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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ALGAS	Asia Least Cost Greenhouse Gases Abatement Strategy
ASR	Air Sensitive Receivers
BDL	Below Detection Limit
BOD	Bio-chemical Oxygen Demand
CC	Construction Contractor
CDM	Clean Development Mechanism
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
DCO	District Co-ordination Officer
DD	Deputy Director
DG	Directorate General
DRR	Disaster Risk Reduction
DWQS	Drinking Water Quality Standards
EE	Environmental Engineer
EIA	Environmental Impact Assessment
EMMP Plan	Environmental Management and Monitoring
EPA	Environment Protection Agency

EPC	Engineering Construction Procurement
EPD	Environment Protection Department
EPHE	Environmental & Public Health Engineering
FGDs	Focused Group Discussion
GDP	Gross Domestic Product
gm	Gram
GoP	Government of Pakistan
IEE	Initial Environmental Examination
LGO	Local Government Ordinance
LDA	Lahore Development Authority
LDL	Lowest Detection Limit
mg/l	Milligrams per liter
MSL	Mean Sea Level
NCS	National Conservation Strategy
NEQS	National Environmental Quality Standards
NEP	National Environmental Policy
NO₂	Nitrogen Dioxide
NOC	No Objection Certificate
OH & S	Occupational Health and Safety

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PAPs	Project Affected Persons
PEPA	Pakistan Environmental Protection Act
PEPC	Pakistan Environmental Protection Council
PEQS	Punjab Environmental Quality Standards
PM	Particulate Matter
SO₂	Sulfur Dioxide
SOP	Standard Operating Procedures
SWM	Solid Waste Management
TA	Technical Assistance
TORs	Terms of Reference
TSS	Total Suspended Solids
UNDP	United Nation Development Pro
WASA	Water and Sanitation Agency

GLOSSARY

Aesthetic	Concerned with beauty or appreciation of beauty.
Agency	A business or organization providing a particular service on behalf of another business, person, or group.
Aquifer	An aquifer is an underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand or silt) from which groundwater can be extracted using water well.
Climate	The weather conditions prevailing in an area in general or over a long period.
Consultant	A person who provides professional advice or services to companies for fee.
Construction Waste	Waste generated from the buildings and construction industry and includes material like bricks, concrete, tiles, debris, ceramics and more.
Convention	An agreement between states covering particular matters, especially one less formal than a treaty.
Demographic	A single vital or social statistic of a human population, as the number of births or deaths.
Ecology	The branch of biology that deals with the relations of organisms to one another and to their physical surroundings.
Endangered species	A species of animal or plant that is seriously at risk of extinction.

Environment	Relationship of natural world (human beings, animals and plants) with physical surroundings (air, land, water).
Excavation	Excavation is the act or process of digging, especially when something specific is being removed from the ground. Archaeologists use excavation to find artifacts and fossils.
Framework	A framework is a real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful.
Hazardous Waste	Hazardous Waste is waste that poses substantial or potential threats to public health or environment.
Impact	The action of one object coming forcibly into contact with another.
Livelihood	A set of activities involving securing the basic necessities—food, water, shelter and clothing of life.
Municipal Waste	Municipal Solid Waste (MSW)—more commonly known as trash or garbage—consists of everyday items we use and then throw away, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries. This comes from our homes, schools, hospitals, and businesses.
Nature	The phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations.

Ordinance

An ordinance is a law enacted by a municipal body, such as a city council or county commission (sometimes called county council or county board of supervisors).

Preservation

Preservation is the strict setting aside of natural resources to prevent the use or contact by humans or by human intervention. In terms of policy making this often means setting aside areas as nature reserves (otherwise known as wildlife reserves), parks, or other conservation areas.

Proponent

A person who advocates a theory, proposal, or course of action.

Policy

A policy is a deliberate system of principles to guide decision and achieve rational outcomes.

Rehabilitation

To restore to a condition of good health, ability to work, or the like.

Resettlement

The settlement of people in a different place.

Resource

A stock or supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively.

Sanitation

Conditions relating to public health, especially the provision of clean drinking water and adequate sewage disposal.

Seismic Hazards

A seismic hazard is the probability that an earthquake will occur in a given geographic area, within a given window of time, and with ground motion intensity exceeding a given threshold.

Stakeholder

A stakeholder is a party that has an interest in a company and can either affect or be affected by the

business. The primary stakeholders in a typical corporation are its investors, employees and customers.

Stage digging

Stage digging is a process by which portions of the root ball are dug over a period of time in order to allow the tree to acclimate to the stresses gradually.

Topography

Topography is the study of the shape and features of the surface of the Earth and other observable astronomical objects including planets, moons, and asteroids.

Vegetation

Plants considered collectively, especially those found in a particular area or habitat.

Valued Environmental Components

Valued environmental components (VECs) are defined as fundamental elements of the physical, biological or socio-economic environment, including the air, water, soil, terrain, vegetation, wildlife, fish, birds and land use that may be affected by a proposed project.



City-One Housing Scheme
INITIAL ENVIRONMENTAL EXAMINATION

EXECUTIVE SUMMARY

TITLE AND LOCATION OF THE PROJECT

“CITY-ONE HOUSING SCHEME LOCATED ON MOUZA HAMIDPUR KANORA SHUJABAD ROAD, MULTAN”.

NAME AND ADDRESS OF THE PROPONENT

SYED SHAUZAB GARDEZI S/O SYED SHAHBAZ HASSAN SHAH GARDEZI

Address: School Road, House number 36-H, Sector F-6/3, Islamabad

CNIC no: 36302-5623701-7

NAME OF THE ORGANIZATION PREPARING THE REPORT

This report is Prepared By:

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A BRIEF OUTLINE OF THE PROPOSAL

Proposed project is the establishment of City-One Housing Scheme of 749.10 Kanals. The main goal of the Proposed Project is the establishment of the Housing Scheme with facilities such access roads, communal facilities, communication facilities, electricity, gas, basic infra-structure, sewerage lines and water supply pipelines. Project site is well connected to the other parts of the city through a metaled road and the major road linked to the site is Multan Road. The detail distribution of the project area is given below.

Land Distribution for City-One Housing scheme

S#	Description	Proposed Area (K)	Proposed Area (%age)
1.	Area of Plots	313.54	41.86
2.	Area of roads & setback & Parking	261.07	34.85
3.	Commercial Area	74.91	10.00
4.	Parks	52.44	7.00
5.	Public Buildings/ Hospital	23.16	3.09
6.	Water & Disposal Works/ Sewer Treatment/ Solid Waste Disposal	9.00	1.20
7.	Area of Graveyard	14.98	2.0
Grand Total		749.10	100.00

The proponent of the CITY-ONE HOUSING SCHEME engaged M/S **Tetrattech Environmental Consultancy** to carry out the environmental for the development of aforesaid project in accordance with Punjab-EPA guidelines. The salient features of the proposed project are given below:

Salient Features of Project

1	Project Title	City-One Housing Society
2	Proponent	SYED SHAUZAB GARDEZI S/O SYED SHAHBAZ HASSAN SHAH GARDEZI
	Project Location	MOUZA HAMIDPUR KANORA SHUJABAD ROAD, MULTAN
	Co-ordinates	30° 5'9.70"N 71°24'20.96"E
3	Land Use in Surrounding of Proposed area	Surrounding are of the project is agricultural in nature.
	North:	Road
	South:	Agricultural Land

	East:	Road
	West:	Agricultural Land
4	Consultant	TETRATECH Environmental Consultancy
5	Total Area	749.10 Kanals
6	Cost of Project	PKR 150 million
7	Tree Planation	designated area
8	Water Source	Ground Water
9	Status of Project	Open/Vacant Land
10	Nature of Area	Agricultural cum Residential
11	Source of Power	WAPDA
WAPDA= Water and Power Development Authority		

THE MAJOR IMPACTS

Environmental impacts have been identified and mitigation measures are recommended within the project area of influence. The major impacts on physical, biological and social environments are described as under:

Impacts Summary

Environmental Parameters	Impact Assessment	
	During Construction	After Construction
1. Location	+2p	+3p
2. Design	+1p	+2p
A: Physical		
Land Resources		
1. Solid Waste	-1t	-2p
2. Land Use	-1p	-1p
Air Resources		
1. Air Emission	-1p	-1p

2. Noise	-1t	-1t
Water Resources and Wastewater Management		
1. Water Resource	-1p	-2p
2. Wastewater Management	-1p	-1p
B: Ecological		
Flora		
1. Vegetation	0	+2p
Fauna		
2. Wildlife	NA	NA
C: Socio-Economic		
1. Transportation	0	+2p
2. Employment	+1p	+1p
3. Aesthetic	-1t	2p
4. Energy Consumption	NA	-1t
▪ Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible ▪ All adverse environmental impacts except natural calamities are manageable easily by implementing EMMP		

RECOMMENDATIONS FOR MITIGATION MEASURES

To manage the environmental and social impacts of the project, significant negative impacts and their mitigations have been covered in this section. For the ease to understand and identify the impacts and to implement their mitigations, a mitigation plan has been developed as a ready reference for the Proponent and Contractor to minimize the negative impacts or to manage activities in such a manner to avoid any adverse negative impact.

Mitigations for physical, biological and socio-economic parameters will be measured to determine compliance with standards established in EMP. The

Monitoring Plan will record the inputs provided by various participants in the environmental and social management process. The air quality is determined once before the commencement of the development and once after the end of the development. During the operational phase solid waste management practices and wastewater disposal practices will be monitored by the concerned authority on the regular basis. Moreover, fire-fighting equipment installed in the public and private buildings will be maintained and monitored on the regular basis.

The total estimated cost for the implementation of EMMP in proposed project area is approximately 2% of the total cost of the project.

PROPOSED MONITORING

A comprehensive Environmental Management and Monitoring Plan (EMMP) have been prepared to effectively manage and monitor the environmental and social impacts for the development of the housing scheme. However, in the interest of commercial viability of the society, all necessary measures to keep the houses and its surroundings environment neat and clean will be adopted. Further recommendations are as following;

- The adverse environmental impacts can be reduced significantly by adopting best management and monitoring practices as well as by implementation EMMP effectively.
- It is recommended to construct the green building instead of conventional building, having green-roofs, insulation as well as maximum utilization of the sunlight. Green roofs will not only attract the customers but will serve as an insulator. In addition, the life of the green roofs is longer than conventional roofs.
- It is recommended that the Proponent should obtain an Environmental Approval (NOC) from the Punjab-EPA before proceeding further into the construction activities.

1. INTRODUCTION

1.1 INTRODUCTION

The development of any project leads to positive and adverse changes in environmental and change in social settings of the project area. The intensity and level of change, however, depends upon the nature of the project and the baseline environmental and socio-economic conditions of the area. The development and commencement of housing society will cause minor adverse environmental impacts on the surrounding area. Thus, an environmental and social study is mandatory to establish the baseline conditions, evaluate the possible adverse impacts if any, and devise the mitigation measures.

The development of a housing scheme is a commercial venture. Availability of a land at the best convenient place and at economical price is the main consideration for the site selection. Availability of access roads, communal facilities, communication facilities, electricity, gas, basic infra-structure, sewerage lines and water supply pipelines is the basic requirement of the development of the housing scheme which will be provided to the residents of the Green Land. As these all facilities are available in the vicinity of the project area.

Section 12 of Pakistan Environmental Protection Act, 1997 (PEPA, 1997) states “No proponent of a project shall commence construction or operation unless he has filed with the Federal Agency an Initial Environmental Examination (IEE) or where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained approval from the Federal Agency in respect thereof.” Later, Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations, 2000 provided the guidelines for categorizing the Projects. According to Schedule-I of PEPA (Review of IEE and EIA) Regulations, 2000; the development of the housing falls under **Category I (1) (Urban Development and Tourism-Housing Schemes)**. i.e., the project requires an IEE Study.

Proposed project is the **CITY-ONE HOUSING SCHEME** Located at Mouza Hamidpur Kanora Shujabad Road, Multan, comprised of residential plots and commercial plots. It would be the first project to facilitate people within their income means who can't but rent properties on open market rates. When it comes to health and vitality of our communities, affordable housing is the key. The need for quality, affordable homes is an important part of Sustainable Development Goals especially with the economic issues Pakistan and majority of countries are facing today. Housing today, has become a serious issue for low-middle income societies and affordable housing does not only provide a shelter rather research shows it promotes improvements to individual outcomes such as employability, crime, health, wellbeing and community cohesion.

The anticipated project will comply with regulation of Pak-EPA 1997, Punjab Environmental Protection (Amendment) Act 2012 and Punjab Development of Cities Act 1976. The land of the project area is owned by the Client. The land ownership documents are attached as Annexure.

The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio-economic/cultural conditions and assess all possible impacts arising during the construction and operation phase of the project and to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulation of Environmental Management Plan (EMP) for implementation of the project in environment friendly manner.

This report is prepared by critical examine of the environmental factors which might be affected due to construction and operation of the project. The purpose of this report is to analyze impacts of the project. This IEE provides the basis for a determination of the degree of the environmental impacts of the project.

The report provides relevant information, as required under the officially approved format, to help the decision makers i.e. EPA Punjab before issuing for the Environmental Approval.

The main objectives of this IEE study were:

- To determine and document the state of the environment of the project area to establish a baseline in order to assess the suitability of the Project in that area.
- To identify pre-construction, construction and operation activities and to assess their impacts on environment.
- Provide assistance to the proponent for planning, designing and implementing the project in a way that would eliminate or minimize the negative impact on the biophysical and socio-economic environment and maximizing the benefits to all parties in cost effective manner.
- To present Mitigation and Monitoring Plan to smoothly implement the suggested mitigation measures and supervise their efficiency and effectiveness.
- To provide opportunity to the public for understanding the project and its impacts on the community and their environment in the context of sustainable development.
- Prepare an IEE Report for submittal to the Environmental Protection Agency, Punjab for according Environmental Approval.

The Project site is geographically located at 30° 5'9.70"N 71°24'20.96"E

1.2 PURPOSE OF REPORT

The purpose of the Initial Environmental Examination (IEE) study is to identify the possible beneficial and adverse environmental impacts of the project as presently envisaged and propose the applicable mitigation

measures to be implemented during the construction and operational stages of the project in order to minimize the negative impacts and preparation of Environmental Management Plan (EMP) to obtain No Objection Certificate (NOC) from EPA-Punjab.

This IEE report has been prepared keeping in view the following regulations and guidelines:

- a)** Pakistan Environmental Protection Act (PEPA), 1997 & Punjab Environmental Protection Act (PEPA), 1997 (amended 2012)
- b)** Pakistan Environmental Protection Agency Regulations, 2000 for review of IEE and EIA.
- c)** Pakistan Environmental Impact Assessment procedures, 2000.
- d)** Guidelines for Preparation and Review of Environmental Reports

1.2.1 NEED OF ENVIRONMENTAL ASSESSMENT

The preparation and submission of an Initial Environmental Examination (IEE) Report for any development project is a statutory obligation under Punjab Environmental Protection Act, 1997 (PEPA, 1997) amended in 2012 in terms of Section 12 of the Act which states as under: “No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency, an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Provincial Agency approval in respect thereof.”

