.01 AM To 31/03/2021 11.59.59 PM	Dev.Off. level/Broker/Corp. Agent/Web Aggregator	:	MARSH INDIA PVT. LTD. - (2D10672900) MARSH INDIA _DO131000_MUMBAI (SI00158956)
Date of Proposal	:	01-Apr-20	Agent/Bancassurance/ Specified Person	:	
Prev. Policy no.	:		Phone No	:	9167084617, 8291897182 / NA
Client Type	:	Corporate	E-mail/Fax	:	Narendra.duggal@marsh.com, Pravin.chandvekar@marsh.com / / /

Premium(₹)	ERF Premium(₹)	GST(₹)	Total (₹)	Total (₹ in words)	Receipt No. & Date
34784	34784	6262	75830	RUPEES SEVENTY-FIVE THOUSAND EIGHT HUNDRED THIRTY ONLY	6203008120000000017 0 - 25/04/20

Details of risk covered under current year policy:

								Deductibles	
Retroactive Date	Paid Up Capital	No Of Locations Involved	AOA	AOA:AOY	AOY	Annual Turnover - Previous Year	Annual Turnover - Proposed Year	No of workmen	No of Other Employee
01/04/2011	<= 15 Crore	1	50000000	1:3	150000000	1575000000	1600000000	150	270

Retroactive Dates

									Deductibles	
Retroactive Date Details	Date	Paid Up Capital	No Of Locations Involved	AOA	AOA:AOY	AOY	Annual Turnover - Previous Year	Annual Turnover - Proposed Year	No of workmen	No of Other Employee
RETROACTIVE DATE 1	01/04/2011	15	1	50000000	1:3	150000000	1575000000	1600000000	150	270

Extensions under the Policy

Name of the Extension	Sub Limit of the Extension	Deductibles of the Extension

Special Conditions	AS PER PUBLIC LIABILITY (ACT) POLICY CLAUSE. NA

Signature Not Verified
Digitally signed by Srinivasan Vaidesvaran
Date: 2020.04.25 14:38:32 IST

THE NEW INDIA ASSURANCE CO. LTD.
(Government of India Undertaking)

Special Exclusions	NA
Special Excess/Deductible	0

Retroactive Dates	Date
Policy Retroactive Date	01/04/2020

Coinsurance Details :

Sl.No.	Coinsurance Type	Company	Office Code	% Share	Premium Share
1	Outgoing	FUTURE GENERALI INDIA INSURANCE COMPANY LIMITED	000015_Begumpet	8	5566
2	Outgoing	HDFC ERGO GENERAL INSURANCE CO. LTD.	001000_001000	8	5566
3	Outgoing	MAGMA HDI GENERAL INSURANCE CO. LTD.	300005	8	5566
4	Outgoing	NEW INDIA ASSURANCE CO LTD.	VIZAG DO-III TIED DO 620300	76	52872

The policy shall be subject to the rules framed under the Public Liability Act 1991 and subsequent amendments from time to time.

The Policy shall be subject to PUBLIC LIABILITY (Act Only) INSURANCE Policy clauses attached herewith.

Clauses	Description
Conditions	Arising out of willful or intentional non compliance of Statutory provisions
Conditions	If Company deny Liability for claim not within 1 year from date of condition claim have been discarded
Conditions	The Insured Owner shall keep record of annual turnover
Conditions	This policy may be canceled by the Insured Owner by giving 30 days notice
Conditions	This Policy may also be canceled by the Insurer by giving 30 days notice
Conditions	Company not be liable to make paymnt,if claim shall be in any manner fraudulent
Conditions	The Policy and the Schedule shall be read together as one contract
Conditions	Any dispute Policy shall be determined in accordance with the law
Conditions	Company notbe liable for clm,relief made after5Yr from date of occurence of acc
Conditions	During claim,any existing insurance covered same Liability, Company not liable to pay
Conditions	No payment shall be made by the insured without the written consent of Company
Exclusions	Damage to property owned,otherwise in Insured Owner control,care or custody
Exclusions	Directly or indirectly occasioned by happening through or in consequence of war
Exclusions	Ionizing radiation or contamination by radioactivity from any nuclear fuel
Exclusions	Radioactive,toxic,explosive of any explosive nuclear assembly
Exclusions	Arising under other legislation except in so far as Sec8,SubSec(1),(2)of Act
Exclusions	In respect of fines,penalties, punitive and or exemplary damages
Exclusions	Arising out of willful or intentional non compliance of Statutory provisions

Premium and GST Details

	Rate of Tax	Amount in INR
Premium		₹ 69568.00
SGST	9	3131
CGST	9	3131
IGST	0	0

In witness whereof the undersigned being duly authorised by the Insurers and on behalf of the Insurers has (have) hereunder set his (their) hand(s) on this 25th day of April,2020.

For and on behalf of

THE NEW INDIA ASSURANCE CO. LTD.
(Government of India Undertaking)

The New India Assurance Company Limited

Date of Issue: 25/04/2020

Duly Constituted Attorney(s)

Stamp Duty under the Policy is ₹1

Mudrank_____Dt._____consolidated Stamp Fees Paid by Pay Order Number_____vide receipt number_____dt._____.

Tax Invoice No : 62030020P0000295

IRDA Registration Number: 190

Annexure – XIII

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

Revenue (CMRF) Department – LG Polymers Gas Leakage - Styrene vapours released from Styrene storage tank of LG Polymers India Pvt. Limited, Visakhapatnam at about 3.30 AM on 07.05.2020 – Sanction of Ex-gratia under Chief Minister's Relief Fund – Orders – Issued.

REVENUE (CMRF & FWC) DEPARTMENT

G.O.RT.No. 449 **Dated: 08-05-2020**
Read:-

From the District Collector, Visakhapatnam, letter No.679/2020/ D3, dated 08 .05.2020.

* * *

O R D E R:

In the circumstances reported by the District Collector, Visakhapatnam in the reference read above, after careful examination of the matter, Government hereby accord sanction and released an amount of Rs.30.00 crores (Rupees Thirty crores only) vide Cheque bearing No.781667, dated 08.05.2020 in favour of District Collector (Relief and Measures), Visakhapatnam through NEFT system from CMRF Current A/c. No:38588079208.

2. The District Collector, Visakhapatnam shall take further necessary action and release the ex-gratia / financial assistance to the deceased / victims, as follows:-

Sl. No.	Particulars	Amount announced
1.	Exgratia to the Kin of the deceased	Rs.1.00 crore per person
2.	Financial Assistance to the victim for their treatment in following categories	
	a) People who undergone Primary treatment	Rs.25,000/- per person
	b) People hospitalized for 2 or 3 days	Rs.1,00,000/- per person
	c) People who are on ventilators	Rs.10,00,000/- per person
3.	Financial Assistance to the individual in the affected villages	Rs.10,000/- per person

3. The District Collector, Visakhapatnam is also requested to furnish the acknowledgement the receipt of the beneficiary lists to Government, for taking further necessary action in the matter.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

V.USHARANI
PRINCIPAL SECRETARY TO GOVERNMENT

To
The District Collector, Visakhapatnam.
Copy to:
The Prl. Advisor to Hon'ble C.M.
The P.S. to Chief Secretary to Govt.
The P.S. to Prl. Secretary to Govt., Revenue (CMRF) Dept.
The O.S.D. to Spl. Officer to C.M.
SF/SCs.

//FORWARDED::BY ORDER//

SECTION OFFICER

Annexure — XIV

ANDHRA PRADESH
India's Surest State

Central Inspection System
Government of Andhra Pradesh

Department of Factories

Inspection ID	12201903012027	Registration Number	. 2027
Date of Inspection	18-Dec-2019	Time of Inspection	03 : 00 PM
Name of the Unit	M/s. L. G. Polymers India Ltd	Address of the Unit	R Venkatapuram Visakhapatnam
Status of the Occupier	Not present	Name of the Occupier	PPC Mohan Rao
Status of the Manager	Not present	Name of the Manager	Prasanth kumar
Mobile Number	9949095136	E-Mail ID	mvraolgchem.com
Name of the Representative	MV Rao		
Power (in HP)	14462	Number of workers	500
Classification	Section 2m(I)	Manufacturing Process and Products	Mfg of polystyrene and EPS

Worker Details

Category	Regular		Contract		Casual		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
On Rolls	233	0	300	0	0	0	533	0
Present on	221	0	247	0	0	0	468	0

Maximum number of workers employed during the year and date 550

Reference number of plans verified, if any

Sl. No.	Reference Number	Reference Date

Details of Records produced if any **Attendance ,Leave Register**

Inspection observations

Ref numbers of observations already communicated on previous inspectors but found not complied during the inspection **Repeat I.o,s 3,4,6,10,13,14,16,18,19,21,24,26 to 30 Of PIO's dated 31.8.2016**

Signature valid
Digitally Signed By K B S PRASAD
(FACTORIES)
Date : 20-Dec-2019 [illegible] IST

Description of fresh observations

1. The following additional machinery was installed without prior approval from the
Director of Factories, A. P, Vijayawada.
(a) DG Set of 1500KVA installed near management block.
(b) Auto Bag Placer equipment of 12 No's with 50 H.P. installed at HIPS Plant
(c) One Cooling Water Pump with 100 H.P. at HIPS Plant.
(d) Heater and its equipment were installed with 60 H.P. at GPPS Plant
Hence submit revised plans duly including the above changes and submit to the Director of Factories, A. P, Vijayawada.for approval.
2. Safety Audit Report for the year 2019 has not been done, submit the above report
Along with the Compliance.
3. Submit Compliance on the Observations (Recommendations) made in Safety Audit Report for the year 2018.
4. Submit updated Onsite emergency Plan duly including all possible scenarios and
Mutual Aid arrangements with neighboring industries arrangements immediately.
5. It is found during in the inspection that many pipelines corroded such as fire water
Sprinklers, Sterne, Monometer Tank – 6.
6. It is found during inspection 533 employees are working on 533 so apply for Amendment of workers from 500 to 533.
7. Provide dyke by Containment Wall around FTP, FST and TRS Steryne Tanks.
8. Provide Sprinkler HIPS Packing Area.
9. Provide dyke / Containment Wall to rubber dissolved solution Tanks
10. Ensure usage of cross bonding while stacking the Plastic Bags
11. Medical Examination including colour blindness to be conducted to the EOT crane Operators.
12. It is found that old Alcohol plant is presently using as goddown of which Chequer plates are hanging ,so replace them immediately as it may fall
on the workers.

13. It is found during the inspection that pipeline at pentane relief valve lines painting are peeled. Ensure the paintings of pipelines are carried out periodically.
14. Open Drains are to be securely covered in front of Pentane Tank form.
15. Provide Louvers instead of vertical cladding at EPC Hall to have more Ventilation.
16. Provide Exhaust Fans at EPC hall to have more Ventilation.
17. Noise levels are high at EPC area, HIPS area. Hence display the sound levels and also ensure the usage of ear muffs/ear plugs to workers working in that area.
18. Welfare Officer has appointed & ratified from the Director of Factories, A. P, Vijayawada as per rules since the employment is more than 500 on dt: 17.12.2019.

Certified that
The above is the inspection findings of inspection in the year 2019.
15/5/2020
Director of Factories, CPAO

Joint Inspection

OFFICE OF THE DEPUTY CHIEF INSPECTOR OF FACTORIES: VISAKHAPATNAM.

R. No.2027 / 2016 Date: 31-08-2016.

INSPECTION ORDER (OR) NOTICE

Factories Act, 1948 and A.P. Factories Rules, 1950 and the Government notification issued thereon.

Sir,

Upon a recent Inspection of your factory by the Deputy Chief Inspector of Factories, Visakhapatnam on 31-08-2016, it was found to the extent indicated below that certain provisions of the Act and Rules were not being carried out.

The orders below are issued or repeated from previous order, without prejudice to any action that the office may take for non-compliance with the provisions of the act and rules there under.

(K.B.S. Prasad)
Deputy Chief Inspector of Factories,
Visakhapatnam.

To:
Sri S.V.Praveen, Occupier,
Sri P.V.R.Prasad, Manager,
M/s L.G.Polymers India Pvt Ltd.,
R.R.V.Puram, Visakhapatnam.

1 Section 7-A (2)a:- a) The cemented cladding to the vessels in HIPS plant is found damaged. Replace the same at once.

2 Section 7-A(2) :-

(i) All the pipe lines of fire hydrant and process pipelines are appearing similar. Arrange for marking on all the process pipe lines to distinguish them from hydrant lines.
(ii) Over flow of diesel tank in generator shed designed in fall safe method.
(iii) .Do not store any material near windows as its obstructs ventilation.
(iv) Remove FRP sheets in the lean to roof shed of GPPS packing section.
(v) . Provide separate Barricading around Scrap grinder and remove MS sheets for better ventilation.

