EXECUTIVE SUMMARY

TITLE OF PROJECT

This executive summary presents an overview of the main findings of the Environmental Impact Assessment Report for Development of a Housing Scheme by **M/s Mian Town Phase-III (Housing Scheme)**. The main objective for establishing this project is to develop a modern housing scheme for providing the residents a clean and green environment so that they could live a comfortable life as the population of the country is growing so fast and standard housing is becoming an issue. Proponent has made a proper plan to make the scheme one of the most developed housing schemes. To maintain the natural beauty, proponent has made provision of trees, plants and green belts in the landscaping of the project.

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 for the Establishment of a Housing Scheme by M/s Mian Town Phase-III (Housing Scheme) falls under **Schedule II** (List of projects requiring an EIA), **Category H** (Urban Development and Tourism.) and **Sub category 1** "Housing Schemes more than 300 kanals". For this instance, EIA of the Project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act, 2012 and IEE/EIA Regulations 2022. The process for conducting environmental assessment and the results of EIA are described in this document.

LOCATION OF PROJECT

Aforesaid Housing Scheme is located at Chak No. 52/4-R, Chistian Road, Tehsil Haroonabad, District Bahawalnagar. Coordinates of site are 29.6257558 73.1247579. Access to project site is provided by Chistian Road.

NAME OF PROPONENT AND ORGANIZATION PREPARING THE REPORT

The details of the proponent are as follow:

Proponent Details	
Proponent Name	Mian Abdul Wahid S/O Chaudhary Abdul Ghani
Address	Post Office Haroonabad, Chak No. 73/4-R, Tehsil Haroonabad, District Bahawalnagr.

In order to comply with the regulatory requirement of environmental laws of Punjab, management of M/s Mian Town Phase-III (Housing Scheme) has entrusted M/s EHS Services with the assignment of carrying out an EIA Study of the said project. The details of the consultant are as follows:

Consultant Details	
Consultant	EHS Services Pvt. Ltd.
Address	House No.#12, Street No.#06, V-Lane Cavalry Ground

	Extension, Lahore Cantt
Focal Person	
Name	Engr. Muhammad Asif
Contact No.	0304-4404111, 0345-3122696

BRIEF OUTLINE OF PROJECT

This report is related to the Development of a residential colony comprising of residential plots, commercial shops, park, public buildings, graveyard, roads and all other basic necessities of life are easily available and approachable in said housing scheme. Scheme will have a capacity to accommodate approx. 600 to 700 persons. Total area of said Scheme is 408.00 Kanals. Total cost of project will be approximately 150 Millions. Nature of area is residential. Coordinates of project site are 29.6257558 73.1247579.

This construction project will be unique in its nature as it will play an important role in boosting and introducing the improved living standard for the residents. The current project will provide employment opportunities, directly and indirectly to a local people of different categories, both skilled and unskilled, during its construction and regular occupancy

SALIENT FEATURES OF PROJECT

Proponent Name:	Mian Abdul Wahid S/o Chaudhary Abdul Ghani
Project Title:	Establishment of a Housing Scheme by M/s Mian Town Phase-III (Housing Scheme)"
Project Location:	Chak No. 52/4-R, Chistian Road, Tehsil Haroonabad, District Bahawalnagar. 29.6257558 73.1247579
Consultant Name:	EHS Services Pvt. Ltd.
Accommodation Capacity:	600 to 700 persons
Cost of Project:	Approx. 150 Millions
Area of plot:	408.00 Kanals
Wastewater:	Wastewater will be discharged in disposal station TMA Drain
Solid Waste:	Will be managed as per area practices by municipal Committee

MAJOR IMPACTS AND RECOMMENDED MITIGATION MEASURES:

Physical Environment Impacts: Soil-related issues include soil erosion, slope stability, and soil contamination. The land excavation and filling, construction activities and maintenance of equipment/vehicles may cause these issues. The quality of soil would be affected, as soil contamination would occur because of the disposal of untreated wastewater or direct disposal of chemical and onsite preparation of materials. Oils, chemical spills, and waste from campsites may also deteriorate the quality of the soil. Dumping of construction wastes/excavated material, in the

surrounding area, may limit the use of land in the project area. The solid waste may be generated due to different construction activities, and it will mainly include surplus excavated and construction

material. Construction machinery and project vehicles will release exhaust emissions, containing Carbon Monoxide (CO), Oxides of Sulfur (SOx), Oxides of Nitrogen (NOx), and Particulate Matter (PM). These emissions can deteriorate the ambient air quality in the immediate vicinity of the project site. Furthermore, construction activities such as excavation, land leveling, filling and vehicular movement on unpaved tracks may also cause fugitive dust emissions. Noise and vibration will be generated by construction machinery and vehicles. The quality of water may deteriorate in the area. During the deep excavation, the aquifer may be hit, and the quality of water will be depleted. Because of the preparation of construction material on-site, leachate may be produced and percolated through the soil. It may then reach the water table and contaminate the water that may be consumed by the local people. Project is being developed on a vacant plot in an area with residential settings in the nearest vicinity. There is a need to implement mitigation measures during the construction and operational phase to minimize the potential negative impacts on these areas.

Mitigations: Soil erosion can be minimized by appropriate land clearing, levelling, and grading. Excavated slopes will not be left untreated/unattended for long durations, and appropriate slope stabilization measures will be taken as per the design. For the domestic sewage from the contractor's camp, a septic tank with soaking pit will be constructed having adequate capacity. Waste oils will be collected in drums and sold to the recycling contractor. The recyclable waste from the project site (such as cardboard, drums, broken/used parts, etc.) will be sold to recycling contractors, or where appropriate to reuse/recycle it. Appropriate sewage treatment mechanisms such as septic tanks of adequate sizes will be incorporated in the design for the treatment of sanitation water. Water quality analysis will be carried out at the project site and at campsite quarterly during the construction phase.

Ecological Environment Impacts: The shrubs will be cleared before the construction phase. The loss of natural vegetation and other project activities will potentially have limited adverse impacts on the faunal resources and habitat of the area as well. The construction of the project will ultimately cause them to leave the area and move to other locations.

Mitigations: The Proponent will implement recommended mitigation measures to ensure minimal impact on the aesthetic beauty and vegetation of surrounding areas. The plantation plan is recommended for the beautification of the project area. It will not only provide an aesthetic view but will also improve the natural vegetation cover and sequester carbon dioxide from the atmosphere. Proponent of project has already allocated green spaces for plantation and thus plantation will be done there. All preventive measures will be adopted to control the spill-over of chemicals and other effluents on the ground to protect soil fauna and ensure microbial activity in accordance with PEQS.

Socio-Economic Environment Impacts: The project is located in a residential area may pose some safety hazards to the local population situated near the project area, during the construction phase of the project. Construction workers may be susceptible to the eye and respiratory diseases due to their routine exposure to dust and exhaust emissions on site. Injuries could happen primarily by occupational-related accidents, animal bites, etc. Activities such as land clearing, earthworks, and construction of facilities present various occupational hazards to the workers on the project site. There are no reported sites of the archaeological or historically significant site at the project site. However, in case an artifact of such significance is found during the construction activities, the Archeology Department will be informed.

Mitigations: Eye and respiratory diseases will be mitigated through routine health screening and training of contractor's employees. The physical injury will be mitigated through the provision of

appropriate training and emergency response procedures. Protected fencing will be fixed around the construction site. The provision of Personal Protective Equipment (PPE) to the workers will be ensured. Protective fencing will be fixed around the construction site. Unauthorized access within the construction area will not be allowed. Vehicle speed of 20 km/hr at the project site will be implemented. Appropriate light diffusers and reflectors will be used, if required, to minimize the public nuisance caused by light pollution.

ENVIRONMENTAL MANAGEMENT PLAN & PROPOSED MONITORING:

For effective implementation and management of mitigation measures, an Environmental Management Plan has been prepared. The EMP provides a delivery mechanism to address potential impacts of project activities, to enhance project benefits and to introduce standards of good practice in all project activities. The EMP has been prepared with the objective of:

- Defining legislative requirements, guidelines and best practices that apply to the project;
- Defining mitigation/ monitoring plan required for avoiding or minimizing potential impacts assessed by the EIA;
- Defining roles and responsibilities of the project proponent and the contractor;
- Defining requirements for environmental monitoring and reporting;
- Defining the mechanism with which training will be provided to the project personnel.
- Environmental sensitivities and impacts, as well as the associated mitigation plan have been addressed in the EMP.

An Environmental Management Plan (EMP) has been prepared and provided in report, providing:

- A systematic approach to ensure that mitigation strategies prepared in this EIA are implemented during project activities.
- An appropriate monitoring plan is devised to ensuring strict adherence to the environmental mitigation and control measures.
- A training program is devised to providing awareness training on all potential environmental issues of the project to all personnel at site.
- A waste management plan, identifying the most suitable waste disposal and pollution control options throughout the project lifecycle.

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 quarterly during construction of the project and report should be submitted to EPA Punjab.
- ***Water quality*** Monitoring of water quality should be conducted before project siting and quarterly during construction of the project and report should be submitted to EPA Punjab. Record should be maintained regarding the underground water pump and consumption
- ***Solid waste*** Record register of solid waste generation and disposal should be maintained

CONCLUSION

The Environmental Impact Assessment 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 expect 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.

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1 SCREENING

According to the Section 12 of Punjab Environmental Protection Act, 1997 (amended 2012) 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 for the Establishment of M/s Mian Town Phase-III (Housing Scheme) falls under **Schedule-II** (List of projects requiring an EIA), **Category H** (Urban Development and Tourism.) and **Sub category 1** "Housing Schemes more than 300 kanals". For this instance, EIA of the Project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act, 2012 and IEE/EIA Regulations 2022.

2 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.

2.1 BACKGROUND OF PROJECT

Currently the rates of urbanization and population growth worldwide are increasing fast and with it come the need for improvement in service provision especially in our urban areas. Pakistan rates of urbanization are escalating and being a developing country; most of its urban population is forced to live in slums. Increased population due to rural-urban migration in search of job opportunities and or higher education in major towns has increased demand for buildings, especially residential houses.

For any project to be initiated in Punjab, it is mandatory to accord Environmental Approval from EPA Punjab under Section-12 of the Punjab Environmental Protection (Amendment) Act, 2012 by filing an IEE or EIA before EPA Punjab, as may be defined in Review of IEE/EIA Regulations, 2022 or recommended by EPA Punjab. For this purpose, the proponent has decided to engage environmental consultants, **M/S EHS Services** to conduct Environmental Assessment for the execution of project. The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio-economic/cultural conditions and assess all possible impacts arising during the construction and operation phase of the project and to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulation of Environmental Management Plan (EMP) for implementation of the project in environment friendly manner. This report is prepared by critically examining of the environmental factors which might be affected due to construction and operation of the project. The purpose of this report is to analyze impacts of the project. This EIA provides the basis for a determination of the degree of the environmental impacts of the project. The report provides relevant information, as required under the officially approved format, to help the decision makers i.e. EIA Punjab before issuing for the Environmental Approval.

