

Chapter-7

Additional Studies

A) RISK ASSESSMENT

7.1 INTRODUCTION

The risk assessment studies have been conducted for identification of hazards, to calculate damage distances and to spell out risk mitigation measures. **M/s. Genext Steels Private Limited** is a Greenfield project, proposes establishment of mini integrated steel plant with captive power plant at Survey Nos. 661, 662, 664, 665, 1822 & 1823, Village: Bagodara, Tehsil: Bavla, District: Ahmedabad, State: Gujarat. Unit proposes production of Pellet plant (Pellets – 800 TPD) DRI Kilns (Sponge Iron – 600 TPD), Steel Melting Shop (MS Billets – 1,000 TPD), Rolling Mill (Structural Steel TMT Bars & Rolled products – 1,000 TPD), Power Generation–12 MW [7 MW through Waste Heat Recovery Boiler (WHRB) and 5 MW through Fluidized bed combustion (FBC) Boiler].

Hazard analysis involves the identification and quantification of the various hazards/unsafe conditions that exist in the plant. Risk analysis follows an extensive hazard analysis, involving identification and assessment of risks the neighbouring populations are exposed to as a result of hazards present. Based on the risk estimation Disaster Management Plan (DMP) has been prepared.

7.2 STUDY OBJECTIVE

The objectives of environmental risk assessment are following,

- Identifying the potential hazardous areas so that adequate design safety measures can be adopted to reduce the likelihood of accidental events,
- Identifying the stakeholders and evaluating their risk along with proposing adequate control techniques,
- Identifying the probable areas of environmental disaster which can be prevented by proper design of the installations and its controlled operation, and
- Managing the emergency situation or a disastrous event, if any, during the plant operation.

7.3 HAZARDOUS IDENTIFICATION

Hazard identification involves the process of collecting information on:

- The types and quantities of hazardous substances stored and handled,
- The location of storage tanks & other facilities,

- Potential hazards associated with the spillage and release of fuel.

The steel manufacturing industry is labor intensive and uses large scale and potentially hazardous manufacturing processes. The industry experiences accident rates that are high compared with some other manufacturing industries. Some examples of such hazards likely to occur in proposed Sponge Iron Plant, Induction Furnace, Continuous casting machine, Rolling Mill, CPP unit are given below. These mainly impact on those working within the industry, although health hazards can also impact on local communities.

- Fire
- Explosion
- Physical Hazards due EOT cranes, conveyor system, material handling
- Fugitive Dust of Raw Material handling at charging bay, storage yard, Crusher, DRI Kiln, billet crushers
- Occupational health issue of Fly Ash, slag crushing dust, dolomite exposure
- Collapse of Structures/Fall of Material, stacking failure
- Loading/Unloading /Packaging Operations failures
- Electrocution/ Electrical Hazards
- Accidental Spillage of hot molten metal & Diesel fuel

A preliminary hazard analysis here carried out is to identify the major hazards associated. Finally, risk reducing measures are deduced and implemented. The identification of hazards anticipation for the proposed project activities are presented below.

7.3.1 Identification of source of Ignition

- Creation of hotspots during operation & maintenance of Process equipment
- Self-ignition of hot materials
- The electrical Discharge (thunderbolt, electrostatic charges, short circuits), Static charge.

7.3.2 Identification of sources of Fire & Explosion

- Oil and Lubricant Room (spillage)
- Fine Coal Hoppers
- Coal Storage area
- Electrical Substations (Short circuit)
- FBC Boilers
- Induction Furnace

7.3.3 Thermal radiation

Enlists damage consequences due to different Heat Loads are given below:

Table 7.1 List of Damages Envisaged at Various Heat Loads

Sr. No.	Heat loads (kW/m ²)	Type of Damage Intensity	
		Damage to Equipment	Damage to People
1	37.5	Damage to process equipment	100% lethality in 1 min. 1%
2	25.0	Minimum energy required to ignite wood	50% Lethality in 1 min. Significant injury in 10 sec
3	19.0	Maximum thermal radiation intensity allowed on thermally unprotected equipment	--
4	12.5	Minimum energy required to melt plastic tubing	1% lethality in 1 min
5	4.0	--	First degree burns, causes pain for exposure longer than 10 sec
6	1.6	--	Causes no discomfort on long exposures

7.3.4 Physical Hazards onsite

- Dust Exposure at coal handling area
- Dust Exposure of Fly Ash, Bottom Ash
- Dust Exposure of minerals, Slag (SMS)
- Accident due to EOT crane, Conveyor system, Material handling
- Slip/Trip/Fall due to improper stacking of material

7.3.5 Loading/Unloading operation/Storage

- Approach of heavy good vehicles for unloading material
- Work inside hopper/Silo for unblocking of mouth
- Excessive Dust during Loading/unloading operation
- Airborne dust
- Conveyor moving parts
- Cleaning of overflows
- Unauthorized passages, travelling over transportation system
- Motor overloading
- Unclean platforms causing staggering and falls

7.3.6 Silo cleaning operation

- Work in confined spaces
- Falling of material
- Falling of personal from working platform
- Exposure to dust

- Use of lifting equipment

7.3.7 Steel Melting Shop

The main hazards arise out of the use of hot metal and oxygen at the spillage of hot metal cause serious burn injuries and fires. Severe explosions are also caused due to hot metal falling over a pool of water, resulting in injuries to persons, fire and damage to equipment due to flying of hot splinters & splashing of liquid metal/slag. Sudden break out of molten metal result in heavy explosions, due to their coming in contact with water, thereby causing serious burn injuries to persons and damage to equipment.

7.3.8 Electrical Hazard

Electrical equipment such as motors, circuit breakers, transformers, and switchgear can produce sparks and ignite dust clouds and hybrid dust/air mixtures in the vicinity.

- Ingress of dust into enclosures with subsequent ignition causes smoldering or burning (fires)
- Dust that enters an enclosure will settle out as layers on internal surfaces and become heated
- Electrically conductive dusts causes short-circuiting when deposited on exposed electrical components and circuits
- Abrasive and/or corrosive dusts damages components of electrical equipment
- Electric shock

7.3.9 Dust and Gas

Dust is generated from handling and storage of raw materials. In the melting process, high temperature operations are conducted; workers may be exposed to gas inhalation hazards. Recommendations to prevent exposure to gas and dust include the following:

- Facility for ventilation to maximize air circulation. Outlet air shall be filtered before discharge to the atmosphere;
- Exhaust ventilation should be installed at the significant point sources of dust and gas emissions;
- Provide separate eating facility that allow for washing before eating;
- Provide facilities that allow work clothes to be separated from personal clothes, and for washing/showering after work;
- Implement a policy for periodic health checks.

7.3.10 Captive Power plant (CPP Unit)

- Steam Handling and Pressure drop (Steam Explosion)
- Fly Ash handling

- Exposure to High temperatures
- Physical Hazards
- Blast overpressure
- Design failure
- Failure of Safety Relief devices
- Id fan/PA fan/SA fan failure
- Circulation line failure
- Turbine system failure
- Furnace bed maintenance for FBC Boiler
- Dosing System Failure (HP and LP)
- Failure of fuel firing system/Burner Management system (BMS)
- RCC chimney blockage
- Temperature drop and failure of Air cooled condenser, Low pressure (LP) and High Pressure (HP) heater and Drain cooler
- Failure of re-circular system
- Pump failure (Boiler feed, HSD unloading, Transfer)

7.3.11 Waste Heat Recovery Boiler (WHRB Unit)

- Blast Over pressure
- Steam Pressure drop
- Leak , Catastrophic rupture in gas lines
- Temperature drop in Boiler, Pre heater
- Process failure

7.3.12 Respiratory Hazards

Damaged material should be repaired or removed while other materials may be monitored and managed. Any handling of insulation materials deemed to contain asbestos or any other hazardous material should only be performed by properly trained and certified contractors and personnel following internationally accepted procedures for their repair or removal;

- Use of asbestos must be avoided in new installations or upgrades;
- An LDPE sheet should be placed under the item to be insulated (e.g. tube or vessel) and under the stock of insulation material to be layered, to prevent surface contamination with fibers.

7.3.13 Noise

Raw and product material handling as well as the production processes themselves may generate excessive noise levels.

