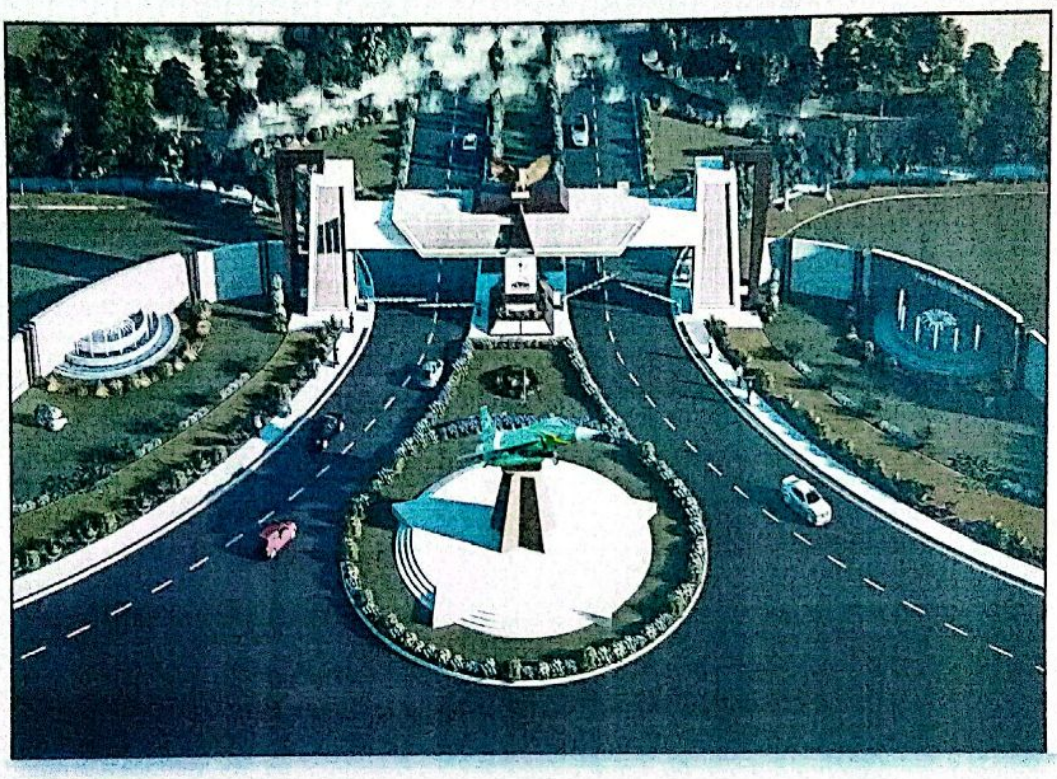
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ETIHAD CANAL VIEW PRIVATE HOUSING SCHEME, RAHIMYAR KHAN

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT 2023



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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

1. TITLE & LOCATION OF PROJECT:

Proposed project is about construction of residential apartments Building under the name of Etihad Canal View Private Housing Scheme. The proposed site is located at Mouza Ali Akbar Sanghi & Mouza Bindoor, Sadiq Canal Road, Tehsil & District Rahim Yar Khan. Total Land area of the proposed Project is 495.90 Kanals. Therefore, Environmental Impact Assessment (EIA) is prepared for submission to EPA Punjab and to obtain NOC from EPA Punjab. The land is fully owned by proponent. Proponent has power of attorney to Apply before EPA Punjab to obtain EA. The Housing Scheme will be developed in phases. Currently, in first phase proposed development and construction is planned to construct Basements and parking area. Majority of these lavish houses will be used seasonally by their owners. The land required for the project activity is owned by the proponent and no extra land acquisition involved in this project. Non- Encumbrance Certificate (Farad) of said land is obtained by proponent.

The proposed site is located at Mouza Ali Akbar Sanghi & Mouza Bindoor, Sadiq Canal Road, Tehsil & District Rahim Yar Khan.

2. PROJECT PROPONENT

Mr. Syed Javaad Ali is appointed as Project Proponent. Power of attorney is attached as Annexure VI. Detail of contact person at the panel of M/S Etihad Canal View Private Housing Scheme.. is described as below:

Name:	**Mr. Syed Javaad Ali**
Post:	Proponent M/S Etihad Canal View Private Housing Scheme
Contact Details:	**Cell:** +92 321 404 0001

3. ENVIRONMENT CONSULTANTS:

In order to satisfy EPA's requirement to carry out Environmental Impact Assessment (EIA), By **M/S Etihad Canal View Private Housing Scheme** as their

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In order to satisfy EPA's requirement to carry out Environmental Impact Assessment (EIA), By **M/S Etihad Canal View Private Housing Scheme** as their

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Environmental Consultant for this project. As per **Schedule II (Clause-H)** of Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulation 2022, the proposed project falls under category of projects **'Urban development and Tourism'** requiring Environmental Impact Assessment (EIA).

4. PROJECT PARTICULARS:

The project aims at development and construction of residential apartments under the name and style of **M/S Etihad Canal View.** The land required for the proposed project is fully owned by proponent and no land acquisition is involved in the said project. Estimated cost of the proposed project is 1289.34 Million including the cost of land and development of building infrastructure.

It is a purely residential construction plan comprising of model apartments along with a number of facilities for its residents. This construction scheme will be unique in its nature as it will play an important role in boosting and introducing the improved living standard for the residents. The current project will provide employment opportunities, directly and indirectly to a local people of different categories, both skilled and unskilled, during its construction and regular occupancy.

The impacts of the project activities on environment during construction and operation phases have been considered in this EIA report.

The mitigation measures have been proposed to minimize / eliminate the adverse/negative impacts of the project on the environment. A complete Environmental Monitoring and Environment Management Plan are recommended to regulate the requirements of Punjab Environmental Protection Act, 1997 and Schedule-II (Section-H) (Urban Development and Tourism) of Review of IEE/ EIA Regulations, 2022.

Annual environmental monitoring, by a third party will also ensure environmentally sound operation of the project. The proponent / contractor will hire trained staff to ensure the enforcement of Environmental Management Plan. The equipment will be kept in proper condition to save the environment from any damage. During construction phase; air quality, ground water quality and surface water quality will be monitored and in operational phase; air quality and wastewater quality will be monitored.

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5. ENVIRONMENTAL ASSESSMENT:

The impacts of the project activities on environment during construction & operational phases of proposed project have been considered. The mitigation measures have been proposed to minimize / eliminate the negative impacts of the project on the environment. A complete Environmental Monitoring and Environment Management Plan has been recommended to regulate the requirements of Punjab Environmental Protection Act, 1997. Annual overall environmental monitoring by a third party will also ensure environmentally sound operation of the project.

The impacts on environment which are likely to be generated during execution of construction phase are summarized in table below:

ACTIVITY	ENVIRONMENTAL IMPACTS	MITIGATION MEASURES
– Planning and designing of apartments	– Cutting of trees – Involvement of forest and land – Stability issues of building	– No tree will be cut down during construction of said apartment – No forest and land will be included and to ascertain this NEC Farad is available with the proponent. – The apartment buildings are designed by certified engineers / architects based on the reliable data.
– Construction of road; – Excavation; – Construction of Sewerage system – Construction of building and – Construction Machinery – Waste Generate by workers	– Improper storage or handling of hazardous/ flammable materials including paints, fuels, solvents, oil, cement etc.; – Dust due to construction activities like excavation, clearing, leveling, compaction etc.; – Noise due to use of heavy machinery; – Violation of applicable air pollutant emissions or ambient concentration standards; – Safety issues for workers; and, – Solid waste including food waste – Collision of machinery while working/ improper parking	– Hiring of reputable construction contractor with sound knowledge of environment and HSE. – Substantial training of Workers before commencement of work. – Implementation of formal emergency procedures as per code of work by contractor. – Provision of all resources and PPEs consider essential to HSE. – Monitor the performance of contractor/ workers. – Necessary measures like sprinkling of water especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. – Covering or use of wind sheets around the stockpiles to avoid air pollution through

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		dispersion – Contractor will prepare waste management plan related to construction activities; get its approval from proponent and ensure its full implementation. – Control noise through control of working hours and selection of less noisy equipment. – All heavy machinery should be parked at designated area. – PPEs will be provided to the workers and its usage will be made mandatory. – Implementation of measures suggested in EMP of subject study. – Adequate care shall be taken during this phase to avoid any kind of damage to Environment as well as worker's safety.

The impacts on environment which are likely to be generated during execution of operational phase are summarized in table below:

ACTIVITY	ENVIRONMENTAL IMPACTS	MITIGATION MEASURES
– Solid Waste – Liquid waste discharge	– Open dumping of house waste in street or in plots; – Discharge of liquid waste in open area; and, – Epidemic diseases.	– Proper drainage system should be ensured for liquid waste. – Solid waste should be temporally dumped on designated area and picked-up by certified contractor on regular basis. – Perform regular inspection of facility. – Implementation of measures suggested in EMP of subject study. – Avoid storage of hazardous waste more than a day. – Adequate care shall be taken during this phase to avoid any kind of damage to environment as well as worker's safety. – Ensure proper housekeeping; and, – Check and review regularly all elements of Control measures for their continuing effectiveness.

Proposed project is designed to appropriate standards and is fitted with adequate safety and monitoring methods and will be operated by competent person. Proposed project will be equipped with engineering controls and intended to evaluate the environmental impact of proposed operational activity to avoid damage to the environment and risks to safety.

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Comprehensive Environmental Monitoring and Environment Management Plans are prepared to satisfy the requirements of Punjab Environment Protection Act, 1997 and rules and regulations made thereunder. Annual overall environmental monitoring by a third party will also ensure environmentally sound operation of the project. The proponent / contractor will hire trained staff to ensure the enforcement of Environmental Management Plan. The equipment will be kept in proper condition to save the environment from any damage.

During construction phase; air quality, ground water quality and surface water quality will be monitored and in operational phase; solid waste and wastewater drainage will be monitored.

Environmental Committee will be formed to attend and address the issues relating to environment, cleanliness, up keeping, aesthetic beauty of the project site, general environmental enhancement, tree plantation, vegetation promotion, planting of flowers and ornamental plants on site.

The mitigation measures have been recommended in the EIA Report based on the best available techniques which will facilitate the project to operate in environmental friendly manner. Based on the findings of this EIA, it can be concluded that the project has negligible adverse impacts on the existing environment and the proposed project is suitable from environmental point of view.

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CHAPTER-1

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INTRODUCTION

1.1 OVERVIEW

Rahim Yar Khan is the capital District as well as the tehsil of the same name. The city Rahim Yar Khan is one of the few cities in the world that are still at their pioneering places since the formation. It has been renamed customarily amid last 5000 years, first available (on record) name was AROR or ALOR and then it became City of Pattan, Phul Wada, Noshehra and now Rahim Yar Khan. It was declared as a separate administration district in 1943.

The district derives its name from its headquarter Rahim Yar Khan. The previous name of this district was Naushehra, which was built in 1875 A.D by Fazal Elahi Halani on the ruins of the ancient Pul-Wadda during the Sumra supremacy in Sindh. In the year 1881, the Railway Authorities desired to change the name of a railway station in the name of a town called Nowshera situated in Peshawar district. Consequently, in 1881 to avoid any confusion because of similar nomenclature Nawab Sadiq Khan-IV of Bahawalpur also changed the name of the sub-division Naushera after the name of his first son Rahim Yar Khan. Formerly, Rahim Yar Khan was also one of the names of the three districts of the former princely State of Bahawalpur until 1955. Today, it lies on an important train route which runs south to Sukkur and north to Bahawalpur.

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To cope with increasing demand of houses, new constructions are required in this region. Keeping in view the increasing demands, **M/S Etihad Canal View RYK** are in the process to start the development and construction of Apartments Building including Building A, B and C under the name of **"Etihad Canal View"** in limits of Tehsil RYK. The project is located at Mouza Ali Akbar Sanghi & Mouza Bindoor, Sadiq Canal Road, Tehsil & District Rahim Yar Khan. The area under consideration is owned by the proponent wholly and no land acquisition is involved in this project. Land Ownership Document (Non Encumbrance - Fard) of the project is attached as **Annexure-I** of this EIA report. The proposed project site is devoid of any tree or plants, 3-5 trees coming in premises which will be preserved in this project.

The proposed project is one among the construction which are unique in many aspects providing various facilities to its residents. A spacious area for roads with footpaths and parking lots, ornamental plants and fancy lights is an integral part of this construction. Beautiful building design will add glamour to the natural scenic beauty of Tehsil Murree. It will play an important role in boosting the living standard of people in and around the vicinity of proposed project site. The current project will provide employment directly and indirectly opportunities to a large number of workers of all categories, both skilled and unskilled, during its development, construction and regular occupancy.

As already mentioned above, the land required for the proposed construction is fully owned by proponent and no land acquisition is involved in the said project.

As stated earlier, proposed project's site is situated in limits of Tehsil Rahim Yar Khan. Environment Protection Department (EPD), it is mandatory for proponent/ owner to submit Environmental Impact Assessment (EIA) in EPA Punjab and get Environmental Approval (EA) before initiating any type of construction activity in Tehsil Rahim Yar Khan. Therefore, this EIA report has been formulated for the grant of NOC from Punjab Environmental Protection Agency, Lahore.

It is a purely residential construction comprising of model apartments along with a number of other facilities for its residents. For further detail, refer to the write up under the caption, "Nature and Size of the Project" in this chapter".

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1.2 PURPOSE OF THE REPORT

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore in compliance with the legal requirement of Section, 12 of Punjab Environmental Protection Act, 1997; "Preparation and submission of IEE / EIA" for obtaining the Environmental Approval (EA) before starting project activity and **Schedule-II (Clause-H)** of Review of IEE/ EIA Regulations, 2022 stating Urban Development and Tourism requiring Environmental Impact Assessment (EIA). The other relevant regulations and guidelines considered while preparing this EIA report include:

- Policy and procedures for filing, review, and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed sectoral guidelines.
- Hazardous Substance Rules, 2003.

Different environmental aspects like social, physical biological etc. and other related features of the project both during construction & operational phases are highlighted in this EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision makers, EPA Punjab in the present case, before issuing the desired Environmental Approval.

1.3 IDENTIFICATION OF THE PROJECT AND THE PROPONENT

a. Contact Person

Mr. Syed Javaad Ali

Project Proponent

M/S Etihad Canal View Private

Housing Scheme

Address: 143 – Ahmad Block, New Garden Town, Lahore
Cell: +92 321 404 0001

b. Consultant

For the preparation of the EIA Report of the proposed project, the proponent has hired the services of the environmental consultants; M/S Elite Environmental Solutions (Pvt.) Limited Team comprising of Environmental Engineers, Chemical Engineers, Environmental experts

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and Environmentalists has worked on this report. Elite Environmental Solutions (PvL) Limited is one of the pioneers Environmental Consultancy Companies in Pakistan with an unrivalled reputation for providing expert, tailored services and solutions. Elite Environmental Solutions (Pvt.) Limited provides the environmental services, litigation and consultancy to clients both industry and government.

Elite Environmental Solutions (Pvt.) Limited is providing quality services in various environmental sectors i.e.

Contact Details:

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Address	House No.03, Qayoum Block, Mustafa Town, Wahdat Road, Lahore
Contact No.	+92 300 6509353
EPA Visiting Person:	Engr. Amna Shahzadi
Address	House No.03, Qayoum Block, Mustafa Town, Wahdat Road, Lahore
Contact No.	+92 300 4580827

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1.4 NATURE AND SIZE OF THE PROJECT

The Murree Hills are studded with different types of buildings, including many multistoried structures. Industrial buildings include sawmills, small-scale cottage operations and medium to large-scale multistory poultry farms. There are also many shopping areas and a wide range of recreation facilities including golf courses that attract a large number of tourists.

The number of houses in the area has increased partly due to the rise in local population and partly due to investments by government and private agencies in developing military colonies, offices, educational institutions, hotels and guesthouses, and residential areas. Many of these are occupied only seasonally.

The number of tourists in the area has expanded quite significantly with the improvement of the roads and transport facilities. Other contributing factors include restricted international travel that has prompted many to spend vacations within the country, and improved national economy that has given a boost to domestic tourism.

The proposed project aims at construction of the Apartments in the limits of Tehsil RYK. The area under consideration for construction of Apartments is owned by the proponent wholly and no land acquisition is involved in this project. The proposed building plan requires total land area of 495.90 Kanal.

The existing state of area demands such development of modern and classic construction style by keeping all important environmental factors in consideration. Project proponents are environmentally conscious of such developments and they are striving hard to cater all the environment related issues at the best level in their management. This EIA report is the proof of this consciousness that the management is going for the approval of their project before its implementation. This project of **"Etihad Canal View"** is designed to comply withlocal and national standards of pollution. This project will be a trendsetter in the area of Tehsil Rahim Yar Khan in construction sector.

The design of the sectors has been finalized while keeping all the environmental and developmental factors in due consideration. The designing of Apartments has been made by

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Highly experienced, qualified, and competent structural engineers following the latest building safety codes also. Protection from natural disaster like earthquake has also been considered according to the applicable safety codes. Further, the soil investigation of the land has been carried out by proponent to check the slope stability and the results shows that land under the proposed project is solid with negligible chances of soil failure. Further, to stabilize the structures

The design of proposed construction plan of Apartments has incorporated well-developed sewerage system and primary treatment of sewerage before its final disposal, which will cater the needs of residents of these apartments.

It is very hard, at this moment, to calculate the exact quantity of water required for the development of proposed Apartments during construction and operation. However, estimates are made in this EIA report based on the quantity of water used in similar projects. It is estimated that around 500-800 Gallons of water per day will be used during construction of infrastructure of the project. While the proposed project will consume around 1500-2000 Gallons per day water at its full occupancy by keeping in view that these apartments will not remained under residency throughout a year, it will be seasonal. The requirements of this water will be fulfilled by installing electrical water pumps. These water pumps will be installed by Etihad Canal View.

The designs of the buildings fulfill the latest safety and technical requirements of modern construction. The design of the apartments fulfills the requirements of building by laws. It also incorporates the features that it should look neat and tidy, adding scenic beauty to the area around in particular and the village in general.

Adequate open space has been provided around the apartment blocks in strict compliance with the Building Regulations, 2005 of TMA. This open space is necessary for proper ventilation, light and easy movement around the apartments. The building regulations of the TMA have also been followed while designing the buildings of the proposed project.

As written above the proposed construction plan is located at Sadiq Canal Road, Tehsil & District Rahim Yar Khan. The land area of the project site is almost levelled and grassy.

1.5 LOCATION OF THE PROJECT

Construction of proposed project is planned to be sited at Mouza Ali Akbar Sanghi & Mouza Bindoor, Sadiq Canal Road, Tehsil & District Rahim Yar Khan. Location map of the proposed project is presented in Chapter-3, under heading "*Project Location/ Site Layout*" of this report.

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1.6 SCOPE OF STUDY

For achieving the objectives of EIA, the study is mainly divided into the following sub-tasks:

- Identification of various legal / statuary requirements as set forth by the Punjab Environmental Protection Act, 1997 and the guidelines for preparation of EIA Reports and review of existing regulatory framework in the country with referenceto the development projects;
- Collection of data related to physical, ecological, and socio-economic recourses of the project area;
- Identification and evaluation of salient environmental impacts;
- Identification of necessary mitigation measures to minimize the adverse impacts; and
- Preparation of an Environmental Management Plan (EMP).

The key steps followed while conducting EIA are briefly described below.

1.6.1 Review of Project Documents

Previous relevant reports have been reviewed for getting insight into the project area and related issues. Some offices and organizations were also visited for acquisition of published reports and data.

1.6.2 Reconnaissance Survey

The reconnaissance survey under this study was conducted on August 13, 2022 by an interdisciplinary team consisting of Environmentalist, Health & Safety Specialist to conceptualize the project and understand the potential environmental and social impacts associated with the proposed project and also to familiarize the environmental setting and local conditions.