3 Section 7A(2) :- safe and suitable arrangements to be made to the workers for crossing the road while moving from the main plant to HIPS plant .

4 Section7-A(2)(c) :- Training needs on occupational health and safety to the workers shall be critically analyzed based on the level of awareness among the workers being employed. The syllabus for each topic shall be prepared covering the subject in depth, which can be validated by a third party if there is no qualified safety officer approved by Director of Factories, AP employed and the course of lectures shall be accordingly finalized.

certified that this is the Compliance order issued on the inspection made in 2016 year

Director of Factories (FAC)

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5 Section 7(A) read with Section 41 and Rule 61 F(3) :- At present the forklift is in the factory is being operated without a reverse alarm .This is highly unsafe. Provide and ensure the working of reverse alarm to all the fork lifts in the factory that are being used in such a way that the reverse alarm should activated as soon as the vehicle is being reversed.

6 Section 14:- Ensure effective functioning of hood provide at HIPS die head to extract water fumes.

7 Section 31 Rule 56 :- Air compressor are pressure vessels. Every pressure vessel shall be thoroughly tested by competent person externally once in every period of 6 months, internally once in 12 months and hydrostatically once in 4 years and details of examination shall be recorded in Form 8 and a copy of it shall be submitted to this office

8 Section 32 :-

1. Provide ladder with railing to the GPPS rotary valve pit.
2. Provide railing to the ladder leading to the DV approach platform.
3 .Provide toe boards to the DV approach platform.
4.provide ladder with railing to the rotary valve pit.

9. Section 33 :-

i. Cover all the drains at tank area.
ii. Rotary valve pit to be securely covered

10 √Section 38 Rule 61 :- Provide smoke detectors in product ware house.

11 Section 38 Rule 61(9) :- Provide glow sign exit boards to ensure their visibility during night time even in case of power failures.

12 Section 38 Rule 61:- a) The design of sprinkler arrangement for process vessels in HIPS plant shall be reexamined in view of the close away positioning of sprinkler in square shaped arrangement.

13 Sec 41C and Rule 61 (SC) B.

Appoint One full time Medical Officer and one nurse and dress compounder and one sweeper-cum-ward boy throughout the working period.The O.H.C having at least 2 rooms each with a minimum floor area of 15 sq.mt with floors and walls made of smooth an impervious headrace and adequate illuminations and ventilations as well as equipment as per the schedule assessed to rule, and the O.H.C shall be suitably equipped to manage medical emergencies.

14 Section 41 Rule 61-0(4) :- Carryout testing of all the reaction vessels in use or to be taken into use by competent person at least once in two years. Submit latest reports to this office for verification.

15 Section 41G Rule 61(SG) A :- Reconstitute safety committee by including members from purchase and security department etc and also send the minutes of the meeting to the office of the deputy chief inspector of factories Visakhapatnam and also circulate the minutes of the meetings among the safety committee members. The committee should assist and cooperate the management in achieving the aims and objectives outlined in

13/2/2020

the "Health and safety Policy" of the occupier The committee should also discuss reports on safety ,environmental and occupational health surveys, safety audits, risk assessment, emergency and disaster management plans and implementation of there commendations made in the reports.

Section 41C Rule 61(sc)B:- The equipment provided in occupational health centre is not as per the prescribed list. Arrange for providing the same immediately.

MSIHC Rule:- Arrange for safety audit for the year 2016 immediately and submit the report with compliance

Section 41 Rule 61 F(4) :- The products bags were found stacked in godown without leaving gap between wall and stack. Arrange 1 meter gap between walls to stack and stack to stack.

Section 41 –C and Rule 61-(SC) A :- The health hazard associated with each work in the factory varies widely with the nature of each work. Therefore, the medical examination of the workers in the factory shed be designed keeping the track of such potential hazards for each worker based on nature of his work rather than limiting it for checking the general fitness of a worker. A matrix between the nature of work Vs suggested medical examinations based on this scientific approach, shall be developed as a ready reckoned and the same shall be submitted to this office

Section 41 and Rule 61E :- Provide and ensure usage of suitable personal protective equipment like safety shoes, gloves goggles aprons and face shields to all workers including contract workers.

Section 41-B (4) :-

i. Submit safety survey report in the prescribed pro forma.
ii. Submit chemical fact sheet.
iii. Submit updated on-site emergency plan of the factory.

Section 46 Rule 70 :- constitute a canteen management committee by equal number persons nominated by the occupier and elected by the workers.

Section 46 Rule 71:- Get all the staff of the canteen engaged In handling food stuffs are medically examined by the medical officer for the following tests once in a year.

i. Routine blood examination ;
ii. Routine and bacteriological testing of faces and urine for germs ,dysentery and typhoid fever ;
iii. Chest X-Ray.

.section 64 Rule 84: No adult worker shall be required or allowed to work on over time which shall not exceed 50 hours in any quarter of a calendar.

Section 83&Rule 87read with Rule 102 A :- Produce the record of leave with wages in respect of all workers including the (contract/casual) working in the factory.

Section 87 and Rule 95 Schedule XV Part-II Para 15 :-

i. All Parts of plant, equipment and machinery used in the process like reactors, condenser, centrifuges etc., failures of which can lead to emergency, shall be got immediately tested by the competent person approved by Director of Factories, AP.

duly following the testing procedures evolved by him and thereafter once in every two years. Record of such tests shall be maintained and made available for inspection.

ii. All parts of plant, equipment and machinery used in the process like reactors, condenser, centrifuges etc.. failures of which can lead to emergency, shall be got examined by the competent person approved by the Director of Factories, AP once in every month. Record of such tests shall be maintained and made available for inspection.

Section 87 and Rule 95 Schedule XV Part-II Para-4 :-

1. Arrange for display of hazardous properties of chemicals being used in the factory at conspicuous locations near storages and usage areas.

2. Instruct and educate all workers including illiterate workers about the hazards in the process including the specific hazards and also to deal with the hazards involves including properties of substances used in process to which they may be exposed to, in the normal course of work as well as abnormal conditions and the precautions to be taken against each and every hazard.

3. Obtain an undertaking from each worker within 30 days of his employment in the factory that he/she had read all the contents of notices Instructions etc, and understood them; thereby he shall abide by them.

Section 87 Rule 95 schedule XXVII :-

i. Noise levels are high at GPPS extrusion area. Ensure usage of ear plugs by workers in that area.
ii. Noise levels are high at HIPS packing shed. Ensure usage of ear plugs by workers in that area.

Section 87 Rule 95 Schedule XV Part III-Para 1(5)& Para 2(1) :

i. Provide non sparking tools wherever solvents are used.
ii. Prevent accumulation of static charge by providing suitable metallic connections/Crocodile clips specially to pipe lines, belt drives, reactors etc.

Section 87 Rule 95 Schedule XX :

1. Para 2 :- made the flooring of the HCL tank area of impervious corrosive and it shall be constructed as to prevent collection or accumulation of any corrosive substance.
2. Para 3 :- Provide suitable aprons, face shields chemical safety goggles hand gloves and shoes to the HCL handling workers.
3. Para 5 :- Display the following notice near HCL handling area in red color in a language understood by the majority workers.

Danger

Corrosive substances cause severe burns and vapors thereof may be extremely hazardous. In case of contact immediately flood the part affected with plenty of water for at least fifteen minutes.

Get medical attention quickly.

Para 10(d):- Get the container holding HCL examined once in a year to find out the defects and maintain a record of such examinations.

Section 87 Rule 95 Schedule XV :-

1. Para -9:- provide labeling for the storage tanks and capacities to be indicated.

Section87 Rule 95 Schedule XXIX :- Provide LPG leakage detectors with alarm at LPG handling area.

Note: You are therefore advised to send a rectification report on points raised above within a fortnight.

Notes:- 1. On 31-08 -2016 by Deputy Chief Inspector of Factories, Visakhapatnam.
2. Working 2m (i) Polystyrene.
3. " 420 " workers on 31-08 -2016.
4. ---
5. ---
7. Issued Inspection orders to Occupier and Manager.
8. No claim.

Submitted to the Director of Factories, Andhra Pradesh, Vijayawada.

Deputy Chief Inspector of Factories (FAC)

Annexure - XV

GOVERNMENT OF ANDHRA PRADESH

ABSTRACT

Industries and Commerce Department - Containment, Control, and Prevention of COVID - 19 Epidemic - Resuming of Industries - Orders - Issued.

INDUSTRIES AND COMMERCE (P&I) DEPARTMENT

G.O.RT.No. 98 Dated: 03-05-2020.

Read the following: -

1. G.O. Rt.No.88, I& C (P&I) Department, Dt. 18.04.2020.
2. G.O. Rt.No.92, I& C (P&I) Department, Dt. 29.04.2020.
3. MHA, GoI Order No. 40-3/2020-DM-I(A) Dt. 01.05.2020.

*****

ORDER:

The Industries and Commerce Department had issued consolidated guidelines vide GO Rt NO.88 given in the reference 1st read above along with certain modifications in GO Rt No.92 given in reference 2nd read above, for permitting industries to operate in the State duly imposing certain restrictions and distancing norms to prevent onset of community transmission of the Corona-virus.

2) Now, vide the order in reference 3rd cited above, the Ministry of Home Affairs (MHA), Government of India has issued new guidelines for containment of COVID-19 for the extended period of National lockdown for a further period of two weeks with effect from 4th May 2020.

3) As per the revised orders mentioned above, the districts in the State are categorised as Red, Orange and Green depending upon the case load and other factors. Districts of Kurnool, Guntur, Krishna, SPSR Nellore and Chittoor have been classified as Red Districts while Vizianagaram is classified as Green. The rest of the 7 districts are classified as Orange districts. The categorisation of mandals previously made will cease to exist with the new classification of districts.

4) In compliance of the above, partial modifications to the orders issued in G.O.Rt.No.88, Industries & Commerce Department, dated: 18.04.2020, are hereby issued:

a. No Industrial activities shall be permitted in the Containment Zones either in the urban or rural areas. The Containment Zones shall be notified by the District Administration or the State government from time to time.
b. The labour force working in the units shall not be taken from the Containment Zones as mentioned in point (a) above.
c. Intermixing of labourers and staff coming from different places shall be avoided within the factory as far as possible.

d. Every industry shall function duly following all the social distancing norms and all other measures for containing the spread of COVID-19 and all such measures as required from time to time. The Industry shall display prominently the SOPs being followed for social distancing at their premises.

e. **In the Rural areas, the following are applicable**
   i. All Industrial activities are permitted completely subject to points (a) to (d) above and subject to safeguards for prevention of spread of COVID 19, without any reference to essential or non-essential products in all Red/Orange/Green districts.

f. **In the Urban Areas, the following are applicable**
   i. Industrial activities are permitted completely subject to points (a) to (d) above and subject to safeguards for prevention of spread of COVID-19, without any reference to essential or non-essential products in Orange and Green districts.
   ii. In case of Red zone districts, Industrial establishments in **urban areas** subject to points (a) to (d) above shall be permitted as follows:
      1. Special Economic Zones (SEZs), Export Oriented Units (EOUs), industrial estates and industrial townships with access control.
      2. Manufacturing units of essential goods, including drugs, pharmaceuticals, medical devices, their raw material and intermediates; production units which require continuous process, and their supply chain; manufacturing of IT hardware; jute industry with staggered shifts and social distancing; and manufacturing units of packaging material.

5) No separate/ fresh permissions will be required from any authority for activities already permitted to operate under the guidelines on "lockdown" measures up to 3rd May, 2020. The Standard Operating Protocols (SOPs) issued by MHA will continue to operate.

6) After 3rd May, 2020, the industrial units can automatically resume operations in all permitted areas and activities as mentioned above, without any specific permission or NOC but with a self-certification to be given by the head of the industrial unit. S(he) will self-certify to run the unit by complying with all the Standard Operating Procedures (SOPs) with regard to social distancing and other measures for containing the spread of COVID-19 as prescribed in G.O. Rt. No. 88, without any relaxation whatsoever in this regard. A form for self-certification /under taking in place of NOC is required to be made along with the other details in https://www.apindustries.gov.in/Covid19/ on resumption of operations.

7) The District Collectors as Chairpersons of the DIPC shall guide and encourage the permissible units to restart the operations and also operate with migrant labour wherever available so that skilled manpower is gainfully retained.