2.2 IDENTIFICATION OF THE PROJECT AND PROPONENT

2.2.1 Location of the Project

Aforesaid Housing Scheme is located at Chak No. 52/4-R, Chistian Road, Tehsil Haroonabad, District Bahawalnagar. Coordinates of site are 29.6257558 73.1247579.

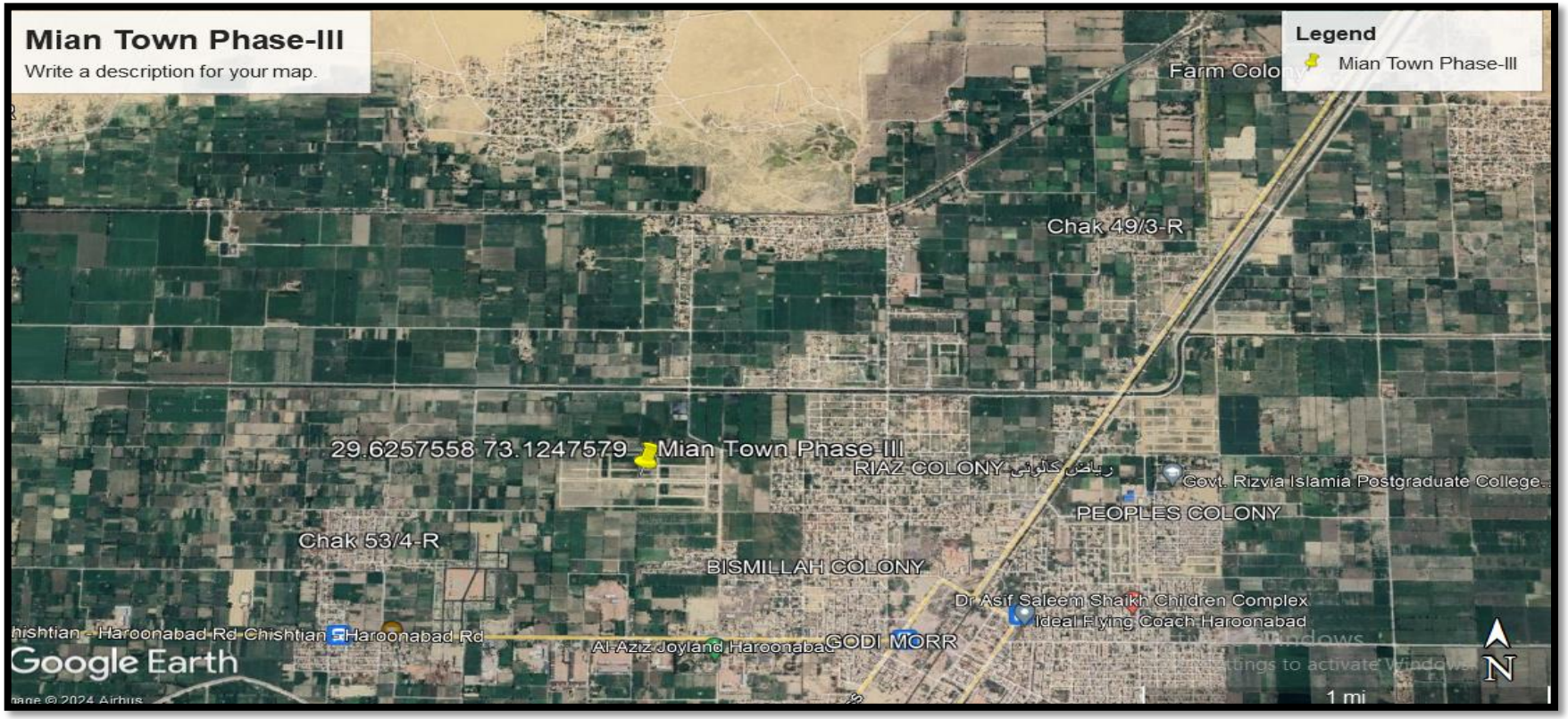

Figure 2-1: Location Map

2.2.2 Nature of Project

The Environmental Impact Assessment (EIA) report covers the project for the construction of residential scheme "Mian Town Phase-III " The salient features of this project have been described in Chapter 5, and briefly in Executive Summary of EIA.

2.2.3 Size of project

Said Project will provide residential plots, commercial shops, park, public buildings, roads. Scheme will have a capacity to accommodate approx. 600 to 700 persons

2.2.4 Proponent

The details of the proponent are as follow:

Proponent Details	
Proponent Name	Mian Abdul Wahid S/O Chaudhary Abdul Ghani
Address	P.O. Haroonabad, Chak No. 73/4-R, Tehsil Haroonabad District Bahawalnagar

2.3 Details of Consultants

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

EHS 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	
Consultant	EHS Services Pvt. Ltd.

Address	House No.#12, Street No.#06, V-Lane Cavalry Ground Extension, Lahore Cantt
Focal Person	
Name	Engr. Muhammad Asif
Contact No.	0304-4404111, 0345-3122696

Study team:

The following table lists the names of experts involved in the making of EIA report:

Table 2-1: List of Experts

Sr. #	Name	Qualification	Role
	Engineers		
i.	Engr. M. Asif	M.Sc. Chemical Engineering	Monitoring and Testing
ii.	Engr. Muzna Manzoor	M.Sc. Environmental Engineering	Designing and report review
iii.	Engr. Fahad Nazir	M.Sc. Chemical Engineering	Socioeconomic Survey
iv.	Engr. Rida Azhar	B.Sc. Environmental Engineering	Report preparation
v.	Mahtab Alam	M.Sc. Chemical Engineering	Collection of baseline data
vi.	Saad Khattak	B.Sc. Chemical Engineering	Site survey and analysis of impacts on surroundings

2.4 PURPOSE OF EIA REPORT

The development of any Project leads to positive and adverse changes in environmental and change in social settings of the Project Area. The intensity and level of change, however, depends upon the nature of the Project and the baseline environmental conditions of the area. The commencement 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, 2000 provided the guidelines for categorizing the Projects. According to Schedule-II of PEPA (Review of IEE and EIA) Regulations, 2022; the construction of the housing scheme having area more than 300 kanals falls under category H (1). i.e., the project requires an EIA study.

2.5 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.

2.6 Approach & Methodology

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

- **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

- **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.

- **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.

- **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 proposed project components.

- **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 proposed 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 proposed 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 proposed Project, a tentative AOI was delineated.

- **Survey of AOI**

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.

- **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, proformas and maps were developed to collect the information

- **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.

- **Screening of Potential Environmental Impacts and Mitigation Measures**

Based on the generally established baseline conditions in the adjacent as well as in the Project Area, potential physical, ecological and social impacts of the Project were identified, evaluated and quantified, wherever possible. A logical and systematic approach was adopted for impact identification and assessment by utilizing a combination of the secondary data, satellite imagery, environmental checklists, socioeconomic survey proformas, field observations and discussion with the local residents of the Project Area. To mitigate the significant adverse impacts, adequate mitigation measures and implementation framework were proposed so that the proponent could incorporate them beforehand in the design phase.

- **Environmental Management Plan (EMP)**

An EMP has been prepared to ensure the adequacy and effectiveness of the proposed protocol by clearly identifying the roles and responsibilities of the agencies, responsible for implementation, monitoring and auditing of EMP activities, existing and suggested framework, necessary approvals and the required further studies. EMP also include organizational setup, a monitoring mechanism, monitoring plan, environmental and social parameters to be monitored with their frequency. Similarly, costs for environmental monitoring and social component/social mitigation measures were also included as part of the EMP. Environmental monitoring, evaluation, auditing and reporting mechanism were also proposed in the EMP.

2.7 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

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 proposed 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

Said project will have positive and negative impacts at local and national level. The establishment of the said project will contribute to enhancing Pakistan's domestic productivity, and help diversify Pakistan's economy. It will create potential of improvement for social and cultural values of local people's exchange of values and standards through positive social interactions. Positive changes in lifestyles will occur due to availability of income when the natives take up Company jobs.

3.4 Important issues and concern raised during consultation

During consultation it was observed that maximum of people was in favor of project and following issues and concerns were raised during Stakeholder Consultation:

- Air emissions and noise should be controlled effectively.
- Locals should be preferred for the job opportunities.
- Solid waste should be managed effectively by adopting the standard practices of the area.
- Cleanliness of the area should be ensured.
- Waste should not be dumped openly.
- Health of the workers should be ensured.
- Workers should be hired from local community.
- Environmental enhancement measures such as; Tree plantation, monitoring and safety should be ensured
- HSE plan should be enforced strictly
- Preventive measures should be adopted to avoid any unfortunate incident
- Proponent shall work for betterment of community

- All emissions and effluents shall be managed properly to avoid public nuisance

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 deals with an analytical overview of the different alternatives that have been considered while planning of the proposed project. The analysis has been carried out critically so as to justify the need of the Project. 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

If we consider no project option then we will lose all positive impacts that will be caused due to the project; like providing residential plots to the all income groups, provision of basic infrastructure to the people that would live there, loss of potential employment and business opportunity. Secondly, if the demand of housing sector is not met through government schemes. The private sector will spring up residential housing societies in the suburbs and rural areas to meet the demand. This will have a far greater impact on the environment. The "No Project Option" does not appear reasonable given the above facts. However, the expected negative impacts can be minimized by adopting appropriate mitigation measures.

4.2 Site Alternative

The objective rationale for this option was found lacking on two counts. Firstly, the land is under ownership of proponent. Secondly, despite relocating the project, the pertinent environmental impacts on the air, water, soil, and socioeconomic environment would remain almost similar in nature as would be at the present site. Contrarily, the site owing to a number of advantages appears to be a good choice for constructing the project because not only is the open land but also is also available and located amidst a good environment. As the land is not under any other product usage, its usage for developing the housing scheme will not involve adverse land use change. All the civic amenities and the infrastructure required for a housing scheme such as water supply, sewerage system, electricity, telephone, and natural gas is already available near the project area site. Furthermore, the construction of the project at this site does not involve the dislocation or resettlement of any population. On the other hand, relocating or shifting the project to some other site might involve land use change and or displacement and resettlement of the occupants

Additionally, if the proponent buys land at a new site, the cost of the project may shoot up exorbitantly, thus rendering it economically non-viable and non-affording for the target population. The objective analysis indicates that exercising the option of shifting the project to some other location will render the project socially and financially non-viable. Therefore, in view of the position explained above, this alternative option of shifting the project from the current site to some other location was found not feasible. Distances from nearest receptors and facilities are:

Receptors	Name	Distances
Residence	Chak 53/4-R	1.15Km
Educational Institute	Vital City School	2.84Km
Hospital	Tahir Medical Complex	3.38km
Road	Chistian Road	0.83Km

4.3 Economic Alternative

The immediate economic benefits of the proposed project are the generation of employment opportunities and revenues. The direct and indirect jobs creation will occur in a broad range of industries such as construction services, repair and maintenance, electricity supply, hardware and building supplies retailing, motor vehicles and parts retailing, water supply, sewerage and drainage services, waste collection, treatment and disposal services, gas supply, rental and hiring services, garden supplies retailing, cleaning and janitorial, pest control, printing, etc. The negative impacts due to the projects construction and operational phases can be minimized, controlled, and eliminated, if the mitigation measures as suggested in the EIA report are implemented.