1.6.3 Data Collection

Both primary and secondary data were collected to accomplish the objectives of the study. The primary data was collected by conducting field survey on July 28-29 year 2023 through environmental monitoring, individual interviews of local population, focus group discussions and consultations with local community, while secondary data was collected from the published government documents, i.e. Economic Survey of Pakistan, District Population Census, Multiple Indicators Clusters Survey, Weather data, Government Acts, Laws and Regulations. Based on the environmental checklist, socioeconomic questionnaires and area profile as well format for consultations, field surveys were carried out to collect data on the physical, biological and social environment aspect of the project site.

i) Physical Environment

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The physical aspects of the project site covered the following:

» Soils - type of soils, erosion, stability

» Land use pattern of the area including agriculture crops, barren lands, industrial and residential use

» Affected buildings - residential, industrial, commercial, and structures of buildings

» Drainage pattern

» Available energy source(s)

» Other private/ public infrastructure/ utilities like pipelines, electric poles

» Water resources available both surface and groundwater

» Air quality and noise level in the project impact corridor

ii) Biological Environment

In consideration of ecological environment, the following main aspects were studied:

» Existing vegetation along the project impact corridor

» Trees likely to be affected due to the project implementation (if any)

» Endangered species both flora and fauna

» Wildlife in the project impact corridor

» Forests and game reserves existing along project impact corridor

» Beneficial plants and animals in the project impact corridor

» Aquatic life including fish resources

» Wetlands within the vicinity of the project impact corridor

iii) Social Environment

Social assessment has attempted to determine the social implications in terms of assumed positive and negative impacts as a result of the implementation of the proposed project. The socioeconomic baseline data covered the following major aspects:

» Demographic profile

» Population

» Number of households

» Literacy status

» Nature of business/ occupations

» Livelihood/ income

» Living standard of the population

» Access to credit

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» Social infrastructure available

» Women issues

» Community perceptions about the Project

1.6.4 Stakeholders/ Public Consultations

During the detailed field survey dated July 28, 2022; consultations were made with local community/ general public as well as intent officials. The basic purpose of these consultative meetings/ focus group discussions were to i) share information with stakeholders about the expected impacts of proposed development works on the physical, biological, and socioeconomic environment; ii) understand stakeholders' concerns regarding various aspects of the project, including the existing conditions and the potential impacts of the proposed project.

1.6.5 Data Processing and Analysis

After collecting all above data from different sources including interviews from communities, consultations, physical observations, and data compiled from other documents was analyzed. Accordingly, the results were presented through tables (means, percentage, number), graphical/ pictorial illustrations.

1.7 PERSONS PERFORMING EIA STUDY

EIA study of the project has been conducted by Elite Environmental Solutions (Pvt.) Limited Pakistan, according to the Review of IEE/EIA Regulations 2022, Pakistan Environmental Protection Agency (Pak EPA), Punjab Environmental Protection Act, 1997, and other relevant Regulations and completed this EIA Report. List of names, qualifications and roles of team members carrying out the EIA study is provided as **Annexure-VII** of this document.

1.8 ROLES AND RESPONSIBILITIES

The executing firm/company of the proposed project is M/S Etihad Canal View. Role and responsibilities have been proposed in the EIA report. Proposed mitigation measures, as defined in the EMP will be primarily implemented by the management of M/S Etihad Canal View. with responsibilities assigned to various departments. Project Proponent will strictly adhere to implementation of all mitigation measures contained in this report in order to minimize any negative impact on any component of environment during and after execution of project. Institutional arrangements have been suggested in Chapter-7 ofthis document, so that proposed mechanism of environmental protection shall work in time.

1.9 ROLE OF ENVIRONMENTAL PROTECTION AGENCY, PUNJAB

The main responsibility of Environmental Protection Agency, Punjab will be to monitor the mitigation measures, which will be taken up or implemented by M/S Etihad Canal View.

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EPA is endorsed to inspect compliance of sections 13, 14, 17, & 18 of IEE/ EIA Regulations, 2022, which enunciate the conditions for approval, confirmation of compliance, entry, inspection and monitoring of proposed project. Hence, EPA Punjab is the sole entity which is responsible to issue the necessary approval by exercising powers under section 12 of Punjab Environmental Protection Act 1997 after proper review of this EIA document.

1.10 ORGANIZATION OF EIA REPORT

The EIA report is divided into following chapter:

Executive Summary

Chapter 1: Introduction

Chapter 2: Legal Framework

Chapter 3: Project Description

Chapter 4: Description of Environment

Chapter 5: Stakeholder Consultation

Chapter 6: Impact Identification & Mitigation Measures

Chapter 7: Environmental Management Plan

Chapter 8: Findings and Recommendations

Annexure

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CHAPTER-2

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POLICY, LEGAL & ADMINISTRATIVE FRAMEWORK

2.1 GENERAL

This section deals with the current policy as well as legal and administrative framework related to carrying out of Environmental Impact Assessment of various projects.

Like other Projects, the proposed Project, before its execution, is required to go through an Environmental Assessment, in accordance with the provisions of the Punjab Environmental Protection Act, 1997.

2.2 EXISTING REGULATIONS AND LEGAL FRAMEWORK

According to environmental laws of the country development projects have to undergo the process of Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) in order to predict and mitigate the impacts of the development at an early stage. Based on nature, size, cost and associated impacts, the proposed project has been categorized for EIA Study according to the Regulation "4" of Statutory Notification issued on June 13, 2000 (S.R.O.339 (1) /2001). The Proposed Project is Construction and development of Etihad Canal View Private Housing Scheme located in Tehsil Rahim Yar Khan which is being declared as Urban Development and Tourism. As per **Schedule-II (Clause-H)** of the IEE / EIA Regulations 2022 made under section 12 of Punjab Environmental Protection Act, 1997 under which the Environmental Impact Assessment (EIA) is mandatory for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

This EIA Study has been carried out in the light of the policy guidelines of the Government of Pakistan, under the procedures and practices formulated by the Provincial Environmental Protection Agency (EPA-Punjab).

2.3 RELEVANT LEGAL / INSTITUTIONAL FRAMEWORK

The applicable laws for the environmental study of the proposed project are briefly given below. The proponent of the proposed project will abide by the applicable laws and regulations.

2.3.1. NATIONAL CONSERVATION STRATEGY, 1992

On March 1, 1992, the Cabinet of Pakistan approved the National Conservation Strategy. It describes the stark reality of the country's deteriorating resource base and its implications for what is still largely a natural resource-based economy. It sets forth the beginnings of a plan to integrate environmental concerns into virtually every aspect of Pakistani economic life.

The strategy has three overriding objectives: conservation of natural resources,

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Sustainable development, and improved efficiency in the use and management of resources.

2.3.2. PEPO, 1983 AND PEPA, 2012

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO), which was replaced by the Pakistan Environmental Protection Act (PEPA) 1997, through an Act of Parliament. Now the PEPA 1997 has been replaced by Punjab Environmental Protection Act, 1997 on 18th April, 2012. Under Sec. 8 of Environment Protection Ordinance (EPO) 1983, it was necessary tocarry out IEE / EIA for all development projects, but there were no IEE / EIAregulations under that ordinance.

Under section 12 of the Punjab Environmental Protection Act, 1997 it is mandatory to take an Environmental Approval Environmental Protection Agency for commencement of any construction of project. This study has also been carried out under section 14 "***Handling of Hazardous Waste***" of the Punjab Environmental Protection Act, 1997 stated "no person shallgenerate, collect, consign, transport, treat, dispose of, store, handle or import any hazardous substance except (a) under a license issued by the Provincial Agency andin such manner as may be prescribed; or (b) in accordance with the provisions of any other law for the time being in force, or of any international treaty, convention, protocol, code, standard, agreement or other instrument to which Pakistan is a party".

2.3.3. NATIONAL ENVIRONMENTAL POLICY 2005

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

- Conservation, restoration and efficient management of the natural 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.

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2.3.4. NATIONAL FOREST POLICY 2001

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 are as follow:

1. Population planning in critical eco-systems.
2. Providing substitutes to firewood in the wooded mountains.
3. Reducing the impact of socio-economic causes.
4. Reducing poverty, poverty of opportunity, and powerlessness.
5. Reducing political interference in the Forestry and Wildlife Departments.
6. Renovating and invigorating the institutions of RNR.
7. Supporting Local Governments in the sustainable development of their RNR.
8. Policies for fragile natural Eco-systems.
9. River rain forests.
10. Irrigated Plantations.
11. Preservation of relict and unique forests.
12. Wildlife.
13. Rangelands and desert eco-systems.
14. Planting of trees and fodders on farmlands.

2.3.5. REVIEW OF IEE AND EIA REGULATIONS, 2022

The GOP has issued Review of Initial Environmental Examination and Environmental Impact Assessment Regulations 2022, to review the Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA) Reports.

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6. Renovating and invigorating the institutions of RNR.
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12. Wildlife.
13. Rangelands and desert eco-systems.
14. Planting of trees and fodders on farmlands.

2.3.5. REVIEW OF IEE AND EIA REGULATIONS, 2022

The GOP has issued Review of Initial Environmental Examination and Environmental Impact Assessment Regulations 2022, to review the Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA) Reports.

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2.3.6. GUIDELINES FOR THE PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS, 1997

The GOP has also framed guidelines for the preparation and review of IEE/EIA of projects in various developmental sectors.

2.3.7. PUNJAB ENVIRONMENTAL QUALITY STANDARDS (PEQS)

Powers conferred under clause (c) of sub-section (1) of section 4 of Punjab Environmental Protection Act, 1997 has been approved the Punjab Environmental Quality Standards (PEQS), 2016 for municipal and industrial effluents, noise, drinking water, motor vehicle exhaust, air emissions, industrial gaseous emissions and treatment of liquid & disposal of biomedical waste.

2.3.8. GUIDELINES FOR SENSITIVE AND CRITICAL AREAS

GOP has issued Guidelines for Sensitive and Critical Areas in October, 1997. The objective of the guideline is to provide guidance to project proponents and other stakeholders in the environmental assessment process, so that the proposed projects are planned and sited in way that protects the values of sensitive and critical areas.

2.3.9. POLICY & PROCEDURES FOR THE FILING, REVIEW & APPROVAL OF ENVIRONMENTAL ASSESSMENTS, NOVEMBER-1997

Environmental Assessment is the Primary means of managing the approval of new development proposals in Punjab. Environmental Assessment allows for the systematic examination of proposals, clear procedures which provide for the interests of relevant Government Departments and other stakeholders to carefully consider the environmental impacts of new developmental projects.

2.3.10. GUIDELINES FOR PUBLIC CONSULTATION, PAKISTAN ENVIRONMENTAL PROTECTION AGENCY OCTOBER, 1997

This guideline is part of a package of regulations and guidelines which include:

» Punjab Environmental Protection Act, 1997
» Policy and Procedures for filing, review and approval of environmental assessments
» Guidelines for the preparation and review of Environmental Reports
» Guidelines for sensitive and critical areas
» Punjab Environmental Quality Standards (PEQS)
» Detailed sectoral guidelines

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2.3.11. PUNJAB WILDLIFE PROTECTION ACT, 1974

This act was framed in 1974 by the Province Punjab and is about of protection and conservation of Wildlife.

2.3.12. FOREST ACT, 1927

This act was framed in 1927. The Forest Act, 1927 is still the basic charter for the forest departments in Pakistan. This law empowers provincial governments to manage forest areas.

2.3.13. PUNJAB LOCAL GOVERNMENT ORDINANCE, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. Under the Ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

2.3.14. PAKISTAN PENAL CODE, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land. Sections 272 and 273 of this Act deal with the adulteration of food or drink. Noise pollution has been covered in Section 268, which defines and recognizes noise as a public nuisance. "A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger or annoyance to the public or to the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right."

2.3.15. OCCUPATIONAL HEALTH

Construction and operational activities could affect the occupational health of the workers. Quantitative national standards with respect to the above aspect are yet to be developed in Pakistan. However, guidance in qualitative terms can be obtained from the Pakistan Factories Rules, 1962 (based on the Factories Act, 1934) and the Labor Laws (Amended) Ordinance, 1972.

2.3.16. TOXIC OR HAZARDOUS WASTE

Protection of the environment with regards to toxic and hazardous waste is covered by the Pakistan Penal Code (PPC), 1860. Environment Protection Department (EPD), Punjab, is mandated to monitor the transportation of hazardous materials within the provincial limits.

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2.3.17. HAZARDOUS SUBSTANCE RULES, 2003

Rule 5 stated that project/ industrial activity must be accompanied by Environmental Impact Assessment (EIA) involving generation, collection, consignment, transport, treatment, disposal, storage, handling/ import of hazardous substance in respect of which the license is sought.

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CHAPTER-3

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PROJECT DESCRIPTION

3.1 TYPE AND CATEGORY OF PROJECT

According to environmental laws of the country, development projects have to undergo the process of Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) in order to predict and mitigate the impacts of the development at an early stage. Based on nature, size, cost and associated impacts, the project under consideration has been categorized for EIA Study. The Project is the development and construction of Apartments Building under the name of "Etihad Canal View Private Housing Scheme Mouza Ali Akbar Sanghi & Mouza Bindoor, Sadiq Canal Road, Tehsil & District Rahim Yar Khan. The total land for this project is 495.90 Kanals.

TMA Approved Map of Building is annexed with the report.

The total cost of project is about Rs. 1289.34 Million including the cost of land and development. This project requires NOC / License under Section 12 of Punjab Environmental Protection Act 1997 and Schedule-II (Section-H) (Environmental Sensitive Area) of Review of IEE/ EIA Regulations, 2022. The Environmental Impact Assessment (EIA) fulfills the mandatory requirement for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

As mentioned earlier, proposed project's site is situated in rural limits of Tehsil Murree. Environmental Protection Department (EPD), Punjab has declared Tehsil Murree as Environmental Sensitive Area. It is mandatory for proponent/ owner of project sited in environmental sensitive area to submit Environmental Impact Assessment (EIA) in EPA Punjab and get Environmental Approval (EA) before initiating any type of construction activity in Tehsil RYK. It is a purely residential construction comprising of model apartments along with a number of other facilities for its residents.

Consolidated Certificate issued by Patwari is attached as **Annexure-II** which clearly shows that no litigation is involved in the project and the land is fully owned by Etihad Canal View.

3.3 OBJECTIVES OF THE PROJECT

Due to growing population and urge for better living standards of life, demand for new western style buildings having all of modern facilities of human need, has been

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Raised during recent years. M/S Etihad Canal View has planned to construct the Houses in limits of Tehsil RYK. Keeping in view the growing demand of modern style buildings and need for better living society, they are going to start the development and construction of Apartments on land already owned by proponent located at Mouza Ali Akbar Sanghi & Mouza Bindoor, Sadiq Canal Road, Tehsil & District Rahim Yar Khan. The project aims to offer better living standards, achieve design/ construction features of buildings matching with applicable standards. For more details, please refer to "1-Introduction-Nature and size of the project" above.

3.4 ALTERNATIVES CONSIDERED & THEIR REASON OF REJECTION

Construction of Etihad Canal View Private Housing Scheme is purely a residential venture. To fulfill the viable aspects of the residential property under reference of this EIA Report, it is to be sited at a place where there are bright prospects and need of the same. It should also meet the legal requirements of the Town Municipal Administration (TMA) in the matters relating to the land use conditions of the project area.

An analysis of available alternatives is necessary to establish that the most suitable management and technology options will be adopted for the project, while minimizing environmental impacts. This evaluation explains the selection of appropriate option that was required to ensure optional results within defined set of economic environmental, health and safety constraints. In particular, it outlines the following project options:

1. The "No-Development Option"
2. Alternative Site Option

1. No Development Option: No project means there would be no project at all. The no project option, if taken, would stop the community from an important and necessary project which is the need for today as per limited resources/ facilities being provided to general public. Other impacts of the 'No project' option would be loss in employment and social welfare in the project area, as the project is bound to create jobs and improve the lifestyle of the community of the area through different community development and social welfare projects. From the environmental point of view, this option would result in the loss of opportunity in further improvement of the environmental management of the area, environmental baseline data, and the mitigation and compensatory programs.

2. Alternative Site Option- Site Selection Criteria: In reference to the project

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alternatives, 2 sites were visited but due to lack of land documents and desired kanal for Project those sites were rejected. One reason of site selection is that Image heights Houses on 4.5 Kanals is under construction near proposed land,local community also lives there. Further, the proposed site is located in already developed village and no The final selection of site is based on following criterion:

- **Accessibility:** The site should be accessible from a permanent road to allow ready transport.
- **Water Supply:** Availability of adequate water supply, which should also meet drinking water standards.
- **Soil Condition for civil structures:** Suitability and stability of soil conditions required for civil structures
- **Sufficient land availability:** Availability of sufficient land to design and layout plan in an appropriate manner, with consideration of future expansions.
- **Electricity:** Availability of electricity from the National Grid for an uninterrupted supply of power, required for the project.

In view of all above criteria regarding site selection, it is to be sited at a place where there are bright prospects and need of the same. It should also meet the legal requirements of the Town Municipal Administration (TMA) in the matters relating to the land use conditions of the project area. The infrastructure and cable network is already present at the proposed project site. Availability of access road, communication facilities, electricity, basic infrastructure, sewerage etc. is another necessary requirement for the proposed project which are already available at the proposed site.

Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with new sculpt, comfortable and luxury residential apartments in the area.

All the above stated qualities for an ideal site for proposed project are present in the selected project site. All the other basic infrastructural requirements are also available at the selected site. Accordingly, the selected site is best suited for construction of the residential scheme.

Such projects are dire need of time by keeping in mind the growing rate of tourism in Pakistan. With due attention to environmental protection and implementation of mitigation measures suggested in this EIA report; the construction of Apartments is a blend of elegant location, most efficient and cost effective design, elaborated by

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quality construction, is simply the best. Therefore, the present site is ideally suitable for this project.

Further, most importantly the issue of land ownership was taken into consideration during finalization of site. There are serious issues of land ownership in Murree area. Therefore, the land is transferred to the proponent through court and the NEC Farad of land is obtained by Etihad Canal View Private Housing Scheme. Copy of the Farad is attached as annexure in this report.

3.5 PROJECT LOCATION/ SITE LAYOUT

The project site is located at Tehsil Rahim Yar Khan as mentioned earlier. Proposed project site is an open area surrounded by residential land. Project location map has shown in figure 3.1 below. Project layout plan is attached as Annexure-III, however the detailed location map is attached as **Annexure-IV**. Digital topographical map of (Proposed Project land) is attached as Annexure V.