8) Therefore, the District Collectors / Superintendents of Police / Director of Industries, Andhra Pradesh, Vijayawada /Director of Factories, Andhra Pradesh, Vijayawada /Commissioner of Labour, Andhra Pradesh, Vijayawada/Commissioner of Transport, Andhra Pradesh, Vijayawada are hereby instructed to strictly implement the modified consolidated guidelines accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

NILAM SAWHNEY
CHIEF SECRETARY TO GOVERNMENT

To

1. All the District Collectors
2. All the Superintendent of Police
3. Commissioner of Police, Vijayawada and Visakhapatnam
4. Director of Industries, Andhra Pradesh, Vijayawada
5. Director of Industries, Andhra Pradesh, Vijayawada
6. Director of Factories, Andhra Pradesh, Vijayawada
7. Commissioner of Labour, Andhra Pradesh, Vijayawada
8. Commissioner of Transport, Andhra Pradesh, Vijayawada
9. All the General Managers of DIC
10. All the Zonal Managers of APIIC

Copy to:

PS to Chief Secretary to Government
PS to Special Chief Secretary to Govt., Industries & Commerce Dept.
PS to Secretary to Hon'ble Chief Minister
PS to DGP, Andhra Pradesh

// FORWARDED: : BY ORDER//

SECTION OFFICER

Annexure III

Styrene

What is Styrene?

Styrene is a colourless, clear liquid. It has a sweet smell and can be found in nature as well as manufactured. Styrene was originally found in the oriental sweetgum tree (Levantstyrax). It can also be found in common foods and beverages, such as strawberries, coffee, cinnamon, peanuts, and tobacco. Manufactured styrene has a wide range of uses and is a component of many goods, including: polystyrene, fiberglass, packaging materials, electrical insulation, home insulation, drinking cups and food packaging, rubber, and carpet backing.

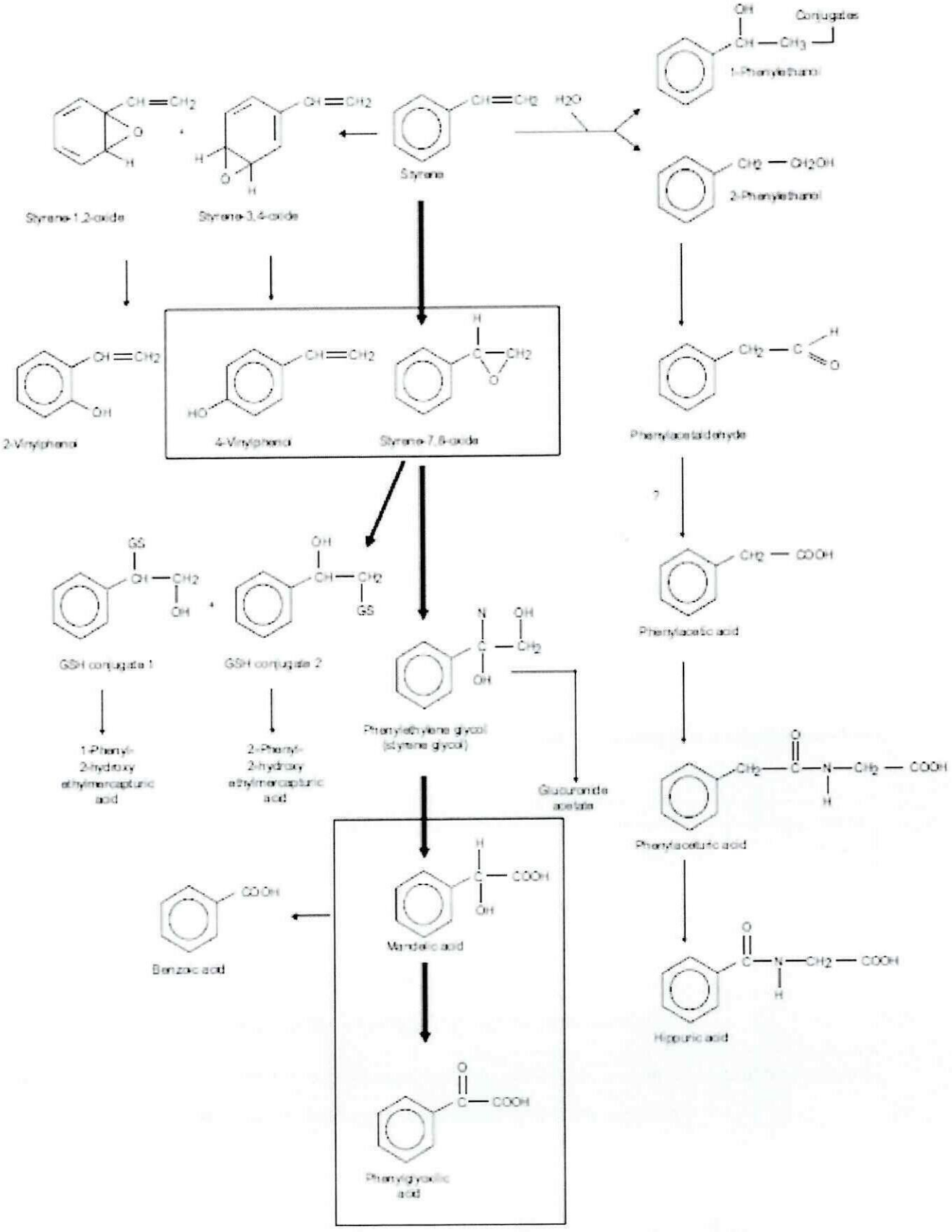
Physical and Chemical Properties:

Styrene is a volatile, highly flammable compound. Styrene vapour is heavier than air. At concentrations normally encountered in the workplace, the air and styrene mixture is not significantly heavier than clean air. Styrene evaporates more rapidly at high temperatures (eg. the evaporation rate at 30° C is twice that at 20 ° C). Styrene can be smelled at very low concentrations. Prolonged exposure to styrene reduces a person's ability to smell it. Styrene liquid is soluble in body fat and can be absorbed through the skin; however, studies have shown that the styrene present in polyester resin is not easily absorbed through the skin. Inhalation is therefore the major route of exposure.

Property	Information	Reference
Molecular weight	104.15	O'Neil et al. 2001 Lide 2005
Color	Colorless to yellowish	Windholz 1983
Physical state	Liquid	Sax and Lewis 1987
Melting point	-30.6 °C	O'Neil et al. 2001
Boiling point	145.2 °C	Verschueren 2001, Weast 1985
Density at 20 °C	0.9059	O'Neil et al. 2001
Odor	If pure, sweet and pleasant; commonly contains aldehydes which provide it with a penetrating, sharp, and unpleasant smell	Verschueren 2001
Odor threshold:		
Water	0.73 mg/L	HSDB 2009
	0.011 mg/L	Amoore and Hautala 1983
Air	1.36 mg/m^3	Amoore and Hautala 1983
Solubility:		
Water at 15 °C Water at 20 °C Water at 40 °C	280 mg/L 300 mg/L 400 mg/L	Verschueren 2001
Organic solvents	Soluble in alcohol, ether, acetone, carbon disulfide	Windholz 1983
Partition coefficients:		
Log K_{ow}	2.95	Hansch et al. 1995; EPA 1984a
Log K_{oc}	2.96	Sabljic et al. 1995
Vapor pressure at 20 °C	5 mmHg	Verschueren 2001
Henry's law constant at 25 °C	2.61x10^{-3} atm-m^3/mol (calculated)	EPA 1981
Autoignition temperature	914 °F (490 °C)	Sax and Lewis 1987
Flashpoint	87 °F (31 °C) (closed cup) 34.4°C (Tag open cup)	O'Neil et al. 2001; Kirk-Othmer 2001
Flammability limits	No data 0.9 (lower); 6.8 (higher) 1.1 (lower); 6.1 (higher)	CEFIC 2008; Kirk-Othmer 2001
Conversion factors	1 mg/m^3=0.23 ppm; 1 ppm=4.33 mg/m^3	Verschueren 2001

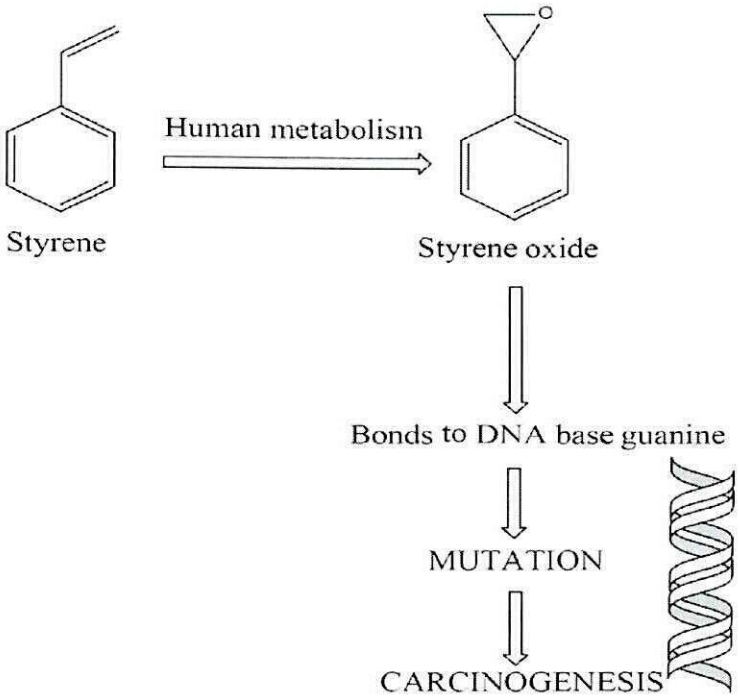
How Does Styrene's Biotransformation Lead to Carcinogenicity?

The main method of styrene exposure is inhalation. A small amount of styrene is ingested or absorbed through dermal contact. Styrene is extensively metabolized by the body enzymes into other chemicals that are excreted through urine.



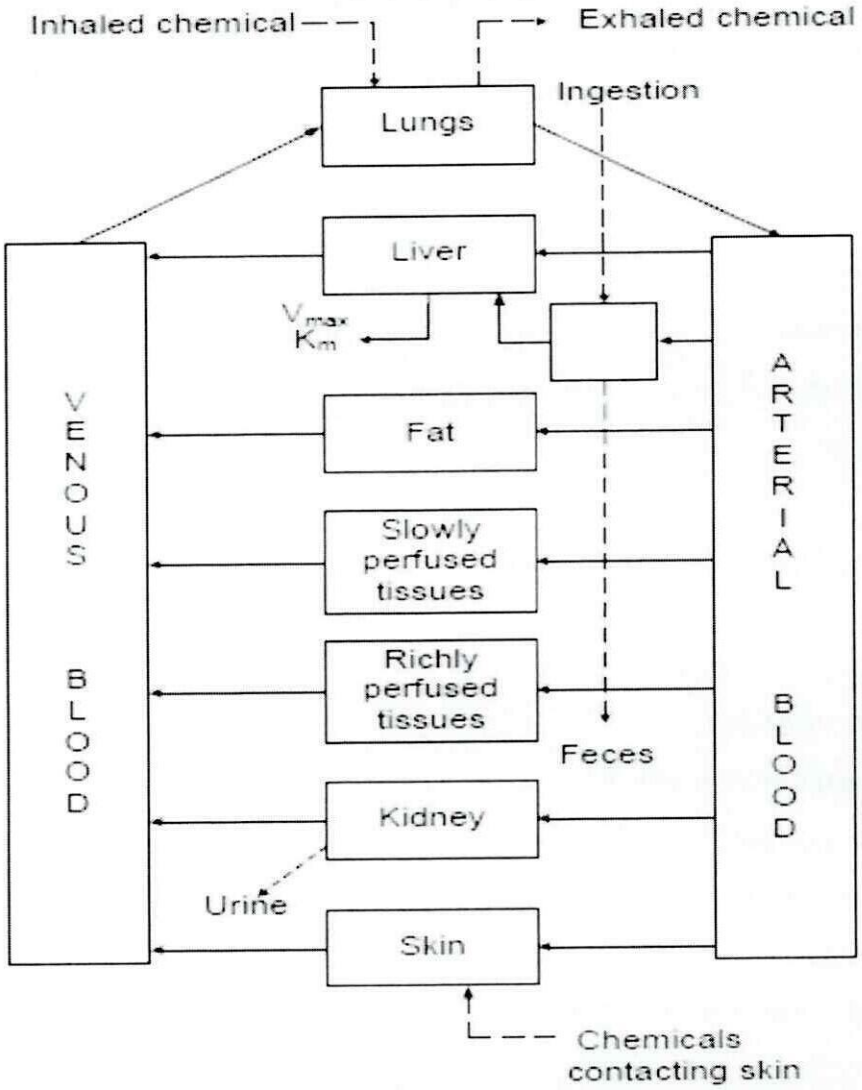
Styrene Metabolism in Humans and Animals

Metabolic action is required for carcinogenicity and toxicity. In the photo below, the metabolites from styrene bond to the DNA base guanine and cause carcinogenic effects.



