

**“ATLANTIS MURREE (COMMERCIAL/RESIDENTIAL APARTMENT)”**

**TEHSIL AND DISTRICT MURREE**



## **ENVIRONMENTAL IMPACT ASSESSMENT (EIA)**

**Submitted to  
Environmental Protection Agency, Rawalpindi  
February, 2026**

**Prepared and submitted by**

**APEX ENVIRONMENTAL SOLUTION & SERVICES  
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# ***EXECUTIVE SUMMARY***

## **Title and Location of Project**

This report presents key findings of the Environmental Impact Assessment (EIA) of the said project title Atlantis Murree (Commercial/Residential Apartment), at Mouza Lakot Expressway, Tehsil and District Murree. This report has been prepared to fulfill the requirements of Section 12 of the Pakistan Environmental Protection Act 1997(amended-2017) (PEPA), Initial Environmental Examination and Environmental Impact Assessment Review Regulations, 2022 and the guidelines provided in the Pakistan Environmental Assessment Procedures, 1997(amended-2017).

## **Name of Proponent**

Mr. Muhammad Usman Hafeez s/o Muhammad Hafeez is the proponent of Atlantis Murree (Commercial/Residential Apartment).

## **Name of Organization Preparing the Report**

In order to comply with the regulatory requirement of environmental laws of Punjab, M/s **AES & Services** has been entrusted for the assignment of conducting Environmental Impact Assessment (EIA) of Atlantis Murree (Commercial/Residential Apartment).

## **Policy, Legal and Administrative Framework**

This study has been accomplished in line with the provisions – guidelines and directives of Punjab Environmental Protection Agency. Punjab Environment Protection Act 1997 (amended 2012) being as principal legislation of environmental protection in Punjab Province envisages protection, improvement, conservation and rehabilitation with the help of legal action against polluters and green awakening of communities. The Act is applicable to a broad range of issues and extends to socioeconomic aspects, land acquisition, air, water, soil, marine and noise pollution,



as well as the handling of hazardous waste. The discharge or emission of any effluent, waste, air pollutant or noise in an amount, concentration or level in excess of the Punjab Environmental Quality Standards (PEQSS) specified by the Punjab Environment Protection Agency (PEPA) are prohibited under the Act.

**Brief Outline of Project (Details are given in Chapter 6)**

The objective of the project is to develop a residential building to facilitate the population of Murree and tourists/visitors with state-of-the-art residential apartments building with all the required facilities in one place. The structure is three floors high (Ground + 2 floors) and is situated on a total plot area of 1-Kanals. The estimated cost of the project is PKR 80 million. The project is a purely residential development, designed as a modern model apartment complex with a variety of facilities for its residents. This construction is unique in nature and aims to enhance the standard of living for the community. The project will also create employment opportunities for local people, both skilled and unskilled, during the construction phase and ongoing occupancy. The key details of the project under study are summarized below:

**DETAIL OF OWNER / CHIEF EXECUTIVE/PROPONENT.**

The detail is as under:-

Name of proponent/applicant	Mr. Muhammad Usman Hafeez s/o Muhammad Hafeez
Residential address of owner	House No.27, Street No.20, Sector B, Mohalla Phase 1, Islamabad
Postal address	Mouza Lakot Expressway, Tehsil and District Murree
Contact Number	(051) 6161116

**DETAIL OF PROJECT ATLANTIS MURREE.**

The detail of project is as under:-

i.	<b>Name of project/Hotel</b>	Atlantis Murree (Residential Apartment)
ii.	<b>Location</b>	Mouza Lakot Expressway, Tehsil and District Murree
iii.	<b>Total Area</b>	1-kanal
iv.	<b>Cost</b>	Estimated cost of the project is 80 million Pak. rupees.



v.	<b>No. of floor</b>	3 (G+2)
vi.	<b>Ground floor</b>	1
vii.	<b>Nature of Project</b>	The Environmental Impact Assessment (EIA) report covers the project of Atlantis Murree (Commercial/Residential Apartment).
viii.	<b>Purpose of Project</b>	The purpose of an apartments is to provide a comfortable and private living space where individuals or families can reside, relax, and carry out their daily activities. It offers essential facilities such as sleeping areas, a kitchen for preparing meals, and living spaces for rest and social interaction, creating a place that feels like home.
ix.	<b>General process</b>	<b>Atlantis Murree (Commercial/Residential Apartment)</b> is a residential apartment building located on <b>Murree Expressway in Murree, Punjab, Pakistan</b> . It's a developed apartment property offering units for living, typically used by residents and sometimes rented out due to Murree's appeal as a hill station. The building provides basic residential facilities and serves as a place for comfortable permanent or seasonal living in the scenic Murree area.

### DETAIL OF AREA

i.	<b>Water body/storage</b>	Water channel/stream found within 500m radius of site. <b>Yes / No.</b>
ii.	<b>Human Settlement</b>	Human settlement found within 01 km radius of site <b>Yes / No.</b>
iii.	<b>Waste water of Atlantis Murree discharged into which water channel?</b>	Treat the sewerage waste water through septic tanks, then disposed outside the Murree boundary.

### Major Impacts and Recommended Mitigation Measures

**Physical Environment Impacts:** Atlantis Murree (Commercial/Residential Apartments), an already constructed project located in Murree, has contributed positively to land stabilization and organized land use in the project area. During the construction phase, controlled excavation, cutting, and filling activities were undertaken in accordance with approved engineering designs, which helped improve slope stability and reduce the risk of uncontrolled soil erosion in the hilly terrain.

Proper site leveling, retaining structures, and paved surfaces have enhanced soil strength and minimized erosion potential. The developed infrastructure has replaced previously exposed or uneven land with a stable and planned residential layout, thereby improving the overall physical



condition of the site. Any temporary soil disturbance caused during construction has been permanently mitigated through landscaping, compaction, and surface finishing works.

Potential soil contamination risks associated with construction activities were limited in nature and managed through controlled handling of construction materials, fuels, and lubricants. With the project now in the operational phase, the likelihood of soil contamination is minimal due to the absence of excavation works and the implementation of proper wastewater management and solid waste disposal systems. Regular maintenance practices further ensure that oils, chemicals, and other hazardous substances do not adversely affect soil quality.

Construction waste and surplus excavated material were disposed of in designated areas in accordance with approved waste management practices, preventing indiscriminate dumping and preserving surrounding land usability. The conversion of the site into a residential apartment complex represents a planned and beneficial land-use change, contributing to organized urban development and improved land value in the area.

During the operational phase, emissions from vehicles and standby equipment are limited and localized, with no significant adverse impact on soil quality. Overall, the project has resulted in improved land utilization, enhanced soil stability, and long-term environmental benefits through controlled development and effective site management.

**Mitigations:** At **Atlantis Murree (Commercial/Residential Apartments)**, located in Murree, effective mitigation measures were incorporated during the construction phase and continue during the operational phase to ensure protection of soil quality and land stability.

Soil erosion was minimized through planned land clearing, proper leveling, and controlled grading in accordance with approved engineering designs. Excavated slopes were not left untreated for extended periods; instead, appropriate slope stabilization measures, including retaining structures and surface protection, were implemented to ensure long-term slope stability and reduce erosion risks in the hilly terrain.

Domestic sewage generated from the contractor's camp during the construction phase was managed through the installation of septic tanks with soaking pits of adequate capacity. These systems ensured safe disposal and treatment of wastewater, preventing soil and groundwater contamination. During the operational phase, appropriately sized septic tanks and sewage management systems have been incorporated into the project design to effectively treat sanitation wastewater from residential units.

Waste oils generated from construction machinery and maintenance activities were safely collected in designated drums and handed over to authorized recycling contractors, preventing indiscriminate disposal and soil contamination. Recyclable solid waste generated at the project site, including cardboard, metal drums, and broken or used parts, was segregated and sold to licensed recycling contractors or reused where feasible, promoting resource recovery and reducing environmental burden.

Regular water quality analysis was carried out at the project site and contractor's camp on a quarterly basis during the construction phase to ensure compliance with environmental standards. These monitoring practices helped verify the effectiveness of implemented mitigation measures and ensured that soil and water resources remained protected.



**Ecological Environment Impacts:** The site allocated for **Atlantis Murree (Commercial/Residential Apartments)**, located in Murree, originally comprised a vacant plot with limited ecological value. The natural vegetation cover at the project site was sparse in nature, consisting mainly of grass and scattered shrubs along the site boundaries, with no significant trees or sensitive habitats present within the project footprint.

Any necessary removal of shrubs and a very limited number of trees during the construction phase was carried out in a controlled manner and restricted strictly to the project area. As the site lacked dense vegetation and did not support any protected, endangered, or ecologically significant floral species, the impact on local flora remained minimal and localized.

Similarly, faunal presence within the project area was limited due to the absence of substantial vegetation cover and natural habitats. The construction activities may have temporarily disturbed small and common fauna, prompting them to move to nearby areas with similar or better habitat conditions. However, no permanent or significant adverse impacts on faunal resources were anticipated or observed.

Following project completion, landscaping and plantation works have been incorporated into the residential development, including the introduction of ornamental plants, grasses, and native tree species. These measures have enhanced green cover, improved micro-habitat conditions, and contributed positively to the local ecological environment. Overall, Atlantis Murree (Residential Apartments) represents an environmentally responsible development with minimal ecological disturbance and long-term ecological improvement through planned landscaping and green spaces.

**Mitigations:** The Proponent of **Atlantis Murree (Commercial/Residential Apartments)**, located in Murree, has implemented and will continue to implement recommended mitigation and enhancement measures to ensure minimal impact on the aesthetic beauty and natural vegetation of the surrounding area.

A comprehensive plantation and landscaping plan has been incorporated into the project design for the beautification of the residential complex. Dedicated green spaces have already been allocated within the project area, where plantation activities have been and will continue to be carried out. The proposed plantation not only enhances the visual appeal of the project but also contributes to improving natural vegetation cover, enhancing local biodiversity, and sequestering carbon dioxide from the atmosphere.

Native and ornamental plant species suitable for the local climatic conditions have been prioritized to ensure sustainability and long-term survival of vegetation. The development of landscaped areas, lawns, and planted buffers has improved the microclimate and ecological balance of the project site, thereby providing environmental benefits beyond the immediate project boundaries.

All necessary preventive measures are being adopted to control and prevent any spill-over of chemicals, oils, fuels, or other effluents onto the ground surface. Proper handling, storage, and disposal practices are in place to protect soil fauna and maintain natural microbial activity in the soil. These measures are being implemented in strict compliance with the **National Environmental Quality Standards (NEQS)**, ensuring environmental protection during both construction and operational phases.



Overall, these mitigation and enhancement measures demonstrate the project proponent's commitment to environmentally responsible development, ecological improvement, and sustainable residential living at Atlantis Murree (Residential Apartments).

**Socio-Economic Environment Impacts: Atlantis Murree (Commercial/Residential Apartments)**, located in Murree, is situated within an established residential area. During the construction phase, potential safety risks to nearby residents were temporary and effectively managed through controlled construction practices, restricted working hours, and proper site management. With the project now completed and operational, no construction-related safety hazards remain for the surrounding community.

Occupational health risks to construction workers, such as exposure to dust and exhaust emissions, were addressed through the provision of personal protective equipment (PPE), implementation of dust suppression measures, and regular maintenance of construction machinery. These measures significantly reduced the likelihood of eye, respiratory, and other work-related health issues. Workplace safety protocols and supervision further minimized the risk of occupational accidents and injuries.

Potential occupational hazards associated with land clearing, earthworks, and construction activities were managed through adherence to approved health and safety plans, worker training, and the enforcement of standard operating procedures. As a result, construction activities were carried out in a controlled and safe manner, ensuring the well-being of the workforce.

From a socio-economic perspective, the project generated employment opportunities for skilled and unskilled labor during the construction phase and continues to contribute positively to the local economy during operation through property management, maintenance services, and related commercial activities. The presence of the residential apartments has enhanced local infrastructure utilization and increased the overall value of the surrounding area.

No archaeological or historically significant sites were reported within the project area. However, a chance-find procedure was incorporated into the construction management plan, under which the relevant authorities, including the **Archaeology Department**, would be immediately informed if any artifact of cultural or historical importance were discovered.

Overall, Atlantis Murree (Residential Apartments) has resulted in positive socio-economic outcomes, improved housing availability, and enhanced community development, with all potential risks effectively managed in accordance with regulatory requirements.

**Mitigations:** At **Atlantis Murree (Commercial/Residential Apartments)**, located in Murree, effective occupational health and safety measures were implemented during the construction phase to protect workers and nearby residents. Eye and respiratory health risks were minimized through routine health screening, worker training, and dust control measures. Physical injuries were mitigated through proper safety training, availability of emergency response procedures, and continuous site supervision.

Personal Protective Equipment (PPE) was provided and its use strictly enforced for all workers. Protective fencing was installed around the construction site to prevent unauthorized access and



ensure public safety. Vehicle movement within the project area was controlled, with a speed limit of 20 km/hr implemented to reduce accident risks.

Where required, appropriate light diffusers and reflectors were used to minimize light pollution and public nuisance. With the completion of construction, these measures have ensured a safe environment and contributed positively to the overall socio-economic well-being associated with Atlantis Murree (Commercial/Residential Apartments).

### **ENVIRONMENTAL MANAGEMENT PLAN & PROPOSED MONITORING:**

An Environmental Management Plan (EMP) has been prepared for **Atlantis Murree (Commercial/Residential Apartments)**, located in Murree, to ensure effective implementation and management of all mitigation measures identified in the EIA. The EMP provides a structured mechanism to address potential environmental impacts, enhance project benefits, and ensure adoption of good environmental practices throughout project activities.

The EMP has been developed with the objectives of defining applicable legislative requirements, guidelines, and best environmental practices relevant to the project. It establishes mitigation and monitoring measures necessary to avoid, minimize, and manage potential environmental impacts identified during the EIA process. Clear roles and responsibilities of the project proponent and contractors have been defined to ensure effective environmental compliance.

The EMP also outlines requirements for environmental monitoring, documentation, and reporting to ensure continuous compliance with environmental standards. A mechanism for environmental training has been included to raise awareness among project personnel regarding potential environmental issues and required preventive measures.

Environmental sensitivities and associated impacts have been adequately addressed in the EMP through a systematic implementation framework. The Plan ensures that all mitigation measures proposed in the EIA are effectively implemented, monitored, and reviewed. An appropriate monitoring program has been devised to ensure strict adherence to environmental mitigation and control measures.

In addition, a comprehensive waste management plan has been included, identifying suitable waste handling, disposal, and pollution control options throughout the project lifecycle. Overall, the EMP demonstrates the project proponent's commitment to environmentally responsible development and sustainable operation of Atlantis Murree (Residential Apartments).

### **Proposed Environmental Monitoring**

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated



which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for following Environmental Parameters is recommended:

 **Ambient Air**

Monitoring for ambient air should be conducted on quarterly basis during constructional phase of the project and report should be submitted to EPA Punjab.

 **Noise**

Regular monitoring for noise level should be maintained periodically during construction phases of the project and report should be submitted to EPA Punjab.

 **Water quality**

Monitoring of water quality should be conducted on quarterly basis during construction and operation phases of the project and report should be submitted to EPA Punjab. Record should be maintained regarding the underground water pump and consumption.

**CONCLUSION**

This EIA contains description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. It is concluded in this study that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context. This report further draws the conclusion that the impacts identified are easily manageable and reversible, no long-term impact is expected and no deterioration or consequential depletion of local natural resources is expected. It is accordingly recommended that Environmental Approval for the project should be issued by the Punjab Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponents of the project.



# **1. INTRODUCTION**

This chapter includes the data relevant to the undertaking of the Environmental Impact Assessment (EIA) and details of the project title, project proponent, Consultants, the rationale of the project and the approach taken to the EIA study.

## **1.1 Project Background & Overview**

Rapid urbanization and population growth worldwide have significantly increased the demand for improved housing and urban services, particularly in developing countries. Pakistan is experiencing accelerated urban growth, driven largely by rural–urban migration in search of employment opportunities, education, and improved living standards. This growing urban population has placed considerable pressure on existing housing infrastructure, especially in major towns and tourist centers.

Murree, a well-known hill station and tourist destination, has witnessed a continuous increase in population due to tourism-related economic activities and migration. As an exurb of Islamabad and an administrative center of Murree, Murree holds strategic importance in the region. It is located within the Pir Panjal Range, approximately 60 km northeast of Islamabad and Rawalpindi, and forms part of the scenic Murree–Galyat region, renowned across South Asia for its natural beauty and greenery.

Historically developed during the British colonial period, Murree has evolved into one of Pakistan’s largest and most prominent resort towns. In recent years, surrounding areas such as Bhurban and Patriata (New Murree) have also developed rapidly, further increasing demand for planned residential facilities. As population pressure continues to rise, the need for well-designed, environmentally responsible residential developments has become critical.

In this context, Atlantis Murree (Residential Apartments) has been developed to meet the growing demand for quality housing in a planned and sustainable manner. The project contributes positively to organized urban development, improved living standards, and socio-economic growth of the area.

### **Regulatory Framework and Purpose of the EIA**

Under Section 12 of the Punjab Environmental Protection (Amendment) Act, 2012, it is mandatory for any project in Punjab to obtain Environmental Approval from the Environmental



Protection Agency Punjab by submitting an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA), in accordance with the Review of IEE/EIA Regulations, 2022.

To fulfill this statutory requirement, the project proponent engaged qualified environmental consultants, AC Services, to carry out the Environmental Impact Assessment of Atlantis Murree (Residential Apartments). The purpose of this EIA study is to establish the environmental baseline conditions, including physical, biological, and socio-economic aspects, and to assess potential impacts associated with the construction and operational phases of the project.

The study also identifies appropriate mitigation measures to eliminate or reduce potential impacts to acceptable levels and formulates a comprehensive Environmental Management Plan (EMP) to ensure environmentally responsible project implementation. This report has been prepared through a critical evaluation of environmental factors that may be affected by the project and provides the necessary information in the approved format to assist the competent authority in the environmental decision-making process.