7.3.14 Fire & Explosion Hazards

Handling of liquid metal may result in explosions causing melt run out, and burns, especially if humidity is trapped in enclosed spaces. Other hazards include fires caused by melted metal and the presence of liquid fuel. Recommended techniques to prevent and control explosion and fire hazards include the following:

- Protect flammable gas, oxygen pipelines and combustible materials during 'hot work' maintenance activities;
- Design electrical equipment to prevent risk of fire in each plant area (e.g. voltage/ampere design and degree of cable insulation; protection of cables against hot liquid exposure; use of cable types that minimize fire propagation)

7.3.15 Heat and Hot Liquid

High temperatures and direct radiation are common hazards in integrated metallurgical plants. High temperatures can cause fatigue and dehydration. Direct radiation also poses a risk to sight. Potential contact with hot metal or hot water may occur from the cooling zone, from splashes of melted metal, and from contact with hot surfaces. Recommended measures for prevention and control of exposure to heat and hot liquids/materials include the following:

- Shield surfaces where close contact with hot equipment or splashing from hot materials is expected;
- Implement safety buffer zones to separate areas where hot materials are handled or temporarily stored. Rail guards around those areas should be provided, with interlocked gates to control access to areas during operations;
- Use appropriate PPEs (e.g. insulated gloves and shoes, goggles to protect against radiation, and clothing to protect against heat radiation and liquid metal splashes);
- Install cooling ventilation to control extreme temperatures;
- Implement work rotations providing regular work breaks, access to a cool rest area, and drinking water.

7.3.16 Fire & Explosion Index

Fire and Explosion Index (FEI) is useful in identification of areas in which the potential risk reaches a certain level. It estimates the global risk associated with a process unit

and classifies the units according to their general level of risk. FEI covers aspects related to the intrinsic hazard of materials, the quantities handled and operating conditions. This factor gives index value for the area which could be affected by an accident, the damage to property within the area and the working days lost due to accidents. Fire and explosion index is then calculated as the product of Material Factor (MF) and Unit Hazard Factor. Degree of hazards based on F& EI given in the following **Tables 7.2** and **Table 7.3** respectively.

Table 7.2: Degree of Hazards Based on F& EI

FEI Range	Degree of Hazard
0 – 60	Light
61 – 96	Moderate
97 – 127	Intermediate
128 - 158	Heavy
159 and Above	Severe

Table 7.3: Calculated Degree of Hazards for Genext

S. No.	Unit	Parameter	Hazard F&EI Potential	Remarks
1	Raw materials & Products	Iron ore	Light	Physical Hazard
		Coal	Moderate	Fire
		Fly Ash, Bottom Ash, Slag	Moderate	Dust & Toxic
		Other fluxing minerals	Light	Dust & Toxic
		Product steel	Light	Physical Hazard
2	Iron making In Rotary kiln/Steel making in Induction Furnace	Coal reduction fuel gas	Intermediate	Flammable and CO pollution
		Molten metal	Intermediate	Personnel injury & fire
		Hot Metal	Intermediate	Personnel injury & fire
		Burning coal	Intermediate	Personnel injury & fire
3	Rolling Mills	Hot rolled metal	Intermediate	Personnel injury & fire
4	Fuel gas Distribution	Gas leaks	Intermediate	Fire and CO pollution
5	Electric power supply	Short circuit	Intermediate	Fire
6	Transformer	Electrical Fire	Light	Explosion & fire
7	Steam turbine generator building	Explosion	Moderate	Fires in Lube oil system, Short circuit in control room/ switch gear, cable galleries & oil drum storage
8	Boilers explosion	Heat recovery Boilers	Moderate	Fire/steam
9	Coal Handling	Storage shed	Moderate	Fire or dust explosion

	plant			
10	Coal Storage	Storage shed	Moderate	Spontaneous Combustion

7.3.17 Heat Stress

Workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress. Exposure to extreme heat can result in occupational illnesses and injuries. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. Heat can also increase the risk of injuries in workers as it may result in sweaty palms, fogged-up safety glasses, and dizziness. Burns may also occur as a result of accidental contact with hot surfaces or steam. Prevention of heat stress in workers is important. Employers should provide training to workers so they understand what heat stress is, how it affects their health and safety, and how it can be prevented.

Radiant heat flux intensity, kW/m²	Effects on people
1.5	No harm; safe for the general public and for the stationery personnel
2.5	Intensity tolerable for 5 min; severe pain above this exposure time
3	Intensity tolerable for non-frequent emergency situations for 30 min
5	Pain for 20 s exposure, first degree burn. Intensity tolerable for those performing emergency operations
6	Intensity tolerable for escaping emergency personnel
9.5	Second degree burn after 20 seconds
12.5-15	First degree burn after 10 seconds, 1% fatality in 1 min
25	Significant injury in 10 s, 100% fatality in 1 min
35-37.5	1% fatality in 10 s

7.4 MITIGATION MEASURES

Risk Mitigation measures for the proposed project activities require adoption of best safety practice at the respective construction zones as well as operational phase within the works boundary. In addition, the design and engineering of the proposed facilities will take into consideration of the proposed protection measures for air and water environmental as outlined in earlier Chapter.

7.4.1 Coal Handling Plant

- Coal handling unit shall be minimum 500 meters away from the residential area, school/colleges, Historical Monuments, Religious Places, Ecological sensitive area as well as forests area. Also from Railway line, Express ways, National Highways, State ways and District Roads and from water bodies like River, Nala, Canal, Pond etc.
- Coal storage unit shall provide paved approach with adequate traffic carrying capacity.

- Compound wall with adequate height should be constructed around the coal storage area
- The unit should have adequate water supply through pipe/ surface water before selection of the site.
- Coal storage unit should ensure that stacking of coal in heaps does not get higher than the compound wall of premises of unit
- Adequate dust suppression measures should be provided to prevent fugitive emission and also risk of fire. Similar measures should be adopted for loading/unloading operations. Coal ash should be transported in tankers, which are covered and closed and there is no chance of spillage during transportation.
- Firefighting measures should be provided to avoid any fire and ensure that there is no explosive or chemical reaction in storage yard.
- Coal unit should take measures to control the air pollution while loading/handling coal. Specific measures should be under-taken to avoid fugitive emission at the time of loading/unloading of coal by individual coal yard unit.

7.4.2 Induction Furnace

- Gas safety man would accompany the team and would test the atmosphere for the presence of CO, before starting the work. If CO, concentration is found exceeding the safe limit, the job would be undertaken using necessary safety appliances viz., Oxygen Breathing Apparatus/Blower type Gas mask.
- Any gas cutting /welding job would be undertaken with the clearance from Gas safety man.

7.4.3 Control Rooms

- Control rooms shall be blast proof and shock proof
- The building shall be located upwind of the process storage and handling facilities.
- Adequate number of doors shall be provided in the control room for safe exit
- Smoke detectors system shall be provided for control rooms at suitable locations
- One hydrant (minimum) for every 45m per wall of the building shall be positioned all around the building

7.4.4 Gas Explosion, Prevention & Preventive Measure

The following actions would be taken to prevent any gas explosions in case of gas leakage.

- For works on gas lines/equipment, non-sparkling copper tools will be used. If such tools are not available, grease coated steel tools would be used.

- Electrical drill & other electrical equipment will not be used as these can give rise to sparks.
- The gas line would be thoroughly purged with steam before undertaking the job on the same.
- Naked lights will not be used near any de-pressurized gas main or equipment unless the same has been thoroughly purged.
- In case of profuse leakage of gas, action would be taken for water sealing and isolating that portion.
- The approach road to the gas line complex would be kept free from any obstructions.
- If gas catches fire due to some leakage, it will be extinguished with plastic clay, steam or water.
- The portion of gas main affected would be cooled down with water. The valve will not be closed when fire is still there and the pressure in the main will be maintained at minimum 100mm (WC).
- Gas tapping points of flow or pressure measurement will be cleaned with wooden stick or grease coated wire.
- If lighting is necessary near gas line, portable spark, proof electrical lamps of low voltage or explosion proof torchlight will be used for enclosed areas.

7.4.5 Mitigation measure for Hot Metal spillage

Any accumulation of water will be prevented in such vulnerable areas.

- In case of minor leakages, the flow of molten metal will be controlled.
- If there is major breakout, the area would be cut off and cordoned.
- Vital connections e.g. water, gas, compressed air, oxygen etc., would be cut off or regulated as per requirement.

7.4.6 Electrical safety

- Adequately rated and quick response circuit breakers, aided by reliable and selective digital or microprocessor based electromagnetic protective relays would be incorporated in the electrical system design for the proposed activities.
- The metering and instruments would be of proper accuracy class and scale dimensions.
- Fire Hydrant system

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- All the fire extinguisher system will be controlled by the Security Department. Safety department will consist of qualified safety manager, safety officer and supporting staff.
- Portable fire extinguishers
- Sprinkler system employed near fire prone areas
- Fire Buckets

Table 7.4: Details of Fire Fighting Facilities onsite

Sr. No.	Name of site		Type of Extinguisher
1	Cable galleries		CO ₂ & Foam type, Dry chemical powder
2	High voltage panel		CO ₂ & Foam type, Dry chemical powder
3	Control rooms		CO ₂ & Foam type, Dry chemical powder
4	MCC rooms		CO ₂ & Foam type, Dry chemical powder
5	Pump Houses		CO ₂ & Foam type, Dry chemical powder
6	Offices		Dry chemical powder, foam type
7	Godowns		Foam type
8	Bunkers, enclosed collector	Silo, dust	CO ₂ type, N ₂ type, automatic sprinkler, fixed spray nozzle (unless water reactive)

7.4.7 Personal Protective Equipment (PPE)

Personal Protective equipment kept onsite are made readily available to plant personnel. **Table 7.5** shows the lists of recommended Personal Protective equipment (PPE) onsite.