How can styrene enter and leave body?

Enter your body	Inhalation: When you breathe air containing styrene, most of the styrene will rapidly enter your body through your lungs. Ingestion: Styrene in food or water may also rapidly enter your body through the digestive tract. Dermal contact: A very small amount may enter through your skin when you come into contact with liquids containing styrene.
Leave your body	Once in your body, styrene is broken down into other chemicals. Most of these other chemicals leave your body in the urine within few days.



Note: This is a conceptual representation of a physiologically based pharmacokinetic (PBPK) model for a hypothetical chemical substance. The chemical substance is shown to be absorbed via the skin, by inhalation, or by ingestion, metabolized in the liver, and excreted in the urine or by exhalation.

Source: Adapted from Krishnan and Andersen 1994

Conceptual Representation of a Physiologically Based Pharmacokinetic Model for a Hypothetical Chemical Substances

What are known of Styrene's Toxic kinetics and Mechanism of Action?

Not much is known about styrene's mechanism of action or toxicokinetics. Styrene can be oxidized by many CYP450 isozymes, so activation and deactivation of styrene can vary based on tissue type. It is metabolized in mice in the liver and lungs. Styrene-7,8-oxide is a metabolite of styrene that is genotoxic and can travel by blood in humans. This indicates that it can cause tumor growth in locations other than where it is formed. The tumorigenic response of styrene

is dependent on the balance between the rate of activation and rate of detoxification, though information on these rates in humans is not available.

What are the Known Target Organs of Styrene?

- Lymphohematopoietic system
- Esophagus
- Pancreas
- Kidney
- Lungs

Signs and Symptoms of Styrene Toxicity

Acute:

- Mucus membrane irritation
- Eye irritation
- Gastrointestinal effects
- Metallic taste
- Drowsiness
- Vertigo
- Slight muscular weakness

Chronic:

- Central nervous system effects
- Hearing loss
- Peripheral neuropathy
- Dermatitis and blistered skin
- Liver effects
- Reproductive effects

What Treatments are Available for Styrene Toxicity?

The only treatment for styrene toxicity is treating the effects and symptoms of exposure and avoiding re-exposure to styrene. This includes monitoring for styrene-related cancers and tumors.

What happens to styrene when it enters the environment?

Air: Styrene is quickly broken down in the air, usually within 1-2 days.

Water and soil: Styrene evaporates from shallow soils and surface water. Styrene that remains in soil or water may be broken down by bacteria or other microorganisms.

Transport and Partitioning

Should styrene be released to the environment, its vapor pressure indicates that it will partition to the atmosphere. In the atmosphere, styrene exists as a vapor. Styrene is an oily liquid that is slightly volatile; its vapor pressure has been determined to be approximately 5 mm Hg at 20 °C (Verschueren 2001). A small fraction of the styrene released to the atmosphere may dissolve into condensed water vapor such as clouds and raindrops. A Henry's law constant (H) is a measure of the tendency of a chemical to partition between its gas phase and water. A value for H has not been experimentally measured for styrene, but it may be estimated by dividing the vapor pressure of styrene by its solubility in water at the same temperature (EPA 1982a). In this case, the value of H is approximately 2.61×10^{-3} atm-m^3 /mole at 25 °C.

Analogous air-water partition coefficients were measured at 37 °C, yielding a value of approximately 5.4×10^{-1} atm-m^3 /mole (Sato and Nakajima 1979). The magnitude of these values suggests that only a small fraction of vapor-phase styrene would dissolve into atmospheric water droplets. Physical processes such as precipitation and dry deposition would not be significant mechanisms for removing styrene from the atmosphere because of its high photochemical reactivity (EPA 1984b).

Transformation and Degradation

The major fate of atmospheric styrene is determined by the rate of photooxidation. Styrene may be transformed by direct photolysis, but the half-life of this process may be on the order of 50 years (EPA 1984b). Kopczynski et al. (1972) found that styrene was not degraded by direct photolysis after 6 hours of exposure.

Styrene is more quickly photooxidized by ozone and hydroxyl radicals. The rate constant for the reaction of styrene with ozone at ambient temperatures (about 25 °C) has been measured and is approximately 0.17–2.16x10-19 cm^3 /molecule-second (Atkinson et al. 1982; EPA

1979a). Assuming that the mean concentration of ozone in the troposphere is $10x10^{12}$molecules/cm^3 (EPA 1980), the half-life of styrene would be approximately 13 hours. The rate constant for the reaction of styrene with hydroxyl radicals has been measured as $5.3x10^{-11}$ cm^3 /molecule-second (Bignozzi et al. 1981). Assuming that the concentration of tropospheric hydroxyl radicals varies from $3x10^5$ to $1x10^7$ molecules/cm^3 (Mac Leod et al. 1984), it follows that the atmospheric half-life of styrene would be between 0.5 and 17 hours. More recent studies provide a similar rate constant of $5.9x10^{-11}$ cm^3 /molecule-second (Bunce and Dryfhout 1992) and $5.8x10^{-12}$ cm^3 /molecule-second (EPA 1993a), with a corresponding half-life of ~2.2 hours. Consequently, it is not expected that styrene will persist in the atmosphere, due to the combined and rapid effects of ozone- and hydroxyl radical-initiated atmospheric degradation processes. Transformation products resulting from such degradation processes include primarily oxygen-containing hydrocarbons such as phenol, phenylacetaldehyde, and phenoxy radical (Sloane and Brudzynski 1979) or other compounds (Atkinson and Arey 2003), as well as other aromatic hydrocarbons such as the benzyl radical and other unsaturated hydrocarbons (Sloane and Brudzynski 1979).

Reference:

https://u.osu.edu/helmig-mason.1/2019/06/30/styrene-toxicity/https://www.atsdr.cdc.gov/PHS/PHS.asp?id=419&tid=74

REPORT ON

PREVAILING AIR AND WATER ENVIRONMENT AROUND LG POLYMERS, VISAKHAPATNAM AFTER STYRENE GAS LEAK

CSIR-National Environmental Engineering Research Institute
(NEERI)

Hyderabad Zonal Centre
Uppal Road, Hyderabad-500007

May 2020

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ACKNOWLEDGEMENT

An accident occurred at LG Polymers, Visakhapatnam where the stored styrene monomer in vertical MS storage tank of 2500 KL capacity has spread to the surrounding villages of Venkatapuram, Padmanabhapuram, SC & BC Colony.

In regard to the above, CSIR-NEERI, Hyderabad Zonal Centre has taken up the environmental assessment of air and water (groundwater and surface water) around the buffer zone of LG polymers, Visakhapatnam. The team visited the site during the period May 12-16, 2020 and carried out the air sampling, water sampling (groundwater, surface water) around LG polymers, Vizag. The samples were collected for the analysis of styrene concentration in air environment, groundwater and surface water (lake, pond and reservoir).

CSIR-NEERI acknowledges the contribution & help rendered by the Andhra Pradesh Pollution Control Board (APPCB) for accompanying during the site visits, sampling and in collating information from Industry.

The help and cooperation rendered by all the officials who have directly or indirectly contributed to the study is greatly acknowledged.

REPORT ON PREVAILING AIR AND WATER ENVIRONMENT AROUND LG POLYMERS, VISAKHAPATNAM AFTER STYRENE GAS LEAK

Preamble:

M/s LG Polymers India Pvt Ltd was established in 1961 as "Hindustan Polymers" for manufacturing Polystyrene and its Co-polymers at Visakhapatnam, India. The industry is located at R.R. Venkatapuram, Visakhapatnam District. An accident occurred at 03:02 am on 07.05.2020 from 2500 KL styrene tank. The company has stored styrene monomer in vertical MS storage tanks of 2500 KL and 3500 KL capacity provided with internal cooling system through refrigeration to maintain below 200°C. The styrene gas has spread to the surrounding villages of Venkatapuram, Padmanabhapuram, SC & BC Colony. The concentrations of styrene were high at the time of accident in the villages.

In regard to the above, CSIR-NEERI, Hyderabad Zonal Centre has taken up the environmental assessment of air and water (groundwater and surface water) around the buffer zone of LG polymers, Visakhapatnam. The team visited the site during the period May 12-16, 2020 and carried out the air and water sampling (groundwater, surface water) around LG polymers, Vizag. The samples were collected for the analysis of styrene concentration in air environment, groundwater and surface water (lake, pond and reservoir). The details are presented in the following chapter.

Background:

M/s LG Polymers India Pvt Ltd (LGPIL) was established in 1961 as "Hindustan Polymers" for manufacturing Polystyrene and its Co-polymers at R.R. Venkatapuram, Visakhapatnam District in an extent of 219 acres area to manufacture Expandable Polystyrene using Styrene (C_8H_8), Pentane (C_6H_{12}) and HCl as main raw materials. It merged with M/s Mc Dowell & Co. Ltd. of UB Group in 1978. It was taken over by LG Chem (South Korea), Hindustan Polymers was renamed as LG Polymers India Private Limited (LGPIL) in July, 1997. It is an old industry, Category A industry and applied for EC under violation window and is pending at MOEF&CC. Very recently, MOEF&CC (IA Division) issued vide letter F.No. 22-12/2020-IA-III dated May 15, 2020 stating that the project of LGPIL attracts the provisions of schedule 5(e) of the EIA notification. The industry imports styrene monomer from Dubai, Singapore and South Korea. The

industry has a strength of total 475 nos. of workers employed including permanent (275 nos.) and contract (200) worker with a valid consent to operate up to 31-12-2021.

Andhra Pradesh Pollution Control Board (APPCB) also issued CFE & CFO (expansion) on 20.06.2018 to the industry to produce Engineering Plastics - 36.67 TPD with certain conditions which is valid up to 30.04.2023. The industry was not in operation due to lockdown

Styrene Gas Leak Accident:

- An accident occurred at 03:02am on 07.05.2020 from 2500 KL tank. The company has stored styrene monomer in vertical MS storage tanks of 2500 KL and 3500 KL capacity provided with internal cooling system through refrigeration to maintain below 200°C. Due to accident the styrene gas has spread to the surrounding villages of Venkatapuram, Padmanabhapuram, SC & BC Colony.
- The concentrations of styrene were high at the time of accident in the villages. The concentrations could not be measured at the time as there were lethal and villages were inaccessible. Subsequently the concentrations of styrene were measured in the ambient air at 9:30 AM. The APPCB officials started the Ambient Air Quality Monitoring with handy samplers from 9.30 AM on 07.05.2020 and Ambient Air Quality Monitoring was taken up on regular basis and the results are presented in Table 1.
- As per the monitoring values the styrene gas is present at low concentrations in the range of 1 to 2.5 ppm in Venkatapuram, Padmanabhapuram, SC & BC Colony.
- As per the information received from the industry, the tank temperature is 70 °C at 2.30 pm on 11.05.2020 and intermittent emissions from the Breather valve are observed.
- It is to submit that as per the air quality norms the styrene gas should not be present in the breathing air. The low concentrations will cause respiratory and skin sensitivity. As per the information from the management of M/s. L G Polymers the reaction is not yet totally controlled, therefore the villagers should be away, till the total gas is decomposed/diluted in the ambient air. Normally the gas will decompose in 12-24 hrs if there is no further addition from the storage tanks.

What is Styrene?

Polystyrene (PS) is a common engineering polymer, used on its own as a plastic or in combined forms with other plastics, resins and chemicals ('Thermocol', polyester resins, SBR-Styrene-Butadiene Rubber are well known). PS is produced by controlled polymerisation of styrene. The extent or the degree of polymerisation (technically called as 'degree') decides the properties. Styrene – a common product made by petrochemical industry world over, is itself an aromatic organic chemical, made by catalytic reaction of benzene and ethylene to form ethyl benzene, followed by dehydrogenation. Styrene is liquid at ambient temperature, and is reasonably safe to handle and transport, though inherently flammable and toxic. Bulk quantities of styrene are imported from China. Besides being used to make Polystyrene, styrene is also used as a raw material for some perfumery and speciality organic chemicals. LG Chemicals, the Korean company owns the polystyrene plant at Vizag, Andhra Pradesh. This plant has gone through multiple ownerships, with stepwise capacity enhancement over the last fifty years.