Commercial activities are going on along the RYK expressway and the commercial activities are increasing rapidly in this area. Land use in the surrounding of the project area is described as below:

North: Proposed Housing Scheme

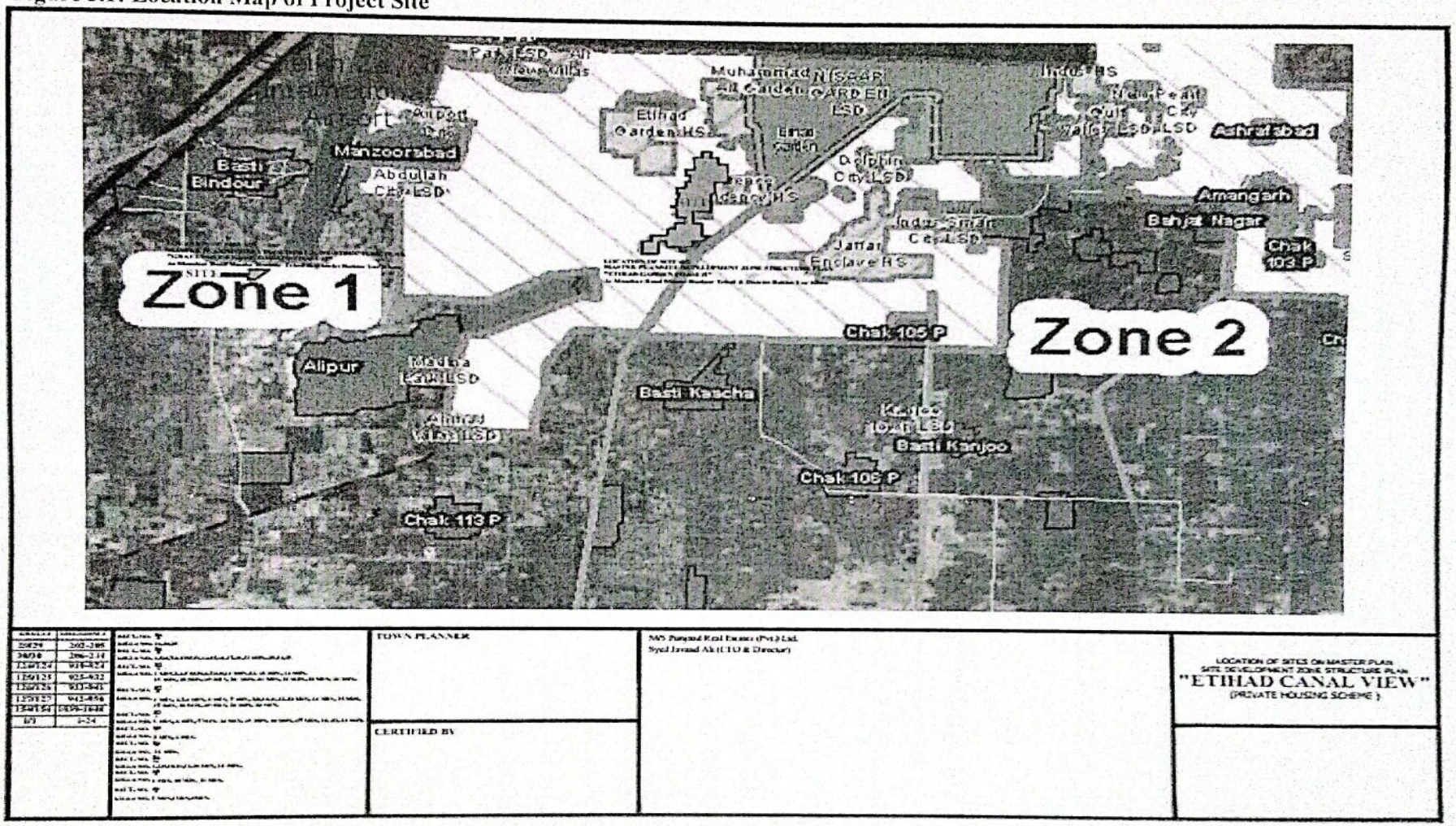
South: Local residential area

East: Open land and vacant plots

West: Local residency

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Figure 3.1: Location Map of Project Site



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3.6 LAND USE AT THE PROJECT SITE

The project site is owned by the Proponent and is currently vacant. 3-5 trees are present at the land, considered for current construction. These trees will be preserved during construction and development of apartment. Proposed area is almost levelled and grassy. The Land Ownership Documents (Non Encumbrance- Fard) is appended as **Annexure-I**. The land is transferred to proponent so no litigation is involved in this project. Consolidated Certificate issued by Patwari is attached as **Annexure-II** which clearly shows that no litigation is involved in the project and the land is fully owned by M/s Etihad Canal View.

3.7 ROAD ACCESS

In order to facilitate developments and growing tourism, basic infrastructure facilities like roads network, natural gas, water and power supply, means of transportation and communications etc. are being improved/ developed speedily. The site is easily accessible through Sadiq Canal Road.

3.8 VEGETATION FEATURES OF SITE

Project site is situated within the low population area of Tehsil Rahim Yar Khan. On account of unfavorable environment and due to site presence in already developed village the natural flora has been shifted to upper regions. However, few varieties of faunal species are present in the area; Details of vegetation features are covered in Chapter – Description of Environment. However, this is worth mentioned that there are only 3 trees present on the land under consideration at the moment. These trees will be conserved during the whole developmental process. This project is based on the idea of **NO TREE CUTTING**.

3.9 ENERGY/ POWER SOURCE

As mentioned above in this EIA report, the project under reference of this EIA is construction of residential apartments and there will be no high energy consuming process/activity involved in this project. The energy will be required to fulfill the

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Household and small commercial requirements of the apartments. This energy will be supplied by Water and Power Development Authority (WAPDA) to the occupants of the proposed apartments.

It is estimated that around 15-20 KW energy will be required during the operational of infrastructure of the project while around 60-80KW energy will be required during full occupancy of the said project.

3.10 WATER REQUIREMENT

Adequate quantity of underground water is available to meet even all the project requirements. The quality of water is also satisfactory. This factor also supports the decision regarding sitting of the project at the existing site.

It is projected that around 500 – 800 Gallons of water will be used on daily basis during construction of the said project. Water requirement of the proposed project will be met via extraction with installation of electrical water pumps. It is estimated that about 1500-2000gallon per day of the water will be needed during regular occupancy phase of proposed project. It is worth mentioning that proposed project doesn't involve process water; the stated quantity of water will be required for sanitation purposes/ allied activities only. Therefore, this negates the major concern of effluent generation as well. It is pertinent to mention here that majority of residents of these apartment will visit this area on seasonal basis. Therefore, this quantity of water will only be required during peak season.

3.11 SOLID WASTE

The garbage collection system is embedded in the designing of proposed construction of Apartments. Approximately 40 - 50 kg per day solid waste will be generated during full occupancy of the apartments. All type of solid waste will be segregated at the point of their generation. Recyclables including plastics, metal, paper, glass, rags will be sold in the market while the leftovers will be duly disposed of at designated site for solid waste disposal. To accomplish this all, a comprehensive system is already in place with state of the art equipment and operation system by Rawalpindi Waste Management Company (RWMC). The waste produced by the project activities will be purely municipal waste and the already working RYKWMC will also be taking waste of the project during its regular occupancy. A contractor will be hired to transport the waste to a central point for collection by RYKWMC.

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3.12 PROJECT COST & MAGNITUDE OF OPERTAION

The estimated capital cost of the proposed project is about PKR 1289.34 Million including land and development cost. The quantities have been worked out from the design drawings. The rates for cost estimates are based on land cost, construction work, contractor cost and cost of the equipment/ machinery with 10% escalation. At operation stage, the project proponent will be involved for operation and maintenance of the proposed facility.

The development under reference of this EIA will be spread on an area of 495.90 Kanals. Components of the proposed project are already described in the earlier part of this report. There will be no industrial process/ activities associated with the project.

3.13 SCHEDULE OF IMPLEMENTATION

Proposed project is settled for Environmental Approval to start its implementation. It is planned that the following schedule of project implementation will be adhered to. This is subject to the conditions that everything goes according to planning and no serious bottlenecks are encountered.

3.14 DESCRIPTION OF THE PROJECT

The project has been duly described at: "1-Introduction- Nature and size of the Project-Purpose of the report, identification of the project and the project proponent." Besides, an Housing Scheme is not just a place for residency but also facilitates its residence with state of the art parks, community center, market places etc.

3.15 DESCRIPTION OF THE PROCESS

The project has been duly described at: "1-Introduction- Nature and size of the Project-Purpose of the report, identification of the project and the project proponent."

3.16 DETAILS OF RESTORATION & REHABILITATION PLANS

Construction of Apartments in limits of Tehsil RYK being a purely residential venture, will continue to maintain its highly organized way of work including restoration and rehabilitation in environmental friendly way even at the end of the first life of the project. Since it is a residential project therefore to lend the project another life, rehabilitation work of the entire project will continue so that the project remains as useful and viable during its second life like its first life. Rather, the then state of the art technology in residential sector will continuously be adopted so as to keep as a state of the art construction for years over end.

Major rehabilitation work will include filling back the excavated land, debris disposal according to internationally sustainable practices, scientific disposal of all sorts of solid wastes and grass plantation on pre-planned areas, cleaning of unpaved areas etc.

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Debris or any other wastes resulting from demolishing of the buildings will be disposed-off in environmentally sustainable fashion. The materials capable of recycling/ reuse will be either sold in the market or to be reused for other suitable purposes. While dismantling the structures all Government rules and regulations as applicable to such activities will be strictly adhered to.

During entire construction period, necessary precautions will be taken to ensure that no damage will be done to the basic infrastructures like power transmission lines telephone lines, roads, private or public property and daily human life as well.

Safety measures as desired under the code of demolition will be adopted to avoid any harm to humans, property around or the environment in the project area. Dust to be

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Generated will be minimized by constant sprinkling of water. After completion; all construction matrix, debris and garbage will be removed off immediately from the site within the minimum possible time under safe conditions. Any minor spillover of these materials will be cleared adequately. The land, if and where pitted will be adequately leveled. On the whole, the project site and the area in its near vicinity will be made neat and clean to maintain the scenic beauty of the area.

3.17 GOVT. APPROVALS AND LEASES REQUIRED BY THE PROJECT

Project Proponent has accorded approvals/ certifications for their project from all relevant regulatory bodies successively. The land is totally owned by Etihad Canal View and the area is pure residential as Image Heights, Murree Oaks and other local communities are already existing there. Non Encumbrance Certificate also issue in the name of Etihad Canal View. Approvals obtained from different departmentsso far are enlisted as under:

1. TMA Approval
2. Forest Department Report
3. Punjab Highway Report

All of these approvals have been provided under **Annexure-VIII** of this document. So far the Environmental Approval from the EPA, Punjab, Lahore is the major requirement for which this EIA report has been prepared and submitted.

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CHAPTER-4

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DESCRIPTION OF ENVIRONMENT

4.1 GENERAL

This Section of the report covers a comprehensive description of the baseline conditions of the project and its related influence area with respect to the physical, biological, and social aspects. In addition to the secondary data, the field survey was carried out in July, 2023 and the environmental baseline conditions were established based on socioeconomic interviews[2]; impact location profiles; environmental profile questionnaires and public consultations.

4.2 PHYSICAL RESOURCES

Following is a brief description of various physical resources of the Project Site.

4.2.1 Topography, Geology & Soil

Proposed project site is located at 28.366794° Lat 70.307219° Long. The project area is generally flat and falls in Riverine area. It is present at the elevation of 266 feet above sea level.

The geology of the project area is composed of sedimentary and volcanic rocks. The area of this region is even and alluvial plain. According to Atlas of Pakistan the soil of project area is loamy and clayey.

Brief demographical profile of city is mentioned in Table 4.1 below.

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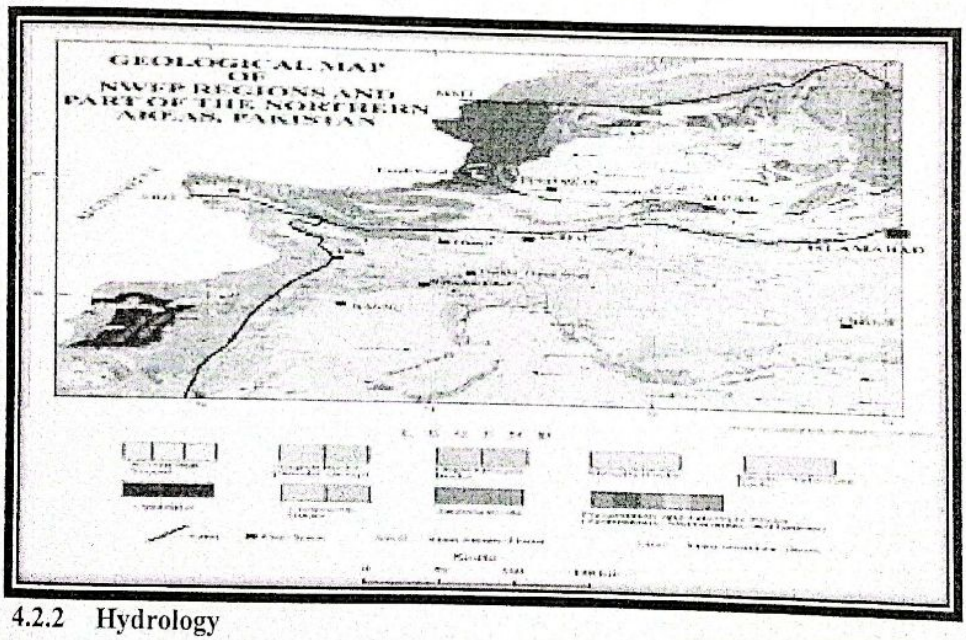
Table 4.1 Demographic profile of Rahim Yar Khan

Item	Unit	Value
Total area of the District	Sq.km	11,880
Tehsils	Number	04
Density	Sq.km	1,322
Union Councils	Number	139
Total population of the District (census 2017)	Number	4,807,762
Population (male)	Number	2,461,780
Population (female)	Number	2,345,413
Transgender	Number	228
Literacy rate of the District	%	56
Average household size	Number	6.1

Source: Rahim Yar Khan District: district in Punjab Province, Pakistan

Figure 4.2 shows the types of general geologicalconditions in the NWFP regions and Northern part of Pakistan.

Figure 4.2: Geological map of Northern Areas of Pakistan



4.2.2 Hydrology

The project area lies at the moderate slope with upward and downward steep slopes of the hill side on overburden of 3 m to 9 m thick. The overburden is underlain by Murree formation comprising alternate beds of sandstone and siltstone having varying thickness with shale as dominant rock. The beds of sandstone and siltstone are highly disturbed due to tectonical activities in the past. The outcrops of sandstone, silty sandstone and shale can be observed at places in the project area.

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The general strike of the area is north-east and dip ranges from 26 degree to 43 degree towards south east.

Underground Water

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The ground water table in project area is 10-15 m deep. A supplemental network of municipal and private wells as deep as 200 meters (m) produces ground water primarily from quaternary alluvial gravels. The strata of the subproject area are water bearing and alluvial deposits, giving groundwater potential throughout the locality. The local population is generally reliant on supply from the hand pumps. The chemical quality of ground water varies in different areas and at different depths. Potable water is available in the area. Irrigation supplies are perennial and tube wells have been installed to make up the deficiencies. Table 4.2 shows the number of diesel and electric Tube wells installed in district.

Table 4.2: Diesel and Electric Tube wells

Total Number of Wells	Government	Private
18,823.0	58.0	18,765.0

The chemical quality of groundwater is:

- Generally fresh in the area along the rivers: and
- Brackish/ saline in the central parts of the Doabs

One of the reasons of poor groundwater quality at shallow depth in the area is water logging in the past. Whereas, different impervious thick clay layers at depth up to 450 ft. separate the shallow aquifer from the fresh groundwater aquifer at depth. Therefore, the groundwater quality in the project area improves with depth.

Surface Water/Wet Lands

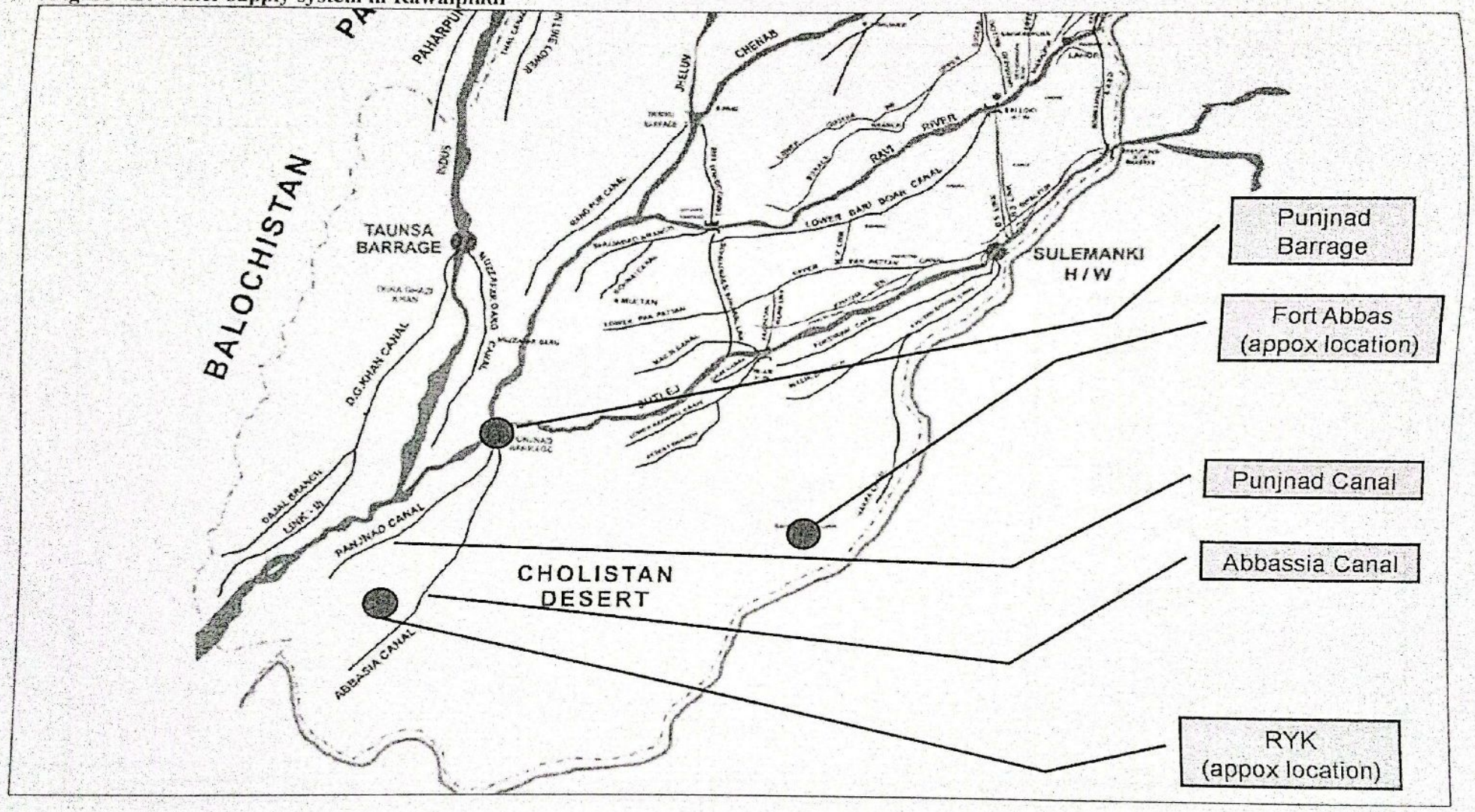
The Soan River along with their tributaries are the main sources of ground water recharge and surface water supplies in the area. The Kurang and Soan Rivers are dammed at Rawal and Sambli Lakes, respectively, to supply water for the semi-urban area. The water supply system of district Rawalpindi is shown in figure 4.3 below

4.2.3 Seismicity

According to Building Code of Pakistan, Rahim Yar Khan has been placed in Zone 2A. Therefore, location does not warrant any special considerations in on account of seismic sensitivity.