The current Project falls under Schedule- I, Section I, Sub section 3(Urban Development) and above of IEE/EIA Regulation as per section 12 of Environmental Protection Act and thus requires Initial Environmental Examination (IEE).

1.2.2 IDENTIFICATION OF PROJECT AND PROPONENT

The proposed Project consists of the design and construction of CITY-ONE HOUSING SCHEME. The salient features of the project are given as under:-

Table 1: Salient Features of Project

1. Name of proponent	Syed Shauzab Gardezi S/O Syed Shahbaz Hassan Shah Gardezi
2. Name of project	CITY-ONE HOUSING SCHEME
3. Location/ Address of the site	MOUZA HAMIDPUR KANORA SHUJABAD ROAD, MULTAN
4. Nature/ Feature of the project	Mix Use Development
5. Major process during construction	Excavations, Concrete, Mixing, Elevation, Finishing
6. Estimated cost of project	150 million
7. Plot area of the project	The total project area is about 749.10 Kanals. The CITY-ONE HOUSING SCHEME consists of residential and Commercial plots.
8. Electricity connection capacity	MEPCO
9. Detail of standby generators	NO Standby Generator will be installed during Development and operation.

10. Project start	1 month after getting NOC from all relevant departments
11. Project completion duration	6 Months

1.3 DETAILS OF CONSULTANTS

For the preparation of the IEE Report of this Proposed Project, the proponent has hired the services of the environmental consultants; M/S TetraTech Environmental Consultancy. Following table lists the names of those experts:

Table 2: List of Experts

Sr. No.	Team Member	Position Held	Qualifications
1	Naveed Ahmed	Chief Executive	M. Phil Environmental Sciences BS Environmental Sciences University of Gujrat
2	Miss Maham Ayesha	Senior Environmental Analyst	MS Environmental Sciences, NUST BS Environmental Sciences,



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			University of Gujrat (UOG)
3	Fareeha Maryam	Zoologist	BS Zoology University of Gujrat (UOG)
4	Mr. Shahzaib Ahmed	Social Scientist	M. Phil Development Studies, PIDE, Islamabad. M.Sc. Development Sciences Islamic International University, Islamabad
5	Tayyaba Saleem	Environmentalist-I	BS (Hons) Environmental Sciences Lahore College For Women University Lahore
6	Oan Raza	Environmentalist-II	BS Environmental Engineering University of Engineering & Technology, Lahore
7	Rahma Butt	Environmentalist-III	BS (Hons) Environmental Sciences

			Lahore College For Women University Lahore
8	Amna Hafeez	Environmentalist-IV	M.Sc. Mountain Conservation and Watershed Management The University of the Punjab, Lahore

1.4 NATURE, SIZE AND LOCATION OF THE PROJECT

CITY-ONE HOUSING SCHEME is a Mix-Use development comprising of commercial and residential Plots. Total project area is 749.10 Kanals, 41.86% of total area is residential while 10.00% is commercial and remaining area is open. The Housing colony consists of Residential and Commercial plots, Parks, Mosque, Parking Area, Public Building and Service area.

Aggregate of plots:

Table 3: Schedule of area

S#	Description	Proposed Area (K)	Proposed Area (%age)
1.	Area of Plots (including apartments) 5.56-K	313.52	41.86
2.	Commercial Area	74.91	10.00
3.	Roads & Setback & Parking	261.07	34.85
4.	Parks	52.44	7.00
5.	Public Buildings/ Hospital	23.16	3.09
6.	Water & Disposal Works/ Sewer Treatment/ Solid Waste Disposal	9.00	1.20

7.	Area Of G-Yard	14.98	2.00
Grand Total		749.10	100.00

The site location map of the project and the significant localities around the project are given as under-:



1.5 APPROACH ADOPTED TO CONDUCT THE STUDY

Following approach and methodology has been adopted for conducting the IEE studies:

1.5.1 REVIEW OF AVAILABLE DATA

A detailed review of the following available documents of the project was conducted:

- ❖ Desk Studies
- ❖ Preliminary Design Report
- ❖ Construction Drawings
- ❖ Layout Plans

The basic objective of the review was to fully understand the Project and the extent of the developmental activities. The review of studies helped to assess the nature and extent of the impacts related to the implementation and operation of the proposed project activities.

1.5.2 ENVIRONMENTAL BASELINE SURVEY OF THE PROJECT

Prior to the start of the baseline environmental survey, a checklist was developed. The major items, which were considered for physical, ecological and social environment, are discussed in the subsequent paragraphs.

Physical Environment

For collecting information on the physical environment, the following main parameters were considered:

- a)** Land Resources (including land use, soil composition, topography, geology, contamination of soil and soil erosion, etc.)
- b)** Water Resources (including available surface water resources and natural streams, spring water, etc.)
- c)** Climate (including temperature, rainfall, humidity, wind direction, etc.), Ambient Air and Noise Quality
- d)** Existing solid waste management and effluents disposal practices and storm water drainage

Ecological Environment

Under the ecological environment, the following main parameters were covered:

- a)** Flora
- b)** Fauna

Social and Cultural Environment

To assess the social and cultural baseline settings of the Study Area, social survey was carried out to accomplish the following specific objectives:

- a) To establish the socio-economic conditions.
- b) To identify the potential disruption of private infrastructure.
- c) To identify poor and vulnerable groups and strategies to ensure that such groups should get benefit from the Project.
- d) To ensure adequate public/stakeholder consultations and their participation.
- e) To identify the effects on available common resources of the community due to the implementation of the Project.

1.5.3 ANALYSIS OF DATA

After collection of the physical, ecological, environmental and social data from both primary and secondary sources; a critical analysis was made to assess the existing baseline conditions and potential impacts.

1.5.4 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

- Environmental problems due to project location.
- Environmental problems related to design.
- Environmental problems resulting from project operations.
- Potential environmental enhancement measures.

1.5.5 PREPARATION OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)

An EMP depicting the mitigation measures and monitoring plan has also been developed. Institutional capacity building of the Client has also been reviewed and enhancement was proposed for the effective implementation of the EMP.

2. REGULATORY FRAMEWORK FOR IEE

2.1 LEGAL STATUS

Notwithstanding the social and economic benefits, every development project interacts, in varying degrees, with physical, ecological and human resources of the project area and its environmental assessment studies, therefore, form an essential part of the feasibility studies of every project so as to make it environmentally acceptable besides being technically and economically feasible. In order to ensure the achievement of these objectives, laws, regulations and standards have been formulated by the relevant institutions at the respective national level by international agencies.

Following environmental laws, standards and guidelines were referred during the preparation of this IEE report:

2.1.1 NATIONAL CONSERVATION STRATEGY

The Pakistan National Conservation Strategy (NCS), which was approved by the federal cabinet in March 1992, is the principal policy document on environmental issues in the country (EUAD/IUCN, 1992).

The NCS outlines the country's primary approach towards encouraging sustainable development, conserving natural resources, and improving efficiency in the use and management of resources. The NCS has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment. The core areas that are relevant in the context of the proposed project are pollution prevention and abatement, restoration of rangelands, increasing energy efficiency, conserving biodiversity, supporting forestry and plantations, and the preservation of the cultural heritage.

2.1.2 NATIONAL ENVIRONMENT POLICY, 2005

The national environmental policy 2005 aims to protect conserve and restore Pakistan's environment in order to improve quality of the life of citizens through sustainable development. The main objectives of the policy are;

- Conservation, restoration and efficient management of the environmental resources.
- Integration of the environmental considerations in policy making and planning process.
- Capacity building of government agencies and other stakeholders at all levels for the better environmental management.
- Meeting international obligations effectively in line with the national aspirations.
- Creation of a demand for environment through mass awareness and community mobilization.

2.1.3 THE NATIONAL FOREST POLICY 2001 OF PAKISTAN

This policy covers the Renewable Natural Resources (RNR) of Pakistan i.e. Forests, Watersheds, Rangelands, Wildlife, Biodiversity and their habitats. The policy seeks to launch a process for eliminating the fundamental causes of the depletion of RNR through the active participation of all the concerned agencies and stakeholders, to realize the sustainable development of the resources. It is an umbrella policy providing guidelines to the Federal Government, Provincial Governments and territories for the management of their RNR. In consonance with it, the Provincial and District Governments may devise their own policies in accordance with their circumstances.

The goal of this policy is to foster the sustainable development of RNR of Pakistan, for the maintenance and rehabilitation of its environment and the enhancement of the sustainable livelihoods of its rural masses especially women, children and other deprived groups.

The elements of the policy shall be as follows:

- Reducing the impact of socio-economic causes.
- Population planning in critical eco-systems.
- Providing substitutes to firewood in the wooded mountains.
- Reducing poverty, poverty of opportunity, and powerlessness.
- Reducing political interference in the Forestry and Wildlife Departments.
- Renovating and invigorating the institutions of RNR.
- Supporting Local Governments in the sustainable development of their RNR.
- Policies for fragile Eco-systems.
- Riverain forests.
- Irrigated Plantations.
- Preservation of relict and unique forests.
- Wildlife.
- Rangelands and desert eco-systems.
- Planting of trees and fodders on farmlands.

2.1.4 PUNJAB ENVIRONMENTAL PROTECTION (AMENDMENT) ACT (PEPA) 2012

Among many other salient features of the Punjab Environmental Protection (Amendment) Act, 2012 it empowers the Pakistan EPA to:

- Delegate powers, including those of environmental assessment, to the its lower staff;
- Identify categories of projects to which the Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) provisions will apply;
- Develop guidelines for conducting IEE and/or EIA and procedures for the submission, review and approval of the same;

- Develop environmental emission standards for parameters such as air, water and noise and
- Enforce the provisions of the PEPA -2012 through environmental protection orders and environmental tribunals headed by magistrates with wide-ranging powers, including the right to fine violators of the Act.

The PEPA can frame environmental regulations tailored to the requirements of the province. They are also required to review and approve EIAs/IEEs of all the development projects undertaken in the Punjab province.

2.1.5 PAKISTAN ENVIRONMENTAL PROTECTION ACT, 1997

The promulgation of the Environmental Protection Ordinance, 1983 was the first codifying legislation to the issue of environmental protection. Later, the Government passed the Pakistan Environmental Protection Act (PEPA), 1997, which is the basis of IEE/EIA studies carried out for the projects in Pakistan.

PEPA, 1997 is a comprehensive legislation and provides protection, conservation, rehabilitation and improvement of the environment. It contains concrete action plans and programs for the prevention of pollution and promotes sustainable development. The salient features of the law are:

- It covers the air, water, soil, marine and noise pollution including pollution caused by motor vehicles.
- The Act provides National Environmental Quality Standards (NEQS) for wastewater, air emissions and noise.
- Law provides clear cut guidelines for IEE/EIA for various projects as per their magnitude and anticipated impacts.
- Law also empowers Federal Government to issue notices and to enforce them for the protection of the environment.

For the effective implementation of the provisions of PEPA, 1997, Pakistan Environmental Protection Agency, headed by a Director General was

constituted. On the same pattern, Provincial Environmental Protection Agencies were created in all the provinces. Environmental Tribunals were also constituted according to PEPA, 1997.

2.1.6 PAKISTAN ENVIRONMENTAL PROTECTION AGENCY REGULATIONS, 2000 FOR REVIEW OF IEE& EIA

Under Section 12 (and subsequent amendment) of the 1997 Act, a project falling under any category specified in Schedule II requires the proponent to file an IEE or EIA with the federal agency. Within ten working days of the IEE or EIA having been submitted, the federal agency will confirm that the document submitted is complete for the purpose of review. During this time, should the federal agency require the proponent to submit any additional information; the IEE or EIA will be returned to the proponent for revision, clearly listing those aspects that need further discussion. Subsequently, the federal agency shall make every effort to complete an IEE review within 45 days and an EIA review within 90 days of filing of the complete information of report.

Pak-EPA regulations (SRO 339 (I)/2000) state that an EIA is required for federal or provincial projects or major road projects with a total cost of Rs.50 million or more. EIAs are also required in cases where projects are to be implemented in environmentally sensitive areas are likely to cause adverse environmental effects. IEE of this project has already been conducted and EIA study is now submitted as per requirement of EPA.

2.1.7 PAKISTAN ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURES

These guidelines are descriptive documents describing the format and content of IEE/EIA reports to be submitted to Federal and Provincial EPA/EPD for obtaining NOC. Following are the major areas, which are covered by these guidelines:

- The Environmental Assessment report formation (scoping, type and category of project, description of project, alternatives, site selection, baseline data).
- Assessing impacts (identification, analysis and significance).
- Mitigation and impact management and preparing an environmental management plan.
- Reporting (format, main features, shortcomings, other forms of presentation).
- Review and decision making (role, steps, remedial options, checks and balances).
- Monitoring and auditing (systematic follow up, effective data management).
- Project Management (inter-disciplinary teams, programming and budgeting).

2.1.8 GUIDELINES FOR PUBLIC CONSULTATION

The Federal EPA provides these guidelines to deal with possible approaches to public consultation and techniques for designing an effective program of consultation that reaches out to all major stakeholders and ensures the incorporation of their concerns in any impact assessment study. These guidelines cover:

- Consultation, involvement and participation of stakeholders
- Effective public consultation (planning, stages of EIA where consultation is appropriate)
- Facilitation involvement (including the poor, women and Non-Governmental Organizations (NGOs))

2.1.9 NATIONAL ENVIRONMENTAL QUALITY STANDARDS (NEQS), 2000

The NEQS 2000, specify the following standards:

- Maximum allowable concentration of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters, sewage treatment facilities, and the sea (three separate sets of numbers).
- Maximum allowable concentration of pollutants (16 parameters) in gaseous emissions from industrial sources.
- Maximum allowable concentration of pollutants (two parameters) in gaseous emissions from vehicle exhaust.
- Maximum allowable noise levels from vehicles.

These standards apply to the gaseous emissions and liquid effluents. Standards for ambient air quality have not been prescribed as yet.

2.1.10 NATIONAL RESETTLEMENT POLICY AND ORDINANCE

As referred above, at present the only legislation relating to land acquisition and compensation is the Land Acquisition Act (LAA) of 1894. Experience with large-scale infrastructure development projects implemented by institutions such as WAPDA has demonstrated the need for a cohesive national policy for resettlement. Following a national consultative process, a national resettlement policy and a related ordinance were drafted known as Draft Resettlement Policy, 2002 which still has to be approved by the government.

2.1.11 OTHER ENVIRONMENT RELATED STATUTES

This section outlines the other statutes apart from Pakistan Environmental Protection Act, 1997, which are relevant to the project.

The Land Acquisition Act, 1894

At this point, the only legislation relating to land acquisition and compensation is the LAA of 1894. The LAA is, however, limited to a cash compensation policy for the acquisition of land and built-up property, and damage to other assets, such as crops, trees, and infrastructure. The LAA

does not consider the rehabilitation and resettlement of disrupted populations and the restoration of their livelihoods.

The Project will involve acquisition of proprietary land. The land will be acquired under the LAA 1894. In the Act there are provisions for normal acquisition of land under Section 6 (4) or emergency acquisition under Section 17 (4).

Pakistan Explosives Act, 1884

Under the Explosives Act, the project contractors are bound by regulations on handling, transportation and using explosives during quarrying, blasting, and other purposes.

