Table of Contents

EXECUTIVE SUMMARY

Title and Location of the Project

Subject project is the proposed Housing Scheme Etihad Town Premier Enclave under the name of Etihad Town (Pvt) Limited Mouza Rakh Khamba, Raiwind Road Lahore, and proponent intends to get the environmental approval for the subject project by the submission of EIA Report for the said project for the compliance of section 12 of PEPA 1997 (Amended 2012). Etihad Town (Pvt) Limited's management intends to get the approval of Housing Scheme. project area is 401.84 Kanal and after that the complete area of Housing Scheme will be the 2200.38 Kanal. The cost of the project will be 2.8 billion.

The subject proposed project falls under Schedule II, Category H, Clause 1 under Rules and Regulations of EIA/IEE 2000 (Amended 2022). TORs of the study under clause 5 (f) of policy and procedure for the filing, review and approval of environmental assessment are annexed as **Annexure-c.**

Location

The proposed project site is located at Mouza Rakh Khamba, Raiwind Road Lahore.
Coordinates: 31°26'23.04"N, 74°13'52.12"E

Google map and layout is attached as **Annexure-B**

North .....NK shah Muhammad Road

East.....Main Raiwind road lahore

South .....covered

West .....Muhafiz town

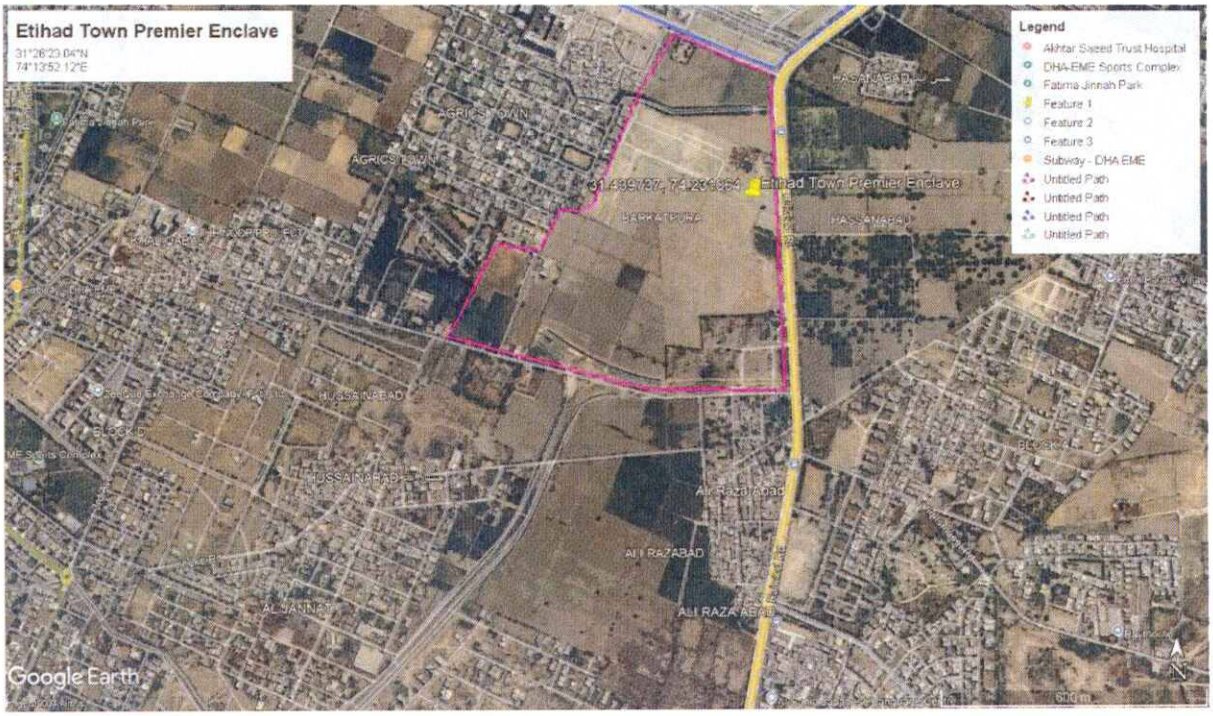


Figure 1: Location of the project site

Project Proponent

Name: Rao Muhammad Shafqat Iqbal

Proponent CNIC: 36402-4454084-9

Residence: 178/C&, Upper Mall Scheme, Lahore

For further details Copy of CNIC of the proponent and undertaking witnesses and other relevant documents are attached as **Annexure-B** with the EIA Report.

Environmental Consultant

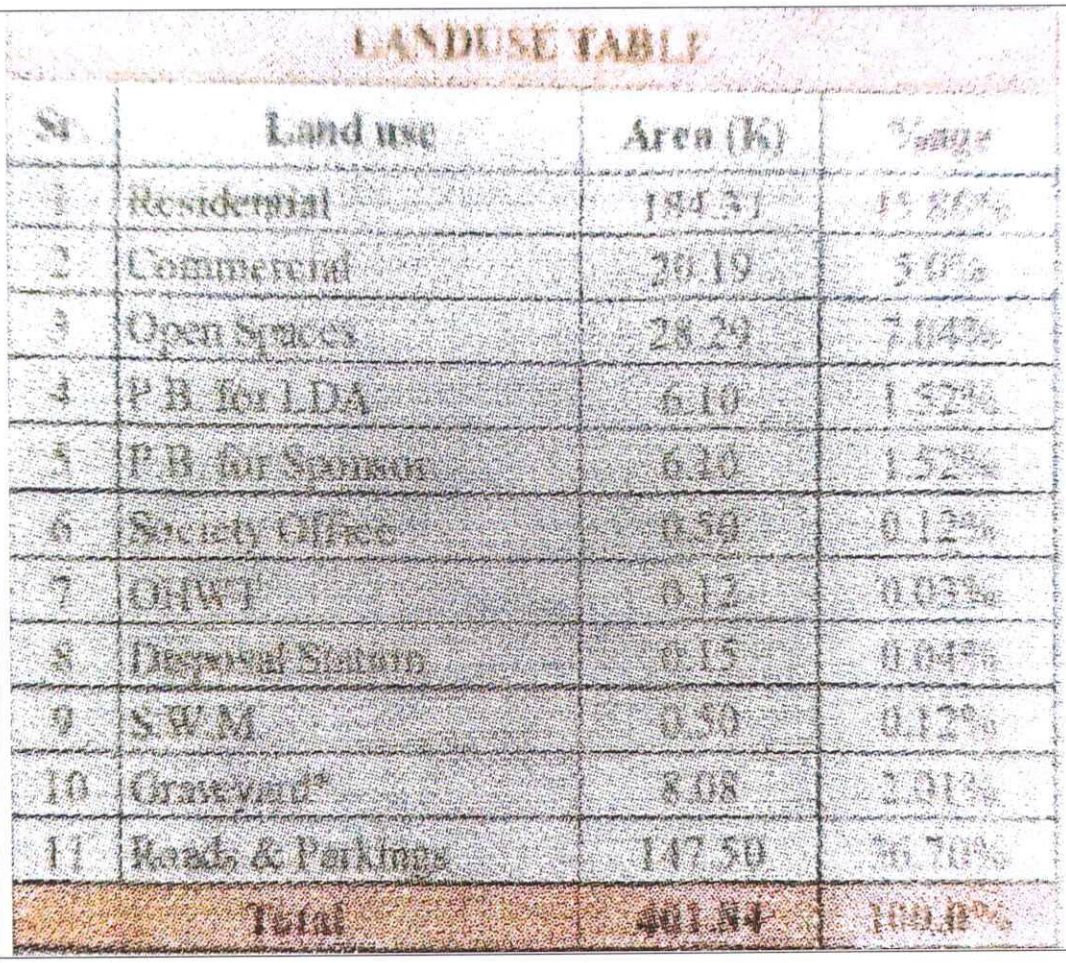
Pak Green Enviro-Engineering (Pvt.) Ltd, as independent consultants, has been appointed by the proponent to conduct Environmental impact assessment (EIA).

Company office address is 46-M, Gulberg III, Lahore

Contact: 042-35441444, 0303-4442335.

For detail company profile see the *Chapter # 1 "Introduction"*

Brief outline of the proposal

Name of Project	Proposed Housing Scheme Etihad Town Premier Enclave by M/S ETIHAD TOWN (PVT) LIMITED.
Location	Mouza Rakh Khamba, Raiwind Road Lahore.
Purpose of the project	Housing Scheme
Current status of the project:	Status of the project is proposed construction will be started after getting the environmental approval.
Cost	Rs. 2.8 billion Approx.
Land Requirement	
Total Area for the of Housing Scheme	401.84 Kanal
Land use	
Fired bricks and clay blocks	Variable
Cement	

LANDUSE TABLE

Sr.	Land use	Area (K)	Percentage
1	Residential	194.31	48.35%
2	Commercial	20.19	5.02%
3	Open Spaces	28.29	7.04%
4	P B for LDA	6.10	1.52%
5	P B for Spanish	6.10	1.52%
6	Society Offices	0.50	0.12%
7	OHWT	0.12	0.03%
8	Disposal Station	0.15	0.04%
9	S.W.M	0.50	0.12%
10	Graveyard	8.08	2.01%
11	Roads & Parkings	147.50	36.70%
	Total	401.84	100.00%

composites	
Concrete	
Glass	
Metal	
Storage and handling of construction material	Constructional waste will be placed, at plot present in the Housing Scheme for waste disposal. From there some of the waste will be reused for landscaping of the area within the scheme. Rest will be handed over to local contractor. Contract with the contractor will be made before commencement of work.
Solid Waste	Area of 0.5 kanal is reserved in Housing Scheme for safe disposal of Domestic of waste and solid waste collection.
Final Destination	Contract will be made with local contractor before commencement of work.
Source of water drinking water	Ground water will used as a source of drinking water for the proposed Housing Scheme
Source of Water consumption	Domestic
Mode of treatment	Raw water is treated through septic tank.
Manpower	
Labor Force during construction	40-50 persons approx.
Labor force during operation that will be sanitary worker, Security guard, watchman	Approx. 12-15 persons

The Major Impacts

In order to identify all the activities associated with the project during construction phase with potential to cause adverse environmental impacts and harm, a thorough review has been conducted and following impacts have been identified:

Table 1: Summary of Major Impacts & their Proposed Mitigation during construction Phase

Potential Impact	Criteria for determining Significance	Key Mitigation Measures
Dust Emissions— Dust and PM may be generated during road construction and excavation activities. Gaseous emissions from site generators and transportation vehicles may affect ambient air quality in the vicinity of the project site .	An increase in visible dust beyond the boundaries of the construction site or Concentration of PM_{10} in excess of 150 $\mu g/m^3$ PEQS for Ambient Air	Sprinkling of water on dusty roads, tracts and surfaces is recommended; During excavation works drop heights will be minimized to control the fall of materials reducing dust escape; Use of wind shield around stockpiles is recommended; Vehicle speed restrictions should be applied in the project area; Raw materials should be transported in covered trucks;
Solid waste Management— If solid waste will not be managed properly, it may cause negative impacts	Generation of excessive waste; Recyclable waste and reusable waste is discarded, Littering, Improper disposal.	Constructional waste should be utilized for road filling and maintenance purposes; Domestic waste should be disposed off properly, handed over to contractors, placed in bins; Proper solid waste management plan should be devised and implemented.
Waste water - water used in construction process and excessive water generate as wastewater and it also produced from campsite domestic activities	PEQS parameters	Waste water after treatment in sewage treatment plant or other facility should be disposed off scientifically.
Construction Noise- Noise may be generated during landscaping activities and from generators and transportation vehicles at the project site; which may be a nuisance for the workers.	OSHA standards	Activities generating high levels of noise should be minimized at the project site. If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Proper tuning of construction machinery and vehicles is recommended.