Background of polystyrene reaction

- PS is made from Styrene by *thermal initiation process*; i.e. styrene is initially heated to start up the reaction, following which the inherent exothermic (i.e. heat liberating) nature of the resulting polymerization reaction causes the temperature to rise rapidly.
- Styrene tends to self-polymerise, even at ambient temperature with very slow reaction rates. However even the slow rates of self-polymerisation cause major issues including heat liberation and blockages in the tank. The rate of this reaction doubles every 10 deg C. The combination of polymerisation- heat liberation- temperature rise- and further polymerisation can lead to rapid reaction and heating- this is known as a 'run-away reaction'. As the temperature rises, styrene starts vaporising. The pressure in the storage tank may progressively increase, and the safety valves provided on the tanks may open. In order to avoid such polymerization, styrene is mixed with a polymerization inhibitor (TBC, i.e. 4-tert-Butyl Catechol) at controlled concentrations.

The reasons for accident maybe summarised as follows:

1. ***Uncontrolled polymerization during prolonged storage***
2. ***Failure of temperature control systems on styrene storage tank***
3. ***Non-adherence to SOPs***

Sampling and Analysis:

CSIR-NEERI, Hyderabad Zonal Centre has carried out sampling and analysis of air and water (groundwater and surface) environment around the buffer zone of LG Polymers, Visakhapatnam. The study was carried out during the period May 12 – 16, 2020. The details of the air and water environment are described in detail below:

Air Environment:

Ambient levels of Styrene and Total Volatile Organic Compounds (TVOCs) sampled at different locations near the LG Polymers Storage Tank and at about 0.5 km radius area, 1.0 km radius area, 1.5 km radius area, 2 km radius area and 3.0 km radius area from the LG Polymers Storage Tanks (LGPST) as centre respectively using (i) sorbent tubes and analysed on GC/MS for styrene and (ii) the handheld TVOC analyser with Styrene as independent variable from 12-05-2020 to 15-05-2020. Sampling locations where air samples have been collected are shown in **Fig. 1** and details are given in **Table 1**.

The ambient air quality locations for sampling styrene around LG Polymers, Visakhapatnam are selected based on the predominant wind directions observed from daily wind data and confirmed with climatalogical normals. It is observed that during the summer/study period, the predominant winds are from SW, W, SSW, S directions (SW sector) as shown in **Fig. 2**, implying the impact zone shall be in NE, E, NNE, N directions (NE sector) from LGPST as centre. The following are the observations:

Analysis of Results on GC/MS

The concentrations of styrene (obtained by sampling using sorbent tubes and analysis on GC/MS using NIOSH1501 Method) at different locations in the study area (3 km radius area from LG Polymers Storage Tanks (LGPST) are given in **Table 2**.

- Styrene concentrations in the ambient air is observed to be 1058.8 $\mu g/m^3$ near Storage Tank in LG Polymers.

- Styrene concentration in the ambient air is observed to be 41.2 µg/m^3 at Venkatapuram (near Railway Bridge), i.e. < 0.5 km from the LG Polymers Storage Tank.
- At all other locations styrene is not detected (< 16.7 µg/m^3, which is the lowest detection limit by the GC/MS method)

In-situ Values from TVOC Analyser

The in-situ/spot concentrations of styrene and TVOC observed at different locations from the handheld TVOC analyser are given in **Table 3**.

- Styrene ambient values varied between 0.3 ppm (1278 µg/m^3) to 1.4 ppm (5964 µg/m^3) near Storage Tank in LG Polymers
- TVOCs varied between 0.4 to 3.2 ppm near Storage Tank in LG Polymers
- Styrene ambient values varied between BDL to 0.1 ppm (426 µg/m^3) in the 0.5 km radius area from LG Polymers Storage Tank
- TVOCs varied between BDL to 0.2 ppm in the 0.5 km radius area from LG Polymers Storage Tank
- Styrene ambient values varied between BDL to 0.1 ppm (426 µg/m^3) in the 0.5 km - 1.0 km radius area from LG Polymers Storage Tank
- TVOC ambient values varied between BDL to 0.2 ppm in the 0.5 km - 1.0 km radius area from LG Polymers Storage Tank
- Styrene ambient values observed to be BDL in the 1.0 km - 3.0 km radius area from LG Polymers Storage Tank
- TVOC ambient values varied between BDL to 0.1 ppm in the 1.0 km - 3.0 km radius area from LG Polymers Storage Tank

From the above analysis it may be inferred that the impact of Styrene is significant near the LG Polymers and around 500 m distance from the LG Polymers Storage Tanks (LGPST) as the styrene concentrations are observed to be high up to 500 m radius area from LGPST. But the impact is also spread up to 1.0 km distance where in-situ/spot values of styrene were observed. The ambient values of styrene are observed up to 1.0 km as styrene is a heavy gas and tends to settle rapidly on the ground and thus may not have reached farther distances after the measures to stop leakage of styrene gas have completed.

Also the styrene monomer would have dispersed in the NE sector from LGPST as the predominant winds are from SW direction, but mostly the styrene monomer got dispersed in the western to south western sector from LGPST. This may be because styrene is a heavy gas and due to building downwash effect, as styrene monomer gas released from the top of the storage tank, it got descended towards ground and dispersed locally at the time of the accident.

Generally, ambient air in urban locations contained styrene at average concentrations of 0.29 to 3.8 $\mu g/m^3$, while styrene in rural and sub-urban air has been measured at 0.28 to 0.34 $\mu g/m^3$ (ATSDR, 1992). The styrene concentrations in the ambient air of Visakhapatnam study area during the study period are found to be exceeding the above ambient concentration levels or standard values. Also, the styrene values are higher very close to the LGPST and up to 500 m from LGPST compared to Ontario's ambient air quality criteria of styrene equal to 400 $\mu g/m^3$ (24 hrly average) for limiting effect on human health.

The odor of styrene is still persistent in the study area near LGPST during the study period as the odor threshold for styrene is 0.32 ppm or 1363 $\mu g/m^3$ (Amoore and Hautala, 1983).

Spot concentrations of TVOCs are observed up to 3.0 km distance from LGPST with higher values observed near LGPST and up to 500 m distance from LGPST. The higher values of TVOCs up to 3.0 km are due to contribution from other sources like vehicles and industries in the surrounding area.

It may be concluded that periodic evaluation of styrene levels in the ambient air up to 2 km radius area surrounding LGPST will help in understanding styrene levels in the ambient air and their impacts on human health and vegetation/animals is to be carried out.

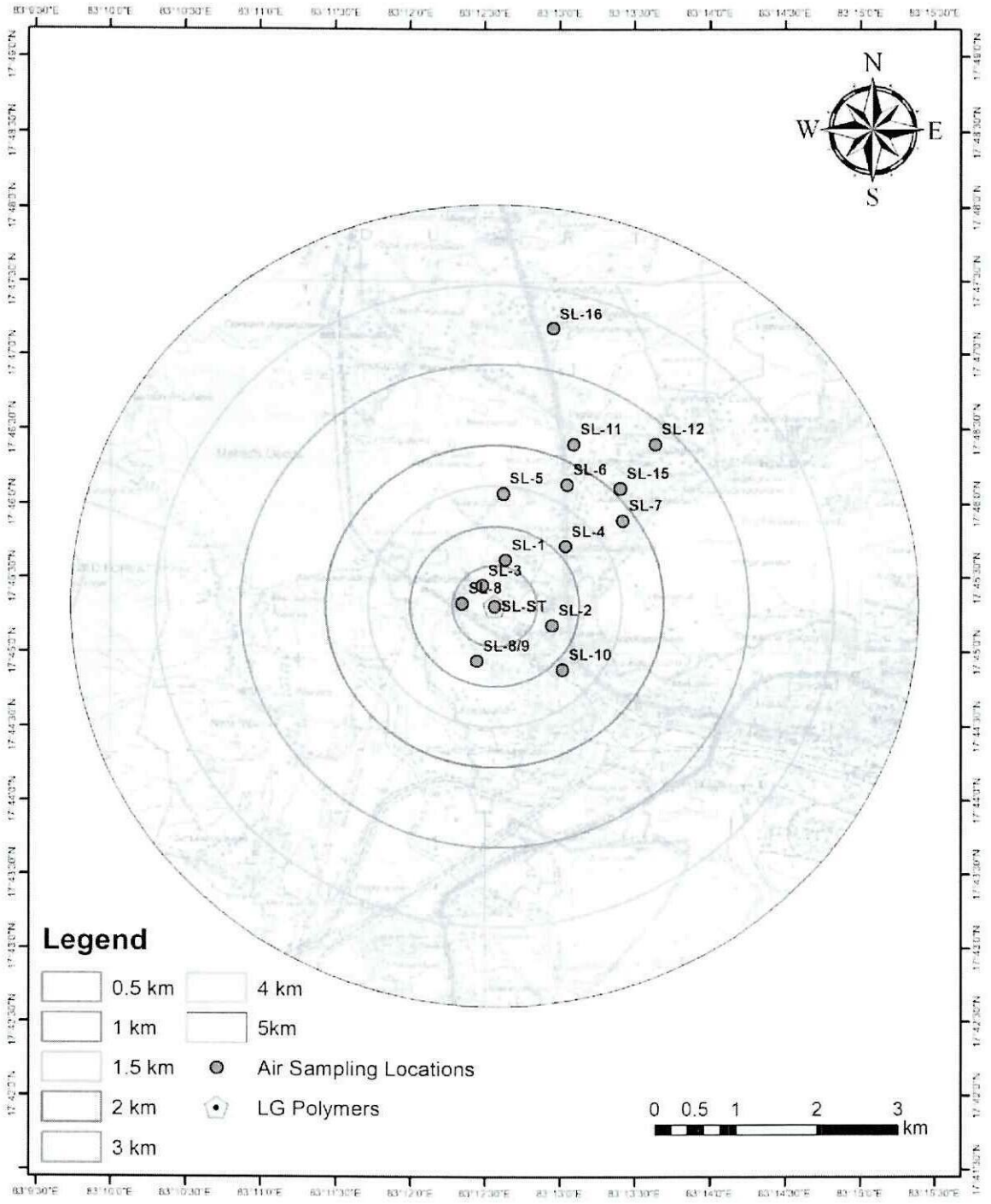

Fig. 1: Map showing air sampling locations around LG Polymers, Vizag

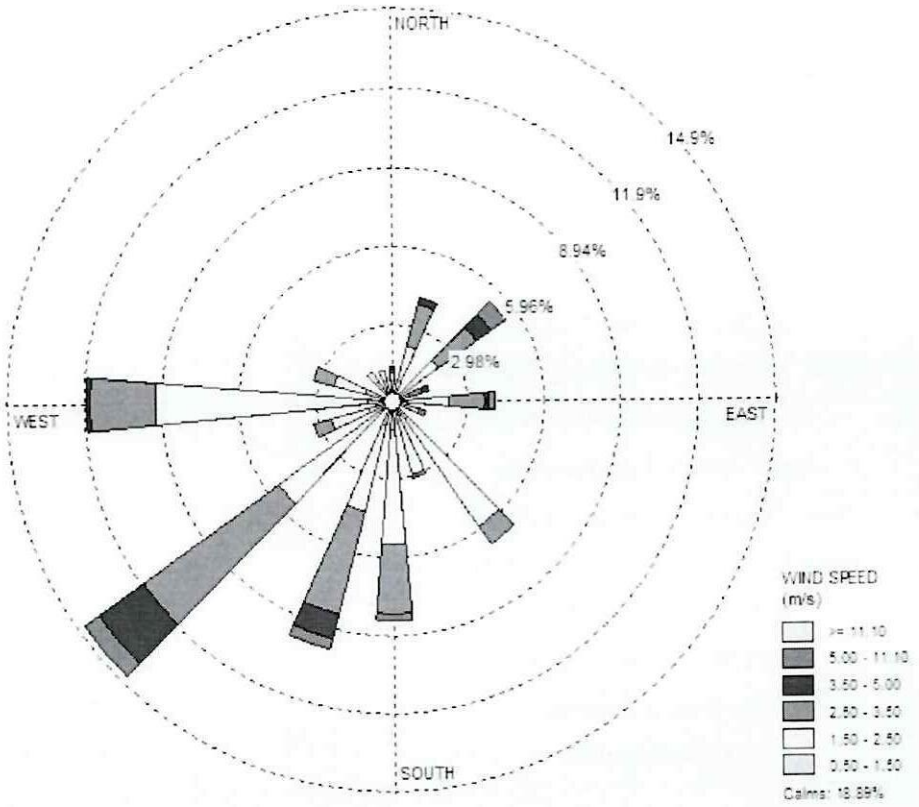

Fig. 2: Windrose for Visakhapatnam during Summer season

Table 1: Details of Air Sampling Locations LG polymers Visakhapatnam Styrene Study