The Forest Act, 1927

The Forest Act empowers provincial governments to prohibit the clearing of forest for cultivation, grazing, hunting, removing forest produce; quarrying and felling, lopping and topping of trees, branches in reserved or protected areas.

Pakistan Penal Code, 1860

The Pakistan Penal Code deals with offences where public or private property and/or human lives are affected due to the intentional or accidental misconduct of an individual or body of people. In the context of environment, the Penal Code empowers the local authorities to control noise, noxious emissions and disposal of effluents. The NEQS enforced by the EPAs supersede the application of this legislation on industries and municipalities.

Provincial Wildlife Act, 1974

In addition to empowering the provincial wildlife departments to establish game reserves, parks, and wildlife sanctuaries, this Act regulates the hunting and disturbance of wildlife

3. PROJECT DESCRIPTION

3.1 TYPE AND CATEGORY OF PROJECT

Pakistan Environmental Protection Act (PEPA), 1997 amendment in 2012 stipulates that an IEE is mandatory for Development Projects. Therefore, an IEE is required for projects for policy procedure, filing, review and approval of environmental assessments". As this project is enlisted in EIA/ IEE regulation 2000 Schedule- I, Section I, Sub section 3 (Urban Development) so IEE is conducted.

3.2 OBJECTIVES OF THE PROJECT

The main objectives of the project CITY-ONE HOUSING SCHEME:

- To revive the economic status of the area
- To overcome the Shortage of Housing
- It will Prevent Distress Migration
- To Improve Standard of Living
- This project will result in Promoting Business & Employment
- Providing buyers through Long-Term Financing of 10-20 years period

3.3 STUDY OF ALTERNATIVES

3.3.1 NO PROJECT OPTION

No project option will mean that the project is necessary and there is no other option. This project is situated at Mouza Hamidpur Kanora Shujabad Road, Multan. So, the Housing Society will be developed at this place in order to boost up commercial activities along with the best residential facilities to the residents of Area.

3.3.2 YES, PROJECT OPTION

Urban and Peri-Urban areas in a country usually account for 30-40% population and in Pakistan's framework they account for 35% population of

the country. During periods of recession, developed countries boost their economy through spreading on housing sector and in particular on the development of rural societies that accord to almost 2/3rd of the population of a country to prevent distress migration towards urban areas in search of better living conditions and employment opportunities by providing the same facilities and opportunities in rural areas

This project intends to do same through outlining key goals and solution to achieve Prime Minister's vision of providing shelter and employment opportunity to the masses of Pakistan by providing affordable houses in the classified categories (urban, peri-urban & rural) by NPHP program.

3.3.3 SITE FEASIBILITY

Economic viability, investment limitations, market volume, ensured availability of customers, availability of dependable energy source, availability of project basic support systems and environmental management are the main considerations. All these factors were taken into consideration while selecting a suitable site for the project. The present place from all point of views was the most suitable. The major points taken into consideration and their summary discussion, for the site selection is given as under:-

- Easy access for everyone

Proposed project can be accessed directly from Multan Bypass Road.

3.4 ELECTRICITY ALTERNATIVES

The main supply of electricity is from MEPCO Electric Supply Company.

3.5 WATER ALTERNATIVES

Water is necessary to carry out daily routine work and some water is also necessary during Development. For construction and operational phase ground water will be used.

3.6 LOCATION AND SITE LAYOUT

CITY-ONE HOUSING SCHEME is located At MOUZA HAMIDPUR KANORA SHUJABAD ROAD, MULTAN. The project site is accessible through Multan Road and Co-ordinates of project site are at 30° 5'9.70"N 71°24'20.96"E, location of the project site is given below;



Figure 1: Site Location Map

3.7 ROAD ACCESS:

Proposed project site is easily accessible through roads Multan Road.

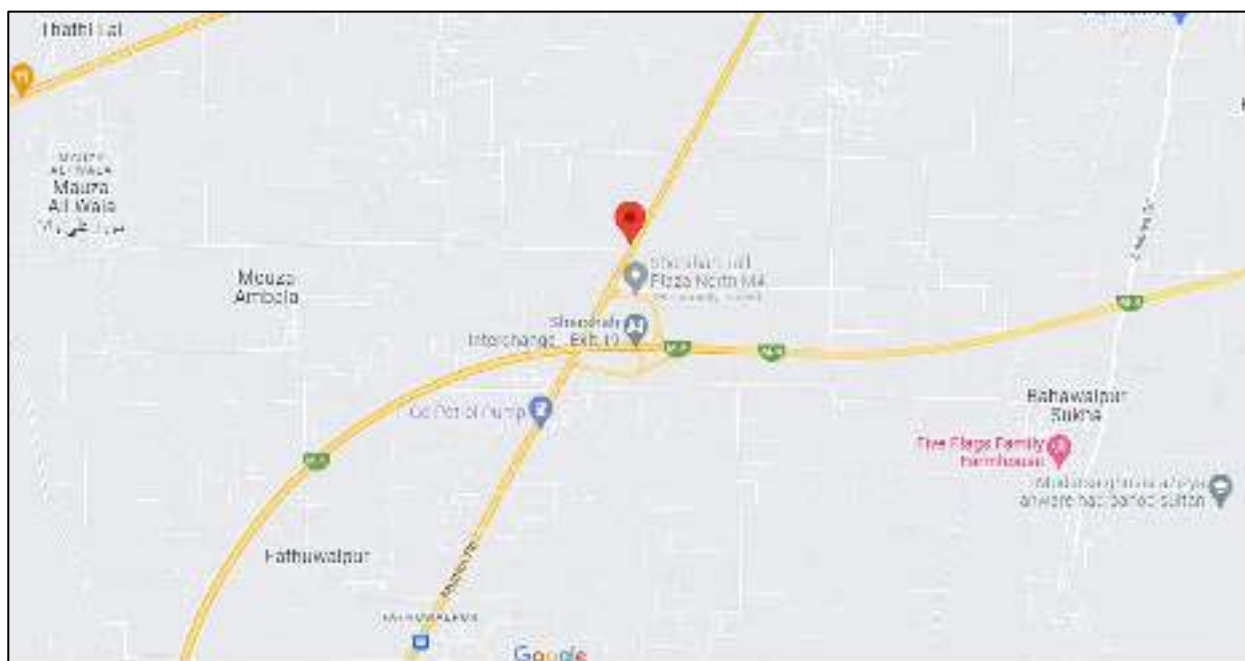


Figure 2: Road Access Map

The layout plan with detail features of the project is attached in Annexure.

3.8 LAND USE PLAN

CITY-ONE HOUSING SCHEME comprises of following features with the total area 749.10 Kanals.

Table 4: Distribution of Land

S#	Description	Proposed Area (K)	Proposed Area (%age)
1.	Area of Plots (including apartments) 5.56-K	313.52	41.86
2.	Commercial Area	74.91	10.00
3.	Roads & Setback & Parking	261.07	34.85
4.	Parks	52.44	7.00
5.	Public Buildings/ Hospital	23.16	3.09
6.	Water & Disposal Works/ Sewer Treatment/ Solid Waste Disposal	9.00	1.20
7.	Area Of G-Yard	14.98	2.00

Grand Total	749.10	100.00
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The Detail of plot is as follows and Map is attached an Annexure:

Table 5: Detail of Plots

Sr#	Category	Quantity
1	Residential	683
2	Commercial	261
3	Others	-
Grand Total		944

3.9 VEGETATION FEATURE ON SITE

The site is an agricultural area partially covered with grass patches and a few trees.

3.10 WATER REQUIREMENT AND WATER BALANCE

For construction stage the ground water will be used. About average 3500 Litres of ground water will be used in construction phase of the project. About 129770 L/D of water will be used during the operational phase of the project. Water balance during the operational phase is given as under:-

- 🧴 Total Water Usage = 129,770 L/D
- 🧴 Washrooms, washings, restaurants = 64885 L/D
- 🧴 Gardening = 25954 L/D
- 🧴 Others = 12977 L/D
- 🧴 Wastewater production = 103815 L/D

3.11 WASTEWATER DISPOSAL

The wastewater will be the municipal in nature and will be passed from (Wastewater Treatment Plant design attached in Annexure) before the final disposal which is 500 meters from the project site municipal drain permission letter attached from the concerned department.

3.12 COST AND MAGNITUDE OF THE PROJECT

Main activities will be taken during construction phase are the excavation works, foundation works and Structures concreting. As it is a residential housing scheme so the activities take place during operation will be according to the project scope. The development and civil work cost of the project is about approximately 150 million.

3.13 SCHEDULE OF IMPLEMENTATION

Duration for the completion of 749.10 Kanals is about 1 year. There will be a symmetrical process. The process is divided in to 3 phases

Preconstruction phase

This phase includes:

- Site investigation & Evaluation
- Budgeting
- Design
- Schedules of working
- Obtaining all relevant NOC

Construction phase

This phase includes:

- Management team & Construction Crew
- Excavation
- Construction of building
- Provision of allied facilities
- Mitigation process
- Amenities and Shops Development
- Managing safety
- Monitoring & Evaluation

Operational phase

This phase includes:

- Implementation of fire safety, emergency evacuation plans
- Security management
- Finishing of amenities, restaurants, club, gymnasium and shops
- Finishing of the Residential Apartments
- Open for the Visitors

3.14 PROJECT DESCRIPTION

3.14.1 Project's Construction Activities

3.14.1.1 Site Preparation Works

The proposed project site will be prepared for construction. This will involve clearing of vegetation, excavation works and transportation of construction materials. This will be undertaken in a phased approach to mitigate soil erosion and the impacts of excessive dust generation. Due to the nature of the

proposed project, construction will involve the use of heavy machinery such as excavators. The engineers will also utilize human labor where necessary so as to create employment to the local residents especially the youth.

3.14.1.2 Storage of Materials

Constructional materials will be stored on site. Bulky materials such as stones, ballast, sand and steel will be carefully piled at designated areas on site. To avoid piling large quantities of materials on site, the proponent will order bulky materials such as sand, gravel and stones in quotas.

3.14.1.3 Masonry, Concrete Work and Related Activities

The project involves a lot of masonry work, laying of plumbing and related activities. General masonry and related activities include, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labor intensive and will be supplemented by machinery.

3.14.1.4 Structural Steel Works

The building will be reinforced with structural steel for stability. Structural steel works involve steel cutting, welding and erection.

3.14.1.5 Plumbing

Installation of pipe-work will be done to connect sewage from the ablution blocks to a sewer system. Plumbing activities will include metal and plastic pipe cuttings, the use of adhesives, metal grinding and wall drilling among others.

3.14.2 Project's Operational Activities

3.14.2.1 Facility Users

The Proposed commercial and recreational development, when completed will target both local and foreign visitors.

3.14.2.2 Solid waste

The proponent will provide facilities for handling solid waste generated within the facility. These will include dust bins/skips for temporarily holding waste

within the premises before final disposal at the designated sites. CITY-ONE HOUSING SCHEME intends to develop a solid waste management plan to ensure that the volume of solid waste generated within the entire development is minimized through the principles of reduce, re-use and recycle.

3.15 RESTORATION AND REHABILITATION PLAN

The restoration work comprises the removal of temporary construction works. No individual will have to leave the area for this project so there will be no resettlement issues. There were no trees present on site. In order to enhance the environmental features of the site, the indigenous trees will be planted accordingly (Landscaping Plan is attached as Annex).

3.16 GOVERNMENT APPROVALS

The project is seeking Environmental Approval from Punjab Environmental Protection Agency (Punjab-EPA) and District Council Multan.

4. DESCRIPTION OF ENVIRONMENT

This chapter provides baseline data (physical, biological and socio-economic parameters) related to the project and study area. The information has been compiled by using primary and secondary data resources. This chapter also refers to the theoretical analysis of the methodology adopted for collection of baseline data. The underlying principles and practices adopted in this regard are also discussed.

4.1 Methodology

The methodology employed to collect the baseline data and information regarding the social structure and various related parameters as discussed in sub-sections below:

4.1.1 Data Collection

The primary data was collected by visiting the project area and its communities in its nearby vicinity. The secondary data regarding physical parameters (topography, geology, seismology, and climate) was obtained by visiting relevant various government departments and their official websites. The biological parameters such as flora and fauna were studied by preparing a floristic list based on visual observation and fauna was studied by using opportunistic approach. The species were recorded with reference to their existence in the project area. Information on wildlife fauna species (mammals, amphibians, reptiles, birds, etc.) in the assessment area was compiled based on opportunistic observation, gathering the existing information and consultation with local experts, community members and government and Non-Government Organizations (NGOs). The socioeconomic aspects were studied and analyzed by studying detailed village profile and by conducting household surveys.

4.1.2 Social Survey

The purpose of social survey was to record the present condition of the people living in the project area and to assess the expected project impacts on their

life, subsistence systems and socio-cultural conditions. Prior to conducting the field surveys, the following steps were taken:

- Clear boundaries of the project area were identified
- Decided the sampling procedure in order to draw a representative sample size of the target population and households
- Developed the tools for data collection i.e. questionnaires to access the socio-economic status of the area

4.1.3 Sampling Design

Social baseline data of the persons residing in the study area has been estimated and collected through random sampling by using pre-developed questionnaires.

4.1.4 Questionnaires

In order to test the validity and reliability of the proposed questionnaires, they were reviewed to assess whether questions needed to be clarified, changed or re-sequenced and then a final editing of questionnaires was conducted prior to their application in the project area.

4.1.5 Data Editing and Analysis

The filled questionnaires and recorded information were compiled by the same field investigators who were involved in the data collection. This was done immediately after completing the field investigations. Data sets were processed. Analysis of the data and preparation of conclusions in the minimum possible time was done using statistical techniques of data analysis.

4.2 Review of Legal and Administrative Framework

The objective of reviewing legal and administrative framework is to obtain information on all legislation pertaining project development. The Socio-Environment Team of Consultants reviewed the environmental policies,

national, international and provincial laws and guidelines relevant to the development of project which helped in systematic identification of impacts.

4.3 Baseline Conditions

Baseline conditions refer to the existing physical, environmental and socio-economic status of the project area. On the basis of baseline information, the project interventions are assessed, and mitigation measures are proposed. The baseline information also helps to indicate the specific issues to be monitored during construction and operational phases. The baseline data (physical, biological and socio-economic parameters) related to the project area is described below. Information provided is based on primary and secondary data collected by site visits, desk studies and consultation with locals respectively. This section gives the overview of the topology, geology, seismology and meteorological conditions of whole city whereas, it gives detailed information about the surface water, ground water and air quality of the project area. The detail of each parameter is discussed in sub-sections below:

The physical environment consists of existing landform and land use at the project site including geology, pedology, hydrology, meteorology and climatology. The pre-project condition (i.e. baseline) of these components of the physical environment is described in detail. To identify the potential impacts on the physical, biological and socio-economic environment that is likely to arise from the project activities.

4.4 PHYSICAL ENVIRONMENT

This section provides a clear description of the physical resources such as topography, soil, climatic conditions, surface and groundwater resources and quality, ambient air quality and geology of the project site but also city. The description of physical environment of project site is presented in following subsections.