Overall, this EIA serves as a basis for determining the significance of environmental impacts and demonstrates that Atlantis Murree (Commercial/Residential Apartment) is a compliant, sustainable, and environmentally responsible residential development

## **1.2 Identification of the Project and Proponent**

### **1.2.1 Nature of Project**

The Environmental Impact Assessment (EIA) report covers the development of a **residential building project, namely “Atlantis Murree (Commercial/Residential Apartment)”**. The project comprises a planned residential apartment complex designed to provide quality housing facilities in an environmentally responsible manner. The salient features of this project have been described in Chapter 5, and briefly in Executive Summary of EIA.

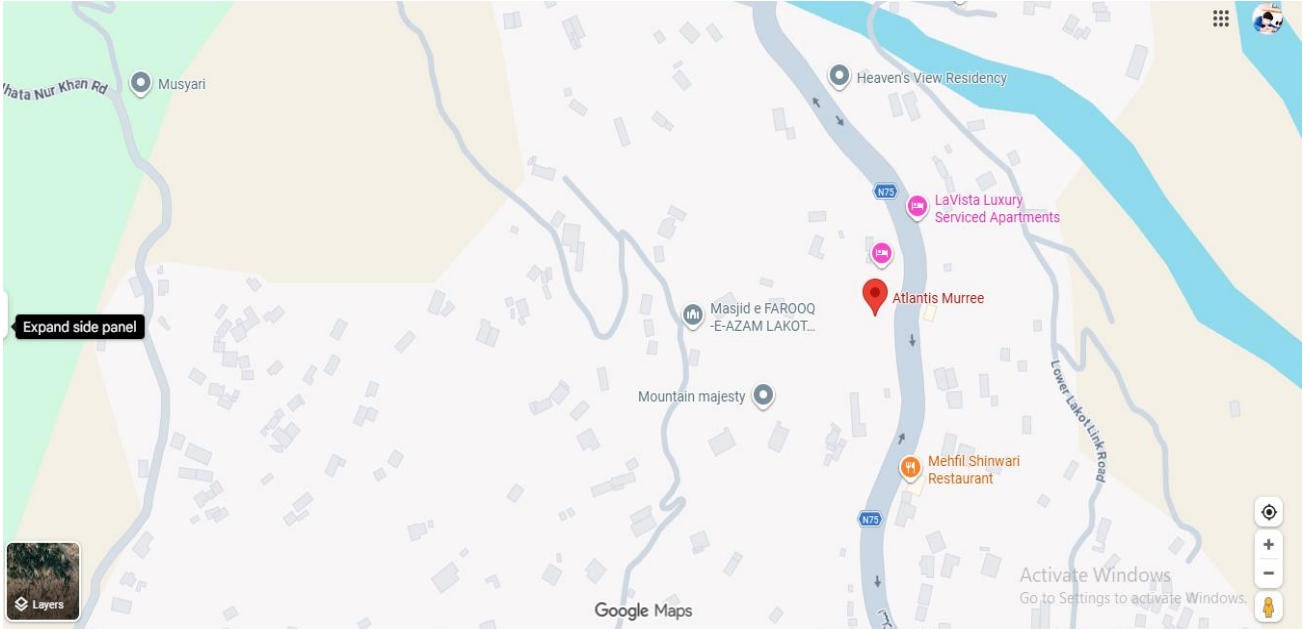
### **1.2.2 Area/Size of project**

Atlantis Murree (Commercial/Residential Apartment) consists of 3floors. Total plot area1-kanal.



### **1.2.3 Location of the Project**

Atlantis Murree (Commercial/Residential Apartment), at Mouza Lakot Expressway, Tehsil and District Murree. Coordinates of site are Latitude 33. 881938, Longitude 73. 39455.



**Figure 1: Location Map**

### **1.2.4 Proponent**

Mr. Muhammad Usman Hafeez s/o Muhammad Hafeez is the proponent of Atlantis Murree (Residential Apartment). Details of proponent are given in following table:

**Table 2: Details of Proponent**

<b><u>Proponent Details</u></b>	
<b><u>Name</u></b>	Mr. Muhammad Usman Hafeez
<b><u>Address</u></b>	House No.27, Street No.20, Sector B, Mohalla Phase 1, Islamabad
<b><u>Contact No</u></b>	(051) 6161116
<b><u>Email</u></b>	



### 1.2.5 Details of Consultants

For the preparation of the EIA Report of the said project, the proponent has hired the services of the environmental consultants; **Apex Environmental Solution and Services**. Team comprising of environmental engineers, chemical engineers, environmental experts and environmentalists has worked on this report. AES & Services is one of the pioneers Environmental Consultancy Companies in Pakistan with an unrivalled reputation for providing expert, tailored services and solutions. AE Services provides the environmental services, litigation and consultancy to clients both industry and government.

AES & Services is providing quality services in various environmental sectors i.e.

- Environmental Assessment Reports i.e. IEE/EIA
- Environment Management Plans (EMP)
- Designing of Emission Control Equipment
- Waste Water Treatment Plant (WWTP) Designing
- WWTP Construction Supervision, Commissioning and Operations
- Establishing Bottled Water Plant based on RO or UF
- Lab testing (Drinking Water & Waste Water Analysis , Soil Analysis, Sludge Testing, Petroleum/ Lube Oil Testing, Fertilizer Analysis, Pesticides in Water, Soil, Fertilizer, Coal, Coke Analysis) • Monitoring and inspection
- Environmental modeling

### Consultant Details

**Table 3: Details of Consultant Details**

<b><u>Consultant</u></b>	<u>Apex Environmental Solution and Services Pvt.</u>
<b><u>Address</u></b>	<u>Main Ali Town (Near Press Club) Adyala Road</u> <u>Rawalpindi</u>



Based on the requirements of the study, consultant formed a team of experts comprising a team leader (Environmental Specialist) with professional support from the Environmental Engineer, Environmental Scientists and chemical engineers. The professional staff was involved in analyzing the data, impact assessment and mitigation measures and report compilation. The following table lists the names of experts involved in the making of EIA report:

## **List of Experts**

### **Sr. # Name Qualification Role Engineers**

- **Dr. Malik Muhammad Akhtar**
- **Syed Zeeshan Haider MPhil ENVIRONMENTAL SCIENCE Report Preparation**
- **Muhammad ABBAS MPhil Chemistry Designing and report review**
- **Muhammad Waseem MPhil Chemistry**
- **Khatija MPhil Climate Change and Sustainable development**
- **Aftab Islam MPhil Chemistry**

### **1.3 Purpose of EIA**

The establishment/development/construction of any Project leads to positive and adverse changes in environmental and change in social settings of the Project Area. The intensity and level of change, however, depends upon the nature of the Project and the baseline environmental conditions of the area. The construction of said project will cause minor to moderate adverse environmental and social impacts on the surrounding area. Thus, an environmental and social study is mandatory to establish the baseline conditions, evaluate the possible adverse impacts if any, and devise the mitigation measures.

Section 12 of Pakistan Environmental Protection Act, 1997 (PEPA, 1997) states “No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an Initial Environmental Examination (IEE) and, where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained approval from the Provincial Agency in respect thereof.” Later on, Punjab Environmental Protection Agency (Review of IEE and EIA) Regulations, 2022 provided the guidelines for categorizing the Projects. According to



Schedule-II of PEPA (Review of IEE and EIA) Regulations, 2022; the construction of the said project falls under category I (2). i.e., the project requires an EIA study.

#### **1.4 Objectives of EIA**

**The main objectives of this EIA study were:**

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

#### **1.5 Approach & Methodology**

The following approach and methodology was adopted for carrying out the EIA study of the said project:

##### **1.5.1 Approach for EIA**

The approach for conducting EIA of said Project is to follow the requirement of Punjab Environmental Protection Act 1997, Initial Environmental Examination and Environmental Impact Assessment



Review Regulations 2022 and the guidelines provided in the Pakistan Environmental Assessment Procedures, 1997

### **1.5.2 Orientation**

Meetings and discussions were held among the members of the EIA Consulting Team. This activity was aimed at achieving a common ground of understanding of various issues of the study. Subsequent to the concept clarification and understanding, a detailed data acquisition plan was developed for the internal use of the EIA consulting team. The plan identified specific data requirements and their sources; determined time schedules and responsibilities for their collection; and indicated the logistics and facilitation needs for the execution of the data acquisition plan.

### **1.5.3 Desktop Studies**

Prior to mobilization, the consultants conducted a desktop study through collection and review of guidelines, data and reports related to the proposed project, that included (a) review of National and Provincial Environmental Legislations; (b) Google Earth Satellite Imagery; (c) and other relevant documents/drawings and design data provided by the Client.

### **1.5.4 Review of Environmental Laws and Institutional Requirements**

All applicable national and international laws, legislations, guidelines along with relevant international protocols were reviewed relevant to the said project components.

### **1.5.5 Delineation of Study Area / AOI**

For an EIA Study, a clear delineation of the Study Area / Area of Influence (AOI) is required. Study Area / AOI is the area within which the potentially significant impacts of the said Project activities (direct or indirect) are envisaged. In this report, the Study Area / AOI is the area where the Project impacts has been accessed on the environment due to the said Project activities. Based on the available Google Earth Imagery, Project footprints were overlaid on the existing Project Area Imagery. Utilizing the information collected through the detailed site visit, consultations with the locals and concerned departments and foreseen impacts of the said Project, a tentative AOI was delineated.



### **1.5.6 Survey of AOIs**

A team of Environmental Scientists, Environmental Engineers and Sociologist carried out the environmental and social survey of the AOI to familiarize themselves with the local conditions and the environmental settings. During the survey, the information regarding the topography, soils, surface water, groundwater, flora & fauna, social settings and major settlements along the AOI were observed.

### **1.5.7 Environmental Baseline Survey of the Project**

Detailed environmental and social survey was carried out within the AOI as mentioned above. For data collection, formal meetings were held and data collected through visual observations, interviews with the local residents and officials. In order to collect the relevant published information, government offices were also visited. Prior to the start of field activities comprehensive checklists, preforms and maps were developed to collect the information.

### **1.5.8 Stakeholder Consultations**

The Consultant identified Project stakeholders and held meetings with them during the surveys to receive feedback on the expected environmental issues related to the Project and suggested mitigation measures. Meetings were carried out with stakeholders to discuss the issues/constraints and get their views and feedback to mitigate the potential environmental as well as social impacts associated with the implementation and operation of the Project.

### **1.5.9 Screening of Potential Environmental Impacts and Mitigation Measures**

For the development of Atlantis Murree (Residential Apartment), a comprehensive environmental screening was conducted in line with established baseline conditions of the surrounding and Project Area. Potential physical, ecological, and socio-economic impacts associated with the project were carefully identified, evaluated, and quantified wherever applicable.

A structured and systematic assessment approach was adopted, utilizing secondary data, satellite imagery, environmental checklists, socioeconomic survey proformas, detailed field observations, and



consultations with local residents. This ensured that all relevant environmental and community considerations were thoroughly addressed.

The assessment concluded that the project is environmentally manageable, with impacts that can be effectively mitigated through the implementation of appropriate measures. Accordingly, practical and proactive mitigation strategies, along with a clear implementation framework, have been proposed to be integrated into the design and planning phase of Atlantis Murree (Residential Apartment). These measures will help enhance environmental sustainability, safeguard local ecology, and contribute positively to the socio-economic development of the area.

#### **1.5.10 Environmental Management Plan (EMP)**

An Environmental Management Plan (EMP) has been developed specifically for Atlantis Murree (Residential Apartment) to ensure effective environmental and social management throughout the project lifecycle. The EMP clearly defines the roles and responsibilities of the concerned parties for implementation, monitoring, and auditing, along with the required approvals and any additional studies, where necessary.

It outlines an appropriate organizational structure, monitoring mechanism, and a concise monitoring plan covering key environmental and social parameters with defined frequencies. The EMP also incorporates estimated costs for environmental monitoring and social mitigation measures, ensuring practical implementation. A structured system for environmental monitoring, evaluation, auditing, and reporting has been included to maintain compliance and promote sustainable development of the Atlantis Murree (Commercial/Residential Apartment) project.

#### **1.6 Structure of Report**

This EIA reviews information on existing environmental attributes of the Study Area. Geological, hydrological and ecological features, air quality, noise, water quality, soils, social and economic aspects and cultural resources are included. The report predicts the probable impacts on the environment due to the said project. This EIA also proposes various environmental management measures. Details of all background environmental quality, environmental impact/pollutant



generating activities, pollution sources, predicted environmental quality and related aspects have been provided in this report. The structure of the assessment report will be as follow:

- **Section 1 “Introduction”** briefly presents the project background, objectives, methodology and need of the EIA study.
- **Section 2 “Description of Project and Alternative”** furnishes information about the studied alternatives, location of the proposed project, cost and size of the project, its major components and alternatives considered for the proposed project to select at the preferred alternative for detailed environmental assessment.
- **Section 3 “Environmental Baseline”** describes physical, biological and socio-economic conditions prevalent in the project area.
- **Section 4 “Anticipated Environmental Impacts and Mitigation Measures”** identifies and evaluates impacts of the project activities during the construction and operation stages and recommends with the measures proposed to mitigate potential environmental impacts of the road project.
- **Section 5 “Environmental Management Plan”** outlines roles and responsibilities for the implementation of the proposed mitigation measures, training needs of the staff for implementation of the mitigation measures, monitoring requirements, monitoring cost etc.
- **Section 6 “Public Consultation”** identifies the main stakeholders and their concerns raised through scoping sessions, and deals with the measures to mitigate the social impacts.
- **Section 7 “Conclusion and Recommendations”** elaborates the conclusion of subject environmental study and suggests the recommendations to address the issues raised from proposed construction activities.



## **2. SCREENING**

According to the Section 12 of Punjab Environmental Protection Act, 1997 (amended 2017) which states;

*“No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be or where the project is likely to cause an adverse environmental effect an Environmental Impact Assessment (IEE) and has obtained from the Government Agency approval in respect thereof.”*

As per the statutory notification of Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 made under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), The project falls under *Schedule II, (List of projects requiring EIA), Category I(Urban Development and Tourism) and Sub category 2“Multistoried Buildings, Residential Apartments, Education Institutions, Restaurants and Hotels with Height More than 70ft and Area more than 2 Kanals”*.

For this instance, Environmental Impact Assessment of the Project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act, 2012 and IEE/EIA Regulations 20.



## **3. SCOPING**

### **3.1 Introduction**

The scoping identifies the key issues and impacts that should be further investigated. The Scoping defines the spatial and temporal boundaries, important issues and concerns raised during consultation and significant impact factors to be determined.

### **3.2 Objectives**

The key objectives of this scoping are to:

- Inform the public about the said project
- Identify main stakeholders and their concerns and values
- Define reasonable and practical alternatives to be addressed
- Focus the important issues and significant impacts to be addressed in the EIA report
- Define the boundaries in time, space and subject matter
- Set requirements for the collection of baseline and other information
- Establish the Terms of Reference (TOR's) for the EIA study

### **3.3 Spatial and Temporal Boundaries of Environmental Assessment**

The development of **Atlantis Murree (Commercial/Residential Apartment)** is expected to generate both local and national impacts, with overall positive outcomes. The project will contribute to economic growth by stimulating local investment, supporting the construction and service sectors, and creating employment opportunities for residents.

It will promote socio-economic uplift by increasing household incomes, encouraging positive social interaction, and improving living standards through enhanced residential and commercial facilities. Overall, Atlantis Murree (Commercial/Residential Apartment) will support sustainable urban development and contribute to the region's economic diversification

### **3.4 Important issues and concern raised during consultation**

During stakeholder consultations regarding the already constructed **Atlantis Murree (Commercial/Residential Apartment)**, it was observed that the majority of participants expressed support for the project. The following key concerns and suggestions were highlighted to ensure continued environmental compliance and community well-being:



- Effective control of air emissions and noise levels during operation.
- Preference for local residents in employment opportunities.
- Proper management of solid waste in accordance with standard municipal practices, ensuring no open dumping.
- Maintenance of cleanliness in and around the project area.
- Protection of workers' health and safety through strict implementation of HSE plans.
- Adoption of preventive measures to avoid any unfortunate incidents.
- Implementation of environmental enhancement measures such as tree plantation, regular monitoring, and safety arrangements.
- Proper management of all emissions and effluents to prevent public nuisance.
- Continued contribution of the proponent toward the betterment of the local community.

Overall, the feedback reflects community support while emphasizing the importance of responsible environmental and social management of the operational apartment project.

### **3.5 Significant impacts and factors to be determined**

**Main impacts and factors to be determined are;**

- Occupational Health and safety
- Site Security
- Traffic Management
- Community impacts
- Control Air emissions
- Job opportunities for locals
- Confined noisy activities
- Resource conservation
- Avoid excessive water consumption
- Energy efficient techniques must be adopted
- Proper site restoration after construction
- Tree plantation at designated green areas
- Emergency preparedness



## **4. ALTERNATIVES**

This chapter provides an analytical overview of the different alternatives that were considered during the planning of the **Atlantis Murree (Commercial/Residential Apartments)** project. The analysis has been carried out critically to justify the rationale and decisions behind the development of these residential apartments.

**The following alternatives considered during the conduct of the study are given as below:**

- No Project Option (NPO).
- Location/Site Alternatives, their selection and rejection criteria.
- Design/Technology alternatives, their selection and rejection criteria.
- Environmental Alternatives, their selection and rejection criteria.
- Economic Alternatives, their selection and rejection criteria.

### **4.1 No project Option**

The “do-nothing” scenario refers to a situation where **Atlantis Murree (Commercial/Residential Apartments)** had not been constructed. Under this scenario, the area would have continued in its existing state, without the economic and social benefits brought by the development. While no land acquisition or construction-related environmental impacts would have occurred, the region would have missed an opportunity to contribute to the objectives of **Sustainable Development Goal 11**, which aims to make cities and human settlements inclusive, safe, resilient, and sustainable.

Since the apartments are already constructed, the “with project” scenario demonstrates tangible benefits. The development has provided economic revitalization, improved infrastructure, and enhanced the social well-being of nearby communities. Any temporary environmental or social impacts during construction have now ceased, and the site has stabilized. Proper adherence to the **Environmental Management and Monitoring Plan (EMMP)** during construction ensured that adverse impacts were minimized and the surrounding environment returned to baseline conditions after completion

### **4.2 Site Alternatives**

No site alternatives were considered as the project is located in an area surrounded by cluster of residential apartment buildings, hotels and restaurants and tourism visiting facilities. The selected land is under the ownership of the owner without any dispute. There is no protected or environmentally sensitive area present in the vicinity. Moreover, the basic infrastructure facilities, i.e. metaled road network, proximity to electric



transmission system, manpower, project economic viability with reference to specific site, land use policies, further expansion possibilities, and etc. are available on-site.