		• Ear muffs and ear plugs are recommended in case of high noise levels. • Rubber wounds should be placed underneath the generator to avoid the vibration.
Vegetation Loss/ Soil erosion— Minor negative impact may arise as only some weeds and grasses are present at the project site which will be cleared for the purpose of construction.	Unnecessary or excessive removal of trees and shrubs.	No major tree cutting/ vegetation loss issue will be involved in the subject project as project site is free of any dense vegetation. Only few trees are present which will be relocated or 12 trees of 6 feet high will be planted in replacement of each tree. Preparation of a Reinstatement Plan to restore the land after the constructional activities is recommended.
Soil Contamination—Oil and Chemical spills can contaminate the soil.	Presence of visible amount of hydrocarbon in soil	Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated.
Socioeconomic impacts— Inter-cultural differences between the project staff from other areas and the local community may arise due to the subject project. Positive socioeconomic impacts due to increased infrastructure, employment opportunities and economic growth.	No community complaints. Increased employment facilities in the area; Increased infrastructure	Training of the non-local project staff on local culture and norms; Avoidance of unnecessary interaction of local population with the non-local project staff. Employment opportunities should be provided to the local people.

Table 2: Summary of Major Impacts & their Proposed Mitigation during Operational Phase

Potential Impact	Criteria for determining Significance	Key Mitigation Measures

Impact due to Location	Seismic Region and flood Zone Specification	There are no significant negative impacts on the environment due to the project location/ selected site, because the project is construction of housing scheme which has no significant impact on the surrounding community.
Gaseous Emissions- During the operational phase of the project, gaseous emissions from project site generator may affect the air quality of the project area.	PEQS for Ambient Air	Housing scheme should ensure the PEQS compliance and should not be allowed to emit hazardous pollutants. Proper tuning of generator should be done to avoid the excessive gaseous emission from the generator. Vehicle emissions inspection should be done on regular basis. Sprinkling should be done on the unpaved area to avoid dust pollution/ particulate matter.
Noise- Noise due to constructional activity, machinery and generators can be a nuisance for the workers in the working area.	OSHA Standards	Activities generating high levels of noise should be minimized at the project site . Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff in case of noise at the project site . Generator should be covered with canopy. Proper maintenance and tuning of the vehicles should be done. Sound proof rooms should be built for generators to be installed at the project site to control the noise (if any).
Discharge of wastewater- The discharge of untreated municipal wastewater may be a negative impact of the subject project.	PEQS for Municipal Effluents (mg/l, unless otherwise defined)	The proponent has allocated land for waste water treatment facility Wastewater must be treated before its discharge.

		Compliance of PEQS for effluents should be ensured. Monitoring should be conducted as per PEQS and reports should be submitted to EPA.
Health & Safety Issues- different constructional and operational activities at the project site may cause health and safety issues for workers if precautionary measures will not be adopted.	OSHA Standards	Proper training of workers and staff should be conducted to avoid the accidents. Use of PPEs should be implemented at workplace. Safe drinking water must be provided to workers, staff, and poor people of the area. Safety signs & boards should be placed
Solid waste management- If solid waste will not be managed properly, it may cause negative impacts.	Exposure to potentially hazardous waste; Generation of excessive waste; Recyclable waste and reusable waste is discarded; Littering; Improper disposal.	A solid waste management division will be formulated. And solid was disposed of as per compliance of the district council. Solid waste will be recycled as possible, and open dumping will be discouraged.

Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for Environmental Parameters is recommended:

Ambient Air

Regular monitoring for Ambient Air should be conducted during construction and operational phase of the project and report should be submitted to EPA Punjab.

Noise

Regular monitoring for noise level should be conducted during construction and operation phase of the project and report should be submitted to EPA Punjab.

Water quality

Regular monitoring for water quality should be conducted and report should be submitted to EPA Punjab.

Recommendation: Environmental Monitoring data log book should be maintained by the project proponent.

Screening

The subject proposed project falls under Schedule II, Category H, Clause1 under Rules and Regulations of EIA/IEE 2000 (Amended 2022).

CHAPTER # 1

INTRODUCTION

Purpose of the Report

Environmental impact assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore in compliance with the legal requirement for Punjab Environment Protection Act-1997 (Amended 2012), Section 12- for obtaining No Objection Certificate (NOC) for the subject project. The other relevant regulations and guidelines considered while preparing this EIA Report include:

- Policy and procedures for filing, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed sectorial guidelines

Various aspects like environmental, social, physical and other aspects of the project both during construction and its regular occupancy are highlighted in this EIA Report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision makers, EPA Punjab in the present case, before issuing the desired Environmental Approval.

Identification of the project and proponent

The proposed project is a proposed of housing scheme.

Project Proponent

Name: Rao Muhammad Shafqat Iqbal

Proponent CNIC: 36402-4454084-9

Residence: 178/C & D, Upper Mall Scheme Lahore

For further details Copy of CNIC of the proponent and undertaking witnesses and other relevant documents are attached as **Annexure-B** with the EIA Report.

Details of Consultant

Pak Green Enviro-Engineering (Pvt.) Ltd is an independent company, who conducts IEE, EIA, EMP and other environmental investigations through its panel of environmental consultants, public participation practitioners and experienced environmental managers. The company has its own recommended instruments to check the baseline environmental data/PEQS and lab analysis facility for water, waste water priority parameters.

Contact: Pak Green Enviro-Engineering (Pvt.) Ltd.
Office No. 46 M, Gullberg III, Lahore
Tel: 042-35441444, 03034442335
Email: info@pakgreen.pk; pak.green@hotmail.com

The current study was carried out by the following professionals:

Sr. No.	Designation	Name/Qualification	Experience
1	**Chief Environmentalist**	**Abdul Hafeez Nasir** PhD Scholar Environmental Management	12 years' experience as Environmentalist
2.	**Director**	**Mian Iftikhar Ahmed** Ms. Environmental Sciences	8 years' experience as environmentalist
3.	**Environment Professional**	**Sabeera Tauheed** M.Phil Environment Science	4-year experience as Environmentalist
4.	**Environmentalist**	**Nageen Qayyum** B.Sc. Environmental Sciences	1.5-year experience as Environmentalist
5.	**Environmental Engineer**	**Muhammad Imran** BS Environmental Engineer	1.5-year experience as Environment Engineer

Brief description of Nature, Size and Location of Project

Nature:

The subject proposed project falls under Schedule II, Category H, Clause 1 under Rules and Regulations of EIA/IEE 2000 (Amended 2022).

Size:

The proposed project is 401.84 Kanal.

Location

The proposed project site is located at Mouza Rakh Khamba, Raiwind Road Lahore

North .....NK shah Muhammad Road

East.....Main Raiwind road lahore

South .....covered

West .....Muhafiz town

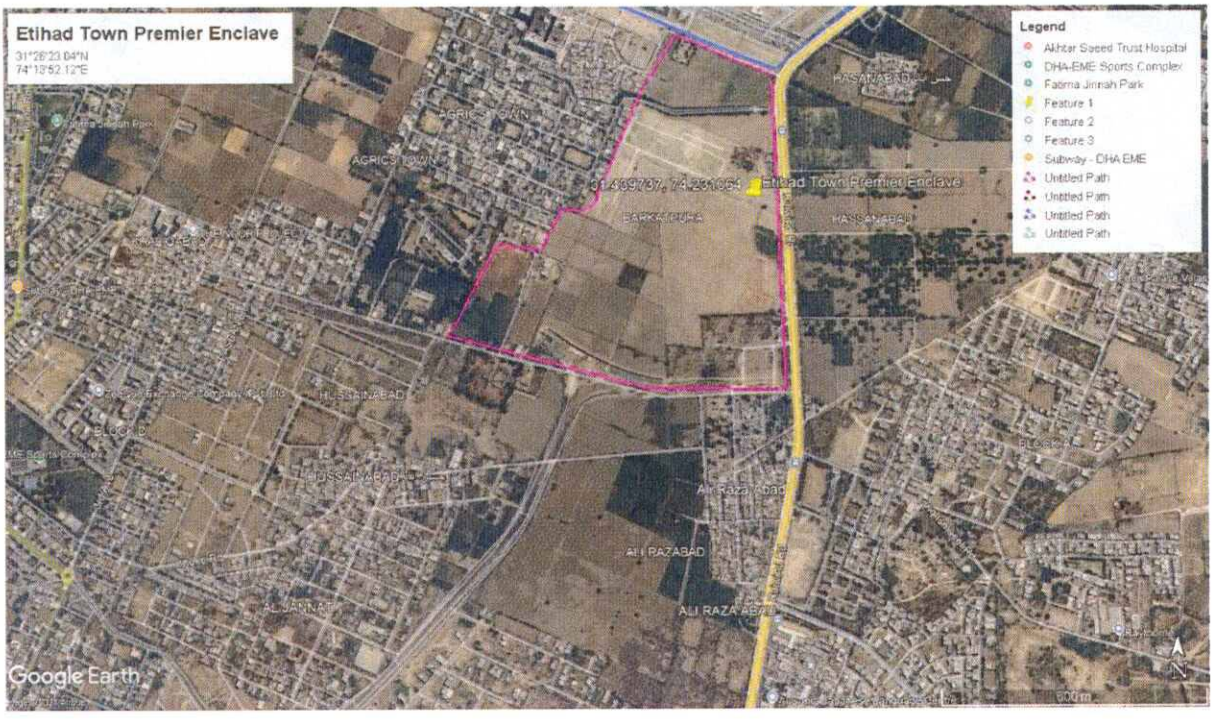


Figure 2: Google map of the project site

Scoping

Spatial and Temporal Boundaries of Environmental Assessment

This project spans at the area of 401.84 Kanal. The existing land use is residential cum commercial as the project lies in an residential area in District Lahore. The main road along with the project site is Raiwind Road. The following map shows the spatial and temporal boundaries of the project. For further details Google earth map of the project on A3 page is attached as Annexure- B with the report

Important issues and concerns raised during consultation

Important issue and concerns raised by the community during consultation include the impact of traffic and solid waste. The Proponent ensured that area for solid waste is allocated in area and proper roads will be developed within the society.

Significant Impacts to be determined

The major impact from this kind of facility will be dust and particulate matter pollution during construction. For this purpose, the proponent has ensured proper sprinkling.

CHAPTER # 2

Consideration of the Alternatives

Site alternatives, their selection and rejection criteria

Rejected Site A

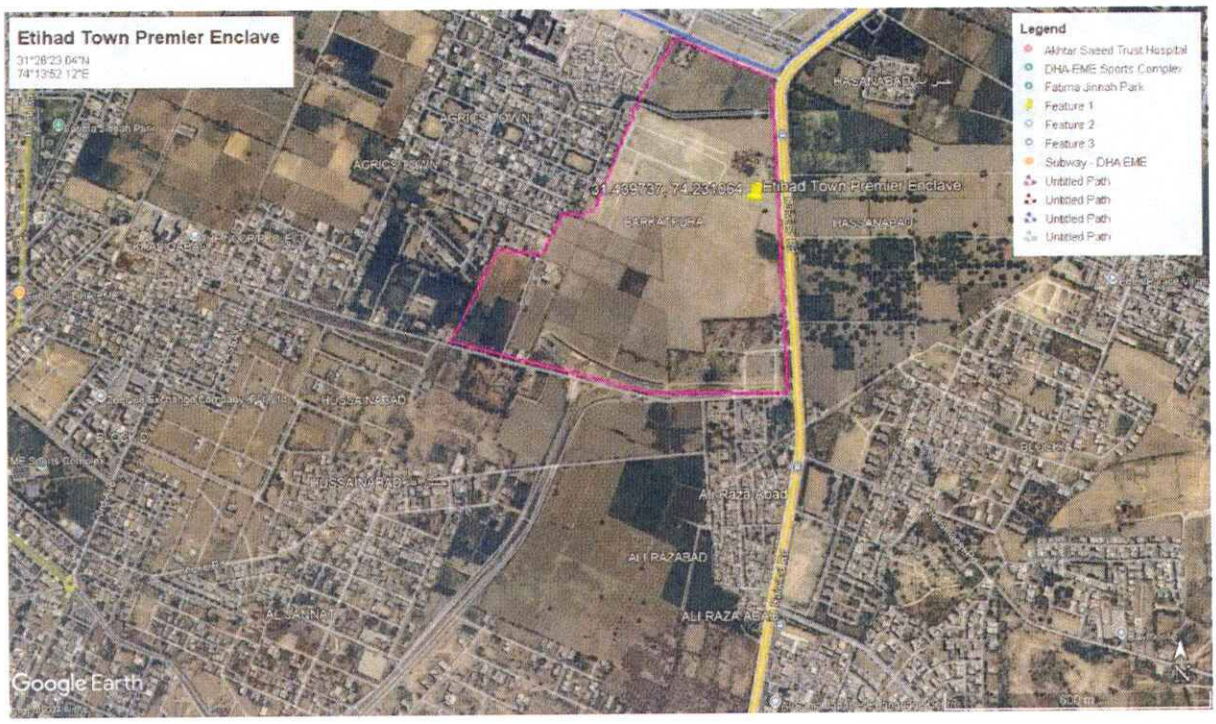
- **Location**: Near Gujranwala
- **Reasons for Rejection**:
    1. Proponent was not the owner of this land.
    2. Site was adjacent to a populated area, posing potential social and environmental challenges.