4.4.1 Topography

Multan is located in Punjab province. Located on the banks of the Chenab River, Multan is Pakistan's 5th most populous city, and is the premier cultural and economic centre of southern Punjab. Multan is a commercial and industrial centre, as it is connected with the rest of the country through rail and air. The city occupies expanding area of around 781 square kilometer of the land with an elevation of 122 m. The project area comprised of soil in the surrounding which is fertile thereby supports cultivation. There is no presence of rocks in the vicinity of the project area.

4.4.2 Geography

Multan District is the cultural and economic centre of Southern Punjab. Geographically, it is located in the center of country. Elevation of Multan is 400 feet above sea level. Multan covers an area of 227 square kilometres (88 square miles). Multan is located in a bend created by five rivers of central Pakistan. It is built on a mound just east of the Chenab River. Multan District is surrounded by Khanewal to the North, Vehari to the East and Lodhran to the South. The Chenab River passes on its Western side, across which lies Muzaffargarh. There are four tehsils of Multan i.e. Jalalpur Pirwala, Multan City, Multan Saddar and Shujabad. Nearest major cities from Multan are Dera Ghazi Khan, Bahawalpur and Muzaffargarh.

Project site:

No freshwater body is available near site. Groundwater from depth of 70-75 ft. can be used for drinking and other purpose. Ground water quality report of area is annexed.

4.4.3 Seismicity

Seismic Zoning Map of Pakistan showing Proposed Project site area is presented in Figure below indicating zones according to the Building Code of Pakistan - 2007. The city, the project site falls in Seismic Zone 2A according to the Seismic Zoning Map of Pakistan.

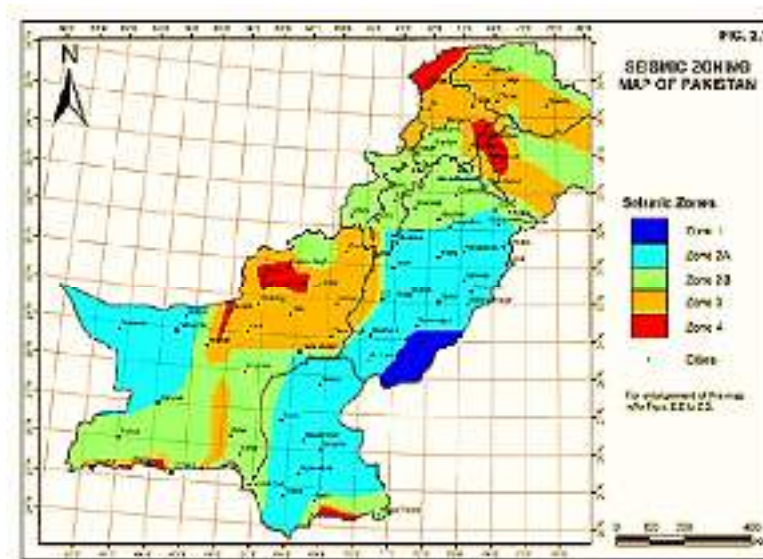


Figure 3: Seismic Zoning Map of Pakistan

4.4.4 Climate

The climate of Multan is typical of that of southern Punjab. The maximum temperature in summer reaches 42°C. In winter the minimum temperature is 4.5°C. The mean maximum and minimum annual temperatures in summer are 32.6°C and 28.6°C respectively. The summer season starts from April and continues till October. May, June and July are the hottest months. The winter season starts from November and continues till March. December, January and February are the coldest months

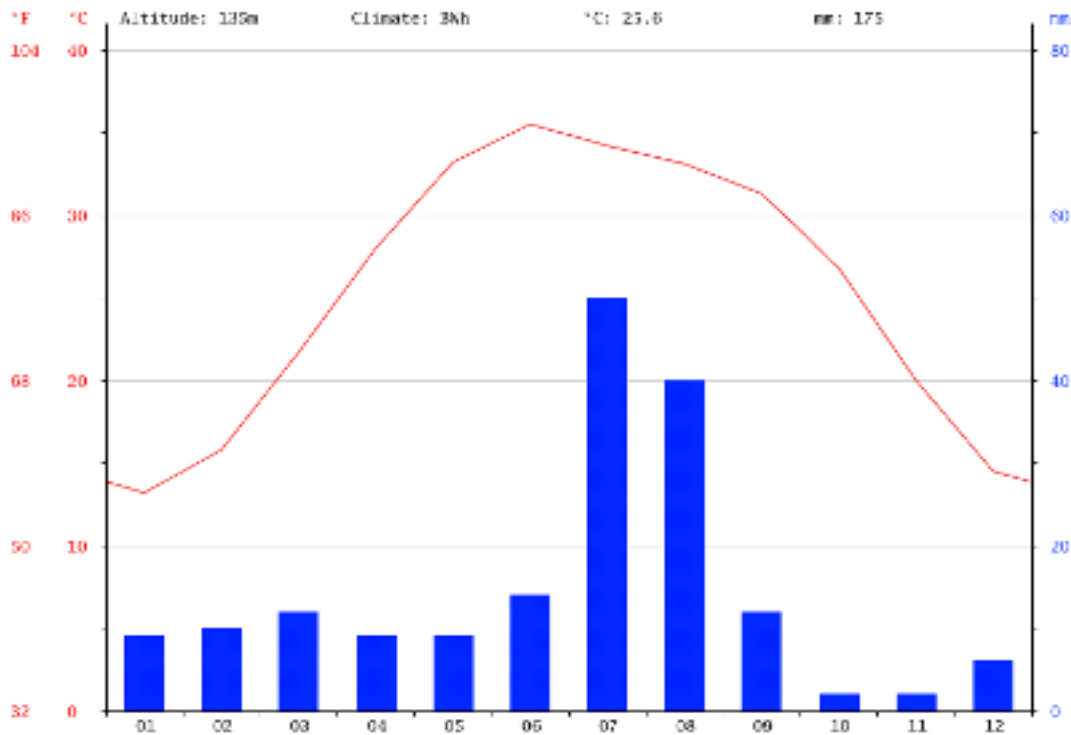


Figure: Graph illustrating annual temperature & rainfall

Rainy weather alternates with oppressive weather. The rainfall is 500 mm per annum. In the recent year, the maximum average precipitation occurred in September and it was around 50-100mm.

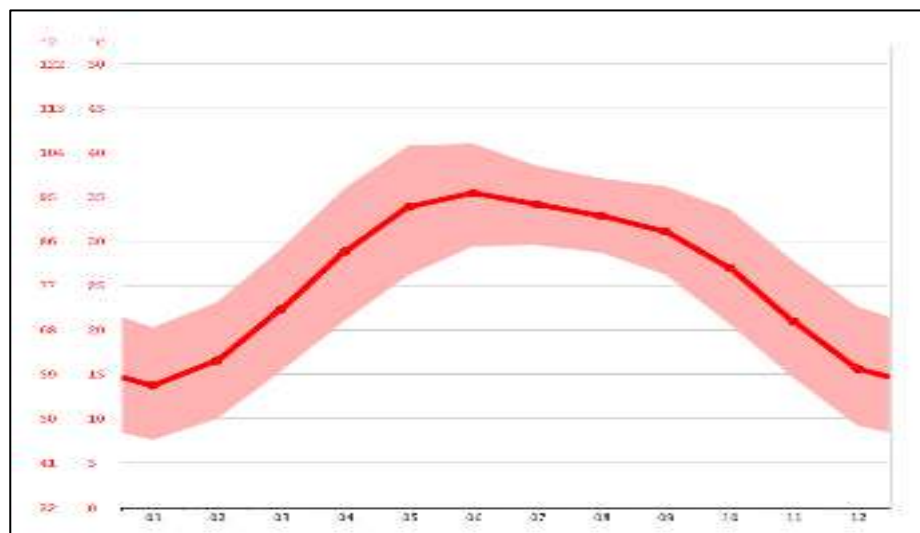


Figure 4: Average Temperature

4.4.5 Noise Level

Noise is described as an unwanted sound emitted from un-avoidable sources of anthropogenic activities. Daily based natural induced sources of noise are rare to none but human induced noise sources are plenty and un-avoidable. Physically, there is no distinction between sound and noise. Sound is a sensory perception and the complex pattern of sound waves is labeled noise, music, speech, low altitude aero plane flying etc.

Environmental noise is a common cause of hearing loss of people indulged in industrial activities. Noise pollution in the city is on the rise with most residents complaining that the noise is becoming a public nuisance.

Project Site

Noise level was monitored at the time of field survey reports are attached as an Annexure I.

4.4.6 Ambient Air Quality

The degradation of air quality in all the large cities is a major environmental concern these days. Air pollution levels in urban centers have either crossed safe limits given in the PEQS or have reached the threshold values.

About 60 to 70% of the deterioration in the air quality is due to the vehicular emissions. The parameters which have proved to be the major threat are particulate matter and concentration of oxides of nitrogen that are relatively higher in all the large cities of Punjab.

It was observed during the visit that Petrol and Diesel operated vehicles are emitting smoke and exhaust gasses in excessive quantity which are the leading sources of environmental pollution and responsible for the air quality worsening. In fact, exhaust emissions (including dangerous gases such as carbon monoxide, oxides of nitrogen, hydrocarbons and particulates) and Evaporative emissions (including vapors of fuel, which is released into the atmosphere, without being burnt) are the prime reasons of deterioration of air

quality. It was however observed during the visit that environment of the project area is clean.

Project Site:

Ambient air quality was monitored during field survey of site reports are attached as an Annexure I.

4.5 BIOLOGICAL ENVIRONMENT

A survey of the local biological environment was conducted which includes the study of flora and fauna of the project area. Section below explains the findings based on the social survey conducted during site visit.

4.5.1 Flora

Trees, also called the 'lungs' of the earth, are important for the restoration of the ecosystem. People can benefit incalculably from their survival and existence. Trees have also been a source of medicine for thousands of years and a refuge for various species of birds.

Project Site:

No threatened or endangered species and medicinal plants are present in the project area. No vegetation or plants will be removed due to commencement of project as the site was clear and no flora existed there. Taai, Baccane, Eucalyptus and Neem are present around the project site.

However proper tree plantation and green belts are planned by the proponent as marked on map and is under-development. Greenery and trees are present in surroundings of site too. Site area is agricultural in nature.

4.5.2 Fauna

With an increase in the rate of urbanization, the ecology of area has been considerably affected but there is no threatened or endangered species found in the project site. No wildlife was present there. Only cats, dogs, sparrows

and crows passed by temporarily. No permanent habitat of any fauna was found.

4.6 Socio-Economic Environment

This section provides collective information about the existing socio-economic and environmental condition of the project area within the AOI. The different types of socio-economic aspects were covered such as demographic profile, occupation, education and health facilities. This data helped in identifying major interventions for the development of Environmental Management and Monitoring Plan (EMMP). The study also helped to assess the positive or adverse impacts on local community. The major occupation of the people in the study area is agriculture and the detail of crops, being sown in this specific area is given below:

Cultivated Crops

Main crops and fruits of the District of Multan are wheat, cotton, sugarcane, mangoes and citrus. The average annual production of wheat, sugarcane, mangoes and citrus during the period 1998-2001 was 454, 178, 88 and 50 thousand metric tons respectively and of cotton was 559 thousand bales. A variety of vegetables is also grown in the district.

Livestock

People in Multan have common livestock which include; Cows, Buffalos, Sheep, Goats and Hens. there are a number of poultry farms present in the city.

4.6.1 Socio-Economic Profile of Study Area

This topic provides an overview of the baseline information relating to the socio-economic environment of the project area and the AOI. The socio-economic study gives information about the demographic profile, occupation, education and health facilities in the project area.

4.6.2 Demographic Information of Study Area

The establishment of project will be located in agricultural cum residential area in Multan. The demographic features include the information on population, family system and size, occupation, income and other social amenities available, etc.

4.6.3 Social and Public Amenities Available

The social and public amenities present in the area are given below:

a. Physical structures

There is no population living in the project area but the study area is populated. The land use on the project site is agricultural cum residential. The people in this area are privileged of basic facilities like health, proper sewerage and sanitation facility, medical facilities, provision of safe drinking water, etc.

b. Religious Structure

There is no shrine, structure or any other religious infrastructure present within close proximity of proposed project site that could be damaged and dislocated due to the proposed project establishment.

c. Protected Structures

There is no protected site, structure or any other social infrastructure present close to the proposed project site.

d. Cultural Heritage and Community Structure

As stated earlier that the project area has no physical structure that may be damaged due to the establishment hospital. TetraTech team also visited the study area but did not find any cultural heritage and community structure within the study area that could be impacted due to the proposed project.

4.7 Quality of Life Values

Socio-Economic Questionnaire and Environmental Checklist were used as survey tools by the survey team to collect desired information.

Occupation of Respondents

Majority of the respondents (20%) belongs to the labor class, 33% have their own business, 13% daily wagers, 13% attached with agriculture, 7% shopkeepers and remaining 7% are private employees. During survey, efforts were made to interact with people representing all walks of life. The detailed graphic representation of occupational status is given below:

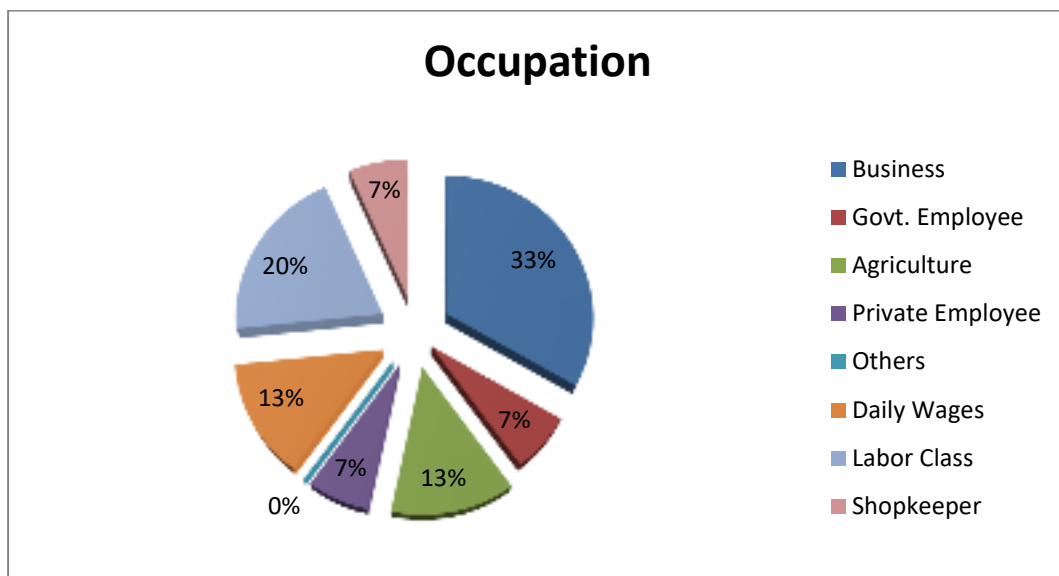


Figure 5: Occupation of Respondents

Personal Income

Based on the sample survey results, as the figure shows that nobody was earning less than 20,000 rupees, 69% of respondents fall within the income range of 20,000 – 25,000, 23% respondents earn 30,001 – 40,000 while only 5% of the respondents earn within the range of 40,001 – 45,000.