4.4 Environmental Alternative

The proposed project site is located on an open plot which is easily accessible through main road. The project area comprises of open plots and residential areas. There may be potential environmental and human health impacts of the proposed project during the construction phase of the project. However, the proposed project will have a dedicated sewerage treatment plant, an efficient solid waste management system and features of the eco-friendly building such as the use of energy-efficient items have been planned in the scheme. Considering the environmental protection measures to be taken during the construction and operational phase of the project and the sustainable features of the proposed project, it can be implied that the proposed project will enhance the environment of the project area during the operational phase of the project especially when looking at the alternatives to the project.

4.5 Conclusion

No alternative site has been identified. If the project is not implemented, then all positive impacts related to the housing project will be lost. So, the best option is to ‘build as proposed’ by mitigating its potential negative impacts.

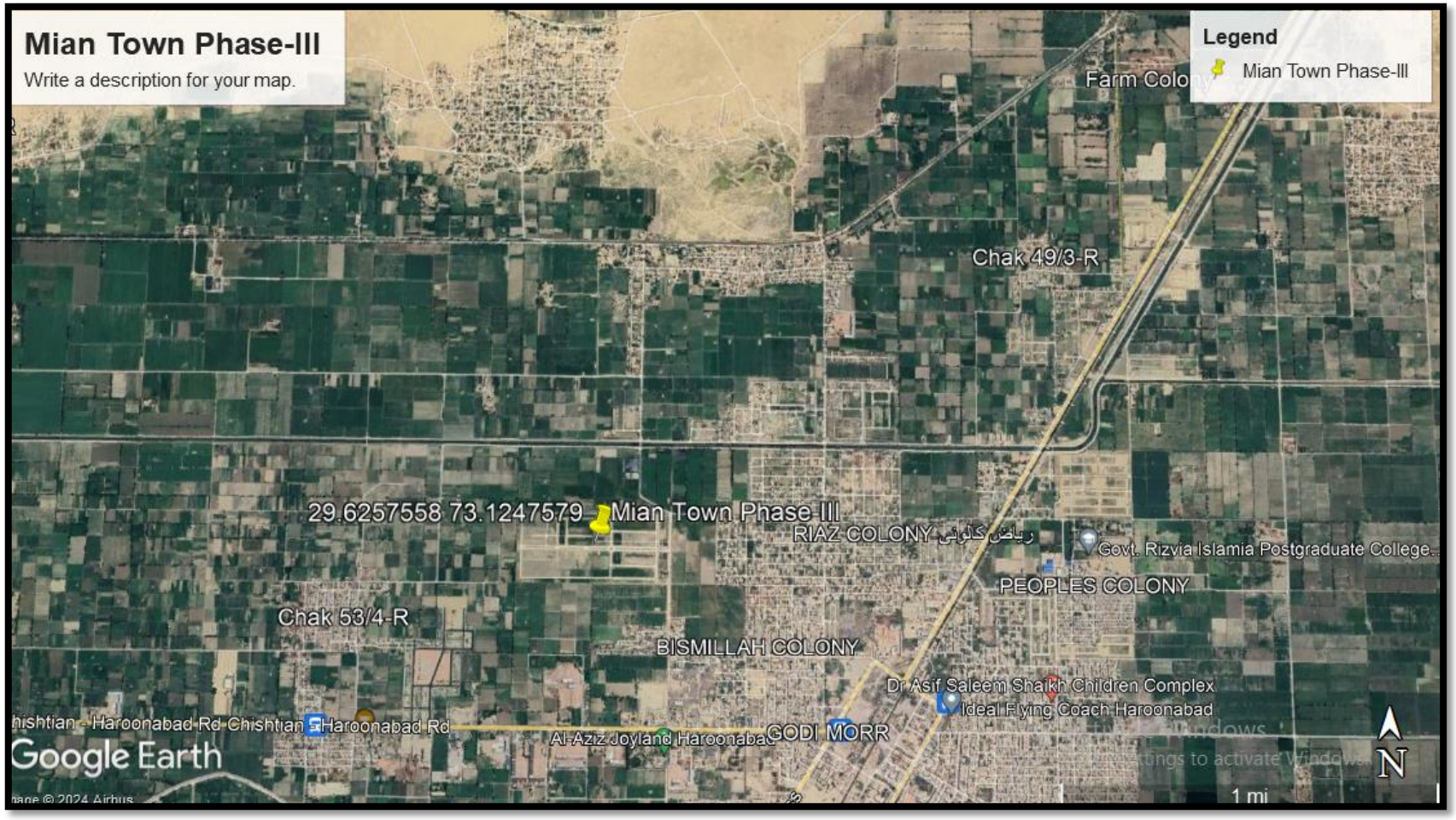

Figure 4-1: Nearest Receptor

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

Following are the main objectives of said housing scheme:

- ✓ The main objective of the project is to meet the growing requirements of housing units for all income groups.
- ✓ To provide residential accommodation for general public.
- ✓ To provide various services viz: roads, drainage, water supply and sanitary sewerage system, to the people living there.
- ✓ To reduce the pressure on already overcrowded housing in Pakistan
- ✓ To cope with the abnormally increased and pressing demand for government and general public housing units.
- ✓ To provide employment opportunities both directly (workers and employees) and indirectly by accelerating the business activities in the project area.
- ✓ Indirectly the project will improve the living standards of the people and strengthen the economy.

5.3 Government Approvals

Project Proponent has accorded approvals/ certifications for their project from all relevant regulatory bodies successively. Approvals obtained from different departments have been annexed.
Following is the list of approvals acquired:

- ✓ No objection certificate for wastewater disposal in municipal committee sewer line
- ✓ Technical clearance certificate from District Council
- ✓ Non encumbrance certificate

5.4 LOCATION & LAYOUT OF PROJECT

The project is located at Chak No. 52/4-R, Chistian Road, Tehsil Haroonabad, District Bahawalnagar. The GPS coordinates of the project site are 29.6257558 73.1247579.
Location Plan is given in Fig 3-2.
Layout map of the project site is annexed.

5.5 LAND USE

The land is owned without any dispute. The nearby area is residential in nature.

5.6 ROAD ACCESS

Said project site is accessible through Lahore-Chistian Road . Road Network around project site is shown in below fig 3-5.

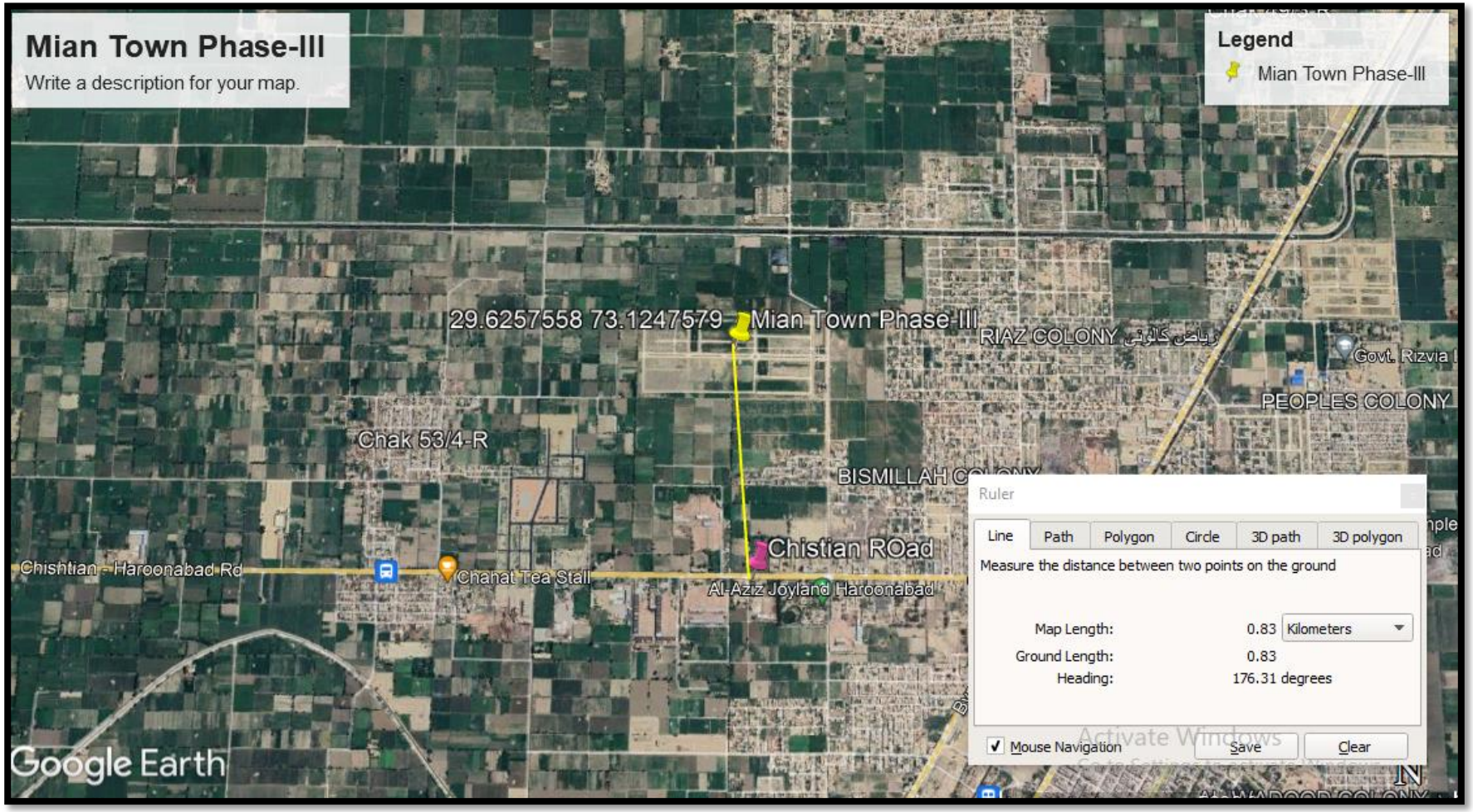

Figure 5-1: Road Accessibility

5.7 RELOCATION AND REHABILITATION PLAN

The main areas to be considered for site restoration include the construction area, temporary tracks; land used for vehicle and material stores, material excavation pits etc. These areas should be restored to its original condition with the maximum possible effort. The restoration work comprises the removal of temporary construction works and removal of any fence installed, leveling of areas (wherever required), etc. The following procedures will be adopted for the restoration of the site:

- All temporary construction built for the site development will be removed.
- Any debris from construction activities should be removed properly from the site.
- All fencing and gates will be removed and pits will be backfilled.
- Whole of the site will be covered with the original soil to the original levels and grades and re-vegetation will be done, where required.

None of the locals or residents will be relocated or infrastructure will be affected or destructed because land is already under the ownership of the project owner. There is no need for the relocation or dismantling of significant structure. Hence, no relocation and rehabilitation is required.

5.8 VEGETATION FEATURES OF SITE

The project area is surrounded by residential areas. Some bushes and shrubs are present around the project site. However proper land scapping and tree plantation will be ensured.