Table 7.5: Summary of Recommended Personal Protective Equipment According to Hazard

Description	Workplace	Hazards Suggested PPE
Eye and face protection	Flying particles, molten metal, gases or vapors, light radiation	Safety glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords	Plastic helmets for top and side impact protection
Hearing protection	Noise	Hearing protectors (ear plugs or ear muffs)
Foot protection	Falling or rolling objects, points objects. Corrosive or hot liquids	Safety shoes and boots for protection against moving and falling objects, liquids and chemicals
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures	Gloves made of rubber or synthetic material (Neoprene), leather, steel, insulation materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors	<ul style="list-style-type: none">➤ Facemasks with appropriate filters for dust removal and air purification (chemical, mists, vapors and gases).➤ Single or multi-gas personal monitors, if available
	Oxygen deficiency	Portable or supplied air (fixed lines). Onsite rescue equipment
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Insulating clothing, body suits, aprons etc. of appropriate materials
Fly Ash	Fly ash handling and storage	<ul style="list-style-type: none">➤ For handling, dust-proof goggles and rubber or PVC gloves.➤ For large quantities or where heavy contamination is likely, wear: coveralls.➤ For high dust levels, wear: a Full-face Class P3 (Particulate) or an Air-line respirator.➤ For inhalation risk exists, wear: a Class P1 (Particulate) respirator.

7.5 NATURAL CALAMITIES WHICH MAY LEAD TO EMERGENCY**7.5.1 Heat Stroke**

Heat stroke is the most serious heat-related disorder. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106 °F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not given. Measures proposed for reduction of heat stress around furnace and for safe handling of the hot metal considering the provision of Gujarat Factories Rules.

Symptoms of heat stress

Symptoms of heat stroke include:

- Hot, dry skin or profuse sweating
- Hallucinations
- Chills
- Throbbing headache
- High body temperature
- Confusion/dizziness
- Slurred speech

First Aid

Take the following steps to treat a worker with heat stroke:

- Move the sick worker to a cool shaded area.
- Cool the worker using methods such as:
 - ✓ Soaking their clothes with water.
 - ✓ Spraying, sponging, or showering them with water.
 - ✓ Fanning their body.

7.5.2 Earthquake

The project area falls under the seismic zone-III, which is the Low risk earthquake. It may trigger into a technological disaster, includes collapse of old structures, buildings leading to fire and explosion. Earthquake cannot usually be forecasted and therefore precautions immediately prior to such event are not usually possible.

Emergency recovery plan has been considered by the emergency management team as per the situation and site conditions as follows in **Table 7.6:**

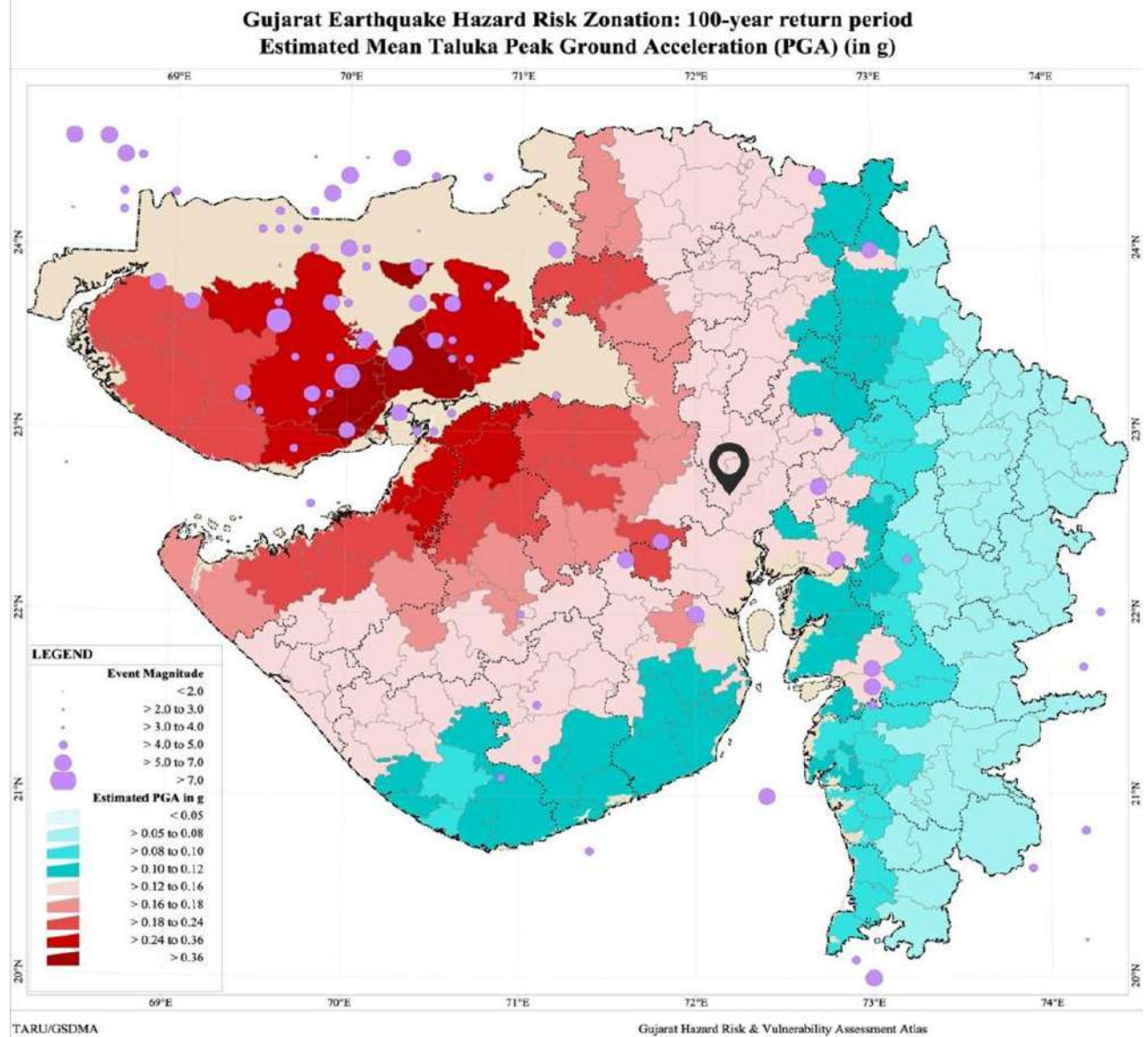
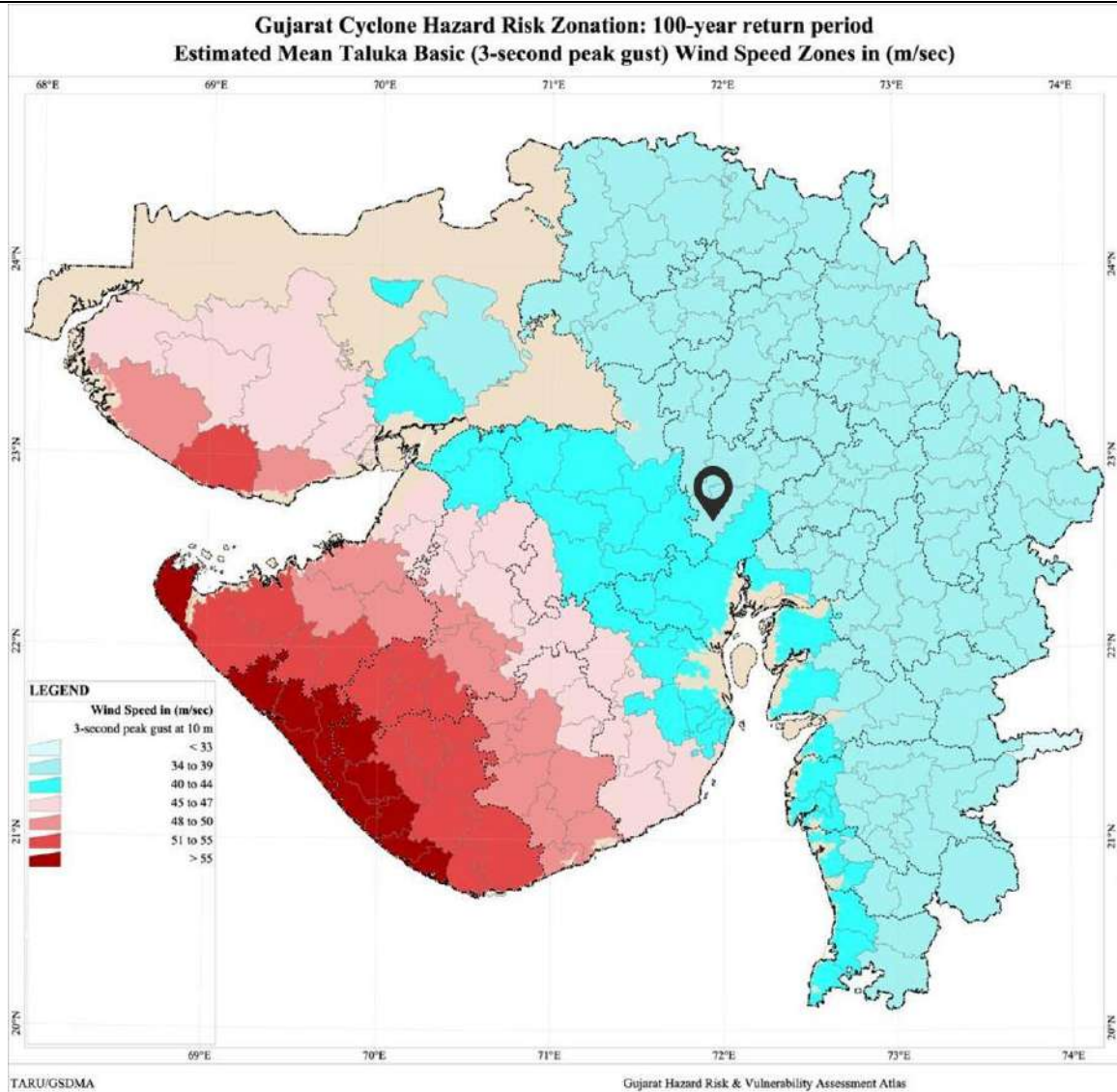