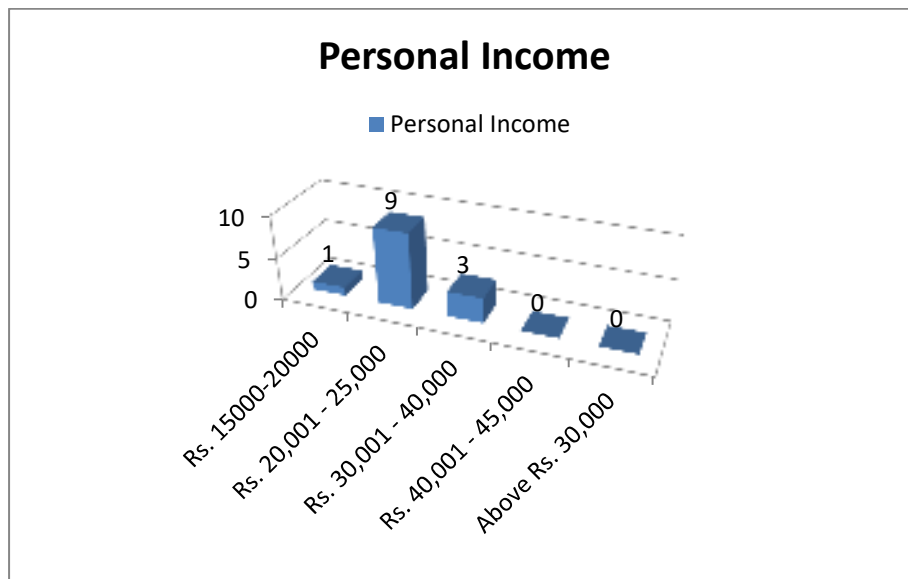


Figure 6: Personal Income

Educational Institutes

The site is privileged with the educational facilities govt and many other educational centers like Government Degree college for women are present near the study area.

Facilities Available

Facilities available at the houses, shops are fortunate here. It shows that electricity, water supply, telecommunication, sewerage, gas supply and every other routine facilities are available in study area.

Literacy Rate

From survey results, it was found that 7% of the studied population was illiterate, 36% was up to primary level, 43% studied up to middle level and only 14% of the respondents studied up to higher secondary level.

Common Diseases

According to the survey the common diseases recorded in the project area were, Diabetes, Fever, Hepatitis, Hypertension, stomach problems, Malaria, Typhoid, Nephritis and Diarrhea.

4.8 Stakeholders Consultation

Respondents were inquired about their views regarding the proposed project. Out of total 14 respondents 95% of the respondents knew about the project whereas, rest of the respondents doesn't have prior knowledge of the project planning and commencement. Almost 90% respondents of were in favor of the establishment of hospital in their vicinity as this will increase the employment opportunities and raise the overall socio-economic status of the area.

Table 6: Concerns and Solutions

Main Theme	Concerns	Solutions
Employment	The hiring during operational phase, locals should be considered realistically	The proponent will try to engage local people on priority basis
Environmental Impact	Air pollution, improper handling of wastewater and mitigation of noise impacts	- Based on the result of ambient air and noise sampling, necessary mitigation measures will be adopted - To mitigate the impact of the contamination from the generation of wastewater, waste will be handled properly - To control the air pollution suction hood consisting of bag-house filters and ID fans will be installed

		• Tree plantation will be carried out in the designated green space
Social Impact	Public nuisances issues may arise due to the spread of diseases in the case of improper disposal of the solid waste and the air emission may cause issues	• Proper handling of the waste such as segregation and composting of the solid waste will be carried out to reduce the public nuisance and to improve the public health • To control the air pollution suction hood consisting of bag-house filters and ID fans will be installed • A registered will be maintained to register the complaints of the local community

Community Issues

Community was asked about the burning issues they are facing. The majority of respondents complained about lack of sewerage system, solid waste management system, lack of safe drinking water supply, proper health and educational facilities.

4.9 Site Suitability

Above facts and figure shows that the site is suitable for the project activities as no endangered or sensitive environmental conditions were seen in or around the proposed site.

5. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATIONS

This chapter identifies the potential impacts related with Preconstruction, construction and operation phases of the Project on the physical, ecological and socio-economic domains of the environment. Accordingly, mitigation measures have been proposed to mitigate the negative impacts and to enhance the positive impacts.

5.1 APPROACHES AND METHODOLOGY

During the preparation for the project construction phase the future contractors must be notified and prepared to co-operate with the executing agency, project management, supervising consultants and local population in the mitigation of impacts. Furthermore, the contractor must document and implement the EMP in full and be ready to engage trained environmental management staff to audit the effectiveness and review mitigation measures as the project proceeds. The effective implementation of the EMP will be prepared and must be audited and this will be considered as the most important part of planning. In this regard the proponent must fulfill the requirements of the law and guidance prepared by EPA on the environmental aspects of power projects and the recommendations already made for projects in this IEE and under EIA/IEE regulation and Punjab Environmental Protection Act (amended 2012).

For impact identification, various IEE methodologies are available including the checklists, interaction matrices, networks and overlays. Among these four methods, following two are used in IEE of CITY-ONE HOUSING SCHEME.

- Project Interaction Matrix
- Checklists

Project Interaction Matrix

Interaction matrix is a two-dimensional matrix wherein the project actions are placed along one axis (i.e. along y-axis) and on the other axis there are different environmental parameters likely to be affected by the proposed project actions grouped into categories i.e. Physical, Ecological & Socio-economic Environment. Interaction matrix is used in this project due to the following reasons:

- It provides cause-effect relationship between the project actions and resulting consequences impacts.
- It provides nature (+ve or -ve) and weighting of different impacts.
- It provides cumulative impacts of a project.

Matrix grouped project actions into temporal phases. For the impact assessment, project interaction matrix is used by dividing the project action into different phases (Preconstruction, construction and operation). The environmental impacts are divided into three main categories including physical, ecological and socio-economic domains. The environmental impacts of the project actions are identified and weighed into the following categories:

+3	=	Extremely Beneficial
+2	=	Potentially Positive
+1	=	Slightly Positive
0	=	Insignificant
-1	=	Slightly Negative
-2	=	Potentially Negative
-3	=	Extremely Negative

The assignment of significance is based on the previous knowledge and professional judgment of EIA team experts. The project impact matrix has been developed and attached in Annexure. It may be noted that the

environmental parameters, which are not related to the implementation of the projects, have not been considered in the matrix.

Checklist

The assignment of significance is based on the previous knowledge and professional judgment of EIA team experts. The project Checklist has been developed for “without” and “with mitigation” is attached as Annexure. It may be noted that the environmental parameters, which are not related to the implementation of the projects, have not been considered in the matrix.

5.2 ENVIRONMENTAL IMPACTS AND THEIR MITIGATION DURING PRE-CONSTRUCTION PHASE

5.2.1 ENVIRONMENTAL IMPACTS REGARDING PROJECT LOCATION

The project is the 749.10 kanal land for housing scheme which will be constructed at designated residential area near Mouza Hamidpur Kanora Shujabad Road, Multan. So, there is no impact regarding project location.

Mitigation

As in the case of project location, there are no negative impacts on the environment, so no mitigation measures will be required.

5.2.2 ENVIRONMENTAL IMPACTS REGARDING PROJECT DESIGN

The design for CITY-ONE HOUSING SCHEME has not affected the adjacent residential areas which are present just close to the project site. CITY-ONE HOUSING SCHEME has been designed in order to ensure the privacy of neighborhood. Adequate daylight and air in the neighboring entities and impact in this regard shall be insignificant. The CITY-ONE HOUSING SCHEME is to be designed in a way that it guarantees all compliance with the Punjab Environmental Quality Standards (PEQS) and Building Codes.

5.3 ENVIRONMENTAL IMPACT AND THEIR MITIGATION DURING CONSTRUCTION PHASE

5.3.1 PHYSICAL IMPACTS

Soil contamination

- Soil Construction activities such as excavation, filling and disposal of materials (both solid and liquid) will affect the existing soil conditions in the Project Site and in its nearby surroundings. Spillage from the generator or from moving vehicle will cause contamination of soil at construction sites.
- Construction site will generate about 0.5 kg/person/day solid wastes from site camps and construction debris from construction activities. Although quantity of waste is much less, inappropriate disposal methods will have a negative impact on the physical environment of the project area.

Mitigation

Good engineering practices will help in controlling soil erosion at construction sites. Following measures will be adopted as per site conditions:

- Soil contamination can be curtailed by reducing the oil spill at project construction areas by well maintaining the construction vehicles as well as generators.
- The Contractor is required to impart proper training to his workforce in the handling and proper disposal of solid waste.
- Proper drainage facility will be provided to avoid the water accumulation, which will minimize the soil contamination.
- Ground shall be leveled to avoid slopes.
- Proper solid waste management plan should be developed by the Contractor and implemented to avoid the litter and any other waste problems.

Contamination of Surface and Groundwater Resources

Sewage and sanitary wastewater generated from the construction site may contaminate groundwater, if not disposed of properly. There is Sewer line /Drain present near the project site so all the sewage and sanitary wastewater will drain in it. The proponent has taken environmental approval for the safe and proper disposal of waste generated.

Mitigation Measures of Impacts on Water Resources

Sewage from construction camp will be disposed off using septic tank which has been designed properly keeping in view the following parameters:

- Soil stratigraphy at site
- Depth of groundwater table
- Discharge of sewage from construction camp

The septic tank has been designed by the Design Consultant according to the relevant standards. The example of the septic tank is shown in Figure below;

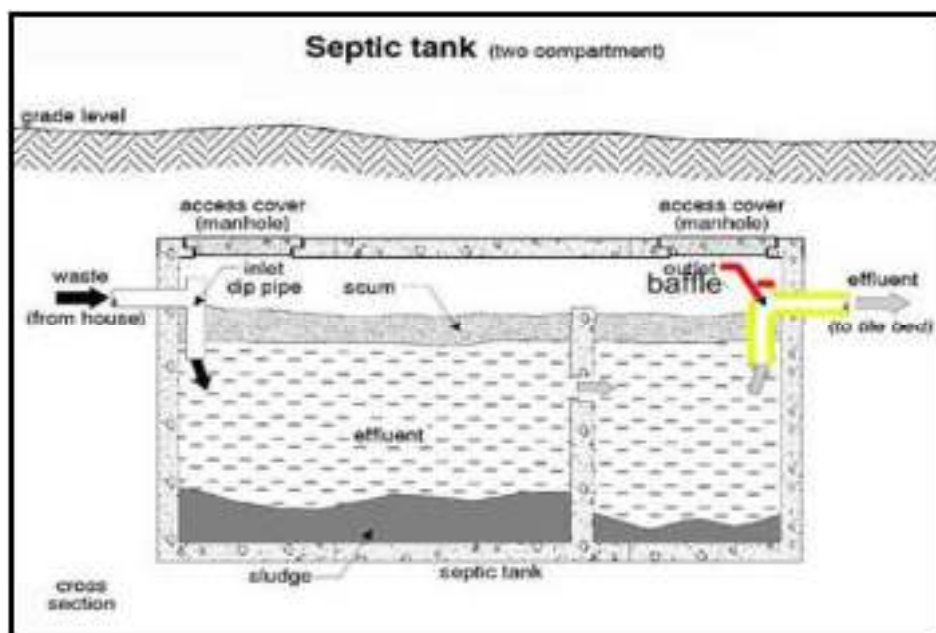


Figure 7: Septic tank

- Avoid accidental spills of oils and lubricants through good practice. Prepare and implement Emergency Response Procedures in case of any spill hazard.

- Construction site effluent drainage should be established in areas with adequate natural drainage channels in order to facilitate flow of the effluents.

Impact on Ambient air quality

Due to the construction activities like excavation, clearing, leveling and compaction with the use of machinery like batching plants, excavators, dump truck and other transport vehicles etc. Most of these are using diesel engines that generate noise and exhaust emissions. The possibility of exhaust emissions increases when old vehicles/plants are utilized for the execution purposes. Generally, the above activity is generating particulate- matter (PM10), smoke, dust, CO and NOx in the ambient air, which is deteriorating the air quality and resulting in impacts on human health, fauna and flora. The movement of heavy machinery and vehicles on the dirt tracks is also causing dust emissions. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface.

Mitigation Measures of Impacts on Ambient Air Quality

- Tuning of vehicles should be made mandatory to reduce the emissions of NOx, SOx, CO and PM10.
- Equipment and vehicles powered with diesel should be well maintained to minimize particulate emissions.
- Haul-trucks carrying, earth, sand, aggregate and other materials should be kept covered during transportation of materials and during storage at site, with tarpaulin.
- The fugitive dust emission will not be a problem because the roads are paved but for the precautionary measure sprinkling of water by water trucks will be done.
- As well as the temporary boundary wall made of wood will be constructed that will act as barrier for air emissions going towards residential area.

Impact on Ambient Noise Levels & Vibration

During the implementation of the project a large amount of equipment and construction machinery will be utilized for construction. The equipment would include excavators, concrete mixer, trucks and other machinery and vehicles. The operation and movement of such equipment will increase the noise and vibration in the Project Area and Neighborhood residential may be disturbed by the noisy activities. The impact will be significant when compared to the without project situation.

Mitigation Measures of Impacts on Noise & Vibration

- For the construction machinery generating noise level in excess of that prescribed in NEQS and WHO limits, Contractor will make arrangements to bring the noise level within applicable limits (including proper tuning of vehicles and mufflers/silencers). Movements of the trucks and other construction machinery causing high noise levels must be restricted at nighttime to avoid disturbance to the nearby locality. Truck drivers should be instructed not to play loud music especially night and stop use of horn.
- As well as the temporary boundary wall made of wood planks will be constructed that will act as barrier.

Disposal of Construction Debris & Garbage

During construction phase of the Project, large quantity of construction waste will produce, the disposal of which, if not managed properly could have negative impacts on the site and surrounding areas. Clearing of shrubs and grass could pose a fire hazard and affect air quality if burned on location. Construction materials including concrete waste, wood, steel, packaging plastics etc. could be dispersed that may result in the blockage of drainage channels if not disposed of at approved disposal sites.

Mitigations

- A site waste management plan should be made the responsibility of the construction contractor to provide for the designation of appropriate waste storage area on the site and a schedule for the timely collection and removal of construction debris to an approved dump site.
- The organic waste produced during site clearing should be mechanically mulched and composted at the site and used for landscaping.
- Arrangements should be made for regular garbage collection and removal of sewage from the construction site.

Traffic annoyance

Due to the movement of large construction vehicle there may be traffic problem.

Mitigation

During the construction phase traffic control measurement will be implemented. All raw materials will be transported to the site at nighttime due to at nighttime traffic flow very low in the project area.

5.3.2 ECOLOGICAL ENVIRONMENT

Impacts on Ecological Environment

❖ Impact on Flora

Project area is open there was no tree present on the project site. All the project activities will be done inside the premises of the boundary walls so there will be no effect on outside the boundaries.

❖ Disturbance to Fauna:

The associated avifauna with tress will be affected and they will move away to nearby nesting places.