5.9 DESCRIPTION OF THE PROJECT

The development of proposed Project has been proposed on a piece of land measuring 408.00 Kanals. The project includes residential plots, open spaces, parks, educational institutes, graveyards, and Roads. .

For the development of Housing Society, the essential infrastructure works include drainage system, water supply, sanitary sewerage system, solid waste management system, electrification, streetlights, security, sui gas works, sanitation. Proponent will also provide soft and hard landscaping, parks, playground and other facilities in the sector. The total estimated cost of the development of Project is Rs 150 Millions. The time schedule for completion of the project is 6 months.

5.10 SUPPLIES

5.10.1 Facilities Provided to the Residents

Said scheme will provide excellent facilities to its residents. Residents will have access to the basic life facilities Parks, Grounds, school etc. within the premises of the Scheme and they will not have to go far for their everyday needs. In short all basic necessities will be provided in adequate manner. Parks will also be part of housing scheme to facilitate the residents.

5.10.2 Environmental Considerations

The said scheme will be an environment-friendly Scheme. Sewerage water from the houses and commercial facilities will be disposed off as per practices of area. The residents will not be allowed to throw their wastes in the open area. Sanitary workers will be hired by the Scheme for handling of solid waste. Final disposal of the solid waste will be done in accordance with the municipal practices of the area.

5.10.3 Public Amenities

Following are the main amenities that will be available to the residents of proposed Housing.

5.10.3.1 Natural Gas Supply

The natural gas supply to the residents of the Housing society will be the responsibility of the Sui-Northern Gas Pipelines Limited (SNGPL).

5.10.3.2 Electricity Supply

WAPDA will be engaged to supply power to the inhabitants of the proposed housing scheme. The efficient utilization of the electricity will be make sure by the residents. To promote the sustainable development solar-powered generated electricity can be utilized as an alternative source of energy. To conserve electricity during operation phase energy efficient electric lights and appliances may be used.

5.10.3.3 Freshwater Supply

Approximately 1000Litres/d water will be required during construction phase. The water requirement for the project during operation phase is only for domestic purpose. Assuming 5 persons per plot and per capita demand to be 150lpcd, total water requirement during operation phase will be approx. 500m^3/d. This requirement will be fulfilled through groundwater from depth of 250ft.

5.10.3.4 Wastewater disposal

Only municipal wastewater will be generated and will be discharged in TMA Drain after treatment. Approximately 72m^3/day will be the wastewater discharge of colony. Recommended/Suggested Design specifications of Treatment plant are as follows:

Design of Grit Chamber:

Q = 72m^3/d = 0.0008m^3/s

Q_{peak} = 0.0020m^3/s

V = 0.30m/s

Calculation of Area:

Area of Grit Chamber= Q_{peak}/V

Area = 0.0020/0.30

Area = **0.0066m^2**

Design of Primary Sedimentation Tank:

Q = 72m^3/d

V= 30m/d

Calculation of Surface Area:

Surface Area = Q/V

Surface Area = 72/30

Surface Area = **2.4m^2**

Calculation of Volume		
Volume = Area*Depth		
A	m2	2.4
Depth	m	4
Volume	m3	9.6
Calculation of DT		
Q = V/t		
Q	m3/hr	3
V	m3	9.6
DT	hr	3.2

Design of Aeration Tank:

Calculation of Volume of basin		
F:M=(Q*BOD)/(V*MLSS)		
Q	(m3/d)	72
MLSS	(mg/l)	3000
F:M	(per day)	0.5

BOD	(mg/l)	200
V	(m3)	9.6

Calculation of Area		
Area = Volume/Depth		
V	m3	9.6
Depth	m	4
Area	m2	2.4

Design of Secondary Sedimentation Tank:

Surface Area = Q/V

Surface Area =72/30

Surface Area **= 2.4m^2**

Total Area required for ETP = 0.0066+2.4+2.4+2.4=7.2066**m^2**

FOS = 10 %

Total Area of ETP= 7.2066+ 0.70266= 7.927m^2 =0.31Marlas

10Marlas plot is designated for installation of ETP

5.10.3.5 Solid Waste Collection and Management

During the construction phase the solid waste will mainly consist of the construction material such as; steel, wood, sand, debris and packaging material. They are re-usable and will be sold to local contractors. During operational phase the solid waste will be mainly generated by the residents mainly consisting of the municipal solid waste such as; kitchen waste, plastic, paper, tin, etc. The solid waste generation rate by each person is approximately 0.4-0.65kg/day. The estimated amount of the solid waste generated will be 200-400kg/d approx. The solid waste collection system will be formulated by the Proponent and it will be a door to door collection system. Domestic solid waste during operation phase will be disposed off according to the municipal practices of that area. Waste from each house bin will be collected in 0.84kanals area marked for solid waste and from here sanitary staff will collect the waste and dispose off properly as per practices of area.

5.10.4 Cost and Magnitude of Operation

The total cost of the project will be 150 Millions approximately and magnitude of operation includes:

- Detailed site survey, planning and demarcation of the various regions in the Project Area.
- Construction of public and social amenities such as; road construction, infra-structure development/public areas, installation of street-lights, demarcation of parks and graveyard.

- Plantation of herbs, shrubs, trees and grasses on the designated area

5.10.5 Schedule of Implementation

The schedule of implementation of construction phase of Project is approximately six months and the detail timeline of the development period is given in Table:

Table 5-2: Timeline for Development Period

Sr. #	Activities	3 Months			3 Months		
		1M	1M	1M	1M	1M	1M
1	Detailed Designing						
2	Lean Development Period						
3	Peak Development Period						
4	Restoration of Site (Plantation/green belt development)						
M=Month							

6 DESCRIPTION OF THE ENVIRONMENT

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

For any development project, the prevailing environmental conditions need to be assessed prior to the stages of planning, designing and execution of the project. Identification of physical, ecological and social aspects of environment and collection of relevant data is essentially important for the evaluation of impacts as well as for the suggestion of adequate mitigation measures, which forms the basis for the implementation of the proposed project in terms of prevailing environmental and social conditions in the study area.

6.3 Study Area/ AOI

It is imperative to delineate the area where the potential significant impacts of the proposed Project are envisaged. The Study Area is the area within which the potentially significant adverse environmental and social impacts of the proposed intervention are envisaged. In the light of this, potential impacts on the existing environment have to be considered in a larger geographical area than the proposed "Project Area" depending upon the extent of direct/indirect impacts.

So the "Study Area" includes the Project Area, nearby land having settlements, agriculture fields, etc. The Study Area map is shown in Figure 4.1.

6.3.1 Site Visits

A team of experts carried out field visits to the proposed project site (Project and Study Area), adjoining areas in order to collect the baseline data on physical, ecological and socio-economic aspects. Primary data was collected from various sources. The people living around the proposed project were interviewed to have their views about the proposed project and the perceived impacts on the natural environment around the proposed project. This included information on land, surface water, groundwater, air, vegetation, animals and human.

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 Topography

District Bahawalnagar lies between 20-51 to 30-22 north latitudes, and 72-17 to 73-58 east longitude. It is bounded on north by districts of Okara, Pakpattan and Bahawalnagar on the East by Ferozpur and Ganganagar district of India, on the south by Indian estate of Bikanir and on the west by Bahawalpur district. River Sutlej forms the northwestern boundary of the district. It is about 163 meters (535 feet) above sea level.

Reference: *PUNJAB MUNICIPAL SERVICES IMPROVEMENT PROJECT (SIP) PLANNING REPORT BAHAWALNAGAR 2008*

6.4.2 Hydrology

Bahawalnagar town is a plain with a minor slope. The sub soil water of the town is brackish and unfit for human consumption. Water table is 4 feet below the ground level and steadily rising. Underground water near Fordwah canal is fit for drinking purpose. A sub soil investigation was carried out along Fordwah Canal from the Wapda Hydrology Department which has recommended installing shallow tube wells of 0.5 cusec capacity at 500 feet apart along Fordwah Canal.

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Groundwater from depth of 200-250ft can be used for drinking and other purpose. Lab reports of water quality are annexed.

6.4.3 Climate

The Bahawalnagar district is spread over 8878 sq. km area with hot and dry climate and the minimum and maximum temperature recorded are 11C and 50C.

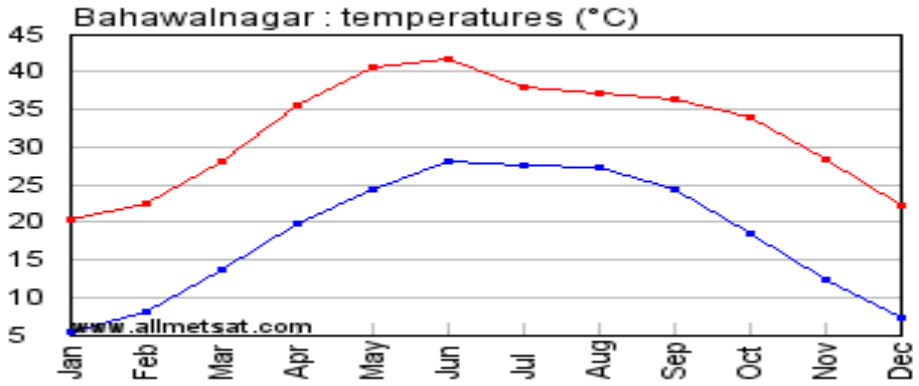

Figure 6-1: Average Temp per month in Bahawalnagar

6.5 Biological Environment

6.5.1 Flora

Main Vegetables include turnip, tomato, cauliflower, potato and onion. The field crops are cotton, sugarcane, millets, wheat, mustards, corn, rice and tobacco. The fruit orchards consist of citrus, dates, guava and in some places pomegranate are also grown.

Source:

Ethno-medicinal investigation of floral diversity of Bahawalnagar district, Punjab, Pakistan

6.5.2 Fauna

No endangered species was observed in nearby areas. Only common animals including horse, cows, goats, crows, cats, dogs and sparrows were present.

6.5.3 Protected areas / National Sanctuaries

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 bythe proposed development interventions; describe the likely impacts on the people and communities taking social, cultural, and economic parameters into account.

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b. discuss the project's impacts on the poor, indigenous and/or ethnic minorities (ifany), 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

The Consultant conducted field survey/investigation on various socio-economic aspects to assess the existing socio-economic environment of the project as well as identify likely impacts under a changing situation with and without the proposed Project. Accordingly, the social study covered the beneficiaries, the affected people and concerned stakeholders in the

area and elicited their views / suggestions for mitigation / enhancement of different types of impacts.

6.6.3 Community/Stakeholders' Participation

Community consultations with different stakeholders, beneficiaries and affected communities of the Project Area were organized to facilitate stakeholders' / peoples' participation in the project activities of the proposed project and their views and feedbacks were incorporated for planning/preparation of the project. Such consultations would strengthen the commitment of a wide cross-section of the affected people, public representatives, government employees and professional groups by giving them an opportunity to participate in key decisions.