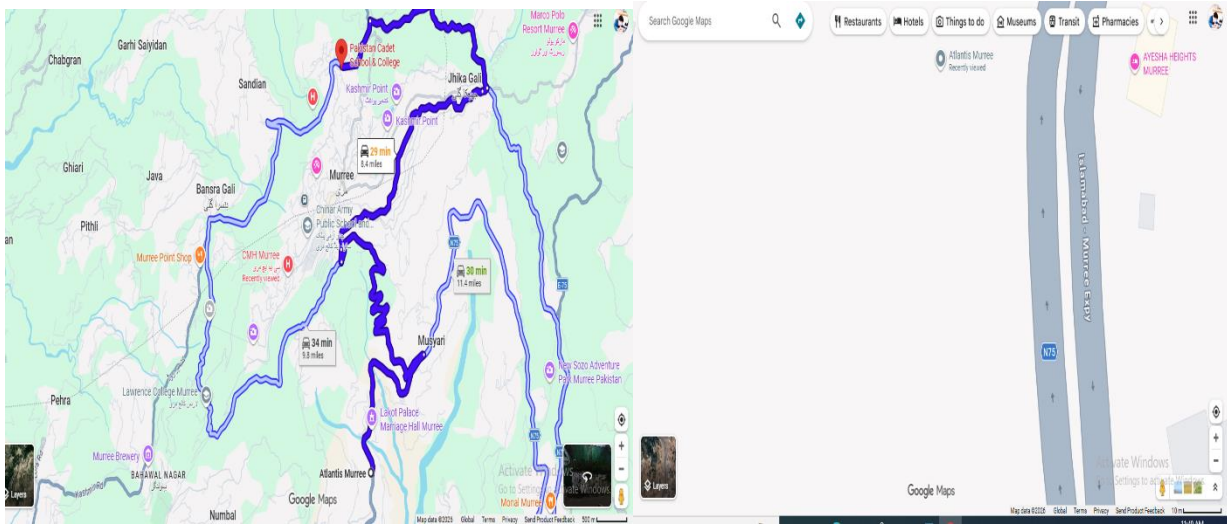
**Reasons of Site Selection**

The proponent has selected this site due to the following reasons:

- Selected site is owned by proponent
- Located on accessible road
- No ecologically sensitive or declared protected area within 10 km of the selected site Areal distances of site from nearest receptors are as follows:

**Table 4: Details of Site Project**

<u>Receptors</u>	<u>Name</u>	<u>Distances</u>
<u>Commercial/Residential</u> <u>Apartment name</u>	Atlantis Murree (Commercial/Residential apartment)	
<u>Educational institute</u>	Pakistan Cadet School & College Murree	10-km
<u>Hospital</u>	THQ Hospital	7-10 km
<u>Road</u>	Main Murree Expressway (N-75)	Adjacent



**Figure 2: Nearest Receptors**



# 5 DESCRIPTION OF THE PROJECT

## 5.1 General

This section covers the project comprehensively. It holds salient features; including location, project site layout, objectives, alternatives, cost and magnitude of operation and various phases.

## 5.2 Objectives of the Project

The primary objectives of the Atlantis Murree (Commercial/Residential Apartment) project are:

- **Provision of Modern Residential Facilities** – To offer high-quality living standards with modern amenities, including spacious apartments, lounge areas, terraces, and recreational facilities.
- **Improvement of Local Living Standards** – To introduce an improved lifestyle and living environment for residents in the area.
- **Employment Generation** – To create both skilled and unskilled employment opportunities for the local population during construction and ongoing use of the apartments.
- **Economic Development** – To contribute to local economic growth by supporting ancillary businesses and services such as cafes, maintenance, and supply of construction materials.
- **Sustainable Development** – To develop the project in compliance with environmental guidelines and sustainable construction practices, ensuring minimal impact on the surrounding environment.

## 5.3 Location & Site Layout of Project

Due to the growing population and the increasing demand for modern residential living standards, the need for new buildings with contemporary facilities has risen in recent years. The proponent has constructed the **Atlantis Murree (Commercial/Residential Apartments)** a two-story building, at **Mouza Lakot Expressway** in Tehsil Murree. This development addresses the demand for modern-style residential apartments and aims to provide better living standards. The project has been completed on land already owned by the proponent and incorporates design and construction features that meet applicable building standards, ensuring quality, comfort, and modern amenities for residents.



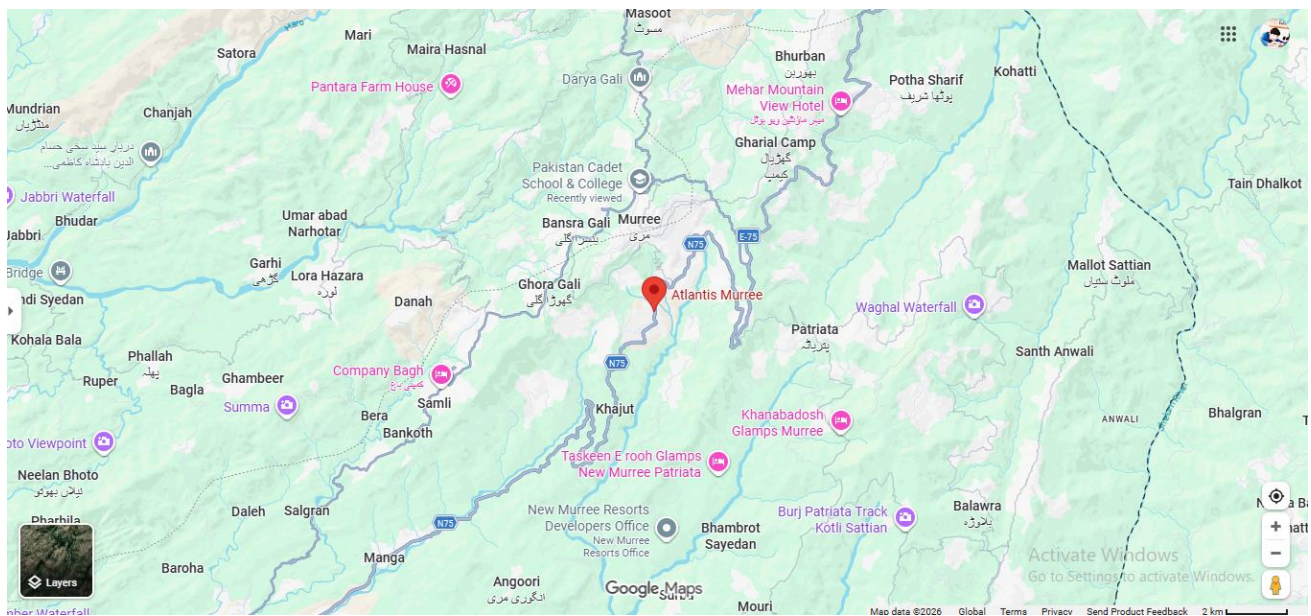
Atlantis Murree (Commercial/Residential Apartment), at Mouza Lakot Expressway, Tehsil and District Murree. Coordinates of site are 33. 8819 38 and 73. 394 55.

### **5.4 Government Approvals**

Project Proponent has accorded approvals/ certifications for their project from all relevant regulatory bodies successively. The land is totally owned by Atlantis Murree Owner. Approvals obtained from different departments have been annexed.

### **5.5 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 metaled road. The site is ideally located at easy access to mouza Lakot Expressway, District Murree. Accessibility map of the project area is provided in fig 3.



**Figure 3: Road Access**



## **5.6 Restoration and Rehabilitation Plan**

The **Atlantis Murree (Commercial/Residential Apartments)**, located at Mouza Lakot Expressway, have been fully constructed and are now in the operational phase. As part of environmental responsibility and compliance with sustainable development standards, residual areas associated with construction, such as temporary tracks, material storage zones, and excavation pits, have been restored or will be restored to their natural state to ensure minimal impact on the surrounding environment.

The restoration and rehabilitation measures undertaken include:

- Removal of all temporary construction structures and site installations used during the construction of **Atlantis Murree (Commercial/Residential Apartments)**.
- Proper disposal and clearing of all debris, leftover construction materials, and waste from the site.
- Removal of temporary fencing and gates, and backfilling of any excavation pits to restore the natural landform.
- Regrading the site to its original levels and contours using native soil, and re-vegetation of disturbed areas where necessary to re-establish natural greenery.
- Continuous monitoring to ensure that restored areas remain stable and integrated with the surrounding environment, minimizing any long-term environmental impact.

These measures ensure that the site complies with environmental regulations and demonstrates responsible post-construction rehabilitation, supporting approval from the Environmental Protection Agency (EPA).

## **5.7 Vegetation Features of Site**

Project site is situated within the low population area of Tehsil Murree. 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**.

## **5.8 Land Use**

The site of **Atlantis Murree (Commercial/Residential Apartments)**, located at Mouza Lakot Expressway, is fully owned by the proponent. The land has been developed for residential purposes. The project area was originally levelled and grassy prior to construction. All land ownership and legal documents are available and appended as **Annexure-I**.



The development of this site has transformed it from vacant land into a modern residential complex, contributing to local housing infrastructure while maintaining compliance with applicable land use regulations and planning standards.

### **5.9 Description of the Project**

Atlantis Murree (Commercial/Residential Apartment), project is a building comprising of Ground Floor and two Floor. Total plot area is 1-kanal.

**The project details have been summarized as under.**

**Table 5: Details of Project**

<b><u>Details of Project</u></b>	
<b><u>Project Title</u></b>	Atlantis Murree (Commercial/Residential Apartment),
<b><u>Location</u></b>	Mouza Lakot Expressway, Tehsil and District Murree
<b><u>Total Area of Plot</u></b>	1-kanal
<b><u>Total Number of Floor</u></b>	3(G+2)
<b><u>Facilities</u></b>	<b>Atlantis Murree (Commercial/Residential Apartments)</b> offer modern living with spacious apartments, 24/7 security, parking, and all basic utilities. The complex also provides landscaped areas, power backup, and recreational spaces for residents.
<b><u>Services</u></b>	<ul style="list-style-type: none"> <li>• <u>water supply system</u></li> <li>• <u>electricity network</u></li> <li>• <u>emergency generator</u></li> <li>• <u>cable TV</u></li> <li>• <u>security</u></li> <li>• <u>telecommunication</u></li> <li>• <u>sewerage treatment system and rainwater harvesting</u></li> </ul>

The project eye captivating design ensure to maximize space and boast interiors with abundant natural light. There is state of the art finishing making it a much more



pleasurable place. All the infrastructure facilities will be provided at the site as per the applicable national and international standards and codes.

Eco-friendly building features have been adopted in the design with the objective to ensure environmental sustainability. Some key eco-friendly aspects of project design include:

- Energy Efficient Lighting
- Maximum use of day light and natural ventilation rainwater harvesting system
- High-performance, double-glazed glass to reduce HVAC load dual flush system for toilets.

### **5.9.1 Utilities**

#### **5.9.1.1 ENERGY/ POWER SOURCE**

As mentioned earlier in this EIA report, the Atlantis Murree (Commercial/Residential) Apartments are fully constructed. There are no high energy-consuming industrial processes involved in the apartments; energy requirements are primarily for residential use, including lighting, appliances, and essential services.

Electricity for the apartments is supplied by the Water and Power Development Authority (WAPDA). It is estimated that around 10–15 kW of energy is required for regular operations, while full occupancy may require up to 40–50 kW to meet the needs of all residents efficiently.

#### **5.9.1.2 WATER REQUIREMENT**

Adequate underground water is available at the site of Atlantis Murree (Commercial/Residential Apartments) to meet the daily needs of all residents, and the water quality is satisfactory. This ensures that the site remains suitable for residential use without causing stress on local water resources.



It is estimated that around 1000 gallons of water per day are currently required during normal occupancy for domestic purposes, including sanitation and allied activities. The apartments do not involve any industrial or process water use, so effluent generation remains minimal. Most residents use the apartments seasonally, so actual water demand may fluctuate, increasing during peak occupancy periods. Water supply is managed efficiently through existing pipelines and pumps, ensuring reliable availability for all residents.

### **5.9.1.3 SOLID WASTE**

The Atlantis Murree (Commercial/Residential Apartments) have an integrated solid waste management system as part of their design. During full occupancy, approximately 10–20 kg per day of solid waste is generated from residential activities.

All solid waste is segregated at the point of generation. Recyclable materials, including plastics, metals, paper, glass, and rags, are collected and sent to the market for recycling, while the remaining waste is disposed of at designated solid waste disposal sites.

A comprehensive waste management system is already in place, operated by the Rawalpindi Waste Management Company (RWMC), with modern equipment and operational procedures. All municipal waste generated by the apartments is collected regularly by RWMC. Additionally, a contractor is employed to transport waste from the site to a central collection point for proper disposal.

### **5.9.1.4 Fire Safety provisions/arrangements for the project**

The Firefighting System is designed in accordance with National Fire Protection Association (NFPA) standards and requirements. The Fire Suppression Systems provided for the project are as follows:

- Standpipe and Hose System according to NFPA-14
- Automatic Sprinkler System according to NFPA-13
- Portable Extinguisher according to NFPA-10
- Fire Fighting pumps according to NFPA-20



## **5.9.2 Details of Construction Activities**

The Atlantis Murree (Commercial/Residential Apartments) have already been constructed using modern building techniques and materials.

### **5.9.2.1 Site Preparation**

The site of **Atlantis Murree (Commercial/Residential Apartments)** was originally flat and cleared of shrubs before construction. All site preparation activities, including leveling and excavation, have already been completed in accordance with the approved structural and architectural plans.

### **5.9.2.2 Building Construction**

The construction of **Atlantis Murree (Commercial/Residential Apartments)** has been fully completed. During construction, the following civil activities were carried out in accordance with approved designs and standards:

- Excavation and laying of foundations
- Masonry work for walls and structural components
- Concrete work for slabs, beams, and columns
- Finishing works including plastering, painting, and surface treatments
- Construction of paved areas and internal road

### **5.9.2.3 Contractor's Arrangements**

The construction of **Atlantis Murree (Commercial/Residential Apartments)** was carried out by a qualified and experienced contractor with expertise in modern and high-quality residential projects. All construction activities were executed according to approved standards and specifications, ensuring a state-of-the-art residential complex.

### **5.9.2.4 Construction Camps**

During the construction of **Atlantis Murree (Commercial/Residential Apartments)**, temporary camp sites were established in suitable areas with adequate space for machinery parking, material storage, and workshops. Locations were selected to ensure accessibility to local markets and communication facilities, while maintaining a safe distance from sensitive areas. All arrangements were approved and supervised by the site engineer and project management, ensuring safe and organized construction operations



#### **5.9.2.5 Work Force**

The construction of **Atlantis Murree (Commercial/Residential Apartments)** involved a workforce comprising professional, technical, skilled, semi-skilled, and unskilled labor. During construction, the number of personnel varied according to the contractor's schedule and project requirements. Priority was given to hiring skilled and unskilled labor from local communities to support employment opportunities and ensure efficient project execution.

#### **5.9.2.6 Construction material**

The construction of **Atlantis Murree (Commercial/Residential Apartments)** utilized materials such as coarse aggregates (crushed stone), fine aggregates (sand), soil, water, asphalt, reinforcement, and cement. Almost all of these materials were locally sourced and procured from nearby suppliers, ensuring availability, quality, and support to the local economy.

### **5.10 COST AND MAGNITUDE OF THE PROJECT**

The total estimated cost of the **Atlantis Murree (Commercial/Residential Apartments)** project was approximately PKR 80 million. The scale of the project included the following major activities, all of which have been completed:

- Detailed site survey, planning, and demarcation of different areas within the project site
- Boundary marking and plotting of the land
- Construction of pavements and internal roads
- Installation of sewerage system along with provision of basic facilities such as electricity, telephone, and parking
- Excavation and laying of foundations, followed by structural erection
- Civil construction work for the apartment buildings
- Plantation of various ecologically important species in designated green areas

The project has successfully transformed the site into a modern, fully operational residential complex with all required infrastructure and amenities.

### **5.11 SCHEDULE OF IMPLEMENTATION**

The construction of **Atlantis Murree (Commercial/Residential Apartments)** was completed successfully within a period of approximately 12 months. All planned activities, including site preparation, civil works, and installation of utilities, were carried out according to the approved schedule, and the apartments are now fully occupied.



**Table 6: Details of Schedule of implementation**

Sr. #	Activities	6 Months			6 Months		
		2M	2M	2M	2M	2M	2M
1	Site survey, planning and boundary markings						
2	Work on pavements and sewerage system laying						
3	Laying of foundations excavation						
4	commencement of erection work						
5	Construction work						



## **6. ENVIRONMENTAL AND SOCIAL BASELINE**

### **6.1 General**

This section covenants with the prevailing environmental conditions of the project area. Information that has been collected from different sources, including public literature, reports of other studies conducted in this area, knowledge with concerned government departments and the first-hand surveys and field measurements has been presented in this section. This chapter encompasses all the important aspects of local environment; such as biological resources, socioeconomic development and quality of living values.

A Social survey in the Project Area was also carried out through consultation with the various communities. Local residents living in the Project Area were interviewed to obtain their feedback regarding Project and its impacts on their daily life/future in the short and long term.

### **6.2 Purpose of Baseline**

**Atlantis Murree (Commercial/Residential Apartments)**, assessing the prevailing environmental conditions was essential prior to construction. Identification of the physical, ecological, and social aspects of the site, along with the collection of relevant data, was carried out to evaluate potential impacts and ensure the implementation of adequate mitigation measures. This baseline assessment provided the foundation for executing the project in a manner consistent with the environmental and social conditions of the study area, ensuring sustainable development and minimal adverse effects.

### **6.3 Study Area/ AOI**

The Atlantis Murree (Commercial/Residential Apartments) have been successfully constructed, providing modern residential facilities in the area. The Study Area encompasses not only the project site but also surrounding land, including nearby residential settlements, agricultural fields, and other adjacent areas, highlighting the broader positive impact of the development.



Assessment of both direct and indirect effects indicates that the project has been implemented in a manner that minimizes any negative environmental or social impacts. The development has enhanced the local infrastructure, improved housing standards, and supported sustainable land use, ensuring that the project benefits the surrounding environment and communities while meeting all regulatory requirements.