Sr. No	Location Details	Sample Code	Latitude/ Longitude
1.	Nandamuri Nagar Near Community Building	SL-1	N 17°45'37.4" E 83°12'38.2"
2.	Bapuji Nagar Near Bureddy Brothers House, Gopalapatnam	SL-2	N 17°45'11.0" E 83°12'56.9"
3.	Venkatapuram Village Near Venugopala swamy Temple	SL-3	N 17°45'27.0" E 83°12'28.7"
4.	Krishnanagar-BRTS Road Near Vedika Function Hall	SL-4	N 17°45'43.0" E 83°13'02.2"
5.	Naiduthota- Venkata Sai Nagar Near Varasiddi vinayaka Temple	SL-5	N 17°46'04.5" E 83°12'37.3"
6.	Naiduthota-BRTS Road Near Bhashyam School	SL-6	N 17°46'07.8" E 83°13'02.9"
7.	Anjanadri colony, Prahladapuram	SL-7	N 17°45'53.6" E 83°13'25.2"
8.	Venkatapuram, Near Railway Bridge	SL-8	N 17°45'19.9" E 83°12'20.7"
9.	Santosh Nagar-Kothapalem	SL-8/9	N 17°44'56.7" E 83°12'26.6"
10.	Prasanth Nagar Gopalapatnam Near Sai baba Temple Centre	SL-10	N 17°44'53.1" E 83°13'01.1"
11.	Vepagunta- Prasanthi Nagar Near Lakshmi Ganapathi Temple	SL-11	N 17°46'24.1" E 83°13'05.7"
12.	Srinivasanagar Simhachalam Road	SL-12	N 17°46'06.4" E 83°13'38.3"
13.	Appannapalem Near JUNNRAM Colony	SL-15	N 17°46'34.3" E 83°13'24.3"
14.	Krishnarayapuram - NAD Colony Near M.S. Ramayya Company	SL-16	N 17°47'11.0" E 83°12'57.4"
15.	LG Polymers Near Storage Tank	SL-ST	N 17°45'18.8" E 83°12'33.8"

Table 2: Styrene Concentrations in the Ambient Air at Different Locations in the Study Area

Sr. No	Sample Code	Date of Sampling	Styrene Concentration ($\mu g/m^3$)	Date of Sampling	Styrene Concentration ($\mu g/m^3$)
1.	SL-1	14.05.2020	< 16.7	16.05.2020	< 16.7
2.	SL-2	14.05.2020	< 16.7	16.05.2020	< 16.7
3.	SL-3	13.05.2020	< 16.7	16.05.2020	< 16.7
4.	SL-4	13.05.2020	< 16.7	17.05.2020	< 16.7
5.	SL-5	13.05.2020	< 16.7	15.05.2020	< 16.7
6.	SL-6	13.05.2020	< 16.7	15.05.2020	< 16.7
7.	SL-7	13.05.2020	< 16.7	18.05.2020	< 16.7
8.	SL-8	14.05.2020	41.2	16.05.2020	< 16.7
9.	SL-8/9	14.05.2020	< 16.7	16.05.2020	< 16.7
10.	SL-10	14.05.2020	< 16.7	16.05.2020	< 16.7
11.	SL-11	15.05.2020	< 16.7	17.05.2020	< 16.7
12.	SL-12	15.05.2020	< 16.7	17.05.2020	< 16.7
13.	SL-15	15.05.2020	< 16.7	17.05.2020	< 16.7
14.	SL-16	15.05.2020	< 16.7	17.05.2020	< 16.7
15.	SL-ST	14.05.2020	1058.8	17.05.2020	< 16.7

Table 3: TVOC and Styrene Spot Concentrations in the Study Area

Sr. No	Sample Code	TVOC (ppm)	Styrene (ppm)	Sampling Date
1.	SL-1	BDL	BDL	14.05.2020
2.	SL-2	0.2	0.1	14.05.2020
3.	SL-3	0.2	0.1	13.05.2020
4.	SL-4	0.2	0.1	13.05.2020
5.	SL-5	0.2	0.1	13.05.2020
6.	SL-6	0.2	0.1	13.05.2020
7.	SL-7	0.2	0.1	13.05.2020
8.	SL-8	0.2	0.1	14.05.2020
9.	SL-8/9	BDL	BDL	14.05.2020
10.	SL-10	0.1	BDL	14.05.2020
11.	SL-11	BDL	BDL	15.05.2020
12.	SL-12	BDL	BDL	15.05.2020
13.	SL-15	BDL	BDL	15.05.2020
14.	SL-16	BDL	BDL	15.05.2020
15.	SL-ST	0.4	0.3	14.05.2020
		3.2	1.4	

Water Environment:

The groundwater and surface water quality monitoring is an effort to obtain information on chemical quality through representative sampling in different hydrogeological units. The groundwater samples (Dug Wells – 18 nos.) and surface water samples (Reservoir – 4 nos, Lake – 1 no, Collection Tank – 1 no, Fish Pond – 1 no, Drain – 1 no) were collected in the buffer zones of 0.5 km, 1 km, 1.5 km, 2 km, 3 km, 4 km, 5 km radius around LG Polymers Storage Tanks, Visakhapatnam during the period May 13 – 16, 2020 **(Fig. 2)**. The groundwater samples were collected from dug (open) wells as and surface water samples from reservoir, collection tank, lake, drain and fish pond (**Table 4**). The water locations for sampling styrene around LG Polymers, Visakhapatnam were selected based on the elevation of the area and the drainage pattern.

Analysis of results of groundwater and surface water on GC-MS/MS

The concentrations of styrene (obtained by sampling using vials and analysis on GC-MS/MS with purge and trap method) at different locations in the study area are given in **Table 5**. The detection limit of GC-MS/MS is 0.5 ppb.

As per World Health Organization (WHO, 2003) guidelines for drinking water, the guideline value for styrene in drinking water is 0.02 mg/l. The guideline value indicates that the styrene may affect the acceptability of drinking water above the guideline value. The USEPA standard shows that the maximum containment level (MCL) is 0.1 ppm. The following observations are being made from the analysis results of water samples:

- Styrene concentrations in water samples was observed to be less than 0.02 mg/l in all the samples except at SGL-9
- Styrene concentration at SGL-9 is 0.0345 mg/l which is at an approximate distance of 1.5 km from LG Polymers
- At all other locations styrene detected was less than 0.2 ppm (< 0.5 ppb, which is the lowest detection limit by the GC/MS method)

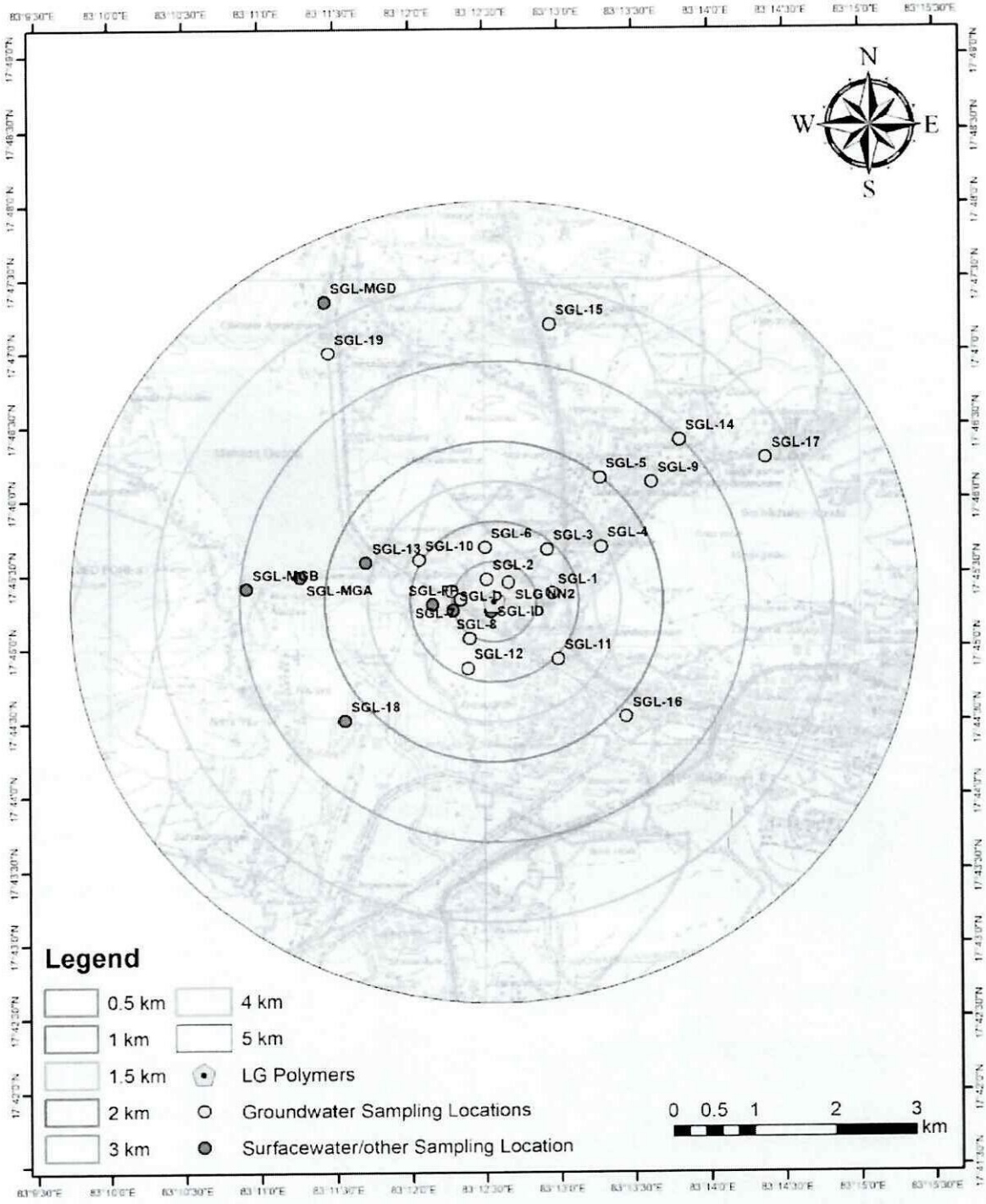

Fig. 2: Map showing groundwater and surface water sampling locations around LG Polymers, Vizag

Table 4: Groundwater and Surface water sampling locations around LG Polymers, Vizag

Sr. No	Sample Details	Sample Code	Latitude/ Longitude	Type of Source
1.	RR Venkatapuram (Adjacent to right side of LG polymers)	SGL-1	N 17° 45' 22.1" E 83° 12' 57.1"	Dug Well
2.	VenkataPuram (In house adjacent to primary school)	SGL-2	N 17° 45' 27.9" E 83° 12' 30.8"	Dug Well
3.	Krishnanagar- Vepagunta (Near Durgamalleswaraswamy Temple)	SGL-3	N 17° 45' 39.9" E 83° 12' 55.2"	Dug Well
4.	Virat Nagar- Prahaladapuram (H.No 15-141)	SGL-4	N 17° 45' 41.0" E 83° 13' 17.2"	Dug Well
5.	Saimadhavanagar-sector II Naiduthota	SGL-5	N 17° 46' 08.9" E 83° 13' 16.7"	Dug Well
6.	Padmanabhanagar (Janatanagar Colony 9th LANE)	SGL-6	N 17° 45' 40.9" E 83° 12' 30.2"	Dug Well
7.	Venkatapuram (Near House of EApparao)	SGL-7	N 17° 45' 19.7" E 83° 12' 20.3"	Dug Well
8.	Agriculture Fields on way to Santosh Nagar - Venkatapuram	SGL-8	N 17° 45' 03.9" E 83° 12' 23.8"	Dug Well
9.	Srinivasa Nagar- Simhachalam Road	SGL-9	N 17° 46' 07.1" E 83° 13' 37.4"	Dug Well
10.	VenkataPuram (SC-BC Colony)	SGL-10	N 17° 45' 35.9" E 83° 12' 03.5"	Dug Well
11.	Kothapalem (Santosh Nagar 3rd Lane)	SGL-12	N 17° 44' 51.9" E 83° 12' 23.2"	Dug Well
12.	Meghadri Gedda	SGL-13	N 17° 45' 34.9" E 83° 11' 42.3"	Reservoir
13.	Appannapalem- Simhapuri Colony (H.NO-24-167/2 Gayatrinagar)	SGL-14	N 17° 46' 24.0" E 83° 13' 48.4"	Dug Well
14.	Krishnarayapuram-NAD Colony (House backside of M.S. Ramayya Company)	SGL-15	N 17° 47' 11.5" E 83° 12' 56.5"	Dug Well
15.	SC Colony- Old Gopalapatnam (Adjacent to Rly Track of Simhachalam North Station)	SGL-16	N 17° 44' 31.9" E 83° 13' 26.9"	Dug Well
16.	Chandrapuri Colony –Old Adavivram (H.No-11-138) Simhachalam Road	SGL-17	N 17° 46' 16.7" E 83° 14' 22.7"	Dug Well
17.	Kota-Narva	SGL-18	N 17° 44' 30.6" E 83° 11' 33.6"	Lake
18.	Chintala Agraharam (Near Trimatha Temple Agriculture Fields)	SGL-19	N 17° 46' 59.9" E 83° 11' 27.7"	Dug Well
19.	Venkatapuram (Near Railway Bridge)	SGL-D	N 17° 45' 15.3" E 83° 12' 17.3"	Drain
20.	LG Polymers- Oil Skimmer Tank	SGL-ID	N 17° 45' 14.8" E 83° 12' 32.5"	Collection Tank
21.	Venkatapuram (Near the House of L Apparao)	SGL-NN1	N 17° 45' 23.0" E 83° 12' 16.8"	Dug Well
22.	Inside LG Polymers	SLG NN2	N 17° 45' 26.6" E 83° 12' 39.6"	Dug Well
23.	Venkatapuram (Bapanna Cheruvu)	SGL-FP	N 17° 45' 17.6" E 83° 12' 09.0"	Fish pond
24.	Meghadri Gedda	SGL-MGA	N 17° 45' 29.0" E 83° 11' 16.2"	Reservoir
25.	Meghadri Gedda	SGL-MGB	N 17° 45' 24.3" E 83° 10' 54.8"	Reservoir
26.	Meghadri Gedda Near Juthada Village Road	SGL-MGD	N 17° 47' 20.8" E 83° 11' 26.3"	Reservoir