Rejected Site B

- **Location**: Near Jaranwala
- **Reasons for Rejection**:
    1. The available site was rich in nutrients and ideal for agricultural purposes.
    2. The area was not large enough for the establishment of the housing project.
    3. Heavy traffic movement in the area would cause major traffic management issues.

Selected Site

- **Location**: Mouza Rakh Khamba, Raiwind Road Lahore
- **Project**: of Etihad Town (Pvt) Limited housing facility



- **Reasons for Selection**:
    - Easy access to roads, power supply, and other basic facilities.
    - Economically feasible.
    - No vegetation clearance required.
    - The land is plain and suitable for construction.
    - Plentiful availability of water.

Design/Technology Alternatives, Their Selection, and Rejection Criteria

The proposed project will consist of the establishment of an extended housing facility under the name of Etihad Town (Pvt) Limited. The housing facility aims to provide high-quality residential spaces.

- **Conventional Construction Methods**: Traditional methods have limitations in terms of sustainability and environmental impact.

- **Preferred Methods**: The project will employ advanced and eco-friendly construction methods. State-of-the-art technology will be used to ensure minimal environmental impact, such as reduced emissions and efficient waste management.

Environmental Alternatives, Their Selection, and Rejection Criteria

The project is located within a residential zone. Constructing the housing project in this area will have minimal impact on the daily lives of people living in Lahore. The project proponent will ensure that any emissions produced during construction and operation are within the PEQS limits. Additionally, a wastewater treatment plant will be installed within the proposed project to handle domestic wastewater efficiently.

Economic Alternatives, Their Selection, and Rejection Criteria

The project proponent intends to construct an extended housing facility under the name of Etihad Town (Pvt) Limited. This project will provide employment for 200 laborers during the construction phase and 50 workers and managerial staff during the operation phase. The housing facility will contribute to the economic development of the lahore. By offering quality residential spaces, the project will attract more residents and stimulate local economic activity.

CHAPTER # 3

DESCRIPTION OF THE PROJECT

Type and Category of the Project:

Site proposed for the subject project is situated at Etihad Town (Pvt) Limited, The total area of the project site is 401.84 Kanals.

The subject proposed project falls under Schedule II, Category H, Clause 1 under Rules and Regulations of EIA/IEE 2000 (Amended 2022).

Objectives of the Project

The establishment of this state-of-the-art facility shall fulfill the following objectives:
To establish business of the proponent, to contribute in national economy, to provide employment opportunity to local and other people. Improve the living standards of people and urban development.

Housing Scheme is to promote integrated and balanced growth of the urban centers with the preparation of Master Plan in which various land uses by way of optimum utilization of land are earmarked for identified purposes such as residential, commercial, public and semi-public, transport and communication, open space, agriculture and allied.

Project will create jobs for the indigenous people, will engage local people with construction of the project, and improve their living standards. Project is environmentally friendly in all aspects.

Alternatives Considered, and Reasons for their Rejection:

Demand Alternative

Low-cost housing schemes are necessary for big cities of Pakistan otherwise unplanned housing schemes will continue to emerge and create security challenges for the government. When planned housing schemes are not provided as an alternative then people will continue to

live in slums which are basic breeding sites for the crime. So, the subject project will contribute to providing the reasonable housing scheme to fulfill the demand.

Location Alternative

The proponent is the owner of the location and has considered it the best suited site for of the housing scheme, therefore this project has no other alternative location.

Location and site layout of the project site:

Project site is located at Mouza Rakh Khamba, Raiwind Road Lahore.

Land use on site:

Site proposed for the subject project is an open plot and the property of the proponent. Land ownership documents are attached with this report as **Annexure-B**. Site is situated in the housing society. All laws and by laws of the government are applicable to any land planning and use as well.

Vegetation features of the project site

Presently site is completely open. The site is fairly level. 5-6 trees and different grasses and weeds are present, trees and grasses will be cleared for the purpose of construction. As the project site is located in housing society, extensive plantation has been done all around the society and further plantation is planned to be done in future.

Cost and Magnitude of operation:

Total area for the project 586.06 Kanals and initial cost of the project is Rs. 2.8 billion PKR. The cost estimates of the project have been based on the Consultant's estimates with M.R.S. rates published by Government of the Punjab and on the basis of previous experiences.

Schedule of implementation

Necessary legal, administrative and financial formalities are being finalized. Construction will be started after getting the Environmental Approval.

Description of the project

Subject project is the proposed Housing Scheme Etihad Town Premier Enclave under the name of Etihad Town (Pvt) Limited at Mouza Rakh Khamba, Raiwind Road Lahore.

Project Details

Name of Project	Proposed Housing Scheme Etihad Town Premier Enclave under the name of ETIHAD TOWN (PVT) LIMITED
Location	Mouza Rakh Khamba, Raiwind Road Lahore.
Purpose of the project	Housing Scheme
Current status of the project:	Status of the project is proposed project construction will be started after getting the environmental approval.
Cost	Rs. 2.8 billion Approx.
Land Requirement	
Total Area for the of Housing Scheme	401.84 Kanal

Land use

LANDUSE TABLE

Sr.	Land use	Area (K)	% age
1	Residential	195.31	48.65%
2	Commercial	20.19	5.03%
3	Open Spaces	28.29	7.04%
4	P B for LDA	6.10	1.52%
5	P B for Spinlon	6.10	1.52%
6	Society Office	0.50	0.12%
7	OHWT	0.12	0.03%
8	Disposal Station	0.15	0.04%
9	S.W.M	0.50	0.12%
10	Graveyard	8.08	2.01%
11	Roads & Parkings	147.50	36.70%
	Total	401.84	100.00%

Residential

DETAILS OF RESIDENTIAL PLOTS

Sr.	CATEGORY	NO OF PLOTS
1	1 Kanal Plots	25
2	10 Marla Plots	68
3	05 Marla Plots	408
	Total	501

Commercial

DETAILS OF COMMERCIAL PLOTS		
1	2.66 Marla Plots	12
2	4.0 Marla Plots	15
3	5.33 Marla Plots	13
4	8 Marla Plots	25
5	Misc.	6
	Total	71

Details of mortgage plots

DETAILS OF MORTGAGED PLOTS			
Sr.	PLOTS	AREA (M)	NO. OF PLOTS
1	41 TO 72	12.15	32
2	94 TO 107	3.42	14
3	191 TO 193 & 256 TO 259	4.06	7
4	216 TO 220	1.83	5
5	101 TO 126	1.87	6
6	327 TO 352	6.60	26
7	414 TO 419	1.70	6
8	494 TO 511 & 513 TO 514	5.10	20
9	353 TO 359	1.76	7
10	560 TO 568 & 583 TO 589	3.90	16
	Total	42.93	139

Fired bricks

and clay blocks	Variable
Cement composites	
Concrete	
Glass	
Metal	
Storage and handling of construction material	Constructional waste will be placed, at plot present in the Housing Scheme for waste disposal. From there some of the waste will be reused for landscaping of the area within the scheme. Rest will be handed over to local contractor. Contract with the contractor will be made before commencement of work.
Solid Waste	Area of 0.5 kanal reserved in Housing Scheme for safe disposal of Domestic of waste and solid waste collection.
Final Destination	Contract will be made with local contractor before commencement of work.
Source of water drinking water	Ground water will used as a source of drinking water for the proposed Housing Scheme
Source of Water consumption	Domestic
Manpower	
Labor Force during construction	40-50 persons approx.
Labor force during operation that will be sanitary worker, Security guard, watchman	Approx. 12-15 persons

The entire project will be augmented by the provision of the following:

- CCTV Security System
- Fire Alarm System
- Hard and soft landscaping.

Design Criteria for Development

All the construction activities of **M/s ETIHAD TOWN (PVT) LIMITED** Housing Scheme at **Mouza Rakh Khamba, Raiwind Road Lahore** will be carried out according to the

schedule and will be completed in time. The utility services that will be provided at the Housing Scheme include water supply system, electricity network, telecommunication system, network of Roads & streets, Sui Gas, Sewerage network and Waste Water Treatment in accordance with the PEQs

Water Requirement:

The proposed project has 2390 plots with 6000-8000 number of people estimated based on average 3-5 persons, about 2000 cubic meter per day of water may be required for total estimated population of the ETIHAD TOWN (PVT) LIMITED Housing Scheme at Mouza Rakh Khamba, Raiwind Road Lahore.

Source of Water

WASA will provide the water connection at the project site which will be used to fulfill the water requirements at the project site. For the storage of water, underground and overhead water tanks will be constructed at the project site.

Treatment of Waste water

60-70% waste water will be treated in sewage treatment plant

Sewage Treatment Plant:

Sewage treatment is a type of wastewater treatment which aims to remove contaminants from sewage to produce an effluent that is suitable to discharge to the surrounding environment or an intended reuse application, thereby preventing water pollution from raw sewage discharge

Working Principle:

As sewage enters a plant for treatment, it flows through a screen, which removes large floating objects such as rags and sticks that might clog pipes or damage equipment. After sewage has been screened, it passes into a grit chamber, where cinders, sand, and small stones settle to the bottom. Once the water is treated, it can be discharged safely into the environment, or it can be reused for non-potable purposes like irrigation, industrial uses, or groundwater recharge. Proper maintenance of sewage treatment plant is essential so that it operates efficiently and effectively.

One sewage treatment plant is already installed for the housing scheme

Recommendations

There are several ways to improve the efficiency of sewage treatment plant. Here are some suggestions;

1. Regular maintenance of plant including inspection, cleaning and repair of equipment can improve the efficiency of the plant. Proper maintenance can prevent breakdown. Reduce downtime, and extend the life of equipment.
2. Optimization of the treatment process can also improve the efficiency of the plant. This can involve adjusting the treatment parameters, such as flow rate, pH and temperature to achieve the best possible treatment results.
3. Educating and training of plant operators can also improve the efficiency of the plant. Properly trained operators can identify and optimize the treatment process and reduce downtime.

Wastewater Disposal:

Proponent will construct his own drainage line as per direction from authoritative body. Septic tanks will be installed at household level and water will be treated to achieve the PEQS and final disposal through the disposal facility will be done at the responsibility of the project proponent and permission from the relevant regulatory body will be obtained.

Solid Waste Management

Waste effluents will primarily consist of the domestic sewage from the houses and public buildings. About 5000-8000 kg/day (approx.) of domestic solid waste may be generated from the project after construction of all houses and it will be disposed of as per policy of the local municipal authority.

Solid waste storage:

Storage area of 2.0 kanal has been allocated for the disposal of solid waste and disposal of sewage within the said Housing Scheme. Designated vehicles will collect the Solid waste from the storage site and will be disposed of in environmentally friendly way in compliance of local municipal authority and waste recycling will be encouraged by the project proponent to avoid the massive dumping.

Solid waste facilities:

Waste bins will be placed in every street. Waste containers/wheel bins will be placed at different points; sanitary workers/sweepers will be appointed for collection of waste.