## **6.4 Physical Environment**

This part examines the physical resources such as topography, soil, climate, surface and ground water resources and quality, ambient air quality and noise of the Project site to assess whether the project under assessment can or does have any impacts on any of these parameters. The description of physical environment of project site is presented in the following sub sections.

### **6.4.1 Geographical Location**

The **Atlantis Murree (Commercial/Residential Apartments)** are located at Mouza Lakot Expressway, Tehsil & District Murree. The site lies within the administrative boundaries of Murree, Rawalpindi District, which is situated between **33° 4' to 34° 1' North latitudes** and **72° 38' to 73° 37' East longitudes**.

Rawalpindi District is bordered to the north by Islamabad Capital Territory, Abbottabad, and Haripur districts of Khyber Pakhtunkhwa (KP); to the south by Chakwal and Jhelum districts; to the west by Attock District; and to the east by the River Jhelum, beyond which lie Bagh, Rawalakot, and Kotli districts of Azad Kashmir.

The specific coordinates of the **Atlantis Murree (Commercial/Residential Apartments)** are **Latitude 33.8819 N and Longitude 73.39455 E**. The project's location is ideal for residential development, offering accessibility, scenic surroundings, and proximity to essential services, while complying with local land use and planning regulations.





**Figure 4: Location Map of District**

### **6.4.2 Topography**

Rawalpindi district is divided into 3 distinct portions:

- Mountainous region: This contains the hills of Murree, the northern portion of Kahuta, and Kotli Sattian Hills
- The Piedmont Plains or the sub-montane areas of Rawalpindi: These extend up to Kahuta and the west bank of River Jhelum, then down into Gujar Khan Town till it reaches the borders of Jhelum district
- Plains or Potowar: The plains include the area of Rawalpindi Town on the southwest of Murree, and the entire Gujar Khan Town except its hilly areas on the bank of Jhelum and the southeastern portion of Kahuta town

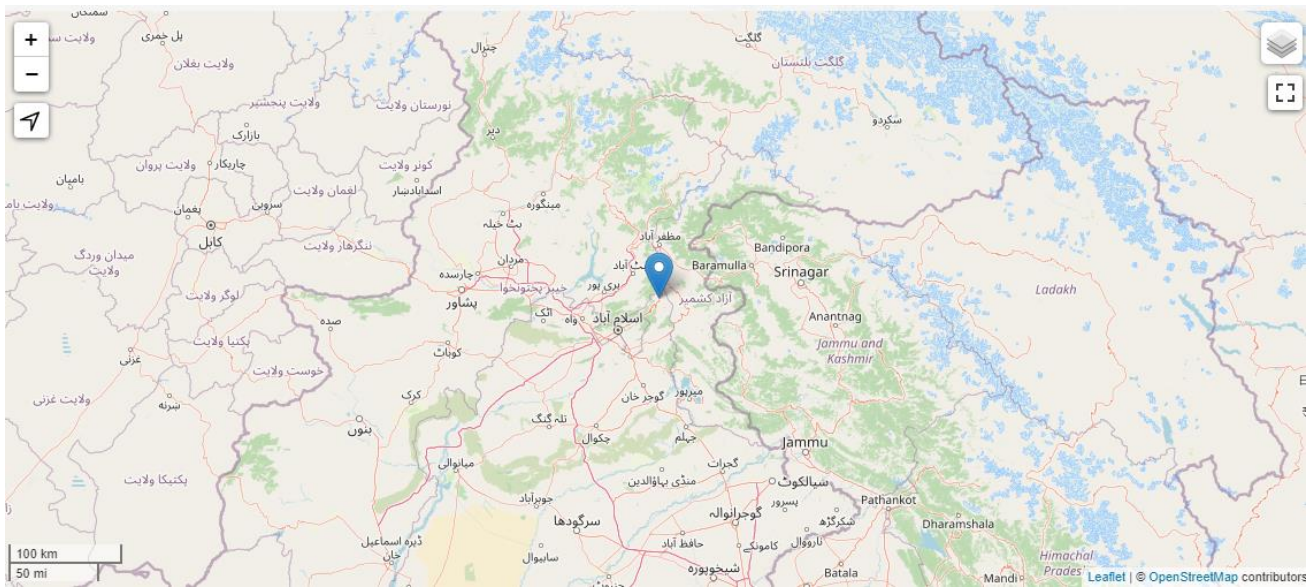
The hills of Murree and Kahuta consist of a series of spurs which also include the Margalla Range (Islamabad district). These hills gradually end in the low Bagham hills in Gujar Khan Town and are a part of the outer Himalayas, gradually falling in height from the peaks of Kashmir in the north to Bagham hills in the south. The Murree and Kahuta hills consist of 5 main spurs that are more or less parallel to each other,

running sharply down to Jhelum River. These 5 spurs are Murree, Charihan, Paphundi or Patriata, Kotli, and Utrina.

The Murree spur is the highest spur, forming the outer part of the Himalayas, and houses the Murree city at a height of 2,286 m. various streams run westward into the Plains from these hills. Parallel to the Murree spur is the Charihan spur, which is a few hundred meters lower in height than Murree Hills. The next spur is the Paphundi or Patriata spur, which is at a height of about 2,134 m above mean sea level. The Soan River flows through this spur and its top runs down northeastward spreading in a continuous lofty crest for about 24 km up to Jhelum River. The Kotli spur lies to the east of the Patriata spur. It rises to its highest point (1,856 m or 6,090 feet) in the south, in Kahuta town, in the plateau of the Narar Mountains. The last spur, the Utrina spur, is lower than the others; its highest point is 1,158 m (3,800 feet). This spur forms the boundary between the mountainous and hilly portions of Kahuta town.

#### **6.4.3 Seismicity**

The district belongs to Zone 3 of the Seismic Zone Map of Pakistan. This means moderate to severe damage to property due to earthquakes.



**Figure 5: Seismic Zoning**



#### **6.4.4 Soils**

Clay soils in the district exhibit 5 distinct strata. They are (from south to north):

- Coarse pebbles with sand or clay
- An alluvial stratum deposited by an older river system in the Soan Basin
- Alluvial deposits of the present river system
- An airborne top layer of silt or clay (loess)
- Conglomerate and loose gravel deposits.

#### **6.4.5 Climate**

Rawalpindi features a humid subtropical climate, with long and very hot summers, a Monsoon, and short, mild, wet winters. There is a wide variation of climate among various parts of the district. The Murree and Kotli Sattian towns have severe winter and mild summers, while Gujar Khan, Rawalpindi, and Taxila towns have a hot summer and relatively mild winters.

In the Potohar region of the district, the summers are hot and winters are quite cold. June is the hottest month, when the mean maximum temperature reaches 39 °C, while the mean minimum temperature during winter goes down to between 0 to -1 °C.

There are 2 rainy spells in the district, one of which is the Monsoon, which begins in July and ends in September. There are far more rains in the eastern part of the district than the western, and rain falls on one side of Margalla Hills but not on the other. The other rainy season starts in January and lasts till the beginning of March.

In Murree, the average rainfall is about 1,142 mm, with about 140 rainy days in a year. In the Plains, the mean average annual rainfall is about 913 mm.



## Temperature

The project area has hot summer and cold winters. In Murree, the mean maximum temperature ranges from 10.2 °C to 28.6 °C and the mean minimum temperature ranges from -2 °C to 1.1 °C (July, 2020 to June 2021). **Table 7** shows the mean maximum average temperature and mean minimum average temperature from April, 2020 to March, 2021 respectively.

**Table 7: Month-wise Mean Min. & Max. Temperature (°C)**

<u>Mean Temp.</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<u>Min.</u>	<u>-1.6</u>	<u>0.3</u>	<u>4.1</u>	<u>8.8</u>	<u>13.1</u>	<u>16.7</u>	<u>18.7</u>	<u>18.1</u>	<u>14.7</u>	<u>9.2</u>	<u>4.3</u>	<u>0.2</u>
<u>Max.</u>	<u>10.9</u>	<u>12.3</u>	<u>17</u>	<u>22.1</u>	<u>26.8</u>	<u>28.6</u>	<u>26.6</u>	<u>25.8</u>	<u>24.8</u>	<u>22</u>	<u>17.5</u>	<u>13.8</u>

*Source: [www.Climatdata.Org](http://www.Climatdata.Org)*

## Humidity

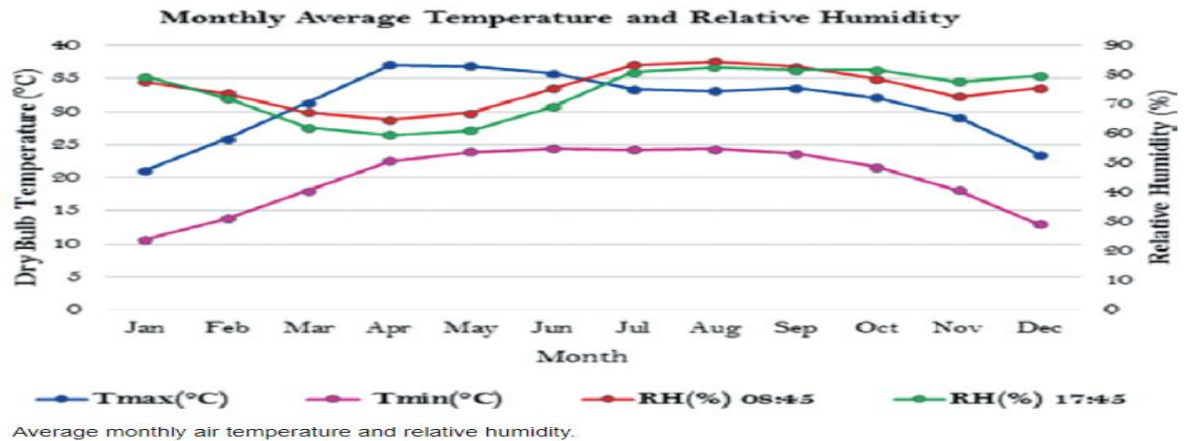
The humidity variation in the year 2021 from January to July in project area ranges from 45% to 75%. Month-wise relative humidity values are shown in Table 8.

**Table 8: Month-wise Relative Humidity**

<u>RH (%)</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Se p</u>	<u>Oct</u>	<u>No v</u>	<u>De c</u>	<u>Ann.</u>
	<u>62</u>	<u>64</u>	<u>61</u>	<u>57</u>	<u>50</u>	<u>56</u>	<u>78</u>	<u>82</u>	<u>73</u>	<u>61</u>	<u>60</u>	<u>60</u>	<u>61</u>

*Source: [Climatedata.org](http://Climatedata.org), 2021 (Website).*





**Figure 6: Month-wise Relative Humidity**

Climate in region is warm and temperate. When compared with winter, the summers have much more rainfall. The rainfalls mainly occurred during the months of July, which is commonly known as monsoon month. The wettest month (with the highest rainfall) is July (251mm). The driest month (with the lowest rainfall) is November (44mm). Month-wise total rainfall is presented in table 9.

**Table 9: Month-wise Total Rainfall (mm)**

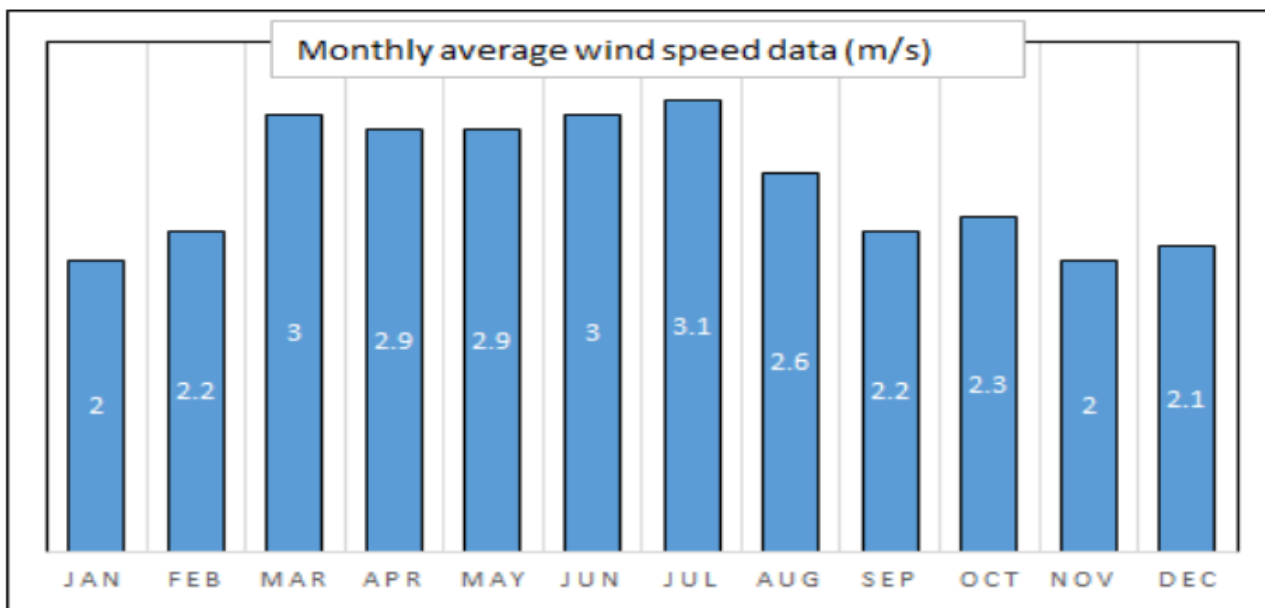
<u>Rainfall</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Se</u>	<u>Oct</u>	<u>No</u>	<u>De</u>	<u>Ann.</u>
	<u>11</u>	<u>189</u>	<u>208</u>	<u>15</u>	<u>92</u>	<u>118</u>	<u>25</u>	<u>220</u>	<u>11</u>	<u>48</u>	<u>44</u>	<u>69</u>	<u>941</u>
	<u>1</u>			<u>5</u>			<u>1</u>		<u>1</u>				

*Source: Climatedata.org 2021 (website).*

**Wind Direction**

The predominant wind direction is from South-West (SW) to North-East (NE) directions. The average and maximum wind speed for District Rawalpindi is indicated





**Figure 7. Average and Maximum Wind Speed:**

## **6.5 Biological Environment**

### **6.5.1 Flora**

The district is rich in flora. In the upper reaches of Murree Hills, the most common flora is deodar (*Cedrus deodara*), spruce (*Picea*), chir (*Pinus roxburghii*), fir (*Abies balsamea*), blue pine (*Pinus walliciana*), biar (*Pinus excels*), paludar (*Abiess mithiana*), barangi or Mexican oak (*Quercus crassifolia*), amaltas (*Cassia fistula*), kamila or kum kum tree (*Mallotus philippenesis*), dhavi or fire flame bush (*Woodfordia floribunda*), and banakrot or horse chestnut (*Aesculus indica*).

Shrubs in Murree Hills include sanatha (*Dodonea viscosa*), granda or bush plum (*Carissa spinarum*), bhaikar or malabar nut (*Adhatoda vasica*), kahu or wild olives (*Olea cuspidate*), and phulai (*Acacia modesta*).

Some of the grasses in Murree Hills include khabal (*Cynodon dactylon*), kanhi (*Saacharum spontaneum*), lamb (*Aristida depressa*), and dab (*Desmostachya bipinnata*).

In the lower hills, the most common flora is phulai (*Acacia modesta*), Kao (*Olea ferruginea*), chestnut (*Aesculusindica*), juniper (juniperous), walnut (*juglans*), oak (*Quercus*), maple (*acer*), poplar (*populus*), wild olives (*Olea*), chir (*Pinus roxburghii*), drek (*Melia semper virans*), and sanatha (*Dodonaea viscosa*).

In the Plains, the most common trees are shisham (*Dalbergio sissoo*), toot (*Morus alba*), drek (*Melia semper virens*), phulai (*Acacia modesta*), ber (*Zizyphus jujube*), pipal (*Ficus religosa*), kikar (*Acacia Arabica*), lasura (*Cordiamyxa*), shamshad or boxwood (*Buxus wallichiana*), puran or punna (*Ehretia serrate*), sohanjna or horse radish (*Moringa pterygosperma*), amla (*Phyllunthus emblica*), kakar singhi or zebrawood (*Pistacia integerrima bunge*), kali mirch or pepper tree (*Schinus molle Linn*), and kain (*Ulmus wallichiana*).

Some of the herbs and shrubs of the district include puthkanda (*Achyranthes aspera Linn*), cholai (*Amaranthus Viridis L.*), bathu (*Chenopodium album L.*), saunf (*Fomecal vulgaris L.*), dhamini buti (*Malvestrum coromendelianum Garcke*), wild olives (*Olea cuspidate*), piaz grass (*Asphoddelus tenuifolium*), jangli jal grass (*Avena Fatua L.*), rose (*Rosa indica*), datura or thorn apple (*Datura inoxia*), kainch mainch or night shade (*Solanum nigrum*), and bhakra or puncture vine (*Tribulus terrestris*).

### **6.5.2 Fauna**

Common mammalian fauna of the district includes rhesus monkeys, flying squirrel, foxes, jackals, wolves, bears, fox, wild boars, barking deer, wild goats, hare, Punjab ural, chinkara, axis deer, hog deer, nil gai, Mediterranean pygmy shrews, Holston's long-tailed hamster, pygmy jerboa, desert bat, snow leopards, and small Indian mongoose.

The reptilian and amphibian fauna include frogs/ toads, tortoises, 6 or 7 types of lizards, beaked thread snake, Brahminy blind snake, and the saw-scaled viper.

A large number of migratory birds visit the district, some of which include grey and black partridges (rare), various types of ducks and geese, quails, Indian tree-pie, white-backed vulture, common myna, little green bee-eater, 2 types of doves, parakeet, black



drongo, fantail flycatcher, purple sunbird, Indian robin, spotted owlet, common babbler, common pariah kite, pond heron, black-winged kite, hoopoe, grey hornbill, yellow-billed magpie, common kingfishers, pied kingfishers, white-headed duck, and chakor.