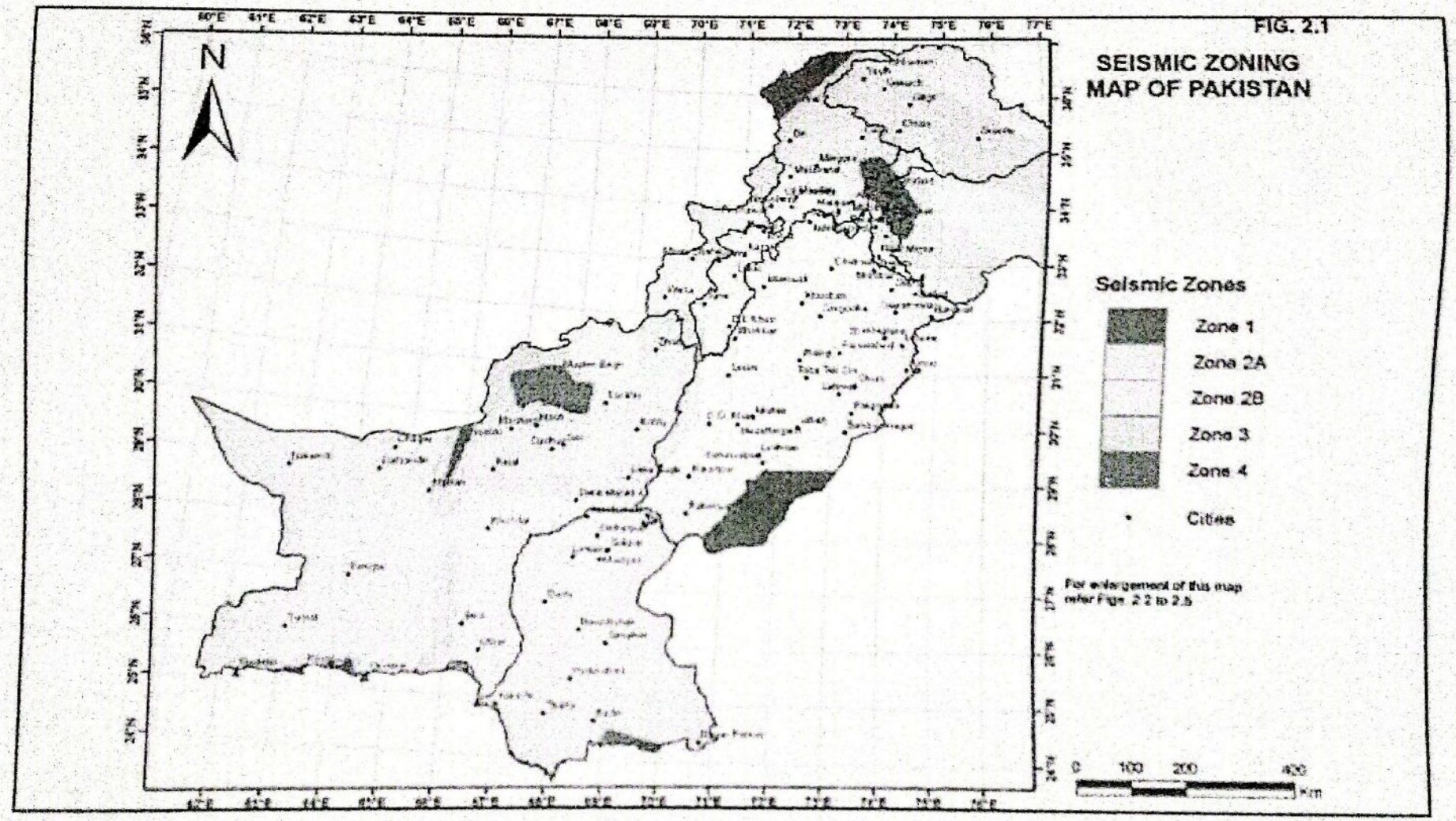
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Figure 4.3: Water supply system in Rawalpindi



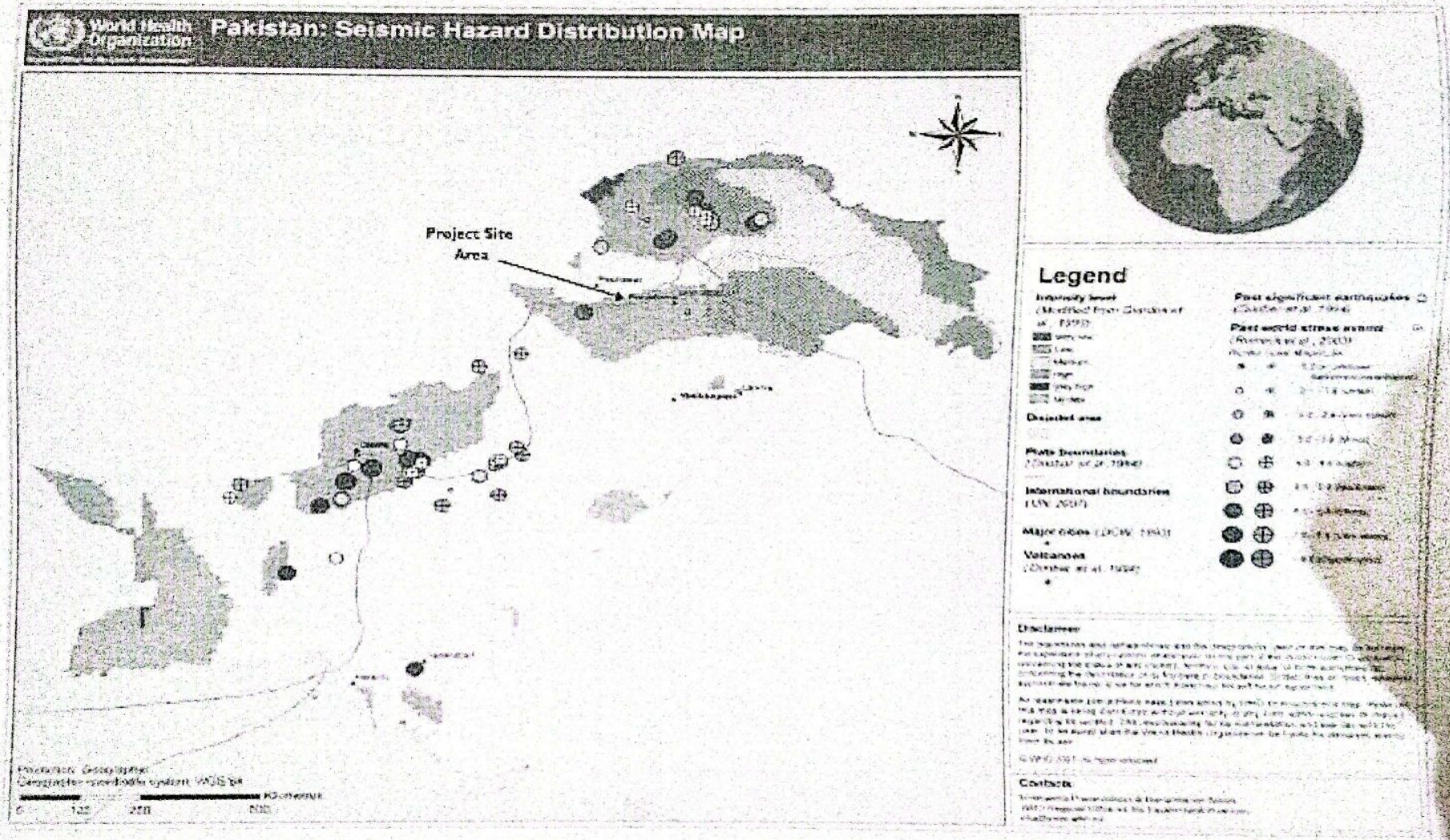
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Figure 4.4: Seismic Zoning Map of Pakistan



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Figure 4.5: WHO Seismic hazard map of Pakistan



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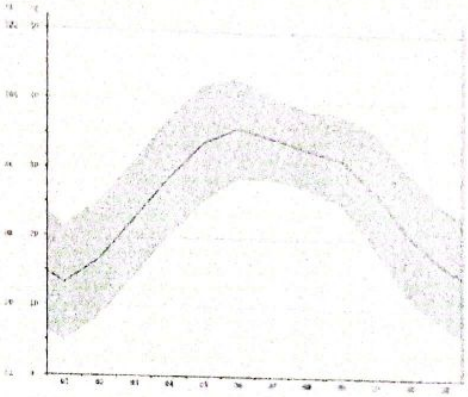
4.2.4 Climate

The climate at study area is considered to be BWh according to the Köppen-Geiger climate classification. In Rahimyar Khan, the average annual temperature is 26.2 °C | 79.2 °F. Precipitation here is about 101 mm | 4.0 inch per year. The meteorology of area is measured in terms of following parameters:

a. Temperature and Precipitation

June is the warmest month of the year. The temperature in June averages 36.0 °C | 96.8 °F. January has the lowest average temperature of the year. It is 13.3 °C | 55.9 °F. Precipitation here is about 101 mm/ 4.0 inch per year.

The trends of average minimum and maximum temperature are shown below (Graph 4.1).

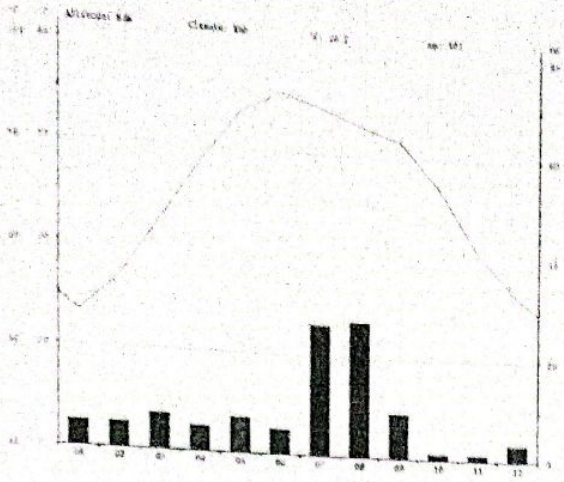


Graph 4.1: Maximum and Minimum Temperature

The trend of average monthly precipitation is shown below (Graph 4.2[1]).

[1] Available on: https://en.climate-data.org/asia/pakistan/punjab/rahimyar-khan-3016/

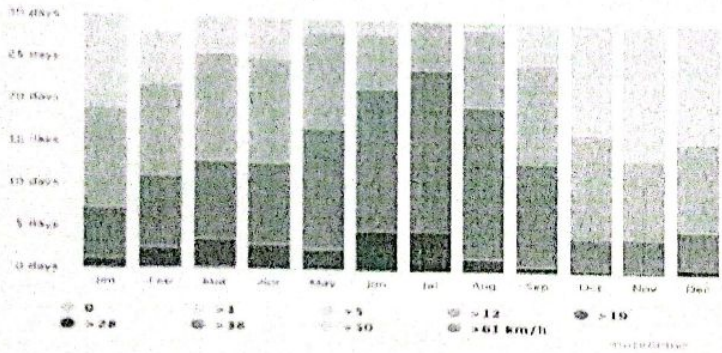
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Graph 4.2: Average Monthly Precipitation (mm)

b. Wind Speed

Wind speed in study area varies throughout the year. The graphical representation of maximum, average and minimum wind speed for each month is shown below (Graph 4.3[2]).



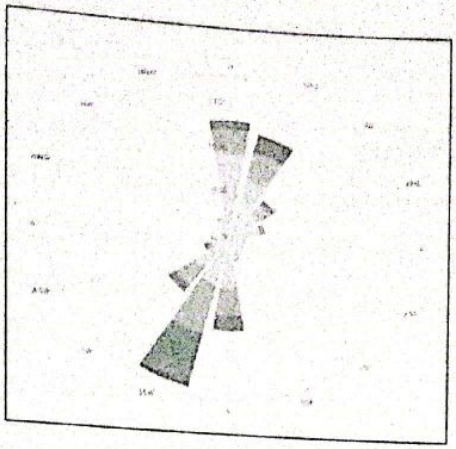
Graph 4.3: Wind Speed

c. Wind Direction

Wind direction of any area shows that from which direction the wind is blowing. For this purpose wind rose diagram is formulated which shows that for how many hours the direction of wind blow from specific direction i.e. from SW to NE etc. the prominent wind direction of district is NS. Wind rose of study area is shown below (Graph 4.4[3]).

[2] https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/rahim-yar-khan_pakistan_1167460
[3] https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/rahim-yar-khan_pakistan_1167460

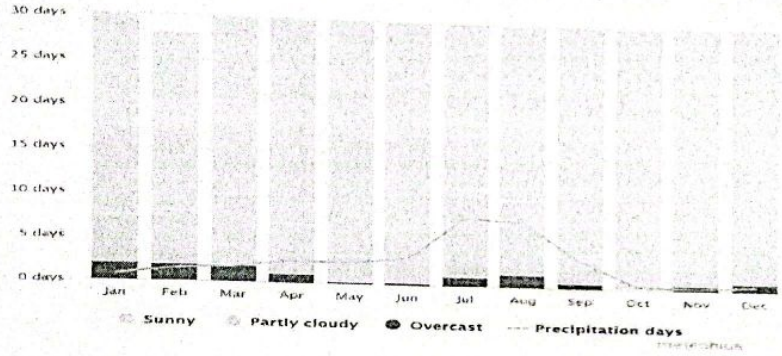
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Graph 4.4: Wind Rose Diagram

d. Sunshine

Sunshine of any area shows that how many days are sunny in a month. The sunshine patterns for a specific area vary accordingly. For each month, the number of sunny and cloudy days for study area is shown below (Graph 4.5[4]):



Graph 4.5: Sunshine Patterns

The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

[4] https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/rahim-yar-khan_pakistan_1167460

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ECOLOGICAL RESOURCES

4.2.5 Biodiversity

The ecological environment of an area is generally considered sensitive to large-scale developments. Disturbances and imbalances in the ecological environment can adversely affect biodiversity features of an area. The biodiversity of an area generally reflects the abundance and richness of the biological and the ecological resources.

4.2.6 Forestry (Flora)

Since the project site is situated in the semi-urban region of District Rawalpindi therefore, there is no likelihood of any forest or any type of flora worth mentioning around the project.

As the project area is located in commercial area, so no significant forest is present in the study area. Some shrubs and grasses were found in study area grown on the bank of roads and open spaces. Although common trees have been grown in the study area including Kikar, Mulbury, Phulahi and Eucalyptus, etc. The detail of the trees is given below in Table 4.1. No forest was found in the study area.

Table 4.1: Common Trees & Plants of Study Area

Sr.#	Scientific Name	Local Name
1	Acacia Karoo	Kikar
2	Morus	Mulbury
3	Acacia modesta	Phulahi
4	Eucalyptus globulus	Eucalyptus

Main Fruits

The commonly occurring main fruits of the area are Mango, Apple, Plums, Apricot, Grapes, Banana, Citrus, Guava and Peach.

Crops

Rice; Maize and Sugarcane are the major crops being grown during the kharif (summer) and Wheat; Gram; Barley and Rabi Fodder are the major crops being grown during the rabi (winter) seasons.

Vegetables

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The commonly available vegetables of the area are: Carrots, radish, ladyfinger, cauliflower, cabbage, turnip, red and green chilli, spinach, peas, pumpkins, bittergold, and tomatoes.

4.2.7 Wildlife (Fauna)

The study on terrestrial fauna in the study area is based upon the field investigation and reports of Forest Department. A variety of animals found in study area which are categorized as Mammals, Birds, Reptiles and Amphibians.

a. Mammals

Some of the common Mammals found in study area are Urial, Dog and Monkey. Following table gives the Common and Zoological names of Mammals:

Table 4.4: Mammals present in Study Area

Sr. No.	Common Name	Zoological Name
1	Urial	Ovis orientalis vignei
2	Dog	Canis Lupus Familiaris
3	Monkey	Macaca Fascicularis

b. Birds

Native species of birds present in study area are pigeon, sparrow, crow, golden orioles, woodpeckers and black partridges. Common and Zoological names of birds are given in Table 4.5:

Table 4.5: Major Birds present in Study Area

Sr. No.	Common Name	Zoological Name
1	Pigeon	Columbidae
2	Sparrow	Passeridae
3	Crow	Corvus
4	Golden orioles	Oriolus oriolus
5	Woodpeckers	Picidae
6	Black partridges	Melanoperdix niger

c. Reptiles and Amphibians

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The native species of reptiles and amphibians observed in Study Area are Snake, Lizard and Frog.

Table 4.6: Reptiles and Amphibians of Study Area

Sr. No.	Common Name	Zoological Name
1	Snake	Serpentes
2	Lizard	Lacertilia
3	Frog	Anura

d. Endangered Faunal Species

The endangered species present in study area is Urial which has been declared protected under national, provincial or local government definitions as well as international agreements/protocols ratified by Government of Pakistan.

4.2.8 Fisheries and Aquatic Biology

The project site is in the semi-urban setting which is far away from rivers. Swan River, Haro River and Jehlum River are some of the major rivers that flow in the district. The fish production has been increasing day by day in the district which is playing a vital role in the economy of the country. However, there are no worth mentioning sources of fishery in the form of fresh water fishery or fishing ponds or else in the area of influence of the project.

4.3 SOCIOECONOMIC ENVIRONMENT

This section provides an overview of the baseline information relating to the socio-economic environment of the study area. The information collected from the respondents comprised their occupation, civic facilities, educational and health facilities, agricultural status including livestock population.

4.5.1 Demographic Profile

According to the 2017 population census the district has a population of 4,814,006 3. Population Statistics of district Rahim Yar Khan is given below in Table 4.7[5]:

Table 4.7: Population Statistics of Rahim Yar Khan District

District/Tehsil	Population	
	2017	1998
Rahim Yar Khan District	4,814,006 3	141,053
Rahim Yar Khan Tehsil	1,530,330	985,655
Sadiqabad Tehsil	1,264,752	772,548
Liaquatpur Tehsil	1,035,509	698,985

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Khanpur Tehsil	983,415	683,865

4.5.2 Infrastructure

There is a network of metalled and unmetalled road in the study area. Project area can be accessed through metallic road KLP road. Most of the families live there in houses made up of cement and bricks.

4.5.3 Education

There are number of government and private schools, colleges and universities are being functional in the study area which are imparting education to the locals.

4.5.4 Health

The health facilities including various health care centers, hospitals, dispensaries, basic health units, dental clinics and city medical centers are present in the study area.

4.5.5 Civic Facilities

PTCL telephone exchanges are being operating in the study area. Cellular phone service and Electricity is available in the study area. Natural gas is also available in study area.

4.5.6 Language

According to the 1998 census, the most widely spoken first language in the district was Saraiki, spoken by 62.6% of the population. 27.3% identified their language as Punjabi, 2.9% as Urdu and 2.9% as Sindhi.

4.5.7 Common Diseases

In this area, common diseases are Common Cold, TB (Tuberculosis), Typhoid, Malaria, Goiter, Dysentery and Hepatitis.

4.5.8 Quality of Life Values

People of the area have non-nomadic life style and are living here from times of their ancestors. In the project area the main sources of income are agriculture and industries. Field survey reveals that only one in three people is literate (33.1%). There are currently 2,250 public schools in Rahim Yar Khan. The condition of these public schools is substandard. On top of that, public schools lack functional basic facilities.

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CHAPTER-5

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PUBLIC CONSULTATION

5.1 GENERAL

This section deals with the public concerns about the said project. As already given in the previous sections, the said project is about Development and Construction of Apartments Building under the name of Etihad Canal View.

Consultation with stakeholders is a tool for managing two-way communication between the project sponsor and the public. Its goal is to improve decision making and build understanding by actively involving individuals, groups and organizations which have a stake in the project. This involvement increases project's long term viability and enhances its benefits to locally affected people and other stakeholder.

Consultation with the community and their active participation plays a vital role in successful implementation of the development projects. To identify the different types of stakeholders and ascertain their perception about the project, an impact assessment survey was conducted by keeping in view the requirement of *'Review of IEE/ EIA Regulations 2022'*. Stakeholders were consulted with the help of structured/ semi-structured tools. Informal group discussions were also held as an additional tool for obtaining feedback that are being discussed on the following pages.

Public consultations were carried out keeping in view the following main objectives:

- Sharing of information with stakeholders/ public on the proposed project activities and assess expected impacts.
- Understanding the stakeholder's concerns regarding the various aspects of the project, including the project technology, existing situation and the potential impacts of the project during construction and operational phase of the project.

The forums mentioned in subsequent sections were consulted. Written views and observations with particulars of people, environmental experts, and officials consulted is described comprehensively in table 5.1 and the proformas filled during consultation by all stated forums is appended as **Annexure-XII** of this document.

5.2 PROPONENTS' ENVIRONMENT MANAGEMENT TEAM

As stated in earlier sections, project of Etihad Canal View, is in its planning phase. Once the project comes in its construction phase, a team with representatives from key management functions will be developed to assess issues, aspects, opportunities and existing manufacturing process w.r.t environment. Therefore, it is too early to substantiate the stated inscription.

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5.3 THE RESPONSIBLE AUTHORITY

Proponent is responsible for the environmental impacts of this project and has taken commitment to implement the mitigation measures proposed in the Environmental Management Plan with subsequent review and approval conditions. Proponent ensured to use all practicable means consistent with other essential considerations to protect and preserve environmental quality.

5.4 OTHER DEPARTMENT & AGENCIES

About 4 people from different governmental departments such as Civil defense, RDA, PHA and Agricultural consulted for proposed project. The environmental concerns and suggestions made by the officials were listed out, discussed and suggestions were accordingly mentioned in the table 5.1.

5.5 ENVIRONMENTAL PRACTITIONERS & EXPERTS

The Environmental Experts has been informed with briefing on project interventions including its benefits. All of consulted experts asked questions to get information about different components of project. About 3 experts were consulted and their recommendations have been mentioned in table 5.1.