Solid waste collection and transport:

Wheel bins and hand carts may be used for waste collection and proper schedule and route will be developed and allocated for solid waste collection vehicles for collection the waste and transfer to the storage facility of Housing Scheme and ultimate disposal as per policy of the local municipal authority.

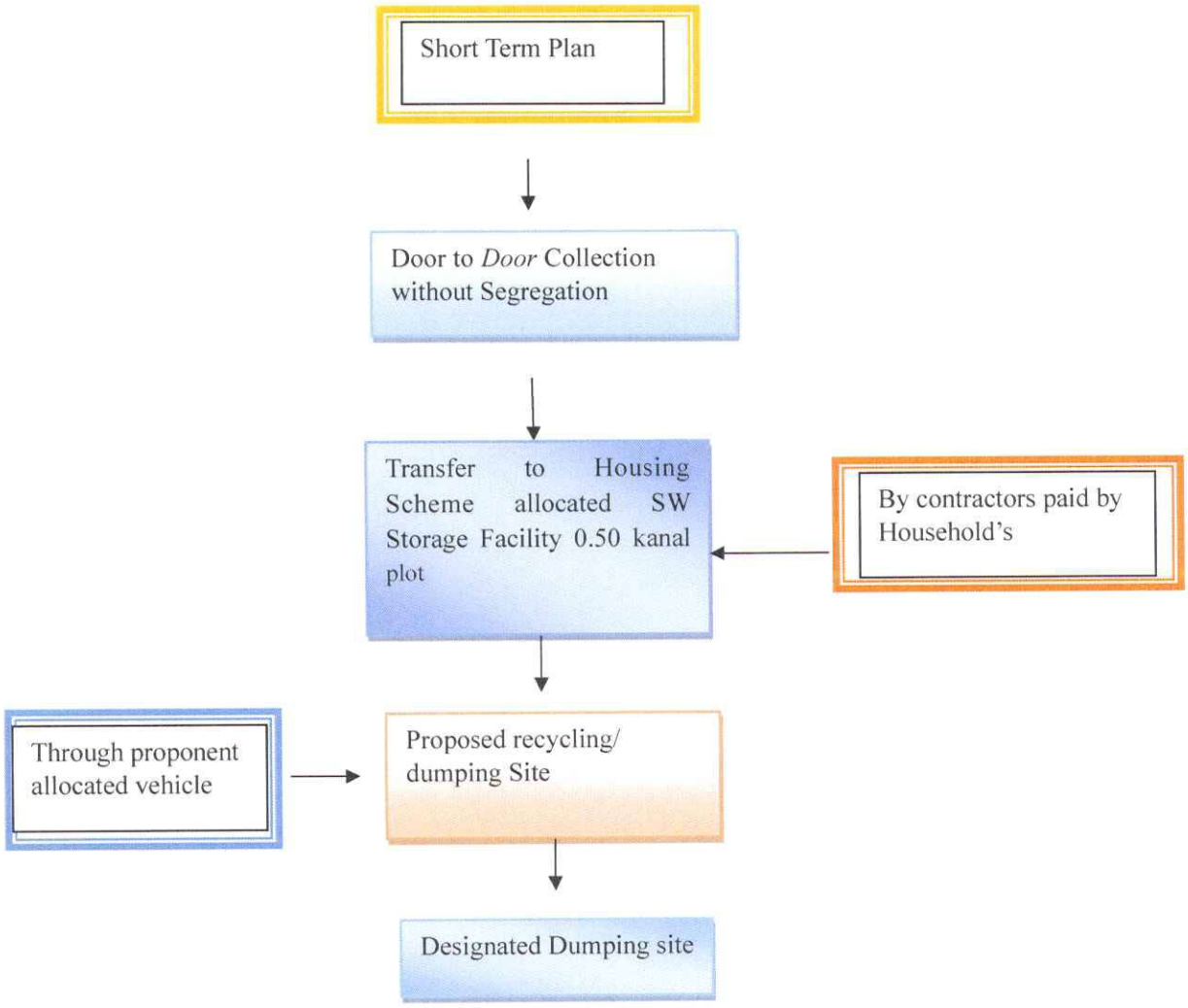
Schedule for waste collection

The waste will be collected on daily basis from houses and waste containers/wheel bins and transfer to the storage area and to the final destination.

Awareness plan

All sanitary workers should undergo extensive training in SWM, including the linkage between a deteriorating environment, waste, and human health, the treatment and management of waste, occupational hazards, health and hygiene, collection and transportation procedures, and etc.

Flow Chart for the SWMP:



Atmospheric Emissions:

Dust and particulate matter can be generated during the construction activities. Sprinkling of water will be done on dust tracks, stock piles; raw material will be covered by plastic sheets, loading and unloading of raw material will be done at night etc.

Health, Safety & Hygiene

First Aid facility

Proper medical facilities and proper training about first aid will be provided to workers and staff to cope with any incidental accidents.

Personal Protective Equipment (PPEs)

At subject project during working hours, PPEs like gloves, masks, boots, caps, earplugs, safety clothing etc. will be available and provided to workers to protect at workplace.

Table 3: Types of PPEs with Exposure to Hazards

Protection	Occupational Hazards	PPEs
Head Protection	Falling objects, inadequate height clearance, and overhead power cords	Helmets with or without electrical protection
Hand protection	Hazardous material, cuts or lacerations, vibrations, extreme temperatures	Synthetic or Rubber gloves, leather, insulating material etc.
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Glasses, shield protective, etc.
Hearing protection	Noise, ultra sound	Hearing protectors like ear plugs, ear muffs
Respiratory protection	Dust, fogs, fumes, gases, smokes, vapors, oxygen deficiency	Facemasks or air supply
Body protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Aprons, insulating clothing etc. of appropriate materials

Safety signs/Safety boards

At any workplace Safety signs and symbols are very important to avoid many accidents. They must be in easy and understandable language to all the workers during constructional phase. Workers should have the knowledge of sign wordings and they must be trained and aware about them. Safety signs, symbols and boards must be provided by every department to protect the workers and employees from the risks of hazards that has not been controlled by other means. Safety signs and boards give safety message, and they must be of different colors that workers could understand their meanings easily. At the subject project, safety signs and boards will be placed to avoid the workers and staff from any risk.

Sui Gas

Sui gas will be provided after approval from the department.

Telecommunication

Telephone facility will be provided by the PTCL. An underground cable will also be provided for electronic media after approval from the competent authority.

Plantation

Planation will be done within the proposed site of project as per direction of the EPA Punjab. Also, at the existing housing scheme maximum plantation has been done and park/green belts are present for the society children's

Schedule of plantation

Plantation will be done within the premises of the subject project along the boundary walls, road sides, in the parks and green belts. Schedule will be followed as per condition of the Environment.

Budget for plantation:

A specific budget of total cost will be invested on the environmental improvement, plantation & other allied facilities.

No. of Plants/Trees to be planted:

Maximum plantation of indigenous species will be planted at the project area, and number of plantations will be according to condition of the environmental approval.

Fire Protection System

Fire protection system will be installed at public facilities/ buildings to avoid the fire hazards.

Security:

Security guards round the clock are present which improves the security of the project site and also in its vicinity.

Project Cost

The approximate cost of project is Rs. 2.8 billion (Pakistani Rupees) approx.

Infrastructure

Basic infrastructure/ utilities are present near the Project site.

Institutions

Some institutes are present near the project site. In fact, Comsat university situated opposite to the housing scheme

Nearby Human Settlement

Site is the urban area of Lahore.

Transportation:

Project site is well provided with roads networks.

Power sources and transmission

The power requirements in the area are fulfilled by WAPDA and the electricity provision to the site will also be provided by WAPDA.

Agriculture Development

The project site is situated at **Raiwind Road Lahore.**

The land in the surrounding is residential.

Restoration / Rehabilitation Plan

All possible precaution will be taken to prevent an untoward incident in terms of life and property losses. The demolition materials will possibly be reused and recycled. All excavated surfaces will be termite proofed.

One completion of the project, the debris will be removed from the site in order to maintain aesthetics of the project. All measures will be undertaken for ensuring occupational safety, security and clean environment in the project area.

Government approvals required by the project:

Management of **ETIHAD TOWN** Housing Scheme will get all the approvals from concerned departments after getting Environmental approval from EPA Punjab

CHAPTER # 4

DESCRIPTION OF ENVIRONMENT

This section describes the baseline conditions, which cover the existing Physical, ecological and socio-economic environment of the project as well as study area. Data was collected by reviewing secondary data and field survey.

Physical Environment/ Resources

Topography:

The topography of the project area is flat. The General height of the area is approximately 220 meters above the Mean Sea Level (MSL). The district Lahore is divided into two parts. The low-lying alluvial soil is along the Ravi River, and the upland in the east. Upland is a plain slope from north-east to south-west. The lowlands are generally inundated during the monsoon season by Ravi River, flowing in the west of district along its boundary with district Sheikhupura. Below figure is showing the topography of the area.

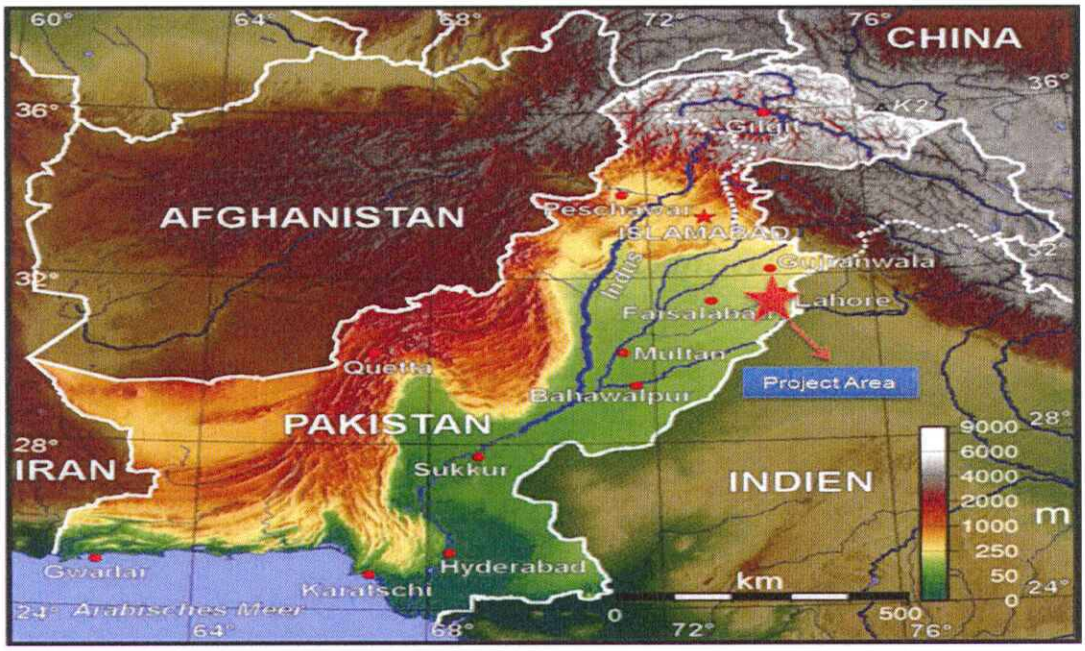


Fig: Picture showing the topography of the project area

Soil:

The soil in the Project Area is cohesion less and is of alluvial type deposited by Ravi River. Various soil layers below the ground level includes: silt, silty clay, silty sand, poorly graded sand with silt, lean clay etc. The soil is different in character and generally inclined to be dry. However, it is rich in potential plant nutrients.

Climate and metrology:

Seasonal climatic conditions must be considered for the design and execution of Project. The climate including air, temperature, precipitation, humidity and evaporation is an influencing factor, affecting the construction of project and other engineering structures. However, to determine the overall effect of the climatic stresses, daily and seasonal temperature changes, site altitude, direct solar radiation, and precipitation must be considered. The Project Area has extreme climate: it has hot summer and cold winters. The summer starts from April and lasts till September. May, June, and July are the hottest months. The mean maximum and minimum temperature ranges from 40.4 ℃ and 27.3 ℃ respectively for these months.