### **6.5.3 Protected areas / National Sanctuaries**

Protected wildlife areas of Rawalpindi district include:

- Murree-Kahuta-Kotli Sattian National Park; Rawalpindi district
- Kathar Game Reserve; Rawalpindi district
- Loi Bher RF Game Reserve and Wildlife Park; Rawalpindi district
- Murree Wildlife Park; Rawalpindi district
- Bhurban Wildlife Breeding Center; Rawalpindi district
- Lawrencepur Wildlife Breeding Center; Rawalpindi district
- Rawat Wildlife Breeding Center; Rawalpindi district
- Margalla Hills National Park; Rawalpindi district

There is no wildlife sanctuary or game reserve or any other protected area within the project area.

### **6.6 Socioeconomic Baseline**

This section outlines the results of the social assessment, through primary and secondary data, and other studies, with information and/or data disaggregated by gender, vulnerability, and other social groupings, including:

- a. Define, identify, and enumerate the people and communities to be intervened by the proposed development interventions; describe the likely impacts on the people and communities taking social, cultural, and economic parameters into account.
- b. Discuss the project's impacts on the poor, indigenous and/or ethnic minorities (if any), and other vulnerable groups; and



- c. Identify gender and resettlement impacts (if any), and the socioeconomic situation, impacts, needs, and priorities of women.

#### **6.6.1 Reconnaissance Field visit**

A reconnaissance visit to the project, before conducting detailed survey was conducted by the consultant, that helped in collection of necessary data/information for primary assessment through consultations with project stakeholders including project beneficiaries and project affected persons.

#### **6.6.2 Data Collection and Field Survey**

For the Atlantis Murree Residential Apartments, a comprehensive field survey and investigation were conducted to assess the existing socio-economic conditions of the area and to understand the positive impacts resulting from the project. The social study focused on local residents, beneficiaries, and relevant stakeholders, gathering their views and feedback on how the project has enhanced living standards, improved infrastructure, and contributed to local employment opportunities.

The survey confirmed that the project has brought tangible social and economic benefits to the surrounding communities, and any potential concerns were identified and addressed through effective mitigation measures and responsible project management.

#### **6.6.3 Community/Stakeholders' Participation**

During the development of the **Atlantis Murree (Commercial/Residential Apartments)**, consultations were held with local stakeholders, beneficiaries, and nearby communities to ensure their active participation in the project's planning and execution. Feedback and suggestions from these consultations were considered and incorporated to enhance the project's design, services, and benefits.

These interactions helped strengthen the engagement and support of local residents, public representatives, government officials, and professional groups, ensuring that the project



aligns with community needs and contributes positively to the social and economic well-being of the surrounding area.

#### **6.6.4 Population**

Population According to census 2017 total population of district is 5,405,633. Average annual growth rate is 2.52

#### **6.6.5 Religion**

The main religious groups in the area are Muslims and Christians. The population of the surveyed settlement is predominately Muslims

#### **6.6.6 Language**

Punjabi is the most common language spoken by majority of population in the area. Urdu is spoken as secondary language.

**Table 10: Language Distribution**

<u>Urdu</u>	<u>7.4%</u>
<u>Punjabi</u>	<u>83.8%</u>
<u>Sindhi</u>	<u>Negligible</u>

<u>Pushto</u>	<u>5.3%</u>
<u>Balochi</u>	<u>Negligible</u>
<u>Siraiki</u>	<u>0.4%</u>
<u>Others</u>	<u>2.8%</u>

#### **6.6.7 Agriculture**

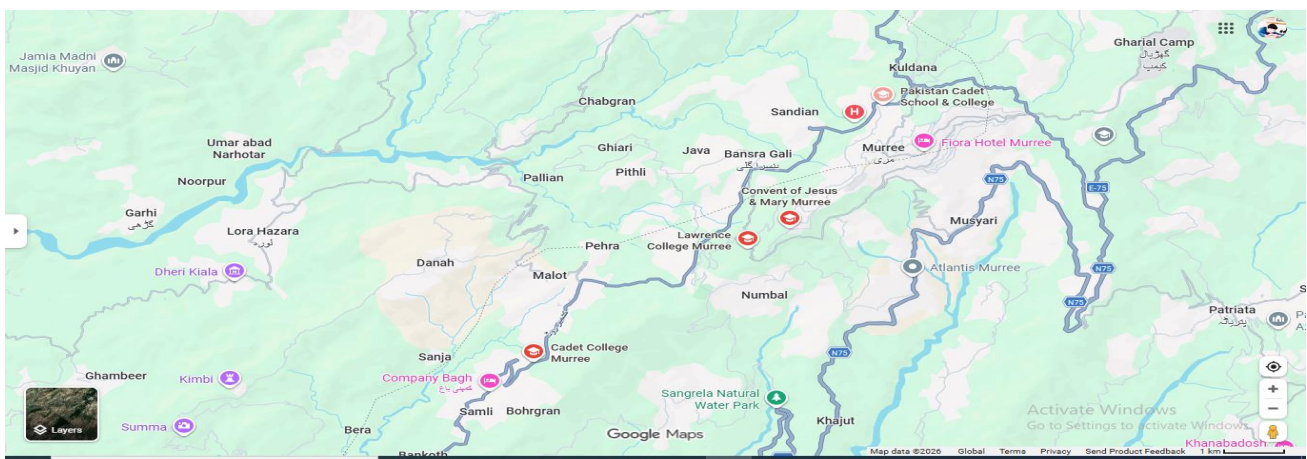
- Rawalpindi district belongs to the High Rainfall area of Pakistan and hence agriculture is dependent upon rainfall.



- The crops of the district include wheat, maize, jowar, groundnut, bajra, moong, maash, masoor, gram, guar seed, sunflower, rapeseed & mustard, barley, sesanum, sugarbeet, linseed, sunn hemp, castor seed, and walnut.
- Fruits grown in the area include apple, citrus, guavas, mangoes, peaches, pears, apricot, bananas, loquat, ber, mulberry, watermelon, musk melon, plums, strawberries, and raspberries.
- Vegetable produce of the area includes potatoes, onions, okra, bottle gourd, brinjal, turnip, carrot, cauliflower, peas, tomatoes, chilies, garlic, tinda, and radish.

### **6.6.8 Educational Facilities**

Figure 8 Represent Educational Institutes present in site project.



**Figure 8: Education Institutes in Project Area**

### **6.6.9 Health Facilities**

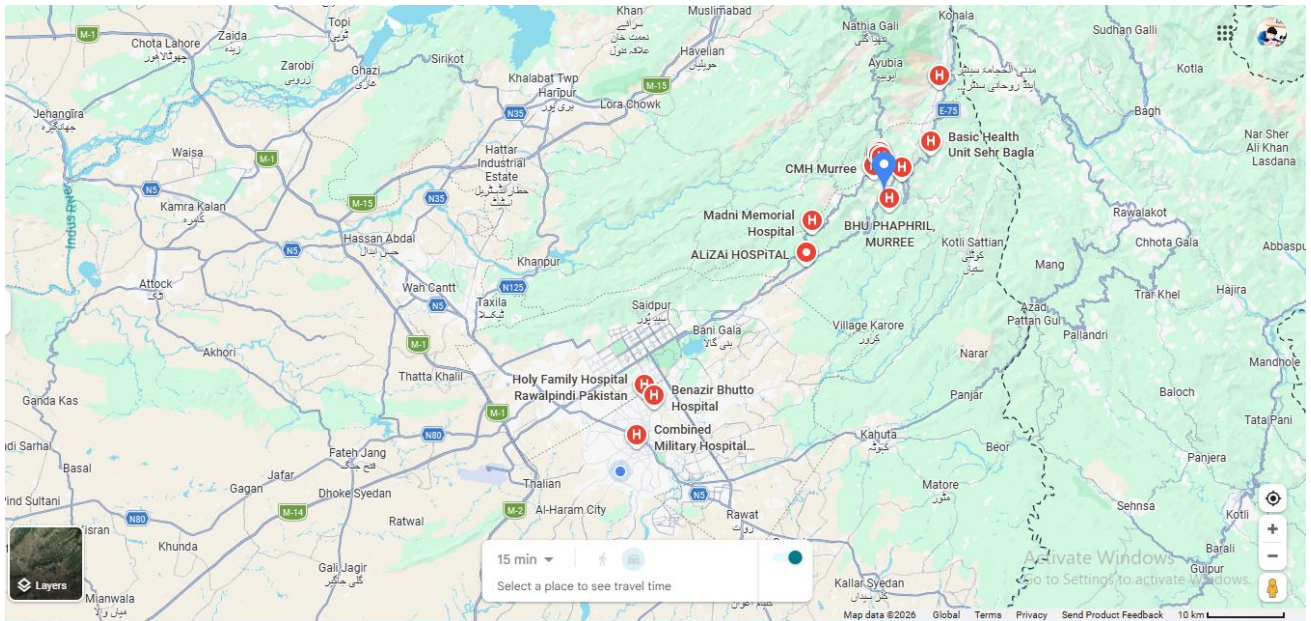
For the residents of Atlantis Murree (Commercial/Residential Apartments), health services are accessible through the Tehsil Headquarters (THQ) Hospital, Murree, which provides comprehensive medical care to the local population. The hospital is supported by doctors, paramedics, technicians, and other support staff, ensuring availability of essential health services for residents.



The presence of THQ Hospital Murree ensures that the apartment community has timely access to healthcare facilities, enhancing the overall safety and well-being of the residents.

### **Health facilities in District**

Health Facilities in Project Area are given in fig 9.



**Figure 9: Health Facilities in Project Area**

### **6.7 Lab Reports of Environmental Analysis**

Water and Air quality was tested by Punjab EPA certified laboratory. Grab sampling was conducted at existing water bores, which are being used by the community. The parameters were analyzed against Punjab Environmental Quality Standards (PEQS). Lab reports are annexed as Annexure IV

### **6.8 Site Suitability**

#### **Wetlands**

There are no wetlands in the project area.



## **Endangered Species**

There are no endangered species of flora and fauna in the project area.

## **Wildlife Sanctuaries and Game Reserves**

No wildlife sanctuary or game reserves are located in the vicinity of the project area. **Critical Habitats**

No wildlife sanctuary or game reserve (Critical Habitats) exists in the project area.



## **7. IMPACT ASSESSMENT**

### **7.1 General**

This section discusses the environmental considerations related to the Atlantis Murree (Commercial/Residential Apartments), including the methodologies used for identifying impacts and assessing their characteristics such as nature, magnitude, extent, timing, duration, reversibility, and risk.

Since the apartments are already constructed, the assessment focuses on the positive and managed impacts on environmental receptors within and around the project area. The evaluation highlights how construction practices have complied with environmental standards and mitigated potential adverse effects, ensuring that the project contributes positively to the surrounding environment and community.

### **7.2 Impact Identification and Characterization**

The identification of impacts is done on the basis of literature review, site surveys and expert opinion on prevailing site conditions and sensitive receptors. Characterization is done on the basis of significance, probability and prevalence of the potential impacts in the surrounding environment.

### **7.3 Significance Rating**

The overall significance of the impacts is defined based on the result of a combination of the consequence rating and the probability rating. Each identified impact is analyzed in terms of magnitude, extent, duration, and probability of occurrence, the value of the affected environment and likely degree of recovery of the affected area.

**Table 11: Impact Characterization**

<u>✓ Nature</u>	<u>(direct/indirect)</u>
<u>✓ Duration of impact</u>	<u>(short term, medium term, long term)</u>
<u>✓ Geographical extent</u>	<u>(local, regional)</u>
<u>✓ Timing</u>	<u>(project phase: before, during and after construction)</u>



✓ <u>Reversibility of impact</u>	<u>(reversible/irreversible)</u>
✓ <u>Likelihood of the impact</u>	<u>(certain, likely, unlikely, rare)</u>
✓ <u>Impact consequence severity</u>	<u>(severe, moderate, mild).</u>
✓ <u>Impact significance</u>	<u>(High, medium, low)</u>

**Table 12: Impacts Matrix**

Environmental component Project Component	PHYSICAL ENVIRONMENT										BIOLOGICAL ENVIRONMENT										SOCIAL ENVIRONMENT	
	Climat	Geolog	Seismicit	Soils contaminatio	Land use	Surface Water	Groundwater	Air Quality	Slope Failure	Noise	Aquatic Ecosystem	Wetland Ecosystem	Trees	animals & Endangered Species (Plant	Migratory Species	Birds and Animals	Plants	Wildlife	Disposal	Public/Workers Health	Employment	
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
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
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
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

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



## **8. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURE**

### **8.1 GENERAL**

This Chapter identifies the potential impacts (positive and adverse) on the physical, biological and socio-economic environment of project area due to said project. It also identifies measures that will help to mitigate the adverse environmental and social impacts (if any) and it will enhance positive impacts of the project. Impacts are assessed by analyzing their magnitude and sensitivity, which is a legal requirement

### **8.2 Anticipated Impacts of Project**

Subsequent to the characterization, appropriate mitigation measures were identified, in order to minimize, if not completely eliminate, the adverse impacts associated with project activities. The impact characterization of the predicted impacts and mitigation measures are discussed below:

#### **8.2.1 Impacts due to Project Location**

The location of **Atlantis Murree (Commercial/Residential Apartments)** provides scenic surroundings, accessibility, and integration with local infrastructure. The site selection has ensured minimal environmental disruption while maximizing benefits to the surrounding community.

##### **8.2.1.1 Land Acquisition & Change in Land Use Pattern**

As mentioned above the said 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. Project site is located in area already surrounded by hotels, restaurants and apartments. The adjacent land value will be increased by this project.



### **Mitigation**

No.

#### **8.2.1.2 Environmental Sensitive Areas**

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

### **Mitigation**

Not required.

#### **8.2.1.3 Historical, Archeological or Cultural Sites**

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

### **Mitigation**

Not required.

#### **8.2.1.4 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 waste of land.

### **Mitigation**

Not required.

#### **8.2.2 Design Related Impacts**

The construction of Atlantis Murree (Commercial/Residential) Apartments was carried out in strict compliance with engineering standards and regulations, including the Uniform Building Code – 1997 and Building Code of Pakistan Seismic



Provisions – 2007. The building’s design ensures structural soundness, safety, and durability.

As the apartments are already constructed, the design has proven to be environmentally safe, with no adverse impacts arising from the building itself. Any potential environmental concerns were anticipated during planning, and appropriate mitigation measures were implemented to ensure compliance with environmental standards and sustainable construction practices.

### **Mitigation**

No.

#### **8.2.2.1 Seismic Hazard**

The said 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 **Atlantis Murree (Commercial/Residential Apartments)** have been designed and constructed in accordance with the Uniform Building Code – 1997 and Building Code of Pakistan Seismic Provisions – 2007, ensuring that the building is structurally sound and capable of withstanding moderate to major earthquakes.

#### **8.2.2.2 Traffic Patterns**

The main entrance to the project site is from the Murree-Islamabad Expressway 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.



### **8.2.2.3 Aesthetic Value.**

The project has been carefully designed and will accommodate the natural environment and topography as much as possible such that there is little slope cutting and stabilization requirement. This also favors the project objectives which involves a development that is aesthetically coherent with ambient environment and can fit in to the natural ambience in subtle way.

### **8.2.3 Construction Phase Impacts**

The construction of **Atlantis Murree (Commercial/Residential Apartments)** was the most significant phase regarding environmental considerations, as most potential impacts occurred during this period. All construction activities were carefully managed to minimize disturbances to the physical, biological, and social environment of the site and nearby communities.

Proper mitigation measures and adherence to environmental standards ensured that any temporary impacts during construction were controlled, and the area has now stabilized, with the apartments fully operational and integrated into the local environment.

Construction phase is the most significant part of the project with respect to environmental considerations, since most of the impacts are likely to take place during this period. Various construction activities will invariably create environmental disturbances, which may have impacts on the physical, biological and social environment of the area and nearby communities.

Such impacts include the following:

#### **Physical Environment**

- Soil erosion and degradation
- Air quality deterioration
- Water Quality (Surface and ground water)



### **Biological Environment**

- Loss of Vegetation
- Damage to wildlife

### **Socio-economic Environment**

- Traffic congestion
- Noise and vibration
- Safety hazards, Public health and nuisance issues

#### **8.2.3.1 Soil erosion and contamination**

Following impacts on soil quality are envisaged due to said project interventions:

During the construction of Atlantis Murree (Commercial/Residential Apartments), minor impacts on soil quality were anticipated due to excavation, land clearing, and leveling activities. Temporary disturbances may have occurred to the surrounding land surface.

Any leftover construction debris, materials, or minor leakages of oils, lubricants, or chemicals from machinery and vehicles were properly managed and removed to prevent contamination of the soil. These measures ensured that soil quality in and around the project site remains stable, and impacts were minor and limited to the project area. The site has now stabilized, and no ongoing soil contamination or erosion issues exist.

#### **Mitigations:**

The following mitigation measures were effectively implemented during the construction phase of **Atlantis Murree (Commercial/Residential Apartments)** to minimize soil erosion and contamination:

- All excavated spoils were disposed of at designated sites, and disturbed areas were restored to their original or near-original condition.
- Use of heavy machinery on wet soil was avoided to prevent damage to soil structure.
- Land clearing, leveling, and grading activities were minimized to reduce soil disturbance.
- Plantation of native tree species was carried out to control soil erosion and enhance site stability.
- Vehicles and equipment were not repaired at the project site; where unavoidable, impervious sheeting was used to prevent soil contamination.
- Septic tanks of adequate capacity were installed to safely manage domestic sewage generated during construction.



- Any waste oils generated were collected in sealed drums and handed over to authorized recycling contractors.
- Domestic solid waste was disposed of in an environmentally safe manner to avoid soil and water contamination.
- All unused and leftover construction materials were completely removed from the site upon completion of construction, and the site was properly rehabilitated.

These measures ensured that construction-related impacts on soil were minor, localized, and fully controlled, with no residual adverse effects during the operational phase of the project.

### **8.2.3.2 Air Pollution**

---

During the construction phase of **Atlantis Murree (Commercial/Residential Apartments)**, air quality was temporarily affected due to fugitive dust emissions from construction machinery, unpaved surfaces, and movement of construction vehicles. Dust dispersion depended on meteorological conditions such as wind speed, wind direction, temperature, and atmospheric stability. Increased construction activities and vehicular movement contributed to localized airborne dust; however, larger particles settled near the source, while suspended particulate matter (SPM) remained airborne for limited durations.