Table 5: Styrene concentration in groundwater and surface water locations around LG Polymers, Vizag

Sr. No	Sample Code	Date of Sampling	Styrene (ppm)
1.	SGL-1	15.05.2020	0.0033
2.	SGL-2	14.05.2020	BDL
3.	SGL-3	14.05.2020	BDL
4.	SGL-4	15.05.2020	0.0045
5.	SGL-5	15.05.2020	0.0025
6.	SGL-6	13.05.2020	0.0073
7.	SGL-7	14.05.2020	BDL
8.	SGL-8	16.05.2020	0.0014
9.	SGL-9	15.05.2020	0.0345
10.	SGL-10	13.05.2020	BDL
11.	SGL-12	14.05.2020	BDL
12.	SGL-13	13.05.2020	BDL
13.	SGL-14	15.05.2020	0.003
14.	SGL-15	15.05.2020	0.0023
15.	SGL-16	16.05.2020	0.0016
16.	SGL-17	15.05.2020	0.0112
17.	SGL-18	16.05.2020	0.0016
18.	SGL-19	15.05.2020	0.0017
19.	SGL-D	14.05.2020	BDL
20.	SGL-ID	14.05.2020	
21.	SGL-NN1	14.05.2020	BDL
22.	SLG NN2	14.05.2020	BDL
23.	SGL-FP	14.05.2020	BDL
24.	SGL-MGA	16.05.2020	0.0014
25.	SGL-MGB	16.05.2020	0.0015
26.	SGL-MGD	16.05.2020	0.0013

Water Quality and Bio-assay test of Meghadri Gedda Reservoir:

The samples were collected from the Meghadri Gedda reservoir and analysed for styrene concentration and for the major water quality parameters. Bio-assay test was also carried out for the same. The results are presented below:

Water Quality:

The samples had styrene concentration in the range of BDL – 0.0015 ppm. The water quality is presented in the Table 6. The results revealed that pH was 7.7 which was normal. Total dissolved solids is 270 mg/l and hardness was 88 mg/l. Sodium was found to be 48 mg/l and Biological oxygen demand was 4.7 mg/l and high oil and grease was found in the sample of 10 mg/l. The high BOD indicate that there is high biological activity, decaying plants.

Table 6: Water Quality of Megadri Gedda Reservoir

Sr. No	Parameter	Unit	Value
1.	pH	-	7.7
2.	EC	µs/cm	454
3.	TDS	mg/l	270
4.	Turbidity	NTU	1.0
5.	TSS	mg/l	6.0
6.	Total Hardness (as $CaCO_3$)	mg/l	88
7.	Calcium Hardness (as $CaCO_3$)	mg/l	56
8.	Magnesium Hardness (as $CaCO_3$)	mg/l	32
9.	Magnesium	mg/l	8
10.	Sodium	mg/l	48
11.	Potassium	mg/l	7
12.	Total Alkalinity (as $CaCO_3$)	mg/l	148
13.	Sulphate	mg/l	20
14.	Chloride	mg/l	38
15.	Nitrate- Nitrogen	mg/l	2.3
16.	Nitrite-Nitrogen	mg/l	BDL
17.	Ammonical Nitrogen	mg/l	2.1
18.	Available Phosphorus	mg/l	BDL
19.	Total Phosphorus	mg/l	0.077
20.	BOD	mg/l	4.7
21.	COD	mg/l	42
22.	Oil and Grease	mg/l	10

Bio-Assay Test:

Environmental bioassay is an experimental process wherein the assessment of toxicity on biological organisms is tested. The purpose of this test is to determine the acute toxicity of substances (toxicants) to fish in fresh water. Acute toxicity is an exposure test of short duration (days). Aquatic ecosystems are affected by numerous natural and chemical substances. These substances may be responsible for possible impacts on the structure and function of aquatic organisms. Since chemical analysis of pollutants does not cover all toxic substances, bioassays have been developed for bio-monitoring and evaluation of toxic substances in freshwater and natural ecosystems. Bioassays assess the potential harm of toxicants and are based on the response of living organisms to the toxicants in the water.

Test Procedure: The zebra fishes were obtained from a local aquarium. All fishes were transferred directly into a glass aquarium of 20 litres capacity for acclimatization. The fishes were acclimatized in uncontaminated (dilution) water (normal tape water) for three days before they were used. The test was performed using five glass aquariums filled with different test solution concentrations by mixing the sample and normal tape water One control experiment i.e with normal tape water was run and measurements of pH and temperature were carried out during the test. In the remaining four aquariums, five fishes were transferred directly into each glass aquariums filled with 1 litre of test water samples with minimum handling. No food was offered during the exposure period i.e. 96 hours. Fish behaviour and mortality were observed and recorded as frequently as possible during the exposure period. The Bioassay test has been carried out on the meghadri gedda reservoir sample.

Dilution/control water: Drinking-water supply, good-quality, uncontaminated natural water.

Test fish: Zebra fish (*Danio rerio*), in good health and free from any apparent malformation.

Test type: Static (test solutions remain unchanged through the test duration). The test was performed without pH adjustment because pH of test solutions were within the range 7.4-7.7

Test duration: 96 hours

Feeding: No food supplied to the test fishes during exposure period.

Aeration: None

Table 7: Bio-assay test results and fish mortalities during exposure period

Concentration of test sample	pH	Temp (°C)	Fishes tested	Mortality (no. of fishes)						
				2 hr	6 hr	12 hr	24 hr	48 hr	72 hr	96 hr
Control Sample	7.45	34.4	5	0	0	0	0	0	0	0
25	7.74	34.1	5	0	0	0	0	0	0	0
50	7.67	34.1	5	0	0	0	0	0	0	0
75	7.72	34.2	5	0	0	0	0	0	0	0
100	7.77	34.4	5	0	0	0	0	0	2	2

It is to conclude that as per the bio-assay test, the fishes were found to be stable in all the concentration samples except for fishes tested with 100% concentration of Meghadri Gedda reservoir sample. It was observed that out of 5 fishes, 2 fishes were dead at the end of 72 hrs. About 60% survival was observed in 100% reservoir sample after 72 hrs.

The water quality results indicate that Meghadri Gedda reservoir water cannot be used directly for domestic and drinking purpose due to moderate to high organic content. Furthermore, bioassay test indicated that 60% survival of fish with 100% reservoir sample after 96 hrs. Therefore, either activated carbon adsorption method or combined ozone-activated carbon treatment method can be used for the removal of organic content in the reservoir water. The combined ozone-activated carbon treatment is an effective method and also reduces the chlorine demand in the water treatment network.

Conclusion:

Based on the field survey, air and water sampling and analysis, the following are inferred:

- Styrene concentrations in the ambient air is observed to be 1058.8 $\mu g/m^3$ near Storage Tank in LG Polymers using the GC/MS analysis
- Styrene concentration in the ambient air is observed to be 41.2 $\mu g/m^3$ at Venakatapuram (near Railway Bridge), i.e. < 0.5 km from the LG Polymers Storage Tank
- At all other locations styrene is not detected (< 16.7 $\mu g/m^3$, which is the lowest detection limit by the GC/MS method)
- Spot concentrations of TVOCs are observed up to 3.0 Km distance from LGPST with higher values observed near LGPST and up to 500 m distance from LGPST. The higher values of TVOCs up to 3.0 km are due to contribution from other sources like vehicles and industries in the surrounding.
- The odour of styrene is still persistent in the study area near LGPST during the study period as the odor threshold for styrene is 0.32 ppm or 1363 $\mu g/m^3$ (Amoore and Hautala, 1983).
- Styrene concentrations in water samples was observed to be less than 0.02 mg/l in all the samples except at SGL-9
- Styrene concentration at SGL-9 is 0.0345 mg/l which is at an approximate distance of 1.5 km from LG Polymers
- BOD value of reservoir sample was found to be 4.7 mg/l which shows the increased biological activity
- Periodic evaluation of styrene levels in the ambient air up to 2 km radius area surrounding LGPST will help in understanding styrene levels in the ambient air and their impacts on human health and vegetation/animals is to be carried out.

Future Work:

CSIR-NEERI, Hyderabad Zonal Centre will be carrying out the air and water environment every month starting from May for a period of 8-9 months to assess the long term effect on the air and water environment. The plan of work is as follows:

- Collection of air samples, groundwater and surface water samples around LG polymers
- Analysis of the air, groundwater and surface water for styrene concentration
- Understanding the various parameters in air, groundwater and surface water
- Air modelling to understand the effect of the plume and prediction of the future scenario
- Risk assessment studies

References:

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Amoore, J.E. and Hautala, E (1983): Odor as an aid to chemical safety: Odor thresholds compared with threshold limit values and volatilities for 214 industrial chemicals in air and water dilution. Journal of Applied Toxicology, 3(6):272-290.

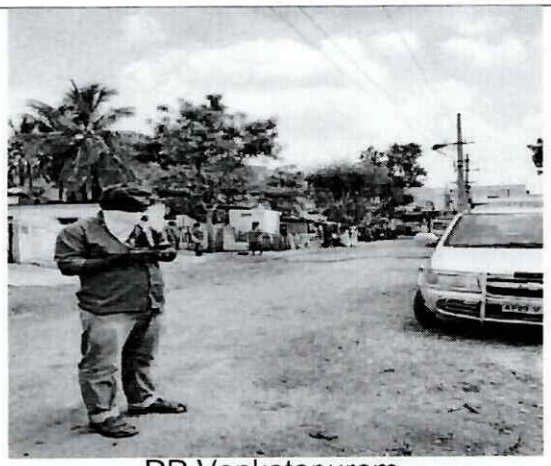
WHO (2003) Styrene in drinking-water. Background document for preparation of WHO Guidelines for drinking-water quality. Geneva, World Health Organization (WHO/SDE/WSH/03.04/27).

https://www.freedrinkingwater.com/water-contamination/styrene-contaminants-removal-water.htm

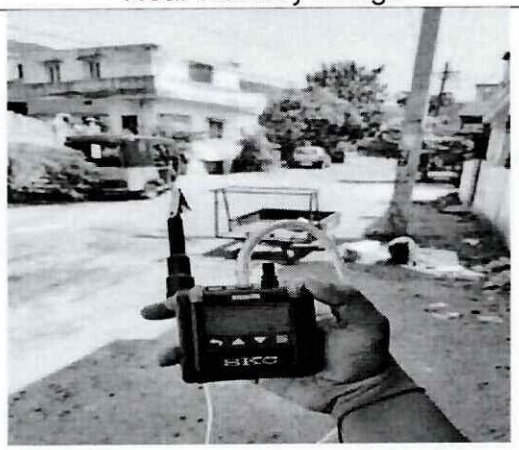
Photographs of Air and TVOC sampling at some locations in the Study Area