The winter seasons lasts from November to March. December, January and February are the coldest months. The mean maximum and mean minimum temperature ranges from 19.8℃ to 5.9℃ in January. Temperatures in the Project Area vary from 5.9 ℃ to 40.4 ℃.

The project area receives rains in all the seasons but monsoon rain is pronounced and constitutes a definite rainy season between the month of July and September. The average rainfall is about 629 millimeters per year. Below table summarizes month-wise temperature, precipitation, and relative humidity in the study area.

Month-wise temperature, precipitation, and relative humidity in the study area

Month	Mean Temperature		Precipitation (mm)	Relative Humidity AT 0500 HRS (%)	Relative Humidity AT 2000 HRS (%)
	Maximum	Minimum			
January	19.8	5.9	28.92	80.4	51.9
February	22.0	8.9	37.14	79.0	52.4
March	27.1	14.0	34.3	68.6	42.2
April	33.9	19.6	44.32	50.2	25.3
May	38.6	23.7	24.38	45.7	27.2
June	40.4	27.3	91.62	59.1	40.9
July	36.1	26.8	150.52	76.7	60
August	35.0	26.4	161.42	78.8	65.9
September	35.0	24.4	67.28	74.4	56.4
October	32.9	18.2	11.74	70.6	44.2
November	27.4	11.6	4.44	77.1	48.8
December	21.6	6.8	9.94	82.9	53.73
Annual	**30.8**	**17.8**	**666**	**70.34**	**47.4**

Source: *Meteorology Department Lahore*

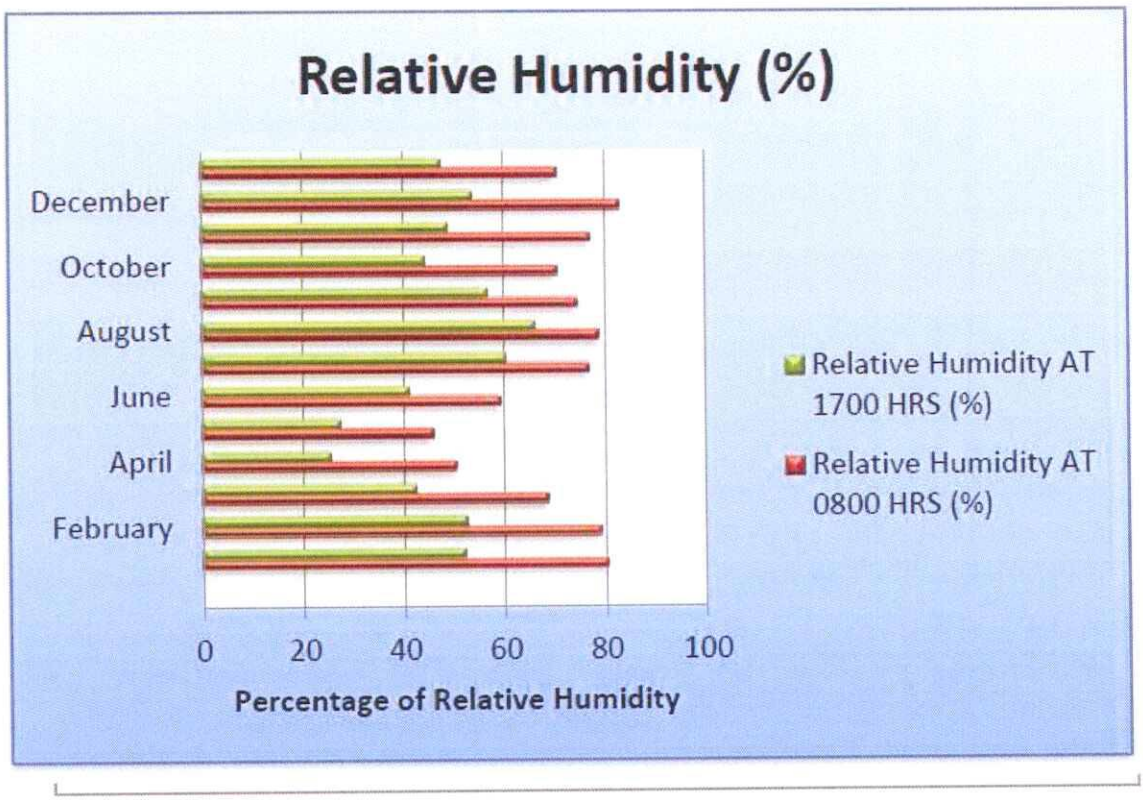


Fig: Picture showing the Relative Humidity in the Study Area

Wind Direction and Wind Speed

Data about wind direction and wind speed for the year 2004, 2005, 2006, and 2007 is available on the format of average daily basis. While, on hourly basis it is available for the year 2008 0nly. Below tables show the average wind speed and wind direction for the year 2004-2007.

Fig: Picture showing the Average Wind Speed (m/sec) (2004-2007) in the project area

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	5S7E	N63W	N54W	N37E	N10W	S72E	S77E	S77E	S22W	N10W	S45E	N23E
2005	N62W	N45E	N54W	N60E	N15E	S89E	S82E	S61W	S57E	S	N54W	C
2006	N37W	N45W	N3E	N36E	S79E	N85E	S56E	S53E	S22E	N45W	N68W	W
2007	N45W	N54E	N3E	N18W	N51E	S15E	S28W	S47E	N77E	N45W	N45W	N28W

***Source**: Meteorology Department Lahore*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	N56W	N55W	N78W	N44W	S71W	S13E	S16E	N56E	S80W	N69W	S75W	W
2005	N80W	N62W	N44W	N67W	N63W	S52W	E	S71W	N54E	W	N68W	N68W
2006	N55W	N47W	N41W	N51W	S46W	S30W	S61E	N67E	N61W	N76W	N71W	N65W
2007	N77W	N55W	N70W	N82W	N39W	S47W	S36E	N67E	N32W	N61W	W	N65W

***Source**: Meteorology Department Lahore*

Fig: Picture showing the Wind Direction at 0800 (2004-2007) in the study area

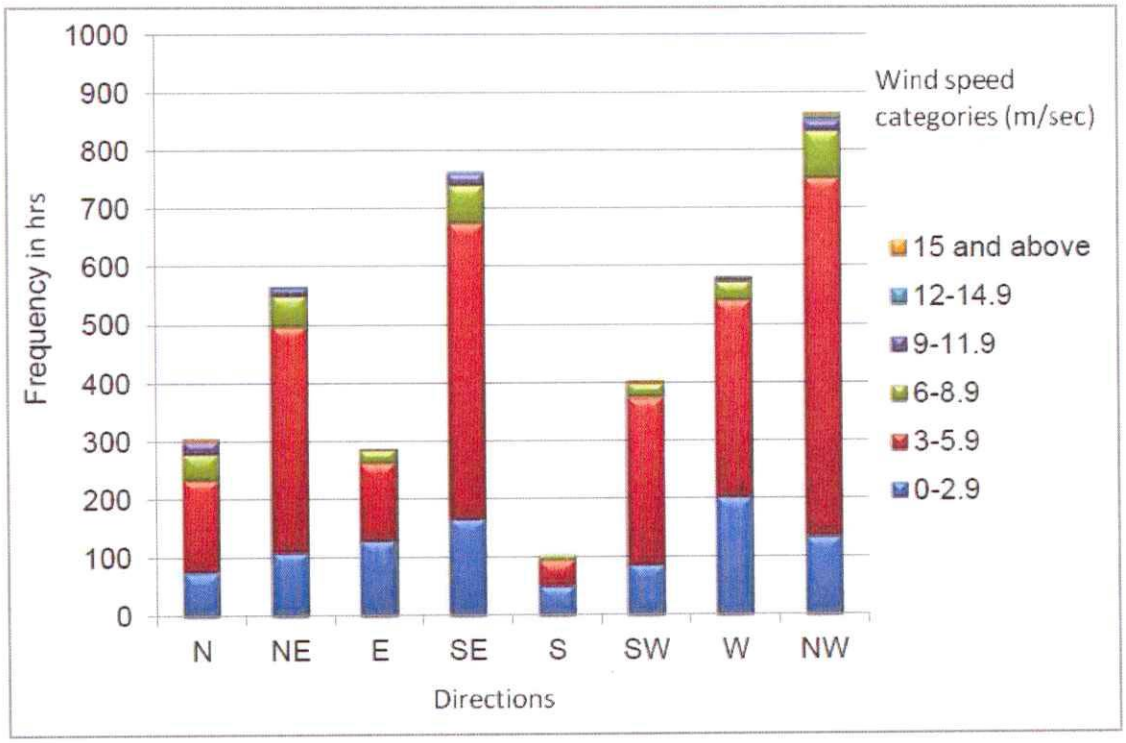


Fig: Picture showing the Wind Direction at 1700 (2004-2007) in the project area

Fig: Picture showing wind speed and wind direction in the city of Lahore 2008

In winter (November-February) the predominant direction is West and North West, in summer (March-June) the predominant direction is South-East while in Moon soon/ summer season (July-October) the predominant direction is South East. Seasonal wise direction and wind speed is shown in the Figures below.

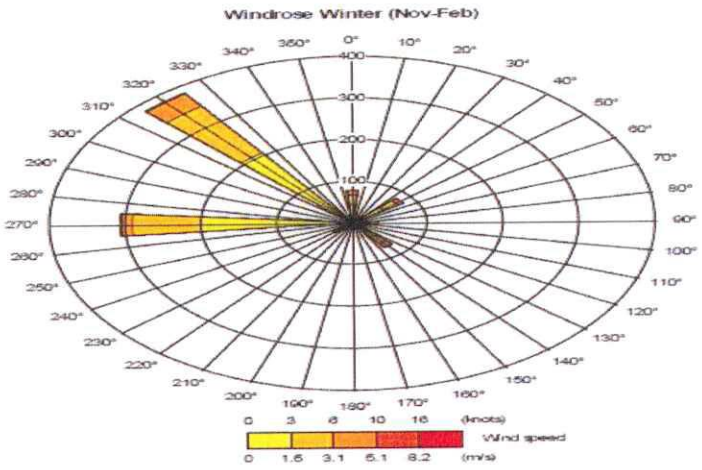


Fig: Picture showing the Wind Rose for the winter, Lahore

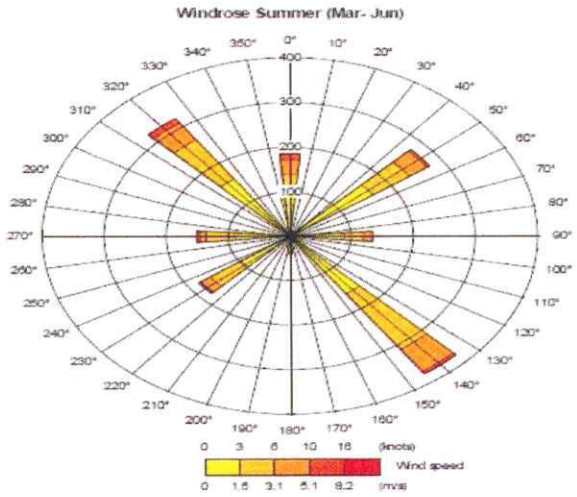


Fig: Figure showing the Wind Rose for the summer (MAR-JUNE) Lahore

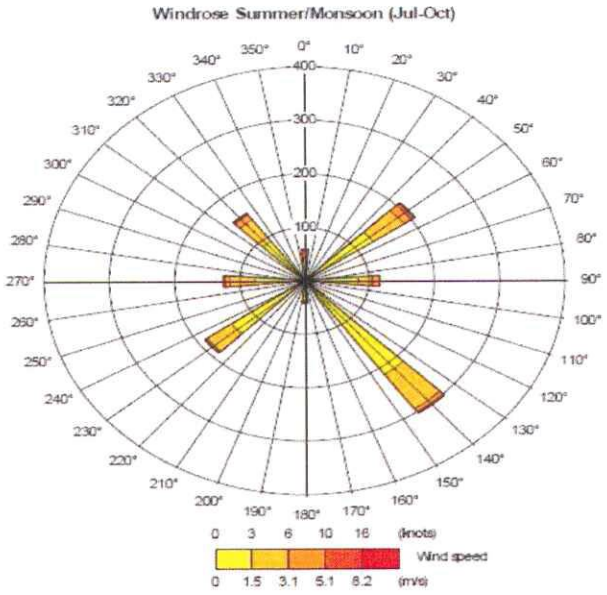


Fig: Figure showing the Wind Rose for the summer/ Moon soon (July-OCT), Lahore

Ambient Air Quality:

Atmospheric pollution, particularly in urban areas like Lahore, has a strong impact on daily life. Motor vehicles are a major source of air pollution. Monitoring was conducted at the project site by using Fine Dust Sampler IPM-FDS 2.5/10µ and Ambient Air Analyzer.