Potential impacts included dry deposition of dust on nearby vegetation, vehicles, and structures. Emissions from construction machinery and standby generators using fossil fuels also contributed to short-term air quality deterioration. These impacts were closely monitored and managed through appropriate mitigation measures. Overall, the effects on air quality were temporary, localized, and confined to the construction phase only. Following completion of construction, air quality in the project area has returned to normal baseline conditions, and no adverse impacts persist during the operational phase.

#### **Mitigation Measures**

During the construction phase of **Atlantis Murree (Commercial/Residential Apartments)**, air quality impacts were effectively mitigated through the implementation of appropriate environmental management practices by the contractor. The following measures were adopted:



- All vehicles, machinery, equipment, and generators used during construction were kept in good working condition and properly maintained to minimize exhaust emissions.
- Open burning of solid waste at the construction site was strictly prohibited.
- Preventive dust control measures were adopted during on-site material mixing, loading, and unloading activities.
- Construction materials such as sand, gravel, rocks, and spoil were transported in covered trucks using tarpaulins, and all vehicles complied with applicable **PEQS** for carbon emissions and noise.
- Regular water sprinkling was carried out at the site to suppress excessive dust emissions.
- Emissions from power generators and construction machinery were controlled through routine maintenance and timely repairs.
- Construction equipment idling was minimized to reduce unnecessary emissions, and engines were shut down during idle periods wherever practicable.
- PEQS applicable to gaseous emissions from construction vehicles, equipment, and machinery were strictly enforced.
- Construction workers were provided with protective masks to minimize inhalation of dust.
- Air quality was regularly monitored in accordance with the Environmental Monitoring Plan (EMP).
- Vehicle speed within the project area was restricted to a maximum of 20 km/hr and effectively controlled.

These mitigation measures ensured that air quality impacts during construction were temporary, localized, and well within permissible limits, with no residual adverse effects during the operational phase of the project.

### **8.2.3.3 Noise and Vibration**

During the construction phase of **Atlantis Murree (Commercial/Residential Apartments)**, noise and vibration were temporarily generated due to the operation of construction machinery and equipment such as excavators, compactors, trucks, dumpers, graders, cranes, and concrete-related equipment. The movement and



operation of this machinery resulted in a temporary increase in noise and vibration levels within the project area.

These impacts were short-term, localized, and moderate in nature, and were managed through appropriate construction practices and controls. Following completion of construction activities, noise and vibration levels have returned to normal background conditions, and no adverse impacts are observed during the operational phase of the project.

### **Mitigations**

During the construction phase of **Atlantis Murree (Commercial/Residential Apartments)**, the following mitigation measures were effectively implemented to control noise and vibration impacts:

- Construction machinery generating noise levels above the permissible limits prescribed in **PEQS** was properly maintained, tuned, and fitted with effective mufflers and silencers to bring noise levels within acceptable limits.
- Movement of trucks and heavy construction machinery was restricted during nighttime hours to prevent disturbance to nearby residential areas.
- Drivers were instructed to avoid the use of horns and loud music, particularly during night-time operations.
- Where required, appropriate noise barriers and boundary walls were provided near machinery and activities located close to sensitive receptors.
- Construction workers were provided with suitable personal protective equipment, including ear caps and earmuffs, and were trained in their proper use.
- Low-noise machinery and equipment with noise shielding and absorption features were used wherever feasible.
- Contractors adhered strictly to approved work schedules, ensured regular maintenance of equipment, and implemented standard operating procedures to minimize noise generation.



- Compliance with **PEQS noise standards** was ensured throughout the construction period.

These measures ensured that noise and vibration impacts were temporary, controlled, and confined to the construction phase, with no residual effects during the operational phase of the project.

#### **8.2.3.4 Impact on Water Resources (Surface and Groundwater Contamination)**

During the construction phase of Atlantis Murree Residential Apartments, activities that had the potential to affect soil quality also posed a limited risk of surface and groundwater contamination. These activities included solid waste handling, sewerage disposal, equipment and vehicle maintenance, and the handling of fuels, oils, and chemicals, as well as sanitation facilities at temporary camp sites.

However, these potential impacts were minor, localized, and effectively controlled through proper waste management, safe storage practices, and appropriate sanitation systems. No significant contamination of surface water or groundwater was observed, and water resources in and around the project area remain unaffected during the operational phase of the project.

#### **Mitigations**

To prevent surface and groundwater contamination during the construction phase of **Atlantis Murree (Commercial/Residential Apartments)**, the following mitigation measures were successfully implemented:

- Wastewater generated from construction activities was not discharged into any natural water bodies.
- Septic tanks of adequate capacity were provided to safely manage construction-related wastewater and sewage from temporary camps.
- Septic tanks and sumps were constructed at safe distances from water bodies, dry stream beds, and waterholes, with sump bottoms maintained above the groundwater table to prevent contamination.
- Washing of vehicles and machinery at the project site was strictly prohibited.
- Open disposal of waste was not allowed, and all waste was managed through approved disposal methods.
- **PEQS** and **WHO** guidelines were followed for the management and disposal of any effluent generated from project-related activities prior to discharge.



These measures ensured that potential impacts on surface and groundwater resources were effectively controlled, resulting in no adverse effects during the operational phase of the project.

#### **8.2.3.5 Solid/Construction Waste Generation**

During the construction phase of **Atlantis Murree (Commercial/Residential Apartments)**, solid and construction waste was generated at various stages of development. Without proper management, such waste could have caused odor, aesthetic issues, and created breeding grounds for disease vectors, as well as potential leachate generation affecting groundwater.

However, an effective solid waste management system was implemented throughout the construction period. As a result, the impacts of solid and construction waste were moderate, temporary, and localized. All waste was properly collected, segregated, and disposed of through approved methods, ensuring that no long-term environmental impacts persist during the operational phase of the project.

#### **Mitigations:**

To manage solid and construction waste during the construction phase of **Atlantis Murree (Commercial/Residential Apartments)**, the following mitigation measures were effectively implemented:

- The **3Rs waste management hierarchy (Reduce, Reuse, and Recycle)** was adopted to minimize waste generation.
- A proper recording system was maintained to document the quantities of waste generated, recycled, and disposed of.
- Work camps and waste disposal sites were not located within one kilometer of inhabited areas to avoid nuisance and health risks.
- Technical design features were incorporated for refuse collection containers to minimize environmental and fire hazards.
- Safe handling, storage, and disposal procedures were implemented for hazardous and harmful materials.
- Open burning of waste was strictly prohibited at all stages of construction.
- Recyclable waste was reused on-site where feasible or sold to authorized recyclers in the local market.
- Solid waste generated during construction activities and at camp sites was safely disposed of at designated waste disposal facilities.
- Waste containers were properly labeled, indicating the type and quantity of waste stored.
- Construction workers and supervisory staff were educated and encouraged to practice waste minimization, reuse, and recycling.



- The waste disposal plan was periodically reviewed throughout the construction phase, considering site conditions and weather variations.
- Close coordination was maintained with relevant authorities to ensure proper and lawful disposal of construction waste.

These measures ensured that solid and construction waste impacts were effectively controlled, temporary, and confined to the construction phase, with no residual environmental impacts during the operational phase of the project.

#### **8.2.3.6 HSE Issues**

During the construction phase of **Atlantis Murree (Commercial/Residential Apartments)**, worksite-related accidents and exposure to hazardous materials posed potential risks to workers and nearby communities. The impacts were moderate and temporary, and were effectively managed through proper safety measures and training.

#### **Mitigations:**

To manage health, safety, and environmental (HSE) risks during the construction of **Atlantis Murree (Commercial/Residential Apartments)**, the following mitigation measures were implemented:

- The contractor strictly followed **World Bank EHS Guidelines** throughout the construction phase.
- Basic medical training was provided to selected staff, and essential medical services and supplies were made available to all workers.
- Work safety measures and good workmanship practices were enforced to ensure no health risks to laborers.
- Proper use of **Personal Protective Equipment (PPE)** by all workers was ensured and monitored.
- Timely public notifications were issued regarding planned construction activities to keep nearby communities informed.

These measures ensured that all HSE risks were effectively mitigated, and the project has been completed without any residual adverse health or safety impacts.

#### **8.2.3.7 Impacts on Public Health and Safety Hazards**

During the construction of **Atlantis Murree (Commercial/Residential Apartments)**, potential impacts on public health and safety included risks from construction activities, vehicular movement, and temporary disruptions near nearby communities. These could have involved



roadside accidents, minor air (dust) pollution, noise, vibration, and potential contamination risks from oils or chemicals.

However, all such risks were effectively managed through proper safety protocols, controlled access to construction areas, environmental safeguards, and awareness measures for both workers and local residents. Conflicts with the local community were minimized through stakeholder engagement and communication. As the project is now fully constructed and operational, there are no ongoing public health or safety hazards from the project.

### **Mitigations**

During the construction of Atlantis Murree Residential Apartments, the following measures were implemented to safeguard public health and safety:

- Provision of medicines, first aid kits, and emergency vehicles at the worksite was ensured.
- Laborers with transmittable diseases were restricted to designated areas within the construction site.
- Access to the site was controlled to prevent entry of unauthorized persons, particularly children.
- Workers were trained in construction safety procedures, environmental awareness, and equipped with safety boots, helmets, gloves, ear plugs, and protective masks, with usage monitored consistently.
- Proper safety and diversion signage was installed, especially in urban areas and accident-prone locations.
- Vehicle speed limits were established in consultation with local stakeholders and strictly enforced at 20 km/hr within the site.
- Mitigation measures for air and noise pollution were applied to minimize impacts on nearby communities.
- Defensive driving practices were promoted among project drivers through training, posters, and awareness programs.



- Personnel injury risks were mitigated through safety training and emergency response procedures.
- Construction staff worked under improved safety and labor conditions.
- Firefighting equipment was provided at site offices, and workers received firefighting training.
- Road signage was installed at appropriate locations to reduce safety hazards associated with construction-related traffic.

These measures ensured that public health and safety risks during construction were temporary, controlled, and fully mitigated. With the project now operational, no residual hazards remain for the surrounding communities.

#### **8.2.3.8 Occupational Health and Safety Occupational Health and Safety (OH&S)**

During the construction of **Atlantis Murree (Commercial/Residential Apartments)**, potential occupational health and safety (OH&S) impacts included risks from site activities such as earth clearing, leveling, compaction, pavement finishing, and equipment operation. Workers could have faced eye injuries from stone or metal particles, hazards from falling objects, vibration exposure, respiratory irritation from cement dust, overexertion, awkward postures, and welding-related risks including electric shock, fumes, fire, and explosions.

Additional risks included slips, trips, and injuries from moving vehicles or machinery, as well as falls from height. These impacts were temporary, localized, and of moderate probability during the construction phase.

Through strict adherence to safety protocols, proper use of **personal protective equipment (PPE)**, and comprehensive training, all occupational health and safety risks were effectively mitigated. With construction now complete and the apartments operational, no ongoing OH&S hazards remain on-site.

#### **Mitigations**

During the construction of **Atlantis Murree (Commercial/Residential Apartments)**, the following measures were implemented to manage occupational health and safety risks:



- Basic medical training was provided to selected staff, and essential medical services and supplies were made available to all workers.
- Workers were trained in construction safety procedures and environmental awareness, and were equipped with **safety boots, helmets, gloves, protective masks, goggles, and shields**, with proper monitoring to ensure correct and sustained usage.
- Contractors ensured the provision of medicines, first aid kits, and ambulances at camp sites and work areas.
- Personnel were instructed to properly use **Personal Protective Equipment (PPE)**, and warning signs were displayed along work sites to communicate hazards and prevent accidents.
- Safety lookouts and controlled access measures were established to prevent unauthorized people and vehicles from entering areas during hot or hazardous work activities.

#### **8.2.3.9 Impact on Biodiversity-Habitat**

During the construction of Atlantis Murree Residential Apartments, the primary potential impacts on biodiversity were related to temporary habitat disturbance due to site preparation, establishment of construction yards, and clearance of minor vegetation. While such activities could have affected local flora and fauna, these impacts were limited in scope and localized within the project area.

All disturbed areas have since been restored or stabilized, and no permanent adverse effects on habitats or wildlife populations remain. The operational apartments do not pose ongoing threats to local biodiversity, and the project area continues to support the surrounding ecological balance.

#### **Mitigation**

During the construction of **Atlantis Murree (Commercial/Residential Apartments)**, the following mitigation measures were implemented to minimize impacts on local biodiversity and habitats:



- Potential camp sites were selected to **avoid areas of dense vegetation**.
- The establishment of borrow areas or access tracks in forested or ecologically sensitive land was strictly avoided.
- The land required for camp sites, temporary storage, or dumping was kept to the **minimum necessary** for project operations.
- Clearance of vegetation was carried out only after obtaining approval from the project engineer.
- Vegetation clearing was **limited strictly to areas necessary for construction**, ensuring no unnecessary damage to surrounding habitats.

#### **8.2.3.10 Impact on Biodiversity -Tree cutting**

At the site of **Atlantis Murree (Commercial/Residential Apartments)**, there were no mature trees, only small shrubs, some of which were removed during construction. To compensate for this, a tree management plan was implemented:

- Each removed shrub was compensated by planting five seedlings, ensuring restoration and expansion of green zones within the project area.
- The Environment Officer ensured the provision of appropriate fuels in camps to prevent any fuelwood collection from surrounding areas.

With these measures, the impacts from shrub removal were **minor and temporary**. In the long term, as newly planted trees and shrubs mature, the area's greenery and ecological benefits will increase, resulting in a moderate beneficial impact on local biodiversity.

#### **8.2.3.11 Impact on Terrestrial Fauna**

The key terrestrial species in the project area, which are considered as sensitive receptors, are:

- Fox
- Squirrel
- Rabbit

The accidental striking of all terrestrial fauna by project vehicles on access routes is a considerable risk during the project, although this is easier to mitigate during establishment of borrow areas.



## **Mitigation**

During the construction of **Atlantis Murree (Commercial/Residential Apartments)**, the following mitigation measures were implemented to minimize impacts on local habitats, vegetation, and wildlife:

- Establishment of borrow areas within ecologically sensitive zones was strictly avoided.
- Borrow areas, if required, were only approved in previously converted or barren lands.
- Hunting, harassment, or disturbance of wildlife was strictly prohibited.
- Project vehicles were limited to a speed of 30 km/hr to reduce the risk of striking fauna.
- All vehicles were properly maintained and fitted with mufflers to reduce noise.
- Development of new access tracks was minimized, and existing tracks were kept to the minimum required width as approved by the Engineer.
- Construction camp sites were selected in areas that are non-sensitive to wildlife to avoid ecological disturbances.

Following these mitigation measures, the residual impact on biodiversity was **minor and temporary**, limited only to the potential risk of wildlife encounters on access routes.

### **8.2.3.12 Impact on Avifauna**

The area surrounding Atlantis Murree (Commercial/Residential Apartments) supports both migratory and resident bird species, particularly during the winter months. While avifauna prefers undisturbed marshy or wetland habitats, some birds are also found in cultivated lands and near settlements within the project area.

During construction, minor temporary disturbances to birds occurred due to vehicle movement, personnel activity, operation of camps, and construction machinery. No migratory bird landing zones were located within the immediate project site.

Post-construction, any minor habitat loss for avifauna has been compensated through tree and shrub planting and the preservation of nearby wetland areas. As a result, the impacts on birds are now negligible, and the project area continues to support local avifauna without any long-term adverse effects.



## **Mitigation**

During the construction of **Atlantis Murree (Commercial/Residential Apartments)**, the following mitigation measures were implemented to protect avifauna and minimize impacts on local bird species:

- Development of new access tracks was minimized, and existing tracks were restricted to a maximum width of 3 meters.
- Biodiversity monitoring was conducted quarterly to assess the status of avifauna and evaluate any effects from habitat changes.
- Hunting or harassment of wildlife, including birds, was strictly prohibited.
- Project vehicles were properly maintained and fitted with mufflers to reduce noise disturbances to birds.
- Construction camp sites were located in areas non-sensitive to wildlife to minimize operational impacts on avifauna.

With these measures in place, residual impacts on birds were **minor and temporary**, and with construction now completed, the site supports local avifauna without any ongoing adverse effects

### **8.2.4 Operation Phase Impacts**

The potentials impacts and their mitigation measures are as follow: -

#### **8.2.4.1 Increased Pressure on Utilities**

With the Atlantis Murree (Commercial/Residential Apartments) now operational, the influx of residents may place additional demand on local infrastructure, utilities, and social amenities. However, the project has been designed to ensure adequate provision of water, electricity, and sewage facilities, minimizing stress on existing services. Any minor pressures during peak occupancy periods are manageable and do not cause significant adverse effects on the surrounding community.



#### **8.2.4.2 Drinking Water Consumption**

The Atlantis Murree (Commercial/Residential Apartments) currently consumes approximately 1000–1500 gallons of water per day during regular occupancy. This level of water usage is well within the capacity of local water resources and does not exert any negative impact on the groundwater table or surrounding water supply.

#### **Mitigation**

Not Required.

#### **8.2.4.3 Solid Waste Generation and Disposal**

During the operation of Atlantis Murree (Commercial/Residential Apartments), solid waste primarily consists of food waste, paper, plastics, and other domestic materials. Proper waste management systems are in place, including segregation, collection, and disposal, ensuring that no environmental or health hazards arise from the operational waste.

#### **Mitigation Measures**

To effectively manage solid waste generated during the operation of **Atlantis Murree (Commercial/Residential Apartments)**, the following measures are implemented:

- Segregation at source: All waste is separated into organic and recyclable materials at the point of generation.
- Primary collection: Each floor has a chute system for initial waste collection.
- Compaction: Waste from ground floor chutes is compacted to facilitate safe handling.
- Dedicated contractor: Handling, collection, and disposal of waste is managed by a licensed waste management contractor.
- Storage facilities: Waste bins are provided on each floor and collected in a centralized storage area designed according to the volume of waste generated.
- Environmentally safe disposal: The licensed contractor disposes of all waste at designated municipal disposal sites in an environment-friendly manner, following local regulations.
- No need for private landfill: Despite the volume of waste, there is no requirement for the project to develop its own landfill.

These measures ensure that solid waste from the operational phase does not cause any environmental or health hazards.



#### **8.2.4.4 Wastewater Generation & Disposal**

The project on becoming functional will generate wastewater which will be mainly sewage. Small quantities of hazardous waste will also be generated during maintenance activities in the building (such as oily waste etc.). All type of wastewater generated (i.e., drainage of sewage, showers, and kitchen effluent etc.) will be directed to the septic tank prior to disposal into a nearby out fall sewer.