1. Adeel Pervaiz Sr. Manager Landfill LWMC
2. Dr. Fariha Arooj. Assistant Professor UVAS
3. Dr. Mujtaba Baqir. Lecturer GCU

5.6 AFFECTED & WIDER COMMUNITY

The people of the project area are pro project installation. They are of the view that the project will enhance the economic benefits. About 30 persons were consulted during the public survey and majority of people consulted were of view that this project will provide employment opportunity to locals of the area. They focused on a point to encourage such projects in order to increase economic development as well as to improve living standards of area. At the same time, they foresee that project management will feel their social, moral and legal obligation and bring in Environment Management Order whereby environment will not be tempered as mentioned in table 5.1.

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Table 5.1: List of participants during stakeholder consultations & concerns

Sr.#	Date	Location/ Venue/ Address	Particulars of Participants	Feedback/ Concerns
Official Consultations				
1.	28-07-2022	Rawalpindi Development Authority, R.W.P.	Mr. Sadoon Basra [AD Engineering, RDA]	- It's a good initiative for economy empowerment of the area. This project augments jobs opportunity and security of the area. - Be ensuring during the development of project no harm to flora, fauna and no tree cutting involved.
2.	28-07-2022	Director General Agricultural (Field) Murree Rd., R.W.P.	Mr. Khalid Mahmood [Dy. Director Agriculture]	- Stated project shall not affect irrigation channels or stream. Agricultural land shall be protected to its intent rather using it for industrial purposes; as far as this could be considered.
3.	28-07-2022	Parks and Horticulture Authority, Islamabad	Mr. Faisal Ahmed [Assistant Director]	- Every new project must be planned with tasteful landscaping as living within aesthetically pleasing environment. New societies should promote tree planation as its enhanced scenery and protect from floods.
4.	28-07-2022	Punjab Fisheries Department Rawal Town near Rawal Chowk	Mr. M. Iftikhar [Dy. Director, Fisheries]	- Stated project shall not disrupt aquatic natural ecosystem (if any nearby). So we have no objection in the commencement of this project.
Environmental Experts				
5.	29-07-2022	Environmental Expert	Mr. Adeel Perviz	- No construction, preliminary or otherwise relating to the project shall be started until and unless the Environmental Approval has been issued by EPA.
6.	29-07-2022	UVAS, Data Ganj Bakhsh Town, Lahore	Dr. Fariha Arooj [Assis. Prof UVAS]	- The environmental reports must be available for better understanding to comment. - All mitigation measures must ensure by proponent while development of this project.
7.	29-07-2022	Govt. College University Lahore	Dr. Mujtaba Baqir [Lecturer, GCU]	- As Murree is declared as sensitive area, development projects must be supervised by proponent and concerned department.

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				- Solid Waste should be handled properly on daily basis and proper drainage system for waste water must be designed keeping in view heavy rainfall.
Public Consultation				
1.	01-08-2022	Ihata Noor Khan Tehsil Murree Dist. Rawalpindi	Mr. Rameez Abbasi [Property Dealer]	- As per description this seems to be good project & it is requested to provide maximum jobs to local community.
2.	01-08-2022	Ihata Noor Khan Tehsil Murree Dist. Rawalpindi	Mr. Sajid [Labor]	- I have no issue on this project. It will provide opportunities for local residence.
3.	01-08-2022	Abbasi Muhala Shawala Murree	Mr. Adeel Abbasi [Sanitary worker]	- In order to support the underprivileged of locals, labour/ jobs must be provided to common people.
4.	01-08-2022	Ihata Noor Khan Tehsil Murree Dist. Rawalpindi	Mr. Saeed [Salesperson]	- No issues regarding the project except request for cleanliness of the area.
5.	01-08-2022	Village Kohi District Rwp.	Mr. Shamraiz [Local seller]	- Stated project is helpful to provide the employment opportunities and managing the life better.
6.	01-08-2022	Ihata Noor Khan	Mr. Usman [Security Guard]	- This factor has employed many locals and facilitating many local families.
7.	01-08-2022	Ihata Noor Khan	Mr. Naveed [Shopkeeper]	- Look as if good project and such project must be encouraged for increased opportunities of employment
8.	01-08-2022	Gorakhpur Village, PO Dahgal, Adyala Rd., R.W.P.	Mr. Waleed [Horse ride service provider]	- Its good project regarding provision of jobs.
9.	01-08-2022	Ihata Noor Khan	Mr. Awais [worker]	- It is requested to take care of cleanliness of area and have no issues regarding project.
10.	01-08-2022	Village Kohi District Rwp.	Mr. Fazil [shopkeeper]	- It's a good initiative for better of environment.
11.	01-08-2022	Ihata Noor Khan	Mr. Javeed [Shopkeeper]	- Seems upright project for job opportunities.
12.	01-08-2022	Village Kohi District Rwp.	Mr. Toqueer [Automobile Workshop]	- I have no issue on this project. Plots should be in range so that poor people can afford.
13.	01-08-2022	Ihata Noor Khan	Mr. Waheed [Student]	- As population of the country increasing day by day so such projects will provide good life style.

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14.	01-08-2022	Village Kohi District Rwp.	Mr. Farhan [Worker in Petrol pump]	- I have no objection on this project.
15.	01-08-2022	Ihata Noor Khan	Mr.Noman Abbasi [Business Man]	- To meet the demands of residence such societies are ideal project. People demand better life style is these days. No issues regarding stated project.
16.	01-08-2022	Ihata Noor Khan	Mr. M. Javaid [Hotel Owner]	- This is a good project in area and no issues regarding project.
17.	01-08-2022	Mussyari Village R.W.P.	Mr. Gulzar [Shopkeeper]	- No issues regarding stated project. Its will provide many jobs to locals.
18.	01-08-2022	Ihata Noor Khan	Mr. Pervaiz Abbasi [Peon]	- Must ensure cleaning of the area. I have no issue on the development of the project.
19.	01-08-2022	Village Kohi District Rwp.	Mr. Arshad Mehmood [Worker]	- We don't have any kind of offence regarding the housing society.
20.	01-08-2022	Mussyari Village R.W.P.	Mr. Bilal Qasim [No work]	- Two other societies with uplift living standard also developing here. It will increase the beauty of the area.
21.	01-08-2022	Ihata Noor Khan	Ms. Ijaz Abbasi [Student]	- Near locality of society will benefit by attaining employed.
22.	01-08-2022	Ihata Noor Khan	Mr. Raja Hafeez [Shopkeeper]	- There isn't any kind of issue or problem due to society.
23.	01-08-2022	Adyala Road Murree	Mr. Umer Khan [Private Job]	- It's a good opportunity for having job during development. Many worker of different sector will get jobs.
24.	01-08-2022	Mussyari Village R.W.P.	Mr. Adeel Ahmad [Shopkeeper]	- I have no objection on the development of this project.
25.	01-08-2022	Gorakhpur, Adyala Rd., R.W.P.	Mr. Nabil Qazi [property dealer]	- This society will benefit the locals with engaging local peoples of the area.
26.	01-08-2022	Ihata Noor Khan	Mr. Ahsan [business man]	- This area is better for living and if residency is lavish than it's a plus point for the people.
27.	01-08-2022	Gorakhpur, Adyala Rd., R.W.P.	Mr. M. Qasim [Business]	- Waste generated by society must be collected on regular basis.
28.	01-08-2022	Ihata Noor Khan	Mr. Abdullah	- There is decent trend setting up due to appartments. I

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			[Shopkeeper]	have no problem on this project.
29.	01-08-2022	Mussyari Village R.W.P.	Mr. Akhtar [Business man]	- There isn't any problem to us or nearby due to this project.
30.	01-08-2022	Mussyari Village R.W.P.	Mrs. Adeel Sajid [Worker]	- I think no problem will generate to the local community.

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CHAPTER-6

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SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

6.1 GENERAL

The potential environmental impacts have been studied related to design, location, construction and operational stages of the proposed project. Environmental protection measures are recommended to eliminate adverse environmental impacts or to reduce them to an acceptable level within the prevailing legislative and regulatory framework.

6.2 IMPACT ANALYSIS

Potential Environmental impacts associated with proposed study has been analyzed by a process wherein a group of experienced people with relevant experience were involved for identifying potential safety and operational problems associated with the design, maintenance or operation of a proposed project. They assessed different parts/ components of proposed project in critical view to environmental protection. Proposed project has been evaluated laterally and collectively about what impacts might be expected to arise with the proposed project. Impacts are evaluated on the basis of magnitude, immediacy and sustainability. Evaluation criteria are as follows:

- Magnitude
  - Type of impact (direct, indirect, cumulative)
- Immediacy
  - Temporal extent (during construction, after construction)
  - Spatial extent (local, widespread)
- Sustainability and Reversibility
  - Mitigability (fully, partially)
  - Monitoring (fully, partially)

Furthermore, ***consultative meetings*** were held for impact analysis with EIA team members and proponent of the project. Risk rating factors were the main agenda of these meetings for each environmental inventory element. Final outputs are presented in following sections below.

6.3 METHODOLOGY FOR IMPACT IDENTIFICATION

Screening of the potential impacts associated with the proposed project activities was carried out with help of Checklist and Leopold Matrix methods specifically tailored for this project.

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6.3.1 Checklist

This lists significant environmental effects known to have occurred in past relevant development projects. This is arranged to permit (i) ready screening out of non-pertinent items by checking the column 'No significant effects' and (ii) ready grading of significant environmental effects by degree of effect. The checklist presented as Table 6.1 shows checklist of environmental parameters & its consequences for Construction and development of Etihad Canal View.

6.3.2 Leopold Matrix

With the help of this matrix, interaction of various project activities with various components/aspects of the environment was identified. This interaction was then categorized with respect to its severity of impacts, as follows:

- Low : L
- Medium: M
- High: H
- Positive Impact: P
- No Impact: N

With the help of the above ranking, less important/ severe impacts were screened out from the ones which were more important, needing further discussion as presented in table 6.2.

6.4 IMPACT CHARACTERIZATION

Subsequent to the impact screening, various characteristics of the potential impacts including spatial extent (local, regional, global), nature (direct/indirect), temporal extent (temporary, permanent), reversibility, severity, sensitivity of receptors and significance of impacts were determined.

Impacts characterization associated to project activities/ operational phase and their explanation is presented in table 6.3.

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Table 6.1: Checklist for Environmental Consequences

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
1) Earth Resources							
1.1	Excavation and leveling	✓				Minor	Excavation of insignificant level will be carried out for the basement of Proposed retail outlet.
Geological hazards							
	Faults		✓				The building structure will be designed to withstand the seismic action (Load) without local or general collapse.
	Landslides			✓			Proposed project area comprising on hard rock. There are no chances of Land sliding as other societies' are also existing.
	Un-engineered fill			✓			
1.2	Earthquake consideration	✓				Minor	The proposed structure will be designed to withstand seismic loads in accordance with the Uniform Building Code – 1997, Building Code of Pakistan Seismic Provision – 2007 to ensure the safety of the building during such an event. The significance of this impact is minor as the proposed building will be constructed as per the applicable building code for Rawalpindi and adjoining areas
1.3	Contaminated soils		✓				Possibility of soil contamination due to oil spills from generators, vehicle workshops, and accidental spills. The chances of soil Contamination are close to negligible.
1.4	Contaminated surface or groundwater		✓				The chances of groundwater contamination are close to negligible as the proposed site is an area where no major activity generating excessive effluent exists.
1.5	Borrow pits		✓				Borrow pits (if any), will be restored after completion of the construction activities.
1.6	Loss of high-quality farmlands			✓			Proposed project area is declared as residential area. Half area of the proposed project is open land with tree and grass.
1.7	Site drainage	✓				Minor	A surface drainage system will be designed to cater the needs of the project site.
2) Air Quality							
Substantial increase in onsite air pollutant emission-construction phase							
	Dust emissions during construction	✓				Moderate	Dust emissions during construction will be mitigated by applying

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Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
2.1	activities						measures as per EMP.
	Emissions from vehicles and machinery		✓			Minor	Emissions from vehicles and machinery used during the construction phase will be mitigated by adoption of measures as presented in EMP.
	Substantial increase in odor during construction		✓				Paint, polishing, pesticide spray would produce odor. Safe Use Action Plan will be implemented and further impacts will be mitigated by using proper mitigation measures as per EMP.
Substantial increase in onsite air pollutant emission-operation phase							
2.2	Emissions from generators		✓				Proposed project activity would involve use of generator of 25 kVA capacity during load-shedding hours. Therefore, proper mitigation measures for use of generator would be adopted as per EMP to avoid deterioration of air quality.
	Increase in odor			✓			
	Violation of applicable air pollutant emissions or ambient concentration standards	✓					To limit air emissions from proposed facility, it must be properly operated and carefully maintained.
	Consideration of indoor air quality	✓					apartments will be designed according to the RDA rules and regulation. There must be proper ventilation.
3) Water Resources and Quality							
3.1	River, stream or lake onsite or around the project site			✓			
3.2	Provision of safe drinking water during operational phase				✓		Water needs will be fulfilled by groundwater which is found safe for drinking after monitoring results appended as **Annexure-XI.**
3.3	Presence of any wetland of national importance (like game reserve, wildlife sanctuary etc.) or international significance (like Ramsar site etc) located within or around the proposed project site			✓			
3.4	Discharges to surface or groundwater			✓			
3.5	Onsite bulk storage of liquid fuels or hazardous materials.		✓				Minor quantity of daily usage fuel, paints etc. may be stored on padded floor with impermeable lining or as per regulated SOPs.
3.6	Site Drainage.			✓			The sewerage from the proposed facility will be disposed off after due treatment in proposed 3 stage septic tanks. Small diameter sewer line

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Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
							collecting the sewage flow from the proposed center will be combined with the external nearby sewer drain at an appropriate point keeping in view the diameter and invert level etc.
4) Cultural resources							
4.1	Pre-hisotric, historic or paleontological resources within or around the proposed construction site.			✓			
4.2	Any gazetted or notified archaeological site located within or around the project site			✓			
4.3	Any cultural, religious site located around the project site.			✓			
4.4	Site/ facility with unique cultural or ethnic values.			✓			
5) Biological resources							
5.1	Vegetation removal			✓			Proposed project does not involve any vegetation removal/ tree cutting. 3-5 trees coming in premises of project which will be preserved.
5.2	Construction in wetlands or riparian areas			✓			
5.3	Use of pesticide/ rodenticide/ insecticide	✓				Minor	Anti-termite treatment will be used according to Regulation 22 CFR 216.3 (b) (a through I). Only registered pesticide from USEPA will be used. Proper safety measures including use of Personal Protective Equipment (PPE) will be ensured. Selection, storage and application of pesticide will be recommended as per 2011 Pakistan Programmatic Umbrella PERSUAP.
5.4	Protected areas (wildlife sanctuary, national park) or within game reserve declared by provincial wildlife Ordinances/ Laws			✓			
5.5	Any rare, threatened or vulnerable wildlife or vegetation specie observed/reported in or near project site			✓			
5.6	Presence of core habitat for any key			✓			

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Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
	wildlife species, within or in close vicinity of project site (e.g. path of migratory birds)						
6) Planning and Land Use							
6.1	Potential conflict with adjacent land uses			✓			
6.2	Non-compliance with existing codes, plans, permits or design criteria			✓			
6.3	Potential impact on adjacent buildings due to construction of existing structures			✓			
6.4	Construction in public park or designated recreational areas			✓			
6.5	Create substantially annoying source of light or glare			✓			
6.6	Relocation of > 10 individuals for +6 months			✓			
6.7	Interrupt necessary utility or municipal services for more than 10 individuals for +6 months			✓			
6.8	Substantial loss/ inefficient use of mineral or nonrenewable resources			✓			
6.9	Increase in existing noise levels	✓					Noise will be generated during construction/ operational activities. To minimize the noise impact proper mitigation measures will be adopted as per EMP.
6.10	Non-compliance with building codes (structure failure)			✓			
7) Traffic, Transportation and Circulation							
7.1	Increase vehicle load or congestion on existing roads		✓				Main Murree-Islamabad expressway Road can bear load upto double excel truck however; restoration of any damage to road shall be paid by project proponent.
7.2	Onsite congestion due to fuel transporting vehicles.			✓			No.
8) Hazards, Workers Safety							

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Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
8.1	Substantially increase risk of fire, explosion, or hazardous chemical/ fuel/ petrol spill or leakages		✓				Any potential increase in risk of fire, explosion, or hazardous chemical/ fuel/ petrol release will be minimized onsite for handling any emergency situations as mentioned in EMP.
8.2	Accidents or human health hazard		✓				Risks of accidents and human health hazards will be avoided by putting caution signs and use of PPE during work hours as mentioned in EMP.
8.3	Workers safety	✓				Minor	Safety procedures will be ensured during construction, electrical installations and operational activities.
9) Hazardous waste							
9.1	Increase quantity of heavy metals			✓			
9.2	Bulk quantities of hazardous materials or fuel storage			✓			
9.3	Increase in hazardous waste		✓			Minor	All hazardous waste needs to be disposed properly via suitable disposal option.
10) Non-Hazardous waste							
10.1	Construction waste/ Municipal waste	✓				Minor	Impacts from construction/ municipal waste will be mitigated according to measures mentioned in EMP.
10.2	solid waste management	✓				Minor	Solid waste will be managed as per EMP.
11) Electrical and Mechanical Installations and Fixtures							
11.1	Presence of Halons, HCFC's in HVAC systems, refrigeration equipment and fire suppression equipment.			✓			
11.2	Presence of PCBs in electrical equipment.		✓				Electrical equipments free from PCBs must be installed.
11.3	Safety issues for using low quality cables and appliances.			✓			
12) Paints							
12.1	Presence of Lead and arsenic or any other banned chemical in the paints.		✓				Some paints may contain toxic substances such as arsenic[4]. Such paints will not be allowed to use.
13) Spills/ Leakages							
13.1	Leakages from generators & boiler		✓				Regular monitoring is required to prevent any leakages.

[4] TECHNICAL BULLETIN HEALTH EFFECTS INFORMATION, Oregon Department of Human Services, http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/Monitoring/Documents/health/arsenic.pdf

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Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
13.2	Leakages from vehicles and fuel storage tanks			✓			
13.3	Petrol spills/ leakages		✓				Project management will apply strict rules on his workers and labor to ensure that no spill or leakages are caused. If spills/ leakages occur, it should be managed as per measures suggested in EMP.
14)	**Result**						
14.1	Substantial adverse impact			✓			
14.2	Adverse impact			✓			
14.3	Minimal impact	✓					Overall the project will have minimal impact.

Notes:
Y*: Yes, M*: May be, N*: No, B*: Beneficial
** Impacts: Minor, Moderate, Major

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Table 6.2: Leopold Matrix – Impacts for Construction Etihad Canal View RYK.