Mitigations

Almost 3500 trees of single species are planted at project site which will not cut down during construction phase. In order to enhance the environmental measures of the site the Landscaping plan has been prepared and attached as Annexure. As almost significant amount of open area will be used for the landscaping, so it will enhance the natural features of the area.

5.3.3 SOCIO ECONOMIC ENVIRONMENT

❖ Impacts on Local Population

The population residing in and the surroundings of the Project Area will be affected during the construction phase as follows:

- Insecurity problems may arise for the local population due to the Contractor's workers during the construction phase
- Community may face the noise and dust problems during the construction activities.
- Theft problems to the community by the Contractor's workers and vice versa.

Mitigations Measures of Impacts on Local Population/Workforce

- Contractor should select specific timings for heavy machinery operation to cause least disturbance to the population considering their peak movement hours.
- Effective construction controls may be made by the Contractor to avoid inconvenience to the population due to noise, smoke and fugitive dust.
- Haul-trucks carrying concrete, aggregate and sand fill materials will be kept covered with tarpaulin to help contain the construction materials being transported to the specific site.
- The Contractor should warn the workers not to involve in any theft activities and if anyone would involve in such type of activities, he will have to pay heavy penalty and would be handed over to police. Similarly, at the time of hiring labour/workers, Contractor has to ensure that the workers should be of good reputation/character.

- ❖ Impacts on Public Health and Safety Hazard
- Construction activities, particularly excavation and movement of haul trucks and machinery may prove dangerous for the safety of the workers as well as for local residents.
- Contractor's staff while working on height, transoms, etc. may slip and get injured. Similarly, working at excavated areas may also cause injuries due to the failure of side slopes of excavation.
- The storage of all solid waste shall be practiced preventing the attraction, harborage or breeding of insects or rodents, and to eliminate conditions harmful to public health or which create safety hazards, odors, unsightliness or public nuisance.

Mitigation Measures of Impacts on Public Health and Safety Hazards

- Contractor will ensure the provision of medicines, first aid kits, emergency vehicles, etc. at the workplace. Compliance with the safety precautions for construction workers as per International Labor Organization (ILO) Convention No. 62 will be ensured by the Contractor.
- Health safety procedure is also prepared and will be implemented. Training of workers in the construction safety procedures, environmental awareness, and equipping all construction workers with safety boots, helmets, gloves, ear plugs, and protective masks, and monitoring their proper and sustained usage.
- Fire Safety System Layouts is attached in Annexure.

5.4 ENVIRONMENTAL IMPACTS AND MITIGATIONS MEASURES DURING THE PROJECT OPERATION

5.4.1 GROUND WATER RESOURCE

During the operational phase the ground water will be used although during the construction phase groundwater will be used. The quantity of water used during operational phase is given as under:-

Total Water Usage during operational phase: 129770 L/D approximately

The quantities of required water from groundwater usage will ultimately impact on level of ground water resource which may reduce with the passage of time.

Mitigation

In order to reduce the impact on ground water resource following measures will be adopted.

- There will be proper lining and engineered structure to avoid the leakage.
- The water conservation will be adopted in washrooms that will be installed water saving gadgets and eco-devices.

5.4.2 AIR EMISSIONS

Air Emission is emitted from the stacks of generators. Stack emissions of generators will produce gasses like NO_x, SO_x, CO₂, PM and CO. These gasses will cause air pollution if not properly managed or mitigated.

Mitigation

- Generators should be maintained properly and tuned up in respect of air to fuel ratio in order to have these pollutants within the NEQS limit.
- Regular monitoring on all emission sources should be done and measures will be taken if found non-compliance with NEQS

5.4.3 NOISE

There will be noise of generators during the operation that may have impact the nearby residencies.

Mitigation

To mitigate the noise, impact the generator will be put in a separate generator room at the roof top and it will be compulsory to use PPEs in case of Inspection and any other activity in generator room.

5.4.4 SOLID WASTE

Daily solid waste generation during operational phase will be 1 ton/day consisted of municipal as well as food waste. The waste is generated by households and from commercial points.

Mitigation

CITY-ONE HOUSING SCHEME management will Purchase Solid Waste collection vehicles for carrying waste from site on daily basis.

- The large waste bins will be placed at suitable places at all visitor areas.
- The waste will be collected from shop to shop and from the bins placed by the workers of waste management team.

5.4.5 WASTEWATER

Daily wastewater generation during operational phase will be 12977 L/D from households.

Mitigation

- The wastewater will be the municipal in nature and will be passed from septic tank before the final disposal in specified drain system.
- The extra treatment will be done by increasing the bacterial activity in septic tanks through the anaerobic and sludge degradation bacteria.

5.4.6 SECURITY ISSUE

There is need for vigilant security presence in and around the CITY-ONE HOUSING SCHEME round the clock on a permanent basis to guard against theft and terrorist activities. The security concerns will have to be addressed adequately. Any threat to the security should be dealt with as a major challenge.

Mitigation

A comprehensive Security Plan is developed and implemented for CITY-ONE HOUSING SCHEME which includes construction of a security check post on

the main entrance gate consisting of security guards. The aim of the security is to check out the in and out movements of vehicles and to monitor all the security related issues. The walk through gates will also be installed for checking of the visitors. In addition to this the security guards regularly monitor in and around the whole park to ensure proper security. Moreover, the security cameras will be installed at critical places inside and outside the walk and shop park. The security cameras are operated from the common control room.

5.4.7 EFFECT ON FLORA

There will be no effect on flora.

Mitigation

So, there will be no mitigatory measures are required. Anyhow native plants will be planted in abundance within CITY-ONE HOUSING SCHEME. The plantation will enhance the environmental features of the project.

5.4.8 EFFECT ON FAUNA

There will be no effect on fauna.

Mitigation

So, there will be no mitigatory measures are required for them. But use of native trees will welcome the local and migratory birds for nesting and shelter.

5.4.9 ASSESSING IMPACTS

Planning for environmental assessment depends upon reliably predicting project impacts on resources and managing those impacts to achieve the greatest gain or the smallest loss. The basis of the prediction is the knowledge of the proposed project and of local resources with which it is expected to interact. Two types of information are, therefore, needed: a comprehensive description of all resources likely to be affected by each of the project components, and an understanding of the project component itself. The baseline information given in the previous section includes all resources,

natural and human and all aspects of those resources that may be expected to be touched, directly or indirectly, by the project. Conversely, project information will include all aspects of construction or operation that might affect the environment. Following are the probes which should consider before assessing the impacts.

What is the problem?

The proposed project is of Mix use Development. The nature of the land is open land having native vegetation such as Neem, Kikar, Safeda and wild grass. The study area is fertile, leveled and agricultural land. In addition, to the noise and fugitive dust emissions during the development phase solid waste management and disposal issues may arise along with wastewater disposal issues. The major impact associated with the operation of project includes the management of the solid waste generated during the processing, wastewater management and air pollution due to the emission of particulate matter from generators and vehicles.

When problem will occur and when it should be addressed?

The impacts from the establishment of project will occur during the operation due to the development involved of housing scheme and the people residing in the project area. These issues included; noise generation, fugitive dust emissions, solid waste management, wastewater disposal, top-soil removal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

Where problem should be addressed?

The problem will be generated from site development and operation of the unit. So, it should be addressed on source i.e. at site within the same time frame.

How the problem should be addressed?

Proper mitigations measures will be provided according to the nature of the impacts/problems. For example, against dust emissions sprinkling of water may be done on regular basis, for solid waste proper solid waste management and disposal practices may be adopted, to manage liquid waste proper treatment may be made before discharging into the receiving body. The change landscape is estimated to be quite minor and the removed topsoil may be used to reclaim the disturbed areas.

5.4.10 APPROACH TO ASSESSMENT

Various components of the project will interact with local resources in different ways. Therefore, it is useful to divide the project into units small enough that the interactions may be examined individually as well as collectively. The main construction components of the project are Excavations, Concrete, Mixing, Elevation, Finishing and installation of entertainment facilities. Each of these is in effect a project itself. Various aspects of each component are treated separately. They are examined both in terms of construction period and much longer period of project operation. Some component of the project has positive and some have negative impact on environment and on the different factors like socio-economy of the community.

Negative impact

This residential, entertainment as well as commercial development has no potential negative impacts on environment as well on the socio-economic feature of community. Anyhow it has some impacts which have discussed as well as their mitigatory measures have well defined in the previous section.

Positive impacts

The positive impacts of the project are given as under:-

- Majority of people perceive that development of the housing scheme would cause high positive impacts on them and their communities.

- They have high expectations and hopes from the proposed project and its management.
- They co-relate their positive attitude towards the housing scheme with many socio-economic opportunities and benefits.
- People believe that the development of housing scheme will open up an employment opportunity for local people. These employment opportunities will follow a chain of indirect benefits i.e. the young people of these communities will get employment and business opportunities.
- This trend will enhance family protection, socialization and emotional satisfaction of people.
- This project will provide many opportunities for the wage earners and for those people want to settle their own business.

5.4.11 RISK ASSESSMENT

Risk assessment is done for construction phase which will describe the potential impacts/hazards so that the precautions/control may adopt accordingly.

Risk Magnitude/ severity	Assigned Values	Probability/ Likelihood	Assigned Values
Low	1	Highly Unlikely	1
Medium	2	Unlikely	2
High	3	Possible	3
Extreme	4	Likely	4
Catastrophic	5	Very likely	5

Table 7: Risk assessment during construction and operational phase of CITY-ONE HOUSING SCHEME

Hazard	Source	Duration Hours/day	Severity S	Likelihood L	Risk amount S*L
Noise	Generators and excavation	8	2	4	8
Dust	Excavation and transportation of construction materials	8	3	4	12
Vibration	Excavation	8	2	3	6
Falling objects	Construction activities	8	4	2	8
Ergonomics	No proper posture for Work	8	3	3	9
Workload	Continues work	8	2	3	6
Temperature	Sunlight during summer	8	3	4	12
Fire	Flammable materials,	8	3	4	12

	electrical short circuit				
Work at height	----	During work	3	4	12
Air pollution	Vehicles and generator	During their working	3	5	15

Likelihood →	1	2	3	4	5
Severity ↓					
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

Green color boxes (1-5): Low risk and unlikely to cause health impact.

Yellow color boxes (6-12): Noticeable risk. It has potential to cause medium impacts.

Red color boxes (15-25): High risk & cause high level health impacts.

5.4.12 CONTROLS

All most all the risks which can occur in this project during both construction and operational phase does not fall in high risk area. But there is still need of controls which are given below:

- Generator should put at such place where its noise does not disturb the community as well as the workers during construction.
- New technology generator should be used and its proper maintenance to avoid the air emission.
- Regular tuning of construction vehicles and generators.
- To avoid the dust water should sprinkle after specific duration.
- PPE should be provided to workers.
- Job rotation to avoid work pressure.
- Proper holdings, controls and use of PPEs for safe work at height.

5.4.13 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

Besides the concrete measures to be adopted as described above, the quality of environment will further be enhanced through the running of project in complete accordance with the 5RS Principles- Reduce, Reuse, Recycle, Refurbish and Retrofit. Good housekeeping practices will be the order of the day.

6. ENVIRONMENTAL MANAGEMENT PLAN

6.1 ENVIRONMENTAL MANAGEMENT PLAN

This Chapter provides an overall approach for managing and monitoring the environmental issues and describes the institutional framework and reporting mechanism to implement the Environmental Management Plan (EMP) for the construction of CITY-ONE HOUSING SCHEME. The EMP has been prepared with the following objectives:

- Provide the details of the project impacts along with the proposed mitigation measures, and a corresponding implementation schedule.
- Define the roles and responsibilities of the project proponent, contractor, and supervisory consultants in order to effectively communicate environmental issues among them.
- Frame a monitoring mechanism, reporting frequency, auditing mechanism and identifying monitoring parameters to ensure that all the mitigation measures are completely and effectively implemented.
- Define the requirements necessary for documenting compliance with EMP and communicating it to all the concerned regulatory agencies.

6.2 STRUCTURE OF EMP

The EMP has been divided into the following sections:

- Review of regulatory requirements and applicable standards
- Mitigation Management Matrix (MMM)
- Institutional Arrangements for Implementing the EMP
- Roles and Responsibilities of the different agencies.
- Environmental Monitoring Plan
- Training program

6.3 REGULATORY REQUIREMENTS AND APPLICABLE STANDARDS

The main law and legislation concerned with the environment is Pakistan Environmental Protection Act (PEPA) 1997. This Act is a fairly comprehensive

legislation and provides for protection, conservation, rehabilitation and improvement of the environment.

The salient features of the law are:

- No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal EPA or Provincial EPAs an EIA and has obtained NOC.
- Establishment and Formation of the Pakistan Environmental Protection Council (PEPC).
- Powers and Functions of the Federal and Provincial Environmental Protection Agencies.
- Prohibition of certain discharges or emissions.
- NEQS for wastewater, air emissions and noise.
- Empowers Government to issue notices and to enforce them for the protection of the environment.

The proposed project related environmental laws/guidelines are as follows:

- Pakistan Environmental Protection Agency Regulations, 2000 for Review of IEE and EIA
- Pakistan Environmental Impact Assessment Procedures
- Guidelines for Public Consultation
- NEQS
- Sectoral Guidelines for Environmental Reports, Major Roads, October 1997

6.4 MITIGATION MANAGEMENT MATRIX (MMM)

This matrix identifies the environmental impacts of multipurpose project during the construction and operation stages and establishes the linkages between the environmental and social impacts, mitigation strategy and the agencies responsible for execution. The MMM identifies the following:

- The mitigation measures recommended in EIA.

- The person/organization directly responsible for adhering to or executing the required mitigation measures.
- The person/organization responsible for ensuring and monitoring adherence to the mitigation measures.
- The parameters which will be monitored to ensure compliance with the mitigation measures.
- The timing at which the mitigation or monitoring has to be carried out.

Table 8: Mitigation management matrix

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
Construction phase					
Physical Environment					
1	Soil erosion may take place in the project as a result of excavation. Soil contamination may take place due to the generated solid waste at project	▪ Good engineering practices should be adopted by Contractors, which will help to control soil erosion at the construction sites.	CC	SC and CITY-ONE HOUSING SCHEME Management	▪ Equipment maintenance. ▪ Placement of solid waste storage containers at project site. ▪ Collection and disposal by CITY-ONE HOUSING SCHEME

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
	site in addition to oil spillage from generator or vehicles.	▪ Soil contamination can be curtailed by reducing the oil spill from generator and other machinery at project construction areas, proper solid waste management. ▪ The Contractor is required to impart proper training to his workforce in the storage and			

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
		handling of obnoxious materials, like oil, diesel and petrol that can potentially cause soil contamination.			
2	Sewage is generated from the construction site. This may contaminate surface and groundwater, if not disposed of properly	▪ Septic tank and artificial drainage pipe should be developed and attached to natural drainage. ▪ Additional Bacteria	CC	SC and CITY-ONE HOUSING SCHEME Management	▪ Septic tank

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
		will be dose in the septic tank in order to degrade the waste and sludge			
3	Generation of noise and exhaust emission due to construction activities like excavation, clearing, leveling and compaction	▪ Tuning of vehicles should be made mandator y to reduce the emission s of NOx, SOx, CO and PM10. ▪ Water Sprinklin g on roads	CC	SC and CITY-ONE HOUSING SCHEME Managem ent	▪ Maintenance of Vehicles ▪ Water Sprinkling ▪ Filled Vehicles covered with tarpaulin

Sr. no .	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
		▪ Equipment and vehicles should be well maintained to minimize particulate emissions. ▪ Haul-trucks carrying, earth, sand, aggregate and other materials should be kept covered during transportation of materials			

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
		and during storage at site, with tarpaulin.			
Ecological Environment					
1	There will be no tree will be affected with the implementation of the project. All project activities will be done under the premises of the boundary	Approximately 3500 trees are planted within the housing scheme which will not cut down during construction phase In order to enhance the environmental measures of the site the	CC	SC and CITY-ONE HOUSING SCHEME Management	Plantation of trees

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
	walls so there will be no effect on outside the boundaries.	significant number of indigenous trees will be planted. Landscaping plan has been prepared and attached as Annex-I.			
Social Environment					
1	People will face the noise and dust problems during the construction phase especially for the nearby residents	Effective construction controls may be made by the Contractor to avoid inconvenience to the population due to noise, smoke and fugitive dust.	CC	SC and CITY-ONE HOUSING SCHEME Management	- Sprinkling of water in dust affected areas as per schedule - Timing of vehicle movement to be noted.