6.6.4 Population

The following table shows the population of the district and its tehsils as per 2017 Census:

Urban Population	**17.5%**
Rural Population	82.5%
Total Population	2,897,446

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 6-1: Bahawalnagr Languages

Urdu	**5.2%**
Punjabi	82.9%
Sindhi	Negligible
Pushto	0.2%
Balochi	Negligible
Siraiki	11.4%
Others	0.3%

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6.6.7 Agriculture

The district belongs to the Northern Irrigated Plains Agro-Ecological Zone of Pakistan. It produces one of the best quality cotton in the region.

The crops of the district include cotton, sugarcane, wheat, maize, rice, groundnut, gram, guarseed, jowar, bajra, moong, maash, masoor, rapeseed & mustard, sunflower, barley, sesanum, and linseed.

Fruits of the district include citrus, mango, guava, jaamun, pomegranate, phalsa, banana, and dates.

Vegetable produce of the district includes potatoes, onions, cauliflower, bitter gourd, okra, turnip, peas, tomatoes, garlic, chilies, sugarbeet, and coriander.

6.6.8 Educational Facilities

The following table shows the details of educational facilities of the district as per Punjab Development Statistics 2018-19:

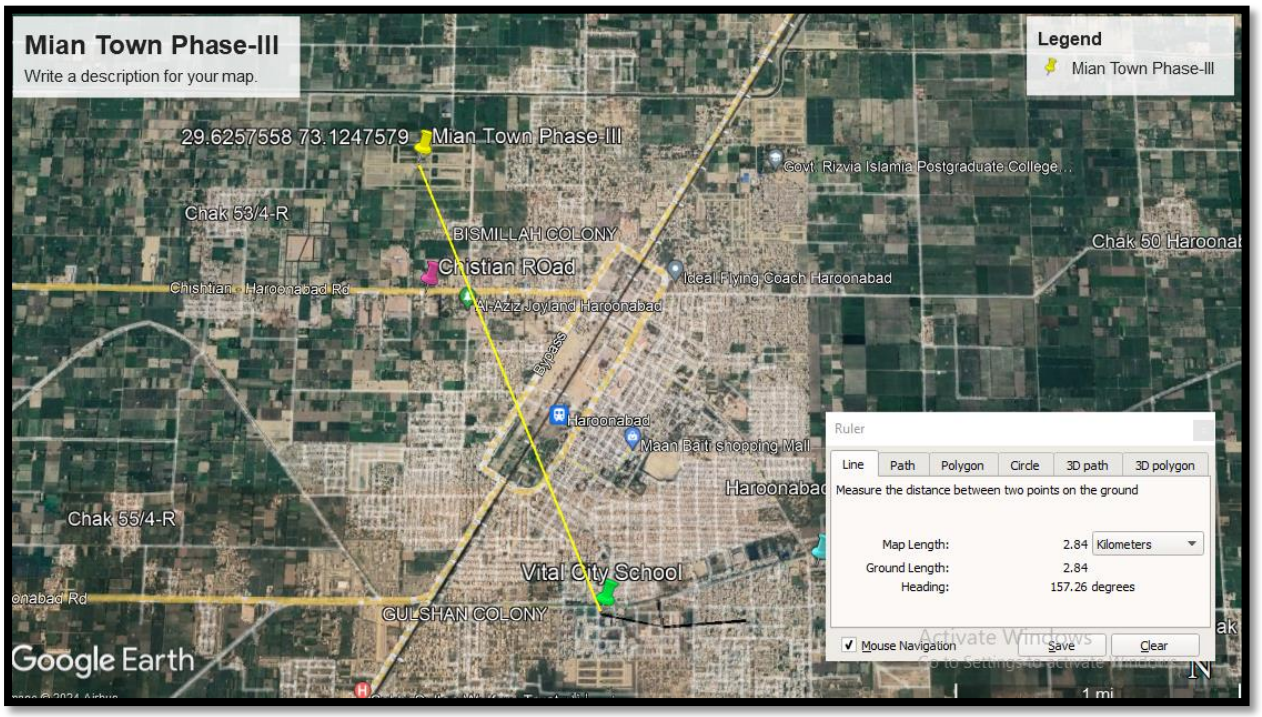

Figure 6-7: Education Institutes in Project Area

6.6.9 Gender Situation Analysis

Women in the project area have no recognized role in the authority structure of the city. Most of the women stay at home and only travel outside the village in case of visiting relatives, and weddings and to hospitals in nearby towns. However, the traditional attitude of not sending girls to school is changing now, because parents realized and understand that basic education is necessary for each individual without the discrimination of sex.

6.6.10 Social and Cultural Values

The existing communities reflect rural culture with its characteristic norms and values. Women do all household work by themselves. Mostly women do the teaching job. Majority of the population follows Islamic tradition. Common food is wheat bread. Yogurt, Lassi and milk are also used. The common dress for males is Shalwar Qameez and for females Shalwar, Qameez and Dupatta/Chadar. Marriages are celebrated in traditional manners.

6.6.11 Conflict Resolution Mechanism

The people of the area were found to be loving, caring and hardworking. They reported that for petty conflicts resolution, they involve the senior and influential people of the area, who after listening to both the parties try to reach an unbiased decision which is acceptable to the aggrieved. Generally, the people accept the decisions of the influential

6.6.12 Health Facilities

The District Health Officer (DHO) is overall in charge of health services provided in the

district. This DHO is supported by doctors, paramedics, technicians, and other support staff. The major diseases that afflicted the residents of the area are seasonal. Cough, flu, fever etc. are the most commonly encountered seasonal diseases. No case of any major disease was reported during the survey.

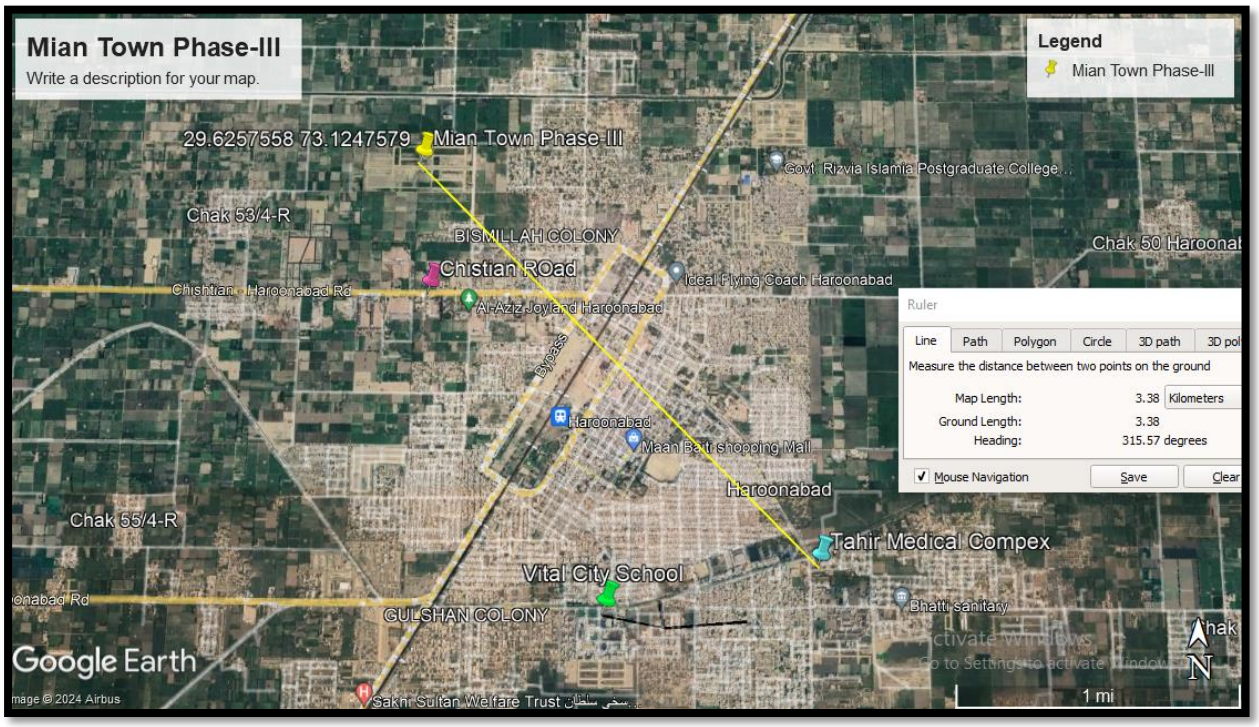

Figure 6-8: Hospitals in project area

6.6.13 Means of Transportation

The modes of transport among the local villagers are buses and wagons. Personal transport includes bicycles, motor cycles and cars owned by the residents of area.

6.7 Lab Reports of Environmental Analysis

Water 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 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

7.1 General

Assessment of impacts depends on the nature and magnitude of the activity being undertaken, as well as the type of environmental control measures that are envisaged as part of the project proposal. The potential impacts from the project area are identified and assessed based on the type and scale of the various activities associated with this project.

Several aspects and potential impacts were identified for each phase (Project Location, Construction and Operation) of the development, with impacts evaluated in terms of their nature, occurrence, possibility and severity potential.

7.2 Screening of Potential Impacts

Several impacts are likely as a result of the construction and operation of the project. Such impacts may be direct, indirect or ultimate. For the purposes of this EIA, these potential impacts (whether direct, indirect or ultimate), are assessed based on their magnitude (short-term or long-term) and effect (positive or negative). Impacts are also classified in three groups: impacts due to project location, impacts as a result of project construction and impacts as a result of project operation.

All the potentially significant environmental impacts from the project are grouped below:

Air Environment

- Impact on ambient air quality

Noise Environment

- Impact on ambient noise

Water Environment

- Impacts on surface and ground water quality

Land Environment

- Impacts on land use

Ecological Impacts

- Impacts on trees/vegetation
- Impacts on forests and wildlife

Socio-Economic Impacts

- Impacts on other infrastructure
- Impacts on employment
- Impacts on public health and safety
- Impacts on cultural resources
- Impacts on aesthetics

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7.3 Impacts due to Project Location

The development will have both socio-economic and environmental implications as discussed in the sub-sections below.

7.3.1 Relocation of People

Currently, there are no infringements on the project site that may be affected therefore relocation exercises are not required.

7.3.2 Loss of Vegetation

Considering the scale of the project and commonly found flora and fauna within the project influence area, no significant adverse effects are envisaged on the ecology of the area.

7.3.3 Shifting of Utilities

There will not be any shifting of existing utilities such as water supply pipelines, sewers, electrical lines, etc. due to the said project.

7.3.4 Impact on Archaeological/Cultural Property

Within the project influence area there are no significant archaeological properties, hence no impact in this area is anticipated.

7.4 Impacts due to Project Design

Design of the said project can have impacts on the environment if it is not prepared accordingly. It is necessary to consider a sustainable project approach. Sustainability is an important issue to consider in design, not only due to environmental concerns but also due to economic and social matters, promoting architectural quality and economic advantages.