Table 7.6**Emergency recovery plan**

Step	Activity	Action By
Preparedness	<ul style="list-style-type: none"> ▪ Constitute Emergency Response Team ▪ Identify ECC, if the identified ones are damaged ▪ Control centers to be equipped with <ul style="list-style-type: none"> ✓ Alarming ✓ Communication facilities ✓ Emergency vehicles/equipment ✓ List of emergency contacts & suppliers ✓ Medical facilities 	Plant Key Person
Action during effective period	<ul style="list-style-type: none"> ▪ Do not panic. Raise alarm ▪ Avoid standing near to windows, external walls ▪ Stand near the columns or duck under sturdy furniture. ▪ Assemble at emergency assembly point as there may be aftershocks 	Individual(s)
Action after effective Period (Establish Emergency Control Center. Site Main Controller to direct all activities)	<ul style="list-style-type: none"> ▪ Assess situation and initiate shut down of plants (if required) ▪ Initiate search & rescue (if required) ▪ Evacuation of people. ▪ Recovery/ Rehabilitation Work ▪ Medical care for the injured. ▪ Supply of food and drinking water. ▪ Temporary shelters like tents, metal sheds etc. ▪ Repairing lines of communication and information. ▪ Restoring transport routes ▪ Take head count ▪ Activate emergency plan as situation demands ▪ Assess damage 	Main Controller, Incident Controller, Site Incident Controller, Coordinators – Fire & Security, Safety, Material and Medical

7.5.3 Cyclone

The project area falls under low risk for Cyclone. The contingency actions shall be based on the weather forecasts obtained from meteorological stations and the local meteorological department. Some of the important actions to be carried out are as follows:



Prior to Cyclone

- Communication with the local meteorological department.
- Maintain distances from storm in order to execute preparatory actions in a shorter time.
- Considering the consequences about the emergency might have on operations and personnel.
- Review all operations carefully to ensure that systems in jeopardy are taken care of or shut down.
- Ensure the readiness of first aiders, emergency vehicles, medical centre, medicines etc.
- Metallic sheets, loose materials, empty drums and other light objects shall be properly secured.
- Flush the drainage systems.

During Storm

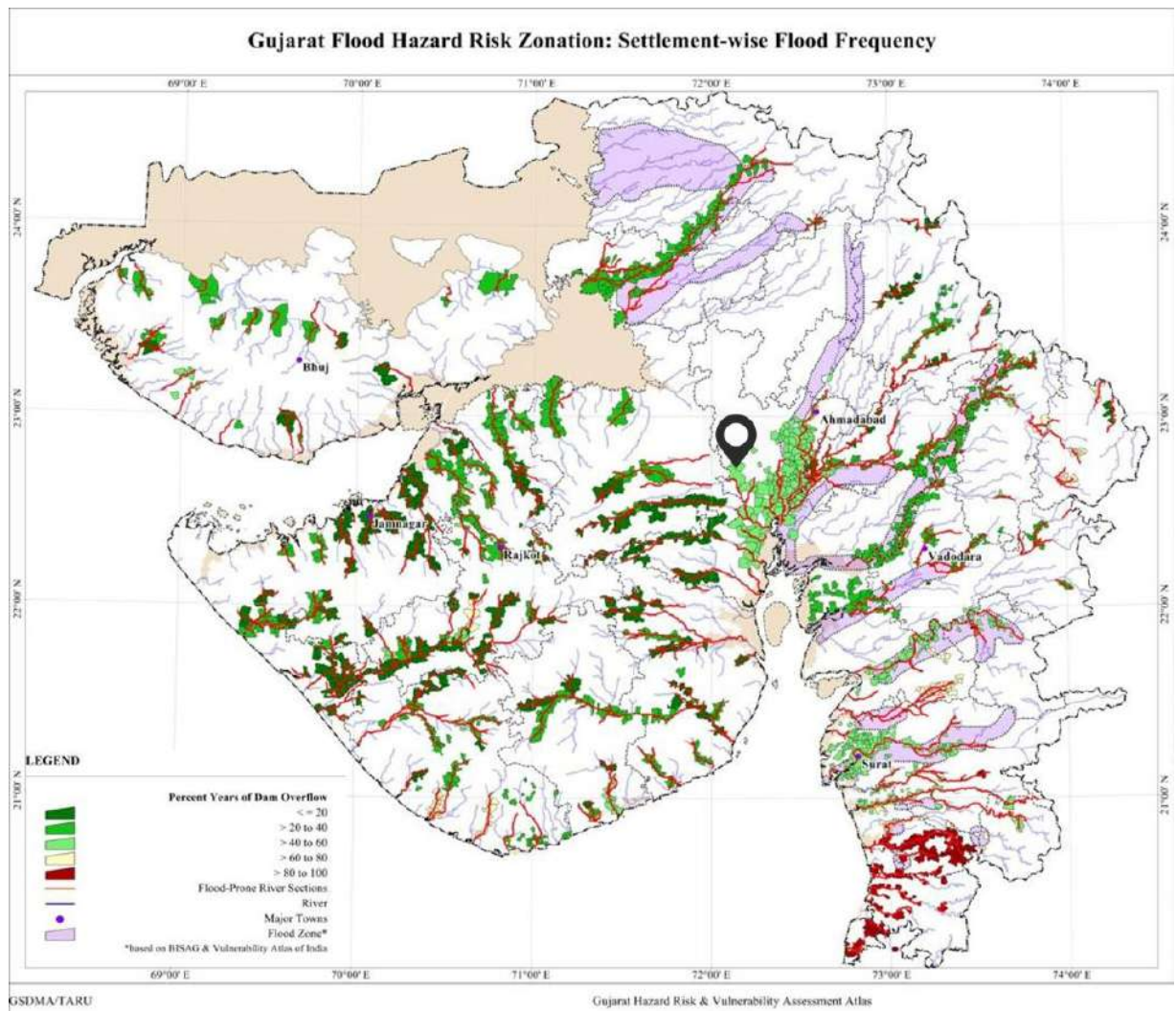
- Remain calm.
- Avoid going outdoors.
- Do not seal the office completely as the suction created by the difference in atmospheric pressure inside and outside can rip open a window or door by breaking window glass panes.

After the Storm

- Do not touch electric lines.
- Stay away from the disaster area.
- Take special precautions in driving vehicles since the under-pavement could cave in due to the weight of automobile.

7.5.4 Flood

The study area is at moderate risk for floods due to dam overflow. Flood control measures will be taken as required maintaining the Plant safety.



7.6 GENERAL SAFETY PRECAUTIONS & OCCUPATIONAL HEALTH

Safety of plant personnel and equipment's is of paramount importance irrespective of plant size. Unit should bring its environment, health and safety policy and follow it. Proper safety procedures are being followed as far as possible including the use of personal protective gadgets (hand gloves, dust masks, face shield, goggles, apron etc. as required) by the workers while charging material manually (if required). A schedule has been drawn up for regular preventive maintenance of each unit and the same needs to be faithfully followed as far as possible. The unit's management should ensure that all rotating machines and moving parts are provided with appropriate guards and the guards are put back in the position after checkup and maintenance. All the control systems are being periodically checked for their reliability and accuracy. Ventilation has been provided in process area where chances of buildup of concentration of hazardous chemicals are high to prevent fire/toxic hazard. Electrical grounding of all equipment is ensured. **Genext Steel Pvt. Ltd.** will adopt suitable measures for the proper occupational health safety of workers complying to OSHA standards. Permissible Exposure Level (PEL) of various Chemical Handled onsite is listed below in **Table 7.7**.