To record the baseline ambient air quality of the project area, monitoring was conducted at advised locations to assess the concentration of priority pollutants (Carbon monoxide, Nitrogen dioxide, Sulphur dioxide and PM_{10}) in the air. Lab reports of Ambient Air Monitoring are attached as **Annexure-D** with the EIA Report.

Noise Level Monitoring:

Basic Environmental conditions:

During the measurement following conditions were prevailed on workplace:

Metrological Conditions:

During the noise level monitoring weather was dry and sky was clear. Air was blowing at normal speed

Monitoring Instrument:

The description of the instrument used for the noise level monitoring is given below:

Name: Digital sound level meter

Model: AR824

Company: Intel Instruments plus

Frequency Range: 31.5 Hz to 8 kHz

Methodology adopted:

Noise level was monitored at four points and the lab results are attached as **Annexure-D.**

Ground water:

The underground water is supplied by the WASA in the project area. The water analysis was completed and lab results are attached as **Annexure-D.**

Ecological Resources

As climate of Lahore is semi-arid and subtropical, the vegetation of the district falls under scrub, dry, tropical thorn forest type as per phyto-geographical classification of the area but this vegetation is confined to the graveyards in the Lahore city and the project site is free from such type of vegetation.

Flora:

There are four small trees of *Dilbergia sisso* (Shisham) present at the plot which will be removed or transplanted to the other area and in compensation twenty trees of 6 feet height will be planted in the Lahore city with the consultation of PHA.

Fauna:

Different birds were observed at the project site during the site visit including sparrow, crow, pigeon and dove etc. When the building will be established, pots containing plants and habitats for the pigeons will be provided for the fauna.

Socioeconomic Environment:

Social Environment

This section deals with the social conditions of the Project Area. Data was collected during the field survey and from the secondary sources, during the field survey interviews with the residents, shopkeepers, students, pedestrians and drivers were held and observations were taken after giving due consideration to the desk/ office study results.

Demographic Characteristics of the Project Area

The total population of Lahore District has crossed 12,642,000.

Religion

The population of the district is predominantly Muslims i.e., approx. 95 percent, other minorities like Christians, Sikhs and Hindus etc. are approx. 5 percent.

Education

Lahore is known as Pakistan's education capital, with more colleges and universities than any other city in the country. Lahore is Pakistan's largest producer of professionals in the fields of science, technology, IT, engineering, medicine, nuclear sciences, pharmacology, telecommunication, biotechnology and microelectronics. Most of the reputable universities are public, but in recent years there has also been an upsurge in the number of private universities. The current literacy rate of Lahore is 74%. Lahore hosts some of Pakistan's oldest educational institutes: Government College Lahore (now Government College University), established in 1864; Forman Christian College, a chartered university established in 1864; University of the Punjab, established in 1882; Kinnaird College, established in 1913; and University of Engineering and Technology, Lahore (UET Lahore), established in 1921. UET is also Pakistan's oldest technical degree-awarding institute and its first university in the field of engineering and technology.

Lahore's institutes in the fields of computer science, IT, and engineering include the National University of Computer and Emerging Sciences (NUCES or FAST-NU) and Punjab University College of Information Technology. Notable architecture schools include Beaconhouse National University, COMSATS Institute of Information Technology, University of South Asia, National College of Arts and University of Engineering and Technology, Lahore. Notable business schools include the Lahore University of Management Sciences (LUMS), Lahore School of Economics, Forman Christian College, and University of Management and Technology. University of Education, established in 2002, is Pakistan's first specialized university in the field of education.

Lahore also provides education in many fields of health sciences. Notable medical colleges offering MBBS degrees include Allama Iqbal Medical College, Fatima Jinnah Medical College, King Edward Medical University, Lahore Medical and Dental College, Services Institute of Medical Sciences, Shaikh Khalifa Bin Zayed Al-Nahyan Medical and Dental College and Shalamar Medical and Dental College. Important postgraduate institutes are Punjab Institute of Cardiology and University of Health Sciences, Lahore. University of Veterinary and Animal Sciences is the only college in Lahore providing education in the field of veterinary medicine. De 'Montmorency College of Dentistry is an important college of dentistry. There are many institutes offering education in fields of nursing and pharmacy as well.

Notable schools include Aitchison College, St. Anthony's College, Lahore College of Arts and Sciences, Lahore Grammar School and Salamat School System. Aghaz School System is present near the subject project.

Health Facilities

Ample medical and health facilities are available in the Lahore Metropolitan Corporation area and its suburbs. Shaukat Khanam Hospital is the latest addition in the medical care facilities in Lahore for the most dangerous disease in the country. i.e., Cancer. There are also other hospitals of voluntary organizations which provide health cover to the general public. King Zaid Bin Sultan Hospital is also a very advanced addition in the medical care for Lahore. Among the prominent hospitals are General Hospital, Lady Willington Hospital, Mayo Hospital, Fatima Jinnah Hospital, The Children Hospital, Services Hospital, and Ganga Ram Hospital etc. Besides, a number of private medical practitioners, Hakims and homeopathic doctors are also practicing in the city. Some famous Health facilities located in the Project vicinity are Hameed Latif Hospital, Wapda Hospital and Lady Willington.

Quality of Life Values

All classes of people are present in Lahore City; People lead lives according to their income.

Civic Amenities

Civic amenities like potable drinking water, dispensary and rest area are available near the project site.

Games:

Cricket, Football, badminton, Hockey, Volleyball, Kabaddi and Kushti are major sports of Lahore District.

Welfare of Employees

Management of project is mindful of the fact that the satisfied employees will deliver better output.

Historical buildings near the project site:

National Hockey Stadium, Pakistan Radio, Agriculture department, Punjab Public Service Commission are the historical buildings near the project site.

Aesthetic Values:

Like the general trend among the citizens of area, most of the people have low awareness about environment. Even then, some people take cleanliness and neatness of the environment lightly. Some people throw municipal solid wastes (MSWs) on the streets. Sense of personal responsibility to keep the environment clean as good citizens is even now lacking among a few people.

CHAPTER # 5

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & THEIR MITIGATION MEASURES

The following chapter describes the overall possible impacts of said project on the physical, biological and socioeconomic environment due to the location, Design, during construction phase, during operation phase of the project and mitigation measures to minimize the significance of the possible impacts.

Environmental parameters regarding

1- Project Location:

Subject project is the proposed of housing scheme Etihad Town Premier Enclave under the name of ETIHAD TOWN (PVT) LIMITED, Defence Road, Lahore. The proposed site is present in ETIHAD TOWNs Housing Society. There is not any sensitive area near the project site. So, if the proponent/Developer fulfills all the HSE conditions and Society development laws and rules than this scheme will not cause any adverse environmental impacts on the society. Development of this project will increase the living standards and employments for the local people of the district. Overall, the impacts of this development due to the location are positive on the local community of District and country.

Impact significance: very Low or may be positive

Nature of impact: direct

Duration: Long-term

Timing: Construction and Operation phase

Reversibility: NA

Likelihood: Low (unlikely),

Consequences: very low or may be positive

Mitigation Measures and Recommendations:

- Housing Scheme proponent should build the boundary wall all around the Housing Scheme Proponents should enhance the road infrastructure within the Housing Scheme and main link road.
- Proponents should place all the safety and location signs and maps at the specific indemnified place.

- Proper parking arrangements should be maintained during the construction and operational phase of the development.
- Location can be considered as positive impact on the community due to the facilities provided to the community.

2- Project design

Subject of Housing Scheme under the name of ETIHAD TOWN (PVT) LIMITED project that is design on the 586.06 Kanal for the houses building, commercial building, public parking, parks and grave yard and for the solid waste management and waste water treatment facility a plot is reserved. The main buildings are;

- Houses
- Commercial shops/ Market
- Parks
- Solid waste

Following are the major Environmental impacts due to the development related to the design:

Impacts

- Structural stability of the proposed houses and whole scheme
- Soil structure and soil bearing capacity.
- Road infrastructure design
- Emergency exit in the houses as well as society for the emergency situations
- Firefighting system
- Wastewater disposal system design
- Rain water harvesting capacity of the drainage system.
- Electricity hazardous

Impact significance: moderate to high or may be negative.

Nature of impact: direct

Duration: Long-term

Timing: Constructional phase & Operation phase

Reversibility: NA

Likelihood: moderate to high

Consequences: moderate to high or may be negative

Mitigation measures and recommendations

Following are the mitigation measures and recommendation to minimize the anticipated impacts

- Road infrastructure should be according to the laws and regulations.
- Emergency exist should be design during the designing phase for public building.
- Firefighting system should be design for the emergency situations.
- Waste water drainage should be design vast to bear the rain water capacity of the society.
- Electricity system should be design safe and sound, electricity wires should be covered by thick plastic/electricity resistant covers.
- All the design should be approved from the concern authority to minimize the impacts due to the designing.

3- During the construction phase

Project is the of housing scheme under the name of ETIHAD TOWN Phase II .

Impacts

Impacts related to the construction phase of the subject project are discussed below:

- **Grubbing and stripping**

Grubbing and stripping may be a minor and short-term impact on the physical environment during the construction phase. It may also be a health and safety hazard for the people at or near the project site .

- **Leveling and compaction of the land**

Leveling and compaction of the land is also a short term and minor impact on the physical environment and it may also be a health and safety hazard for the workers.

- **Demarcation of project and other facilities**

It may also be a minor impact on the physical environment due to the subject project.

- **Generation of dust during loading and unloading of construction materials**

It is also a minor and short-term impact on the physical environment and also for health and safety, which may arise during the construction phase.

- **Generation of noise on account of vehicular use and construction activities**

It is also a minor and short-term impact on the physical environment and also for health and safety, which may arise during the construction phase.

- **Gaseous emission due to the vehicles and stand by generator (if any)**

It may also be a minor impact on the physical environment during the construction phase, if vehicles and generators are not properly tuned.

- **Local flooding due to over-use of water and leakage of pipes**

It may be a minor and short-term impact on the physical environment if precautionary measures have not been taken.

- **Safety of construction workers, people in the surroundings and passersby**

Health and safety issues may arise during the construction phase if proper precautionary measures will not be taken.

- **Any outbreak of fire due to electrical and other failures**

This issue may arise due to carelessness or improper management, and it may be a serious hazard which may affect the environment or may also cause the loss of property or life.

- **Solid waste generation due to domestic and construction activities**

Solid waste generation due to domestic and construction activities may be a negative impact on environment if not managed properly.

- **Wastewater generation from the domestic and constructional activities**

Wastewater generation due to domestic and construction activities may be a negative impact on environment if proper wastewater treatment and management system will not be implemented.

- **Ground water quality**

Ground water quality may be affected by the development if proper mitigation measures will not be implemented.

- **Impacts on Fauna and Flora**

Construction will impact the flora/ vegetative cover and fauna present at the project site .

- **Security threat**

Security issue is a major socioeconomic impact which may arise during the construction phase.

- **Impact on land value**

Construction of the subject project may cause positive or negative impact on the land value.