Mitigation Measures

- The design process should be carried out in recognition of identified hazards and risks assessment. Accepted design solutions should focus on maximum possible opportunity for risks reduction.
- Carry out engineering surveys including environmental surveys depending on the level of complexity and potential hazards of the planned facilities in the area of construction.
- Integrate within the existing environmental infrastructure at site to facilitate sharing of services and amenities (e.g. power, water, solid refuse collection and roads), safety arrangements and waste management systems among others. This has already been catered as per the designs annexed.
- Minimize risks to health and impacts to external environment. Suitable anti-pollution facilities (solid waste containment and organized removals, waste water purification) should be part of the design.

7.5 Impacts during Construction/Development Phase

7.5.1 Raw Material Transportation

The said Project area is located in the agricultural cum residential zone and some roads of the area are un-metalled. During the transportation of the raw-material such as cement,

bricks, sand, gravels, etc., the dust may be generated which could may impact the near-by community.

Nature of Impact

The nature of the impact is medium, short-term and significant.

Mitigation

Impacts of raw materials can be reduced significantly by adopting better management and monitoring practices. Following management and monitoring practices will be adopted to reduce the impacts:

- Proper tuning of vehicles will be done on the regular basis
- Restrict excessive transportation of the vehicles as well as the speed of the haulage trucks that shall not exceed the speed limit of 40km/hour
- Cover the vehicles with tarpaulin carrying sand

7.5.2 Impacts on Vegetation

Project site has some trees and bushes. It will be make sure that removal of trees is avoided as much as possible. 3-5 fold trees will be grown in case of removal of trees. The impact is considered to be insignificant.

Nature of Impact

The nature of the impact will be low, short-term and insignificant.

Mitigation

Following mitigation measure will be adopted to reduce the impact of the vegetation removal:

- Trees should be planted as soon as the construction on-site completed
- Dust along the un-metalled road should be control by regular sprinkling water on the construction material

7.5.3 Impacts on Water Resource

During construction phase, water will be used for the preparation of the raw material as well as for domestic consumption and will cause negative impact on water resources. The consumption of the water will cause negative impact on the water resource of the area, it may pollute the water resources due to spillage of petroleum products from vehicles as well as the workers working on the Project Site will also consume water.

Nature of Impact

The nature of impact is low, short-term and insignificant.

Mitigation

Following mitigation measures will be adopted to avoid the impact on water resources

- Avoid un-necessary consumption of the water
- Close the tap when water isn't in use
- Proper tuning of vehicles will be required to protect the petroleum products from spillage
- The labor will use the public toilets already present near the Study Area.

7.5.4 Impacts on Air Quality

During construction phase, the machinery working on Project Site may cause air pollution due to release of the pollutants such as; carbon dioxide, NOx and SOx from the burning of the fossil fuels in the vehicles. Dust may be generated due to the excavation activity. No other impact is envisaged that may pollute the air quality.

Nature of Impact

The nature of the impact will be low, short-term and insignificant.

Mitigation

Following mitigation measures will be adopted to reduce the impact on the air quality:

- Proper tuning of vehicles will be done on the regular basis in order to control the air pollution
- Avoid unnecessary movement of the trucks carrying raw-materials
- Avoid excavation and filling activity on the windy days
- Regular water sprinkling on dusty areas will reduce dust emissions

7.5.5 Impacts of Noise

During construction phase, heavy construction machinery will be used. The machines are noisy and can cause a certain degree of nuisance to the nearby residents. The noise levels of machines and vehicles vary widely depending on the type of noise generated and level of activity. Some common impacts of noise nuisance include annoyance, sleep disturbance and interference with communication. Acceptable levels of noise are regarded to be 40 dB(A) during the night and 50 dB(A) during the day. Since construction will take place during the day only the 50 dB(A) level is of importance. As the said Project is located in the residential zone so the noise related impacts will cause significant impact on the nearby community.

Nature of Impact

Nature of impact will be low, short-term and significant

Mitigation

Following mitigation measure will be adopted to reduce the noise;

- The noise related activities should be done during the day time to ensure minimum

disturbance to the local community

- Proper tuning of the vehicles should be done on regular basis
- Noise related activities should be done speedily and completed as soon as practically possible
- Construction activity will be confined to the small reserved area

7.5.6 Impacts on Land-Use

The land-use around the Project Site is characterized as residential zone. No impact is anticipated as the housing society is proposed to be constructed in residential area and the construction will not change the land use of the area.

7.5.7 Impacts on Socio-Economic Environment

During this phase, skilled and unskilled labor will be required. Employment opportunities for the un-skilled workers will therefore increase which will enhance the positive benefits for the local people who are in dire need of income for sustenance. Furthermore, indirect opportunities for employment will arise from the provision of services to the construction teams, such as sale of raw-material such as cement, bricks, sand etc., as well as food and beverages for the labor and after completion of construction phase serve as a permanent business opportunity. In this sense the construction of the Housing Society will have a positive impact on the employment situation of the nearby communities.

Nature of Impact

This impact is considered to be positive, short-term and significant.

7.5.8 Impacts on Cultural and Historic Sites

There will be no adverse impact anticipated on the cultural and historical sites as there is no cultural and historical sites located within the Study Area that could be impacted due to the construction of Said Project.

7.5.9 Impacts on Human Settlements

There is no dispute related to the land ownership and dislocation of any human settlements. Moreover, there will be no possibilities of demolition and relocation of any physical infrastructure. The potential adverse impact is considered insignificant in nature because the Project Area is located in residential zone. Said scheme will not cause any adverse impact or may not cause public nuisances.

7.5.10 Impacts of Work Accidents

To limit the risk of accidents, safety procedures will be put in place and enforced by the foreman to ensure that vehicles and machinery only drive in designated places by authorized personnel.

Nature of Impact

The nature of the impact will be minor, low, short-term and insignificant.

Mitigation

Following mitigation measures will be adopted;

- Make sure all the workers wear Personal Protective Equipment (PEPs) while working
- Regular checking of the machines should be done in order to maintain working machinery and to avoid accidents

7.6 Impacts of Operational Phase

7.6.1 Land and Soil

After the end of the construction phase the area will be restored back to its original state. After completion of construction phase different ornamental plants and native tree species will be planted in parks and around the public buildings. This will improve the overall ecology, aesthetic and landscape of the area whereas; the un-paved roads will be converted to metalled roads. This will have positive and significant impact on the land and soil condition of the area.

Nature of Impact

This impact is considered to be positive, long-term and significant.

7.6.2 Energy Consumption

A large amount of energy will be consumed during the operational phase for lightning, heating and cooling during different weathers as well as during the construction of public and private buildings. Pakistan is an energy deficient country and it will cause significant adverse impact on the Energy Sector.

Nature of Impact

The nature of impact will be direct, low, long-term and significant.

Mitigation

Following mitigations should be adopted to reduce the energy consumption of the housing society:

- Energy efficient equipment and appliances should be installed in order to conserve energy
- Renewable energy options can be considered for the production of electricity such as solar system for lightening the street-lights

7.6.3 Solid Waste Management

Solid waste generated from the households can be divided into two categories: organic waste (e.g., food waste) and inorganic waste (e.g., service materials, glass, plastic, etc.). In the terms of weight, a large portion of the solid waste consist of organic kitchen waste and it may produce vector which could transfer diseases to humans and can be the cause of public nuisance.

Nature of Impact

The nature of impact will be direct, medium, long-term and significant.

Mitigations

Following mitigations should be adopted to reduce the issues related to the solid waste:

- A door to door solid waste collection system will be formulated to avoid public nuisance and to provide hygienic conditions
- Solid waste should be stored in the covered bins in order to avoid the growth of vectors and rodents as well as to control the odor and to reduce public nuisance
- Solid waste should be collected and transported to the waste disposal site on the daily basis

7.6.4 Wastewater

The domestic activities during the operation phase of the project will involve the use of large quantities of water. Wastewater generated from housing scheme will be domestic in nature.

Mitigation Measures

The proponent of the project will lay down sewerage system of the whole scheme. All the wastewater will be discharged in TMA Drain after treatment.

7.6.5 Socio-economic Impact

When a development project is launched in a community, it helps in boosting up the socio-economic conditions by providing the people different economic opportunities. The construction of housing scheme would have a great impact on the commercial activities of the locals.

The socio-economic impacts like employment, education, life, style and cultural uplift are the direct benefits during this stage for the people of the Project Area. Local people will be hired for different jobs, i.e. gardening, housekeeping, cooking, tuitions, driving etc. Facilities like commodity market and medication will also generate working opportunities for the shopkeepers of nearby communities. The human resources will be developed at local level for future development activities in the area. The institutional facilities like roads, dispensaries, proper drainage and sewerage will help improve the lot of the people. Operation of the project will also result in the increase land values. All the Project related job opportunities will ultimately improve per capita income of the population in the area. This is a major positive impact.

Mitigation: As this is a positive impact so it doesn't need mitigation measures.

7.7 Potential Environmental Enhancement Measures

Following are the positive impacts of the Said Project that will enhance the overall socio-economic and ecological condition of the Project Area.

7.7.1 Employment/Poverty Alleviation

The employment opportunities in the Project Area will be increased due to the development and operation of the said project. During development and operation of the said scheme unskilled workers will be required as labors, sanitary workers and sweepers as well as for the skilled workers such as; accounts and managers to run the administration office. In totality, the overall economic conditions of the area will be improved.

7.7.2 Local Economy

The employment opportunities and/or income sources generated by the Project development and operation will be long term in nature. These will be enhanced once the construction phase is completed. The local economy will experience a slight boom during development period and for the construction of public and private buildings.

7.7.3 Increased Business Opportunities

For a construction of the public and private buildings in the housing society a number of raw-material will be required. Many venders can supply the required stuff to the on daily and weekly basis. This will serve as a new business opportunity and it will enhance the socio-economic status of the people direct linked with it.

7.7.4 Increased Housing Capacity and Standards

Housing Society will enhance the housing capacity and standard of the housing. The development is being carried out in the residential zone. Development of the housing society in this zone will solve the issue related to non-availability of the adequate space and shelter.

7.7.5 Infrastructure Development

The development of said Project in this zone will enhance the land values in this particular region. Their price will be high due to many building facilities including accommodation, market places and hospitals nearby the project zone as well as provision of amenities in the region such as electricity, drinking water supply and sewerage system, etc. So, the more population will be settled near the said Project Area due to increased facilities.

7.7.6 Tree Plantation

The tree plantation will be carried out along the boundary of the Project Site, parks, green belts and open green spaces as the part of the Project part. This will include plantation of ornamental as well as indigenous species of the plants. The plantation will improve the overall ecological conditions of the area.

Green areas are mentioned on map. Trees and plants will be grown in all parks and all open spaces. Greenery for beauty enhancement of housing scheme will be done. Shade trees including sheesham, neem will be grown outside boundary of project. Grasses, median plants and median shrubs will also be grown. Aesthetic and beauty plants including roses and jasmine will be grown. Trees height will be between 3-7 ft. Total number of plants and trees will be approximately 100-150. Spacing between plant to plant will be 6-8m.

8 ENVIRONMENTAL MANGEMENT AND MONITORING PLAN

8.1 General

This EIA provides the Environmental Management Plan (EMP) of the project for its construction and operation phases to keep it environment benign as well as the monitoring plan to ensure the compliance of the established EMP.