- Dust Exposure level of shop floor workers shall be appropriately monitored.
- Check of the effectiveness of preventive and control measures on regular basis.
- Adequate supplies of potable drinking water is to be provided .Water supplied to areas of Plant food preparation or for the purpose of personal hygiene (washing or bathing) are according to drinking water quality standards.
- Where there is potential for exposure to harmful dusts by ingestion arrangements are to be made for clean eating areas, where workers are not exposed to the hazardous or noxious substances.
- Periodic medical hearing checks are to be performed on workers exposed to high noise levels.
- Provisions are to be made to provide OHS orientation training to all new employees to ensure they are apprised of the basic site rules of work at/on the site and of personal protection and preventing injury to fellow employees.
- Contractors that have the technical capability to manage the occupational health and safety issues of their employees are to be hired, extending the application of the hazard management activities through formal procurement agreements.
- Ambulances and first aid treatment facilities are made available for any emergency situation.

Table 7.7: PEL level Summary as per OSHA

Sr. No.	Chemical Name	OSHA PEL	Cal/OSHA PEL	NIOSH REL	ACGIH
		mg/m ³	8-hour TWA (ST) STEL (C) Ceiling mg/m ³	Up to 10-hour TWA (ST) STEL (C) Ceiling mg/m ³	TLV
1.	Coal Dust				0.9 (resp.) bituminous or lignite; 0.4 (resp.) anthracite (coal dust to be monitored for crystalline silica)
	a) Respirable fraction less than 5% SiO ₂	2.4 mg/m ³	0.9 (bituminous)	1	
	b) Respirable fraction greater than 5% SiO ₂	10/(%SO ₂)	0.1 (bituminous)		
2.	Iron oxide	10 (fume)	5 (fume)	5 (dust and fume)	5 mg/m ³
3.	Fly Ash (calcium oxide, silicates)	--	--	--	1 mg/m, natural as Wollastonite (IHL, no asbestos and <1% crystalline silica)
4.	Carbon Mono oxide	55 mg/m ³	25 ppm	35 ppm	25 ppm
Reference- OSHA/PEL exposure limit Guide					

Workers' health shall be evaluated by pre designed format, given below for chest X rays, Audiometry, Spirometry, Vision testing (Far & Near vision. color vision and any other ocular defect) ECG, during pre-placement and periodical examinations that will give the details of the same.

Spirometry Tests						
Year	Total Manpower	FVC (litres)	FEV 1	FEV 1/FVC %	PEFR	Conclusion

Physical Examination Tests								
Year	Total Manpower	Pulse	ECG	BP	Right Eye	Left Eye	Color Blindness	Squint

Investigations Tests						
Year	Total Manpower	Blood (CBC)	Blood Sugar (F& PP)	Lipid profile	Urine (R&M)	Conclusion

Audiometry Tests					
Year	Total Manpower	Audiometry done	Normal	Abnormal	Conclusion

Annual report of health will be reviewed for Genext Steel Pvt. Ltd., manpower once the facility the proposed activity is operational as per above given formats.

Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers.

Necessary required budgetary allocation will be kept for to ensure safety of all Employees including contract & casual workers.

7.7 RISK REDUCTION MEASURES

For the risk reduction, the following salient suggestions and recommendations are made:

- On site and off site emergency response plan should be prepared and circulated to concern persons.
- Personnel at the proposed plant and public in surrounding area should be made aware about the plant and risk associated with them.
- A written process safety information document should be compiled for general use.
- The document compilation should include an assessment of the hazards presented including (i) Physical data (ii) thermal data (iii) process and mechanical design.
- A system of checking testing/sealing of relief valves during major plant overhauls should be instituted for plant equipment, wherever it is applicable.
- Predictive and preventive maintenance schedule should be prepared for equipment, piping, etc. and thickness testing should be done periodically as per standard practices.
- Safe work practices should be developed to provide for the control of hazards during operation and maintenance such as: (i) lockout /tag out (ii) Confined space entry (iii) Opening process equipment or piping (iv) Control over entrance into a facility by maintenance, contractor or other support personnel.
- Personnel engaged in handling of hazard activities should be trained to respond in an unlikely event of emergencies.
- The plant should check and ensure that all instruments provided in the plant are in good condition, regular preventive maintenance must be carried out and records of preventive maintenance should be maintained.
- Safety measures in the form of Do and Don't Do should be displayed at strategic locations especially in local language and English.

7.8 GENERAL WORKING CONDITIONS**(a) House Keeping**

- All the passages, floors and stairways should be maintained in good condition. The system should be available to deal with any spillage of dry or liquid chemical at the plant.
- Walkways should be clearly marked and free from obstructions.
- In the plant, precaution and instructions should be displayed at strategic locations.
- All pits, sumps should be properly covered or securely fenced.
- Roads/walkway within the plant should be maintained neat and clean.

(b) Ventilation

- Adequate ventilation should be provided in the work floor environment.
- The work environment should be assessed and monitored regularly.
- Local ventilation is most effective method for controlling dust and gaseous emissions at work floor.

7.8.1 Safe Operating Procedures

- Safe operating procedures should be available for all operations practices and equipment.
- The workers should be informed of the consequences of failure to observe the safe operating procedures.

7.8.2 Work Permit System

Work permit system should be followed at the plant. Hazardous work permit should be used for hot work, electrical works, working in confined space etc.

7.8.3 Personnel Protective Equipment (PPEs)

- The required PPEs for each area/operation should be identified and the necessary PPEs, like helmets, goggles, hand gloves, mask, safety belts, ear muff and plug, etc. should be made available to the personnel.
- The workers should be trained for proper use of PPEs.
- The system should establish and maintained for replacement of damaged PPEs by testing and safety requirements.
- Lockers should be provided to the workers for safe custody and storage of PPEs.

7.8.4 Emergency Preparedness

- On-site emergency plan should be prepared and readily available for an unlikely event of emergency.

- Emergency telephone numbers should be available and display properly strategic locations.

7.8.5 Static Electricity

- All equipment and storage tanks/containers of flammable materials should be bounded and earthed.
- Electrical resistance for earthing circuits should be maintained. Periodic inspections should be done for earth pit and record should be maintained.

7.8.6 Access

- Adequate safe access should be provided to all places where workers need to work and all such access should be in good condition.

7.8.7 Material Handling

- Material handling areas should be clearly defined.
- The workers should be made aware about the hazards associated with manual material handling.

7.8.8 Communication System

- Adequate communication facilities should be available at the plant and supported with uninterrupted power supply.
- Communication facilities should be checked periodically for its proper functioning.

7.8.9 First Aid Facilities

- First box should be provided at strategic locations within the plant.
- At least one stature should be available in first aid room.
- List of important telephone numbers should be displayed in first aid room.

7.8.10 Accident Reporting, Investigation and Analysis

A system should be initiated for accident and near miss reporting, investigation and analysis. To motivate and awareness among the personnel at the plant about safety, total accident (lost time injury) free days can be displayed on the board prominently at strategic location.

7.8.11 Safety Inspections

The system should be initiated for checklist based routine safety inspection and internal audit of the plant periodically. Safety inspection team should be formed from various disciplines and departments.

7.8.12 Safe Operating Procedures

Safe operating procedures should be formulated and updated, specific to process & equipment and distributed to concerned plant personnel.

7.9 DISASTER MANAGEMENT PLAN (DMP)

A comprehensive DMP that will be implemented in the industry as presented below.

7.9.1 Objectives

- To localize the emergency
- To minimize the consequences
- To ensure that following concepts are considered, namely rescue, first aid, evacuation, rehabilitation, spreading the information.

7.9.2 Elements of On-Site Emergency Plan

- Assess the size of event
- Plan formulation and liaison
- Actions like: Raise alarm, communication within and outside
- Appoint key personnel and deploy. Appoint Controller.
- Emergency Control Center
- Action on site/Action off-site.
- Alarm and visual signals at strategic points

7.9.3 Organization

Table 7.8 Organization Chart

Chief Controller of Disasters (Factory General Manager)					
Team-1	Team-2	Team-3	Team-4	Team-5	Team-6
Area Coordinator	Medical Coordinator	Material Coordinator	Fire-Safety Coordinator	PR Coordinator	Security Coordinator
Plant Manager	Chief Chemist	Civil Engineer	Power plant Manager	HR Manager	Security Officer

7.9.4 Duty Allocation**1. Chief Disaster Controller (Chief Operating Officer)**

- Take control and declare emergency
- Be there
- Contact Authorities

2. Area Co-Ordinator

- Take steps. Make emergency shut-down of activities. Put everything in safe condition.
- Evacuate.
- Commence initial firefighting, till Fire Department comes to take up.
- Identify materials requirements and call Material Manager.