- **Dislocation of the people**

Construction of the subject project may cause the dislocation of the local people if any, which is a negative impact on the socioeconomic environment.

- **Loss of public and private infrastructure**

Construction of the subject project may cause loss of public and private infrastructure if any, which is also a negative impact on the socioeconomic environment.

Impact significance: moderate to high or may be negative

Nature of impact: direct

Duration: Short Term

Timing: Construction phase

Reversibility: NA

Likelihood: moderate

Consequences: moderate

Mitigation Measures and Recommendations

- Precautionary measures should be adopted to save the environment from the impacts of grubbing, stripping, leveling and compaction and health and safety of workers should be ensured during these construction phases.
- Demarcation of the project building and other facilities should be according to the laws and regulations.
- Sprinkling of water on dusty tracks is recommended to avoid the generation of dust on dusty tracks.
- Vehicles should be properly tuned to reduce the impacts of dust and noise.
- Mitigation measures should be taken to meet the PEQS at the stack of generators.
- Proper mitigation measures should be taken to reduce the noise generation during the construction activities.
- PPEs i.e., ear muffs, helmets and masks etc. should be provided to workers to ensure their health and safety during the construction activities.
- Precautionary measures should be taken to reduce the local flooding due to over-use or leakage of pipes.
- Health and safety of construction workers, people in the surroundings and passersby must be ensured.
- Precautionary measures should be taken to avoid any outbreak of fire due to electrical and other failures.
- Constructional waste should be used for landfilling purposes.
- Domestic solid waste should be kept in dust bins and should be handed over to local contractors.

- Wastewater treatment facility should be incorporated in the design of the project to treat the wastewater produced due to constructional and domestic activities before the final disposal.
- Add more vegetation to restore the land by more plantations.
- Essential services like water supply, sewerage disposal and solid waste management must be in working condition.
- Construction timings should be scheduled to cause minimum disturbance to neighbors.
- Because of presence of security guards round the clock the security at the project site will be improved as well as in its vicinity. Impact will be moderate positive.
- Land value in the surrounding area will increase due to completion of the present project. Impact will be moderate positive.
- The project does not involve dislocation of the people. There is no requirement of resettling a single person. Impact is nil.
- No movable or immovable property and infrastructure of public and private sectors will be lost or damaged during construction and operation stages. Impact will be nil.

4- During Operational Phase

Project is the proposed construction of community center. Main environmental issues associated with Project operation are as follows.

- **Heavy traffic**

It may be a major problem if proper traffic management laws will not be implemented.

- **Vehicular emissions**

There will be a rush of traffic at the project site because many people will occupy the project site so there could be the issue of vehicular emissions.

- **Solid waste generation due to domestic activities**

Solid waste generation due to domestic activities will be the impact of the subject project.

- **Waste water due to domestic activities**

Production of waste water due to domestic activities is a long term and major impact of the subject project.

- **Fire due to short circuits and other activities**

Fire due to short circuits and other activities is a major hazard, which may cause the loss of property and life.

- **Gaseous emissions from the generators**

Gaseous emissions from the generators may be a negative impact on the environment due to the subject project.

Impact significance: moderate to high or may be negative

Nature of impact: direct

Duration: Long-term

Timing: operational phase

Reversibility: NA

Likelihood: moderate to high

Consequences: moderate to high or may be negative

Mitigation Measures & Recommendations

- Traffic management system should be ensured.
- Properly tuned vehicles should be used and non-tuned vehicles should be banned.
- A well-designed firefighting system should be constructed to cope with fire situations in the area.
- PEQS compliance of generators should be ensured.
- Solid waste bins should be regularly cleaned and solid waste must be handed over to the certified contractors.
- Wastewater treatment facility should be constructed on the reserved place to treat the domestic waste water.
- Proper plan for waste water collection should be devised.

Potential Environmental Enhancement Measures

The proposed project will be installed with all precautionary measures to enhance and safe the environment. Following necessary measures will be adopted during construction and operation:

- Sprinkling of water will be done on dusty road and tracks.
- PPEs will be provided during construction activity.
- Constructional waste and domestic solid waste will be disposed-off or utilized properly.
- Local people will be informed in advance when work is about to start in an area.
- Machinery will never be left unattended.

- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged for the project would be forced to adhere to the load specifications of the access road. No overloading would be allowed in any case.
- Safety signs and boards will be placed during construction.
- Machinery will be kept maintained.
- Waste water will be treated through septic tank that will be installed within the premises of building.
- Area will be restored with native plants. A proper tree plantation plan will be formulated to save the environment.
- Solid waste will be handed over to contractors and agreement will be made.
- Noise will be controlled by adopting proper measures.
- PPEs will be provided to workers during working.
- Firefighting equipment's and system will be installed.
- Safety signs will be placed at all locations where required.
- Hygienic conditions will be ensured and proper quality will be maintained by quality control testing.
- First aid facilities will be made available.
- Any possible measure will be adopted to make the project safe and environmentally friendly.

Serial	Environmental Issues/ Impacts	Mitigation Measures
PLANNING, SITE SELECTION AND DESIGN STAGE		
1	Observance of administrative and legal formalities	Project proponent will get all the approvals from concerned departments after getting Environmental approval from EPA Punjab.
2	Acquisition of land	Fard Arazi attached with the EIA Report
3	Loss of environmentally sensitive areas	Avoid utilizing such patches of land. There is not any sensitive area near the project site however the project proponent will achieve the PEQS at the boundary wall of the subject project
4	Changes in traffic pattern	Prepare suitable in/out traffic plans

5	Potential conflicts with stakeholders	It is recommended to Settle the issues through scoping and specific group discussions.
6	Resettlement issues	No resettlement issues
7	Project Design	Structure Stability Assessment of soil should be done, as per design i.e. total area society, No. of plots, etc. Provision of Emergency Exits, Assembly Points, firefighting arrangements, water storage for firefighting should be incorporated in the design for public. Project proponent is committed to provide all these provision in the design of the project.
SITE DEVELOPMENT STAGE		
1	Erosion due to stripping and site clearance	Sprinkling of water on road side or dusty tracks
2	Generation of dust	• Careful loading and unloading of construction materials is recommended. • Sprinkling of water on construction site and surrounding areas is recommended.
3	Generation of noise	• Avoid suing forbidden horns at the site. • Do not throw heavy equipment and construction materials in haphazard manner.
4	Local flooding/ponding	Immediate repair and maintenance of water supply pipes and sewers in case of any defect will be undertaken.
5	Outbreak of fire	Keeps the firefighting equipment at the oil storage area.
6	Safety	• Safety of the workers and others must be ensured. • Privacy of the neighbors must not be disturbed.
7	Labor issues	Employ the local labor as far as possible.

CONSTRUCTION STAGE		
1	Minor erosion of land	• Add more vegetation, restore the land by more plantation. • Sprinkling of water on dusty tracks is recommended
2	Contamination of land and water	Hazardous substances like oil, fuel, etc. should be kept on concreted surface. Essential services like water supply, sewerage disposal and solid waste management must be in working condition.
3	Impacts of dust, noise and smoke on neighbors	Sprinkle water on dusty tracks is recommended. Avoid suing forbidden horns at the site. Do not throw heavy equipment and construction materials in haphazard manner. Proper tunings of vehicles and machinery must be ensured. Schedule construction timings should be implemented for minimum disturbance to neighbors. Continuous Environmental monitoring must be ensured as per proposed monitoring plan.
OPERATION STAGE		
1	Contamination of land and water sources	Continuous vigilance on maintenance of services is recommended. Tarpaulin sheets must be placed to avoid leaching of oil into ground
2	Fire breakouts	Firefighting equipment must be kept in working condition at specific area
3	Safety/security concerns	Safety of the workers and others must be ensured.
5	Occupational Health, Safety and Environment	• Regular medical check-ups are recommended to improve the working condition and efficiency of workers during constructional phase. • Safety of management, workers and visitors must be ensured.

		• Observance construction and safety codes must be ensured.
6	Production of Solid Waste	• Area for solid waste will be reserved within the subject project. • The solid waste must be managed on regular basis. • The domestic waste must be disposed in municipal channel.

Purpose of Mitigation measures

Purpose of mitigation measures should include:

- What is the problem i.e., in terms of "major environmental impacts" which may arise by the subject project activity?
- When the problem will occur and when it should be addressed?
- Where the problem should be addressed?
- And how the problem should be addressed?

The major impacts may arise by the subject project, particulate matter, dust, noise and solid waste. Other impacts are of minor importance. These impacts will arise during construction and operation but precautionary measures will be adopted prior to start the activity, during the activity and post activity.

Any impact that would arise due to the subject project activity will be addressed on site. Trainings will be conducted on site prior to start work while other precautionary measures will also be adopted to make the project safe and environmentally friendly.

HSE manager/environmental manager along with site manager will be appointed to assess any impact that could be arisen during both phases. He would be responsible to address the problem and to mitigate it.

Ways of achieving mitigation measures

By adopting proper mitigation measures, any anticipated major or minor environmental impacts could be controlled or mitigated. The details of impacts and mitigation measures have been discussed in previous chapters.

Management shall take appropriate measures to provide pollution free and safe environment during the proposed project activity by implementing improved management practices and monitoring techniques suggested in EMP.

Management will adopt such plan that will assure the minimum impact on the environment and health by implementing proper mitigation measures. Design of the project will assure the structure stability and project life in a long run.

Management will develop Restoration/ reclamation or tree planation plan to restore the project area. Maximum Plantation will be done with native species within the unit, along the boundary wall and along the road side if directed by EPA. Also, in-front of main area, horticulture plan will be formulated and area for this will be reserved.

Corporate Social Responsibility (CSR)

CSR means "the continuing commitment by business to behave ethically and contribute to economic development while improving quality of life of the workforce and their families as well as of the local community and society at large. CSR Committee of **ETIHAD TOWN** housing scheme entrusted with task of identifying areas where the Management of **ETIHAD TOWN** housing scheme located at **Defence Road Lahore** could participate positively to the development and improvement of better society in the project area.

Undertaking

The proponent has committed to comply with the relevant construction by-laws/ safeguards and the environmental enactments for the environmental preservation. Project proponent has given Undertaking and Affidavit a respectively

CHAPTER # 6

ENVIRONMENTAL MANAGEMENT PLAN & MONITORING PROGRAM

Purpose and Objectives of the EMP:

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the IEE.
- Define the responsibilities of the project proponent.
- Define a monitoring mechanism and identify monitoring parameters in order to:

1. Ensure the complete implementation of all mitigation measures
2. Ensure the effectiveness of the mitigation measures
3. Provide a mechanism for taking timely action in the face of unanticipated environmental situations
4. Identify training requirements at various levels.

Management Approach:

The overall responsibility for compliance with the environmental management plan rests with the project proponent.

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked.

Institutional Capacity

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE/Project Manager
- In-Charge Administration
- Supervisor of project
- Environmental Engineer

Training Schedules

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged. It will be imparted by a team of experienced trainers.

Training of contractor

Training of contractor & workers will be the part of the TORs regarding the construction of the scheme. The provisions given in EIA Report *Chapter 4 Screening of Potential Environmental Impacts & Their Mitigation Measures* will be followed.

TORs will be including the training and submission of reports in the following area:

1. Handling of Machineries in a safe way
2. Use of PPEs
3. Maintenance of vehicles and submission of Environmental Monitoring Reports
4. Maintenance of Water Consumption records
5. Testing of water and waste water and submission of Environmental Monitoring Reports
6. Placement of safety signs/boards during construction
7. Sprinkling of water on the roads and dusty tracks
8. Monitoring of generator emissions

Training regarding all other aspects of HSE will be ensured by the contractor during the construction phase.

Responsibility of EMP

Overall responsibility for implementation of EMP will be that of project proponent. He will appoint HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage the all HSE condition at the PEQS.

Equipment Maintenance Details

The subject project is the proposed of housing scheme. Proponent will maintain the records for Health Safety & Environment and will hire HSE manager to check and deal with the HSE issues. The company shall maintain PPEs, medical facilities, firefighting Equipment's as fire buckets, fire hydrants and fire extinguishers and records for their periodic fillings or replacement.