As per the environmental legislation in Pakistan, the EMP for the operations phase, along with other documents, is to be submitted 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 require monitoring. This section also underlines the monitoring framework for both construction and operation phases to check compliance of the EMP and to take timely actions for correction in case any accidence of significant criteria, requirements or goals are found.

8.2 Objectives of Environmental Management Plan

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the EIA.
- Define the responsibilities of the project proponent and contractor and provide a means of effective communication of environmental issues between them.
- Identify monitoring parameters in order to ensure the effectiveness of the mitigation measures
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

8.3 Management Approach

The organizational roles and responsibilities of the key players are summarized below:

Proponent*:* The project proponent will undertake overall responsibility for compliance with the EMP. Proponent will carry out verification checks to ensure that the contractors are effectively implementing their environmental and social requirements.
Contractors*:* The contractors will implement the majority of environmental and social mitigation measures. The contractors will carry out field activities as part of the project. The contractors are subject to certain liabilities under the environmental laws of the country, and under its contract with proponent.

Table 8-1: Summary of impacts

Environmental Parameters	Risk Assessment	Recommended Mitigation

	During	After	
1. Location	+2p	+3p	There is no dispute associated with the ownership of the land The proposed area is not inhabited by any ecologically important or protected flora and fauna specie as well as within 1.0 km vicinity of the Project Area no archaeology and historical important site is located
2. Design	+1p	+2p	The design of the Project will be sustainable as it follows the principles of energy conservation and management. The design of the public buildings will follow the maximum utilization of the sunlight, insulation of building to reduce heat exchange (as insulation of the building will reduce the electricity consumption), high roofs to keep the building cool, etc.
A: Physical			
Land Resources			

Solid Waste	-2p	-2p	A door to door solid waste collection system will be formulated to avoid public nuisance and to provide hygienic conditions Solid waste should be stored in the covered bins in order to avoid the growth of vectors and rodents as well as to control the odor and to reduce public nuisance Solid waste should be collected and transported to the waste disposal site on the daily basis Good management practices should be adopted to avoid the spread of diseases among the locals Appropriate in-housekeeping, sanitary and solid waste management practices should be adopted

Land Use	-1p	+2p	The prices of the land will be enhanced due to availability of facilities including accommodation, market places and hospitals as well as provision of amenities in the region such as electricity, drinking water supply and sewerage system, etc.
Air Resources			
Air Emission	-1p	-1p	Proper tuning of vehicles should be done on the regular basis in order to control the air pollution Avoid unnecessary movement of the trucks carrying raw-materials Avoid excavation and filling activity on the windy days Impact can be minimized through a management program which ensure dust will be controlled by regular watering the dusty areas Regular water sprinkling may be done to control the dust generation
Noise	-1t	-1t	The noise being generated is within the PEQs limit but it can be further mitigated by properly tuning the machinery and automobiles. The noise related activities should be done during the day time to ensure minimum disturbance to the local community Proper tuning of the vehicles should be done on the regular basis, so that the noise level will be reduce up to the acceptable limits Construction activity will be confined to the small reserved area
Water Resources and Wastewater Management			
Water Resource	-1p	-1p	The capacity of the toilet tanks in the public and private buildings should be reduced in order to conserve water Wastewater will be discharged in TMA Drain after treatment

B : Ecological

Flora			
Vegetation	0	+2p	Trees will be planted along the boundary of the Project Area, parks and in the boundaries of parking zone.
Fauna			
Wildlife	NA	NA	No impact on the fauna and its habitats are foreseen as the Project Area is located in agricultural cum residential zone
C: Socio-Economic			
Transportation	0	0	Strict speed limit for the movement of vehicles should be regulated Avoid unnecessary movement of the vehicles Enforce traffic rules with true spirit
Employment	+1p	+1p	During this phase, skilled and unskilled labor will be required. Employment opportunities for the un-skilled workers will therefore increase which will enhance the positive benefits for the local people who are in dire need of income for sustenance. Indirect opportunities for employment will arise from the provision of services to the construction teams, such as sale of raw-material such as cement, bricks, sand etc., as well as food and beverages for the labor and after completion of construction phase serve as a permanent business opportunity.
Aesthetic	-1t	2p	The aesthetic of the area will be disturbed on the temporary basis during the construction phase The housing society adds to the beauty of the area as green belts are developed
Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible ***All adverse environmental impacts except natural calamities are manageable easily by implementing EMMP***			

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8.4 Environment Management Plan

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

Table 8-2: Proposed Mitigation Actions

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
Construction Phase					
1.	**Air Quality** – Dust resulting from construction – Use of heavy machinery can generate exhaust and dust emissions – Dispersion of particles from stockpiles during high velocity wind – Smoke from burning of waste materials or burning of firewood in the labor camp	Compliance with prescribed PEQS to control air pollution	– Necessary measures like sprinkling of water on regular basis especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. – Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion – Periodic maintenance and management of all the machinery and vehicles – Cutting and burning trees / shrubs for fuel will be prohibited. Instead gas cylinders should be used in the labor camp for cooking purposes. Similarly waste burning will not be allowed.	Construction Contractor with coordination of Proponent	Proponent/ EPA

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2.	**Water Quality** □ Run-off water from construction area – Drainage of wastewater on ground can contaminate the soil and groundwater. – Inappropriate disposal of waste. – Open sewerage water disposal on land can contaminate ground water and cause generation of mosquitoes and various other insects in the area. – Leakage of oil and chemical materials from construction	□ Control of groundwater or surface water pollution from construction activities	– Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater – Maximize the use of treated waste water on site (e.g. sprinkling purpose to control dust) – Proper disposal of waste material on dumping sites to avoid leachate generation and contamination of groundwater – Prohibit illegal dumping of waste – The contractor will repair / replace / compensate for any damages caused by the Construction activities to the drinking water source/s. – Regular water quality monitoring according to determined sampling schedule;	Construction Contractor with coordination of Proponent	Proponent/ EPA

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3.	**Waste** – Waste from construction activities – Domestic waste from workers	– Proper & safe handling and disposal of construction related waste – Compliance with applicable waste management rules for hazardous and non-hazardous waste disposal – Implementation of waste management plan	– Ensure prevention of inappropriate disposal of waste material – Conduct separate collection of construction and domestic waste to promote recycling and re-use – Ensure maximized use of construction debris on-site to fill excavations etc. – Dispose non-recyclable and hazardous waste material properly according to waste management rules – Proper disposal of waste on agreed site as per agreed method. The area to be leveled and contoured after disposing excess material. No waste or debris will be thrown in the river or other water bodies – Contractor will prepare waste management plan related to construction activities; get its approval from proponent and ensure its full implementation	Construction Contractor with coordination of Proponent	Proponent/ EPA
4.	**Noise** – Noise caused by construction machinery and vehicles used for mobilization of equipment and workers	– Compliance with prescribed PEQS to control Noise pollution	– The contractor will strictly follow the PEQS for ambient noise – Control noise through control of working hours and selection of less noisy equipment. – Prohibit use of pressure horns – Provision of acoustic enclosures (hoods and shrouds) on generator – Proper maintenance of vehicles and construction equipment. – The personal protective equipment (PPE) will be provided	Construction Contractor with coordination of Proponent	Proponent/ EPA

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

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

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Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
		condition prior to the commencement of the work or to a condition agreed with the project management and landscaping of the site	– Care will be taken during handling and disposal of waste. . – Avoid mixing of hazardous waste with non-hazardous waste. – Safe transportation of construction equipment from the site. – Empty/available space will be covered with grassy lawns & ornamental plant species like roses, jasmine, and seasonal flowers		
Operational Phase					
1.	Air Quality Deterioration	Compliance with Ambient air quality (PEQS) standards for control of ambient air pollution	– A waste collection system must be put in place to remove waste regularly and disposing it at designated disposal sites. – Odour will be reduced by developing a green belt.. Herbs (Mentha spicata, the common name is Mint or Podina.) would also be used for counteracting odour	Project Manager	Project Proponent/ EPA

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2.	Water Quality □ Wastewater/ Sewerage	□ Compliance with Wastewater standards	– Sewerage after due treatment will be discharged to MC disposal station Peer Murad – Adequate disposal system shall be made available and maintain the sewer lines both on site and off site. – Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer.	Project Manager	Project Proponent/ EPA
3.	Waste □ Municipal Solid Waste	– Compliance with waste management rules – Prevention of inappropriate waste disposal	– Implementation of waste management program consisting of reduce, reuse and re-cycling of materials – Systematic collection and protected storage of waste – Wastes like paper, plastics, wood, fused bulbs, fluorescence electric tubes, rags, plastic and metal cans, glass articles shall be sold in the market for reuse. – Prohibition of dumping of any contaminating material	Project Manager	Project Proponent/ EPA Punjab
4.	Noise & Vibration □ Noise and vibration from generators & water pump	□ Compliance with prescribed PEQS to control Noise pollution	– No activity producing extra ordinary levels of noise will be allowed – Adequate basis & enclosure of generator & water pumps to reduce the vibration & noise – Standby generator shall be curtailed within the limiting values of the Punjab Environmental Quality Standards.	Project Manager	Project Proponent/ EPA Punjab

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5.	Environment quality enhancement measures: – Flowers and plants and trees – Aesthetic beauty of the buildings and the area	Enhanced land value and scenic beauty of the area	– Plantations in and around the proposed facility must be carried out. – Fountains or other such aesthetic measures must also be taken into consideration in order to increase the beauty of area. – All other necessary measures shall also be taken to maintain standards of cleanliness so that the buildings may add to the scenic/aesthetic beauty of the area around.	Project Manager in close liaison with project proponent	Project Proponent/ EPA Punjab

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8.5 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.

Table 8-3: Environmental Monitoring of Construction Phase

Components	Objective of Monitoring	Parameters to be Monitored	Measurement	Frequency	Location	Responsibility
Noise Levels	To determine the effectiveness of the noise abatement measures on the sound level	Noise level on the site and adjacent area on dB(A) scale	Noise level reading will be Taken	Twice during construction	At least two locations on the scheme boundary	Environment Officer /manager
Waste Collection, Storage and Disposal	To check the availability of Waste Management System and Implementation	Inspection of Waste Generation, collection, Storage and Disposal at site	Visual inspection	Once daily	Construction site	Environmental officer/manager
Soil contamination	To determine the effectiveness of the control measures taken to minimize the spillage of oil and chemicals	Inspection of equipment and vehicles so that they may not affect the quality of soil.	Visual inspection and availability checks	Monthly inspection	All vehicles and equipment in use at construction site	Contractor/Environmental officer

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Workers safety	To check and evaluate the effectiveness of the workers' safety plan	Injuries and accidents	Recording injuries	Daily	Onsite	HSE/Contractor

8.6 ROLES & RESPONSIBILITIES OF ENVIRONMENT MANAGEMENT TEAM

The organizational structure for the Environment Management Plan is outlined below:

8.6.1 Primary Responsibilities

The primary responsibility for implementing EMP lies with the owner of project.

8.6.2 Operation Management & Control

Conducting the operational activities in environmentally sound manner will be the responsibility of the concerned Manager; for which he will be trained.