3. Medical Co-Ordinator

- Establish Emergency Center, Treat affected persons, Transfer/ Remove Patients

- Assign and Deploy staff
- Contact Authorities

4. Material Co-Ordinator

- Dispatch necessary supplies
- Arrange purchases

5. Fire & Safety Co-Ordinator

- Overall in-charge for Fire and Safety.
- Coordinate with area coordinator and direct the operations
- Coordinate with City and other fire-tenderers.

6. Security Co-Ordinator

- Remove crowd
- Arrange gate security
- Contact Police
- Arrange evacuation
- Contact outside Agencies if asked.
- Handle news media
- Mobilize vehicles
- Arrange food, clothing to Officers inside.

7. Emergency Control Center

- Adequate Internal phones
- Adequate external phones
- Workers tally
- Map showing hazardous storages, fire horns, safety equipments, gates and side gates, assembly points, list of persons.

8. Action on Site

- Evacuate. Non-essential people first at assembly point
- Persons accounting & Record of next-of-kin
- Public relations

9. Post Disaster Analysis

- Why it happened?
- Whether on-site operations failed? In what respect?
- How to avoid such failure in future?
- Report to be submitted in detail to Authorities.
- Compensation arrangements if any, commenced?

- Call suggestions on shortfalls observed.
- Give rewards openly, pull defaulters individually.

7.10 INDUSTRIAL HAZARDS AND SAFETY

Maintenance of occupational safety and health is very closely related to productivity and good employer-employee relationship. The plant will be operated in compliance with all applicable safety and health laws and regulations. For occupational safety following measures will be incorporated in the proposed plant.

7.10.1 Hazard Identification

Safety Audit will be conducted by qualified technical personnel to study the installation and activities of the industry and to suggest measures to protect personnel and property against the risks. The areas of possible hazardous incident are given for follow up action:

- i. Fire in coal & coke storage yard, and diesel storage tanks.
- ii. Electric Short circuit and consequent fire accident.
- iii. Any likely sort of explosion in Boiler area
- iv. Puncture in inside wall of induction furnace
- v. Fall from high level structures

7.11 ON-SITE MANAGEMENT PLAN

The On-Site emergency plan will be circulated to all concerned members of emergency teams. It is essential that all concerned familiarize themselves with the overall on-site emergency plan and their respective roles and responsibilities during and in emergency. They should also participate regularly in the mock drills that will be conducted so as to keep themselves and the emergency organization in a state of perpetual preparedness at all times to meet any emergency.

7.11.1 Objectives, Scope and Contents of On-Site Emergency Plan

Objectives of emergency planning are to maximize the resource utilization and combined efforts towards emergency operations and would broadly cover the following.

- To localize the emergency and if possible eliminate it.
- To minimize the effects of accidents on people and property.
- To take remedial measures in the quickest possible time to contain the incident and control it with minimum damage.
- To mobilize the internal resources and utilize them in the most effective way.

- To get help from the local community and government officials to supplement internal manpower and resources.
- To minimize the damage in other sections.
- To keep the required emergency equipment in stock at right places and ensure that they are in working condition.
- To keep the concerned personnel fully trained in the use of emergency equipment.
- To give immediate warning to the surrounding localities in case of an emergency situation arising.
- To mobilize transport and medical treatment of the injured.
- To educate the public in the surrounding villages regarding hazards.
- To arrange for rescue and treatment of casualties.
- To safe guard the people.
- To identify the causalities and communicate to relatives.
- To render necessary help to concerned.
- To rehabilitate area affected.
- To provide information to media & government agencies

7.11.2 Scope of Onsite Emergency Plan

The plan covers information regarding the properties of the Industry, type of disasters and disaster/accident-prone zones, the actual disaster control plans with authority delegation, controlling and other details. General details like location, project layout, neighboring entities and the assistance they can render etc., are also provided.

The important elements considered in this plan are;

- Statutory requirements
- Emergency organization
- Roles and Responsibilities
- Communications during emergency
- Emergency shutdown & control of situation
- Rescue & Rehabilitation
- Emergency facilities
- Important Information

The primary purpose of the on-site emergency plan or DMP is to control and contain the incident and to prevent them from spreading. It is not possible to cover every eventuality in the plan and the successful handling of the emergency will depend on

appropriate action and decisions being taken on the spot. Other important aspects needing to be considered include the following.

7.11.3 Emergency

A major emergency in any situation is one, which has the potential to cause serious injury or loss of life, which may cause extensive damage to the structures in the vicinity and environment and could result in serious disruption to normal operation both inside and outside the industry premises. Depending on the magnitude of the emergency, services of the outside agencies may also be required for supplementing the internal effort to effectively handle the emergency and to contain the damage.

The Management has to take effective steps to assess, minimize and wherever feasible eliminate the risks to a large extent. Accidents may still occur and it is necessary to be fully prepared to tackle all such emergencies if and when they occur. It is likely that the consequences of such emergencies will be confined to the units concerned or may affect outside. If the consequences are confined within the plant boundary, it is then termed as On Site Emergency and will be controlled by Chief Emergency Controller.

In order to generate the plans it is necessary to first determine the kinds of accidents leading to an emergency that can occur in the industry. The most widely used technique in practice is based on experience accumulated over many years and safety audits.

7.11.4 Methodology

The considerations in an emergency planning include the following:-

- Identification and assessment of hazards and risks
- Hazard, consequence analysis
- Alarm and communication procedures
- Identifying, appointment of personnel & assignment of responsibilities
- Identification and equipping Emergency control centre, Identifying Assembly, Rescue points, Medical facilities.
- Emergency preparedness plan, procedures, steps to be taken before, during and after emergency.
- Formulation of plan and emergency sources.
- Training rehearsal, evaluation and updating the plan.

7.11.5 Structure of Emergency Management

- a. Noticing the accidents
- b. Informing declarer of emergency
- c. Declaration of emergency

- d. Functions of declarer
- e. Interaction with outside agencies
- f. Emergency action plan & chart
- g. Emergency action plan
- h. In case of major emergency, the steps to be taken immediately by various agencies are all follows.

Sr. No.	Step to be taken	Agency
1	Noticing of emergency situation	Operator/Supervisor
2	Assessment of Situation	Section head
3	Information to emergency Declarer	HOD
4	Plant siren for declaring emergency depending on situation	Emergency Declarer
5	Shutdown of equipments /Plant	Shop Head
6	Assessment of impact and organizing control measure	Incident/Site Controller
7	Proper function of control rooms	Emergency controller
8	Co-ordination with outside agencies	GM – HR
9	Control measures at site (Rescue, evacuation, Fire Fighting etc.)	Incident Controller
10	Seeking help from outside, nearby factories	Incident controller & safety Head
11	All clear Signal (After controlling emergency situation)	Emergency Declarer

7.11.6 Infrastructure at Emergency Control Centre

Emergency control centers should therefore contain the following:

- An adequate number of external telephones; if possible, one should accept only outgoing calls, in order to bypass jammed switchboards during an emergency.
- An adequate number of internal telephones
- Radio equipment
- A plan of the works, to show:
 - Areas where there are large inventories of hazardous materials.
 - Sources of safety and first aid equipment.
 - The fire-Fighting system and additional sources of water.
 - Site entrance and roadways, including up-to-date information on road Traffic.
 - Assembly points.
 - Vehicle parking and rail sidings.

- Additional work and layout plans detailing alternate routes and affected areas, during an emergency.
- Note pads, pens and pencils.
- A list of key personnel, with addresses, telephone numbers, etc.

The emergency control center should be sited in an area of minimum risk. Suitable location from where clear view of the plant is possible or the control room can be designated as Emergency Control Center. All the Site Controller/ Incident Controller Officers, Senior Personnel would be located here or have access to the ECC.

7.11.7 Assembly Point

In an emergency, it will certainly be necessary to evacuate personnel from affected areas and as precautionary measure, to further evacuate non-essential workers, in the first instance, from areas likely to be affected, should the emergency escalate. The evacuation will be effected on getting necessary message from i.e. on evacuation; employees would be directed to a predetermined safe place called Assembly Point. Proposed Location: Area opposite to service building will be the Assembly Point where all non-key personnel would assemble on getting direction over Public-Address System. Outdoor assembly points, predetermined and pre-marked, will also be provided to accommodate evacuees from affected plant area(s). Roll call of personnel collected at these assembly points, indoor and outdoor will be carried out by roll call crew of safety team to account for any missing person(s) and to initiate search and rescue operations if necessary.

7.11.8 Emergency Management Training

- The Key Personnel would undergo special courses on disaster management. This may preferably be in-plant training. The Managers, Senior Officers and Staff would undergo a course on the use of personal protective equipment.
- The Key Personnel belonging to various Teams would undergo special courses as per their expected nature of work at the time of emergency.
- The plant management should conduct special courses to outside agencies like district fire services to make them familiar with the plant layout and other aspects, which will be helpful to them during an emergency.

7.11.9 Mock Drills

It is imperative that the procedures laid in this Plan are put to the test by conducting Mock Drills. To avoid any lethality, the emergency response time would be clocked below 2 minutes during the mock drill.