Environmental Budget

The cost which is required to effectively implement the mitigation measures is important for the sustainability of the Project in operational stage of the Project. Company has allocated the specific amount of total cost of the budget for Environmental Budget annually for the Training, maintenance and management of Environment that will include filling and maintenance of equipment's, restoration, plantation, and availability of PPEs, strategic planning to cope with any emergency situation and formulate the disaster management plan to cope with natural disaster. Any equipment or devices failure or replacement will not be included in this budget.

Environmental Technical Assistance and Training Plan

In order to raise the level of professional and managerial staff, there is a need to upgrade their knowledge in the related areas. HSE/Project Manager should play a key role in this respect and arrange the training programs.

HSE/Project Manager will provide training to staff and workers about the best environmental management practices at the construction site and affective implementation of the EMP.

The training modules will include air, noise and water pollution monitoring, social awareness, Environmental Laws, Punjab Environmental Quality Standards (PEQS), Usage of personal protection equipment's, and health and safety related issues on the construction site.

The HSE/Project Manager will train all workers & staff in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of Sexually Transmitted Infections (STI) HIV/AIDS and in general health and safety matters, and on the specific hazards of their work. Training should also consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation.

HSE/Project Manager will arrange Training on monthly or quarterly basis regarding health & safety, hygiene, firefighting and first aid.

Summary of Environmental Impacts and Mitigation measures is present in following table in term of Environmental Management Plan:

ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED HOUSING SCHEME OF ETIHAD TOWN

Serial No.	Potential Impact	Mitigation measure to be taken:		
		During the Construction phase	**During the Regular operations**	**Responsibility**
Physical Environment				
1	**Traffic related problems** Since adjacent road is busy so the constructional and operational activities of the subject project may cause traffic issues in the project area.	1- To minimize the impacts of constructional activities of housing scheme ETIHAD TOWNs Lahore on the project area, vehicles number will be regulated in a way that no stampedes will occur at the project site.	During the regular operations, additional area will be reserved exclusively for parking of cars and motor cycles, which will help to avoid any traffic related issues due to the subject project in the area.	Environmental/ Project Manager
		2- As far as possible, large size vehicles in very limited number will be allowed to visit the project site during night time so that it may not disturb the routine traffic of the area.	Management will ensure that no vehicle or motor cycle will be parked at the front of the road and project site as well. This will minimize the impact of the project on the routine traffic of the area.	

2	**Water supply** The increased withdrawal of groundwater for the project activities may affect the groundwater resources of the project area.	1- WASA will provide the water connection at the project site which will be used to fulfill the water requirements at the project site.	WASA will provide the water connection at the project site which will be used to fulfill the water requirements at the project site.	Environmental/ Project Manager
		2- It shall be ensured that no activity tempers with the water supply system.	It shall be ensured that no activity tempers with the water supply system.	
		3- Project proponent committed to provide safe drinking water to all staff and resident	Project proponent committed to provide safe drinking water to all residents and staff.	
3	**Solid wastes** Improper disposal of solid waste	1- Solid wastes produced during the construction activities shall be segregated and duly disposed of i.e., Constructional Solid waste will be used for road repairing and maintenance purpose or will be handed over to the relevant contractors.	1- Solid waste bins will be placed at suitable places in the whole society.	Environmental/ Project Manager
			2- Sludge will be replaced on regular basis.	
			3- Specific area will be allocated in the society for the storage of solid waste; all the waste will be collected at that point.	
		4- Domestic solid waste and sludge will be	5- From that point, waste will be	

		handed over to the certified contractors.	handed over to the Lahore Waste Management Company and agreement will be made for this purpose. 6- Sanitary workers will be hired by the management for the waste handling and management within the building.	
4	Waste water	1- The sewage to be generated shall be discharged into the sewage treatment plant for its treatment. 2- Periodic cleaning of the sewage plant and allied treatment facilities is recommended.	The sewage to be generated will be discharged into the SEWAGE TREATMENT PLANT for treatment at PEQS levels. As there will be no chemical contamination, therefore, simple oxidation may reduce its pollution load. Sewage and other waste effluents will be handled to avoid contaminating surface and groundwater. No contaminated effluents will be released into the environment without having been treated.	Environmental/ Project Manager

			Monitoring will be conducted by EPA certified lab.	
5	Health & safety	1- Local people will be informed in advance when work is about to start in an area. This may result in people keeping young children away from work areas.	Fire Fighting system and emergency exits will be made available in the subject ETIHAD TOWN (PVT) LIMITED to cope with any emergency situation.	Environmental/ Project Manager
		2- Safe driving practices will be adopted, particularly while passing through settlements.	Basic health facilities will be provided to employees.	
		3- Job opportunity will be provided to local people of the area	Security guards will be hired to ensure the security of the staff and residents.	
		4- Training will be provided to workers to avoid any accidents/ injuries.	Job opportunity and living place will be provided to local people of the area.	

		5- Basic health facilities will be provided to employees	Operators will be hired to operate the lifts and other facilities to ensure the safety of the people and to avoid any accidents.	
6	Noise	1- The project construction activities don't involve any activity which may create high noise levels.	No activity producing extra ordinary levels of noise will be allowed as a policy matter.	Environmental/ Project Manager
		2- In order to avoid noise in the project area, vehicles to carry raw materials, shall be operated during night time as far as possible.	Generator will be installed in a specially constructed room where its noise will be curtailed within the limiting values of the Punjab Environmental Quality Standards.	
		3- Ear plugs will be provided & implemented in case of high noise levels.	Monitoring will be conducted by EPA Certified lab as per PEQS if required.	
		4- Noise level monitoring has been conducted by EPA certified lab & results are attached with the report.		
7	Gaseous emissions and particulate	1- Construction materials i.e. sand, clay and like shall be	1 standby diesel fired generator of 60-80 KVA shall cater for emergency	Environmental/

	matter/dust emissions	transported to the project site during night time and will be stored away from the road or foot path. They will be kept under cover to avoid any fugitive dust. 2- Dust may generate during unloading of raw materials. 3- All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke. 4- Ambient air quality has been monitored by EPA certified Lab and results are incorporated within the report. 5- Water will be sprinkled on all exposed surfaces to suppress emissions of dust.	situation only. Their exhaust will be emitted through an adequately fabricated stack.	Project Manager

		6- Dust emission from soil piles and aggregate storage stockpiles will be reduced by keeping the material moist by sprinkling of water at appropriate frequency or erecting windshield walls on three sides of the piles such that the wall project 0.5 m above the pile, or covering the pile, for example with tarpaulin or thick plastic sheets, to prevent emission.	Monitoring will be conducted as per PEQS rules.	
		7- All equipment, generators, and vehicles used during the constructional activities will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.		
8	Soil erosion	1- The clearing of vegetation along proposed site will be	Maximum plantation is recommended within at outside the project site to restore the land.	Environmental/ Project Manager

		minimized as far as possible.		
		2- Trees necessary to be removed for the purpose of construction will be removed in a way that their roots will not be separated from the trunk, so that they could be planted somewhere else.	Tarpaulin sheets will be placed under generator (s), and other leaching substances.	
		3- Open fires will not be allowed anywhere outside the proposed site.	Land will be restored and rehabilitated by planting indigenous plants. Proper rehabilitation plan will be implemented.	
BIOLOGICAL ENVIRONMENT				
9	Fauna and Flora	1- Proposed site is devoid of any protected species of both fauna & flora	Awareness programs will be planned regarding the protection of fauna & flora.	Environmental/ HSE Manager
			Species of Indigenous plants will be planted at site.	
Others				

10	Enhancement of aesthetic beauty of the area	---	Flower pots containing flowers and plants will be planted to the improvement of the environment around. Street lights will be provided on the roads to add beauty to the front site and the environment around. All other necessary measures shall also be taken to maintain standards of cleanliness so that the housing scheme may add to the scenic/aesthetic beauty of the area around.	Environmental/ Project Manager
11	Staff for catering the Environmental Management Plan	---	Special staff will be recruited by the management to implement this Environmental Management Plan on regular basis.	Management

CHAPTER # 7

STAKEHOLDERS PARTICIPATION

Team of M/s Pak Green Enviro-Engineering (Pvt.) Ltd. visited the project site , had discussions with stakeholders and consult with the local people to evaluate the project socio-economic impacts. People were providing with massive information about the project and have positive remarks regarding the project development.

Public discussions were held with the inhabitant of the surrounding area. They are quite positive to the project and see the project as growing business. The people observe strong positive impacts regarding employment, business and structural development due to this project. IEE findings depict that people perceive overall positive social and economic impacts by the project. Their attitude towards the project installation is highly optimistic. Majority of the people are convinced for development in the area and they correlate this progress with the pace of their social mobility. Proponent has ensured to maintain the aesthetics of the area, reclaim the land and also to provide jobs/employment during construction and at the time of functioning of the project. Moreover, project proponent admitted to adopt all the mitigation measures to control any impacts resulting from the subject project.

Methodology of consultation:

The IEE team carried out public consultations at various locations around the Project site . The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices, Govt. offices, shops, etc. near the Project area:

- Selection of the stakeholders for consultation, reconnaissance of the project site and initial discussions with the neighboring residents, shopkeepers, drivers etc.
- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

Consultations were held with the followings;

Proponent

Possible impacts and mitigation measures related to the subject project were discussed with the project proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environmentally friendly.

The Responsible Authority

Management of the subject project is the responsible authority to take all measures prior to the activity.

Other departments and agencies

For the impact analysis detailed meetings were held with the management of the subject project, local community, education institutes, health institutes, hospital and NGOs. Issues were discussed that may affect the environment and also the implementation of proposed project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan.

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultations is to obtain the feedback from the relevant persons.

Environmental Practitioners and Experts

Team of M/s Pak Green visited the project site , had discussions with stakeholders and consulted with the local people to evaluate the project socio-economic impacts. People of the area belong to different professions like mostly belong to employment, own businesses, doctors, some in abroad, in Army, teaching, in agriculture, etc. Women were also consulted for their point of view regarding the betterment of the area by this project, some of them communicated but according to social value of the area they mostly hesitate to communicate comfortably and get pictured. People provide the massive information about the project and have positive remarks regarding the project development.

Affected & Wider Community

There is no affected community present in the radius of our study area. PGEE team has consulted with the inhabitants of the different villages. They provided positive remarks regarding the subject project.

Sample size of 20 respondents was selected by the Team of consultants for conducting the socioeconomic survey. Women were also consulted for the said survey; while most of them were not willing to give personal information. Stakeholder's participation Performa's and socioeconomic questionnaire were get filled by the inhabitants to evaluate the project socio-economic impacts. List of respondents and socioeconomic questionnaires are attached as **Annexure-F.**

CHAPTER # 8

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

- The IEE study reveals that the project is economically viable, socially acceptable and environment friendly.
- It will generate additional jobs during construction and operation phases.
- Project is environmentally friendly and pollution free.
- The proponent has committed to implement the project in the environment friendly manner.
- Project proponent has ensured to install the Waste Water Treatment facility to treat the domestic waste water prior to discharge into drain.
- Project proponent has ensured to adopt the proper solid waste management system.
- Proponent has ensured to adopt all the necessary measures to control any impact if resulting from the project.
- Project proponent has ensured to provide the safe drinking water to all workers and staff.
- Project proponent has prepared and implemented very comprehensive Security and Fire Fighting Standards Operating Procedures.

RECOMMENDATIONS

- In view of the comprehensive screening process and findings of the present study there is no need of conducting further investigations.
- Extensive plantation has been done in the housing society and more is recommended.
- A good firefighting system should be installed.
- Proper solid waste management system should be followed according to direction of the Local Government.
- High standards of bio-security and safety should be enforced during operation stage. Safety of the workers should be top priority for the management.
- Management should continue to assist the local communities as a corporate social responsibility.

The present EIA Report is enough to meet the administrative and legal framework. Therefore, the environmental approval may be accorded for the present project.