Sr. no .	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
		▪ The site will be closed with wooden planks which reduce the dust and the noise levels going towards the residents ▪ Temporarily, the Contractor should select specific timings for heavy machinery operation so as to cause least disturbance to the population considering			

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
		their peak movement hours.			
2	Construction activities, particularly excavation and movement of haul trucks and machinery may prove dangerous for safety of the workers as well as for the residents. Contractor's staff while working on the high-rise columns, transoms, etc. may slip	- Contractor will ensure the provision of medicines, first aid kits, emergency vehicles, etc. at the workplace. - Training of workers in the construction safety procedures, environmental awareness, equipping all construction workers	CC	SC and CITY-ONE HOUSING SCHEME Management	Instruct Staff of the Contractor to strictly follow the HSE policies of the company

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
	and get injured.	with safety boots, helmets, gloves, ear plugs, and protective masks, and monitoring their proper and sustained usage.			
Operational phase					
Physical Environment					
1	1 cubic meter per day of the ground water will be used. The groundwater usage will ultimate impact on level of ground	- There will be proper lining and engineered structure to avoid the leakage. - The water conservation will be adopted in washrooms	CITY-ONE HOUSING SCHEME Management	EPA	Plantation of plants

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
	water resource which may reduce with the passage of time.	that will be installed water saving gadgets and eco-devices.			
	The solid waste generation during operational phase will be 1 ton per day if not managed cause the aesthetic problem with spread of diseases. The 1 cubic meter per day from different	- The large waste bins will be placed at all the floors - The waste will be collected from each floor and from the bins placed by the workers of waste management team. - The wastewater	Sultan City Housing Management	EPA	Regular Monitoring of Solid waste collection

Sr. no.	Anticipated impacts	Mitigation measures	Responsibility		Actions/Monitoring parameters/Monitoring methods
			Execution	Monitoring	
	activities in walk and shop park	will be the municipal in nature and will be passed from septic tank before the final disposal in main sewer line drain.			
Social Environment					
1	The construction of this residential cum commercial and entertainment complex will increase the social life of the community.	Proper maintaining the Multi-purpose Building to ensure the increasing lifestyle of the community.	-	-	Monitoring to be conducted to make sure that proposed plan is working

6.5 INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTATION OF EMP

The main institutions involved in the implementation and management of EMP will be as follows:

-  Supervisory Consultants (SC)
-  Construction Contractor (CC)
-  Punjab Environmental Protection Agency (Punjab-EPA)
-  CITY-ONE HOUSING SCHEME

6.6 ROLES AND RESPONSIBILITIES

The key organizations will have the following roles and responsibility during the construction and operation stages:

6.6.1 CONSTRUCTION STAGE

During the construction stage, Construction Contractor (CC) will be mainly responsible for the execution of the mitigation measures. Supervisory Consultants (SC) will be responsible for the monitoring of the compliance with top management as defined in mitigation management matrix.

6.6.2 OPERATION STAGE

During the operational stage of the project, role of CC and SC will gradually decrease. During this phase of the project, implementation of recommendations of EMP and its supervision will be the responsibility of CITY-ONE HOUSING SCHEME Management and Punjab-EPA as defined in mitigation management matrix.

6.7 ENVIRONMENTAL MONITORING PLAN

6.7.1 OBJECTIVES

The objectives of the environmental monitoring during the construction and operation stages are as follows:

- To check compliance with the requirements of the EMP by monitoring activities of the project contractors. This will be called Activity Monitoring.
- To monitor actual impacts of the project activities on physical, ecological and socioeconomic receptors of the Project Area so that any impacts not anticipated in the EMP or impacts which exceed the levels anticipated in the EMP can be identified and appropriate mitigation measures can be adopted in time. This objective will be achieved through effects monitoring.

To achieve these objectives, the following monitoring program will be implemented.

6.7.2 MONITORING STRATEGY

Activity Monitoring

Activity monitoring will be carried out to ensure compliance with the requirements of the EMP.

The mitigation management matrix will be used as a management and monitoring tool. Activity monitoring will be the responsibility of all organizations involved in the operation, i.e. top management of multi-purpose building, Project Consultants and the Contractors and hence it will be done at three levels:

- Activity Monitoring by CITY-ONE HOUSING SCHEME
- Activity Monitoring by Consultant's field monitors
- Activity Monitoring by the Contractor's officers

The Contractors will report compliance with the MMM to SC and CITY-ONE HOUSING SCHEME management for verification.

Effects Monitoring

Effects monitoring will be the responsibility of CITY-ONE HOUSING SCHEME management. Monitoring requirements have been outlined in the EMP.

However, a detailed monitoring program is attached. The monitoring program describes in detail the resources and methodology that will be adopted for the purpose of Effects Monitoring.

Physical Environment will target at identifying project impacts on:

- Water
- Air

Ecological Environment

Floral surveys will be conducted to determine the effects of different project activities on Flora. The recommended effects monitoring protocol for Flora are provided.

Socio-economic Environment

Effects on the socio-economic environment will be monitored by the consultants who will conduct survey both during construction and operation stage. The surveys will be structured to ascertain the level of impacts during the course of the project and the implementation of mitigation measures prescribed in the EMP such as health and safety of communities.

Table15 Recommended Activity Monitoring Protocol for Physical, Ecological and Social Environment

Parameter/Receptor	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
Water Quality	▪ Near the project area ▪ Concrete preparation plants	Discrete grab sampling and laboratory testing of water samples.	▪ Sampling and laboratory testing should be done on Monthly

Parameter/Receptor	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
	Fuel (Petrol. Oil and Grease) products storages		- basis during the construction and annually during the operational stage. - Outlet and drains from the mechanical repair units should include testing.
Dust Emissions	Construction site	Visual checks	Daily visual monitoring during routine monitoring by activity monitors and reported on a monthly basis during the

Parameter/Receptor	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
			construction period.
Noise Levels	▪ Construction site ▪ Nearby area due to track movement	Noise meter	▪ On fortnight basis throughout the construction period. ▪ Quarterly during the operational stage.
Stack emissions and Ambient Air	Silencers of heavy machinery, trucks and other vehicles. Stack monitoring of generator. Construction site Ambient Air	Monitoring of ambient air quality in ppb.	▪ Monthly monitoring of air pollution parameters including PM, NO_x, SO_x, CO, Hydrocarbons during the construction period, and annually during the

Parameter/Receptor	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
			operation stage only for ambient air
Ecological Environment			
Plants disruption	As plants are present at site so it will be monitored around the Project Area during the construction phase	Plants	Weekly during routine monitoring and reported on monthly basis during the construction period, and once in a year monitoring and reporting during the operation period.
Socio-cultural Environment			

Parameter/Receptor	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
Inconvenience to community	All around the Project Area	Consultations with community to get feedback about inconvenience due to the construction activities to perform their daily routine chores.	▪ Monthly monitoring and reporting during the construction period.

Table 16 Recommended Effects Monitoring Protocol

Parameter/Receptor	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
Water Quality	▪ Sampling from the points located at a greater distance from the construction sites to	▪ Sampling and laboratory testing of wastewater from WASA drainage system relative away	▪ Sampling and laboratory testing should be done on monthly basis during the

	ensure that they show the influence on a wider range of receiving body.	from project site	construction stage and annually during the operation stage.
Air Quality	▪ Existing residential near the project site.	▪ Ambient air quality monitoring in ppb.	▪ Monthly air quality monitoring for NOX, SOX, CO, PM10 during the construction stage. Once a year during the operation stage.

6.8 MATERIAL TRANSPORTATION PLAN (MTP)

Material Transportation Plan will be prepared which specifies the routes for material transportation for construction of this multipurpose Complex. These routes have been established in such a way that there is minimum hindrance or disturbance to the local communities and flow of traffic. HSE arrangements and proper documentation have been planned in order to achieve the above objectives as follows:

- Material Transportation HSE Arrangements
- Transportation timings should preferably be at nighttime to minimize the traffic conflicts.
- Filled trucks should be covered with tarpaulin to avoid fugitive dust and should be visually inspected for proper loading, sealing and decontamination.
- Vehicles should have passed an annual inspection and carry the fitness certificate.
- The truck drivers will be strictly instructed not to play music and do not use horns at nighttime to minimize disturbances.

Material Transportation Documentation

A field logbook will be maintained for the documentation. This logbook will additionally serve to document observations, personnel onsite, equipment arrival, and departure times, a truck exit inspection checklist and other project information.

Field logbooks will document where, when, how, and from whom any vital project information is obtained. Logbook entries will be completed and accurate enough to permit reconstruction of field activities. Logbooks will be bound with consecutively numbered pages. Each page will be dated and the time of entry notice. All entries will be legible, written in black ink, and signed by the individual making the entries. Language will be factual, objective, and free of personal opinions or inappropriate terminology. If an error is made, corrections will be made by crossing a line through the error and entering the correct information. Correction will be dated and initialed. No entries will be obliterated or otherwise rendered unreadable.

Entries in the field logbook will include at a minimum the following for each field work date:

- Site name and address
- Recorder's name
- Time of site arrival/entry on site and time of site departure

- A summary of any onsite meetings
- Description of transport vehicle(s)
- Quantity of excavated soils in truckloads (approximate percentage of full load)
- Names of waste transporters and proposed disposal facilities
- Quantity of import fill material in truckloads
- Levels of safety protection

The HSE officer of the Contractor will communicate HSE requirements and tailgate safety meetings to all drivers and on-site workers. He will provide information related to contaminant descriptions, and requirements for the containment and cleanup of an accidental release along with basic safety requirements, name of personnel in-charge, contact information and a map and directions to the nearest hospital.

6.8.1 ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

In this section, the mitigation measures that are required, for construction and operation of project, to reduce residual impact to acceptable levels and achieve the expected outcomes of the project, are discussed. The Environmental Management program is based on the type, extent and duration of the identified environmental impacts for construction and operation of project.

It is important that the recommendations and mitigation measures are carried out according to the spirit of the environmental assessment process and in line with the guidelines. The impact prediction has played a vital role in reconfirming that typical mitigation measures and approaches will achieve the necessary environmental controls based on the feasibility and detailed design assumptions available at this stage.

6.8.2 ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION PHASE

In order to facilitate the implementation of the EMP, during construction phase the contractor must co-operate with consultant and proponent and mitigates the impacts. Furthermore, the contractor must be primed through the contract documentation and ready to implement all the mitigation measures. Proponent will make provision to recruit, engage retain and replace trained environmental management staff and these staff should audit the effectiveness and review mitigation measures as the subprojects are rolled out. Proponent will also need to confirm that contractors and their suppliers have complied with all statutory requirements and have appropriate and valid licenses and permits for all powered mechanical equipment and to operate in line with local authority conditions.

6.8.3 ENVIRONMENTAL MANAGEMENT DURING OPERATIONAL PHASE

In order to achieve good compliance with environmental assessment principles during operation the environmental staff must be appointed included fire fighters as well as environmental engineers to monitor the environmental aspects, to ensure compliance with the statutory obligations under the PEPA. It is recommended that the project management unit (PMU) should engage directly with EPA to address all environmental aspects in the detailed design and contracting stages. The environmental staff will cover the implementation of environmental mitigation measures in the project packages.

6.8.4 MONITORING PROGRAMS

The monitoring program is always a basis of information in identifying environmental and socio-economic impacts for use in informed decision-making. During the study socio -environmental issues as well as mitigation measures during planning phase have been identified. Some area, however,

will require monitoring during construction and operation of the project. It, therefore, becomes necessary to include a monitoring program as part of the project. The land resources would require monitoring. In particular landscaping of the area to be used for spoil disposal would require monitoring during project construction and project operation phase. Water resources monitoring will include the ground water and wastewater produce from the site. This will involve both quantitative and qualitative aspects of water resources.

Development projects bring social change in their wake. Much of this is beneficial, particularly that which promotes economic and social development. But there is always another side to development: of wage earners, families, or skill groups left behind by new methods of production, of micro-economics destroyed by new technologies, or the disintegration of village communities by population growth and a capitalizing economy. Some of this can be foreseen in a general way. Much of it would occur, even in the project area, whether or not Project is built. It seems clear that longer a project is in place, the more difficult it becomes to separate the social effects of that project from the wider processes of social change already at work in a region. Monitoring of social impacts may therefore be of value for similar project in future.

- The monitoring staff will be consisting of environmental engineers and environmental analysts. Their responsibilities will be:
- To ensure all statutory environmental submissions under PEPA and other environmentally related legislation are thoroughly implemented.
- To ensure all environmental requirements and mitigation measures from the environmental assessment of project.
- To execute any additional IEE and IEE requirements needed due to fine tuning of the projects and that environmental performance targets are included in the contracts prior to project commencement;

- To ensure all environmental requirements and mitigation measures from the IEEs and environmental performance criteria are incorporated in the project.
- Work with management (consultants), supervising consultant and contractors to manage and monitor the implementation of the project EMP.

6.8.5 MONITORING SCHEDULE

The project falls in schedule I of EIA/IEE regulation 2000. This project does not fall in category of industries because of this reason schedule of monitoring is self-defined.

Table 9: Monitoring Schedule of Implementation during Construction Phase

Parameter	Frequency	Remarks	Responsibility
Solid waste	Fortnight	Visual check to access the disposal methods	Contractor and supervisor
Particulate matters	Monthly	Instrumental measurement	Contractor and supervisor, Reporting to EPA
Exhaust gases	Monthly	Instrumental measurement	Contractor and supervisor, Reporting to EPA
Ground water quality and wastewater	Annually	Monitoring of water and wastewater parameters	Contractor and supervisor, Reporting to EPA

Parameter	Frequency	Remarks	Responsibility
Noise and vibration	Monthly	Measurement of noise and vibration due to construction activities and vehicle movement	Contractor and supervisor, Reporting to EPA
Health and safety	Monthly	Monitoring of health and safety of workers	Contractor and supervisor

Table 10: Schedule of monitoring during the operational phase

Parameters	Frequency	Remarks	Responsibility
Air Quality	Annually	Ambient air quality	Administration of project and Reporting to EPA
Noise	Biannually	Noise by activities in the multi-purpose building	Administration
Surface and ground water	Annually	Monitoring of water and wastewater parameters defined by EPA	Administration and Reporting to EPA
Solid waste	Annually	Waste generation	Administration of the project

6.8.6 HEALTH AND SAFETY PLAN

CITY-ONE HOUSING SCHEME will make every effort to provide a safe, healthy work environment. All employers, supervisors and workers must be dedicated to the continuing objective of reducing risk of injury.