- 1st Step: Test the effectiveness of communication system
- 2nd Step: Test the speed of mobilization of the plant emergency teams
- 3rd Step: Test the effectiveness of search, rescue and treatment of casualties
- 4th Step: Test emergency isolation and shut down and remedial measures taken on the system
- 5th Step: Conduct a full rehearsal of all the actions to be taken during an emergency.

The Disaster Management Plan would be periodically revised based on experiences gained from the mock drills.

7.11.10 Proposed Communication System

The instrument and control system will take care of the following operating philosophy of the plant-

- The project will be provided with a control system located in a central control room.
- The shift engineer will operate the plant from his console panel.
- All operations will be represented in a graphic panel on the console and every operation will be depicted as operating sequences.
- All operating parameters will be displayed in digital format.
- Alarms will be provided for all parameters, when they exceed set values.
- High-High/Low-Low alarms and trip functions will be provided to trip
- Pumps/compressors to bring the entire system to a safe shutdown.
- Alarm signal code is set for process description

7.11.11 Emergency Medical Facilities

Stretchers, gas masks and general first aid materials for dealing with chemical burns, fire burns, etc., would be maintained in the medical center as well as in the Emergency Control Room. A range of medicines should be maintained in the ECC/Medical Center. Breathing apparatus and other emergency medical equipment should be provided and maintained. The Medical Center should display poster for treating burns and first aid. The qualified doctors of the medical center should use their professional judgment for medical treatment.

7.12 OFF SITE EMERGENCY PLAN

Objective

If the effects of the accident or disaster inside the plant are felt outside of its premises, it calls for an off-site emergency plan, which should be prepared and documented in advance in consultation with the District Authorities.

Key Personnel

The ultimate responsibility for the management of the off-site emergencies rests on the Collector/District Magistrate/ Deputy Commissioner. He will be assisted by representatives from all concerned organizations, departments and services at the District level. This core group of officers would be called the District Crisis Management Group (CMG). The members of the group will include:

- 1) Collector/District Magistrate Deputy Commissioner
- 2) Commissioner of Police
- 3) Municipal Commissioner, if municipalities are involved
- 4) Deputy Director, Health
- 5) Pollution Control Board Representative

An Operation Response Group (ORG) will then be constituted to implement the directives of the CMG. The various government departments, some or all of which will be concerned, depending on the nature of the emergency, could include:

- | | |
|---------------------------|--------------------|
| • Police | • Animal Husbandry |
| • Health & Family Welfare | • Agriculture |
| • Medical | • Civil Defense |
| • Revenue | • PWD |
| • Fire Service | • Civil Supplies |
| • Transport | • Panchayats |
| • Electricity | |

The SC and IC, of the on-site emergency team, will also be responsible for communications with the CMG during the off-site emergency.

Education to Public

People living within the influence zone should be educated on the emergency in a suitable manner. This can be achieved only through the Local and District Authorities. However, the Project Authority can extend necessary information to the Authorities.

In the aftermath, factory inspectors may wish to ensure that the affected areas are rehabilitated safely. In addition, they may require items of plant and equipment essential for any subsequent investigation to be impounded for expert analysis, and may also want to interview witness as soon as practicable.

In the state of Gujarat, District Emergency Control (Contingent) plans have been formulated, and some rehearsed, for some districts and the copies are available from the local factory inspectorate. All hazardous factories needing on-site and off-site emergency plans are advised to keep constant liaison with them.

The communication system between the factory and various above role-playing authorities must be effective. Ineffective public telephone system will not be useful in emergencies. Therefore, it should be improved and other effective system like duplex (two way) radio telephone, wireless set, hot line, emergency lead vehicles, etc., should be maintained between important organizations.

(B) Social Impact Assessment

Total land 37.82 Acre is purchased from the owners on a mutually agreed price. There will be no Rehabilitation & Resettlement (R&R) involved as there is no habitation or livestock in the acquired land. However, preference will be given to local people for employment.

Detailed Social Impact Assessment (SIA) study is given below:

Introduction

Corporate Environmental Responsibility (CER) refers to a company's duties to withdraw from damaging natural environments. The term derives from Corporate Social Responsibility (CSR). Also can be referred as corporate initiative to assess and take responsibility for the company's effects on the environment and impact on social welfare. The term generally applies to companies efforts that go beyond what may be required by regulators or environmental protection groups.

Moreover, while proposing the Corporate Social Responsibility Rules under Section 135 of the Companies Act, 2013, the Chairman of the CSR Committee mentioned the Guiding Principle as follows: "CSR is the process by which an organization thinks about and evolves its relationships with stakeholders for the common good, and demonstrates its commitment in this regard by adoption of appropriate business processes and strategies. Thus CSR is not charity or mere donations. CSR is a way of conducting business, by which corporate entities visibly contribute to the social good. Socially responsible companies do not limit themselves to using resources to engage in activities that increase only their profits. They use CSR to integrate economic, environmental and social objectives with the company's operations and growth." CSR is not charity or mere donations. CSR is a way of conducting business, by which corporate entities visibly contribute to the social good. Socially responsible companies do not limit themselves to using resources to engage in activities that increase only their profits. They use CSR to integrate economic, environmental and social objectives with the company's operations and growth.

Corporate Social Responsibility is not a new concept in India, however, the Ministry of Corporate Affairs, Government of India has recently notified the Section 135 of the Companies Act, 2013 along with Companies (Corporate Social Responsibility Policy) Rules, 2014 "hereinafter CSR Rules" and other notifications related thereto which makes it mandatory (with effect from 1st April, 2014) for certain companies who fulfill

the criteria as mentioned under Sub Section 1 of Section 135 to comply with the provisions relevant to Corporate Social Responsibility.

CSR is generally understood as being the way through which a company achieves a balance of economic, environmental and social imperatives ("Triple-Bottom-Line-Approach"), while at the same time addressing the expectations of shareholders and stakeholders. The term "Corporate Social Responsibility (CSR)" can be referred as corporate initiative to assess and take responsibility for the company's effects on the environment and impact on social welfare. The term generally applies to companies efforts that go beyond what may be required by regulators or environmental protection groups.

Purpose of the CER/CSR

Corporate social responsibility (CSR) is a broad term used to describe a company's efforts to improve society in some way. These efforts can range from donating money to non-profits to implementing environmentally-friendly policies in the workplace. The group's CSR activities are rooted in the knowledge that businesses have a duty to enable all living beings to get a fair share of the planet's resources. Businesses are powerful constituents of society and the most successful, respected, and desirable businesses exist to do much more than make money; they exist to use the power of business to solve social and environmental problems. Genext will involve in a community development and environment preservation projects. Social activities relate to health, primary education, skills training and entrepreneurship, livelihoods and women empowerment.

Objective of study

The main objectives are as follows:

1. To assess the impact of the project on agricultural situation;
2. To examine the impact of the project on pattern of demand;
3. To assess the in impact of the project on consumption pattern;
4. To examine employment and income effects of the project;
5. To explore the possibility of local industrialization as an offshoot of the
Project;
6. To examine the effect of the project on education status of the people in the study
area; and
7. To judge peoples' perception regarding the project

Survey Methodology

The survey aims to document the living conditions, level of socio-economic development of the region and the socio-economic profile of people in the core and buffer zones of the study area. The survey was organized to collect information on socio-economic variables at the village level as well as household level. The village level data are collected from revenue offices, Panchayat office; Censuses while the household level data are collected through questionnaire method. The agreed methodology has been followed with the tools of SIA. The following strategies were adopted for undertaking the study.

Consultation with Representatives of focus area

Close coordination was maintained with concerned Public Representative's Offices, Local representatives and common village people. Assessment of the area was made by industry representative along with Team of M/s San Envirotech Pvt. Ltd.

Assessment of studied area

Pre-contract field visit was conducted with assessment of the area and people interacting with concerned employees and few opinion leaders of the area. This visit facilitated the strategic plan to complete the study in stipulated time.

Focus Group Discussion

A guiding principle was developed to conduct focused group discussion with different categories of people of the studied villages.

Study of Village Profile

This study includes village level survey of Population, Economics, Land use Pattern, Employment pattern, Healthcare Facilities, Amenities for Livelihood. This primary data is statistically validated and the statistical differences and is interpreted in the light of economic impacts.

Sources of Information

As per the scope of present study, the information on the sociological aspects like demography, human settlements, social aspects like SC & ST population, literacy levels and economic aspects like occupational structure of workers has been gathered and compiled from secondary sources viz. the District Census Statistical Handbook, 2011 for Ahmedabad district as these documents being comprehensive and authentic. Land use pattern and infrastructure, demographic and socio-economic environment, and living standard and infrastructure as per the census record of 2011 are provided in **Section 3.15 of Chapter 3**.