#### **Mitigation**

- As there is no source of chemical contamination in the process water, the generated wastewater will not contaminate the environment, and its quality meets the prescribed limits of PEQS-Pakistan.
- Sewerage will be treated in a three-stage septic tank system.
- Treated effluents will be reused for sprinkling on unpaved areas, landscaped spaces, plants, and vegetation within or around the project site.
- Any remaining nominal effluent will be safely discharged into nearby drains through submerged sewerage pipes.
- During the laying of sewage pipes, care will be taken to ensure existing pipes, wires, or other systems are not damaged.
- Sewage lines, both on-site and off-site, are installed at safe distances from drinking water supply lines to prevent any contamination from leaks.

These measures ensure safe and environmentally responsible management of wastewater for the project

#### **8.2.4.5 Traffic Flow and Congestion**

Traffic from the project is unlikely to impact the ongoing traffic in the area. Also, as per the prevailing building regulations, the builders, and developers of residential and commercial projects are mandated to reserve sufficient car parking space for the residents and their visitors within the project building.



## **Mitigation**

- To avoid roadside parking, the project has reserved car parking space.
- Vehicles will be parked at designated parking area.

### **8.2.4.6 Fire Safety**

Fire is one major hazard for buildings. It may result from short circuiting or improper storage of fuel, carelessness by the residents leading to fire etc. Fire can cause loss of life and property.

## **Mitigation**

### **1. Fire Protection Systems**

Standpipes and fire extinguisher are used in compliance with relevant NFPA Standards for the total covered area of the building.

Additionally, fire alarm system will be provided to monitor the source of heat/smoke/fire in their early stages to minimize the impact. UPS for the Alarm system will be provided.

### **2. Life Safety Plan**

Risks involve with the fire hazard can be reduced by adopting following mitigation measures:

- For all engineering designs, IBC (international Building Control), EN 54 and NFPA codes will be followed.
- Standard fire and smoke detection and protection gadgets, for example, alerts, fire hoses and hydrants to be given in the structure.
- The facility will possess a detailed emergency and evacuation plan that will be regularly drilled to make sure that the responsible staff remains trained at all times.



- Firefighting equipment such as fire extinguishers and hydrants systems will be maintained at strategic locations within residential area.
- Fire safety signs will be prominently displayed with in the blocks.

#### **8.2.4.7 Social Conflicts due to Socio-Cultural Differences**

The Atlantis Murree (Commercial/Residential Apartments) attracts residents and visitors from diverse ethnic and socioeconomic backgrounds, including some from outside the area. While this diversity enhances the social and economic vibrancy of the community, minor conflicts could arise due to differences in customs, traditions, or interests. These potential issues are expected to be temporary and manageable, as community engagement and awareness programs were implemented during construction and continue to foster positive interactions among residents and local stakeholders.

#### **Mitigation**

Constant association and transparent communication with the ongoing business operators and locals can mitigate the impact. Additionally, sharing the undertaking benefits in type of work for neighborhood would make positive perception of project.

### **8.3 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES**

#### **8.3.1 Employment Opportunities**

The Atlantis Murree (Commercial/Residential Apartments) has provided significant employment opportunities for the local population of Murree. Both skilled and unskilled residents were engaged in construction and related activities, enabling them to earn a livelihood and improve access to basic necessities.

After completion, employment continues in various roles such as management staff, caretakers, cleaners, security personnel, and technicians, contributing to local economic development and skill enhancement within the community.



### **8.3.2 Provision of Market for the Supply of Building Materials**

During construction of **Atlantis Murree (Commercial/Residential Apartments)**, large quantities of building materials were sourced locally. This created a ready market for local suppliers, including quarrying companies, hardware shops, and individual vendors, providing them with increased business opportunities and contributing to the local economy.

### **8.3.3 Increased Business Opportunities**

The Atlantis Murree (Commercial/Residential Apartments) project generated significant business opportunities for the local community. The presence of construction staff and now the residents has created a steady demand for goods and services, benefiting small-scale traders, including food vendors, retail shops, and service providers in the surrounding area.

### **8.3.4 Revenue to National and Local Government**

Through payment of relevant taxes, rates and fees of government and the local authority, the said project will contribute towards the National and local.



# **9. ENVIRONMENTAL MANAGEMENT PLAN**

## **9.1 GENERAL**

This chapter summarizes the various mitigation measures as outlined previously in this EIA Report that will be implemented during the construction, operational and decommissioning stages of project. It does not discuss further the mitigation measures which have been adopted within the design and planning of the project, as these are comprehensively covered in previous section of this EIA Report. Outline and key features of the EMMP for operations phase of the aforesaid project is presented in the sub-sections below. As per the environmental legislation in Pakistan, the compliance status of the conditions mentioned in the construction should be submitted along with other documents to the environmental protection agency to obtain confirmation for compliance and Environmental Approval for project operation. Even after implementation of the suggested mitigation measures, the impact may remain significant, and requires regular environmental monitoring.

## **9.2 Objectives**

For the effective implementation and management of the mitigation measures, it is necessary to develop an EMMP which basically provides a delivery mechanism to address the potential impacts of the Project activities. Moreover, to facilitate the implementation of the mitigation measures, the EMP has been prepared to manage probable adverse environmental impacts due to the project interventions in a way which minimizes these adverse impacts on the environment and socio-economic conditions of the project area. The specific objectives of the EMP are to:

- ✚ Outlining the mitigation measures required for avoiding or minimizing the potential impacts assessed by EIA and to mitigate the impacts identified during the present EIA.
- ✚ Maximize potential project benefits and control negative impacts.



- ✚ Define a monitoring mechanism to ensure that the EMP achieves its desired objectives.
- ✚ Ensure the complete implementation of all mitigation measures.
- ✚ Maintain essential ecological process through preservation of Biodiversity; and,
- ✚ Assess training requirements for different stakeholders at various levels.
- ✚ Developing a monitoring mechanism and identifying the requisite monitoring parameters to confirm effectiveness of the mitigation measures recommended in the EIA.
- ✚ Defining roles and responsibilities of the Project proponent for the implementation of EMP and identifying areas where these roles and responsibilities can be shared with other parties involved in the execution and monitoring of the Project
- ✚ Defining the requirements necessary for documenting compliance with the EMP and communicating it to all the concerned regulatory agencies
- ✚ Prescribing the mechanisms with which consultation with stakeholders during the Project will be maintained.

### **9.3 COMPONENTS OF THE EMP**

The EMP consists of the following:

- ✚ Management plan
- ✚ Monitoring Plan
- ✚ Communication and documentation
- ✚ Institutional capacity
- ✚ Environmental training



## 9.4 ENVIRONMENT MANAGEMENT PLAN

It lists all the mitigation measures identified in the EIA and the associated environmental or social aspect in line during operational phase with the administrative framework involving all the responsible implementing authorities who are required to take the planned actions/measures. It enhances project benefits by reducing its impacts and making it environmental friendly

**Table 13: Environment Management Plan**

<u>Sr #</u>	<u>Project Component &amp; Impact</u>	<u>Targets to Achieve</u>	<u>Mitigation/ Preventive Action</u>
<b>Construction Phase</b>			
1.	<p><b><u>Air Quality</u></b></p> <ul style="list-style-type: none"> <li>- Dust resulting from construction – Use of heavy machinery can generate exhaust and dust emissions</li> <li>-Dispersion of particles from stockpiles during high velocity wind</li> <li>-Smoke from burning of waste materials or burning of firewood in the labor camp</li> </ul>	<p>Compliance with prescribed PEQS to control air pollution</p>	<p>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.</p> <p>Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion</p> <p>Periodic maintenance and management of all the machinery and vehicles</p> <p>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.</p>
2.	<p><b><u>Water Quality</u></b></p> <ul style="list-style-type: none"> <li>Run-off water from construction area</li> <li>- Drainage of wastewater on ground can contaminate the soil and Groundwater.</li> <li>- 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.</li> <li>- Leakage of oil and chemical materials from construction</li> </ul>	<p>Control of groundwater or surface water pollution from construction activities</p>	<p>Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater</p> <p>Maximize the use of treated waste water on site (e.g. sprinkling purpose to control dust)</p> <p>Proper disposal of waste material on dumping sites to avoid leachate generation and contamination of groundwater – Prohibit illegal dumping of waste</p> <p>The contractor will repair / replace / compensate for any damages caused by the Construction activities to water source/s.</p> <p>Regular water quality monitoring according to determined sampling schedule;</p> <p>The contractor shall ensure that construction debris do not find their way into the drainage system which can block</p>



Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action
	Activity		Prohibit washing of machinery and vehicles in surface waters, provide sealed washing basins and collect wastewater in Sedimentation/ retention pond.
3.	<u>Waste</u> -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
4.	<u>Noise</u> 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

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action
			noisy machinery The personal protective equipment (PPE) will be provided to the workers and its usage will be made mandatory



5.	<b>Biological Resources</b> <ul style="list-style-type: none"> <li>- Removal of vegetation covers by cutting of trees, crops, herbs and shrubs</li> <li>- Fauna including birds and animals will be affected during excavation, movement of labor and carriage of goods and machinery</li> </ul>	<ul style="list-style-type: none"> <li>- Obligation to respect wildlife, Forest and Fisheries Laws.</li> <li>- Conserve biodiversity and its terrestrial as well as aquatic habitat</li> </ul>	<ul style="list-style-type: none"> <li>- Proposed project site does not involve cutting of any trees</li> <li>- Plantation of maximum number of trees.</li> <li>- Staff and workers should be instructed not to Damage nearby vegetation of the surrounding area.</li> <li>- Open fires should be prohibited in the area to avoid the hazard of fire and impact on nearby flora and fauna.</li> <li>- Proper disposal of organic waste (if any) generated to avoid rodents and other insects' generation.</li> </ul>
7.	<b>Staff Conduct</b>	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
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	<ul style="list-style-type: none"> <li>- Contractor will apply strict rules on his workers and labor to ensure that no spill or leakages are caused</li> <li>- Chemical waste will be disposed of in approved disposal site.</li> <li>- PPE will be enforced to use during the handling and application of chemicals</li> <li>- The contractor will employ the general criteria for oil and leakage at construction sites, as per standards</li> </ul>

<u>Sr #</u>	<u>Project Component &amp; Impact</u>	<u>Targets to Achieve</u>	<u>Mitigation/ Preventive Action</u>
		<u>Associate</u>	
9.	Workers Health & Safety	Prevention of any possibility of work site accident /impact on worker's health	<ul style="list-style-type: none"> <li>- Provision of Personal Protective Equipment to the workers – Provision of first aid box at work site to cope with emergency situation</li> <li>- Safety training to the workers</li> <li>- Safe driving training to the drivers</li> <li>- Adequate safety signs on site</li> </ul>



			<ul style="list-style-type: none"> <li>- Install fire extinguishers at fire handling places – Any loss of public/ private property will be compensated by the contractor</li> <li>- Regular checks should be carried out to ensure a contractor is following Safe working procedures and practices.</li> </ul>
<u>10.</u>	<u>Socio-economic Impacts</u>	<ul style="list-style-type: none"> <li>- Prevention of conflicts among locals and make the project socially acceptable</li> <li>-Empowerment of locals to possible extent</li> <li>- Increase in employment and business opportunities for locals</li> </ul>	<ul style="list-style-type: none"> <li>- Contractor's activities and movement of staff to be restricted to designated and within industry</li> <li>- 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</li> <li>- The site must be kept clean to minimize the visual impact of site</li> <li>- 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 affected by the projects</li> <li>- Employ local residents as much as possible</li> </ul>
<u>11.</u>	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.

<u>Sr #</u>	<u>Project Component &amp; Impact</u>	<u>Targets to Achieve</u>	<u>Mitigation/ Preventive Action</u>
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		condition prior to the commencement of the work or to a condition agreed with the project management and landscaping of the site	<ul style="list-style-type: none"> <li>– Care will be taken during handling and disposal of waste. . – Avoid mixing of hazardous waste with Non-hazardous waste.</li> <li>– Safe transportation of \ construction equipment from the site.</li> <li>– Empty/available space will be covered with grassy lawns &amp; ornamental plant species like roses, jasmine, and seasonal flowers</li> </ul>
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**Operational Phase**

<u>1.</u>	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.
<u>2.</u>	Water Quality Wastewater/ Sewerage	Compliance with Wastewater Standards	<ul style="list-style-type: none"> <li>– Sewerage after due treatment will be discharged to drain passing nearby site.</li> <li>– Adequate disposal system shall be made available and maintain the sewer lines both on site and off site.</li> <li>– 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 <u>sewer</u>.</li> </ul>

<u>Sr #</u>	<u>Project Component &amp; Impact</u>	<u>Targets to Achieve</u>	<u>Mitigation/ Preventive Action</u>
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3.	<u>Waste</u>  <u>Municipal Solid Waste</u>	<ul style="list-style-type: none"> <li>- Compliance with waste management rules</li> <li>-Prevention of inappropriate waste disposal</li> </ul>	<ul style="list-style-type: none"> <li>- Implementation of waste management program consisting of reduce, reuse and re-cycling of materials</li> <li>- Systematic collection and protected storage of waste - Wastes like paper, fluorescence electric tubes, rags, plastic and metal cans, glass articles shall be sold In the market for reuse.</li> <li>- Prohibition of dumping of any contaminating material</li> </ul>
4.	Noise & Vibration  Noise and vibration from generators & water pump	Compliance with prescribed PEQS to control Noise pollution	<ul style="list-style-type: none"> <li>- No activity producing extra ordinary levels of noise will be allowed</li> <li>- Adequate basis &amp; enclosure of generator &amp; water pumps to reduce the vibration &amp; noise</li> <li>- Standby generator shall be curtailed within the limiting values of the Punjab Environmental Quality Standards.</li> </ul>
5.	Environment quality enhancement measures: <ul style="list-style-type: none"> <li>- Flowers and plants and trees</li> <li>-Aesthetic beauty of the buildings and the area</li> </ul>	Enhanced land value and scenic beauty of the area	<ul style="list-style-type: none"> <li>- Plantations in and around the proposed facility must be carried out.</li> <li>- Fountains or other such aesthetic measures must also be taken into consideration in order to increase the beauty of area.</li> <li>- 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.</li> </ul>



## **9.5 Roles and Responsibilities of Environment Management Team**

For **Atlantis Murree (Commercial/Residential Apartments)**, the Proponent has established an Environment Management Team to ensure all environmental safeguards are implemented effectively. The team oversees compliance with mitigation measures, monitors air, noise, wastewater, and solid waste management, coordinates with contractors and local authorities, and ensures resources are available for maintaining environmental standards. This ensures the project continues to operate in a safe and environmentally responsible manner.

<b><u>Position Responsibility</u></b>
<p style="text-align: center;"><b>Project Manager</b></p> <p>The Project Manager of <b>Atlantis Murree (Commercial/Residential Apartments)</b> supervises all construction activities, prepares schedules, forecasts resources for engineering and technical tasks, and ensures the effective implementation of the EMMP. The manager conducts regular performance reviews and takes corrective or remedial actions whenever required to maintain project quality and environmental standards.</p>
<p style="text-align: center;"><b>Contractor</b></p> <p>The Contractor for <b>Atlantis Murree (Commercial/Residential Apartments)</b> is responsible for developing the facility according to the contract with the Proponent, following all HSE policies and procedures, and implementing the specific aspects of the EMMP assigned to them. This ensures that construction is completed safely, efficiently, and in compliance with environmental standards.</p>
<p style="text-align: center;"><b><u>HSE Executive</u></b></p> <p>The HSE Executive for <b>Atlantis Murree (Commercial/Residential Apartments)</b> is responsible for preparing environmental monitoring reports and any necessary permit applications, overseeing construction to ensure the implementation of mitigation measures, and conducting regular monitoring and review of EMMP compliance to maintain environmental and safety standards throughout the project.</p>



### contractor

For **Atlantis Murree (Commercial/Residential Apartments)**, the HSE Executive is responsible for preparing environmental monitoring reports, managing permit applications, overseeing the implementation of mitigation measures, and regularly reviewing EMMP compliance to maintain environmental and safety standards. The Contractor inspects the constructed facility, develops policies and procedures on environmental, social, health, and safety matters, oversees EMMP implementation, analyzes monitoring results, prepares reports for the Project Manager, plans training programs for personnel, and ensures the facility meets all regulatory and safety requirements after construction completion.

## 9.6 ENVIRONMENTAL MONITORING PLAN

Environmental monitoring is a vital component of the Environmental Management Plan. It is the mechanism through which the effectiveness of the environmental management Plan in protecting the environment is measured. The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation and planning corrective actions.

## 9.7 REPORTING AND REVIEWING PROCEDURES (Communication and Documentation)

For **Atlantis Murree (Commercial/Residential Apartments)**, an effective system for storing, communicating, and reviewing environmental information is implemented as part of the EMP. An independent monitoring consultant ensures precise recording and maintenance of all data in a standardized format, communicates this information to a central location, stores raw data in a centralized database, and processes the information to produce **periodic environmental monitoring reports**. This system ensures transparent documentation and effective tracking of all environmental management measures throughout the project.

**Data recording and maintenance:** For **Atlantis Murree (Commercial/Residential Apartments)**, all monitoring forms will be numbered and a **tracking system** will be maintained for each. When a form is issued for field use, its number will be recorded, and monitors will account for each form upon completion. This ensures that **all forms—whether filled, unused, or discarded—are returned to the office**, maintaining accuracy, accountability, and proper documentation of environmental monitoring data.



**Storage of information:** For **Atlantis Murree (Commercial/Residential Apartments)**, a centralized **database** will be maintained to store all information collected during the project. This database will include records of **training programs, staff deployment, non-compliance incidents, corrective actions, water resource management, and results of environmental effects monitoring**, ensuring that all project-related data is organized, easily accessible, and available for review by relevant authorities.

**Meeting:** For effective monitoring, management and documentation, of the environmental performance during the operation, environmental matters will be discussed during a daily meeting held on-site. Environmental concerns raised during the meetings will be mitigated after discussions with the proponent site representatives.