Supervisors will be held accountable for the health and safety of workers under their supervision. Supervisors are subject to various duties in the workplace, including the duty to ensure that machinery and equipment are safe and that workers work in compliance with established safe work practices and procedures.

Every worker must protect his or her own health and safety by working in compliance with the law and with safe work practices and procedures established by the employer. Workers will receive information, training and competent supervision in their specific work tasks to protect their health and safety.

It is in the best interest of all parties to consider health and safety in every activity. Commitment to health and safety must form an integral part of this organization, from the president to the workers.

6.8.7 INSTITUTIONAL CAPACITY

The main institutions involved in environmental management and monitoring program will be as follows:

- CITY-ONE HOUSING SCHEME Supervisory Consultants (SC)
- Construction Contractor (CC)
- Punjab Environmental Protection Agency (Punjab-EPA)

These key organizations will have the following roles and responsibility during the construction and operation stages:

6.8.8 CONSTRUCTION STAGE

During the construction stage, Construction Contractor (CC) will be mainly responsible for the execution of the mitigation measures. Supervisory

Consultants (SC) will be responsible for the monitoring of the compliance of environmental management plan (EMP) and NEQS defined by EPD.

6.8.9 OPERATION STAGE

During the operational stage of the project, role of CC and SC will gradually decrease. During this phase of the project, implementation of recommendations of EMP and its supervision will be the responsibility of monitoring team coordinating with top management.

6.8.10 SUMMARY OF IMPACT AND THEIR MITIGATION MEASURES

Sr. No.	<i>Anticipated Impacts</i>
Construction phase	
Physical Environment	
1.	▪ Dust may take place in the project areas as a result of excavation. ▪ Soil contamination may take place due to the generated solid waste at site in addition to oil spillage through generators.
2.	Sewage is generated from the construction camps. This may contaminate surface and groundwater, if not disposed of properly
3.	▪ A Number of machinery and equipment is in operation for the construction of this multipurpose complex like Rigs, excavators, dumping trucks, Mobile concrete mixer and elevators generating noise, particulate matter (PM10), smoke, dust, CO, and NOx in the ambient air which may deteriorate the air quality and cause impacts on human health, fauna and flora. ▪ Due to movement of trucks and other vehicles noise and vibration may increases and residents of the nearby settlements may get affected.

Sr. No.	<i>Anticipated Impacts</i>
Ecological Environment	
1.	▪ Cutting of trees and clearing of grasses and shrubs.
Social Environment	
1.	▪ The project construction will not harm any private structures. As it is a residential area, so this housing scheme will play a role to increase the facilities.
2.	▪ Construction activities, particularly excavation and movement of haul trucks and machinery may prove dangerous for safety of the workers as well as for the residents. ▪ Contractor's staff while working on the high-rise columns, transoms, etc. may slip and get injured.
Operational Phase	
Physical Environment	
1.	▪ 129770 L/D of water will be used. This may impact the ground water resource which may reduce with passage of time
	▪ Air Emission is emitted from the stacks of generators. Stack emissions of generators will produce gasses like NO_x, SO_x, CO₂, PM and CO. These gasses will cause air pollution if not properly managed or mitigated. ▪ There will be noise of generators during the operation.
	Daily solid waste generation during operational phase will be 1 ton/day consisted of municipal as well as food waste. The waste is generated mostly by households.

Sr. No.	<i>Anticipated Impacts</i>
	Daily wastewater generation during operational phase will be 103815 L/D from different activities by residents.
Ecology	
	Approximately 3500 trees are planted inside CITY-ONE HOUSING SCHEME at different locations. For Noise reduction and visual barrier neem and date trees will be planted on boundary walls. The plantation will enhance the environmental features of the project The Use of native trees will welcome the local and migratory birds for nesting and shelter.

6.9 MITIGATION AND IMPACT ASSESSMENT

6.9.1 IMPACT AND THEIR MITIGATIONS DURING CONSTRUCTION PHASE

The most likely environmental problems to occur during construction phase could due to:

- Construction machinery,
- Compaction of soil activity,
- Leveling of land,
- Moving vehicles,
- Construction of building and associated civil work.
- The problems which are associated with these activities are:
- Gaseous emission of SO₂, NO_x and CO, hydrocarbons etc
- Particulate Matter (PM)

- Noise
- Effluent
- The mitigations use to avoid these impacts are:
- Vehicles transporting loose construction material (clay, sand etc) to be covered with tarpaulins.
- Routine service and maintenance of vehicles and machines to reduce engine emissions.
- During periods with abnormal wind speeds, in particular during dry weather conditions, workers on the construction site should be provided with adequate inhalation and eyes protection gears. In case particulates in air hamper a clear view over the site completely, so that safety is impaired, the construction should be interrupted until weather conditions improve.
- Spraying exposed soil with water to reduce PM10 emissions and particulate matter deposition. Water to be applied at a rate to maintain a moist surface, but not create surface water runoff or erosion conditions.
- During construction, water would be supplied from the water storage facility already provided at the work site which is very closely present to the project site.
- Potable drinking water for construction workers would be provided.
- Solid wastes resulting from the construction activity after segregation of usable or recyclable material will be disposed of properly to avoid any threat to environment.
- Power mechanical equipment like bulldozers, air compressors, concrete pumps, excavators, concrete mixers, and heavy cranes etc. shall only be used with low sound power, whenever possible.
- The building machinery equipment shall be well maintained and serviced regularly during construction phase.
- Silencers or mufflers on construction equipment shall be used.

6.9.2 IMPACT AND THEIR MITIGATIONS DURING OPERATIONAL PHASE

The major impacts of operational phase are:

- Air Pollution
- Noise
- Surface water
- The mitigation will be used to avoid the impacts are:
- Continuous monitoring of ambient air for SO₂, NO_x, CO and PM shall be carried.
- Continues monitoring of the standby generator shall be carried out.
- Septic tank will be made for disposal of wastewater
- A noise measurement campaign during full operation at operation start should be implemented to verify that the actual noise levels are in line with NEQS.

What are the hazards?	When will the risk occur?	Who might be harmed and how?	What will the actions do take?	Responsible Person
Buried services	During construction	Plant operator and any worker in the vicinity	Proper training and provision of PPEs	Safety Officer
Worker fall into excavation	During construction	Worker in the vicinity Serious injuries	Physical barriers on excavation edges	Operator and supervisor
Ground contamination	During construction &	Worker working there during	Provision of good site welfare	Supervising consultants

What are the hazards?	When will the risk occur?	Who might be harmed and how?	What will the actions do take?	Responsible Person
	operational phase	construction and operational phase	facilities, septic tank to prevent ground contamination	
Inhalation of gases	During construction	Workers	Provision of PPE & use of new technology generators	Supervising consultants and top management
Water contamination	During construction & operation phase	Worker, nearby community	Proper drainage of wastewater, installation of underground septic tank	Supervising consultants and Building's management team
Noise	During construction & operation phase	Worker, nearby community	Generator will put in the close canopy, new technology will be used	Supervising consultants and Building's management team

6.9.3 OBJECTIVE OF MITIGATORY MEASURES

Mitigation is the stage of the IEE process when measures are identified to avoid, minimize or remedy impacts. These measures are implemented as part

of the process of impact management, together with any necessary adjustments to respond to unforeseen impacts. Both elements are integral to ensuring that the IEE process leads to practical action to offset the adverse environmental impacts of proposed developments. The migratory measures are designed to minimize the environmental impacts of the project.

6.9.4 EQUIPMENT MAINTENANCE DETAIL

Maintenance and washing of all heavy mobile machinery & vehicles should be carried out at adequate service stations. Regular maintenance of all vehicles and machines to be used on site will be mandatory. It should be noted that the project footprint is small and therefore the number of construction vehicles to visit the project site will also be very less in number as compared to the large scale project. Maintenance and re-fueling (if necessary) of any construction equipment shall be done at a decent distance from the excavation area and only be undertaken on sealed area. Any re-fueling must be handled carefully taking particular attention to avoid any spilling of any fuel.

6.9.5 ENVIRONMENTAL BUDGET

Environmental monitoring cost related to the mitigation measures of environmental parameters related to the location of construction site and activities, borrow materials, etc. will be the sole responsibility of the Contractor and he will take care of cost implications. Tentative annual monitoring cost as per environmental monitoring plan is given in Table below.

Table 11: Annual Monitoring Cost

Sr. #	Phase	Item	Cost per Year (Rs.)
1	Construction	Monitoring and Laboratory Testing	2,00,000
		Salary and Direct Cost	1,00,000

2	Operation	Monitoring and Laboratory Testing	30,000
		Salary and Direct Cost	50,000

6.9.6 SITE SELECTION

The site is selected on the basis of prohibition area, environmental sensitivity, competent to the surrounding and suitability.

The site is not present in the prohibited area. The area is as well not situated in the environmental sensitive area as this area does not fall in the high seismic zone, not near the river as there are very low chances of flood and not extremely polluted area. The site is competent and suitable for this type of complex as this area is in the commercial zone.

6.9.7 IMPACT SIGNIFICANCE

Impacts significance is defined based on its acceptance ecologically, socially as well as on the basis of environmental standards that either it is according to the environmental standards or not.

6.9.8 ECOLOGICAL IMPORTANCE

The impact of this housing scheme has least ecological risk. Few of the trees on site are affected due to the implementation of the project. However, before the construction phase 3500 trees of 6 feet are planted at project site which will enhance the environmental feature of the project. Moreover, use of native trees will welcome the local and migratory birds for nesting and shelter.

6.9.9 SOCIAL IMPORTANCE

Development projects bring social change in their wake. Much of this is beneficial, particularly that which promotes economic and social development. Another side to development as it provides the opportunities for wage earners and skill groups of local community as well as for the outsiders.

It seems clear that this commercial cum residential and entertainment complex has positive impacts on the social life of the area.

During the construction stage in case of any complaint, it can be noted down by the site representative. The site representative will maintain a register of complaints received from the local communities and measures will be taken to mitigate these concerns. They will report the status of complaints in his monthly report to top management, for information and further action.

6.10 EQUIPMENT MAINTENANCE DETAILS

All Construction vehicles, Earth moving equipment, Construction equipment and Material handling equipment will be maintained in accordance with the Maintenance Scheduling for Mechanical Equipment (Facilities Instructions, Standards, and Techniques Volume 4-1A – Revised 2009), U.S. Department of the Interior Bureau of Reclamation.

The contractor will make the detail plan for maintenance schedule of their machinery before the construction to be started and will be submitted to the consultant. The contractor will do the continuous follow-up and regular checks will ensure on all the construction machinery equipment's.

6.11 TRAINING PROGRAMS

Environmental training for construction period will form part of the environmental management system. The training will be directed towards all personnel for general environmental awareness.

6.11.1 OBJECTIVES

The key objective of the training program is to ensure that the requirements of the EMP are clearly understood and followed throughout the Project.

6.11.2 ROLES AND RESPONSIBILITIES

SC will be responsible for conducting environmental training to all the Project personnel on potential environmental issues of the Project through

Contractor, who will be responsible to arrange training and ensure the presence of targeted staff. SC will prepare a Project specific training manual for this purpose. Contractors on their part will be required to provide induction training/briefing to all their staff at the time of their recruitment and before the start of any activity in the Project Area. This will be followed by training arranged by the SC to all the targeted staff.

6.11.3 TRAINING LOG

A training log will be maintained by the SC. The training log will include;

- Topic
- Date, time and location
- Trainer
- Participants

7. CONCLUSION

7.1 CONCLUSION

The project aims in construction of “CITY-ONE HOUSING SCHEME” located at Mouza Hamidpur Kanora Shujabad Road, Multan. According to the “Punjab Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000” the project falls in schedule I. Accordingly, this IEE has been prepared for issuance of NOC/EA by the EPA, Government of the Punjab, Lahore before initiation of the project on ground.

7.2 CONSTRUCTION PHASE

The potential impacts during construction stage are summarized below. Majority of these impacts are of temporary nature and can be mitigated as described below:

- 1)** The construction camp will result in generation of solid waste. It is estimated that about 10 to 15 labors will have employed at construction site, which will be generating solid waste from camp site (i.e. @ 0.5 Kg of solid waste per capita per day generation rate). This waste can contaminate the surface, ground water and soil. Proper solid waste management plan should be developed by the Contractor and implemented to avoid the littering and any other waste problems. Adequate number of solid waste containers should be placed at various locations for ease in storage and collection/disposal of solid waste by CITY-ONE HOUSING SCHEME Waste Management team.
- 2)** Soil Construction activities such as excavation, filling, development of road, construction camps may affect the existing soil conditions in the Project Area. In addition, such work is likely to lead to changes in the existing drainage pattern and may have a significant adverse impact on the environment that can be mitigated by good engineering practices.

The proper drainage facility will be provided at the camp areas to avoid the water accumulation, which will minimize the soil contamination

- 3) Soil contamination may take place due to the generated solid waste at project site in addition to oil spillage at site which can be curtailed by reducing the oil spill at project construction areas, proper solid waste management.
- 4) During construction stage, dust problem can affect the health of the community belonging to nearby residential areas. However, proper mitigation measures will remedy the impacts and in order to avoid dust problems during the construction stage, contractor should sprinkle water at least twice a day during the construction activities.
- 5) Construction machinery using diesel engines will generate noise and exhaust emissions. Generally, the above machinery will generate particulate matter (PM10), smoke, dust, CO and NOx in the ambient air, which can deteriorate the air quality and result in impacts on human health and nearby fauna and flora. The movement of heavy machinery and vehicles on the dirt tracks can also cause fugitive dust emissions. Periodic tuning of vehicles should be made mandatory to reduce the emissions of NOx, CO, Hydrocarbons (HC) and PM10.
- 6) Around 3500 trees are planted on site which will not cut down during construction. Further the indigenous trees will be planted as per landscaping plan at the site.

7.3 OPERATION STAGE

The project during its operational phase will definitely have long term positive and beneficial impacts, which include the following:

- There are no sensitive elements/segments of environment around the project site.
- Noise level, wastewater will remain well within the prescribed limits of the PEQs.

- EMP as recommended in this IEE Report is to be put in place during operations of the project.
- In accordance with EMP the monthly and annual monitoring of environmental parameters by a third-party environmental laboratory also certifies that the project will run in accordance with legal requirements.

Based on the IEE report, it can be concluded that the project will give the residential and commercial facility and job opportunities for local and outsider that comes to Multan for livelihood. Further, the implementation of the environmental mitigation measures, monitoring proper and compliance of the environmental standards/legislations will make the Project environmentally more sustainable.

7.4 RECOMMENDATION

Based on the facts summarized as above, the project merits for issuing Environmental Approval by the Environmental Protection Agency, Government of Punjab.