Environmental component / Project Component	PHYSICAL ENVIRONMENT										BIOLOGICAL ENVIRONMENT									SOICAL ENVIRONMENT							
	Climate	Geology	Seismicity	Soils contamination	Land use	Surface Water	Groundwater	Air Quality	Slope Failure	Noise	Aquatic Ecosystem	Wetland Ecosystem	Trees	Endangered Species (Plants & animals)	Migratory Species	Birds and Animals	Plants	Wildlife	Disease Vectors	Public/ Workers Health	Flow of Road Traffic	Employment	Structures and Infrastructure	Health & Safety hazards	Cultural & Religious Values	Tourism & Recreation	Disruption of Businesses
Location of proposed project	L	N	H	L	L	N	N	N	H	N	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	P	N
Design phase of proposed project	L	N	H	N	L	N	N	N	H	N	N	N	N	N	N	N	N	N	N	N	N	P	P	N	N	P	N
Construction of Apartments	M	L	H	M	L	N	N	M	H	M	N	N	N	N	N	N	N	N	M	M	L	P	P	M	N	P	N
Operational Phase of project	N	N	M	N	L	N	N	N	M	L	N	N	N	N	N	N	L	N	N	N	N	P	P	N	N	P	N

*Key: P: Positive Impact; N: No Impact; L: Low Impact; M: Medium Impact; H: High Impact

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Table 6.3: Impact Characterization

Environmental Impacts → / Categories	Health & Safety Hazard	Soil Contamination	Water Quality	Air Quality	Explanation
Nature	Direct	Direct	Direct	Direct	**Direct:** The environmental parameters are directly affected by the Project construction or operation. **Indirect:** The environmental parameter changes as a result of alteration in another parameter.
Duration of Impact	Long term	Short term	Short term	Short term	**Short-term:** The impacts that last only during the construction of the proposed Project e.g., noise from the construction activities. **Medium-term:** lasting for a period of few months to a year the project before naturally reverting to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil. **Long term:** lasting for period much greater than medium term impact before naturally reverting to the original condition such as loss of soil due to erosion.
Geographical Extent	Local	Local	Local	Local	The geographical extent may be local or regional (spatial dimension)
Project Phases	On going	On going	On going	On going	Pre-construction (designing), Construction and Operational. Impacts are ongoing only during construction phase
Reversibility of impacts	Temporary	Temporary	Temporary	Temporary	**Temporary:** The impacts that don't cross ecosystem threshold value of resilience. **Permanent:** The impacts that exceed ecosystem threshold value of resilience i.e., community that cannot come back to its original stage without external aid.
Likelihood of the Impact	Certain	Likely	Likely	Likely	**Certain:** Impact anticipated occurring under extreme circumstances. **Likely:** Impact will probably occur under less extreme circumstances. **Possibly:** Impact may possibly occur during different stages of the project. **Unlikely:** Impact could occur during many stages of the project. **Rare:** Impact may occur but only under exceptional circumstances.
Impact Consequence Severity	Major	Minor	Minor	Minor	**Major:** When an activity causes irreversible damage to a unique environmental feature; causes a decline in abundance or change in distribution over more than one generation of an entire population of species of flora or fauna; has long-term effects (period of years) on socio-economic activities of significance or regional level. **Moderate:** When an activity causes long-term (period of years), reversible damage to a unique environmental feature; causes reversible damage or change in abundance or

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					distribution over one generation of a population of flora or fauna, has short-term effects (period of months) on socio-economic activities of significance on regional level. **Minor:** When an activity causes short-term (period of few months) reversible damage to an environmental feature; slight reversible damage to a few species of flora or fauna within a population over a short period; has short term (period of months) effects on socio-economic activities of local significance. **Negligible:** When no measurable damage to physical, socio-economic, or biological environment above the existing level of public concern; and conformance with legislative of statutory requirements.
Significance of Impact	Medium	Low	Low	Low	Impact may be categorized as high, medium, or low. Based on the consequence, likelihood, reversibility, geographical extent, duration, level of public concern; and conformance with legislative of statutory requirements.

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6.5 IMPACT SIGNIFICANCE

Subsequent to screening and characterization, impacts of significant importance are described below:

- Health hazard for staff, workers, and nearby communities caused by not following PPEs, as well as improper construction activities and use of construction equipment and machineries
- Safety hazards caused by various stages of construction activities as well as natural disasters (earthquake, slope failures, landslides etc.)
- Seismic Hazards by natural cause
- Air quality deterioration by use of construction machineries/ vehicle exhaust, dust emissions, odor due to paint, polishing and pesticide spray

These impacts and their mitigation measures are discussed in detail below at each stage of proposed project activities.

Based on the above screening and evaluation process the following determination (check all that apply) is recommended. It is assessed that proposed project has minimal adverse impacts after proper implementation of mitigation measures proposed for each associated activity.

The activity contains. . .	(equivalent regulation)
☐ Very low risk sub-activities	categorical exclusion(s)
☐ After environmental review, sub-activities determined to have **no significant adverse impacts**	negative determination(s)
☒ After environmental review, sub-activities determined to have **no significant adverse impacts, given appropriate mitigation and monitoring.**	negative determination(s) with conditions
☐ After environmental review, sub-activities determined to have **significant adverse impacts**	positive determination(s)

6.6 Mitigation & Impact Assessment

Anticipated Environmental Impacts of proposed project of Construction of Etihad Canal View are determined. Upon consequent, relevant mitigatory measures have been suggested and presented in table 6.4 below.

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Table 6.4: Mitigation and Impact Assessment

Sr. #	PROJECT ACTIVITY	DESCRIPTION*			MITIGATION MEASURES**
		When	*Where*	*How*	
I. Earth Resources					
1.1.	Excavation & Leveling	»Construction phase	»Proposed Project site	»Excavation will be carried out for the basement of proposed building.	»Excavated soil should be stockpiled at appropriate locations. Adequate enclosures to be provided for such storage, to avoid blowing away by wind and run off with storm water. »Use of security fences or hazard tapes to warn and control the access of unauthorized persons to the excavated site. »Weekly monitoring during excavation & reporting by HSE manager of construction contractor.
1.2.	Earthquake consideration	»Planning/ designing phase	»On site	»The building structure will be designed to withstand the seismic action (load) without local or general collapse. »Significance of Impact is minor	»The design specification will be followed to withstand seismic loads in accordance with the Uniform Building Code (UBC) - 1997 and Building Code of Pakistan (BCP), Seismic Provisions - 2007, as required by local codes and standards for high degree of structural competence, reliability and ease of construction[5]. »It will be executed and managed at planning & design phase by design contractor.
1.3.	Soil contamination	»Construction & Operational Phase	»On site	»Improper handling of construction material by construction workers; »Inadequate handling & disposal of contaminated soil.	»Impart proper training to their workforce in the storage and handling of obnoxious materials that can potentially cause soil contamination by construction contractor. It must be monitored and implemented by HSE manager of construction contractor. »Implement mitigation measures suggested under sub-section 6.9.2 & 6.10.3.
1.4.	Loss of trees/ vegetation	»Construction Phase	»Project site	»No tree cutting is involved in stated project.	»It will be executed by project proponent.
1.5.	Land Use	»Planning, Construction	»On site	»Potential impact on adjacent buildings due to	»The construction contractor must ensures that all structure, equipment, materials and facilities used or created on site

[5] *Structural design at present in Pakistan is designed as per UBC-97 and ACI 318-02M because of the local techniques, procedures, technologies and material available for concrete and other construction material. The building Codes BCP, SP-2007, Design of Concrete Structures by Arthur H. Nilson, Design of Reinforced Concrete by M. C. Cormac, Foundation Analysis and Design by J.E. Bowles will also be followed in due course of time upon availability of advanced materials and techniques in Pakistan*

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		& Operational Phase		construction of proposed facility; it is anticipated to be minor; »Aesthetic value of the area might get impaired.	for/ or during construction activities are removed. »Tree plantation must be encouraged in and around project site for enhanced aesthetics of the area.
2. Air Quality					
2.1.	*Dust Emissions*	»Construction phase	»On site	»Due to construction activities, dust will be generated.	»Sprinkling of water to suppress dust emissions. »Periodic Environmental monitoring in specific to air quality will be carried out by HSE manager of construction contractor.
2.2.	Emissions from vehicles/ generator stack/ chemical fumes from fuel storage tanks	»Designing, Construction & Operational Phase	»On & Off site	»Vehicles washing, servicing and repairing works onsite »Flue gas emissions from generator & fuel storage tanks if not maintained properly	»Use of properly maintained and tuned vehicles/ equipment/ generators onsite to avoid air and soil pollution. »Properly designed and maintained ventilation as it is one of the more effective ways of reducing exposure to harmful chemicals in the form of fumes. »Implement mitigation measures suggested under sub-section 6.9.5 & 6.10.5. »Periodic Environmental monitoring in specific to air quality will be carried out by HSE manager of construction contractor. »Besides, it will be taken care to operate processes and activities to minimize emission hazardous to health of proposed project by Design Contractor & Project Proponent.
2.3.	Increase in odor	»During operational phase	»On site	»Odor from petrol storage tanks/ fueling or defueling area.	»Proposed facility must be properly ventilated & designed. »It will be executed by construction contractor and ensure compliance to use of PPEs by workers while handling petrol. »HSE manager will monitor use of PPEs by workers on daily basis.
3. Water Quality					
3.1.	Surface/ Ground water Contamination	»Construction & Operational Phase	»On & off site	»Improper sanitation system for construction as well as operational workers.	»Proper sanitary system must be provide to construction workers on temporary bases during construction phase. »The chances of water contamination are close to negligible as no major activity generating excessive effluent exists. »It will be executed by construction contractor during construction phase & project management during operational

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					phase. »Implement mitigation measures suggested under sub-sections 6.9.4 & 6.10.4.
4. Traffic, Transportation, Circulation					
4.1.	Congestion on existing road	»Construction Phase	»On site	»Traffic jams or congestion on road by the movement of construction/ raw material/ vehicles during the peak traffic hours.	»Traffic jams or congestion on road will be eliminated by avoiding the movement of vehicles during the peak traffic hours »Allocation of proper place for vehicles will be carried out to avoid congestion and haphazard movement of vehicles onsite. »Daily monitoring by HSE manager of construction contractor to ensure pedestrian/ operator's safety and their ability to complete the task without incident.
5. Solid Waste					
5.1.	Municipal waste	»Construction & Operational Phase	»On Site	»Garbage produced by workers; »Hideous littering by workers engaged for operational activities.	»Measures should be adopted for safe and environment friendly disposal of all generated solid and liquid wastes. It is recommended that workers must restrict their activities within the project premises. »Orientation trainings will be provided to the workers for identification, segregation & management of solid waste during construction & operational phase. »Weekly monitoring and inspection of waste management related facilities and activities in order to ensure compliance as per applicable rules & regulations by project management. »Maintain records of training.
5.2.	Hazardous waste	»Operational Phase	»On site	»Regular and thorough management of hazardous waste which is absolutely essential for efficient operation.	»Monthly monitoring & inspection of haz. waste management activities directly resulting from executing the project process by project management during operational phase. »Implement mitigation measures suggested under sub-section 6.10.9.
6. Health & Safety					
6.1.	Accidents/ human health hazards	»Construction Phase	»On site	»Construction activities will pose certain negative impacts on workers.	»Ensure safe working practices are observed at all times while carrying out work activities by construction contractor. »All accidents, whether to themselves, others or property must immediately be reported to project management.

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					»Site specific HSE Plan must be used as a guide to ensure that the Contractor working on this project. »HSE manager by Construction Contractor will be responsible for periodic site safety inspections. »Implement mitigation measures suggested under sub-section 6.9.10.
6.2.	*Noise/ Vibrations*	»Construction Phase	»On site & On duty	»Construction activities such excavation, use of heavy machinery etc. may generate noise; »Use of unnecessary horns by drivers of construction/ fuel transporting vehicles; »Noise will also arise from generators operational during load-shedding hours.	»Drivers must be aware of their code of conduct and avoid use of unnecessary horns. »Implement mitigation measures suggested under sub-sections 6.9.6. & 6.10.6. »Minimum number of vehicle must be used for construction material to mitigate noise and exhaust emissions. »Daily monitoring by HSE manager of construction contractor to check compliance as per PEQS during construction phase. »Noise from generators must be curtailed within limiting values set by PEQS via engineering control.
6.4.	Emergency Response	»Design, & Construction Phase	»On site & On duty	»There are always chances of fire risks/ another hazard of worth considering (explosion, petrol spills, earthquakes etc.)	»Operating procedures must be in place to minimize the fire danger at the site. » It must be executed and monitored by project proponent in close liaison with design contractor of stated facility.
7. *Material Storage and others*					
7.1.	Construction Material Storage	»Construction phase	»On site	»Poor housekeeping leads to injuring of workers.	» Stockpiles shall not be situated such that they obstruct natural pathways » Stockpiles shall not exceed 2m in height unless permitted by Concerned Engineer on site » If stockpiles are exposed to windy conditions or heavy rain, they shall be covered either depending on the duration of the project. Stockpiles may further be protected by the construction of low brick walls around their bases

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					» All substances required for vehicle/ machinery maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site » Hazardous substances / materials are to be transported in sealed containers or bags » Spraying of herbicides / pesticides shall not take place under windy conditions
7.2.	Spills/ leakages	»Construction Phase	»Project area	»Spills/ leakage may result due to improper handling of paints, fuels, solvents, cements, chemicals etc.	»Ensure proper handling and storage of chemicals/ paints/ fuels etc. and should be marked to highlight their content. »Workers must be aware of their code of work. »Compliance to above stated as well as to use of PPEs by workers must be monitored by HSE manager of Construction Contractor during construction phase and project management during operational phase.
7.3.	Use of pesticides/ insecticides	»Construction Phase	»Project area	»Use of mosquito repellent sprays/ fumigation to disinfect and control pest/ disease vectors.	»Mosquito repellent sprays/ fumigation should be carried out as per project safety plan. All safety measures including use of PPE must be ensured. »HSE manager will monitor compliance to use of PPEs during pesticide spray.
7.4	Biological Hazards	»Construction phase	»Project site	»Excavation for the foundation of apartments	» Proposed project site does not involve cutting of any trees » Plantation of maximum number of trees. » Staff and workers should be instructed not to damage nearby vegetation of the surrounding area. » Open fires should be prohibited in the area to avoid the hazard of fire and impact on nearby flora and fauna. » Contractor staff should be given clear instructions that they should not hunt any birds/ animal in the project area/ site » Barriers/ fencing/ or boundary wall should be installed

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			project site during constructions » Proper disposal of organic waste (if any) generated during the construction stage to avoid rodents and other insects' generation.

** It contains when problem will occur and when, where & how it will be occur.*

*** It suggests whys of achieving mitigation measures [changing in planning and design/ improved monitoring and management practices/ compensation in money terms/ replacement, relocation & rehabilitation*

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Moreover, assessed impacts and their mitigation measures are discussed in detail at each stage of proposed project activities as described below.

IMPACTS DUE TO PROJECT LOCATION

The project envisages Construction and development of housing scheme under the name of Etihad Canal View., located at Mouza Ali Akbar Sanghi & Mouza Bindoor. Sadiq Canal Road, Tehsil & District Rahim Yar Khan. The possible environmental impacts due to project location are described below.

6.7.1 Land Acquisition & Change in Land Use Pattern

As mentioned above the proposed project site is situated in area where no worth mentioning activity with special reference to environment is involved hence no significant adverse impact will happen. The adjacent land value will be increased by this project.

Mitigation

No.

6.7.2 Environmental Sensitive Areas

There is not any environmentally sensitive or critical zone in or around the project site.

Mitigation

Not required.

6.7.3 Historical, Archeological or Cultural Sites

There are no cultural resources, historical place or archeological sites such as ancient monuments, forts, sculpture, etc. to be destructed.

Mitigation

Not required.

6.7.4 Existing Infrastructure

Infrastructure like roads, electricity, telephone, natural gas and drainage system is already present in the area. As existing planning and design standards are suited to local conditions, hence, there will not be any unnecessarily wasteful of land.

Mitigation

Not required.

DESIGN RELATED IMPACTS

The construction plan of Apartments is taking all the consideration of all engineering details, their soundness and else as desired under the rules and regulations "Uniform Building Code – 1997, Building Code of Pakistan Seismic Provision – 2007" for such

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constructions. This will automatically take care of the soundness of the building and its design.

The present EIA Report testifies that there will not be any environmental problems at all due to project design.

In view of these considerations no environmental problems are foreseen in the context of design. However the possible impacts of proposed project have been considered and their mitigation measures justified in Environmental Impact Assessment.

Mitigation

No.

6.8.1 Drainage Pattern

Drainage system is available around the project site for waste water disposal. The project site is located at Sadiq Canal Road, Tehsil & District Rahim Yar Khan and there is open drain present nearby project site. All the waste water (constituting sewage only) from the proposed facility will be disposed into this drain after due treatment in 3 stage septic tanks.

Mitigation

As there is no significant impact on drainage pattern, so, no mitigation is required.

6.8.2 Seismic Hazard

The proposed project is situated in Seismic Zone 3. In this zone intermittent earthquakes with fundamental periods greater than 1.0 second may cause damage to structures.

Mitigation

The structure of the proposed apartments has been designed in accordance with Uniform Building Code – 1997, Building Code of Pakistan Seismic Provision – 2007, so that the building may withstand moderate to large earthquakes.

6.8.3 Water Resources

Ground water will be extracted via installation of electric pumps. Major use of this ground water is for allied activities such as washroom/ official activities by workers.

Mitigation

- Ensure that projected use of ground water is within the capacity of natural system to replenish itself.
- Use indigenous vegetation that requires less water, drip irrigation or shaded plantings.
- Workers should strictly be advised not to misuse or waste ground water in any way.

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6.8.4 Traffic Patterns

The main entrance to the project site is from the Sadiq Canal Road. This road passing by the project site has high carrying capacity and there will be no need to construct a separate road for this project. The existing road will be utilized for all the traffic movement involved in this project.

Mitigation

Not required.

6.8.5 Emergency response

There are always chances of earthquakes and other manmade disasters such as fires due to electrical short-circuiting, overheating, forest fire etc. Besides, proposed building layout has been designed with inception of such considerations.

Mitigation

The following mitigation measures will be adopted to minimize or eliminate the emergency situations:

- The design of proposed project will also include emergency exits and open space for gathering which can be used during emergency situation.
- Adequate water distribution system will be designed, which could also supply adequate quantity of water for fire-fighting during emergency.
- Fire hydrants and firefighting extinguishers will be provided at locations where necessary.

6.9 IMPACTS DURING CONSTRUCTION STAGE

The potential environmental impacts of the proposed project along with the mitigation measures during the construction stage have been described as following:

6.9.1 Impacts on Topography

Civil work will be done for the construction of proposed facility so there will not any major changes in the existing topography of the project site. The changes due to the civil work will be of localized nature. There will be no significant changes off-site the project area.

Mitigation

Not required.

6.9.2 Impacts on Soils

The overall geology and soil quality of the project site is not expected to be adversely impacted due to the execution of the proposed project during the construction period.

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Mitigation

Vigorous plantation needs to take place at the project site so that soil becomes stabilized.

6.9.3 Impacts on Groundwater

As mentioned above very small level civil work will be undertaken for establishment of the said apartments so the water quality will not be disturbed too much extent.

Mitigation

- The workers will be provided with washrooms and toilets at site.
- Proper sanitary system will be developed on temporary bases.

6.9.4 Impacts on Surface Water

Excessive runoff, especially in rainy days, due to different activities to be carried out during construction phase can result in the increase of Total Dissolved Solids (**TDS**) and Total Suspended Solids (**TSS**) in small water channels. Similarly, untreated sewage can result in high value of Chemical Oxygen Demand (**COD**) and Biochemical Oxygen Demand (**BOD**) of surface water.

Mitigation

- The workers will be provided with washrooms and toilets at site.
- Proper sanitary system will be developed on temporary bases.
- Wastewater effluent from construction equipment, washing-yards should be passed through the primary treatment process to remove macro contaminants before discharging it into natural streams.

6.9.5 Impacts on Air Quality

Due to the construction activities like excavation, clearing, leveling, compaction, material transportation, earthing/ grounding etc. dust will be generated which will ultimately increase the Particulate Matter (PM) value in the area. Gaseous emissions from the heavy machinery and vehicles will also come out and this will affect the quality of ambient air. This may also pose health risk to the construction workers and residents who suffer from respiratory ailments.

Mitigation

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- Periodic environmental monitoring and testing of emissions from vehicles should be carried out in order to keep the concentration of various pollutants including CO_2, Noise & Smoke within the PEQS limiting value.
- Ambient gaseous monitoring for various pollutants like CO, NO_2, SO_2, PM_{10} etc. should also be carried out periodically.
- Periodic maintenance of the machinery will be carried out to reduce the concentration of emissions.
- Haul-trucks carrying earth, sand, aggregate etc. will be kept covered with tarpaulin to help contain construction materials and being transported within the body of each carrier between the sites.
- Tyres of the vehicles and heavy machinery will be washed and the waste water produced as a result of this activity will be reused after due treatment. This will reduce concentration of PM in the ambient air.

6.9.6 Noise

Project activities like compaction, use of heavy machinery during the clearing of the site and trolleys and trucks used for the transportation of materials will create some noise and vibration. The noise may affect the workers and residents of the surrounding communities of the project site.

Mitigation

- Engines of vehicles visiting the project site should be properly tuned-up.
- Use of heavy machinery should be restricted to daylight hours in order to minimize noise pollution and vibration arising from the construction site.
- To bring down noise levels within the PEQS limiting values, noise control measures should be taken such as provision of silencers on the heavy construction vehicles and sound insulation materials should be used as barriers.
- Wide zone of green plants will also help decrease sound levels.
- As the proposed project is going to be constructed in the area far away from residential communities. This will further reduce the exposure of noise to the surrounding communities.