**Reporting:** For **Atlantis Murree (Commercial/Residential Apartments)**, the monitoring team will prepare **daily, weekly, monthly, and other periodic reports**, culminating in a **final environmental report** based on the information collected. Additionally, the Proponent’s site representative and the Contractor will prepare **weekly environmental reports**. Copies of all reports will be submitted to the **Proponent and the Contractor’s higher management** to ensure proper tracking and compliance with environmental management measures.

### **9.8 Schedule for Implementation & Environmental budget**

Approximately PKR 1.8 Million budget will be reserved for tree plantation, solid waste management, trainings and environmental monitoring. Monitoring tests for ambient air quality, noise and groundwater quality will also be conducted.

**Table 14: Schedule for Implementation & Environmental budget**

<b><u>Amenities</u></b>	<b><u>Frequency</u></b>	<b><u>Cost in PKR (Million)</u></b>	
<u>Ambient air monitoring</u>	<u>Construction:</u> <u>Biannually</u> <u>Operation: quarterly</u>	<u>20,000/-</u>	<u>0.8 Million</u>
<u>Noise monitoring</u>	<u>Construction:</u> <u>Biannually</u> <u>Operation: quarterly</u>	<u>10,000/-</u>	



<u>Water quality monitoring</u>	<u>Construction:</u> <u>Biannually</u> <u>Operation: quarterly</u>	<u>20,000/-</u>	
<u>Health &amp; safety</u>	<u>Daily</u>	<u>500,000/-</u>	
<u>Tree Plantation/Green Belts Development</u>	<u>Monthly</u>	<u>200,000/-</u>	
<u>Solid Waste Management</u>	<u>Monthly</u>	<u>50,000/-</u>	
<u>Trainings</u>	<u>Monthly</u>	<u>1 Million</u>	
<b><u>Total Cost</u></b>		<b><u>PKR 1.8 Million</u></b>	

### **9.9 Training Program**

Training programs are a necessary agenda that has to be implemented to effectively implement Environmental Management & Monitoring Plan. The Environment, Health & Safety Officer will impart training to the contractor's staff. The key objective of the training program is to ensure that the requirement of EMP are clearly understood and followed throughout the project. The training shall cover following areas

- EMP communication and documentation requirement.
- Community issues and their mitigation measures.
- Safe construction practices
- Use of personnel protective equipment's (PPEs)
- Environmentally sound construction practices
- Vehicular safety.
- Site restoration requirement.
- Solid Waste Disposal

**Table 15: Environmental Monitoring Plan**

<u>Environment Component</u>	<u>Parameters</u>	<u>Standards / Guidelines</u>	<u>Locations</u>	<u>Monitoring Period/</u>	<u>Responsibility</u>
				<u>Frequency/</u>	
				<u>Sampling No/year</u>	



<b>PRE-CONSTRUCTION STAGE</b>					
<b>Trees/ Herbs/ Shurbs cutting</b>	Monitoring to check that the required minimum of trees are cut.	Inspection	Throughout the project areas	During tree felling and site clearing operations	SM
	Check whether proper compensation is received by PAPs				
<b>CONSTRUCTION STAGE</b>					
<b>Air Quality</b>	SO <sub>2</sub> , NO <sub>x</sub> , CO, O <sub>3</sub> , SPM, PM <sub>10</sub> , PM <sub>2.5</sub> , Humidity, Wind direction, Wind speed, Temperature	Air quality standard by NEQS	Throughout the project areas	Quarterly	SM
<b>Dust</b>	Dust control	Air quality standard by NEQS			
<b>Noise Level</b>	dB(A)	Noise Pollution			
<b>Water Quality</b>	Surface water: Temperature, Turbidity, pH, TDS, EC, TSS, DO, COD, BOD <sub>5</sub> .	Water quality standard by NEQS			

**Groundwater: Color, odor,  
Water quality standard by NEQS**

**As Above**

	Taste, Temperature, Turbidity, pH,	NEQS	Groundwater		
	TDS, EC, TSS,		near project corridor	Quarterly	As Above
	CaCo <sub>3</sub> , hardness, Potassium, Nitrate, Nitrite (as NO <sub>2</sub> ), Phosphate, Arsenic, COD, DO, TSS, Total Coliform, Faecal Coliform and E.Coli.				
<b>Soil Pollution</b>	Soil texture, pH, EC,	Government of Pakistan Standards	At all project sites	Twice a year	As Above
	Available Phosphorus and SAR.				



	<p>Check on liquid waste to be carried out by experienced personnel and using proper procedures.</p> <p>Careful and proper handling of oil and other hazardous liquids.</p>				
<b>Soil Erosion</b>	<p>Visual check for soil erosion and siltation.</p> <p>Visual inspection of erosion prevention measures and occurrence of erosion.</p>	Non specific	Material storage sites and all the water bodies near the project corridor	Monthly	As Above

**Check drainage plan Implemented correctly;**

<b>Drainage Congestion</b>		Monitoring	Throughout the project areas	Weekly during monsoon	Site Management
	Conduct regular inspection				
<b>Wildlife</b>	Wildlife habitat and movement	None Specific	Areas alongside corridor	Quarterly	Site Management
<b>Waste Management</b>	Check storage, transportation, disposal, handling of hazardous waste;	Monitoring	Throughout the project areas	Weekly	Site Management
<b>Health and Safety</b>	<p>Check quality of food and accommodation at construction camp.</p> <p>Check safe water supply, hygienic toilet at camps and construction of drain at camp sites.</p>	Monitoring	Construction sites, labor camps	Regularly	Site Management



	Check toilets are close to construction site and separate toilet for female workers;				
	First-Aid kit with required tools and medicine;				
	The heavy construction material to handled and stored safely putting due care on public safety				
	Heavy construction materials to be stored and handled safely: and Check personal protective equipment				

**Table 16: Training Plan**

<b><u>Type of Training</u></b>	<b><u>Training Description</u></b>	<b><u>Period</u></b>	<b><u>Duration</u></b>	<b><u>Training By</u></b>	<b><u>Trainee</u></b>
<b>Occupational Health &amp; Safety for workers</b>	Health, safety and hygiene. Proper usage of Personal Protective Equipment (PPE's), Precautions to be taken for working safely	Before Construction Activities	Full Day	EHS Manager	
<b>Solid Waste Management</b>	Waste segregation, identification of Hazardous Waste, Use of PPEs and waste Handling	Before Commencement of Project Activities	Full Day	External Sources	
<b>Vehicular safety</b>	Safe operation and maintenance of all vehicles, insurance in accordance with the applicable local and provincial/federal laws	Before Commencement of Project Activities	Full Day	EHS Manager	
<b>Health Safety and Environmental Auditing</b>	Health Safety and Environmental Audits, Reporting Requirements	Before Commencement of Project Activities	Full Day	External Sources	
<b>Implementation of environmental management and monitoring plan</b>	Explanation of Environment Management and Monitoring Program	Quarterly. As soon as the project activities start	Full Day	External Sources	



# **10 STAKEHOLDERS CONSULTATION**

## **10.1 GENERAL**

For **Atlantis Murree (Commercial/Residential Apartments)**, public consultation was carried out to understand the concerns of local communities and other stakeholders who may be affected by the project. This process was conducted in accordance with **EPA guidelines** and the IEE/EIA Review Regulations, which require stakeholder engagement for any socio-environmental study.

The objectives of the consultation were to:

- Share information about the development and operation of Atlantis Murree (Commercial/Residential Apartments).
- Assess potential impacts on the physical, biological, and socio-economic environment.
- Understand stakeholder concerns regarding various aspects of the project.
- Gauge perceptions of social impacts and identify any issues related to project implementation.
- Determine awareness levels and community acceptability of the project.
- Invite stakeholders to express their views on the positive and negative impacts of the project on their lifestyle and environment.

All comments received during these consultations were considered in **finalizing the development plan**, ensuring that the project aligns with local expectations and sustainable development goals.

## **10.2 OBJECTIVES OF CONSULTATION**

For **Atlantis Murree (Commercial/Residential Apartments)**, public consultation plays a crucial role in assessing the potential impacts of the project on local stakeholders and ensuring its successful implementation. It provides a platform for exchanging knowledge with all stakeholders, allowing the project team to understand environmental, social, and technical concerns. The main objective of these consultations is to **verify anticipated environmental and social issues**, identify previously unknown or project-specific concerns, and update the project planning based on **first-hand observations and feedback** from stakeholders who are familiar with the site. This approach ensures better-informed, more acceptable, and sustainable decision-making for the project.

## **10.3 IDENTIFICATION OF STAKEHOLDERS**

All the people who are directly or indirectly affected or concerned with the project are the stakeholder. Besides the living population of the surrounding areas, some other stakeholders were identified and contacted. They are the key players including; shops owners, vendors, public offices, school, university, hospitals, Not only published material (Both brief and comprehensive literature were obtained on request) but also noted their



views and the concerns. Following stakeholders are identified for this project: Project stakeholders include the settled families, either property owners or the tenants, businessmen (land owners, traders, shopkeepers, vendors, transporters, restaurant owners etc.), employees of the commercial entities. PAPs are of two types, for instance:

### **10.3.1 Direct**

For **Atlantis Murree (Commercial/Residential Apartments)**, the directly affected persons (PAPs) are those who will benefit from the project, such as residents, local labor, and nearby service providers. The project is designed to cause **no disturbance to the local community**, while providing improved residential facilities, enhanced amenities, and employment opportunities.

### **10.3.2 Indirect**

For **Atlantis Murree (Commercial/Residential Apartments)**, indirect impacts may be experienced by people living or conducting business within the project's area of influence. These indirect stakeholders include:

- Government agencies responsible for overseeing project-related activities.
- Government departments involved directly or indirectly in the execution and monitoring of the project.
- Staff of political, cultural, religious, or social/scientific organizations who are associated with or affected by project activities.

These indirect stakeholders are considered in planning and implementation to ensure minimal disruption and enhanced benefits to the wider community.

## **10.4 PUBLIC DISCLOSURE**

Public disclosure is the outcome of all such activities where public is involved at least in the information sharing process. This is an integral part of that process so before the proponent applies for NOC to the EPA, this disclosure will be distributed properly among all stakeholder. It is the responsibility of the proponent and the consultants to display public disclosure document at prominent places where community has easy access.

## **10.5 CONSULTATION PROCESS**

Information disclosure, public consultation and discussion regarding the various aspects of the project with the people of the area are necessary. This process is intensified during the EIA Studies, and separate rounds of public consultations were held. Surveys were carried out in order to investigate physical, biological and socio-economic resources falling within the immediate area of influence of the project. Primary data collection included:



- ❖ Data collection regarding the socio-economic condition of the study area
- ❖ Pretesting of socio-economic survey tools in the field
- ❖ To consult the locals for collection of information on biological environment

Various meeting with the stakeholders were held the following objectives:

- ❖ Share information with stakeholders on the said project and expected impacts on community in the vicinity of the project
- ❖ Understand stakeholders' concerns regarding various aspects of the project, including the existing condition of the upgrading requirements, and the likely impact of construction and operation activities
- ❖ Provide an opportunity to the public to influence the project design in a positive manner
- ❖ Obtain local and traditional knowledge, before decision making
- ❖ Increase public confidence about the proponent, reviewers and decision makers
- ❖ Reduce conflict through the early identification of controversial issues, and work through them to find acceptable solutions
- ❖ Dissemination of information through discussions, education and liaison
- ❖ Documentation of information narrated by the stakeholders and mitigation measures proposed by the stakeholders
- ❖ Incorporation of public concerns and their address in the EIA; and eliciting their comments and feedback

### **10.5.1 Consultation Methodology**

The methodology adopted for consultations is summarized below.

#### **10.5.1.1 Consultation Material**

The main document for distribution to stakeholders during the consultations was Social Impact Assessment Interview.

#### **10.5.1.2 Consultation Mechanism**

Primary stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in the Urdu language. During these meetings a simple, non-technical, description of the project was given, with an overview of the project's likely human and environmental impact. This was followed by an open discussion allowing participants to voice their concerns and opinions. In addition to providing communities with information on the said project, their feedback was documented during the primary stakeholder consultation. The issues and suggestions raised were recorded in field notes for analysis,



and interpretation. By reaching out to a wider segment of the population and using various communication tools such as participatory needs assessment, community consultation meetings, focus group discussions, in-depth interviews, and participatory rural appraisal EIA involved the community in active decision-making. This process will continue even after this EIA has been submitted, as well as during future EIA in which similar tools will be used to create consensus among stakeholders on specific environmental and social issues. Secondary stakeholder consultations were more formal as they involved government representatives and local organizations, consulted during face-to-face meetings. They were briefed on the EIA process, the project design, and the potential negative and positive impact of the project on the area's environment and communities. It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflict with community's leaders or local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the EIA report.

### **10.5.2 Primary Stakeholders Consultation**

The community consultations were conducted with the community members outside their settlements to encourage and facilitate their participation. Consultation was done for 1 day.

#### **10.5.2.1 STAKEHOLDER CONCERNS AND RECOMMENDATIONS**

For **Atlantis Murree (Commercial/Residential Apartments)**, community representatives from neighboring streets were consulted to understand their views and concerns regarding the project. Key findings and recommendations from these discussions are summarized below:

#### **Concerns Raised:**

- Noise levels during construction due to machinery and vehicle movements may be disturbing.
- General mobility of residents may be temporarily affected during construction.
- Proper management of solid waste is essential.
- Rainwater harvesting should be implemented wherever possible.
- Trees should be planted along drain embankments to prevent soil erosion.

#### **Recommendations for Mitigation:**

- Roads and paths damaged during construction will be restored by the proponents or contractor.
- Movement of machinery and equipment will be scheduled to minimize inconvenience to the local population. Project vehicles will follow traffic rules and road etiquette.
- Construction activities will avoid interference with local customs, traditions, and pedestrian movement.
- All labor, especially unskilled labor, will be sourced locally and provided with proper training.



- Private properties and lands will not be encroached upon, and any disturbed lands will be rehabilitated.
- The proponents will supervise the contractor to ensure that all concerns of the local population are addressed.
- Proper disposal of liquid and solid waste will be ensured.
- No environmental hazards will be created at the project site.

Overall, the consultations revealed **general satisfaction with the project**, and these mitigation measures have been incorporated to ensure smooth implementation, minimize disturbances, and promote sustainable development for the community.

### 10.5.3 Secondary Stakeholders Consultation

The consultations were carried out with the local government officials. Comments and recommendations of all consulted stakeholders are presented in table below:

S#	Participant	Designation	Concerns/Remarks
<b>Responsible Authority</b>			
1	<b>Official Concerned</b>	<b>Inspector Environment</b>	<ul style="list-style-type: none"> <li>✚ The environmental reports must be available for better understanding to comment.</li> <li>✚ All mitigation measures must ensure by proponent while development of this project.</li> <li>✚ As Murree is declared as sensitive area, development projects must be supervised by proponent and concerned department.</li> <li>✚ A solid waste management plan for the operation period must be prepared.</li> <li>✚ The plantation of shrubs and ornamental trees should be executed keeping in mind the seasons.</li> <li>✚ The project description, exact location, site area should be clearly mentioned in the report.</li> </ul>
<b>Departments and Agencies</b>			
<b>Rawalpindi Development Authority, R.W.P.</b>			
2	Mr. Sadoon Basra	AD Engineering, RDA	<ul style="list-style-type: none"> <li>✚ It's a good initiative for economy empowerment of the area. This project augments jobs opportunity and security of the area.</li> </ul>



			<ul style="list-style-type: none"> <li>Be ensuring during the development of project no harm to flora, fauna and no tree cutting involved.</li> </ul>
<b>Proponent Environment Management Team</b>			
<b>3</b>	<b>Mr. Muhammad Usman Hafeez</b>	Proponent	<ul style="list-style-type: none"> <li>Local employment will be ensured</li> <li>Tree plantation will be done to make project environment friendly</li> </ul>
<b>4</b>	Mr. Muhammad Abbas	EHS Officer	<ul style="list-style-type: none"> <li>No waste will be dumped improperly</li> </ul>
<b>Environmental Practitioners and Experts</b>			
<b>5</b>	<b>Dr. Malik Muhammad Akhtar</b> Syed Zeeshan Haider  M.Abbas Khatija	PhD  MPhil Environmental Science M.Phil (Chemistry) MPhil Climate Change and Sustainable development	<ul style="list-style-type: none"> <li>Proponent should give preference to the local unemployed youths when employing workers for the project.</li> <li>Proponent shall follow Environment Protection Act Regulations throughout construction and operation of project</li> </ul>
<b>Affected and Wider Community</b>			
<b>6</b>	Mr. Khurram	NGO (Parho Barho Punjab)	<ul style="list-style-type: none"> <li>They focused on a point to encourage such projects in order to increase economic development as well as to improve living standards of area</li> </ul>

# **11 CONCLUSION AND RECOMMENDATIONS**

## **11.1 CONCLUSION**

This Environmental Impact Assessment (EIA) for **Atlantis Murree (Commercial/Residential Apartments)** has been conducted in accordance with the relevant guidelines of the Government of Punjab, with the objective of identifying and assessing potential environmental and social impacts of the project. The study includes a detailed description of the project, baseline environmental conditions, potential impacts, and proposed mitigation measures, along with an Environmental Management Plan (EMP) for implementation. Temporary moderate impacts on air quality and noise levels during construction have been mitigated through vehicle and equipment maintenance, silencers, water sprinkling, and careful scheduling. Measures have also been implemented to prevent contamination of water and soil from construction materials and wastewater, and solid waste is properly managed. The EMP defines roles and responsibilities, monitoring requirements, documentation, site restoration, and staff training to ensure all mitigation measures are effectively implemented. With strict enforcement of these measures, residual environmental impacts are expected to be minimal, while the project provides positive social and economic benefits to the surrounding community.

## **11.2 RECOMMENDATIONS**

According to Section 12 of the Pakistan Environmental Protection Act, 1997(amended 2017), environmental approval is mandatory prior to the commencement of any project that may have adverse environmental impacts. Based on the overall assessment of the EIA, it is concluded that **Atlantis Murree (Commercial/Residential Apartments)** is not likely to cause significant negative impacts on the social, physical, or biological environment, provided that the proposed mitigation measures are properly implemented. It is recommended that all mitigation measures outlined in the Environmental Management Plan (EMP) be fully applied during the design, construction, and operational phases. On the basis of these findings, adoption of the recommended mitigation measures ensures that the project will be environmentally acceptable, and the EIA report may therefore be approved with the condition that the EMP is implemented in letter and spirit.