❖ **Socio Economic Survey within study area:**

1) Educational facility

Literacy is an important indicator for understanding the socio-economic development of any area. Many villages of the study area have no proper education facility and literacy rate is very low especially women. *According to the Gujarat State Census Statistical Handbook, 2011*, the male literacy in the study area is found to be 66% and the female literacy in the study area is found to be 44%. The difference in literacy rate between male and female is found to be much wider. The overall study indicates that the literacy rate in female population is alarmingly low which can be attributed to the social structure prevailing in the villages and traditional family trends. The educational facilities in the study area are good due to the presence of good infrastructure for basic education like primary schools and high schools for higher education.

As per 2011 census, there are 14 primary schools, 4 Secondary schools, 2 senior secondary school in all 13 villages within 10 km radius. *As per field survey*, there are 18 Primary Schools, 12 Secondary Schools, 3 High School within 10 km radius of the area. However, there is a lack of ITI within this area keeping in view of the industrialization around these villages and need of semi-skilled and skilled labor for the industrial units. Area is an industrial zone and skilled manpower is essential. Unit will contribute to start vocational training or join hands with other industrial group ITI institutes.

2) Health & Family welfare

As per 2011 census, 13 villages in the study area have 1 Primary Health Centre, 4 Primary Health Sub Centre, 1 Veterinary hospital, 1 Family Welfare Centre in study area of 10 km. *As per field survey*, there are 1 primary health center, 3 sub-centers, and 10 private medical practitioners. Primary Health Centre is located at village Shiyal. There is no any Employees' State Insurance (ESI) Hospital within the study area.

Based on above study, it is concluded that health and family welfare facility found poor in the study area. Unit will arrange 2-3 health checkup camp during monsoon and provide free medicines.

3) Drinking water and Sanitation Facilities

As per 2011 census, all the villages in the study area have mainly tap water supply as a source of drinking water. In addition to this, some of the villages have facility of Tube well water supply, Hand Pump water facility, Well water facility, tank water facility, 3 villages have River/canal.

As per field survey, there is lack of drinking water facilities in the study areas. Many part of study area has saline water from ground source for drinking purpose. Unit proposed to provide RO system for drinking water in Bagodara, Gundanapara & Mithapur village or any village suggested by local authority. Unit will contribute fund towards storage of drinking water facility at selected villages.

It is observed that the basic amenities of separate toilet for boys and girls; and drinking water are available in all primary schools across all villages in the study area. But in backward areas people do not have the toilet facility available at their homes. So they have been left with no other option except to defecate in open. Few household had got toilet constructed under the Government Scheme but they were not in working condition because of absence in regular supply of water or not being fully constructed. There are inadequate drainage facilities. As a result, Dengue, Malaria and Gastro problems are prevalent in this area. Unit will contribute fund towards the improvement.

4) Women Empowerment activities

In some cases, women bear larger losses in terms of educational attainment, employment and wages. In terms of employment, which is a major determinant of livelihood, Ahmedabad rural talukas shows lower than state average in Worker Participation Rates (WPR). There is distinct Gender disparity in WPR across all talukas, with women substantially under-represented in main workers category.

As per 2011 census, 69.84% of female population are non-workers. 49.08% of male population is part of main worker, while only 10.64% of female population is a part of main workers. 5.55% of male workers are marginal workers, while 19.52% of female workers are engaged in such type of activities. Thus, unit proposes to provide education and training to engage more women in employment opportunities.

5) Preservation of Environment and Sustainable Development

For Preservation of Environment, unit will develop greenbelt/plantation programme in surrounding villages. Unit will promote uses of non-conventional source of energy i.e. solar power. Unit will contribute to develop natural composting pits which benefits to reduce municipal solid waste and generate organic manure; which is utilize for agriculture activity.

Need Analysis of the Target Beneficiaries in the Project Area

Various needs were identified during the baseline survey within the study area. Major problems they are facing are given below.

- Poor availability of water for irrigation and drinking purpose
- Lack of good medical facilities
- Unemployment
- Health and sanitation program
- Poor educational facilities

In the assessment of socio-economic conditions, few indicators were identified for further attention and strategic planning as given below:

Target Project Area

Total 13 villages fall within the study area; Out of which unit will give priorities to Bagodara, Gundanapara & Mithapur villages for CER activities according to the below mentioned criteria. It may vary based on the outcome of the public demand during the public hearing.

- Largely affected by industrial growth
- Vicinity to the project site
- Sourcing of employees from these areas
- Low level socio-economic status of the people
- Lack of adequate intervention of voluntary organization in the area

The focus area of comprehensive program includes: health, education, sanitation, sustainable livelihood & infrastructure development.

Details of expenditure for CER activities:

Estimated cost of the project : Rs. 261.0 Crores

Expenditure earmarked towards CER : Rs. 5.22 Crores
(2% of the project cost)

The detailed expenditure break-up of above activities for the five years are given below:

Table 7.9 Detailed expenditure for CER activities

Sr. No.	Activities	Years (Rs. in Crore)					Total Budget (Rs. in Crore)
		1 st	2 nd	3 rd	4 th	5 th	
1	Educational facilities & trade training to educated unemployed	0.2	0.2	0.2	0.2	0.2	1
2	Health and Family Welfare facilities	0.3	0.3	0.3	0.3	0.3	1.5
3	Drinking water and sanitation facilities	0.26	0.26	0.26	0.26	0.26	1.3
4	Women Empowerment activities	0.18	0.18	0.18	0.18	0.18	0.9
5	Preservation of Environment and Sustainable Development-Maintaining village ponds, encouraging rain water harvesting in village	0.12	0.1	0.1	0.1	0.1	0.52
Total		1.06	1.04	1.04	1.04	1.04	5.22

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Tentative planning of detailed activities to be taken are as follows.

Proposed Activities	Selected areas or villages	Frequency
Provide Uniforms to poor children (around 500 pairs)	Schools of Bagodara, Gundanapara, Shiyal & Mithapur	Every year at least up to five years
Provide Computer supplies and furniture in schools (as per actual requirements)		Every year up to five years
Scholarship to poor children (100 students)		Every year
Provide fund to renovation/ repair/ building of toilets	First priority to villages Bagodara, Gundanapara, Shiyal & Mithapur; then other villages in core & buffer area	Every year up to five years (as per actual requirements)
Provide fund to renovation/ repair/ building of public drinking water systems		
Arrange medical camp during the rainy season		Every year
Supply free medicines to local PHCs/clinics		Every year (as per actual requirements)
Tree Plantation - road side, local school area & other public areas (2000 trees per year)	Villages of Bagodara, Gundanapara, Shiyal & Mithapur	Every year up to five years
Rain water harvesting efforts		Over a period of 5 years (as per actual requirements)
Solar panel installations in rural areas		
Miscellaneous	First priority to villages in core area and then villages in buffer area	Every year up to five years

Implementation of such program will be ensured by constituting a Committee comprising of the

- Project proponent
- Representatives of village Panchayat
- Representative of the District Administration

Action taken report in this regard will be submitted to the Ministry's Regional Office.

(C) PUBLIC CONSULTATION

The public hearing was conducted by GPCB on 03.11.2018 on the basis of the draft EIA/EMP incorporating the Terms of References. Point raised during the public hearing by participants is summarized below with reply/action taken by project proponent.

Table 7.10 Points raised during public hearing

Statement of issues raised by the public and response of the project proponent with action plan is as follows.					
Sr. No.	Name and Address	Point Represented	Reply from Project Proponent	Time Bound Action Plan proposed	Budgetary provision
1	Shri Kanubhai M. Makwana, Local leader & Director APMC, Bavla Village: Bagodara	<ul style="list-style-type: none">He informed that, earlier it was seems that there will be air pollution, there will be water pollution and wastewater from the industry would be discharged into River Bhogavo but as per the clarification given today, industry will neither discharge wastewater outside nor in into underground. Therefore, we all welcome this industry. Care should be taken that there should be no difficulty to us due to operation of this industry. Employment shall be given to local people and further informed that condition of surrounding villages is poor, hence employment shall be given to them and care must be taken for no creation of pollution and promises given today must be implemented and we welcome this industry.	<ul style="list-style-type: none">Representative of project proponent has assured that, care will be taken for no creation of pollution. APCM like ESP and bag filters will be installed and efficiently operated and GPCB & CPCB norms will be maintained and assured that in the event of non-functioning of EMS, the plant will be taken under shut down.	--	--
2	Shri Rameshbhai J. Makwana, Local leader & Vice chairman APMC, Bavla Village: Bagodara	<p>He informed that it is my opinion that surrounding area will get employment due to upcoming of this industry. It is to be assured that there will be no problem of pollution.</p> <p>He suggested that employment shall be given to the local people and their health shall be maintained, then we have no objection for upcoming industry.</p>	<p>Company technical representative has replied that as shown in their presentation, employment will be given to the local people, training center shall also be established and man force will be created by giving required training. He further informed that, they will take suggestion from Sarpanch of surrounding villages for CSR activities and budget will be allotted for the required activities of the villages.</p>	--	--