6.9.7 Water Consumption

During the construction of project approximate quantity of water will be used and it will not exert any significant effect on water table.

Mitigation

Not required.

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Waste Generation

During the construction of project waste will be generated such as debris waste including clay, sand, crush, stones, paper, plastic, wood pieces, iron and steel as scarp, wires, rags, ropes etc., sewage and solid wastes from construction camp.

Mitigation

- Most of construction waste will be utilized on site to fill excavated sites or recycled; remaining of it will be properly disposed-off/ landfilled.
- Septic tanks will be constructed for the treatment of sewage waste from construction camps and other construction activities. After due primary treatment of sewerage in septic tanks, it will be disposed-off in drain passing nearby the project site.

6.9.9 Construction Debris

Each phase of the development will produce solid waste, the disposal of which, if not managed properly could have negative impacts on the site and surrounding area.

Mitigation

» A site waste management plan should be made the responsibility of the project 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.

» Only small quality of the waste will be produced as no major excavation is involved in the project.

6.9.10 Health and Safety of Workers

The construction activities will impose certain negative impacts on health and safety of the workers, however mitigation measures will be required to minimize/ eliminate health and safety related negative impacts of the project.

Mitigation

Implementation of the following measures will ensure health and safety of the workers during the proposed construction stage:

» The Contractor will ensure that the workers / laborers are trained in safety procedures for all relevant aspects of construction.

» Proponent of the Project will make regular checks to ensure that the contractor is following safety working procedures/ safety measures.

» Formal emergency procedures will be developed for proposed project site in case of an accident. First aid kits and other necessary equipment will be kept available at

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site along with the list of emergency phone numbers to be contacted in case of any accident.

6.9.11 Impacts on Flora & Fauna

There are 3-5 trees coming in the vicinity of proposed project site which will be preserved. The establishment of the proposed project will not affect the fauna of the area.

Mitigation

Following mitigation measures will be adopted to restore the environment as much as possible.

» Impact mitigation calls for protecting and restoring as much of the original condition on the development site as possible.

» In an effort to preserve the existing biodiversity, naturally occurring plants such as those used primarily by the birds for food and shelter should be planted for their survival. This would ensure that primarily native plants are used in the landscape plan thus minimizing the use of imported species and eliminating the introduction of potentially invasive species.

» Using bird feeder may encourage the displaced avifauna to remain in or return to the general vicinity, thus maintaining the existing biodiversity.

» The project contractor should be subject to punitive penalties for removal or damage of ecologically valuable trees designated for protection or relocation (if any).

6.9.12 Transportation of Construction Materials

Transportation of heavy machinery implies heavy traffic on the roads leading to the site with possible impacts to the surrounding area (dust, spillage, emissions and noise). Use of uncovered vehicles for transportation of construction materials can lead to inadvertent dispersal of materials during heavy rains or high winds during dry periods. This could have a negative impact on the residents of the surrounding.

Mitigation

» The construction activity will go on for a short period of time and there will be no worth mentioned impacts from this activity on the project area.

» Arrangements should be made with contractors to ensure that the vehicles used for transporting materials and machinery to the site are appropriately sealed and covered to minimize dust.

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- Dust producing materials such as sand or cement should be stockpiled in low enclosures and covered, away from drainage areas where they could easily be washed away during rainfall.

6.9.13 Traffic Congestion

During the construction of the project, movement of heavy trucks and machinery will have only a minor impact on the traffic of main Sadiq Canal Road as it is a wide road specially designed for this kind of heavy traffic.

Mitigation

No mitigation measures are required as this activity will be for a short period of time and the carrying capacity of main Sadiq Canal Road is fair enough to accommodate this traffic for that much time period.

6.9.14 Employment Generation

During construction stage of the proposed project, about 35-40 workers / laborers will be engaged. This will be positive change.

Mitigation

Not required.

IMPACTS DURING OPERATIONAL PHASE

The potential environmental impacts of the proposed project along with the mitigation measures during the operational phase have been described as following:

6.10.1 Impacts on Climate

The operation of proposed project will not affect the climate of the area on overall.

Mitigation

Not required.

6.10.2 Change in land use

As mentioned earlier, the proposed project is about Construction of Etihad Canal View Private Housing Scheme., and no worth mentioning activity related to environment is involved at this phase of project, hence no significant adverse impact will happen.

Mitigation

Not required.

6.10.3 Impacts on Soils

The overall geology and soil quality is not expected to be adversely impacted due to the execution of the proposed project activities.

Mitigation

Vigorous plantation needs to take place at the open vacant spots by project proponent

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soil becomes stabilized.

Effluent Generation

the proposed project no process wastewater will be produced. Approximately 10 gallons/ day of wastewater will be generated from toilets/ washrooms. This water to take treatment before discharging.

Mitigation

- As there is no source of chemical contamination in the process water so the waste water to be generated will have no water contamination and the waste water quality will meet the prescribed limits of PEQS-Pakistan.
- The sewerage water will be treated in three stage septic tank.
- The treated effluents will be used for sprinkling on the unpaved area, landscaped area, plants and vegetation within/ or around project site.
- The remaining effluent of nominal quantity will be discharged into nearby drain through submerged sewerage pipes.
- While laying sewage pipes, measures will be adopted to ensure that other pipes, wires or systems already existing in the route of the sewage pipes from the building to the main sewer line are not damaged.
- Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer.

6.10.5 Air Quality Deterioration

While operational stage of the proposed project there is no impact on air quality is anticipated as in its operational phase, this project is clearly of residential nature.

Mitigation

Not required.

6.10.6 Noise and Vibration

There is no such significant impact of noise and vibration associated with operational phase of this proposed project.

Mitigation

Not required.

6.10.7 Water Consumption

About 1500-2000 gallons of water will be used per day by the proposed project during the regular operation. This quantity of water will not exert any negative impact on water table.

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so that soil becomes stabilized.

6.10.4 Effluent Generation

From the proposed project no process wastewater will be produced. Approximately 10 - 15 gallons/ day of wastewater will be generated from toilets/ washrooms. This water needs to take treatment before discharging.

Mitigation

» As there is no source of chemical contamination in the process water so the waste water to be generated will have no water contamination and the waste water quality will meet the prescribed limits of PEQS-Pakistan.

» The sewerage water will be treated in three stage septic tank.

» The treated effluents will be used for sprinkling on the unpaved area, landscaped area, plants and vegetation within/ or around project site.

» The remaining effluent of nominal quantity will be discharged into nearby drain through submerged sewerage pipes.

» While laying sewage pipes, measures will be adopted to ensure that other pipes. wires or systems already existing in the route of the sewage pipes from the building to the main sewer line are not damaged.

» Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer.

6.10.5 Air Quality Deterioration

While operational stage of the proposed project there is no impact on air quality is anticipated as in its operational phase, this project is clearly of residential nature.

Mitigation

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6.10.6 Noise and Vibration

There is no such significant impact of noise and vibration associated with operational phase of this proposed project.

Mitigation

Not required.

6.10.7 Water Consumption

About 1500-2000 gallons of water will be used per day by the proposed project during the regular operation. This quantity of water will not exert any negative impact on water table.

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Mitigation

Not Required.

6.10.8 Solid Waste Generation

During the regular operation of the proposed project 40-50kg solid waste will be produced, only kitchen waste/ Municipal Solid Waste will be produced.

Mitigation

The solid waste above is recyclable. This solid waste will be disposed off in an environment-friendly manner in line with the local municipality and through a licensed contractor who should dispose of the solid waste at the designated site by the local municipality..

6.10.9 Health and Safety of Workers

The project activities will not impose certain negative impacts on health and safety of the residents. However, no mitigation measures will be required to minimize/ eliminate health and safety related negative impacts of the project.

Mitigation

Not required.

6.10.10 Employment Generation

During the regular operational stage of the proposed project approximately 15-20 workers will be engaged. This will be a major positive impact.

Mitigation

Not required

6.10.11 Fire Risk

There is always a chance of fire at any kind of premises/ buildings. If the fire-fighting arrangements may not arrange this will be a major negative impact.

Mitigation

The following mitigation measures will be adopted during the regular operational stage of the proposed project:

- Emergency Exits
- Smoke Detectors
- Fire Extinguishers (DCP 05 cylinders, AFFF 03 cylinders,CO2 02 cylinders, DCP 02 Trolleys)
- Emergency Signs
- Floor Marking
- First Aid Boxes (02)

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» Fire-fighting Kit

6.11 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 house-keeping will be the order of the day.

Proposed apartments will increase the land value, aesthetic value of area and will provide the tourists with proper facilitated residence to enjoy their visits.

During construction and regular operation of the project activity, persons will be employed. Local people will be preferred for employment. People of all categories will get employment during construction as well as operational phase of the project.

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CHAPTER-7

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ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

7.1 ENVIRONMENTAL MANAGEMENT

To implement the recommendations and suggestions for environmental protection included in Chapter 6, a comprehensive management plan is needed.

The objective of the Environmental Management Plan (EMP) is to address all the major environmental issues and provide framework for the implementation of the proposed mitigation measures during the proposed project activities. The proper implementation of the EMP will ensure that all the adverse environmental impacts identified in the EIA are adequately mitigated, either totally prevented or minimized to an acceptable level. The required actions to achieve those objectives will be successfully adopted by the concerned institutions or regulatory agencies. The implementation of EMP will be carefully coordinated with design and management program of the project to ensure that relevant mitigation measures are implemented at the most appropriate stage and resources are properly allocated to achieve the desired results.

The purpose of the EMP is to ensure that the activities are undertaken in a responsible non-detrimental manner with the objectives of: (i) providing a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensuring that safety recommendations are complied with.

7.2 INSTITUTIONAL CAPACITY

7.2.1 Environmental Committee and its Responsibilities

Project Proponent will constitute an Environmental Management Committee including at least one qualified and experienced environmental scientist / engineer who will be responsible for the environmental management and supervisory affairs during the different stages of the project. This person can be hired by the management or can be on contract basis. The responsibilities of the EMC are as follows:

- To ensure implementation of all the proposed mitigation measures during different stages of the proposed project;
- To organize routine monitoring of water, air quality, noise etc.
- To develop operational guidelines and implementation schedule.
- Receiving complaints from people in the vicinity of the project and concerned

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institutions and assisting the local environmental authority including establishing liaison with EPA.

- To ensure that project is being implemented in an environmental friendly manner, causing least harm to the existing environment including flora and fauna, geology and soil, surface and ground water, air quality, existing utilities etc. as already discussed in Section 6.
- To look after the efficiency of Horticulture Committee (HC).

A team will be formed named as "Horticulture Committee" (HC) to attend the issues relating to cleanliness, up keeping, aesthetic beauty of the project site, general environment enhancement, tree plantation, vegetation's promotion, planting of flowers and ornamental trees on site.

Project proponent will be responsible for the execution of the project with coordination of the client. The proponent will be bound to follow the provisions of the contract documents especially about the environmental protection measures and apply good management techniques and methodology without damaging the existing environment. Obligation(s) of the proponent, to safeguard and mitigate adverse impacts and rehabilitate the environment will be addressed through environmental provisions in the contract document(s) as already highlighted in Chapter 6 and through adequate implementation at site.

7.3 TRAINING SCHEDULES

The management staff and labor of proposed project will be trained about the requirements of Environmental Management System, including but not limited to the environmental health and safety, efficient use of resources, emergency response, fire protection and safety / security issues etc.

In order to raise the level of professional and managerial staff, they need to upgrade their knowledge in the related areas. The project management will play a key role in this context.

Environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures, it would be difficult to implement effective environmental protection measures. Domestic training program is proposed to train the staff. Training Plan has been formulated as part of EMP which is presented as Table 7.1 below:

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Table 7.11 Staff Training Plan

Objective	Regular training & learning opportunities are an investment that helps employees to prosper their skills for their own and the organization's benefit.
Responsible	M/S Etihad Canal View Private Housing Scheme
Incharge	Project Management
Trainer/ Facilitator	Internal and External Trainers

[Sign here]

Training Schedule*:

Following training schedule will be adhered to train the workforce of Etihad Canal View internally and by external trainers. Toolbox talk will be the regular feature of this training plan on weekly basis.

Training Topics	Month 1-4	Month 4-8	Month 9-12
Environmental Compliance of applicable laws			
Safe Use of Machinery			
Code of Conduct			
Health & Safety			
Emergency Drill			
First Aid			
Handling of hazardous material and use of PPE			
Environmental Safeguards			

*Please note – orientation/trainings will continue to be conducted twice a year, per the mentioned schedule.

Training will continue to be provided at 8:00 a.m. The entire training sessions will last approximately 3.5 hours, but may take as long as 4 hours, depending on the number of people in attendance.

New staff should be made aware of this training orientation session, at the time of hire.

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IMPACTS & MITIGATION MEASURES

7.4 The EMP provides comprehensive mitigation and management measures for the following phases of the project:

7.4.1 Summary of Impact & Mitigation Measures

This section of EMP provides summary of management principles for the construction & operational phase of the project. The impacts on environment which are likely to be generated during execution of these phases are described in table 7.2.

7.4.2 Mitigation Plan for Construction & Operational Phase

This section of EMP provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications will form part of the contract documentation and therefore, the contractor will be required to comply with the specifications to the satisfaction of the project Manager and Environmental Control Officer, in terms of the construction contract.

This section of EMP provides management principles for the operation and maintenance phase of the project. Environmental actions, procedure and responsibilities are required from proponent within the operation and maintenance phase are satisfied.

7.5 Environmental Monitoring Program

It will be in the fitness of the things to operate this project under the Environmental Management Plan. Regular monitoring of all the significant environmental issues is essential to check the compliance status of EMP. The main objective of the monitoring will be;

- To verify the results of the environmental study with respects to the proposed project.
- To estimate the trends of concentrated values of the issues, which have been identified as critical and then planning the mitigating measures.
- To assess the efficiency of pollution control mechanism.
- To ensure that any additional parameters, other than those identified in the EIA report, do not turn critical after the commissioning of proposed project.

Environmental monitoring program for proposed project is described in table 7.3.

7.6 ENVIRONMENTAL BUDGET

The cost for environmental management and monitoring will be the part of contract of Contractor and Consultants respectively. However, a lump sum amount of PKR 0.5

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million will be allocated by the project proponent as cost for environmental training, monitoring and tree plantation for a period of one year during construction and operation of the project. After that, monitoring program will be revised in consultation with EPA and cost will be revised accordingly.

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Table 7.2: Summary of Mitigation & Impact Assessment

Activity	Environmental Impacts	Mitigation	Manifestation	Methods of Implementation
Construction Phase				
1. Air Quality	– Dust resulting from construction work – Use of heavy machinery can generate exhaust and dust emissions – Dispersion of particles from stockpiles during high velocity wind – Smoke from burning of waste materials or burning of firewood in the labor camp	Necessary measures like sprinkling of water on regular basis especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion Periodic maintenance and management of all the construction machinery and vehicles Cutting and burning trees / shrubs for fuel will be prohibited. Instead gas cylinders should be used in the labor camp for cooking purposes. Similarly waste burning will not be allowed.	– During Construction Phase by Contractor with coordination of Proponent.	– Hiring of reputable contractor with sound knowledge of environment and HSE; – Regular inspection of storage material by competent person – Substantial training of Workers before commencement of work; – Monitor the performance of contractor/ workers.
2. Water Quality	– Run-off water from construction area – Inappropriate disposal of waste. – Open sewerage water disposal on land can	– Use of spill prevention trays and impermeable sheets to avoid. – contamination of the water – Furthermore, septic tanks will be constructed which will be cemented to prevent the domestic water contamination	– Construction Phase by Contractor with coordination of Proponent.	– Hiring of reputable contractor with sound knowledge of environment and HSE; – Regular inspection of site by competent person – Substantial training of Workers before commencement of work; – Monitor the performance of

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	contaminate water quality and cause generation of mosquitoes and various other insects in the area. – Leakage of oil and chemical materials from construction activity	Maximize the use of treated waste water on site (e.g. sprinkling purpose to control dust) – Proper disposal of waste material on dumping sites to avoid leachate generation – Prohibit illegal dumping of waste – The contractor will repair / replace / compensate for any damages caused by the Construction activities to the drinking water source/s.		
3. Solid Waste	– Construction waste from construction activities – Domestic waste from workers – Hazardous waste such as dry batteries and chemicals etc.	– Ensure prevention of inappropriate disposal of waste material – Conduct separate collection of construction and domestic waste to promote recycling and re-use – Ensure maximized use of construction debris on-site to fill excavations etc. – Dispose non-recyclable and hazardous waste material properly according to waste management rule. – Proper disposal of waste on agreed site as per agreed method. The area to be leveled and contoured after disposing excess material. No	– During construction and operational phase	– Project proponent and Contractor

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		waste or debris will be thrown in the river or other water bodies – Contractor will prepare waste management plan related to construction activities; get its approval from RE and ensure its full implementation		
4. Noise	– Noise caused by construction machinery and vehicles used for mobilization of construction equipment and workers	– The contractor will strictly follow the NEQS for ambient noise – Control noise through control of working hours and selection of less noisy equipment. – Prohibit use of pressure horns – Proper maintenance of vehicles and construction equipment. – Minimize/avoid unnecessary use of pneumatic drills and other noisy machinery The personal protective equipment (PPE) will be provided to the construction workers and its usage will be made mandatory	– In Construction Phase by Contractor with coordination of Proponent	- Regular inspection of machinery by contractor. - Proponent ensure contractor working without harming environment.
5. Material Management	- Improper store leads to environmental pollution. - Harm to soil in case of chemical/oil leakage - Worker health injury	– Stockpiles shall not be situated such that they obstruct natural pathways – Stockpiles shall not exceed 2m in height unless permitted by Concerned Engineer on site	– In Construction Phase by Contractor	- Regular inspection of machinery by contractor. - Proponent ensure contractor working without harming environment.

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		If stockpiles are exposed to windy conditions or heavy rain, they shall be covered either depending on the duration of the project. Stockpiles may further be protected by the construction of low brick walls around their bases – All substances required for vehicle/ machinery maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site – Hazardous substances / materials are to be transported in sealed containers or bags – Spraying of herbicides / pesticides shall not take place under windy conditions		
6. Biological Resources	– Removal of vegetation covers by cutting of trees, crops, herbs and shrubs – Fauna including birds and animals will be affected during excavation.	– Proposed project site does not involve cutting of any trees – Plantation of maximum number of trees. – Staff and workers should be instructed not to damage nearby vegetation of the surrounding area. – Open fires should be prohibited in	– *Contractor and proponent responsibility to ensure safe environment.*	*- Regular inspection of machinery by contractor.* *- Proponent ensure contractor working without harming environment.*

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	– movement of labor and carriage of goods and machinery	the area to avoid the hazard of fire and impact on nearby flora and fauna. – Contractor staff should be given clear instructions that they should not hunt any birds/ animal in the project area/ site – Barriers/ fencing/ or boundary wall should be installed at project site to protect movement of animals at the project site during constructions. – Proper disposal of organic waste (if any) generated during the construction stage to avoid rodents and other insects' generation.		

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7. Seismicity		The design specification will be followed to withstand seismic loads in accordance with the Uniform Building Code (UBC) - 1997 and Building Code of Pakistan (BCP), Seismic Provisions - 2007, as required by local codes and standards[6] for high degree of structural competence, reliability and ease of construction.(See section 6.6.2)	Contractor with coordination of proponent and Engineer	Building design should be according to Building code of Pakistan 2007.
8. Workers Health & Safety	- Poor housekeeping - Improper use of equipment - Unskilled staff - Lack of supervision	– Provision of Personal Protective Equipment to the workers – Provision of first aid box at work site to cope with emergency situation – Safety training to the workers – Safe driving training to the drivers – Adequate safety signs on site – Provide training regarding proper handling and use of chemicals/ paints – Install fire extinguishers at fire handling places	- Certified contractor and Proponent	- Proper training of workers. - Ensure worker have specific PPEs.