Near LGPST

Near Railway Bridge

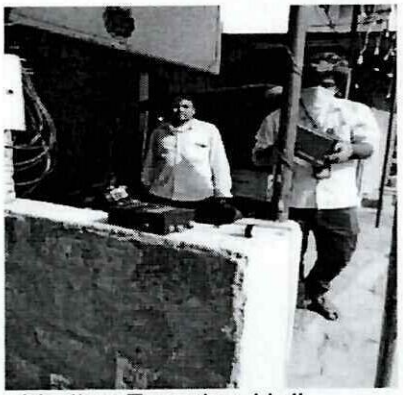


RR Venkatapuram

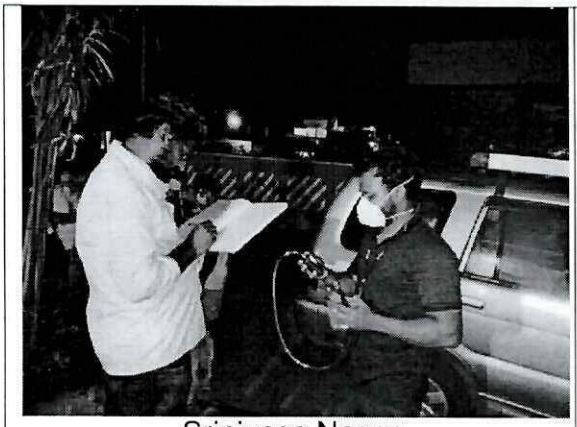


Nandamuri Nagar

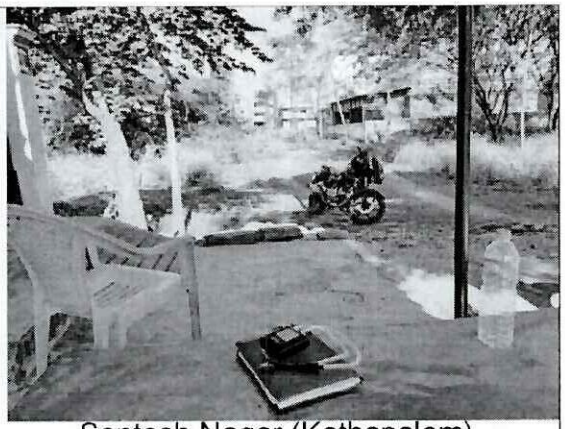
Jnnurm Colony



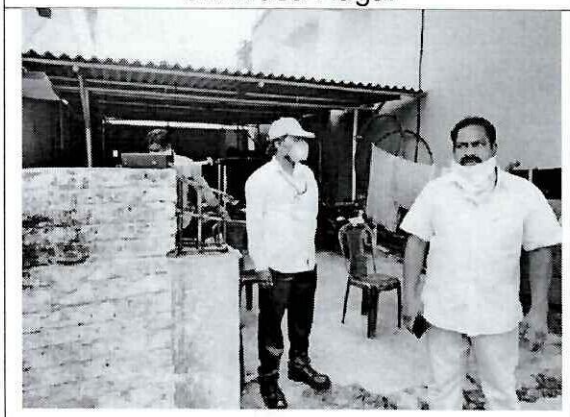
Vedica Function Hall



Srinivasa Nagar



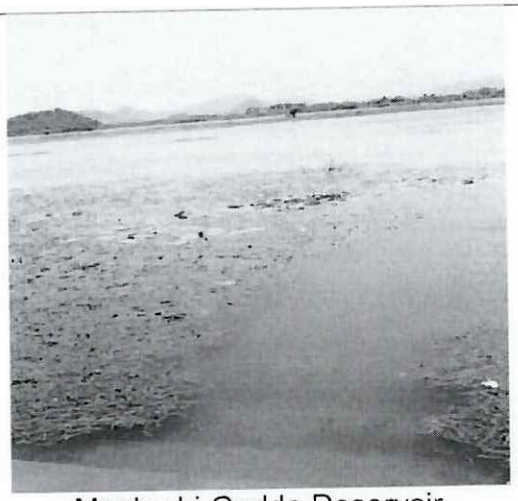
Santosh Nagar (Kothapalem)



Bapuji Nagar

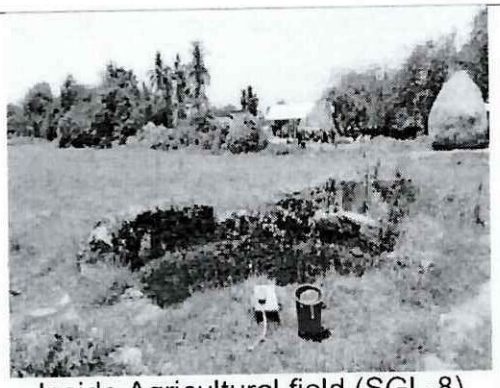
Vepagunta

Photographs of water sampling at some locations in the study area

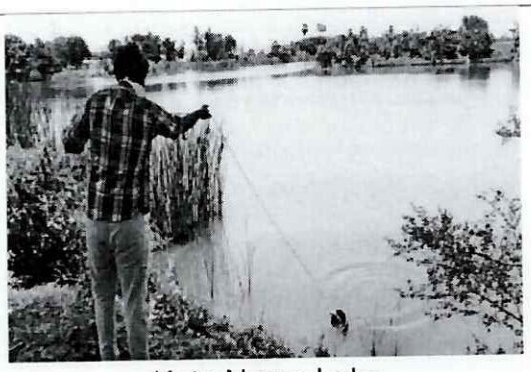


Meghadri Gedda Reservoir

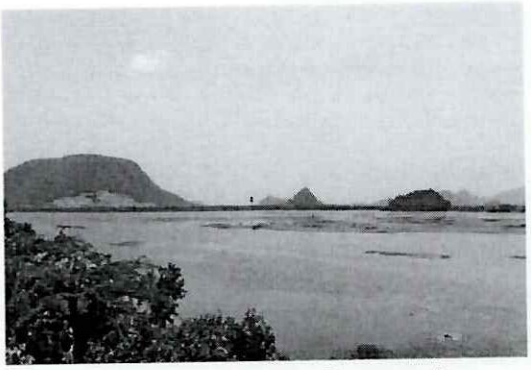
Near Elementary School, Venkatapuram



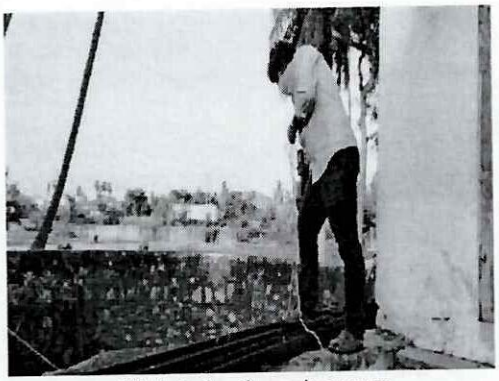
Inside Agricultural field (SGL-8)



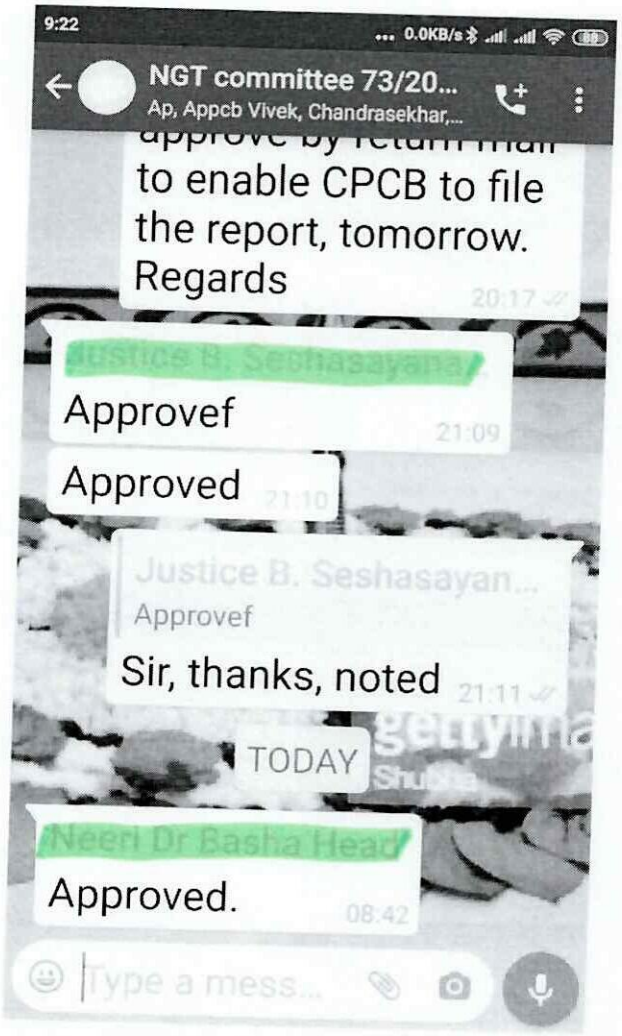
Kota Narva Lake

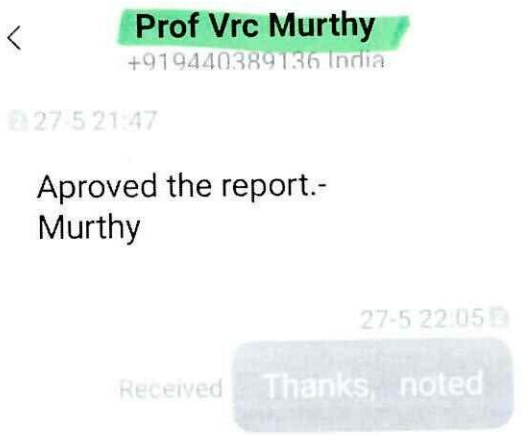


Meghadri Gedda Reservoir



Chintala Agraharam


9:22
0.0KB/s
NGT committee 73/20...
Ap, Appcb Vivek, Chandrasekhar,...
to enable CPCB to file the report, tomorrow. Regards
20:17
Approvef
21:09
Approved
21:10
Justice B. Seshasayan...
Approvef
Sir, thanks, noted
21:11
TODAY
Neeri Dr Basha Head
Approved.
08:42
Type a mess...


Prof Vrc Murthy
+919440389136 India
27 5 21:47
Aproved the report.-
Murthy
27-5 22:05
Received
Thanks, noted
Text message

Email **grbabu.cpcb@nic.in**

Re: Final draft for approval from members of the committee M/s LG Polymers

From : pjencon@gmail.com Wed, May 27, 2020 08:02 PM

Subject : Re: Final draft for approval from members of the committee M/s LG Polymers

To : madhu1960@gmail.com

Cc : bssr1951@gmail.com, Basha Shaik <s_basha@neeri.res.in>, prof chvrmurthy <prof.chvrmurthy@gmail.com>, srivaric@gmail.com, G Rambabu Scientist D <grbabu.cpcb@nic.in>

Approved, please proceed.

On Wed, May 27, 2020, 19:51 Dr. Madhusudanan M <madhu1960@gmail.com> wrote:

> Sirs
> I am directed to forward the the final draft for concurrence from Committee members.
> Certain technical corrections and flow of the report has been modified.
> Kindly endorse the concurrence/approval of the report by return mail. Due to paucity of time the members are requested to endorse their approval through return mail
> --
> Regards,
>
> **Dr.M.Madhusudanan, Scientist 'E' (Regional Director, Chennai)**
> **Central Pollution Control Board,**
> **Regional Directorate, 2nd Floors, 77-A, South Avenue Road, Ambattur Industrial Estate, Ambattur Taluk, Thiruvallur Dist. Chennai 600 058**
> **(R)91 80 23586793 (M),08745057374, 09448019014**
> **(Ministry of Environment Forest & CC, Govt. of India, New Delhi)**

Email **grbabu.cpcb@nic.in**

Re: Final draft for approval from members of the committee M/s LG Polymers

From : director@csiriict.in Thu, May 28, 2020 08:48 AM

Subject : Re: Final draft for approval from members of the committee M/s LG Polymers

To : pjencon@gmail.com

Cc : madhu1960@gmail.com, G Rambabu Scientist D <grbabu.cpcb@nic.in>, Basha Shaik <s_basha@neeri.res.in>, bssr1951@gmail.com, prof chvrmurthy <prof.chvrmurthy@gmail.com>

Approved.

On Wed, 27 May 2020 at 8:02 PM, Jagannadha Rao Patruni <pjencon@gmail.com> wrote:
Approved, please proceed.

On Wed, May 27, 2020, 19:51 Dr. Madhusudanan M <madhu1960@gmail.com> wrote:

Sirs
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Regards,

Dr.M.Madhusudanan, Scientist 'E' (Regional Director, Chennai)
Central Pollution Control Board,
Regional Directorate, 2nd Floors, 77-A, South Avenue Road, Ambattur Industrial Estate, Ambattur Taluk, Thiruvallur Dist. Chennai 600 058
(R)91 80 23586793 (M),08745057374, 09448019014
(Ministry of Environment Forest & CC, Govt. of India, New Delhi)

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