8.6.3 Supervision & Monitoring

Senior Supervisor will be responsible for all environmental issues and for the implementation of EMP.

8.7 REPORTING & REVIEWING PROCEDURES

An effective mechanism to store and communicate environmental information during the project is an essential requirement of an EMP.

8.7.1 MEETINGS

Two kinds of environmental meetings will take place during the project:

- Kick-off meetings
- Weekly meetings

The purpose of the kick-off meeting will be to present the EMP to project staff and discuss its implementation and to discuss any event of environmental significance that has happened in the under-discussion industry or a similar industrial unit to investigate its route causes and develop its solutions.

The purpose of the weekly meetings will be to discuss the conduct of the operation and environmental issues and their management. The proceedings of the meeting will be recorded in the form of a weekly environmental report.

8.7.2 CHANGES-RECORD REGISTER

A change-record register will be maintained at the site, in order to document any changes in project design. These changes will be handled through the change management mechanism.

8.8 Training Schedules

To enhance the capacity of the Proponent/EA as well as the Contractor, training will be imparted related to the environmental and social issues of the project implementation of mitigation measures, the monitoring protocols and reporting mechanism. Project will ensure in-house training for the project staff, contractor and the supervisory staff of the Proponent/EA and the Consultants through the provision of one day basic training and one day advanced training, covering environmental and social aspects of the development

projects in general and implementation requirements will emphasis on the development

projects in general, implementation requirements with emphasis on the roles and responsibilities of the Proponent/EA and the Contractor staff while executing the environmental monitoring plan in particular. The training protocols will include the following aspects:

- Procedures for monitoring the air quality parameters and measures to be adopted for avoiding or minimizing air pollution, particularly from the concrete batching plant and haul-trucks, etc.
- Procedures for monitoring water quality parameters and measures to be adopted for avoiding or minimizing water pollution, particularly from the wastewater effluent generated from the raw-material preparation, machinery washing yards and other obnoxious chemicals whose leaching can deteriorate the quality of the ground water resource
- Safe waste disposal practices to manage the generated solid waste during the constructional and operational phases
- Safe noise levels from the operation of the construction machinery during the constructional as well as operational phase.
- Safety measures against hazards for workforce and the local communities arising from the construction activities
- Use of safety equipment and gadgets by non-skilled workers

Environmental Training Program

Target Audience	Trainers	Contents	Schedule
Wastewater plant employees	3rd party	Wastewater Treatment Plant management	Biannually
Site office staff	3rd party	Fire Fighting (Training/drill)	Biannually
Solid Waste Management	3rd party	Solid waste collection and disposal in earmarked area	Regularly

8.9 Environmental Budget

Approximately PKR 50 thousand budget will be reserved for ambient air, ground water and wastewater monitoring and 5 lac for plants/greenery maintenance. Approx. 0.6 million will be reserved for wastewater treatment plant.

Table: Breakdown of Environmental budget

Amenities	Cost in PKR	
Ambient air monitoring	15,000/-	50 thousand
Noise monitoring	5,000/-	
Water quality monitoring	10,000/-	
Tree Plantation/Green Belts maintenance	20,000/-	
Tree plantation	5 lac	
Wastewater Treatment	0.6 Million	

9 STAKEHOLDERS CONSULTATION

9.1 SOCIOECONOMIC SURVEY AND PUBLIC CONSULTATION

For ascertaining the perceptions of different stakeholders about the project, meetings were held with them. These meetings were held in an open atmosphere, in which participants expressed their views freely. Informal group discussions were also held as an additional tool for the assessment of the perceptions of the stakeholders.

Public Consultation was carried out for a day. Socio-economic survey forms are attached as Annexure-XII with EIA report.

List of people consulted

Name of individuals	Feedback
Abdullah	Environmental Enhancement measures should be taken
Muhammad Yasir	Tree plantation should be ensured
Zain Shahid	Green residency and comfortable environment should be provided
Adil	Affordable residence should be ensured
Muhammad Zeeshan	Waste management should be done properly
Shahzaib	Local people should be preferred for employment opportunities

Awareness Regarding the Project

Out of total 10 respondents, 56% knew about the project whereas 44% were not aware of the project planning and implementation.

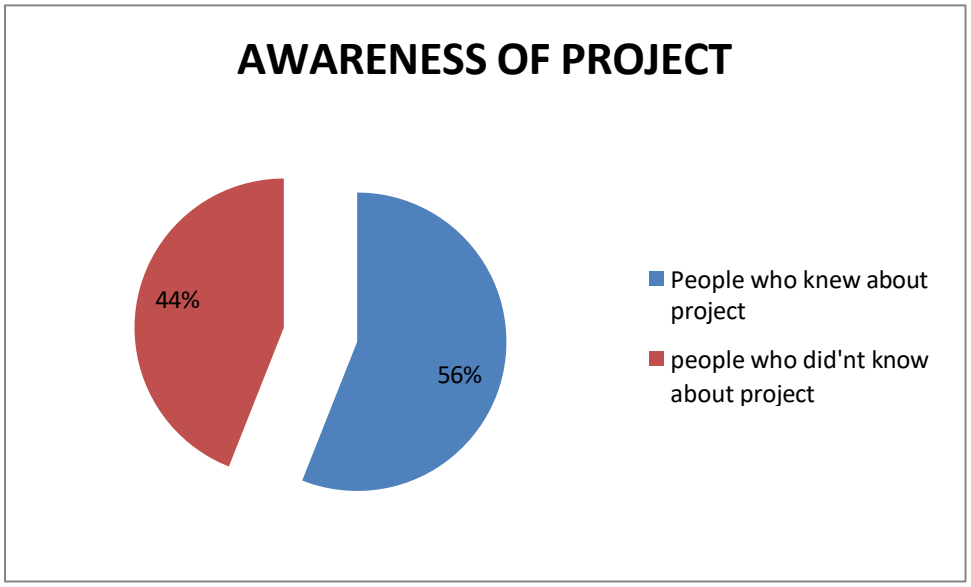

Figure 9-6: Awareness of project

Acceptability of the Project

Majority of the respondents, 99% favored the construction of the project keeping in view its importance. People had following comments regarding project:

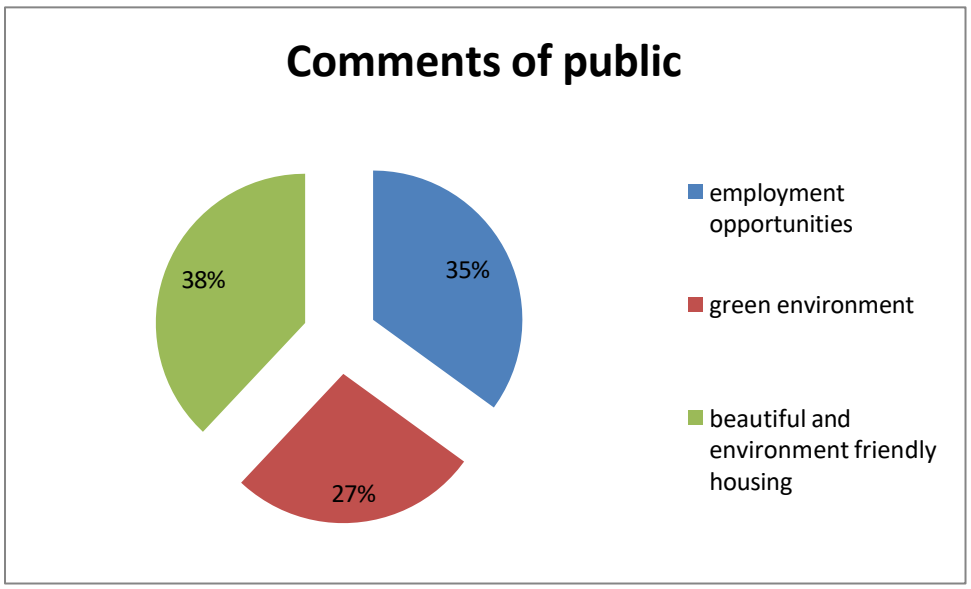

Figure 9-7: Comments of public

Concerns and solutions:

COMPONENTS	CONCERNS	SOLUTIONS
Environmental Enhancement	Trees should be planted to avoid any impact	Trees will be planted along boundary of project Indigenous tress around the facility should be planted to control air pollution
Socio-Economic Uplift	Workers should be hired from local community	Proponent has considered hiring labor from local community to enhance the socio-economic condition of the area as this aspect is included in the scope of the project.
Affordable Living	Residency should not be expensive	Proponent is concerned about the socio-economic condition of the area. The plots will be available and in range for middle class as well.
Solid Waste	Proper disposal of solid waste should be practiced	A designated area have been planned to establish in the society for the collection of solid waste. Solid waste will be disposed of regularly from the site as per practice.

9.2 Stakeholders Consultation

S#	Participant	Designation	Concerns/Remarks
Responsible Authority			
1	Mr. Muhammad Babar Khan	Assistant Director Environment	• Environmental enhancement measures such as; Tree plantation, monitoring and safety should be ensured • WWTP should be installed • Preventive measures should be adopted to avoid any unfortunate incident • Tree plantation must be ensured
Other Departments			
1	Raja Azhar Hayat	Forest Department	• There is no endangered/indigenous species • However, plantation should be done to enhance environment
Proponent's Environment Management Team			
1	Mr. Asif Mr. Fahad	Proponent Environment Manager	• Local employment will be ensured during construction phase • Tree plantation will be done to make project environment friendly • No waste will be dumped improperly Quality will be ensured ETP will be installed and operated
Environmental Practitioners and Experts			
1	Dr. Muhammad Faqir Irfan	PhD. Environment Lawyer	• Health and safety arrangements must be provided • All type of waste should be managed to avoid nuisance
Affected and Wider Community			
1	Mr. Khurram	NGO (Parho Barho Punjab)	• Local employment should be ensured • Proponent shall work for betterment of community

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10 CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

The report presents Environmental Impact Assessment of the Establishment of housing scheme. Its main objective is to provide people with clean and green environment to live a comfortable life.

EIA of Project is performed according to guidelines of EPA. It includes description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study.

The performed EIA showed all anticipated impacts (both positive and negative), associated with the project. Appropriate mitigation measures as explained in the environmental study shall reduce, if not eliminate, these impacts so that these are within acceptable limits. Moreover, no deterioration, depletion or exploitation of local natural resources is expected to be caused by this project.

Based on overall assessment of the environmental impact of the project, it is concluded that the project is not likely to cause any significant adverse impact on the social, physical and biological environment of the area, provided that suitable mitigation measures as identified in this study are implemented.

It is accordingly recommended that Environmental Approval for the project may be issued by the Punjab Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponent of the project.

10.2 Recommendations

The Environmental Impact Assessment study and survey results are finally evaluated to recommend the following:

- Implementation of EMP must be given top priority.
- During construction phase Create environmental awareness amongst the workers by training.
- Provide guidance to workers on use of PPEs and also make it compulsory for them to use PPEs during construction.
- Installation of fire extinguishers in the premises.
- Use of equipment with low operating noise levels within PEQS limits and regular monitoring of machines used during construction phase.