[6] *Structural design at present in Pakistan is designed as per UBC-97 and ACI 318-02M because of the local techniques, procedures, technologies and material available for concrete and other construction material. The building Codes BCP, SP-2007, Design of Concrete Structures by Arthur H. Nilson, Design of Reinforced Concrete by M. C Cormac, Foundation Analysis and Design by J.E. Bowles will also be followed in due course of time upon availability of advanced materials and techniques in Pakistan.*

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		– Any loss of public/ private property will be compensated by the contractor – Regular checks should be carried out to ensure a contractor's is following safe working procedures and practices.		
9. Socio-economic Impacts	- Disturbance to local community by construction work	– Contractor's activities and movement of staff to be restricted to designated construction areas – The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous all the time – Disruption of access for local residents, commercial establishments, institutions, etc. must be minimized – Provide walkways and metal sheets where required to maintain access for public or vehicle – The site must be kept clean to minimize the visual impact of site – Machinery and vehicles are to be kept in good working order for the duration of the project to minimize noise nuisance to neighbors	- Contractor with coordination of proponent and Engineer	- Hiring of reputable contractor with sound knowledge of environment and HSE; - Regular inspection of storage material by competent person - Substantial training of Workers before commencement of work; - Monitor the performance of contractor/ workers.

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		Noisy activities must be restricted to the times given in the Project.		
10. Clearance of site from extra / surplus material and construction equipment	- Tree cutting. - damage to land - soil removal	- Timely removal of waste from the site to avoid congestion at work place. - Construction waste should be collected and disposed separately from other waste. - Contaminated soil (if generated) due to accidental spills will be removed and transported to suitable site for disposal. - Safe transportation of construction equipment from the site. - The contractor must ensures that all structure, equipment, materials and facilities used or created on site for/ or during construction activities are removed. - Empty/available space will be covered with grassy lawns in addition of parks establishment as component of this project. - Use of native vegetation as a part of landscape. Ornamental plant species like roses, jasmine, and seasonal flowers can be used in proposed landscaping, which is a	- Contractor with coordination of proponent and Engineer	- Hiring of reputable contractor with sound knowledge of environment and HSE; - Regular inspection of storage material by competent person - Substantial training of Workers before commencement of work; - Monitor the performance of contractor/ workers.

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Operational Phase		Common practice in this part		
1. Air Quality	- No	– During regular occupancy of the buildings, no activity is envisaged to take place which may generate dust of any significance. Under the policy of the management all care will be taken to keep the in residential activities environmentally sound and sustainable.	–	– Ensure by proponent and EPA
2. Water Quality – Wastewater/ Sewerage	- No	– Sewerage after due treatment will be discharged to drain passing nearby site. – Adequate disposal system shall be made available and maintain the sewer lines both on site and off site. – Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer	–	– Ensure by proponent and EPA
3. Waste – Solid Waste/ Garbage	– Open dumping leads to epidemic diseases	– Implementation of waste management program consisting of reduce, reuse and re-cycling of materials – Systematic collection and protected storage of waste – All wastes to be generated during	–	– Ensure by proponent and EPA

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		the apartments shall be collected daily through locally placed wastes collecting bins. – Of these, wastes like paper, plastics, wood, fused bulbs, fluorescence electric tubes, rags, plastic and metal cans, glass articles and like shall be sold in the market for reuse. Kitchen wastes including vegetables and fruits peels shall be disposed off into the wastes collection bins. Redundant electric gadgets, air coolers, electric fans, redundant furniture, house hold articles, office use equipment etc shall be sold in the markets (KABARIS). – The waste which is useless will be disposed of at appropriate and designated site – Prohibition of dumping of any contaminating material		

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– Noise & Vibration – Noise and vibration from water pumps etc. – Noise from vehicles used for mobilization of equipment/ raw material/ waste		– No activity producing extra ordinary levels of noise will be allowed in the society as a policy matter. – Adequate basis of equipment to reduce the vibration – Adequate enclosure of equipment to reduce noise.		
5. Emergency Response	– In case of fire pollute environment. – Property loss.	– The design of building/ apartments should include emergency exits and open space for gathering which can be used during emergency situation.	–	– Ensure by proponent and EPA

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Table 7.1: Environmental Management Plan for Bilbasi Canal View Private Housing Scheme

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility: Implementation	Responsibility: Monitoring
Construction Phase					
1	**Air Quality** Dust resulting from construction Use of heavy machinery can generate exhaust and dust emissions Dispersion of particles from stockpiles during high velocity wind Smoke from burning of waste materials or burning of firewood in the labor camp	Compliance with prescribed PEQS to control air pollution	- Necessary measures like sprinkling of water on regular basis especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. - Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion - Periodic maintenance and management of all the machinery and vehicles - Cutting and burning trees / shrubs for fuel will be prohibited. Instead gas cylinders should be used in the labor camp for cooking purposes. Similarly waste burning will not be allowed.	Construction Contractor with coordination of Proponent	Proponent/ EPA
2	**Water Quality** Run off water from construction area Drainage of wastewater on ground can contaminate the soil and groundwater Inappropriate disposal of waste. Open sewerage water disposal on land can contaminate ground water and cause generation of mosquitoes and various other insects in the area Leakage of oil and chemical materials from construction	Control of groundwater or surface water pollution from construction activities	- Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater - Maximize the use of treated waste water on site (e.g. sprinkling purpose to control dust) - Proper disposal of waste material on dumping sites to avoid leachate generation and contamination of groundwater - Prohibit illegal dumping of waste - The contractor will repair / replace / compensate for any damages caused by the Construction activities to the drinking water sources. - Regular water quality monitoring according to determined sampling schedule; - The contractor shall ensure that construction debris do not find their way into the drainage system which can block	Construction Contractor with coordination of Proponent	Proponent/ EPA

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Sr #	Project Component & Impact activity	Targets to Achieve	Mitigation/ Preventive Action	Responsibility for Implementation	Responsibility for Monitoring
			them; – Prohibit washing of machinery and vehicles in surface waters, provide sealed washing basins and collect wastewater in sedimentation/ retention pond.		
3.	**Waste** – Waste from construction activities – Domestic waste from workers	– Proper & safe handling and disposal of construction related waste – Compliance with applicable waste management rules for hazardous and non-hazardous waste disposal – Implementation of waste management plan	– Ensure prevention of inappropriate disposal of waste material – Conduct separate collection of construction and domestic waste to promote recycling and re-use – Ensure maximized use of construction debris on-site to fill excavations etc. – Dispose non-recyclable and hazardous waste material properly according to waste management rules – Proper disposal of waste on agreed site as per agreed method. The area to be leveled and contoured after disposing excess material. No waste or debris will be thrown in the river or other water bodies – Contractor will prepare waste management plan related to construction activities; get its approval from proponent and ensure its full implementation	Construction Contractor with coordination of Proponent	Proponent/ EPA
4.	**Noise** – Noise caused by construction machinery and vehicles used for mobilization of equipment and workers	– Compliance with prescribed PEQS to control Noise pollution	– The contractor will strictly follow the PEQS for ambient noise – Control noise through control of working hours and selection of less noisy equipment. – Prohibit use of pressure horns – Provision of acoustic enclosures (hoods and shrouds) on generator – Proper maintenance of vehicles and construction equipment. – Minimize unnecessary use of pneumatic drills and other	Construction Contractor with coordination of Proponent	Proponent/ EPA

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Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
			noisy machinery – The personal protective equipment (PPE) will be provided to the workers and its usage will be made mandatory		
5.	**Biological Resources** – Removal of vegetation covers by cutting of trees, crops, herbs and shrubs – Fauna including birds and animals will be affected during excavation, movement of labor and carriage of goods and machinery	– Obligation to respect wildlife, Forest and Fisheries Laws. – Conserve biodiversity and its terrestrial as well as aquatic habitat	– Proposed project site does not involve cutting of any trees – Plantation of maximum number of trees. – Staff and workers should be instructed not to damage nearby vegetation of the surrounding area. – Open fires should be prohibited in the area to avoid the hazard of fire and impact on nearby flora and fauna. – Proper disposal of organic waste (if any) generated to avoid rodents and other insects' generation.	Construction Contractor with coordination of proponent	Proponent/ EPA
7.	Staff Conduct	– Timely completion of project activities	– The Contractor must monitor the performance of workers to ensure that point relayed during their induction have been properly understood and being followed	Construction Contractor	Proponent/ EPA
8.	Leakages/ spills/ Paints/ Used oil	– Compliance with standards set forth by "Guidelines for Oil Spill Waste Minimization and Management" issued by International Petroleum Industry Environmental Conservation	– Contractor will apply strict rules on his workers and labor to ensure that no spill or leakages are caused – Chemical waste will be disposed of in approved disposal site. – PPE will be enforced to use during the handling and application of chemicals – The contractor will employ the general criteria for oil and leakage at construction sites, as per standards	Construction Contractor	Proponent/ EPA

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Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
		Associate			
9.	Workers Health & Safety	– Prevention of any possibility of work site accident /impact on worker's health	– Provision of Personal Protective Equipment to the workers – Provision of first aid box at work site to cope with emergency situation – Safety training to the workers – Safe driving training to the drivers – Adequate safety signs on site – Install fire extinguishers at fire handling places – Any loss of public/ private property will be compensated by the contractor – Regular checks should be carried out to ensure a contractor is following safe working procedures and practices.	Construction Contractor	Proponent EPA
10.	Socio-economic Impacts	– Prevention of conflicts among locals and make the project socially acceptable – Empowerment of locals to possible extent – Increase in employment and business opportunities for locals	– Contractor's activities and movement of staff to be restricted to designated and within industry – The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous all the time – The site must be kept clean to minimize the visual impact of site – Noisy activities must be restricted to the times given in the Project Specification or General Conditions of contract – The Contractor are responsible for ongoing communication with those people that are interested in / affected by the projects – Employ local residents as much as possible	Construction Contractor with coordination of proponent	Proponent EPA
11.	Clearance of site from extra / surplus material	– Restoration of site to a similar	– Timely removal of waste from the site to avoid congestion at work place.	Construction Contractor	Proponent EPA

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Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
		condition prior to the commencement of the work or to a condition agreed with the project management and landscaping of the site	– Care will be taken during handling and disposal of waste. . – Avoid mixing of hazardous waste with non-hazardous waste. – Safe transportation of construction equipment from the site. – Empty/available space will be covered with grassy lawns & ornamental plant species like roses, jasmine, and seasonal flowers		
Operational Phase					
1.	**Air Quality Deterioration**	– Compliance with Ambient air quality (PEQS) standards for control of ambient air pollution	– During regular occupancy of the buildings, no activity is envisaged to take place which may generate dust of any significance. Under the policy of the management all care will be taken to keep the in residential activities environmentally sound and sustainable.	Project Manager	Project Proponent/ EPA
2.	**Water Quality** – Wastewater/ Sewerage	– Compliance with Wastewater standards	– Sewerage after due treatment will be discharged to drain passing nearby site. – Adequate disposal system shall be made available and maintain the sewer lines both on site and off site. – Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer.	Project Manager	Project Proponent/ EPA

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Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
3.	**Waste** – Municipal Solid Waste	– Compliance with waste management rules – Prevention of inappropriate waste disposal	– Implementation of waste management program consisting of reduce, reuse and re-cycling of materials – Systematic collection and protected storage of waste – Wastes like paper, plastics, wood, fused bulbs, fluorescence electric tubes, rags, plastic and metal cans, glass articles shall be sold in the market for reuse. – Prohibition of dumping of any contaminating material	Project Manager	Project Proponent, EPA Punjab
4.	**Noise & Vibration** – Noise and vibration from generators & water pump	– Compliance with prescribed PEQS to control Noise pollution	– No activity producing extra ordinary levels of noise will be allowed – Adequate basis & enclosure of generator & water pumps to reduce the vibration & noise – Standby generator shall be curtailed within the limiting values of the Punjab Environmental Quality Standards.	Project Manager	Project Proponent EPA Punjab
5.	**Environment quality enhancement measures:** – Flowers and plants and trees – Aesthetic beauty of the buildings and the area	– Enhanced land value and scenic beauty of the area	– Plantations in and around the proposed facility must be carried out. – Fountains or other such aesthetic measures must also be taken into consideration in order to increase the beauty of area. – All other necessary measures shall also be taken to maintain standards of cleanliness so that the buildings may add to the scenic/aesthetic beauty of the area around.	Project Manager in close liaison with project proponent	Project Proponent EPA Punjab

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Table 7.5: Environmental Monitoring Plan for Etihad Canal View RYK

Parameter/Receptor	Location	Monitoring Parameter	Monitoring and Reporting Frequency
Physical Environment			
Water Quality	▪ Ground Water ▪ Surface Water	Discrete grab sampling and laboratory testing of water samples.	▪ Sampling and laboratory testing should be done quarterly during construction stage and on annual basis during the operational stage. ▪ Discharges from the facility should be tested for temperature, pH and turbidity.
Air Quality (Dust emissions, vent emissions)	▪ Tracks along road ▪ Indoor air quality ▪ Inside workplace/ Fuel Storage Area	Ambient Particulate Matter, flue gas emissions, fumes Monitoring. Physical Inspection for petrol leakages or drippings.	▪ Ambient Air Monitoring should be conducted quarterly during construction stage and on annual basis during the operational stage.
Noise Levels	▪ Selected locations along the access	Noise in dB(A)	▪ Quarterly during the construction & annually during operational phase.
Pest Control	▪ Petrol Filling facility	Spray of pesticides and fumigation to avoid spread of vectors.	▪ Once in a year when needed during constructional phase of the project.
Ecological Environment			
Cutting of trees Tree plantation	In all Project Area during the execution of proposed project.	Landscaping.	▪ Monthly during construction phase monitoring and annually during the operational phase.
Socio-cultural Environment			
Inconvenience to community/ Public Health	All around the Project Area	Consultations with community to get feedback about inconvenience due to the constructional activities to perform their daily routine chores.	▪ Quarterly monitoring and reporting during the constructional period.

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CHAPTER-8

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RECOMMENDATIONS & CONCLUSIONS

8.1 RECOMMENDATIONS

The Environmental Impact Assessment (EIA) Report and survey results are finally evaluated to recommend the following:

- The present Environmental Impact Assessment (EIA) Report of Construction and development of Etihad Canal View RYK' meets the administrative and legal framework of the EPA Punjab.
- Care shall be given on the health and safety of workers during construction & operational phases of the project.
- The Proponent should assign trained staff for execution of proposed project activities.
- The Proponent should plant vigorously indigenous plants and trees in and around the project site.
- Consider Fire safety precautions to prevent or reduce the likelihood of a fire to break out.
- There should be adherence to safe working procedures to ensure health safety of workers.
- Mosquito repellent sprays/ fumigation should be carried out to keep facility disinfected and pest free and spread of disease vectors in control.

8.2 CONCLUSION

The EIA Report of Etihad Canal View. located at Mouza Ali Akbar Sanghi & Mouza Bindoor, Sadiq Canal Road, Tehsil & District Rahim Yar Khan– Pakistan is made to fulfill the legal requirement of Punjab Environmental Protection Act, 1997. In order to address the potentially adverse impacts of the project, an EMP has been developed, which will further improve the environmental performance of the project. The EMP assigns roles and responsibilities, provide environmental guidelines and discuss the scope of Environmental Management Plan.

The EIA Report has thoroughly assessed all the potential environmental impacts associated with the project. The environmental impacts identified by the study are manageable. Project specific and practically suitable mitigation measures are recommended to mitigate the impacts. This EIA concludes that proposed project will not pose any major adverse environmental impacts on environment if the anticipated impacts are properly mitigated and the Environmental management Plan is properly implemented. It is environment friendly project as it fosters the economic, social and aesthetic values of country without any environment degradation. The project solves various environmental and social problems already raised by the poor health care system in the Pakistan.

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Therefore, the project under consideration does not require any further environmental study; hence the EIA Report has been completed for the said project so the project of Etihad Canal View., is recommended for the Environmental Approval and issuance of NOC from the EPA, Punjab.

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GLOSSARY

a. **Act:** means Punjab Environmental Protection Act, 1997 [Amendment 2012].

b. **Dust:** are fine powdery materials such as dry earth/ pollen that can be blown in the air.

c. **Discharge:** means spilling, leaking, pumping, depositing, seeping, releasing, flowing out, pouring, emitting, emptying or dumping

d. **Environment:** means air, water and land; all layers of the atmosphere; all organic and inorganic matter and living organisms; the ecosystem and ecological relationships; buildings, structures, roads, facilities and works; all social and economic conditions affecting community life; and the inter-relationships between any of the factors mentioned.

e. **Environmental Impact Assessment:** means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed.

f. **Effluent:** means any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapour.

g. **Hazardous Substance:** a substance or mixture of substances, other than a pesticide as defined in the Agricultural Pesticides Ordinance, 1971 (II of 1971), which, by reason of its chemical activity or toxic, explosive, flammable, corrosive, radioactive or other characteristics causes, or is likely to cause, directly or in combination with other matters, an adverse environmental effect; and any substance which may be prescribed as a hazardous substance.

h. **Hazardous Waste:** means waste which is or which contains a hazardous substance or which may be prescribed as hazardous substance or which may be prescribed as hazardous waste, and includes hospital waste and nuclear waste.

i. **Industrial Activity:** means any operation or process for manufacturing, making, formulating, synthesizing, altering, repairing, ornamenting, finishing, packing or otherwise treating any article or substance with a view to its use, sale, transport, delivery or disposal or for mining, for oil and gas exploration and development, or for pumping

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water or sewage, or for generating, transforming or transmitting power or for any other industrial or commercial purpose.

j. **Industrial Waste:** means waste resulting from industrial activity.

k. **Incineration:** The thermal destruction of waste for the primary purpose of disposal, with or without recovery of energy.

l. *Note: the term incineration generally means 'the act of burning to ashes'.*

m. **Initial Environmental Examination:** means a preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an environmental effect for requiring preparation of an environmental impact assessment.

n. **Leachate:** A liquid that has percolated through and/or been generated by decomposition of waste material. It includes water that come in contact with waste and is potentially contaminated by nutrients, metals, salts and other soluble or suspended components and products of decomposition of waste.

o. **Landfill:** A waste disposal site used for the controlled deposit of solid waste onto or into land.

p. **Mitigation Measure:** means measure for control, reduce or elimination of an adverse impact of a development on environment, including a restorative measures.

q. **Punjab Environmental Quality Standards:** means the permissible standards for emission of air pollutants and noise and for discharge of effluent and waste.

r. **Regulations:** means the Pakistan Environmental Protection Agency, Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000.

s. **Recycling:** Set of processes (including biological) for converting recovered materials that would otherwise be disposed of as waste into useful material and/or products

t. **Reuse:** using a waste product again for the same or different purpose without further manufacture.

u. **Suspended Solids:** are solid particles suspended in water or air that can be removed by filtration or settlement.

v. **Sustainability:** means such developments that meet the needs of the present generation without compromising the ability of future generations to meet their needs.

w. **Waste:** means any material, substance, or by-product eliminated or discarded as no longer useful or required after the completion of a process.

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LIST OF ABBREVIATIONS

ECV	Etihad Canal View
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
EA	Environmental Approval
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMtP	Environmental Monitoring Plan
EPD	Environment Protection Department
EPO	Environmental Protection Order
IESCO	Islamabad Electric Power Company
GOP	Government of Pakistan
HW	Hazardous Waste
IEE	Initial Environmental Examination
IMC	Independent Monitoring Consultant
IPPs	Independent Power Projects
IUCN	International Union for Conservation of Nature
LAA	Land Acquisition Act
MoE	Ministry of Environment
MSW	Municipal Solid Waste
NA	Not Applicable
NCS	National Conservation Strategy
ND	Not Detected
NO	Not Objectionable
PEQS	Punjab Environment Quality Standard
NGO	Non-Government organization
NOC	No-Objection Certificate
NOx	Oxides of Nitrogen
PC	Public Consultation
PEPA	Punjab Environmental Protection Act, 1997
PEPC	Punjab Environmental Protection Council
PM	Particulate Matter
PP	Project Proponent

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PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
RAP	Resettlement Action Plan
RFP	Request for Reports
Sox	Oxides of Sulphur
SP	Seismic Provisions
TES	Threatened, Endangered and Special Status Species
TOC	Total Organic Carbon
UBC	Uniform Building Code
VOC	Volatile organic compound
WAPDA	Water and Power Development Authority
WHO	World Health Organization
WWTP	Waste Water Treatment Plant

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